DRESSER Masoneilan

Instructions
EW1003-ESD Rev. A
01/09

ValVue®-ESD

Digital Communications Software Designed Exclusively for SVI® II ESD

Warranty

Items sold by Dresser,® Inc. are warranted to be free from defects in materials and workmanship for a period of one year from the date of shipment provided said items are used according to Dresser recommended usages. Dresser, Inc. reserves the right to discontinue manufacture of any product or change product materials, design or specifications without notice.

This instruction manual applies to the following instruments and approved software: SVI® II ESD PST Controller and ValVue® ESD software.

The SVI II ESD series positioners are warranted for use only with interface software approved by Dresser, Inc. Consult Masoneilan Dresser factory locations for approved software listing.

About this Guide

This Instruction Manual applies to the following instruments and approved software:

SVI II ESD

- with Firmware version
- with ValVue ESD version 1.0 or greater
- with Model HH375 HART® Communicator with DD published for SVI II ESD

The information in this manual is subject to change without prior notice.

The information contained in this manual, in whole or part, shall not be transcribed or copied without Masoneilan's written permission.

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ValVue ESD Overview

Masoneilan's ValVue ESD Software is a Human-Machine Interface (HMI) software tool that provides a powerful interface to Masoneilan's SVI II ESD, the Model 12300 Digital Level Transmitter (DLT), and other HART instruments used in a Safety Instrumented System (SIS).

ValVue ESD is used to configure, calibrate and perform partial stroke testing and valve diagnostics with the SVI II ESD utilizing HART communications protocol.

Using ValVue ESD you can:

- Monitor SVI II ESD Operation
- Quickly Set Up the SVI II ESD
- Advanced SVI II ESD Set Up
- Calibrate the SVI II ESD
- Configure or Run Partial Stroke Test (PST)
- Check the SVI II ESD Status
- Perform Diagnostics on SVI II ESD

System Requirements

Listed below are the hardware and software requirements for the computer used with ValVue ESD:

Hardware

Processor: PC with minimum 1 GHz Intel Pentium or compatible

RAM: minimum 1gigabyte

Disk: Depends on product

Product	Application Component	Database Component	Total Installation Size
ValVue ESD	15M	30M minimum*	45Meg
PRM Central ValVue ESD	15M	30M minimum*	45Meg
PRM PLUG-IN ValVue ESD	15M	N/A	15Meg

* Assuming 100 devices, 1 PST/month for 5 years

Software

OS:	Windows 2000, Windows XP SP2 Window Server 2003 with Service Pack 1 or Window Server 2003 R2
PRM:	PRM R3.x

Note: *PRM is NOT required for Standalone installations.*

Installing ValVue ESD

ValVue ESD is shipped on a CD with the purchase of an SVI II ESD. To installl ValVue ESD software:

1. Insert the CD into computer CD drive.
2. The CD browser will launch, as shown in Figure 1 on page 2.
3. Select "INSTALL STANDALONE EDITION".
4. If installing the PRM version, select "VIEW YOKOGAWA PRM EDITION".
5. Installation will run automatically.

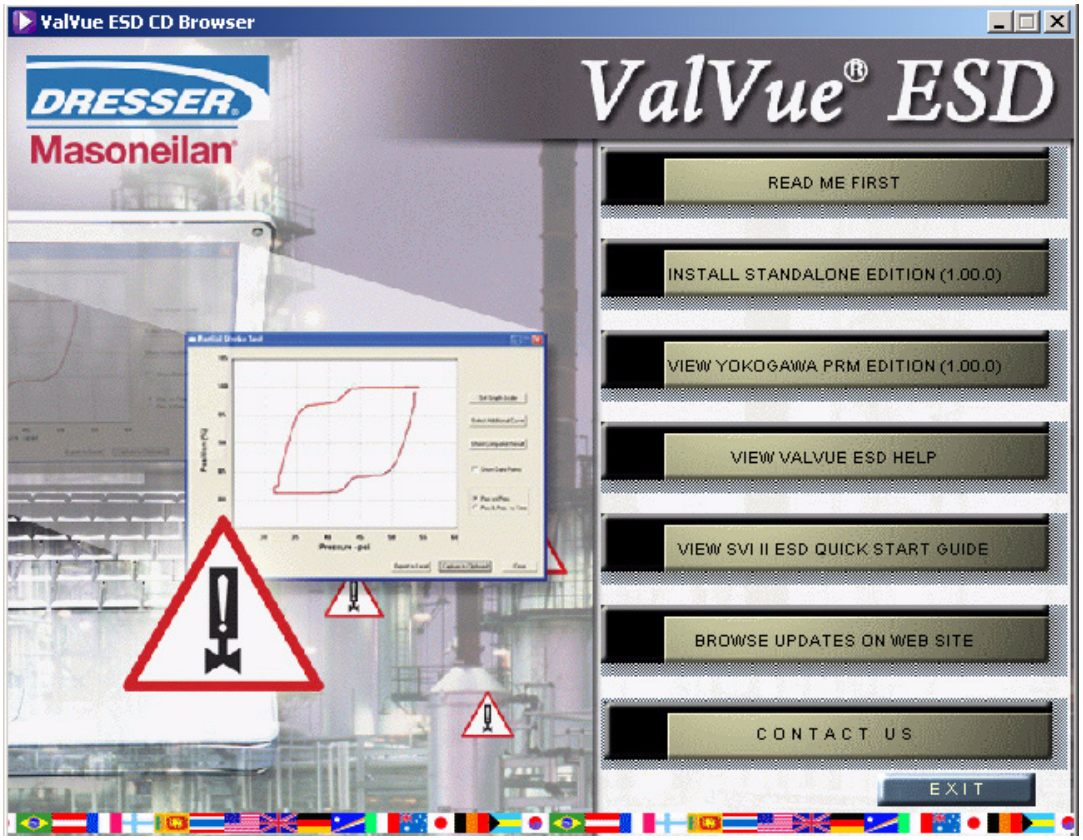


Figure 1 ValVue ESD CD Browser

PRM PLUG-IN ValVue ESD Warning

Listed below are warnings pertaining to the installation of the PRM PLUG-IN ValVue ESD.

PRM Multi-Server

Please note that because of the connection with the database and Central ValVue ESD, the Multi-Server switching feature, available on the PRM client, is not allowed.

PRM PLUG-IN ValVue ESD Installation Folder

As mentioned in installation instructions, the PlugInValVue ESD application must be installed to the same drive and folder on every machine

Registering ValVue ESD

When you start ValVue ESD for the first time the registration window launches. ValVue ESD software must be registered to activate the permanent installation. ValVue ESD can be used without registration for 60 days. (Registration allows Masoneilan to keep track of all of ValVue ESD users so that we can notify you of any changes or important information about new software features and updates.) A registration card is included with the installation CD.

The software package contains a serial number. Keep a record of the serial number in a secure location. Do not discard the registration card. To register your software, you must launch the ValVue to obtain an installation ID number, then contact Masoneilan by mail, telephone, email or Fax, and provide your name, company's name, contact information, the CD-ROM serial number, and the installation ID number from the ValVue ESD login display. Masoneilan contact information is provided on the registration card that is part of the software package.

Your serial number is located on the ValVue ESD package and on the enclosed sticker. Place the serial number sticker on the detachable card included with the Registration Instruction card and store the card in a secure location. You need the serial number to move ValVue ESD to a different computer.

Masoneilan Software Registration Center provides you with software keys that you enter the next time you run the program. Contact Masoneilan for a new software key if you are moving ValVue ESD to a different computer or, if you do not have a serial number.

To register ValVue ESD:

1. Start ValVue ESD either by clicking on the desktop icon or using the Start programs selection.
2. When you start ValVue ESD, the Owner and Product Key registration window appears as shown in the figure below.

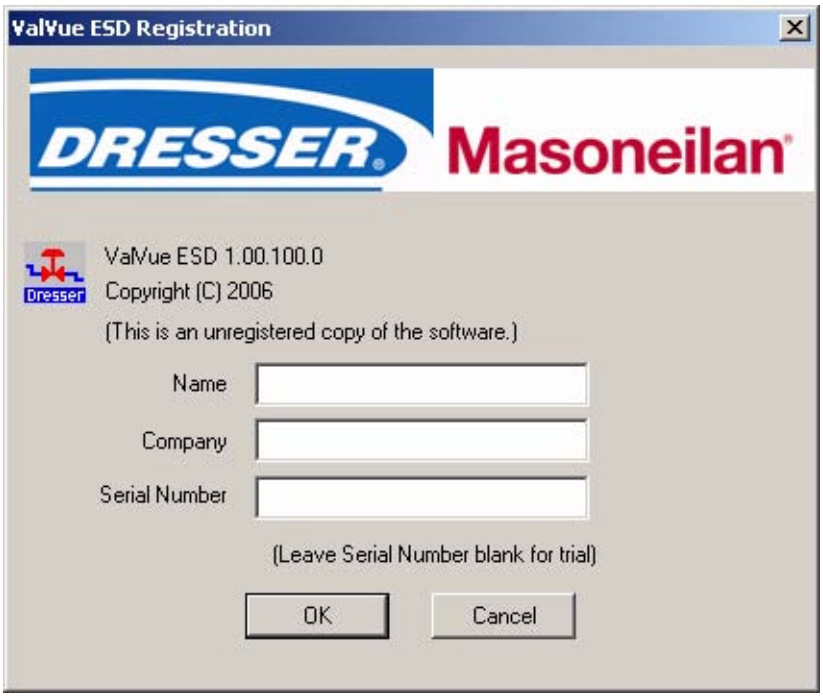


Figure 2 Owner and Product Key Registration Window

3. Enter Name, Company and Product Key information in the registration and click "OK".

Figure 3 Applying Owner and Product Key Information

4. ValVue ESD will launch the software key registration window shown in the Figure below. If you need a software key for the Mux option, click the box next to Mux.

Figure 4 Software and Mux Key Window

5. After selecting optional features, click "Registration".

Figure 5 Launching Registration Window

6. Enter your name and the name of your company. You are now ready to contact Masoneilan with this information, to obtain your software keys.
   There are four methods shown on the Registration Instruction Card:
   - Mail
   - Phone
   - Fax
   - Email

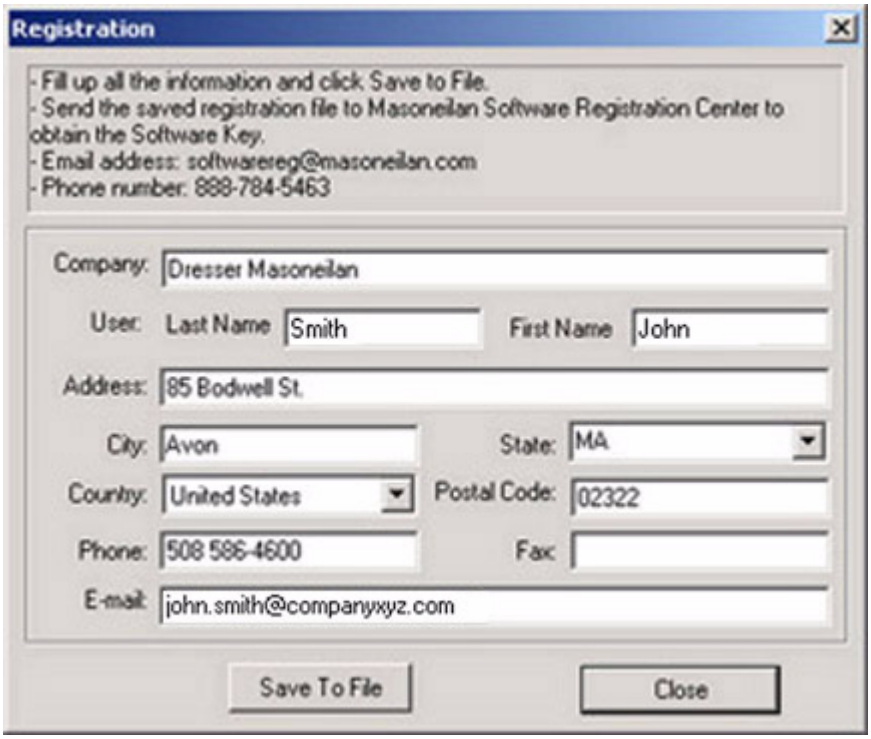


Figure 6 Registration Window

7. Click on "Save to File" in the Registration Window to save your registration file. ValVue ESD. will launch a Windows Browser.
8. Using the Windows Browser, save the registration information in a text file.

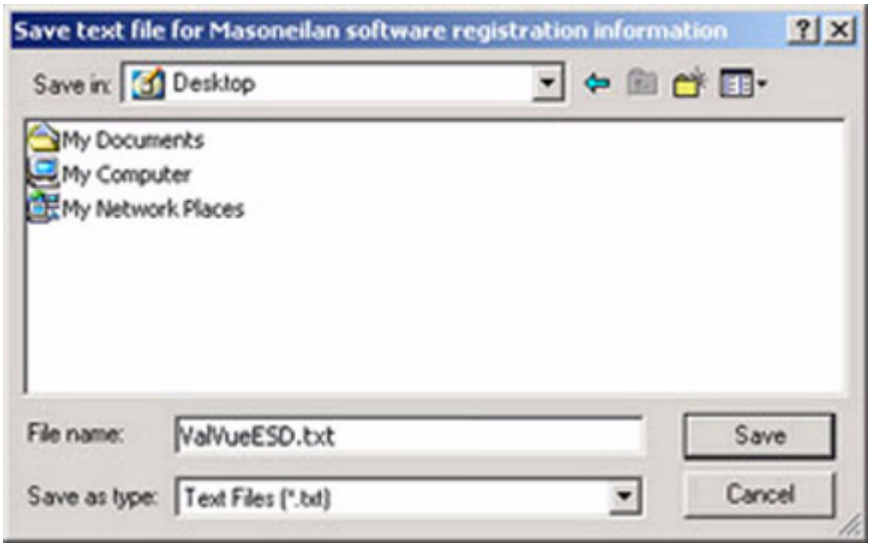


Figure 7 Save Registration Information

9. After you have saved the registration information ValVue ESD will launch the dialog shown in the Figure below. If you would like to email the registration informaton click "Yes".

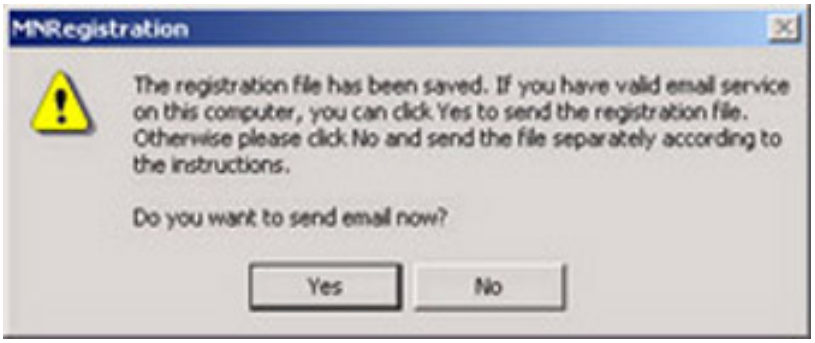


Figure 8 Registration File Saved Dialog

10. When you select email registration info, ValVue ESD will launch your email service and automatically attach the registration and Masoneilan's Software Registration Center. Click "Send" to email the registration.
11. If your email program fails to start, contact the sofware registration center by the email address, phone number, address, or fax number given on the registration card (contained with the ValVue ESD cd).
12. A dialog indicating the email has been sent will be displayed. Click "OK" to close the dialog.

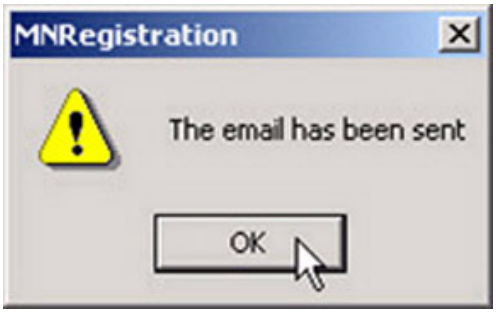


Figure 9 Registration Email Sent Dialog

Entering Software Keys

After you have sent the registration info, Masoneilan will provide you with software keys for ValVue ESD and optional features (when applicable).

Once you have your key to enable the program:

1. Start ValVue ESD.
2. Choose View Registration from the Help menu.
3. Enter the Product Key (if not already entered).
4. Click OK. On the 2nd registration screen, enter the software key returned by Masoneilan.

Figure 10 Entering Software Key

5. If you have the Mux option and need to enter the software key, click on the screen, under the "Unlock Keys" field and the field will become active. Enter the Mux software key.
6. Click on "OK".

Figure 11 Entering Mux Unlock Key

7. When the registration is complete and successful the message shown below will display.
8. Click on "OK" to close the dialog and continue using ValVue ESD.

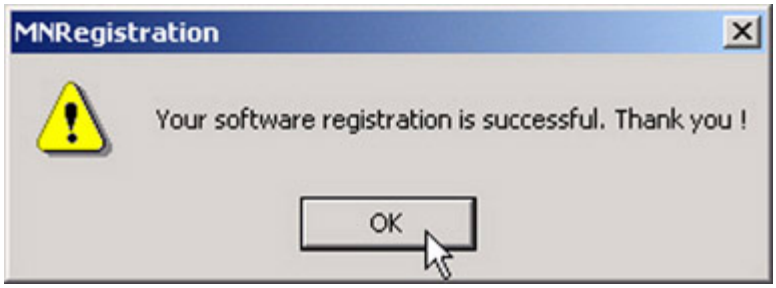


Figure 12 Successful Registration Message

About This Manual

The ValVue ESD Instruction Manual is intended to help a Field Engineer install ValVue ESD, and setup, calibrate, and test an SVI II ESD using ValVue ESD. If you experience problems that are not documented in this guide contact Masoneilan or your local Masoneilan representative. Sales offices are listed on the back cover of this manual.

This manual is organized as follows:

Section 1	Introduction	Provides installation and registration procedure, and an overview of ValVue ESD features and functions.
Section 2	Getting Started	Provides detailed instructions for configuring ValVue ESD options, editing the plant schedule and information on the Connected Devices Screen.
Section 3	ValVue ESD's Work Environment	Provides an overview of ValVue ESD layout, usage and screens.
Section 4	Monitor	Provides user information on the Monitor Screen, including operation and menu structure .
Section 5	Trend	Provides a live visual of SVI II ESD operation. Also describes functions available on the Trend Screen.
Section 6	Configure	Provides instructions for performing configuration and Setup Wizard procedures.
Section 7	Calibrate	Provides instructions for performing calibration.
Section 8	Diagnostics	Provides information on SVI II ESD advanced diagnostics.
Section 9	PST	Provides information about Partial Stroke Testing (PST), including PST configuration, execution and scheduling.
Section 10	Status	Provides SVI II ESD fault status information.
Section 11	Check	Provides live, operational SVI II ESD data and testing ability; including HART.
Section 12	Advanced Setup	Provides information about custom SVI II ESD setup.

Getting Started 2

Main Window

After you have successfully started ValVue ESD the main window will display as shown below. The window is divided into two tabs:

- Connected Devices - Lists all connected devices in the SIS found during initial scan or re-scan.
- Plant Schedule - Provides access to view next scheduled PST, edit schedule and synchronize devices

Each tab has an associated screen and functions. The Connected Devices Screen is displayed upon startup and lists all scanned, available devices on the selected COM port. When "Load Device List from Database on Startup" option is enabled (see “Using a Device List File” on page 24) ValVue ESD will not re-scan the port.

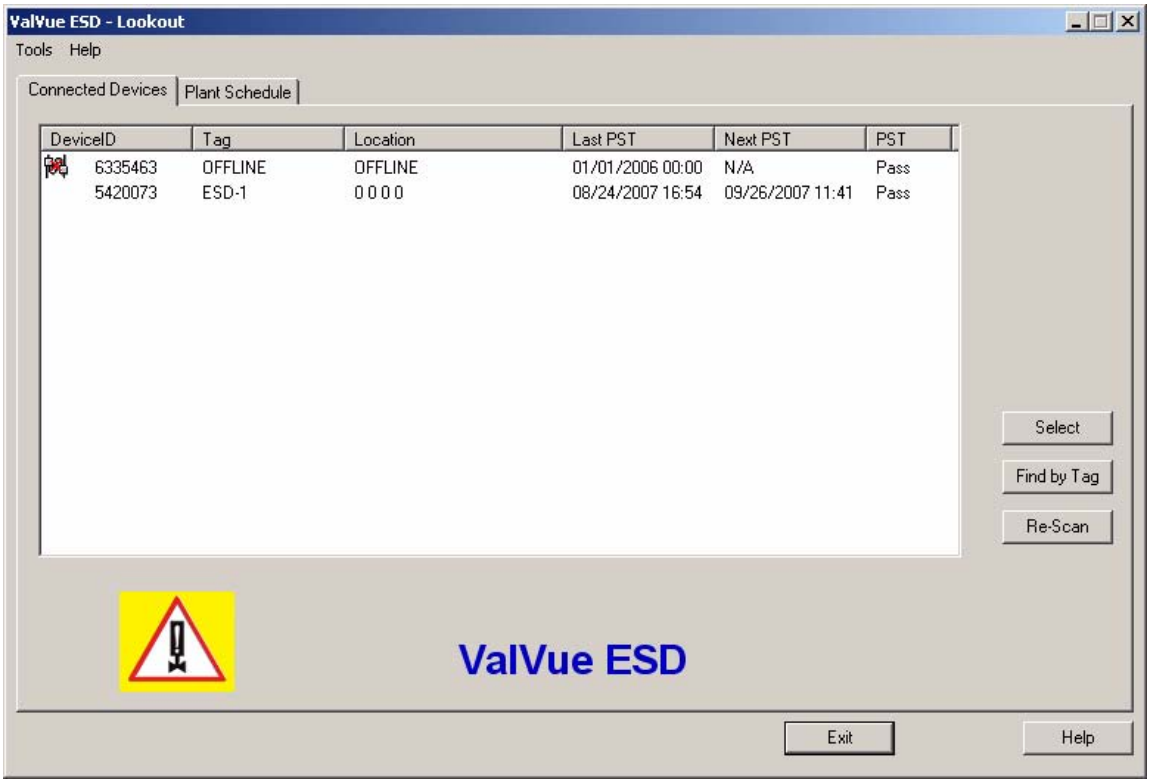


Figure 13 ValVue ESD Main Window - Connected Devices

Connected Devices Icons

When you start ValVue ESD the main window displays the scanned, connected devices and may also display an icon, as shown in the figure below, located to the left of the device name.

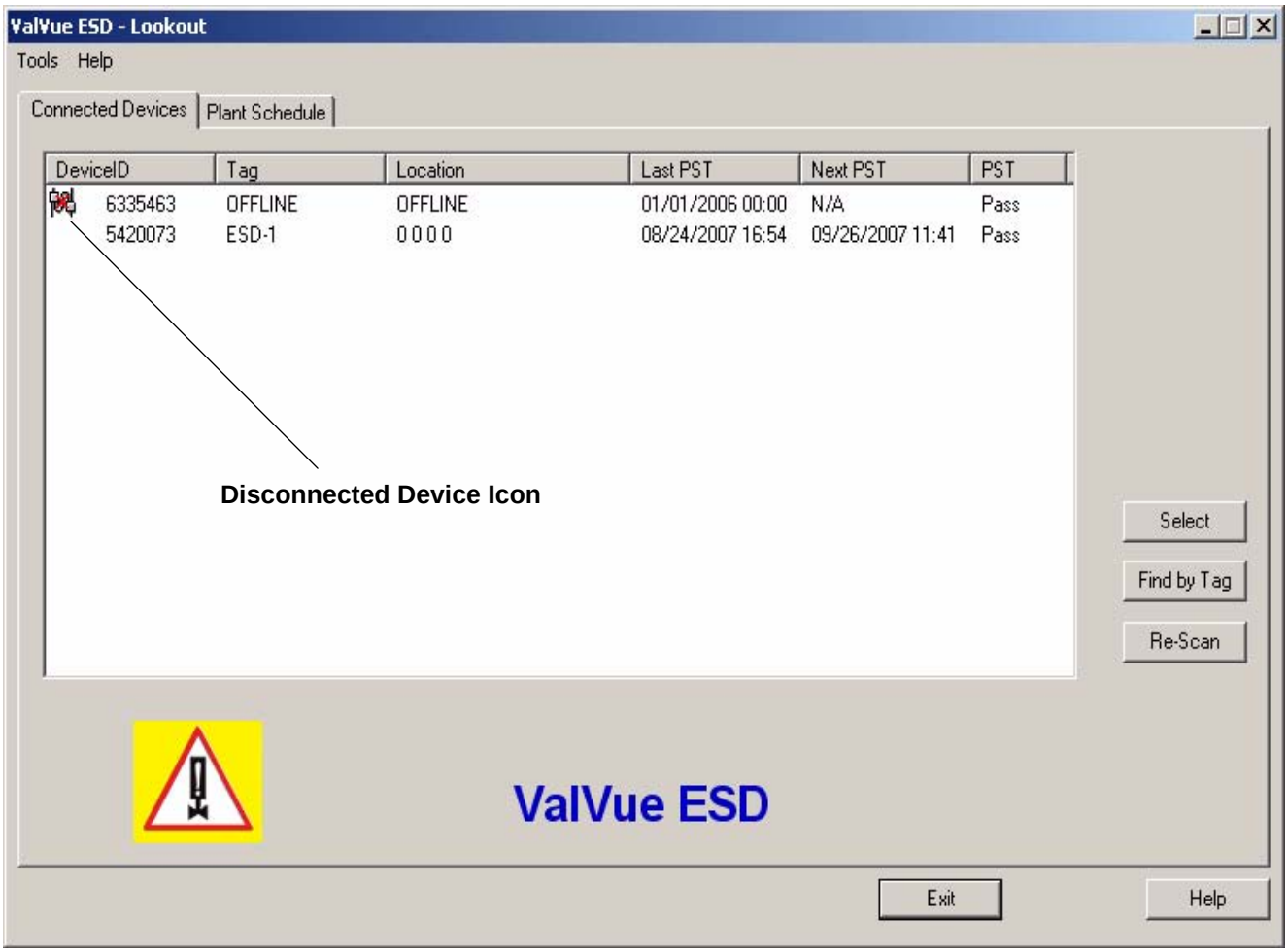
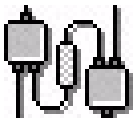
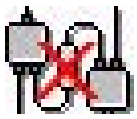


Figure 14 ValVue ESD Main Window with Disconnected Device Icon

There are four icons that can possibly be displayed:



Connected - When this icon is displayed it indicates that the device is connected to the SIS and is available for running ValVue ESD.



Disconnected - When this icon is displayed it indicates that the device is disconnected from the SIS and is only available offline.

Status - When this icon is displayed it indicates that there is more device status information available on the Status Screen.

Unlicensed - When this icon is displayed it indicates that there is no ValVue ESD license available. In this case you will not be able to launch ValVue ESD for the selected device.

Plant Schedule

When you select the Plant Schedule tab the Plant Schedule screen shown below will display. The Plant Schedule tab indicates when the last PST (Partial Stroke Test) was executed and when the next PST is scheduled to occur. You can also edit the plant PST schedule, synchronize the current device, synchronize all devices in the SIS (Safety Integrated System) and export all schedule data to an Excel file.

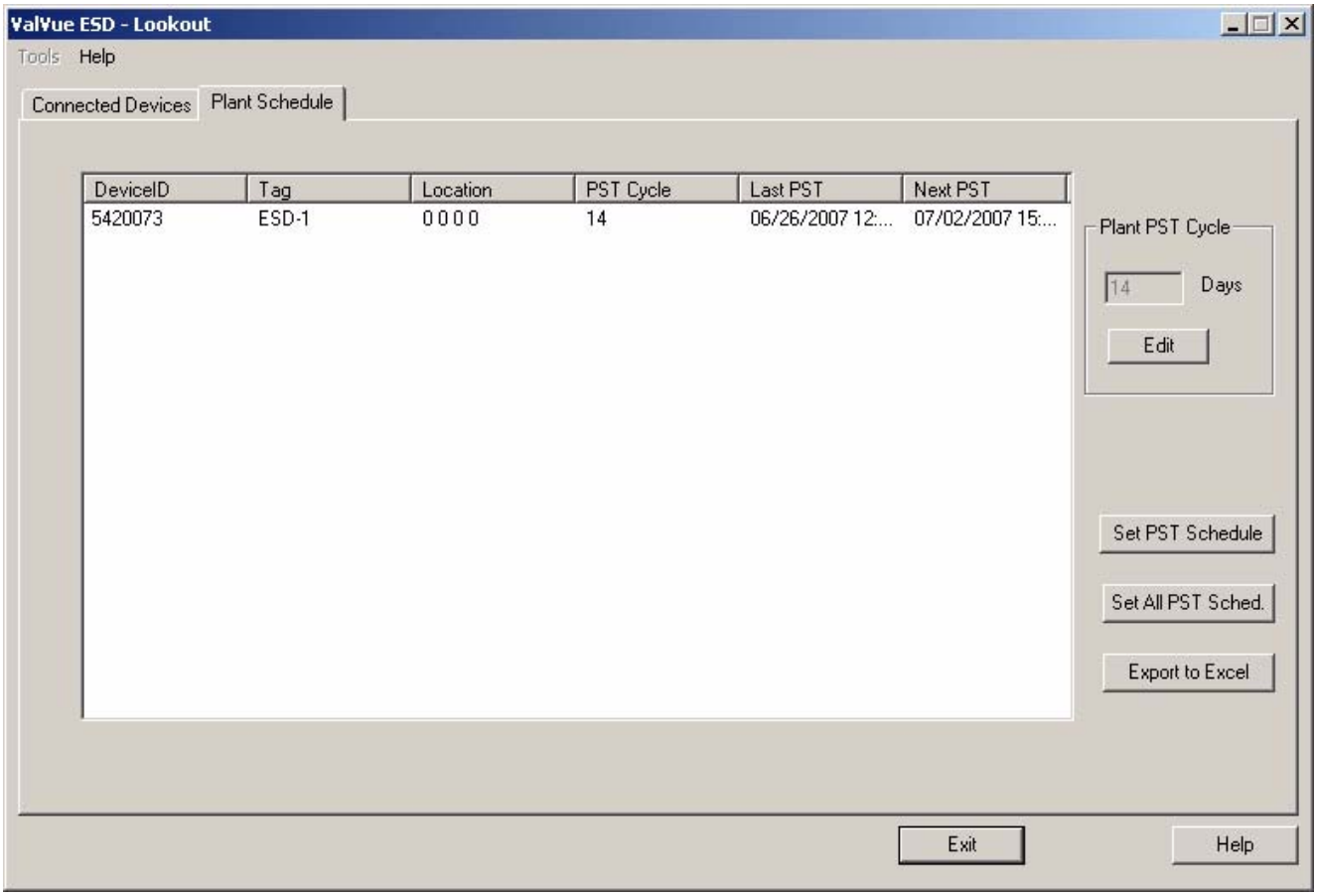


Figure 15 Plant Schedule Screen

Editing Plant Schedule

The Plant Schedule tab in ValVue ESD allows you to edit the schedule for when PST (Partial Stroke Test) is executed for the SIS (Safety Integrated System). You can edit the schedule for an individually selected device or you can edit the PST schedule for all devices connected to the plant.

To edit the plant schedule (for the entire plant):

1. Click on the "Edit" button as shown in the figure below.

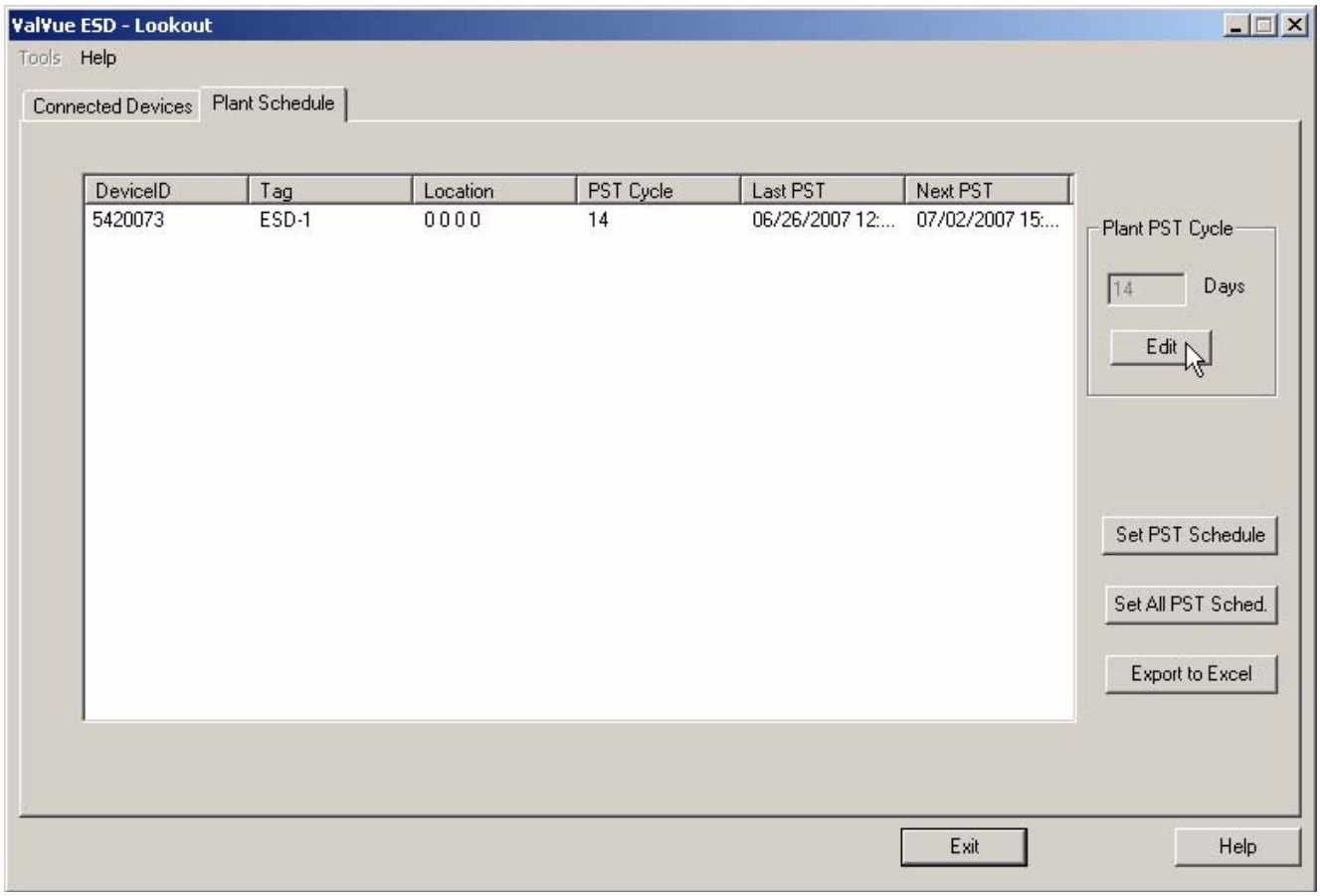


Figure 16 Accessing Edit Function

2. Place the cursor in the "Days" field for Plant Cycle as shown in the figure below.

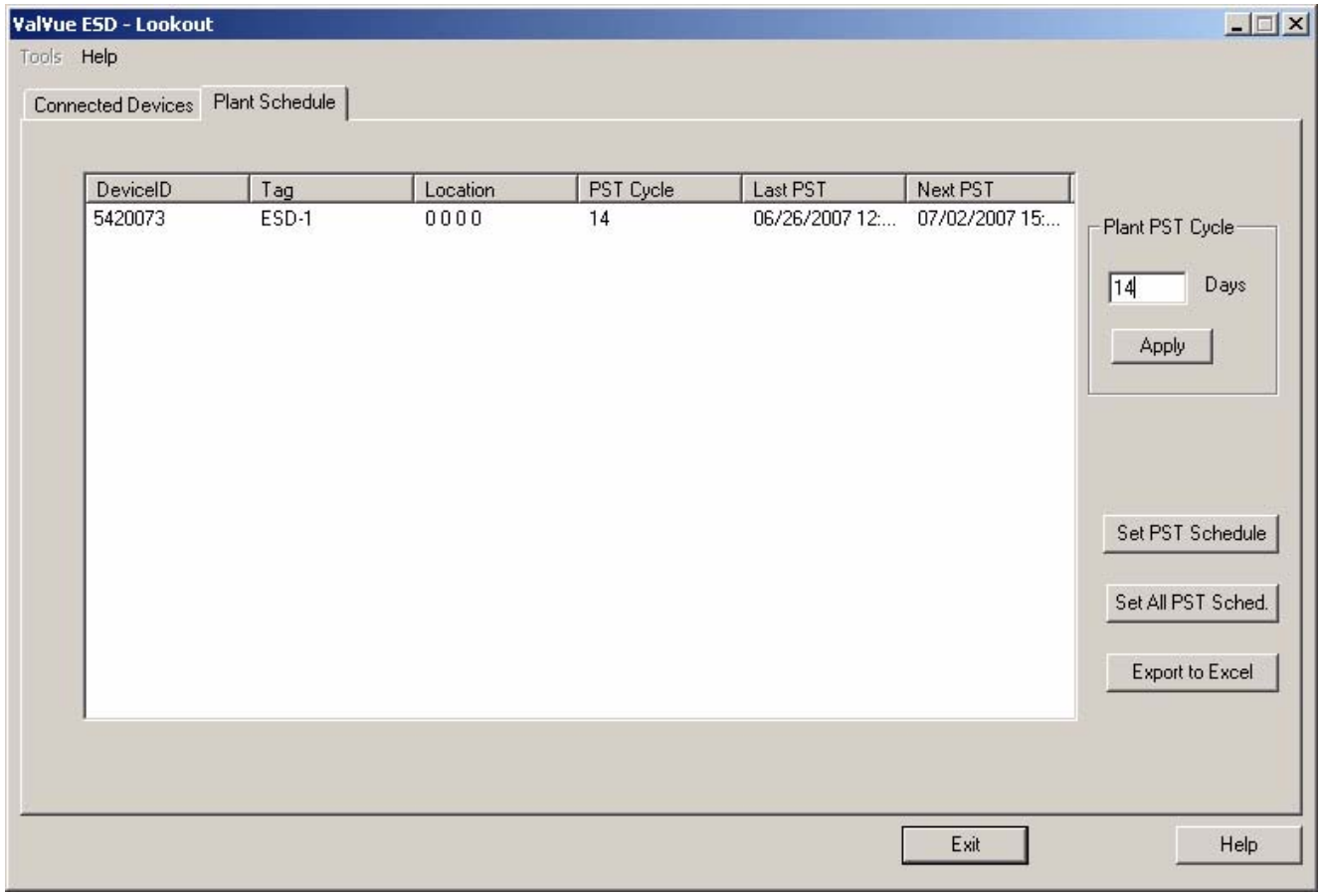


Figure 17 Editing Plant Cycle PST

3. Delete and replace the number of days with the new number of days for the plant cycle.
4. Click on "Apply" to save and apply changes as shown in the figure below.

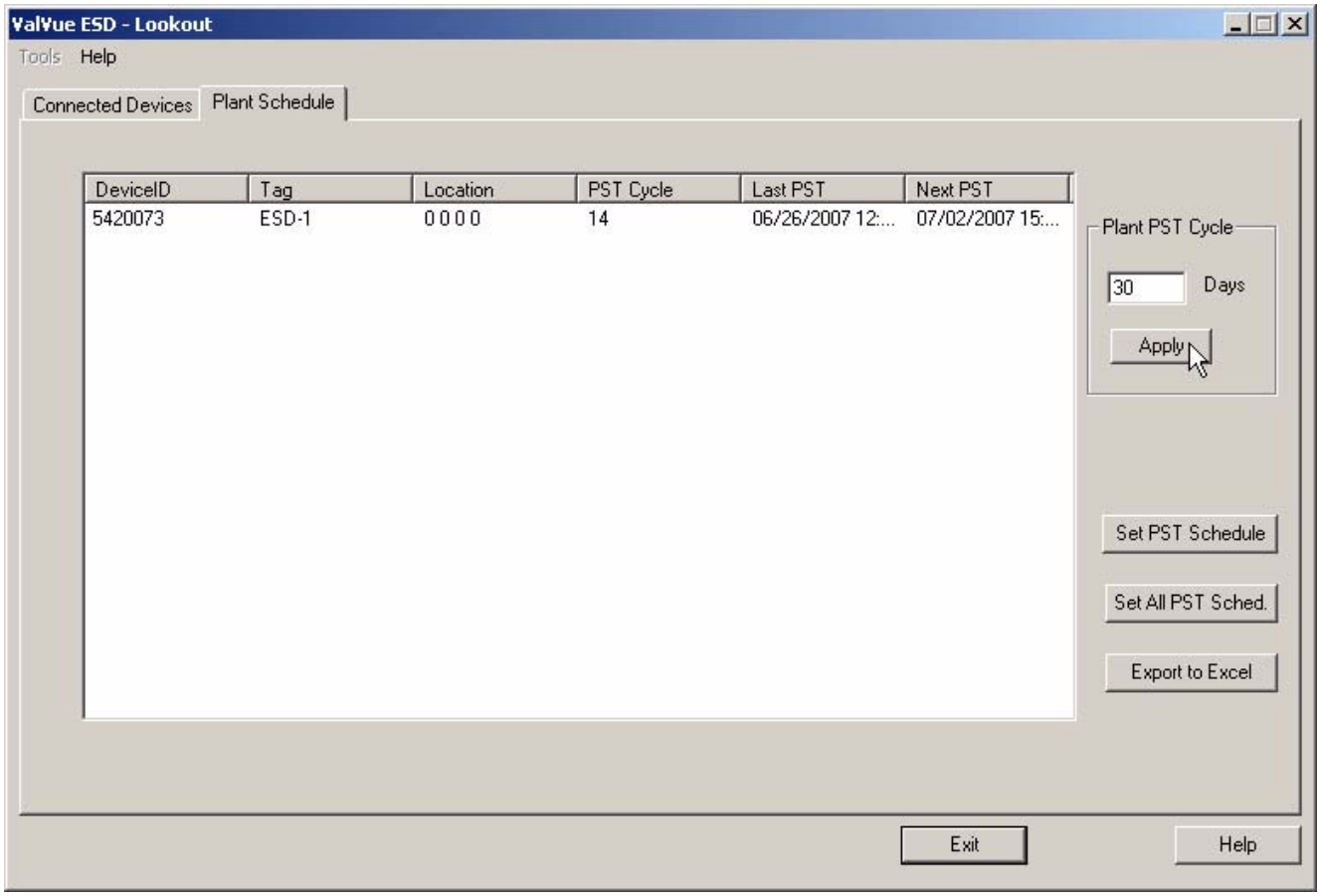


Figure 18 Applying Edits to the Plant Schedule

5. ValVue ESD will issue a warning displayed below, asking you to confirm that you to change the PST schedule for all plant devices.
6. Click on "OK" to save the schedule changes for all plant devices.

Figure 19 Changing Plant Schedule Warning

Editing Plant Schedule for a Selected Device

With ValVue ESD you can also edit the PST schedule for an individual, selected device in the plant.

After you have made edits to the schedule as described above, to change the PST schedule for an individual device:

1. Select the device for schedule update by clicking on the device name as shown below.
2. Click "Set PST Schedule" as shown below.

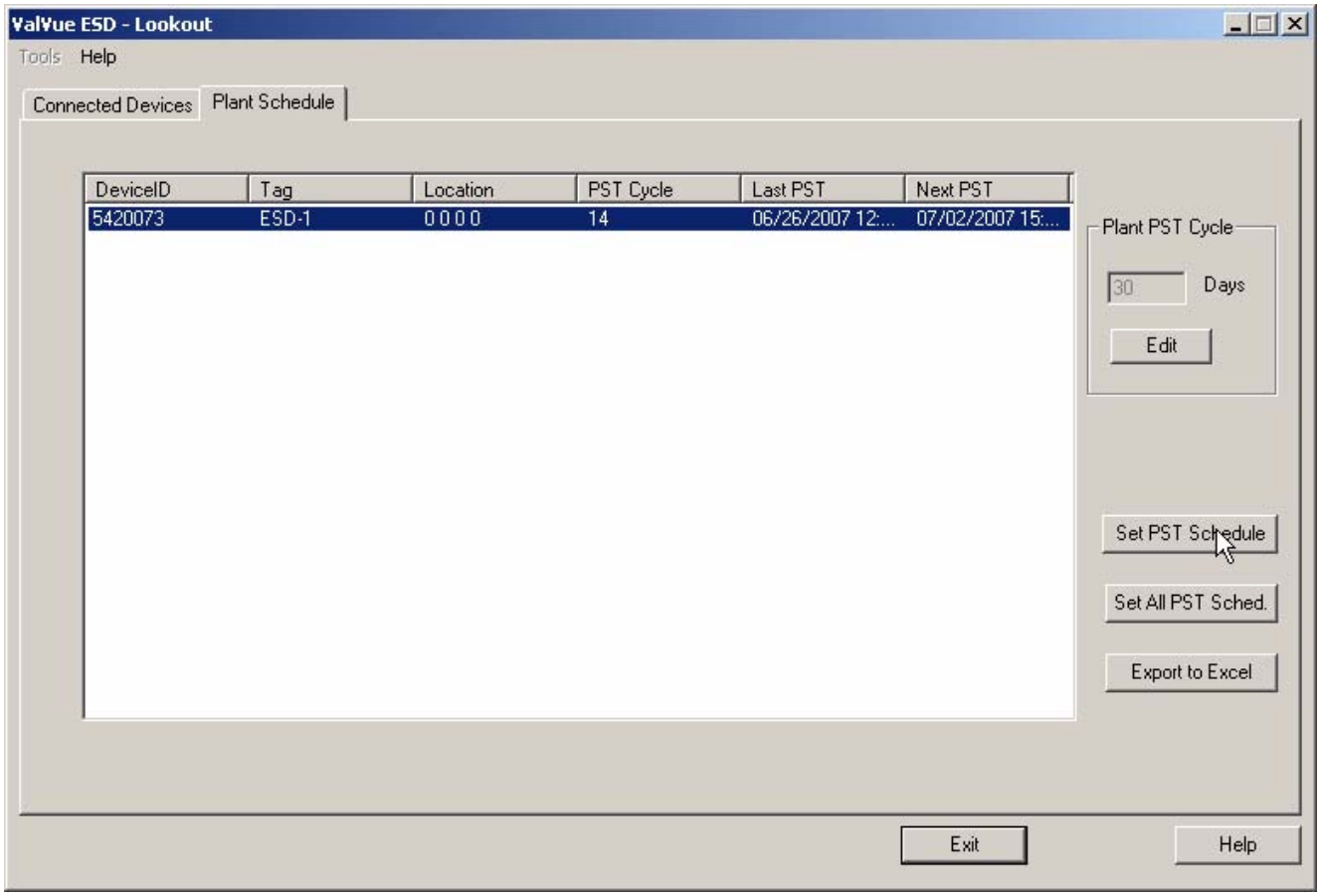


Figure 20 Setting PST Schedule for Individual Device

3. ValVue ESD will issue the dialog displayed below indicating that the new PST schedule for the device has been set.
4. Click "OK" as shown below to close the dialog and return to the Plant Schedule screen.

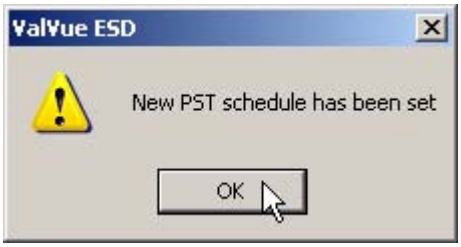


Figure 21 Plant Schedule Set for Individual Device

Export to Excel

ValVue ESD allows you to save or create a comma separated value file (.csv) of the Plant Schedule data and export the file to Excel. With the Excel file you can perform schedule analysis and export the data to other formats. To export a plant schedule to Excel:

1. Click on "Export to Excel" as shown in Figure 22 below.
2. ESDVue will launch Microsoft Excel and display the plant schedule data, as Excel values.

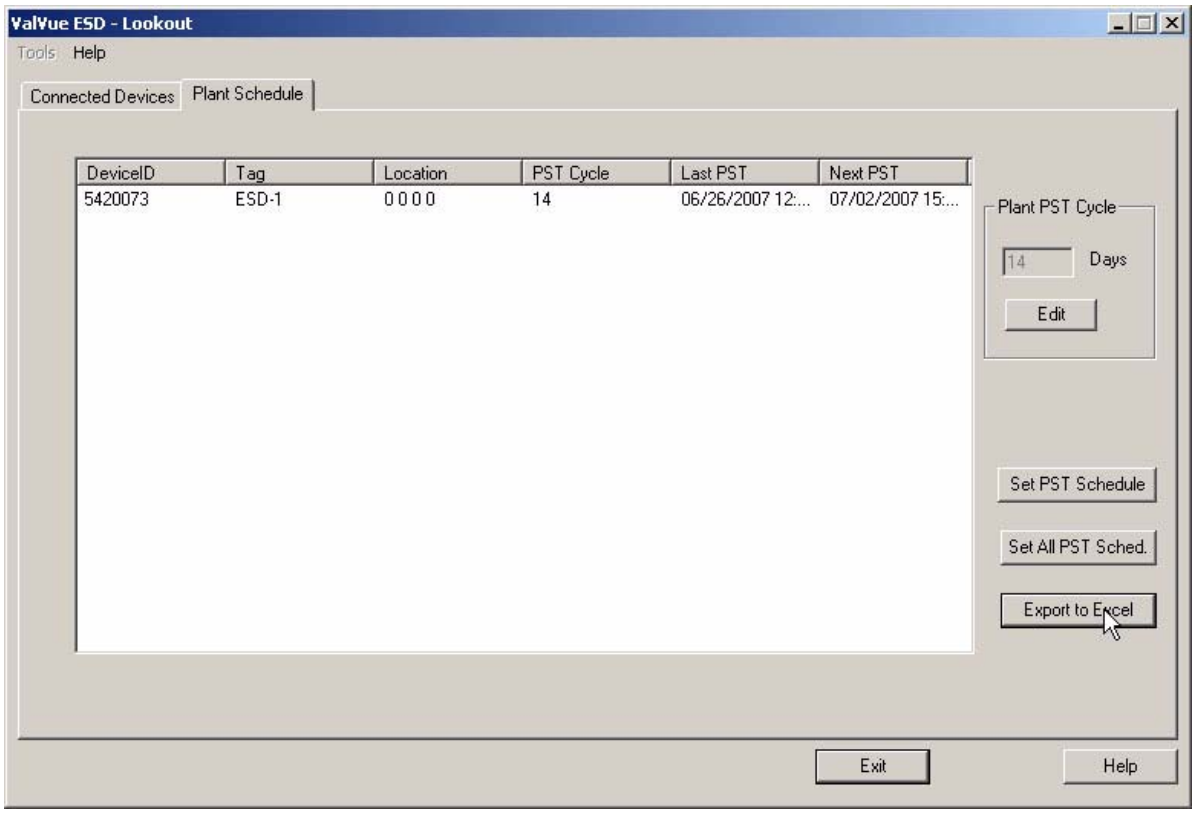


Figure 22 Selecting "Export to Excel"

Connected Devices Help

When you launch Help from the Connected Devices screen, either by clicking the "Help" button at the bottom right corner of the screen, or by selecting "Help" from the Help menu at the top of the screen, ValVue ESD will launch on line help. The on line help will start at the Connected Devices content.

Connected Devices Tools Menu

When you select the "Tools" menu, located at the top of the Connected Devices Screen and shown below, you will have access to the tools necessary to set up the selected device for operation.

See also “Configuring ValVue ESD Options” on page 22 and “Multiplexor Setup and Operation” on page 26.

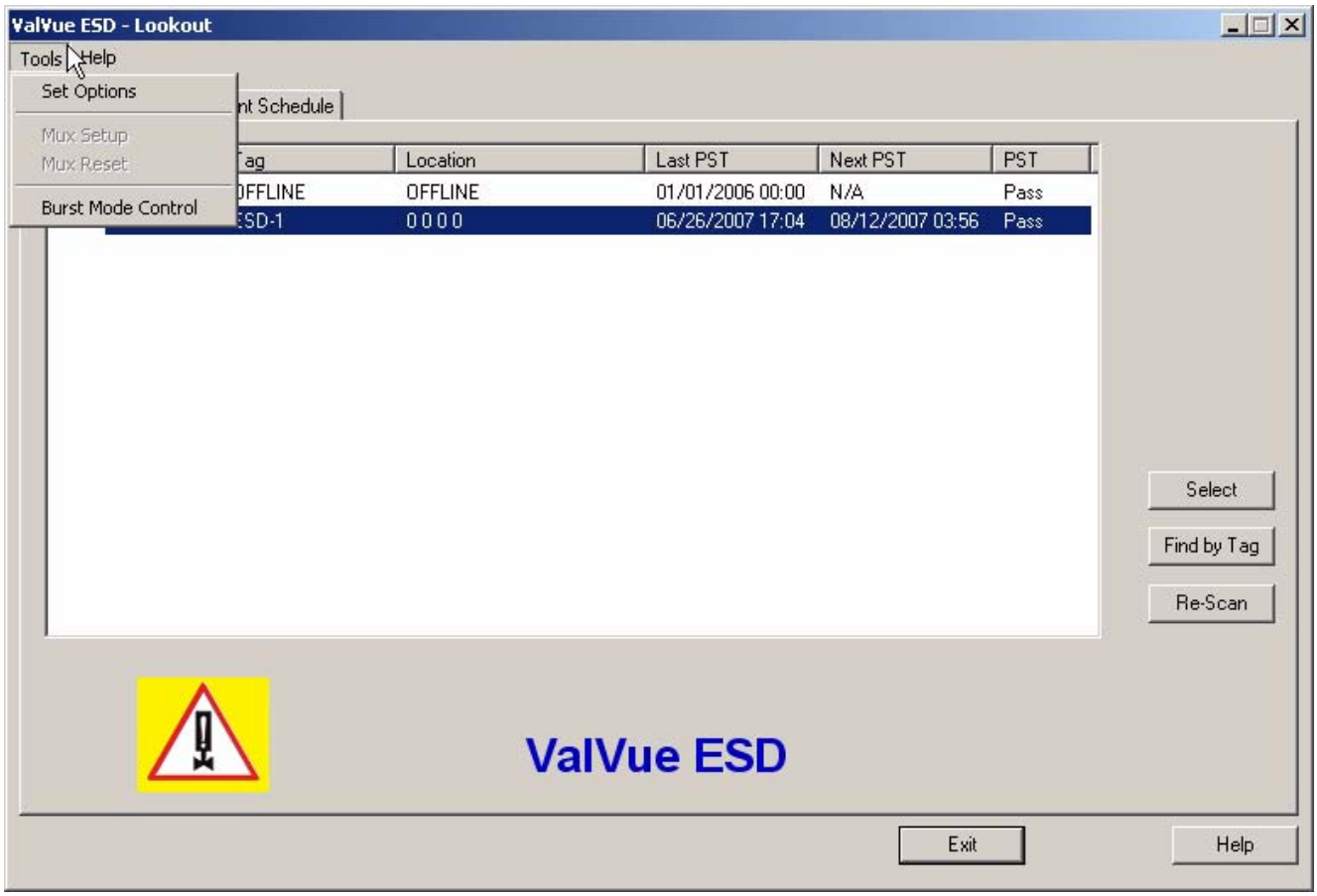


Figure 23 Accessing Connected Devices Tools Menu

Configuring ValVue ESD Options

Launching Set Options

1. When the Connected Devices context menu (right click) is active, select "Set Options" to open the Options dialog.

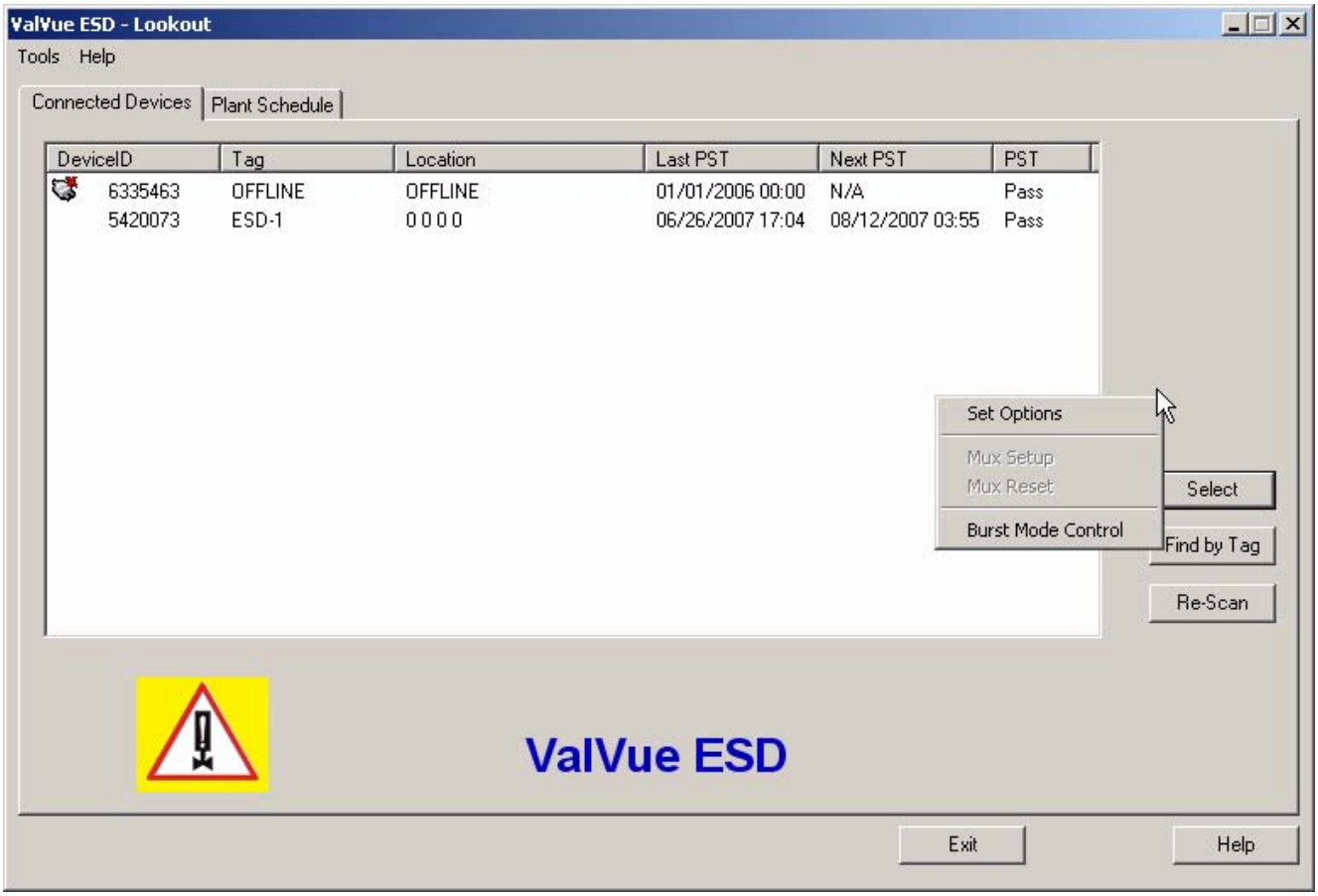


Figure 24 Launching Set Options

Set Options Screen

The Set Options Screen shown below is the area where you set communication parameters for the SVI II ESD.

The following options are available:

- Interval Between Cycles - time between patrolling cycles
- Interval Between Devices - time between each device within a cycle
- Load Device List from Database on Startup - allows loading of saved device addresses and information
- Com Port - select Communications Port
- Hart Option - enable/disable Multidrop feature
- Master Mode - select Primary or Secondary Master
- Use Multiplexor - enable/disable Multiplexor feature
- OK - clicking "OK" after you have changed Options parameters will save the changes and return you to the Connected Devices Screen
- Cancel - clicking "Cancel" will cancel any changes you have made to the Options parameters and return you to the Connected Devices Screen

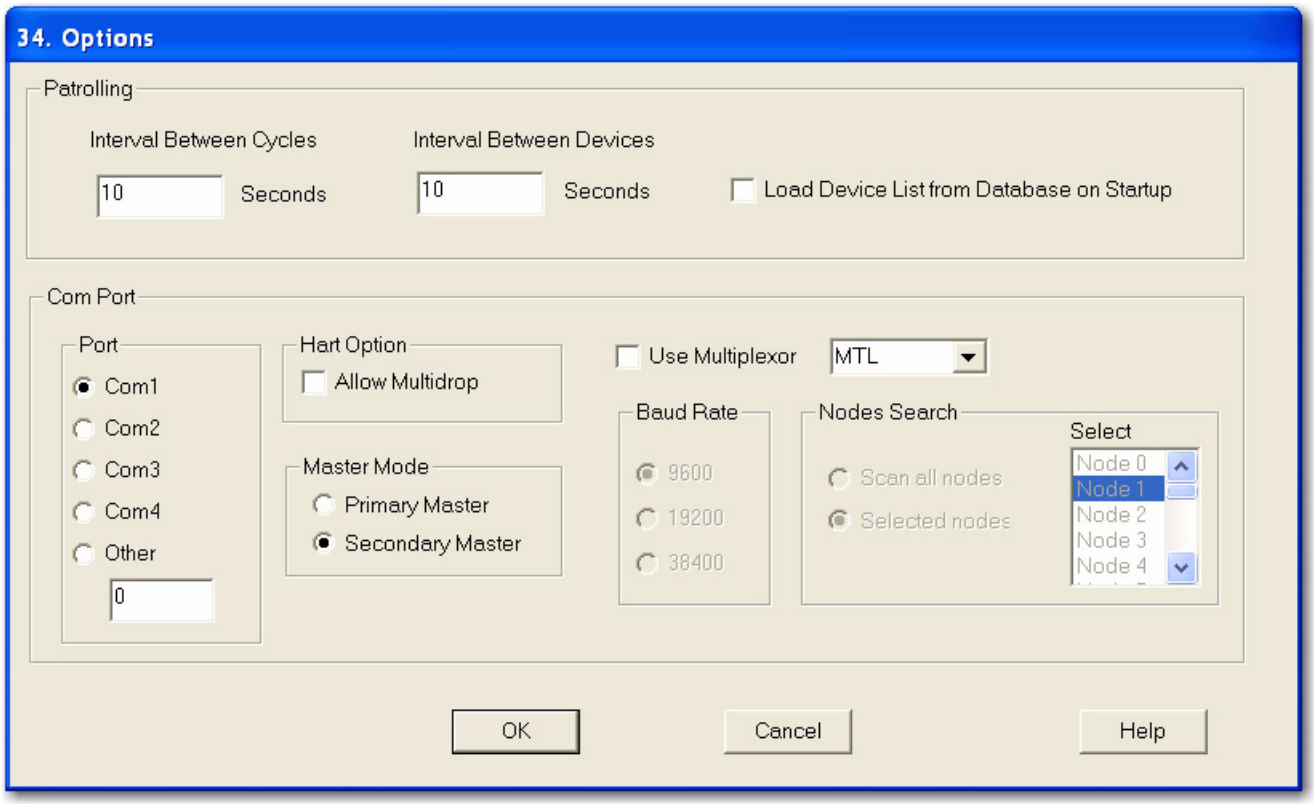


Figure 25 ValVue ESD "Set Options" Screen

Patrolling Interval Between Cycles

Patrolling is the preset time at which ValVue ESD searches for connected devices. ValVue ESD will search through all connected devices. Each time a search through all connected devices is executed is considered a cycle. You can set the interval time between cycles; i.e. when one patrolling cycle has been completed how long should ValVue ESD wait to start another patrolling cycle. To change the interval between patrolling cycles click in the field and change the number (in seconds).

Patrolling - Interval Between Devices

Patrolling is the preset time at which ValVue ESD searches for connected devices. ValVue ESD will search through all connected devices. Each time a search through all connected devices is executed is considered a cycle. You can set the patrolling interval time between devices within a cycle; i.e. when one device has been recognized how long should ValVue ESD wait to patrol for the next device. To change the patrolling interval between devices click in the field and change the number (in seconds).

Using a Device List File

The device list can be saved in a file to eliminate rescanning each time Connect is selected. This is useful only with multiplexors. Unless Load Device List from Database on Startup is selected as an option the device addresses file used is temporary and is rescanned each time the program is restarted. If selected, the user can select a file where they can save the device list. This file is read when the program is started and the list displayed. Select New File to change the file or create a new one.

Com Port Selection

Select the COM Port on your PC that is connected to the HART modem. If you’re not sure about the COM port the modem is connected to go to the Windows Device Manager to locate the Com Port number assigned to the PC.

Multidrop

When more than one device is connected to a loop or if polling addresses other than ‘0’ have been assigned to devices, select "Allow Multidrop". ValVue ESD supports HART devices, including SVI and SVI II, SVI II ESDs, and HDLTs with non-zero polling addresses and supports multiple SVI and SVI II and SVI II ESDs on the same loop for split ranging, for example. If the box is unchecked, ValVue ESD looks for devices only at polling address ‘0’. When in multidrop mode, even if a device is found at polling address ‘0’, ValVue ESD polls addresses up to 15.

Master Mode

ValVue ESD can send commands to a HART device as a primary master or as a secondary master. HART is a Master-Slave communication protocol, where the slave (field device) replies to commands sent by the master. The HART protocol allows for a device to communicate simultaneously with two masters, as long as they are different Masters. One being a Primary Master and the other being a Secondary Master. A Primary Master is defined as a host (or interface) which is connected permanently with a slave, such as a control system. A Secondary Master is a host (or interface) connected temporarily to the slave (like a handheld or laptop computer) and that is not part of the control system.

When used with a multiplexor, operation is allowed when a second HART master, such as a DCS system, is communicating. The ValVue ESD program must be configured to match the configuration of the multiplexor. If the multiplexor is a primary master, ValVue ESD must also be configured to be a primary master.

Mux Option

The "Use Multiplexor" option allows the user to select multiplexor operation. If the Use Multiplexor control is checked then the MUX Setup, and MUX reset controls are added to the Connected Devices page context (right click) menu.

- Check Use Multiplexor and set a baud rate that is equal to the baud rate set on the multiplexor hardware with DIP switches.

Note: *Settings in the Options page for ValVue ESD must agree with the MUX configuration settings that are also shown. The Mux configuration can have originated in other applications.*

Note: *Do not check Use Multiplexor unless ValVue ESD is connected to Multiplexor hardware.*

- The MTL multiplexor supports baud rates of 9600, 19200, and 38400. You must set a baud rate that matches the configuration of the hardware.
- After the options are selected, select "OK" to accept the changes and exit to Connected Devices page or select "Cancel" to discard the changes.

Multiplexor Setup and Operation

ValVue ESD supports the MTL HART multiplexor that allows a user to monitor and operate many SVI II ESD positioners from a single computer.

The MTL 4840 HART maintenance system is a widely used multiplexor for communicating with HART instruments. Connected to a computer serial port with a RS232/RS485 converter, the multiplexor is capable of supporting up to 31 nodes, each with the capability of supporting up to 16 sub nodes. Each sub node can control 16 loops. Therefore, the multiplexor provides the potential to communicate with a maximum of 7936 HART loops, i.e., 31 (nodes) x 16 (sub nodes) x 16 (loops) using one computer interface. Additionally, the multiplexor supports the multidrop connection of HART devices on a single loop. Therefore, using the multidrop feature it is possible to expended capacity of a system beyond 7936 HART devices.

For more information regarding the MTL multiplexor, refer to the manufacturer's documents.

Using the multiplexor capability of ValVue ESD and the MTL multiplexor, monitoring and communicating with many SVI's and other HART devices is possible. After start-up and login to the ValVue ESD program, the Connected Devices page is displayed and provides options to setup the multiplexor.

Use of the optional multiplexor ValVue ESD software requires an additional license and registration. Please contact your local Masoneilan representative for licensing assistance. A 60 day trial of the multiplexor option is provided without licensing.

Selecting Mux Setup

To select the Mux Setup function:

1. After you have checked Use Multiplexor and selected the baud rate and node in the ValVue ESD Set Options (see “Mux Option” on page 25) return to the "Connected Devices" page.
2. Right click on the Connected Devices page background to popup the context menu.
3. Select "Mux Setup".

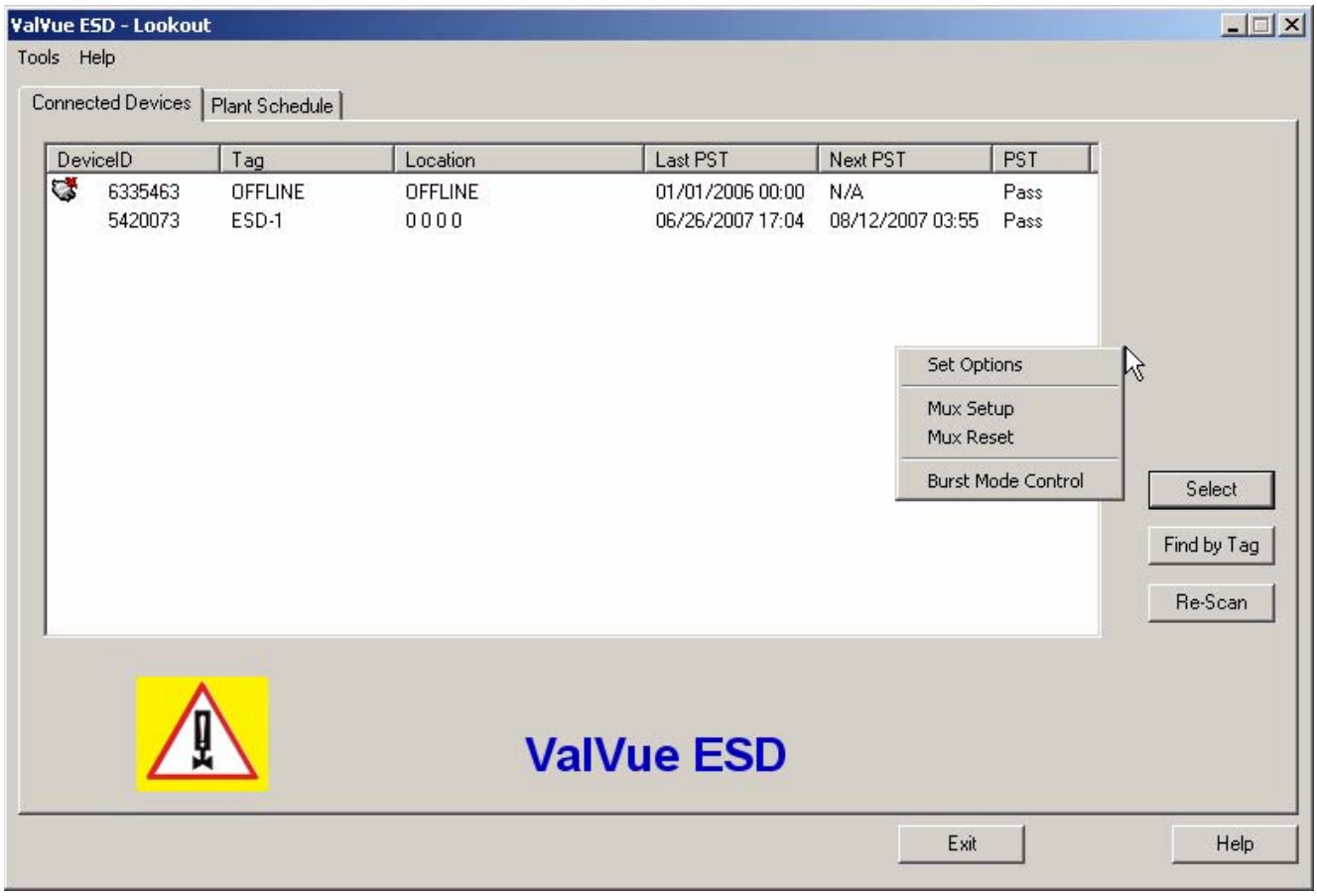


Figure 26 Context Menu with Mux Functions

4. ValVue ESD will launch the Multiplexor Setup window shown below.

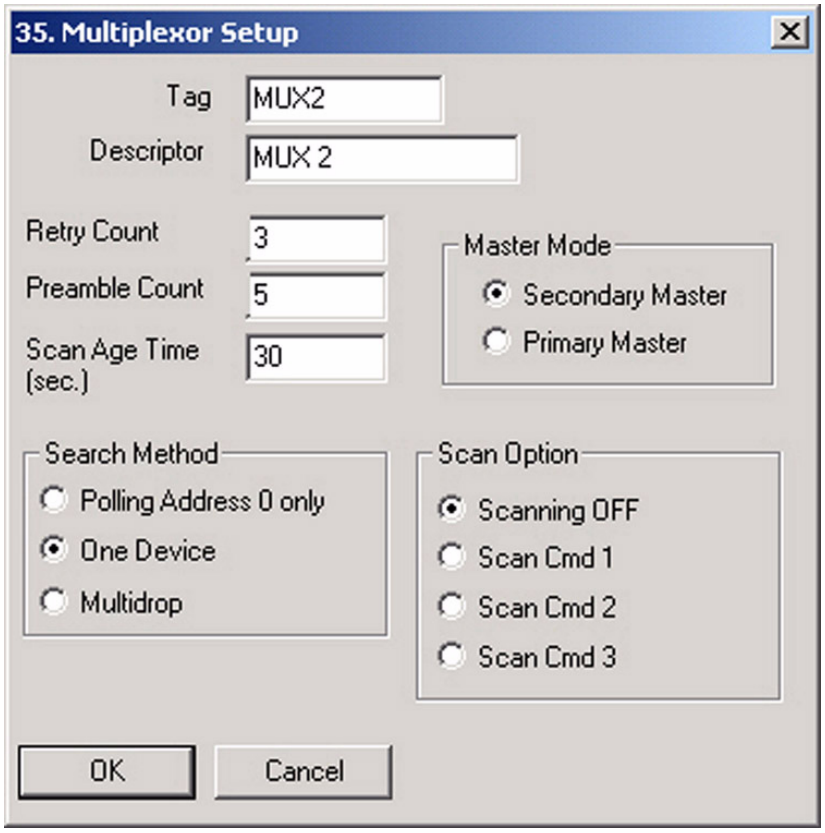


Figure 27 Multiplexor Setup

Configuring the Multiplexor

Multiplexor Setup

Select MUX Setup from the context menu to setup the nodes used on the MTL multiplexor. The Connected Devices page appears and prompts for the nodes to be configured. Type a number between 1 and 31 for the desired node, e.g. 1 for node 1 and select OK. The node address must match the DIP switch setting on the MUX hardware. The Multiplexor Setup dialog displays. Setup includes the following options and parameters.

Primary and Secondary Masters

When the multiplexor is enabled, ValVue ESD must be configured to be the same type of master as the multiplexor. Use both the Options setup and Mux setup screens to check and compare the selection. Both can be primary or both can be secondary. They cannot be different.

The multidrop option substantially increases the time required to scan each node of the Mux.

Multiplexor Options Setup Dialog

Use this procedure to setup Multiplexor options.

1. Right click in the background of the Connected Devices page.
2. Select Set Options from the popup menu.
3. Check the Use Multiplexor box on the Options page.

One option a user must select correctly is which communication serial port the computer uses for the HART communication channel. Once selected in the Options dialog, this selection overrides any selection on the command line that starts the program.

Select the baud rate that is the same as that set with dip switches on the multiplexor hardware.

The device list will be automatically saved to the device database. This file is read whenever the program is started and the saved device list is displayed. This is particularly useful for a multiplexor connected to many devices and saves the time required to re-scan.

Tag

This is a user-entered value. It can be up to 7 characters long and is used to identify the MTL multiplexor node in the system. The tag is displayed in Device List box in Connected Devices page.

Descriptor

A description with up to 15 characters for the MTL multiplexor node.

Retry Count

The number of times the multiplexor retries sending a command to a Hart device before returning with an error. The valid range for this number is 0 to 5. the recommended number for use with ValVue ESD is ‘3’.

Preamble Count

A device using the HART protocol sends a short string of characters at the beginning of each communication to "wake up" the other device. This string is called a "preamble". The number of preambles prefixed to each Hart command sent to a device varies from device to device. The valid range is 2 to 20. Recommended values for this parameter are 3 to 5 when using the Mux. ValVue ESD allows the Mux preamble count to be configured by the user.

Scan Age Time

The length of time in seconds that scan data remains valid. An error is returned when scan data is requested more than the age time since the data was last updated. This parameter is available here to set for other applications that use the multiplexor. ValVue ESD does not support the scanning feature.

Multiplexor Master Mode

ValVue ESD must be set in Options to use the same mode as the multiplexor. Other applications that use the multiplexor or other HART masters can require a special selection. See the multiplexor documentation for further information.

Search Method

When building a device list, the multiplexor can use one of three methods:

1. Polling Address 0 only
   This method looks only at polling address 0 for each loop. Any devices on a loop with a non-zero polling address are not found.
2. One Device
   For each loop, all polling addresses are searched until a device is found. The multiplexor does not continue the search on a loop after the first device is found.
3. Multidrop
   For each loop, polling address 0 is checked. If a device is found, no further search is performed on that loop. If no device is found at polling address 0, polling addresses 1 - 15 are searched and any devices found are added to the device list.

Mux Reset

Select Mux Reset to issue a reset command to a node of the multiplexor. This function is enabled and used only in the multiplexor configuration of the program. The user is prompted for the node that is to be reset. When reset, the multiplexor node re-scans all of the devices connected to it and depending upon the options set for the multiplexor, can take some time to complete. If hardware has been added to the Mux or connected to different Mux channels a rescan must be performed before the ValVue ESD re-scan can be used.

The Mux Reset is necessary when adding or removing HART devices on a Mux network. This function updates the Mux's Look Up Table utilized by ValVue ESD to map devices.

Note: *The Mux hardware re-scan is different from the re-scan performed by ValVue ESD from the Re-scan button. No communication between ValVue ESD and any device takes place on the node until the reset is completed. This can take several minutes, depending on MUX loading.*

Scan Option

The MTL multiplexor has the capability to continually scan the connected Hart devices to report the results. ValVue ESD does not use this feature, but the option is provided to configure the multiplexor as needed by other applications.

The multiplexor can be used to request information about HART devices. Select the MUX Reset popup menu function to issue a reset command to a node of the multiplexor. The user is prompted for the node that is to be reset. When it is reset, the multiplexor node re-scans all of the devices connected to the node (this hardware rescan is different from the re-scan done by ValVue ESD from the Re-scan popup menu function). Depending upon the options set for the multiplexor, this can take a while to complete. No communication can

be done with devices on the selected node until the reset is completed. After the reset is finished, select Re-scan popup menu function to build a device list.

A device list is arranged in the order found on the multiplexor's channels. This list can be very long if there are many connected devices. To find a device by its tag, select the Find by Tag button to open a text entry dialog. Enter a tag name to allow ValVue ESD to search the device list for a device with a matching tag. If found, the device is selected and the window scrolled so that its line is visible.

Selecting the Re-scan popup menu function causes ValVue ESD to build a new device list. All nodes are checked. If there are a large number of devices connected to the multiplexor, this function can take some time to complete. When the re-scan is completed, the user can optionally save the device list to a file so that rescanning is not necessary every time ValVue ESD is started.

Troubleshooting ValVue ESD Used with Mux

The table below lists some of the problems, causes, and corrective actions you may encounter when setting up ValVue ESD used with a multiplexor (Mux).

Table 1 Troubleshooting ValVue ESD Used with Mux

Problem	Cause	Corrective Action
No devices found	Both ValVue ESD and AMS are connected to the Mux	Connect ValVue ESD to the device with a modem. If the installation is fundamentally safe connect the input to the MTL 4046P Isolator. In a general purpose system, connect directly to the device wires.
	The Mux is configured for AMS communication	Reconfigure the Mux for Cornerstone communications mode with MTL provided software.
Baud rate setting does not match setting	Mux	Use Set Options in ValVue ESD to match the setting in the Mux . Refer to the dip switch setting on the MUX.
HART converter (RS-232 to RS485) not working properly.	Check for loose wires Check for power cabling between converter and Mux	Check configuration of converter. Refer to the manufacturer's instructions.
Expected device is not found in Connected Devices list	Device was added after the Mux performed its last scan	Click the Reset Mux button to update or power off/on the Mux.
Devices all have the same tag name in Connected Devices	ValVue ESD and Mux are not configured as the same type of master	Set Mux and ValVue ESD so both are Primary Master or both are Secondary Master.

Configuring Burst Mode

The Burst Mode is a mode where the HART device continuously sends out data without being polled for such data, by a Master. This mode is useful only for devices that are passive (i.e. not a HART master), such as a HART to Analog converter (SPA from Moore Industries, Tri-Loop by Rosemount). It is not necessary to set the burst mode to allow communications with a control system since the control system is a master capable of polling the device. Turning on Burst mode in cases where it is not required will affect the communication bandwidth.

The table below provides a summary of the data returned from the Burst mode (HART Command #3 equivalent to Process-Vars-Current)

Table 2 Burst Mode Data Return

Variable	Description	Units/Range
SVI II ESD (firmware 312)		
PV (Primary Variable)	Valve position	0-100%
SV (Secondary Variable)	Actuator Net Pressure	0-150 psig
TV (Tertiary Variable)	Not used (Future)	
QV (Quaternary Variable)	Not used (Future)	

Use this procedure to configure a burst mode.

1. Select the intended device from the Connected Devices page.
2. Right click on the gray background of the window to pop up a context menu.
3. Select the Burst Mode Control dialog.
4. Select the desired command.
5. Select OK.

Note: *When burst mode is enabled, ValVue ESD DOES NOT allow the detailed device view to open communications to the device.*

Launching a Device

ValVue ESD opens the Device connection window and searches for connected devices. The devices that are found are listed. To stop the searching process, select the **Stop** button. The list includes offline device files and live devices. Scanning can take a few seconds if multidrop is selected. When a Multiplexor is used, the process can take a longer time, depending upon how many devices are connected.

The Connected Devices window is the interface tool for ValVue ESD and devices operating ESDVue. Once a connected device has been selected and launched, ESDVue initiates for the selected device.

Note: *ValVue ESD is the main interface for connected devices. Once a connected device is selected and launched the software tool for a device is called ESDVue.*

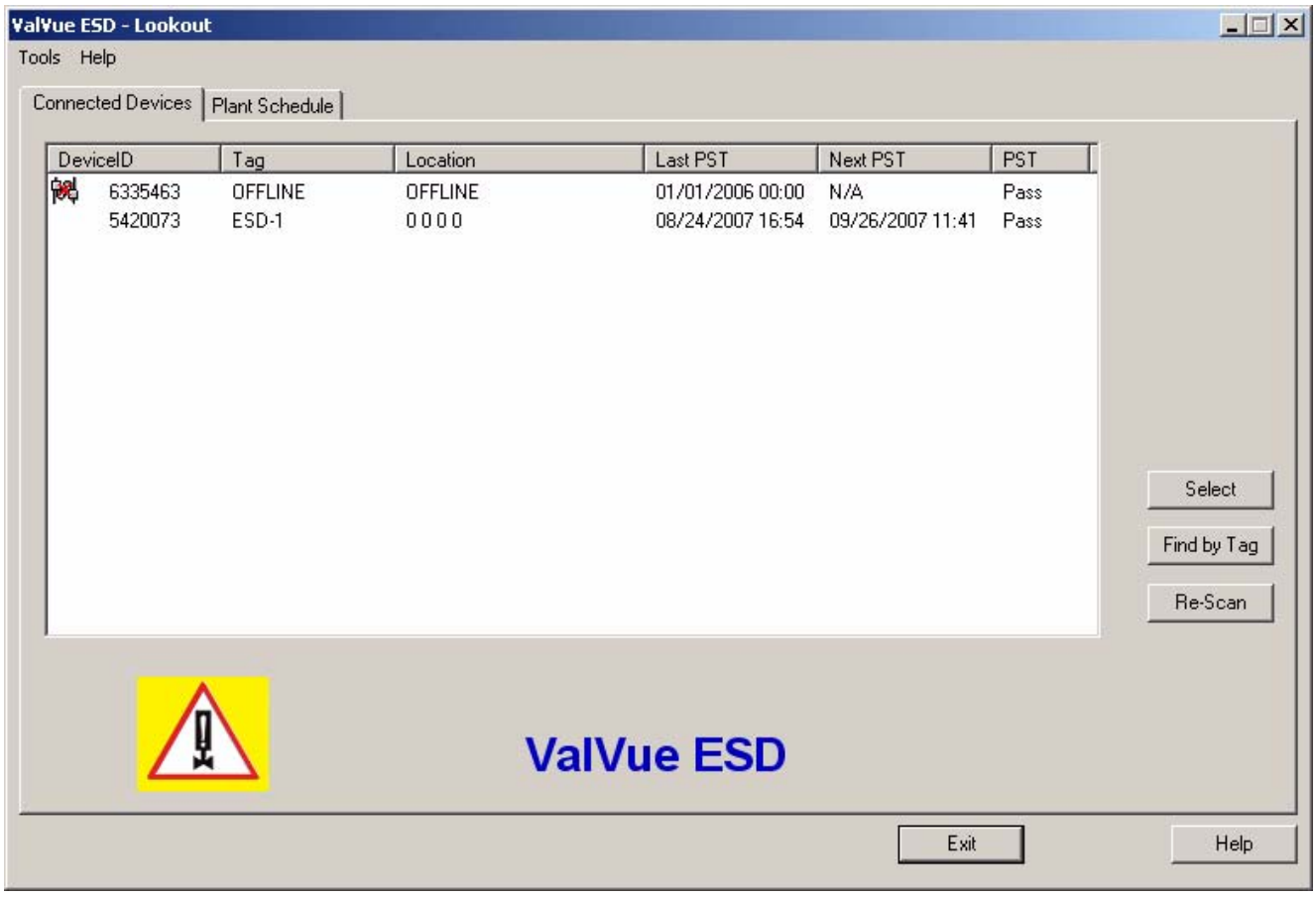


Figure 28 Connected Devices

Offline Mode

There is on offline mode available in ValVue ESD to work with a disconnected Masoneilan HART device.

The offline options serve two purposes:

1. Viewing configuration, calibration and diagnostic data, for SVI II ESD using a dump file (.dp3).
2. Learn the features and functions of both SVI II ESD and ValVue ESD when they are not connected to an actual device.

When SVI II ESD Offline is selected, you are prompted to select a dump file with a dp3 extension that contains configuration and calibration data used for running the SVI II ESD.

Selecting an Offline Device

After the initial device scan executed when you launch ValVue ESD, the Connected Devices Screen is automatically displayed and shows any devices found connected during the scan. You will notice in the figure below that the offline device was found.

There are several ways to select and activate the device:

1. Click on the device name to highlight and then click on "Select" as shown below.
2. You can also double click on the device name

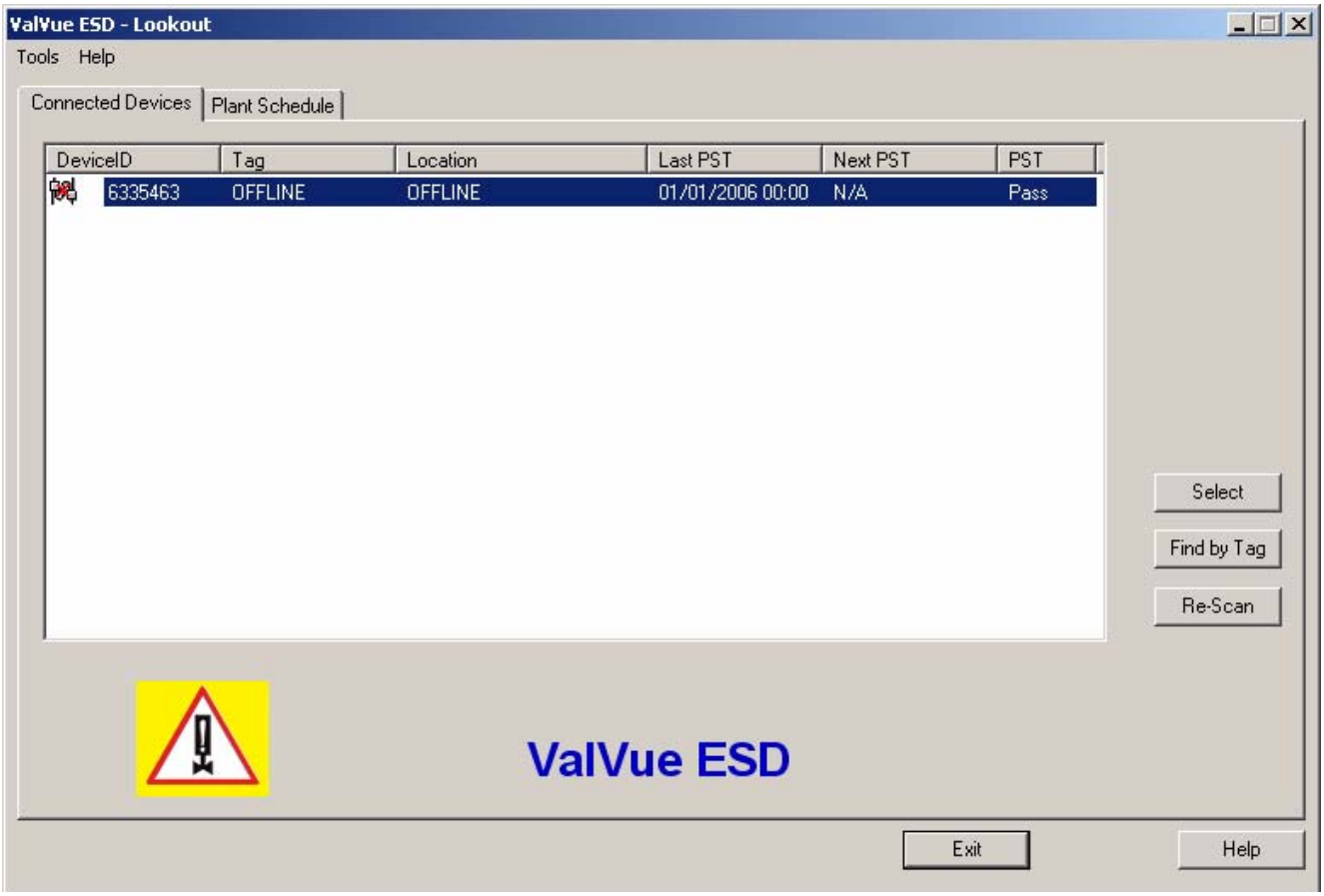


Figure 29 Selecting an Offline Device

3. You can also right click on the device name and select "Launching ESDVue" as shown below.

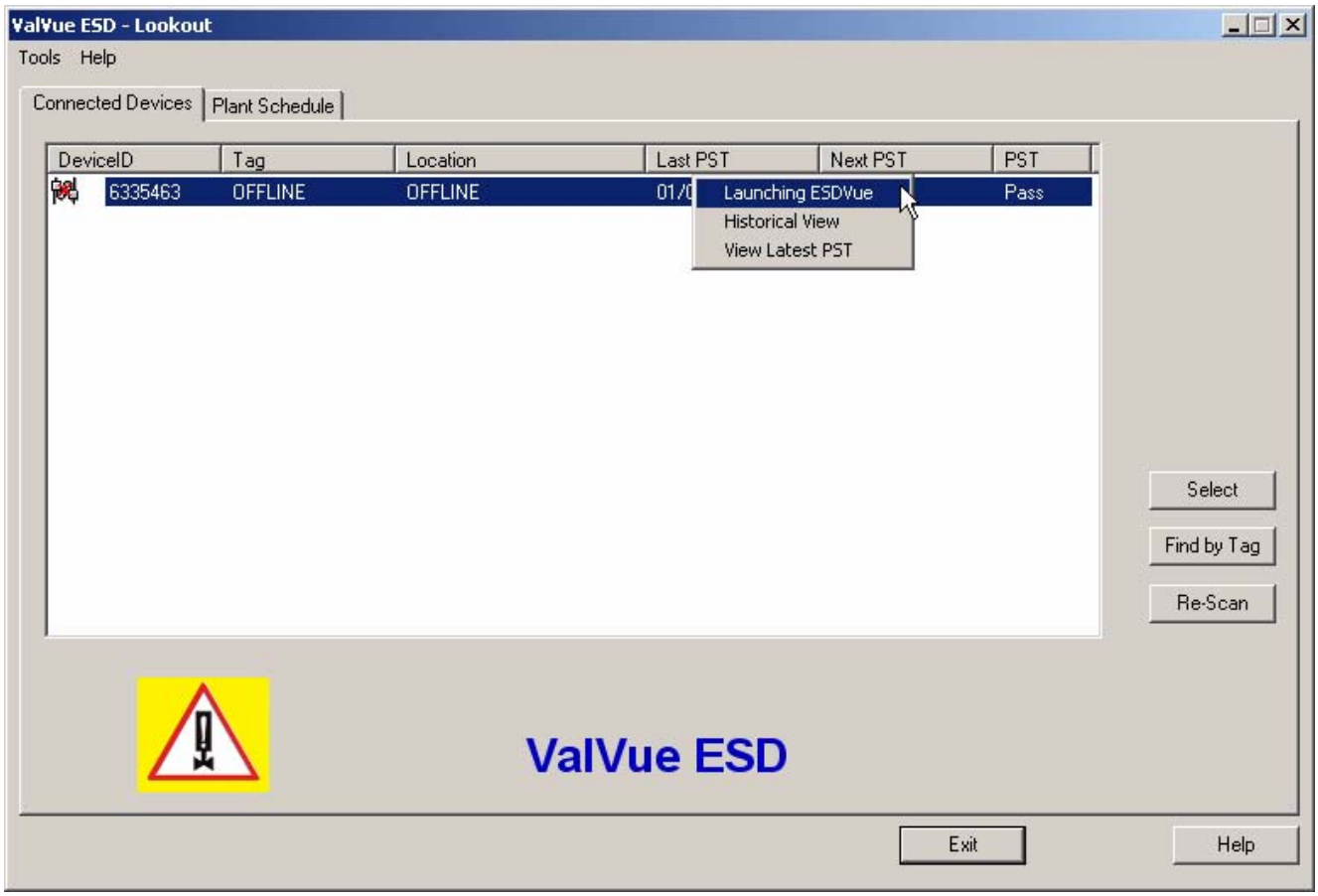


Figure 30 Right Clicking Offline Device

4. Upon selecting a connected device, a File Open window is presented for you to select a dump file as a simulated device. The dump files are installed with ValVue ESD in the same location as the program file: e.g. C:\Program Files\DFC\ValVue ESD. The default location for SVI II ESD file open window is shown below.

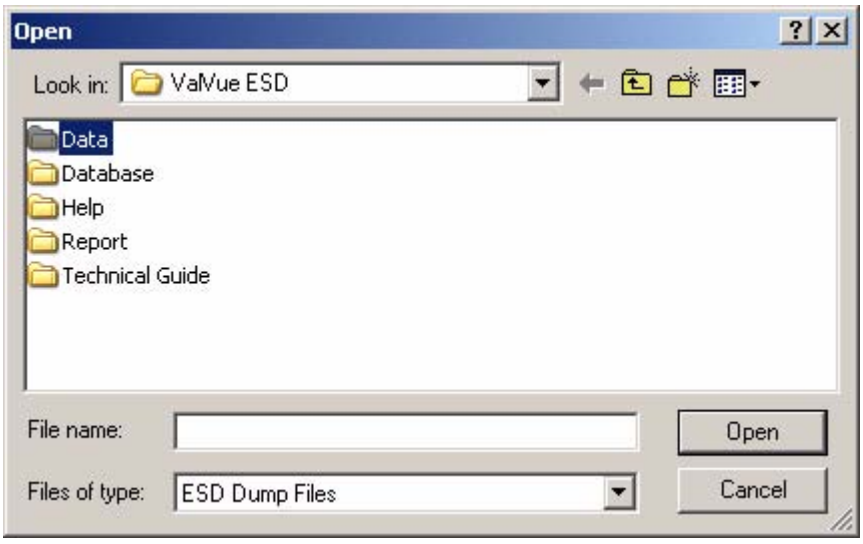


Figure 31 File Open Window Launched at ValVue ESD

5. Within the ValVue ESD folder locate the Data folder.
6. Within the Data folder locate the .dp3 as shown in the figure below and click "Open".

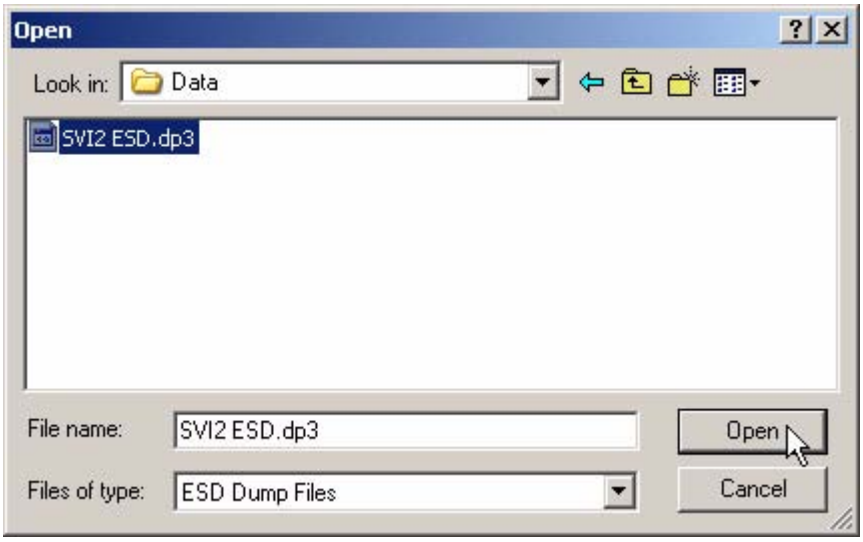


Figure 32 Offline dp3 Data File Default Location

7. After you select the dp3 file and click "Open", ValVue ESD will launch at the Monitor Screen of the offline device as shown below.

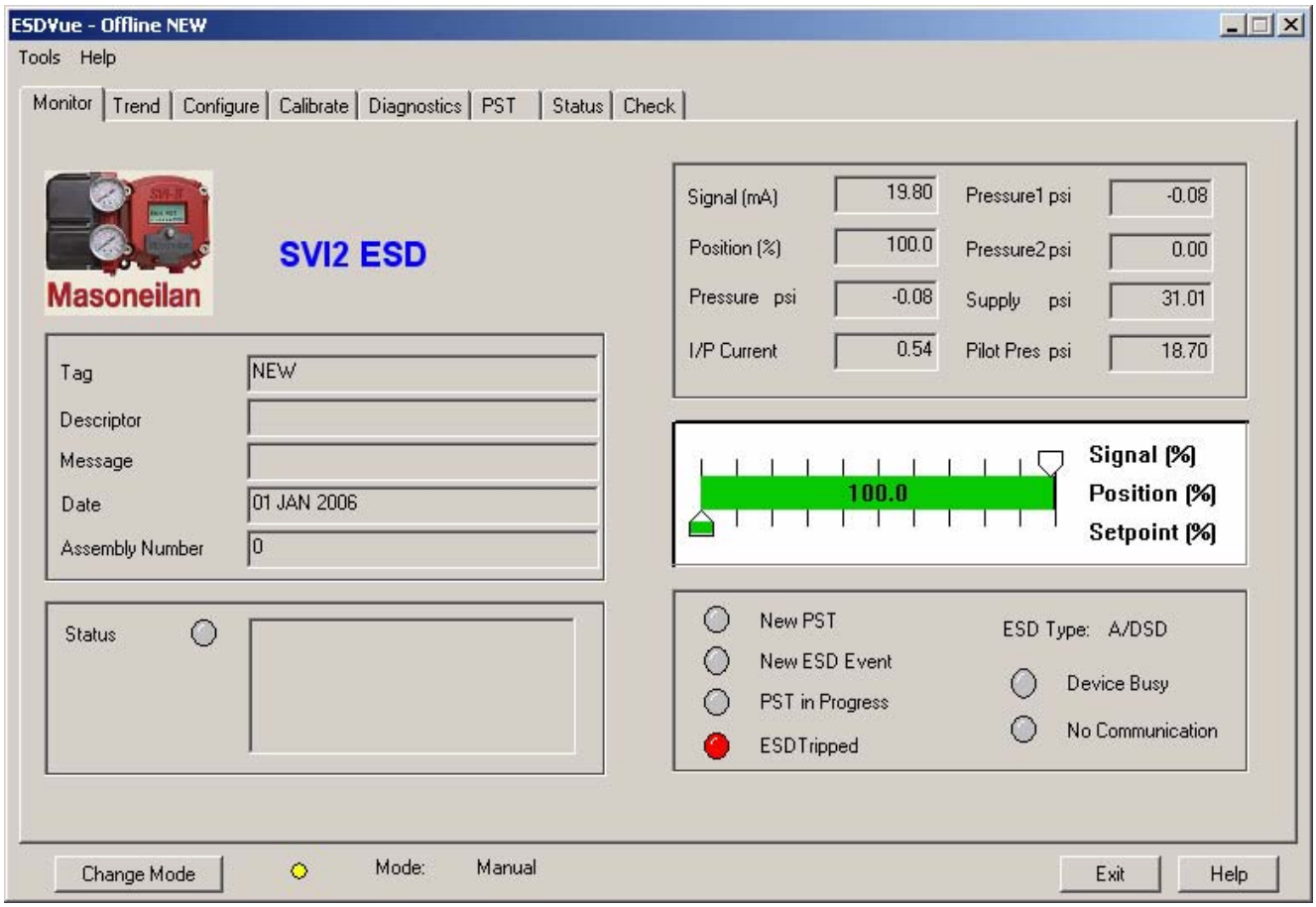


Figure 33 Offline Device Displayed at Monitor Screen

Selecting a Connected Device

After you have successfully logged into ValVue ESD the software will automatically scan the SIS (Safety Integrated System) for any devices that are connected to the system. The connected devices that are found during the scan will be displayed as shown in the figure below.

To activate a connected device:

1. Click on the name of the device you would like to activate (at the top of the Connected Devices screen) as shown below.
2. Click on "Select" as shown below.
3. ValVue ESD will launch the selected device and display the Monitor screen.

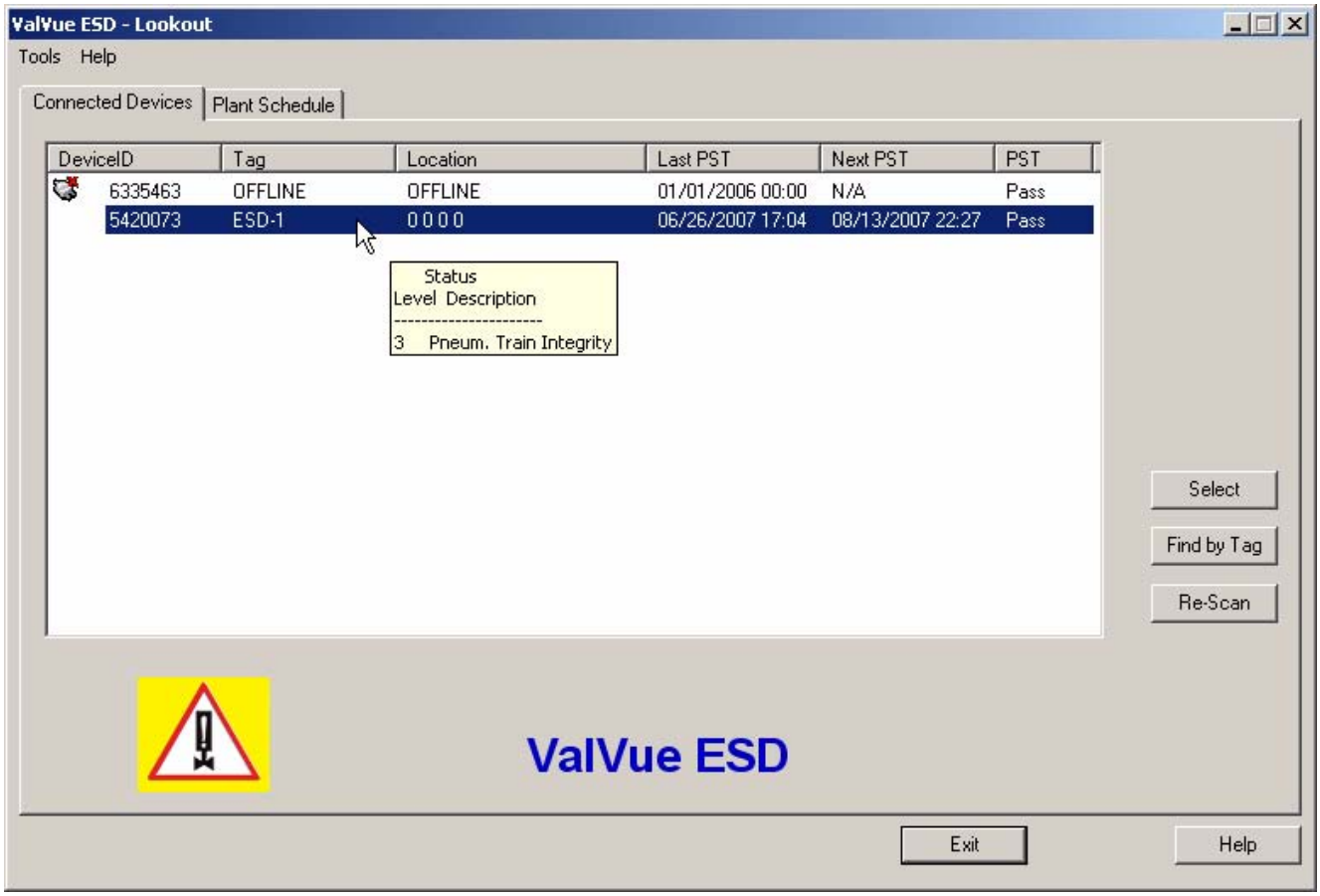


Figure 34 Selecting a Connected Device

Device Information

When you start ValVue ESD the software scans all the devices connected to the controlling computer. As ValVue ESD executes scanning the software also checks the status of each connected device. The status information is shown when you click on the name of a device and appears in a tool tip format as shown in the figure below.

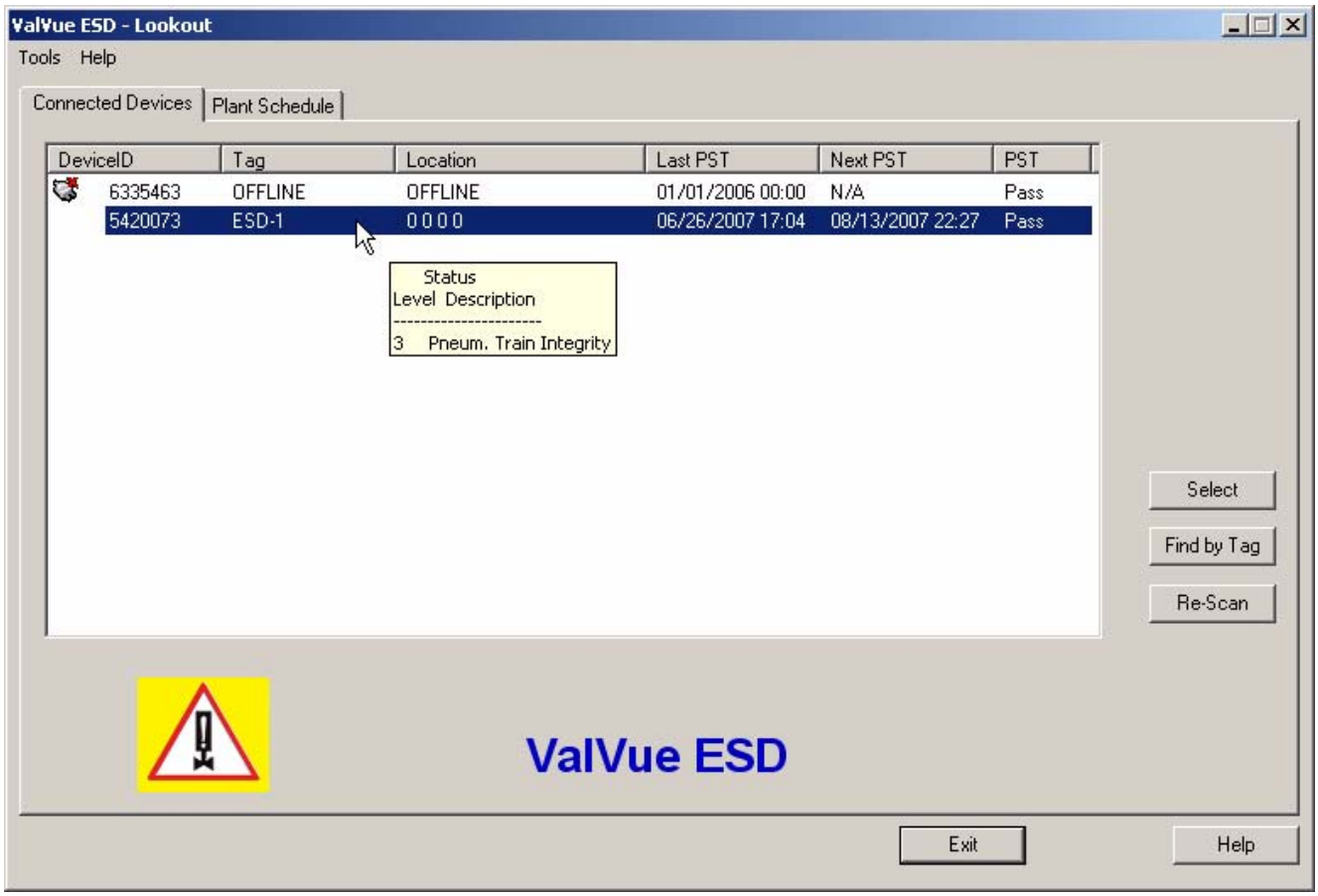


Figure 35 Device Information Displayed

Find by Tag

To find a device by its tag name:

1. Select the Find by Tag button to open a text box.
2. Enter a tag name.
3. Select OK.

The software searches for a device with a matching tag. When found, the device is selected.

Re-Scan

To build a new device list:

1. Select the "Re-Scan" button on the ValVue ESD Connected Devices Screen. In the direct-connect configuration of ValVue ESD all polling addresses are checked if the options allow multidrop. In the multiplexor configuration of the program, all nodes are checked. If there are a large number of devices connected to the multiplexor, this function takes time to complete.
2. When the rescan is completed, you can save the device list to a file so that rescanning is not necessary every time ValVue ESD is started. If there is only one device on the loop, select "Stop" when it has been found to save scan time.

Right Clicking on Device Name

When you right click on a connected device name on the main ValVue ESD screen as shown the figure below you can perform several functions particular to the selected device:

- Launching ESDVue - launches ValVue ESD
- Historical View - launches a historical performance view of the selected device
- View Latest PST - launches the graph representing the most recent PST (Partial Stroke Testing) of the selected device

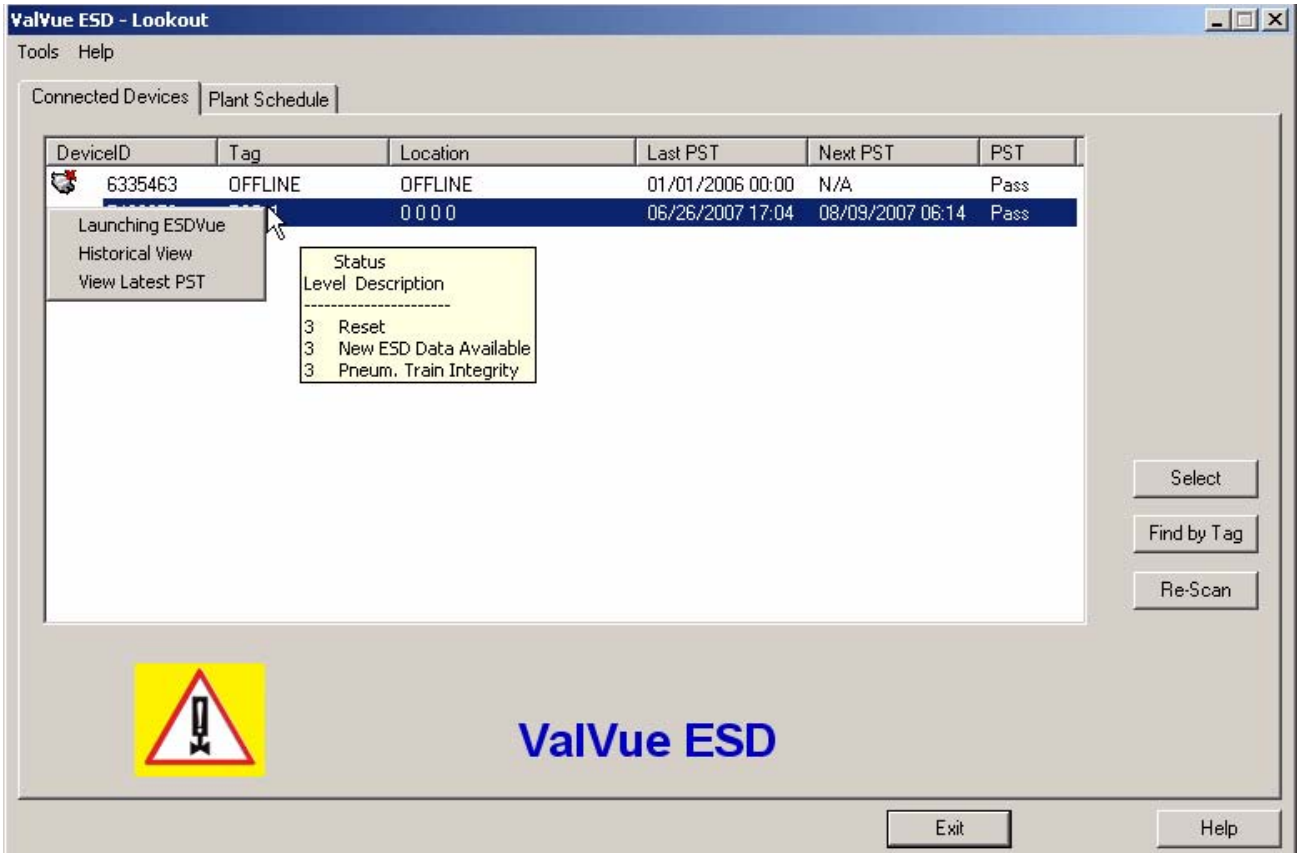


Figure 36 Right Clicking on Connected Device

Launching ValVue ESD

There are three ways to launch ValVue ESD:

1. Right click on the device name (in the list of connected devices) from the main ValVue ESD screen.
2. Select the device on the ValVue ESD main screen and then execute "Select" at the bottom right of the screen.
3. Double click the device name on the main screen to launch ValVue ESD.

Launching Historical View

When you right click the device name in the Connected Devices tab and select "Historical View" ValVue ESD will launch the PST Historical View window shown in the figure below.

To start Historical View:

1. Select the Device ID from the drop down list.
2. Select the Start and End Dates for the PST data you would like to view.

Changing the Historical View Start and End Dates

The Historical View start and end date field is set up as mm/dd/yyyy. There are two methods for changing the PST schedule date field. You can click on each parameter of the date field; i.e. mm, or dd, or yyyy, and change each individual parameter or you access the calendar in the drop down of the date field.

To change the start date schedule for the next PST:

1. Click in each parameter (mm-dd-yy-hh-mm) of the date field and highlight the text.
2. Type over the old value with the new value for each parameter.

OR

3. Click in the drop down, located at the right of PST schedule date field and access the date calendar as shown in the figure below.
4. Using the arrow key on the calendar, change the month if necessary.
5. When in the correct month on the calendar, drag the mouse and select the correct date within the month by clicking on it.

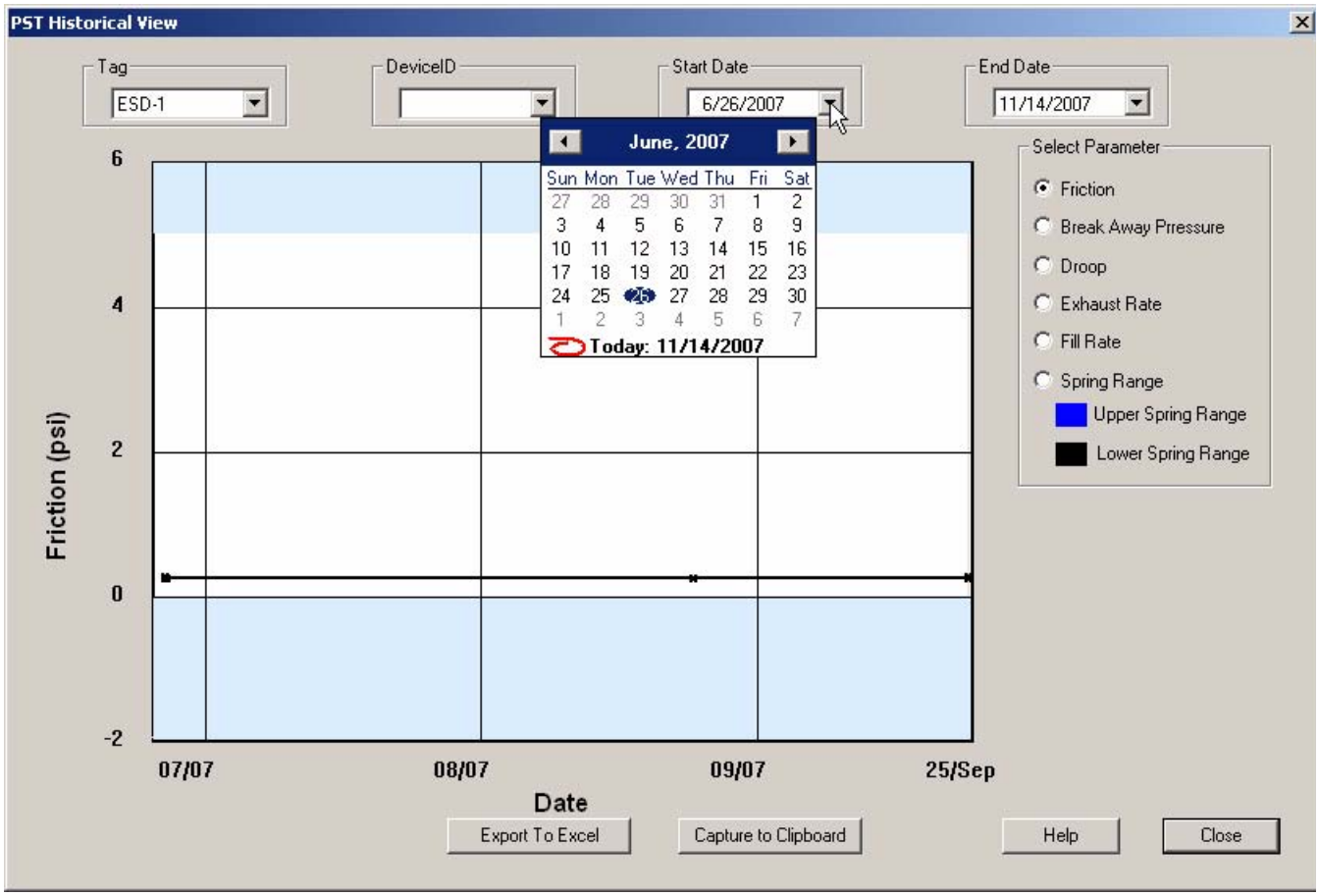


Figure 37 Selecting the Historical View Start Date

6. Select the End Date in the same manner as the Start Date.

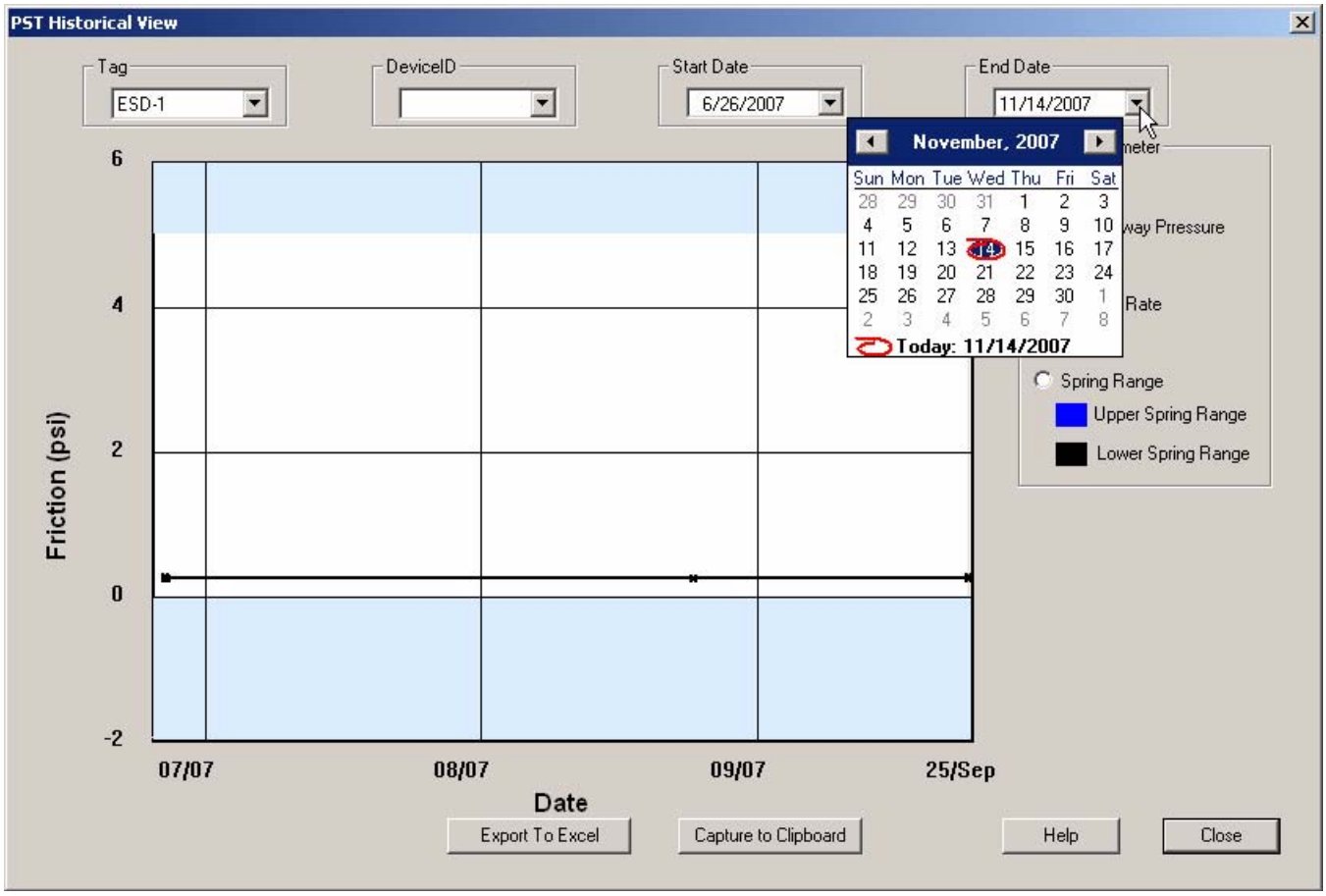


Figure 38 Selecting the Historical View End Date

7. ValVue ESD will display the historical PST data for the selected date range.
8. Select the parameter you would like to view by clicking on the radio button to the left of the parameter name.

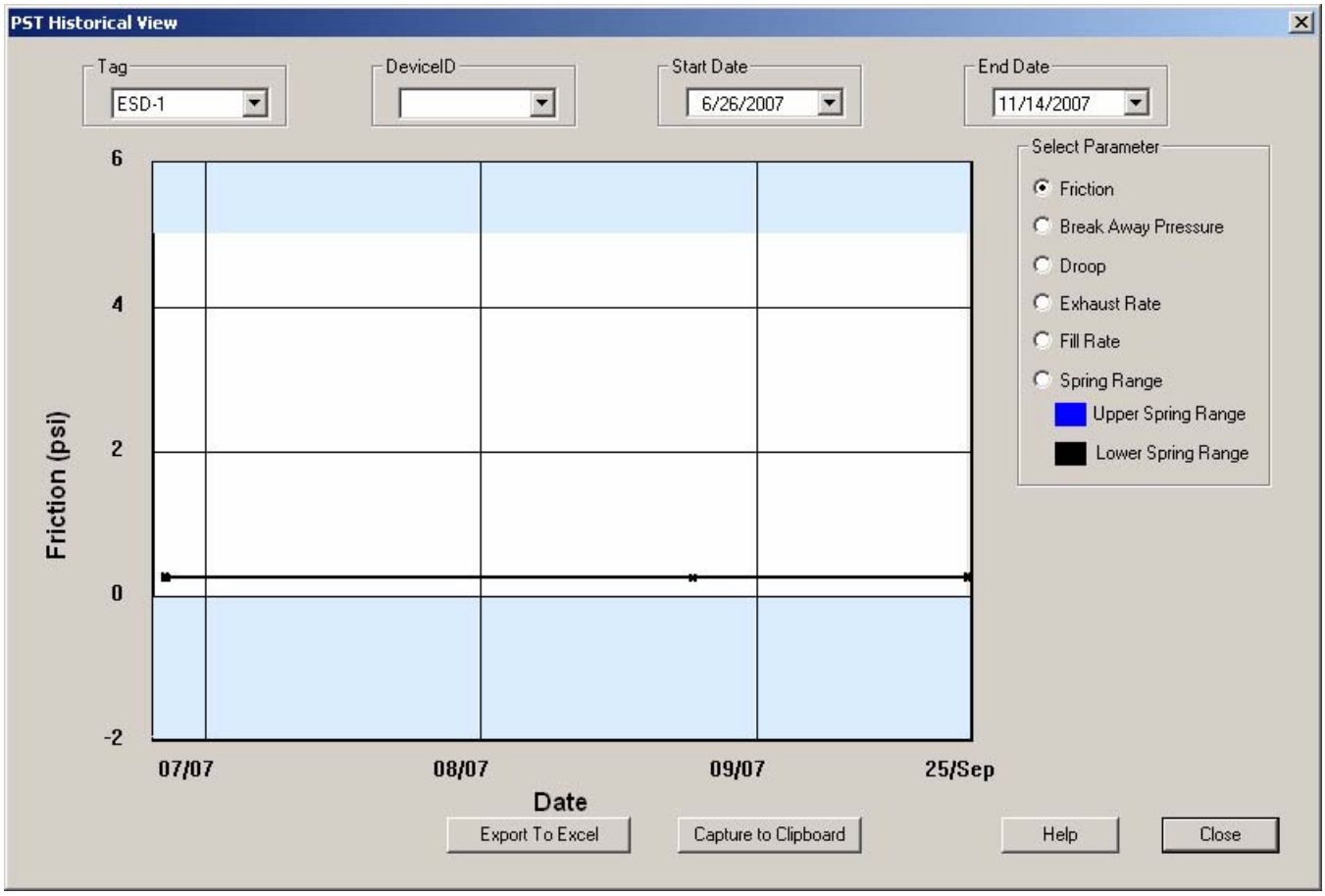


Figure 39 PST Historical View - Friction Displayed

View latest PST

When you right click the device name in the Connected Devices tab and select "View Latest PST". ValVue ESD will launch the latest PST Diagnostic graph as shown in the figure below.

For information on the Diagnostic Graph features, see **PST Diagnostic Graph**.

1. When you click the "Close" button, the lastest PST Diagnostic Graph will close and you will return to the Connected Devices tab.

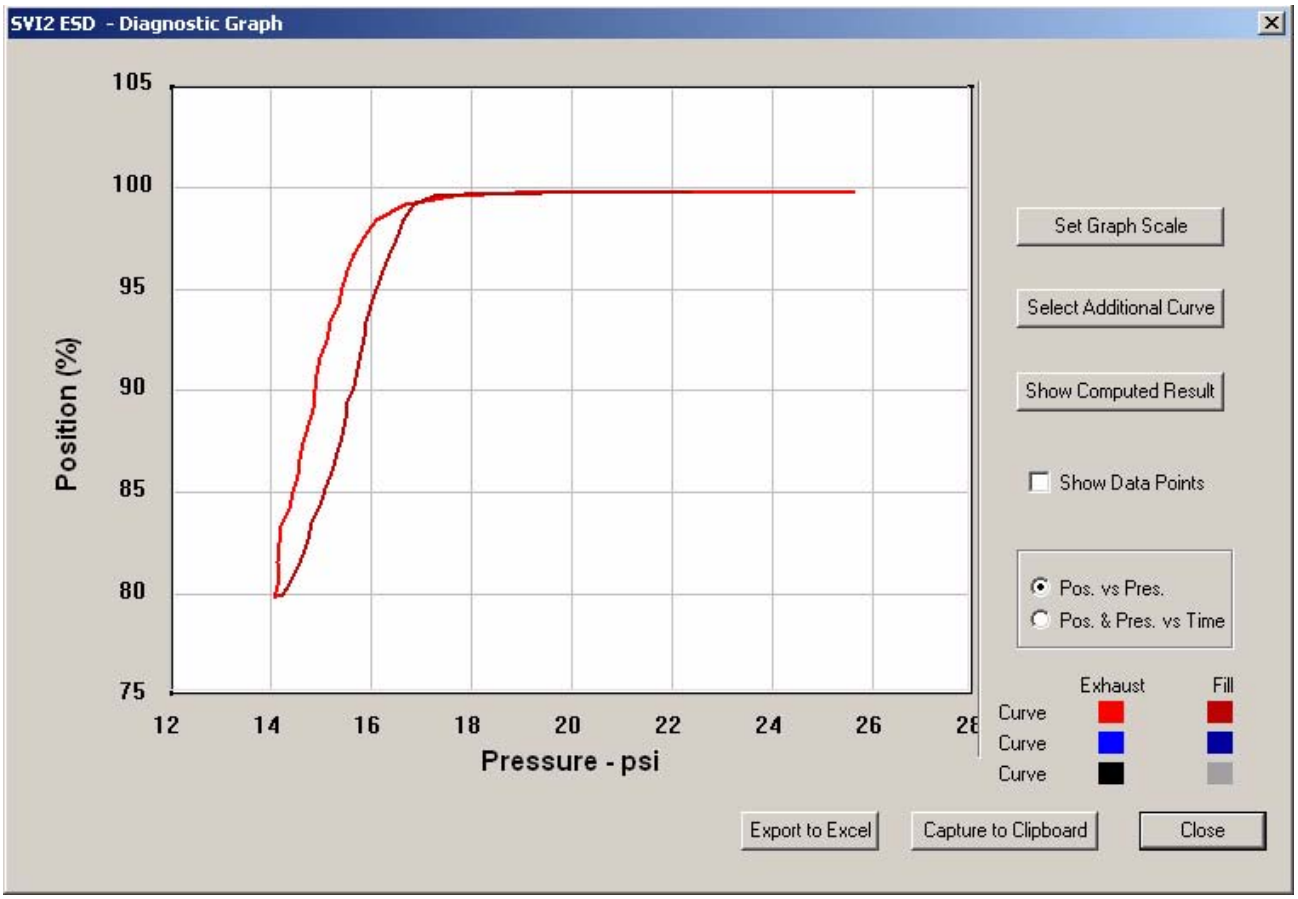


Figure 40 View Latest PST

ESDVue's Work Environment

3

Overview

After you have selected the connected device ValVue ESD will launch and display the device in the first ESDVue screen, Monitor, shown below. ESDVue is set as a series of tabs, with each tab representing one of ESDVue's screens. Tabs and Screens are named according to their function.

Note: *ValVue ESD is the main interface for connected devices. Once a connected device is selected and launched the software tool for a device is called ESDVue.*

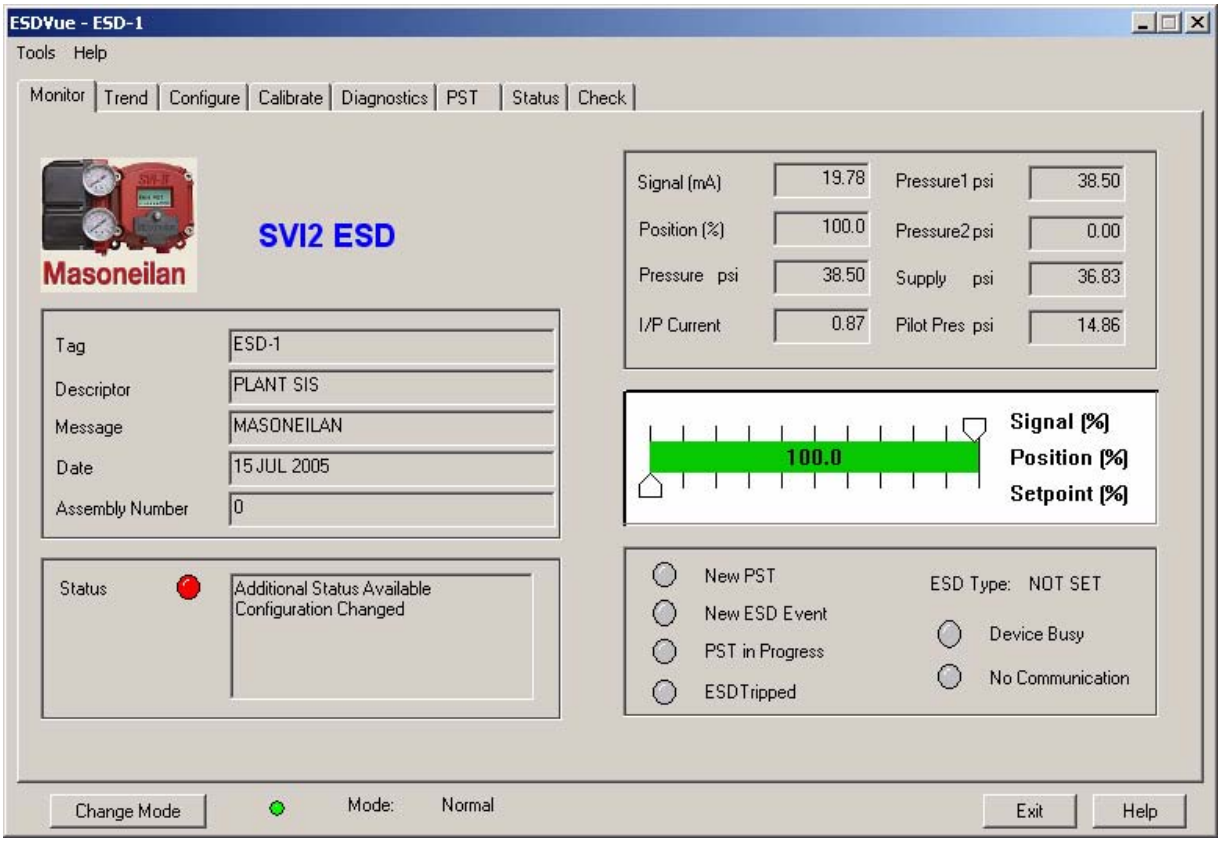


Figure 41 ESDVue Environment

Working in ESDVue

ESDVue is set up as a typical Windows program, with tabs, menus, dialogs, windows and toolbars. After you have successfully logged into ValVue ESD the currently selected device will be displayed in ESDVue's Monitor Screen. The user can either perform operation on the Monitor screen or select another tab to display another ESDVue screen. Each of the screens and related functions are described within this Help system.

Toolbar

The toolbar at the top of every ESDVue Screen has two menu item:; Tools and Help.

Modes of Operation

The SVI II ESD has three modes of operation:

- Normal
- Manual
- Setup

Normal Operation

In the Normal mode of Operation the SVI II ESD responds to the input signal and positions the ESD valve accordingly.

In configurations where the safety function is triggered by current, when the input signal current falls below 5.6mA, the SVI II ESD de-energizes the ESD valve. In the same configuration, when the input signal current rises above 14mA, the SVI II ESD energizes the ESD valve.

In configurations where the safety function is triggered by a discrete 0 - 24Vdc signal, when the input signal voltage falls below 3V, the SVI II ESD de-energizes the ESD valve. In the same configuration, when the input signal voltage rises above 18V, the SVI II ESD energizes the ESD valve.

Manual Operation

In Manual mode of operation the valve does not respond to the input signal. Instead it remains stable in one position which is the position that the valve was in when manual mode was entered or a new position selected by using the HART or pushbutton interface. However, the Shutdown function is activated if the signal is less than 5.6 mA (ASD) or 3 Vdc (A/DSD and DSD).

Setup

In the Setup mode the user can set calibration and configuration parameters. Additionally, the user may run response time tests, step response tests, and valve signatures.

Device Trip

Note: *If the device is tripped, in Normal, Manual and Setup modes the setpoint and the control mode are not affected by a device trip, and as soon as the trip condition is removed (which includes Latch if configured) the valve goes back to the state prior to the trip.*

However, if a process was running at the onset of the trip condition, the valve may also go to where it was before the process started, or stay at the de-energized stop. This is not true for Normal mode.

In failsafe and low power the valve must stay at the de-energized stop.

Change Mode

The Change Mode button located at the bottom left of all ESDVue screens allows the user to change the operating SVI II ESD mode. When selected, the user can change the SVI II ESD mode to any of three operating modes:

- Normal - In this mode the SVI II ESD responds to the input signal and positions the valve accordingly (indicator green).
- Manual - in this mode the valve does not respond to the input signal. Instead it remains stable in one position which is the position that the valve was in when manual mode was entered or a new position selected by the user (by changing the setpoint in the Monitor Screen).
- Setup - In this mode the user can set calibration and configuration parameters. Additionally, the user may run response time tests, step response tests, and positioner signatures (indicator yellow).

Whenever you leave the Normal mode, ESDVue will issue the warning shown below.

1. Click on "OK" to continue the mode change.

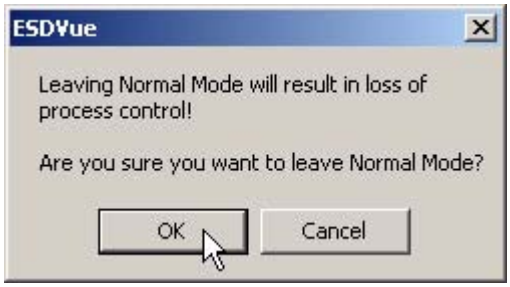


Figure 42 Leaving Normal Mode Warning

Whenever you return to Normal mode, ESDVue will issue the warning shown below.

1. Click on "OK" to continue the mode change.

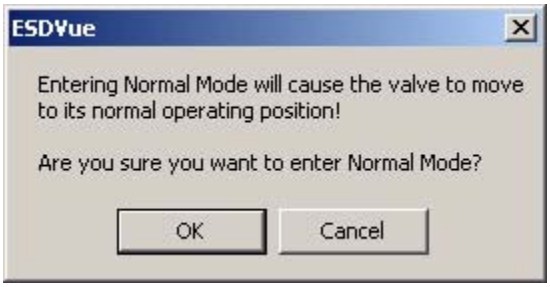


Figure 43 Entering Normal Mode Warning

Exit

Clicking "Exit" quits the program.

Screen Help

There are several methods of accessing Help. The most obvious method and the one present on each screen is the "Help" button located at the bottom, right side. Clicking this "Help" button displays the help file table of contents.

ESDVue Help

ESDVue offers help in many forms. Help changes according to the active Screen and the location within the active Screen. Every Screen has access to the entire ESDVue. On-Line Help system through the Help command button located at the bottom of every screen and through the Help Menu located at the top of every screen. Every Screen also provides context sensitive Help as well that is pertinent only to the active Screen.

Types of Help Available

Help is readily available from anywhere within ESDVue. Help exists in help menus, and in the toolbar available on every screen, and specific context sensitive help on most screens.

- Main Help Menu – available by clicking on the "Help" button, located at the bottom, right corner of every screen
- Context Sensitive Help – available by right clicking within the screen area
- Toolbar Help - located in the toolbar at the top of every screen, available by clicking on "Help" at the top of the screen.

Toolbar Help

ESDVue's toolbar contains a Help menu that provides access to the help file contents (under the Help selection) and under the Tools menu provides access to the context sensitive help for the selected screen.

Help Menu

The Help menu is the same on every screen and contains:

- Help – launches the help file table of contents
- Firmware Info – displays information about the firmware loaded into the SVI II ESD
- About – displays information about ESDVue

Context Sensitive Help

Context Sensitive is available on every ESDVue Screen and the user can access the context help by right clicking in the screen area.

Hot Spots in Help

Whenever a ESDVue screen is displayed in Help, there are many screen fields with additional help provided in the form of a “Hot Spot”. When the cursor is over a hotspot on a hotspot image, it changes into a hand to indicate the area is clickable and provides more help information.

ESDVue Screens

Monitor Screen

From the Monitor Screen, the user can view the basic functions of the SVI II ESD including tag and identification, input signal, setpoint, position, and status. The user can also change the SVI II ESD mode of operation and perform setup and command functions.

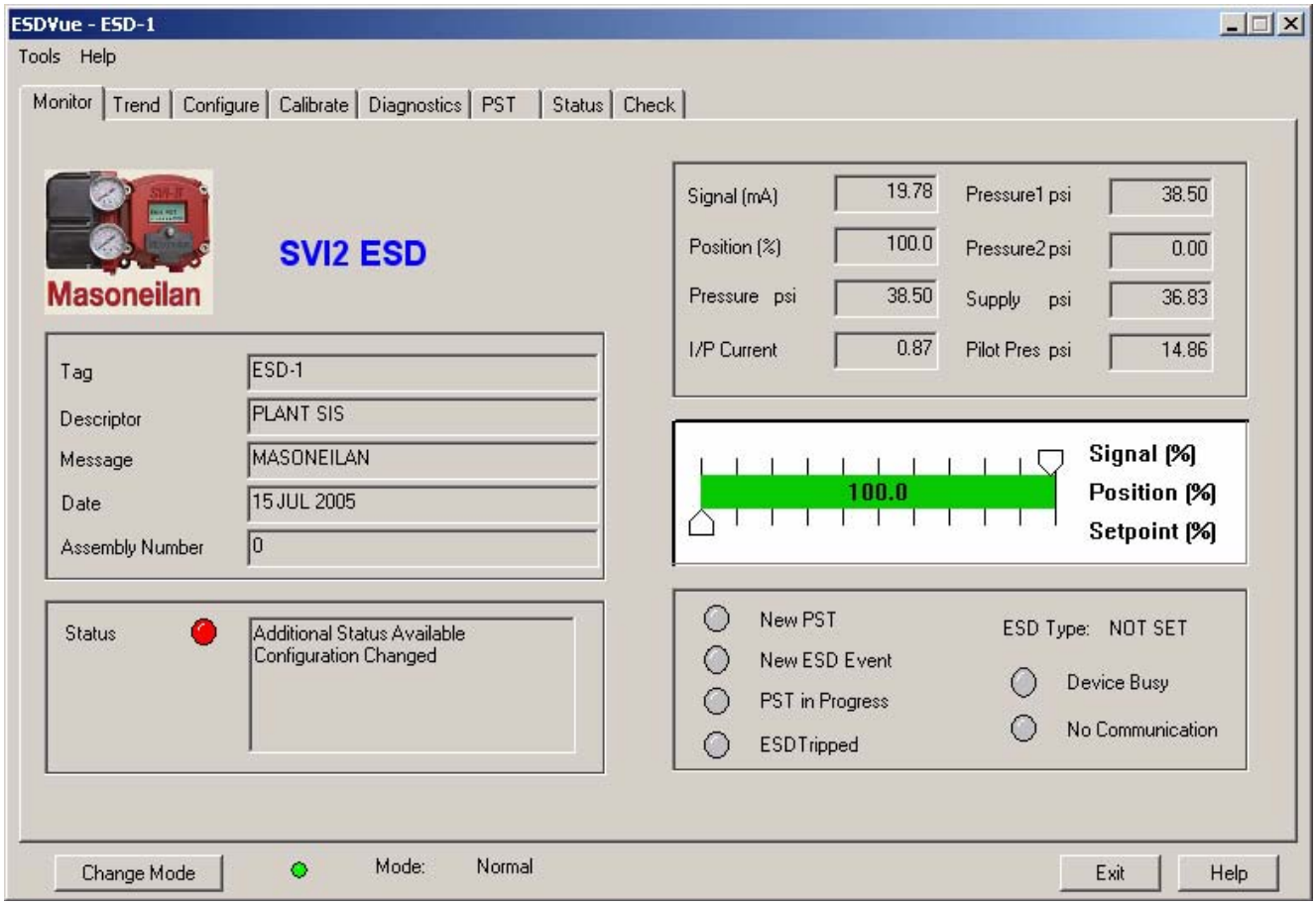


Figure 44 Monitor Screen

Trend Screen

From the Trend Screen the user can observe the performance of the valve in real time.

Figure 45 Trend Screen

Configure Screen

The Configure Screen displays the current configuration parameters and provides the ability to change them.

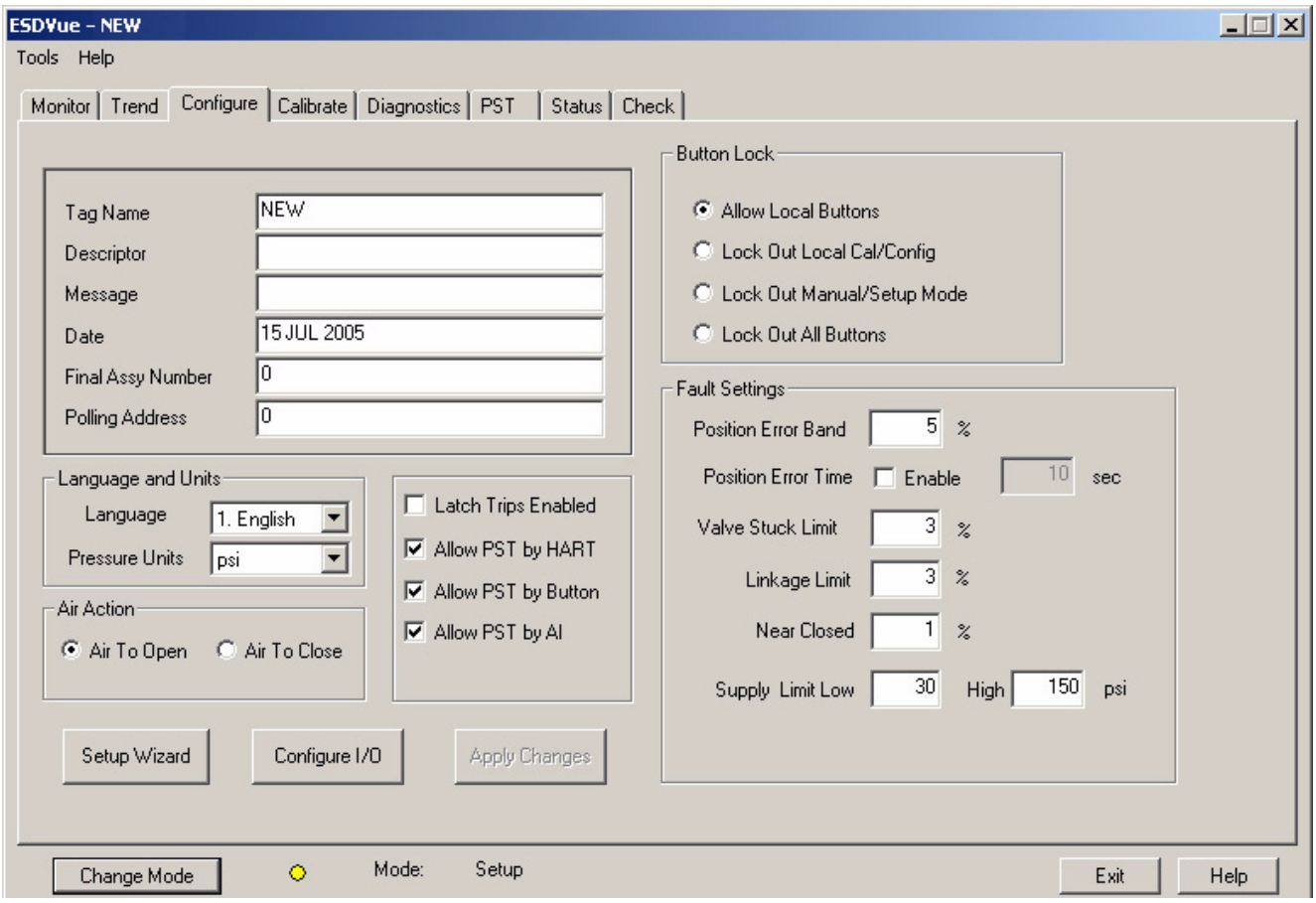


Figure 46 Configure Screen

Calibrate Screen

The Calibrate Screen displays the current positioner's calibration parameters and provides the user the ability to adjust them in the Setup mode.

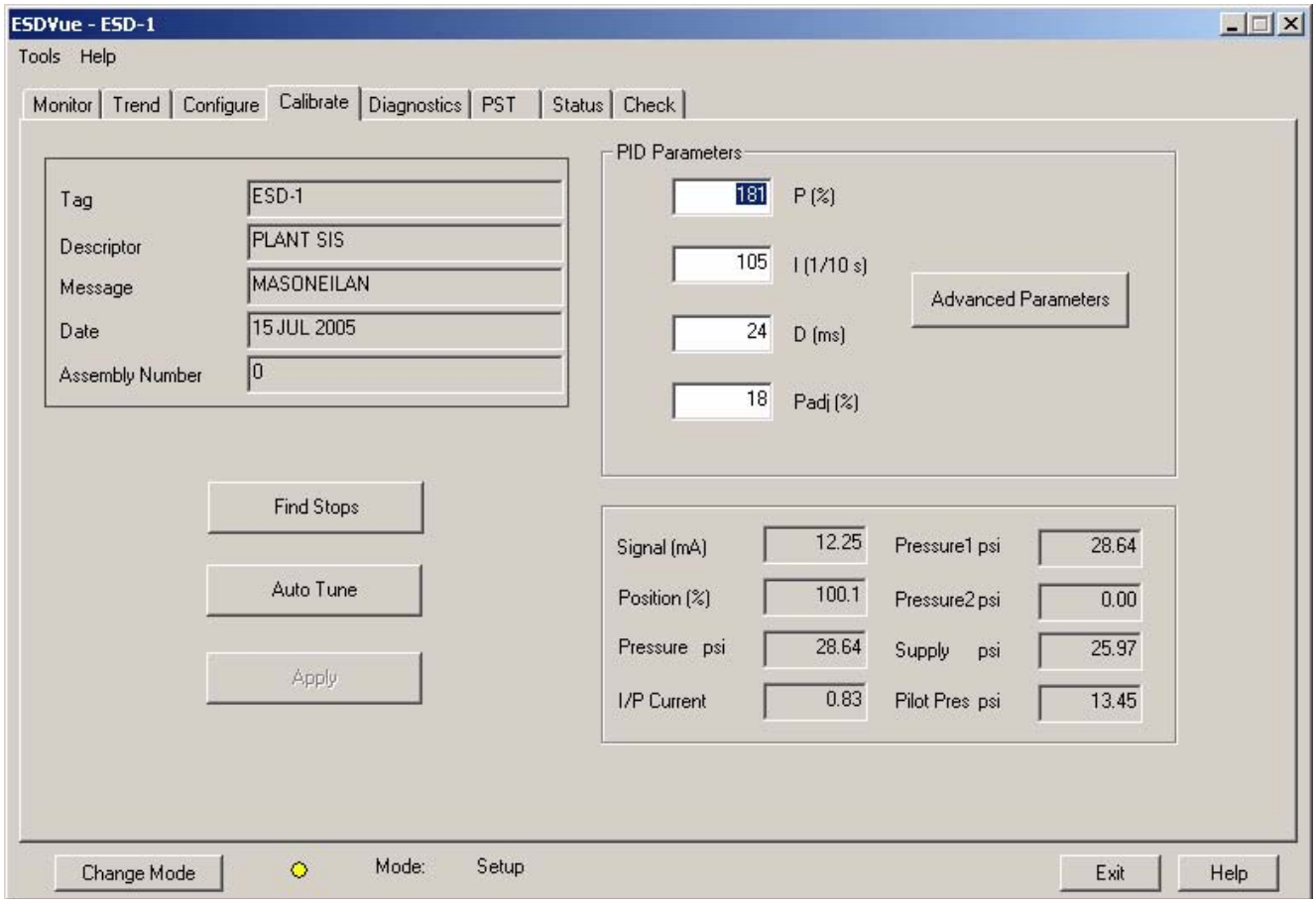


Figure 47 Calibrate Screen

Diagnostics Screen

The Diagnostics Screen provides the ability to functionally test operation of SVI II ESD.

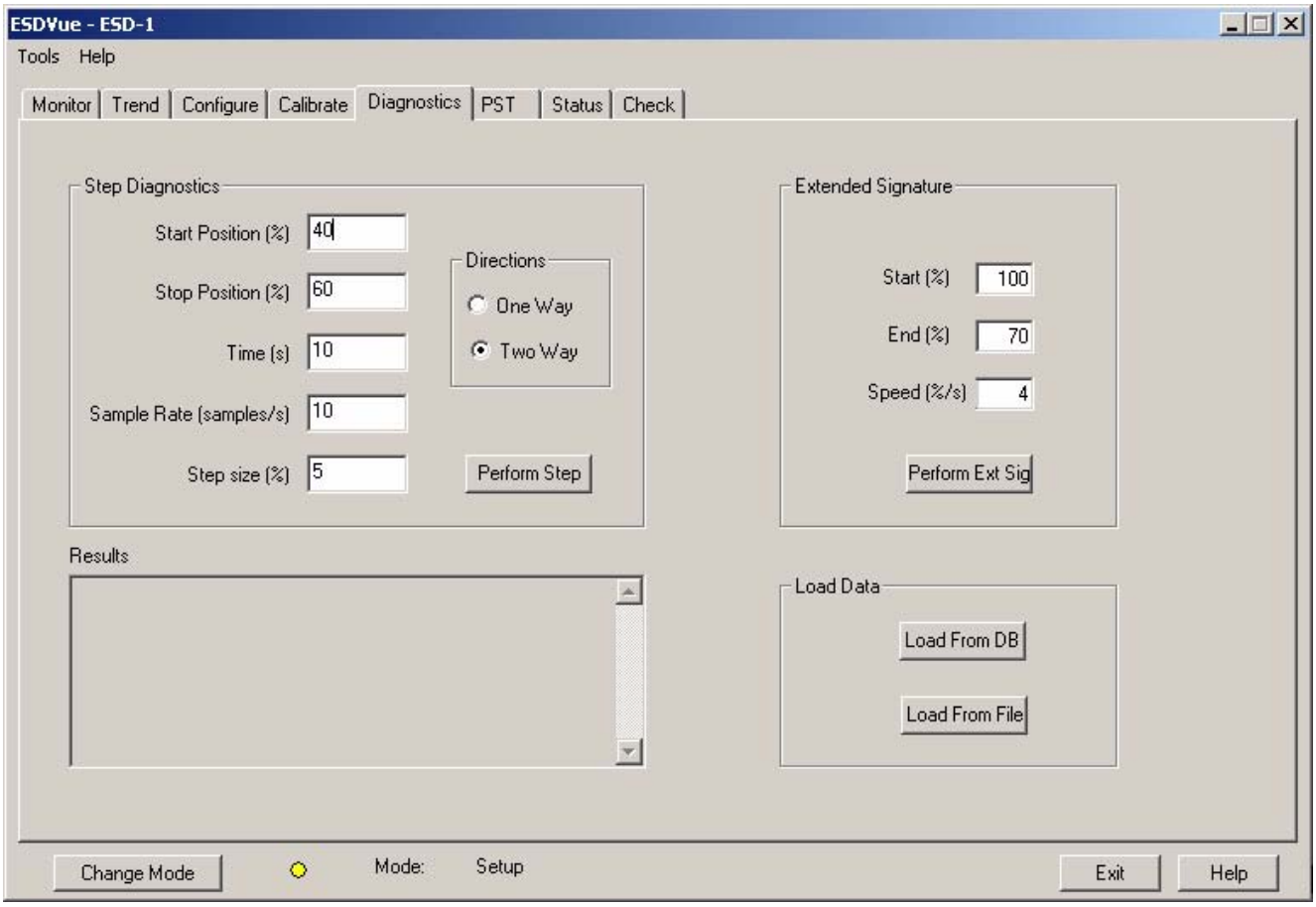


Figure 48 Diagnostics Screen

PST

The PST (Partial Stroke Test) Screen provides access to Partial Stroke Testing, one of the key features of the SVI II ESD.

Figure 49 PST Screen

Status Screen

The Status Screen allows user to see at a glance the operating and internal status of the SVI II ESD.

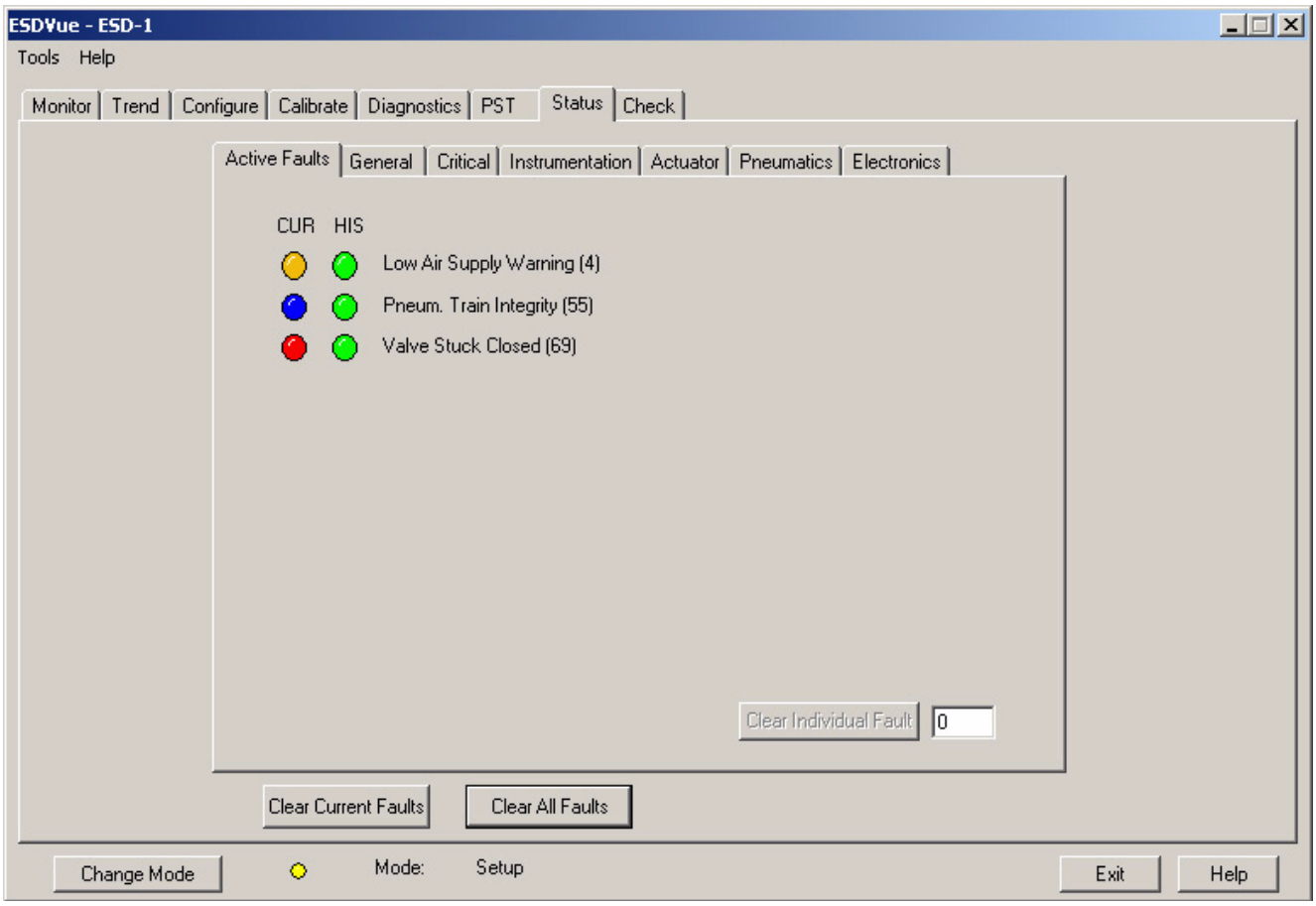


Figure 50 Status Screen

Check

From the Check Screen the user can set monitor some of the basic parameters. This screen is used primarily for troubleshooting.

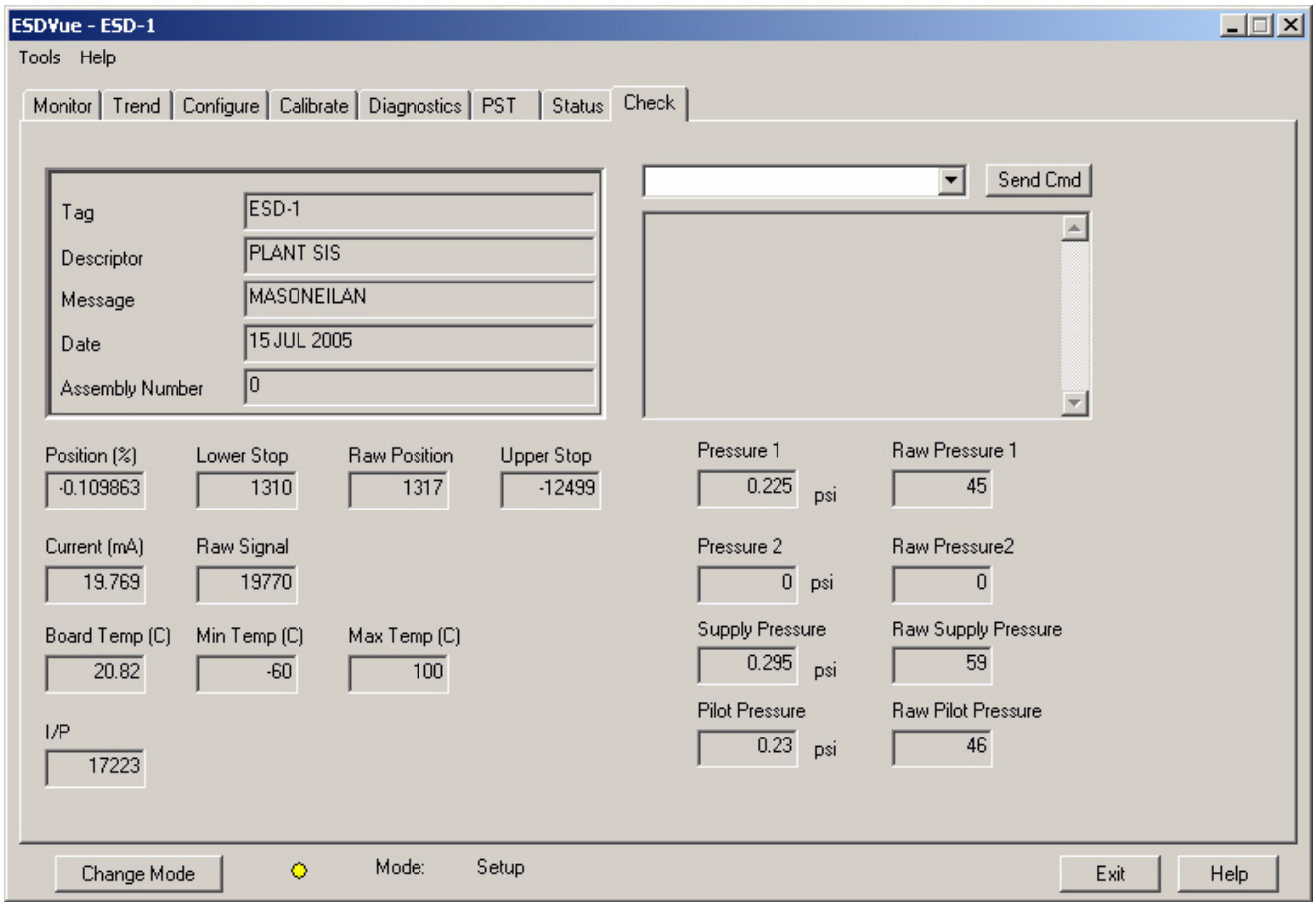


Figure 51 Check Screen

Monitor 4

What You Can Do on the Monitor Screen

The Monitor Screen is the first window displayed upon starting ESDVue. From the Monitor Screen, the user can view the basic functions of the SVI II ESD including; tag and identification, characteristics, setpoint, position, and status.

On the Monitor Screen you can:

- Monitor the current operation of the SVI II ESD
- Change operation parameters
- Monitor the current Positioner Characteristics
- Adjust the Positioner Indicator (graphical representation)
- Generate reports on SVI II ESD operation

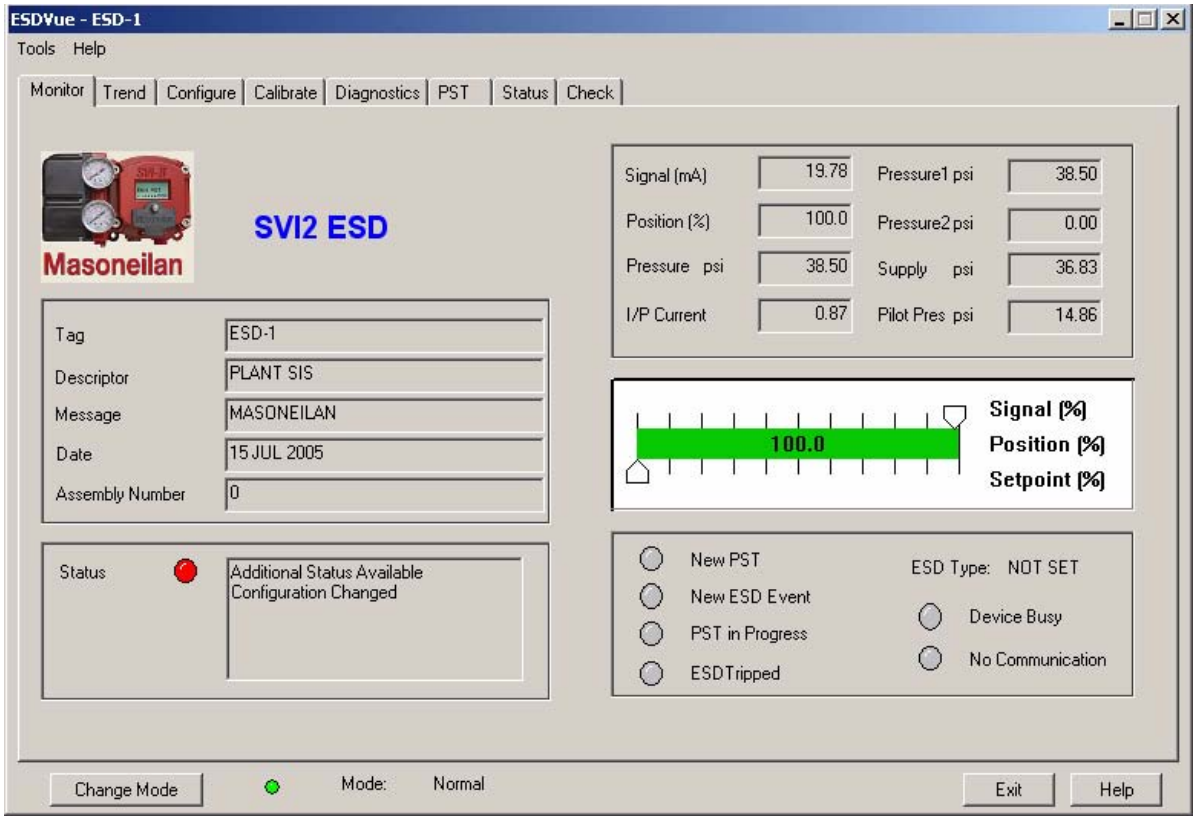


Figure 52 Monitor Screen

Positioner Characteristics

The Positioner Characteristics displayed on the Monitor Screen consist of:

- Signal (mA) - Indicates the input analog signal expressed in mA.
- Position (%) - Indicates the actual valve position in % of valve opening. 0% is always closed and 100% is open.
- Pressure (pressure units) - The SVI II ESD continuously monitors the actuator pressure. It is displayed according to the configured units (psi, bar, or kpa).
- I/P Current - the current in mA generated by the I/P.
- Pressure1 (pressure units) - Actuator pressure when Single Acting.
- Pressure2 (pressure units) - Has no value when Single Acting, in Double Acting.
- Supply (pressure units) - Pressure generated by the air supply.
- Pilot Pres (pressure units) - pressure generated by the I/P.

Pressure, Pressure1 and Pressure2

Pressure, Pressure1 and Pressure2 characteristics change according to the SVI II ESD being either single or double acting. If your unit is single acting Pressure and Pressure1 will both have the same value, the actuator pressure. If your unit is double acting the Pressure value, which is again the acutator pressure will be the difference between Pressure2 - Pressure1.

Position Indicator

The Position Indicator shows the valve position graphically. The indicator consists of 3 parts:

1. The upper part contains an indicator showing the value of the input signal. In Normal mode this is the position setpoint.
   WARNING! - If operating in manual mode, this is the position that the valve will move to if returning operation to normal mode.
2. The center green bar shows the valve position where % = Valve Open. The numerical valve position is shown in the center.
3. The lower part contains an indicator (thumb) showing the valve setpoint. In operating mode this is the same as the signal. In manual mode it is the valve setpoint. The user may drag the thumb to change the valve setpoint. While dragging, the number in the center bar shows the manual setpoint that will be selected when the user releases the thumb.

Signal

Indicates the input analog signal expressed in % of the configured signal range.

Position

Indicates the actual valve position in % of valve opening. 0% is always closed and 100% is open. Because the travel of a valve may exceed its nominal

travel, positions greater than 100% are possible (see **Open Stop Adjustment**).

Setpoint

In NORMAL mode, the setpoint is the target position based on the characterized input. In MANUAL mode, it is the target position to which the SVI II ESD is controlling the valve. The manual setpoint may be changed by dragging the "lower thumb" on the position indicator.

Changing the Setpoint

Prior to changing the position indicator ESDVue must be in Manual mode; click on "Change Mode" and select Manual". There are three ways to change the position indicator:

1. Entering the setpoint value in the Setpoint dialog.
2. Dragging the position indicator.
3. Left clicking on either side of the position indicator modifies the setpoint by 5%.

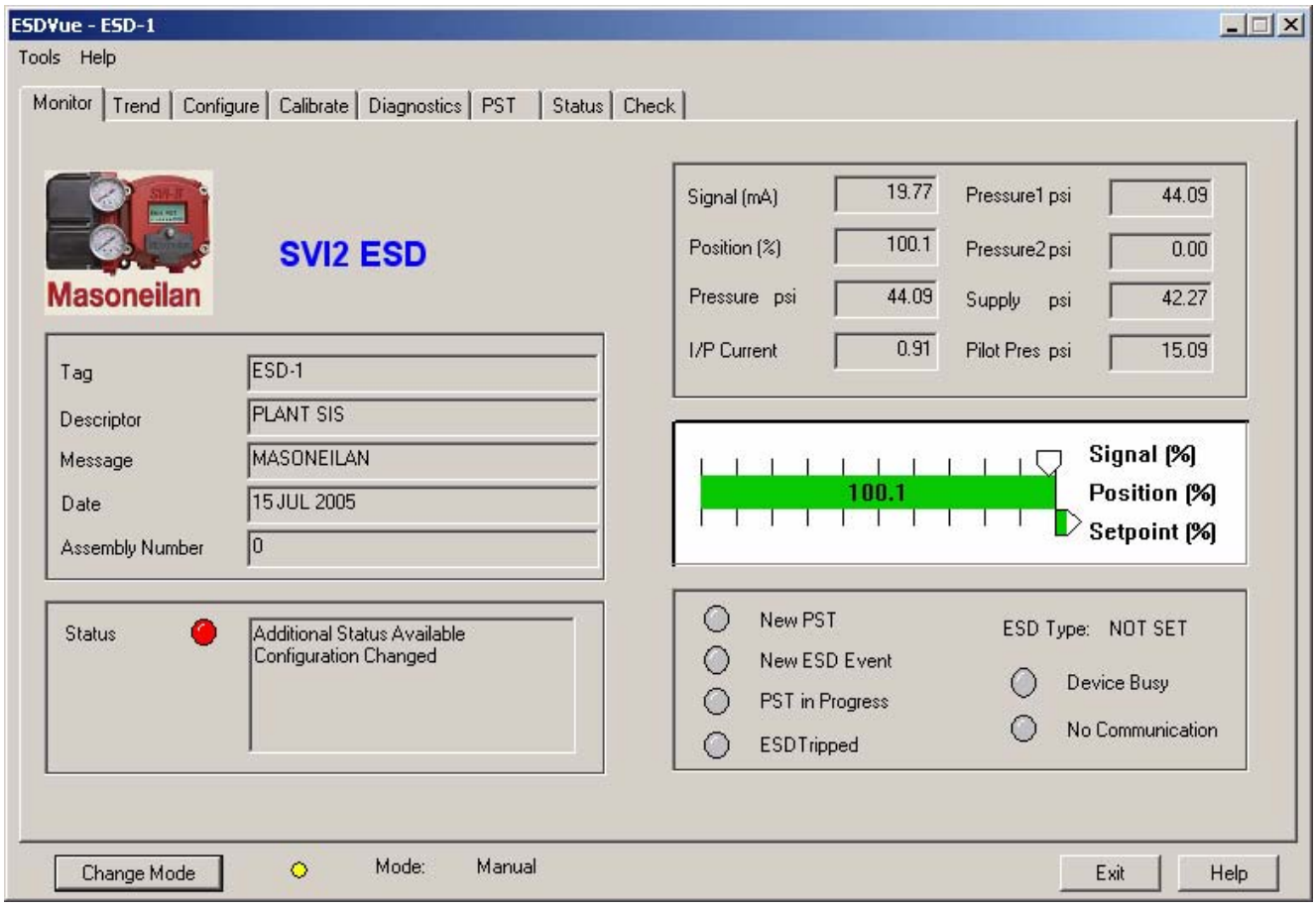


Figure 53 Position Indicator Active

Entering Setpoint Value

To enter a value for the position indicator setpoint:

1. Right click inside the position indicator area.
2. ESDVue will launch the dialog shown below.

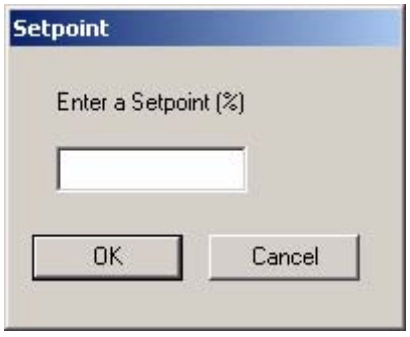


Figure 54 Setpoint Dialog

3. Enter the setpoint percentage and click "OK".

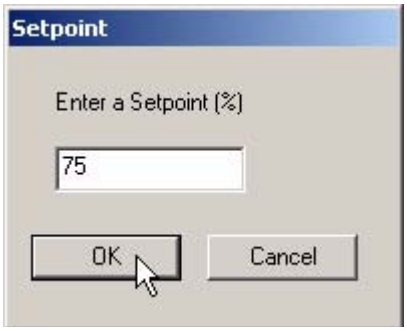


Figure 55 Changing Position Indicator

Status on the Monitor Screen

The SVI II ESD tracks operation and provides several health indicators. When there is a fault code available in the SVI II ESD, this box will contain ‘Additional Status Available’. The fault codes can be retrieved by selecting ‘Read Status’ from the **Send Command** (on the Check Screen) drop down list and then clicking "Send".

The status block also contains other status codes returned by HART. These include ‘Configuration Changed’, ‘Device malfunction’, and ‘Variable out of limits’.

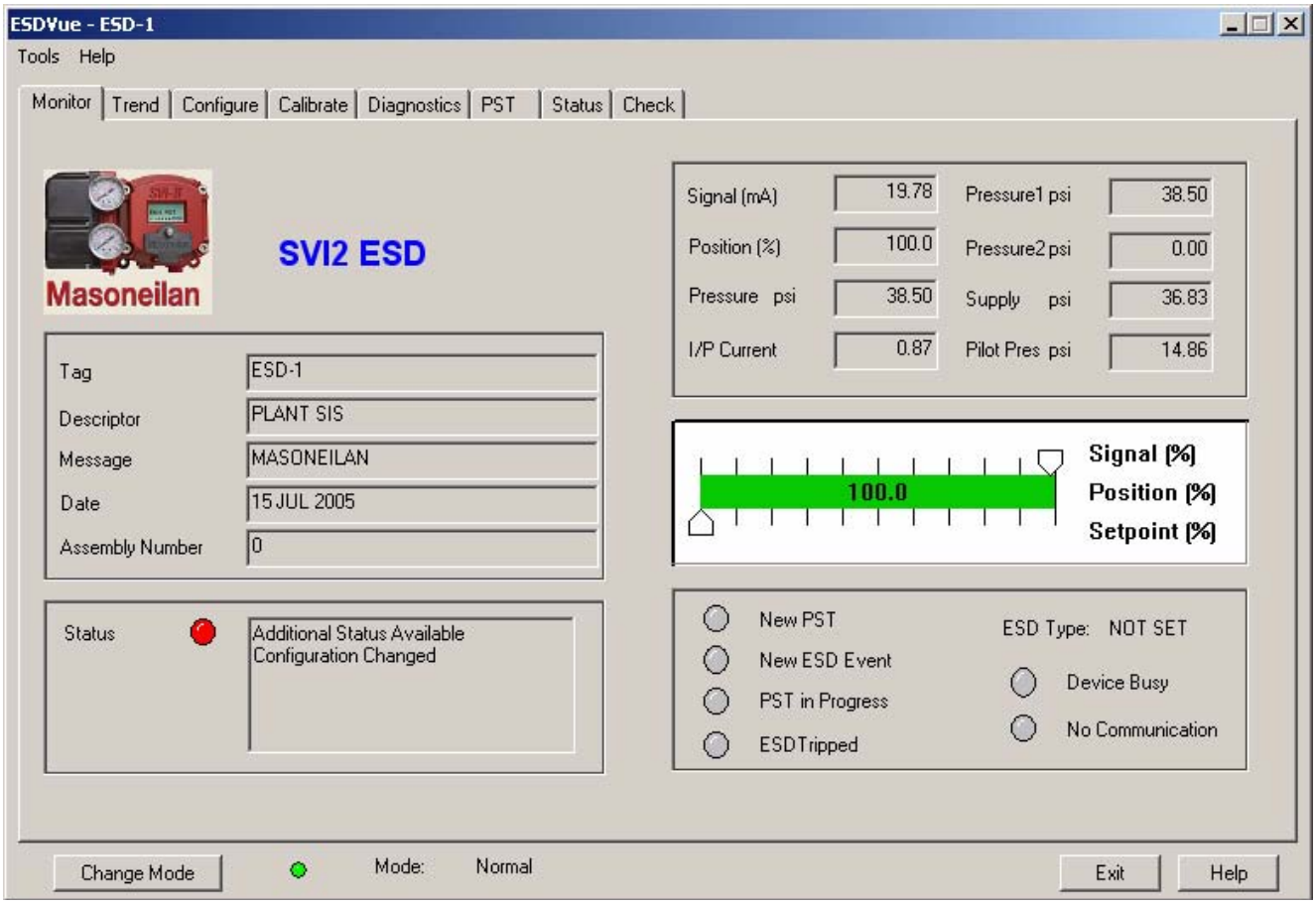


Figure 56 Monitor Screen - Additional Status Available

Tag Information

The Tag Information on the Monitor Screen displays the following items:

- Tag
- Descriptor
- Message
- Date
- Assembly Number

Tag Information is displayed at the same location on the Monitor, Configure and Calibrate Screens but can only be changed on the Configure Screen. (See “Changing Tag Information” on page 87 of this manual.)

PST/ESD Information

The ESDVue Monitor Screen contains status information on SVI II ESD's Partial Stroke Testing (PST) and on the Emergency Shutdown Device (ESD) function. The PST/ ESD status fields are:

- New PST - indicates when a new PST has been executed
- New ESD Event - indicates whether there is a new ESD status event
- PST in Progress - indicates whether a PST is in progress or not
- ESD Tripped - indicates whether the Safety function has been tripped or not
- ESD Type - indicates the type of SVI II ESD device: ASD, DSD, A/DSD - See **ESD Types** for more information
- Device Busy
- Communication/No Communication - indicates if the SVI II ESD is in communication with the Safety System

If the Status field is colored red, that status field is current.

ESD Types

There are three configurations of the SVI II ESD available.

ASD

2 Wire Analog Trigger - 4 - 20 mA signal, 2 wire installations with superimposed HART communications.

DSD

4 Wire Discrete Trigger, 4 - 20 mA signal, 2 wire twisted pair installations with superimposed HART communications for control system and 24 Vdc 2 wire twisted pair for Safety System.

A/DSD

2 Wire Discrete Trigger - 24 Vdc, 2 wire installations with superimposed HART communications.

Monitor Context Menu

When the user right clicks on the Monitor Screen, a context menu appears as shown below.

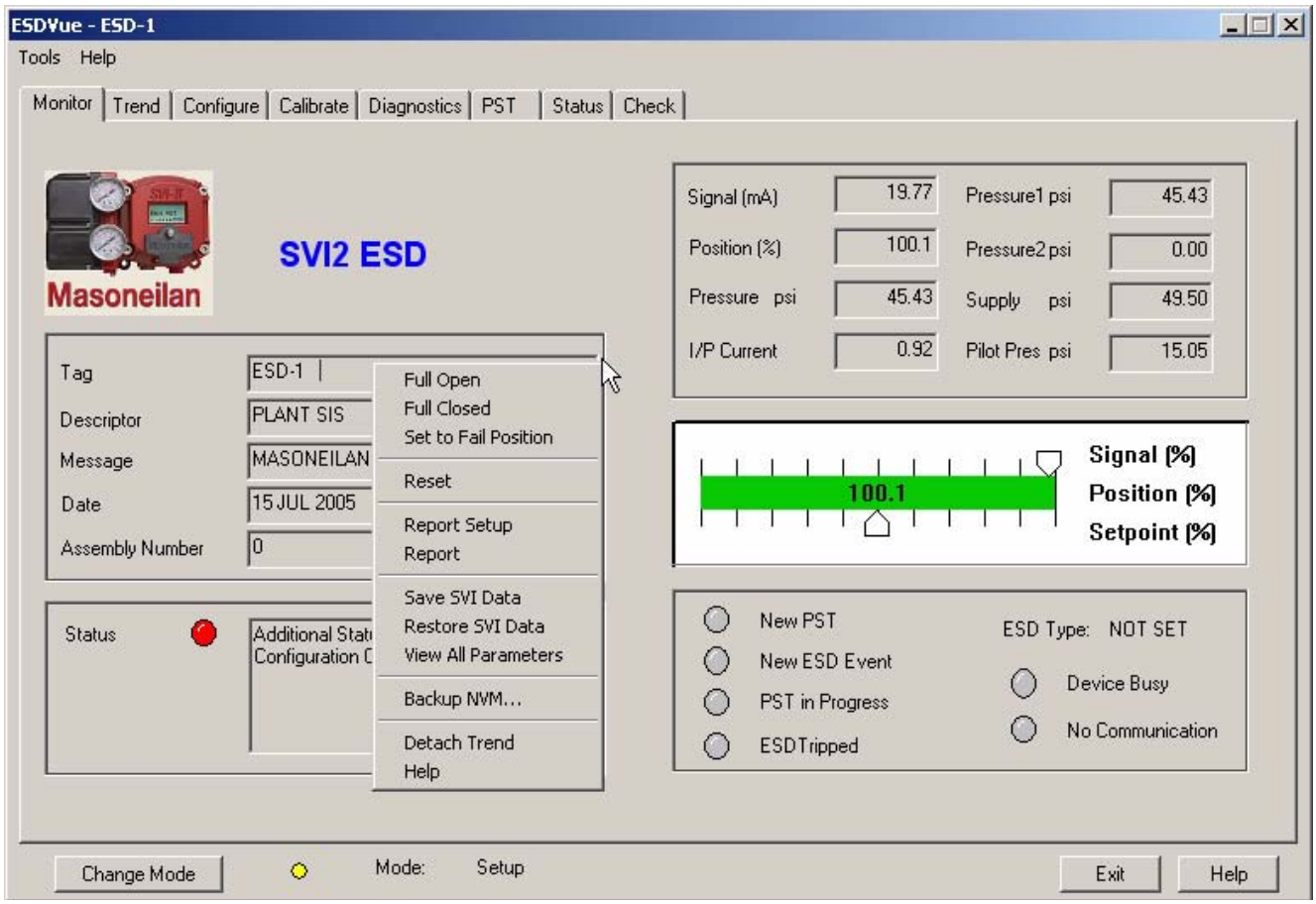


Figure 57 Monitor Screen Context Sensitive Menu

The following items will be displayed and greyed out based on the actual SVI II ESD mode.

Full Open

Moves the valve to full open. This command will take the valve out of closed loop control and will send a high or low signal to the I/P. This is available only in manual or setup mode.

Full Closed

Moves the valve to full closed. This will take the valve out of closed loop control and send a high or low signal to the I/P. This is available only in manual or setup mode.

Set to Fail Position

Sets the Output Pressure (P1) to 0 psi. Moves the valve full open or full closed, whichever is the fail position of the actuator.

Cancel Transfer

Returns the SVI II ESD to manual mode from the bumpless transfer mode (available during a bumpless transfer).

Reset

Issues a master reset to the device, causing it to go through its startup routine and re-initializing all of its operating parameters from non-volatile memory.

WARNING!

THE VALVE WILL MOVE DURING THE RESET OPERATION.

Report Setup (See Report Setup)

Allows the user to set up a report template and printing program.

Report (See Generate Report)

Generates a report of the SVI II ESD parameters.

Save SVI Data

Saves the SVI II ESD internal parameters in a file that can be read and restored by ESDVue.

Restore SVI Data

Restores the contents of a dump file to a Masoneilan device. This can be used to ‘clone’ an SVI II ESD into a new SVI II ESD.

Note: *items like tag, which should be unique, and position calibrations which differ on each positioner are not cloned. This command is available only in manual mode.*

Backup NVM

Allows the user to backup the Non Volatile Memory (NVM). This is useful for factory engineer to help troubleshoot an SVI II ESD.

Detach Trend

Removes the Trend display from the anchored tab format and creates a separate trend display.

Help

Displays the help file at the Monitor Screen instructions.

Full Open

Moves the valve to full open. This command will take the valve out of closed loop control and will send a high or low signal to the I/P. This is available only in manual or setup mode.

Full Closed

Moves the valve to full closed. This will take the valve out of closed loop control and send a high or low signal to the I/P. This is available only in manual or setup mode.

Set to Fail Position

Sets the Output Pressure (P1) to 0 psig. Moves the valve full open or full closed, whichever is the fail position of the actuator.

Reset

Issues a master reset to the device, causing it to go through its startup routine and re-initializing all of its operating parameters from non-volatile memory.

WARNING!

THE VALVE WILL MOVE DURING THE RESET OPERATION.

Reports

One of the functions available on the Monitor Screen is the ability to generate reports. ESDVue provides the ability to extract information about the SVI II ESD operation and dump the information into a report format. When ESDVue extracts the information from a device it requires a template file into which to dump the data. To generate a report with ESDVue you must first create a report template file that includes the parameters you would like to include in the report as well as personalization.

How to Create Reports

There are three basic steps to create reports:

1. Set up the report - **create a report template file**.
2. Select the report setup (report template file) - using the **Report Setup** command from the Monitor Context Menu.
3. **Generate the report** - using the Report command from the Monitor Context Menu.

Creating Report Template Files

The user can create a custom SVI II ESD report by creating a rich text format (RTF) file which is laid out in the format of the desired report. The default template is located in:
C:\Program Files\DFC\ESDVue\Report\EsdFullReport.rtf.

Prior to selecting the set up of the report (ESDVue Monitor Context Menu) you must create the report template file in an rtf format. The report template should include the operation parameters that you would like populated in the report.

ESDVue will substitute the values of SVI II ESD parameters into the text file where ever it finds a parameter name that matches an SVI II AP parameter. For each parameter you would like included in the report place $$ in front of the parameter name.

For example:

Tag = $$Tag

ESDVue will substitute the actual tag name from the SVI II ESD in place of the $$Tag in the report.

When creating the report template file, you should use an application that can save the report template file to an rtf or text file such as WordPad, Microsoft Word, or Notepad.

Note: *rtf files are preferred as you can apply special formatting to the file that can contain fonts, sizes, tabs, etc. and bitmaps. Some .rtf formatting is accepted in Word which is not available in WordPad.*

The allowed SVI II ESD Parameters are listed in **the table below**. The user is encouraged to use the report file (report.rtf) shipped with the application for examples.

Table 3 Report Setup Parameters

Report Parameter	Information Provided in Report
$$Tag	Tag Name
$$Descriptor	Descriptor
$$Date	Date
$$Message	Message
$$AssemblyNumber	Final Assembly Number
$$MfgID	Manufacturer’s ID (101 for Masoneilan)
$$DeviceType	Device Type (200 for the SVI II ESD)
$$DeviceID	Hart DeviceID
$$HWRev	Hardware Revision
$$SWRev	Software Revision
$$CmdRev	Firmware Command Revision
$$PollingAddress	PollingAddress

Table 3 Report Setup Parameters

Report Parameter	Information Provided in Report
$$Position	Position
$$Signal	Input Signal
$$Pressure	Actuator Pressure
$$IPOutput	Signal to the I/P in Counts (0 - 65000)
$$Temperature	Circuit Board Temperature
$$LowTemperature	Historical Low Temperature
$$HighTemperature	Historical High Temperature
$$Output	Output from the process controller
$$Mode	SVI II ESD Mode
$$SignalPercent	Input Signal as Percent
$$AirAction	Air-to-Open/Air-to-Close
$$ActuatorType	Single/Double Acting Actuator
$$PosErrorBand	Position Error Band
$$PosErrorTime	Position Deviation Time
$$Charact	Characterization (Linear, Equal Percentage, etc.)
$$CustomCharact	Displays the Custom Characterization constants Individual items of the characterization curve may be selected by entering: $$CustomCharact[n] - where n is a number between 0 and 17
$$ButtonLock	Button Lock Level
$$Bumpless	Bumpless Transfer On/Off
$$BumplessSpeed	Time to move from Manual to Normal (operating) mode
$$TightShutoff	Tight Shutoff On/Off
$$TSValue	Tight Shutoff Value
$$ULimitStop	Upper Position Limit On/Off
$$ULSValue	Upper Position Limit
$$LLimitStop	Lower Position Limit On/Off
$$LLSValue	Lower Position Limit
$$NearClosed	Value below which is considered Near Closed
$$PosUnits	Position Units of Measure (always %)

Table 3 Report Setup Parameters

Report Parameter	Information Provided in Report
$$PresUnits	Pressure Units (psi, bar, or kpa)
$$SignalUnits	Signal Units (always mA)
$$Language	SVI II ESD Display Language
$$LowSignal	Low Calibration Value
$$HighSignal	High Calibration Value
$$P	Proportional Gain In Positioner
$$Padjust	Adjustment to P when valve is exhausting
$$I	Integral action of positioner
$$Beta	Step size adjustment in positioner
$$D	Derivative action of positioner
$$PosComp	Position range compensation of positioner
$$DeadZone	Dead zone of positioner
$$Damping	Damping coefficient of positioner
$$Travel	Total strokes of the valve
$$Cycles	Total cycles of the valve
$$TimeOpen	Total time open of the valve
$$TimeClosed	Total time closed of the valve
$$TimeNearClosed	Amount of time valve was nearly closed
$$ResponseOpen	Time require to open valve
$$ResponseClosed	Time required to close valve
$$Switch1Type	Condition under which Switch 1 will operate
$$Switch1Value	Value at which Switch 1 will activate
$$Switch1Action	Switch is Normally Closed or Normally Open
$$RawSignal	Signal Value in A/D Counts
$$RawPosition	Position Value in A/D Counts
$$PositionStopLow	Position A/D Counts at the Lower Stop
$$PositionStopHigh	Position A/D Counts at the Upper Stop

Table 3 Report Setup Parameters

Report Parameter	Information Provided in Report
$$OptionConfig $$OptionConfigEx0 $$OptionConfigEx1 $$OptionConfigEx2 $$OptionConfigEx3	Data describing the hardware installed on the positioner
$$Friction	Friction Measured from a Standard Actuator Signature
$$FLowerSpringRange	Lower Spring Range measured from a standard actuator signature
$$FupperSpringRange	Upper Spring Range measured from a standard actuator signature
$$LowPressureActual	Pressure when the actuator is exhausted
$$HighPressureActual	Supply Pressure
$$Speed	Speed at which the last diagnostic test was run
$$SpeedSaved	Speed at which the saved standard signature was run
$$SpeedBaseline	Speed at which the baseline standard signature was run
$$LowerSpringRange $$LowerSpringRangeSaved $$LowerSpringRangeBaseline	Lower Spring Range calculated from the current, saved, or baseline standard signature
$$UpperSpringRange $$UpperSpringRangeSaved $$UpperSpringRangeBaseline	Upper Spring Range calculated from the current, saved, or baseline standard signature
$$Signature	Position/Pressure Pairs Gathered during the Standard Signature Test
$$SignatureSaved	Position/Pressure Pairs Saved in the Saved Standard Signature
$$SignatureBaseline	Position/Pressure Pairs Saved in the Baseline Standard Signature

Report Setup

To set up the report right click on the Monitor Screen and select "Report Setup" from the context menu.

1. When you access "Report Setup" ESDVue launches the dialog displayed below. There are two items which you need to complete in this dialog:
   - ❖ Report Template File Name
   - ❖ Report Program to use
2. ESDVue will launch the Report Setup window with defaults for "Report Template File Name" and "Report Program to Use" as shown below.

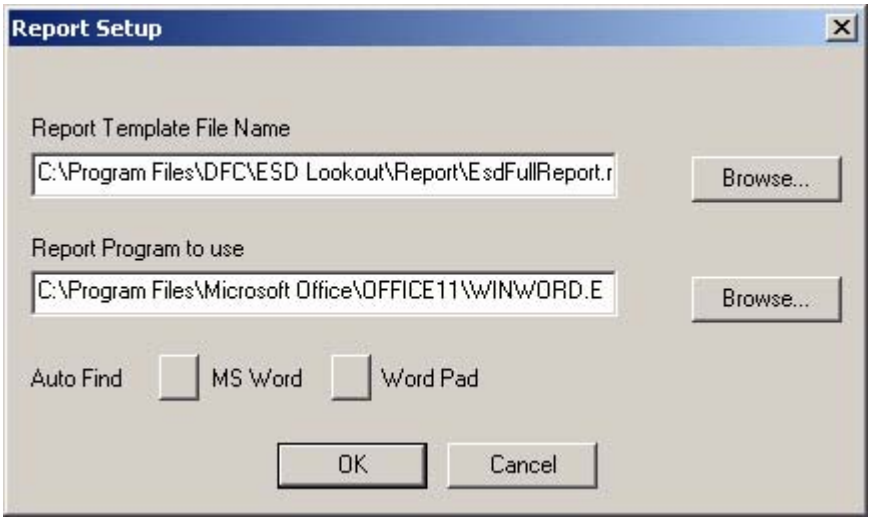


Figure 58 Report Setup Dialog

3. Use the browser or type the path for the Report Template file name and for the program to use to generate the report.

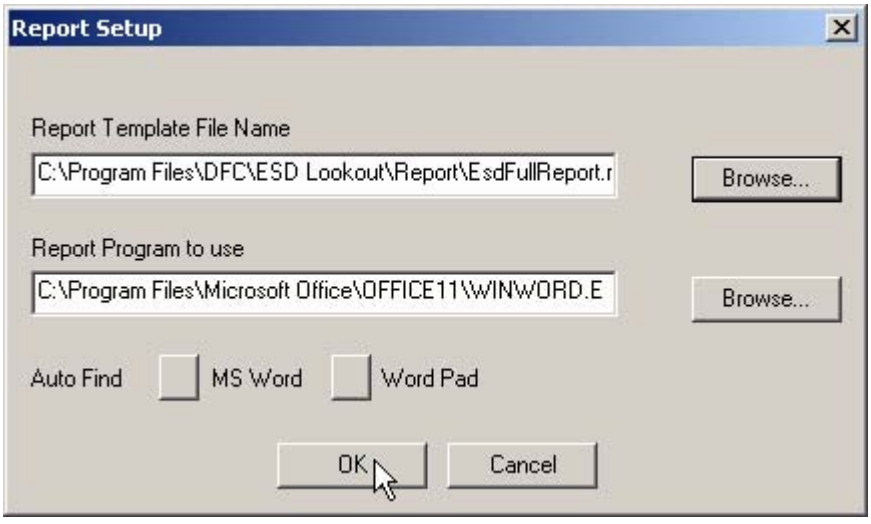


Figure 59 Report Setup Completed

(Generate) Report

To generate a report:

1. On the Monitor Screen select "Report" from the right click, context sensitive menu.
2. The following dialog box will be displayed.
3. Click "OK" to continue.

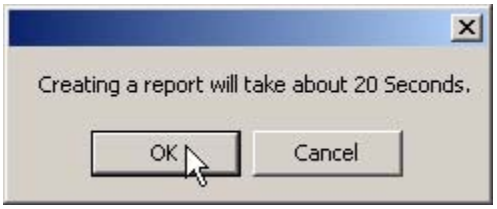


Figure 60 Generate Report Dialog

4. ESDVue will then populate the report template. An example of a report is shown below.

Smart Valve Interface ESD - Configuration Data Sheet

General Information

Tag Name	ESD-1
Descriptor	PLANT SIS
Date	15 JUL 2005
Message	MASONEILAN
Assembly Number	0
Manufacturer's ID	101
Device Type	203
Device ID	5420073
Hardware Revision	3
Transmitter Revision	1
Software Revision	2
Polling Address	0

Operating Data

Position	0.0 %
Signal	19.77 mA
Pressure	-0.01 psi
Switch 1	Closed

Configuration Information

Air Action	ATO
Actuator Type	Single
Position Error Band	5.0 %
Position Error Time	Off
Supply Low Limit	30.000
Supply High Limit	150.000
Stuck Limit	3.000
Button Lock	Level 0

Figure 61 Report Sample Using ESDVue Template

View All Parameters

When you select the "View All Parameters" from the Monitor context menu, ESDVue will display the Device Configure window shown below.

The window has selectable tabs that display the associated parameters for each tab when selected; e.g. when you select "PST Config" tab the PST Configuration parameters will display.

Note: *The*  *appearing in the Device Configure window, or on any screen in ESDVue indicates that there is status information available on the active item; e.g. there may have been a failure, current or historical for the parameter.* *Refer to "Status" on page 251 for further information.*

When you are on the "ALL" tab the table for the "ALL" tab displays all device parameters. The parameters are then partitioned into their respective SVI II ESD functional areas.

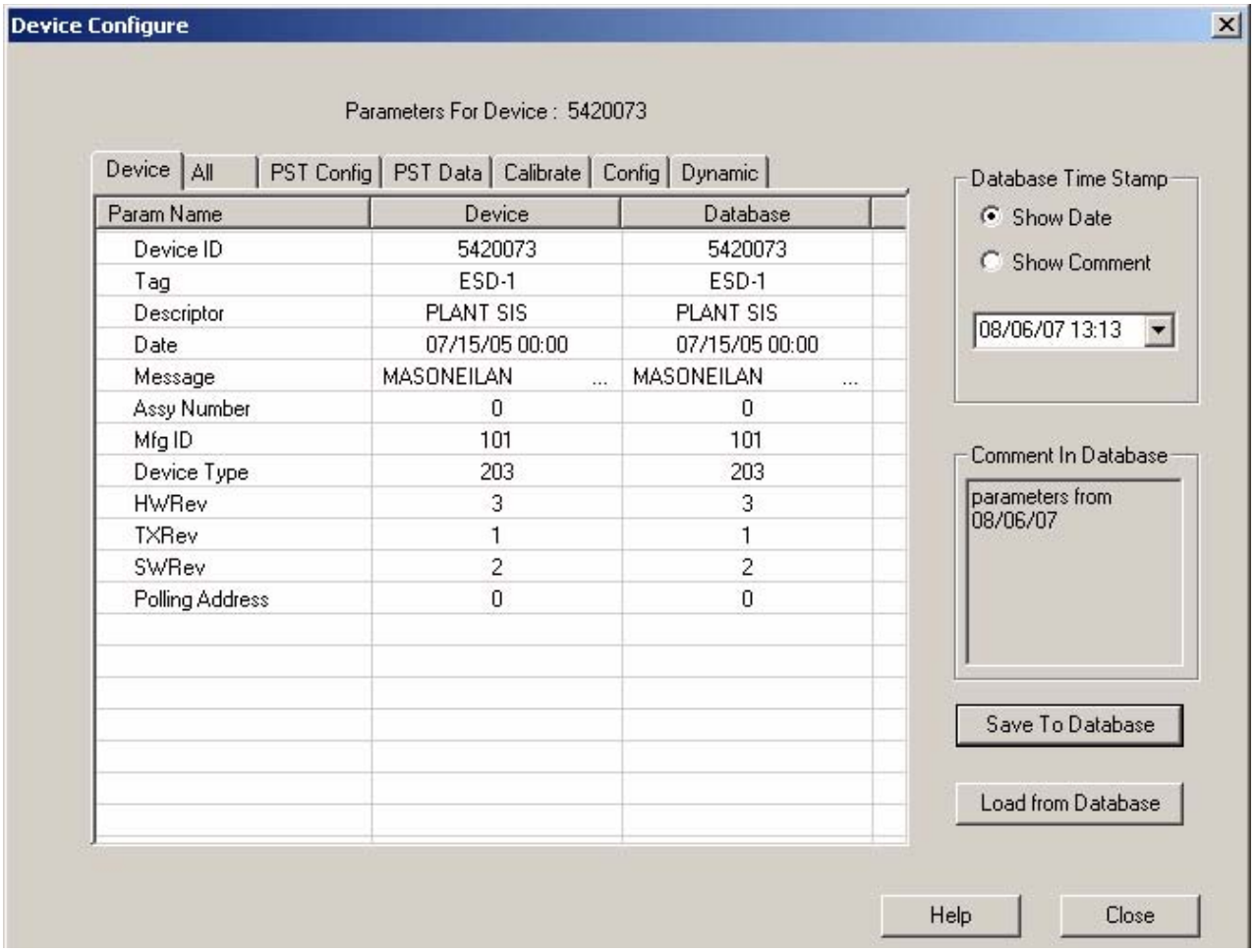


Figure 62 View All Parameters Window

Device

The Device tab is the first tab displayed and displays all parameters that device specific; e.g Device I.D., Tag, Device Type, as shown in the figure below.

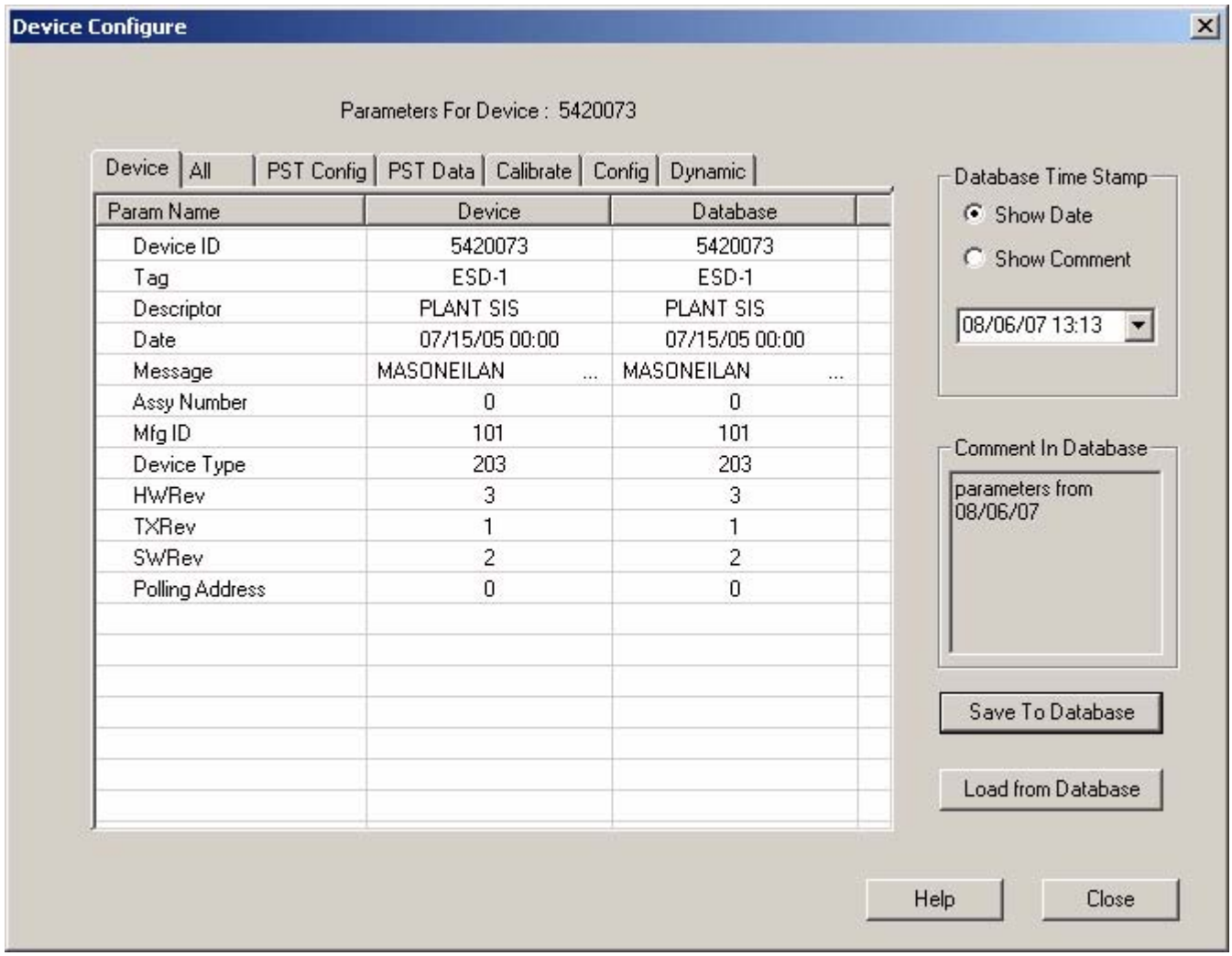


Figure 63 View All Parameters - Device Tab

All

The All tab displays all parameters collected from operation as shown in the figure below.

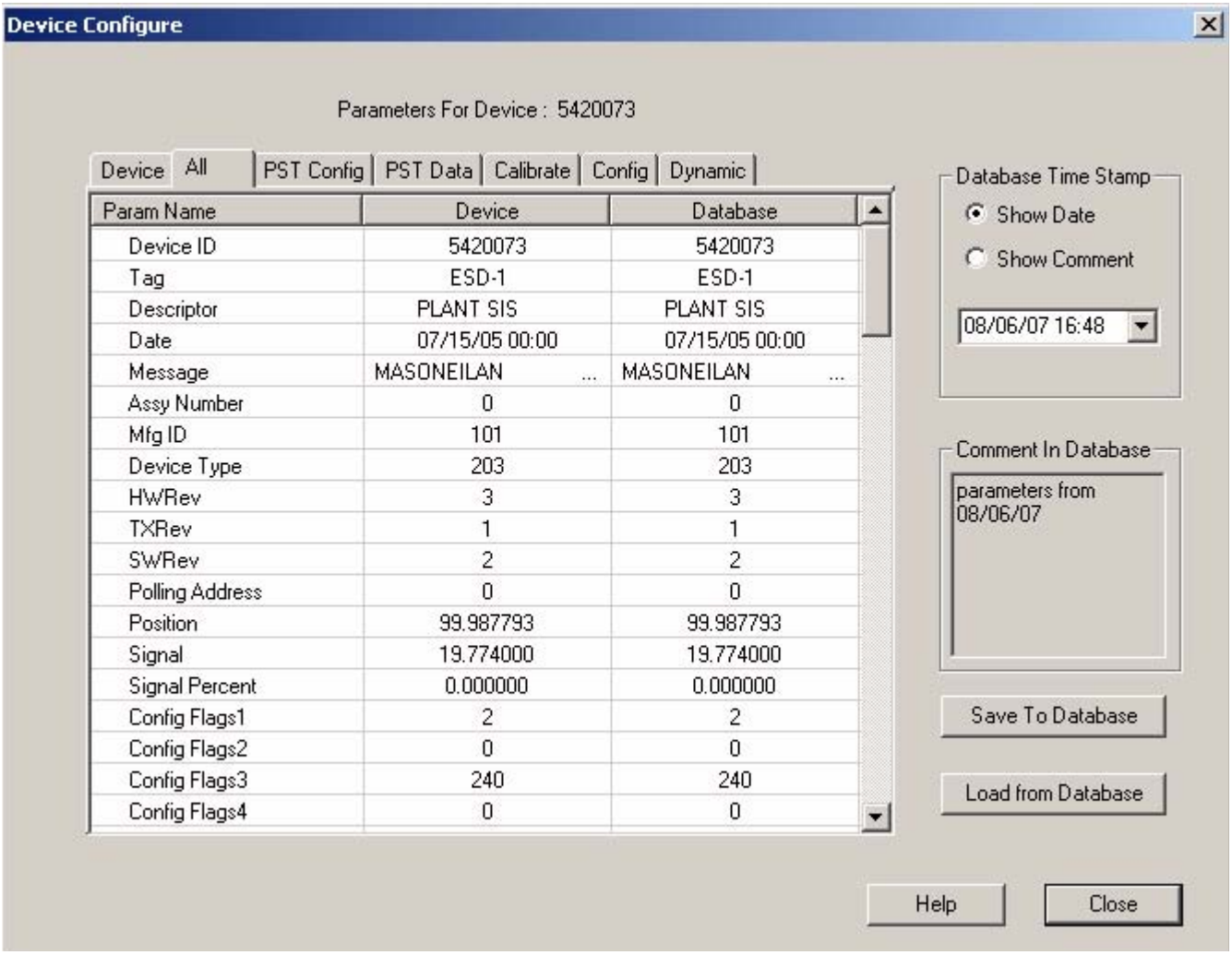


Figure 64 View All Parameters - All Tab

PST Config

The PST Config tab displays all device parameters for configuration of PST scheduling and operation as shown in the figure below.

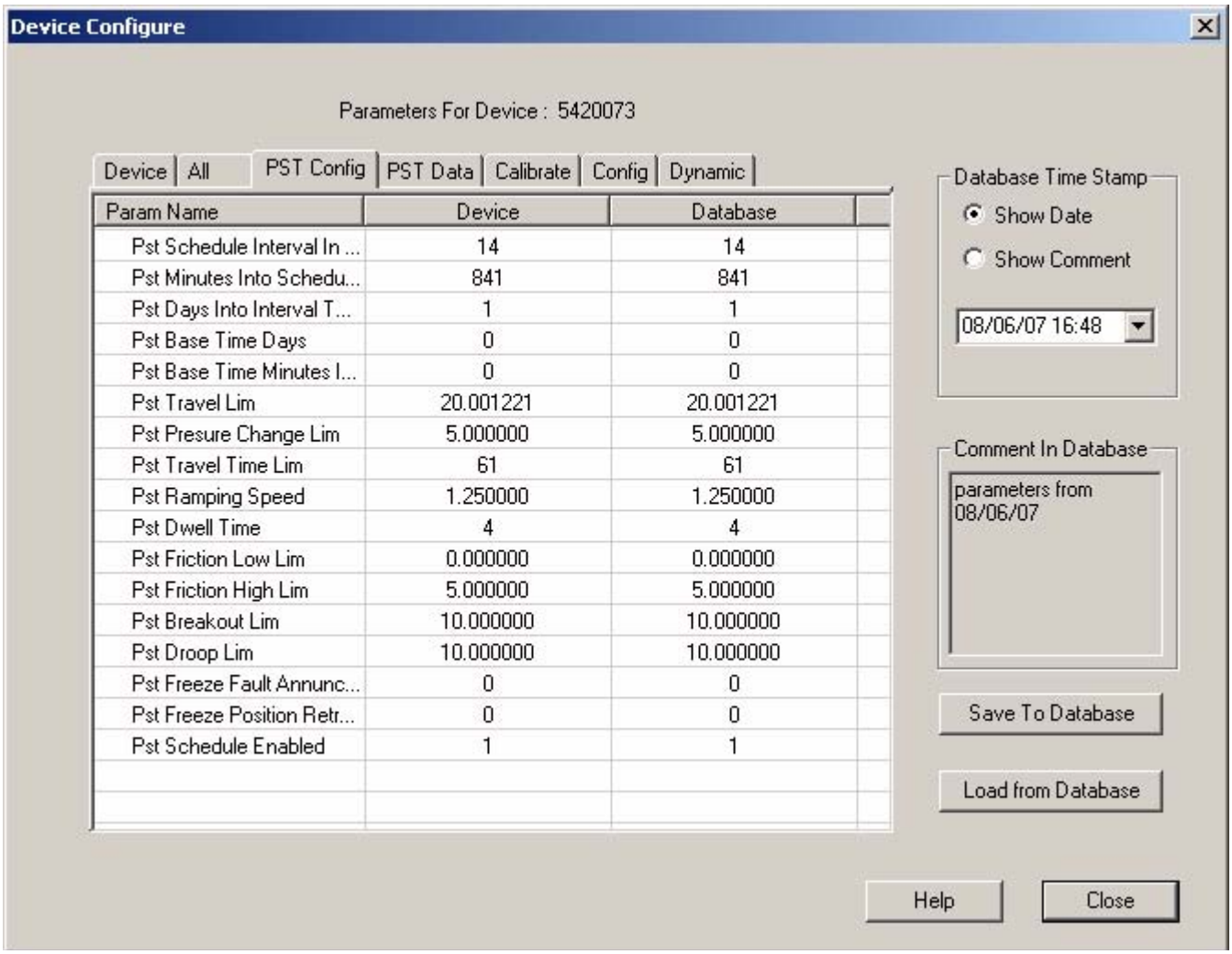


Figure 65 View All Parameters - PST Config Tab

PST DATA

The PST Data tab displays data parameters collected from PST operation as shown in the figure below.

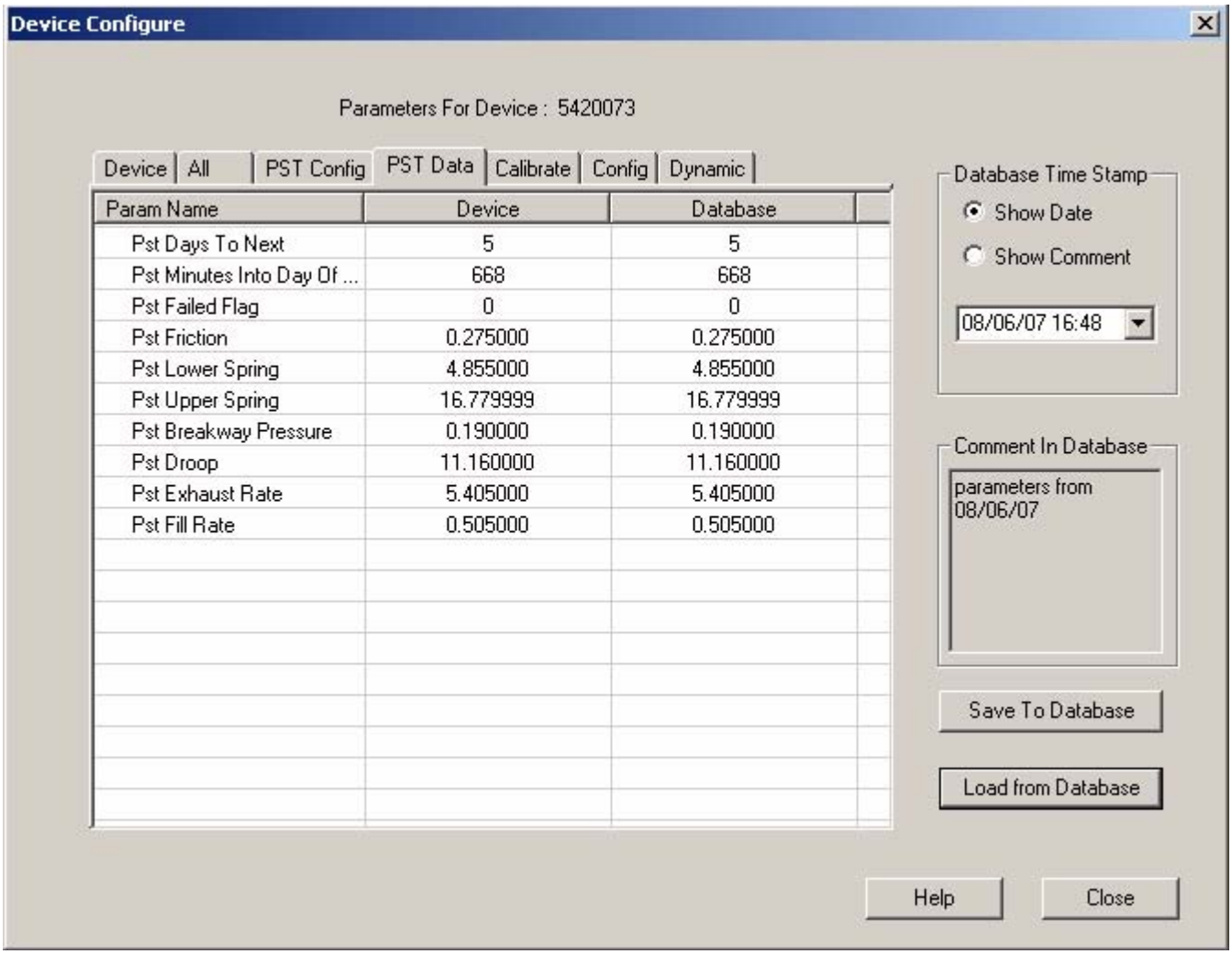


Figure 66 View All Parameters - PST DATA Tab

Calibrate

The Calibrate tab displays the device calibration parameters as shown in the figure below.

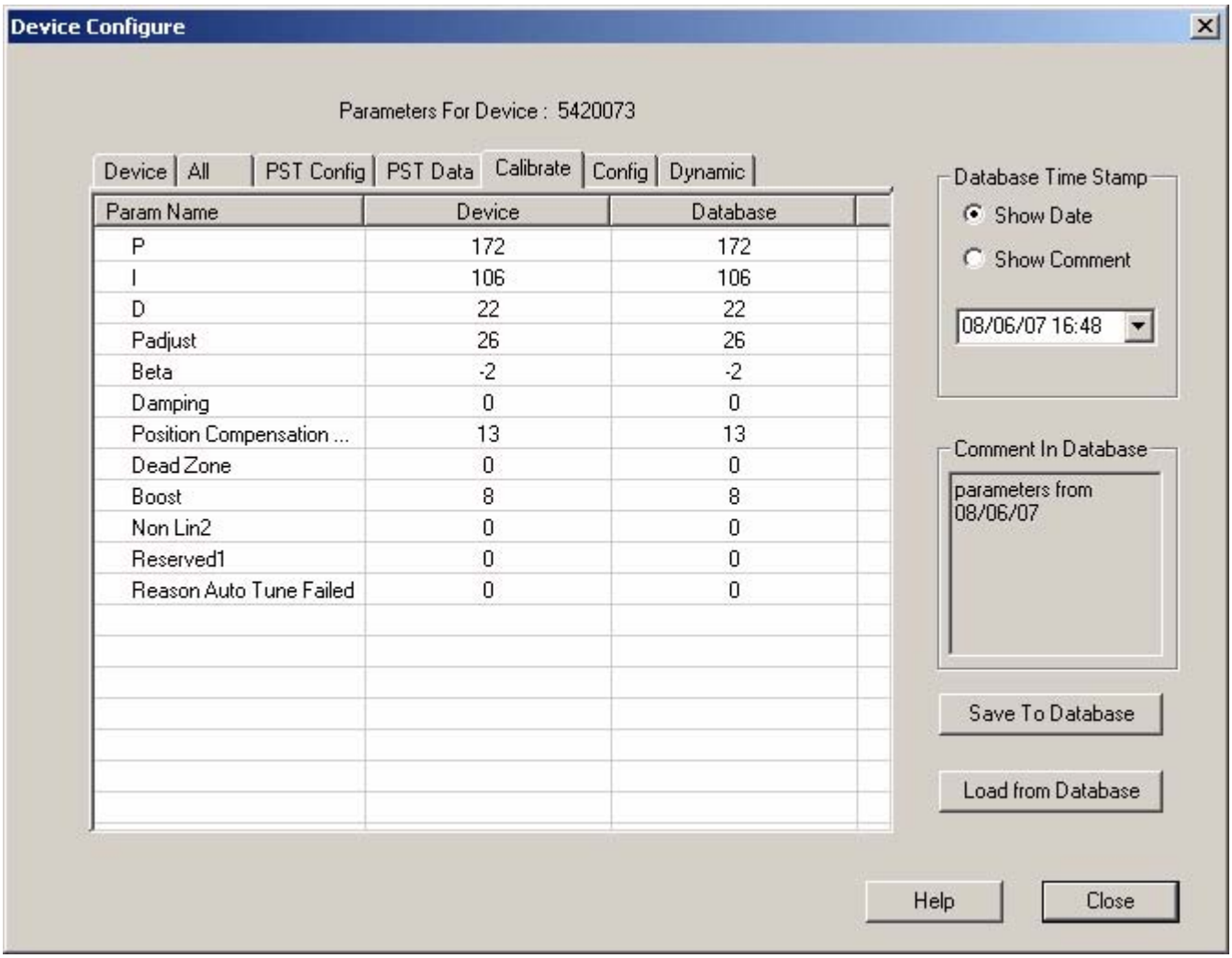


Figure 67 View All Parameters - CAL Tab

Config

The Config tab displays all SVI II ESD configuration parameters as shown in the figure below.

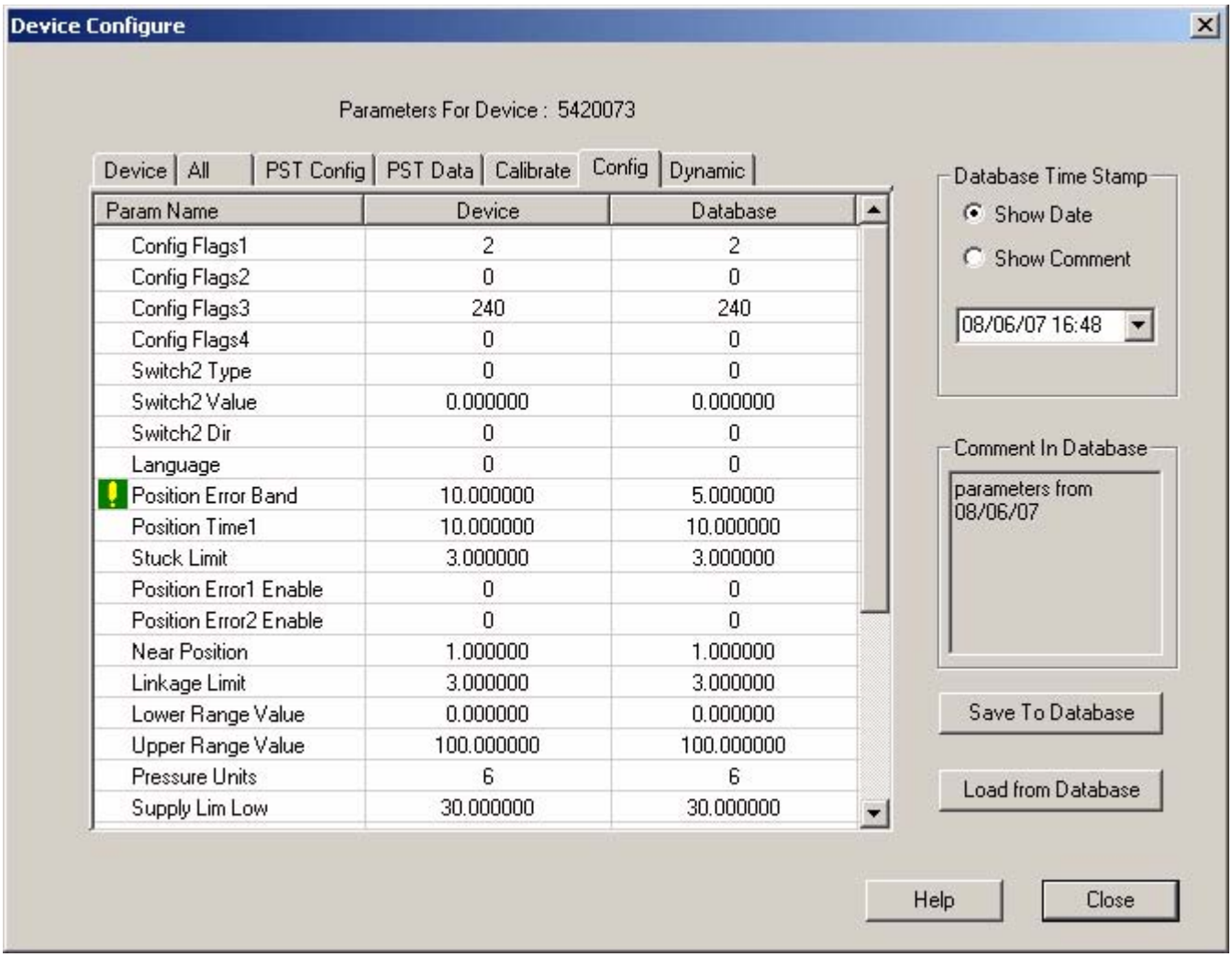


Figure 68 View All Parameters - Config Tab

Dynamic

The Dynamic tab displays all current postion, signal, switch and pressure parameters as shown in the figure below.

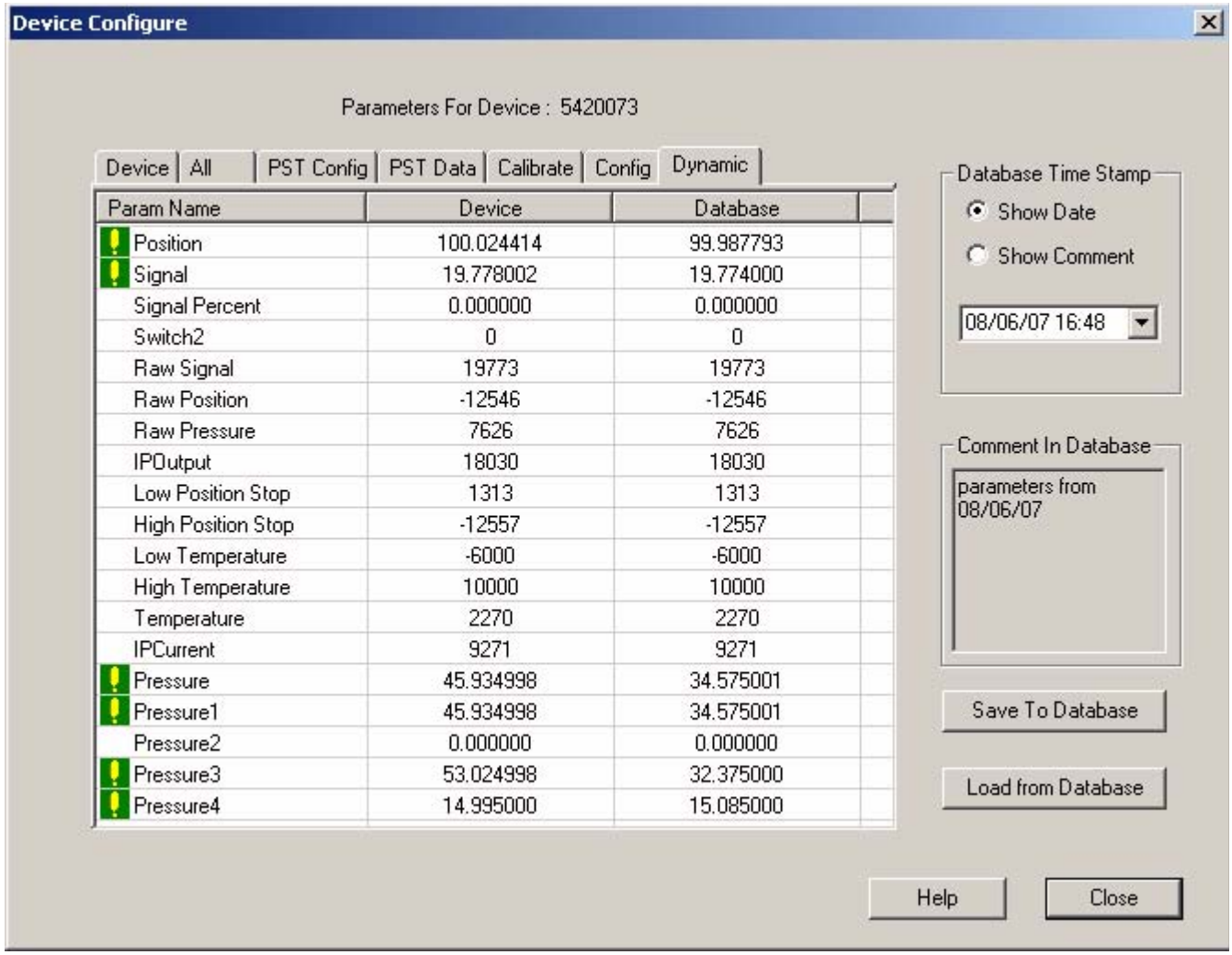


Figure 69 View All Parameters - DYNAMIC Tab

Trend 5

What you can do on the Trend Screen

From the Trend Screen (see Figure below) the user can observe the performance of the valve in real time. These process trend graphs are useful for troubleshooting a control valve and for tuning the PID positioning parameters. The process trend graphs may be only on the Y axis.

The process trend graph can be detached as a separate window from the tabbed dialog so that it can be viewed while performing calibration and diagnostic tasks. To detach the trend, right click in any screen select "Detach Trend". When in manual mode, the bar indicator allows the user to change the valve position by dragging the position indicator.

Figure 70 Trend Screen Displaying All Parameters

Trend Graph Features

The display of any of the four curves on the Trend graph may be turned on or off by checking or unchecking these boxes:

- Position - blue
- Manual Setpoint - black
- Signal Setpoint - red
- Pressure - green

Trend - Y Low/High

The Y axis (position) of the trend graph can be set by entering the values in these edit boxes. Enter a number and hit "Tab" or "Enter" key to set the scale. The axis can be changed by dragging inside the graph and can be returned to the original scale by right clicking in the graph.

Position

Indicates the actual valve position in % of valve opening. 0% is always closed and 100% is open. Because the travel of a valve may exceed its nominal travel, positions greater than 100% are possible.

Signal

Indicates the input analog signal expressed in % of the configured signal range.

Changing the Graph View

Any portion of a diagnostic graph may be examined more closely by entering the new X and Y scales in the proper scale edit boxes or by dragging a box across an area of the graph. If the mouse is dragged across an area, that area will fill the graphic window. Right button clicking on the graph will restore the default scales. Note that the X scale cannot be resized.

Capture to Clipboard

Clicking this button saves an image of the graph on the clipboard. The image (a bitmap) may be pasted into another document (e.g. into a Microsoft Word document).

Trend Context Menu

When the user right clicks on the grey area of the Trend screen (but not in the graph area), a context menu shown below appears. The following items will be on the menu:

Refresh Graph - Restarts the sampling of the trend graph

Stop Graph - Stops the sampling of the trend graph. It can be restarted by selecting Refresh Graph

Detach Trend - Removes the display from the tabbed dialog and creates a separate trend display

Help - Displays the help file at the Trend screen instructions

Figure 71 Trend Context Menu

Configure 6

What You Can Do on the Configure Screen

In the Setup Mode, from the Configure Screen (shown in Figure 72 on page 87), the user can set the information that tells the SVI II ESD how the valve/actuator is configured by adjusting the following parameters:

- Tag Information
- Button Lock
- Fault Settings
- PST Allow Options
- Language
- Pressure Units
- Air Action

On the Configure Screen you can also set up the Inputs and Outputs with Configure I/O (refer to “Configure I/O” on page 93) and quickly commission the SVI II ESD by launching Setup Wizard (refer to “Setup Wizard” on page 96).

Note: *Before making any configuration changes on the Configuration Screen ESDVue must be in "Setup" mode. If you need to change modes refer to “Change Mode” on page 48.*

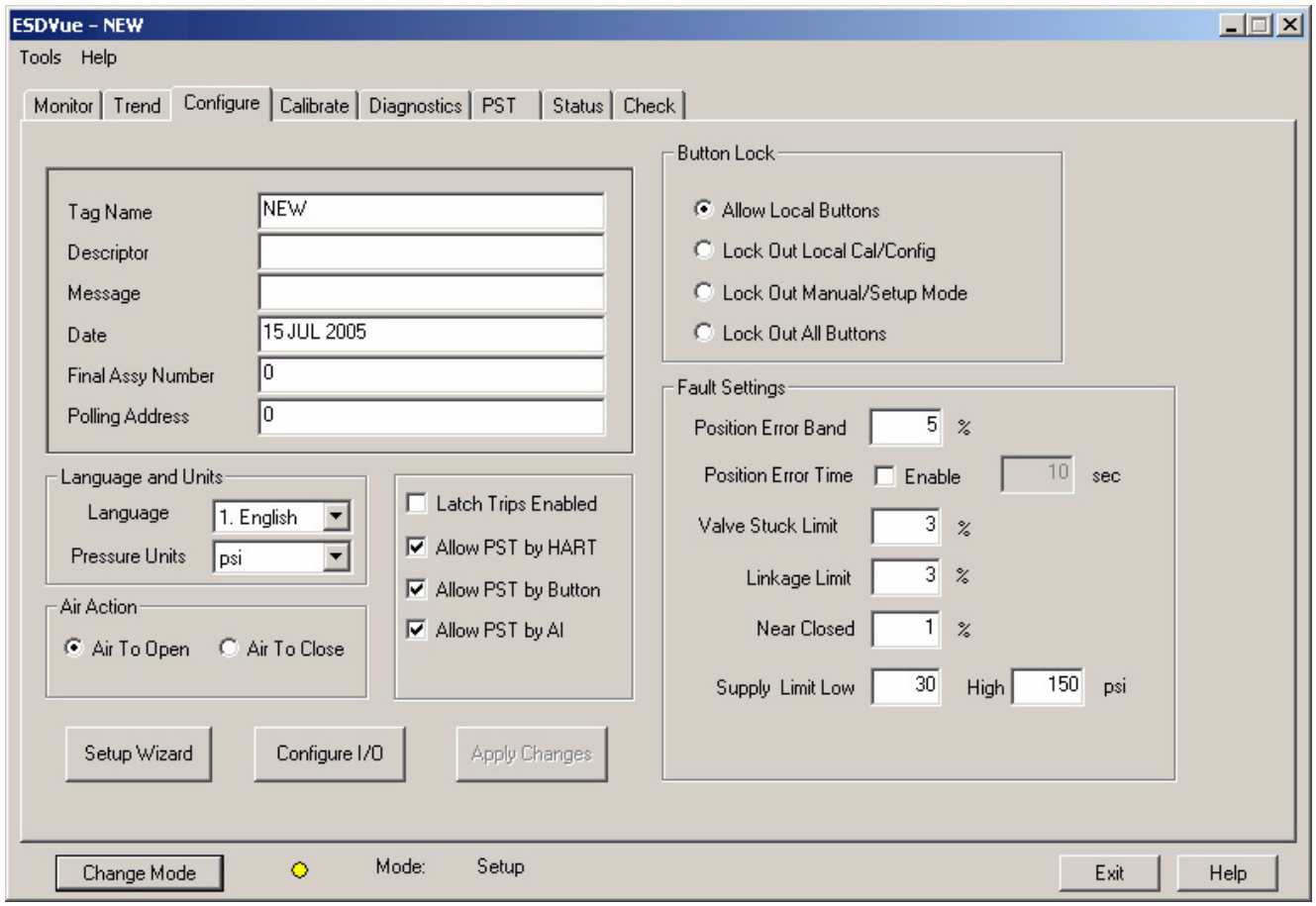


Figure 72 Configure Screen - Setup Mode

Changing Tag Information

To change Tag information on the Configure Screen:

1. In the Setup mode place the cursor in the Tag field you wish to change
2. Delete and type as necessary

Note: *You can also change the tag information through the* **Setup Wizard**.

Button Lock

The SVI II ESD comes with an optional local display and buttons for data entry. These buttons can be used to perform basic SVI II ESD setup without the need for ESDVue or a handheld. It may, however, be desirable after initial setup to 'lock' the buttons so that the SVI II ESD parameters cannot be inadvertently changed from the buttons. Several level of locks are provided:

- **Allow Local Buttons** (level 3): Buttons on the SVI II ESD are enabled.
- **Lock Out Local Cal. - Config.** (level 2): The user may use the buttons to perform operations in normal operating mode and manual mode, however they may not go to configure or calibrate mode.

- **Lock Out Manual/Setup Mode** (level 1): The user may examine variables in normal operating mode but may not put the valve in manual or setup mode (and therefore cannot get to calibrate or configure modes).
- **Lock Out All Buttons** (level 0): The buttons are disabled.

Fault Settings

The user may configure how position errors are handled. A position error occurs when the valve position differs from the requested position (from the input signal in normal operating mode or the manual setpoint in manual mode) by more than the parameters. When this occurs, a status flag is set which is reported during the next HART message only that a flag is set is reported.

After you have adjusted all the Fault Settings parameters click in the checkbox, beside "Enable" to activate.

Fault Settings Options

On the Configure Screen you can set:

- Postion Error Band
- Position Error Time
- Valve Stuck Limit
- Linkage Limit
- Near Closed
- Supply Limit Low
- Supply Limit High

Position Error Band

The Position Error Band setting allows you to define the error band, or the percentage of valve travel, that the requested position is allowed to vary from the actual position. The Position Error Band must be between 0.5% and 199%. If you set a value for Position Error Band outside the range you will receive the error message shown below.

Figure 73 Position Error Band Error Message

Position Error Time

The Position Error Time setting allows you to define the amount of time a position error is allowed to exist before the valve is put in failsafe position. The Position Error Time must be between 1 and 328 seconds. If you set a value for Position Error Time outside the range you will receive the error message shown below.

Figure 74 Position Error Time Error Message

Valve Stuck Limit

The SVI II ESD will issue an alert if a valve is stuck. When the SVI II ESD begins PST, it continually checks the valve travel to see if the valve is responding properly. If the valve is not travelling properly and appears to be stuck, the SVI II ESD will abort the test and report that the valve is stuck. The Stuck Limit fault setting allows you to define the percentage of partial stroke that the valve is allowed to be stuck before a status flag is issued. The Stuck Limit must be between 3% and 20% of the total PST. If you set a value for Stuck Limit outside the range you will receive the error message shown below.

Figure 75 Stuck Limit Error Message

Linkage Limit

The Linkage Limit fault setting allows you to define the amount the measured position is allowed to deviate from the expected position during an energized stop. The Linkage Limit setting is the percentage of deviation allowed between the measured and expected positions. The Linkage Limit must be between 1% and 20%. If you set a value for Linkage Limit outside the range you will receive the error message shown below.

Figure 76 Linkage Limit Error Message

Near Closed

The Near Closed Value determines the value of position below which the valve is considered 'near closed' by the continuous diagnostic calculations. The Near Closed value is defined as a percentage of the total partial stroke, below which the valve is considered near closed. The Near Closed value must be between 0% and 20%. If you set a value for Near Closed outside the range you will receive the error message shown below.

Figure 77 Near Closed Error Message

Supply Limit Low

The Supply Limit Low setting allows you to define the supply pressure value that when sensed by the SVI II ESD will be considered too low. The Supply Limit Low value must be between 30 and 110 psi. If you set a value for Supply Limit Low outside the range you will receive the error message shown below.

Figure 78 Supply Limit Low Error Message

Supply Limit High

The Supply Limit High setting allows you to define the supply pressure value that when sensed by the SVI II ESD will be considered too high. The Supply Limit High value must be between 30 and 120 psi. If you set a value for Supply Limit High outside the range you will receive the error message shown below.

Figure 79 Supply Limit High Error Message

PST Allow Options

The PST Allow options provide the following configuration options:

- Latch Trips Enabled - When "Latch Trips Enabled" is enabled by clicking in the checkbox to the left, it will prevent the SVI II ESD from doing anything in the event that the SVI II ESD is tripped.
- Allow PST by HART - When enabled allows PST to be executed by HART command from a HART device.
- Allow PST by Button - When enabled allows PST to be executed by the display button.
- Allow PST by AI - When enabled allows PST to be executed by Analog Input.

Language

The SVI II ESD can display its menu in:

- English
- French
- Spanish
- Portuguese
- Japanese
- Italian
- German

This list box allows the user to choose which should be used. Note that the ESDVue program will not be affected.

Pressure Units

The user may select the units in which the actuator pressure will be reported. Selections are psi, bar, or kpa.

Air Action

The Air Action configuration option allows you set the action of air upon the valve; Air To Open causes air to open the valve and Air To Close causes air to close the valve.

Configure I/O

The Configure I/O feature allows you to define characteristics of the inputs and output switches and position retransmit.

Accessing Configure I/O

When the user clicks on the Configure I/O button on the Configure Screen, ESDVue launches the I/O configure window shown below. In the Configure I/O window you can change the following configuration parameters:

- Output Switches
- Position Retransmit

To configure the inputs and outputs:

1. Click on "Configure I/O" as shown in the figure below.

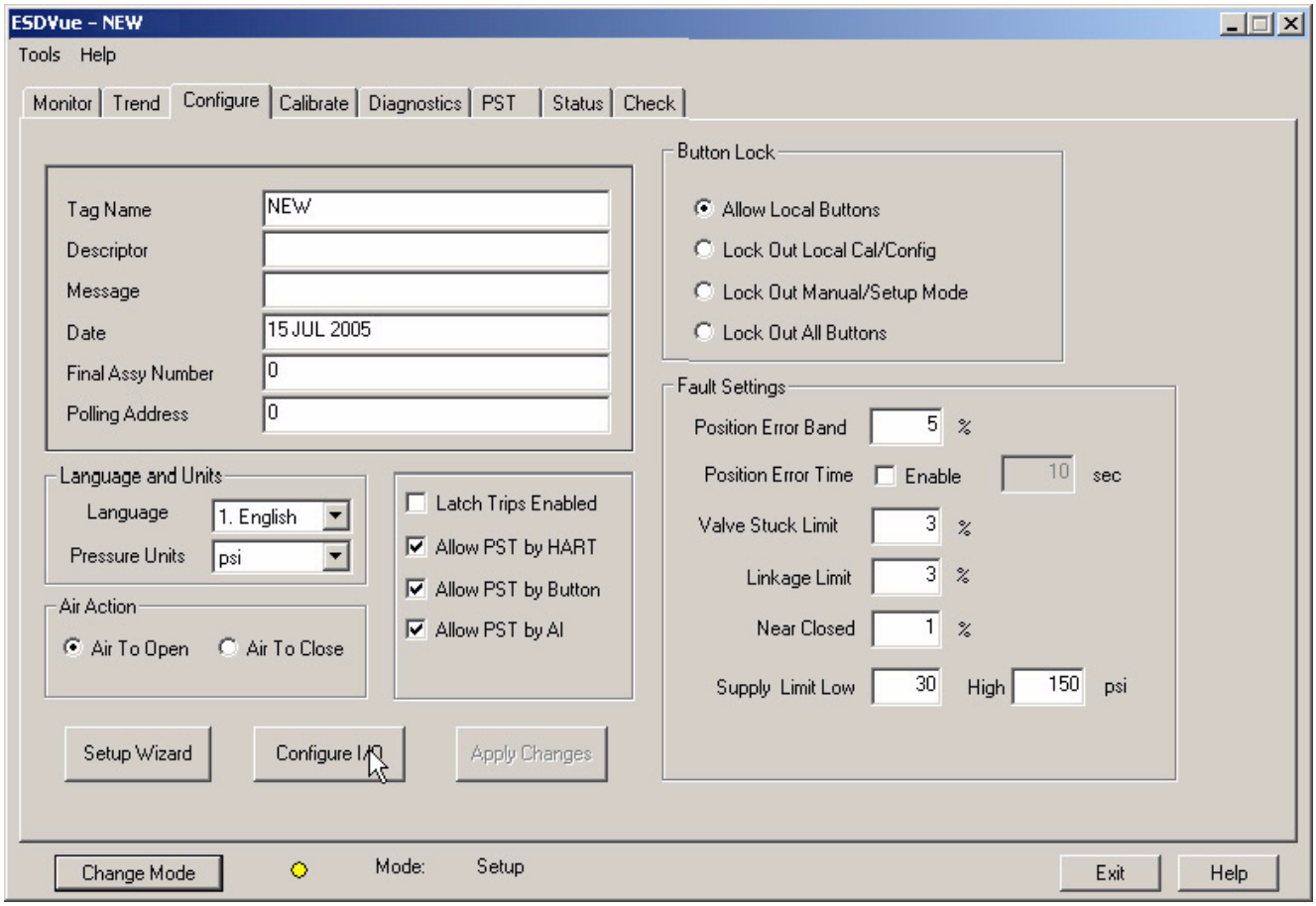


Figure 80 Launching Configure I/O

Configure I/O Window

2. When the user clicks on the Configure I/O button on the Configure Screen ESDVue launches the I/O configure window shown below. In the Configure I/O window you can change the following configuration parameters:
   - ❖ Output Switches
   - ❖ Position Retransmit

To configure the inputs and outputs:

3. Adjust the Output and Input parameters and click "OK" to save the changes and return to the Configure Screen. Descriptions of all the I/O settings are given below.

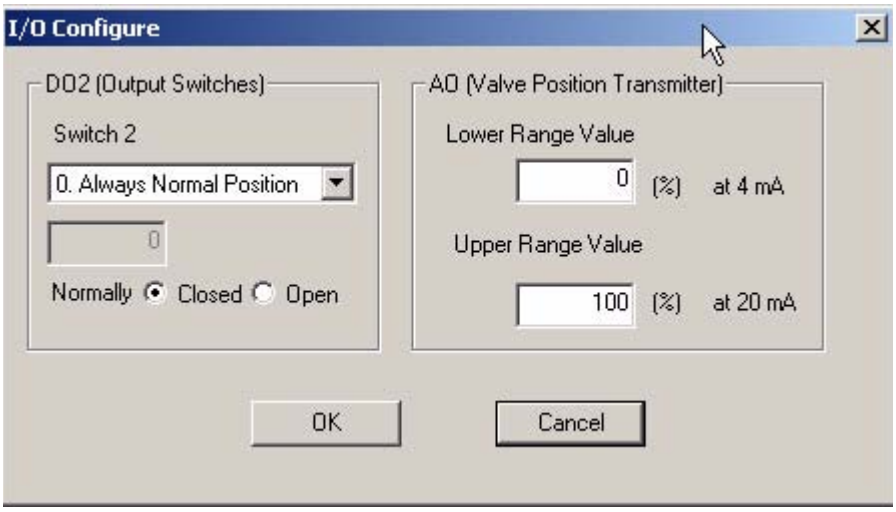


Figure 81 I/O Configure Window

Output Switches (DO2)

The SVI II ESD supports two identical contact outputs which can be logically linked to status bits. The two output switches can be opened or closed in response to conditions that the SVI II ESD detects. These conditions are:

0. **Always Normal Position** - the switch is not controlled by the SVI II ESD and remains in it's default position.
1. **Failsafe** - the switch is activated when the SVI II ESD is in failsafe mode.
2. **Reset** - the switch is activated whenever a reset has occurred and the switch remains activated until the SVI II ESD status is cleared.
3. **Position Error** - the switch is activated whenever a position error has occurred and is deactivated when the position recovers to the correct position.
4. **Tight Shutoff Active** - the switch is activated whenever the device is in tight shutoff (tight shutoff is on and the valve position is less than the tight shutoff position).
5. **Position Low Limit** - the switch is activated whenever the valve position is less than the position setting of this switch control.

6. **Position Upper Limit** - the switch is activated whenever the valve position is greater than the position setting of this switch control.
7. **Manual Mode** - the switch is activated whenever the SVI II ESD is in manual mode, configure mode, calibrate mode, or diagnostic mode.
8. **Annunciate** - the switch is activated whenever the SVI II ESD makes an annunciation; e.g. diagnostics are running, SVI II ESD status has changed.
9. **ESD Triggered** - the switch is activated whenever an Emergency Shutdown event is triggered.
10. **Manual or OOS** - the switch is activated whenever the SVI II ESD is in either Manual mode or Out Of Service (OOS)
11. **PST is running** - the switch is activated whenever PST (Partial Stroke Testing) is running.

The switch can be configured to default as normally open or normally closed.

Note: *The contacts are OPEN when the SVI II ESD is unpowered and may be made to be open or closed when the flag is asserted after boot.*

Position Transmitter (AO)

The SVI II ESD has the ability to retransmit the position signal as an output to another device with 4 - 20 mA current output proportional to position. Enter a lower range value and an upper range value.

Setup Wizard

Running the Setup Wizard is one of two ways to set up the SVI II ESD. When you decide to run the setup you can either run the entire setup wizard or pick and choose which components of the setup wizard you would like to run.

From the Setup Wizard screen the user can rapidly setup the SVI II ESD by configuring some basic parameters. By selecting the appropriate check boxes the user may set the device identification, select the air action, perform a travel calibration, and autotune the positioning parameters. When the selected tasks are started, ESDVue will display a progress screen.

Used primarily for rapid setup of standard valves, the Setup Wizard can dramatically reduce commissioning time in the field. To customize the valve setup refer to “Advanced Setup with ESDVue” on page 288 of this manual.

To run the Setup Wizard you must first be in Setup mode. See “Change Mode” on page 48 for information on changing modes.

1. To start the Setup Wizard select "Setup Wizard" as shown in the figure below.

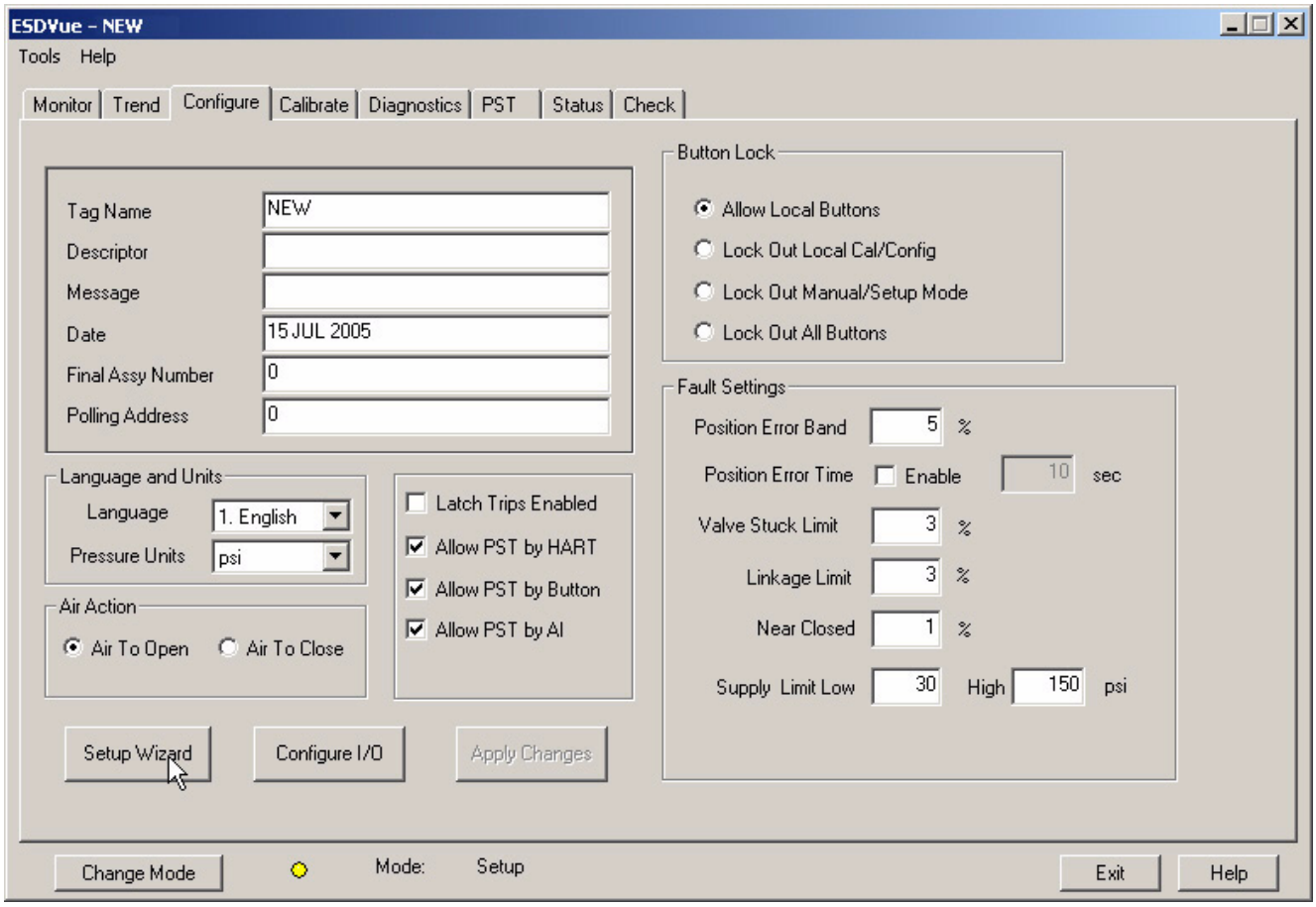


Figure 82 Starting the Setup Wizard

Setup Wizard Selections

After you start the setup wizard ESDVue launches the Setup Wizard window shown below where you can select the setup features you would like the Wizard to perform:

- Set Tag and Descriptor
- Set Air Action
- Calibrate Travel
- Autotune

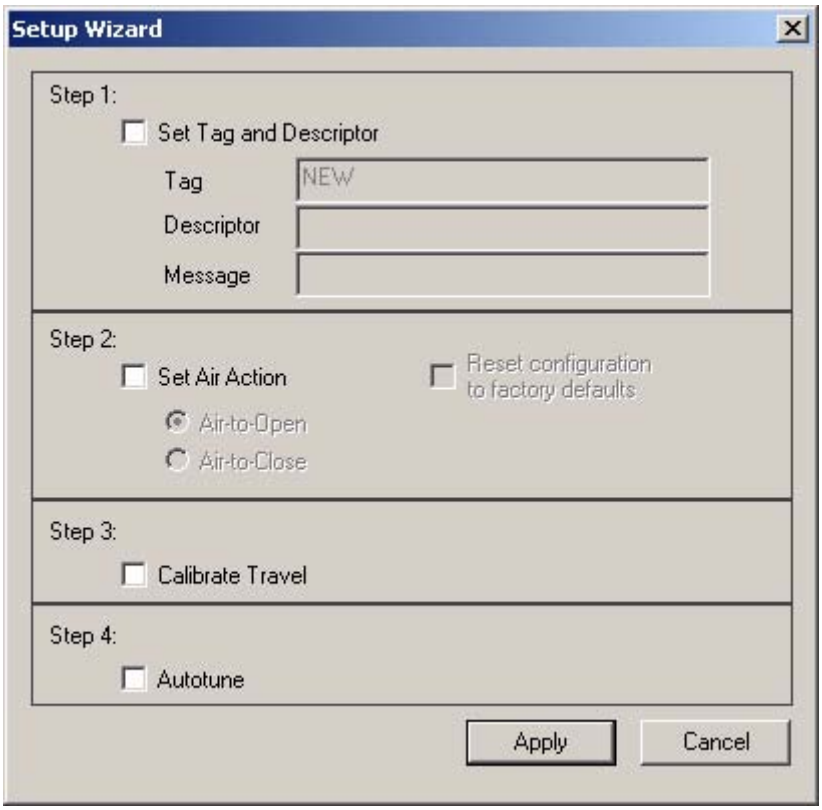


Figure 83 Setup Wizard Selections Window

Step 1 - Setting the Tag and Descriptor

If you are changing Tag and Descriptor information you should make the changes prior to executing ("Apply") the remaining Setup Wizard steps. If you are using the Setup Wizard for calibrating travel and auto tuning, ESDVue runs through the calibrate and auto tune procedures and does not return to the Setup Wizard window.

When you select "Set Tag and Descriptor", ESDVue enables the Tag and Descriptor fields. To set the Tag and Descriptor:

1. Click in the Tag field.
2. Drag and highlight the existing text in the field.
3. Enter the Tag and Descriptor information.

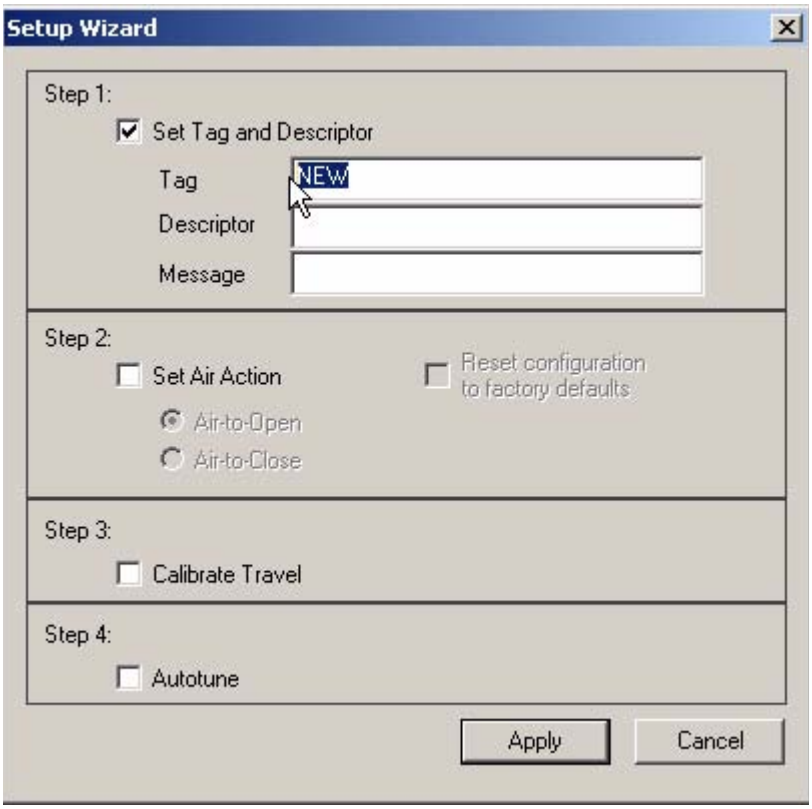


Figure 84 Setup Wizard - Setting Tag and Descriptor

4. Continue to enter text in the Descriptor and Message fields if necessary.

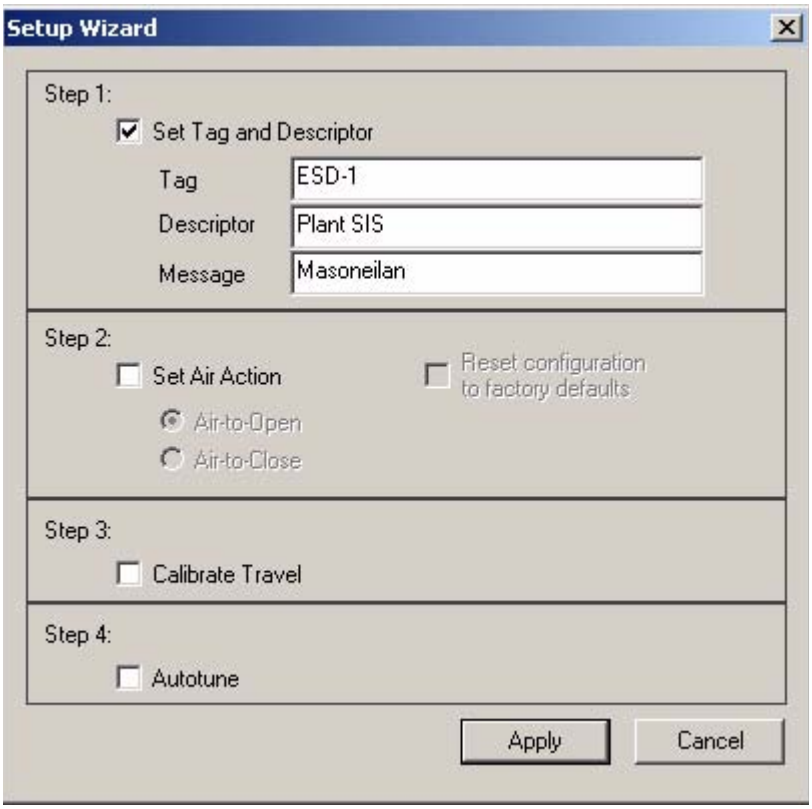


Figure 85 Tag and Descriptor Entered

Note: *The changes made to tag and descriptor will not take place until you click "Apply". You should not click "Apply" until after you have made all your Setup Wizard selections.*

Step 2 - Set Air Action

The Set Air Action step allows you to set the action of the air supply by making one of the following selections:

- Air to Open - air pressure is used through the SVI II ESD to open the valve
- Air to Close - air pressure is used through the SVI II ESD to open the valve

Reset configuration to factory defaults - resets the air action to the factory default

To set the air action:

1. Enable the set air action function by clicking in the checkbox labeled "Set Air Action" as shown below.

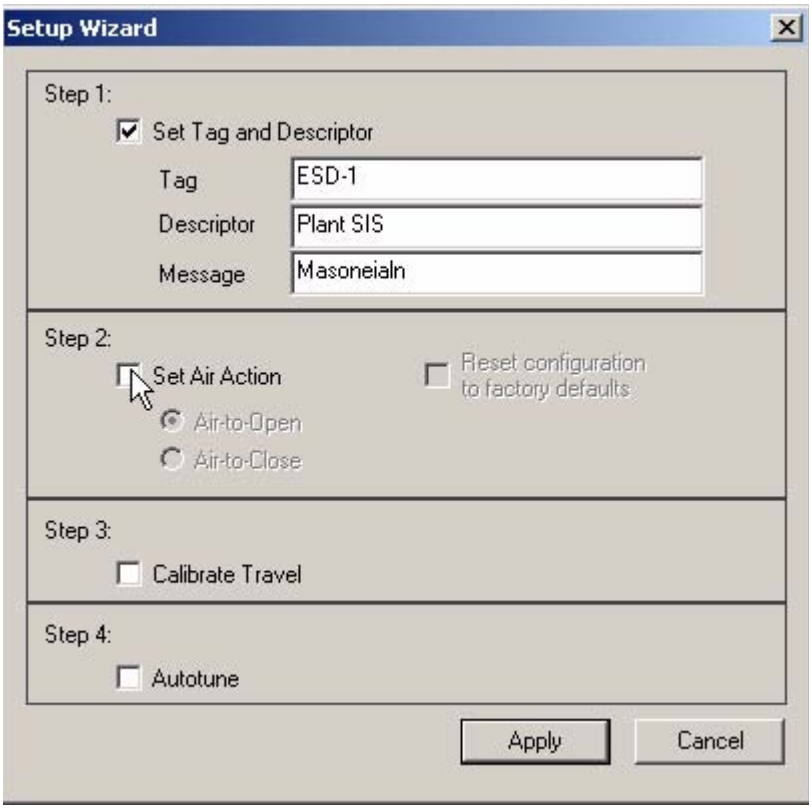


Figure 86 Enabling Set Air Action

When "Set Air Action" is enabled all selections become enabled.

2. Select the appropriate air action by clicking either the radio button for "Air-to-Open" or "Air-to-Close".
3. If you would like to reset the air action configuration to the factory defaults, click the checkbox to the left of "Reset configuration to factory defaults".

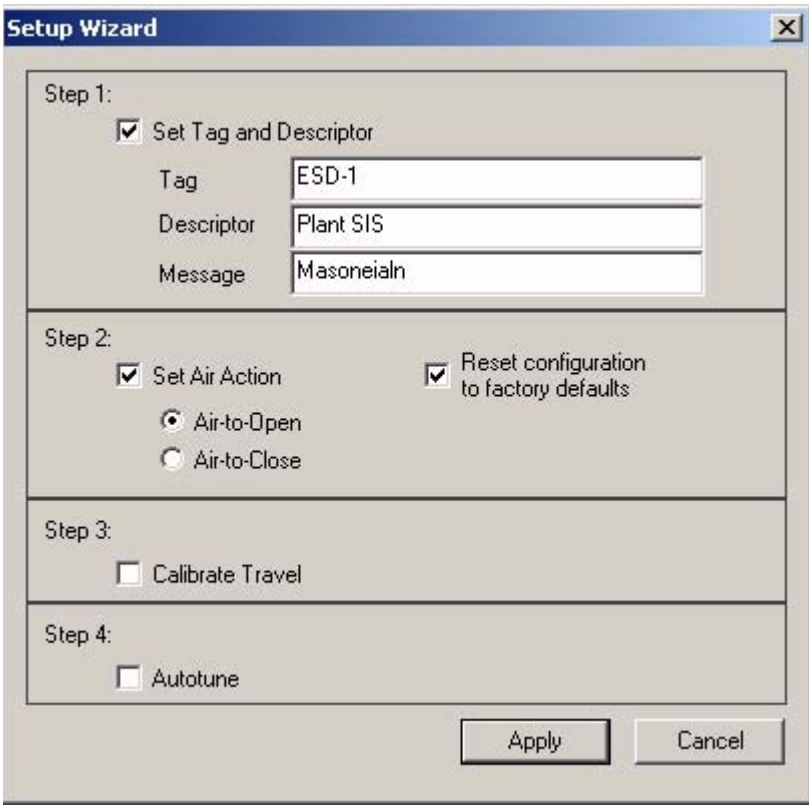


Figure 87 Air Action Set

Note: *The changes made to air action will not take place until you click "Apply". You should not click "Apply" until after you have made all your Setup Wizard selections.*

Step 3 - Calibrate Travel

When selected, the user can perform a Travel Calibration. To determine valve position, the positioner must measure the closed and open positions of the valve. The SVI II ESD will first exhaust the actuator and measure the position, then fill the actuator and measure the position. From these measurements the valve position can be determined.

To calibrate positioner travel with the Setup Wizard:

1. Enable the calibrate travel function by clicking in the checkbox labeled "Calibrate Travel" as shown below.

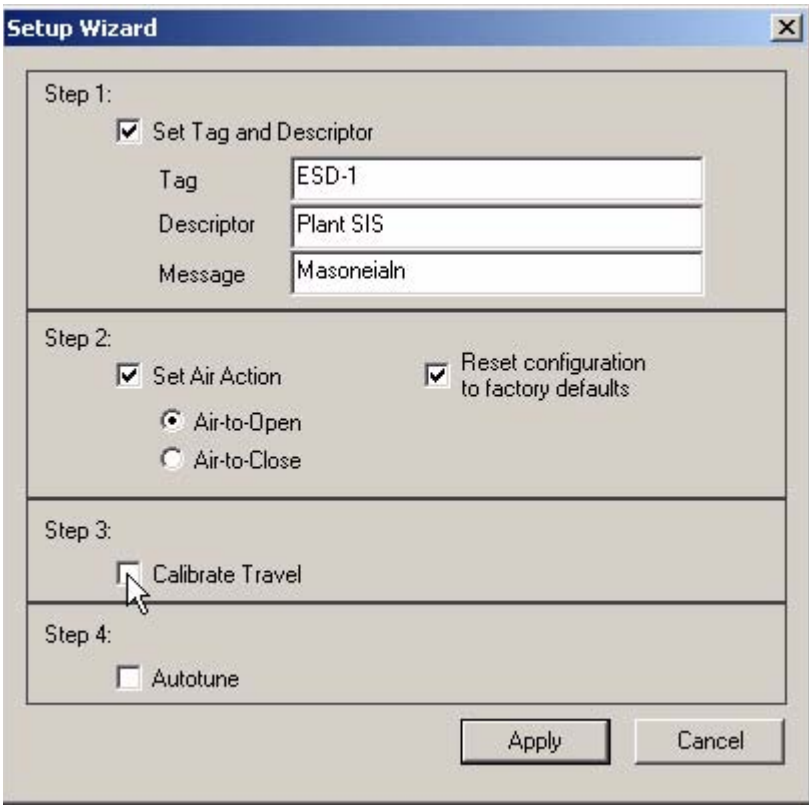


Figure 88 Enabling Calibrate Travel

2. When "Calibrate Travel" is enabled the checkmark will be visible in the checkbox as shown below.

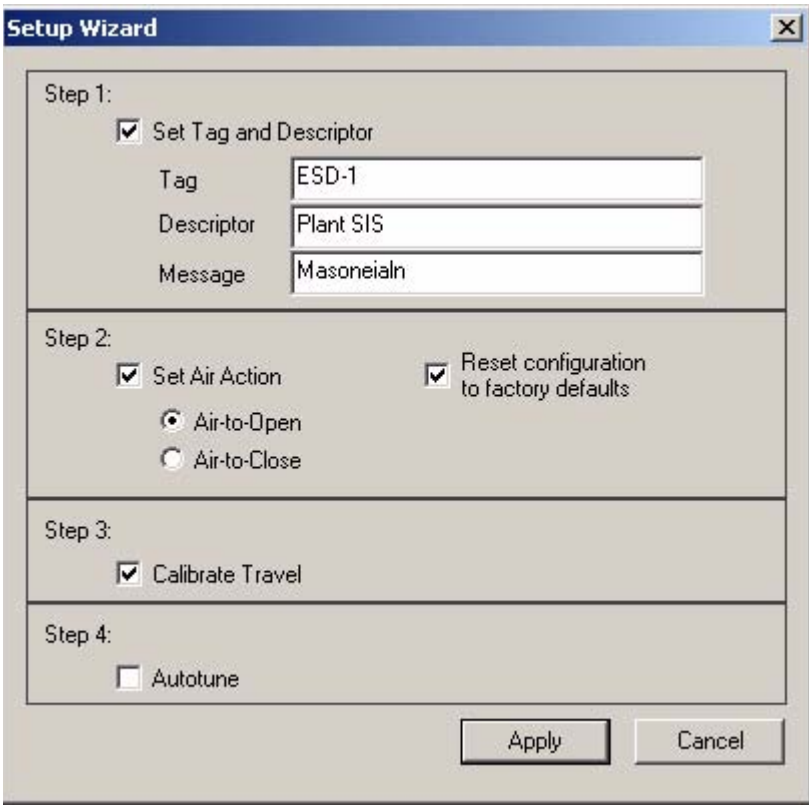


Figure 89 "Calibrate Travel" Set

Note: *The changes made to calibrate travel will not take place until you click "Apply". You should not click "Apply" until after you have made all your Setup Wizard selections.*

Step 4 - Autotune

The SVI II ESD has a built-in positioning Autotune feature. At the moment of setting up the positioner on a valve, this feature automatically computes the optimal parameters for the positioning algorithm. This features does not require valve specific parameters in order to complete successfully. The patented algorithm analyzes the dynamic behavior of the valve assembly, and determines values for the tuning algorithm that are optimal for tight and accurate position control.

The Autotune feature can be launched using the local pushbuttons, a handheld communicator loaded with the device driver (DD), a control system loaded with the DD or ESDVue software.

To autotune the SVI II ESD with the Setup Wizard:

1. Enable the autotune function by clicking in the checkbox labeled "Autotune" as shown below.

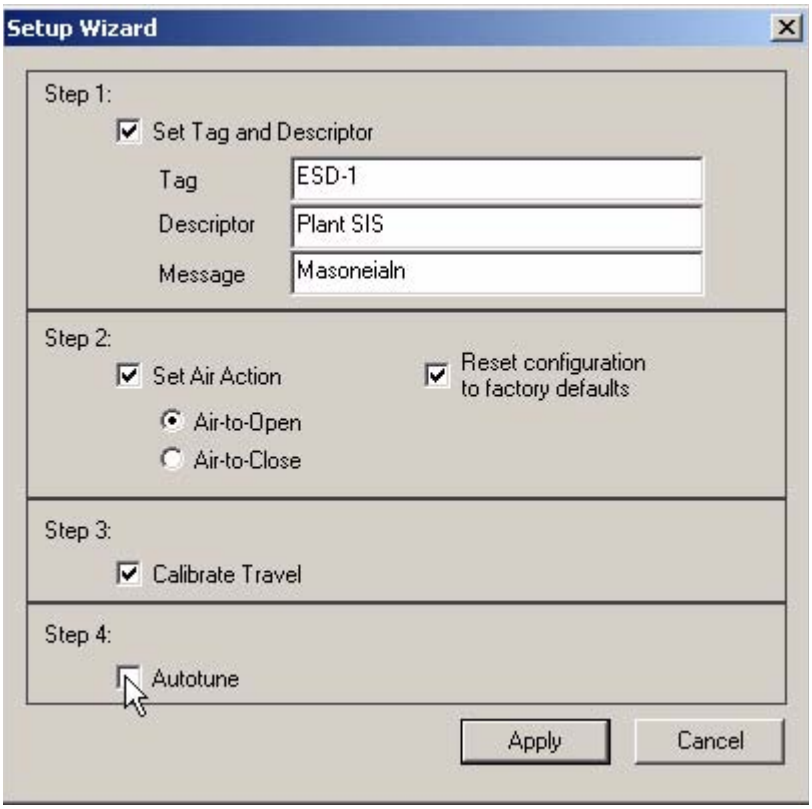


Figure 90 Enabling Autotune

2. When "Autotune" is enabled the checkmark will be visible in the checkbox as shown below.

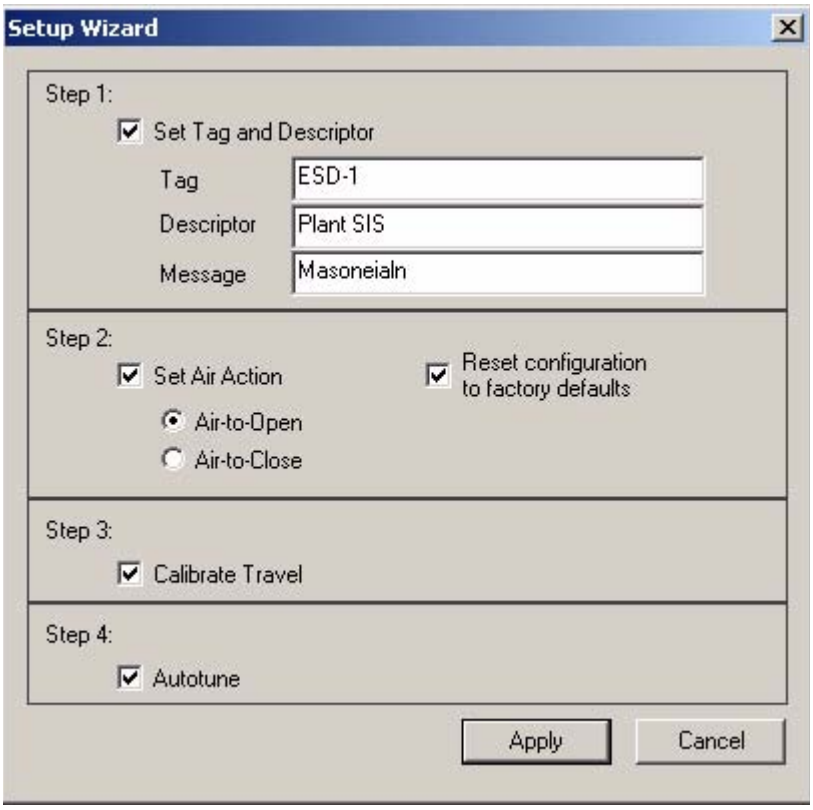


Figure 91 "Autotune" Set

Note: *The changes made to autotune will not take place until you click "Apply". You should not click "Apply" until after you have made all your Setup Wizard selections.*

Setup Selections Made

1. After you have made all your Setup Wizard selections, click on "Apply" as shown in the figure below.
2. ESDVue will apply Step 1 and Step 2 (if selected) and will execute Step 3 and Step 4 (if selected).

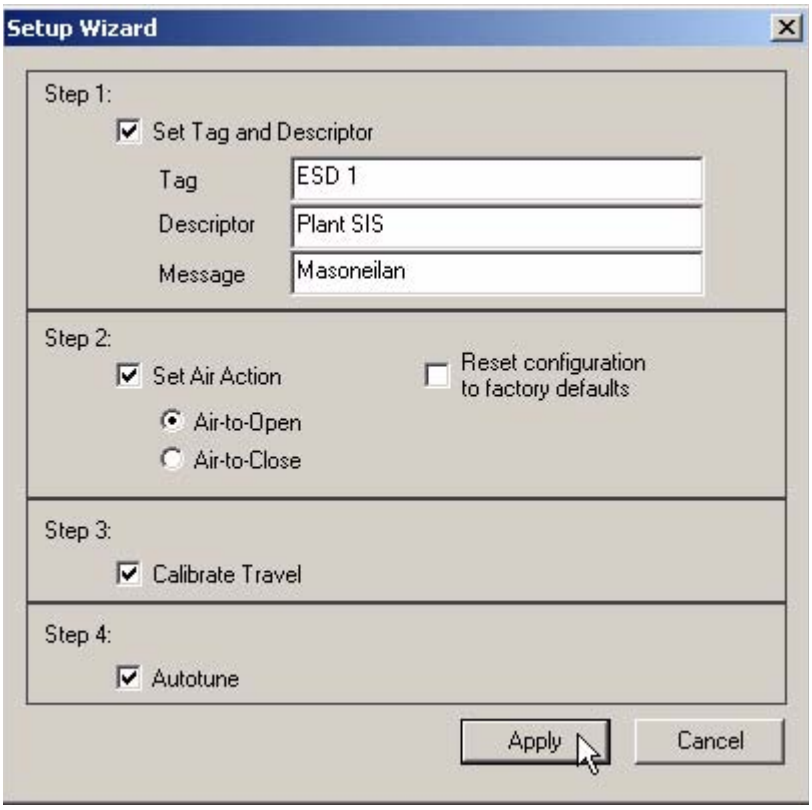


Figure 92 Applying Setup Wizard Changes

3. After you have made and applied your Setup Wizard selections ESDVue will launch a dialog indicating the actions Setup will perform. If the list in the dialog is correct click on "OK". If the list is incorrect click on "Cancel".

Figure 93 Setup Dialog

4. If you are calibrating travel and autotuning with the Setup Wizard, ESDVue will launch the following message.
5. Click "OK" to continue.

Figure 94 Running Setup Wizard Dialog

Setup Wizard Progress

During the course of running the Setup Wizard, ESDVue will display progress dialogs.

1. The progress dialog below indicates that Step 1 - Set Tag and Descriptor, and Step 2 - Set Air Action, are finished.

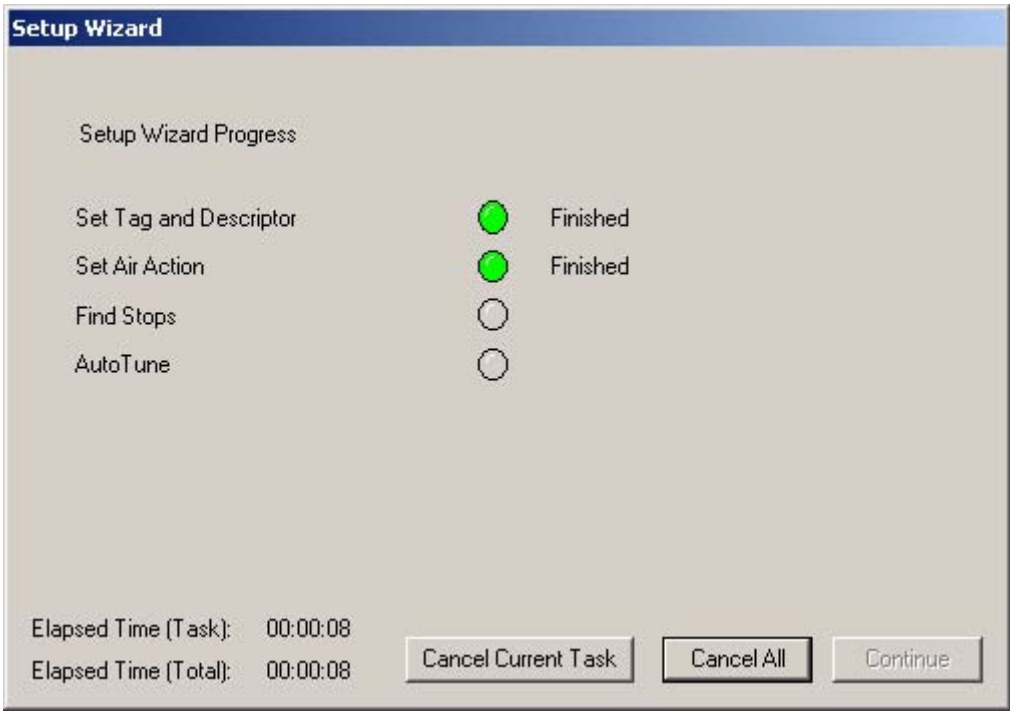


Figure 95 Setup Wizard Progress Dialog

2. ESDVue will continue to issue progress messages, and failures if they happen. The figure below indicates that Step 3 - Calibrate Travel (Find Stops) is running.

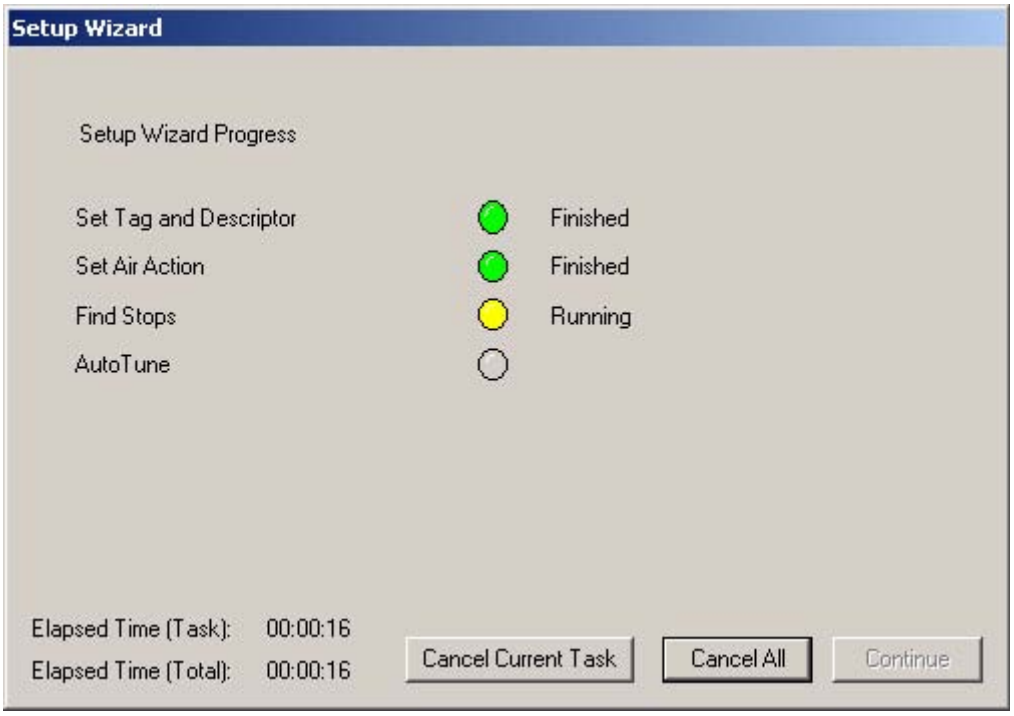


Figure 96 Setup Wizard Progress Dialog - Running Find Stops

3. When the Setup Wizard has completed running Step 3 - Find Stops, progress will continue with Step 4 - Autotune as shown below.

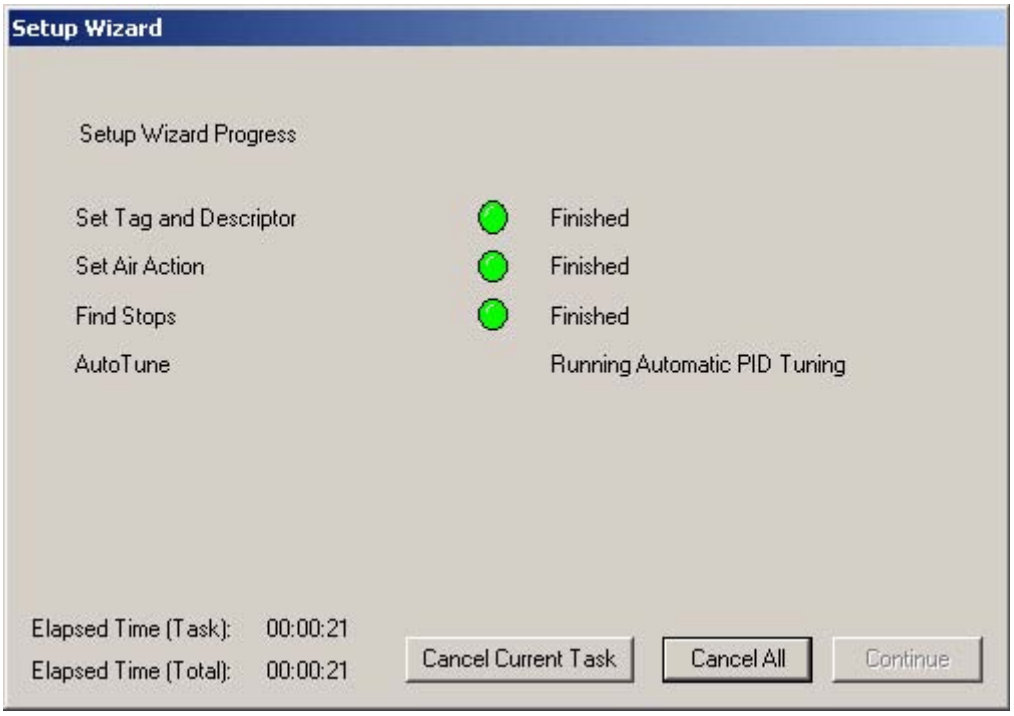


Figure 97 Setup Wizard Progress Dialog - Running Autotune

Setup Wizard Diagnostic Graph

After you have successfully completed Autotune, ESDVue will launch the diagnostic graph for the SVI II ESD that displays the tuning parameters in a graphical format.

There are several features available on the diagnostic graph that can enhance the data collected in the graph:

- **Set Graph Scale** - allows you to change the graph scale on diagnostic graphs so that you can narrow in on one area of the graph, or expand the viewing area.
- **Select Additional Curve** - allows you to view more than one diagnostic curve at a time; being able to compare two curves may facilitate diagnostics.
- **Show Computed Result** - allows you to view the data in a numerical value format.
- **Show Data Points** - when selected, by clicking the checkbox shows the data points on the graph.
- **Save To File** - allows you to save the graph to a file.
- **Export to Excel** - exports the data as a CSV Excel file.
- **Capture to Clipboard** - captures a bitmap image of the graph.
- **Close** - closes the graph and returns the ESDVue Screen.

After you have viewed the graph and made any adjustments if necessary. click on "Close" to close the graph.

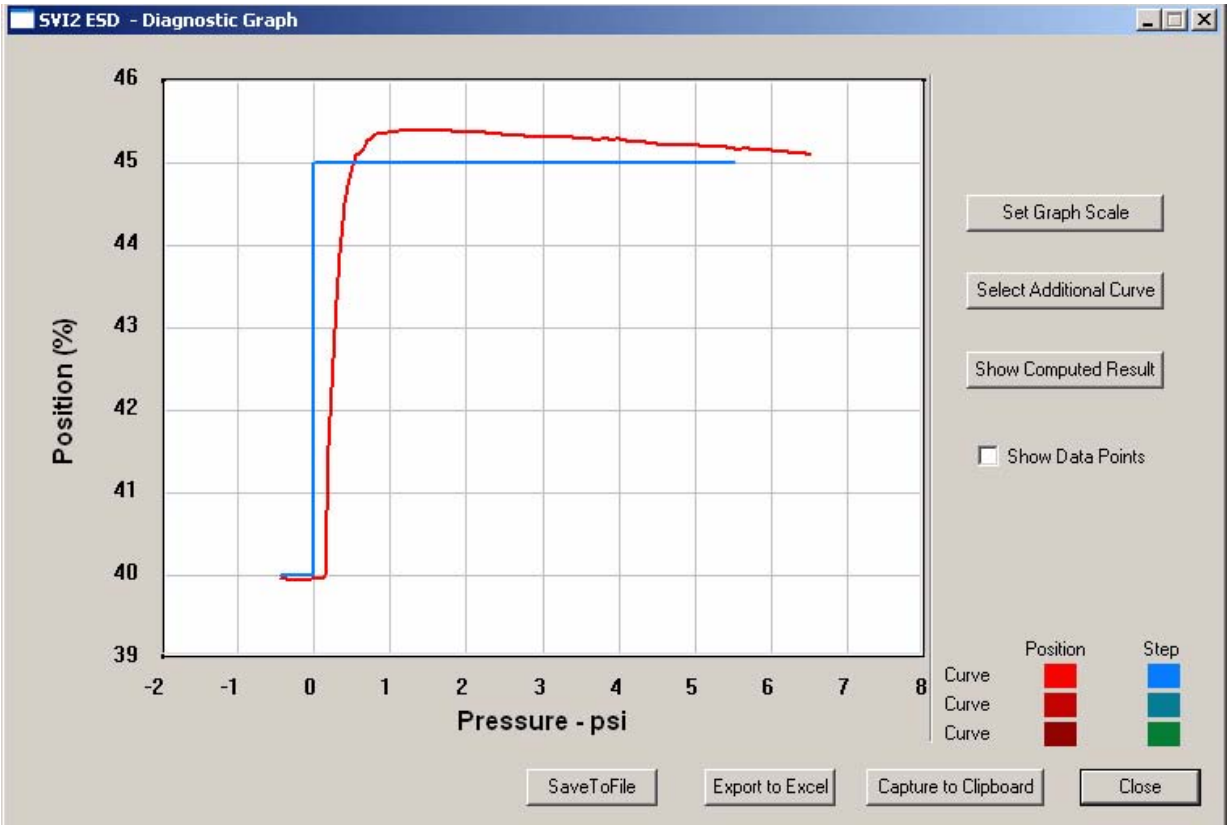


Figure 98 Setup Wizard Autotune Diagnostic Graph

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curves" function).

New Parameters

After you close the Setup Wizard Diagnostic Graph, ESDVue will display the PID Values window as shown in the figure below.

The PID Values window shows the previous and the newly calculated (as a result of auto tune) PID values. To complete the auto tune process, close the PID Values window by clicking "Exit" as shown in the figure below.

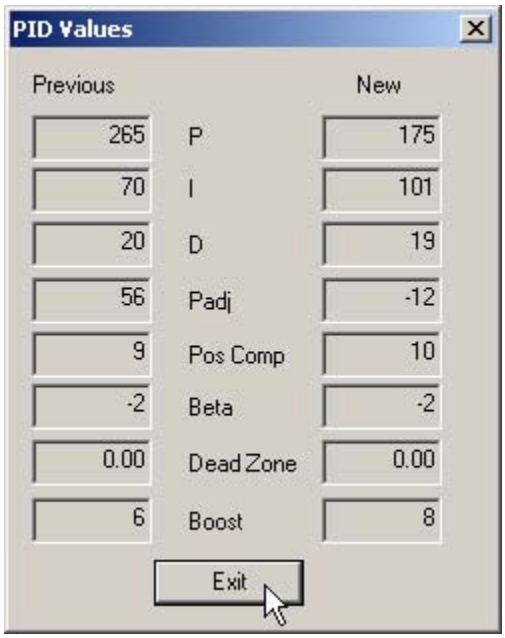


Figure 99 New PID Values After Setup Wizard Calibration

Parameter Definitions

P - Proportional gain in %. Common values for the positioner are 50 for small valves up to 4000 for large valves.

I - Integral time or reset time in 1/10th sec, is the time constant of integral control. Higher values of I cause less integral action, however a value of 0 gives no integral action. Common values are 10 to 200.

D - Derivative time or rate time (msec) is the time constant of derivative control. Common values are 10 to 100.

PAdjust - Valves often have significantly different response when filling verses exhausting. The proportional gain is adjusted by adding Padj (%) to P when the valve is exhausting.

Position Compensation Coefficient (Pos Comp) - The response of the valve is different when the valve is nearly closed than when the valve is nearly open. The position compensation coefficient, which is a number between 0 and 20. Make adjustments to try to equalize the valve response. The normal value is 6. For springless actuators the value is 15.

Beta - Beta is a nonlinear gain factor, ranging from -9 to 9. When beta is 0, the controller gain is linear. Otherwise the gain is the function of error. The larger the beta, the smaller the gain for small error. Typical beta value for a valve position controller is 7 or 8.

Dead Zone - When the valve position is within the setpoint +/- the dead zone, no additional position control is performed. This value is normally 0%, however for high friction valves (e.g. valves with graphite packing) a higher dead zone (%) will help avoid limit cycling due to the stick/slip action of the valve. In these cases the dead zone chosen might be 0.5% to 1%.

The values determined above provide sufficient response for most applications. However these values are determined by a target set of performance criteria built into the SVI II ESD. The user may want performance different than this set and may therefore want to set the PID values differently than determined by Autotune. The user can individually set tuning values from the Calibrate screen.

Setup Wizard Complete

After the Setup Wizard has completed all setup tasks, and you have closed the PID Values window (if you ran Auto Tune) ESDVue will return to the Setup Wizard Dialog.

1. The dialog will indicate "Setup Wizard Complete".
2. Click on "Continue" to close the dialog and return to the Configure Screen.

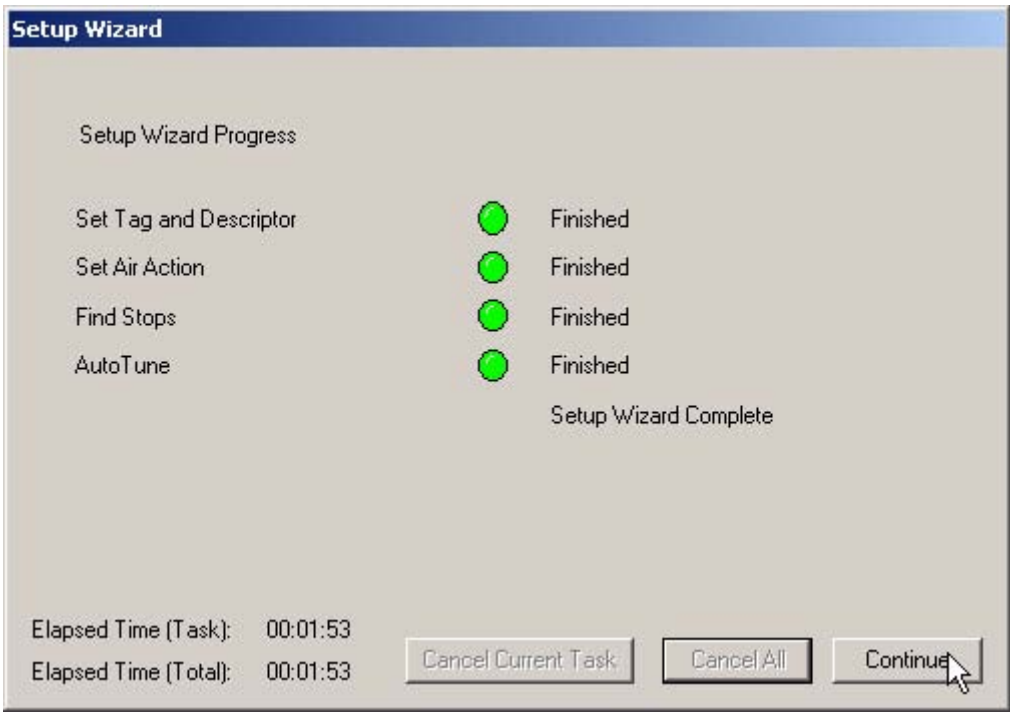


Figure 100 Setup Wizard Complete

Applying Configuration Changes

After you have made all the necessary configuration changes you must apply the changes at the top level of the Configure Screen.

To apply all configuration changes:

Click on "Apply" as shown in the figure below. Clicking Apply causes any changes made in the Configure screen to be written immediately to the SVI II ESD.

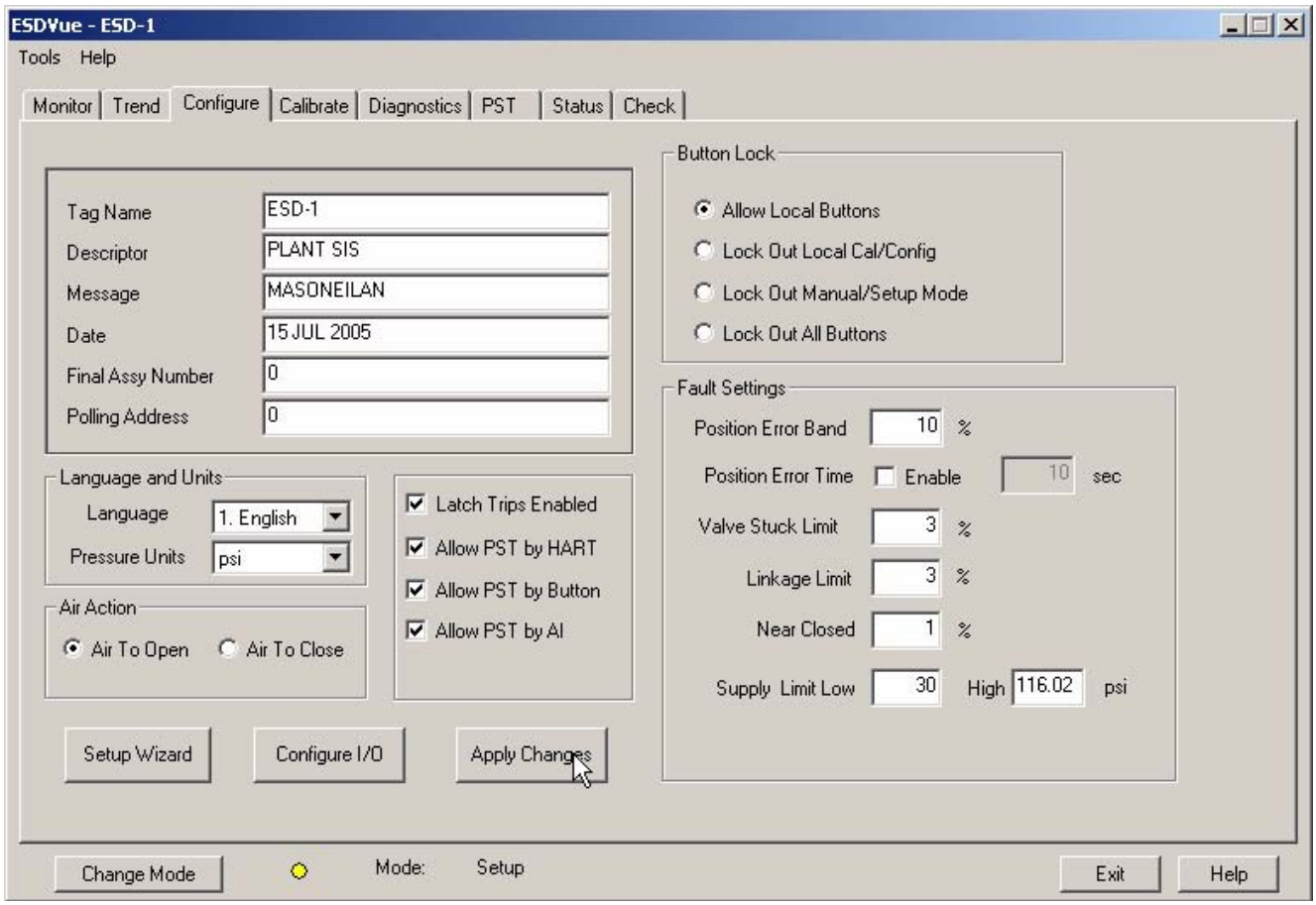


Figure 101 Applying Configuration Changes

Configure Context Menu

When the user right clicks on the Configure screen, a context menu shown below appears.

The following items are on the Configure context menu.

- **Detach Trend** - Removes the Trend display from the anchored tab format and creates a separate trend display
- **Help** - Displays the help file at the Configure Screen instructions

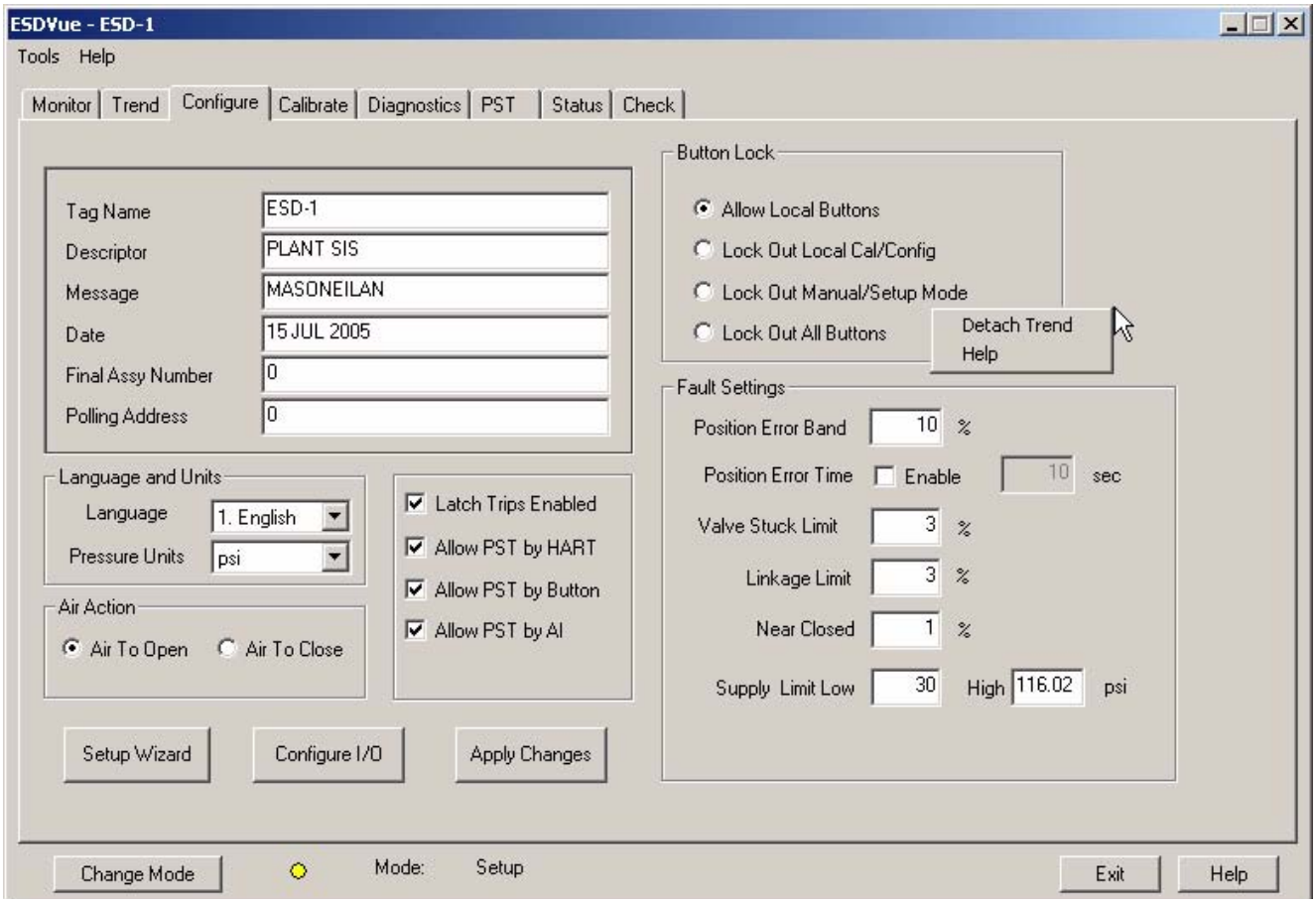


Figure 102 Configure Screen Context Menu

Calibrate 7

What you can do on the Calibrate Screen

The ESDVue Calibrate Screen allows (shown below) you to calibrate:

- Stop Positions
- Signal
- Advanced Parameters (PID - Position tuning parameters)

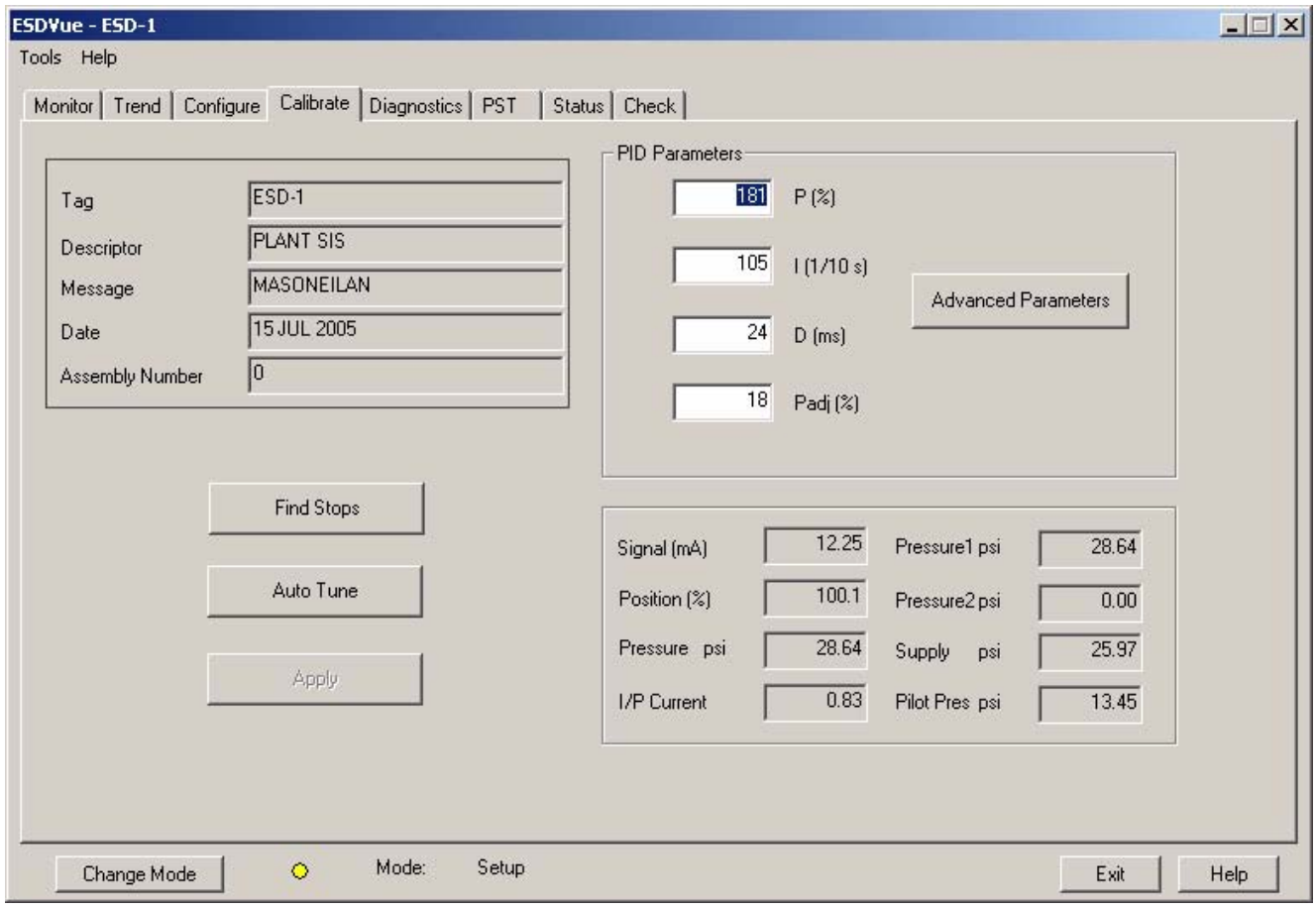


Figure 103 Calibrate Screen

Find Stops

To determine valve position, the positioner must measure and save the closed and open positions of the valve. This can be done automatically by running Find Stops procedure from the Calibrate screen.

The SVI II ESD will first exhaust the actuator and measure the position, then fill the actuator and measure the position. From these measurements the valve position can be determined. Correction can be made for nominal valve travel if it is less than full travel. A progress screen is displayed while the find stops process is running.

To start the Find Stops function:

1. Click on "Find Stops" as shown in the figure below.

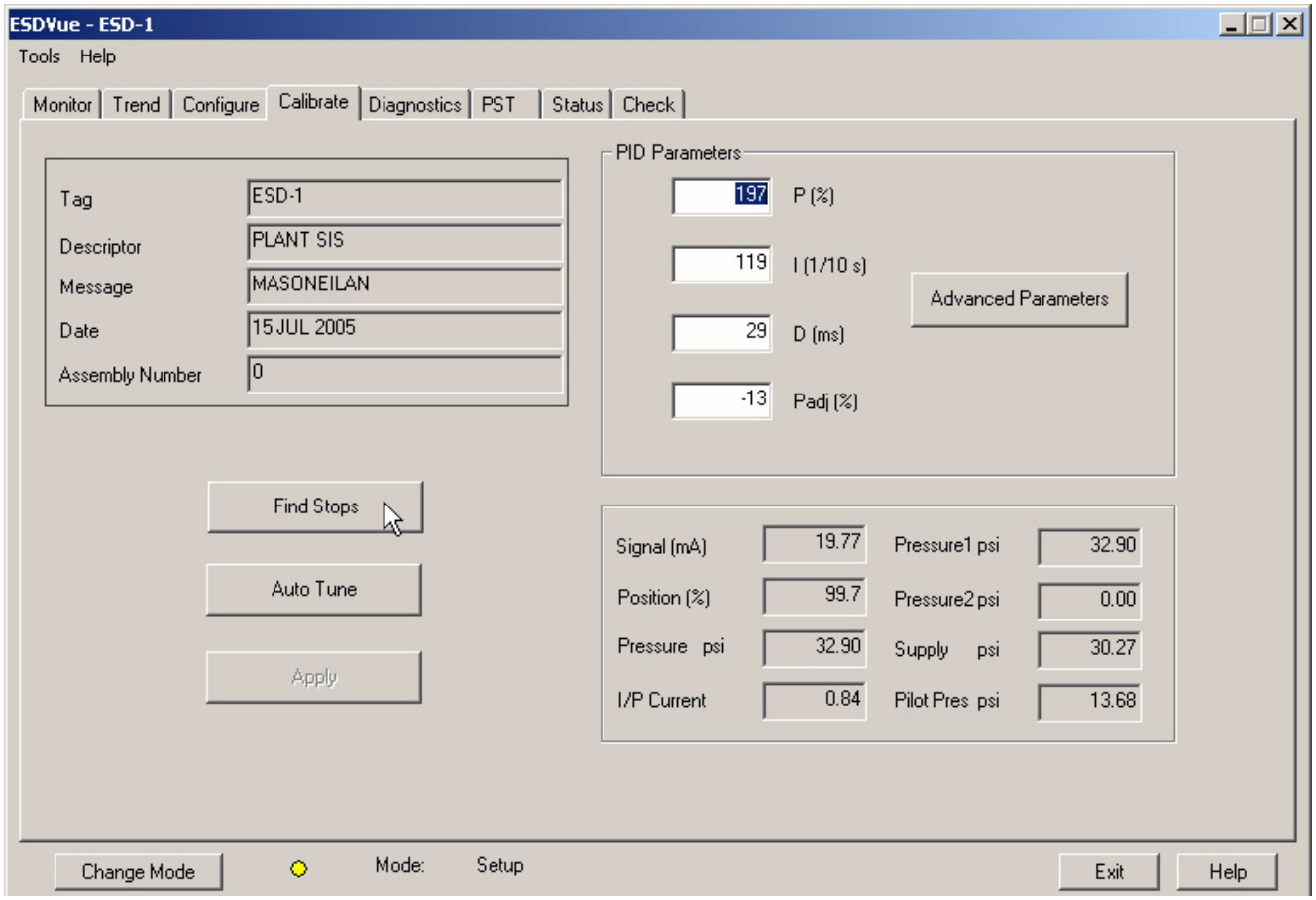


Figure 104 Starting Find Stops

2. After launching Find Stops ESDVue will display the dialog displayed below. Click on "OK" to continue with the Find Stops process.

Figure 105 Starting "Find Stops" Dialog

3. When Find Stops is running a progress dialog will display as shown below.

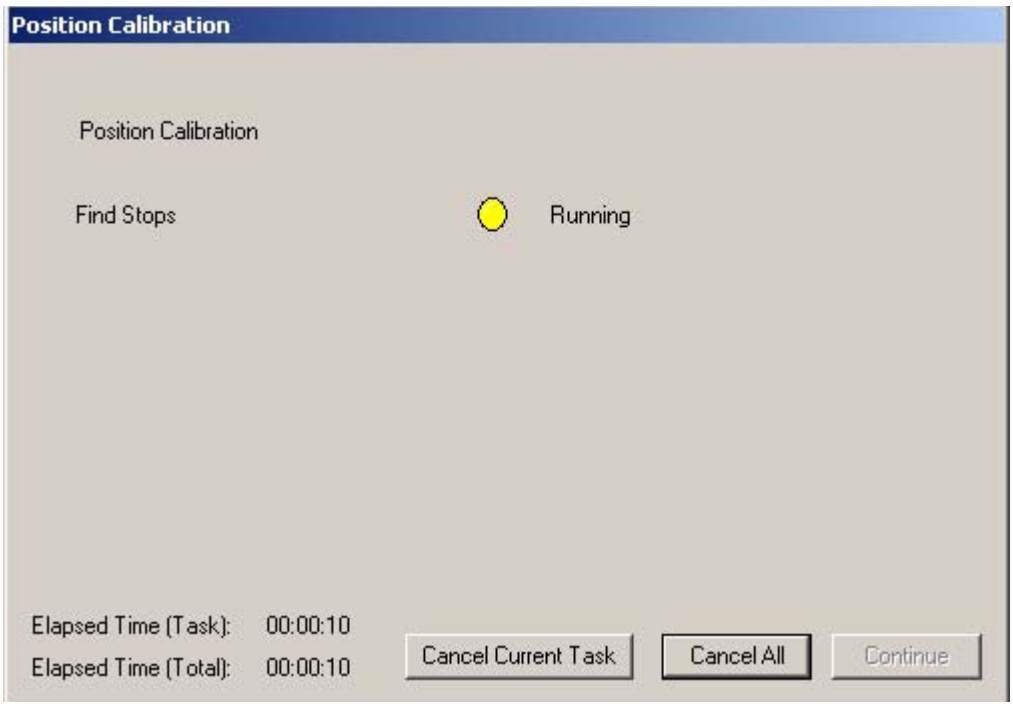


Figure 106 "Find Stops" Dialog

4. When Find Stops has completed operation the progress dialog will display a message indicating that Find Stops is complete, as shown below. You must click on "Continue" to close the dialog and return to the Calbrate Screen.

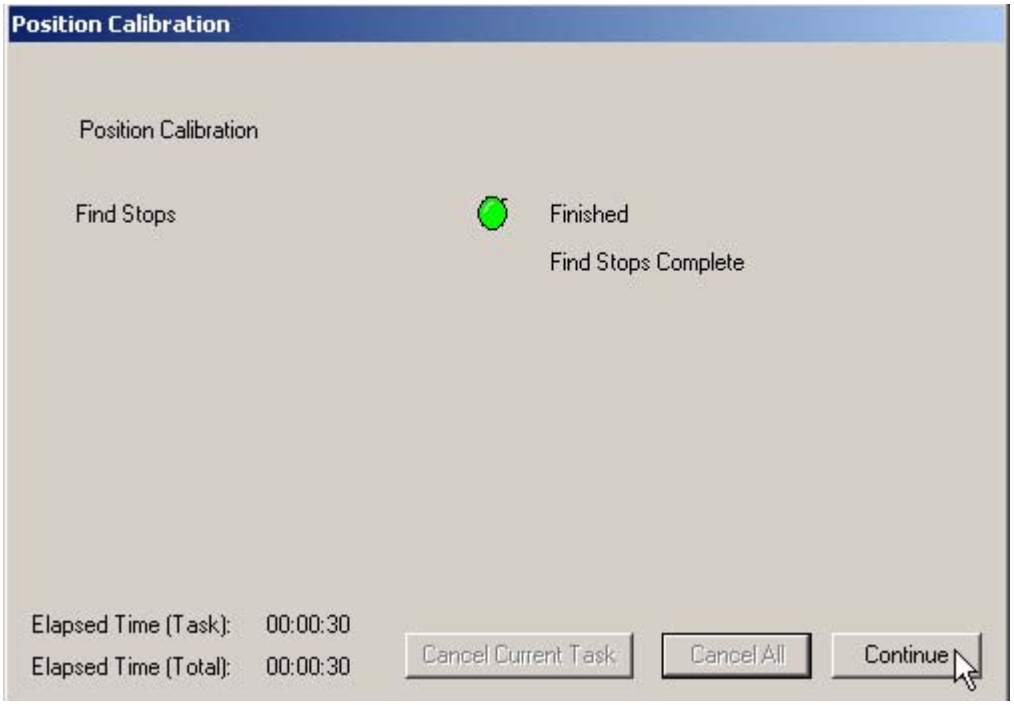


Figure 107 "Find Stops" Complete

Advanced Parameters

ESDVue allows the user to finely tune the SVI II ESD with the addition of advanced calibration parameters. When you click on the "Advanced Parameters" on the Calibrate Screen ESDVue launches the Advanced Parameter window where you can adjust:

- Dead Zone
- Beta
- Position Compensation Coefficient
- Boost
- Stroke Time

To adjust the advanced parameters:

1. Click on "Advanced Parameters" as shown below.

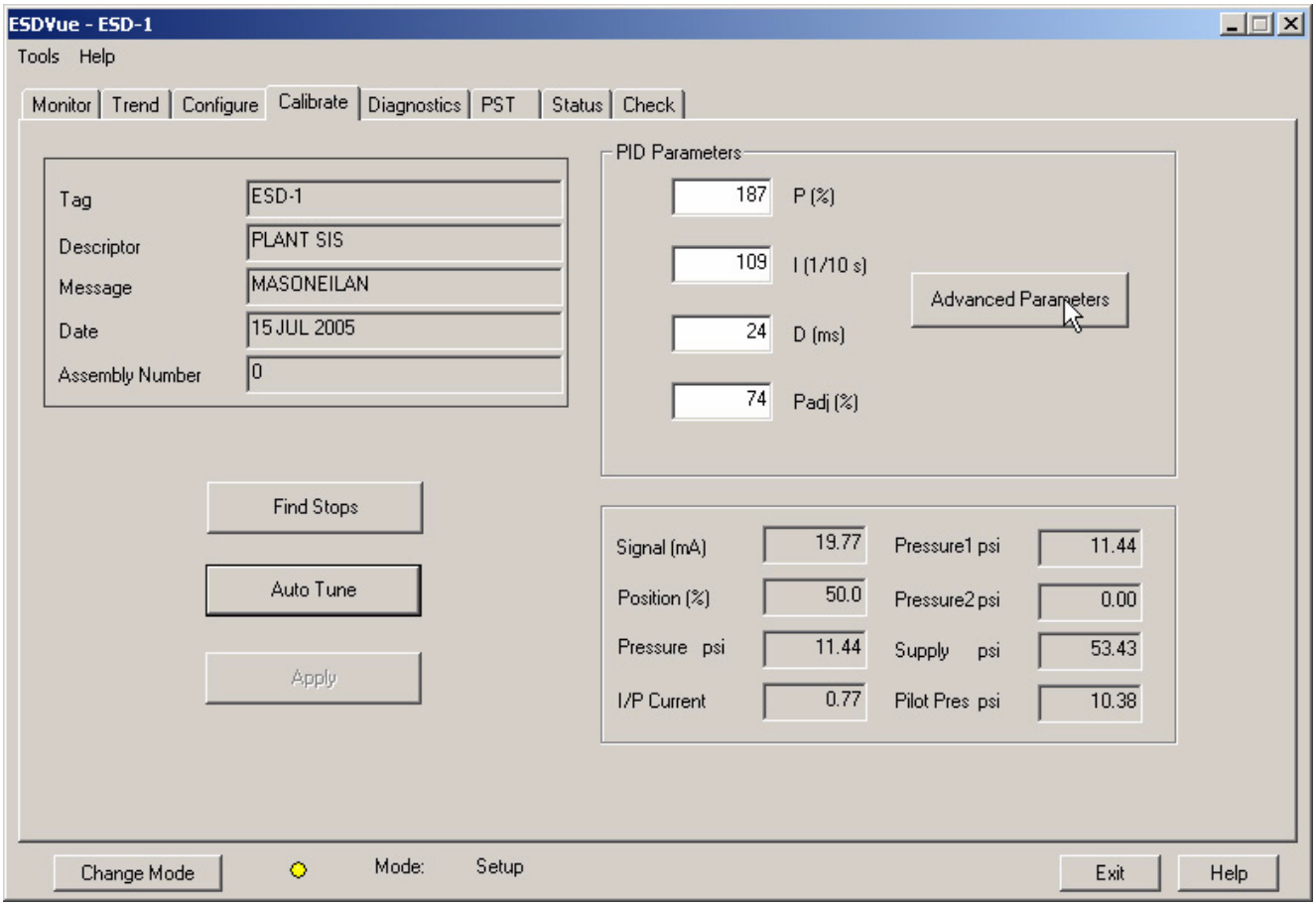


Figure 108 Starting Advanced Parameters

2. ESDVue will launch the Advanced Tuning Parameters dialog shown in the figure below. Adjust the parameters, referring to the table below for parameter descriptions.
   - ❖ Dead Zone：0% to 1%
   - ❖ Beta: -9 to 9
   - ❖ Position Compensation Coefficient: 0 10 20
   - ❖ Boost: 0 to 20
   - ❖ Stroke Time: 0 - 255 sec
   - ❖ Direction: Both Directions, Open, Closed

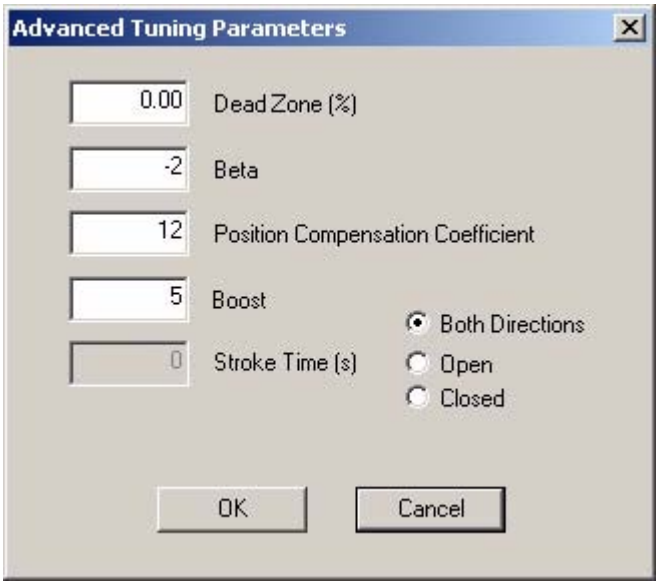


Figure 109 Advanced Parameters Dialog

Table 4 Advanced Tuning Parameters

Tuning Parameter	Description
Dead Zone	When the valve position is within the setpoint +/- the dead zone, no additional position control is performed. This value is normally 0%, however for high friction valves (e.g. valves with graphite packing) a higher dead zone (%) will help avoid limit cycling due to the stick/slip action of the valve. In these cases the dead zone chosen might be 0.5% to 1%.
Beta	Beta is nonlinear gain factor, ranging from -9 to 9. When beta is 0, the controller gain is linear. Otherwise the gain is the function of error. The larger the beta, the smaller the gain for small error. Typical beta value for a valve position controller is 7 or 8.
Position Compensation Coefficient	The response of the valve is different when the valve is nearly closed than when the valve is nearly open. The position compensation coefficient, which is a number between 0 and 9, allows the user to make adjustments to try to equalize the valve response. The normal value is 6.

Tuning Parameter	Description
Boost	The boost field in the PID adjustments controls a supplemental pressure or boost to speed up initial valve response from setpoint from 0 to 100%
Stroke Time	Amount of time in seconds that the valve is stroked.

Auto Tune

The SVI II ESD has a built-in positioning Auto tune feature. At the moment of setting up the positioner on a valve, this feature automatically computes the optimal parameters for the positioning algorithm. This features does not require valve specific parameters in order to complete successfully. The optimal for tight and accurate position control.

The Autotune feature can be launched using the local pushbuttons, a handheld communicator loaded with the device driver (DD), a control system loaded with the DD or ESDVue software. ESDVue must be in Setup mode to perform Auto Tune. (See “Change Mode” on page 48)

To start the Auto Tune function:

1. Click on "Auto Tune" as shown in the figure below.

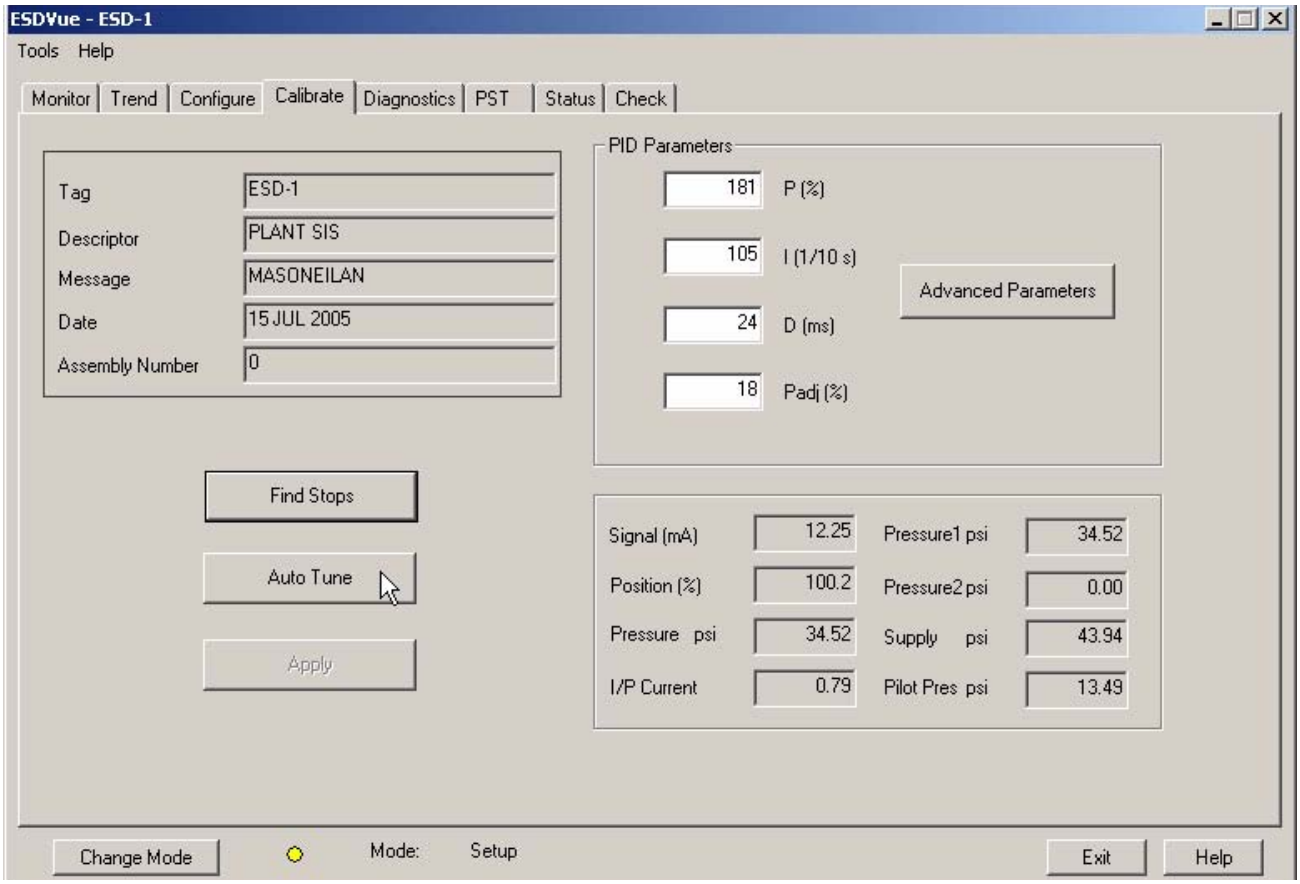


Figure 110 Launching Auto Tune

2. ESDVue will launch the following dialog.
3. Click on "OK" to continue the Auto Tune process.

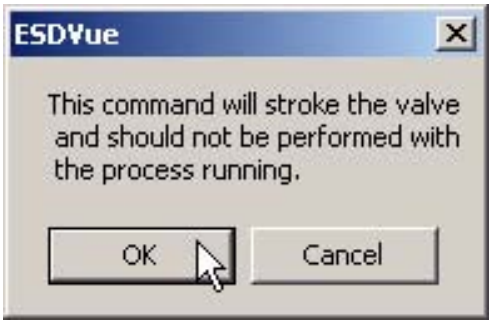


Figure 111 Auto Tune Dialog

4. After you click "OK", ESDVue will launch the Input Value dialog shown below. The value refers to the aggressiveness at which the valve will be stroked.
5. "0" is the default. Change the value if necessary and click "OK"

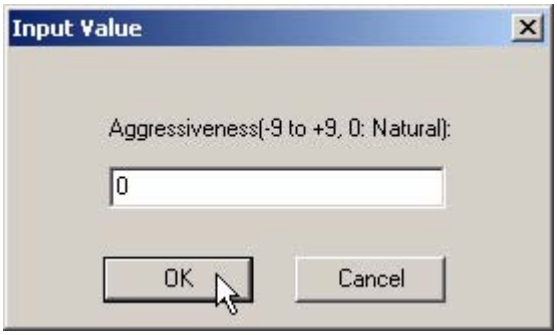


Figure 112 Auto Tune Input Value Dialog

6. ESDVue will start the Auto Tune process and will display a progress dialog as shown below.

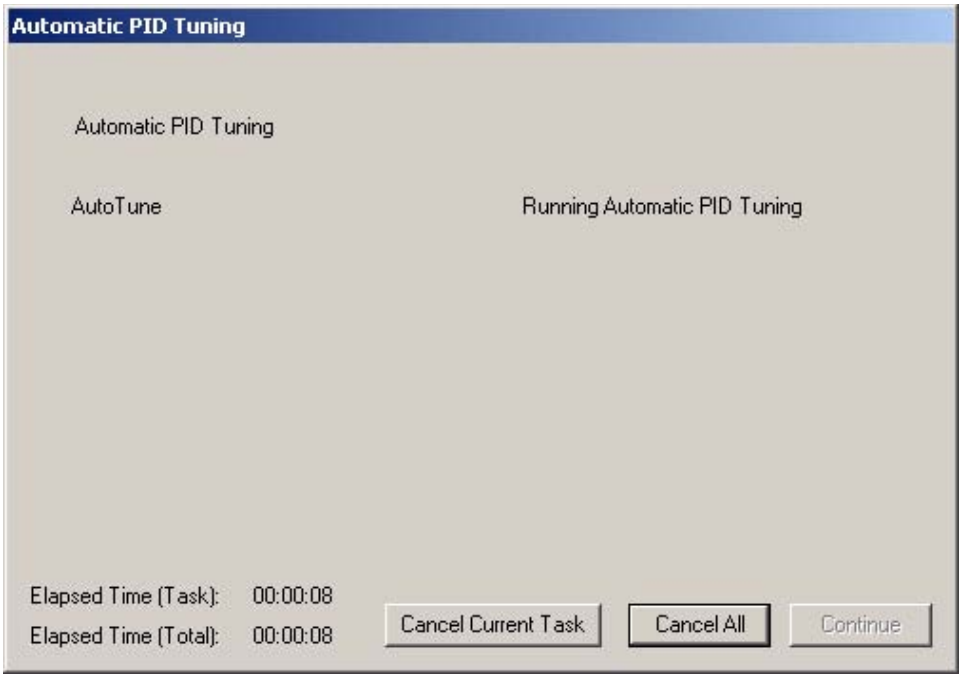


Figure 113 Auto Tune Progress Dialog

7. When the Auto Tune process is complete, ESDVue will display a Auto Tune Finished dialog as shown below. Notice that "Continue" is greyed out, or disabled.

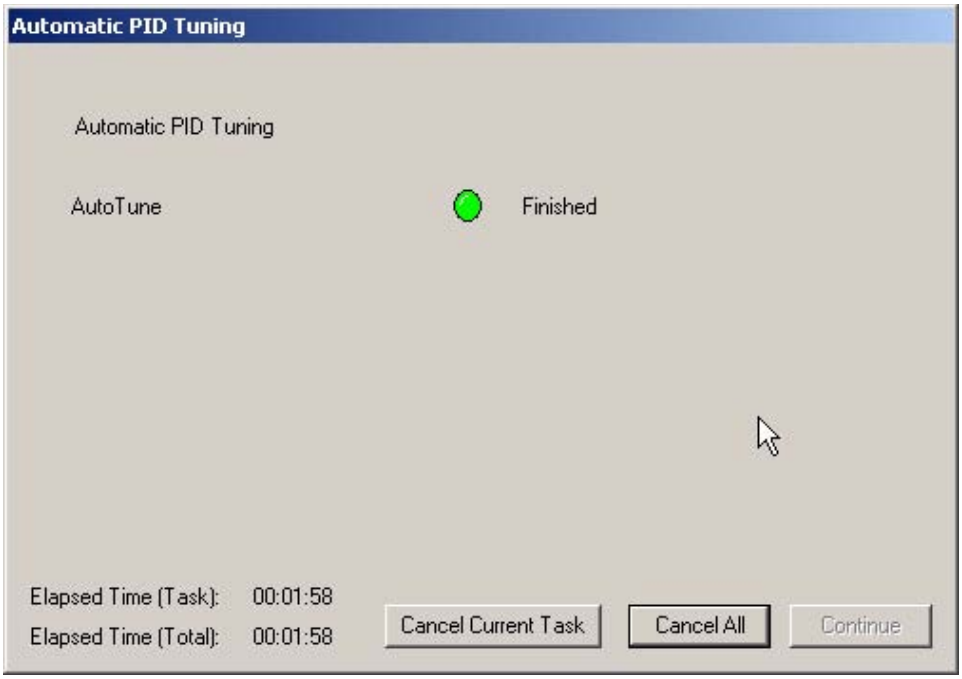


Figure 114 Auto Tune Finished Dialog

8. Upon completion of Auto Tune ESDVue will launch a Diagnostic Graph of the Auto Tune results. There are many features on the Diagnostic Graph that allow you to change the graph scale, select additional curves and show computed results.
9. To complete the Auto Tune process, close the graph as shown in the figure below.

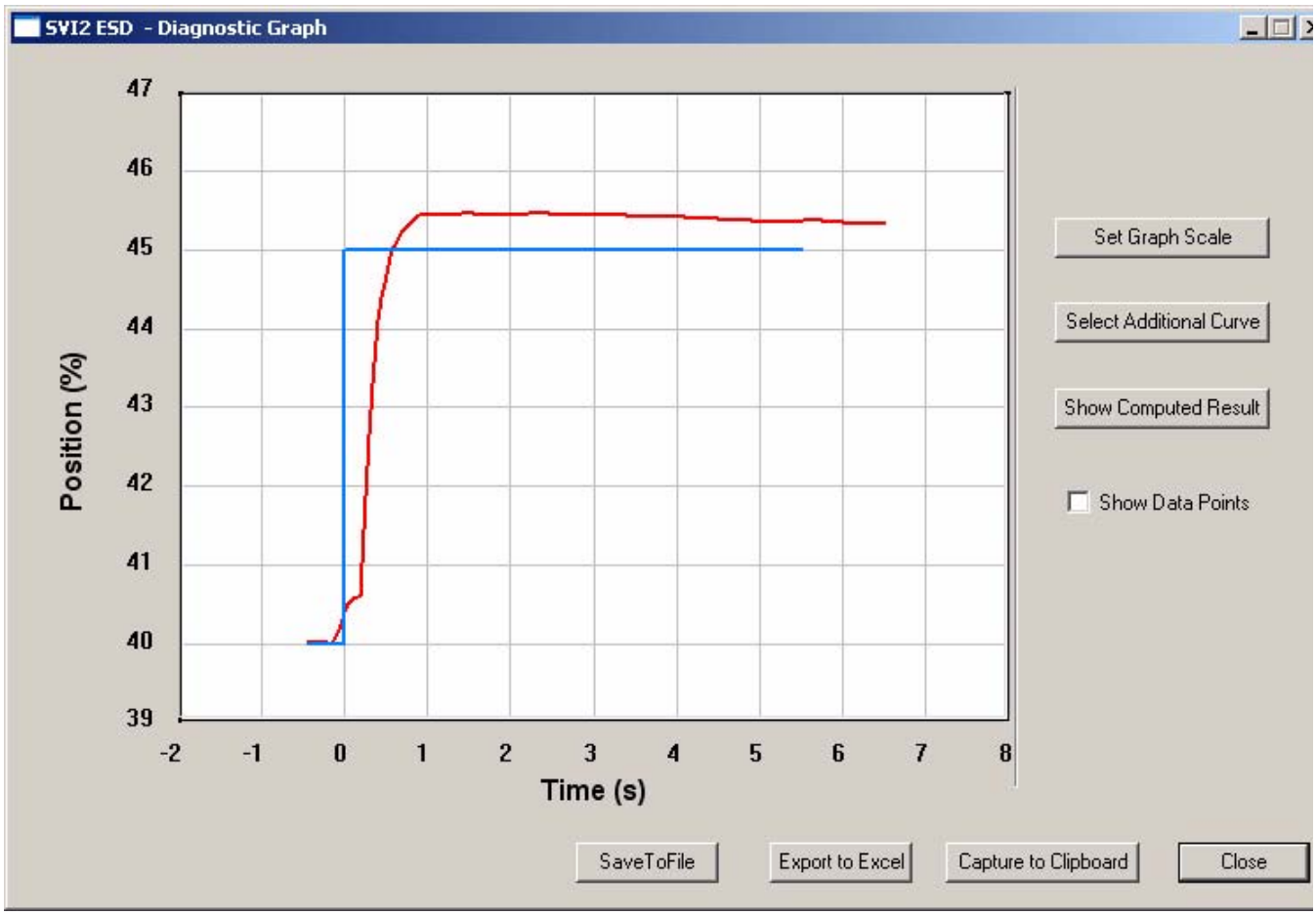


Figure 115 Auto Tune Diagnostic Graph

10. After you close the diagnostic graph ESDVue will launch a window displaying the previous PID values and the new PID values after auto tune.
11. Click on "Exit" to close the window as shown below.

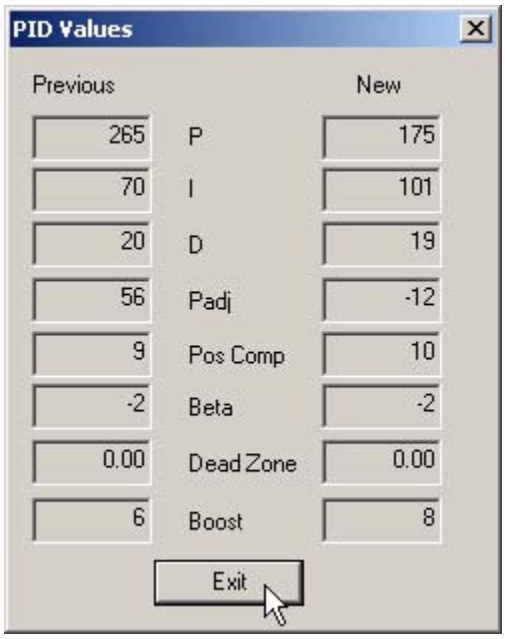


Figure 116 PID Values - Previous and New

12. When you close the PID values window, ESDVue will return you to the Automatic PID Tuning dialog.
13. Click on "Continue" to exit Auto Tune and return to the Calibrate Screen.

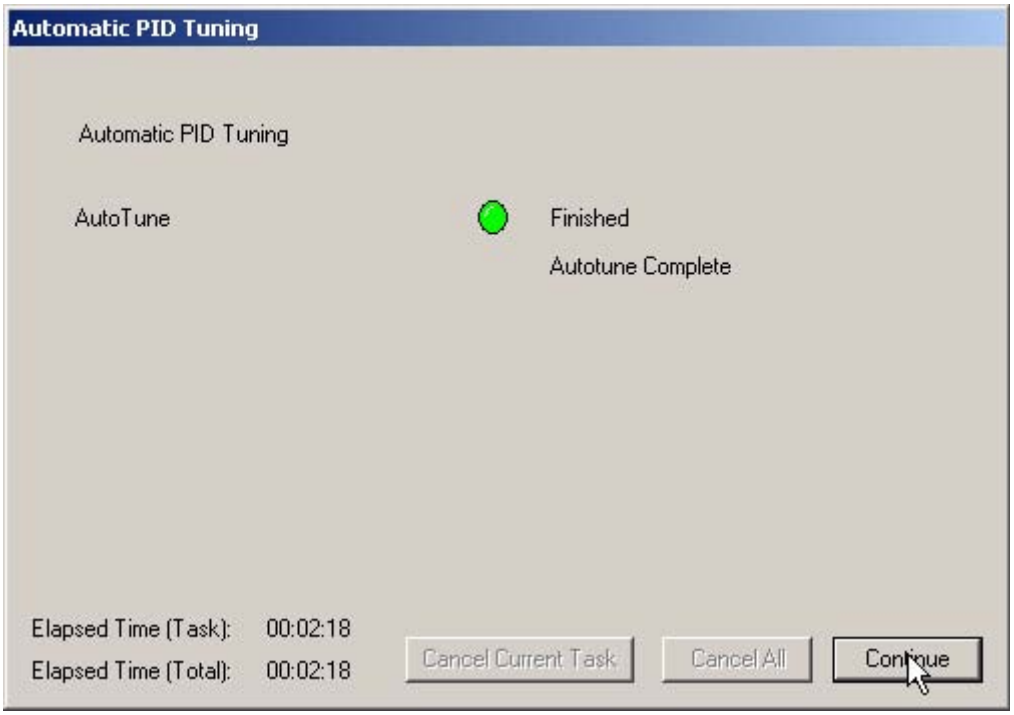


Figure 117 Auto Tune Complete Dialog

Auto Tune Diagnostic Graph

The Auto Tune Diagnostic Graph displays the results of Auto Tune in a graphical format. The X axis shows Time and the Y axis shows Position over Time. The Diagnostic Graph has several features that provide even further diagnostic capabilities.

- Set Graph Scale - allows you to change the coordinates of the Time Position axes
- Select Additional Curve - allows you to display an additional, selected, curve on the graph
- Show Computed Result - allows you to view the data in a numerical value format
- Show Data Points - when selected shows data points collected during testing
- Save to File - allows you to save the graph to a file
- Export to Excel - exports the data as a CSV Excel file
- Capture to Clipboard - captures a bitmap image of the graph
- Close - closes the graph and returns the ESDVue Screen

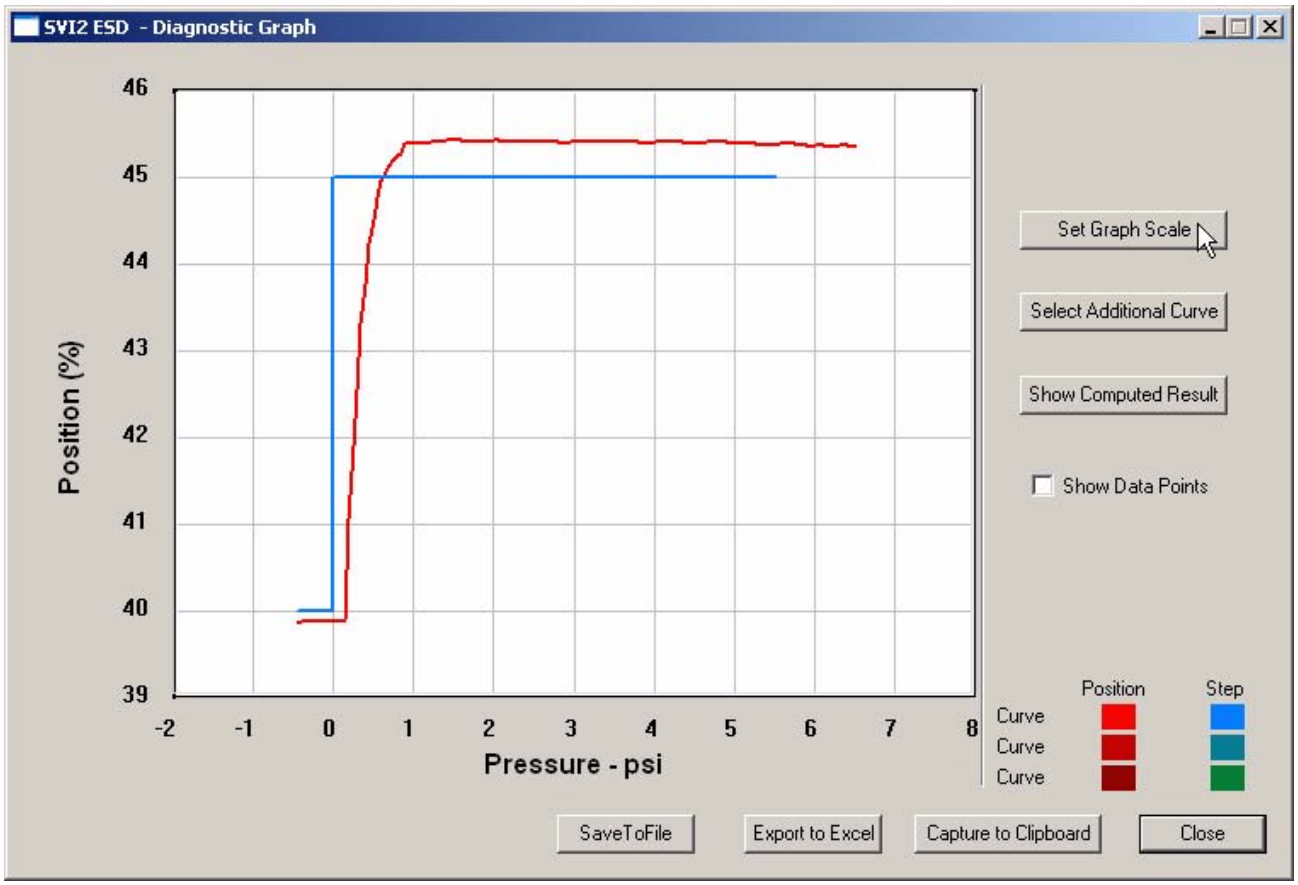


Figure 118 Auto Tune Diagnostic Graph

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curves" function).

Set Graph Scale

ESDVue allows you to change the graph scale on diagnostic graphs so that you can narrow in on one area of the graph, or expand the viewing area.

To change the graph scale:

1. Select "Set Graph Scale" as shown in the figure below.

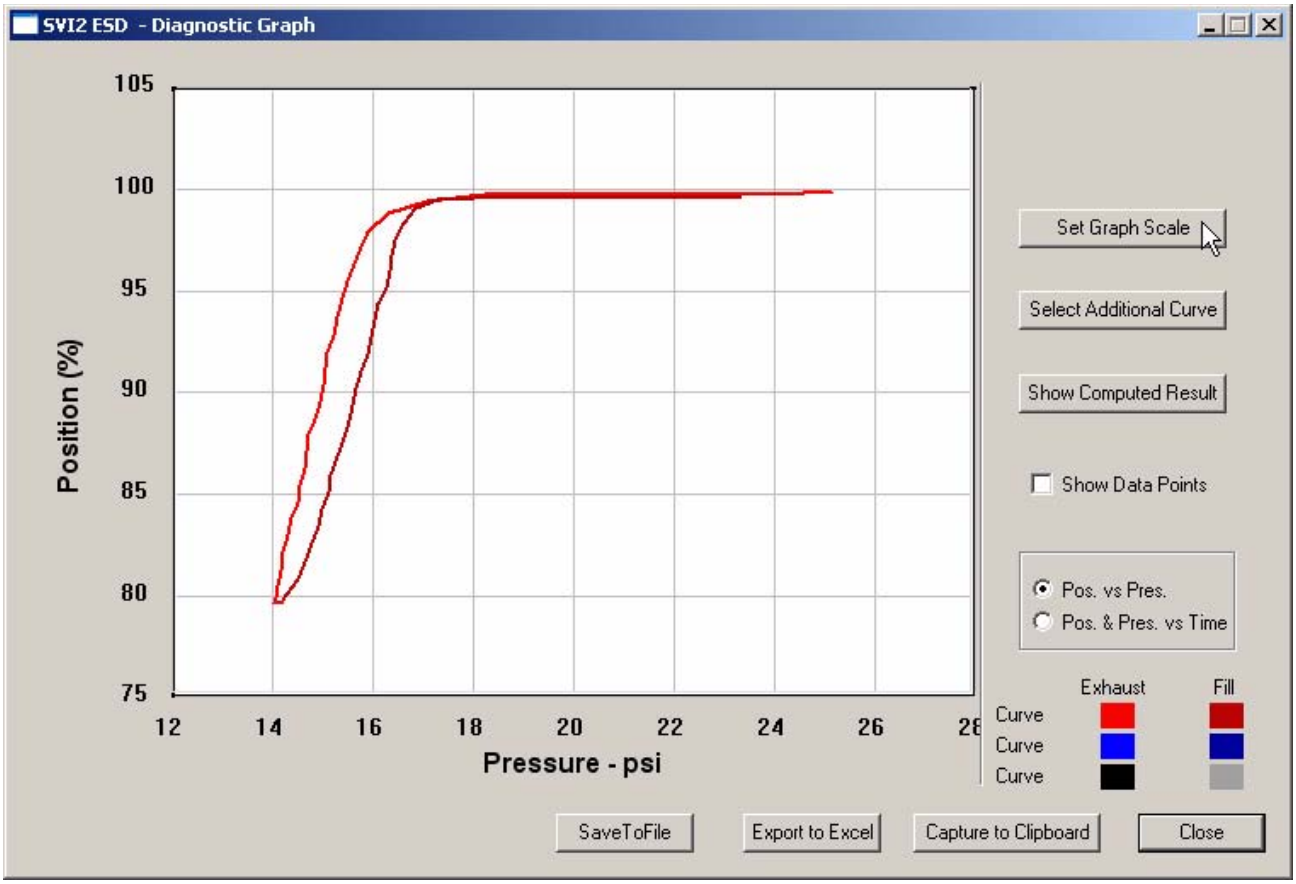


Figure 119 Selecting "Set Graph Scale"

2. ESDVue will launch the Set Graph Scale window shown below.

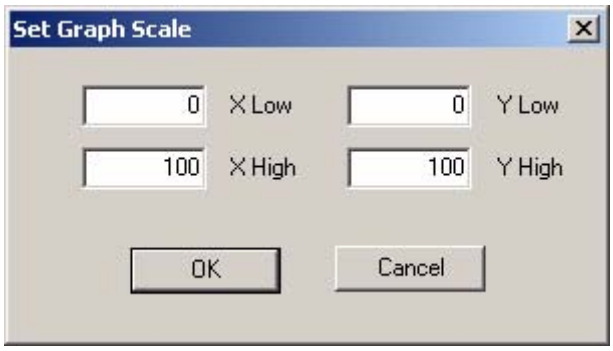


Figure 120 Set Graph Scale Wndow

3. Adjust the X axis and Y axis coordinates as necessary and click "OK".
4. The Diagnostic Graph will reflect the changes made to the axes.

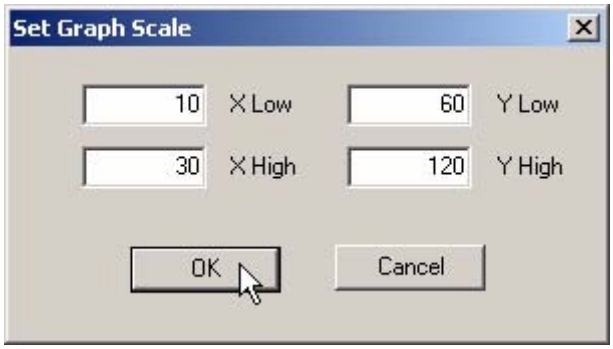


Figure 121 Saving Scale Adjustments

Select Additional Calibration Curve

ESDVue allows you to view more than one diagnostic curve at a time; being able to compare two curves may facilitate diagnostics.

To display an additional curve on the diagnostic graph:

1. Click on the "Select Additional Curve" button as shown below.

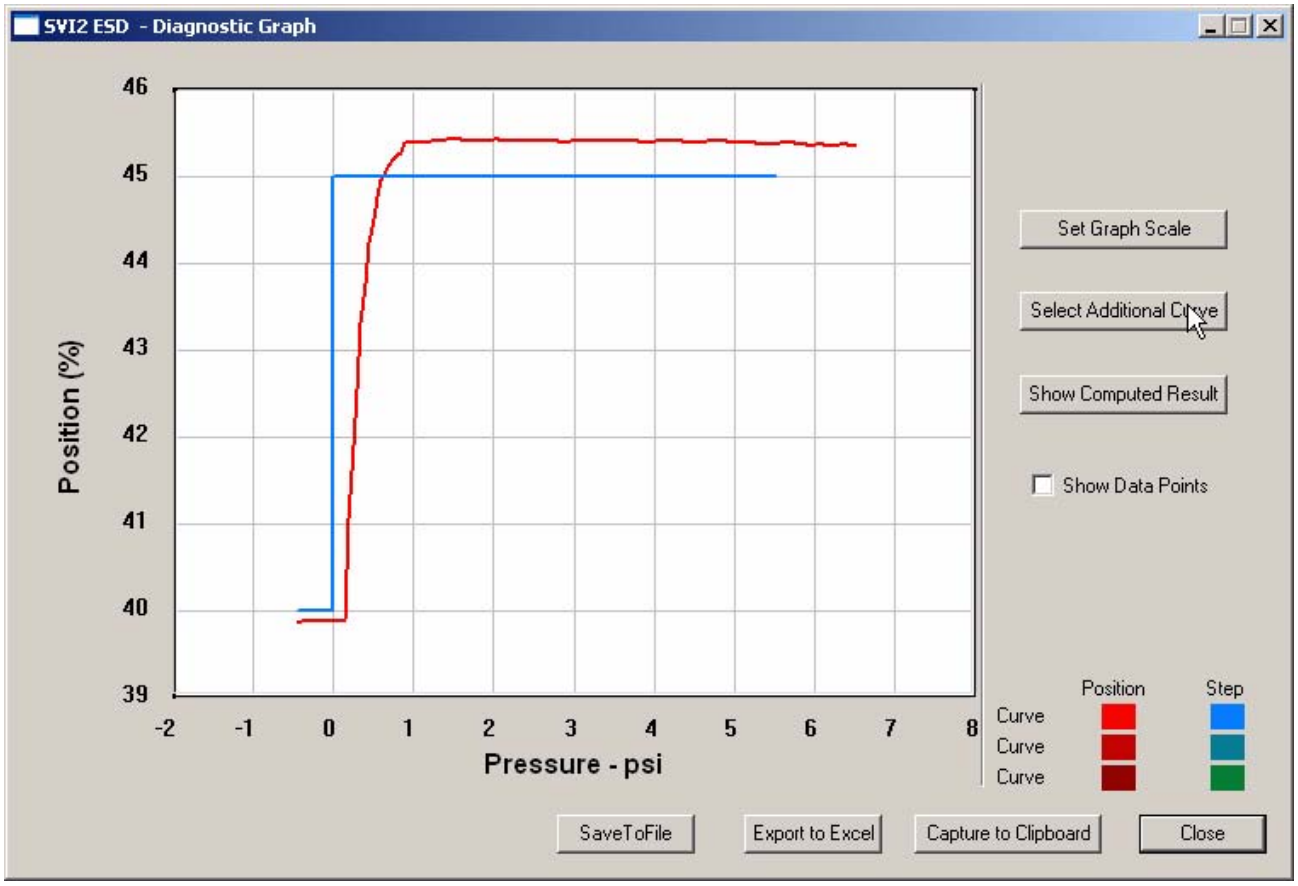


Figure 122 Starting "Select Additional Curve"

2. ESDVue will launch the dialog shown below. "Load Data from Database" and "Load Data from File" are the only active choices for Step Diagnostics.
3. Select the source of the additional curve:
   - ❖ Load from Database - launches window to select data from database
   - ❖ Load Data from File - launches to browser to select file to load
4. The default is "Load Data from Database".

Figure 123 Select Additional Step Curve Dialog

Selecting a Curve from a Database

To select a curve from a database:

1. Click the radio button beside "Load Data from Database", if not already selected.
2. Click on "Load".

Figure 124 Selecting "Load Data from Database"

3. ESDVue will launch the database browser shown below.
4. The browser displays all types of data files and when executed from the Calibration graph defaults to "Step" (the calibration test being a single step).
5. Select the data file with the appropriate time stamp.
6. Click "OK".

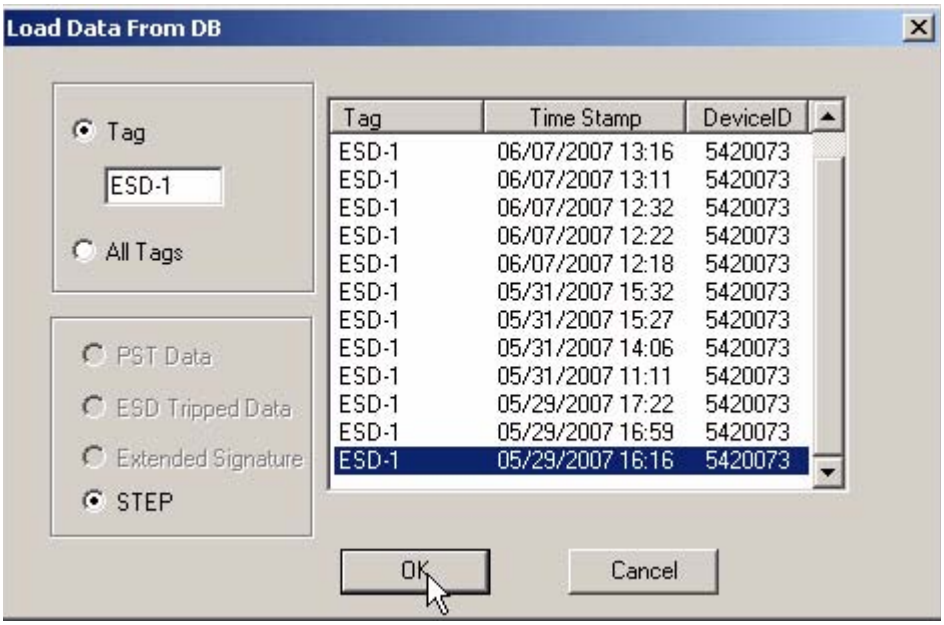


Figure 125 Selecting Database File

Selecting a Curve from a File

You can also load an additional Calibration Curve from a saved file. To select a curve from a file:

1. After you select "Select Additional Curve" from the Auto Tune Diagnostic Graph shown above, ESDVue will display the dialog shown below.
2. Select "Load Data from File".
3. Click on "Load" as shown below.

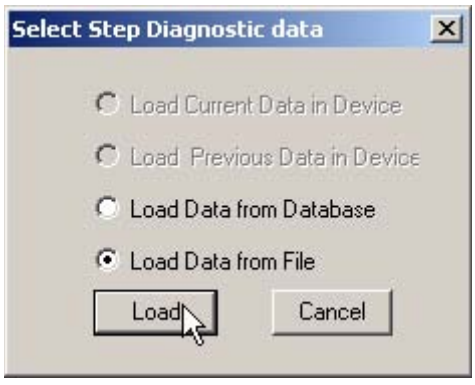


Figure 126 Selecting "Load Data from File"

4. ESDVue will launch a file browser window as shown below.

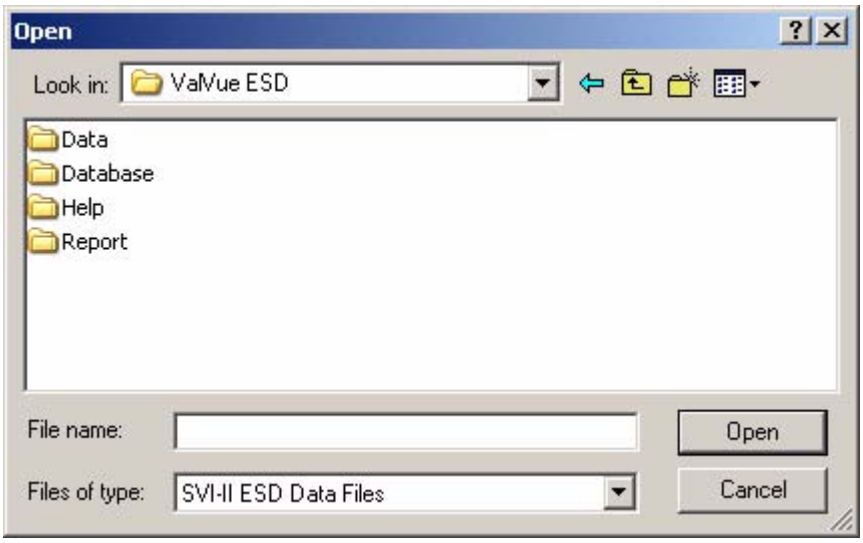


Figure 127 File Browser

5. Using the browser, locate the file you would like to load
6. Select the file name.
7. Click "Open".

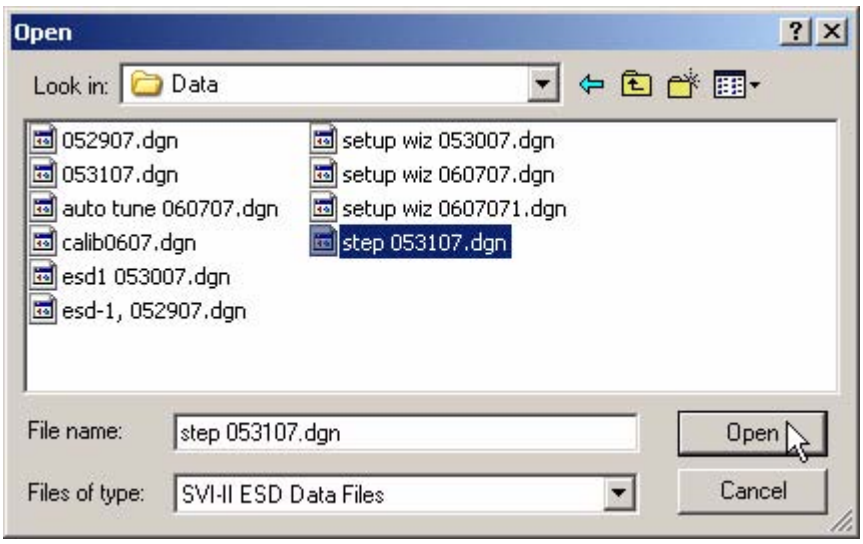


Figure 128 Opening File for Additional Curve

8. After you open the saved file, ESDVue will launch the dialog below.
9. Select the record with the appropriate time stamp and click "OK".

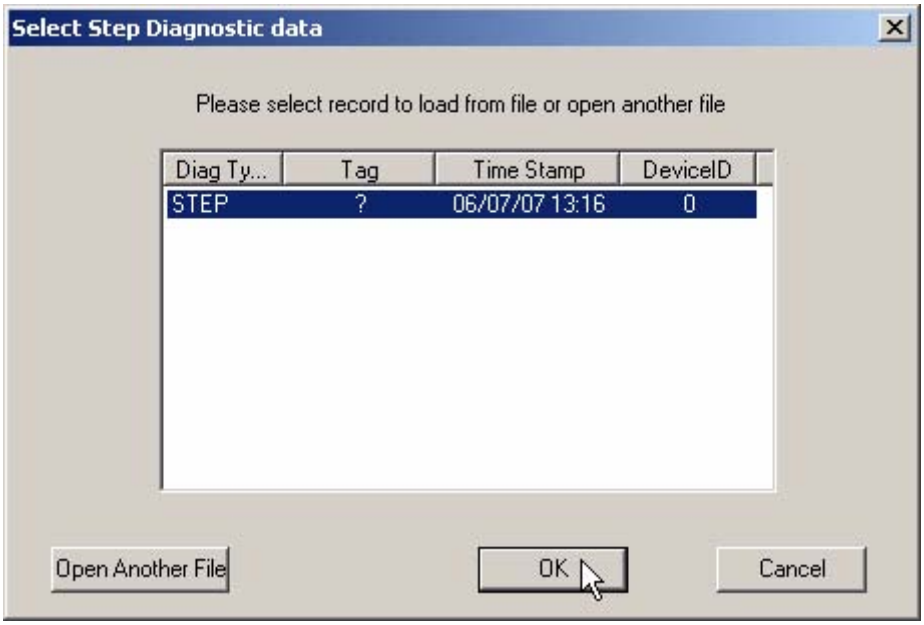


Figure 129 Selecting Calibration Record

10. After selecting additional curve data from either the database or a file, the additional curve will be displayed on the graph with the original curve as shown below.

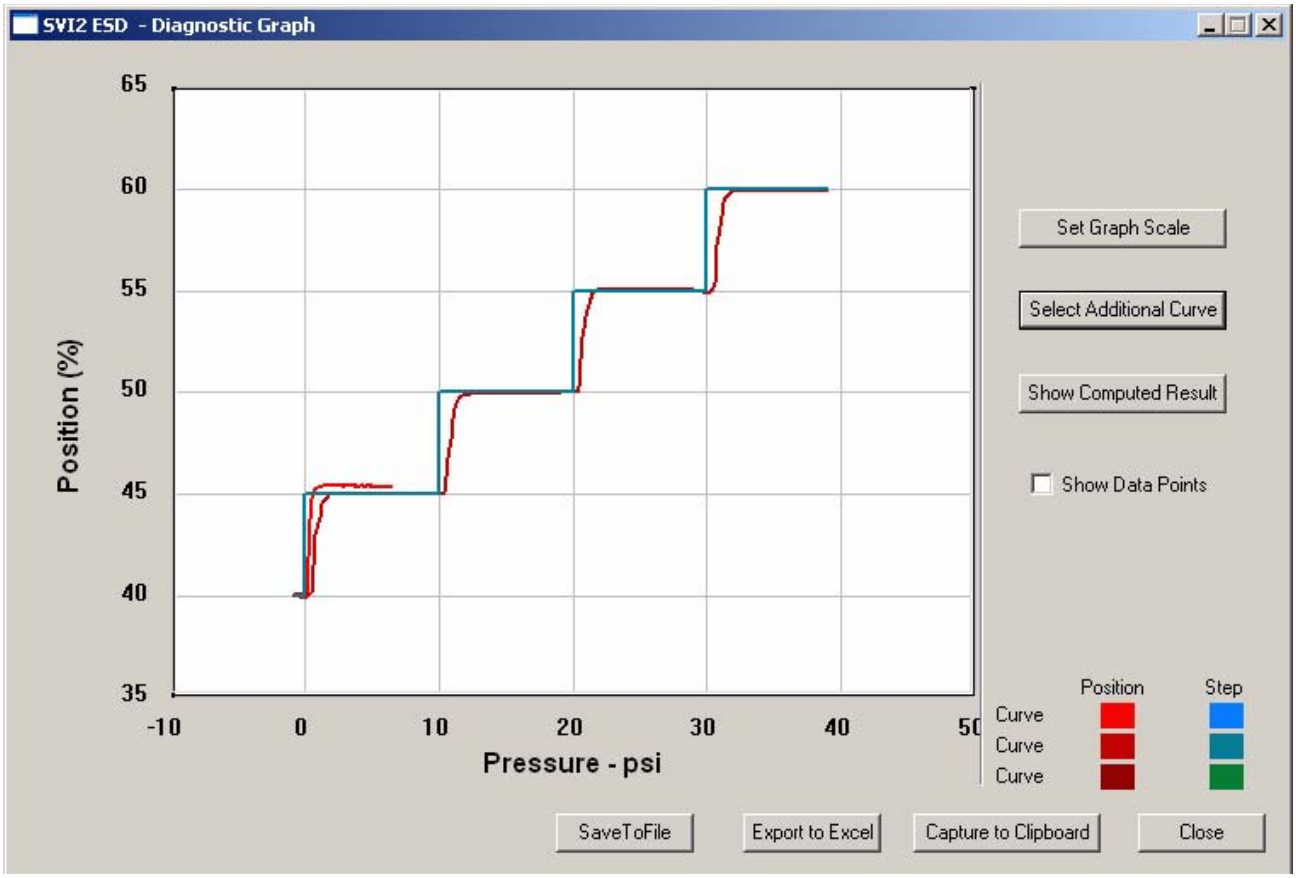


Figure 130 Additional Calibration Curve Displayed

Show Computed Calibration Results

ESDVue allows you to view the results of the Auto Tune Test as a table of numerical values.

To display the computed result for the active Auto Tune Test:

1. Click on "Show Computed Result" as shown below.

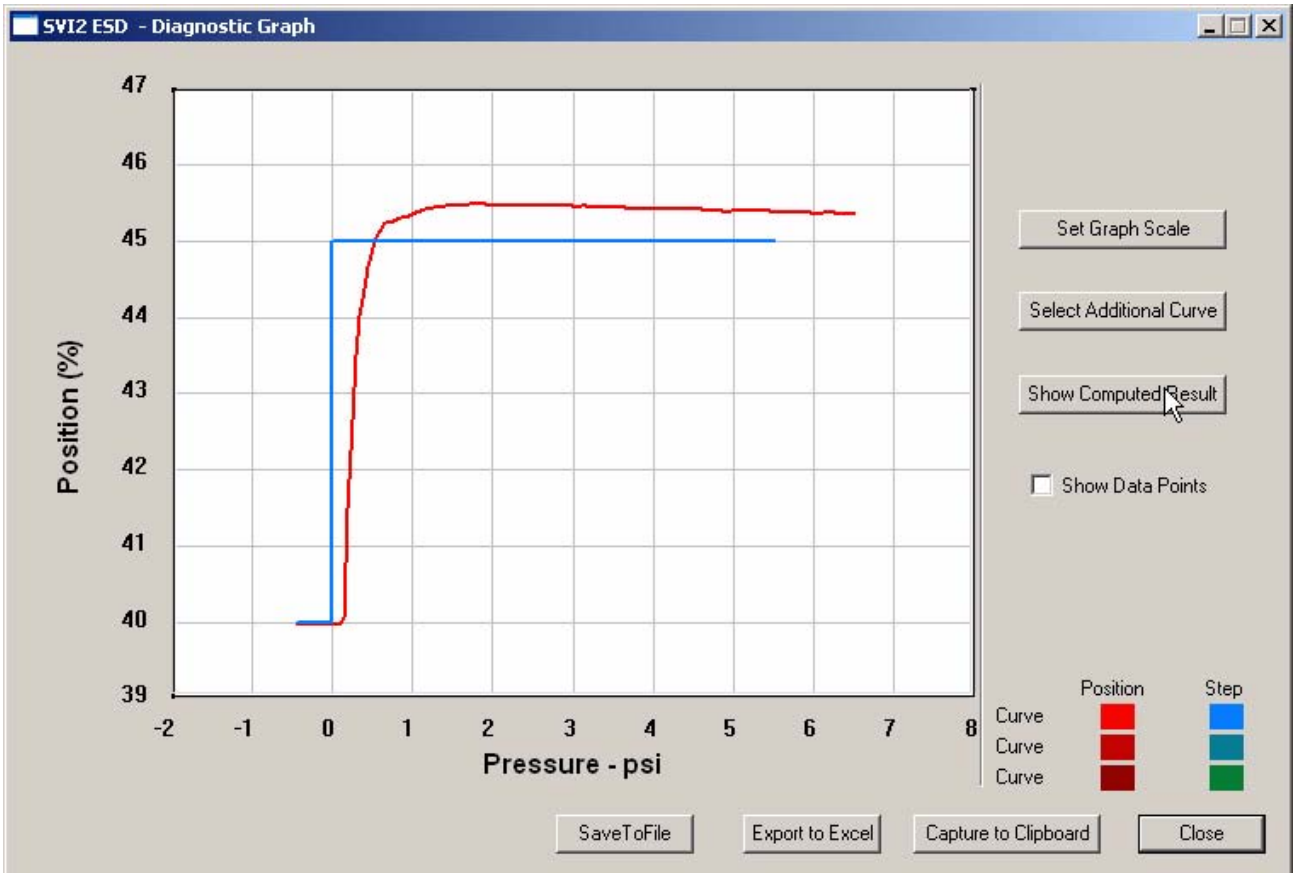


Figure 131 Selecting "Show Computed Result"

2. ESDVue will launch the Step Response Test Result window shown below.
3. All step diagnostic results are displayed in a numerical format.

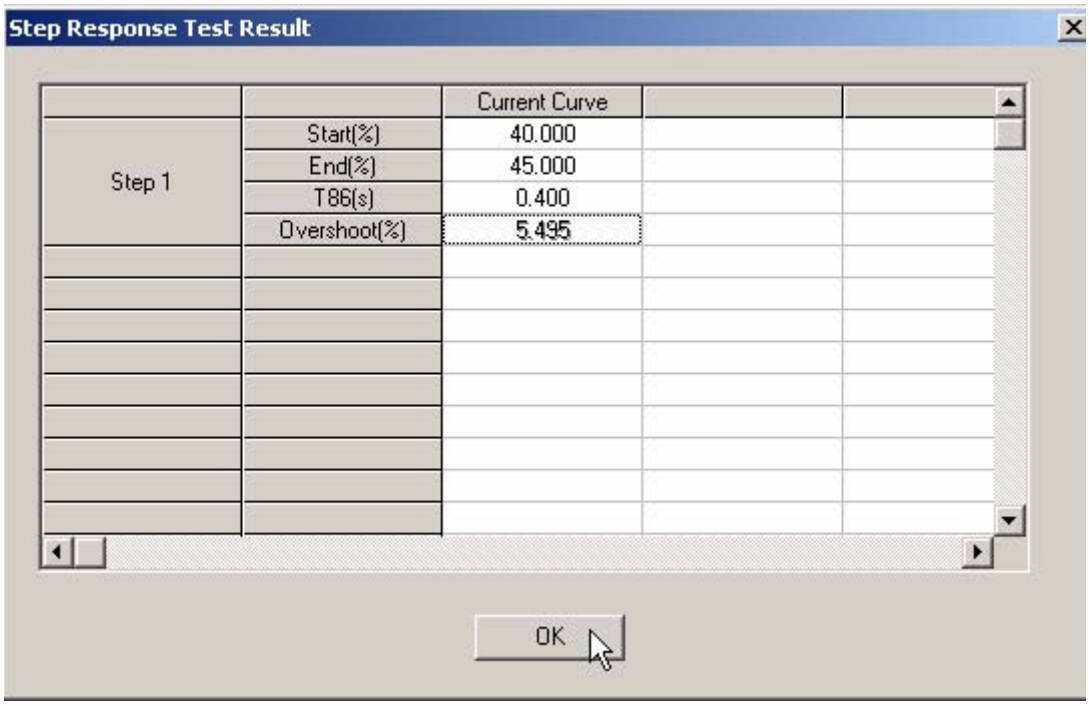


Figure 132 Auto Tune Calibration Computed Result

Save to File

ESDVue allows you to save diagnostic graphs in a graphical format as .dgn files to any specified location.

To save a diagnostic graph to a file:

1. Select "Save To File" as shown below.

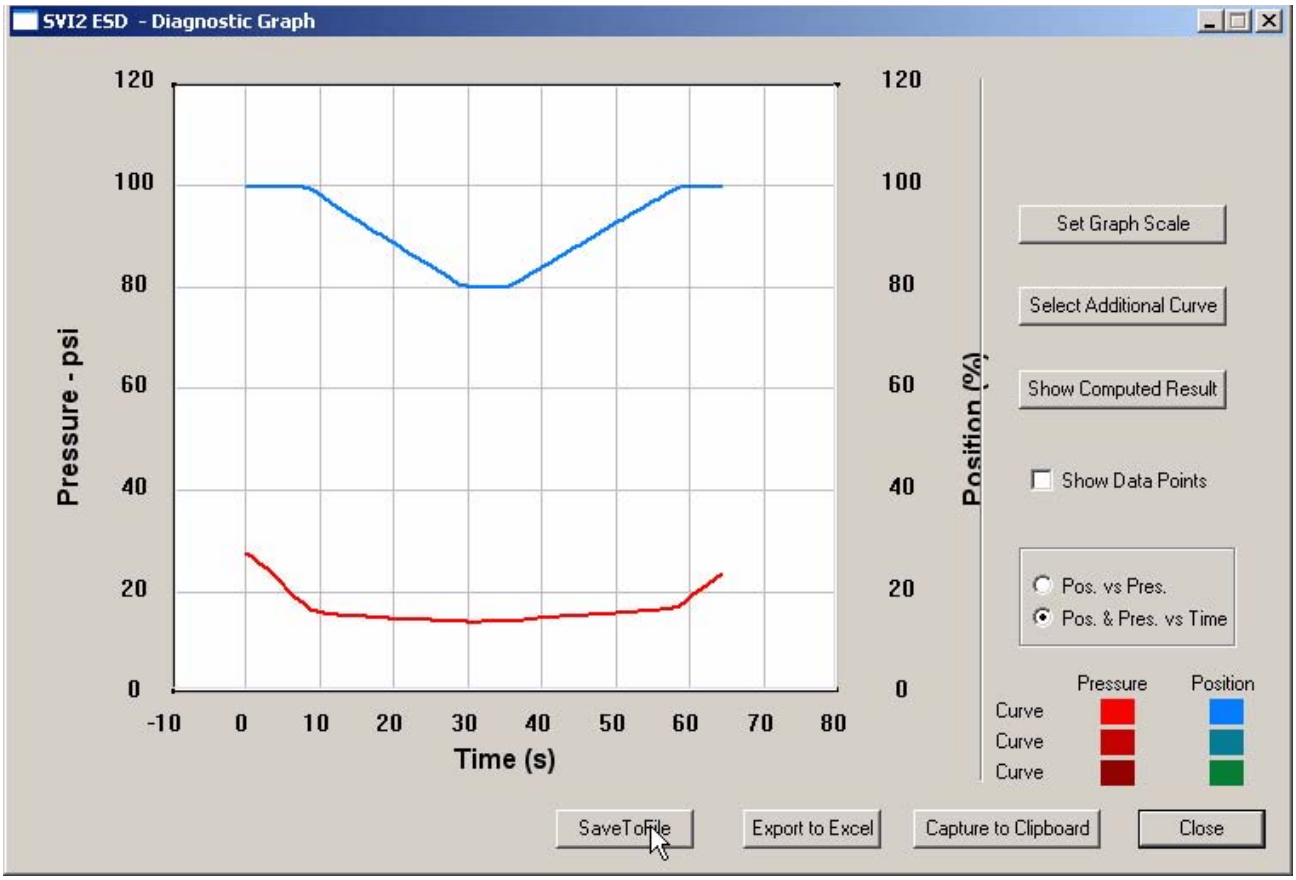


Figure 133 Selecting "Save to File"

2. ESDVue will launch a Windows file browser as shown below.

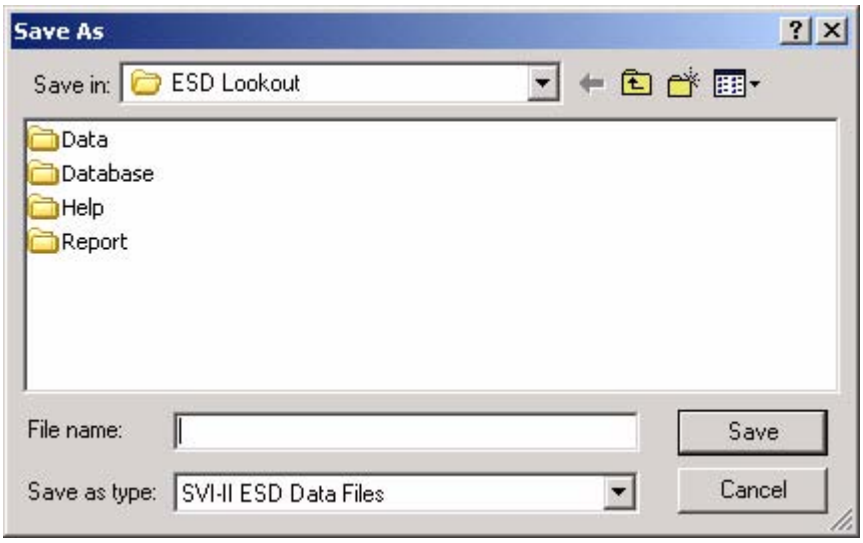


Figure 134 File Browser

3. Locate the folder in which you would like to save the file.
4. Enter a file name.
5. Click on "Save".
6. ESDVue will then close the browser window and return the diagnostic graph.

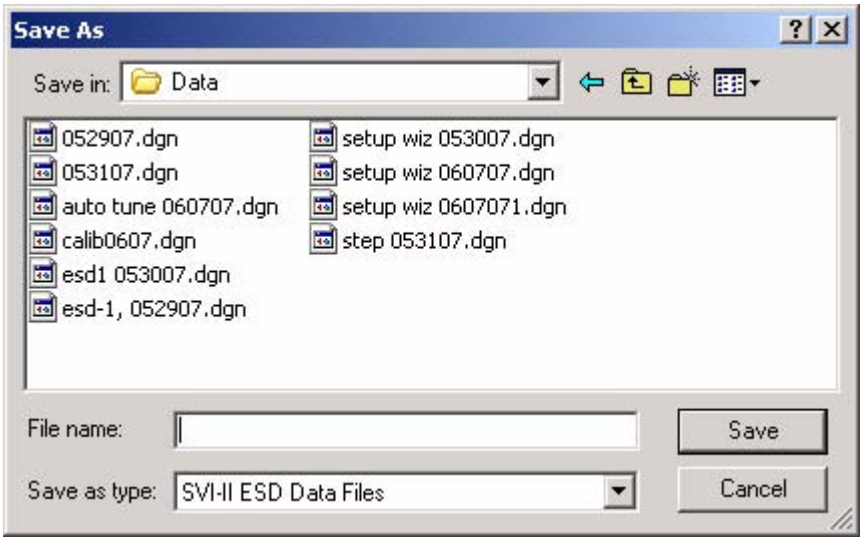


Figure 135 Selecting a Folder for Saving File

Export to Excel

ESDVue allows you to save or create a comma separated value file (.csv) of the diagnostic data from a graph and export the file to Excel. With the Excel file you can create graphs or perform other analysis.

To export a graph to Excel:

1. Click on "Export to Excel" as shown below.

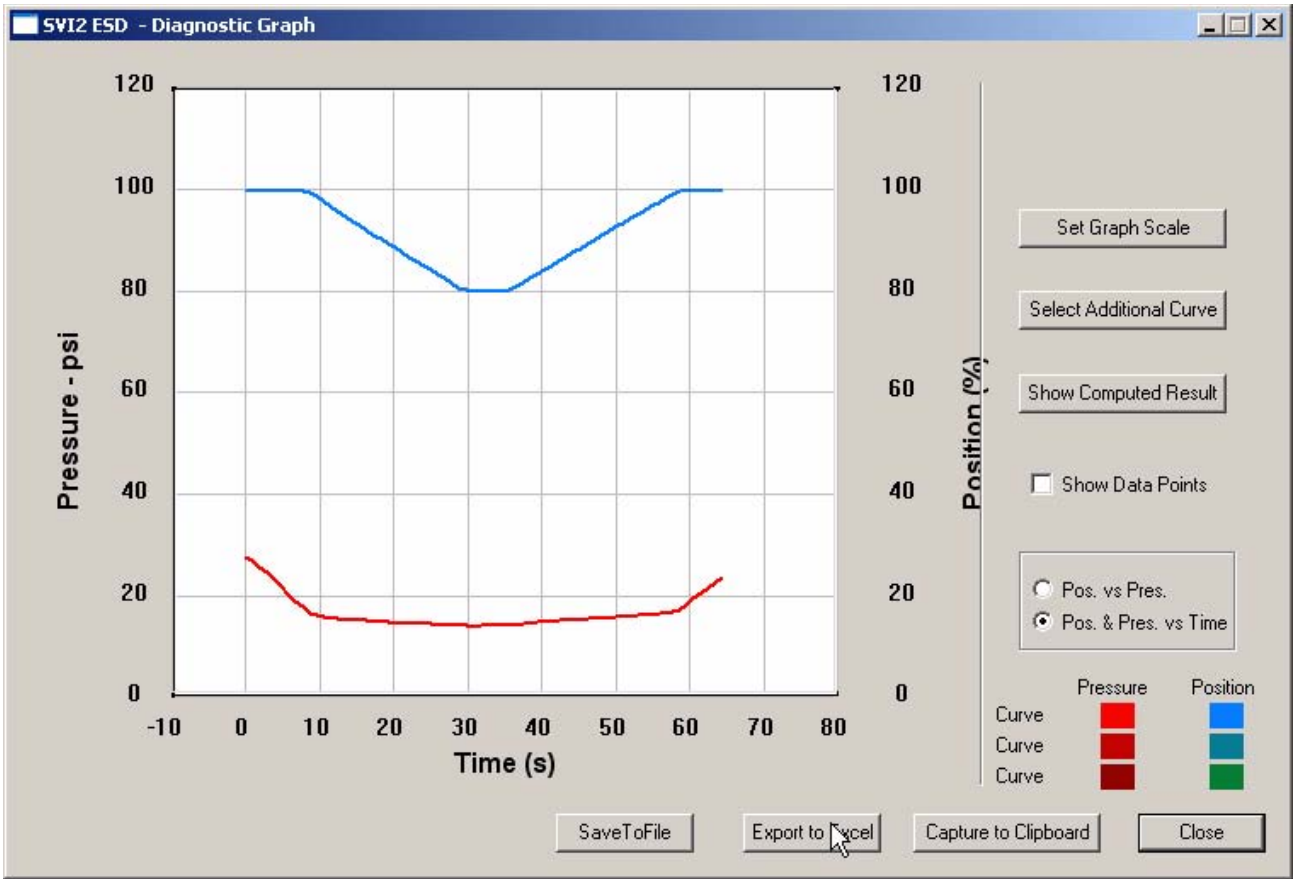
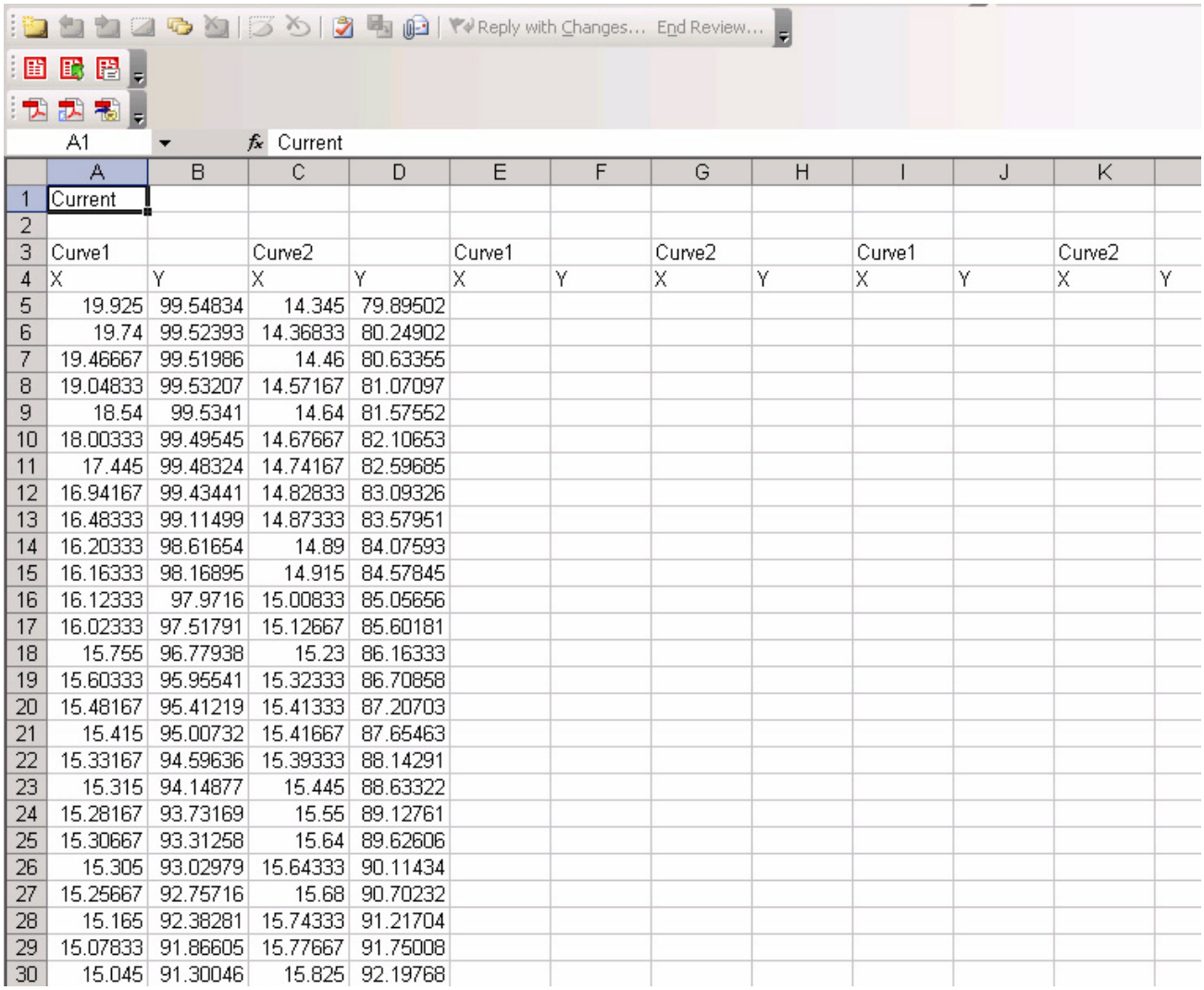


Figure 136 Selecting "Export to Excel"

2. ESDVue will launch Microsoft Excel and display the X axis and Y axis values, taken from the diagnostic graph, as Excel values as shown in the figure below.



	A	B	C	D	E	F	G	H	I	J	K	
1	Current											
2												
3	Curve1		Curve2		Curve1		Curve2		Curve1		Curve2	
4	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
5	19.925	99.54834	14.345	79.89502								
6	19.74	99.52393	14.36833	80.24902								
7	19.46667	99.51986	14.46	80.63355								
8	19.04833	99.53207	14.57167	81.07097								
9	18.54	99.5341	14.64	81.57552								
10	18.00333	99.49545	14.67667	82.10653								
11	17.445	99.48324	14.74167	82.59685								
12	16.94167	99.43441	14.82833	83.09326								
13	16.48333	99.11499	14.87333	83.57951								
14	16.20333	98.61654	14.89	84.07593								
15	16.16333	98.16895	14.915	84.57845								
16	16.12333	97.9716	15.00833	85.05656								
17	16.02333	97.51791	15.12667	85.60181								
18	15.755	96.77938	15.23	86.16333								
19	15.60333	95.95541	15.32333	86.70858								
20	15.48167	95.41219	15.41333	87.20703								
21	15.415	95.00732	15.41667	87.65463								
22	15.33167	94.59636	15.39333	88.14291								
23	15.315	94.14877	15.445	88.63322								
24	15.28167	93.73169	15.55	89.12761								
25	15.30667	93.31258	15.64	89.62606								
26	15.305	93.02979	15.64333	90.11434								
27	15.25667	92.75716	15.68	90.70232								
28	15.165	92.38281	15.74333	91.21704								
29	15.07833	91.86605	15.77667	91.75008								
30	15.045	91.30046	15.825	92.19768								

Figure 137 Diagnostic Graph Data - in Excel

Calibrate Context Menu

When the user right clicks on the Calibrate screen, a context menu shown in the figure below appears.

Note: *Most functions available in the Calibrate context menu are used for advanced SVI II ESD setup and are only accessible when ESDVue is in the setup mode. Refer to "Advanced Setup with ESDVue" on page 288 for further instructions.*

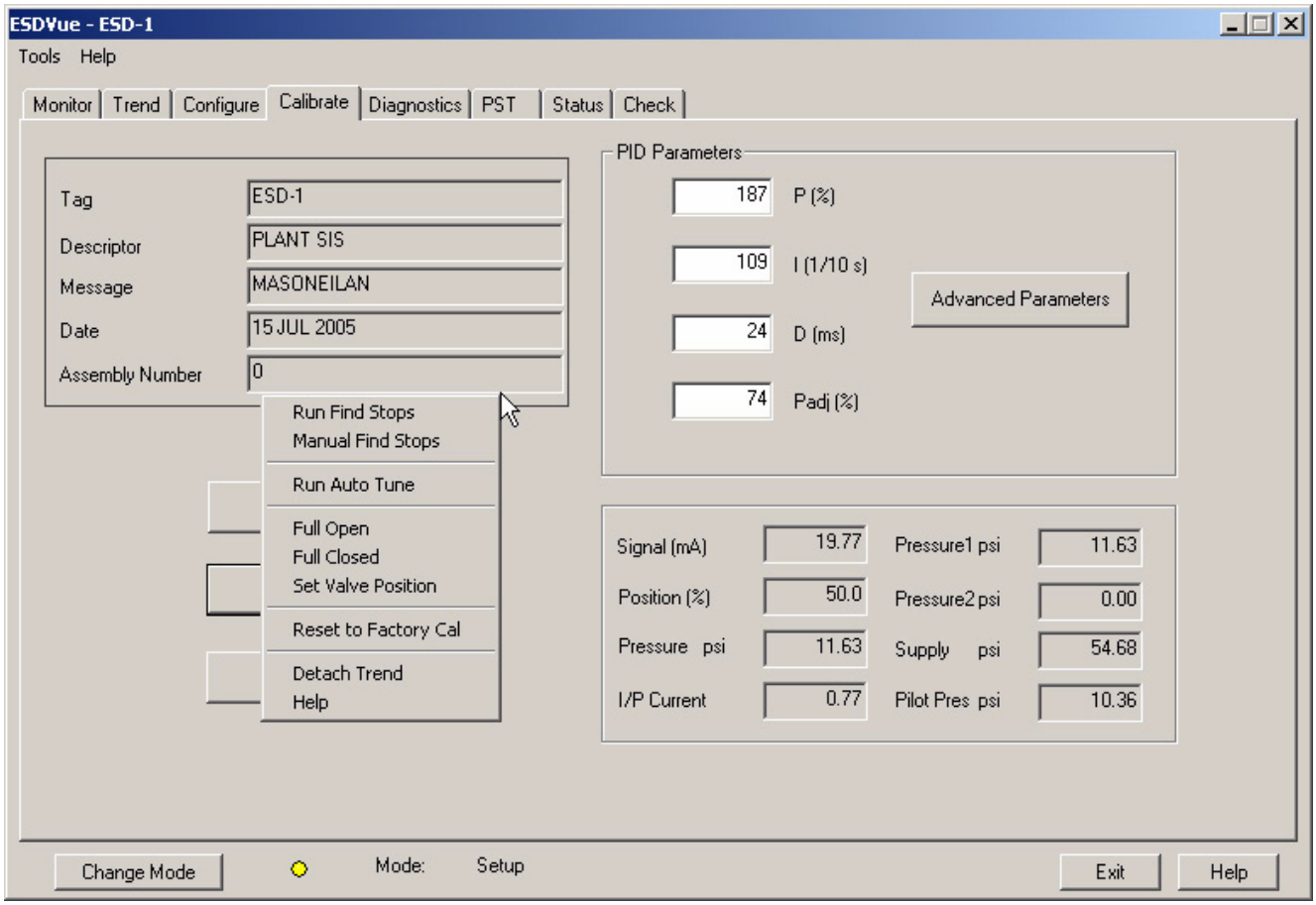


Figure 138 Calibrate Screen Context Menu

The following items are on the Calibrate context menu.

- Run Find Stops - runs the automatic position calibration process.
- Manual Find Stops - allows the user to set the position calibration by moving the valve full closed and full open. On very large valves, the automatic find stops routine may timeout before the valve has reached the end of travel. Manual find stops allows calibration of these valves.
- Run Auto Tune - automatically finds appropriate PID parameters for the valve.
- Full Open - Moves the valve to full open. This command work by taking the valve out of closed loop control and send a high or low signal to the I/P.
- Full Closed - Moves the valve to full closed. This command works by taking the valve out of closed loop control and sends a high or low signal to the I/P.
- Set Valve Position - Allows the user to set the valve to a specific position (this is accomplished by momentarily returning to manual mode, repositioning the valve, and returning to setup mode).
- Reset to Factory Cal - Resets the signal and pressure calibration to their factory settings.
- Detach Trend - Removes the trend display from the tabbed dialog and creates a separate trend display.
- Help - Displays the help file at the Calibrate screen instructions.

Run Find Stops

To determine valve position, the positioner must measure and save the closed and open positions of the valve. This can be done automatically by running the Run Find Stops procedure from the Calibrate screen, context menu.

The SVI II ESD will first exhaust the actuator and measure the position, then fill the actuator and measure the position. From these measurements the valve position can be determined. Correction can be made for nominal valve travel if it is less than full travel. A progress screen is displayed while the find stops process is running.

Steps to Run find Stops

To run Find Stops from the Calibrate screen context menu:

1. Right click in the screen area until the Calibrate context menu appears. In the Calibrate context menu, select "Run Find Stops" as shown in the figure below.

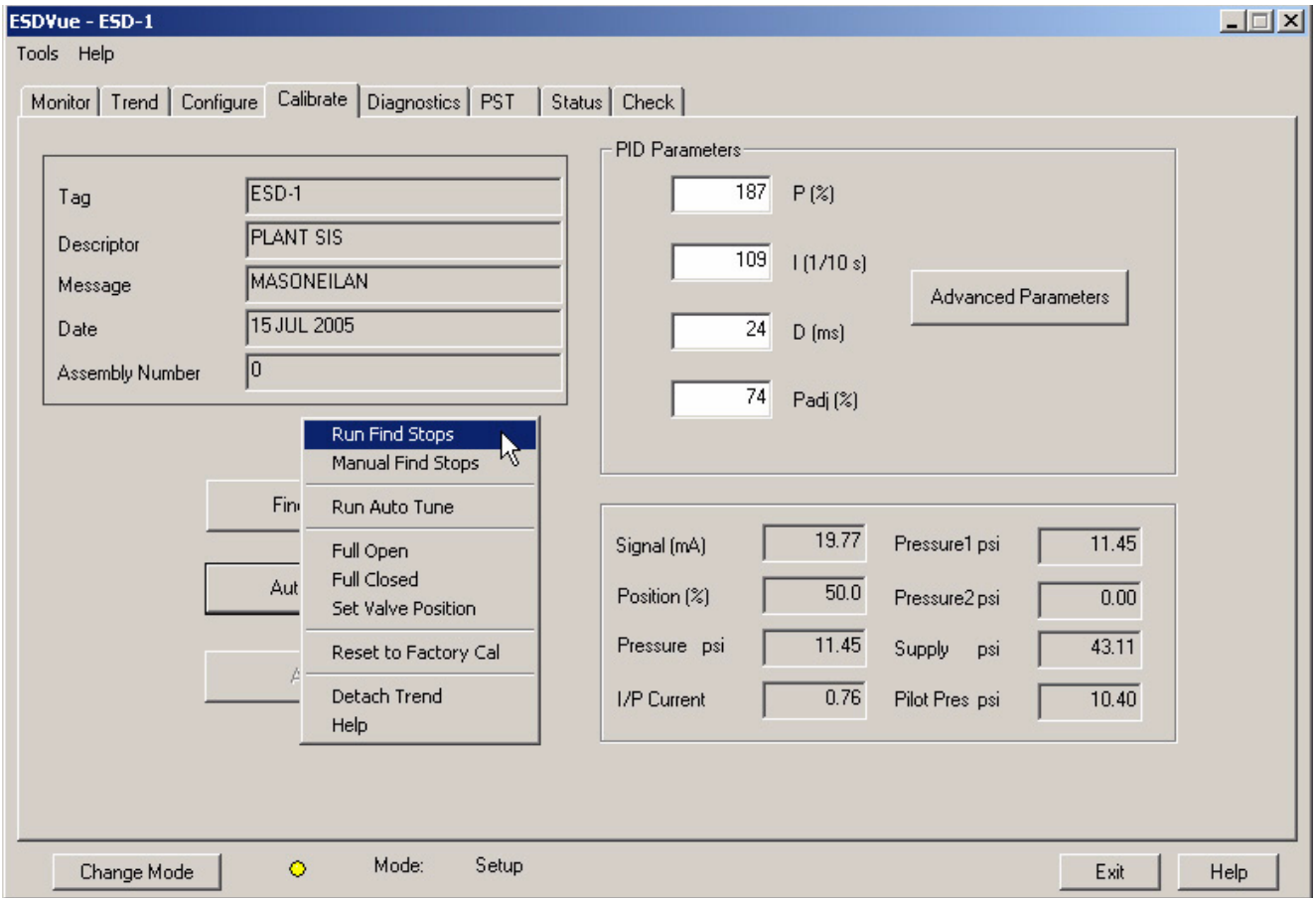


Figure 139 Selecting "Run Find Stops"

2. After launching Find Stops, ESDVue will display the dialog displayed below. Click on "OK" to continue with the Find Stops process.

Figure 140 Starting "Run Find Stops" Dialog

3. When Find Stops is running, a progress dialog will display as shown below.

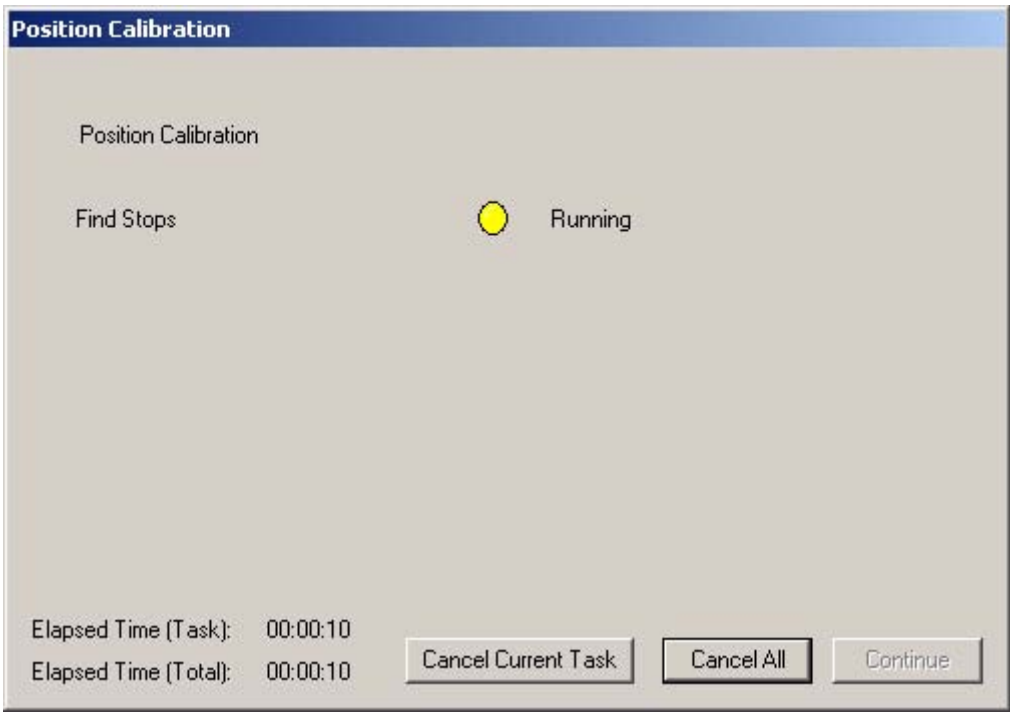


Figure 141 "Find Stops" Dialog

4. When Find Stops has completed operation, the progress dialog will display a message indicating that Find Stops is complete, as shown below. You must click on "Continue" to close the dialog and return to the Calbrate Screen.

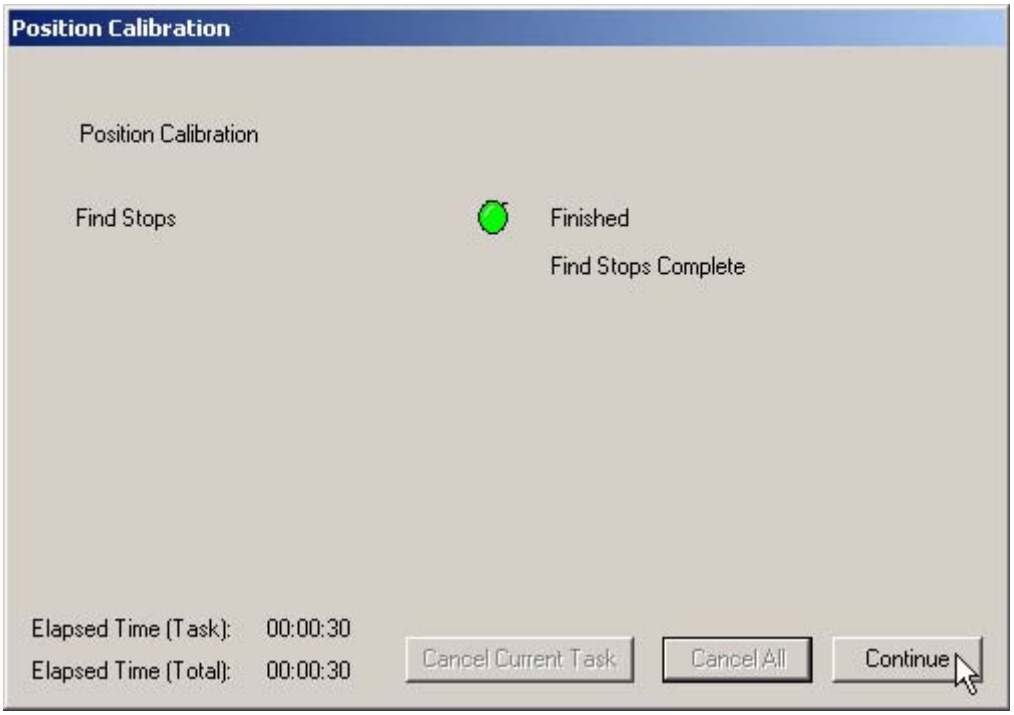


Figure 142 "Find Stops" Complete

Manual Find Stops

On some actuators, it is possible that the automatic Find Stops procedure will not find the correct end positions of the travel. A semi-automatic method of calibrating the stop positions is provided.

When Manual Find Stops is selected, the valve will be moved to full closed and you will be asked to respond when the valve has reached the full closed position. The valve will then be moved to full open and you will be asked to respond when the valve has reached the full open position.

To run Manual Find Stops:

1. In the Calibrate context menu, select "Manual Find Stops" as shown below.

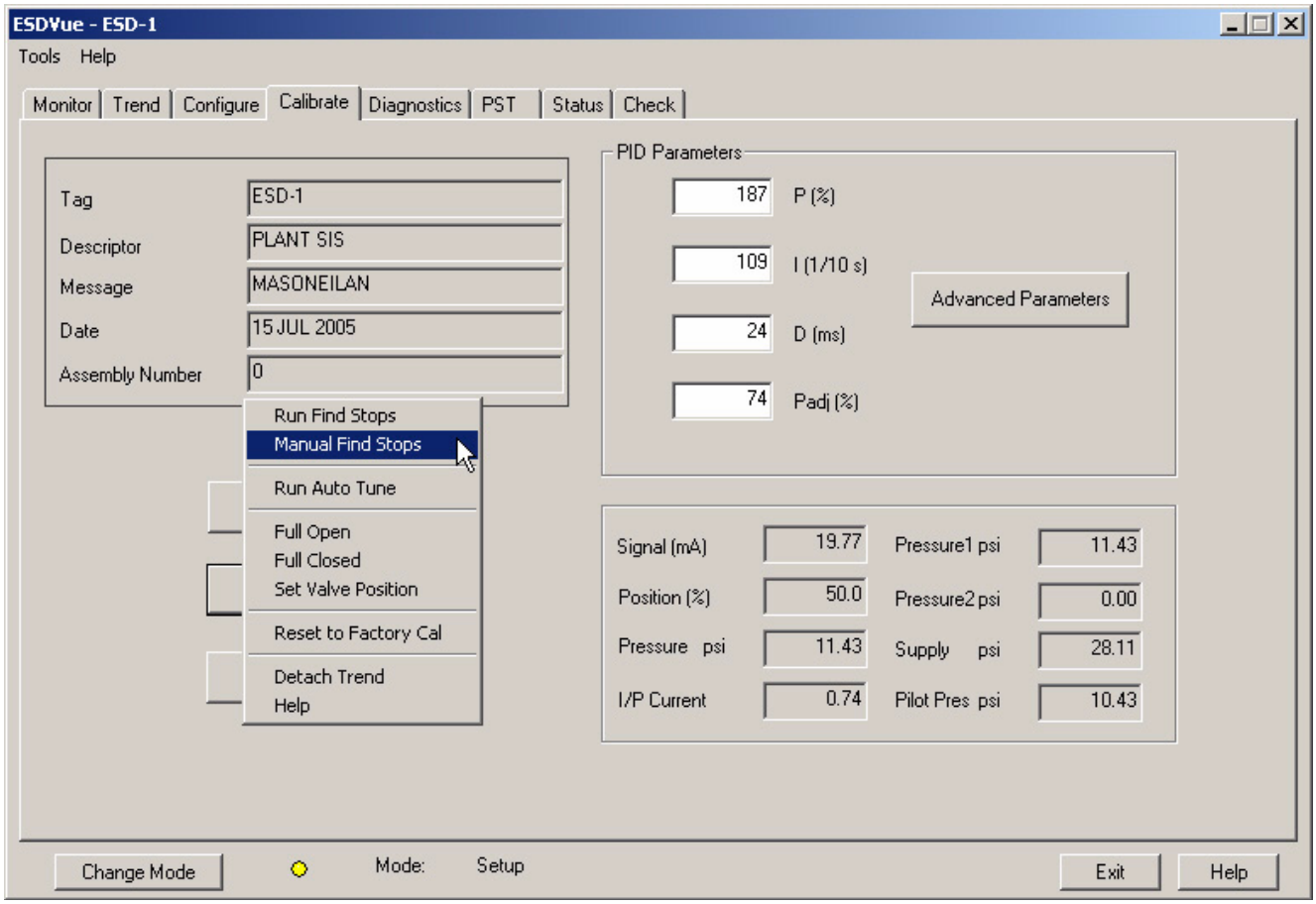


Figure 143 Selecting Manual Find Stops

2. ESDVue will launch the dialog shown below. Click on "OK" to continue.

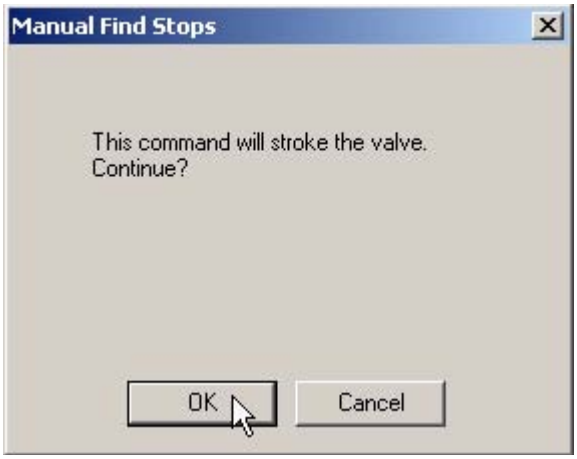


Figure 144 Stroke Valve Dialog

3. ESDVue will move the valve to the fully closed position and launch the dialog shown below. Observe the valve. When the valve is fully closed click on "OK".

Figure 145 Valve Closed Dialog

4. ESDVue will then move the valve to the fully open position and launch the dialog shown below. Observe the valve. When the valve is fully open click on "OK".

Figure 146 Valve Open Dialog

Applying Calibration Changes

1. When you make any changes on the Calibrate Screen, ESDVue will issue the warning displayed below indicating that you must click on the Apply button to save your changes.

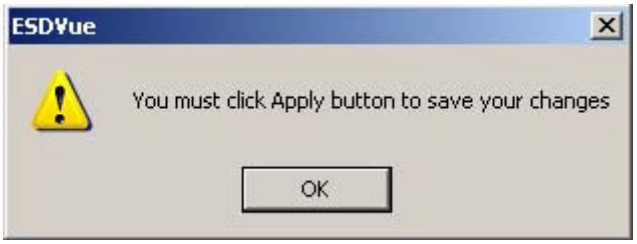


Figure 147 Applying Calibration Changes

2. Click on "Apply" as shown in the figure below to save any changes made in the Calibrate screen and to be written immediately to the SVI II ESD.

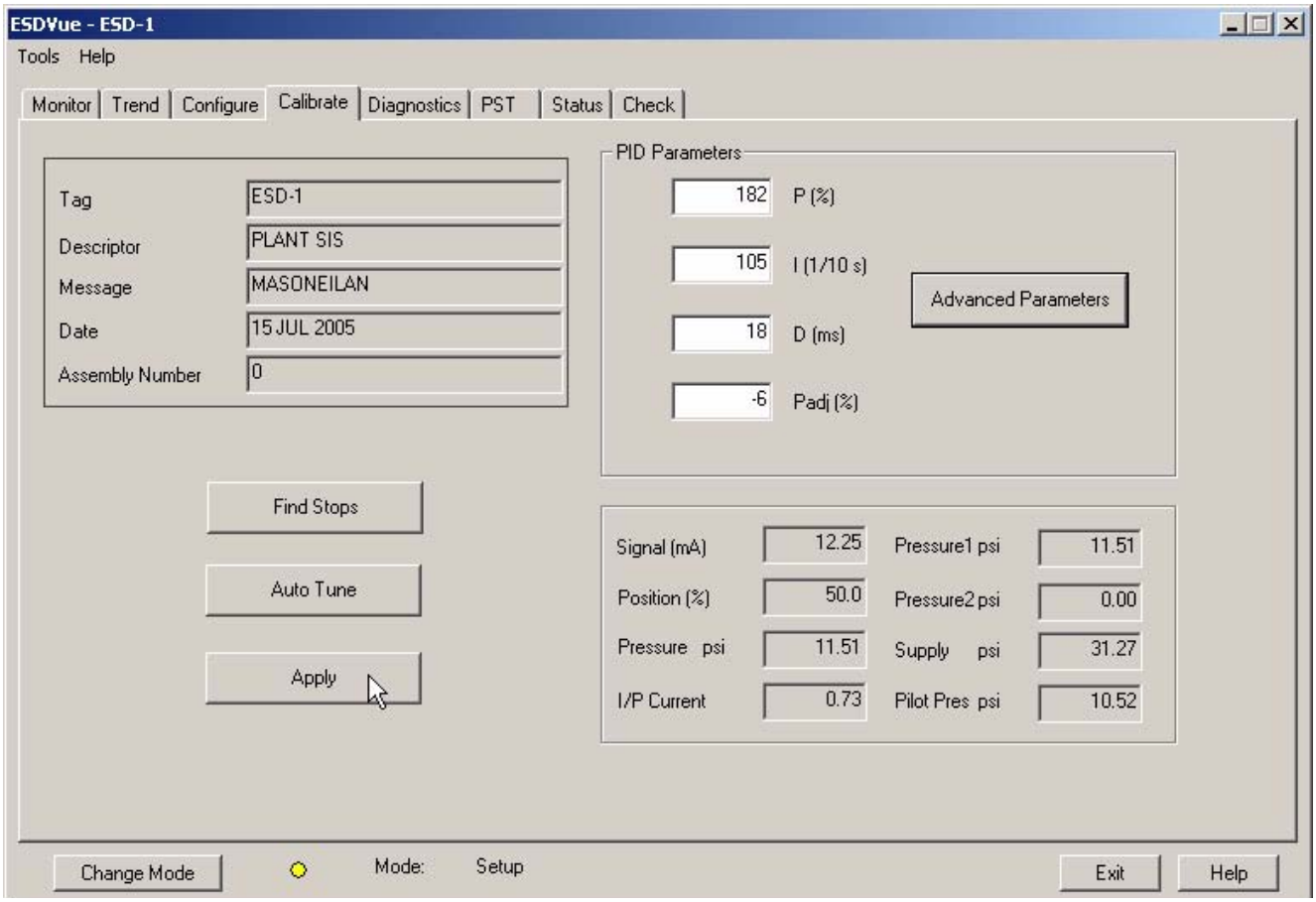


Figure 148 Applying Calibration Changes

Diagnostics 8

What you can do on the Diagnostics Screen

On the Diagnostics Screen shown below you can:

- Perform Step Diagnostics
- Perform Extended Signature Diagnostics
- Load Data from a Database
- Load Data from a File

Note: *To perform any of the diagnostic tests on the Diagnostics Screen ESDVue must be in Setup mode. See "Change Mode" on page 48 for more information*

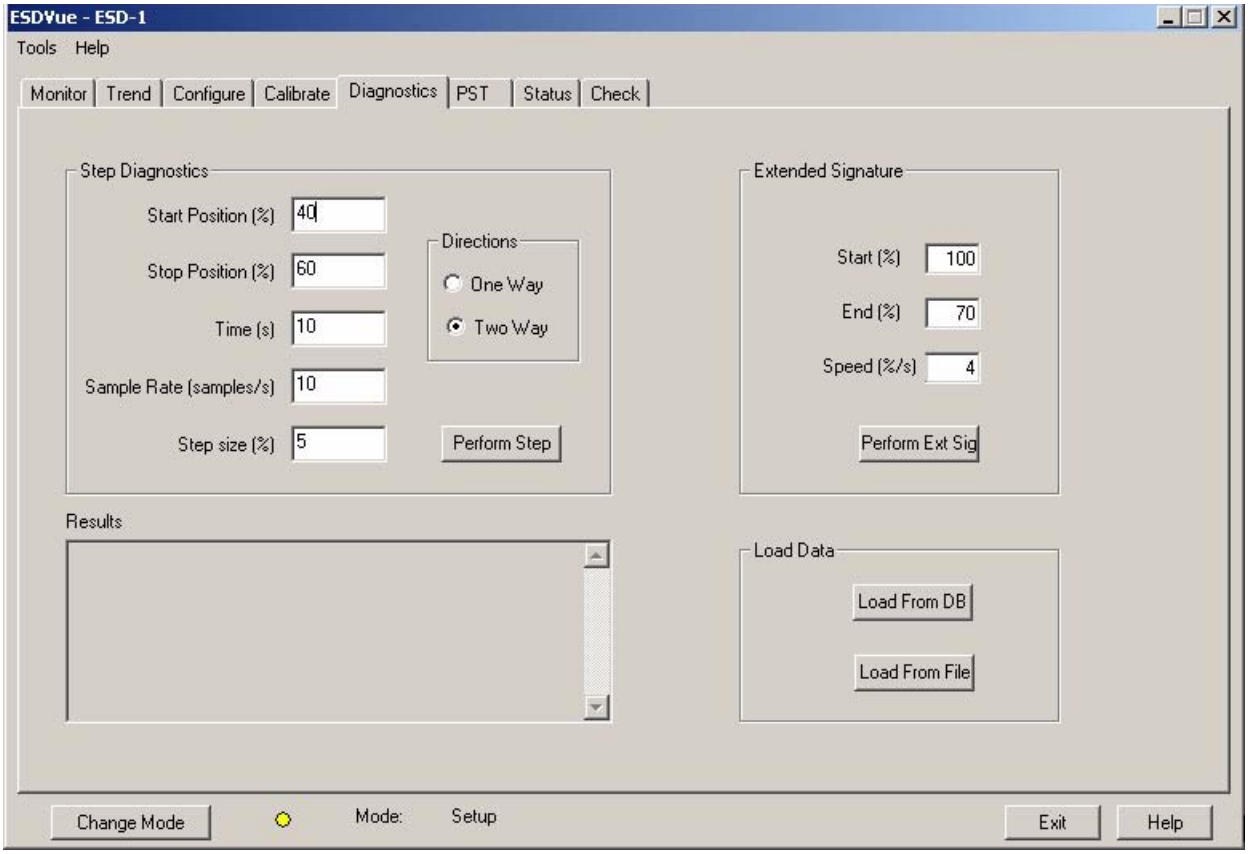


Figure 149 Diagnostics Screen

Step Diagnostics

Note: *To perform any of the diagnostic tests on the Diagnostics Screen ESDVue must be in Setup mode. See "Change Mode" on page 48 for more information*

The Step Test produces a position vs. pressure graph where the valve is submitted to a stepped input. The step profile may contain multiple steps. To run a step profile, the user must enter the starting position, the ending position, the pause between each step, the step size, and whether or not to measure both up and down steps (one way or two way).

The step test will start at the starting position and will make steps according to the size specified in 'step' until the ending position is reached. For each step, the SVI II ESD will measure the position at even time intervals for the amount of time specified in 'time'. If 2-way is specified, when the end position is reached, the procedure is repeated from the end position to the start position. To run the Step Test:

1. If necessary, adjust the following parameters:
   - ❖ Start Position (%)
   - ❖ Stop Position (%)
   - ❖ Time (s)
   - ❖ Sample Rate (samples/s)
   - ❖ Step Size (%)
   - ❖ One Way or Two Way
2. Click on "Perform Step".

Entering Step Test Parameters

If necessary adjust the step test parameters.

To enter the step parameters:

1. Click in the field.
2. Select and highlight the current value.
3. Delete the current value.
4. Enter the new value.

Start/Stop Position

1. Enter the Start and Stop positions for the SVI II ESD for running Step Diagnostics.
2. When entering the Start/Stop Position, the values must be between -5% and 105%. If you try to enter other values you will receive the error message displayed below.

Figure 150 Start/Stop Error Message

Time/Sample Rate

The Time (total amount of time sampling is allowed for each step) and the Sample Rate (number of samples per second) correlate to each other in that when the two parameters are multiplied their value (the total number of samples) cannot exceed 400.

3. If you enter parameter values in the Time and Sample Rate that when multiplied exceeds 400, you will receive the error message shown below.

Figure 151 Time/Sample Rate Error Message

Step Size

The Step Size (total distance of each step) and the Start and End positions correlate to each other in that the step size must be less than the difference between the Start and End positions and also greater than 0.

4. If you enter an incorrect Step Size you will receive the error message shown below.

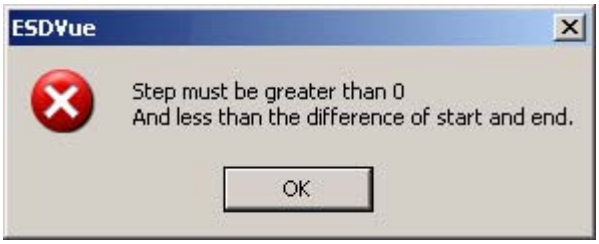


Figure 152 Step Size Error Message

After you have correctly adjusted all Step Diagnostic parameters:

5. Select the test direction: One Way or Two Way. One way will run the step test ramping up, only. Two Way will run the step test ramping up and ramping down.
6. Click on "Perform Step" as shown in the figure below.

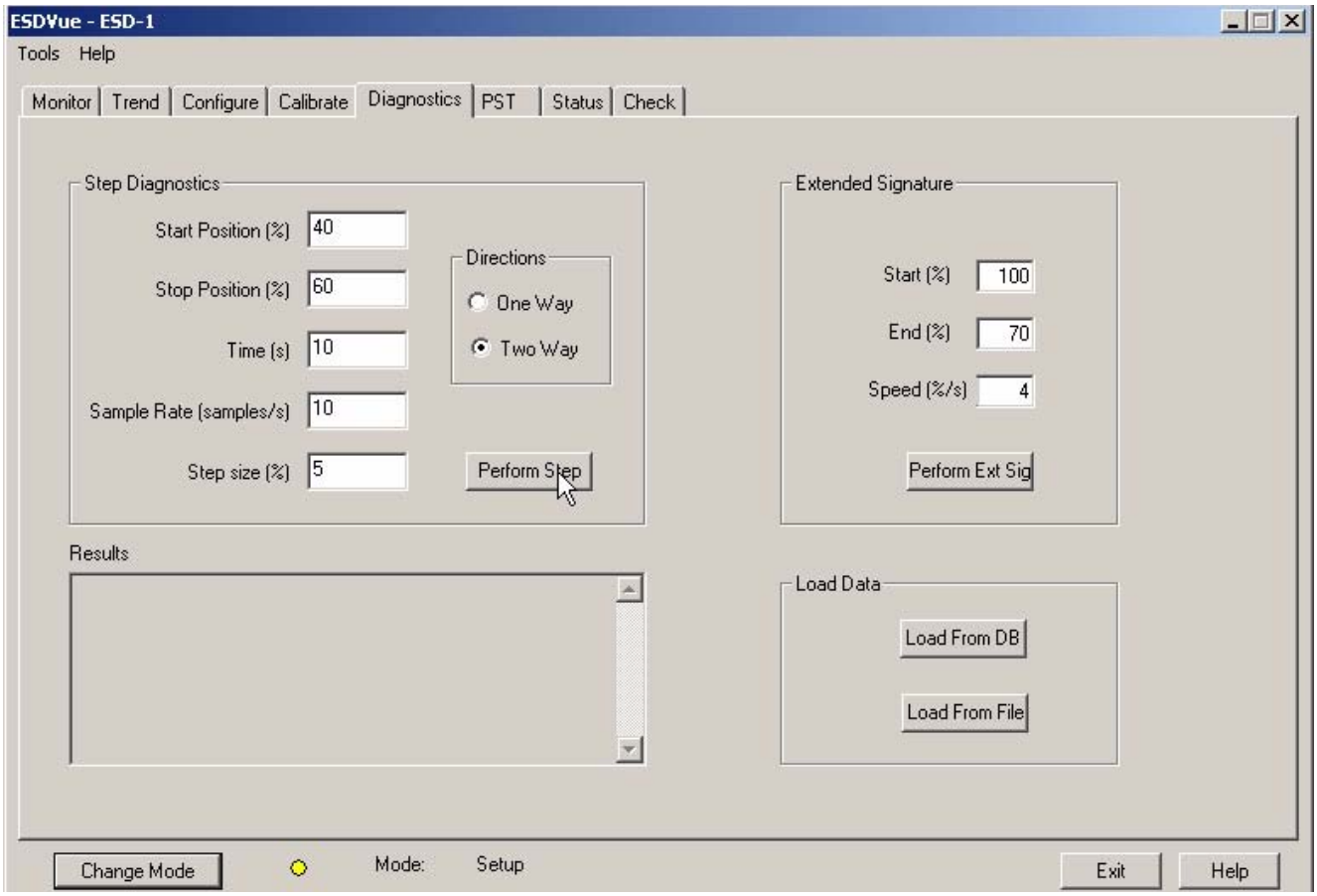


Figure 153 Executing "Perform Step" Diagnostics

7. After you execute the Step Diagnostics you will receive the warning message below, indicating that the step test should not be performed with the process running.
8. Click on "OK" to continue with the test.

Figure 154 Step Diagnostics Warning Dialog

10. For each step ESDVue will display a progress dialog indicating the step being run, as shown below.

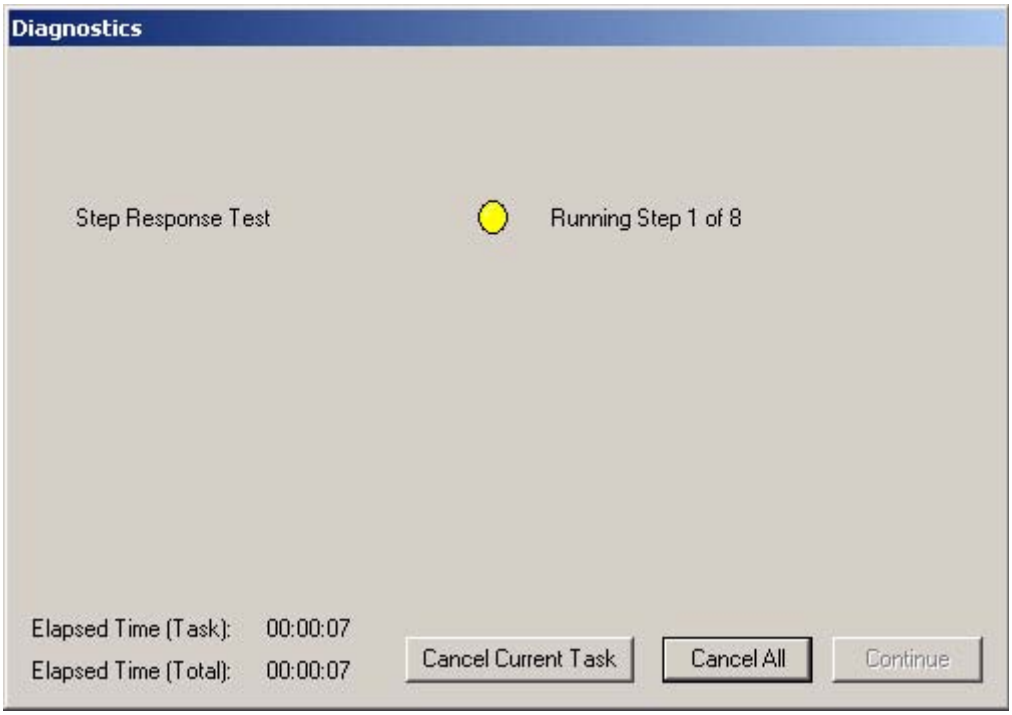


Figure 155 Running a Step

11. After each step has completed running, ESDVue will load the data for the step run as indicated in the figure below.

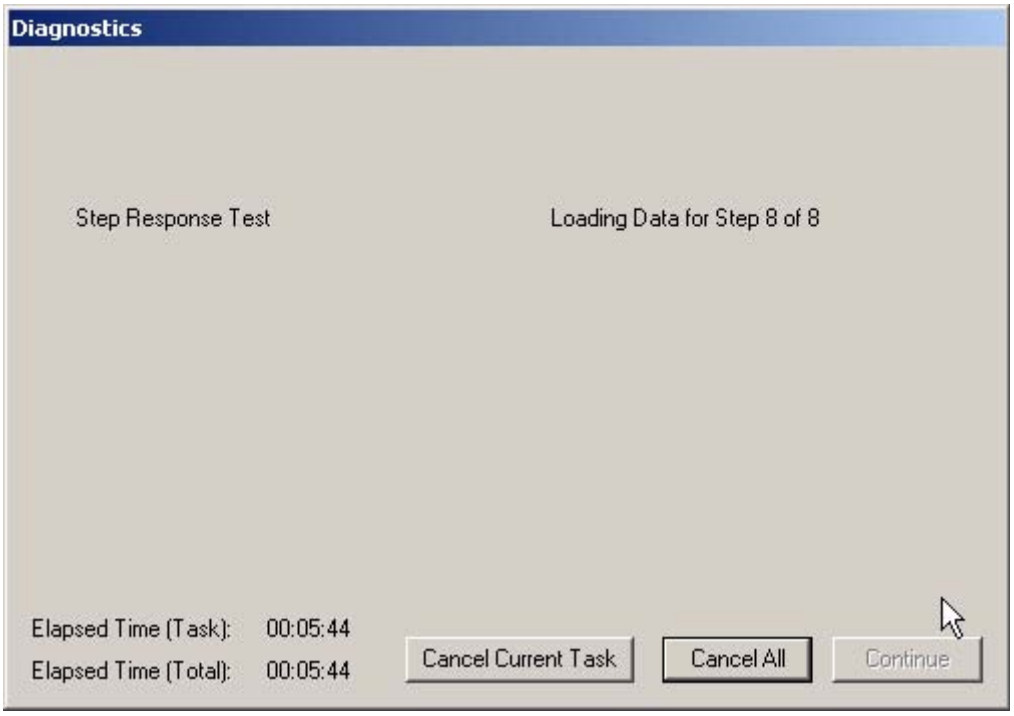


Figure 156 Loading Data for a Step

12. After Step Diagnostics has completed, ESDVue will display the message shown below.
13. Click on "Continue" to close the Diagnostics dialog.

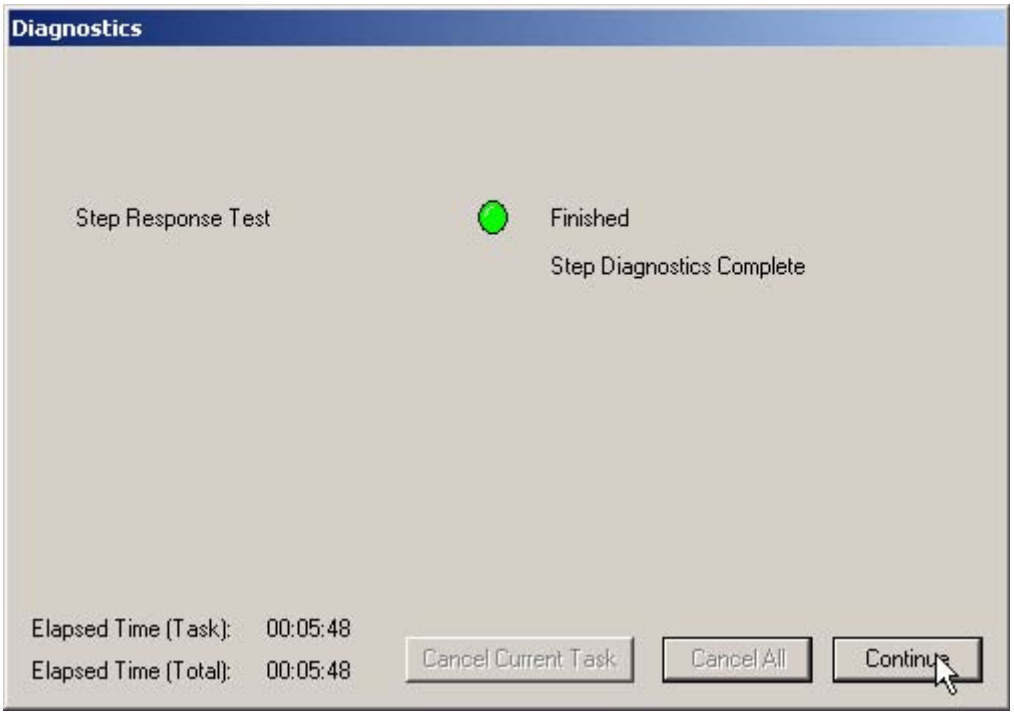


Figure 157 Step Diagnostics Complete - Continue

14. After you close the Step Diagnostics dialog, ESDVue will display the Step Diagnostics graph shown in the figure below.

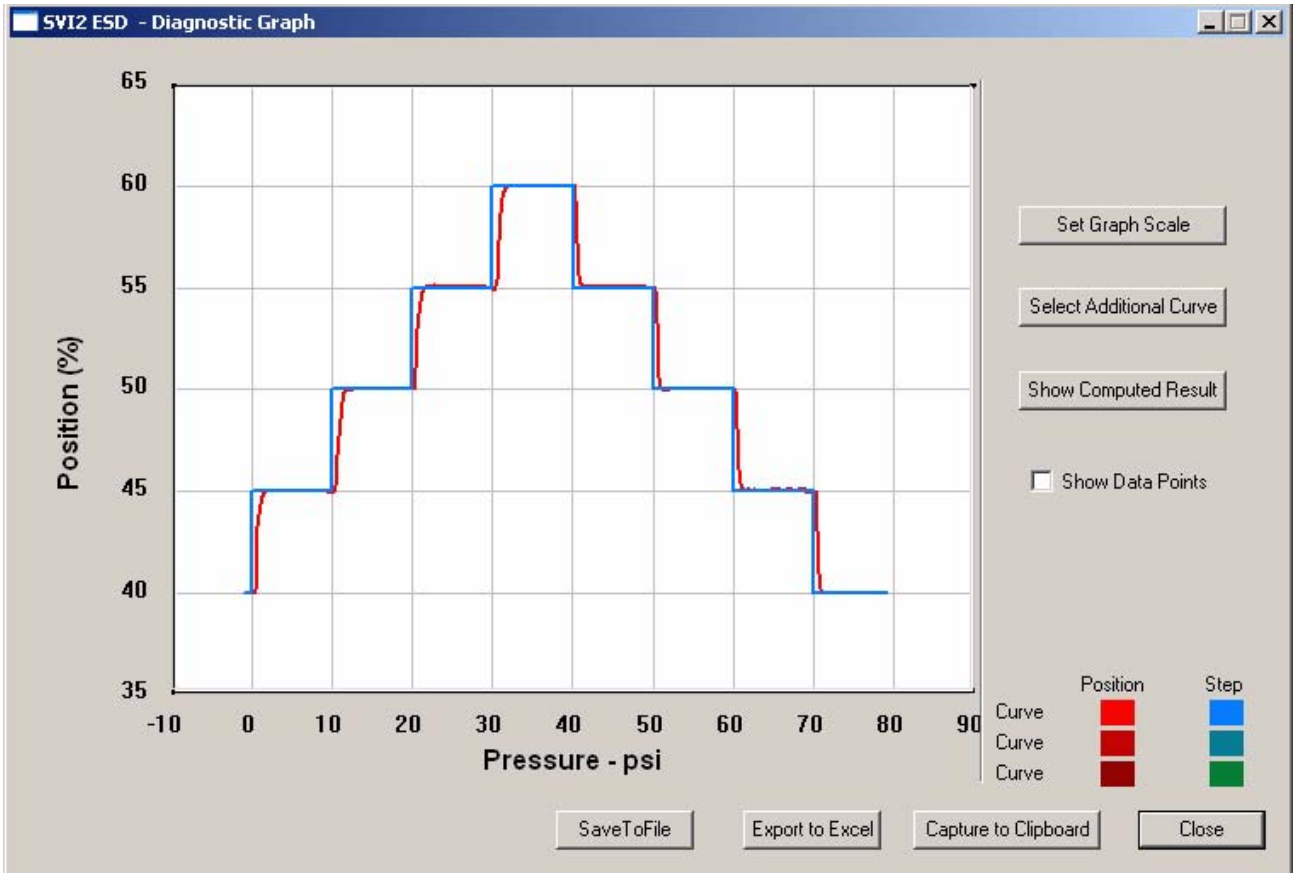


Figure 158 Step Diagnostics Graph

Step Diagnostics Graph

The Step Diagnostics Graph has the same features as all other diagnostic graphs:

- Set Graph Scale - allows you to change the coordinates of the Time Position axes.
- Select Additional Curve - allows you to display an additional, selected, curve on the graph.
- Show Computed Result - allows you to view the data in a numerical value format.
- Show Data Points - when selected shows data points collected during testing.
- Save to File - allows you to save the graph to a file.
- Export to Excel - exports the data as a CSV Excel file.
- Capture to Clipboard - captures a bitmap image of the graph.
- Close - closes the graph and returns the ESDVue Screen.

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curves" function).

Set Graph Scale

ESDVue allows you to change the graph scale on diagnostic graphs so that you can narrow in on one area of the graph, or expand the viewing area.

To change the graph scale:

1. Select "Set Graph Scale" as shown in the figure below.

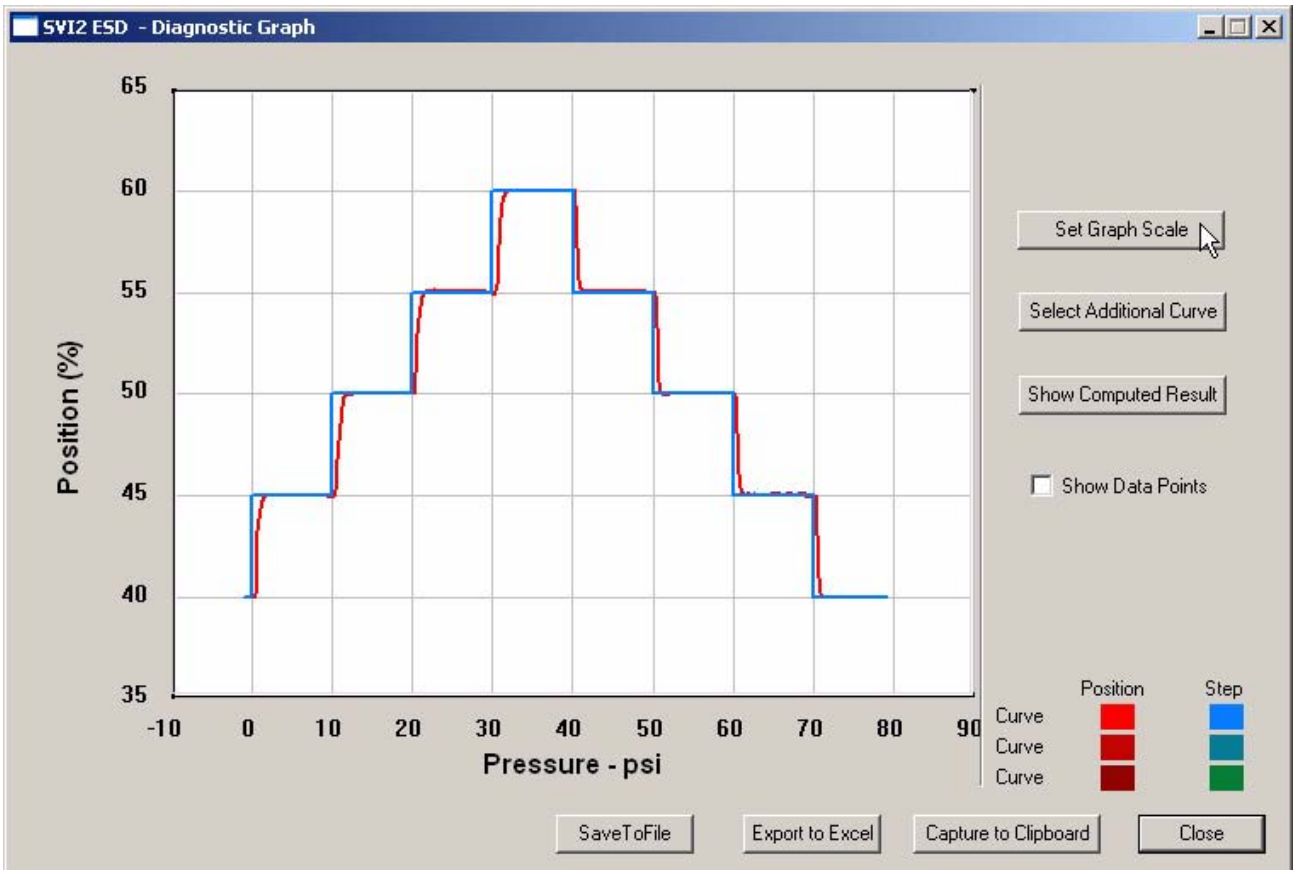


Figure 159 Selecting "Set Graph Scale"

2. ESDVue will launch the Set Graph Scale window shown below.

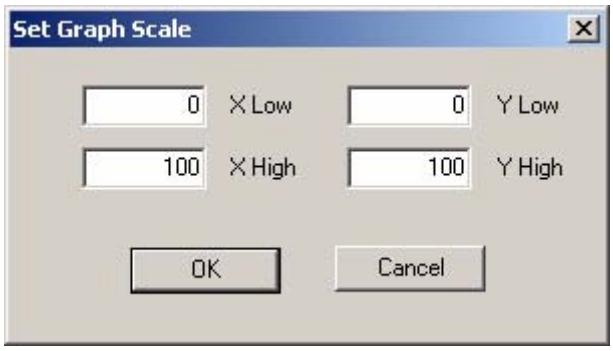


Figure 160 Set Graph Scale Window

3. Adjust the X axis and Y axis coordinates as necessary and click "OK".
4. The Diagnostic Graph will reflect the changes made to the axes.

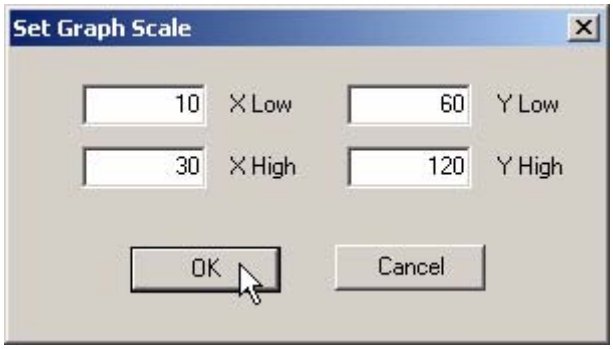


Figure 161 Saving Scale Adjustments

Select Additional Step Curve

ESDVue allows you to view more than one diagnostic curve at a time; being able to compare two curves may facilitate diagnostics.

To display an additional step curve on the diagnostic graph:

1. Click on the "Select Additional Curve" button as shown below.

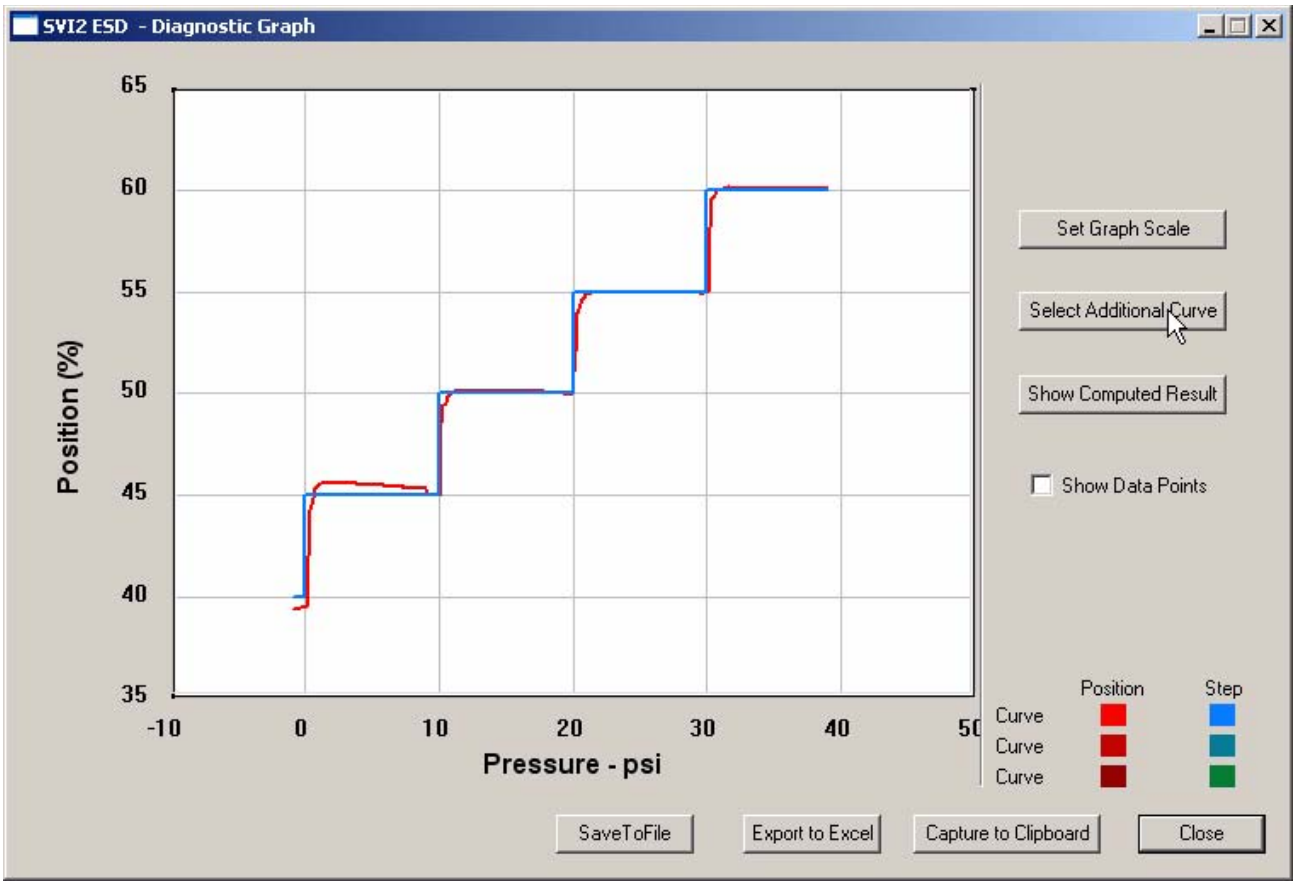


Figure 162 Starting "Select Additional Curve"

2. ESDVue will launch the dialog shown below. "Load Data from Database" and "Load Data from File" are the only active choices for Step Diagnostics.
3. Select the source of the additional curve. The default is "Load Data from Database".
   - ❖ Load from Database - launches window to select data from database
   - ❖ Load Data from File - launches to browser to select file to load

Figure 163 Select Additional Step Curve Dialog

Selecting a Curve from a Database

To select a curve from a database:

1. Click the radio button beside "Load Data from Database", if not already selected.
2. Click on "Load".

Figure 164 Selecting "Load Data from Database"

3. ESDVue will launch the database browser shown below. The browser will display only Step diagnostic data.
4. Scroll through the list of files and locate the time stamp of the file you would like to open.
5. Click on "OK".

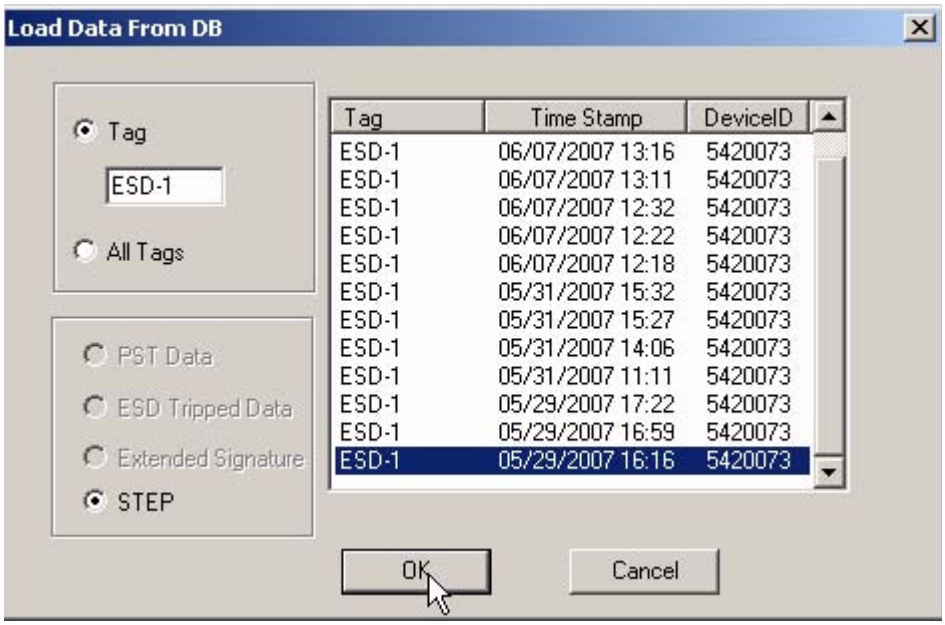


Figure 165 Step Diagnostics Database Browser

Selecting a Curve from a File

You can also load an additional Step Curve from a saved file. To select a curve from a file:

1. After you select "Select Additional Curve" from the Step Diagnostic Graph shown above, ESDVue will display the dialog shown below.
2. Select "Load Data from File".
3. Click on "Load" as shown below.

Figure 166 Selecting "Load Data from File"

4. ESDVue will launch a file browser window as shown below.

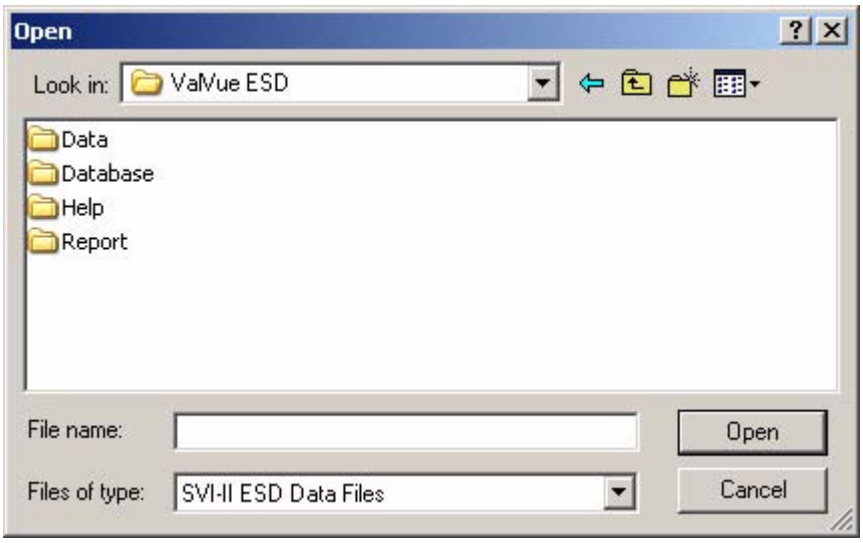


Figure 167 File Browser

5. Using the browser, locate the file you would like to load.
6. Select the file name.
7. Click "Open".

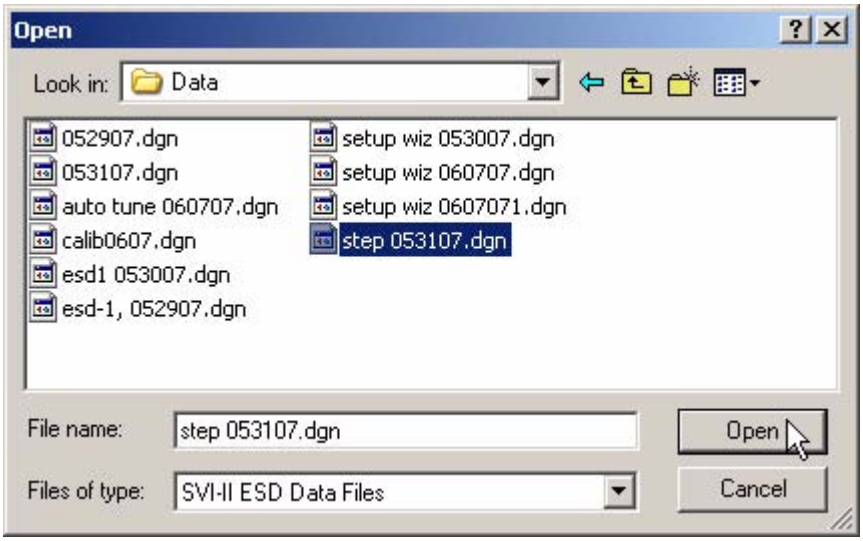


Figure 168 Opening File for Additional Curve

8. After you open the saved file, ESDVue will launch the dialog below.
9. Select the record with the appropriate time stamp and click "OK".

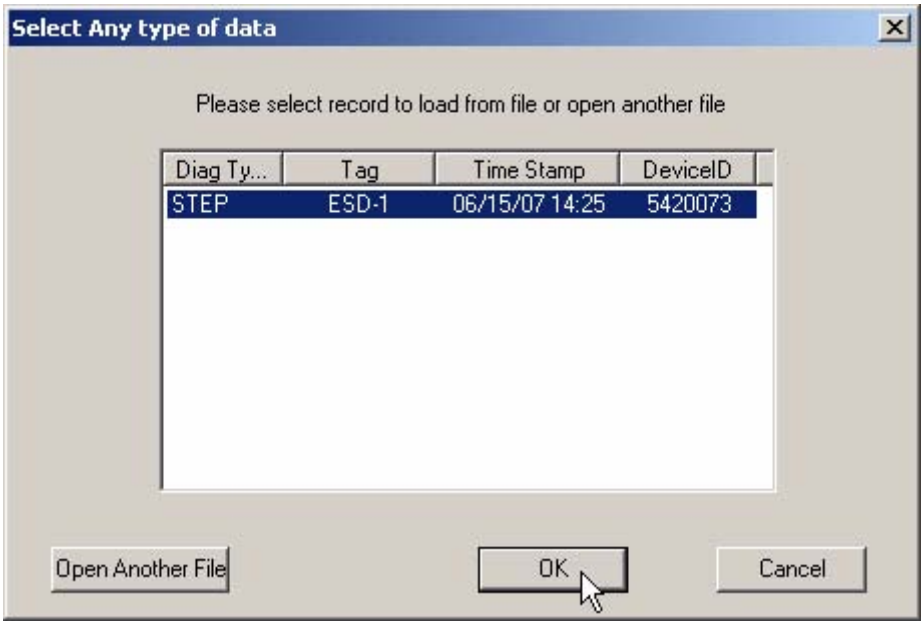


Figure 169 Selecting Step Test Record

Additional Curve Displayed

After selecting additional curve data from either the database or a file, the additional curve will displayed on the graph with the original curve as shown below.

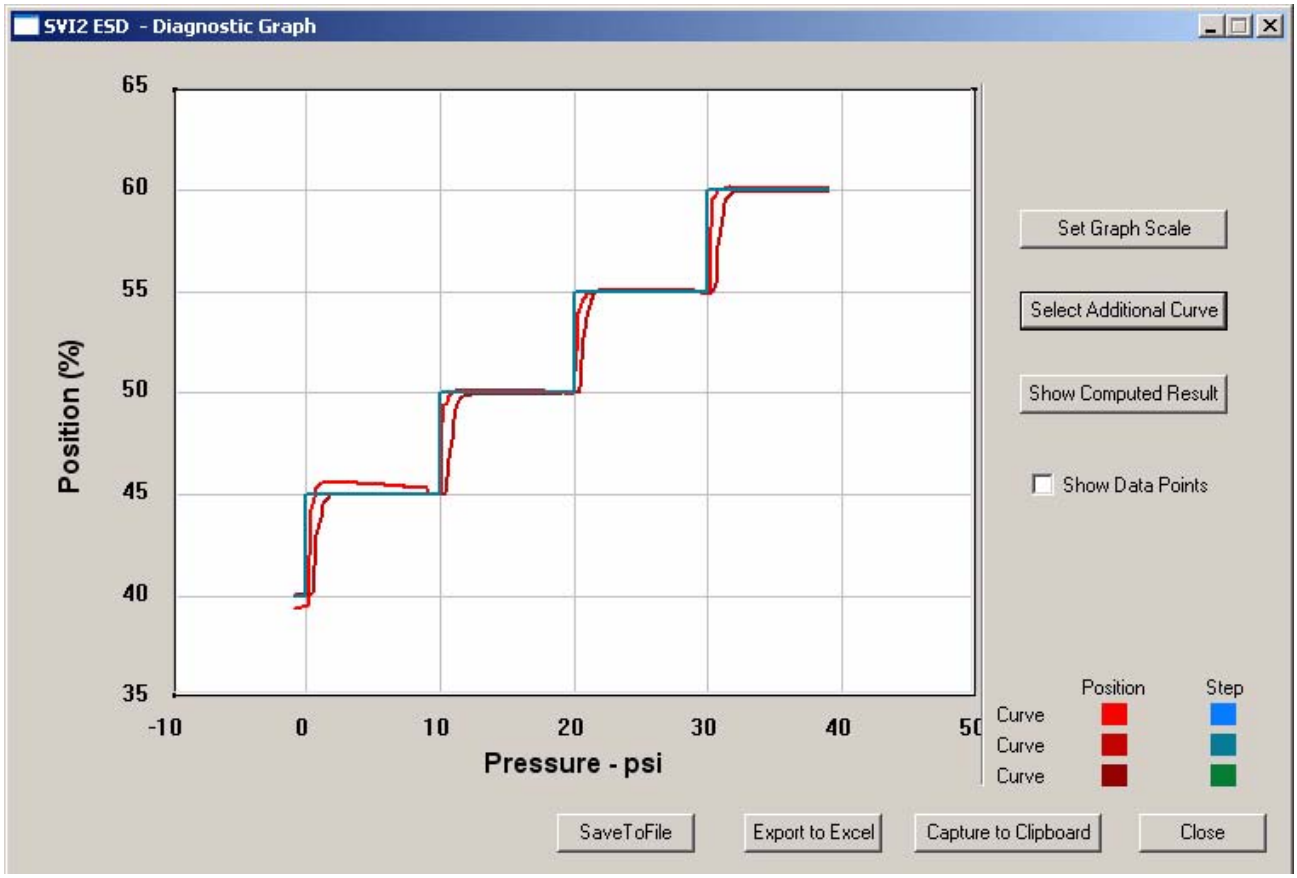


Figure 170 Additional Curve Displayed

Show Computed Step Results

ESDVue allows you to view the results of the Step Test as a table of numerical values.

To display the computed result for the active Step Test:

1. Click on "Show Computed Result" as shown below.

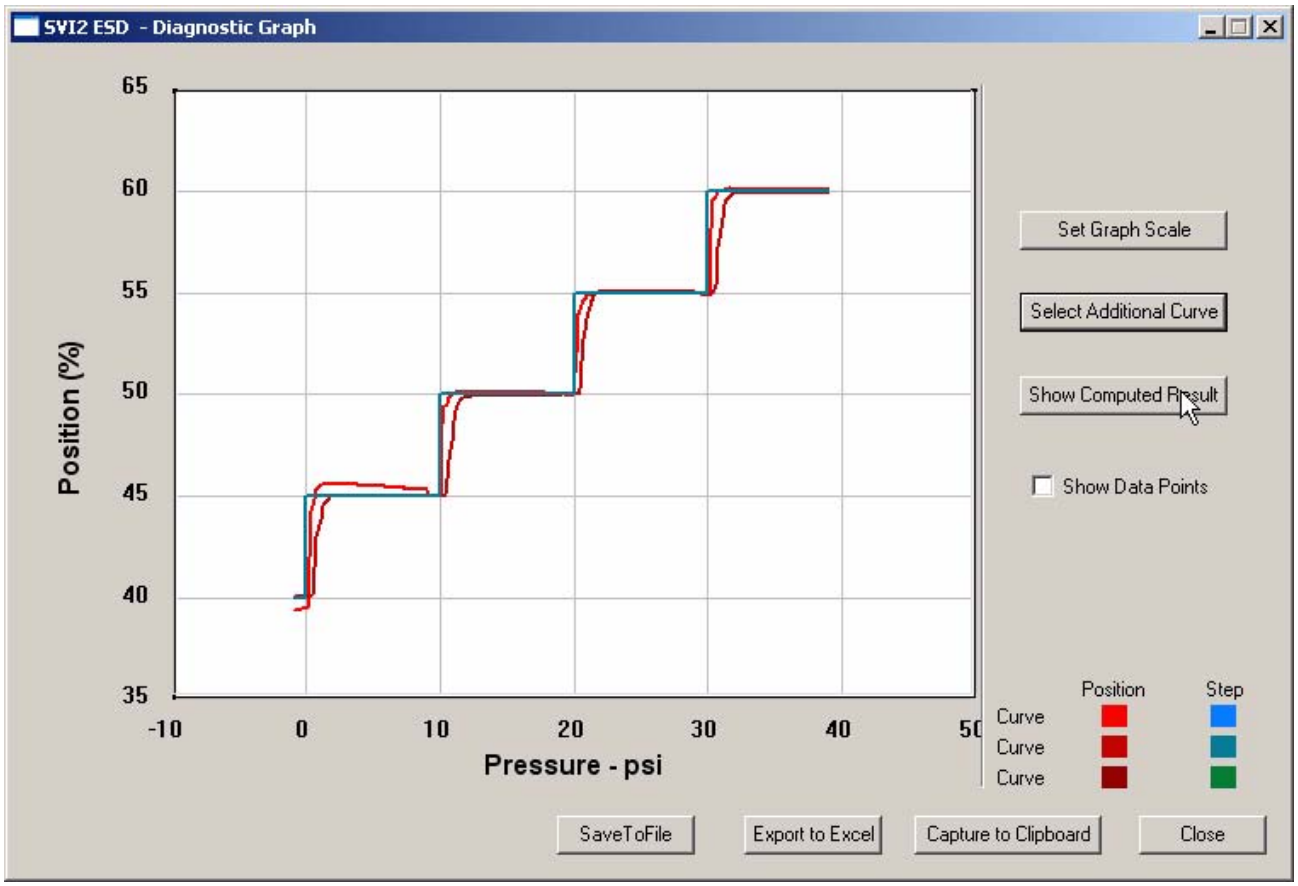


Figure 171 Selecting "Show Computed Result"

2. ESDVue will launch the Step Response Test Result window shown below.
3. All step diagnostic results are displayed in a numerical format.

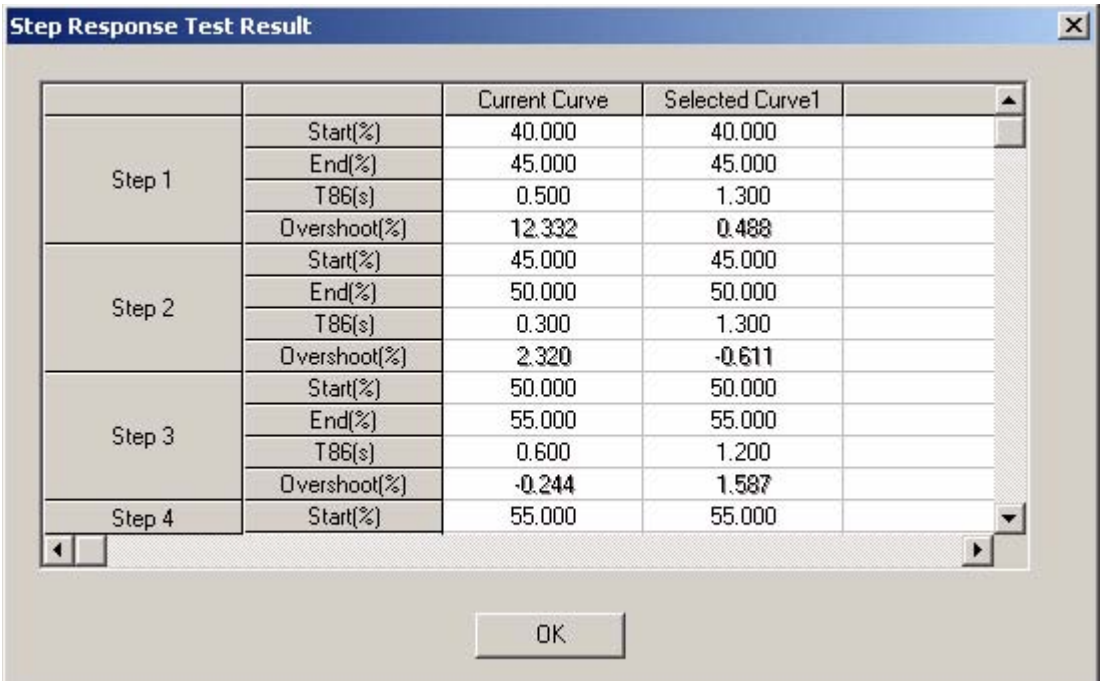


Figure 172 Step Diagnostics Computed Result

Save to File

ESDVue allows you to save diagnostic graphs in a graphical format as .dgn files to any specified location.

To save a diagnostic graph to a file:

1. Select "Save To File" as shown below.

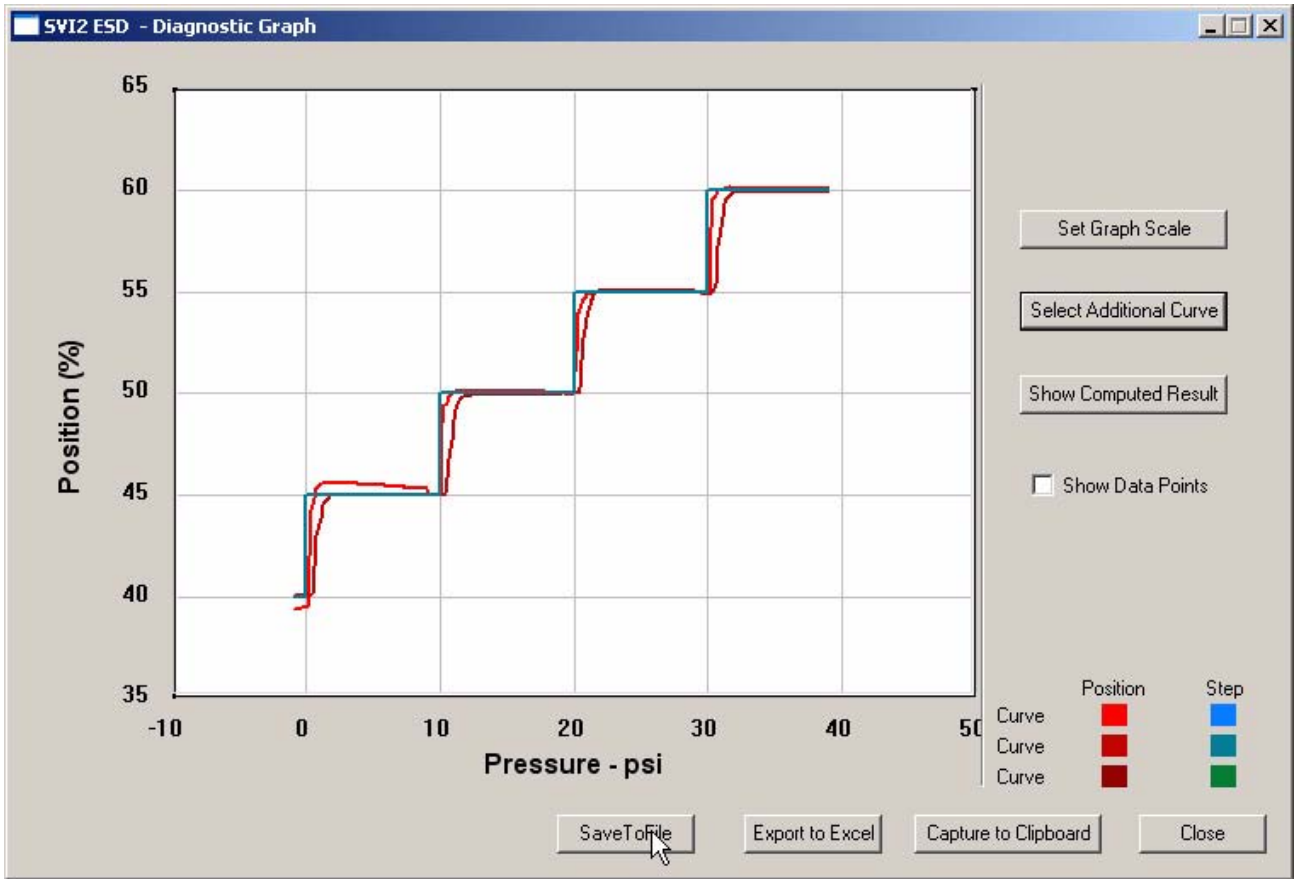


Figure 173 Selecting "Save To File"

2. ESDVue will launch a Windows file browser as shown below.

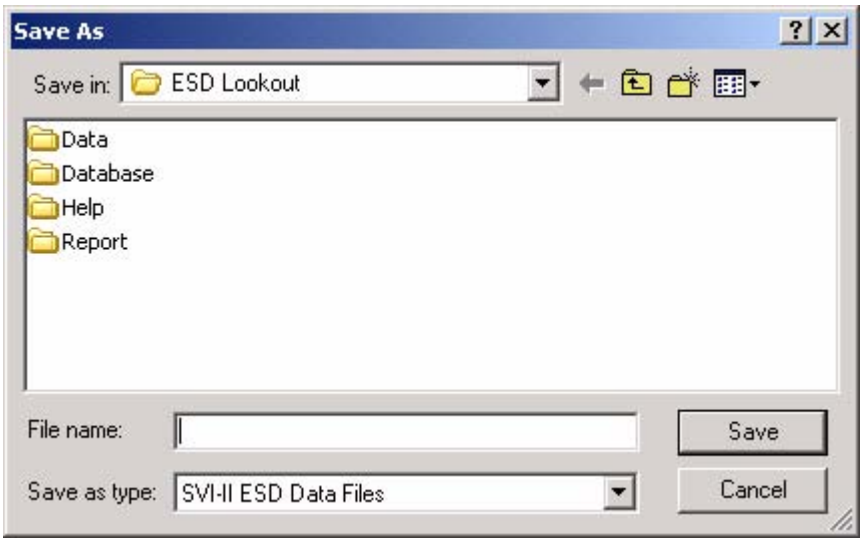


Figure 174 File Browser

3. Locate the folder in which you would like to save the file.
4. Enter a file name.
5. Click on "Save".
6. ESDVue will then close the browser window and return the diagnostic graph.

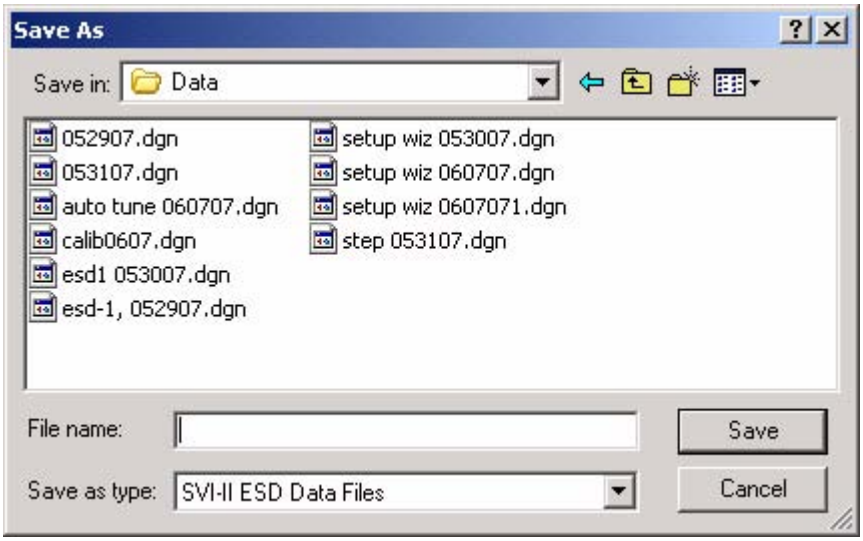


Figure 175 Selecting a Folder for Saving File

Export to Excel

ESDVue allows you to save or create a comma separated value file (.csv) of the diagnostic data from a graph and export the file to Excel. With the Excel file you can create graphs or perform other analysis.

To export a graph to Excel:

1. Click on "Export to Excel" as shown below.

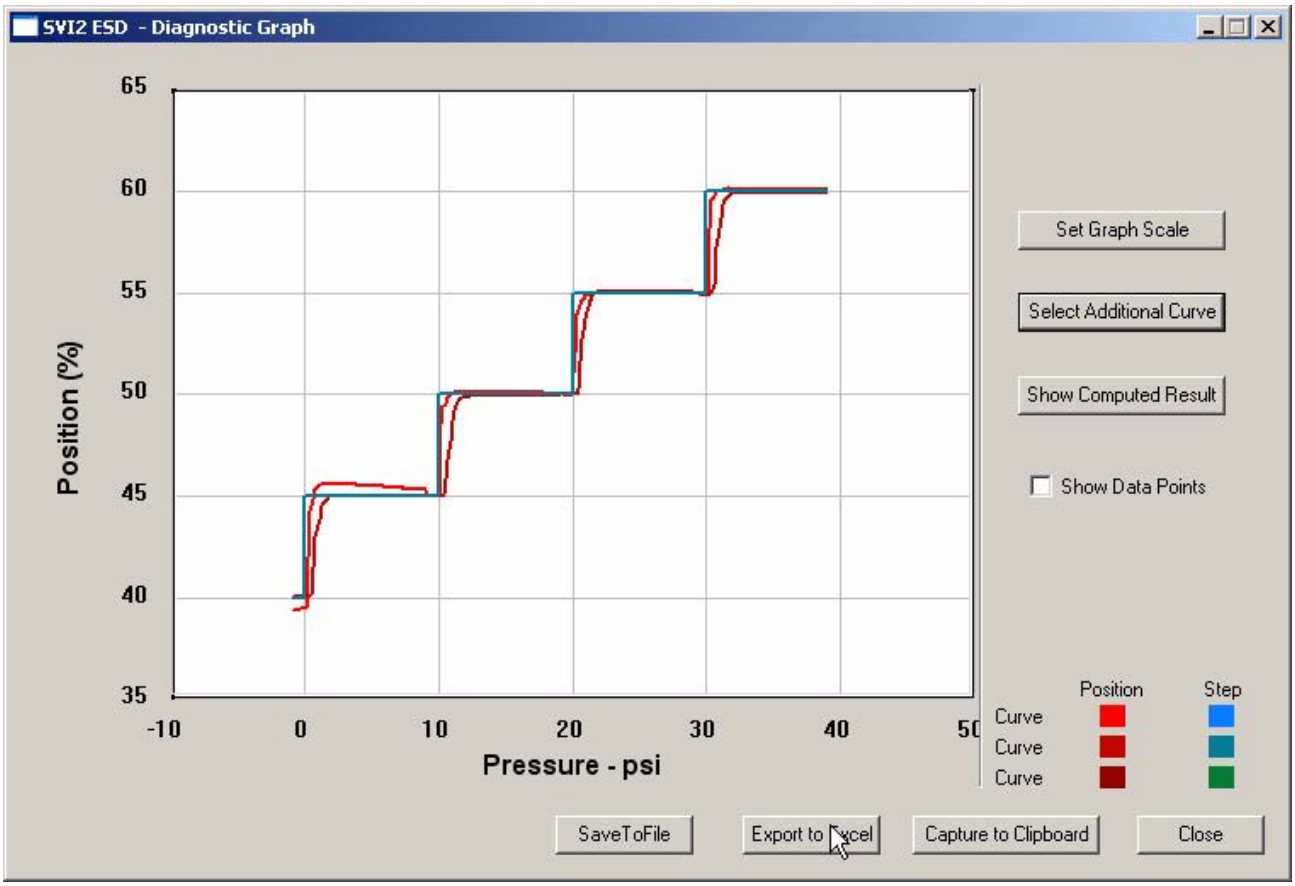
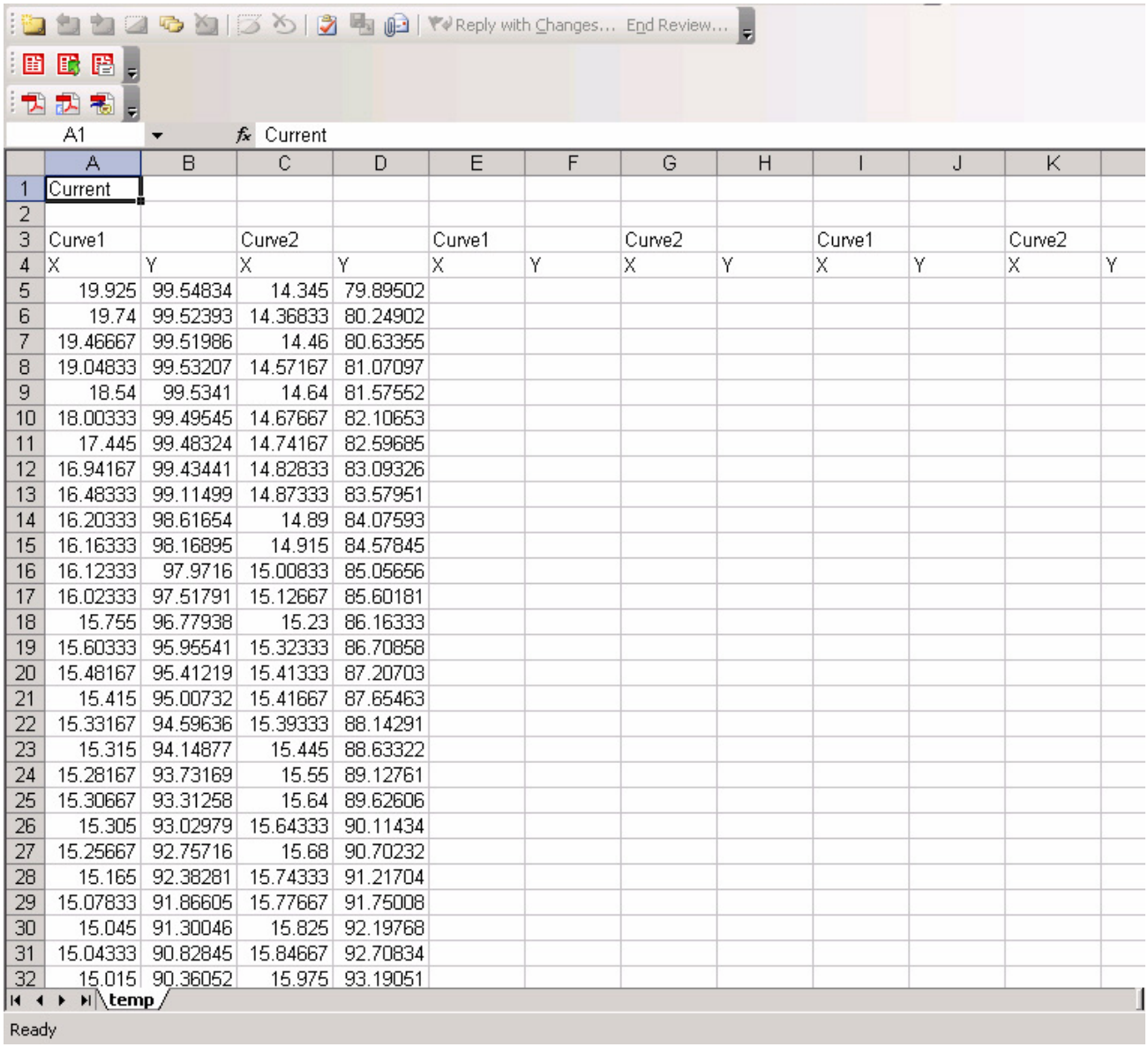


Figure 176 Selecting "Export to Excel"

2. ESDVue will launch Microsoft Excel and display the X axis and Y axis values, taken from the diagnostic graph, as Excel values as shown in the figure below.



A1 Current

	A	B	C	D	E	F	G	H	I	J	K	
1	Current											
2												
3	Curve1		Curve2		Curve1		Curve2		Curve1		Curve2	
4	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
5	19.925	99.54834	14.345	79.89502								
6	19.74	99.52393	14.36833	80.24902								
7	19.46667	99.51986	14.46	80.63355								
8	19.04833	99.53207	14.57167	81.07097								
9	18.54	99.5341	14.64	81.57552								
10	18.00333	99.49545	14.67667	82.10653								
11	17.445	99.48324	14.74167	82.59685								
12	16.94167	99.43441	14.82833	83.09326								
13	16.48333	99.11499	14.87333	83.57951								
14	16.20333	98.61654	14.89	84.07593								
15	16.16333	98.16895	14.915	84.57845								
16	16.12333	97.9716	15.00833	85.05656								
17	16.02333	97.51791	15.12667	85.60181								
18	15.755	96.77938	15.23	86.16333								
19	15.60333	95.95541	15.32333	86.70858								
20	15.48167	95.41219	15.41333	87.20703								
21	15.415	95.00732	15.41667	87.65463								
22	15.33167	94.59636	15.39333	88.14291								
23	15.315	94.14877	15.445	88.63322								
24	15.28167	93.73169	15.55	89.12761								
25	15.30667	93.31258	15.64	89.62606								
26	15.305	93.02979	15.64333	90.11434								
27	15.25667	92.75716	15.68	90.70232								
28	15.165	92.38281	15.74333	91.21704								
29	15.07833	91.86605	15.77667	91.75008								
30	15.045	91.30046	15.825	92.19768								
31	15.04333	90.82845	15.84667	92.70834								
32	15.015	90.36052	15.975	93.19051								

temp

Ready

Figure 177 Diagnostic Graph Data - in Excel

Extended Signature Diagnostics

Note: *To perform any of the diagnostic tests on the Diagnostics Screen ESDVue must be in Setup mode. See "Change Mode" on page 48 for more information.*

The extended actuator signature slowly ramps the pressure to the actuator up and down over a user selected position range and measures the position vs. pressure. The signature is useful for determining valve friction and for identifying performance problems at specific valve positions.

To perform the Extended Actuator Signature Diagnostic test:

1. Adjust the "Start (%)", "End (%)" and "Speed (%/s)" parameters if necessary. To adjust values click in the parameter field, select and delete current value and enter new value.

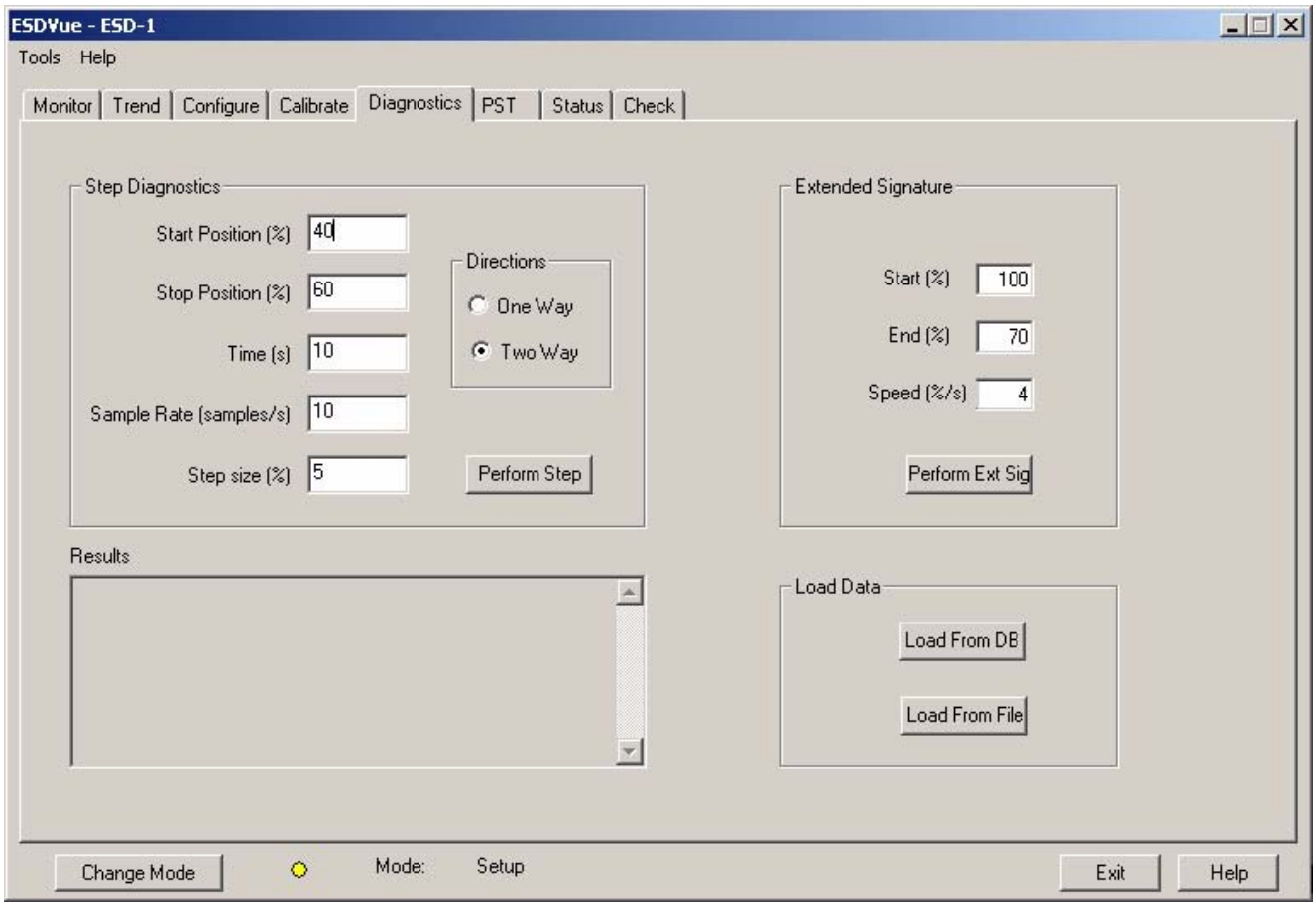


Figure 178 Adjusting Extended Diagnostics Parameters

Start/End Position

The Start/End position parameters are the start and end ramp up/ramp down positions expressed as a percentage of the total travel.

1. Enter the Start and End positions for the SVI II ESD for running Extended Diagnostics.
2. When entering the Start/End Position, the values must be between -5% and 110%. If you try to enter other values you will receive the error message displayed below.

Figure 179 Start and End Positions Error Message

Speed Level

The speed level indicates the speed at which the Extended Diagnostics test is executed, with 1 the slowest and 10 the fastest.

1. Enter the Speed Level for running Extended Diagnostics.
2. When entering the Speed Level, the values must be between 1 and 10. If you try to enter other values you will receive the error message displayed below.

Figure 180 Speed Level Error Message

Starting Exteneded Signature Diagnostics

1. After you have correctly adjusted all Extended Signature parameters, click on "Perform Ext Sig" as shown in the figure below.

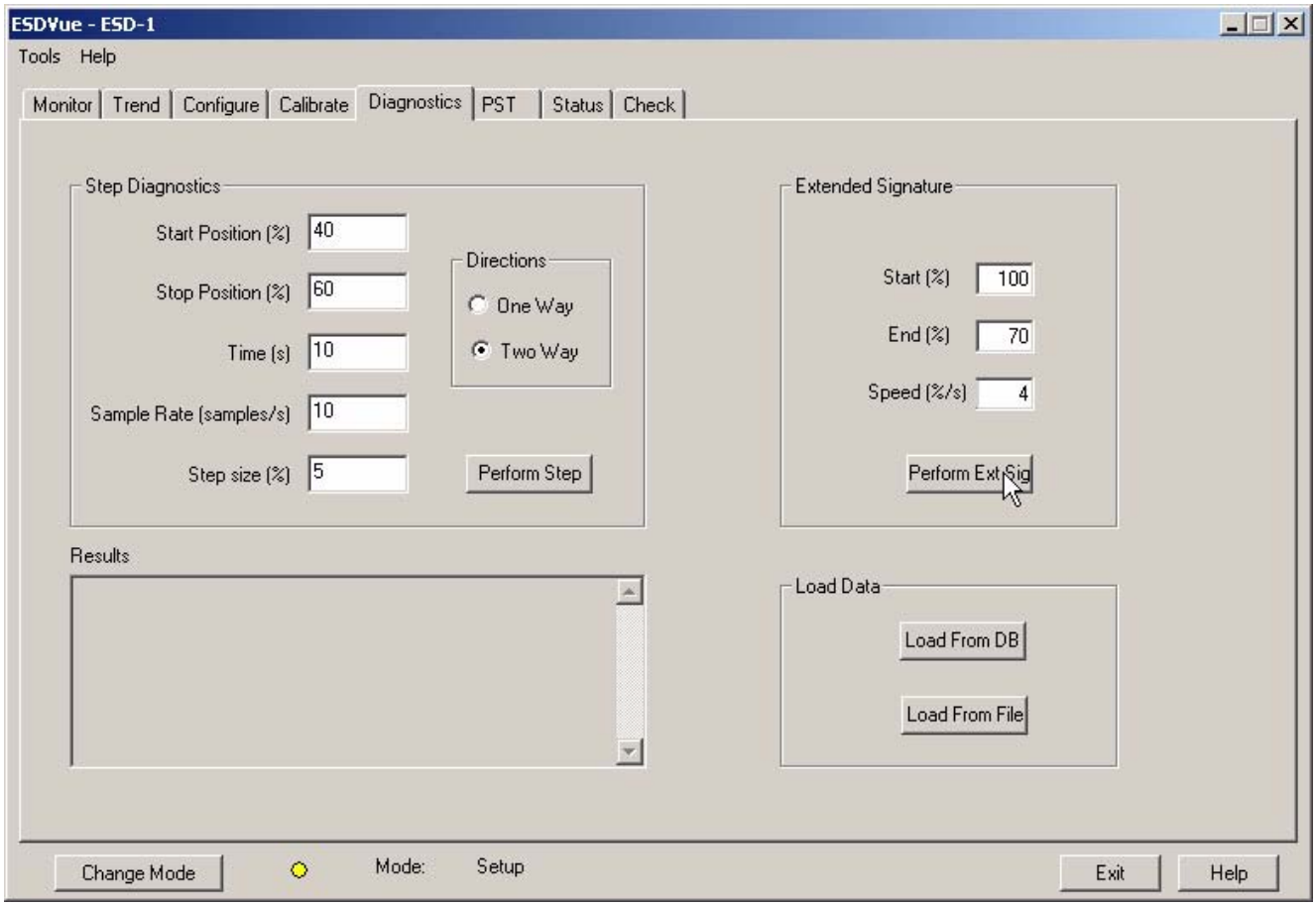


Figure 181 Executing "Perform Ext Sig"

2. ESDVue will launch the warning dialog shown below. Make sure that the SVI II ESD is out of the process control loop and click "OK" as shown below.

Figure 182 EXT Warning

3. ESDVue will start the Extended Actuator Signature and will display the progress dialog shown below.
4. You can cancel the test by clicking one of the cancel buttons.

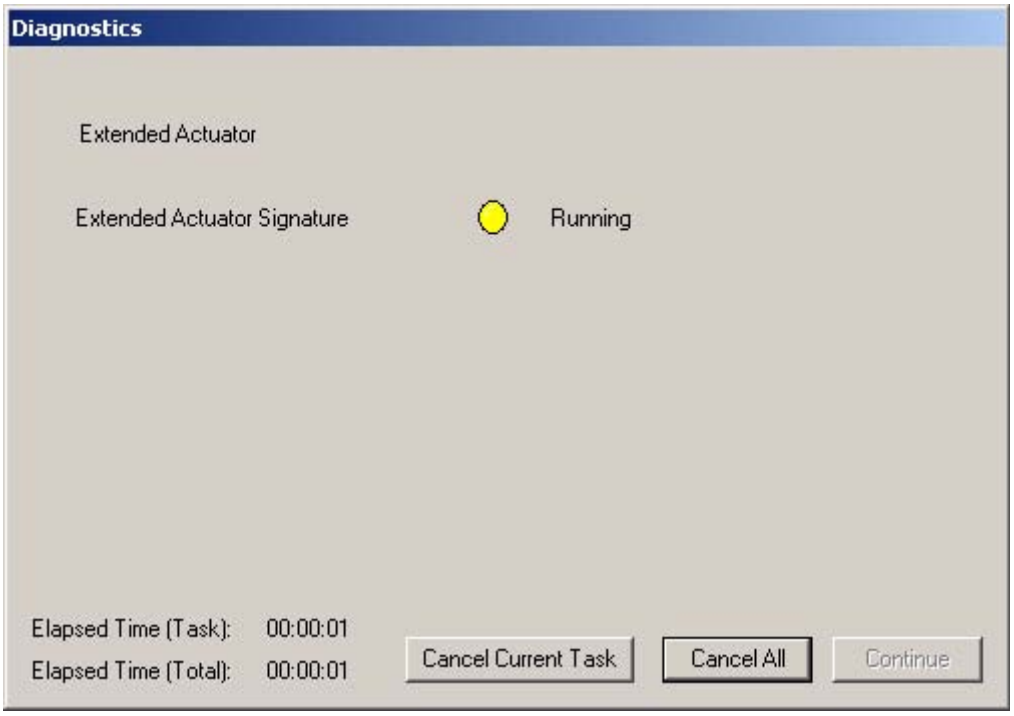


Figure 183 Extended Signature Progress Dialog

5. When the Extended Signature Test is completed the progress dialog will display "Extended Signature Complete" and enable the "Continue" button.
6. Click on the "Continue" button to close the dialog and view the Diagnostic Graph.

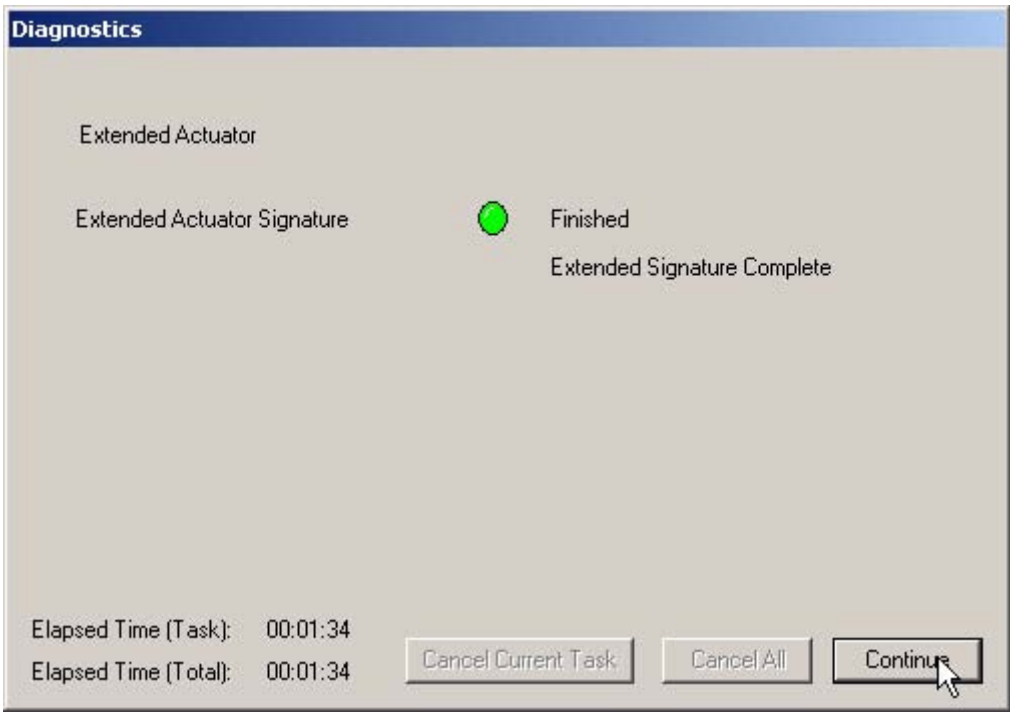


Figure 184 Completing EXT

10. After you close the Extended Signature Diagnostics dialog, ESDVue will display the Extended Signature Diagnositcs graph shown in Figure 185 below.

Extended Signature Diagnostics Graph Features

The Extended Signature Diagnostics Graph has the same features as all other diagnostic graphs:

- Set Graph Scale - allows you to change the coordinates of the Pressure Position axes.
- Select Additional Curve - allows you to display an additional, selected, curve on the graph.
- Show Computed Result - allows you to view the data in a numerical value format.
- Show Data Points - when selected shows data points collected during testing.
- Save to File - allows you to save the graph to a file.
- Export to Excel - exports the data as a CSV Excel file.
- Capture to Clipboard - captures a bitmap image of the graph.
- Close - closes the graph and returns the ESDVue Screen.

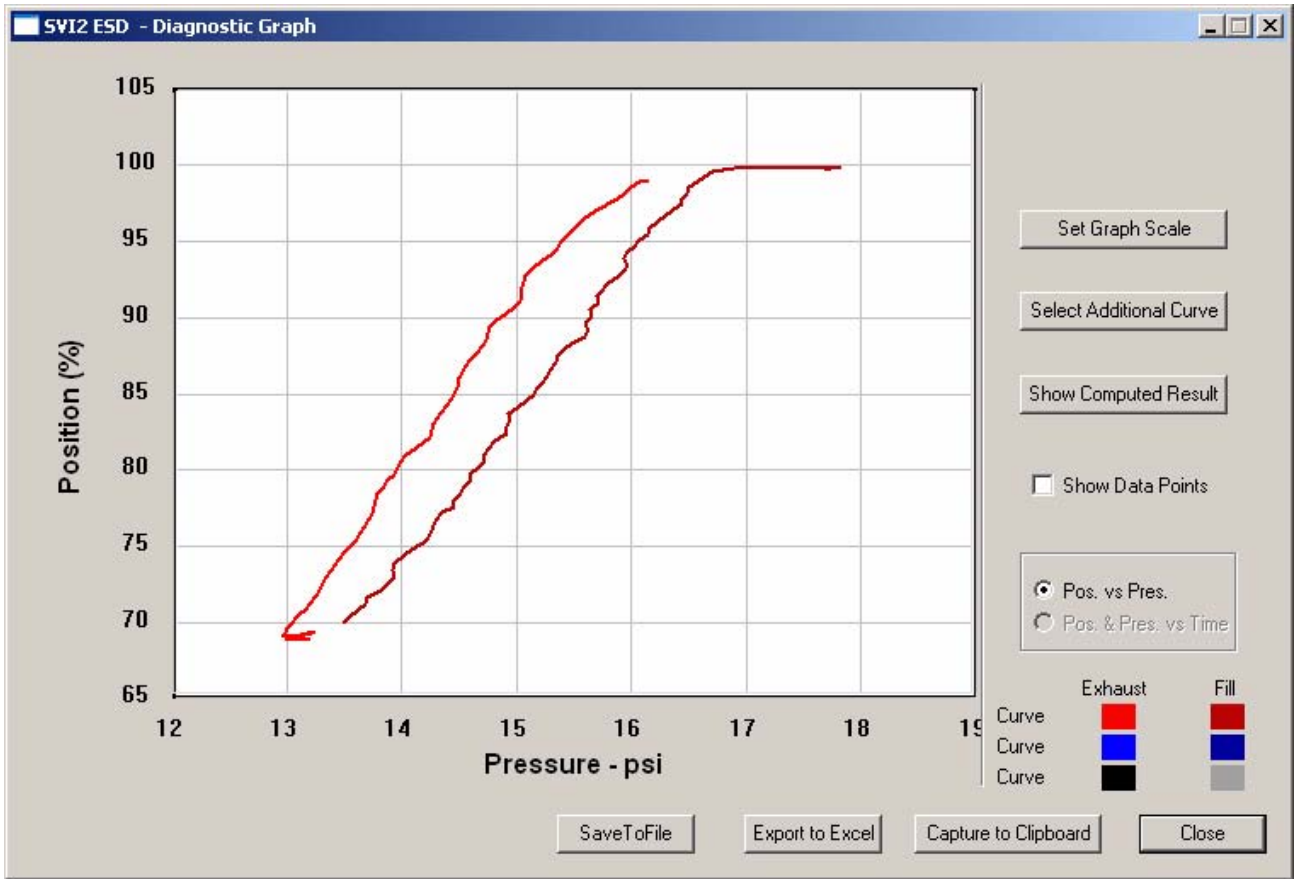


Figure 185 Extended Signature Diagnostics Graph

Set Graph Scale

ESDVue allows you to change the graph scale on diagnostic graphs so that you can narrow in on one area of the graph, or expand the viewing area.

To change the graph scale:

1. Select "Set Graph Scale" as shown in the figure below.

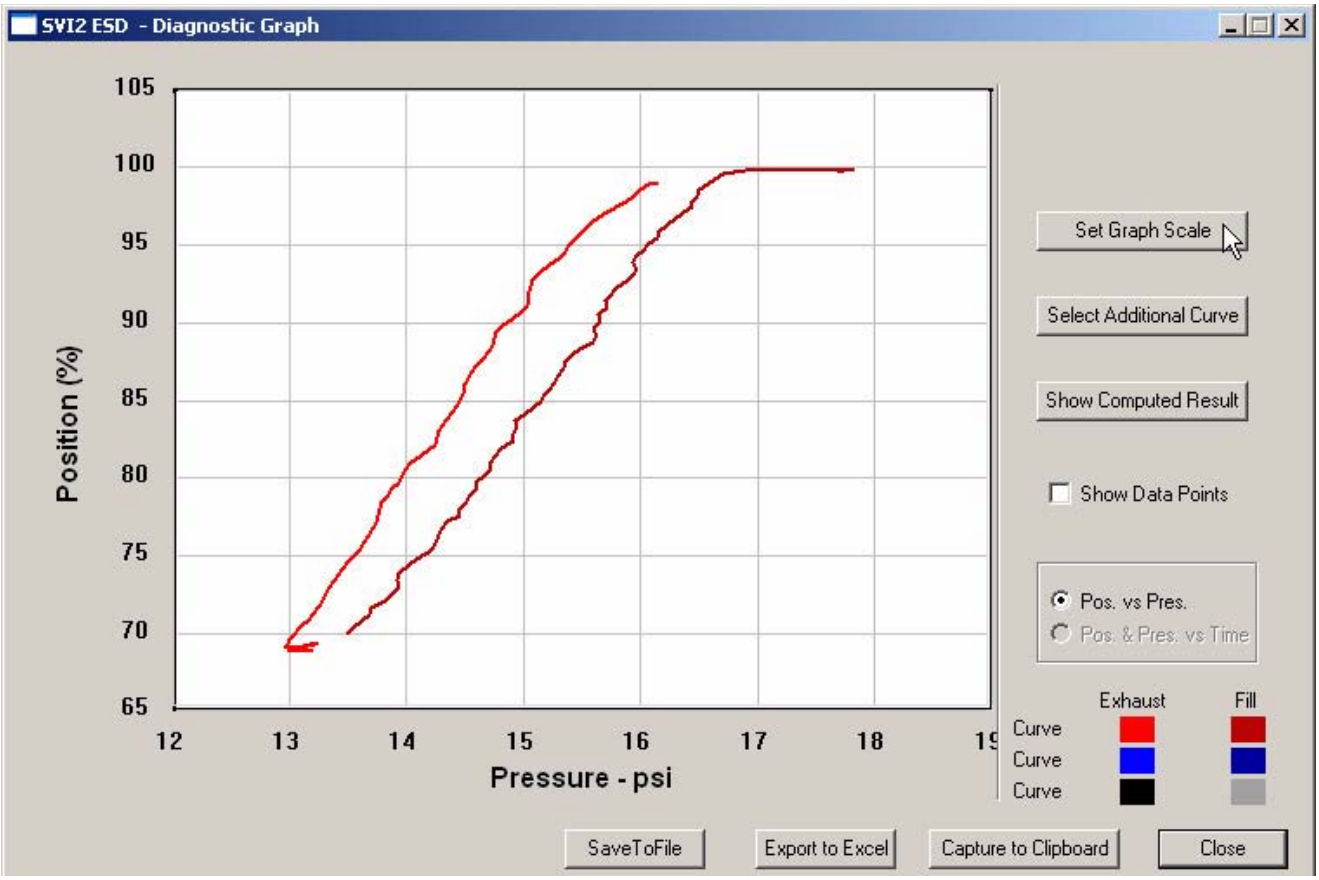


Figure 186 Selecting "Set Graph Scale"

2. ESDVue will launch the Set Graph Scale window shown below.

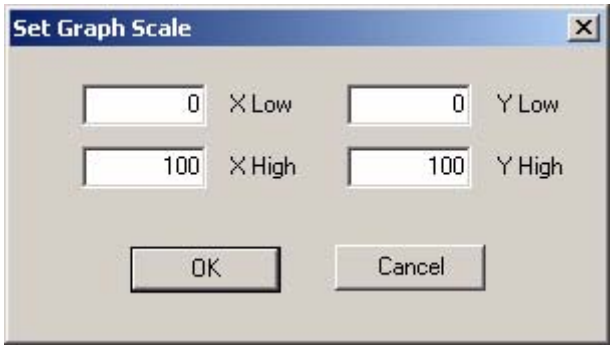


Figure 187 Set Graph Scale Window

3. Adjust the X axis and Y axis coordinates as necessary and click "OK".
4. The Diagnostic Graph will reflect the changes made to the axes.

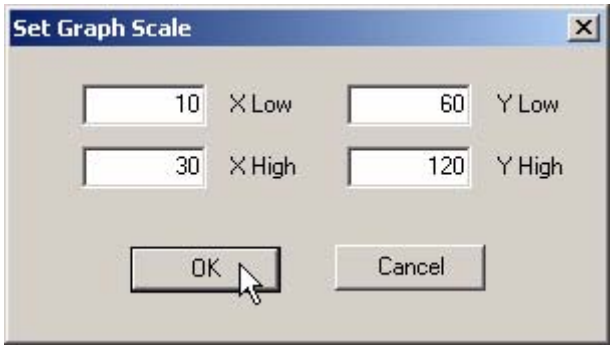


Figure 188 Saving Scale Adjustments

Select Additional Extended Signature Curve

ESDVue allows you to view more than one diagnostic curve at a time; being able to compare two curves may facilitate diagnostics.

To display an additional extended signature curve on the diagnostic graph:

1. Click on the "Select Additional Curve" button as shown below.

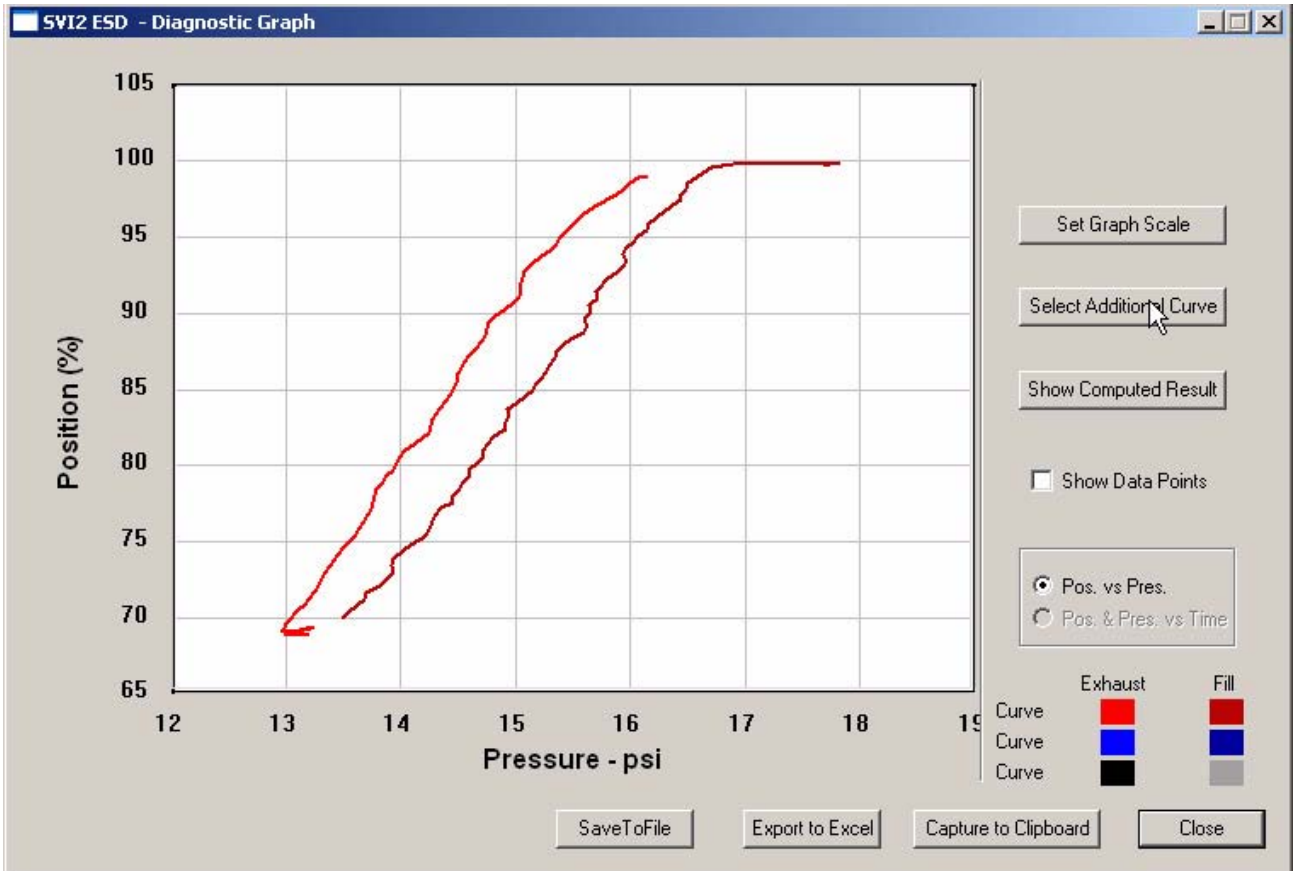


Figure 189 Starting "Select Additional Curve"

2. ESDVue will launch the dialog shown below. "Load Data from Database" and "Load Data from File" are the only active choices for Extended Signature Diagnostics.
3. Select the source of the additional curve:
   - ❖ Load from Database - launches window to select data from database
   - ❖ Load Data from File - launches to browser to select file to load

The default is "Load Data from Database".

Figure 190 Select Additional Extended Signature Curve Dialog

Selecting a Curve from a Database

To select a curve from a database:

1. Click the radio button beside "Load Data from Database", if not already selected.
2. Click on "Load".

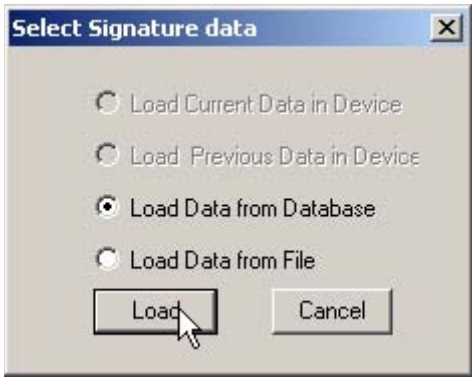


Figure 191 Selecting "Load Data from Database"

3. ESDVue will launch the database browser shown below.
4. The browser display only Extended Signature diagnostic data.

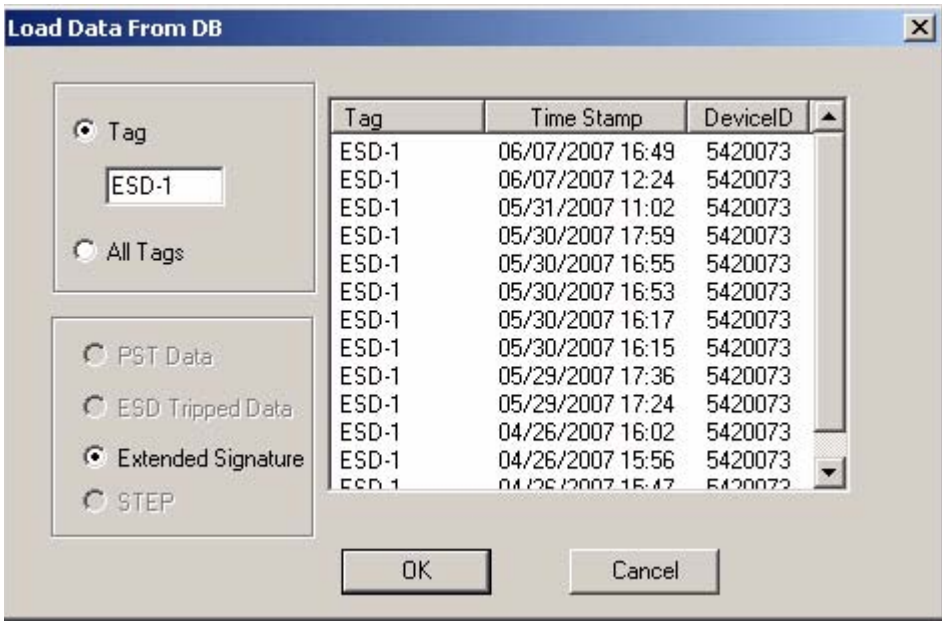


Figure 192 Database Browser Displaying Extended Signature Data

5. Scroll through the list of Extended Signature data files until you locate the file with the appropriate time stamp.
6. Click on "OK".

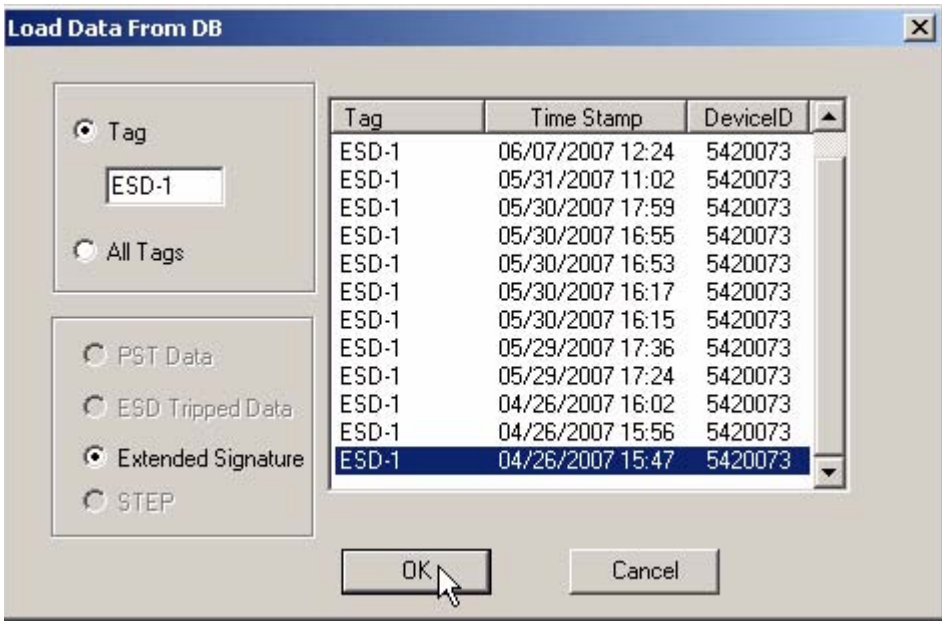


Figure 193 Loading Extended Signature Data

Selecting a Curve from a File

You can also load an additional Extended Signature Curve from a saved file. To select a curve from a file:

1. After you select "Select Additional Curve" from the Extended Signature Diagnostics Graph, ESDVue will display the dialog shown below.
2. Select "Load Data from File".
3. Click on "Load" as shown below.

Figure 194 Selecting "Load Data from File"

4. ESDVue will launch a file browser window as shown below.

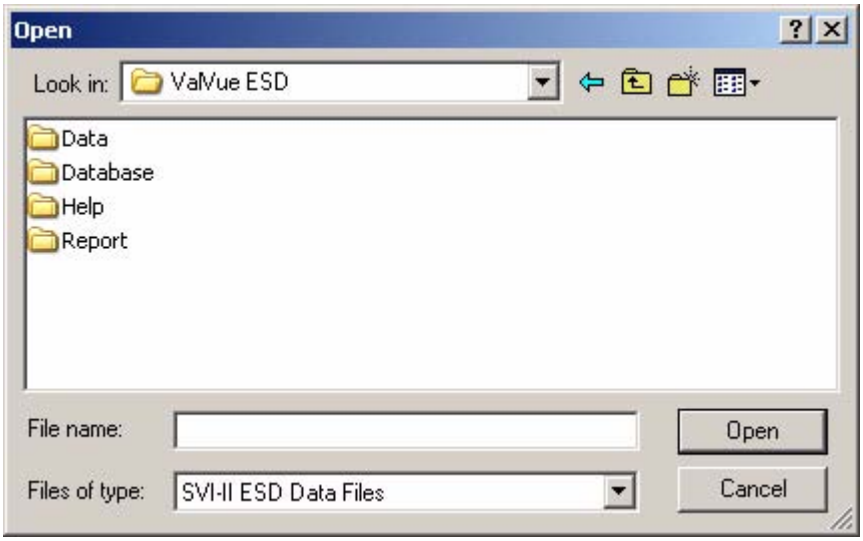


Figure 195 File Browser

5. Using the browser, locate the file you would like to load.
6. Select the file name.
7. Click "Open".

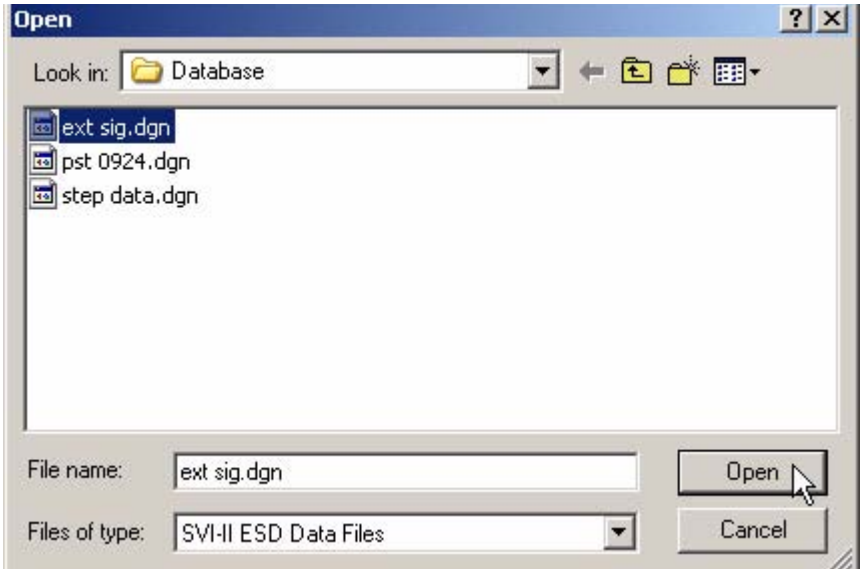


Figure 196 Opening File for Additional Curve

8. After you open the saved file, ESDVue will launch the dialog below.
9. Select the record with the appropriate time stamp and click "OK".

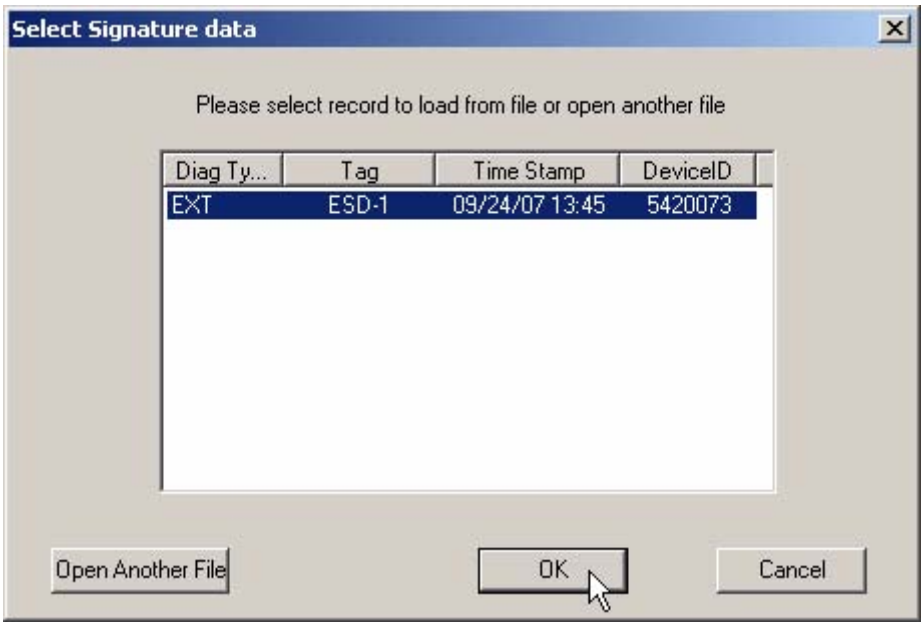


Figure 197 Selecting Signature Data Record

Additional Curve Displayed

After selecting additional curve data from either the database or a file, the additional curve will displayed on the graph with the original curve as shown below.

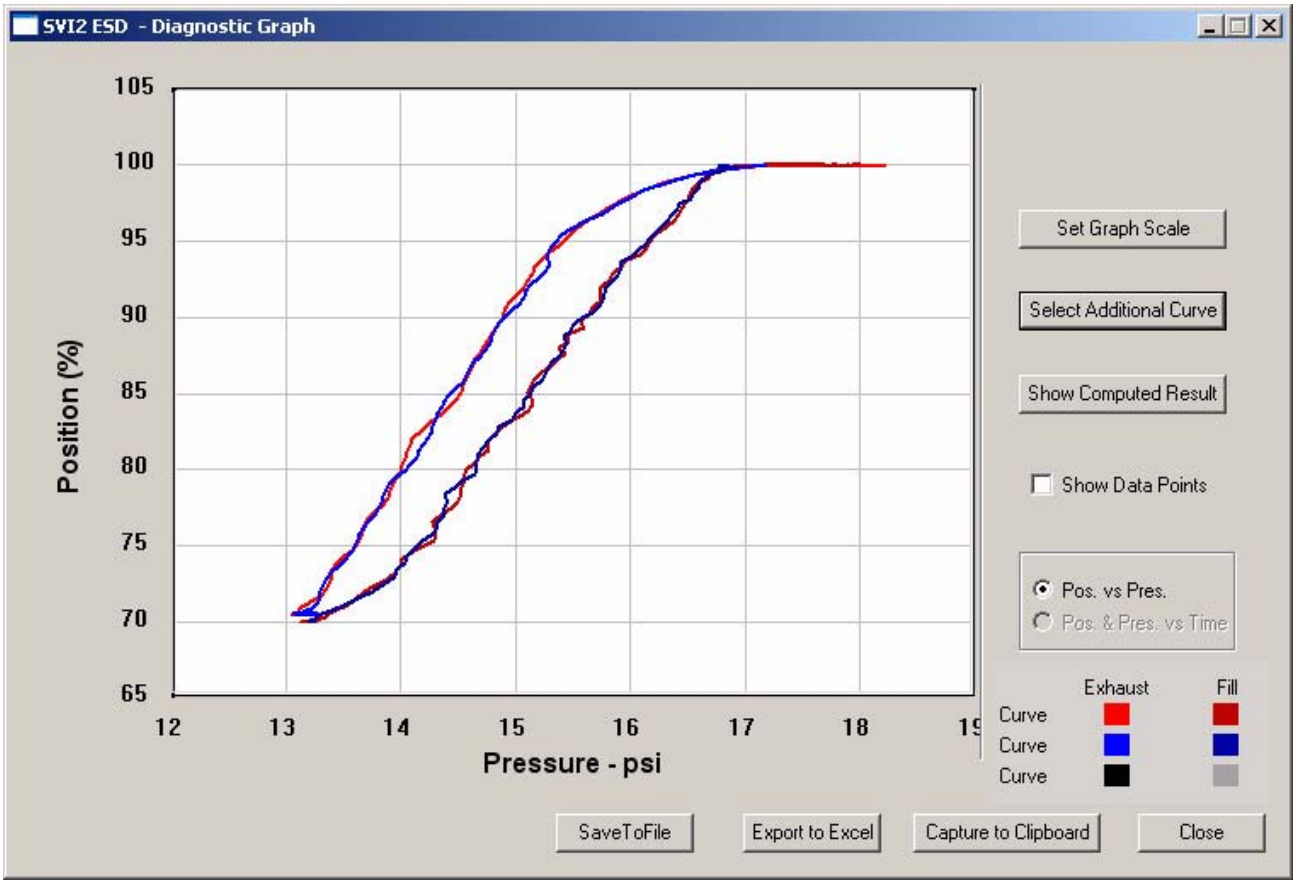


Figure 198 Additional Curve Displayed

Show Computed Extended Signature Results

ESDVue allows you to view the results of the Extended Signature Test as a table of numerical values.

To display the computed result for the active Extended Signature Test:

1. Click on "Show Computed Result" as shown below.

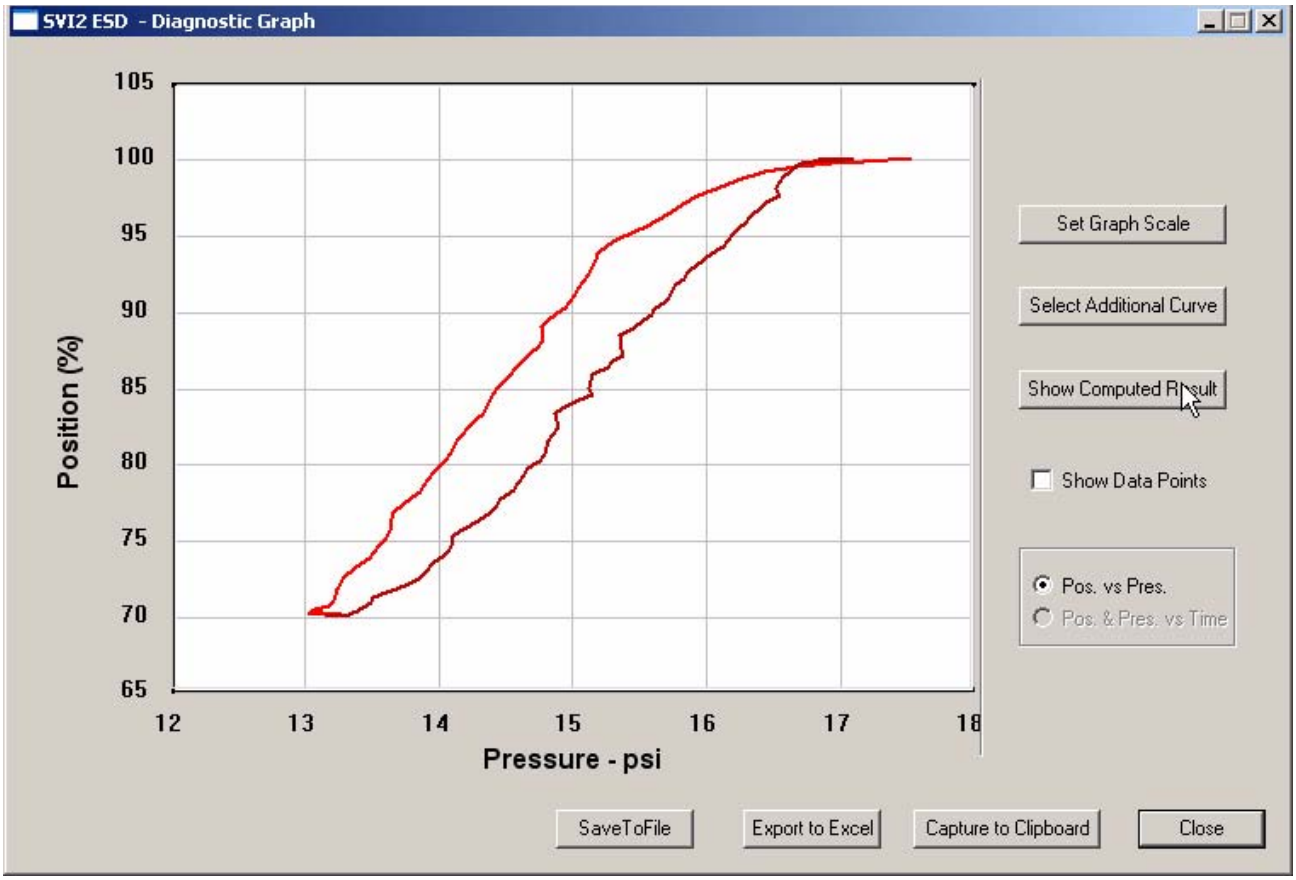


Figure 199 Selecting "Show Computed Result"

2. ESDVue will launch the Extended Signature Test Result window shown below.
3. All extended signature diagnostic results are displayed in a numerical format.

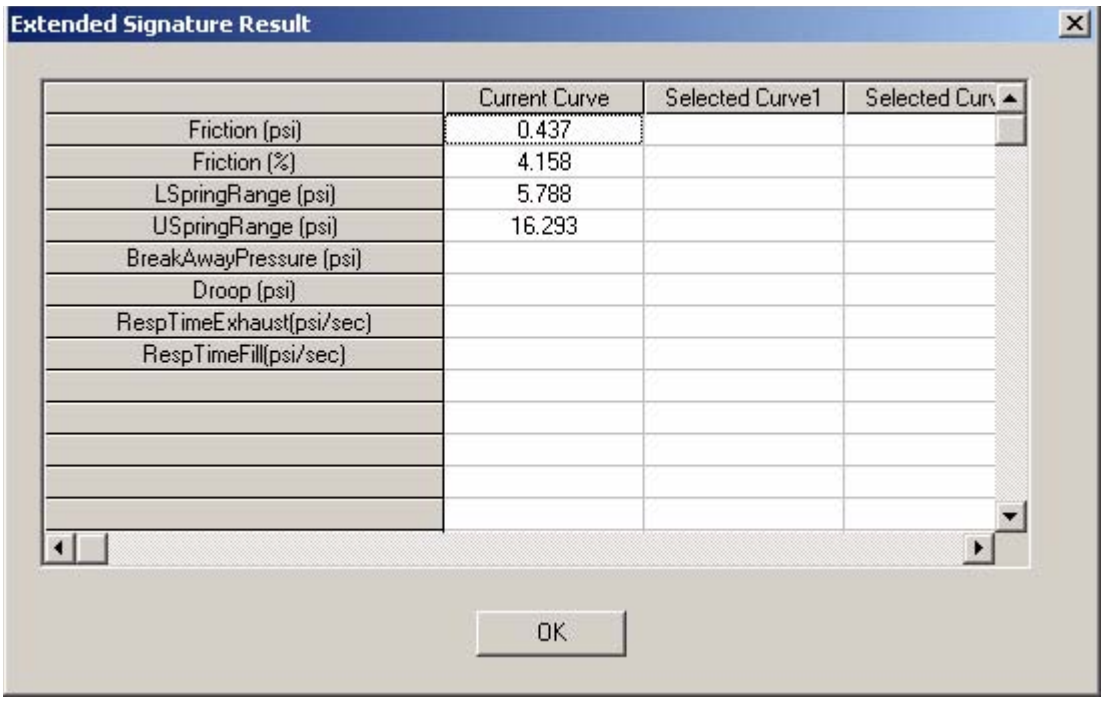


Figure 200 Extended Signature Diagnostics Computed Result

Save to File

ESDVue allows you to save diagnostic graphs in a graphical format as .dgn files to any specified location.

To save a diagnostic graph to a file:

1. Select "Save To File" as shown below.

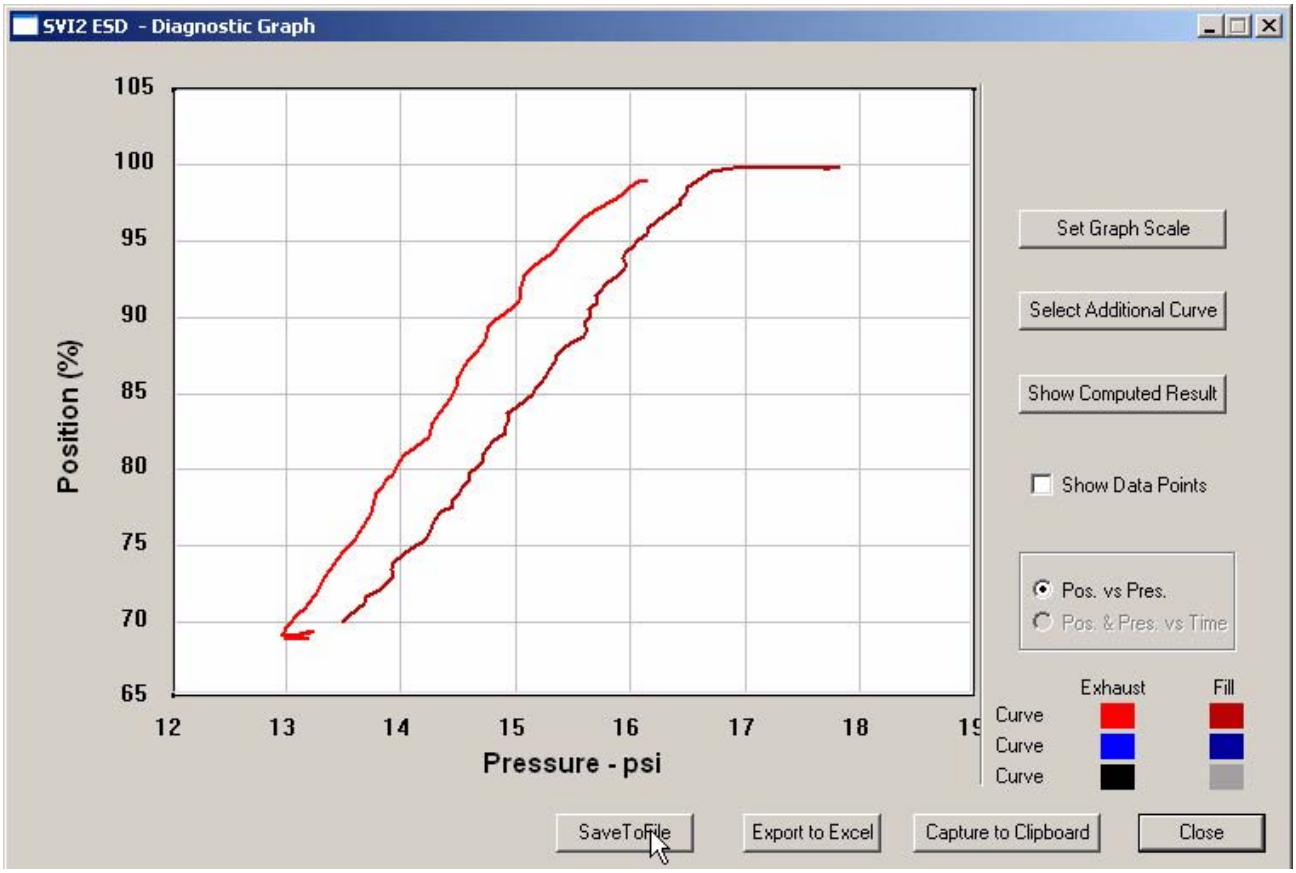


Figure 201 Selecting "Save To File"

2. ESDVue will launch a Windows file browser as shown below.

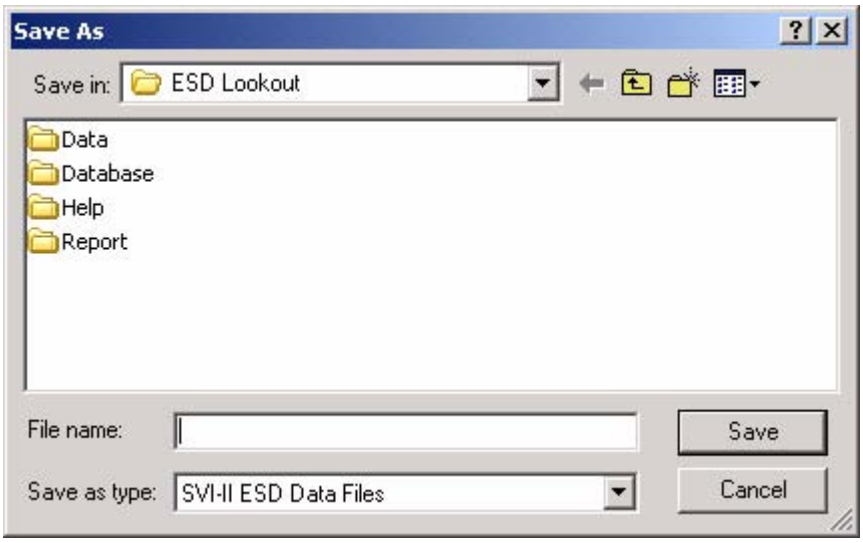


Figure 202 File Browser

3. Locate the folder in which you would like to save the file.
4. Enter a file name.
5. Click on "Save".
6. ESDVue will then close the browser window and return the diagnostic graph.

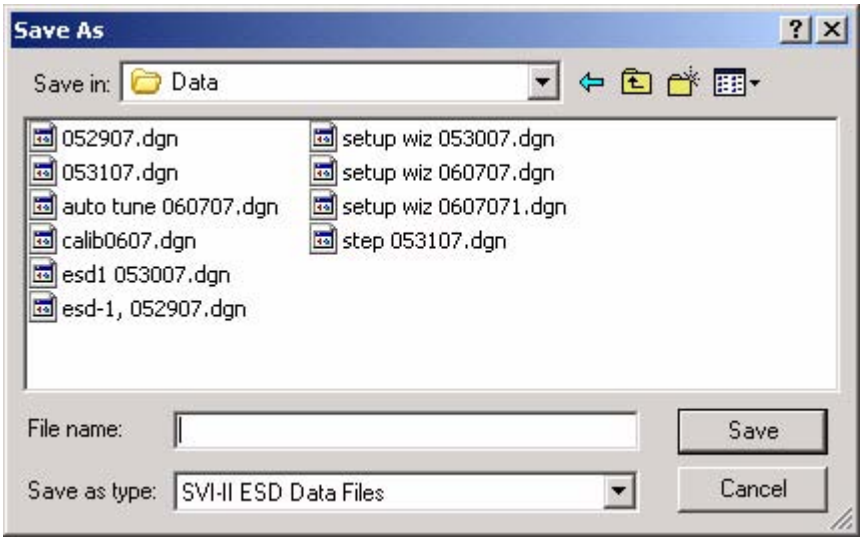


Figure 203 Selecting a Folder for Saving File

Export to Excel

ESDVue allows you to save or create a comma separated value file (.csv) of the diagnostic data from a graph and export the file to Excel. With the Excel file you can create graphs or perform other analysis.

To export a graph to Excel:

1. Click on "Export to Excel" as shown below.

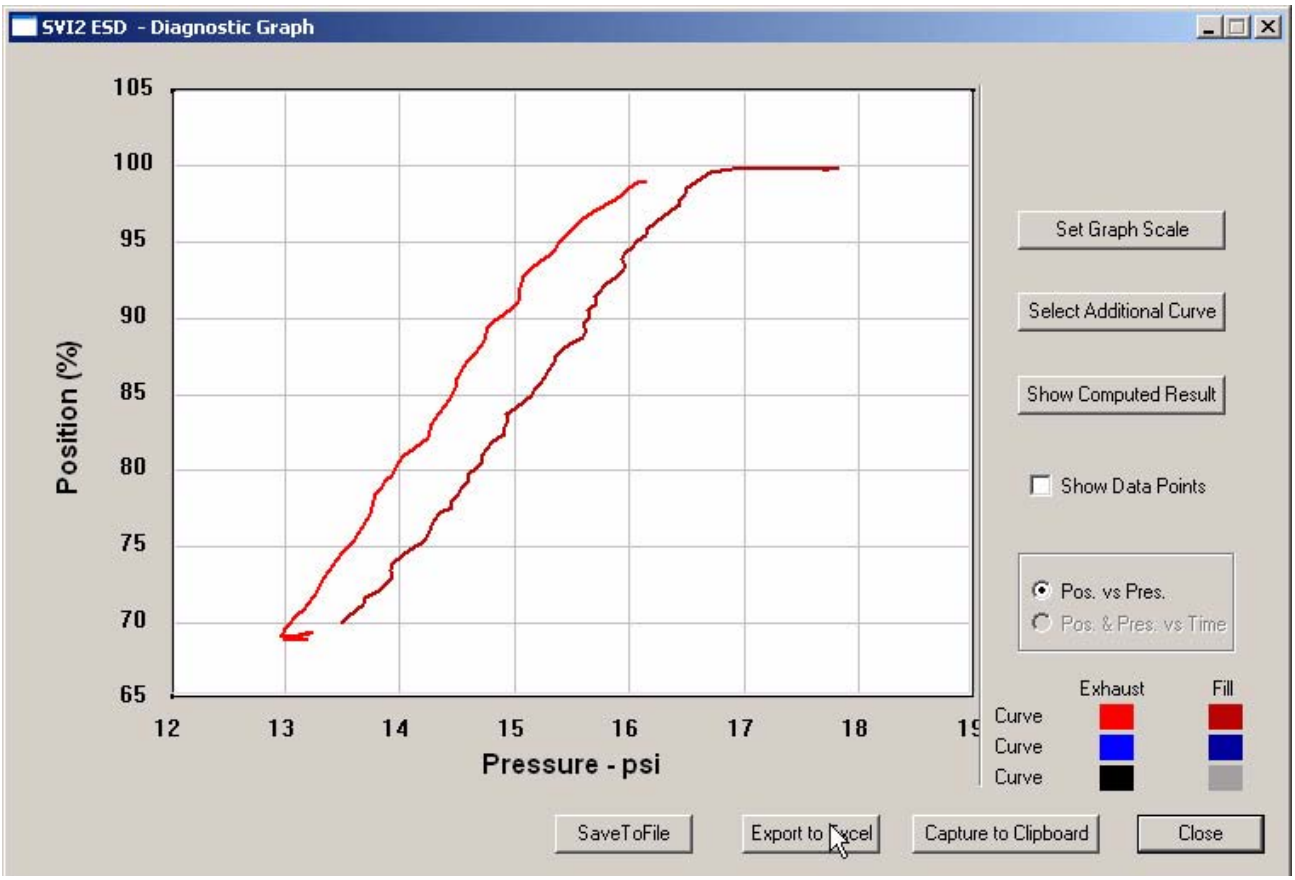
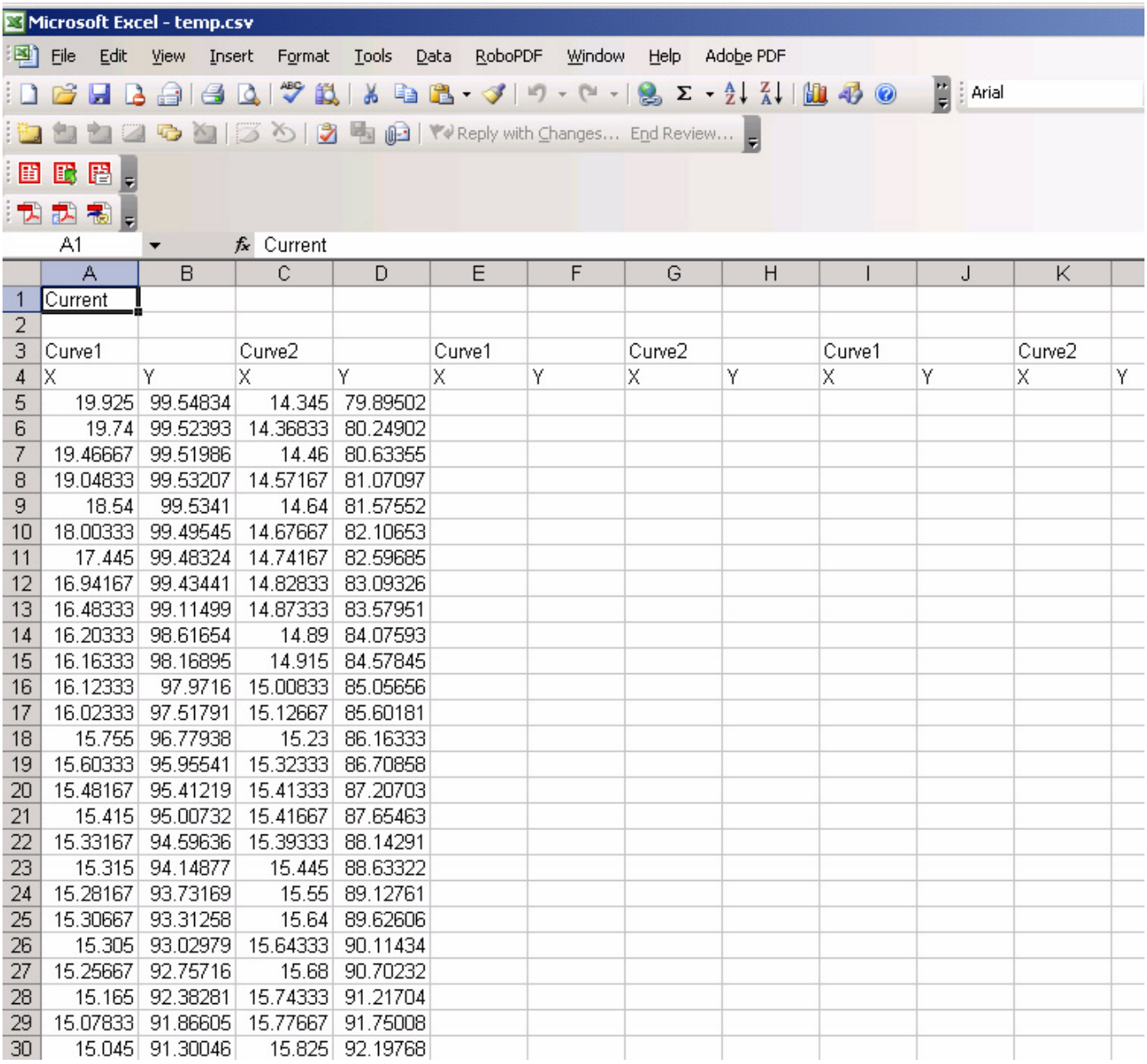


Figure 204 Selecting "Export to Excel"

2. ESDVue will launch Microsoft Excel and display the X axis and Y axis values, taken from the diagnostic graph, as Excel values as shown in the figure below.



	A	B	C	D	E	F	G	H	I	J	K	
1	Current											
2												
3	Curve1		Curve2		Curve1		Curve2		Curve1		Curve2	
4	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
5	19.925	99.54834	14.345	79.89502								
6	19.74	99.52393	14.36833	80.24902								
7	19.46667	99.51986	14.46	80.63355								
8	19.04833	99.53207	14.57167	81.07097								
9	18.54	99.5341	14.64	81.57552								
10	18.00333	99.49545	14.67667	82.10653								
11	17.445	99.48324	14.74167	82.59685								
12	16.94167	99.43441	14.82833	83.09326								
13	16.48333	99.11499	14.87333	83.57951								
14	16.20333	98.61654	14.89	84.07593								
15	16.16333	98.16895	14.915	84.57845								
16	16.12333	97.9716	15.00833	85.05656								
17	16.02333	97.51791	15.12667	85.60181								
18	15.755	96.77938	15.23	86.16333								
19	15.60333	95.95541	15.32333	86.70858								
20	15.48167	95.41219	15.41333	87.20703								
21	15.415	95.00732	15.41667	87.65463								
22	15.33167	94.59636	15.39333	88.14291								
23	15.315	94.14877	15.445	88.63322								
24	15.28167	93.73169	15.55	89.12761								
25	15.30667	93.31258	15.64	89.62606								
26	15.305	93.02979	15.64333	90.11434								
27	15.25667	92.75716	15.68	90.70232								
28	15.165	92.38281	15.74333	91.21704								
29	15.07833	91.86605	15.77667	91.75008								
30	15.045	91.30046	15.825	92.19768								

Figure 205 Diagnostic Graph Data - in Excel

Load Data

ESDVue provides the option of loading saved data from a database or from a file.

Loading Data from a Database

Every time you successfully run a diagnostics test, ESDVue saves the diagnostic data to a database. On the Diagnostics Screen you can load any diagnostic data from the database.

To load diagnostic data from the database:

1. Click on "Load From DB" as shown in the figure below.

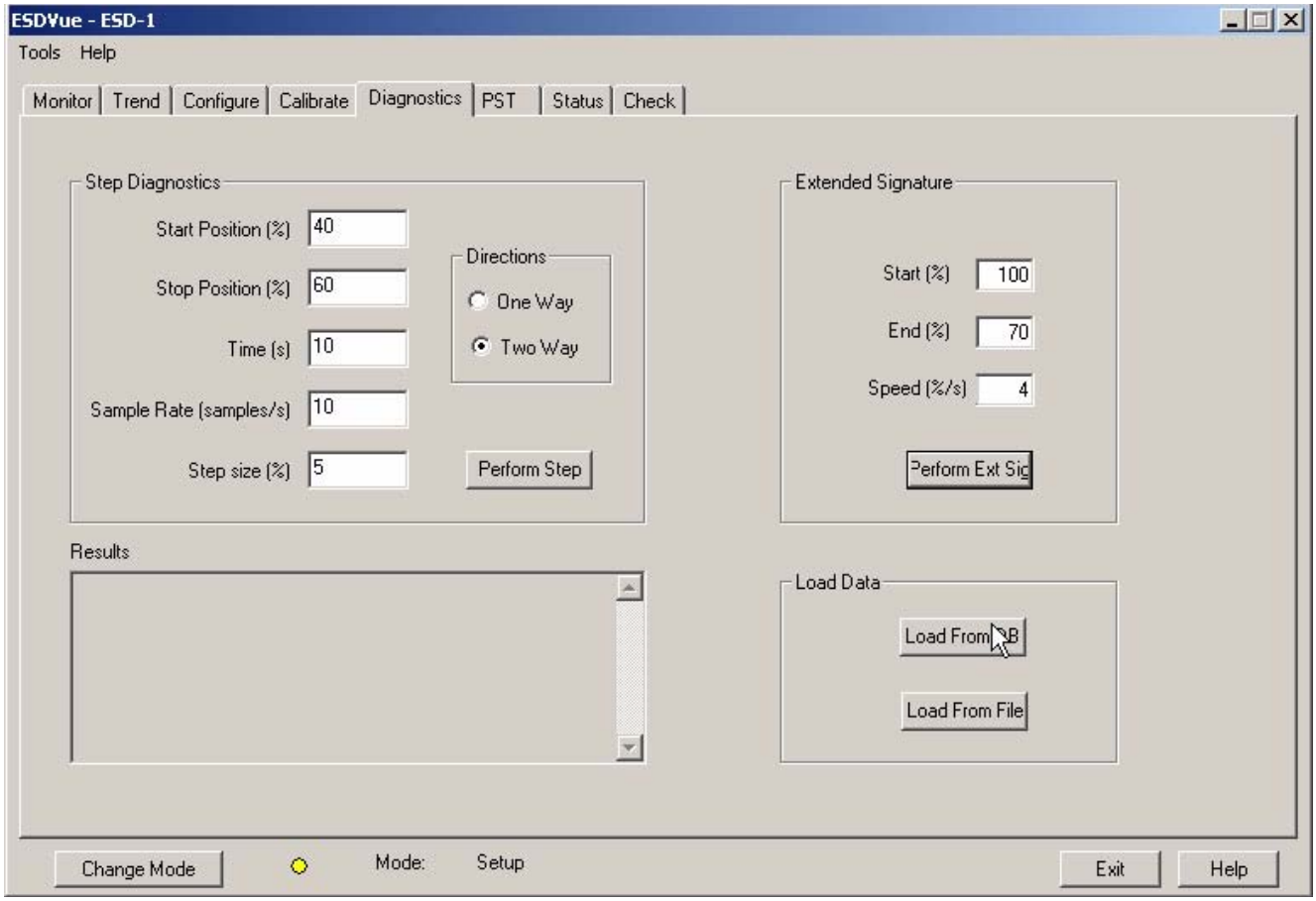


Figure 206 Selecting "Load From DB"

2. ESDVue will launch the "Load Data From DB" window where you select the data you'd like to load on the diagnostic graph.
3. Choose either a particular Device ID or choose All Tags (all devices) for the data to load.
4. After you have made your device selection, select the data type you would like to load:
   - ❖ PST Data
   - ❖ ESD Tripped Data
   - ❖ Extended Signature
   - ❖ STEP
5. Select the type of data you would like to load by clicking the radio button located to the left of the data type name. In the figure below PST Data is selected.
6. After you have selected the data type, scroll through the list presented until you find the Time Stamp you would like to load.

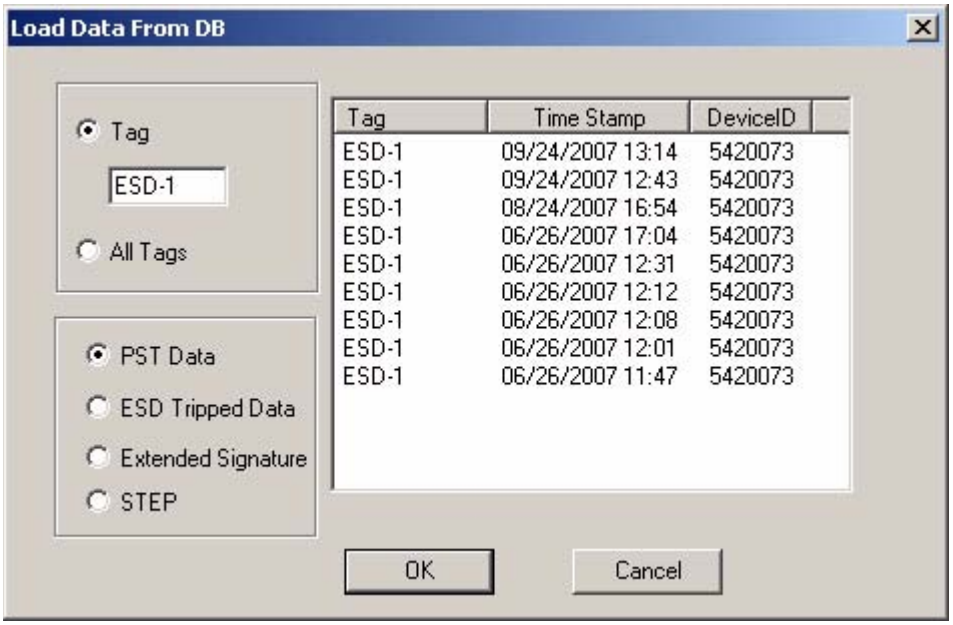


Figure 207 Device and Data Type Displayed

Load from Database Tool Tips

7. You will notice that when hover over a data record name that ESDVue will display all the data for the record as shown in the figure below.

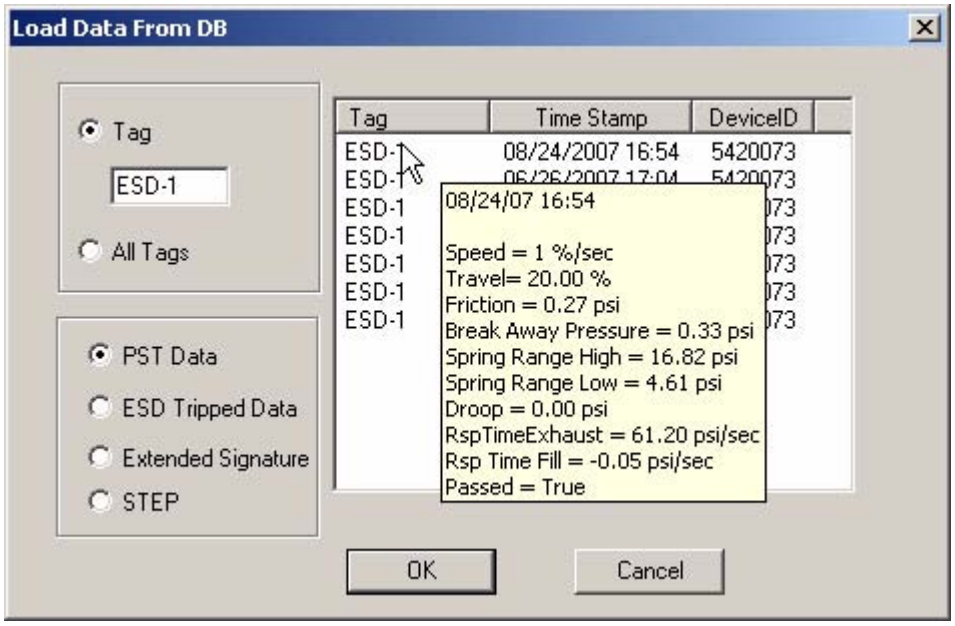


Figure 208 Load Data from DB Tool Tip

8. Select the data for the Time Stamp you would like to view.
9. Click on "OK".
10. The Diagnostic Graph will display the loaded data.

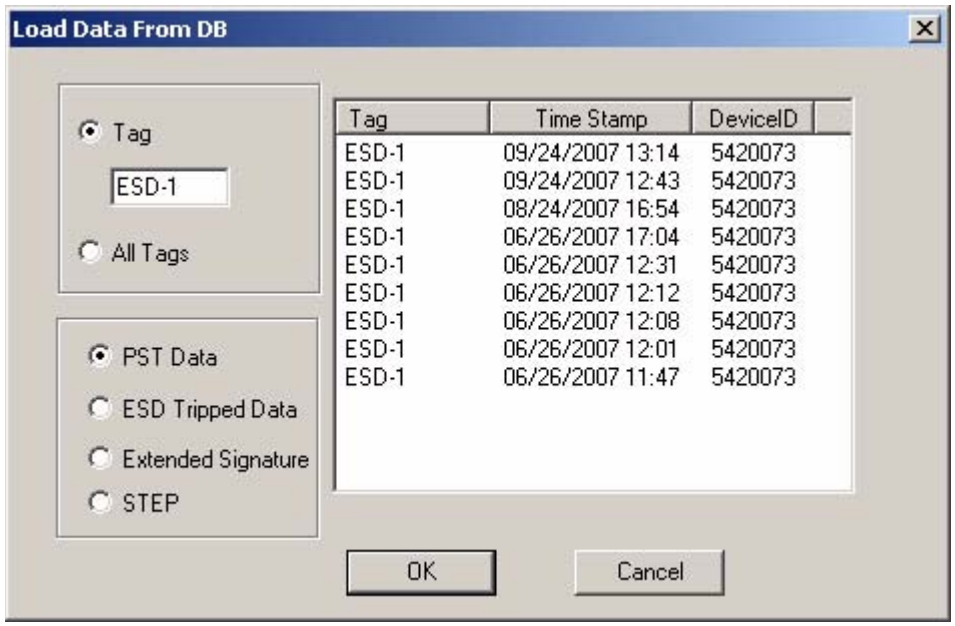


Figure 209 Loading Selected Data

Data File Displayed

After selecting the data record, ESDVue will display the diagnostic graph as shown below.

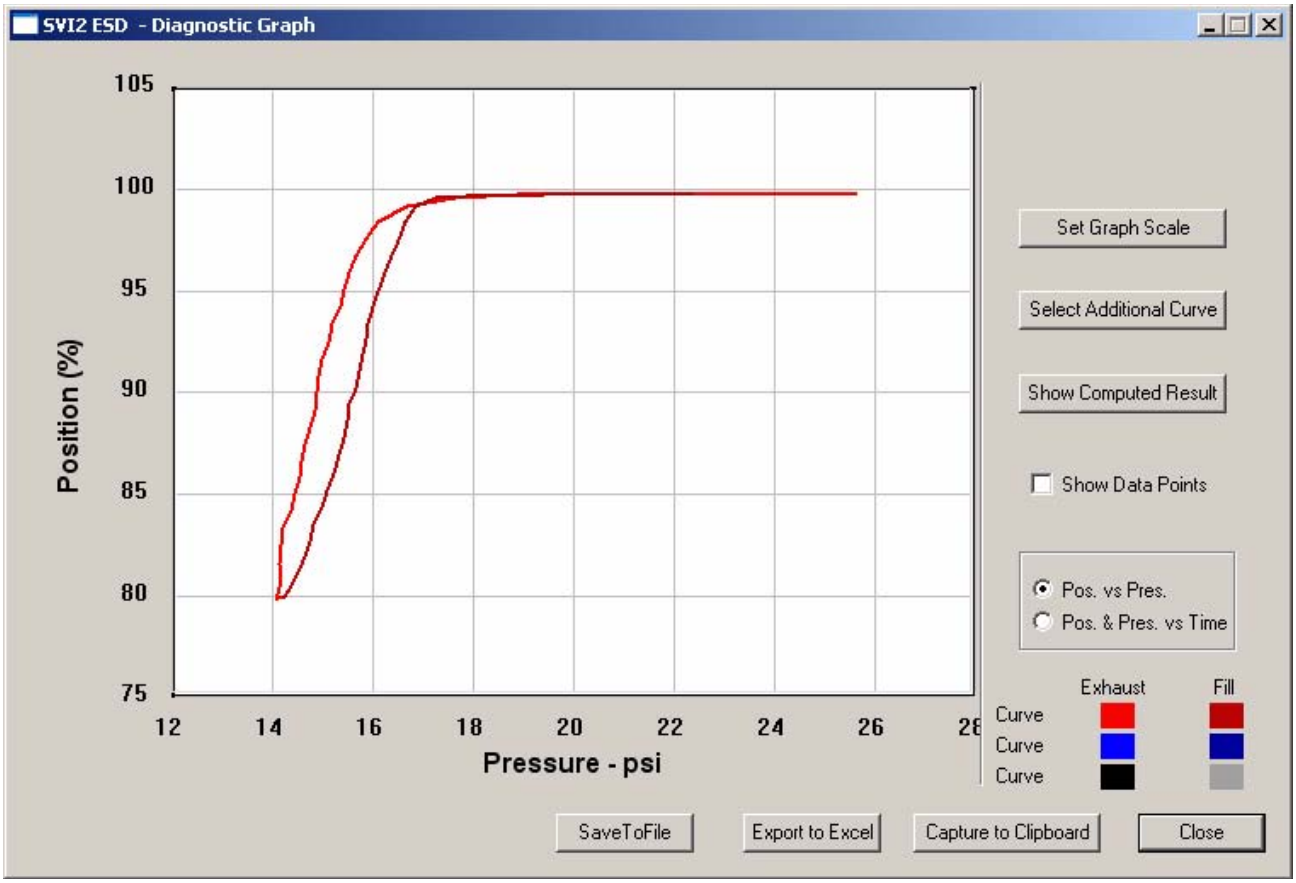


Figure 210 Diagnostic Graph Displayed

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curve" function).

Load Data from a File on Diagnostics Screen

ESDVue allows you load a diagnostic file from the Diagnostics Screen.

To load a file:

1. Click on "Load From File" as shown in the figure below.

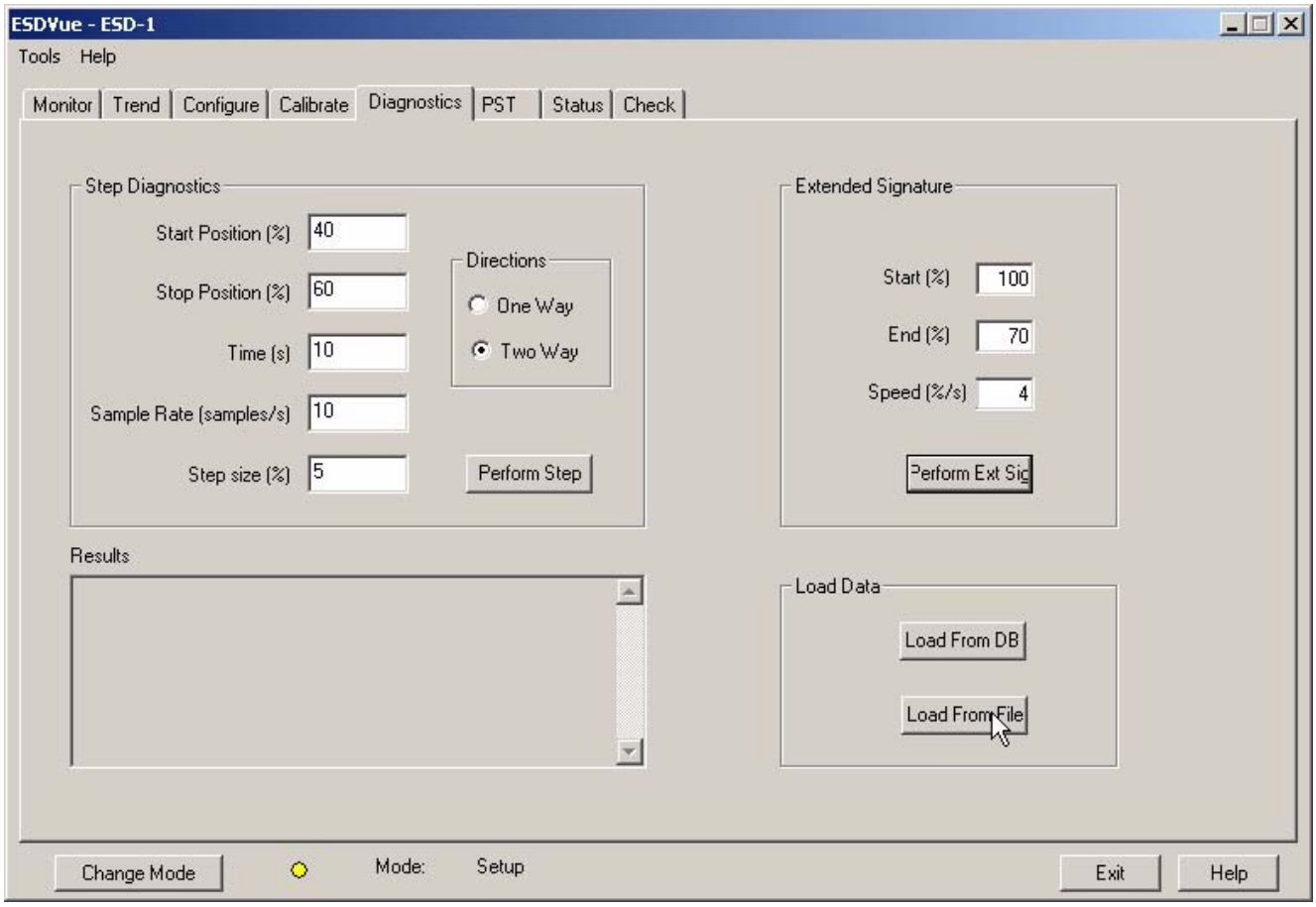


Figure 211 Selecting "Load From File"

2. ESDVue will launch a file browser window as shown below.

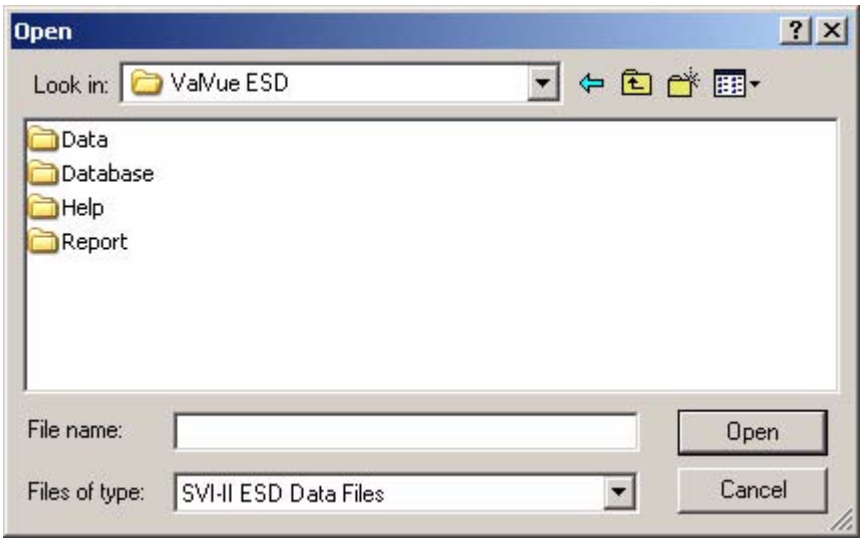


Figure 212 File Browser

3. Using the browser, locate the file you would like to load.
4. Select the file name.
5. Click "Open".

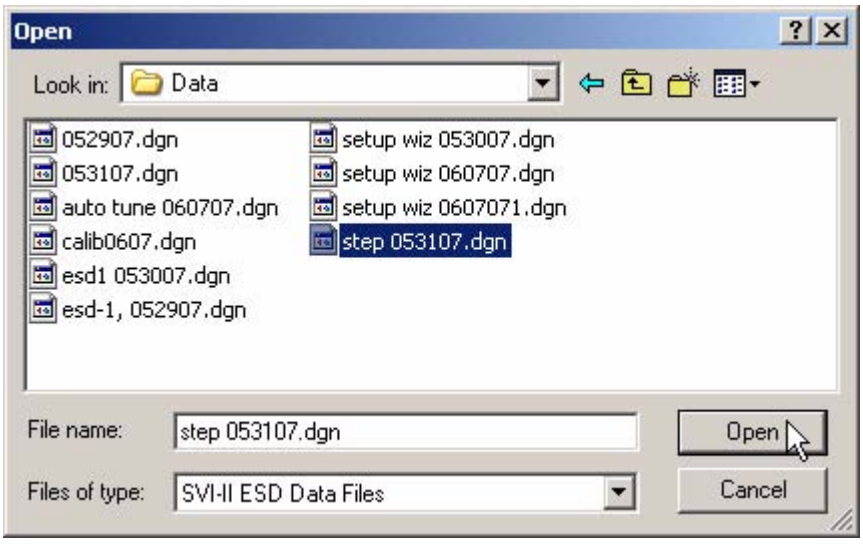


Figure 213 Opening File for Diagnostic Data

6. After you open the saved file, ESDVue will launch the dialog below.
7. Select the record with the appropriate time stamp and click "OK".

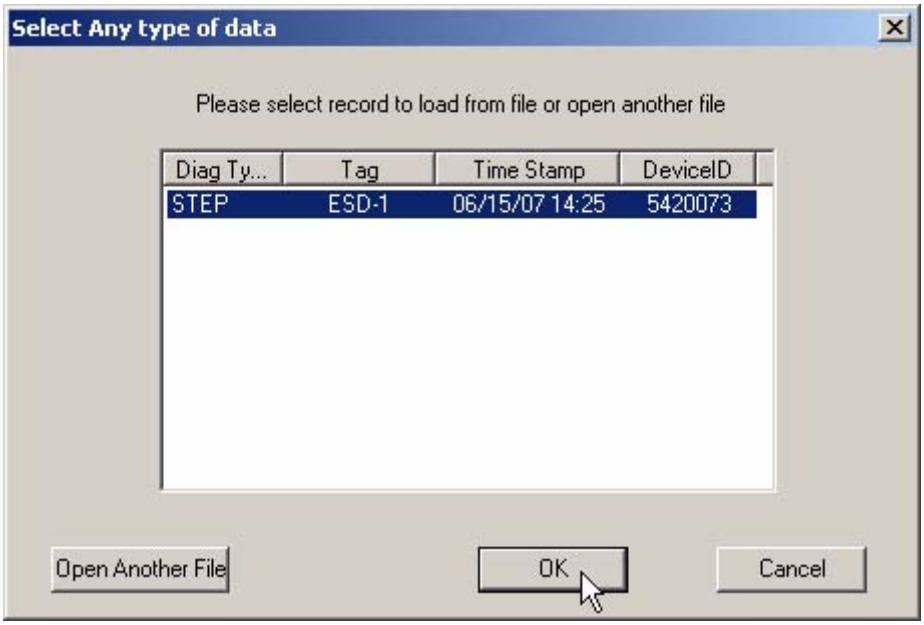


Figure 214 Selecting Step Test Record

Data File Displayed

After selecting the diagnostic file, ESDVue will display the diagnostic graph as shown below.

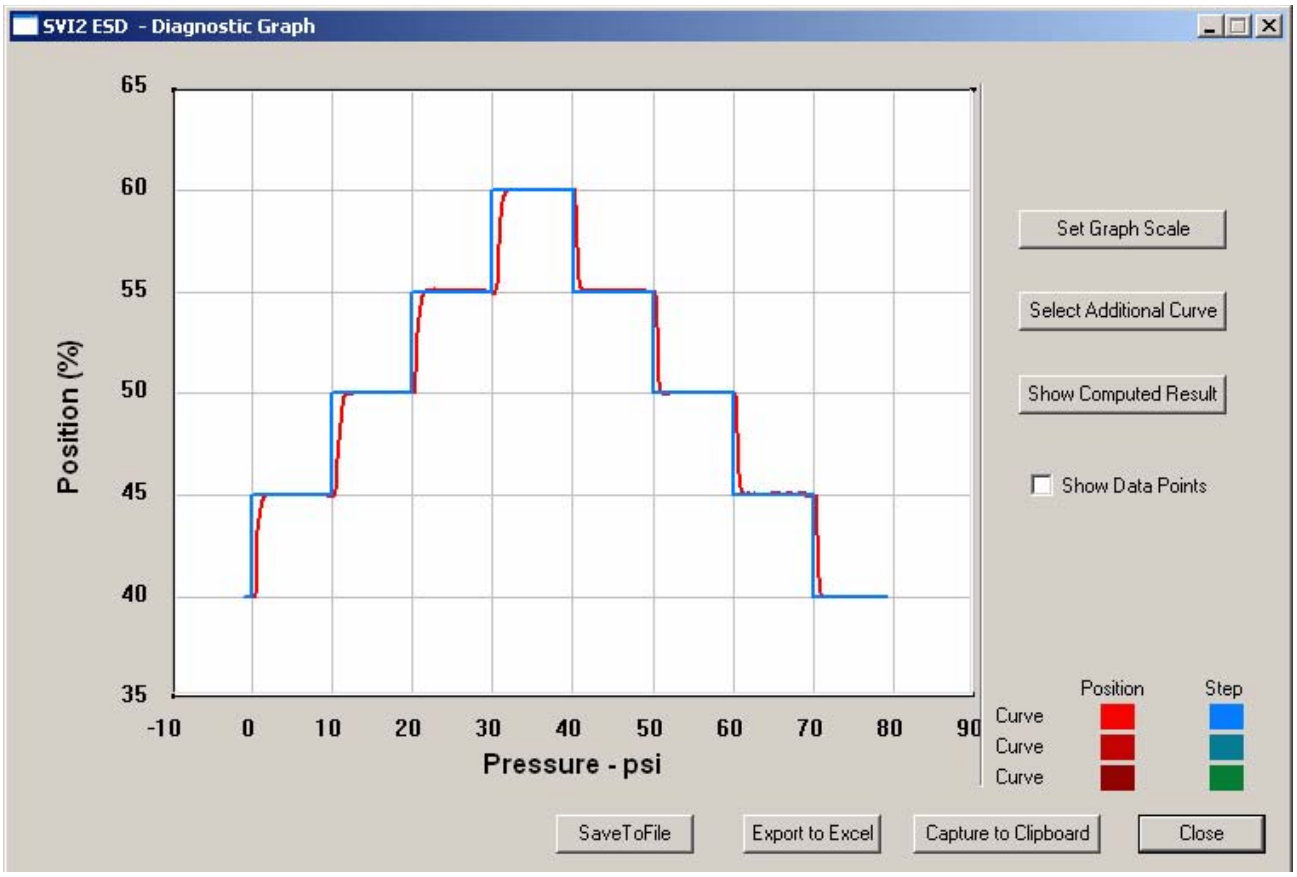


Figure 215 Diagnostic Graph Displayed

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curve" function).

PST 9

What you can do on the PST Screen

The PST Screen is crucial to the ESD operation and is the location where you can:

- Schedule Partial Stroke Testing (PST)
- Configure PST Settings
- Run Diagnostics and View Results

Note: *Operations on the PST Screen can be performed in any mode.*

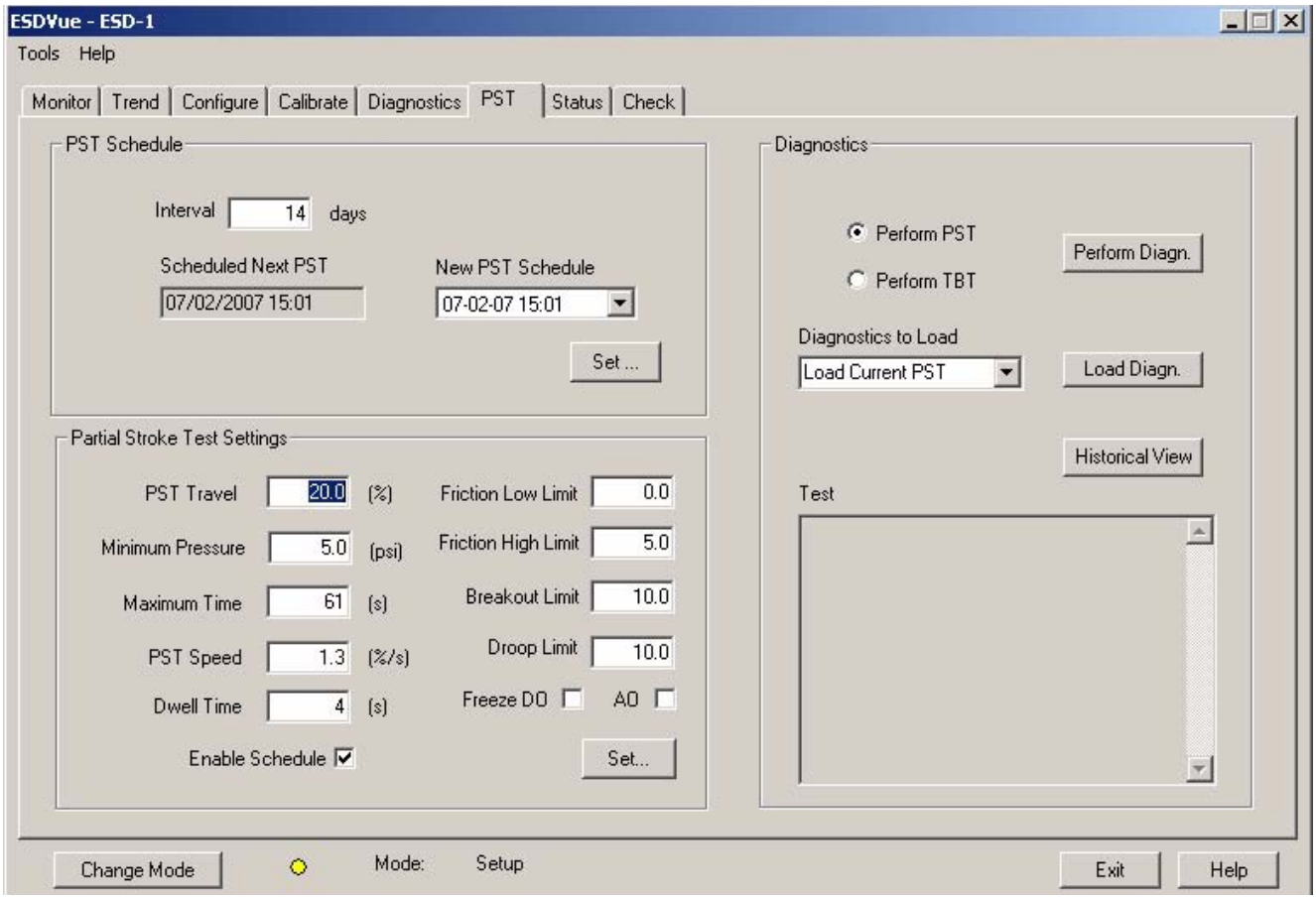


Figure 216 PST Screen

PST Schedule

The PST scheduling area allows you to set up the schedule at which Partial Stroke Test will be executed. There are two parameters you can set for the PST schedule:

- Interval of days - time between PSTs
- New PST Schedule - a new starting date for executing PST

Changing Interval of Days

To set the Interval of days:

1. Click in the number field and highlight the text.
2. Type over the old value with the new value for interval of days.

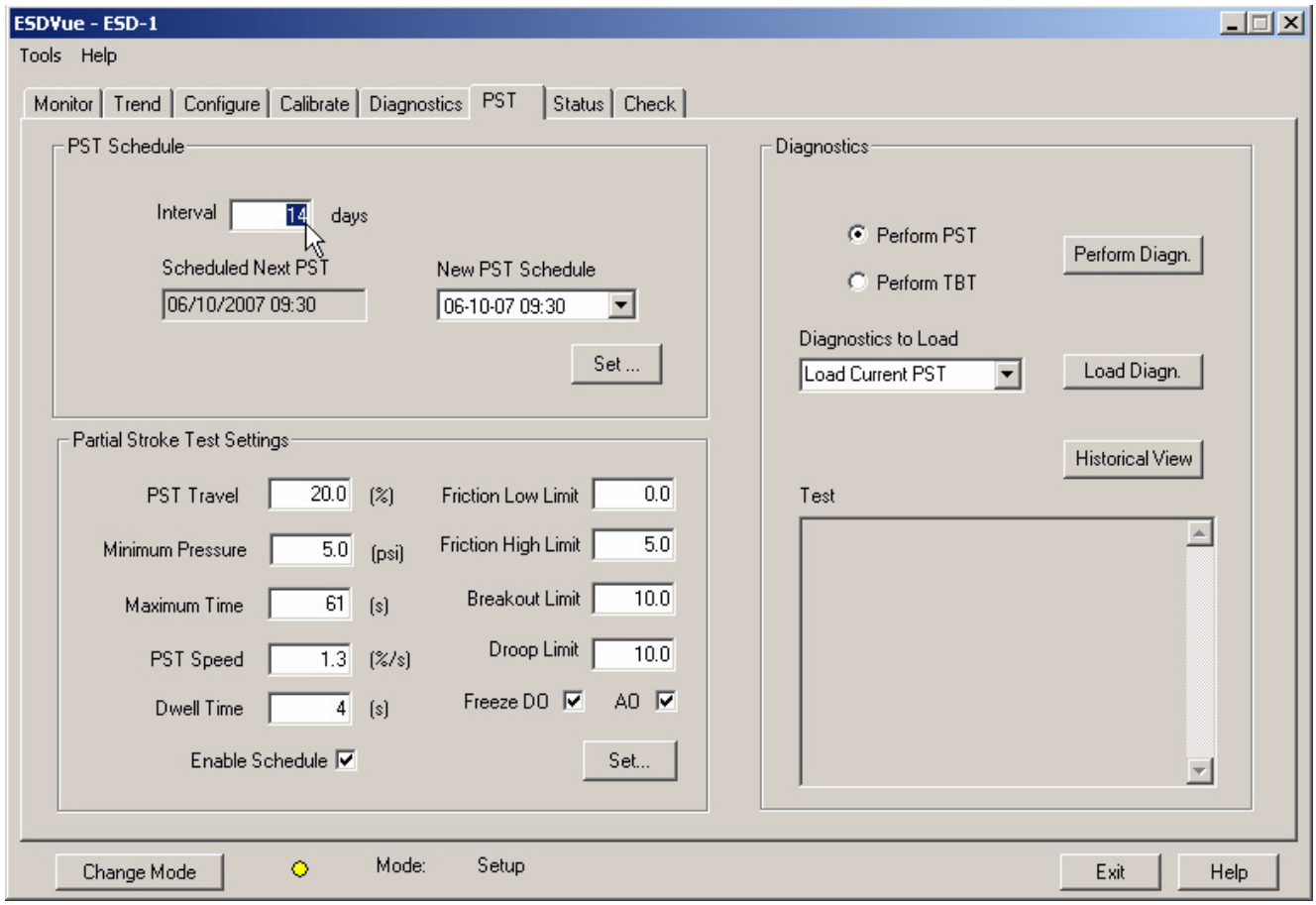


Figure 217 Changing Interval of Days

Changing New PST Schedule

The New PST Schedule date field is set up as mm-dd-yy-hh-mm. The hour field is set for 24 hours; there is no selection for AM or PM. There are two methods for changing the PST schedule date field. You can click on each parameter of the date field; i.e. mm, or dd, or yy etc., and change each individual parameter or you access the calendar in the drop down of the date field.

To change the start date schedule for the next PST:

1. Click in each parameter (mm-dd-yy-hh-mm) of the date field and highlight the text.
2. Type over the old value with the new value for each parameter

   OR
3. Click in the drop down, located at the right of PST schedule date field and access the date calendar as shown in the figure below.
4. Using the arrow key on the calendar, change the month if necessary.
5. When in the correct month on the calendar, drag the mouse and select the correct date within the month by clicking on it.

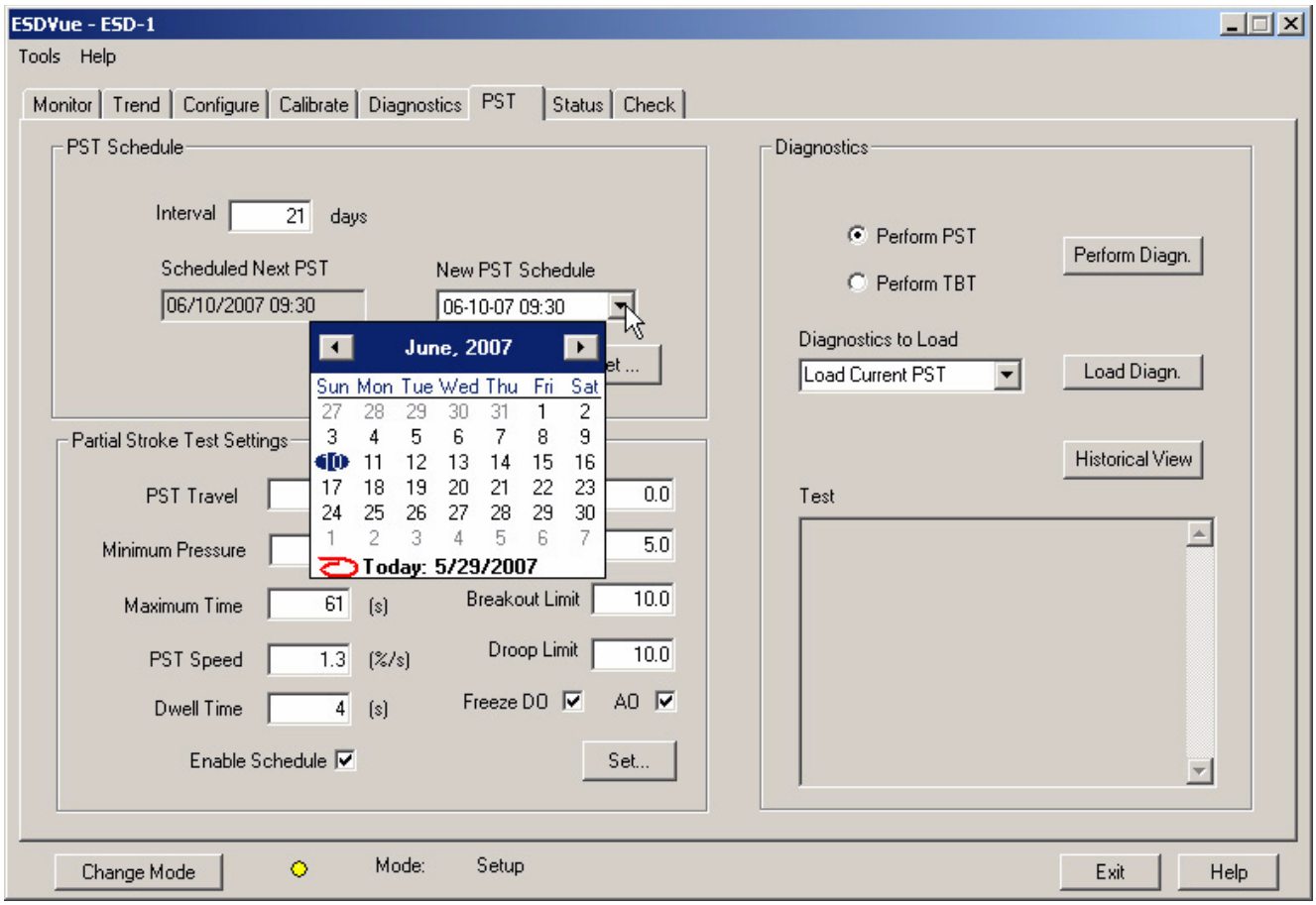


Figure 218 Selecting Calendar Feature

6. After you have made all the necessary PST schedule changes click on "Set" to save the changes as shown on the figure below.

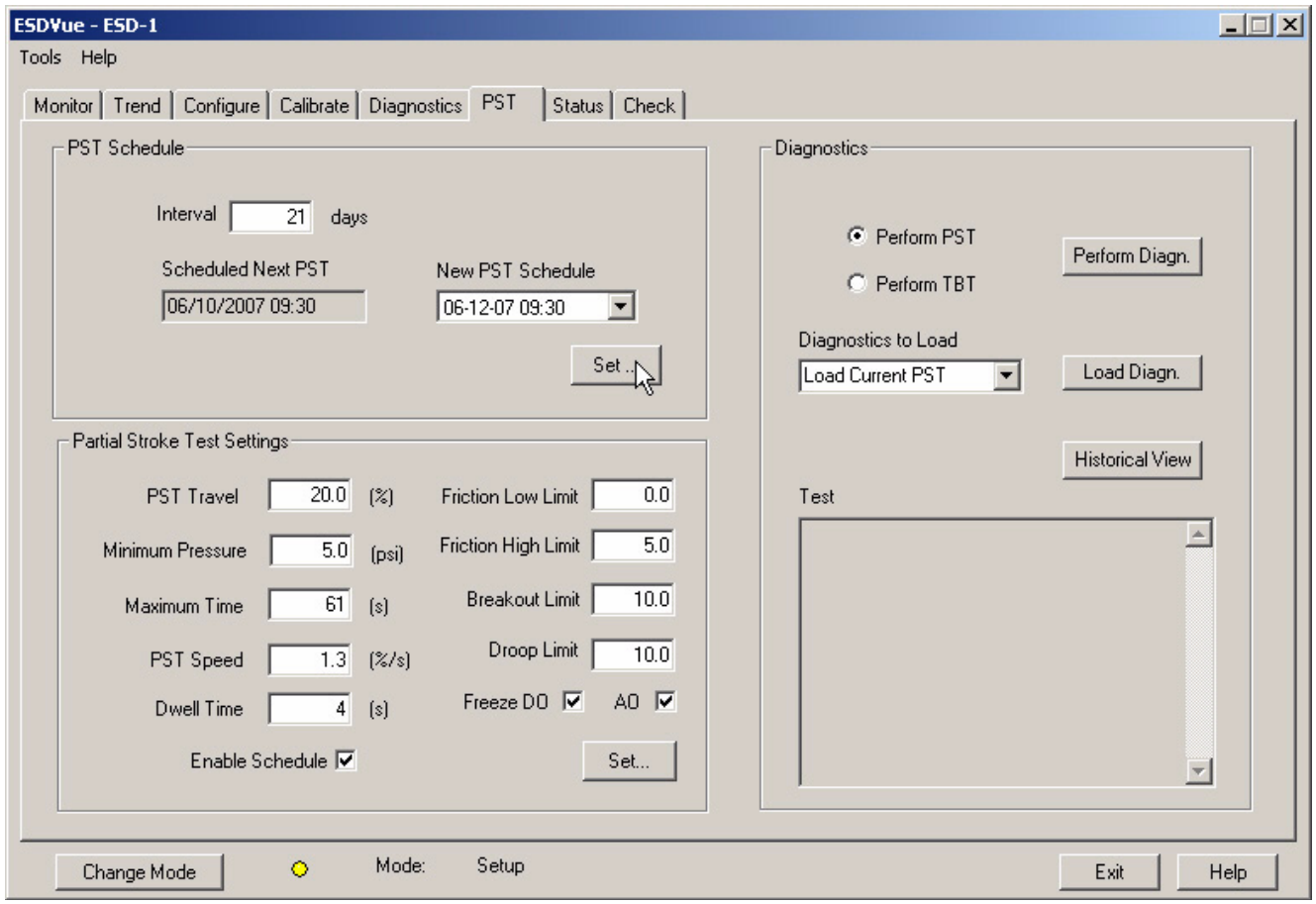


Figure 219 Saving Schedule Changes

PST Configuration

The PST configuration area allows you to configure PST, or partial stroke testing, operation.

Partial Stroke Test Settings

The configurable PST parameters are as follows:

- PST Travel - The allowed valve movement from full Open position in percentage of travel. A typical value is 20%. Maximum allowed is 30%. The greater the travel range, the more accurate the results from the PST Test.
- Minimum Pressure – The allowed reduction in pressure in the actuator to achieve the desired PST Travel. This value depends on the spring range and the valve/actuator hysteresis. To set this value, first, run an Extended Actuator signature from the Diagnostics screen. Then, locate on the Y-Axis of the signature, the X-Axis pressure value for the desired Travel target. For example, if the PST Travel is 30%, what is the pressure value to reach 70% travel. The Y-value selected must be on the upper curve of the graph.
- Maximum Time – The Allowed amount of time in seconds before the PST test aborts. This value can be determine as follows: Maximum Time = (Travel Range * 2 * PST Speed) + Dwell Time +5 seconds.
- PST Speed - The valve travel speed in % Travel per second.
- Dwell Time - The amount of time in seconds between the down ramp and the up ramp of valve stroke.
- Friction Low Limit - The alarm threshold for low friction. This alarm is set if the analyzed friction from the PST test is less than this value. Engineering units of pressure (PSI, kPa or BAR).
- Friction High Limit - The alarm threshold for high friction. This alarm is set if the analyzed friction from the PST test is more than this value. Engineering units of pressure (PSI, kPa or BAR).
- Breakout Limit - The alarm threshold for valve breakout force (force to initiate valve movement). This alarm is set if the analyzed friction from the PST test is more than this value. Engineering units of pressure (PSI, kPa or BAR).
- Droop Limit - The alarm threshold for air supply inlet droop. This alarm is set if the analyzed Air Supply Droop from the PST test is more than this value, indicating a possible clogged up air filter in the air set or lack of volume feeding the SVI II ESD. Engineering units of pressure (PSI, kPa or BAR).
- Freeze DO (Digital Output) – Enable for the DO2 (SW#2) to not change state during a PST.
- Freeze AO (Analog Output) - Enable for the built-in positioner transmitter to not update its output value during a PST.
- Enable Schedule - Enable to allow execution of the Automated PST Schedule.

- Set - Click to save PST configuration.

Figure 220 PST Settings

PST Travel

When configuring the PST Travel, since this is a Partial Stroke Test, you set the parameter as percentage of the total valve travel. The range for PST Travel is between 5% and 30%. If you set a value for PST Travel outside the 5 - 30% range you will receive the error message shown below.

Figure 221 PST Travel Error Message

Minimum Pressure

When configuring the Minimum Pressure for the PST you are configuring the minimum amount of pressure required for the Partial Stroke Test. The pressure change value is in the configured pressure units. The PST Pressure Change must be between -120.0 and 120.0 psi (-828 and 828 kPa, -8.28 and 8.28 bar). If you set a value for PST Travel outside the range you will receive an error message similar to the one shown below.

Figure 222 PST Pressure Change Error Message

Maximum Time

The Max Time parameter is the maximum amount of time allowed for the PST. The value should be between 5 and 300 seconds. If you set the Max Time for a value outside the range you will receive the error message displayed below.

Figure 223 Max Time Error Message

PST Speed

The PST Speed is defined in terms of % of the total PST travel per second. The range for PST speed is 0.25% and 10% in units of % per second. If you set the value for PST Speed outside the range you will receive the error message displayed below.

Figure 224 PST Speed Error Message

Dwell Time

The Dwell Time is the amount of time in seconds between ramp down and ramp up of valve stroke; similar to a threshold state. When performing a PST you want the dwell time range to be between 2 and 60 seconds. If you configure the Dwell Time parameter outside this range you will receive the error message displayed below.

Figure 225 Dwell Time Error Message

Friction Low Limit

Friction Low Limit is the minimum amount of pressure provided during the PST to overcome valve packing friction. You should configure the Friction Low Limit parameter in pressure units in a range between 0.0 to 30.0 psi (0.0 to 207 kPa, 0.000 to 2.069 bar). If you configure Friction Low Limit with a value outside the specified range you will receive an error message similar to the one shown below.

Figure 226 Friction Low Limit Error Message

Friction High Limit

Friction High Limit is the maximum amount of pressure provided during the PST to overcome valve packing friction. You should configure the Friction High Limit parameter in pressure units in a range between 0.0 to 30.0 psi (0.0 to 207 kPa, 0.000 to 2.069 bar). If you configure Friction High Limit with a value outside the specified range you will receive an error message similar to the one shown below.

Figure 227 Friction High Limit Error Messasge

Breakout Limit

The Breakout Limit is the maximum amount of pressure applied to cause valve to break loose and move. You should configure the Breakout Limit parameter in pressure units in a range between 0.0 to 30.0 psi (0.0 to 207 kPa, 0.000 to 2.069 bar). If you configure the Breakout Limit with a value outside the specified range you will receive an error message similar to the one shown below.

Figure 228 Breakout Limit Error Messasge

Droop Limit

The Droop Limit is the amount of pressure drop allowed between ramp down and ramp up of valve stroke in pressure units. You should configure the Droop Limit parameter in pressure units in a range between 0.0 to 30.0 psi (0.0 to 207 kPa, 0.000 to 2.069 bar). If you configure the Droop Limit with a value outside the specified range you will receive an error message similar to the one shown below.

Figure 229 Droop Limit Error Messasge

Freeze DO

The "Freeze DO" parameter will freeze the Digital Output during PST. To enable/disable Freeze DO check/uncheck the checkbox located to the right of Freeze DO.

Freeze AO

The "Freeze AO" parameter will freeze the Analog Output during PST. To enable/disable Freeze AO check/uncheck the checkbox located to the right of AO.

Enable Schedule

The Enable Schedule parameter allows you to enable the PST schedule defined in the PST Schedule function (see “PST Schedule” on page 202 for more information). To enable/disable the PST schedule check/uncheck the box located to the right of "Enable Schedule".

Set

The "Set" button allows you to save all the changes you have made and set the new PST Configuration.

To save changes:

1. Click on the "Set" button.
2. If the PST configuration is successfully saved ESDVue will launch the dialog displayed below.
3. Click on "OK" to close the dialog and return to the PST Screen.

Figure 230 PST Configuration Dialog

PST Diagnostics

One of the important safety features of the SVI II ESD is the ability to test functionality of the instrument. In addition to running a Partial Stroke Test (PST), the ESDVue provides advanced diagnostic capabilities and allows you to test the SVI II ESD terminal board and pneumatics and to run extended testing on the actuator. The diagnostics area of the PST Screen provides access to all the diagnostic testing, shows the results from current testing and allows you to load and view historical data.

Diagnostics Area

The diagnostics area of the PST Screen has the following features:

- Two diagnostic tests to choose:
  - Perform PST - perform Partial Stroke Test
  - Perform TBT - perform Terminal Board Test
- Perform Diagn. - button that executes selected diagnostic test
- Diagnostics to Load - Drop down list from which to select diagnostic data to load onto diagnostic graph
- Load Diagn. - loads selected diagnostic data onto diagnostic graph
- Historical View - provides a graphical, historical view of Partial Stroke Testing for a selected device and selected star/end dates
- Test - panel that displays results from executed PST and EXT

Figure 231 PST Diagnostics

Perform PST

The "Perform PST" diagnostic test runs the basic Partial Stroke Test (PST) on demand. The test also provides diagnostic results in a textual and a graphical format. PST can be performed in Normal or Setup mode.

To perform PST:

1. Select "Perform PST" by clicking the radio button, located to the left.
2. Click on "Perform Diagn."

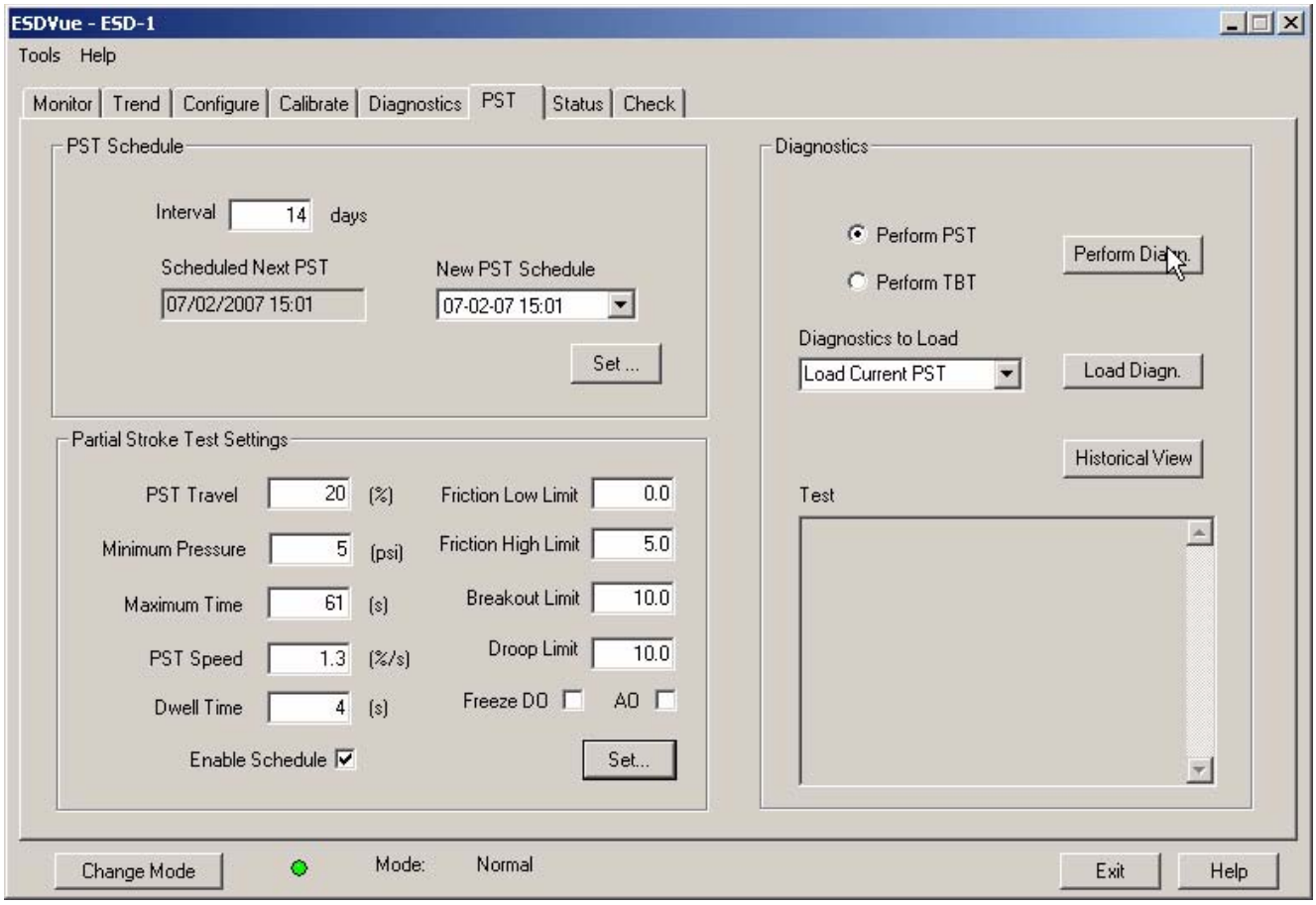


Figure 232 Starting PST

3. ESDVue will start the Partial Stroke Test and will display the progress dialog shown below.
4. You can cancel the test by clicking one of the cancel buttons.

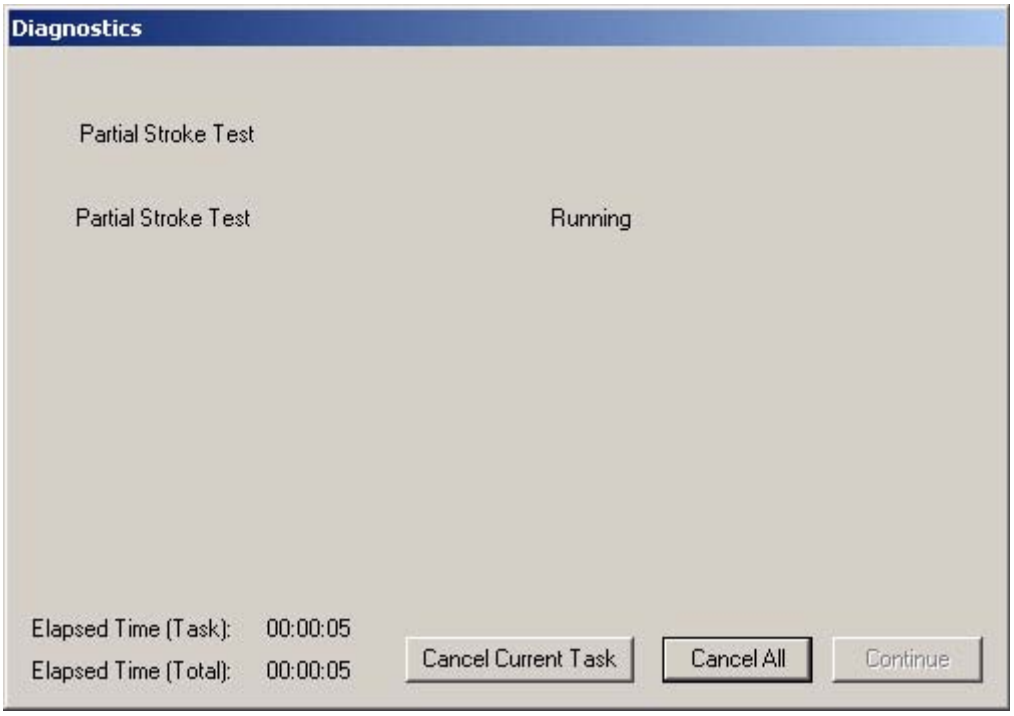


Figure 233 Partial Stroke Test Progress Dialog

5. When the Partial Stroke Test is complete the Diagnostics progress dialog will display "Partial Stroke Test Complete" as shown in the figure below.
6. Click on the "Continue" to close the Diagnostics progress dialog.

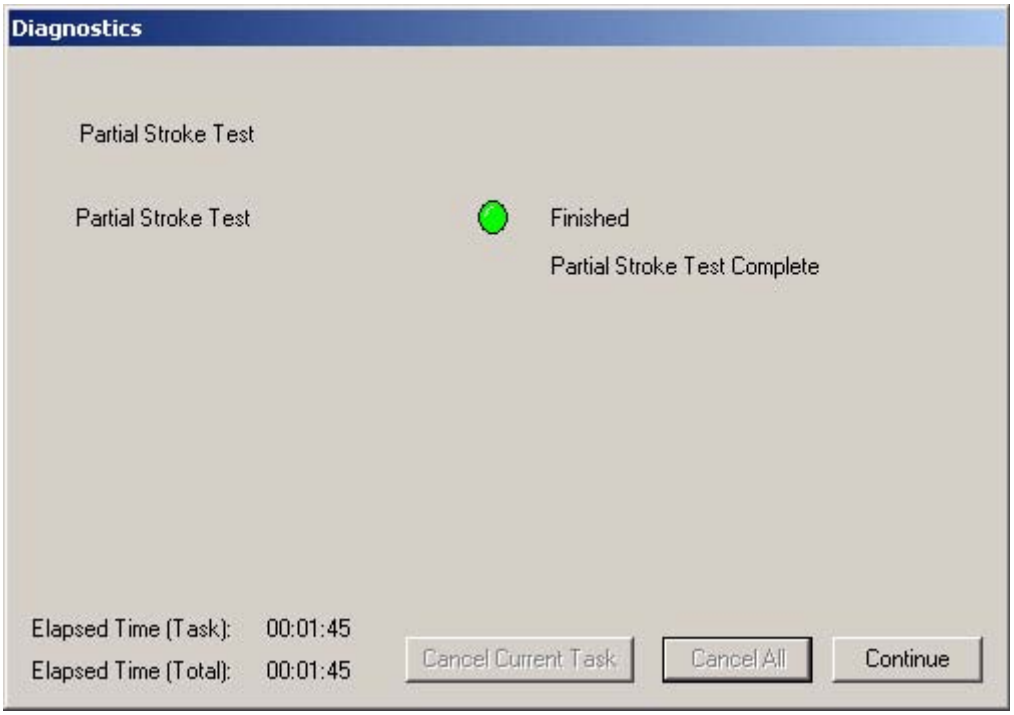


Figure 234 Partial Stroke Test Complete

7. After you close the Diagnostics progress dialog, ESDVue will display the PST Summary dialog that summarizes all PST results as values for each parameter and as pass/fail. From this dialog you can either view the PST Diagnostics Graph or click "Finish" to complete the PST and return to the PST Screen.

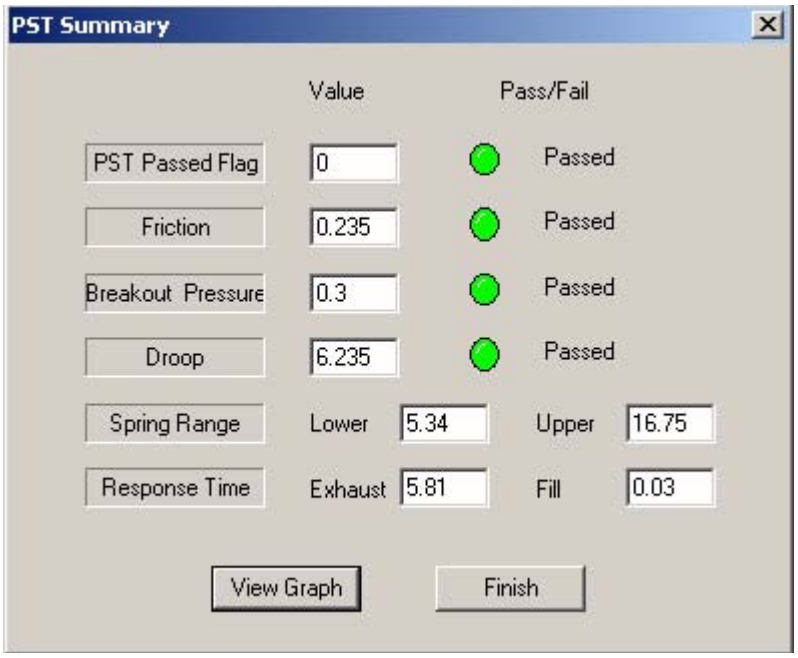


Figure 235 PST Summary

8. To view the PST Diagnostics Graph, click on "View Graph" as shown below. See “PST Diagnostic Graph” on page 218 for graph details.

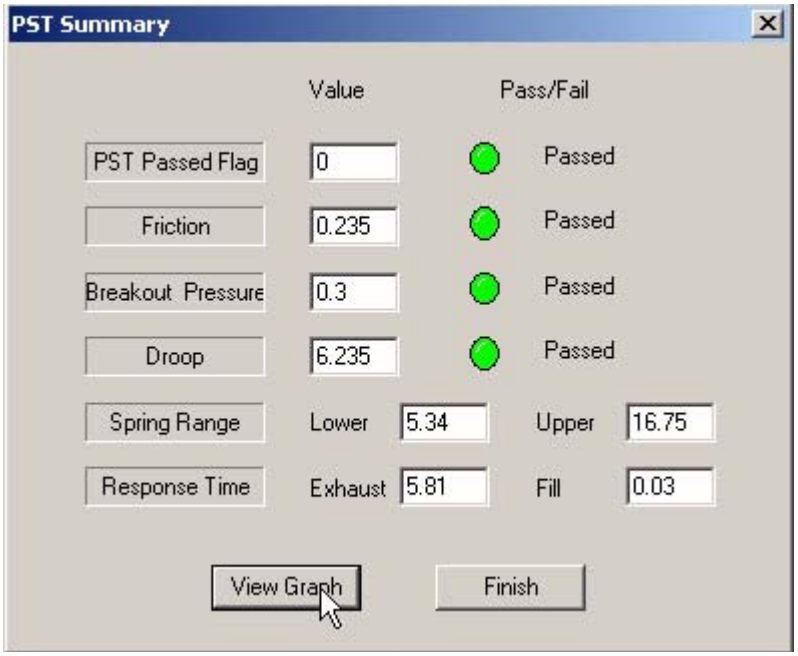


Figure 236 Launching "View Graph"

9. After you have finished viewing the PST Diagnostics graph and close it, ESDVue will return you to the PST Summary dialog, shown above.
10. In the PST Summary dialog click on "Finish" and ESDVue will close the window and return you to the PST Screen.
11. The Partial Stroke Test results will be displayed in the "Test" panel, located at the bottom right of the PST Screen as shown below.

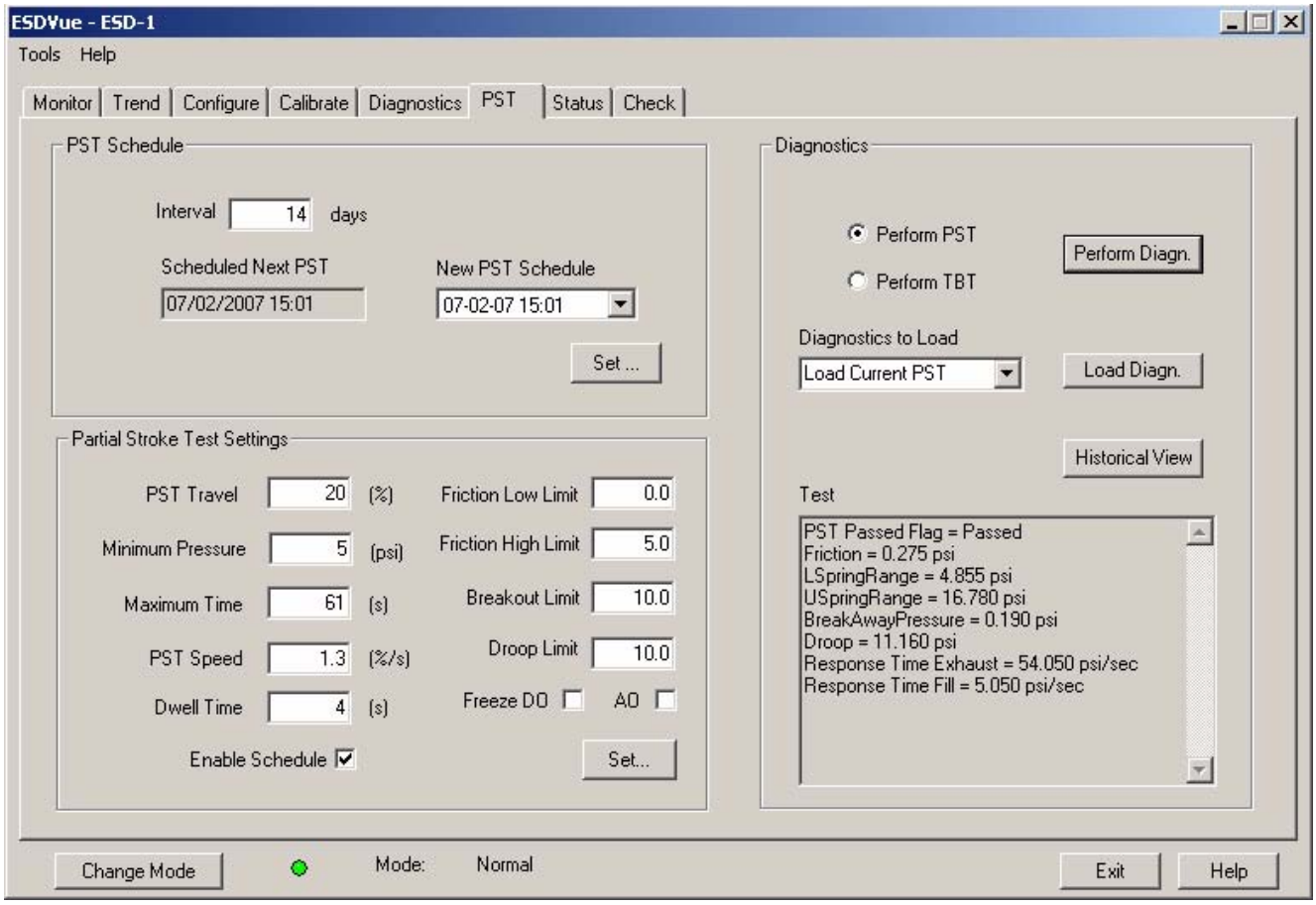


Figure 237 PST Results Displayed on PST Screen

PST Diagnostic Graph

After you complete the PST and select "View Graph" the results will displayed on the Diagnostic Graph as shown below. The Diagnostic Graph has several features that provide even further diagnostic capabilities.

- Set Graph Scale - allows you to change the coordinates of the Pressure, Position axes.
- Select Additional Curve - allows you to display an additional, selected, curve on the graph
- Show Computed Result - allows you to view the data in a numerical value format
- Pos. & Pres. vs Time - allows you to view PST result in a position and pressure vs. time format

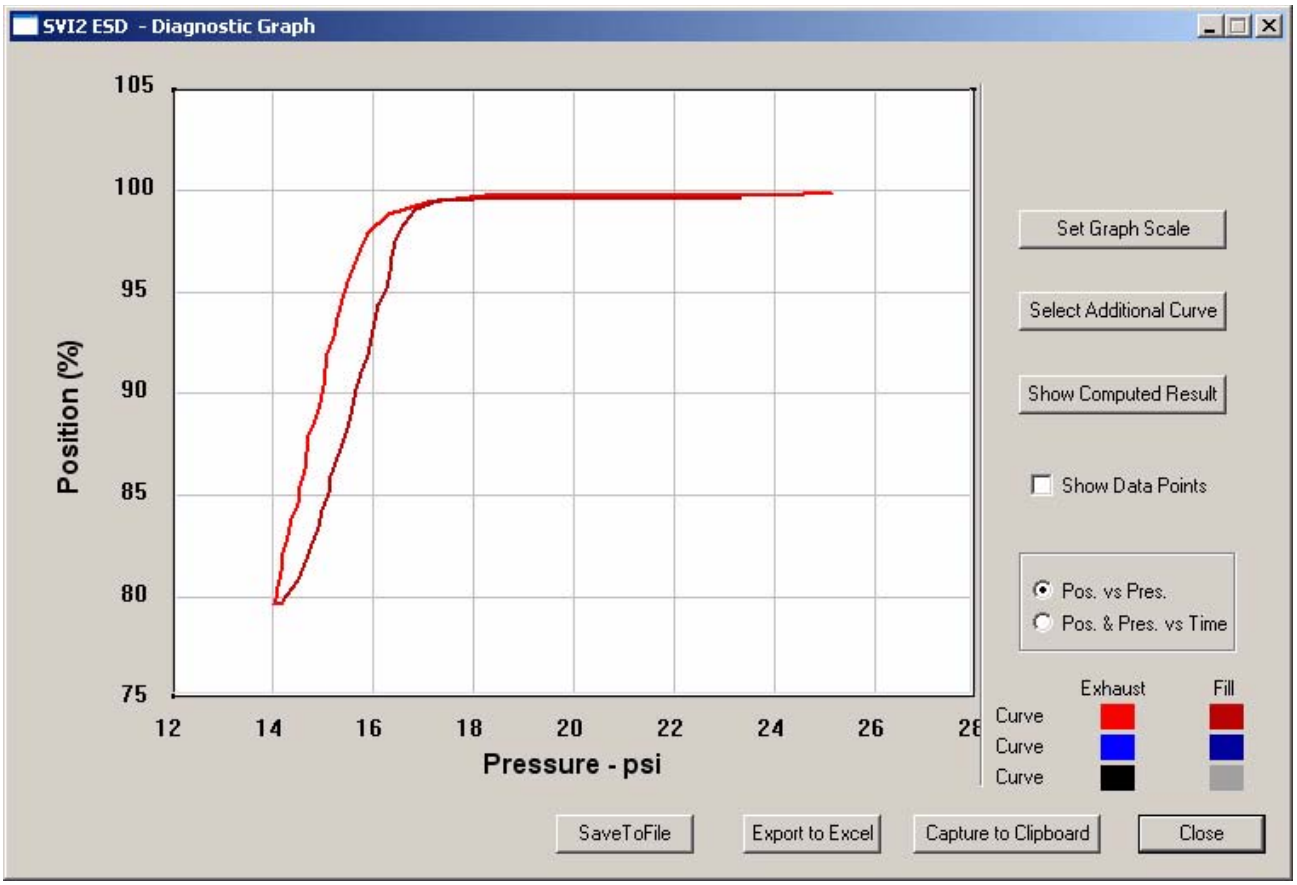


Figure 238 PST Diagnostic Graph

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curve" function).

Set Graph Scale

ESDVue allows you to change the graph scale on diagnostic graphs so that you can narrow in on one area of the graph, or expand the viewing area.

To change the graph scale:

1. Select "Set Graph Scale" as shown in the figure below.

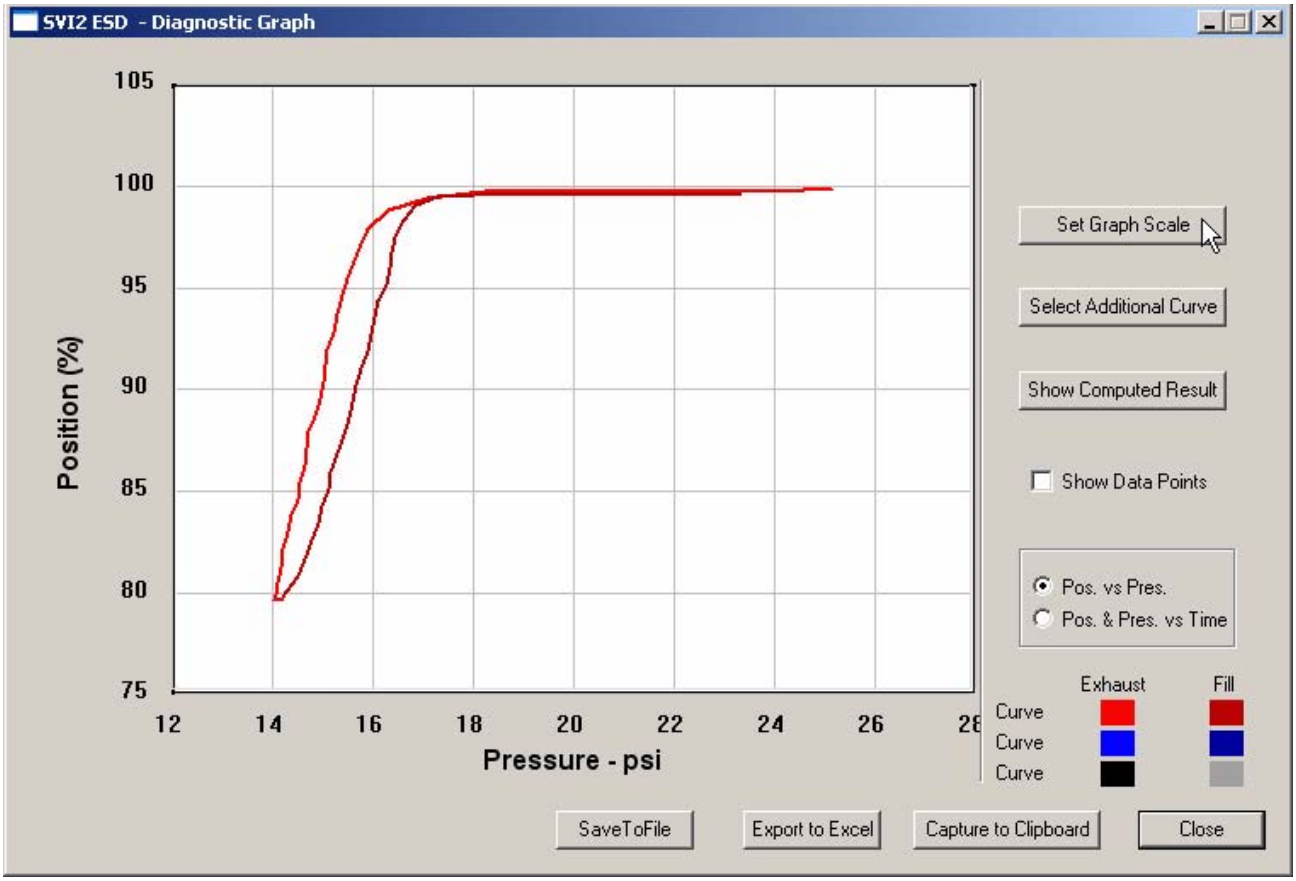


Figure 239 Selecting "Set Graph Scale"

2. ESDVue will launch the Set Graph Scale window shown below.

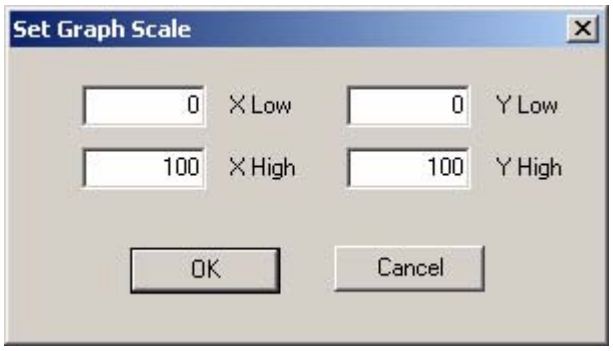


Figure 240 Set Graph Scale Window

3. Adjust the X axis and Y axis coordinates as necessary and click "OK".
4. The Diagnostic Graph will reflect the changes made to the axes.

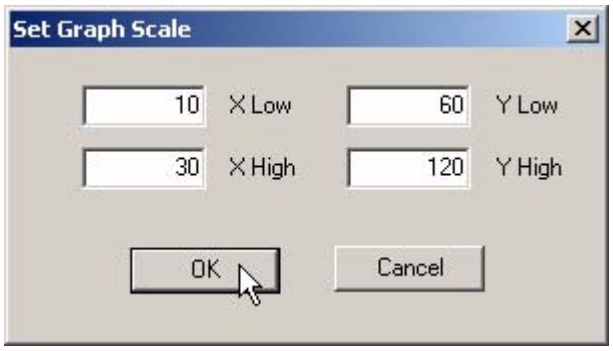


Figure 241 Saving Scale Adjustments

Select Additional PST Curve

ESDVue allows you to view more than one diagnostic curve at a time; being able to compare two curves may facilitate diagnostics.

To display an additional curve on the diagnostic graph:

1. Click on the "Select Additional Curve" button as shown below.

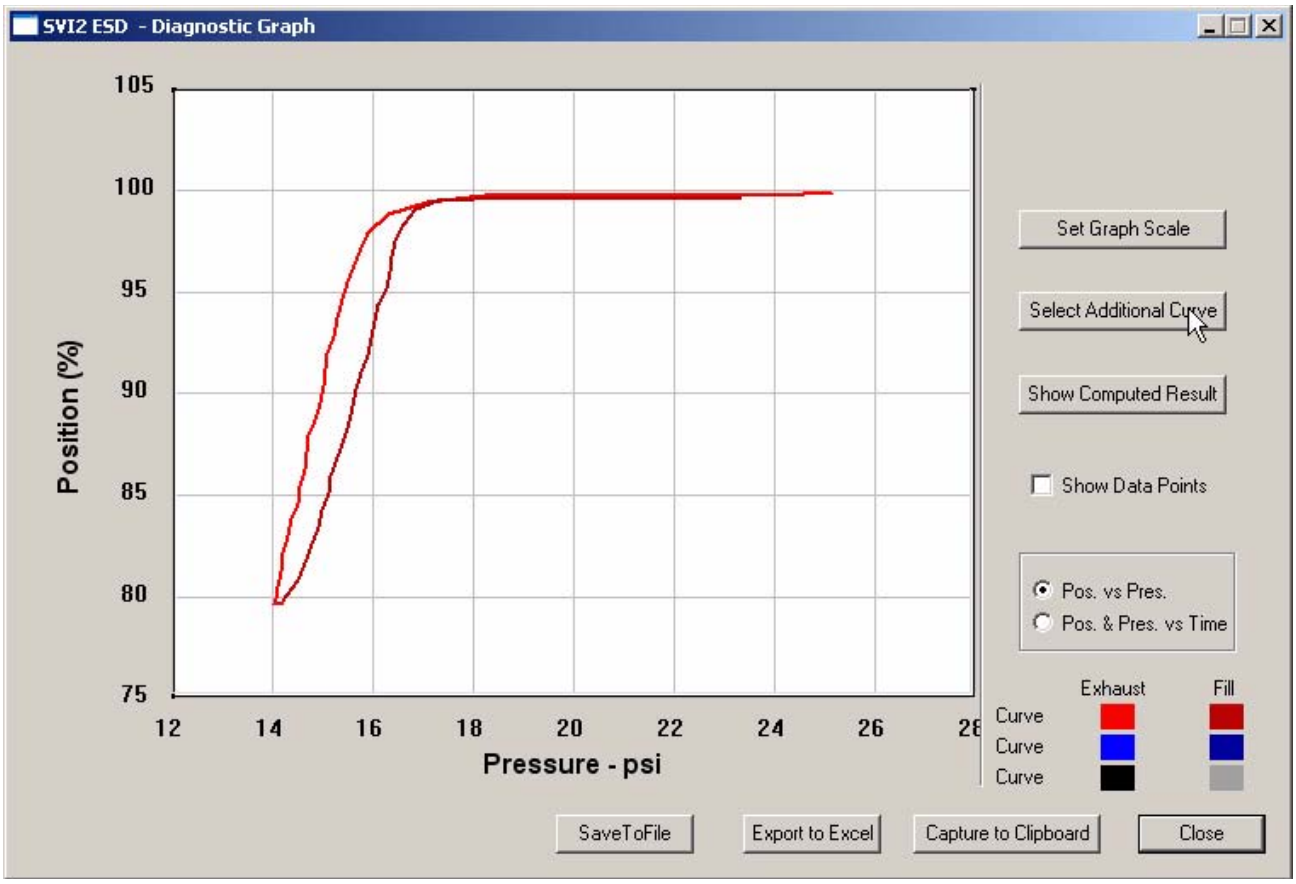


Figure 242 Starting "Select Additional Curve"

2. ESDVue will launch the dialog shown below.
3. Select the source of the additional curve:
   - ❖ Load Current Data in Device - loads current curve
   - ❖ Load Previous Data in Device - loads last saved curve
   - ❖ Load Data from Database - launches window to select data from database
   - ❖ Load Data from File - launches to browser to select file to load

Figure 243 Selecting Data Source

4. After you have selected the additional curve it is displayed as an overlay on the diagnostic graph.

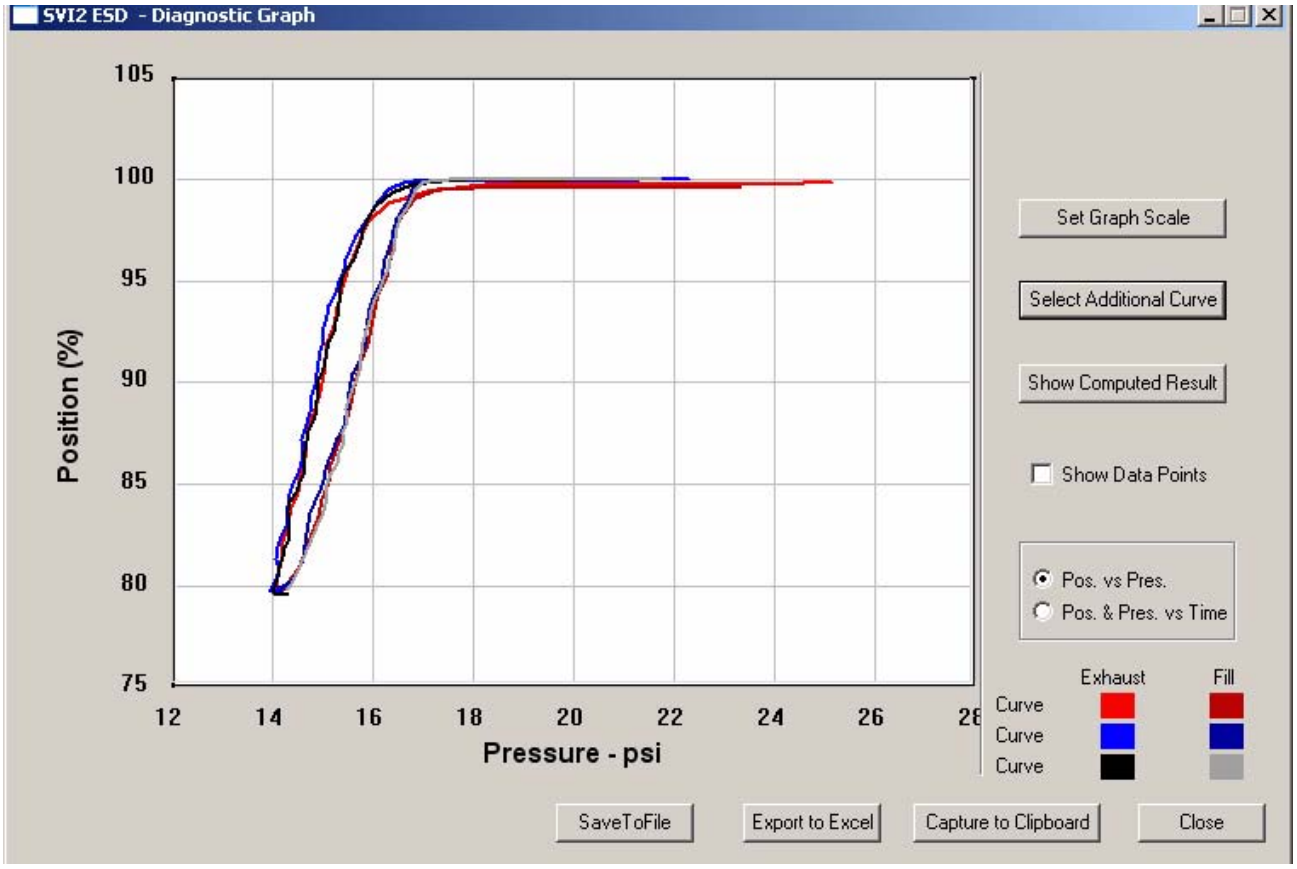


Figure 244 Additional PST Curve Displayed

Show Computed PST Result

ESDVue allows you to view the results of the Partial Stroke Test and any other diagnostic test as a table of numerical values.

To launch the computed result for the active PST:

1. Click on "Show Computed Result".

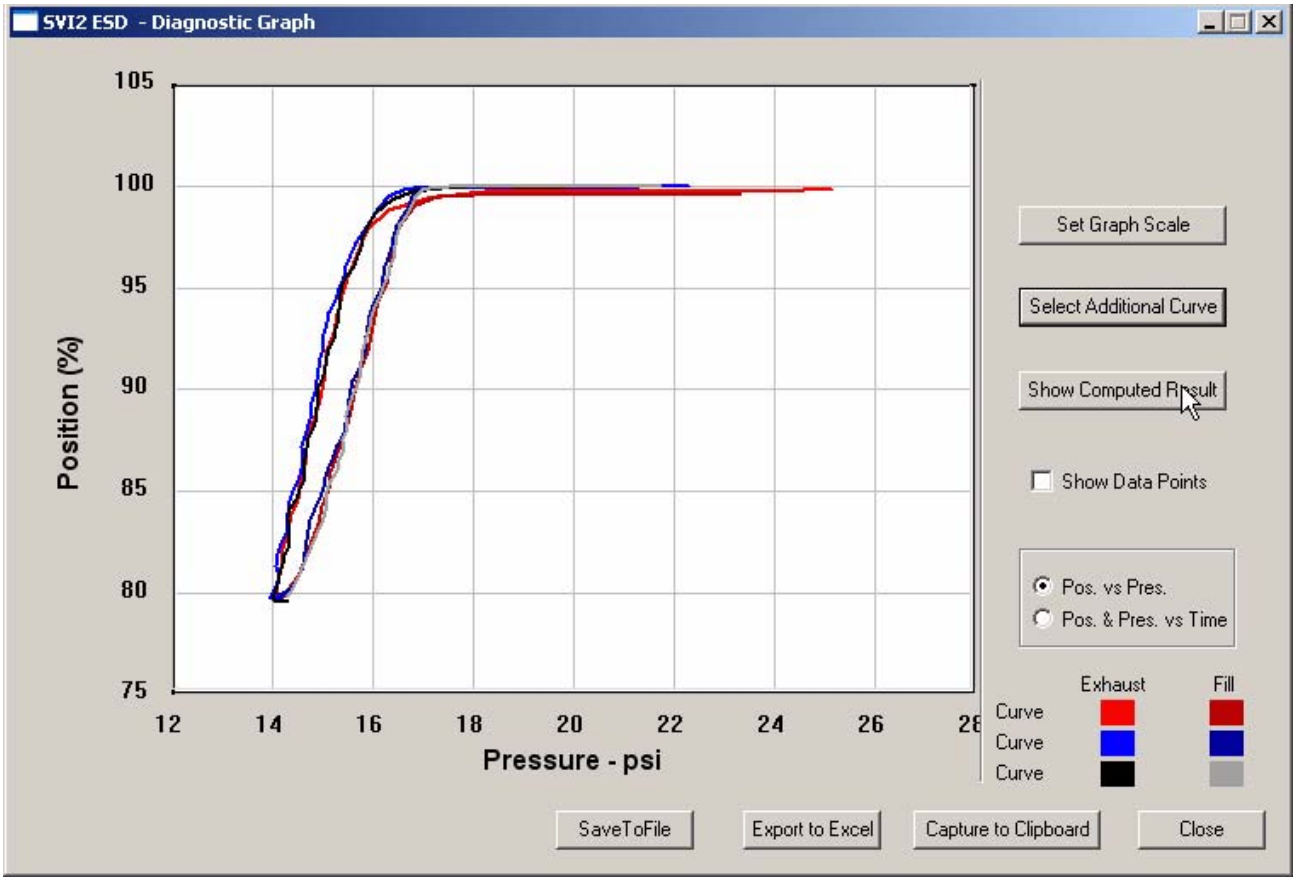


Figure 245 Selecting "Show Computed Result"

2. ESDVue will launch the Partial Stroke Test Result in the window shown below.
3. All diagnostic results are displayed in a numerical format.

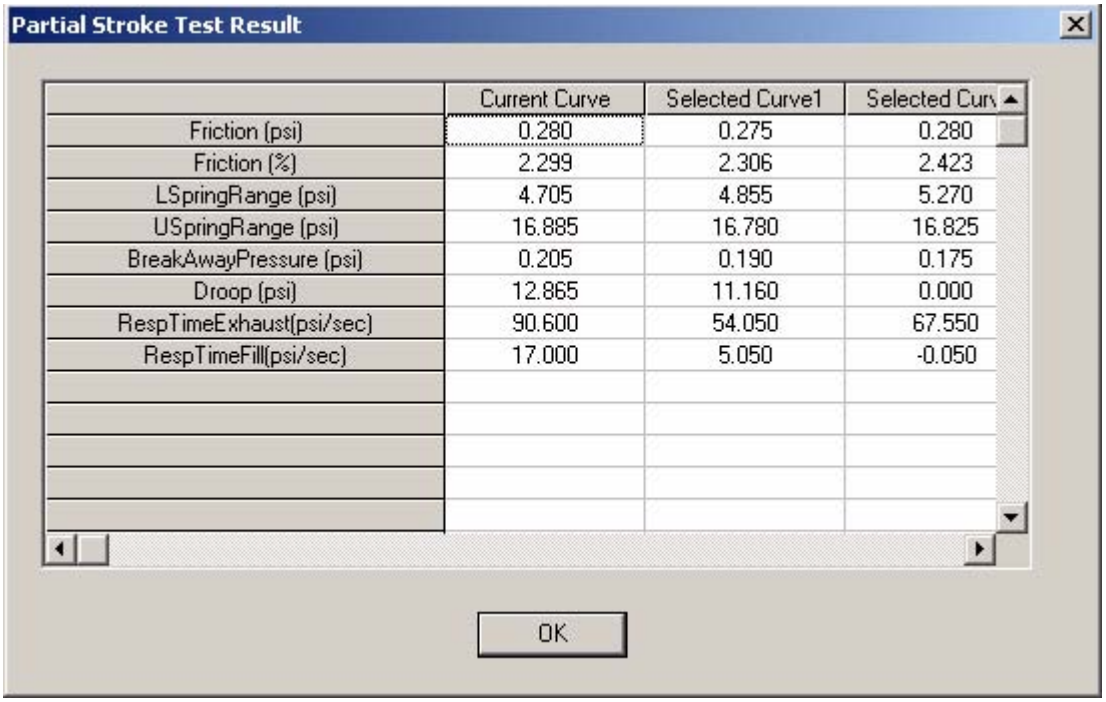


Figure 246 PST Diagnostics Computed Result

Pos. & Pres. vs Time

ESDVue allows you to view the PST results on the Diagnostic Graph in two views:

- Pos. vs Pres. - Position vs Pressure, the default view when the diagnostic graph is launched and is represented by the red curve, as shown in Figure 238 on page 218.
- Pos. & Pres. vs Time - Position and Pressure vs. Time, an additional view displayed above the Position vs Pressure view, that displays the ramp down and up of the PST, and is represented by the blue curve as shown in Figure 247 below.

To display the Position and Pressure vs. Time view:

1. Click the radio button beside "Pos. & Pres. vs Time" as shown below.

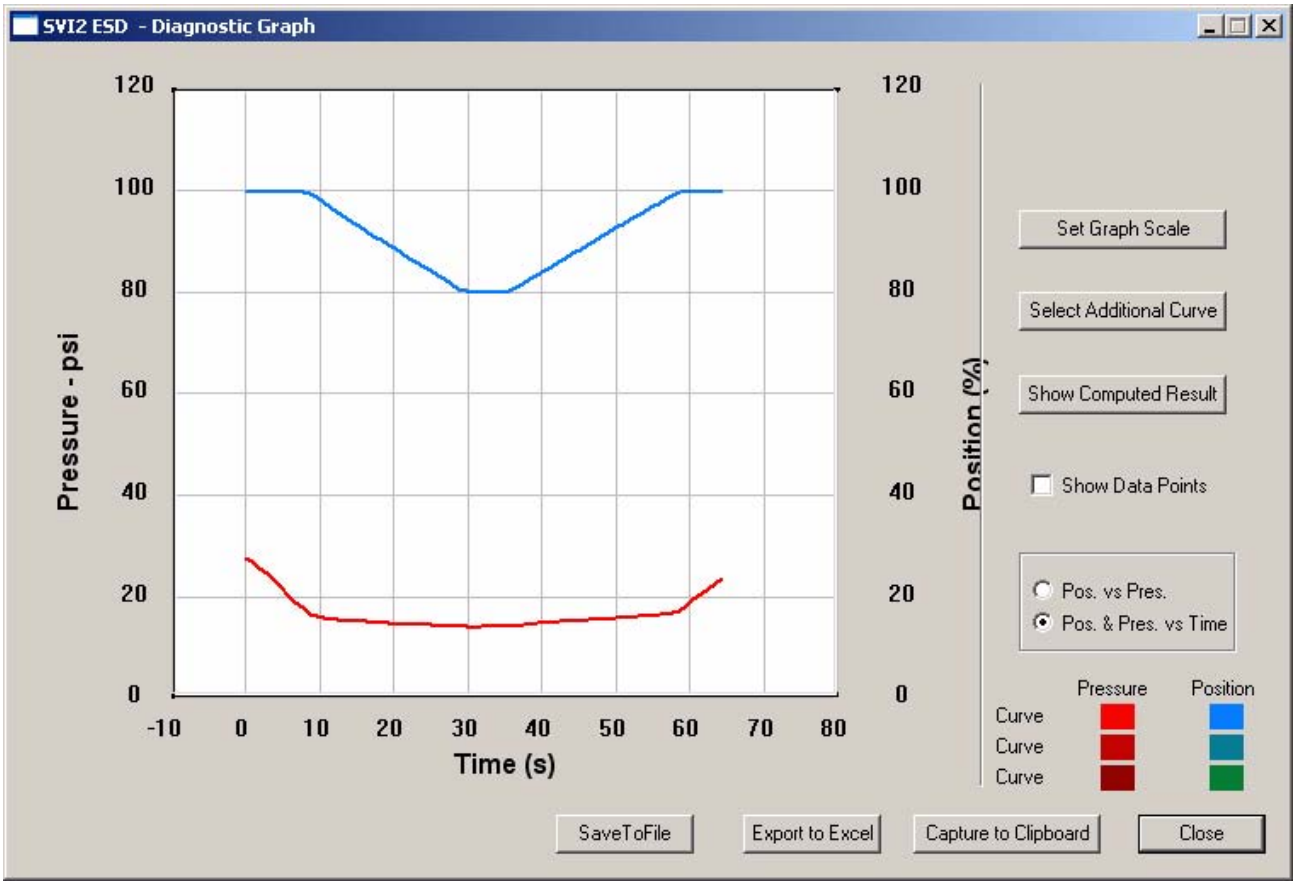


Figure 247 Position and Pressure vs. Time View

Save to File

ESDVue allows you to save diagnostic graphs in a graphical format as .dgn files to any specified location.

To save a diagnostic graph to a file:

1. Select "Save To File" as shown below.

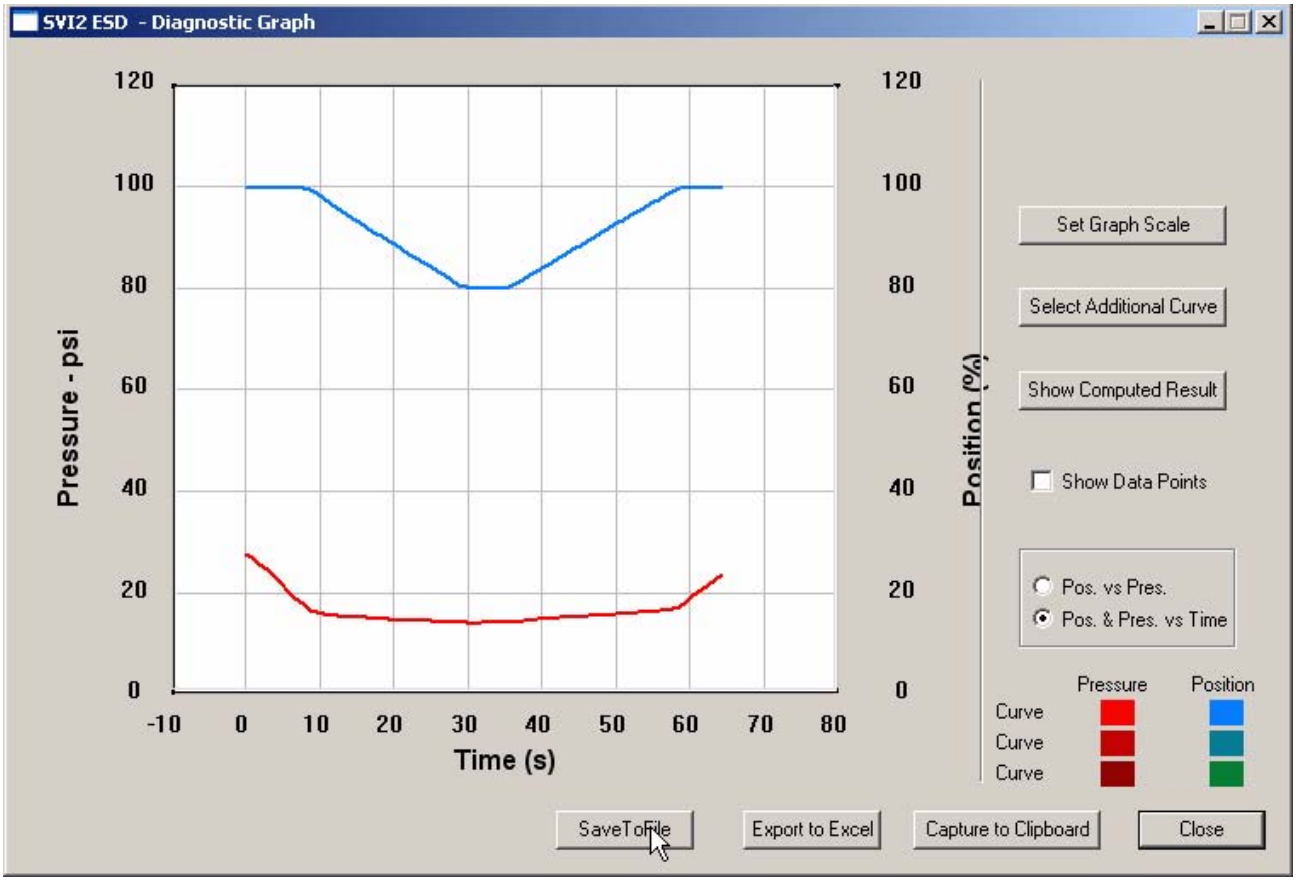


Figure 248 Selecting "Save to File"

2. ESDVue will launch a Windows file browser as shown below.

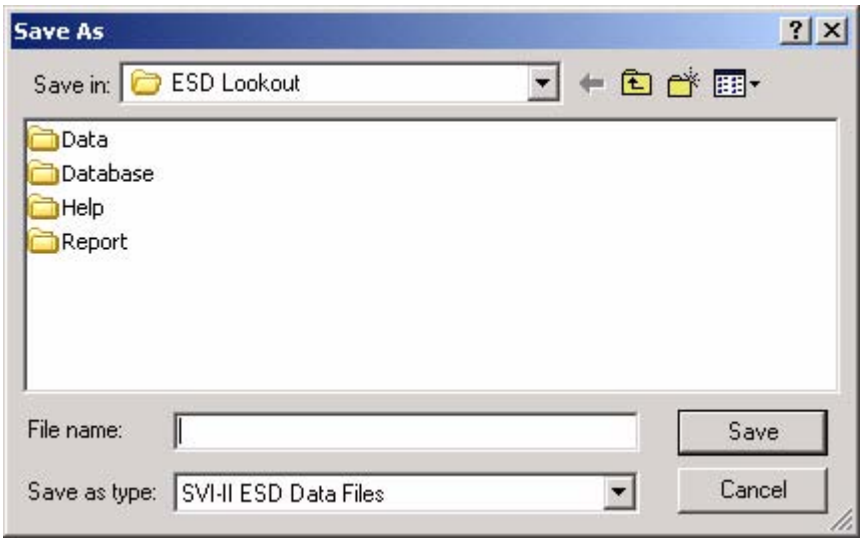


Figure 249 File Browser

3. Locate the folder in which you would like to save the file.
4. Enter a file name.
5. Click on "Save".
6. ESDVue will then close the browser window and return the diagnostic graph.

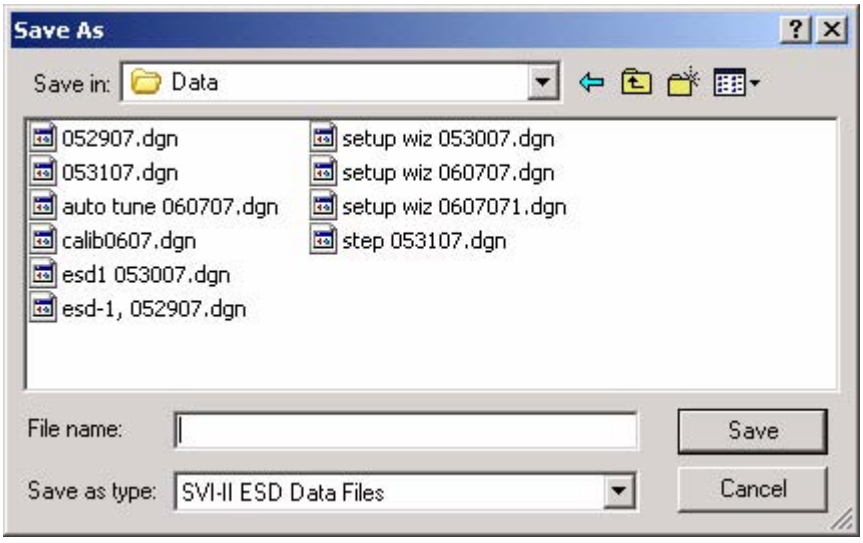


Figure 250 Selecting a Folder for Saving File

Export to Excel

ESDVue allows you to save or create a comma separated value file (.csv) of the diagnostic data from a graph and export the file to Excel. With the Excel file you can create graphs or perform other analysis.

To export a graph to Excel:

1. Click on "Export to Excel" as shown below.

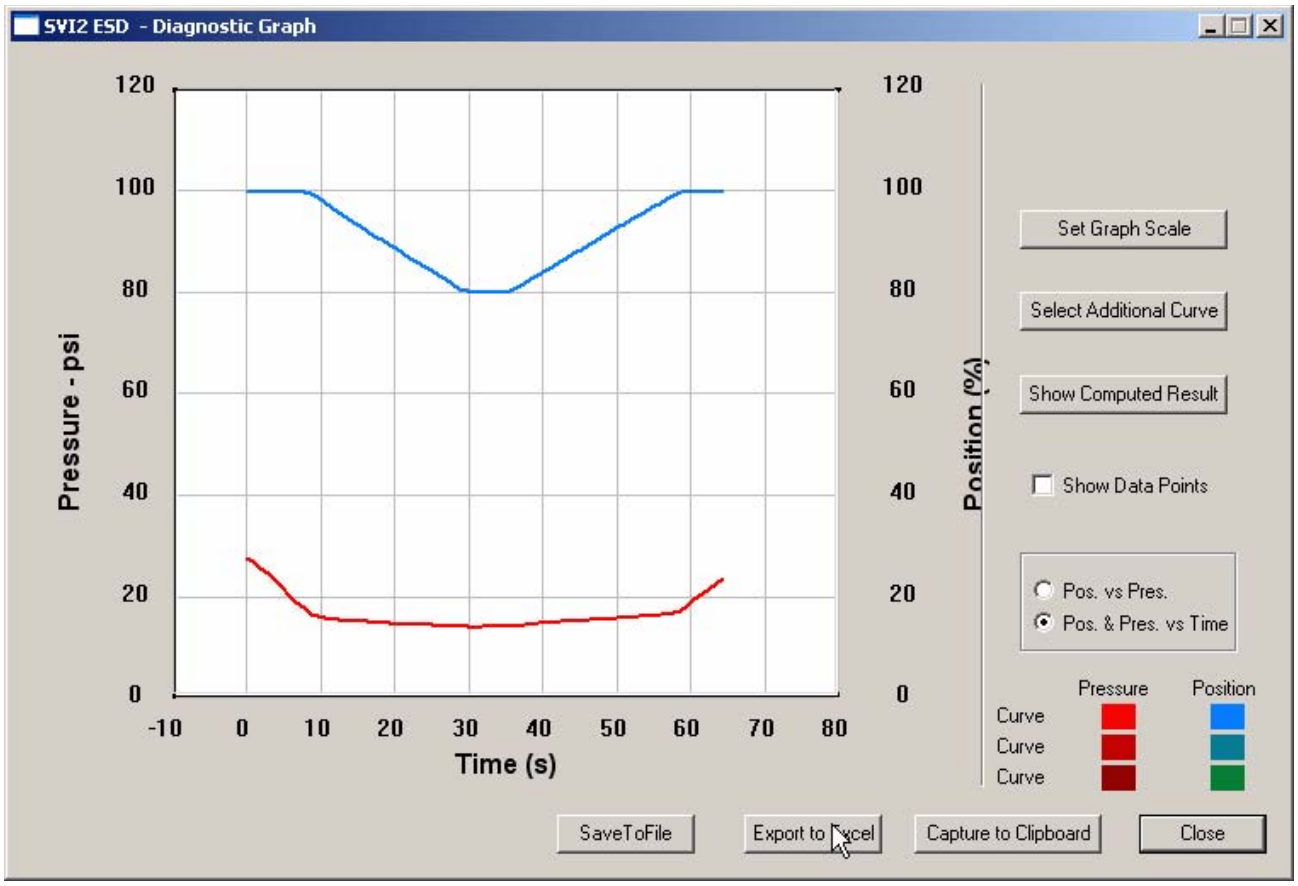
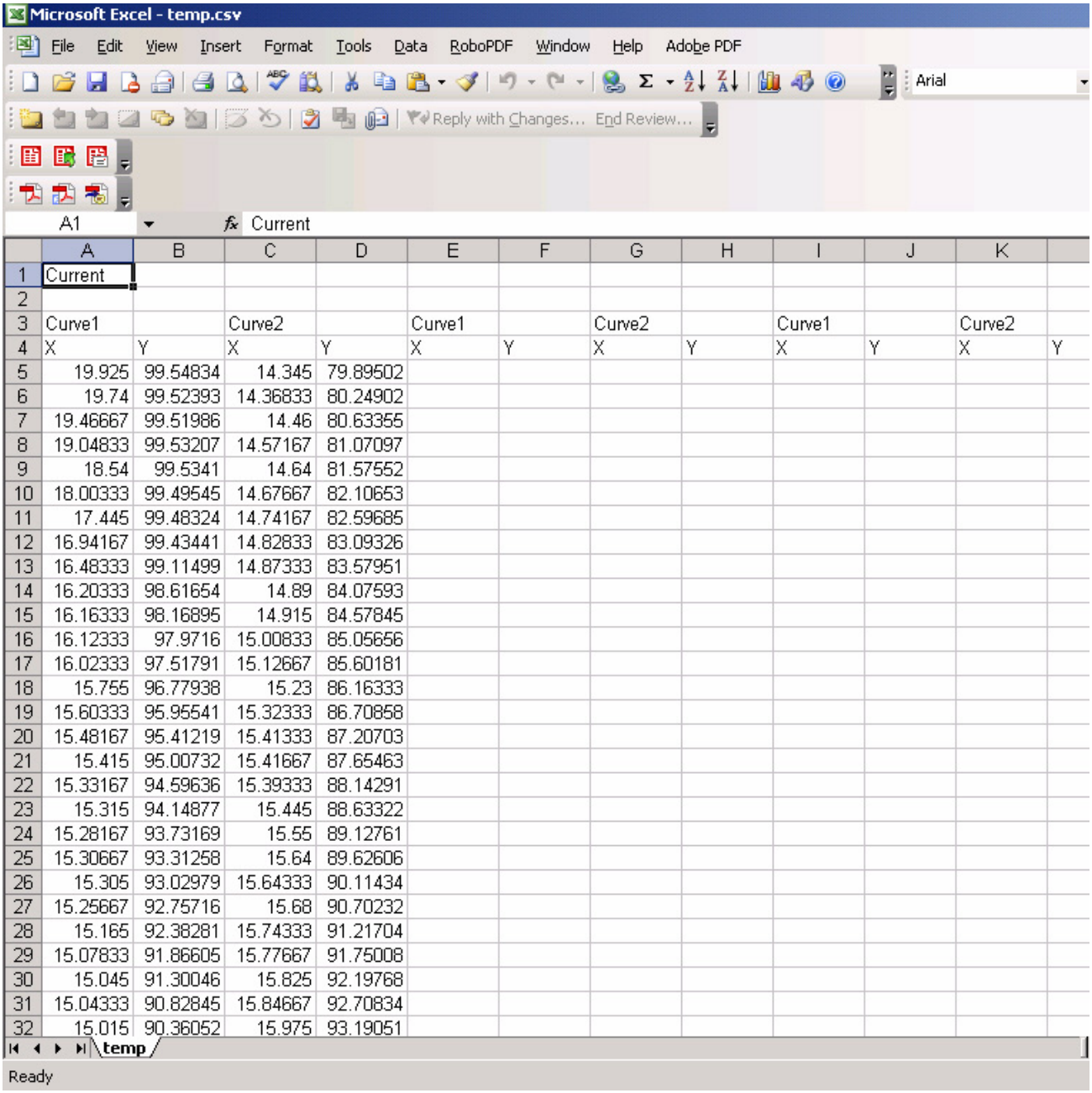


Figure 251 Selecting "Export to Excel"

2. ESDVue will launch Microsoft Excel and display the X axis and Y axis values, taken from the diagnostic graph, as Excel values as shown in the figure below.



	A	B	C	D	E	F	G	H	I	J	K	
1	Current											
2												
3	Curve1		Curve2		Curve1		Curve2		Curve1		Curve2	
4	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
5	19.925	99.54834	14.345	79.89502								
6	19.74	99.52393	14.36833	80.24902								
7	19.46667	99.51986	14.46	80.63355								
8	19.04833	99.53207	14.57167	81.07097								
9	18.54	99.5341	14.64	81.57552								
10	18.00333	99.49545	14.67667	82.10653								
11	17.445	99.48324	14.74167	82.59685								
12	16.94167	99.43441	14.82833	83.09326								
13	16.48333	99.11499	14.87333	83.57951								
14	16.20333	98.61654	14.89	84.07593								
15	16.16333	98.16895	14.915	84.57845								
16	16.12333	97.9716	15.00833	85.05656								
17	16.02333	97.51791	15.12667	85.60181								
18	15.755	96.77938	15.23	86.16333								
19	15.60333	95.95541	15.32333	86.70858								
20	15.48167	95.41219	15.41333	87.20703								
21	15.415	95.00732	15.41667	87.65463								
22	15.33167	94.59636	15.39333	88.14291								
23	15.315	94.14877	15.445	88.63322								
24	15.28167	93.73169	15.55	89.12761								
25	15.30667	93.31258	15.64	89.62606								
26	15.305	93.02979	15.64333	90.11434								
27	15.25667	92.75716	15.68	90.70232								
28	15.165	92.38281	15.74333	91.21704								
29	15.07833	91.86605	15.77667	91.75008								
30	15.045	91.30046	15.825	92.19768								
31	15.04333	90.82845	15.84667	92.70834								
32	15.015	90.36052	15.975	93.19051								

Figure 252 Diagnostic Graph Data - in Excel

Perform TBT

One of the diagnostic tests the ESDVue provides is the TBT, Terminal Board and Pneumatics test. You can run this test with ESDVue in any mode.

To perform TBT:

1. Select the radio button located to the left of "Perform TBT"
2. Click on "Perform Diagn."

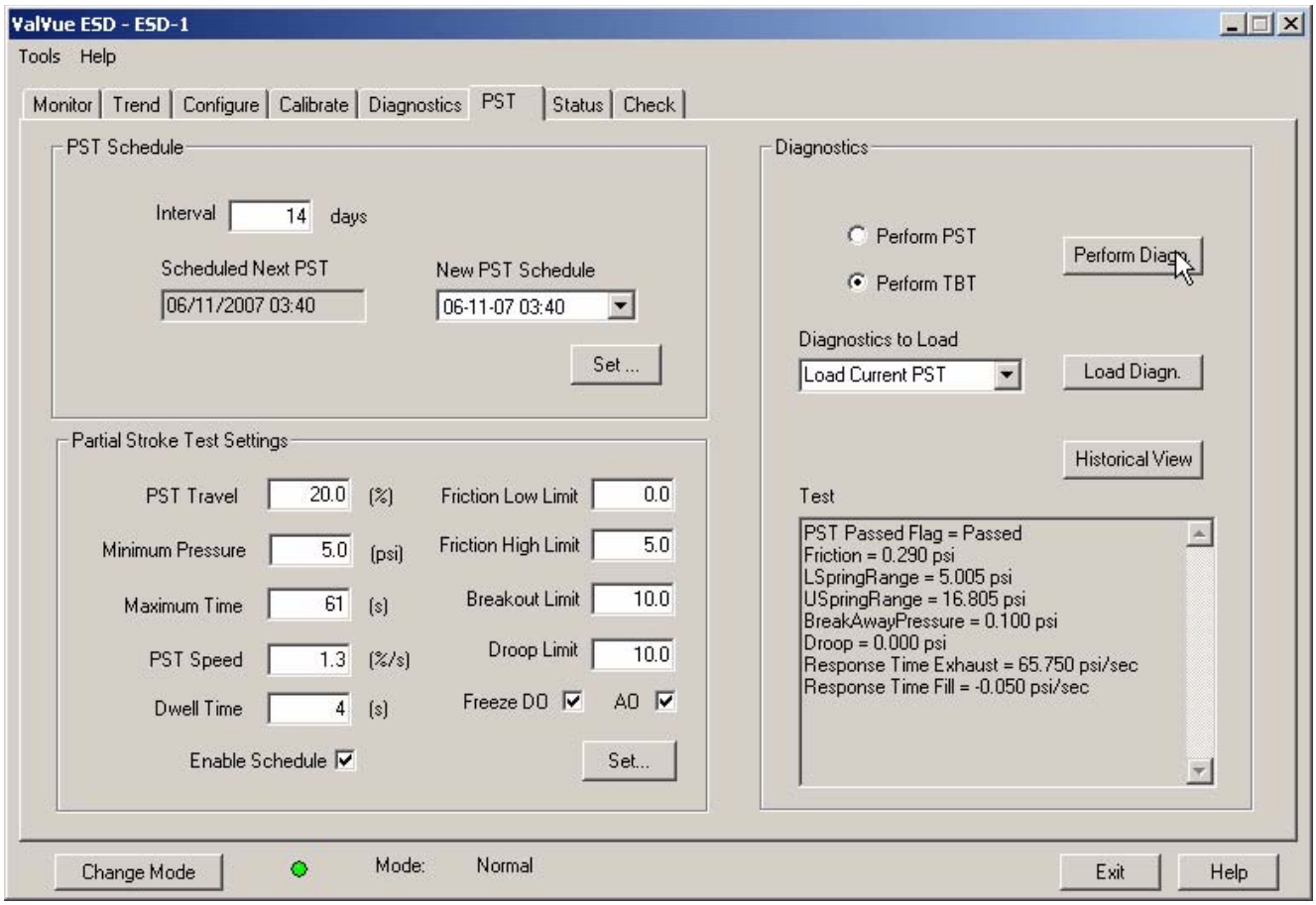


Figure 253 Executing TBT

3. ESDVue will start the Partial Stroke Test and will display the progress dialog shown below.
4. You can cancel the test by clicking one of the cancel buttons.

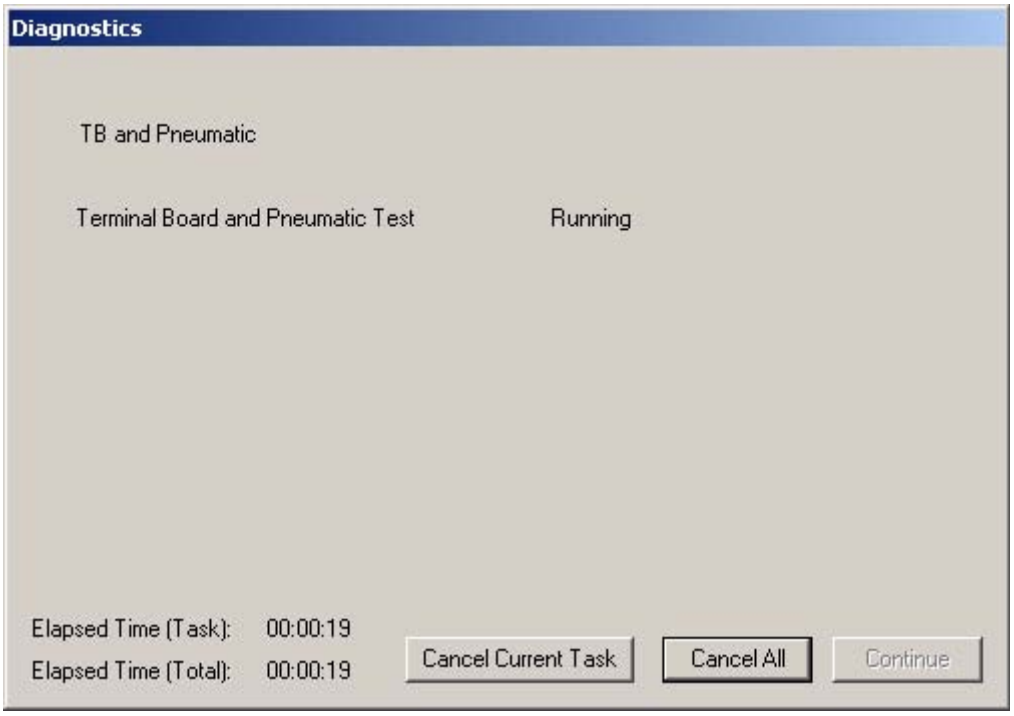


Figure 254 Terminal Board and Pneumatic Test Progress Dialog

5. When the TB and Pneumatic Test is completed the Diagnostics progress dialog will display "TB and Pneumatic Test Complete" as shown in the figure below.
6. Click on "Continue" to close the Diagnostics progress dialog and return to the PST Screen.

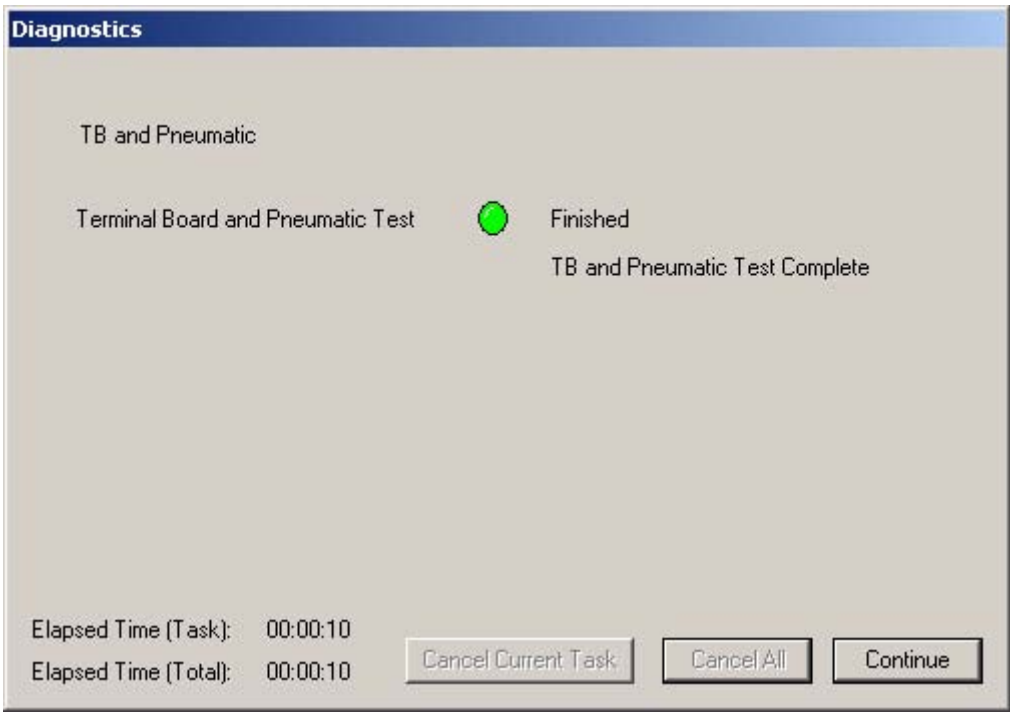


Figure 255 Terminal Board and Pneumatic Test Complete

Load Diagnostic Data

The Load Diagnostics function allows you to load previously saved data onto the Diagnostic Graph. To load data:

First select the data source from the "Diagnostics to Load" drop down list.

- Load Current PST - loads the most recent PST results for the current device
- Load Saved PST - loads the last saved PST results for the current device
- Load Tripped Data - loads the tripped data for the current device
- Load From Database - allows you to select a device and data type from the ESDVue database and view the diagnostics file.
- Load From File - allows you to select a saved diagnostics file and view it.

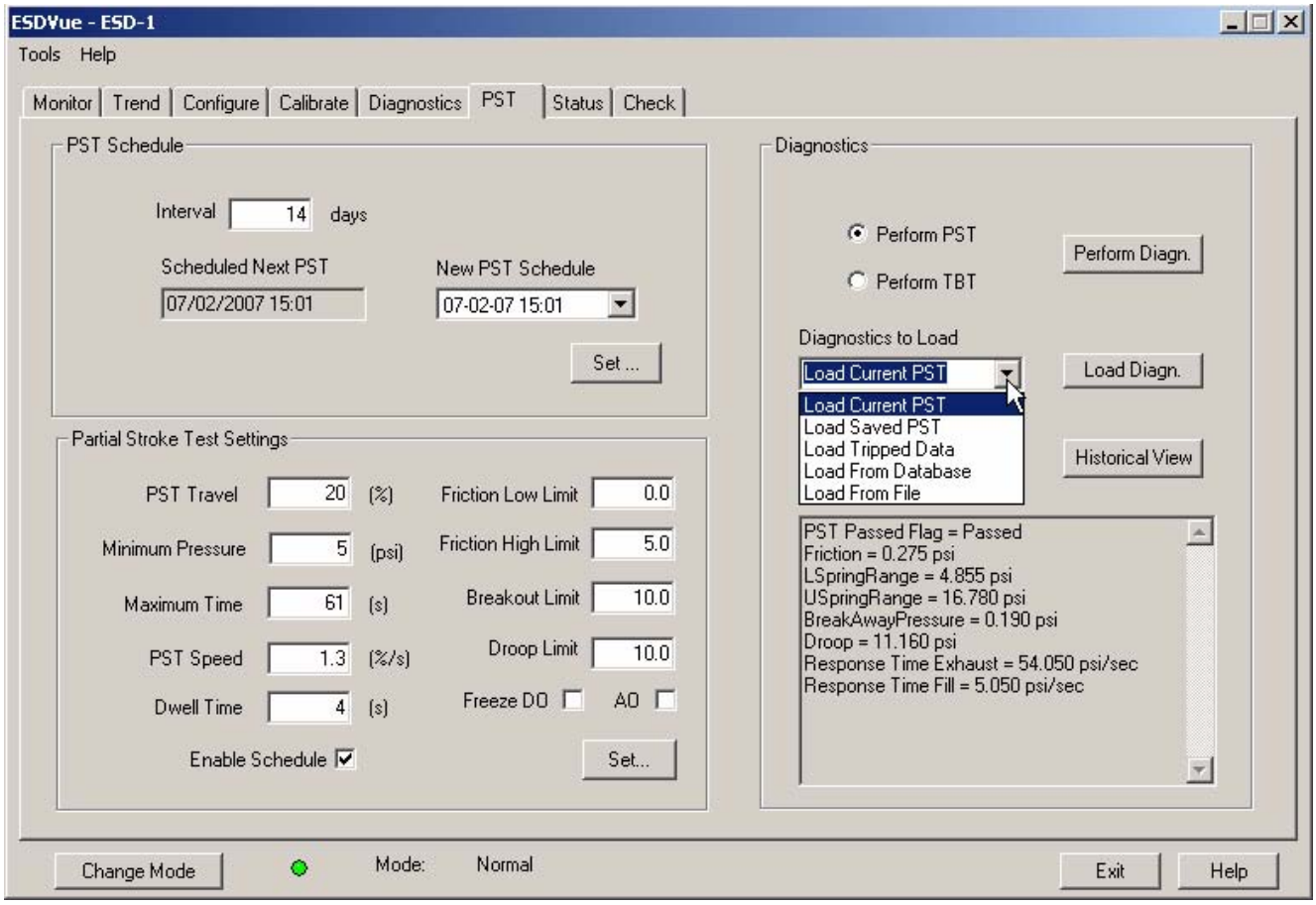


Figure 256 Load Data Selections

Load Data from Database

Every time you execute a diagnostic test ESDVue saves the data from the test to a database. On the PST Screen you can select and load diagnostic data from the database.

To load diagnostics from the database:

1. Click in the drop down list located below "Diagnostics to Load".
2. Scroll through the drop down list until you locate "Load From Database".

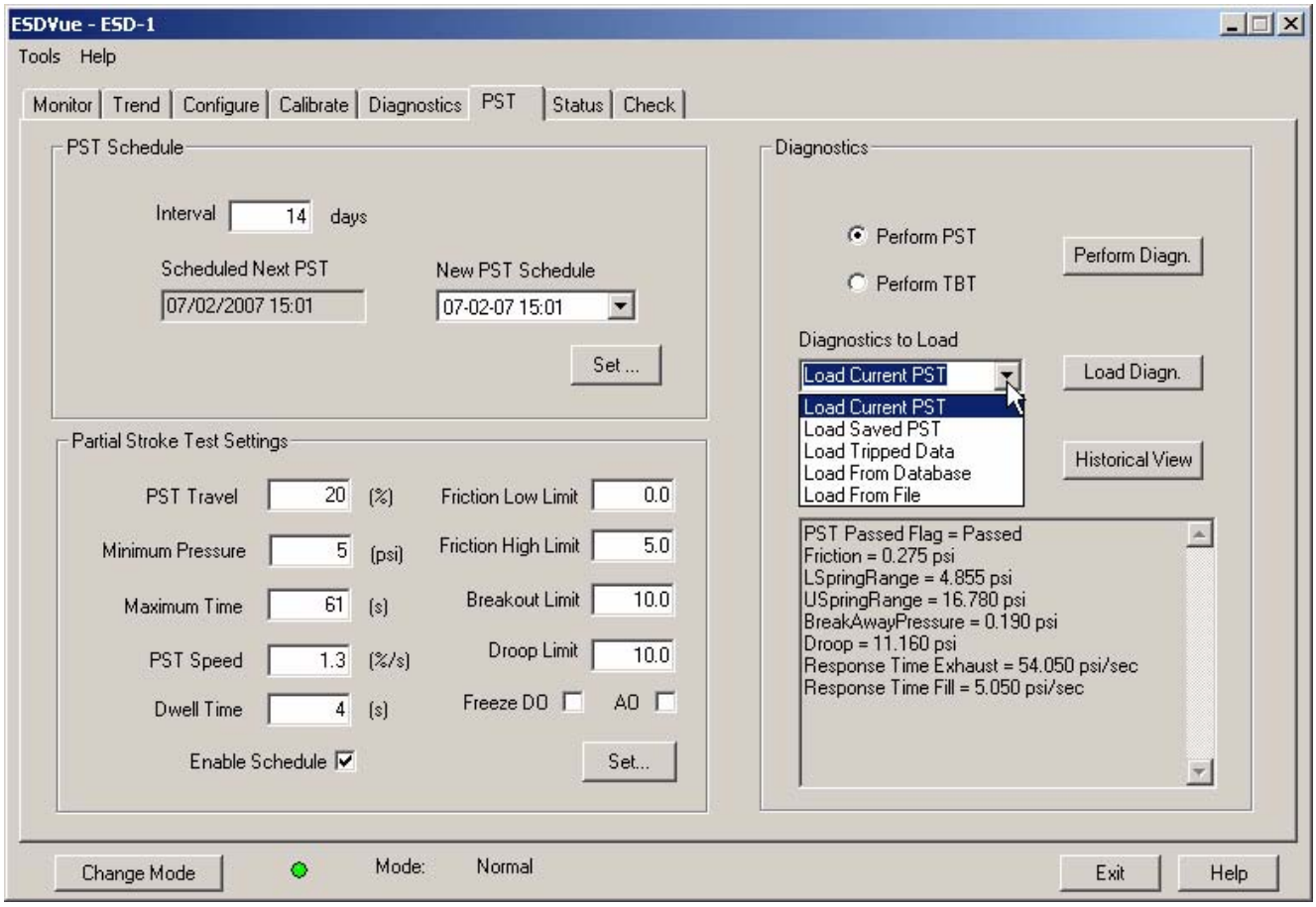


Figure 257 Selecting Data to Load

3. Click on "Load From Database".
4. The "Diagnostics to Load" field will fill with "Load From Database".

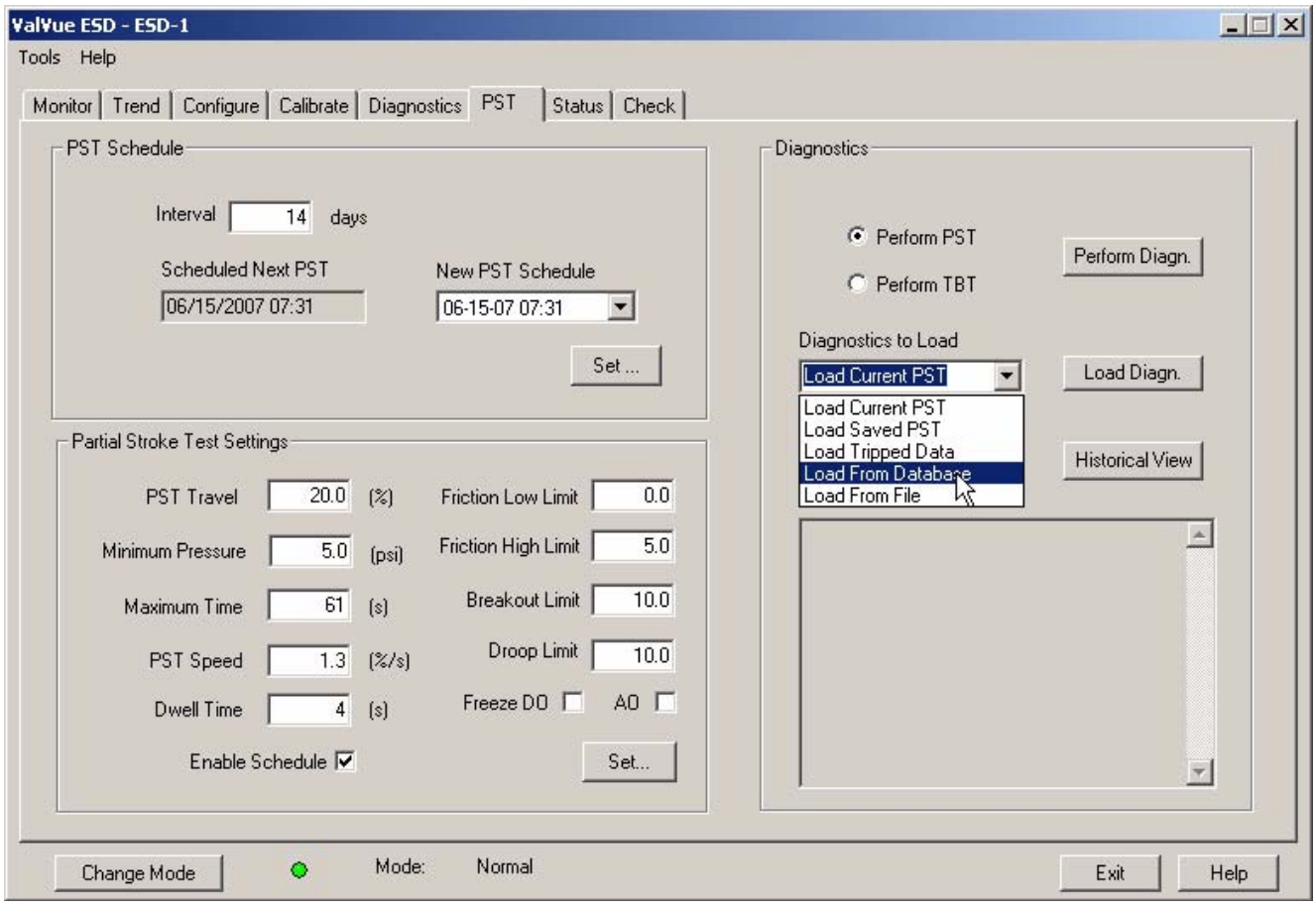


Figure 258 Selecting "Load From Database"

5. Click on the "Load Diagn." button as shown below.

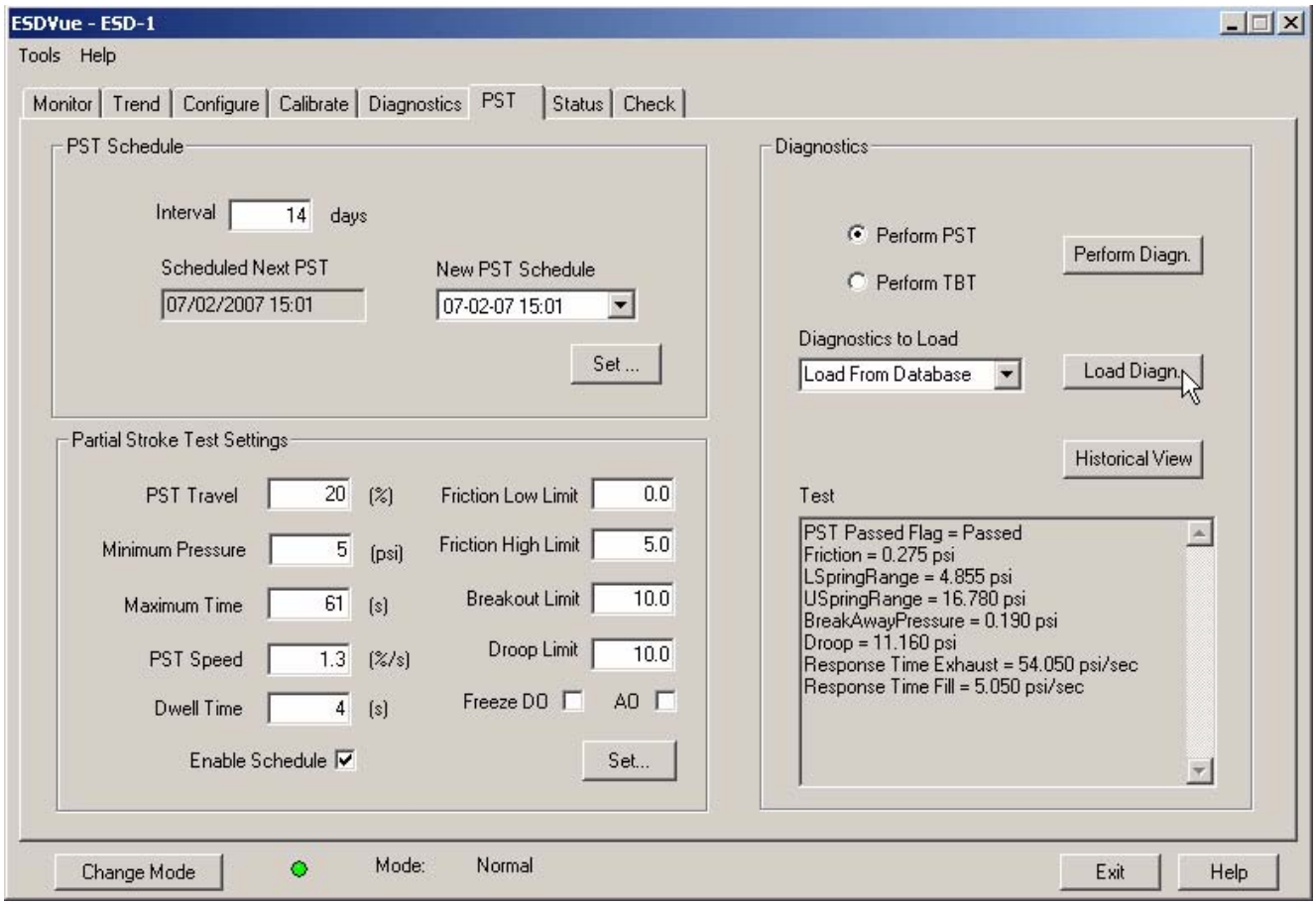


Figure 259 Launching Load Data from Database

6. ESDVue will launch the "Load Data From DB" window where you select the data you'd like to load on the diagnostic graph.
7. Choose either a particular Device ID or choose All Tags (all devices) for the data to load.
8. After you have made your device selection, select the data type you would like to load:
   - ❖ PST Data
   - ❖ ESD Tripped Data
   - ❖ Extended Signature
   - ❖ STEP
9. Select the type of data you would like to load by clicking the radio button located to the left of the data type name. In the figure below PST Data is selected.
10. After you have selected the data type, scroll through the list presented until you find the Time Stamp you would like to load.

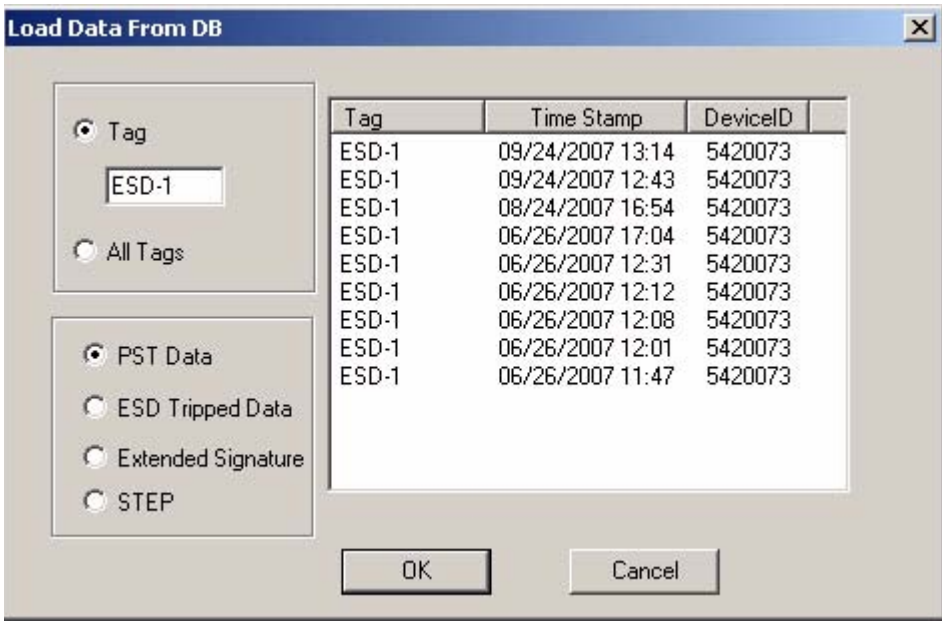


Figure 260 Device and Data Type Displayed

11. Select the data for Time Stamp you would like to view.
12. Click on "OK".
13. The Diagnostic Graph will display the loaded data.

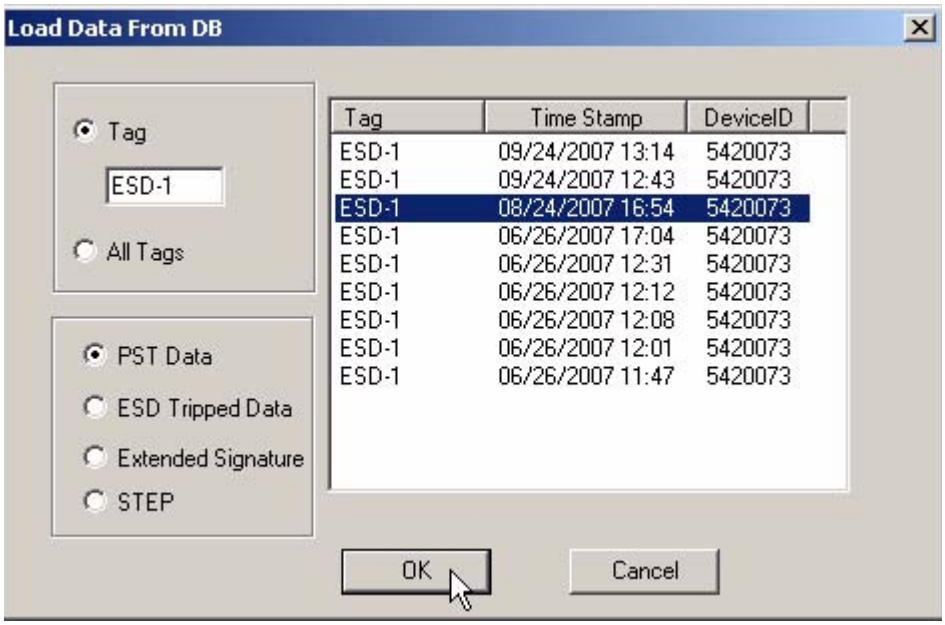


Figure 261 Loading Selected Data

Load from Database Tool Tips

You will notice that when hover over a data record name that ESDVue will display all the data for the record as shown in the figure below.

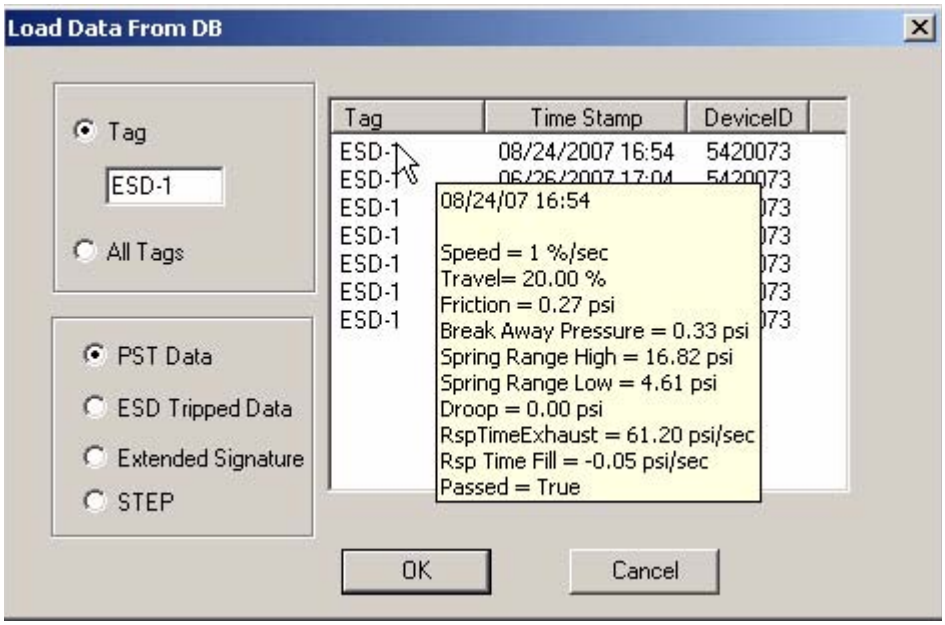


Figure 262 Load Data from DB Tool Tip

Data File Displayed

After selecting the data record, ESDVue will display the diagnostic graph as shown below.

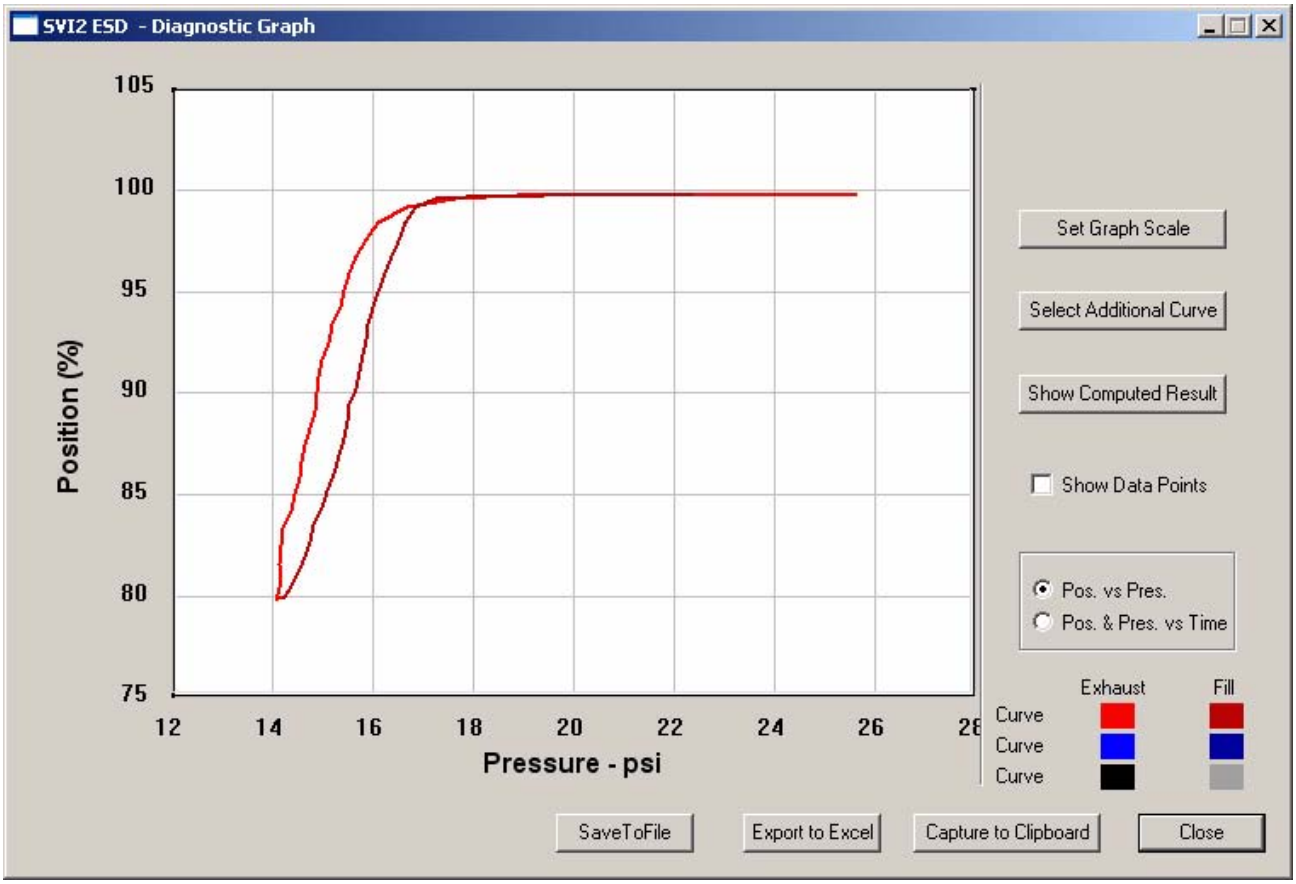


Figure 263 Diagnostic Graph Displayed

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curve" function).

Load from File

ESDVue allows you load a PST or TBT diagnostic file from the PST Screen.

To load a file:

1. Select "Load from File" from the "Diagnostics to Load" drop down list.
2. Click on "Load Diagn" as shown in Figure 264 below.

Figure 264 Selecting "Load From File"

3. ESDVue will launch a file browser window as shown below.

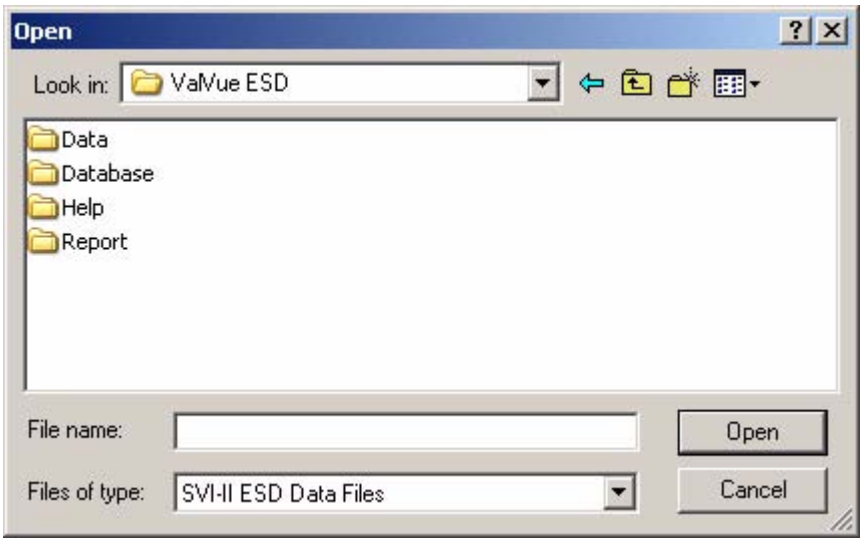


Figure 265 File Browser

4. Using the browser, locate the file you would like to load
5. Select the file name.
6. Click "Open".

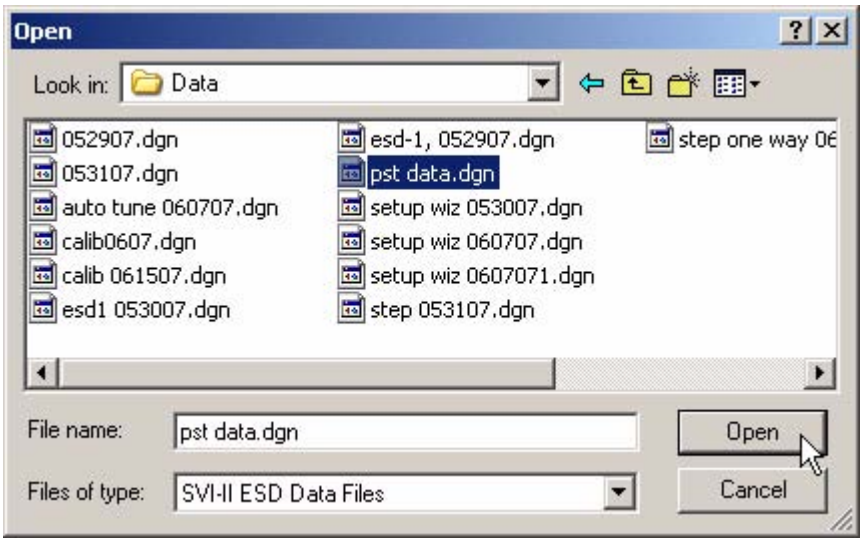


Figure 266 Opening File for Diagnostic Data

7. After you open the saved file, ESDVue will launch the dialog below.
8. Select the record with the appropriate time stamp and click "OK".

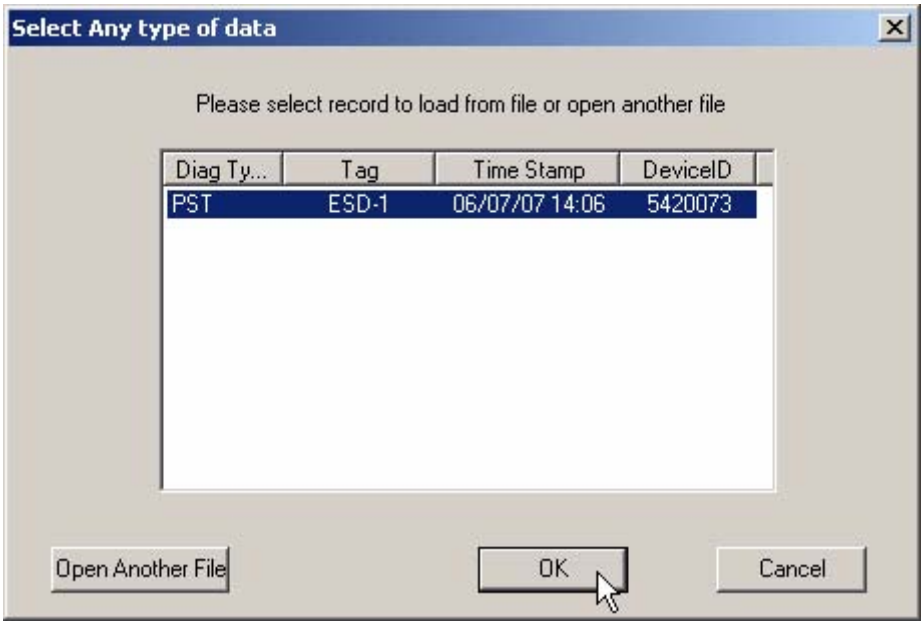


Figure 267 Selecting Diagnostic Record

Data File Displayed

9. After selecting the diagnostic file, ESDVue will display the diagnostic graph as shown below.

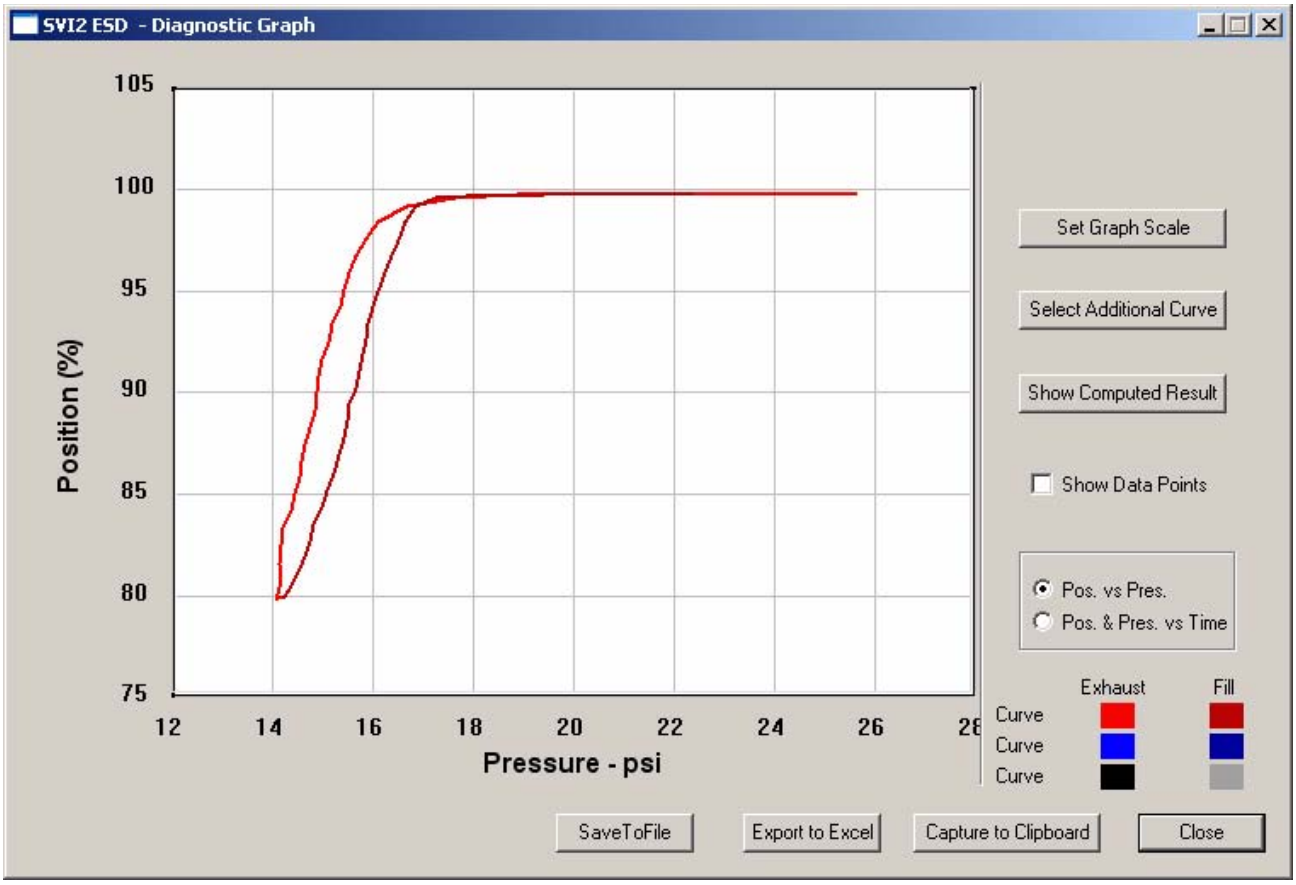


Figure 268 Diagnostic Graph Displayed

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curve" function).

Historical View

The historical view provides a graphic representation of all historical data collected on the selected ESD.

To start Historical View:

1. Click on "Historical View" as shown in the figure below.

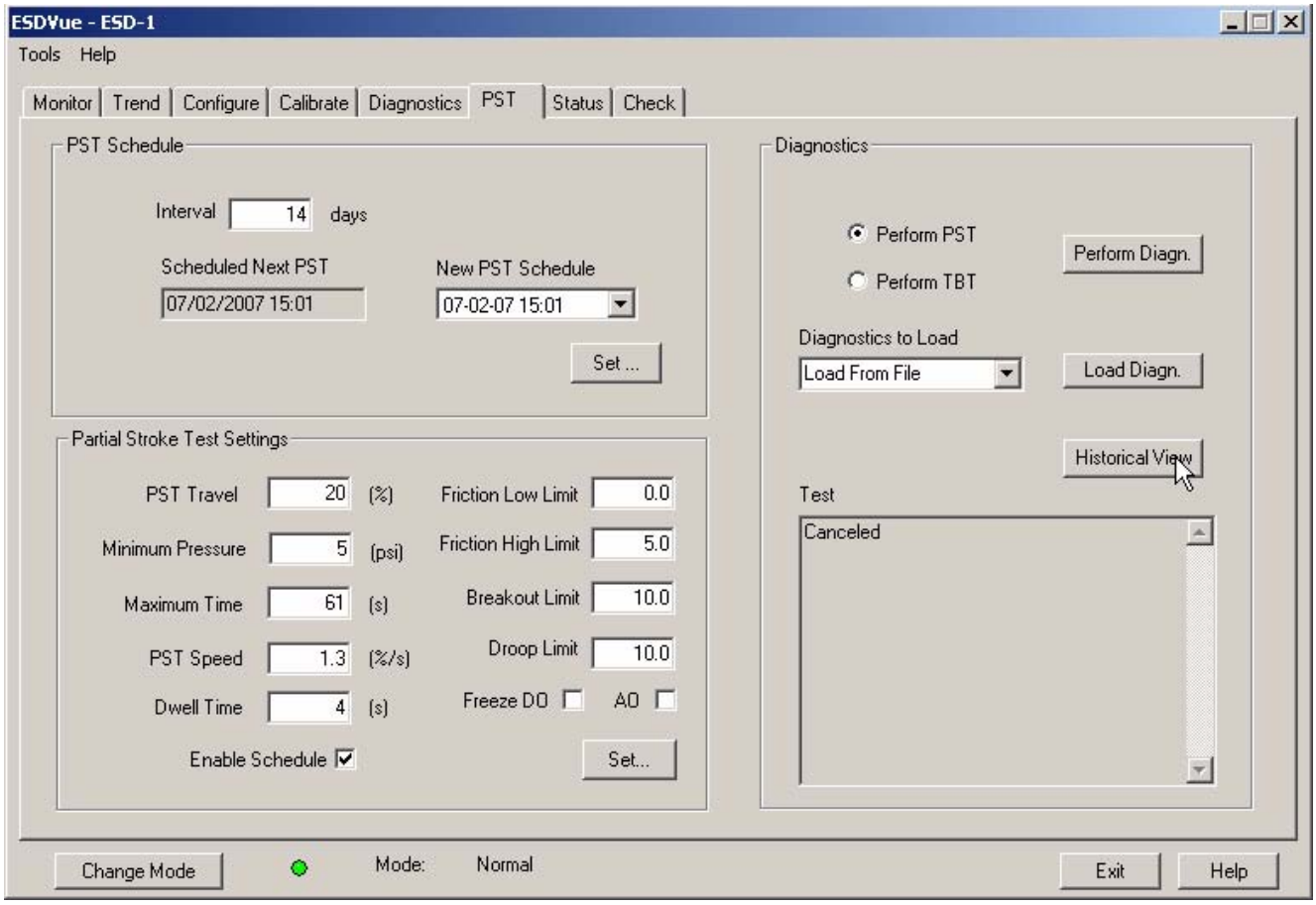


Figure 269 Selecting Historical View

2. ESDVue will launch the PST Historical View window shown in Figure 270 on page 245.
3. Select the Device ID from the drop down list
4. Change the Start and End Dates for the PST data you would like to view.

Changing the Historical View Start and End Dates

The Historical View start and end date field is set up as mm/dd/yyyy. There are two methods for changing the PST Start and End Date fields. You can click on each parameter of the date field; i.e. mm, or dd, or yyyy, and change each individual parameter or you access the calendar in the drop down of the date field.

To change the start date schedule for the next PST:

1. Click in each parameter (mm-dd-yy-hh-mm) of the date field and highlight the text.
2. Type over the old value with the new value for each parameter.

OR

3. Click in the drop down, located at the right of PST Start Date field and access the date calendar as shown in the figure below.
4. Using the arrow key on the calendar, change the month if necessary.
5. When in the correct month on the calendar, drag the mouse and select the correct date within the month by clicking on it.

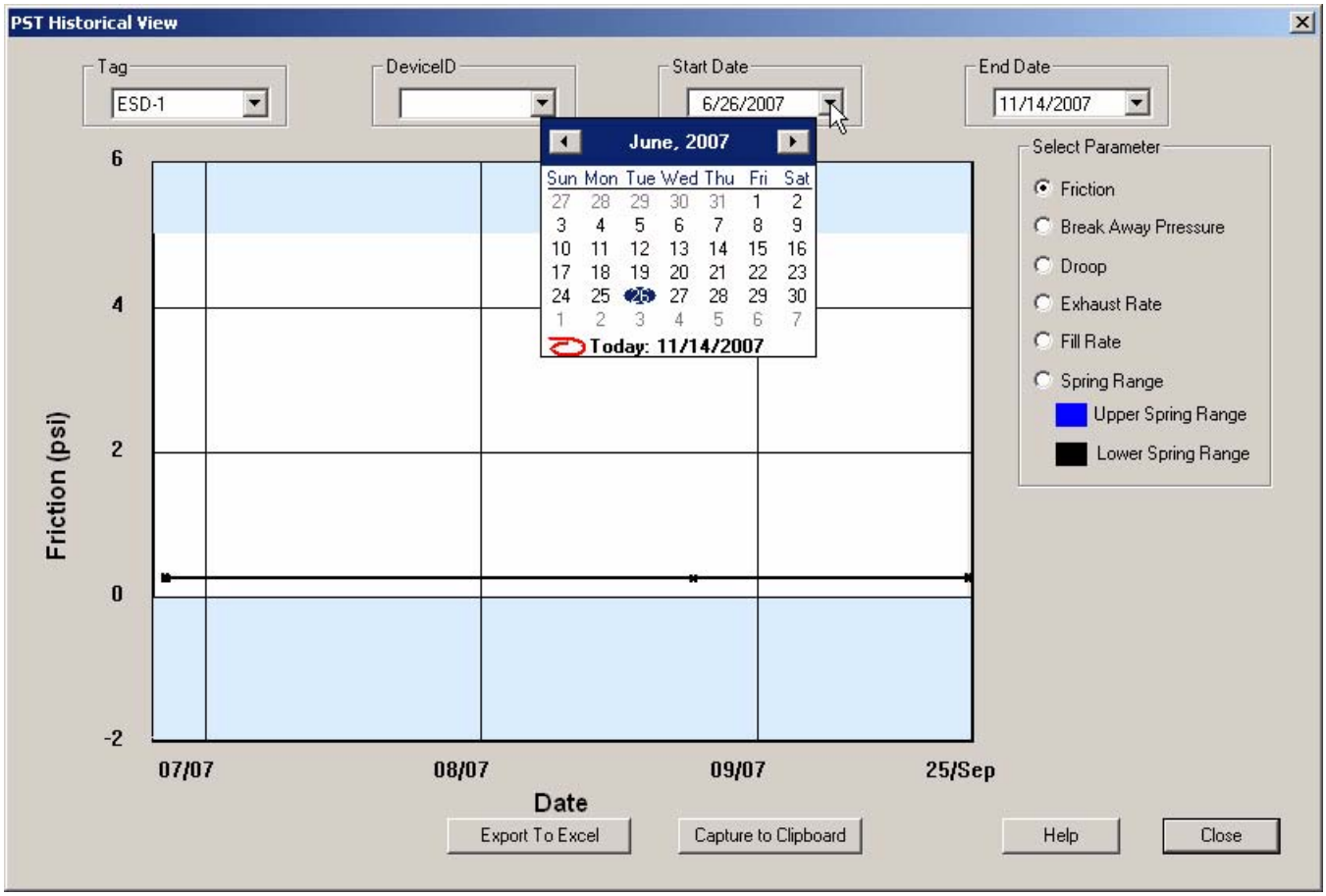


Figure 270 Selecting Start Date for Historical View

6. Select the End Date in the same manner as the Start Date.

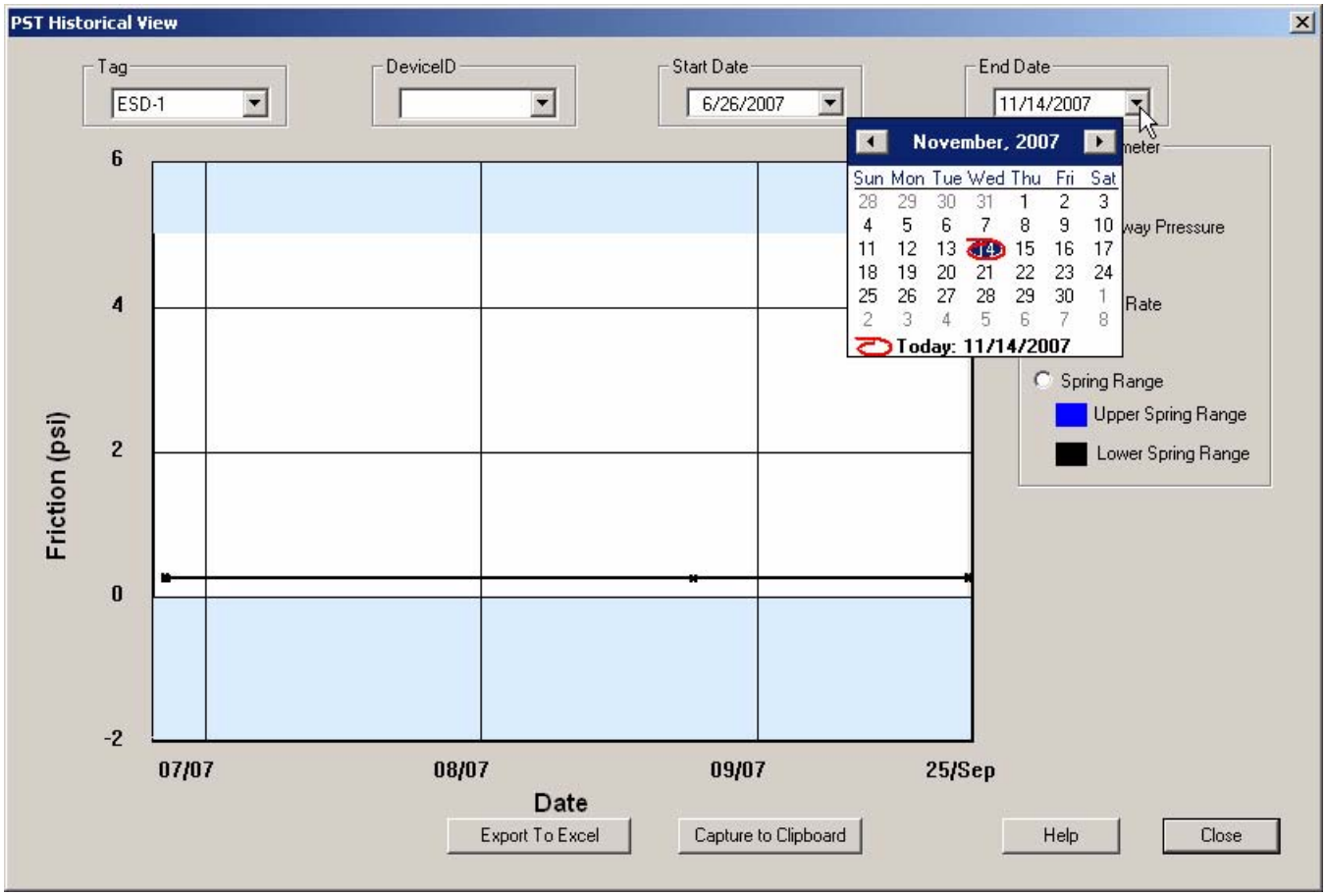


Figure 271 Selecting the Historical View End Date

7. ESDVue will display the historical PST data for the selected date range.
8. Select the parameter you would like to view by clicking on the radio button to the left of the parameter name.

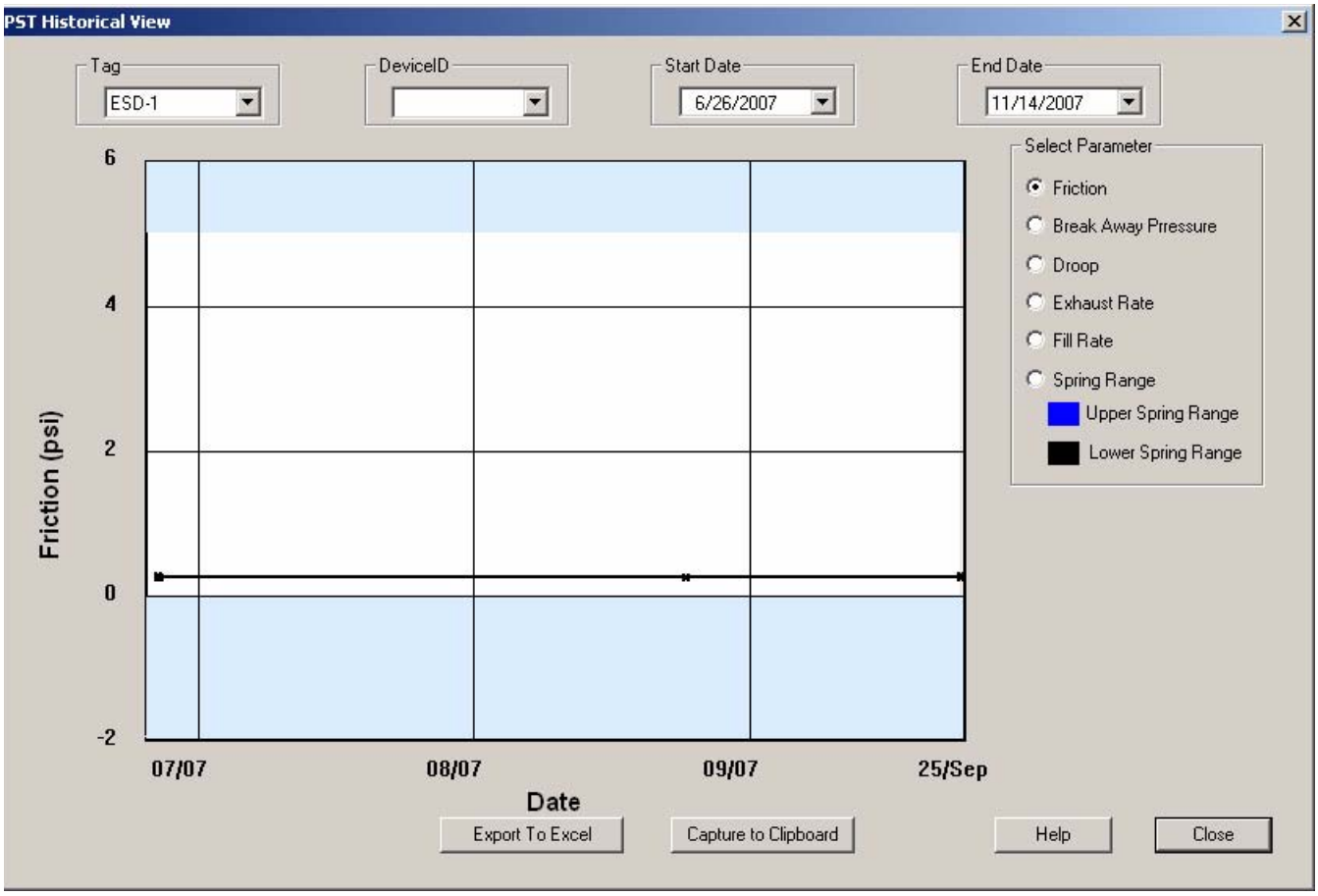


Figure 272 PST Historical View - Friction Displayed

Displaying Historical View Diagnostic Graphs

When the Historical View is active, and have a selected a date range of data points you can view the diagnostic graph associated with each of the data points.

To view a diagnostic graph associated with a historical data point:

1. Locate the correct date on the historical view timeline.
2. Double click on the date's data point as shown in the figure below.

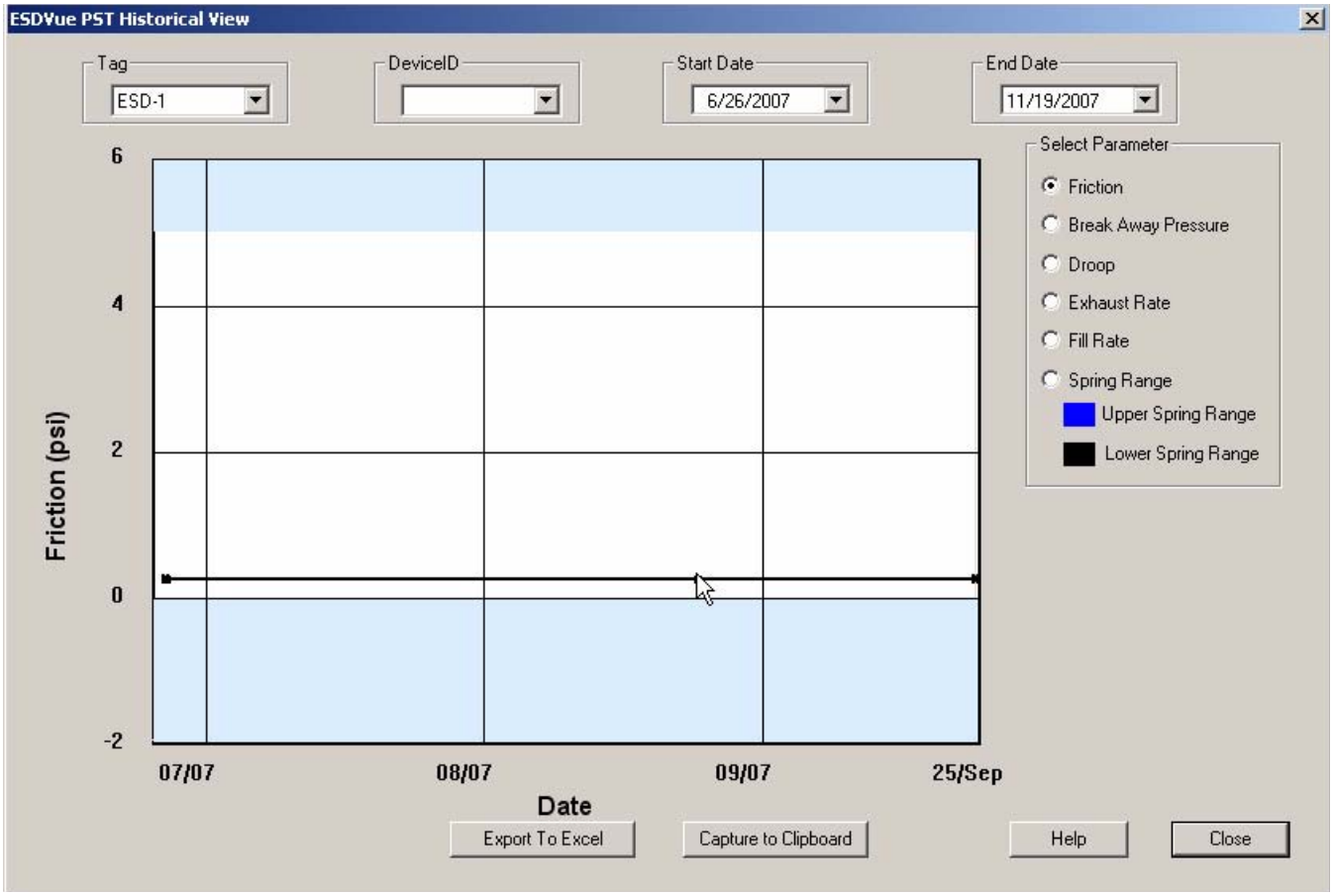


Figure 273 Selecting a Historical View Data Point

3. The diagnostic graph for the selected data point will appear as shown below.

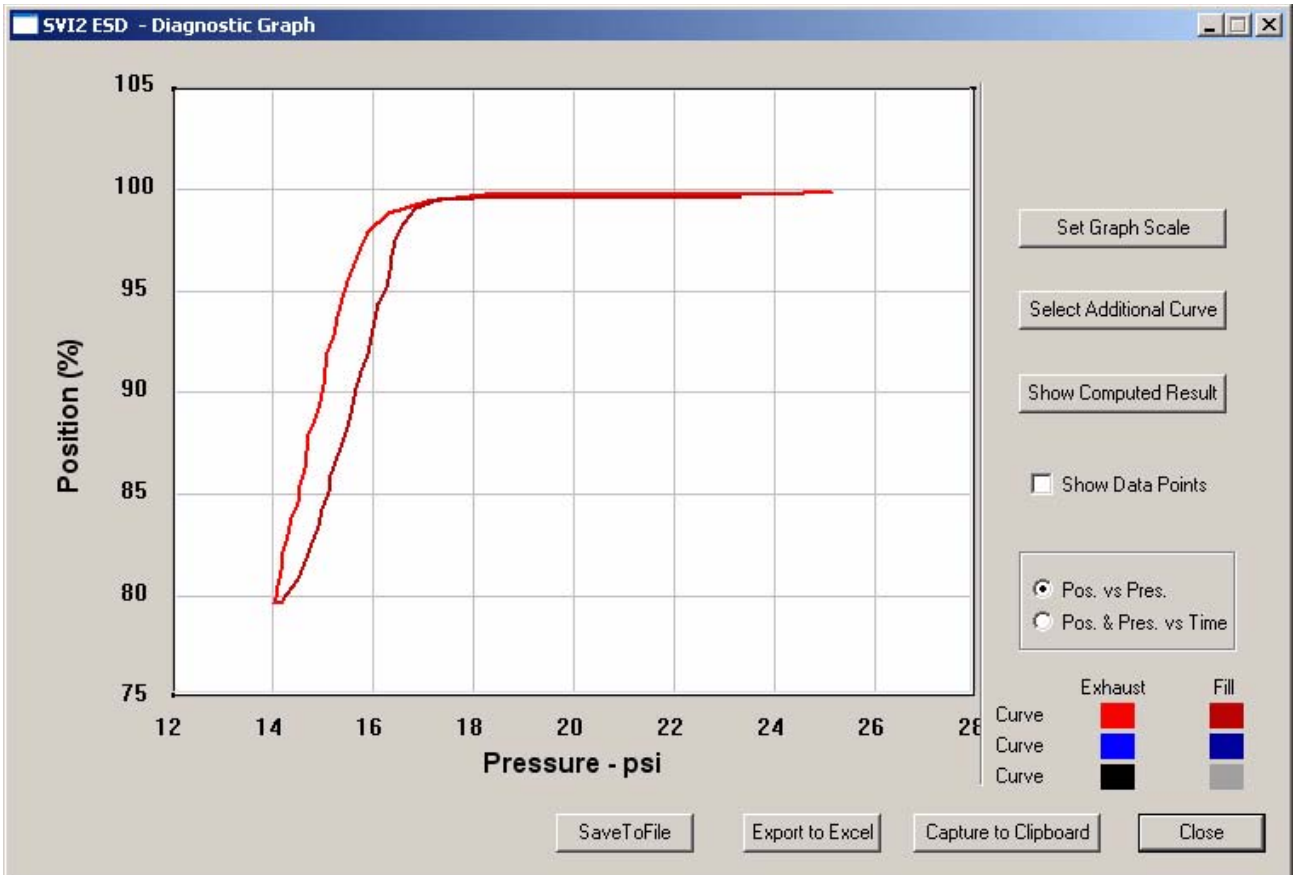


Figure 274 Historical View Diagnostic Graph

Diagnostic Graph Color Legend

Located at the bottom of each SVI II ESD diagnostic graph is a color legend. The legend identifies by color each curve and step on the graph; currently displayed and any additionally selected (using the "Select Additional Curve" function).

PST Context Menu

When the user right clicks on the grey area of the PST screen, a context menu shown below appears. The following items will be on the menu:

- Detach Trend - Removes the display from the tabbed dialog and creates a separate trend display
- Help - Displays the help file at the PST screen instructions

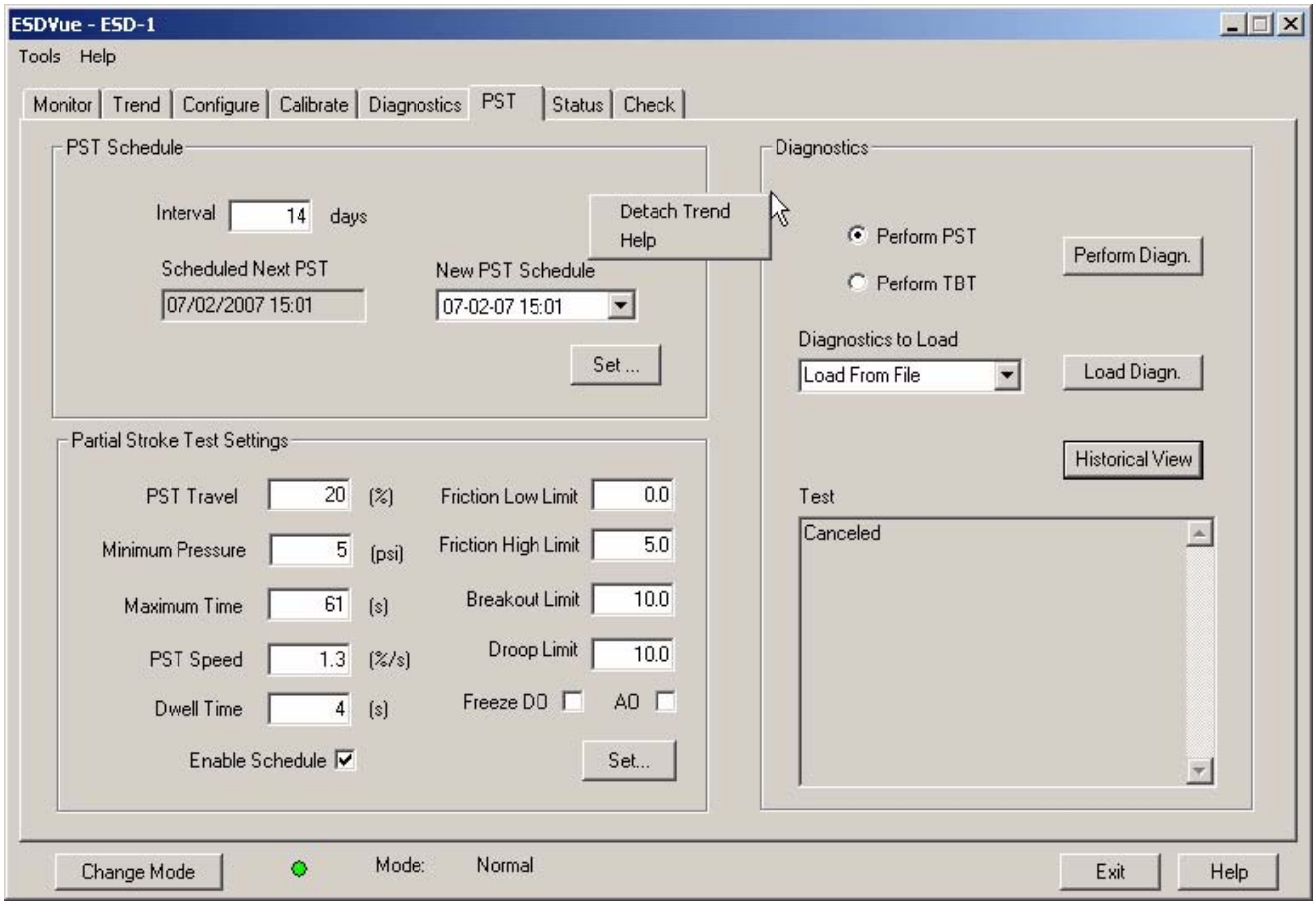


Figure 275 PST Screen Context Menu

Status 10

What you can do on the Status Screen

The Status Screen allows you to see at a glance the operating and internal status of the SVI II ESD. The screen is divided into a series of tabs that provides status, alarm, and fault information in a graphical form for all aspects of the SIS (Safety Instrumented System).

Each alarm condition is color coded according to the criticality of the alarm:

- Blue = low
- Yellow = Medium (error conditions that can occur in normal operation, not faults, that may presently exist or have historically existed)
- Red = High (indicates a fault)
- Green indicates no faults

On the Status Screen you can reset the Current Faults or All Faults (Current and Historical). You can also select and clear an individual fault.

The window has selectable tabs that display the associated parameters for each tab when selected; e.g. when you select "General" tab the General status and fault codes will display.

When you are on the "Active Faults" tab the current active faults are displayed as shown below. The status codes are then partitioned into their respective SVI II ESD functional areas.

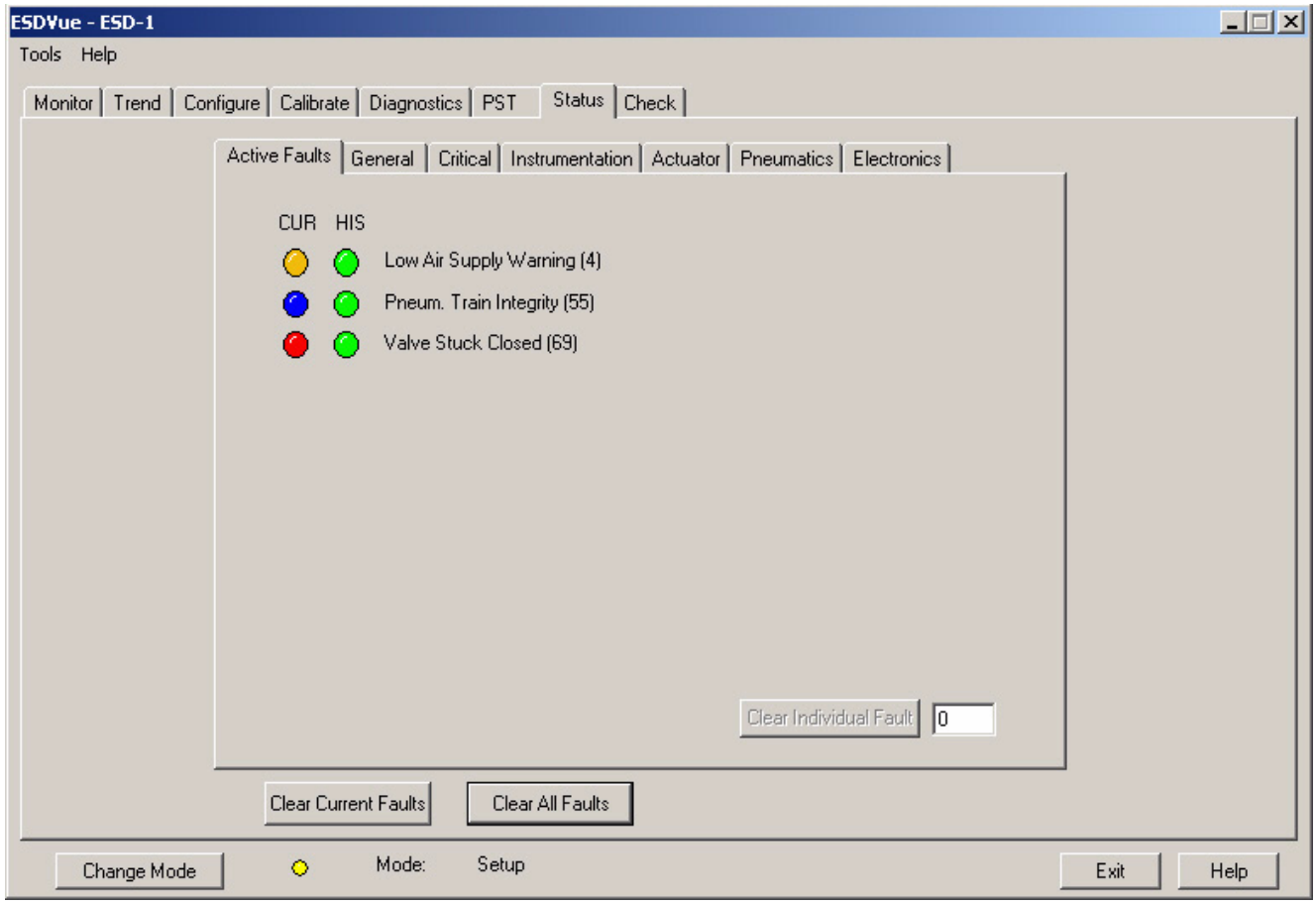


Figure 276 Status Screen

Active Faults

The Active Faults status tab shown in the figure below displays all current faults and provides current and historical information on each fault. There is also a box on the Active Faults tab, located at the bottom right corner, that provides the ability to clear an individual fault. The individual fault lists active faults by Hex value.

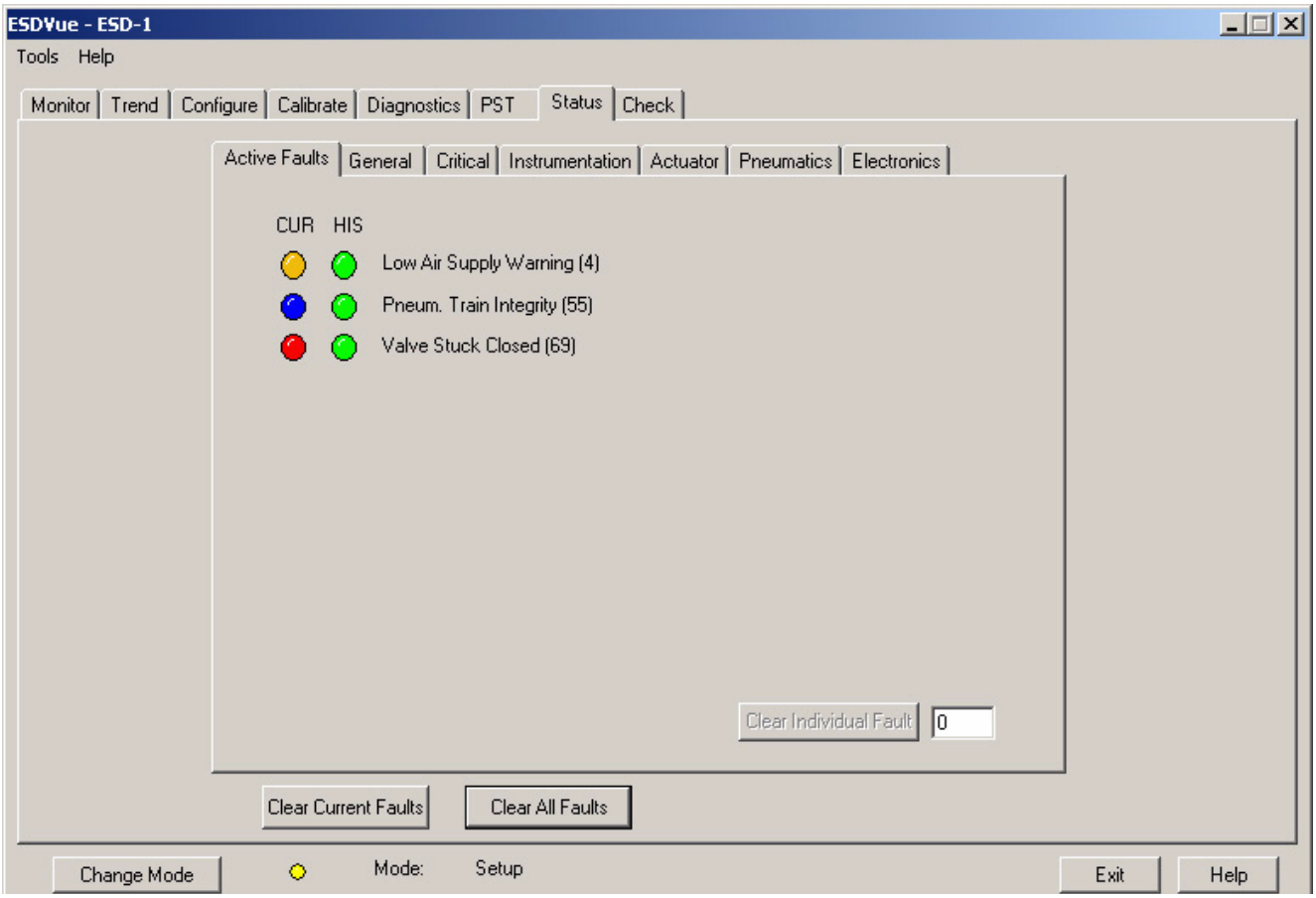


Figure 277 Status Screen Active Faults Tab

General

The General status tab shown in the figure below, displays general faults that cannot be attributed to SVI II ESD components; e.g. electronics, actuator, pneumatics, electronics. The General faults are often testing and data faults.

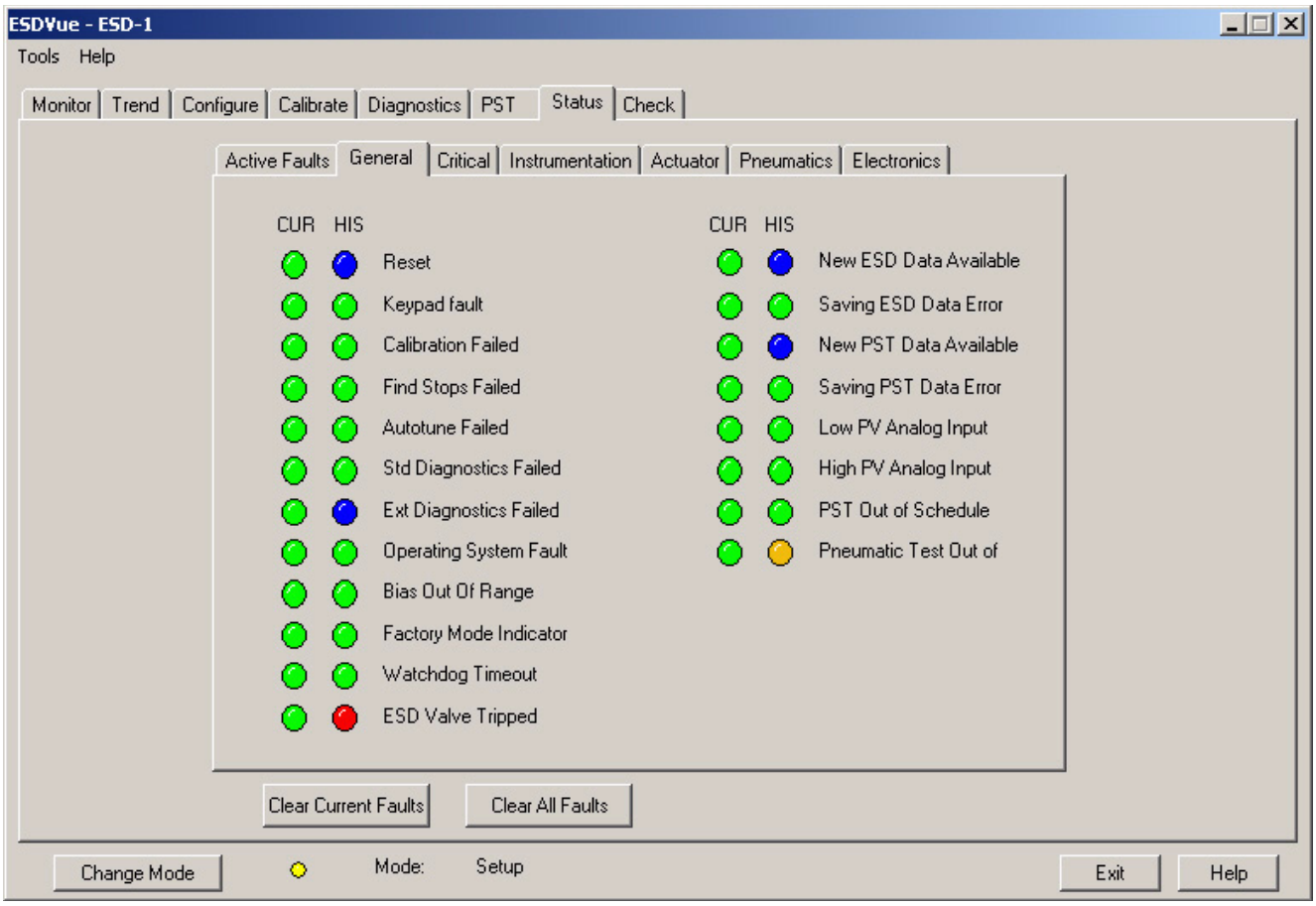


Figure 278 Status Screen General Tab

Critical

The Critical status tab displays all faults that are critical to SVI II ESD operation.

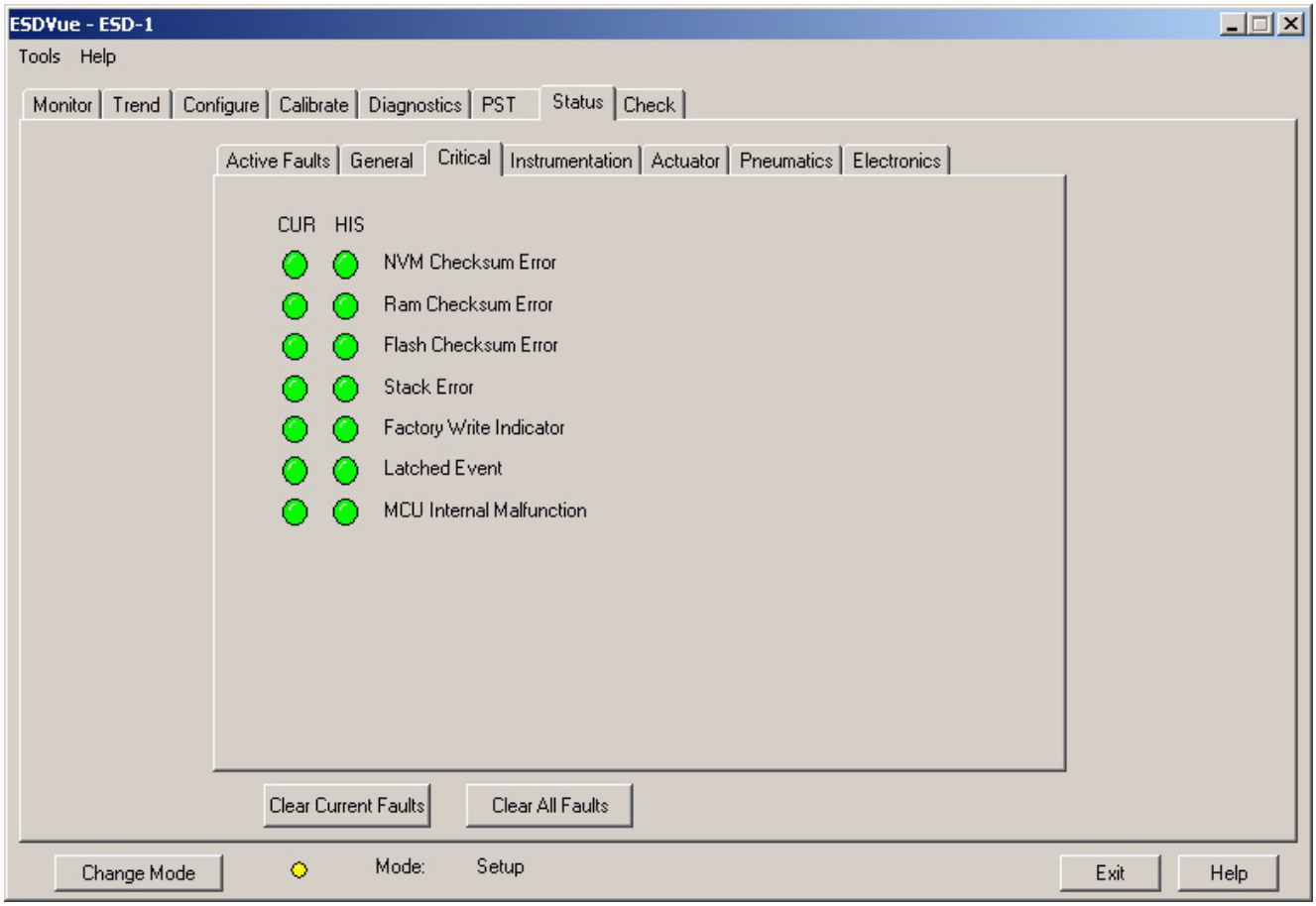


Figure 279 Status Screen Critical Tab

Instrumentation

The Instrumentation status tab shown in the figure below, displays all faults related to instrumentation other than the actuator, pneumatics or electronics.

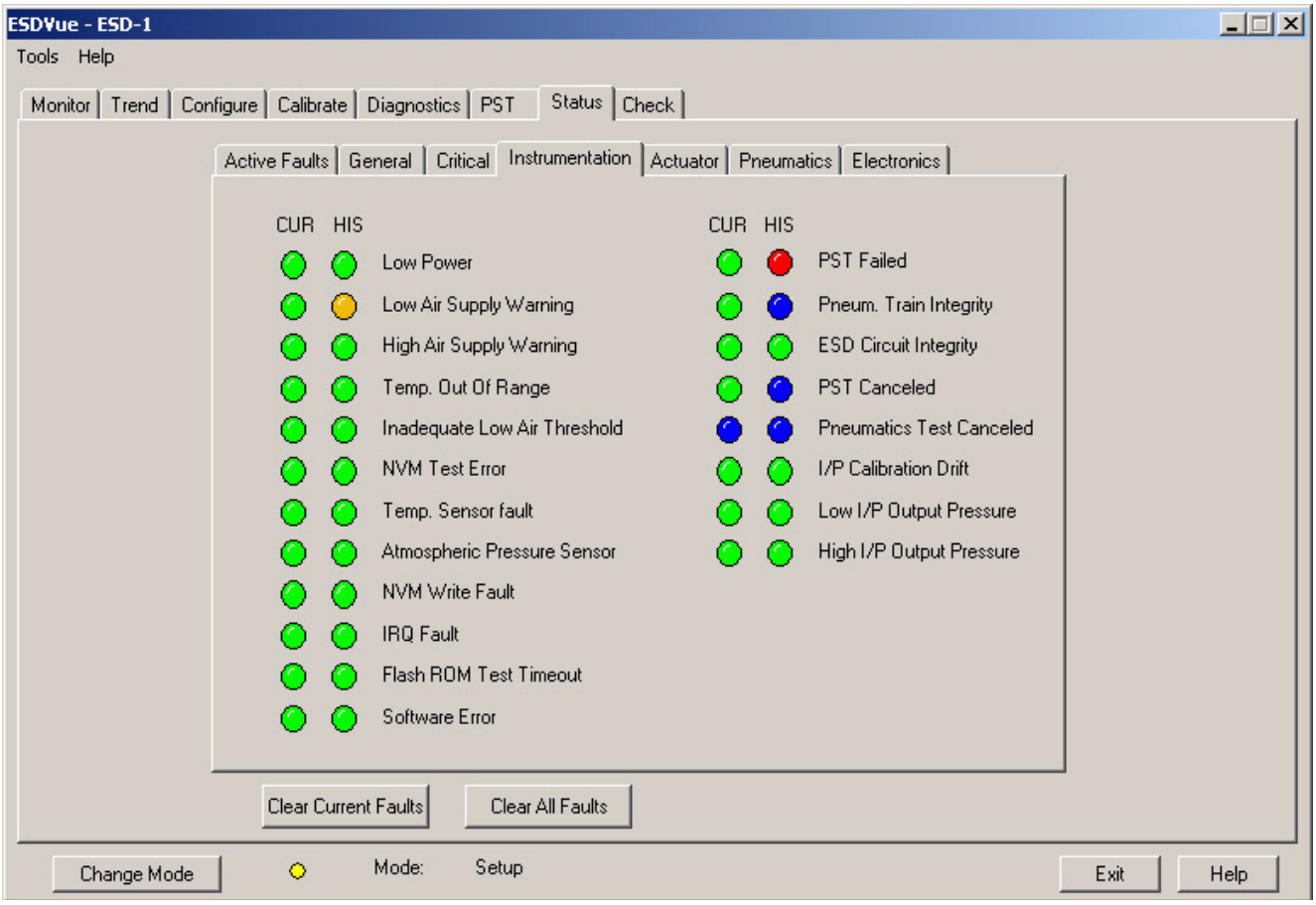


Figure 280 Status Screen Instrumentation Tab

Actuator

The Actuator status tab shown in the figure below, displays all faults related to the actuator upon which the SVI II ESD is mounted.

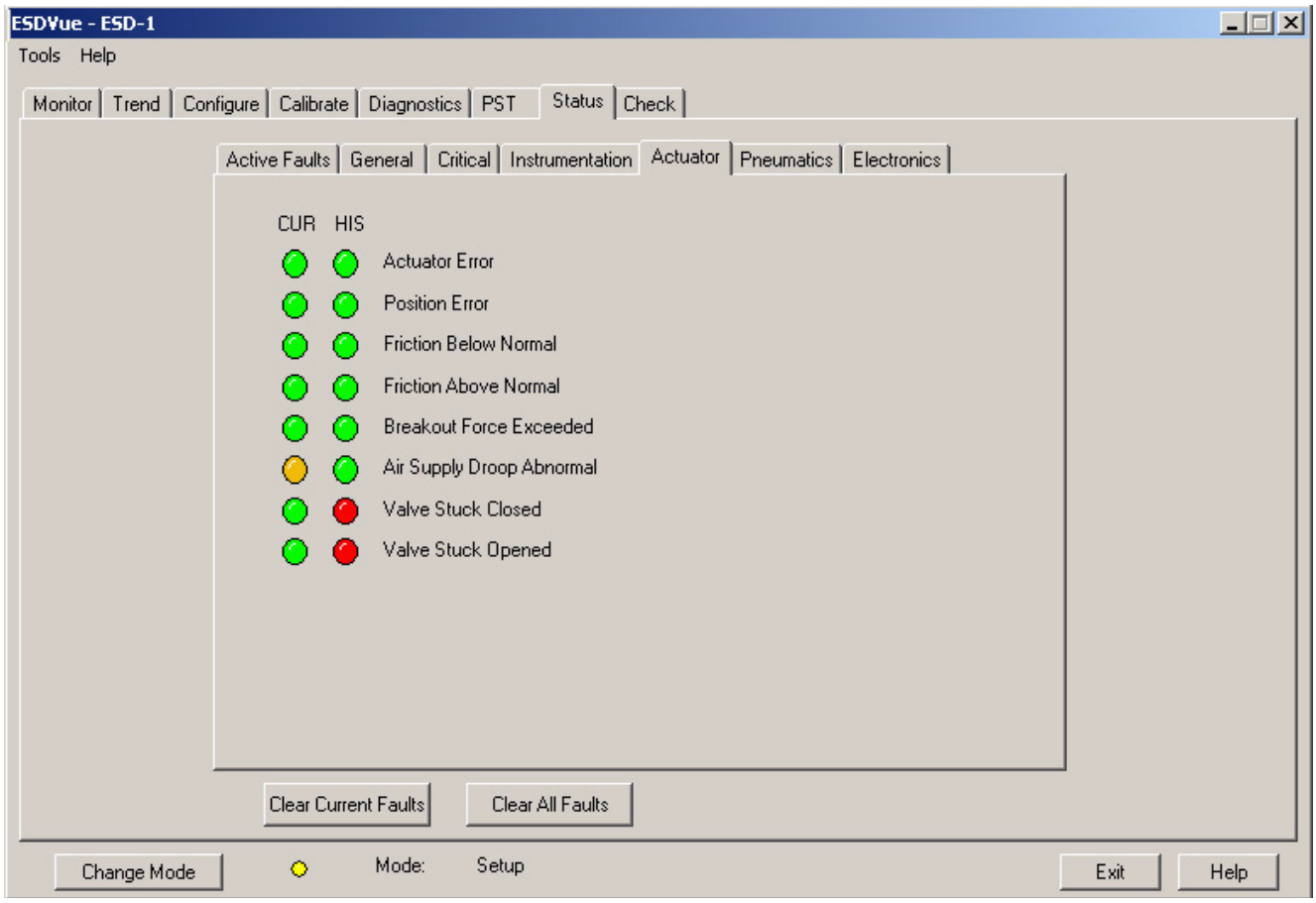


Figure 281 Status Screen Actuator Tab

Pneumatics

The Pneumatics status tab, shown in the figure below displays all faults related to SVI II ESD pneumatics.

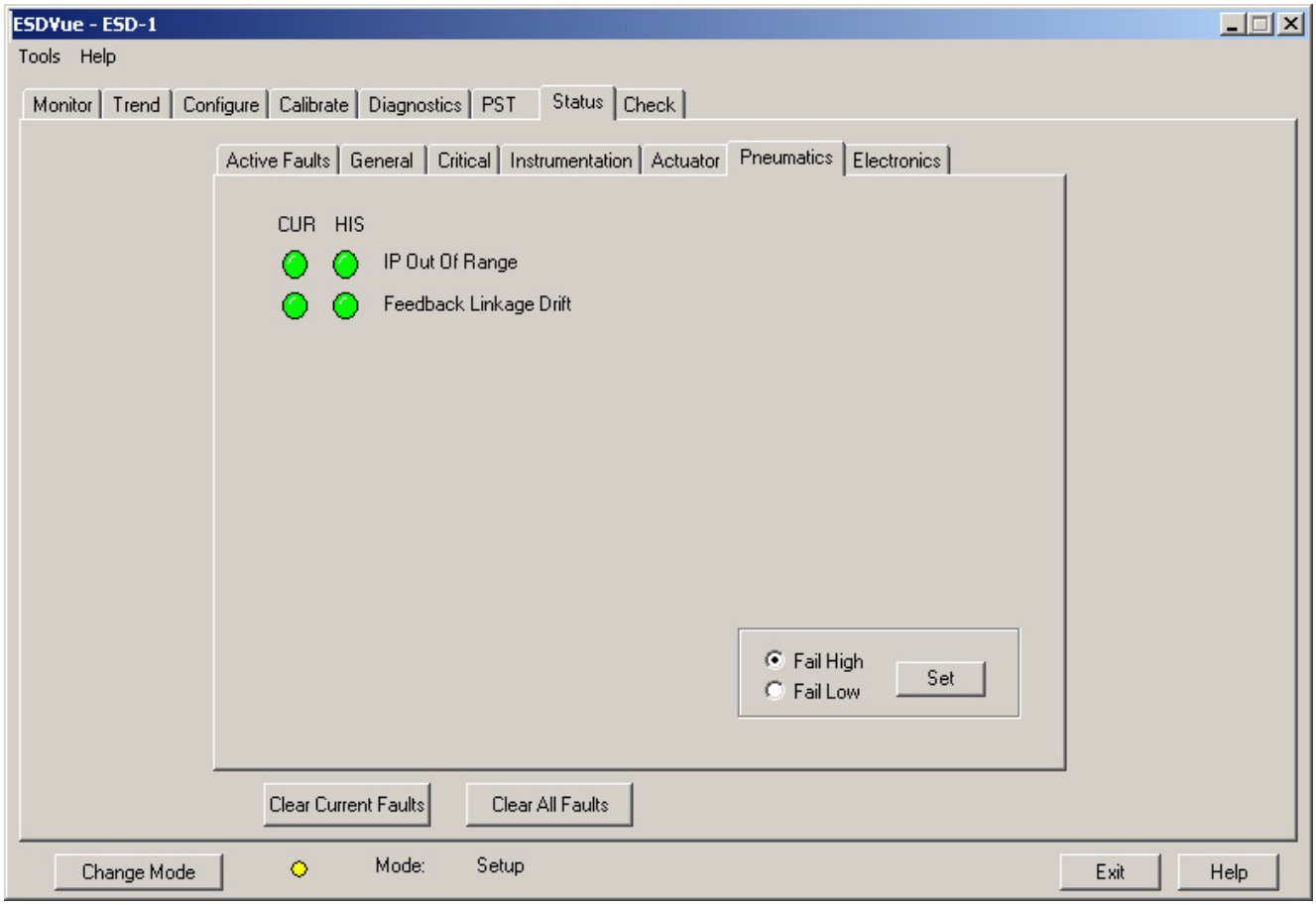


Figure 282 Status Screen Pneumatics Tab

Electronics

The Electronics status tab, shown in the figure below displays all faults related to the SVI II ESD electronics.

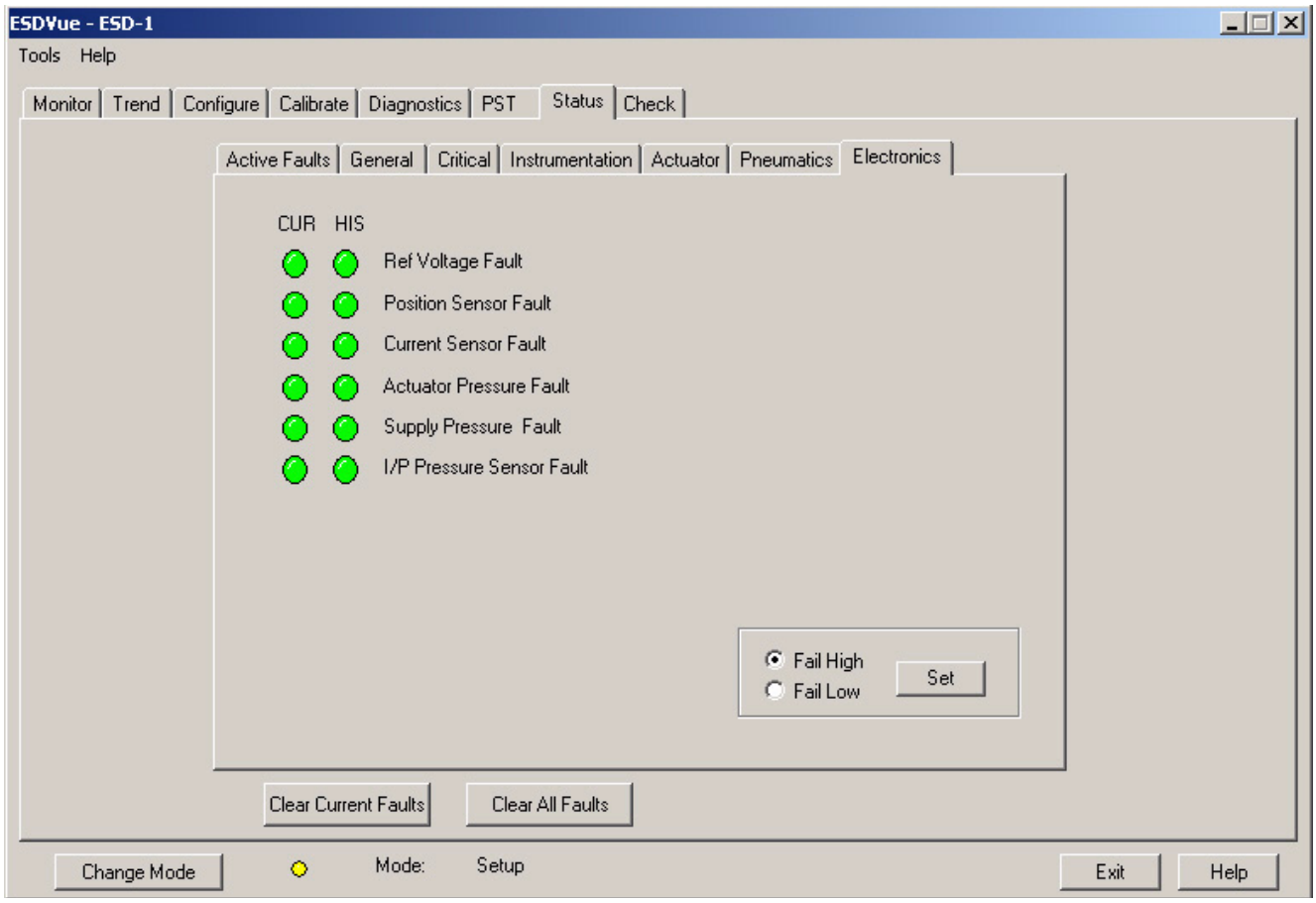


Figure 283 Status Screen Electronics Tab

Clear Current Faults

When you click the "Clear Current Faults" ESDVue resets the status in the SVI II ESD for all current faults only. The buttons on the Status Screen indicating the current faults will revert to green, if the condition is no longer valid.

To clear current faults:

1. On the status screen click on "Clear Current Faults" as shown in the figure below.

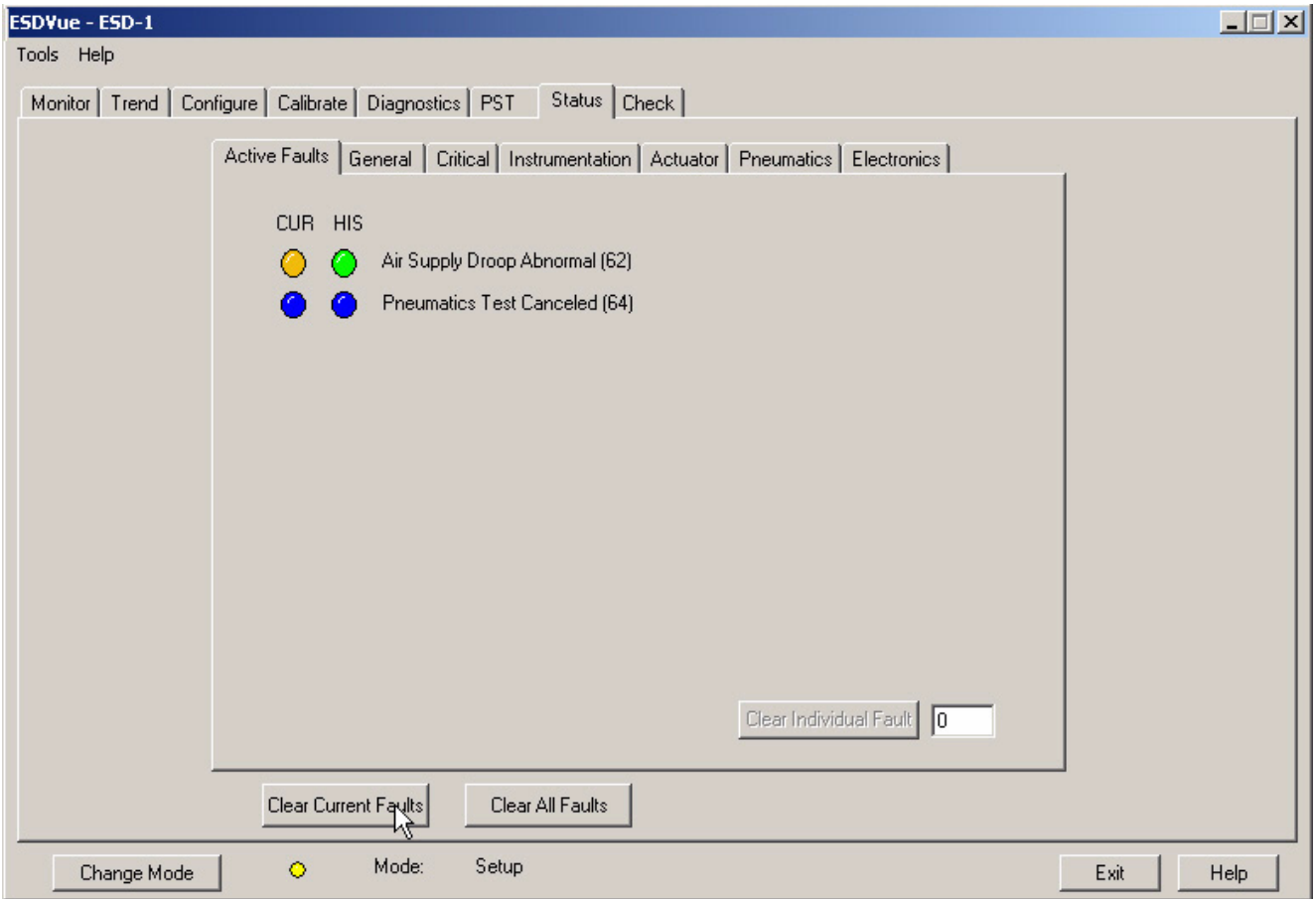


Figure 284 Executing "Clear Current Faults"

2. After you execute "Clear Current Faults" there should be no faults listed as current on any tab or in the Active Faults column of FaultCodes (Hex).

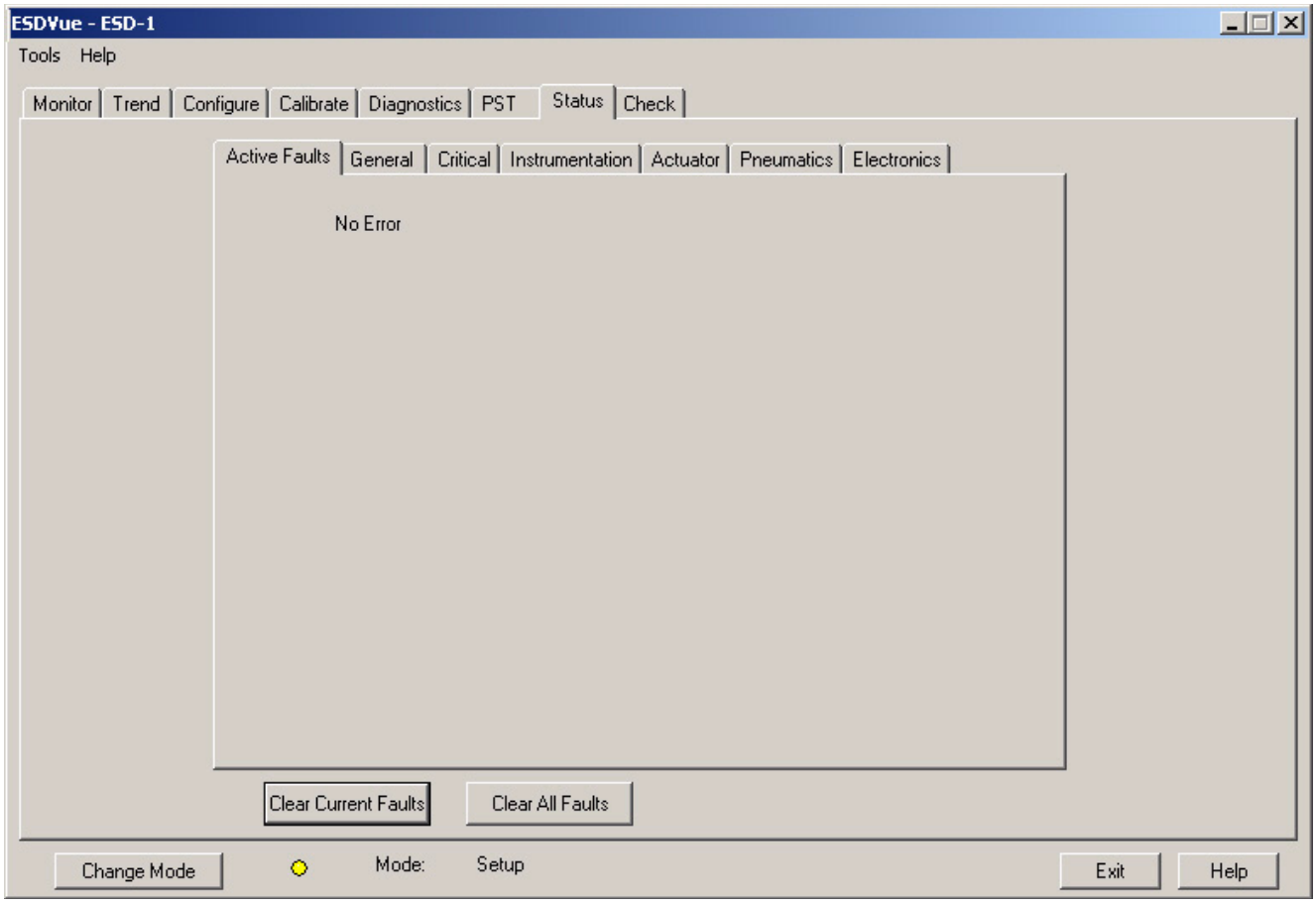


Figure 285 Current Faults Cleared

Clear All Faults

When you click the "Clear All Faults" button ESDVue resets the status bit in the SVI II ESD for all faults, both historical and current. The buttons on the Status Screen indicating the current and historical faults will revert to green.

To clear all faults:

1. On the status click on "Clear All Faults" as shown in the figure below.

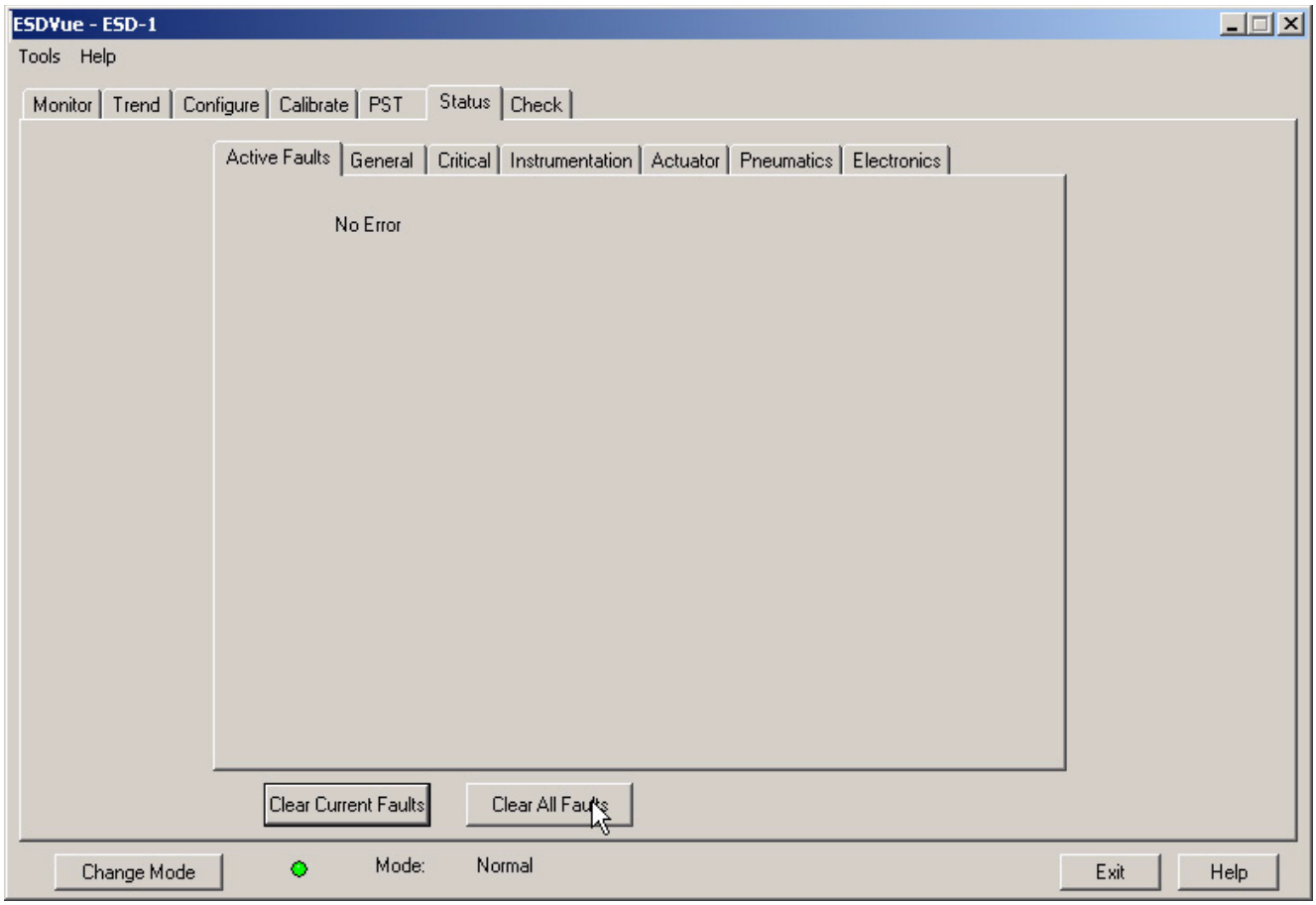


Figure 286 Executing Clearing All Faults

2. After you execute "Clear All Faults" there should be no faults listed as current on any tab.

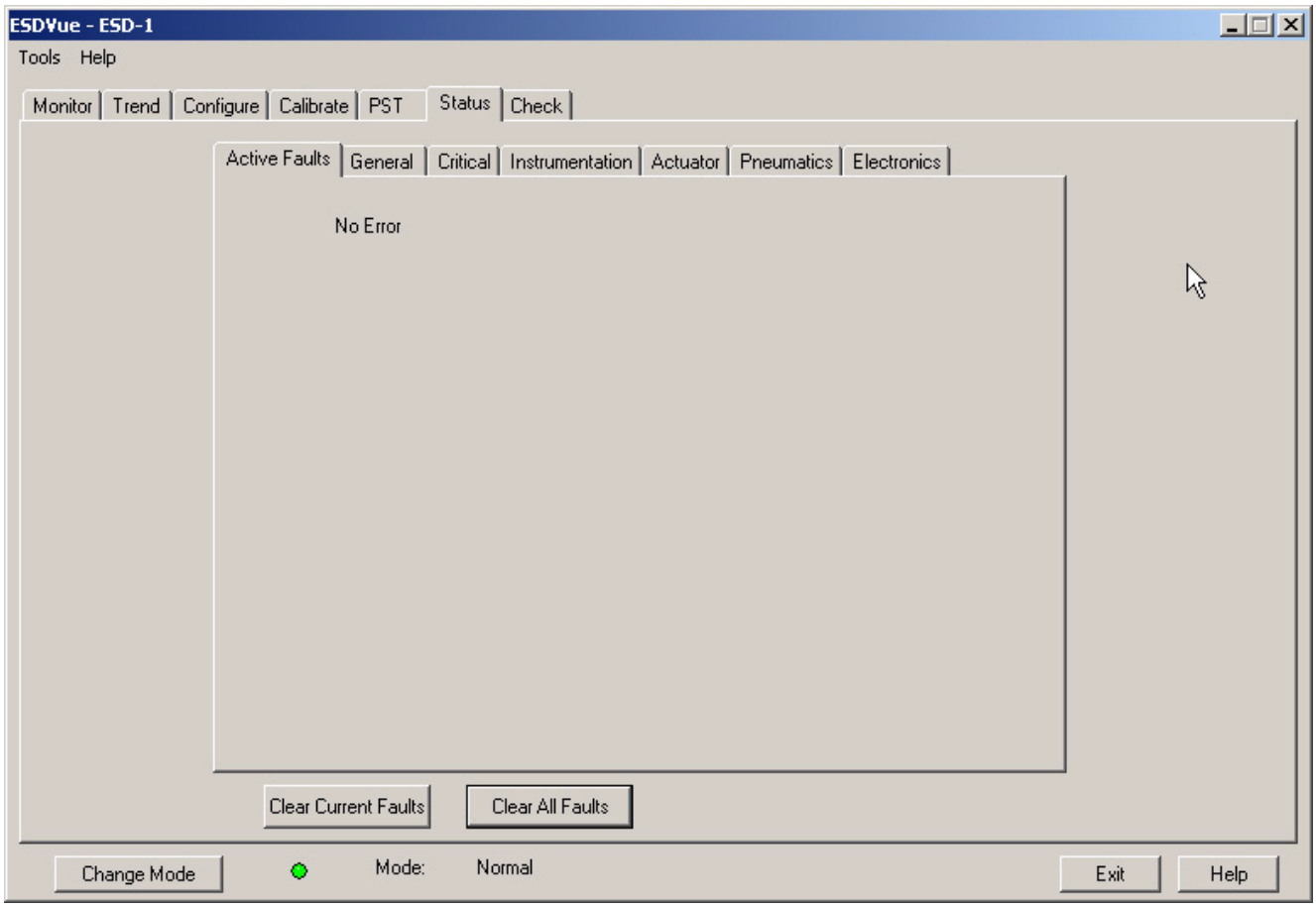


Figure 287 All Faults Cleared

Clear Individual Fault

The Status Screen allows you to select and clear an individual in the Active Faults tab that has a HART fault code, digits enclosed in parentheses, located to the right of the text describing the fault. Refer to the figure below.

To clear an individual fault:

1. Place the cursor in the text box, located to the right of "Clear Individual Fault".
2. Enter the HART number for the fault as shown in the figure below.

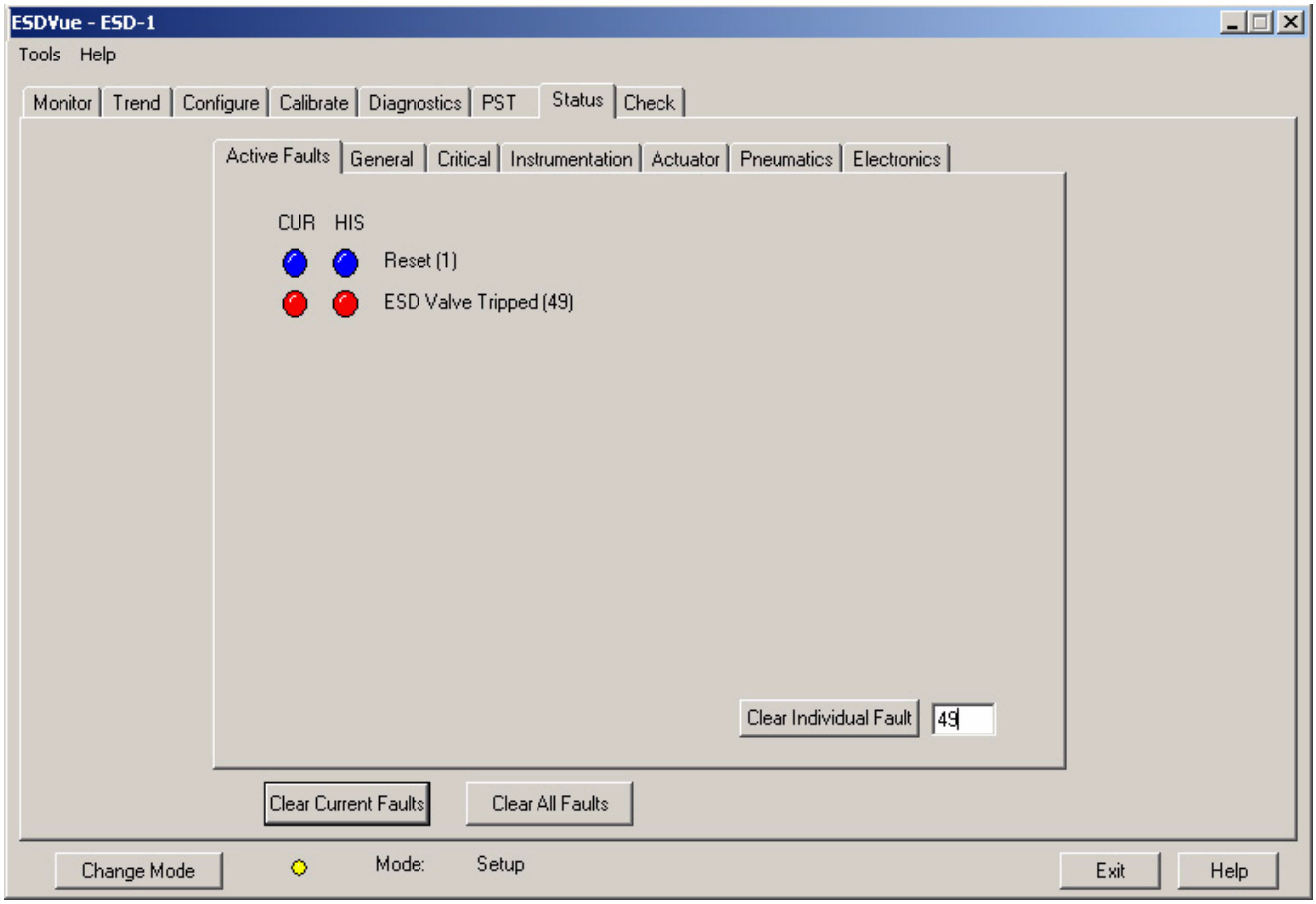


Figure 288 Entering an Individual Fault

3. Click "Clear Individual Fault" as shown below.

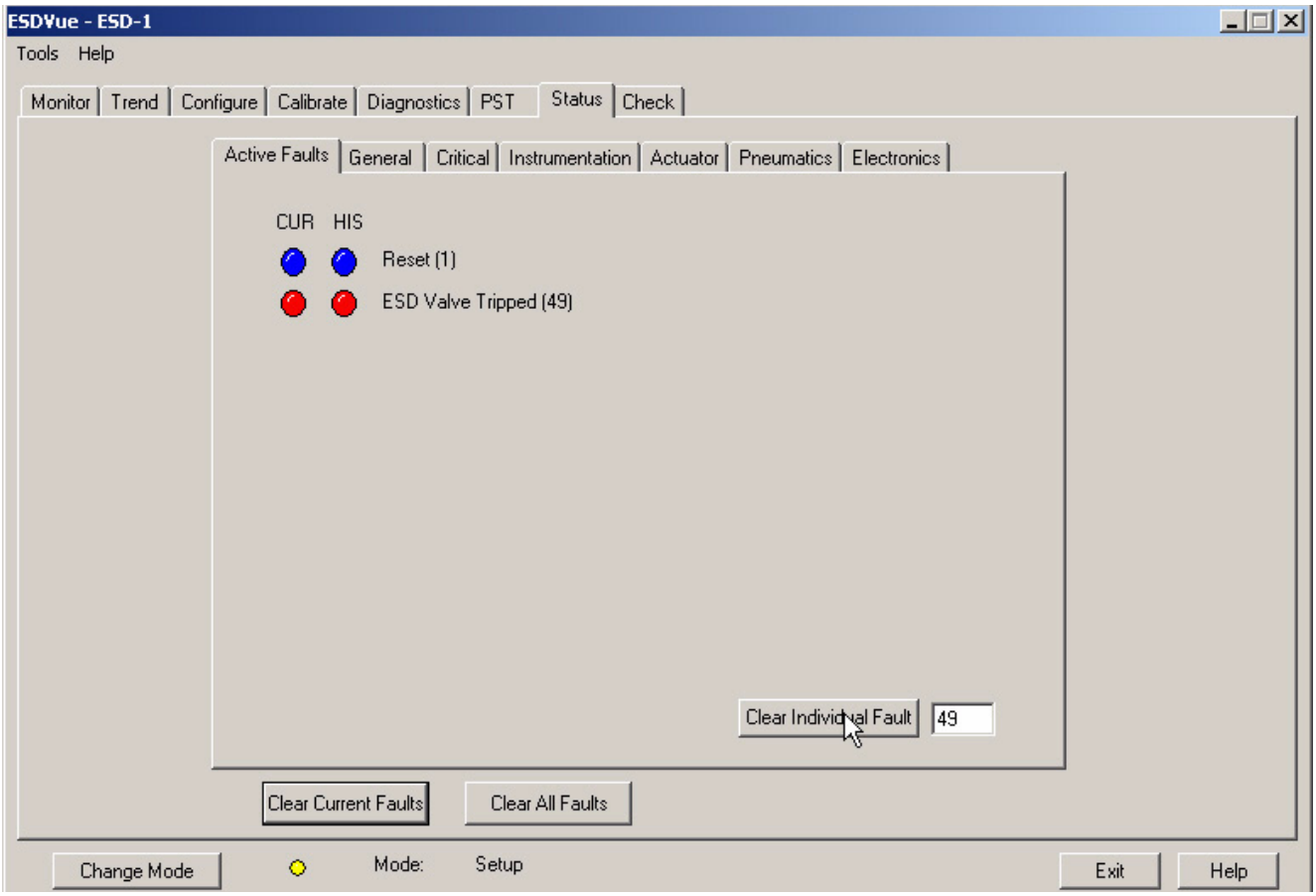


Figure 289 Clearing an Individual Fault

4. The selected fault will be cleared from the Active Faults list and the "Clear Individual Fault" button will return to an inactive state.

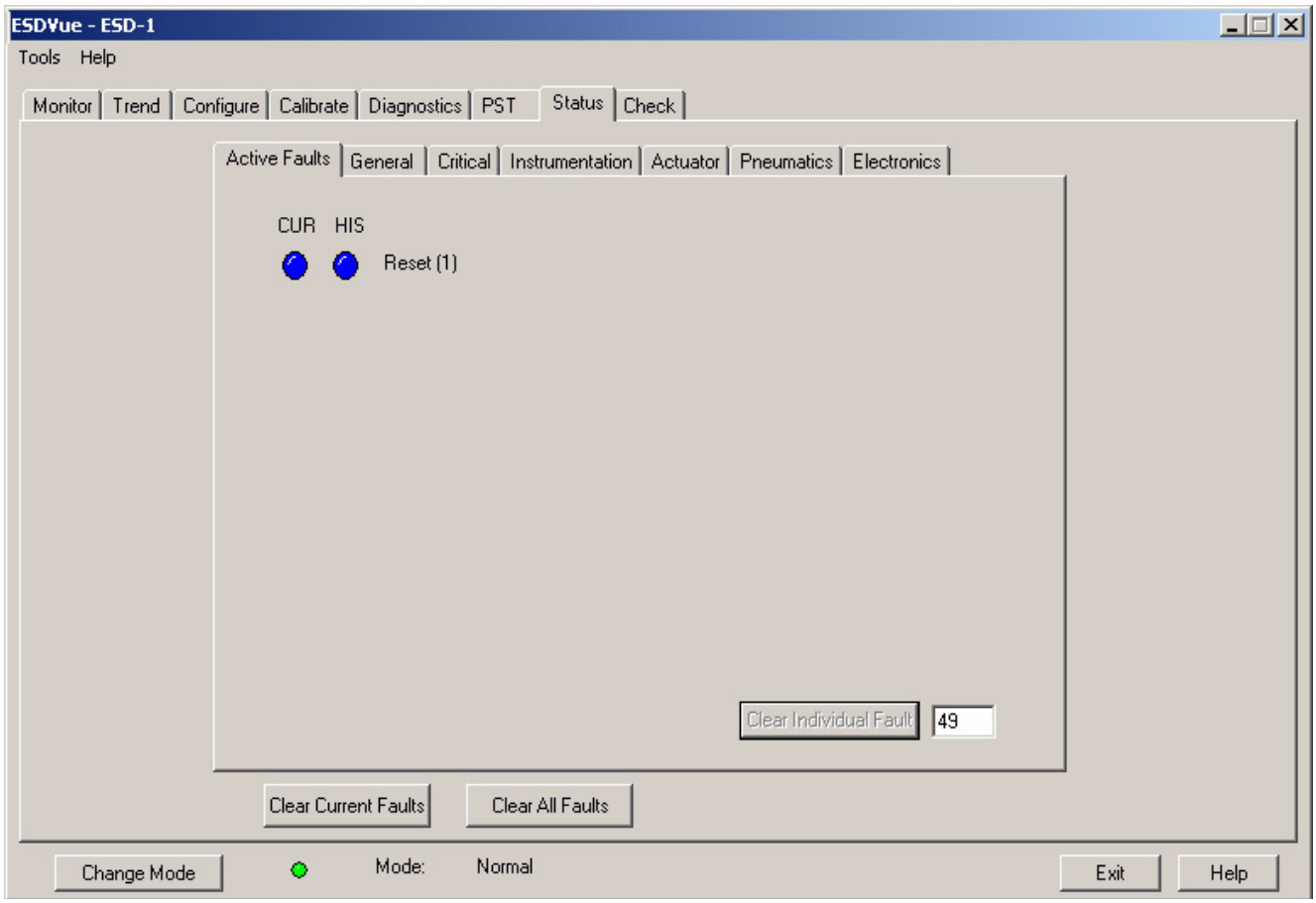


Figure 290 Individual Fault Cleared

Set Fail High/ Low

On the Pneumatics and Electronics tab on the Status Screen you can set whether pneumatics, actuator, or electronics testing will fail at the predefined high or low level. To change this setting you must be in Setup Mode (“Change Mode” on page 48) and simply click on the correct radio button; "Fail High" or "Fail Low".

Status Fault Code List

The Status Screen displays all faults as bytes in the HART Device Status Command. The table below lists all Bytes and their correlating fault bits in the HART Device Status Command.

Fault Matrix

Table 5 below lists and describes faults detected by SVI II ESD. The table also provides information to help determine the fault cause and corrective action.

Table 5 SVI II ESD Fault Matrix

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automati-cally cleared:	Can be cleared:	Persists across resets:	TEXT For DD & ValVue ESD2 English	Probable Cause English	Recommended Action
1	0	0	RESET	3	No	Yes	No	Reset	Device reboot. The power recovered. Incoming signal was below 2.9mA.	Reset the flag using ValVue ESD or HART Hos.t
2	0	1	LOW_POWER	3	Yes, when Input current > 3.25 mA	No	No	Low Power	Device power is below 3.2mA.	Increase mA only if calibration or diagnostics are to be performed.
3	0	2	ACTUATOR	2	Yes if the condition is resolved	Yes	No	Actuator Error	1- Air supply is insufficient. 2- Handwheel or mechanical stop present. 3- Valve stuck of sticking excessively. 4- Unbalance forces on valve trim exceeds actuator capability.	1- Increase air supply above spring final value + 10 psig. 2- Verify if mechanical stop is present. 3- Perform valve signature using ValVue ESD. 4- If possible, perform valve signature under process conditions. Validate sizing of actuator against process condition using ValSpeQ.
4	0	3	AIR_SUPPLY_LOW	2	Yes if the condition is resolved	Yes	No	Air Supply Low	1- Air supply is not turned on or is set below 10psig.	1- Increase air supply above spring final value + 10 psig.
5	0	4	POSITION_ERROR	2	Yes if the condition is resolved	Yes	No	Position Error	1. Positioner is slow to follow command signal due to physical valve wear, such as tight packing, stem build-up, throttling surface friction or actuator friction. 2. Valve is slow to follow command signal due to large volume actuator. 3- Valve will not follow command signal due to insufficient or no air supply. 4- Valve does not move because the device's mode is not set to Normal. 5-. Valve will not follow command signal due to poor positioner tuning for current valve status. 6- Valve will not follow command signal due to positioner malfunction such as I/P or Relay. 7- Valve will not follow command signal due to in-line obstruction.	1- Perform valve signature using ValVue ESD. 2- Perform step test signature using ValVue ESD. Verify that air supply droop during filling is less than 15% or the set pressure. 3- Validate that the air supply set to the instrument is greater that the spring final + 10 psig. 4- Set the mode to Normal using ValVue ESD or HART Host. 5- Perform Autotune or Manual tuning using ValVue ESD or HART Host. 6- Verify if Bias Out Range or I/P Out of Range events are active. 7- Perform valve signature using ValVue ESD.
6	0	5	Undefined (reserved)	2	N/A	N/A	No	Reserved (0-5)		
7	0	6	KEYPAD FAILED	2			No	Keypad Fault	1- The local pushbutton and display is defective.	1- Replace the pushbutton and display assembly.
8	0	7	MARGINAL_POWER	2			No	Marginal Power	1- The input current is less than 3.85mA.	1- Increase loop current to 4mA only if calibration and diagnostics are to be performed.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automati-cally cleared:	Can be cleared:	Persists across resets:	TEXT For DD & ValVue ESD2 English	Probable Cause English	Recommended Action
9	1	0	CALIBRATION_FAILED	3	No	Yes	No	Calibration Failed	1- Calibration of the input sensors was outside the acceptable range when attempting to calibrate.	1- Using precision measuring equipment, perform calibration according to boundary limits of input sensors.
10	1	1	FIND_STOPS_FAILED	3	Yes, If the “find stops” process completes successfully	Yes	No	Find Stops Failed	1- When calibrating stops (Zero / Span) the travel sensor moved outside the acceptable limits 2- A procedure timeout occurred due to an extremely large volume of actuator to displace. 3- Valve position could not stabilize when de-energizing or when energizing the actuator.	1- Using ValVue ESD or HART Host, verify that travel sensor counts is 0 +/- 1000 with the valve closed. For a 90 degree valve, measured sensor count is done at 50% travel. 2- Using ValVue ESD or HART Host, perform a Manual Stop calibration. 3- Verify that air supply is adequate. Verify that accessories (boosters, quick-exhausts, etc.) are not creating instability.
11	1	2	AUTOTUNE_FAILED	3	Yes, If the “autotune” completes successfully	Yes	No	Autotune Failed	1- When performing an Autotune, procedure failed to complete due valve hysteresis beyond 50%. 2- Air supply is insufficient. 3- Air supply droops significantly during actuator filling.	1- Using ValVue ESD or HART Host, perform an Autotune with an aggressiveness level between 2 and 4. Or manual tune the parameters according to the instruction manual. 2- Increase air supply above spring final value + 10 psig. 3- Perform 5-10% steps and observe air supply gauge on the positioner.
12	1	3	STD_DIAGNOSTICS_FAILED	3	Yes, If the diagnostics completes successfully	Yes	No	Std Diagnostics Failed	1- When running a Standard Actuator Signature, the device failed to move the valve between 10% - 90%.	1 - Selected speed is too slow. Increase speed for the test by increments of 1. 2 - Insufficient Air supply.
13	1	4	EXT_DIAGNOSTICS_FAILED	3	Yes, If the diagnostics completes successfully	Yes	No	Ext Diagnostics Failed	1- When running a Extended Actuator Signature, device failed to move the valve between the configured travel.	1- Selected speed is too slow. Increase the speed for the test by increments of 1. 2 - Insufficient Air supply.
14	1	5	OS_ERROR	2	No	Yes	No	Operating System Fault	1- The micro-controller failed an operation.	1- Notify Dresser Masoneilan at svisupport@dresser.com
15	1	6	Undefined (reserved)	1	Yes	Yes	No	Reserved (1-6)	n/a	NOT IMPLEMENTED
16	1	7	Undefined (reserved)	2				Reserved (1-7)	n/a	NOT IMPLEMENTED
17	2	0	BIAS_OUT_OF_RANGE	1	No	Yes	No	Bias Out Of Range	1- The servo signal to the current-to-pressure converter is outside of normal throttling range.	
18	2	1	IP_OUT_OF_RANGE	1	No	Yes	No	I/P Out Of Range	1- The loop current to the internal current-to-pressure converter is outside of normal range.	
19	2	2	TEMPR_OUT_OF_RANGE	2	Yes	Yes	No	Temp. Out Of Range	The board temperature is below -40Deg C or above 85DegC.	NOT IMPLEMENTED
20	2	3	Undefined (reserved)	3	n/a	n/a		Reserved (2-3)	n/a	NOT IMPLEMENTED
21	2	4	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-4)	n/a	NOT IMPLEMENTED
22	2	5	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-5)	n/a	NOT IMPLEMENTED
23	2	6	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-6)	n/a	NOT IMPLEMENTED
24	2	7	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-7)	n/a	NOT IMPLEMENTED
25	3	0	NVM_CHECKSUM	1	No	No	No	NVM Checksum Error	1- A permanent corruption of the content in non-volatile memory occurred.	1- Remove power to the device for 2 minutes and restart the device. 2- If the failure persist, replace the device.
26	3	1	RAM_CHECKSUM	2	No	Yes	No	RAM Checksum Error	1- A corruption of the content in volatile memory occurred.	1- Notify Dresser Masoneilan at svisupport@dresser.com.
27	3	2	FW_CHECKSUM	1	No	No	No	Flash Checksum Error	1- Invalid firmware checksum due to data corruption.	1- Remove power to the device for 2 minutes and restart it. 2- If the failure persists, Replace device.
28	3	3	STACK	2	No	Yes	No	Stack Error	1- A problem with the memory stack occurred.	1- Clear the condition using ValVue ESD or HART Host.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automati-cally cleared:	Can be cleared:	Persists across resets:	TEXT For DD & ValVue ESD2 English	Probable Cause English	Recommended Action
29	3	4	FACTORYMODE	1	No	Yes	No	Factory Mode Fault	1- Device is in the factory mode.	1- Replace device and report the problem at svisupport@dresser.com.
30	3	5	NVM_TEST	2	No	Yes	No	NVM Test Error	1- A problem occurred when testing non-volatile memory.	1- 1- Clear the condition using ValVue ESD or HART Host.
31	3	6	Undefined (reserved)	1	n/a	Yes	Yes	Reserved (3-6)	n/a	n/a
32	3	7	Undefined (reserved)	3	n/a			Reserved (3-7)	n/a	n/a
33	4	0	REF_VOLTAGE	1	No	Yes	No	Ref Voltage Fault	1- A component problem is affecting the circuit board's reference voltage.	1- Replace the device and report problem at svisupport@dresser.com.
34	4	1	POSITION_SENSOR	1	No	Yes	No	Position Sensor Fault	1- Electronic hall sensor component and related components failed.	1- Replace device and report problem at svisupport@dresser.com.
35	4	2	CURRENT_SENSOR	1	No	Yes	No	Current Sensor Fault	1- Electronic input loop current sensor is damaged.	1- Replace device and report problem at svisupport@dresser.com.
36	4	3	TEMPERATURE_SENSOR	1	No	Yes	No	Temperature Sensor Fault	1- Electronic temperature sensor is damaged.	1- Replace device and report problem at svisupport@dresser.com.
37	4	4	2ND_CURRENT_SENSOR	2	No	Yes	No	Current Sensor Fault Reserved	1- Secondary input current sensor is damaged.	1- Replace device and report problem at svisupport@dresser.com.
38	4	5	PRESSURE1	1	No	Yes	No	Actuator Pressure 1 Fault	1- Pressure sensor #1 has been overpressurized and damaged. 2- Pressure sensor #1 has failed due to some malfunction.	1- Replace device and report problem at svisupport@dresser.com.
39	4	6	PRESSURE2	1	No	Yes	No	Actuator Pressure 2 Fault	1- Pressure sensor #2 has been overpressurized and damaged. 2- Pressure sensor #2 has failed due to some malfunction.	1- Replace device and report problem at svisupport@dresser.com.
40	4	7	PRESSURE3	1	No	Yes	No	Supply Pressure Sensor Fault	1- Pressure sensor #3 has been overpressurized and damaged. 2-Pressure sensor #3 has failed due to some malfunction.	1- Replace device and report problem at svisupport@dresser.com.
41	5	0	PRESSURE4	1	No	Yes	No	I/P Pressure Sensor Fault	1- Pressure sensor #4 has been overpressurized and damaged. 2- Pressure sensor #4 has failed due to some malfunction.	1- Replace device and report problem at svisupport@dresser.com.
42	5	1	PRESSURE5	2	No	Yes	No	Atmospheric Pressure Sensor Fault	1- A component problem is affecting circuit board's reference voltage.	1- Replace device and report problem at svisupport@dresser.com.
43	5	2	WATCHDOG_TIMEOUT	2			No	Reserved (5-2)	n/a	NOT IMPLEMENTED
44	5	3	NVM_WRITE	2	No	Yes	No	NVM Write Fault	1- An error occurred when attempting to write to non-volatile memory.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@dresser.com.
45	5	4	IRQ_FAULT	2	No	Yes	No	IRQ Fault	1- The circuit board interrupt request failed.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report the problem at svisupport@dresser.com.
46	5	5	Undefined (reserved)	2	n/a	n/a	n/a	n/a	n/a	NOT IMPLEMENTED
47	5	6	SELF_CHECK	1	No	Yes	No	Self Check Error	1-A general self check failed.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@dresser.com.
48	5	7	SOFTWARE	2	No	Yes	No	Software Error	Operating system failed in conducting a task.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@dresser.com.
49	6	0	ESD_TRIP (_ACTIVE)	1	Yes	No	No	ESD Valve Tripped	SVI II ESD successfully de-energized its pneumatic output.	None. This is a status to confirm that SVI II ESD successfully de-energized its output.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automati-cally cleared:	Can be cleared:	Persists across resets:	TEXT For DD & ValVue ESD2 English	Probable Cause English	Recommended Action
50	6	1	ESD_NEW_DATA	3	No	No	Yes	New ESD Data available	A shutdown event is stored in memory and has not yet been archived by ValVue ESD.	Connect ValVue ESD and wait for flag to self-clear. This will indicate that ValVue ESD successfully archived signature in its database.
51	6	2	ESD_DATA_ERROR	3	Yes	Yes	No	Saving ESD data error	Upon a safety trip (shutdown), a problem occurred when storing event in memory.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@dresser.com.
52	6	3	PST_FAILED	1	Yes	Yes	Yes	PST Failed	PST could not complete successfully because of: 1- Problem venting 2- PST pressure value was reached before target travel 3- PST Time value was reached before target travel 4- An ESD event happened during PST.	1- Verify that vent is not clogged up. Verify that there are no Pneumatic Train Integrity Alarm present. 2- Confirm that PST pressure setting is not too high. Run an extended signature to confirm proper PST Pressure for desired travel target. 3- Verify that vent is not partially clogged or that an accessory is not restricting air exhaust. Increase setting based on PST Travel Rate and PST travel. 4- None
53	6	4	PST_NEW_DATA	3	No	No	Yes	PST New Data	A PST Test is stored in memory and has not yet been archived by ValVue ESD.	Connect ValVue ESD and wait for the flag to self-clear. This will indicate that ValVue ESD successfully archived signature in its database.
54	6	5	PST_DATA_ERROR	3	Yes	Yes	No	Saving PST Error	Upon completion of a PST, a problem occurred when storing event in memory.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@dresser.com.
55	6	6	PNEUMATIC_TRAIN	1	Yes	No	Yes	Pneum. Train Integrity	1- The hourly test detected an unhealthy I/P. 2- The hourly test detected an unhealthy pneumatic relay. 3- The hourly test detected a problem in venting.	1,2 Re-run the test from ValVue ESD (TBT button). If alarm persists contact Dresser Masoneilan. 3- Verify vent condition.
56	6	7	TERMINAL_BOARD_DIAG	2	Yes	No	Yes	ESD Circuit Integrity	The hourly diagnostic detected a possible problem with the internal shutdown circuit.	Rerun TBT test. If situation persists, the unit must be replaced.
57	7	0	AI_PV_LOW	2	Yes	Yes	No	Low PV Analog Input	n/a	Not Implemented
58	7	1	AI_PV_HIGH	2	Yes	Yes	No	High PV Analog Input	n/a	Not Implemented
59	7	2	FRICTION_LOW	1	Yes	Yes	Yes	Friction Below Normal	The friction measured from the PST test is below the configured threshold.	1- Verify proper setting of threshold. 2- Valve shaft maybe broken and not engaging the ball / plug.
60	7	3	FRICTION_HIGH	1	Yes	Yes	Yes	Friction Above Normal	1- The friction measured from the PST test is above the configured threshold. 2- The packing can be overtighten. 3- Possible galling on guiding surfaces.	1- Verify proper setting of threshold. 2- Loosen up packing gland depending on packing type / style and application. Overhaul packing box. 3- Run Extended signature and overhaul valve if condition is validated.
61	7	4	BREAKOUT	1	Yes	Yes	Yes	Breakout Force Exceeded	1- The breakout force measured from a PST test is above configured threshold. 2- The packing gland can be overtighten. 3- Possible galling on guiding surfaces. 4- Possible weakened springs (or broken). 5- Excessive friction between ball and seat.	1- Verify proper setting of threshold. 2-Loosen up packing gland depending on packing type / style and application. Overhaul packing box. 3,4,5- Run Extended signature and overhaul valve if condition is validated.
62	7	5	SUPPLY_DROOP (Supply deviation)	2	Yes	Yes	Yes	Air Supply Droop Abnormal	1- The air supply droop measured during a PST is above the configured threshold. 2- The filter in air filter/ regulator is clogged up. 3- Air supply tubing is too small. 4- Insufficient volume of air supply manifold.	1- Verify proper setting of threshold. 2- Replace filter in the air set. 3- Increase tubing size between air set and SVI II ESD. 4- Re-size manifold.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automati-cally cleared:	Can be cleared:	Persists across resets:	TEXT For DD & ValVue ESD2 English	Probable Cause English	Recommended Action
63	7	6	SUPPLY_LOW	3	Yes	No	Yes	Low Air Supply Warning	1- An air supply loss occurred. 2- Nearby equipment draws a high volume of air. 3- The air set is adjusted less than the configured threshold.	1- Confirm that operations may be returned to normal, then turn on air supply. 2- Resize air manifold. 3- Increase air pressure to 10psig more than upper spring range and more than 30psig.
64	7	7	SUPPLY_HIGH	3	Yes	No	Yes	High Air Supply Warning	1-A failure in the air filter regulator occurred. 2- A nearby equipment drawing a high volume, suddenly quit using air and created a spike in air supply. 3- The air set is adjusted greater than configured threshold.	1- Replace air filter regulator. 2- Resize air manifold. 3-Adjust threshold to be 3-5 psig greater than set air supply.
65	8	0	IP_CAL_DRIFT	2	No	Yes	No	I/P Calibration Drift Warning	1- The current to pressure converter's flexure has been tampered with or misadjusted. 2- An impending failure is present in the flow regulator of the I/P.	1,2 - Service required. Contact Dresser Masoneilan.
66	8	1	IP_SERVO_LOW	1	No	Yes	No	Low I/P Output Pressure	1- The required I/P current is too low to ensure venting of the relay. 2- The I/P flexure is pushed against the nozzle. 3- Faulty I/P flow regulator.	1,2,3 - Service required. Contact Dresser Masoneilan.
67	8	2	IP_SERVO_HIGH	2	No	Yes	No	High I/P Output Pressure	1- The required I/P current is too high to maintain output pressure to actuator. 2- The I/P flexure is pushed away from the nozzle.	1,2 - Service required. Contact Dresser Masoneilan.
68	8	3	LINKAGE_DRIFT	1	Yes	Yes	No	Feedback Linkage Drift	1-In the fully open or fully closed position a raw travel sensor count deviation of x% exists against the calibrated stop value.	1 - Verify that linkage is well fastened. 2- Re-run the Find Stops method. When device goes in Failsafe when running the Find Stop method, clear alarm and rerun the stops.
69	8	4	VALVE_STUCK_CLOSED	1	Yes	Yes	No	Valve Stuck Closed	1- A handwheel is left engaged. 2- Valve is seized in place. 3- Insufficient actuator thrust.	1- Verify presence of a mechanical stops such as a handwheel. 2- Repair valve. 3- Run a PST or Extended signature. If friction is abnormal then overhaul valve.
70	8	5	VALVE_STUCK_OPENED	1	Yes	Yes	No	Valve Stuck Opened	1- A handwheel is left engaged. 2- Valve is seized in place. 3- Exhaust port is clogged up (no venting). 4- An accessory prevents the air from the actuator to be vented.	1- Verify presence of a mechanical stops such as a handwheel. 2- Repair valve. 3- Verify that exhaust port is not restricted. 4- Run a TBT test from ValVue ESD. A failure of the TBT test would indicate a problem in venting.
71	8	6	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a
72	8	7	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automatically cleared	Can be cleared	Persists across resets	TEXT For DD & ESDVue2 English	Probable Cause English	Recommended Action English
1	0	0	RESET	3	No	Yes	No	Reset	Device reboot. The power recovered. Incoming signal was below 2.9mA.	Reset the flag using ValVue ESD or HART Hos.t
2	0	1	LOW_POWER	3	Yes, when Input current > 3.25 mA	No	No	Low Power	Device power is below 3.2mA .	Increase mA only if calibration or diagnostics are to be performed.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automatically cleared	Can be cleared	Persists across resets	TEXT For DD & ESDVue2 English	Probable Cause English	Recommended Action English
3	0	2	ACTUATOR	2	Yes if the condition is resolved	Yes	No	Actuator Error	1- Air supply is insufficient. 2- Handwheel or mechanical stop present. 3- Valve stuck of sticking excessively. 4- Unbalance forces on valve trim exceeds actuator capability.	1- Increase air supply above spring final value + 10 psig. 2- Verify if mechanical stop is present. 3- Perform valve signature using ValVue ESD. 4- If possible, perform valve signature under process conditions. Validate sizing of actuator against process condition using ValSpeQ.
4	0	3	AIR_SUPPLY_LOW	2	Yes if the condition is resolved	Yes	No	Air Supply Low	1- Air supply is not turned on or is set below 10psig.	1- Increase air supply above spring final value + 10 psig.
5	0	4	POSITION_ERROR	2	Yes if the condition is resolved	Yes	No	Position Error	1. Positioner is slow to follow command signal due to physical valve wear, such as tight packing, Stem build-up, throttling surface friction or actuator friction. 2. Valve is slow to follow command signal due to large volume actuator. 3- Valve will not follow command signal due to insufficent or no air supply. 4- Valve does not move because the device's mode is not set to Normal. 5-. Valve will not follow command signal due to poor positioner tuning for current valve status. 6- Valve will not follow command signal due to positioner malfunction such as I/P or Relay. 7- Valve will not follow command signal due to in-line obstruction.	1- Perform valve signature using ValVue ESD. 2- Perform step test signature using ValVue ESD. Verify that airsupply droop during filling is less than 15% or the set pressure. 3- Validate that the air supply set to the instrument is greater that the spring final + 10psig. 4- Set the mode to Normal using ValVue ESD or HART Host. 5- Perform Autotune or Manual tuning using ValVue ESD or HART Host. 6- Verify if Bias Out Range or I/P Out of Range events are active . 7- Perform valve signature using ValVue ESD.
6	0	5	Undefined (reserved)	2	N/A	N/A	No	Reserved (0-5)		
7	0	6	KEYPAD FAILED	2			No	Keypad Fault	1- The local pushbutton and display is defective.	1- Replace the pushbutton and display assembly.
8	0	7	MARGINAL_POWER	2			No	Marginal Power	1- The input current is less than 3.85mA.	1- Increase loop current to 4mA only if calibration and diagnostics are to be performed.
9	1	0	CALIBRATION_FAILED	3	No	Yes	No	Calibration Failed	1- Calibration of the input sensors was outside the acceptable range when attempting to calibrate.	1- Using precision measuring equipment, perform calibration according to boundary limits of input sensors.
10	1	1	FIND_STOPS_FAILED	3	Yes, If the "find stops" process completes successfully	Yes	No	Find Stops Failed	1- When calibrating stops (Zero / Span) the travel sensor moved outside the acceptable limits 2- A procedure timeout occurred due to an extremely large volume of actuator to displace. 3- Valve position could not stabilize when de-energizing or when energizing the actuator.	1- Using ValVue ESD or HART Host, veriy that travel sensor counts is 0 +/- 1000 with the valve closed. For a 90 degree valve, measured sensor count is done at 50% travel. 2- Using ValVue ESD or HART Host , perform a Manual Stop calibration. 3- Verify that air supply is adequate. Verify that accessories (boosters, quick-exhausts, etc.) are not creating instability.
11	1	2	AUTOTUNE_FAILED	3	Yes, If the "autotune" completes successfully	Yes	No	Autotune Failed	1- When performing an Autotune, procedure failed to complete due valve hysterisis beyond 50%. 2- Air supply is insufficient. 3- Air supply droops significantly during actuator filling.	1- Using ValVue ESD or HART Host , perform an Autotune with an agressiveness level between 2 and 4. Or manual tune the parameters according to the instruction manual. 2- Increase air supply above spring final value + 10 psig. 3- Perform 5-10% steps and observe air supply gauge on the positioner.
12	1	3	STD_DIAGNOSTICS_FAILED	3	Yes, If the diagnostics completes successfully	Yes	No	Std Diagnostics Failed	1- When running a Standard Actuator Signature, the device failed to move the valve between 10% - 90%.	1 - Selected speed is too slow. Increase speed for the test by increments of 1. 2 - Insufficient Air supply.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automatically cleared	Can be cleared	Persists across resets	TEXT For DD & ESDVue2 English	Probable Cause English	Recommended Action English
13	1	4	EXT_DIAGNOSTICS_FAILED	3	Yes, If the diagnostics completes successfully	Yes	No	Ext Diagnostics Failed	1- When running a Extended Actuator Signature, device failed to move the valve between the configured travel.	1- Selected speed is too slow. Increase the speed for the test by increments of 1. 2 - Insufficient Air supply.
14	1	5	OS_ERROR	2	No	Yes	No	Operating System Fault	1- The micro-controller failed an operation.	1- Notify Masoneilan at svisupport@masoneilan.com
15	1	6	Undefined (reserved)	1	Yes	Yes	No	Reserved (1-6)	n/a	NOT IMPLEMENTED
16	1	7	Undefined (reserved)	2				Reserved (1-7)	n/a	NOT IMPLEMENTED
17	2	0	BIAS_OUT_OF_RANGE	1	No	Yes	No	Bias Out Of Range	1- The servo signal to the current-to-pressure converter is outside of normal throttling range.	
18	2	1	IP_OUT_OF_RANGE	1	No	Yes	No	I/P Out Of Range	1- The loop current to the internal current-to-pressure converter is outside of normal range.	
19	2	2	TEMPR_OUT_OF_RANGE	2	Yes	Yes	No	Temp. Out Of Range	The board temperature is below -40Deg C or above 85DegC.	NOT IMPLEMENTED
20	2	3	Undefined (reserved)	3	n/a	n/a		Reserved (2-3)	n/a	NOT IMPLEMENTED
21	2	4	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-4)	n/a	NOT IMPLEMENTED
22	2	5	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-5)	n/a	NOT IMPLEMENTED
23	2	6	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-6)	n/a	NOT IMPLEMENTED
24	2	7	Undefined (reserved)	3	N/A	N/A	N/A	Reserved (2-7)	n/a	NOT IMPLEMENTED
25	3	0	NVM_CHECKSUM	1	No	No	No	NVM Checksum Error	1- A permanent corruption of the content in non-volatile memory occurred.	1- Remove power to the device for 2 minutes and restart the device. 2- If the failure persist, Replace the device.
26	3	1	RAM_CHECKSUM	2	No	Yes	No	RAM Checksum Error	1- A corruption of the content in volatile memory occurred.	1- Notify Masoneilan at svisupport@masoneilan.com.
27	3	2	FW_CHECKSUM	1	No	No	No	Flash Checksum Error	1- Invalid firmware checksum due to data corruption.	1- Remove power to the device for 2 minutes and restart it. 2- If the failure persists, Replace device.
28	3	3	STACK	2	No	Yes	No	Stack Error	1- A problem with the memory stack occurred.	1- Clear the condition using ValVue ESD or HART Host.
29	3	4	FACTORYMODE	1	No	Yes	No	Factory Mode Fault	1- Device is in the factory mode.	1- Replace device and report the problem at svisupport@masoneilan.com.
30	3	5	NVM_TEST	2	No	Yes	No	NVM Test Wrror	1- A problem occurred when testing non-volatile memor.	1- 1- Clear the condition using ValVue ESD or HART Host.
31	3	6	Undefined (reserved)	1	n/a	Yes	Yes	Reserved (3-6)	n/a	n/a
32	3	7	Undefined (reserved)	3	n/a			Reserved (3-7)	n/a	n/a
33	4	0	REF_VOLTAGE	1	No	Yes	No	Ref Voltage Fault	1- A component problem is affecting the cicuit board's reference voltage.	1- Replace the device and report problem at svisupport@masoneilan.com.
34	4	1	POSITION_SENSOR	1	No	Yes	No	Position Sensor Fault	1- Electronic hall sensor component and related components failed.	1- Replace device and report problem at svisupport@masoneilan.com.
35	4	2	CURRENT_SENSOR	1	No	Yes	No	Current Sensor Fault	1- Electronic input loop current sensor is damaged.	1- Replace device and report problem at svisupport@masoneilan.com.
36	4	3	TEMPERATURE_SENSOR	1	No	Yes	No	Temperature Sensor Fault	1- Electronic temperature sensor is damaged.	1- Replace device and report problem at svisupport@masoneilan.com.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automatically cleared	Can be cleared	Persists across resets	TEXT For DD & ESDVue2 English	Probable Cause English	Recommended Action English
37	4	4	2ND_CURRENT_SENSOR	2	No	Yes	No	Current Sensor Fault Reserved	1- Secondary input current sensor is damaged.	1- Replace device and report problem at svisupport@masoneilan.com.
38	4	5	PRESSURE1	1	No	Yes	No	Actuator Pressure 1 Fault	1- Pressure sensor #1 has been overpressurized and damaged. 2- Pressure sensor #1 has failed due to some malfunction.	1- Replace device and report problem at svisupport@masoneilan.com.
39	4	6	PRESSURE2	1	No	Yes	No	Actuator Pressure 2 Fault	1- Pressure sensor #2 has been overpressurized and damaged. 2- Pressure sensor #2 has failed due to some malfunction.	1- Replace device and report problem at svisupport@masoneilan.com.
40	4	7	PRESSURE3	1	No	Yes	No	Supply Pressure Sensor Fault	1- Pressure sensor #3 has been overpressurized and damaged. 2-Pressure sensor #3 has failed due to some malfunction.	1- Replace device and report problem at svisupport@masoneilan.com.
41	5	0	PRESSURE4	1	No	Yes	No	I/P Pressure Sensor Fault	1- Pressure sensor #4 has been overpressurized and damaged. 2- Pressure sensor #4 has failed due to some malfunction.	1- Replace device and report problem at svisupport@masoneilan.com.
42	5	1	PRESSURE5	2	No	Yes	No	Atmospheric Pressure Sensor Fault	1- A component problem is affecting circuit board's reference voltage.	1- Replace device and report problem at svisupport@masoneilan.com.
43	5	2	WATCHDOG_TIMEOUT	2			No	Reserved (5-2)		NOT IMPLEMENTED
44	5	3	NVM_WRITE	2	No	Yes	No	NVM Write Fault	1- An error occurred when attempting to write to non-volatile memory.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@masoneilan.com.
45	5	4	IRQ_FAULT	2	No	Yes	No	IRQ Fault	1- The circuit board interrupt request failed.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report the problem at svisupport@masoneilan.com.
46	5	5	Undefined (reserved)	2	n/a	n/a	n/a	n/a	n/a	NOT IMPLEMENTED
47	5	6	SELF_CHECK	1	No	Yes	No	Self Check Error	1-A general self check failed.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@masoneilan.com.
48	5	7	SOFTWARE	2	No	Yes	No	Software Error	Operating system failed in conducting a task.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@masoneilan.com.
49	6	0	ESD_TRIP (_ACTIVE)	1	Yes	No	No	ESD Valve Tripped	SVI II ESD successfully denergized its pneumatic output.	None. This is a status to confirm that SVI II ESD successfully denergized its output.
50	6	1	ESD_NEW_DATA	3	No	No	Yes	New ESD Data available	A shutdown event is stored in memory and has not yet been archived by ValVue ESD.	Connect ValVue ESD and wait for flag to self-clear. This will indicate that ValVue ESD successfully archived signature in its database.
51	6	2	ESD_DATA_ERROR	3	Yes	Yes	No	Saving ESD data error	Upon a safety trip (shutdown), a problem occurred when storing event in memory.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@masoneilan.com.
52	6	3	PST_FAILED	1	Yes	Yes	Yes	PSTFailed	PST could not complete successfully because of: 1- Problem venting 2- PST pressure value was reached before target travel 3- PST Time value was reached before target travel 4- An ESD event happened during PST.	1- Verify that vent is not clogged up. Verify that there are no Pneumatic Train Integrity Alarm present. 2- Confirm that PST pressure setting is not too high. Run an extended signature to confirm proper PST Pressure for desired travel target. 3- Verify that vent is not partially clogged or that an accessory is not restricting air exhaust. Increase setting based on PST Travel Rate and PST travel. 4- None

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automatically cleared	Can be cleared	Persists across resets	TEXT For DD & ESDVue2 English	Probable Cause English	Recommended Action English
53	6	4	PST_NEW_DATA	3	No	No	Yes	PST New Data	1- A PST Test is stored in memory and has not yet been archived by ValVue ESD.	1- Connect ValVue ESD and wait for the flag to self-clear. This will indicate that ValVue ESD successfully archived signature in its database.
54	6	5	PST_DATA_ERROR	3	Yes	Yes	No	Saving PST Error	Upon completion of a PST, a problem occurred when storing event in memory.	1- Clear the condition using ValVue ESD or HART Host. 2- If condition persists, replace device and report problem at svisupport@masoneilan.com.
55	6	6	PNEUMATIC_TRAIN	1	Yes	No	Yes	Pneum. Train Integrity	1- The hourly test detected an unhealthy I/P. 2- The hourly test detected an unhealthy pneumatic relay. 3- The hourly test detected a problem in venting.	1,2 Re-run the test from ValVue ESD (TBT button). If alarm persists contact Masoneilan. 3- Verify vent condition.
56	6	7	TERMINAL_BOARD_DIAG	2	Yes	No	Yes	ESD Circuit Integrity	1- The hourly diagnostic detected a possible problem with the internal shutdown circuit.	1- Rerun TBT test. If situation persists, the unit must be replaced.
57	7	0	AI_PV_LOW	2	Yes	Yes	No	Low PV Analog Input	Future	
58	7	1	AI_PV_HIGH	2	Yes	Yes	No	High PV Analog Input	Future	
59	7	2	FRICTION_LOW	1	Yes	Yes	Yes	Friction Below Normal	1- The friction measured from the PST test is below the configured threshold.	1- Verify proper setting of threshold. 2- Valve shaft maybe broken and not engaging the ball / plug.
60	7	3	FRICTION_HIGH	1	Yes	Yes	Yes	Friction Above Normal	1- The friction measured from the PST test is above the configured threshold. 2- The packing can be overtighten. 3- Possible galling on guiding surfaces.	1- Verify proper setting of threshold. 2- Loosen up packing gland depending on packing type / style and application. Overhaul packing box. 3- Run Extended signature and overhaul valve if condition is validated.
61	7	4	BREAKOUT	1	Yes	Yes	Yes	Breakout Force Exceeded	1- The breakout force measured from a PST test is above configured threshold. 2- The packing gland can be overtighten. 3- Possible galling on guiding surfaces. 4- Possible weakened springs (or broken). 5- Excessive friction between ball and seat.	1- Verify proper setting of threshold. 2-Loosen up packing gland depending on packing type / style and application. Overhaul packing box. 3,4,5- Run Extended signature and overhaul valve if condition is validated.
62	7	5	SUPPLY_DROOP (Supply deviation)	2	Yes	Yes	Yes	Air Supply Droop Abnormal	1- The air supply droop measured during a PST is above the configured threshold. 2- The filter in air filter/regulator is clogged up. 3- Air supply tubing is too small. 4- Insufficient volume of air supply manifold.	1- Verify proper setting of threshold. 2- Replace filter in the airset. 3- Increase tubing size between airset and SVI II ESD. 4- Re-size manifold.
63	7	6	SUPPLY_LOW	3	Yes	No	Yes	Low Air Supply Warning	1- An air supply loss occurred. 2- Nearby equipment draws a high volume of air. 3- The airset is adjusted less than the configured threshold.	1- Confirm that operations may be returned to normal, then turn on air supply. 2- Resize air manifold. 3- Increase air pressure to 10psig more than upper spring range and more than 30psig.
64	7	7	SUPPLY_HIGH	3	Yes	No	Yes	High Air Supply Warning	1-A failure in the air filter regulator occured. 2- A nearby equipment drawing a high volume, suddenly quit using air and created a spike in air supply. 3- The airset is adjusted greater than configured threshold.	1- Replace air filter regulator. 2- Resize air manifold. 3-Adust threshold to be 3-5 psig greater than set air supply.

Sequence	Byte #	Bit #	FAULT Name	Criticality Of Alarm	Automatically cleared	Can be cleared	Persists across resets	TEXT For DD & ESDVue2 English	Probable Cause English	Recommended Action English
65	8	0	IP_CAL_DRIFT	2	No	Yes	No	I/P Calibration Drift Warning	1- The current to pressure converter's flexure has been tampered with or misadjusted. 2- An impending failure is present in the flow regulator of the I/P.	1,2 - Service required. Contact Masoneilan.
66	8	1	IP_SERVO_LOW	1	No	Yes	No	Low I/P Output Pressure	1- The required I/P current is too low to ensure venting of the relay. 2- The I/P flexure is pushed against the nozzle. 3- Faulty I/P flow regulator.	1,2,3 - Service required. Contact Masoneilan.
67	8	2	IP_SERVO_HIGH	2	No	Yes	No	High I/P Output Pressure	1- The required I/P current is too high to maintain output pressure to actuator. 2- The I/P flexure is pushed away from the nozzle.	1,2 - Service required. Contact Masoneilan.
68	8	3	LINKAGE_DRIFT	1	Yes	Yes	No	Feedback Linkage Drift	1-In the fully open or fully closed position a raw travel sensor count deviation of x% exists againt the calibrated stop value.	1 - Verify that linkage is well fastened. 2- Re-run the Find Stops method. When device goes in Failsafe when running the Find Stop method, clear alarm and rerun the stops.
69	8	4	VALVE_STUCK_CLOSED	1	Yes	Yes	No	Valve Stuck Closed	1- A handwheel is left engaged. 2- Valve is seized in place. 3- Insufficient actuator thrust.	1- Verify presence of a mechanical stops such as a handhweel. 2- Repair valve. 3- Run a PST or Extended signature. If friction is abnormal then overhaul valve.
70	8	5	VALVE_STUCK_OPENED	1	Yes	Yes	No	Valve Stuck Opened	1- A handwheel is left engaged. 2- Valve is seized in place. 3- Exhaust port is clogged up (no venting). 4- An accessory prevents the air from the actuator to be vented.	1- Verify presence of a mechanical stops such as a handhweel. 2- Repair valve. 3- Verify that exhaust port is not restricted. 4- Run a TBT test from ValVue ESD. A failure of the TBT test would indicate a problem in venting.
71	8	6	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a
72	8	7	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a

Status Context Menu

When you right click on the Status Screen, a context menu appears as shown in the figure below. The context menu contains only a link to Status on-line help.

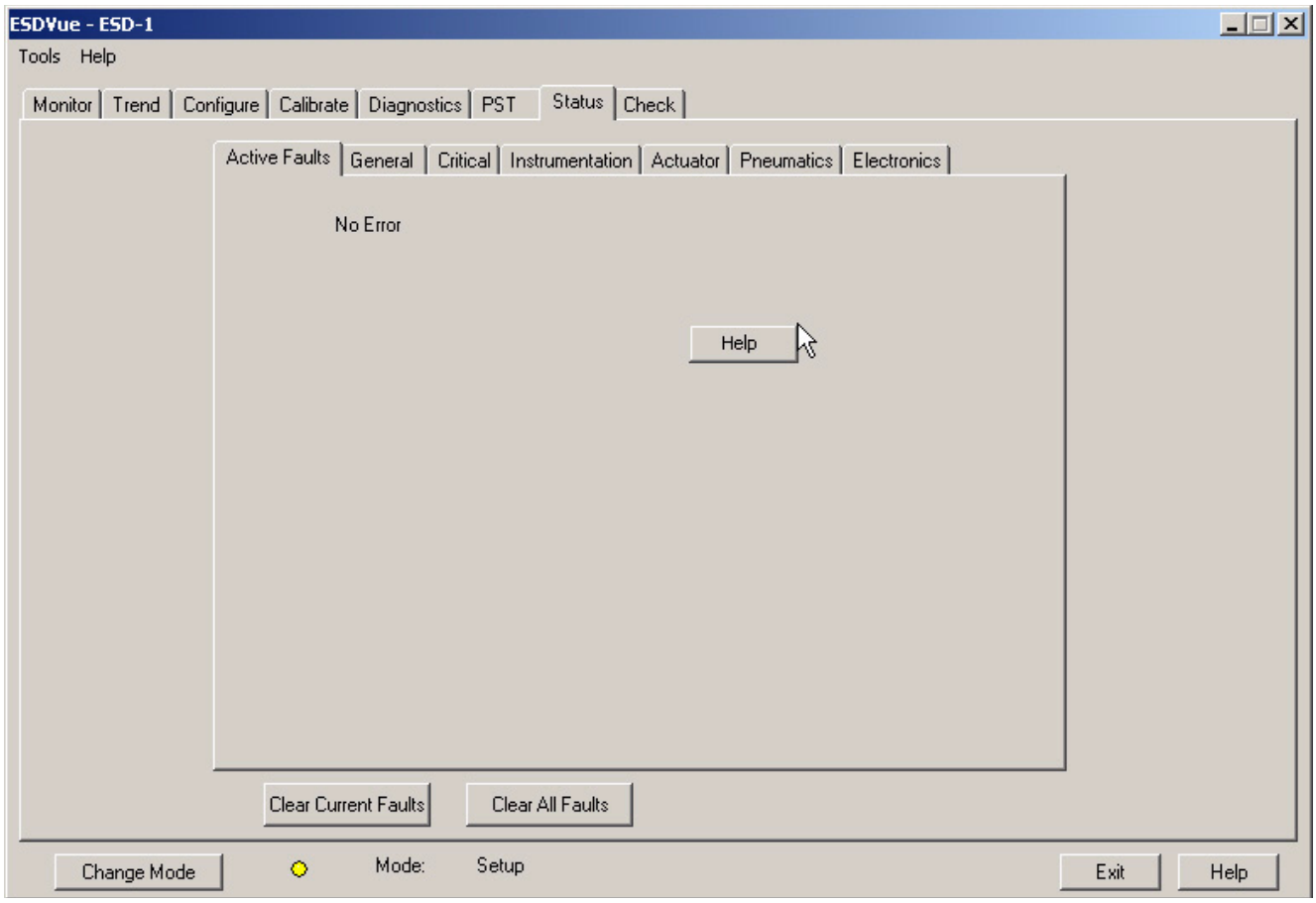


Figure 291 Status Screen Context Menu

Check 11

What you can do on the Check Screen

Check Screen provides the user a method for monitoring and adjusting some of the basic parameters. This screen is used primarily for troubleshooting.

- The Check Screen also allows you to send a HART command and view the result.
- Using the Check Screen Context Menu (right click) or the Tools Menu you can set the SVI II ESD to Full Open, Full Closed and Detach Trend. To perform any action from the Check Screen Context Menu, ESDVue must be in the Setup mode. (See "Change Mode" on page 48 for further information.)

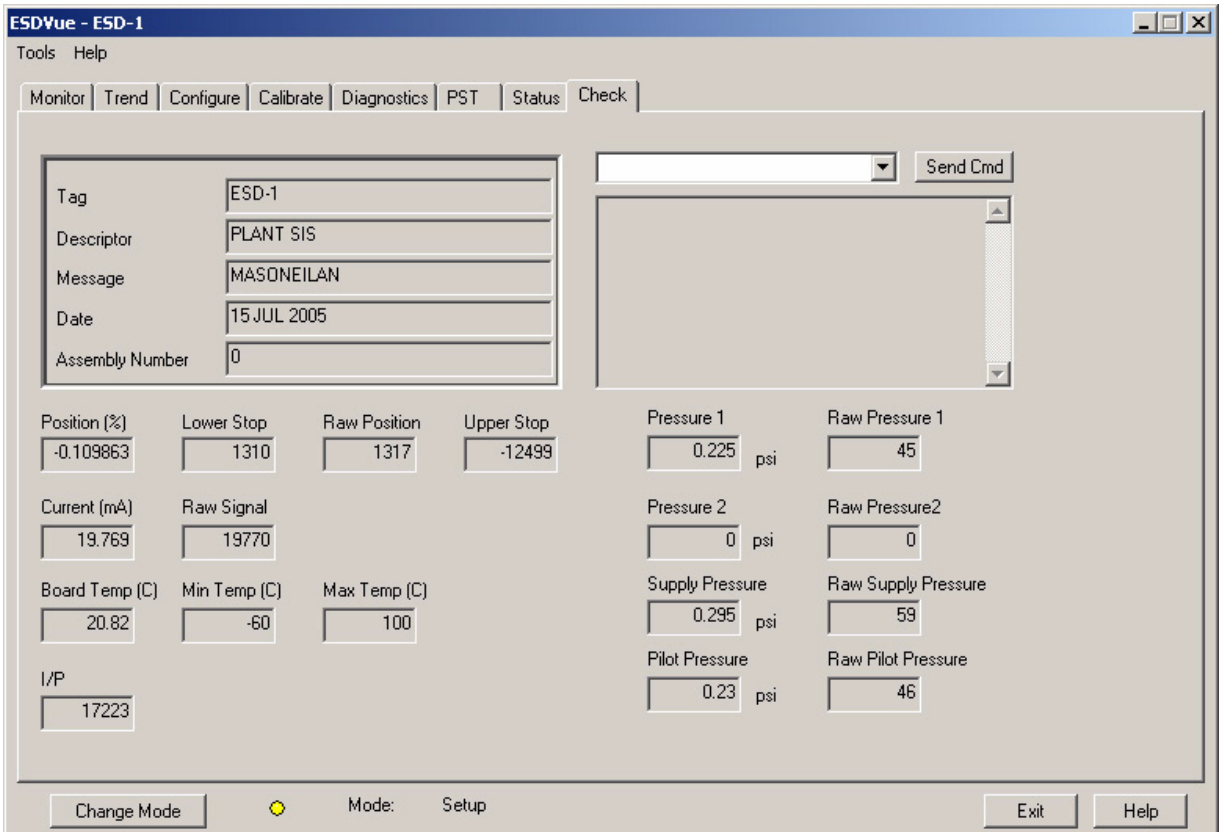


Figure 292 Check Screen

Information Displayed on the Check Screen

The Check Screen is used for troubleshooting and displays the operating parameters of the SVI II ESD including:

- Tag Information
- Position
- Lower Stop
- Raw Position
- Upper Stop
- Current
- Raw Signal
- Board Temperature reading
- Minimum Temperature
- Maximum Temperature
- I/P Reading
- Pressure 1 Reading
- Raw Pressure 1
- Pressure 2 Reading
- Raw Pressure 2
- Supply Pressure
- Raw Supply Pressure
- Pilot Pressure
- Raw Pilot Pressure

Position

Indicates the actual valve position in % of valve opening. 0% is always closed and 100% is open. Because the travel of a valve may exceed its nominal travel, positions greater than 100% are possible.

Lower Stop

The Lower and Upper Stop values are the A/D values measured from the position sensor at the full travel of the valve. The Lower Stop designates the lower end of the valve travel. The raw position measurement must always be between these two numbers. These numbers are useful for troubleshooting problems.

Raw Position

The A/D value measured from the pressure sensor 1. This is used for troubleshooting purposes.

Upper Stop

The Lower and Upper Stop values are the A/D values measured from the position sensor at the full travel of the valve. The Upper Stop designates the upper end of the valve travel. The raw position measurement must always be between these two numbers. These numbers are useful for troubleshooting problems.

Current (mA)

The value of the input signal in miliamps.

Raw Signal

The A/D value measured from the signal sensor. This is used for troubleshooting purposes.

Board Temp (C)

The internal SVI II ESD temperature measured in degrees Celsius. The SVI II ESD also reports the lowest temperature and highest temperature in which it has been operating.

Min Temp (C)

The Min Temp is the minimum temperature in degrees Celsius at which the SVI II ESD reports it has been operating.

Max Temp (C)

The Max Temp is the maximum temperature in degrees Celsius at which the SVI II ESD reports it has been operating.

I/P

The current D/A value being sent to the I/P that controls the valve position. This value is used for troubleshooting.

Pressure 1

The SVI II ESD continuously monitors the actuator pressure. It is displayed in the user selected units (psi, bar, or kpa). Pressure 1 is the actuator pressure for a single acting SVI II ESD.

Raw Pressure 1

The A/D value measured from the pressure sensor 1. This is used for troubleshooting purposes.

Pressure 2

The SVI II ESD continuously monitors the actuator pressure. It is displayed in the user selected units (psi, bar, or kpa). Pressure 2 is the actuator pressure for a double acting SVI II ESD.

Raw Pressure 2

The A/D value measured from the pressure sensor 2. This is used for troubleshooting purposes.

Supply Pressure

The Supply Pressure is the pressure generated by the air supply.

Raw Supply Pressure

The A/D value measured from the air supply. This is used for troubleshooting purposes.

Pilot Pressure

Pilot Pres (pressure units) is pressure generated by the I/P.

Raw Pilot Pressure

The A/D value measured from the I/P pressure sensor. This is used for troubleshooting purposes.

Send Command

One of many features available within ESDVue is the ability to easily send HART commands to the SVI II ESD and receive visible results on the Check Screen, in the result box below the command drop down list. For a complete list of the HART commands see “List of Available HART Commands” on page 285.

To send a HART command:

1. Access the command drop down list by clicking on the arrow located at the right of the field as shown in the figure below.

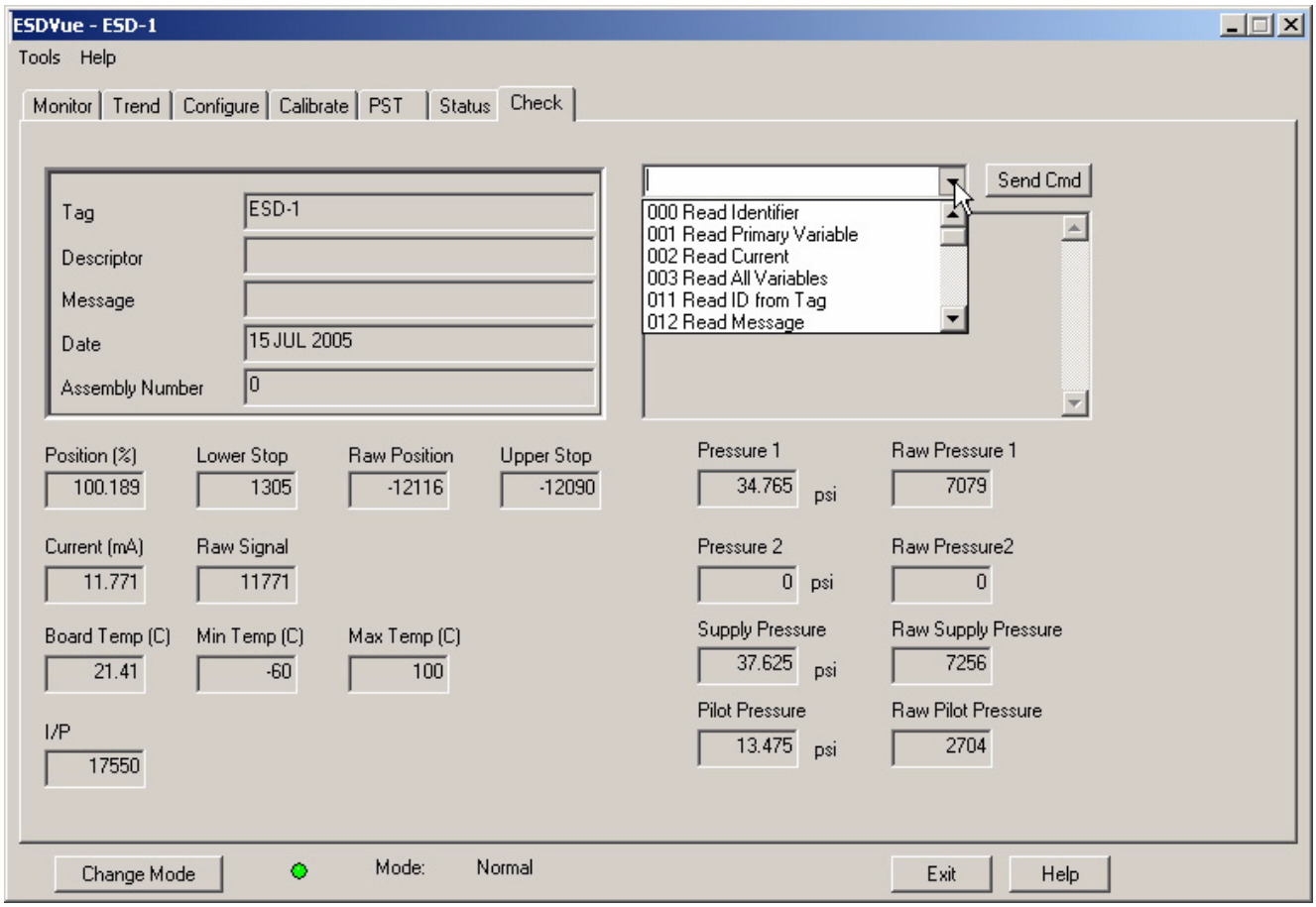


Figure 293 Accessing HART Commands

2. Scroll through the list of commands, and select the command you would like to execute by clicking on its name.

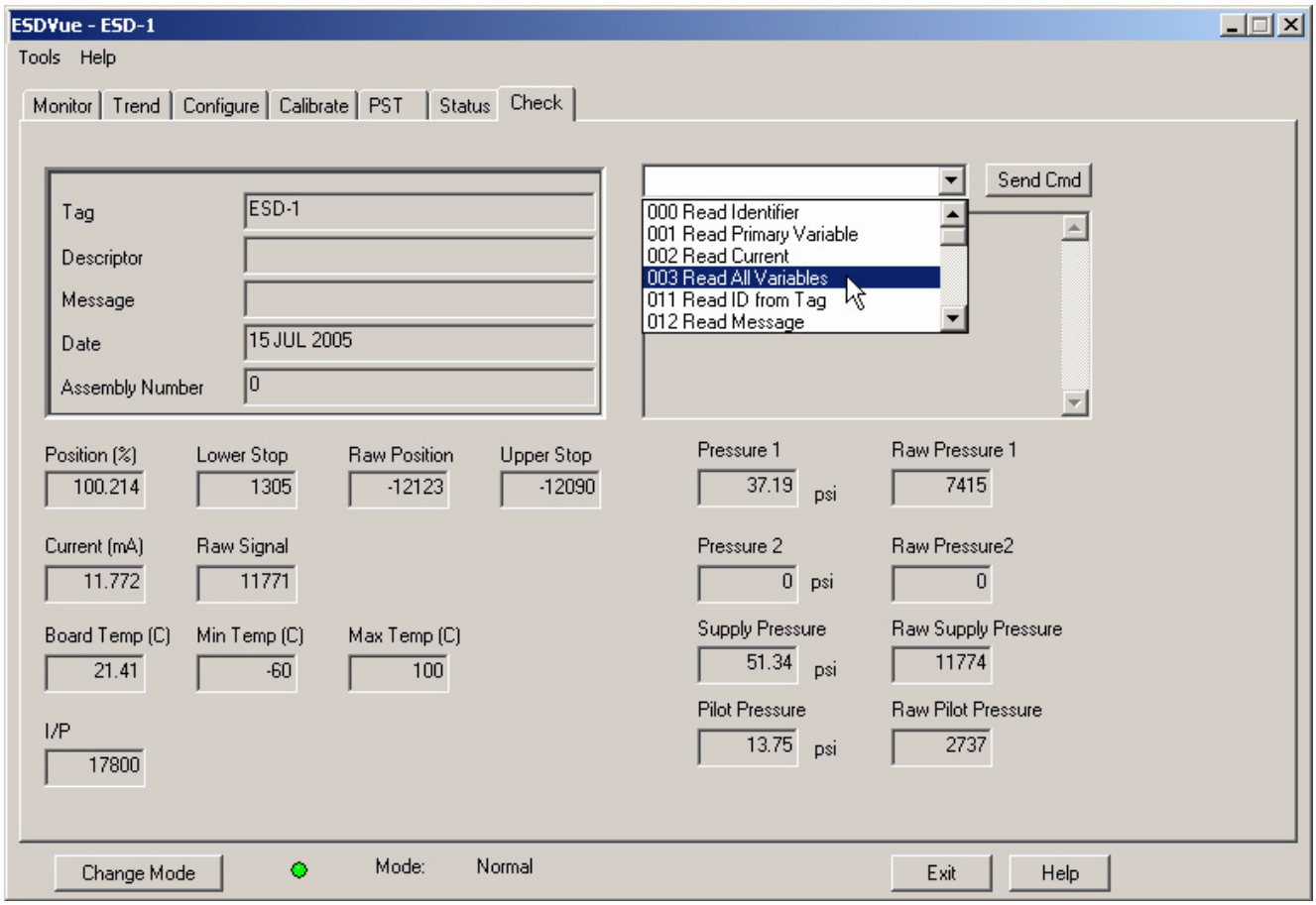


Figure 294 Selecting the Command to Send

3. With the selected command displayed in the command field, click on the "Send Cmd" button.

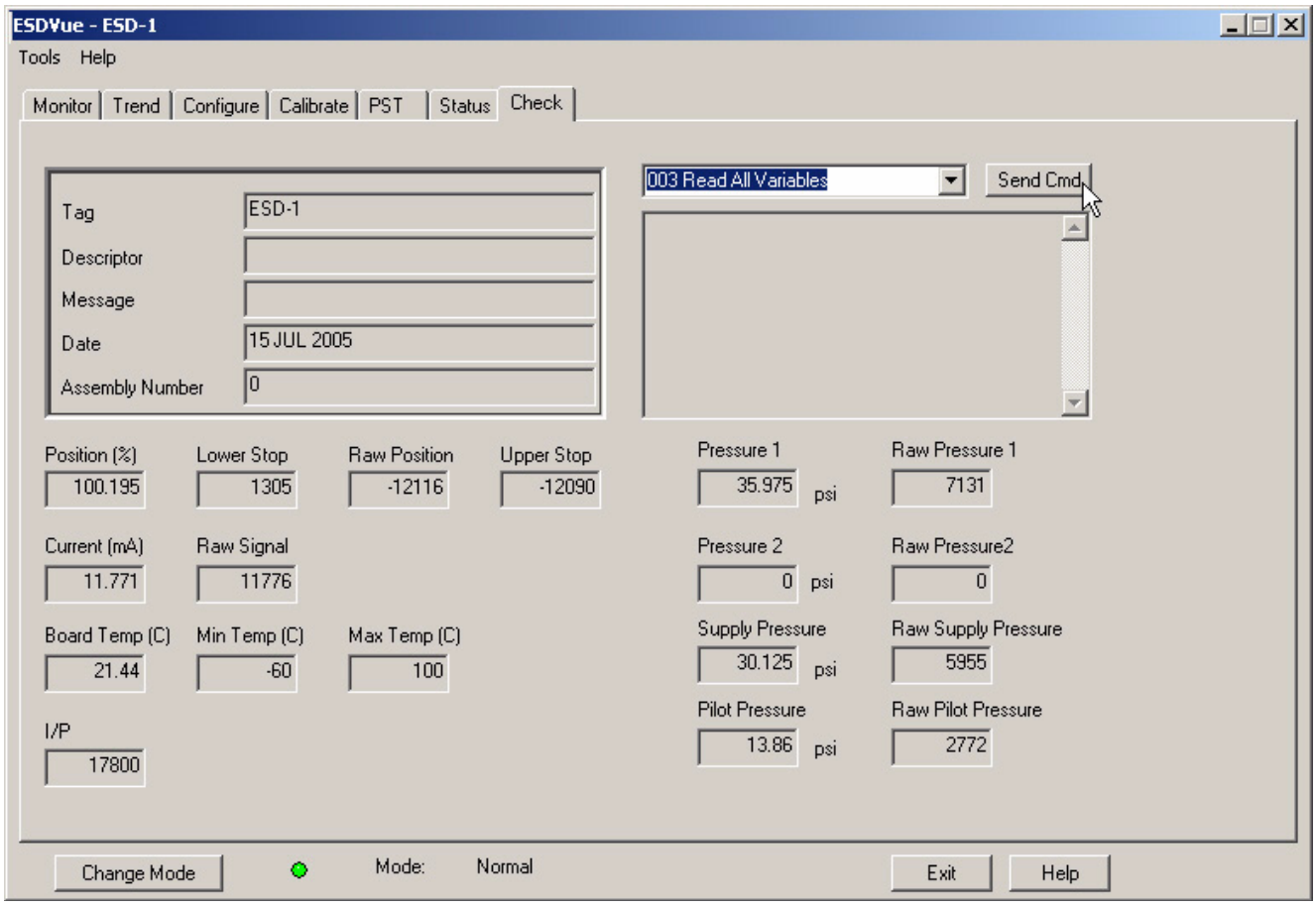


Figure 295 Executing Send Command

4. Read the results in the Result Display.

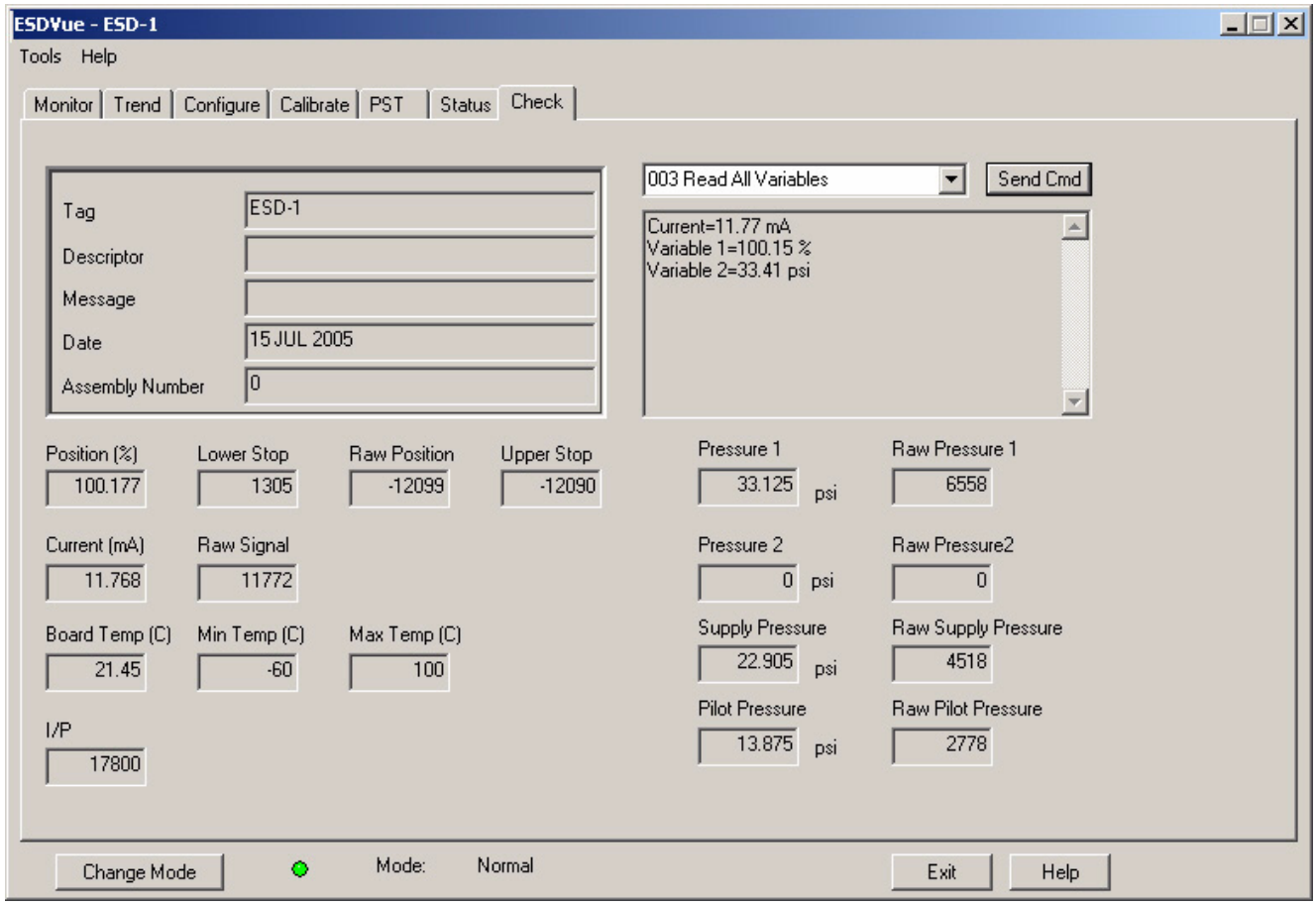


Figure 296 Send Command Results Displayed

List of Available HART Commands

When you click on the drop down arrow, ESDVue displays the available HART commands. Scroll through the list until you locate the command you wish to execute. The following commands can be sent to the SVI II ESD:

000 Read Identifier - Returns the unique identifier from the device including the device ID, device type, and the manufacturers ID.

001 Read Primary Variable - Returns the position in percent open.

002 Read Current - Returns the input signal in mA.

003 Read All Variables - Returns the input signal and the position in percent open

011 Read ID from Tag - Prompts the user for a tag name. The tag name is sent in a HART command and if received by a device with a matching tag name, the ID of the device is returned. The format of the ID is the same as command 001 Read Identifier.

012 Read Message - Reads the message that was stored in the device when it was configured

013 Read Tag & Descriptor - Reads the tag name, date, and the descriptor that was stored in the device when it was configured

016 Read Assembly Number - Reads the final assembly number that was stored in the device when it was assembled at the factory

017 Write Message - This command allows the user to enter a message (up to 32 characters) that will be stored in the SVI II ESD.

018 Write Tag & Descriptor - This command allows the user to enter a tag name (up to 8 characters) and a description (up to 16 characters) that are stored in the
SVI II ESD.

019 Write Final Assembly - This command allows the user to enter an identifying number (0 to 16 million) which is stored in the SVI II ESD.

038 Reset Configuration Changed Flag - This command sets the HART configuration changed bit back to 0. The bit is set whenever a value in the device has changed.

210 Read Configuration - Reads the configuration data from the device and displays it in the response box. The data includes all of the data describing the device set on the Configure Screen including Air-To-Open/Air-To-Close, Tight Shutoff status, Software Position Limit Stops, etc.

200 Read Option Configuration - Reads basic (hardware) configuration information about the positioner.

212 Read Error Limits - Reads and displays the position range and time-outs associated with position and pressure errors

216 Read PID - Reads and displays the valve positioning tuning parameters

136 Read Status - Reads and displays the status flags. These flags describe error conditions that have occurred since the last time they were cleared. See Status Code List for a complete list of possible codes.

138 Clear Status - Clears the status flags. See also Status Code List.

154 Read Setpoint - reads the manual setpoint of the positioner.

141 Read Raw Data - Returns information from the SVI II ESD that is useful to Masoneilan engineers for diagnostic purposes. The information includes the input current on the auxiliary input channel, the A/D values from the pressure, signal, and position measurements, the D/A value of the signal to the I/P, and the internal SVI II ESD temperature.

143 Read Temperatures – reads the historical low and high range to which the positioner was exposed and reads the actual circuit board temperature

201 Read All Pressures – reads the Actuator, Supply and IP pressure (available with the Advanced Diagnostics version)

249 Read Operating Mode – reads and displays the positioner operating mode.

Check Context Menu

When the user right clicks on the Check screen, a context menu shown below appears. The following items will be on the menu:

- Full Open - Moves the valve to full open. This command works by taking the valve out of closed loop control and sends a high or low signal to the I/P.
- Full Closed - Moves the valve to full closed. This command works by taking the valve out of closed loop control and sends a high or low signal to the I/P.
- Detach Trend - removes the trend display from the tabbed dialog and creates a separate trend display.
- Help - displays the on-line help at the Check screen instructions.

Note: *To execute any Context Menu task, ESDVue must be in the Setup mode. (See "Change Mode" on page 48.)*

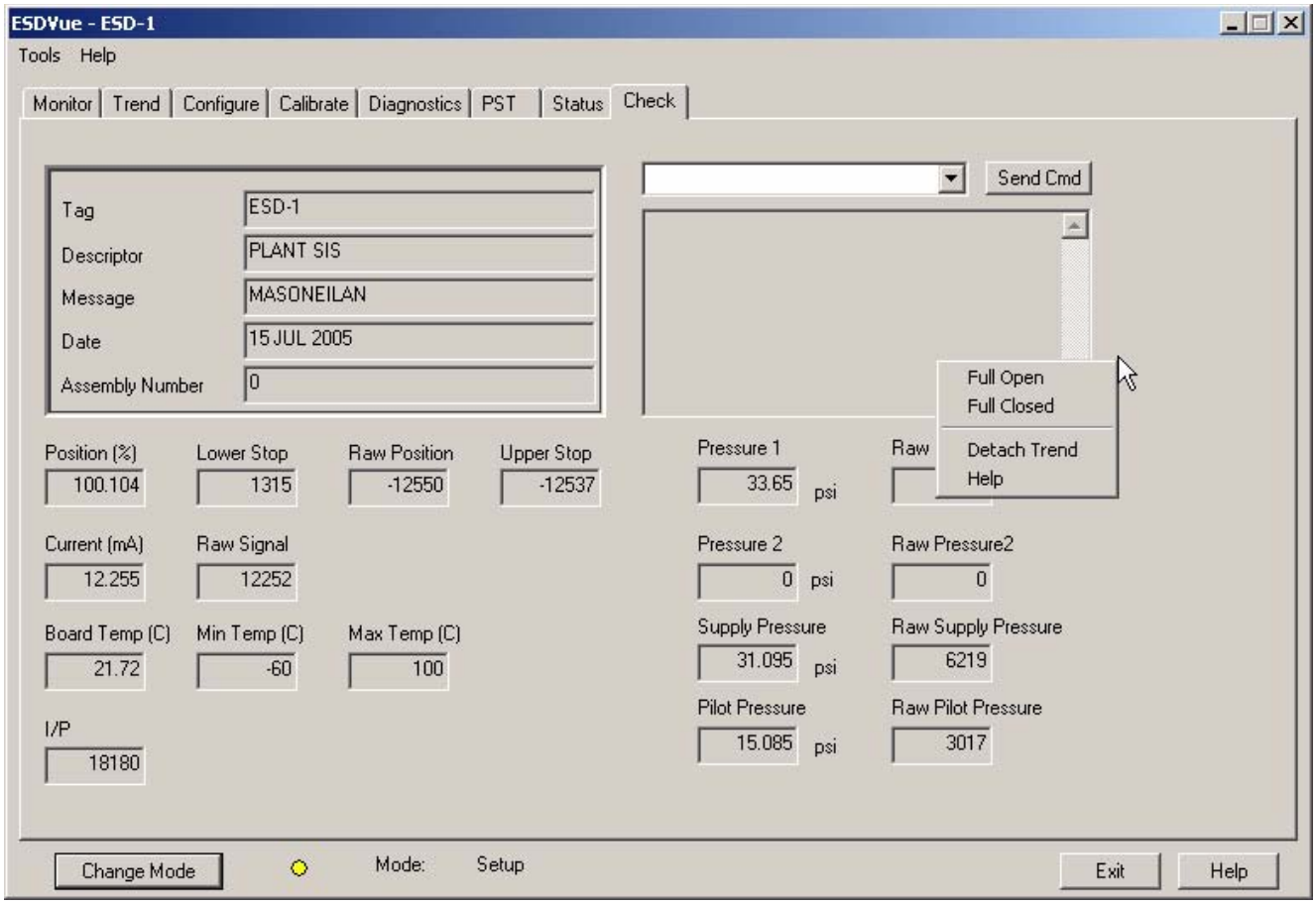


Figure 297 Check Context Menu

Advanced Setup with ESDVue

12

Overview

This chapter provides instructions for a custom, or advanced setup of the SVI II ESD with ESDVue.

Methods to Set Up the SVI II ESD

There are two methods of setting up the SVI II ESD with ESDVue:

1. Run Setup Wizard from the Configure Screen
2. Advanced Setup of the SVI II ESD by an advanced user

The Setup Wizard automatically runs through the specified setup routines and is executed from the Configure Screen. The Setup Wizard is the preferred and recommended method for initializing an SVI II ESD.

Advanced Setup

An advanced user may want to customize the setup beyond the parameters provided by the Setup Wizard.

Steps to Set Up SVI II ESD

To set up the SVI II ESD:

1. Configure the SVI II ESD.
2. Read and Set Configuration Parameters
3. Calibrate the SVI II ESD.
4. Run Find Stops.

or

5. Run Manual Find Stops.
6. Run Auto Tune.
7. View Calibration Parameters.

Before making any configuration or calibration changes ESDVue must be in "Setup" mode. If you need to change modes click on the "Change Mode" button, select "Setup" and click "OK".

Configuration Parameters

Refer to “What You Can Do on the Configure Screen” on page 86 for configuration instructions.

Calibration Steps

The calibration steps in an advanced setup are:

1. Run Find Stops

or

2. Run Manual Find Stops
3. Run Auto Tune
4. View Calibration Parameters

Run Find Stops

To determine valve position, the positioner must measure and save the closed and open positions of the valve. This can be done automatically by running the Run Find Stops procedure from the Calibrate screen, context menu.

The SVI II ESD will first exhaust the actuator and measure the position, then fill the actuator and measure the position. From these measurements the valve position can be determined. Correction can be made for nominal valve travel if it is less than full travel. A progress screen is displayed while the find stops process is running.

To run Find Stops from the Calibrate screen context menu:

1. Right click in the screen area until the Calibrate context menu appears. In the Calibrate context menu select “Run Find Stops” as shown in the figure below.

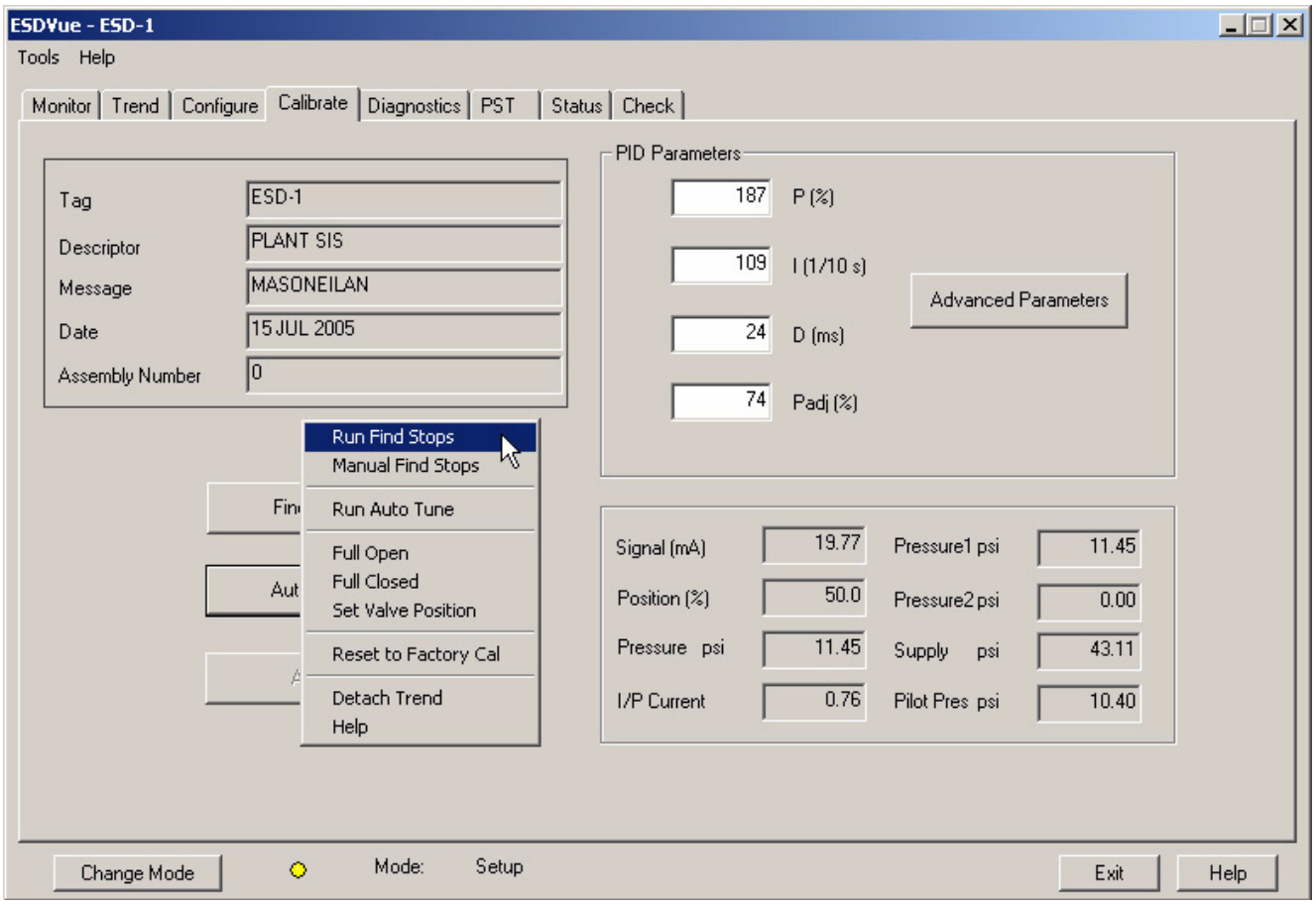


Figure 298 Selecting "Run Find Stops"

2. After launching Find Stops ESDVue will display the dialog displayed below. Click on "OK" to continue with the Find Stops process.

Figure 299 Starting "Run Find Stops" Dialog

3. When Find Stops is running a progress dialog will display as shown below.

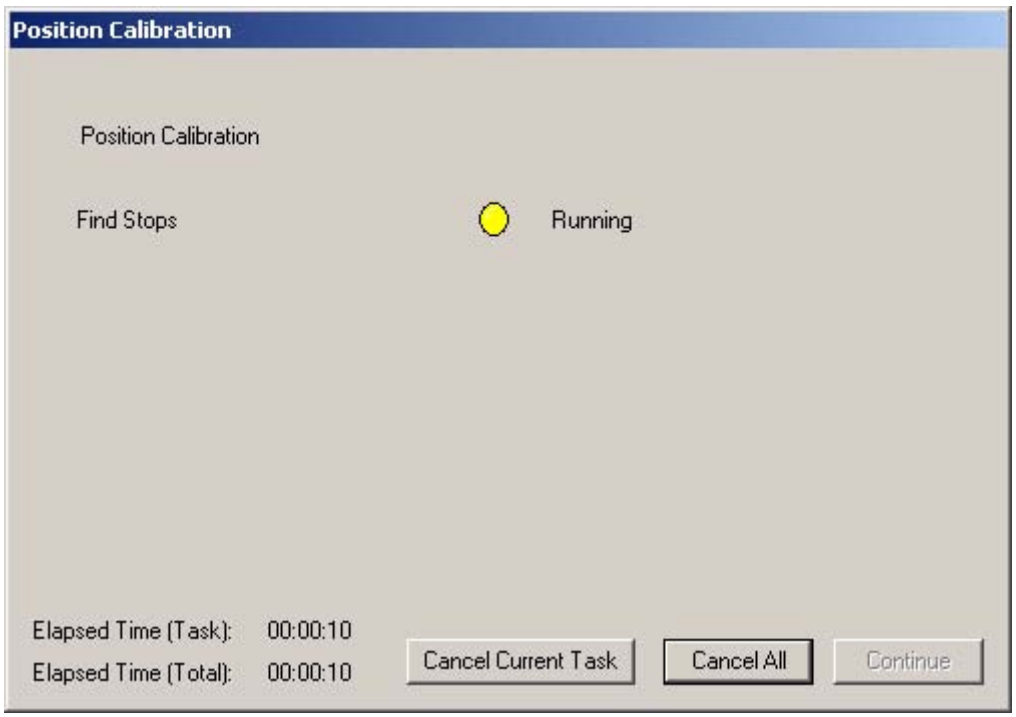


Figure 300 "Find Stops" Dialog

4. When Find Stops has completed operation the progress dialog will display a message indicating that Find Stops is complete, as shown below. You must click on "Continue" to close the dialog and return to the Calibrate Screen.

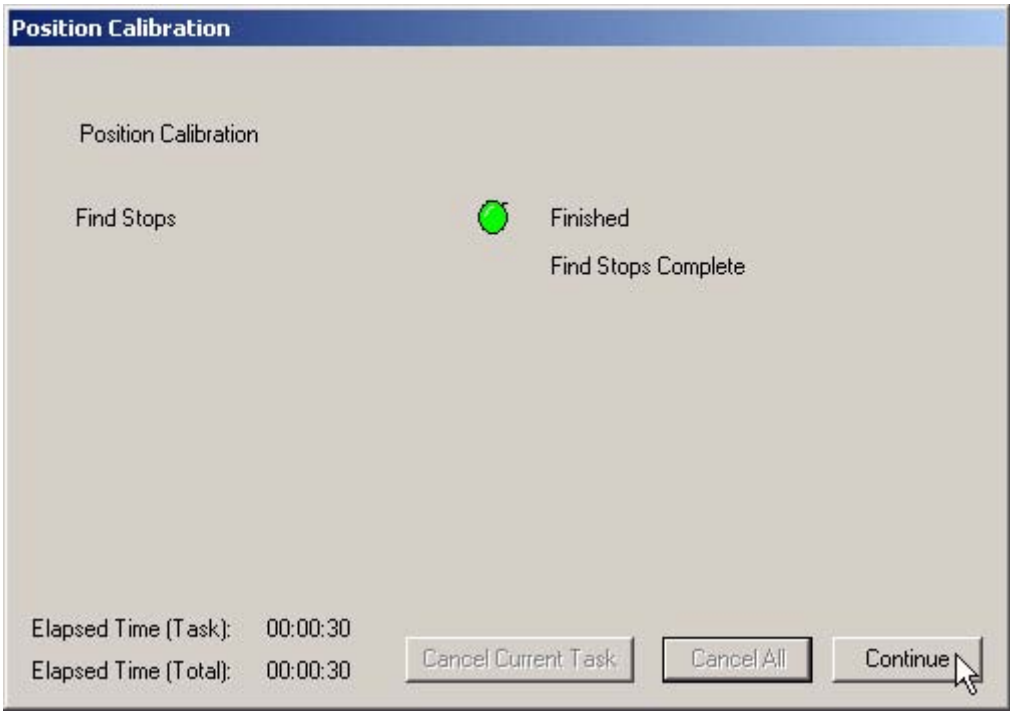


Figure 301 "Find Stops" Complete

Manual Find Stops

On some actuators, it is possible that the automatic Find Stops procedure will not find the correct end positions of the travel. A semi-automatic method of calibrating the stop positions is provided.

When Manual Find Stops is selected, the valve will be moved to full closed and you will be asked to respond when the valve has reached the closed position. The valve will then be moved to full open and you will be asked to respond when the valve has reached the full open position.

To run Manual Find Stops:

1. In the Calibrate context menu, select "Manual Find Stops" as shown below.

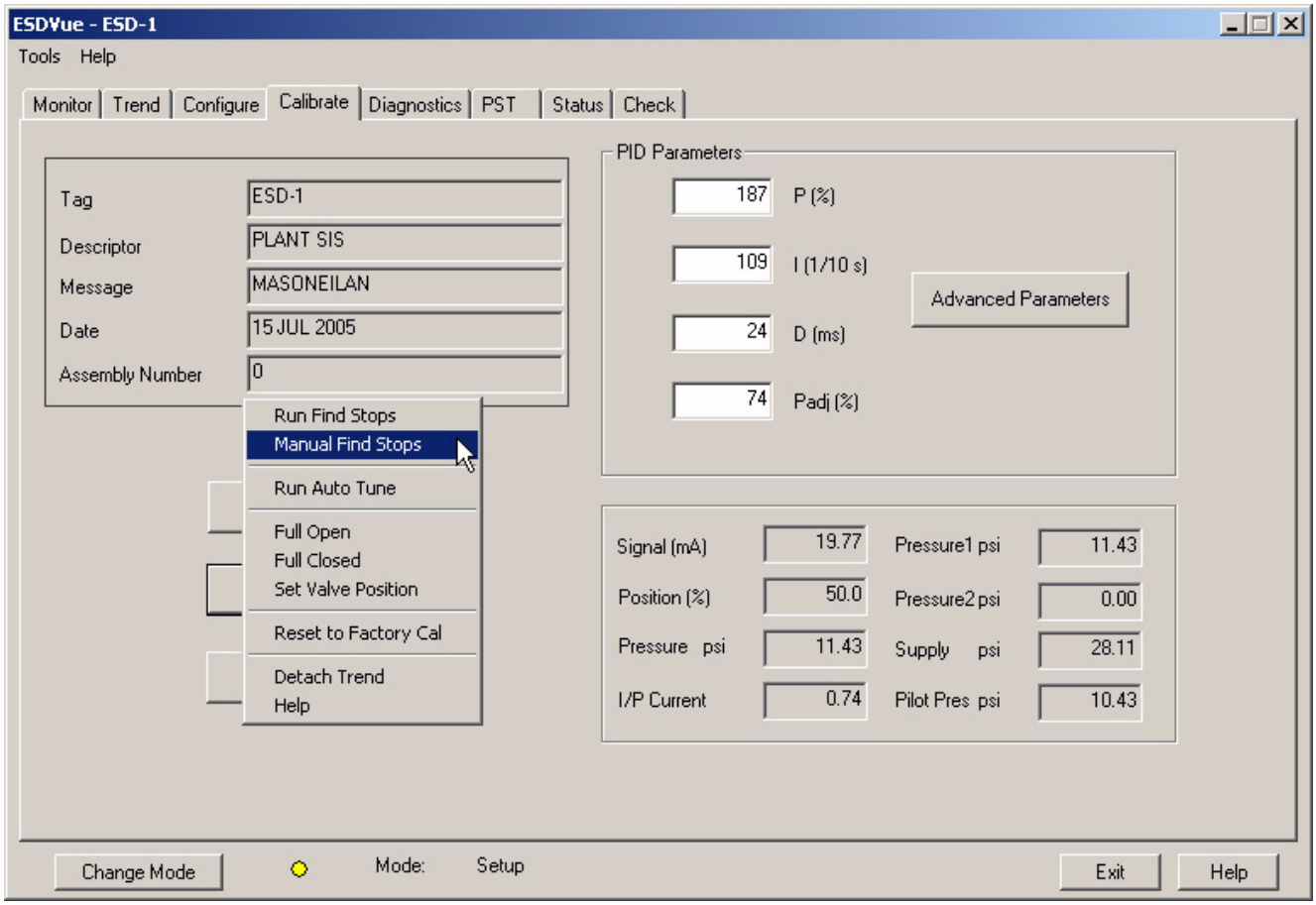


Figure 302 Selecting Manual Find Stops

2. ESDVue will launch the dialog shown below. Click on "OK" to continue.

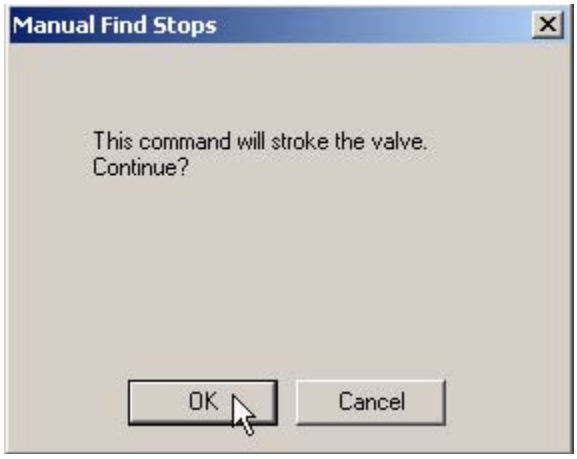


Figure 303 Stroke Valve Dialog

3. ESDVue will move the valve to the fully closed position and launch the dialog shown below. Observe the valve. When the valve is fully closed click on "OK".

Figure 304 Valve Closed Dialog

4. ESDVue will then move the valve to the fully open position and launch the dialog shown below. Observe the valve. When the valve is fully open click on "OK".

Figure 305 Valve Open Dialog

Run Auto Tune

There are three ways to run Auto Tune:

- From the Calibrate Screen - top level (refer to “Auto Tune” on page 122 of this manual.)
- From the Calibrate Screen - context menu (refer to “Calibrate Context Menu” on page 143 of this manual.)
- From the Configure Screen - Setup Wizard (refer to “Step 4 - Autotune” on page 104 of this manual.)

All methods of Auto Tune operate exactly the same.

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