About this Help

This help applies to the following instruments and approved software:

- SVI FF
  - with Firmware version 1.0.0.1 or higher
  - with ValVue version 3.0
  - with handheld communicator with DD published for SVI FF

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In no case does this help guarantee the merchantability of the positioner or the software or its adaptability to a specific client needs.

Please report any errors or questions about the information in this manual to your local supplier or visit www.bhge.com.

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PN 720063605-779-0000 Rev B.

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1. Introduction

SVI FF DTM Introduction

The SVI FF DTM (SVI FF DTM) is a user-friendly interface that facilitates the setup and diagnostics of a control valve. The DTM enables you to configure, calibrate, and operate FOUNDATION Fieldbus pneumatic control valve positioners with internal process control and limit switches. It fully supports FOUNDATION Fieldbus* specifications. DTM operation begins with the Quick Start Configuration, where you can quickly configure positioner key parameters of and use the navigation tree to access tabs to access all operational aspects.
The DTM comes in two versions – Standard and Advanced. *Advanced versus Standard SVI FF DTM Versions* illustrates the capabilities of each version.

### Advanced versus Standard SVI FF DTM Versions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sub-feature</th>
<th>Advanced</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device States</td>
<td>Positioner State</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Positioner Alert Log</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Trend and Position Setup</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Device State</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Configuration</td>
<td>Control Configuration</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Extended RB Configuration</td>
<td>X</td>
<td>-</td>
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<tr>
<td></td>
<td>Extended TB Configuration</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Alerts</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>LCD Display</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Calibration</td>
<td>Find Stops</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Auto Tune</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Quick Wizard</td>
<td>X</td>
<td>-</td>
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<tr>
<td></td>
<td>Full Wizard</td>
<td>X</td>
<td>-</td>
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<tr>
<td>Diagnostics</td>
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<td>X</td>
<td>-</td>
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<td></td>
<td>Ramp Test</td>
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<td>-</td>
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<tr>
<td></td>
<td>Signature Test</td>
<td>X</td>
<td>-</td>
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<td>Histograms</td>
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<td>-</td>
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<tr>
<td></td>
<td>Trends</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Identification</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Print</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write Notes</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
SVI FF DTM Software

The SVI FF DTM provides, through a variety of proprietary host software, the ability to quickly and easily set up the FF you can also monitor operation and diagnose problems with advanced diagnostic capabilities. This help file primarily explains the operation of the SVI FF DTM using PACTWare*.

The SVI FF DTM is a user-friendly, graphical interface used to efficiently setup an FF mounted on any control valve assembly.

Functionality includes:
- Setup Wizard
- Remote display of valve position, actuator pressure(s)
- Set calibration parameters
- Set configuration parameters
- Monitor status/error indicators
- Input/Output configuration
- Trend setpoint, valve position, actuator pressure
- Perform diagnostic test procedures

FF Function Blocks

FF contains the following function blocks:

<table>
<thead>
<tr>
<th>Block Type</th>
<th>Description</th>
<th>Supported Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO (Analog Out) block</td>
<td>Accepts a control signal from an upstream block and passes a signal to the Transducer Block (TB) representing the control network location to which setpoint information must be sent for the valve positioner.</td>
<td>RCas, Cas, Auto, Man, (LO), (IMAN), O/S</td>
</tr>
<tr>
<td>TB (Transducer) block</td>
<td>Located between hardware I/O (actuator, sensor) and AO/DI function blocks. This block passes the control signal from the AO function block to the I/P module to control the valve position. It represents all the functionality of the electronic interface to the physical valve.</td>
<td>Auto, O/S</td>
</tr>
<tr>
<td>DI (Discrete Input) block</td>
<td>Receives the discrete signal from the Transducer Block and passes it to an upstream block. It represents two switch inputs (typically valve position switches) that are made available to any part of the system.</td>
<td>Auto, Man, O/S</td>
</tr>
<tr>
<td>SPLT (Output Splitter) block</td>
<td>Provides the capability to drive two control outputs from a single input. Each output is a linear function of some portion of the input.</td>
<td>Cas, Auto, (IMAN), O/S</td>
</tr>
<tr>
<td>Block Type</td>
<td>Description</td>
<td>Available Modes</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>PID block</td>
<td>Offers PID process control function.</td>
<td>ROut, RCas, Cas, Auto, Man, LO, (IMAN), O/S</td>
</tr>
<tr>
<td>Resource block</td>
<td>Manages the information needed by the fieldbus network management including block scheduling and device identification, etc.</td>
<td>Auto, O/S</td>
</tr>
<tr>
<td>DO (Discrete Output) block</td>
<td>Provides a discrete value to generate a discrete output signal.</td>
<td>O/S, LO, Iman, Cas, RCas</td>
</tr>
<tr>
<td>AI (Analog Input) block</td>
<td>Takes the analog input data from the analog input signal and it makes available to other function blocks. It has scaling conversion, filtering, square root, low cut and alarm processing.</td>
<td>O/S, Man, Auto</td>
</tr>
<tr>
<td>MAI (Multiple Analog Input) block</td>
<td>Provides a way to receive eight analog variables from other modules or physical inputs.</td>
<td>O/S, Man, Auto</td>
</tr>
<tr>
<td>IS (Input Selector) block</td>
<td>Provides four analog inputs that are selected by an input parameter or according to a criterion as first good, maximum, minimum, middle and average.</td>
<td>O/S, Man, Auto</td>
</tr>
<tr>
<td>AR (Arithmetic) block</td>
<td>Calculates some pre-defined equations ready for use in applications as flow compensation, HTG, ratio control and others.</td>
<td>O/S, Man, Auto</td>
</tr>
<tr>
<td>CS (Control Selector) block</td>
<td>Selects among highest, lowest, or average of two or three inputs (from other blocks). Provides balanceless transfer of signals.</td>
<td>O/S, IMan, Man, Auto</td>
</tr>
</tbody>
</table>
About This Help File

These instructions are intended to help a field engineer install, setup, and calibrate an FF in the most efficient manner possible. If you experience problems that are not documented, contact Masoneilan or your local Masoneilan representative.

Conventions Used in This Help File

Conventions used in this help file are as follows:

- *Italicized* letters are used when referencing a term used in the FF display window, for emphasis on important items and for fields where data appears or for user-entered data.
- Actions performed on buttons, checkboxes, etc. appear **bolded**.
- Active links are in **blue**.

**NOTE**

*Indicates important facts and conditions.*

**CAUTION**

*Indicates a potentially hazardous situation, which if not avoided could result in property damage or data loss.*

**WARNING**

*Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.*
Masoneilan Documentation Resources

Masoneilan publishes several different resources for documentation:

- **Bench quick starts** contain information related to configuration and testing in a bench top environment.
- **Hardware quick starts** contain installation information and other basic information related to getting a device installed and very generally configured.
- **Hardware instruction manuals** contain more complete information for configuration of a device. This manual also includes information on background functionality and special circumstances useful in installation, configuration and operation/troubleshooting.
- **Software manuals** contain more complete information for the software configuration of a device. This manual also includes information on background functionality and special circumstances useful in configuration and operation (including diagnostics and their interpretation). These manuals represent the same source material as the online help.
- **Handheld documents**: Give the DD mappings for the product.

Check the website: [https://www.geoilandgas.com/file-download-search](https://www.geoilandgas.com/file-download-search).

Adobe® Acrobat Reader is required to view pdfs.

Related Documentation for the SVI FF DTM

- **ValVue documentation**: The SVI FF DTM works inside various software (such as PACTware), however it is designed to work best with out ValVue 3 software. See the ValVue 3 help or GEA31426 Masoneilan Products ValVue 3 Software Manual.
- **GEA31030 SVI FF Digital Positioner Quick Start Guide**
- **GEA31031 SVI FF Digital Positioner Instruction Manual**
- **GEA31457 SVI FF Bench Quick Start Manual.**
- **GEA32766 SVI FF Quick Card for the Emerson® 475.**
2. Registration

Registration

The SVI FF DTM inherits its license from ValVue 3 if you have that program. However, the DTM itself also has a license. The license trial period works as follows:

Once you download and install the SVI FF DTM software you are granted a 60 day trial period. Masoneilan strongly encourages you to register your license with us as soon as possible. The trial period is broken into two phases:

- During the first 30 days you have access to all the features of the SVI FF DTM, including advanced diagnostics. See Advanced versus Standard SVI FF DTM Versions. You need to contact sales to purchase a license for using advanced features beyond the trial period. Contact BHGE at software.reg@bhge.com.

- During the second 30 day period you no longer have use of the advanced diagnostics, but can still perform basic operations. Once the second 30 day period expires you must register to continue using the product.

The SVI FF DTM can inherit a license from ValVue3.

To open the registration dialog:

1. Right-click the FF device in the Project pane and select Additional functions > Registration or click the Security > License tab. If the product is on trial a dialog appears.
Figure 2  Trial Registration Dialog: Newly Installed

After 30 days, you get the following trial dialog:

Figure 3  Trial Period Down to 30 Days

After 60 days, without purchase or registration, the following dialog appears:

2. Click **OK**.

Use the registration dialog (**SVI FF DTM Registration**) to:

- **Register the Product** - Required before use or at the end of the 30 day trial period. You need to contact sales to purchase a license. Contact BHGE at software.reg@bhge.com.

- **Activate License** - Required before use or at the end of the 30 day trial period.

- **Unregister the Product** - Unregister the product. You can then transfer the license to another machine.
Upgrade the Product - Upgrade the product. Contact Masoneilan to discuss upgrade
features options. You need to contact sales to purchase a license. Contact BHGE at
software.reg@bhge.com.

Figure 4

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SVI FF DTM Registration

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Register the Product

To register the product:

1. Enter the serial number in Step 1.
2. Click or click Next and Contact Information appears.

3. Enter all required information, as marked by *, click and click and Email Registration appears.

4. Ensure you are connected to the internet, click Yes and the registration email appears using your default email setup. The email has an .xml attachment containing licensing information.
Send the email. A return email is sent containing the activation code. Proceed to **Activate License**.

**Activate License**

To activate the license:

1. Enter the emailed software key in Step 4.
2. Click ![Included Features](image) and **Included Features** appears.

![Included Features](image)

**Figure 7** Included Features

3. Click **Close**.
Unregister the Product

To unregister the license:

1. Right-click the FF device in the Project pane, select Additional functions > Registration and Included Features appears.

![Included Features](image)

**Figure 8** Included Features

2. Click **UnRegister** and Unregister Confirmation appears.

3. Click OK and Unregister Confirmation appears.

![Unregister Confirmation](image)

**Figure 9** Unregister Confirmation

4. Click Yes and an unregister email appears. Send the email.

**NOTE**

*Once unregistered, you cannot use the same License Code. You must contact Software Registration for a new code.*
Upgrade the Product

To upgrade:

1. Select **Tools > ValVue Licensing** and **Included Features** appears.

![Included Features](image1)

**Figure 10  Included Features**

2. Enter the new **License Code** provided by Masoneilan and click **Upgrade**.

3. Click **Email Registration** and **Email Registration** appears.

![Email Registration](image2)

**Figure 11  Email Registration**
4. Ensure you are connected to the internet, click **Yes** and the registration email appears using your default email setup. The email has an .xml attachment containing licensing information.

   **NOTE**

   If you do not have access to an internet connection or a default email, click **No** and follow the prompts to save the data to a file and send it later from another laptop.

5. Send the email. A return email is sent containing the activation code. Proceed to **Activate License**.
3. Installation

Installation

Requirements

Using the FF DTM installation procedures discussed requires basic knowledge of Microsoft* Windows* operating systems and the Masoneilan SVI FF positioner. For additional information describing the FF, consult the FF Device Instruction Manual (GEA31031).

Operation of the FF DTM requires installation of ValVue or another DTM frame such as PACTWare software to access the FF DTM. This help uses ValVue 3 as an example.

Hardware and Operating System Requirements

To successfully install and run FF DTM software, your computer system must meet or exceed the following minimum hardware and software requirements:

- CD-ROM or DVD-ROM drive
- National Instruments AT-FBUS or PCM-CIA-FBUS interface card and NI-FBUS software version 4.X.
- Foundation Fieldbus power supply and power conditioner, with terminators
- Additional fieldbus devices that are installed on the bus segment, optional
- Windows Pentium* or compatible microprocessor
- An available serial communication port or USB port
- 1 G of free hard disk space
Before installing the DTM software, you must install the Foundation Fieldbus communications hardware and software. To help to reduce the need for digital communications terminology, refer to an example reference process and Foundation Fieldbus segment in *SVI FF Reference Model Fieldbus Segment*.

![Diagram](image)

**Figure 12  SVI FF Reference Model Fieldbus Segment**

**CAUTION** Improper setup can interfere with process control.
Installing SVI FF DTM Software

To install the software:

1. Double-click **SVI FF DTM Installer.exe**, the Mnregistration UI installs automatically and then the **SVI FF DTM Install Welcome Screen** appears.

![SVI FF DTM Install Welcome Screen](image)

2. Click **Next** and **SVI FF DTM License Screen** appears.
3. Click *I accept the license.....*, Next and *SVI FF DTM AMS/DeltaV System Selection Screen* appears.

![Figure 14  SVI FF DTM License Screen](image)

![Figure 15  SVI FF DTM AMS/DeltaV System Selection Screen](image)
4. Click either **Yes** or **No** and click **Next** and the *SVI FF DTM Choose Destination Folder Screen* appears. Select:

- **Yes** to install AMS only if you are intending to use the DTM to work on a DeltaV system application.

- **No** if you intend to use AMS in stand-alone mode and connect to the positioner directly through a PC interface (USB) card.

![SVI FF DTM Choose Destination Folder Screen](image)

*Figure 16 SVI FF DTM Choose Destination Folder Screen*
5. Click **Change** and navigate to the target directory or just click **Next** and *FF DTM Ready to Install the Program Screen* appears.

![Figure 17 FF DTM Ready to Install the Program Screen](image)

6. Click **Install** and a *Setup Status* screen appears, followed by *FF DTM Finish Screen*.

![Figure 18 FF DTM Finish Screen](image)

7. Click **Finish**.
Failure to Communicate

If the PC (using a modem) fails to communicate with the SVI FF the PC then displays either the message *No Devices Found* in the DTM main screen, or a communication error occurs, or the an error message appears if the device communications fails during the session. Communication failure prevents the PC from establishing a link. Possible causes of communications failure related to installation include:

- Insufficient Foundation fieldbus power
- Poor wiring contacts
- Improper connection of the FF interface card to the computer or driver
- Insufficient FF terminators or too many
- Field device has an address outside the configured range
- Network Management parameter settings are incorrect
- FF card configuration is incorrect

DD installation is recommended (not required).

Run Dialog tool to test connections.

If compliance problems are suspect prepare a detailed description of the loop, including all devices on the loop, type of wiring used, loop length, and presence of any possible interference sources before contacting the factory for assistance.
This page intentionally left blank.
4. SVI FF Work Environment

Overview

This section describes how to accomplish general SVI FF DTM tasks. After you have successfully launched and logged into the SVI FF DTM screen appears.

Figure 19  SVI FF DTM Quick Start
This discussion is restricted to the SVI FF DTM operations only using ValVue as the example host program.

NOTE

If a configured value is outside the acceptable range, a red exclamation point (!) appears next to the field and next to the screen name in the navigation tree.

Identification Area

Displays the positioner and software revisions.

```
SVI FF POSITIONER
Tag: CV0000
Man. ID: 0x1745  Type. ID: 8

Masoneilan Products
Device ID: 0047450008 2345678901 123456789012
Device Rev: 01  DD: 01  SW: 1.0.0.0
```

Figure 20  Tag Display Area

Buttons and Fields

- **Tag**: See Extend TB Configuration.
- **Man. ID**: See Extend TB Configuration.
- **Type ID**: See Extend TB Configuration.
- **Device ID**: See Extend TB Configuration.
- **Device Rev**: See Extend TB Configuration.
- **DD**: See Extend TB Configuration.
- **SW**: See Extend TB Configuration.

Icon Bar

Use this bar to perform common tasks. A grayed out icon means the functionality does not apply to the current application or that you don't have the requisite permission level.

Figure 21  Icon Bar
**Buttons and Fields**

- Saves the presently configured DTM values to the database. This does not download them to the positioner.

- Uploads all parameters from the FF device. These then appear in the fields but are not saved as the DTM's parameters until a save is performed.

- Downloads all DTM parameters to the device.

**WARNING**

*Do not download a configuration to a positioner if the valve is controlling a process. Always isolate the valve from the process before a download. Test the configuration before reconnecting the valve.*

- Uploads the settings from the active tab.

- Downloads the settings from the selected tab.

- Opens a menu where you can select from three different reports covering block parameters, diagnostic test results or positioner health. See Reports.

  *The data that appears in the diagnostic tests report is dictated by whether the unit purchased has Standard or Advanced Diagnostics. If you own a Standard Diagnostics unit, the Advanced Diagnostics fields will show NA.*

- Toggles the navigation pane open/closed.

- Toggles the **Identification Area** area open/closed.

- Displays and changes the state of the Resource block.

- Displays and changes the state of the Transducer block.
Opens the **Write Note** dialog for adding a note related to the project as a whole.

![Image](image1.png)

**Figure 22  Write Note**

Opens the **Write Note For Device** dialog for adding a note related to device.

![Image](image2.png)

**Figure 23  Write Note For Device**

Opens the DTM-related help.

Opens the device-related manual.
Opens the About SVI FF dialog.

![Figure 24 About SVI FF](image)

Displays the connection status.

Not Connected
SVI FF DTM Directory Trees

This section discusses the directory trees for configuring SVI FF DTM operations:

- **Online Parameterization**: Use these tabs to perform tasks with the process active.
- **Offline Parameterization**: Use these tabs to perform configuration tasks that can later be used for positioner/valve operations.

### Online Parameterization

The directory trees (SVI FF DTM Online Parameterization Directory Tree) and are used to navigate the various screens.

![SVI FF DTM Online Parameterization Directory Tree](image)

**Figure 25  SVI FF DTM Online Parameterization Directory Tree**

The tree is broken down into the following functional areas:

- **Quick Start Configuration**: Use this tab to implement air action, control tuning, characterization and network settings (Quick Start Configuration).
- **Device States**: Four tabs and sub-tabs that display positioner and device states and signal readings, a positioner alert log and trend configuration tab (Device States).
- **Configuration**: Consists of Control Configuration: Twenty seven tabs for manual configuring a wide range of settings and alerts (Control Configuration). Sub-areas include:
  - Position configuration for limits, alarms and fault states (Position).
  - Discrete switch configuration (Software Switches).
  - Pressure ranges and alarms (Pressure).
  - Temperature alerts (Temperature).
  - IP alerts (IP Output).
  - Extended RB (Extend RB Configuration) and TB configurations (Extend TB Configuration).
  - Alarms and alerts severity definitions by type (Alarms and Alerts).
  - LCD display settings (LCD Display).
- **Calibration**: Four tabs for performing find stops and Auto Tune and a quick and complete wizard setup (Calibration).
☐ Diagnostics - Five tabs (with sub-tabs) for performing tests, for fault analysis and for viewing data numerically and graphically to analyze positioner/valve performance (Diagnostics) and tabs for histograms (Position Histogram) and trends (Trends Information Presentation).

☐ Identification - Five tabs for configuring valve and positioner namplate settings, network settings, contact and user related information and downloading and uploading all configuration values from/to file (Identification).

☐ Security: Eight tabs for configuring security and permissions access to parameters and procedures and for performing licensing.
Offline Parameterization

The directory trees (SVI FF DTM Offline Parameterization Directory Tree) and are used to navigate the various tabs.

The tree is broken down into the following functional areas:

- **Quick Start Configuration**: Use this tab to implement air action, control tuning, characterization and network settings (Quick Start Configuration).

- **Configuration**: Consists of Control Configuration: Twenty seven tabs for manual configuring a wide range of settings and alerts (Control Configuration). Sub-areas include:
  - Position configuration for limits, alerts, characterization and fault states (Position).
  - Discrete switch configuration (Software Switches).
  - Pressure ranges and alarms (Pressure).
  - Temperature alerts (Temperature).
- IP alerts *(IP Output)*.
- Extended RB *(Extend RB Configuration)* and TB configurations *(Extend TB Configuration)*.
- Alarms and alerts severity definitions by type *(Alarms and Alerts)*.
- LCD display settings *(LCD Display)*.
- **Identification** - Five tabs for configuring valve and positioner namplate settings, network settings, contact and user related information and downloading and uploading all configuration values from/to file *(Identification)*.
- **Security**: Eight tabs for configuring security and permissions access to parameters and procedures and for performing licensing.
ValVue* Set Up and Project Pane Operations

This section describes the ValVue main screen and how to accomplish general ValVue tasks. After you have successfully launched and logged into the ValVue, ValVue Main Screen appears.

The main screen includes four main components:

- **Command Area**, which includes the title bar, main menu and the toolbar.
- **DTM UI Panel**, which displays the UI interface for the specific device DTM.
- Various **Docked Panes**, which include the topology pane, device library, help, and error log tracking.
- **Status Bar**

![ValVue Main Screen](image)

Figure 27  ValVue Main Screen
Command Area

Command area is composed of three components:

- **Title bar**: lists the application name and information about current project and current opened DTM UI and has buttons to minimize/maximize and close.

![Figure 28 Title Bar](image)

- **Main menu**: Provides items for all functions of the DTM software. See the individual menu discussions.

![Figure 29 Main Menu](image)

- **Toolbar**: An icon-driven representation of the main menu. The number of items and those that are active depend on the item selected in the topology. See *Network Menu* of ValVue help for more description of the icons.

![Figure 30 Toolbar](image)
UI Panel

The UI panel depends on the device installed and selected. For Masoneilan products see the individual DTM help. See vendor documentation for non-Masoneilan products.

Figure 31  UI Panel
Docked Panes

ValVue Topology Pane

The topology pane (SVI FF DTM Online Parameterization Directory Tree) is used to navigate the various areas and devices in each area and open a device’s proprietary DTM. This navigation tree can be changed to one of four different views:

- Topology View
- Area View
- Protocol View
- Manufacturer View

See Device Menu of ValVue help for a more detailed explanation.

![Network View](image)

**Figure 32 ValVue Topology Pane: Network View**

The tree is broken down into the following functional areas:

- **View**: Listed just below the yellow bar is the view in use.
- **Field Network or Area**: One level below is either the protocol in use or a listing of the user-defined areas.
- **Protocol**: Next is the protocol in use.
- **Device**: Next is a list of the devices added.
Column Settings

You can add and remove columns appearing in the topology pane. The default is to display a minimal amount of columns and the columns available depend on the active Network View. These items are useful in identify particular valve/positioners. It may be necessary to pull the topology pane to display the fields. Columns available for display include:

- Device Tag (recommended)
- Address (recommended)
- Channel
- Device Type (DTM)
- Changed: Indicates an unsaved parameter change using the pencil icon.

To configure columns:

1. Right-click at the device tag level.

![Figure 33 Column Settings Right Click Menu](image)

The image shows the menu when more than the default columns are shown. Only Column Settings appears then.

Use the Reset Columns menu item or on the Column Settings dialog to reset the column configuration to default.

Use the Hide This Column menu item to hide a selected column.
2. Click **Column Settings** and the dialog appears.

![Column Settings](image)

**Figure 34  Column Settings**

3. Use the add and remove buttons to add/remove items from the *Hidden Columns* or *Visible Columns* lists.

4. Use the move buttons to arrange the order and click **OK**.

The topology pane appears with the columns appearing and arranged as dictated.
Device Library

Use the Device Library to view lists of protocols and devices in the DTM Library. In the DTM Library means that they are installed and ready for use by ValVue. Other protocols and DTM may be on the system, but not ready. See DTM Library Management of ValVue help for instructions on how to manage DTMs.

If you right-click on and item in the Device list you can access a dialog with display only DTM Info.
Error Log Tracking

Accessed from the View menu and clicking in the status bar, use this, via a right-click menu, to view errors, clear errors and view details (Error Info).

![Error Log Tracking Pane](image)

Figure 37 Error Log Tracking Pane

Information in the Error Info dialog can be copied and pasted for troubleshooting purposes.

![Error Info](image)

Figure 38 Error Info
Help

Use this function to access context-sensitive help. The information displayed is dictated by the selection made from the main menu.

![Intelligent Help](image1)

**Figure 39** Intelligent Help

Status Bar

This displays the current user and an icon to indicate errors exist. When you mouse over the user label, the tooltip shows the role information. If you click the error icon, the *Error Log Tracking* appears.

![Status Bar](image2)

**Figure 40** Status Bar
Ribbon View

ValVue has an alternate view for the main screen that is completely icon-driven. This section maps this view to its corresponding functionality in this help.

The ribbon view is comprised of three tabs:

- **Home**: Contains icons related to *Network* issues, *View* issues for how the interface is presented, *Tools* for licensing and *Window* layout.
- **Settings**: Contains icons related to *Project Settings*, *Security Settings* and *General Settings*.
- **Device Utility**: Contains a *Function* area with icons related to connecting and assigning device areas.

![Figure 41 ValVue Ribbon View](image-url)
## Ribbon View Icons Cross-referenced to Functionality

<table>
<thead>
<tr>
<th>Icon</th>
<th>Cross-reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Rebuild Network" /></td>
<td>See Network Menu of ValVue help.</td>
</tr>
<tr>
<td><img src="image" alt="Find New Devices" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Refresh" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="PDF Report" /></td>
<td></td>
</tr>
<tr>
<td><strong>View</strong></td>
<td>This includes:</td>
</tr>
<tr>
<td><img src="image" alt="Panels" /></td>
<td>- Network View</td>
</tr>
<tr>
<td><img src="image" alt="Network View" /></td>
<td>- Device Library</td>
</tr>
<tr>
<td><img src="image" alt="Network View" /></td>
<td>- Error Log Tackling</td>
</tr>
<tr>
<td><img src="image" alt="Network View" /></td>
<td>- Intelligent Help</td>
</tr>
<tr>
<td><img src="image" alt="Network View" /></td>
<td>See View Menu of ValVue help.</td>
</tr>
<tr>
<td><img src="image" alt="Expanding All" /></td>
<td>See View Menu of ValVue help.</td>
</tr>
<tr>
<td><img src="image" alt="Collapse All" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="View Audit Trail" /></td>
<td>See View Menu of ValVue help.</td>
</tr>
<tr>
<td><img src="image" alt="Full Screen" /></td>
<td>See View Menu of ValVue help.</td>
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</table>
### Ribbon View Icons Cross-referenced to Functionality

<table>
<thead>
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<tr>
<td>See Tools Menu of ValVue help.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Window</th>
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<tbody>
<tr>
<td><img src="image" alt="Hide All" /> <img src="image" alt="Show All" /></td>
</tr>
<tr>
<td>See Window Menu of ValVue help.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Reset Layout" /></td>
</tr>
<tr>
<td><img src="image" alt="Switch Style" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Settings</th>
</tr>
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<tbody>
<tr>
<td><strong>Project Settings</strong></td>
</tr>
<tr>
<td><img src="image" alt="DTM Library" /></td>
</tr>
<tr>
<td>See Settings Menu of ValVue help.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field Networks</th>
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<tbody>
<tr>
<td><img src="image" alt="Field Networks" /></td>
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<td>See Settings Menu of ValVue help.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device Type Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Device Type Assignments" /></td>
</tr>
<tr>
<td>See Settings Menu of ValVue help.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><img src="image" alt="Field Network Settings" /></td>
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<tr>
<td>See Settings Menu of ValVue help.</td>
</tr>
<tr>
<td>Security Settings</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Security Settings</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Device Utility</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>See Device Menu of ValVue help.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard Function</th>
<th>See Device Menu of ValVue help.</th>
</tr>
</thead>
</table>
Quick Access Toolbar

The ribbon view has a quick access bar to which you can add favorite tasks in icon form.

To add an item:

- Right-click on any icon and select Add to Quick Access Toolbar.

![Figure 42 Quick Access Toolbar](image)

This toolbar has a pulldown menu indicated by a down arrow.

![Figure 43 Quick Access Toolbar Pulldown Menu](image)

Use the pulldown menu to minimize the ribbon so you can use the Quick Access toolbar only and to place the toolbar below the ribbon.

The icons have a right click menu.

![Figure 44 Quick Access Toolbar Icon Right Click Menu](image)

Use the pulldown menu to minimize the ribbon so you can use the Quick Access toolbar only and to delete icons.
Assign Device Type

If the scan detects a device that is unknown or has unknown device properties, the Assign Device Type dialog appears. Use this dialog to review the information gathered during the network scan and to add or edit to that data. You can then save the assigned data for use with that device type.

Figure 45 Assign Device Type

**Fields and Buttons**

- **Save assignment for devices of same type**
  Click this checkbox to save configuration changes made using this dialog for devices of the same type once is clicked.

- **Show all installed device types of this protocol**
  Click this checkbox to display all devices scanned that are for the detected protocol. This is useful to see related information as reference.

- **Matching Quality**
  Detects the common quality detected. In this case, this is the protocol.

- **Device Type**
  Displays the device type detected.
Configure Assign Device Type

If the Assign Device Type dialog appears:

1. Review the Scan Info fields and ensure that all information is accurate.
2. Click Show all installed device types of this protocol to see information for reference, if required.
3. Click Save assignment for devices of same type and click OK.
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5. How Do I Do Online Parameterization?

Online Parameterization

Use the online DTM UI when the device is connected to the FF interface. Online parameterization means that the positioner/valve is still in the control loop. Tasks available:

- **Online configuration**: Configuring the valve while the positioner is connected to the H1 segment. This can include:
  - **Quick Start Configuration**: Configuring Air Action, Remote Sensor status, Control Tuning settings, Characterization and Device Address and Tag.
  - **Device States**: Viewing device states for a broad range of positioner and block values and configuring trend functionality to study behaviors.
  - **Control Configuration**: Configuring the valve behavior in normal operations.
  - **Fail State Configuration**: Configuring the valve reaction during failures and abnormal conditions
  - **Alert Configuration**: Configuring the alert trigger conditions and responses.
  - **Review of Configuration**: Reviewing offline RB and TB parameter configurations.
- **Diagnostics**: Configuring, running and viewing results of various diagnostics tests. Viewing position histograms and travel and cycle counter totals (with reset available).
- **Identification**: Reviewing/recording information about the positioner, valve, actuator, etc.
- **Security**: Configuring the security settings for the device or for a group of devices.
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6. Quick Start Configuration

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

From the Setup Wizard screen you can rapidly setup the FF by configuring some basic parameters. You can set the device identification, select the air action, perform a travel calibration, and Auto Tune the positioning parameters. When the selected tasks are started a progress screen appears. The Setup Wizard can dramatically reduce commissioning time in the field. To customize the valve setup use Offline Parametrization.

The SVI FF DTM has a built-in positioning Auto Tune feature. This feature automatically computes the optimal parameters for the positioning algorithm without requiring valve specific parameters for completion. The algorithm analyzes the dynamic behavior of the valve assembly, and determines optimal values for the tuning algorithm for tight and accurate position control.

To run the Setup Wizard you must first be in Out of Service mode.

**WARNING**

The valve must be Out-of-Service and isolated from the process during this process.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.
**Buttons and Fields**

**Air Action**

- Use this to set actuator type and air action, relay type and valve type.
  - **Air-To-Open** - Air pressure is used through the FF to open the valve.
  - **Air-To-Close** - Air pressure is used through the FF to close the valve.

**Remote Sensor**

- Use the radio buttons to activate/deactivate the Remote Sensor option.

**Control Tuning**

- **Show control tuning options for single acting**
- **Show control tuning options for double acting**

  Click a radio button to select type: **Single Acting** or **Double Acting**. The options below in this area become restricted to appropriate choices.
Click a radio button to select the tuning profile from Fastest for a very small valve to Slowest for a very large valve. Additionally, the preferred method of Auto Tune, which automatically tunes the valve. Custom requires manually entering values and is only for experts and under special circumstances.

Characterization Type

Use the buttons list to select the characterization type. Control valves are characterized to give a specific relationship between flow capacity (Cv) and percent opening of the valve. The valve can be characterized with special purpose trim or with the FF positioner. Several characterizations are available:

- **Linear**: Causes the valve to open proportionally with the input signal. Select this option if non-linear trim is used in the valve.
- **Equal percent (50:1) and Equal percent (30:1)**: Two equal percentage characterizations are available, one with R=50 and the other with R=30.
- **Quick Open**: The quick opening characterization is the inverse to the Equal percent 50 characterization curve.
- **Camflex %**: This characterizes the valve as a Camflex* valve with settings of Linear and Equal percent 50.

*Characterization Curves* shows the characterization curves in a graphical format.

![Characterization Curves](image)

**Figure 47** Characterization Curves

- **Custom**: Selecting this option activates the Customize functionality to access an additional dialog where you can enter or draw a custom characterization curve. The curve can have up to 21 points and points in between are linearly interpolated.
Run the Quick Start Configuration

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

To run the configuration:

**WARNING**

This procedure moves the valve.

1. Place the system in *Out of Service* mode.
2. Click *Air to Open* or *Air to Close*.
3. Set *Control Tuning* by clicking *Single* or *Double Acting* and setting tuning type. Autotune is recommended, *Custom* requires entering your values.
4. Set *Characterization Type* by clicking either *Linear, EQ% 30, EQ% 50, Quick Open, Camflex* or *Custom*. *Custom* requires entering your values.
5. Enter a *Device Address* and *Device Tag*.
6. Write data to the device on the *Network Settings* tab.
7. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

If the Transducer block is switched to *Auto*, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to *Auto*, then the valve will not be in control.
If the procedure fails:
2. Rerun Find Stops.
   If it fails a second time, reset to factory defaults using servo parameters reset (see Extend TB Configuration).
3. Run the procedure from the start.
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7. Device States

Device States

Use these tabs to observe the overall condition of the valve and of the blocks.

*ValVue SVIFF Setpoint to Position Schema* graphically explains how setpoint and position interact.

![Diagram of ValVue SVIFF Setpoint to Position Schema]

*Figure 48  ValVue SVIFF Setpoint to Position Schema*
Positioner State

Use this tab to view the major position control variables, their state and the status of related alerts. Additionally, some items display a detected process value that turns red when outside of user-specified alert levels. Areas presented include:

- Hardware
- Position
- Pressure
- Temperature

**Positioner State** shows the various components of the tab using color coded boxes by functional area:

- Red boxes indicate alert states.
- Green boxes contain bar graphs for measurements of interest.
- Blue boxes contain key values

![Figure 49 Positioner State](image)
Buttons and Fields

Device State Icons

Indicates that a valve is out of control. The number of times this alert has occurred since the last reset appears next to the icon. The color corresponds to the alert condition:

- **Black**: Value is in a good state (good cascade or non-cascade value).
- **Red**: Value is in an uncertain or bad state. The value may not be accurate or applicable for the device.

Indicates a commissioning failure. The number of alerts appear next to the icon.

Indicates the device is still operating but needs maintenance. The number of alerts appear next to the icon.

Indicates no failure alert.

Indicates the color used on the associated bar graph. For example, setpoint or actual position.

Indicates the color used on the associated bar graph.

Hardware

**Sensor Failure**
Indicates a sensor failure. The Transducer block detects an error condition (e.g. the A/D converter can not provide supply pressure, etc.), and the error is reported in both the Resource and Transducer blocks. The number of times this alert has occurred since the last reset appears to the right. The color corresponds to the alert condition:

- **Black**: Value is in a good state (good cascade or non-cascade value).
- **Red**: Value is in an uncertain or bad state. The value may not be accurate or applicable for the device.

If the sensor failure is persistent, replace the positioner.

**Processor**
Indicates a processor failure. If the processor failure is persistent, replace the positioner.

**Valve Control**
Indicates a valve control issue. To resolve issues, ensure there are no mechanical obstructions, that friction is not too high and that supply pressure is appropriate.

**Commissioning**
Indicates a failure of the process dictates on the Quick Start Configuration tab.

**Air Supply**
Indicates an air supply issue. See the Pressure area below on the tab. The air supply must be five psi above the Spring Range. See Pressure Range.

**Supporting Hardware**
Indicates a supporting hardware failure for: position sensor, temperature sensor, current sensor, pressure sensor and the value of IP, temperature and reference voltage being out of range. If failure is persistent, replace the device.
Details button

Opens the **Fault Details** dialog. On this dialog you can view all faults. Use the buttons to:

- **Clear Current Faults**: Clears currently active faults.
- **Clear All Faults**: Clears currently active and historical faults.
- **Position Control State**: Indicates the state the present control state and contains a button to set the state back to Normal.

![Fault Details Dialog](image)

**Figure 50  Fault Details**

**Position**

**Setpoint Bar Graph**

Displays a bar graph of the setpoint presently in use. The final command value to the positioning algorithm before characterization.

**Actual Position Bar Graph**

Displays a bar graph of the detected position. The actual measured feedback position before de-characterization.

**Setpoint**

Displays the setpoint presently in use.

**Actual Position**

Displays the detected position.
Setpoint from AO block
Lists the setpoint output from the AO block.

Setpoint from DO block
Lists the setpoint output from the DO block.

On/Off SP from DO block
Indicates whether the setpoint is coming from the DO block.

Discrete SP from DO block
Indicates whether the setpoint is coming from the DO block.

Characterized Setpoint
Displays the characterized setpoint.

Characterized Position
Displays the characterized position.

Setpoint Deviation
Indicates this parameter is in alert. See Deviation Alerts Tab.

Setpoint Timeout
Indicates that a valid setpoint is not available. See Control Tab.

Position HIHI
Indicates there is an active HIHI alert condition. See HI and HIHI Alerts Tab. Possible causes include: slippage at position sensor, incorrect configuration, or out of range.

Position HI
Indicates there is a HI alert set. See HI and HIHI Alerts Tab.

Position LO
Indicates there is a LO alert set. See LO and LOLO Alerts Tab.

Position LOLO
Indicates there is a LOLO alert set. See LO and LOLO Alerts Tab.

Travel Accumulation A/ Travel Accumulation B
Indicates there is a Travel Accumulation alert set. See Travel Accumulation A and B Alert Tab.

Cycle Counter A/ Cycle Counter B
Indicates there is a Cycle Counter alert set. See Cycle Counter A and B Alerts Tab.

Near Closed
Indicates there is a Near Closed alert set. See Near Closed Alerts Tab.

Working Time
Indicates there is a Working Time alert set. See Operating Time Alert Tab.

Pressure

CAUTION
Changing the pressure units requires a reboot of NI Configurator for conversion to take effect.
<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Pressure Bar Graph</td>
<td>Displays a bar graph of the detected supply pressure.</td>
</tr>
<tr>
<td>Actuator Pressure A Bar Graph</td>
<td>Displays the detected actuator pressure.</td>
</tr>
<tr>
<td>Supply Pressure</td>
<td>Displays the detected supply pressure.</td>
</tr>
<tr>
<td>Actuator Pressure A/Actuator Pressure B</td>
<td>Displays the detected actuator pressure.</td>
</tr>
<tr>
<td>Pilot Pressure</td>
<td>Displays the detected pilot pressure. The pilot pressure, which is controlled by the electropneumatic converter, controls the rate of air flow that fills or exhausts the actuator. If the temperature compensated pressure sensor reading is outside the range [-1250, 15000] counts for five reads in a row, an alert is set.</td>
</tr>
<tr>
<td>Atmospheric Pressure</td>
<td>Displays the detected atmospheric pressure.</td>
</tr>
<tr>
<td>Supply Pressure HI Alert</td>
<td>Indicates there is a Supply Pressure HI alert set. See <a href="#">Supply Pressure HI Alert Tab</a>.</td>
</tr>
<tr>
<td>Supply Pressure LO Alert</td>
<td>Indicates there is a Supply Pressure LO alert set. See <a href="#">Supply Pressure LO Alert Tab</a>.</td>
</tr>
<tr>
<td>Supply Pressure LOLO Alert</td>
<td>Indicates there is a Supply Pressure LOLO alert set. See <a href="#">Supply Pressure LOLO Alert Tab</a>.</td>
</tr>
<tr>
<td>Temperature /Current</td>
<td>Displays the current detected temperature in a bar graph.</td>
</tr>
<tr>
<td>IP Output Bar Graph</td>
<td>Displays the detected IP Output current in a bar graph.</td>
</tr>
<tr>
<td>Temperature</td>
<td>Displays the current detected temperature.</td>
</tr>
<tr>
<td>IO Output</td>
<td>Displays the detected IP Output current.</td>
</tr>
<tr>
<td>Alert Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Temperature HI Alert / Temperature LO Alert</td>
<td>Indicates there is a Temperature alert set. See Temperature HI Alert Tab or Temperature LO Alert Tab.</td>
</tr>
<tr>
<td>IP Current HI Alert / IP Current LO Alert</td>
<td>Indicates there is an IP Current alert set. See IP Output HI Alert Tab or IP Output LO Alert Tab.</td>
</tr>
</tbody>
</table>
Positioner Alert Log

Use this tab to view a list of historical and active alerts.

**Buttons and Fields**

- **Alert list**
  Shows a list of alert by area with an associated timestamp. Alert icons appear as on the **Positioner State** tab.

- **Show only active alerts**
  Click to filter out inactive alerts.

- **Clear Saved Log**
  Click to clear the DTM's saved log file. This is stored in the target location for the DTM.

- **Clear Device Log**
  Click to clear the device's saved log file.
Trend and Position Setup

Use this tab to configure a trend showing a combination of temperature, position, pressure and current over time. You can add color-coded traces for a number of different values to track their behaviors. Additionally, you can manipulate the setpoint and study how that affects the system behavior. Once finished, you can set a time frame and export the results.

Figure 52  Trend and Position Setup
**Buttons and Fields**

General Graph Functionality

All graphs have some common functionality, including:
- Click-and-hold on any axis' legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - **Tracking Enabled**: Enables/disables tracking.
  - **Update Resume Values**: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - **Zoom to Fit**: Activates a function that sizes the graph to fit the selected display area.

**Add traces checkboxes**
Click a checkbox associated with a value you need to track and it appears on the trend.

**Export functionality**
Use this button and Keep Last pulldown to configure a time period and export results to a .csv file (Export the Trend Setup).

**Setpoint adjustment**
Use this area to create the setpoint:
- Manually (Create a Setpoint Functionality: Manual).
- Automatically using a step, ramp or sine basis (see Create a Setpoint Functionality: Step, Ramp or Sine).

**Figure 53 Setpoint Adjustment**

Use to increment the setpoint either stepwise or quickly.

Use the slider to move the setpoint when the Manual radio button is active.

Use to decrement the setpoint either stepwise or quickly.
Create a Setpoint Functionality: Step, Ramp or Sine
You can create a setpoint based on a step, ramp or sine function:

1. Click the Step, Ramp or Sine radio button.
2. Enter a Size and Period. From here you can Export the Trend Setup

Create a Setpoint Functionality: Manual
You can manually manipulate the setpoint to study results:

1. Click the Manual radio button.
2. Either drag the slider or enter a value in the Manual Setpoint field. From here you can Export the Trend Setup

Export the Trend Setup
Use this area to create and export a trend.

1. Use the Keep Last pulldown to select an increment:
   - Last 10 minutes
   - Last 1 Hour
   - Last 10 Hours
   - Infinite
2. Click Export and a Save As dialog appears.
3. Navigate to the required directory and click Save.
Configuration and States

Use this tab to configure and run one of four types of data collections to study a positioner/valve performance and to create a running series of data collections to historically track valve/positioner performance.

These data collections are done during normal valve operations; there is no need to disturb the control process.

As data collection occurs and once it is complete you can use the associated Graph Results ( “Graph Results” on page 83) and Scatter Plot Results ( “Scatter Plot Results” on page 85) tabs to view both results for the present data collection and call up an historical curve for comparison.

The data collections types that you run from this tab include:

- Solenoid Test (see “Run a Solenoid Test” on page 77)
- Predefined Test (see “Run a Predefined Test” on page 81)
- Signature Test (see “Run a Signature Test” on page 80)
- Custom Test (see “Run a Custom Test” on page 82)

The collected data shown for all types include: Actuator Pressure A, Actuator Pressure B (if double-acting), IP Current, Pilot Pressure, and Supply Pressure. All collections collect 2700 or more data points.

This tab appears only when connected to an SVI FF device version 2.1 or higher and with DTM version 1.4 or higher.
### Buttons and Fields

#### General Graph Functionality

All graphs have some common functionality, including:

- Click-and-hold on any axis’ legend to drag along the axis.
- Press the **CTRL** button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - **Tracking Enabled**: Enables/disables tracking.
  - **Update Resume Values**: Store the axis scale for the **Tracking Enabled**. The next time **Tracking Enabled** is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - **Zoom to Fit**: Activates a function that sizes the graph to fit the selected display area.

#### Data Collection Period

**Solenoid Test**  
Runs a test where you can test using a very brief pulse the action of an installed solenoid without removing the valve form the control loop. High frequency (105 ms per point) - limited time sequence ~ three minutes

**Signature Test**  
Runs a standard diagnostics test. Lower frequency (1 point per second) with a longer time sequence.

**Predefined Test**  
Select a radio button to run a test where you can configure the setpoint and/or the actual position as well as selecting form four predetermined test cycles:

- **0.1 sec - 3 Mins Data**: Collects data every 0.105 seconds for more than three minutes.
- **1 Sec - 30 Mins Data**: Collects data once every second for 30 minutes.
- **1 Min - 30 Hours Data**: Collects data once every minute for 30 hours.
- **30 Mins - 30 Days Data**: Collects data once every 30 minutes for 30 days.

In each case, the left hand number represents the time interval at which data points are collected and the right hand number is the overall test duration.

**Custom Test**  
Select this radio button to run a test where you can configure the setpoint and/or the actual position and set the **Data Collection Period**.

**Data Collection Period**  
Use the pulldown to select a data collection period, including *(Custom Test only)*:

- **105 mSec (3.15 Min.)**
- **210 mSec (6.3 Min.)**
- **420 mSec (12.6 Min.)**
- **840 mSec (25.2 Min.)**
- **1.68 Sec (50.4 Min.)**
- **3.36 Sec (1.68 Hours)**
- **6.72 Sec (3.36 Hours)**
- **13.44 Sec (6.72 Hours)**
- **26.88 Sec (13.44 Hours)**
- **53.76 Sec (1.12 Days)**
- **1.792 Min (2.24 Days)**
- **3.584 Min (4.48 Days)**
- **7.168 Min (8.96 Days)**
- **14.336 Min (17.92 Days)**
- **28.672 Min (35.84 Days)**

In each case, the left hand number represents the time interval at which data points are collected and the right hand number is the overall test duration.
Setpoint/Actual Position

Click an individual checkbox to add/remove this item from the data collected from the device.

Click **Start data Collection** to commence a test and the button turns to **Stop** to interrupt the test.
Run a Solenoid Test

The solenoid is used to force the valve to an open/close position. It stops the air flow from the positioner and releases actuator into the atmosphere. *General Diagram: Solenoid Test Setup* shows a general configuration for a solenoid test.

![General Diagram: Solenoid Test Setup](image)

1. Click the **Solenoid Test** radio button.
2. Click the checkbox associated with Setpoint and/or Actual Position.
3. Click **Start Data Collection**. The data in the graph begins updating.

![Solenoid Test](image)

*NOTE*

Once you see the waveform indicate in the black box in **Solenoid Test**, the solenoid has finished operation and you can stop the test.
4. Compare results on the Graph Results tab.

**Figure 57** Graph Results Tab: With a Comparison Curve Added

*Scatter Plots Results* and *Scatter Plots Results II* show the Scatter Plot Results tabs for two solenoid test with comparison plots shown as well. In both examples you can see that the newer data collection and the historical data collection vary very little, indicating that the valve/positioner performance is consistent.

**Figure 58** Scatter Plots Results
Solenoid Test: Short vs. Long Burst

You can do a test where a short solenoid operation occurs or a longer burst, as in the red box and black boxes in *Short Burst and Long Burst Solenoid Test*, respectively.
Run a Signature Test

Use this tab to ensure that the pressure/position relationship is consistent.

1. Click the **Signature Test** radio button.
2. Click the checkbox associated with *Setpoint* and/or *Actual Position*.
3. Click **Start Data Collection** and wait until all data is uploaded.
4. Review the results using the **Scatter Plots** tab. See “Run a Solenoid Test” on page 77 for a scatter plots discussion.
Run a Predefined Test

Use this tab to analyze valve performance for longer periods. For example:

- Range of travel for a day, week or month.
- Setpoint/position error during a day as caused by temperature or other factors.

![Predefined Test](image)

Figure 63  Predefined Test

1. Click the **Predefined Test** radio button.
2. Click one of the activated radio buttons to select a collection period and overall duration.
3. Click the checkbox associated with **Setpoint** and/or **Actual Position**.
4. Click **Start Data Collection**
Run a Custom Test

Use this tab to detect:

- Fast variations in setpoint and actual positions.
- Cycling.
- Tuning issues.

![Custom Test](image)

**Figure 64  Custom Test**

1. Click the **Custom Test** radio button.
2. Use the **Data Collection Period** pulldown to select a collection period and overall duration.
3. Click the checkbox associated with **Setpoint** and/or **Actual Position**.
4. Click **Start Data Collection**.
Graph Results

Buttons and Fields

General Graph Functionality

All graphs have some common functionality, including:

- Click-and-hold on any axis' legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - Tracking Enabled: Enables/disables tracking.
  - Update Resume Values: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - Zoom to Fit: Activates a function that sizes the graph to fit the selected display area.

Curve checkboxes

Use the color-designated checkboxes to add/remove traces from the graphs. This does not impact data collection.
Position vs. Time (sec) vs. Pressure graph

There are two of these graphs: The top graph represents the running or just completed test. The bottom is a saved test that you can display using the Show Saved Results pulldown list for comparison.

- Left axis displays a scale for the percentage of position.
- Bottom axis displays time.
- Right axis displays pressure in psi.

Use the checkboxes above the graph to activate/deactivate the following traces:

- The red line represents the current supply pressure.
- The purple line represents the current Actuator A pressure.
- The yellow line represents the current Actuator B pressure (box grayed out if no double-acting).
- The navy blue line represents a saved test setpoint.
- The light blue line represents the Actual Position.
- The green line represents the Actual Position.
- The light blue line represents the IP Current.
- The brown line represents the Pilot Pressure.

Click to save the results. You can load back the result in the selection Show Saved Result.

Exports the results as a .csv file. See Export Step Test Results for instructions.

Toggles the view out according to preset values to two times.

Toggles the view in according to preset values to 50%.

Use the pulldown to select a results file and the graph is populated. See Diagnostics Start Step Test for instructions on how to create these files.
Scatter Plot Results

Figure 66  Scatter Plots Results

Buttons and Fields

General Graph Functionality

All graphs have some common functionality, including:

- Click-and-hold on any axis’ legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - Tracking Enabled: Enables/disables tracking.
  - Update Resume Values: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - Zoom to Fit: Activates a function that sizes the graph to fit the selected display area.

Curve checkboxes

Use the color-designated checkboxes to add/remove traces from the graphs. This does not impact data collection.
There are two of these graphs: The top graph represents the running or just completed test, or a test previously completed that is stored on the system (accessed using the Show Results pulldown). The bottom is a saved test that you can display using the Show Saved Results pulldown list for comparison.

- Left axis displays a scale for the percentage of position.
- Bottom axis displays the selection made using the radio buttons at the bottom:
  - IP Current
  - Setpoint
  - Pilot Pressure
  - Actuator Pressure A
- Right axis displays pressure in psi.

Use the checkboxes above the graph to activate/deactivate the following traces:

- The purple line represents the current Actuator A pressure.
- The yellow line represents the current Actuator B pressure (box grayed out if no double-acting).
- The green line represents the Actual Position.
- The brown line represents the Pilot Pressure.

Click to save the results. You can load back the result in the selection Show Saved Result.

Exports the results as a .csv file. See Export Step Test Results for instructions.

Toggles the view out according to preset values to two times.

Toggles the view in according to preset values to 50%.

Use the pulldown to select a results file and the graph to the left is populated. See Diagnostics Start Step Test for instructions on how to create these files.

Use the pulldown to select a results file and the graph to the right is populated. See Diagnostics Start Step Test for instructions on how to create these files.
Device State

Use this tab to view block parameters on a block-by-block basis. The detected value appears where appropriate and the tag state is indicated by the background color, where:

- Red indicates that the item is in alert state.
- Green indicates normal operations.

NOTE  For information on particular parameters and operations refer to FOUNDATION fieldbus documents FF890-FF984.
Buttons and Fields

Fields appear for all block types

Out of Service  Indicates the block is out of service.

Sensor Failure  Indicates a sensor failure in the block parameters.

Power Up  Indicates the block is in power up mode.

Fault State  Indicates the block is in a fault state. The device goes to this state if:
- The host sends a message to Set Fault State
- The processor detects a Fault State and forces the device to this state
- There is a processor communication issue

Maint Now  Indicates that maintenance is required.

Maint Soon  Indicates that maintenance is required soon.

Readback  Indicates a failure detected in readback value.

Local Override  Indicates that the block is in local override mode. The FF device keypad is in control of the device.

NV Data  Indicates the status of non-volatile memory.

Simulation  Indicates the block is in simulation mode.

Static Data  Displays whether there is an error with this data set. If there is an error then the default data is used.

Link Error  Displays the link error status.

Memory Failure  Indicates a memory failure. This error indicates that a RAM data item had a bad checksum.

Configuration  Displays whether or not the configuration of the block allows for normal operations.

Output Failure  Indicates when an output failure is detected by this block (backcalculation input has a BAD status, Device Failure).

Other  Indicates calibration, find stops, autotune failed or factory mode enabled.

RB: Resource Block Tag

Fault State  Indicates, in the field to the right, the fault state:
- Clear
- Active

Condition set by loss of communication to an output block, where the fault is promoted to an output block or a physical contact. When Fault State condition is set, output function blocks perform their FSTATE actions.

It is set by a physical input to the device provided for that purpose, or by setting the SET_FSTATE parameter with a message over the bus. It is cleared by setting the CLR_FSTATE parameter, if the physical input is reset.
**Write Lock**
Indicates, in the field to the right, the write lock state:

- **Unlocked**
- **Locked**

See *Device Access* for an explanation of these states.

**TB: Transducer Block Tag**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setpoint</strong></td>
<td>Displays the present TB block working setpoint,</td>
</tr>
<tr>
<td><strong>Setpoint from AO Block</strong></td>
<td>Displays the last setpoint value output from the AO block.</td>
</tr>
<tr>
<td><strong>On/Off</strong></td>
<td>Indicates whether the setpoint is coming from the DO block.</td>
</tr>
<tr>
<td><strong>Setpoint from DO Block</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Discrete</strong></td>
<td>Indicates whether the setpoint is coming from the DO block.</td>
</tr>
<tr>
<td><strong>Discrete Setpoint from DO Block</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Characterized Setpoint</strong></td>
<td>Displays the characterized setpoint.</td>
</tr>
<tr>
<td><strong>Actual Position</strong></td>
<td>Displays the present TB block position.</td>
</tr>
<tr>
<td><strong>AO Actual Position</strong></td>
<td>Displays the present AO block position.</td>
</tr>
<tr>
<td><strong>On/Off Actual Position</strong></td>
<td>Displays whether or not the TB block is using actual position. Actual discrete valve position,</td>
</tr>
<tr>
<td></td>
<td>provided to DO block as boolean.</td>
</tr>
<tr>
<td><strong>Discrete Actual Position</strong></td>
<td>Displays the present TB block actual position from DO block.</td>
</tr>
<tr>
<td><strong>Characterized Position</strong></td>
<td>Displays the characterized position.</td>
</tr>
<tr>
<td><strong>Supply Pressure</strong></td>
<td>Displays the present TB block supply pressure.</td>
</tr>
<tr>
<td><strong>Actuator Pressure A / Actuator Pressure B</strong></td>
<td>Displays the present TB block actuator pressures.</td>
</tr>
<tr>
<td><strong>Pilot Pressure</strong></td>
<td>Displays the detected pilot pressure. The pilot pressure, which is controlled by the electropneumatic converter, controls the rate of air flow that fills or exhausts the actuator. If the temperature compensated pressure sensor reading is outside the range ([-1250, 15000]) counts for five reads in a row, an alert is set.</td>
</tr>
<tr>
<td><strong>Atmospheric Pressure</strong></td>
<td>Displays the present TB block atmospheric pressure.</td>
</tr>
</tbody>
</table>
**Transducer Err. - Position**
Displays the present TB block transducer position error.

**Transducer Err. - Pressure**
Displays the present TB block transducer pressure error.

**Transducer Err. - Temperature**
Displays the present TB block transducer temperature error.

**Temperature**
Displays the present TB block temperature.

**IP Output**
Display the present TB block IP output current.

**AO: Analog Output Block Tag**

**Set Point**
Displays the present AO block working setpoint.

**CAS_IN**
Displays the CAS_IN setpoint value.

**RCAS_IN**
Displays the RCAS_IN setpoint value.

**Process Value**
Displays the position as derived from either the primary analog value for use in executing the function, or a process value associated with it. Can also be calculated from the READBACK value of an AO block.

**Readback**
Indicates the readback of the actual continuous valve or other actuator position, in transducer units.

**OUT**
The output setpoint value.

**BKCAL_OUT**
Displays the setpoint that is sent to the TB block.

**RCAS_OUT**
Displays the setpoint that is sent to the TB block.

**Target Mode**
Displays the target mode.

**Actual Mode**
Displays the actual block mode.

**Period of Execution**
Displays the period of the last block execution.

**PID: PID Block Tag**

**Set Point**
Displays the present PID block working setpoint.

**Process Value**
Displays the position as derived from either the primary analog value for use in executing the function, or a process value associated with it. Can also be calculated from the READBACK value of an AO block.

**CAS_IN**
Displays the CAS_IN setpoint value.

**RCAS_IN**
Displays the RCAS_IN setpoint value.

**FF_VAL**
Displays the feed forward value.

**BKCAL_IN**
Displays the BKCAL_OUT value.

**ROUT_IN**
Displays the remote output.
TRK_IN_D Displays the discrete input used to initiate external tracking of the block output to the value specified by TRL_VAL.

TRK_VAL Displays the value, if tracking is engaged, to track the as OUT.

OUT Displays the OUT used for setpoint.

BKCAL_OUT Displays the setpoint that is sent to the TB block.

RCAS_OUT Displays the setpoint that is sent to the TB block.

ROUT_OUT Displays the ROUT_OUT value.

Target Mode Displays the target mode.

Actual Mode Displays the actual block mode.

Period of Execution Displays the period of the last block execution.

DO1: DO Block Tag / DO2: DO Block Tag

CAS_IN_D Displays the remote setpoint value, which must come from another Fieldbus block, or a DCS block through a defined link.

RCAS_IN_D Displays the target setpoint and status provided by a supervisory Host to a discrete control or output block.

BKCAL_OUT_D Displays the output value and status provided to an upstream block output tracking when the loop is broken, as determined by the status bits. This information provides bumpless transfer to closed loop control.

OUT_D Displays the discrete output value.

RCAS_OUT_D Displays the remote setpoint value that is sent to the TB block.

Target Mode Displays the target mode.

Actual Mode Displays the actual block mode.

Period of Execution Displays the period of the last block execution.

OS: OS Block Tag

CAS_IN Displays the CAS_IN setpoint value.

BKCAL_IN_1 / BKCAL_IN_2 Displays the BKCAL_OUT value.

OUT_1 / OUT_2 Displays the block OUT value.

BKCAL_OUT Displays the setpoint that is sent to the TB block.

Target Mode Displays the target mode.

Actual Mode Displays the actual block mode.

Period of Execution Displays the period of the last block execution.
### DI1: DI1 Block Tag / DI1: DI1 Block Tag

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANNEL</td>
<td>Displays the configured measurement channel.</td>
</tr>
<tr>
<td>OUT_D</td>
<td>Displays the primary discrete value calculated as a result of executing the function block.</td>
</tr>
<tr>
<td>Target Mode</td>
<td>Displays the target mode.</td>
</tr>
<tr>
<td>Actual Mode</td>
<td>Displays the actual block mode.</td>
</tr>
<tr>
<td>Period of Execution</td>
<td>Displays the period of the last block execution.</td>
</tr>
</tbody>
</table>

### AI1: AI1 Block Tag / AI2: AI2 Block Tag / AI3: AI3 Block Tag

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANNEL</td>
<td>Displays the configured measurement channel.</td>
</tr>
<tr>
<td>OUT</td>
<td>Displays the output value.</td>
</tr>
<tr>
<td>Target Mode</td>
<td>Displays the target mode.</td>
</tr>
<tr>
<td>Actual Mode</td>
<td>Displays the actual block mode.</td>
</tr>
<tr>
<td>Period of Execution</td>
<td>Displays the period of the last block execution.</td>
</tr>
</tbody>
</table>

### MAI: MAI Block Tag

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANNEL</td>
<td>Displays the configured measurement channel.</td>
</tr>
<tr>
<td>OUT_1 ... OUT_8</td>
<td>Displays the a block output required by the OS and analog calculate blocks.</td>
</tr>
<tr>
<td>Target Mode</td>
<td>Displays the target mode.</td>
</tr>
<tr>
<td>Actual Mode</td>
<td>Displays the actual block mode.</td>
</tr>
<tr>
<td>Period of Execution</td>
<td>Displays the period of the last block execution.</td>
</tr>
</tbody>
</table>

### IS: IS Block Tag

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN_1 ... IN_4</td>
<td>Displays the block input value.</td>
</tr>
<tr>
<td>DISABLE_1 ... DISABLE_4</td>
<td>Displays the value of the parameter to switch off the input from use.</td>
</tr>
<tr>
<td>OP_SELECT</td>
<td>Displays the status of a forced input on a settable parameter.</td>
</tr>
<tr>
<td>OUT</td>
<td>Displays the block output value.</td>
</tr>
<tr>
<td>SELECTED</td>
<td>Displays the integer indicating the selected input number.</td>
</tr>
<tr>
<td>Target Mode</td>
<td>Displays the target mode.</td>
</tr>
<tr>
<td>Actual Mode</td>
<td>Displays the actual block mode.</td>
</tr>
<tr>
<td>Period of Execution</td>
<td>Displays the period of the last block execution.</td>
</tr>
</tbody>
</table>
AR: AR Block Tag

*IN and IN_1 ... IN_3* Displays the block input value.

*OUT* Displays the block output value.

*Target Mode* Displays the target mode.

*Actual Mode* Displays the actual block mode.

*Period of Execution* Displays the period of the last block execution.

CS: CS Block Tag

*SEL_1 ... SEL_3* Displays the block input value from the Selector block.

*BKCAL_IN* Displays the BKCAL_OUT value.

*OUT* Displays the block output value.

*BKCAL_SEL1 ... BKCAL_SEL_3* Displays the BKCAL_SEL value from the Selector block.

*Target Mode* Displays the target mode.

*Actual Mode* Displays the actual block mode.

*Period of Execution* Displays the period of the last block execution.
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8. Calibration

Calibration

The Calibration tree contains the following tabs:

- Find Stops
- Auto Tune
- Quick Wizard
- Full Wizard

Find Stops

Use this tab to automatically search for the mechanical valve travel limits and tune the valve position PID control algorithm.

The following list details actuators that must be tuned manually. Look for a Manual Tune Only notice in the TB block tag descriptor. Actuators that may require manual tuning include:

- Actuators with internal leaks, such as pistons.
- Large actuators with high spring ranges.

CAUTION

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

NOTE

If manual tuning is performed enter Manual Tune Only in the TB block tag Descriptor.
Use the Travel Range to adjust calibration at 0% and 100% to match the valve’s working stroke when there is over-travel at one or both stops. Additionally, if the valve linkage introduces a non-linearity, it can be corrected by setting a correction at 50%. The corrections in this dialog box are applied over corrections applied with the Open Stop Adjustment. Use only one set of correction tools for adjusting zero, span, and non-linearity calibrations.

**Determining Values to Disable Tight Shutoff Below, Full Open Above, and Limits**

If Travel Limits have been readjusted after performing Find Stops, then the values that disable the Tight Shutoff Below, Full Open Above, Position Lower Limit, and Position Upper Limit functions must be determined by testing the limits. To disable these functions, set them 10% above the full open mechanical stop position or 10% below fully closed mechanical stop position.

When calculating the relationship between Open Stop Adjustment and Tight Open use the following equation:

\[
\text{Tight Open}_{\text{New}} = \frac{\text{Open Stop Adjustment}_{\text{Previous}}}{\text{Open Stop Adjustment}_{\text{New}}} \times \text{Tight Open}_{\text{Previous}}
\]

**Limit Testing**

1. Isolate the valve from the process.
2. Place the FF in manual operating state. The valve must be calibrated and supplied with correct supply pressure.
3. Measure closed position - Enter a Set Point of -10%. After the valve reaches it’s final value, record the actual position of the closed mechanical stop. The actual position must be less negative than the target position to verify the valve has reached the stop. If the actual position and target position are equal reduce the Set Point until the valve reaches the stop.
4. Disable Tight Shutoff Below, and Position Lower Limit by deducting 10% from the recorded value.
5. Measure open position - Enter a Set Point of 110%. After the valve reaches it’s final value, record the actual position of the open mechanical stop. The actual position must be less than the target position to verify the valve has reached the stop. If the actual position and target position are equal increase the Set Point until the valve reaches the stop.
6. Disable Full Open Above and Position Upper Limit by adding 10% to the value recorded above.

**Figure 68  Calibration Find Stops**

**Buttons and Fields**

- **Auto Stop Limits**
  
  Use this radio button to perform an automatic find stops procedure. This sets the calibration position of the valve at the fully vented position and at full supply pressure.

  To determine valve position, the positioner must measure and save the closed and open positions of the valve. The FF first exhausts the actuator and measures the position, then fills the actuator and measures the position. From these measurements the valve position is determined. Correction can be made for nominal valve travel if it is less than full travel. For double acting actuators, both ports are filled and exhausted.

  See Find Stops Procedures.

- **Manual High and Low Stop Limit**
  
  Use this radio button to perform a procedure that sets the High Stop Limit and Low Stop Limit. See Find Stops Procedures.
**Manual Low Stop Limit**

Use this radio button to perform a procedure that sets the *Low Stop Limit*.  
See [Find Stops Procedures](#).

**Manual High Stop Limit**

Use this radio button to perform a procedure that sets the *High Stop Limit*.  
See [Find Stops Procedures](#).

**Manual Stop Limits**

Use this radio button to run the manual stops.

On some actuators, it is possible that the automatic *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.

*Manual Stops* moves the valve to full closed and you respond when the valve reaches the closed position. The valve then moves to full open and you respond when the valve reaches the full open position.

For some valves where the travel exceeds the nominal travel of the valve, use open *Stop Adjustment* for details about how to trim the open stop.

**Travel Range**

Enter a value to set as the maximum travel. This is used to calculate the working Set Point value.

**Travel Units**

Use the pulldown to select units for *Travel Range*:

- Inch
- cm
- mm
- deg
- Rad
- %

**Open Stop Adjustment**

Use this field and ![start](start.png) to recompute the position scale so that at the value entered in the *Open Stop Adjustment* edit box as a percent of full stops, becomes 100%.

In some valves the travel exceeds the nominal valve travel. You can compensate for this so that the valve position reads 100% at the nominal travel.

*Open Stop Adjustment Diagram* shows how this works. This calibrates the position with the full travel of the valve.

![Figure 69 Open Stop Adjustment Diagram](image.png)
Counts vs. Time Graph

Use this graph to graphically see the counts versus time during the Find Stops procedure.

When calculating the relationship between Open Stop Adjustment and Tight Open use the following equation:

\[
Tight\ Open_{\text{New}} = \frac{\text{Open Stop Adjustment}_{\text{Previous}}}{\text{Open Stop Adjustment}_{\text{New}} \times \text{Tight Open}_{\text{Previous}}}
\]

Click to start the procedure selected above.

Click, once the calibration is complete, to accept the values.

Counts vs. Time Graph

Displays the procedure results graphically.

See Counts vs. Time Graph for a full description of functionality.

- Left axis displays raw positioner sensor value.
- Bottom axis displays time.
- Click-and-hold on any axis' legend to drag along the axis.
- The red line represents a HIHI alert condition.
- The yellow represents a HI alert condition.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.

Raw Sensor Value

Displays the temperature compensated value; in counts. The value typically is between -15000 and +15000 counts.

Pressure vs. Time Graph

Use this graph to graphically see the pressure and position versus time during the Find Stops procedure.

- Left axis displays a scale for the position (blue trace).
- Right axis displays the actuator pressure (red trace).
- Bottom axis displays time.
- Click-and-hold on any axis' legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.

Actuator Pressure

Displays the pressure determined from the procedure.

Position

Displays the position determined from the procedure.

Travel

Displays the maximum travel determined from the procedure.

Find Stops Log

Displays device nameplate information, procedural messages during the runtime and results.

Counts vs. Time Graph

Use this graph to graphically see the counts versus time during the Find Stops procedure.
Figure 70  Counts versus Time Graph

Note 1: The red line in *Counts versus Time Graph* indicates that the valve sensor is rotated to an angle where the reading of the position is impossible. The *Find Stops* is failing.

Note 2: The yellow line in *Counts versus Time Graph* indicates that the sensor is too close to the maximum position and this is a warning condition. The *Find Stops* will work, but the position sensor resolution may not be high.

The magnet graphic displays the rotation real-time degree of the magnet sensor:

- □ -60° to 60° green appears
- □ -60° to 70° or 60 to 70° yellow appears
- □ Less than -70° or greater than 70° red appears
Pressure and Position vs. Time Graph

Use this graph to graphically see the pressure and position versus time during the Find Stops procedure.

![Pressure versus Time Graph](image)

**Figure 71  Pressure versus Time Graph**

Find Stops Procedures

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

Auto Stop Limits

**WARNING**

Tuning strokes the valve over its entire travel. Isolate the valve from the process prior to calibration.

1. Ensure the system is in manual.
2. Click **Auto Stops**.
3. Enter a **Travel Range** value.
4. Use the **Travel Units** pulldown to select a unit.
5. Enter and **Open Stop Adjustment** value. See **Find Stops** to perform **Open Stop Adjustment**.
When calculating the relationship between Open Stop Adjustment and Tight Open use the following equation:

\[ \text{Tight Open}_{\text{New}} = \frac{\text{Open Stop Adjustment}_{\text{Previous}}}{\text{Open Stop Adjustment}_{\text{New}}} \times \text{Tight Open}_{\text{Previous}} \]

6. Click the two graphs beginning showing results, the Find Stops Log lists detected values, test results appears (Auto Stop Limits Results: Succeeded) and if the test fails a list of reasons.

![Figure 72 Auto Stop Limits Results: Succeeded](image)

7. Click Accept.

8. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.
Manual High and Low Stop Limit

**WARNING**

*Tuning strokes the valve over its entire travel. Isolate the valve from the process prior to calibration.*

1. Ensure the system is in manual.
2. Click **Manual High and Low Stop Limit**.
3. Enter a **Travel Range** value.
4. Use the **Travel Units** pulldown to select a unit.
5. Enter and **Open Stop Adjustment** value. See **Find Stops** to perform **Open Stop Adjustment**.

**NOTE**

When calculating the relationship between Open Stop Adjustment and Tight Open use the following equation:

\[
\text{Tight Open}_{\text{New}} = \frac{\text{Open Stop Adjustment}_{\text{Previous}}}{\text{Open Stop Adjustment}_{\text{New}}} \times \text{Tight Open}_{\text{Previous}}
\]

6. Click **Start** , the two graphs beginning showing results. The test seeks the **Low Stop** position and the **Accept Low** button appears.

**CAUTION**

*Ensure that the Raw Sensor Value stabilizes before proceeding.*

7. Click **Accept Low** , the test seeks the **High Stop** position and the **Accept High** button appears.

**CAUTION**

*Ensure that the Raw Sensor Value stabilizes before proceeding.*

The **Confirm** button appears.
8. Click **Confirm** , the Find Stops Log lists detected values, test results appears (Manual Low and High Stop Limits Results: Succeeded) and if the test fails a list of reasons.

![Figure 73 Manual Low and High Stop Limits Results: Succeeded]

9. Click **Accept** .

10. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Manual Low Stop Limit

WARNING

Tuning strokes the valve over its entire travel. Isolate the valve from the process prior to calibration.

1. Ensure the system is in manual.
2. Click Manual Low Stop Limit.
3. Enter a Travel Range value.
4. Use the Travel Units pulldown to select a unit.
5. Click Start, the two graphs beginning showing results. The test seeks the Low Stop position and the Accept Low button appears.

CAUTION

Ensure that the Raw Sensor Value stabilizes before proceeding.

6. Click Accept Low and the Confirm button appears.
7. Click **Confirm**, the **Find Stops Log** lists detected values, test results appears (**Manual Low Stop Limits Results: Succeeded**) and if the test fails a list of reasons.

8. Click **Accept**.

9. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Manual High Stop Limit

**WARNING**

*Tuning strokes the valve over its entire travel. Isolate the valve from the process prior to calibration.*

1. Ensure the system is in manual.
2. Click **Manual High Stop Limit**.
3. Enter a *Travel Range* value.
4. Use the *Travel Units* pulldown to select a unit.
5. Enter and **Open Stop Adjustment** value. See **Find Stops** to perform **Open Stop Adjustment**.
6. Click **Start**, the two graphs beginning showing results. The test seeks the *High Stop* position and the **Accept Low** button appears.

**CAUTION**

*Ensure that the Raw Sensor Value stabilizes before proceeding.*

7. Click **Accept Low** and the **Confirm** button appears.
8. Click **Confirm**, the **Find Stops Log** lists detected values, test results appears (**Manual High Stop Limits Results: Succeeded**) and if the test fails a list of reasons.

9. Click **Accept**.

10. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Auto Tune

Use the Calibration Auto Tune tab for commissioning a valve positioner. It includes the ability to configure PID parameters and aggressiveness while tuning. It is most useful for first time setup of the positioner.

Auto Tune is successful for most valves. However, very large actuators or high hysteresis may require manual tuning.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

**CAUTION**

Do not Auto Tune if manual tuning has been used. Auto Tune creates new parameters that override the manual tuning parameters.

**WARNING**

Before beginning the Auto or Manual range calibration, confirm that the valve is isolated from the process. This procedure exhausts and then fills the valve actuator to supply pressure and therefore strokes the valve over its full range. Supply pressure **MUST NOT** exceed the actuator pressure rating marked on the actuator. Positioner supply pressure **MUST BE** at least 5 psi higher than the upper spring range of the valve.
Figure 76  Calibration Auto Tune

**Buttons and Fields**

**Auto Tune Aggressiveness**
Enter a value that tends the valve to either a slow response (-9) to or overshoot(9). It is advised to increment the value one digit at a time to see the operational results. The default is 0.

**Auto Tune Supply Pressure**
Enter a value for the expected supply pressure.

**PID Configuration Parameters**
Displays the values for these parameters. The PID parameters update after Auto Tune.

**Start Auto Tune**
Click to start the tuning procedure. Updates appear in the Auto Tune Log.

**Actual Position**
Dynamically displays the position as a percent of the configured range.
Auto Tune

**CAUTION**

*For a successful Auto Tune process, the supply pressure must be at least 5 PSI (34.5 kPa) above the spring range.*

1. Ensure the system is in manual.
2. Select an **Auto Tune Aggressiveness**.
3. Enter an **Auto Tune Supply Pressure**.
4. Click **Start Auto Tune**.
Quick Wizard

Running the Quick Wizard is one of three ways to set up the FF. When you decide to run the setup you can either run the entire wizard or pick and choose which components to run. If you choose not to use the Quick Wizard, you can use the components it accesses to configure components separately on the following tabs:

- Quick Start Configuration tab
- Find Stops tab
- Auto Tune tab

Alternately, you can use the Full Wizard.

**WARNING**

The valve must be Out-of-Service and isolated from the process during this process.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.
Figure 77  Quick Wizard Configuration

Buttons and Fields

Procedure Area

No. Displays the number of the procedure.
Procedure Name and checkbox

Displays the procedure as listed on the tab where fields are configured. Use the checkbox to activate the procedure for use by the wizard. These include:

- **Change to OOS Mode**: Changes the positioner to OOS mode.
- **Set Tag**: Sets the physical device tag.
- **Set Address**: Sets the device address.
- **Set Parameters**: Sets parameters configured in the DTM to the device for the following: Air Action, Remote Sensor, Control Tuning and Characterization Type.
- **Download All Parameters**: Downloads all parameters to the device.
- **Find Stops**: Runs all Find Stops operations, including: Travel Range, Travel Units and Open Stops Adjustment.
- **Auto Tune**: Runs all Auto Tune procedures, including: Aggressiveness and Supply Pressure.
- **Step Test**: Runs a Step Test.
- **Ramp Test**: Runs a Ramp Test.
- **Signature Test**: Runs a Signature Test.
- **Save All Test Results**: Automatically saves all test results.
- **Upload All Parameters**: Uploads all parameters from the device to the DTM.
- **Save All Parameters**: Saves all parameters to the DTM database file.

Status

Displays a progress bar during execution for each selected item.

Check All

Click the checkbox to select/deselect all Procedure Name items.

Parameter Area

No.

Displays a number for each parameter associated with the Procedure Name selected in the procedure area.

Parameter

Lists the parameters associated for the Quick Wizard for the Procedure Name selected.

Value

Lists the parameter value read from the tab where it is configured.

**Edit the settings**

Click the button and you are taken to the tab where the values are input. Return to the Quick Wizard tab to continue the process.

Quick Wizard Graph

Displays a graph of % (percentage of the procedure complete) vs. Time with Supply Pressure (red) and Position (blue) traces during the Quick Wizard procedure.
General Graph functionality

All graphs have some common functionality, including:

- Click-and-hold on any axis’ legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - Tracking Enabled: Enables/disables tracking.
  - Update Resume Values: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - Zoom to Fit: Activates a function that sizes the graph to fit the selected display area.

Quick Wizard Log

Displays basic information about test run time and device, along with test-related messages and outcome.

Execute Quick Wizard button

Click to begin execution of configured items.
Run the Quick Wizard

To run the wizard:

**WARNING**

*This procedure moves the valve.*

**CAUTION**

*Procedures e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature* should **NOT** be invoked if the ValVue sequencer is running.

1. Place the system in *Out of Service* mode.
2. Click an item in the *Procedure Name* list or click **Check All**.
3. Click and individual line in the *Procedure Name* list and the items related to that appear in the *Parameter Area*.
4. Click **Edit the settings** and the tab related to the settings appears.
5. Enter values into fields as required.
6. Repeat steps 3, 4 and 5 as required.
7. Click **Execute Quick Wizard** and the wizard commences.
   
   If the procedure fails, use the log information window to get results and advice.
8. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled).
If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Full Wizard

Running the Full Wizard is one of three ways to set up the FF. When you decide to run the setup you can either run the entire wizard or pick and choose which components to run. This wizard has the advantage of accessing diagnostics test. This can be useful for troubleshooting and during initial commissioning. If you choose not to use the Full Wizard, you can use the components it accesses to configure components separately on the following tabs:

- Quick Start Configuration tab
- Find Stops tab
- Auto Tune tab
- Run Diagnostics Start Step Test, Diagnostics Start Ramp Test, Diagnostics Start Signature Test

Alternately, you can use the Quick Wizard.

**WARNING**

The valve must be Out-of-Service and isolated from the process during this process.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.
Figure 78  Full Wizard Configuration
**Buttons and Fields**

**Procedure Area**

- **No.** Displays the number of the procedure.
- **Procedure Name** Displays the procedure as listed on the tab where fields are configured. Use the checkbox to activate the procedure for use by the wizard.
- **Status** Displays a progress bar during execution for each selected item.
- **Check All** Click the checkbox to select/deselect all Procedure Name items.

**Parameter Area**

- **No.** Displays a number for each parameter associated with the Procedure Name selected in the procedure area.
- **Parameter** Lists the parameters associated for the Full Wizard for the Procedure Name selected.
- **Value** Lists the parameter value read from the tab where it is configured.

Click the button and you are taken to the tab where the values are input. Return to the Full Wizard tab to continue the process.

**Full Wizard Graph** Displays a graph of % (percentage of the procedure complete) vs. Time with Supply Pressure (red) and Position (blue) traces during the Quick Wizard procedure.

**General Graph functionality**

All graphs have some common functionality, including:

- Click-and-hold on any axis’ legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - **Tracking Enabled**: Enables/disables tracking.
  - **Update Resume Values**: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - **Zoom to Fit**: Activates a function that sizes the graph to fit the selected display area.

**Full Wizard Log** Displays basic information about test run time and device, along with test-related messages and outcome.

Click to begin execution of configured items.
Run the Full Wizard

To run the wizard:

**WARNING**

This procedure moves the valve.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

1. Place the system in *Out of Service* mode.
2. Click an item in the *Procedure Name* list or click **Check All**.
3. Click and individual line in the *Procedure Name* list and the items related to that appear in the *Parameter Area*.
4. Click **Edit the settings** and the tab related to the settings appears.
5. Enter values into fields as required.
6. Repeat steps 3, 4 and 5 as required.
7. Click **Execute Full Wizard** and the wizard commences.
   
   If the procedure fails, use the log information window to get results and advice.
8. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled).

If you fail to switch the Transducer block to Auto, then the valve will not be in control.
9. Diagnostics

Diagnostics Signature Measurement: General Discussion

The Signature function is a component of the diagnostic function. This function protects the valve from degradation failure and reports on the condition of the control valve or the positioner by comparing the history of signature characterization. To accomplish this objective a positioner must have the ability to measure and retain data describing the characteristics of the control valve and the positioner.

Measurement procedures for signature of the control valve and the positioner force the control valve to move the stem position; thus the measurement procedures must be performed while the process is off line and the device is in Out of Service state.

The DTM has the ability to store locally, the standard actuator signature data. When connected to the SVI FF, the valve signatures can be retrieved from FF non-volatile memory and compared to the current valve position, output pressure and other process information with valve signatures to determine if there is a change in system performance.

CAUTION

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.

The FF with option supports three types of user signature functions:

- Diagnostics Start Step Test
- Diagnostics Start Ramp Test
- Diagnostics Start Signature Test

Additionally, you can view:

- Position Histogram
- Position Error Histogram
Diagnostics Start Step Test

Use this tab to configure and run a Step Test.

The Step Test produces a time vs. position graph where the valve is submitted to a stepped input. The graph can contain data for 2 to 60 seconds of data with data taken up to every 0.05 seconds. The step profile may contain multiple steps. To run a step profile, you 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.

The step test starts at the starting position and makes steps according to the Step Size field until the ending position is reached. For each step, the FF measures the position at even time intervals for the amount of time specified in Time. If Both Ways is specified, when the end position is reached, the procedure is repeated from the end position to the start position.

This test measures the step response characteristic of control valve system. There are four types of step response test:

- **Single Step**
  The single step test consists of a single step response test, with a start time, start point and end point for the test incremented by the step time.

- **Multiple Steps**
  The multiple step response test consists of a series of single step response tests, with new set point for each following test incremented by the step size, executed consecutively in the overall user-specified range. All individual single step tests use the same user-specified step size except the last one, which uses the step size of the remaining portion.

- **Pre-Defined Steps**
  This test consists of steps where step size and timing are configurable. See Run Pre-Defined Steps.

- **Custom**
  Displays an empty table below where you can add settings to customize a test. See Run Custom: Step Test.

The measurement parameter is the output signal of control valve system; the feedback signal of the device (FINAL_POSITION_VALUE.Value).

**WARNING**

This procedure moves the valve. This results in loss of process control.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.
**Figure 79  Diagnostics Start Step Test**

*Step Test Configuration*

- **Current Position**: Displays the current position as a percent of fully open or closed.
- **Current Setpoint**: Displays the current setpoint as a percent.
- **Step Test Type**: Use the radio buttons to select the test type:
  - **Single Step**: Displays fields to configure a One Way or Two Way test. See *Run a Single Step Test*.
  - **Multiple Steps**: Displays fields to configure a One Way or Both Ways test where you can set Step Size during the test time. See *Run a Multiple Steps Step Test*.
  - **Pre-Defined Steps**: Displays fields to configure a test where you can dictate settings for steps. See *Run Pre-Defined Steps*.
  - **Custom**: Displays an empty table below where you can add settings to customize a test. See *Run Custom: Step Test*.
- **One Way**: Click to conduct the test only from the Start Position to the End Position.
**Both Ways**
Click to conduct the test only from the **Start Position** to the **End Position** and back to the **Start Position**. The values of the **Start Position** and the **End Position** determine the direction of the valve stem movement. When the value of the **Start Position** is more than that of the **End Position**, the valve steps down in one way trip, then steps up at return trip, if Both Ways is used.

**Initial Time**
Enter the time after the **Start** is clicked to wait before commencing the actual test. This gives time for stabilization.

**Start Position**
Enter the position for the valve positioning before the test start.

**End Position**
Enter the final position for the valve positioning during the test.

**Step Time**
Enter the time to for each step during the test. The software then operates the test between the **Start Position** and **End Position** in this timeframe.

**Step Size**
Enter the size for each step during a **Multiple Steps** test.

**Around Middle**
Click to run the Pre-Defined Steps test centered on the middle of the test range (**Multi Steps** test only).

**Around Current Setpoint**
Click to run the Pre-Defined Steps test centered on the Current Setpoint (**Multi Steps** test only).

**Up and Down/Up/Down**
Click one to run the test both ways or only one direction (**Multi Steps** test only).

**Step Increase**
Enter a percentage per each step. This is the step size, limited by **Max Step**, which along with the **Step Time** dictates the number of steps performed in the test range (**Multi Steps** test only).

**Max Step**
Enter a percentage for limiting the maximum step size per step of the test range (**Multi Steps** test only).

**Custom Test table**
Enter values for **No.** (number of steps), **Initial Time**, **Start Position**, **End Position** and **Step Time** per test execution line. You can add, rearrange and delete multiple lines of test actions to configure a test.

**Step Test Log**
Displays progress message, values and error messages as the test proceeds.

**Step Test Graph**
Displays graphical results as the test proceeds. The test status appears above the graph.

**Click to start the test. Updates appear in the Step Test Log.**

**Estimated Time**
Displays the estimated time remaining for the test to run based on the test type and configured values.

**Click to save the results. You can load back the result in the selection **Show Saved Result** in Graph/Numeric tabs. See **Save Step Test Results**.**

**Click and a dialog appears to export the results to an Excel file. See **Export Step Test Results**.**
Run a Single Step Test

CAUTION

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.

1. Ensure the system is in manual mode.
2. Click Single Step.

3. Click One Way or Both Ways.

4. Enter values for Initial Time, Start Position, End Position, and Step Time and click Start.

Figure 80 Diagnostics Start Step Test
The *Estimated Time* appears and the *Step Test Log* begins displaying test data. The results appear.

![Step Test Configuration](image)

Figure 81  Diagnostics Step Test Complete: Single Step Both Ways

You can now *Save Step Test Results* or *Export Step Test Results*.

5. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Single Step Graph Results

Use this tab to view numeric results. See *Single Step Numeric Results* for further explanation of screen components.

![Single Step Both Ways Graph Results](image)

**Figure 82  Single Step Both Ways Graph Results**

*Buttons and Fields*

- **General Graph functionality**
  - Click-and-hold on any axis’ legend to drag along the axis.
  - Press the **CTRL** button and mouse drag to zoom/unzoom on the graph.
  - Right-click menu: There is a menu available by right-clicking any axis that has three selections:
    - **Tracking Enabled**: Enables/disables tracking.
    - **Update Resume Values**: Store the axis scale for the **Tracking Enabled**. The next time **Tracking Enabled** is engaged, the tracking restores the axis to the stored scale instead the initial scale.
    - **Zoom to Fit**: Activates a function that sizes the graph to fit the selected display area.
% vs. Time (sec) graph

- Left axis displays a scale for the percentage of step complete.
- Bottom axis displays time.
- The red line represents the current test setpoint.
- The purple line represents the current test position.
- The navy blue line represents a saved test setpoint.
- The light blue line represents a saved test position.
- Toggles the appearance of the data points on/off.

Show Point

Show Point

Click to save the results. You can load back the result in the selection Show Saved Result in Graph/Numeric tabs.

Save

Exports the results as a .csv file. See Export Step Test Results for instructions.

Export

Zoom Out -

Zoom Out -

Toggles the view out according to preset values to two times.

Zoom In +

Zoom In +

Toggles the view in according to preset values to 50%.

Show Saved Results

Use the pulldown to select a results file and the graph is populated. See Diagnostics Start Step Test for instructions on how to create these files.
Single Step Numeric Results

See *Single Step Numeric Results* for further explanation.

![Image of Single Step Both Ways Numeric Results](image)

**Buttons and Fields**

- **Currents Step Test Log**
  - Displays the results from a current step test. These results can be saved or exported.

- **Saved Step Test Log**
  - Displays the results from an historical step test accessed using the *Show Saved Results* pulldown.
  - Click to save the results. You can load back the result in the selection *Show Saved Result* in *Graph/Numeric* tabs.

- **Save**
  - Exports the results as a .csv file. See *Export Step Test Results* for instructions.

- **Export**

- **Show Saved Results**
  - Use the pulldown to select a results file and the graph is populated. See *Diagnostics Start Step Test* for instructions on how to create these files.
Run a Multiple Steps Step Test

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

1. Ensure the system is in manual mode.
2. Click **Multiple Steps**.

![Diagnostics Start Step Test: Multiple Steps](image)

**Figure 84**  Diagnostics Start Step Test: Multiple Steps

3. Click **One Way** or **Both Ways**.
4. Enter values for **Initial Time**, **Start Position**, **End Position**, **Step Time** and **Step Size** and click **Start**.
The Estimated Time and current step in process appears and the Step Test Log begins displaying test data. The results appear.

![Step Test Configuration](image)

**Figure 85  Diagnostics Step Test Complete: Multiple Steps Both Ways**

You can now **Save Step Test Results** or **Export Step Test Results**.

5. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Multiple Steps Graph Results

Use this tab to view the graphical results and compare with a previous test. See *Single Step Graph Results* for further discussion of screen components.

Figure 86 Multiple Steps Graph Results
Multiple Steps Numeric Results

Use this tab to view numeric results. See *Single Step Numeric Results* for further explanation of screen components.

![Multiple Steps Numeric Results](image)

**Figure 87** Multiple Steps Numeric Results
Run Pre-Defined Steps

1. Ensure the system is in manual mode.
2. Click Pre-Defined Steps.

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.

3. Click Around Middle or Around Current Setpoint.
4. Enter values for Initial Time, Max Step, Step Time and Step Increase and click Start.

Figure 88 Diagnostics Start Step Test: Pre-Defined Steps
The Estimated Time and current step in process appears and the Step Test Log begins displaying test data. The results appear.

### Figure 89  Diagnostics Step Test Complete: Pre-Defined Steps Around Middle

You can now **Save Step Test Results** or **Export Step Test Results**.

5. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Pre-Defined Steps Graph Results

Use this tab to view the graphical results and compare with a previous test. See *Single Step Graph Results* for further discussion of screen components.

Figure 90  Pre-Defined Steps Graph Results
Pre-Defined Steps Numeric Results

Use this tab to view numeric results. See *Single Step Numeric Results* for further explanation of screen components.

Figure 91  Pre-Defined Steps Numeric Results
Run Custom: Step Test

**CAUTION**

Procedures (e.g. Find Staps, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

1. Ensure the system is in manual mode.
2. Click Custom.


---

**Figure 92** Diagnostics Start Step Test: Custom Step
4. Right-click in the row and a menu appears to add rows or erase selected rows (Custom Ramp Test Manage Rows).

5. Right-click and select **Insert Before** or **Insert After** or **Erase** to manage the test sequence.

6. Enter the data from step 2 for all subsequent steps.

7. Click **Start**. The Estimated Time and current step in process appears and the Step Test Log begins displaying test data. The results appear.

8. When finished, ensure the Transducer block is returned to Auto.

   **CAUTION**

   If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.
Custom Step Graph Results

See *Single Step Graph Results* for further explanation.

Figure 95  Custom Step Graph Results
Custom Step Numeric Results

Use this tab to view numeric results. See Single Step Numeric Results for further explanation of screen components.

Save Step Test Results

See Save Ramp Test Results.

Export Step Test Results

See Export Ramp Test Results.
Diagnostics Start Ramp Test

Use this tab to configure and run a Ramp Test.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

### Buttons and Fields

**Ramp Test Configuration**

- **Current Position**: Displays the current position as a percent of fully open or closed.
- **Current Setpoint**: Displays the current setpoint as a percent.
Step Test Type

- **Single Ramp**: Displays fields to configure a One Way or Two Way test. See Run a Single Step Test.
- **Multiple Steps**: Displays fields to configure a One Way or Both Ways test where you can set Step Size during the test time. See Run Custom: Ramp Test.
- **Custom**: Displays an empty table below where you can add settings to customize a test. See Run Custom: Ramp Test.

**One Way**

Click to conduct the test only from the Start Position to the End Position.

**Both Ways**

Click to conduct the test only from the Start Position to the End Position and back to the Start Position. The values of the Start Position and the End Position determine the direction of the valve stem movement. When the value of the Start Position is more than that of the End Position, the valve steps down in one way trip, then steps up at return trip, if Both Ways is used.

**Initial Time**

Enter the time after Start is clicked to wait before commencing the actual test. This gives time for stabilization.

**Start Position**

Enter the position for the valve positioning before the test start.

**End Position**

Enter the final position for the valve positioning during the test.

**Ramp Time**

Enter the time for the ramp to run.

**Ramp Rate**

Enter the rate at which upward setpoint changes are acted on in Manual mode, in PV units per second. If the ramp rate is set to zero, then the setpoint is used immediately. For control blocks, rate limiting applies in Auto, Cas and RCas modes.

Ramp rate where the upper Setpoint changes are acted on, in Auto mode, at PV unit per second. If the ramp rate is set to zero or the block is in a mode other than Auto, the Setpoint is used immediately.

The Setpoint from another function block or remote application can also be limited to change at a configurable ramp rate. The default value is 1.#INF (infinity), which eliminates ramp rate limiting.

**Ramp Test Log**

Displays progress message, values and error messages as the test proceeds.

**Ramp Test Graph**

Displays graphical results as the test proceeds. The test status appears above the graph.

Click to start the test. Updates appear in the Ramp Test Log.

**Estimated Time**

Displays the estimated time for the test to run based on the test type and configured values. This updates as ramps complete. You can also see the number of remaining steps.

Click to save the results. You can load back the result in the selection Show Saved Result in Graph/Numeric tabs.

Click and a dialog appears to export the results to an Excel file. See Export Ramp Test Results.
Run Single Ramp Test

**CAUTION**

*Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.*

1. Ensure the system is in manual mode.
2. Click **Single Ramp**.

![Diagnostics Start Ramp Test](image)

**Figure 98** Diagnostics Start Ramp Test

3. Click **One Way** or **Both Ways**.
4. Enter values for **Initial Time**, **Start Position**, **End Position**, **Ramp Time**, **Ramp Rate** and click **Start**.

The *Estimated Time* appears and the *Ramp Test Log* begins displaying test data.
Figure 99  Diagnostics Ramp Test Complete: Single Ramp Both Ways

You can now **Save Ramp Test Results** or **Export Ramp Test Results**.

5. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Run Custom: Ramp Test

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

1. Ensure the system is in manual mode.
2. Click **Custom** and the table appears below to enter multiple test steps.

![Ramp Test Table](image)

3. Enter values for Initial Time, Start Position, End Position, Ramp Time, and Ramp Rate.

---

**Figure 100** Diagnostics Start Custom Test

---
4. Right-click in the row and a menu appears to add rows or erase selected rows (Custom Ramp Test Manage Rows).

![Figure 101 Custom Ramp Test Manage Rows]

5. Right-click and select Insert Before or Insert After or Erase to manage the test sequence.

6. Enter the data from step 2 for all subsequent steps.

7. Click **Start**. The Estimated Time appears and the Ramp Test Log begins displaying test data.

![Figure 102 Diagnostics Ramp Test Complete: Custom]

You can now **Save Ramp Test Results** or **Export Ramp Test Results**.

8. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.
Save Ramp Test Results

See Save Ramp Test Results.

Export Ramp Test Results

See Export Ramp Test Results.
Diagnostics Ramp Test Graph Results

CAUTION

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.

Use this tab to view the graphical results.

![Graph Results](image)

Figure 103  Diagnostics Ramp Test Graph Results
**Buttons and Fields**

**General Graph functionality**
- Click-and-hold on any axis' legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - Tracking Enabled: Enables/disables tracking.
  - Update Resume Values: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - Zoom to Fit: Activates a function that sizes the graph to fit the selected display area.

**Unit name**
Displays the name of the SVI FF unit.

**Setpoint**
Displays the setpoint.

**Actual Up**
Shows the distance up for valve position.

**Actual Down**
Shows the distance down for valve position.

**Show Position Over Time**
Toggles the graph to the right to show AP versus *Time* instead of AP versus *Setpoint*.

**Show Grid**
Toggles the grid on for all three graph areas.

**Setpoint vs. Error graph**
Displays a graph of the setpoint versus the calculated error.

**AP (Actual Position) vs. Setpoint or Time graph**
Displays a graph of the valve position versus the setpoint or versus time.
- Left axis displays a scale for the counts.
- Bottom axis displays time.
- **The red line represents the current test setpoint.**
- The brown line represents the current AP up position.
- The orange line represents current AP down position.
- **The blue line represents the current test setpoint.**
- The green line represents the saved test AP up position.
- The orange line represents saved test AP down position.

**Save**
Click to save the results. You can load back the result in the selection *Show Saved Result* in *Graph/Numeric* tabs.

**Export**
Exports the results as a .csv file. See *Export Step Test Results* for instructions.
Save Ramp Test Results

- Click and the test data is saved in a proprietary format.

Export Ramp Test Results

1. Click and the Save As dialog appears. The software adds a default file name in .csv format.

2. Edit the file name, if required, navigate to a directory and click .

Toggles the view out according to preset values to two times.

Toggles the view in according to preset values to 50%.

Use the pulldown to select a results file and the graph is populated. See Diagnostics Start Step Test for instructions on how to create these files.

Figure 104 Export Test Results
Diagnostics Ramp Test Numeric Results

Use this tab to view log results.

Figure 105  Diagnostics Ramp Test Numeric Results

See  Save Ramp Test Results and  Export Ramp Test Results.

Buttons and Fields

Ramp Test Log   Displays the results from a current step test. These results can be saved or exported.

Ramp Test Log   Displays the results from an historical step test accessed using the Show Saved
Results pulldown.

Click to save the results. You can load back the result in the selection Show Saved
Result in Graph/Numeric tabs.
Diagnostics Start Signature Test

Use this tab to configure and run a Signature Test.

Use the Diagnostics Start Signature Test tab to perform diagnostic tests, and displays test results in the Graph Results tab. Additionally, valve parameters including, Position and Pressure appear for reference in a graph on the run tab.

The Standard Actuator Signature test is a response time test that measures the time for the valve to go from full closed to full open and the time for the valve to go from full open to full closed. For an FF this test measures the friction, spring range and response time.

During the Standard Actuator Signature test the positioner is slowly moved from the starting position to the ending position and back and the two curves (up and down) are measured and displayed in the Graph Results graph.

Measures and saves control valve static characteristic data. The input measuring parameter is output pressure (MEAS_PRESS_AIR); and the output parameter is the feedback signal (FINAL_POSITION_VALUE.Value).

**WARNING**

This procedure moves the valve. This results in loss of process control.

**CAUTION**

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should NOT be invoked if the ValVue sequencer is running.

**NOTE**

During both Open and Closed Loop tests the actual valve range of motion will be somewhat greater than the configured test range.
Figure 106  Diagnostics Start Signature Test

**Buttons and Fields**

**Signature Type**

*Open Loop*  
Use the open loop signature to ramp the pressure smoothly, at a constant rate and measure position and pressure while the valve position moves from the start to the end of the test. During this movement, the position and actuator pressure is measured frequently and saved in the positioner. This data is then read from the device and plotted to show a valve signature.

*Closed Loop*  
Use the closed loop to change the position (setpoint) at a fixed rate from the starting position to the ending position. During this movement, the position and actuator pressure is measured frequently and saved in the positioner. This data is then read from the device and plotted to show a valve signature.

**Direction**

*One Way*  
Click to conduct the test only from the Start Position to the End Position.

*Both Ways*  
Click to conduct the test only from the Start Position to the End Position and back to the Start Position. The values of the Start Position and the End Position determine the direction of the valve stem movement. When the value of the Start Position is more than that of the End Position, the valve steps down in one way trip, then steps up at return trip, if Both Ways is used.
**Number of Points**

Use the pulldown to select the number of data points to gather during the test:

- **Maximum:** The test is run and the software gathers all sampling data.
- **500:** The DTM gathers one data point per every two sampling points.
- **300:** The DTM gathers one data point per every three sampling points.
- **100:** The DTM gathers one data point per every ten sampling points.

**Start Position**

Enter the position for the valve positioning before the test start.

**End Position**

Enter the final position for the valve positioning during the test.

**Ramp Time**

Enter the time for the ramp to run.

**Ramp Rate**

Enter the rate at which upward setpoint changes are acted on in Man mode, in PV units per second. If the ramp rate is set to zero, then the setpoint is used immediately. For control blocks, rate limiting applies in Auto, Cas and RCas modes.

Ramp rate where the upper Setpoint changes are acted on, in Auto mode, at PV unit per second. If the ramp rate is set to zero or the block is in a mode other than Auto, the Setpoint is used immediately.

The Setpoint from another function block or remote application can also be limited to change at a configurable ramp rate. The default value is 1.#INF (infinity), which eliminates ramp rate limiting.

**Signature Test Log**

Displays progress message, values and error messages as the test proceeds.

**Signature Test Graph**

Displays graphical results as the test proceeds. The test status appears above the graph.

Click to start the test. Updates appear in the **Signature Test Log**.

**Estimated Time**

Displays the estimated time and adjusts as the test proceeds.

Click to save the results. You can load back the result in the selection **Show Saved Result** in Graph/Numeric tabs. See **Save Signature Test Results**.

Click and a dialog appears to export the results to an Excel file. See **Export Signature Test Results**.
Run Loop Test

Procedures (e.g. Find Stops, Auto Tune, Step Test, Ramp Test, Signature) should **NOT** be invoked if the ValVue sequencer is running.

1. Ensure the system is in manual mode.
2. Click **Open** or **Closed Loop**.

![Signature Test Configuration]

3. Click **One Way** or **Both Ways**.
4. Use the pulldown to select the number of points to gather.

**Figure 107  Diagnostics Start Closed Loop Test**
5. Enter values for Start Position, End Position, Ramp Time, Ramp Rate and click **Start**. The Estimated Time appears and the Signature Test Log begins displaying test data.

![Diagnostics Signature Test Complete: Closed Loop Both Ways](image)

**Figure 108  Diagnostics Signature Test Complete: Closed Loop Both Ways**

You can now **Save Signature Test Results** or **Export Signature Test Results**.

6. When finished, ensure the Transducer block is returned to Auto.

**CAUTION**

*If the Transducer block is switched to Auto, it then follows the setpoint received from the AO block (if scheduled). If you fail to switch the Transducer block to Auto, then the valve will not be in control.*
Diagnostics Signature Test Graph Results

Use this tab to view the graphical results.

Figure 109  Diagnostics Signature Test Graph Results

Buttons and Fields

General Graph functionality

- Click-and-hold on any axis' legend to drag along the axis.
- Press the CTRL button and mouse drag to zoom/unzoom on the graph.
- Right-click menu: There is a menu available by right-clicking any axis that has three selections:
  - Tracking Enabled: Enables/disables tracking.
  - Update Resume Values: Store the axis scale for the Tracking Enabled. The next time Tracking Enabled is engaged, the tracking restores the axis to the stored scale instead the initial scale.
  - Zoom to Fit: Activates a function that sizes the graph to fit the selected display area.
Show Grid

Show Grid

Actual Up

ActualUp Shows the distance up for valve position.

Actual Down

Actual Down Shows the distance down for valve position.

Actual Position

Actual Position vs. Friction (kPa) Displays a graph of actual position versus friction.

Slope vs. Pressure

Slope vs. Pressure Displays a graph of the slope of the pressure curve versus pressure.

Actual Position vs. Pressure graph

- Left axis displays a scale for the actual position as a percentage of full range.
- Bottom axis displays the pressure.
- The red line represents the current test setpoint.
- The brown line represents the current AP up position.
- The orange line represents current AP down position.
- The blue line represents the current test setpoint.
- The green line represents the saved test AP up position.
- The orange line represents saved test AP down position.

Save and Export

Save

Click to save the results. You can load back the result in the selection Show Saved Result in Graph/Numeric tabs.

Export

Exports the results as a .csv file. See Export Step Test Results for instructions.

Zoom Out -

Zoom Out - Toggles the view out according to preset values to two times.

Zoom In +

Zoom In + Toggles the view in according to preset values to 50%.

Load From DTM Storage

Use the pulldown to select a results file and the graph is populated. See Diagnostics Start Step Test for instructions on how to create these files.
Save and Store In Device

Radio buttons  Click one of the radio buttons to select the type:

- **Baseline**: Saves the result as a baseline curve in the device. You can load a saved signature test from device to the UI and compare to the current test.
- **Custom**: Saves the result as a custom curve in the device. This can be accessed for use at a later time.
- **Current**: Saves the result as the current curve for use by the device.

Once selected, click [Save].

The file is saved in the data storage location as set using the Saved Data Settings fields in Log Configuration.

Load From Device

Radio buttons  Click one of the radio buttons to select the type:

- **Baseline**: Opens a dialog to select an existing baseline curve.
- **Custom**: Opens a dialog to select an existing custom curve.
- **Current**: Opens a dialog to select an existing current curve for use by the device.

Once selected, click [Load].

The file is saved in the data storage location as set using the Saved Data Settings fields in Log Configuration.

Save Signature Test Results

See Save Ramp Test Results.
Export Signature Test Results

1. Click Export and the Save As dialog appears. The software adds a default file name (Export Test Results) in .csv format.

![Save As Dialog]

Figure 110 Export Test Results

2. Edit the file name, if required, navigate to a directory and click Save.
Diagnostics Signature Test Numeric Results

Use this tab to view log results.

![Diagnostics Signature Test Numeric Results](image)

Figure 111  Diagnostics Signature Test Numeric Results

See Save Ramp Test Results and Export Ramp Test Results.

**Buttons and Fields**

- **Currents Ramp Test Log**
  - Displays the results from a current step test. These results can be saved or exported.

- **Saved Ramp Test Log**
  - Displays the results from an historical step test accessed using the Show Saved Results pulldown.

  - **Save**
    - Click to save the results. You can load back the result in the selection Show Saved Result in Graph/Numeric tabs.

  - **Export**
    - Exports the results as a .csv file. See Export Ramp Test Results for instructions.

- **Show Saved Results**
  - Use the pulldown to select a results file and the graph is populated. See Diagnostics Start Step Test for instructions on how to create these files.
Position Histogram

There are two tabs available in this area:

- Position Histogram
- Position Error Histogram

Position Histogram

Use this tab to see a position histogram, see how many cycles are spent in each 5% position increment and to see and reset total operating time for the histogram.

Figure 112 Diagnostics Position Histogram: Position Histogram Tab
### Buttons and Fields

<table>
<thead>
<tr>
<th>Position Histogram (%)</th>
<th>Display a trace of the position histogram.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed - 5%.....95%</td>
<td>Displays how many macro cycles the valve was in different position segments. The counters increase only if the device is under control - the transducer block is in AUTO mode and the quality of the set point is GOOD.</td>
</tr>
<tr>
<td>Open</td>
<td></td>
</tr>
</tbody>
</table>

**Operating Time Threshold**

Enter a time in hours which the software waits before presenting the histogram. In process control applications, the valve follows the relatively slow change of the process setpoint. The positioner collects information all the time. In some cases data is collected when the valve is in transition from one position to another (e.g. during start up or shut down). The small amount of collected data may not be representative of the actual valve/positioner performance and may confuse the interpretation of the results. In order to receive an adequate picture of the valve performance, define an Operating Time Threshold. For a continuously operating valve, an Operating Time Threshold of several hours may be recommended.

<table>
<thead>
<tr>
<th>Total Operating Time</th>
<th>Displays the running operating time for the positioner since the last reset or start of operations.</th>
</tr>
</thead>
</table>

| Reset percentage of Position Histogram | Click this button to reset the data collection. This can be used, for example, if the valve has been serviced. |
Position Error Histogram

Use this tab to see the Position Error histogram, which shows the valve position error in different segments.

Figure 113  Diagnostics Position Histogram: Position Error Histogram Tab
Buttons and Fields

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position Histogram (%)</td>
<td>Display a trace of the position error histogram.</td>
</tr>
<tr>
<td>Closed - 5%-.....95% Open</td>
<td>Displays how many macro cycles the valve was in different position segments. The counters increase only if the device is under control - the transducer block is in AUTO mode and the quality of the set point is GOOD.</td>
</tr>
<tr>
<td>Operating Time Threshold</td>
<td>Enter a time in hours which the software waits before presenting the histogram. In process control applications, the valve follows the relatively slow change of the process setpoint. The positioner collects information all the time. In some cases data is collected when the valve is in transition from one position to another (e.g. during start up or shut down). The small amount of collected data may not be representative of the actual valve/positioner performance and may confuse the interpretation of the results. In order to receive an adequate picture of the valve performance, define an Operating Time Threshold. For a continuously operating valve, an Operating Time Threshold of several hours may be recommended.</td>
</tr>
<tr>
<td>Total Operating Time</td>
<td>Displays the running operating time for the positioner since the last reset or start of operations.</td>
</tr>
<tr>
<td>Reset percentage of Position Histogram</td>
<td>Click this button to reset the data collection. This can be used, for example, if the valve has been serviced.</td>
</tr>
</tbody>
</table>
Trends Information Presentation

Use this area, comprised of four tabs:

- Two to view travel trends (Travel Accumulation Trend A and B).
- Two to view cycle trends (Cycle Counter Trend A and B).

Travel Accumulation Trend A and B

Use these two tabs to track valve travel trends.

Figure 114  Diagnostics Trend Information Presentation: Travel Accumulation Trend A Tab
### Buttons and Fields

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yearly Travel Accumulation Trend (%)</td>
<td>Displays the travel accumulation for the previous full year period. The value increments when the magnitude of the change exceeds the Dead Band. Below the graph is a total for the last four periods previous to the one on the graph.</td>
</tr>
<tr>
<td>Monthly Travel Accumulation Trend (%)</td>
<td>Displays the travel accumulation for the previous full month period. Below the graph is a total for the last four periods previous to the one on the graph.</td>
</tr>
<tr>
<td>Weekly Travel Accumulation Trend (%)</td>
<td>Displays the travel accumulation for the previous full week period. Below the graph is a total for the last four periods previous to the one on the graph.</td>
</tr>
<tr>
<td>Daily Travel Accumulation Trend (%)</td>
<td>Displays the travel accumulation for the previous full day period. Below the graph is a total for the last four periods previous to the one on the graph.</td>
</tr>
<tr>
<td>Alert Bar</td>
<td>Displays the current state of the accumulated travel alert. See Travel Alarms for information on how to clear alarms.</td>
</tr>
<tr>
<td>Remaining Years/Expected Day</td>
<td>Display that indicates when the travel accumulation is expected to go into alert.</td>
</tr>
<tr>
<td>Remaining Months/Expected Day</td>
<td>Display that indicates when the travel accumulation is expected to go into alert.</td>
</tr>
<tr>
<td>Remaining Weeks/Expected Day</td>
<td>Display that indicates when the travel accumulation is expected to go into alert.</td>
</tr>
<tr>
<td>Remaining Days/Expected Day</td>
<td>Display that indicates when the travel accumulation is expected to go into alert.</td>
</tr>
</tbody>
</table>
Cycle Counter Trend A and B

Use these two tabs to track valve cycle trends.

**Figure 115  Diagnostics Trend Information Presentation: Cycle Counter Trend A Tab**

**Buttons and Fields**

- **Yearly Cycle Counter (Counts)**
  - Displays the cycle counter for the previous full year period. The value increments when the magnitude of the change exceeds the Dead Band.
  - Below the graph is a total for the last four periods previous to the one on the graph.

- **Monthly Cycle Counter (Counts)**
  - Displays the cycle counter for the previous full month period.
  - Below the graph is a total for the last four periods previous to the one on the graph.

- **Weekly Cycle Counter (Counts)**
  - Displays the cycle counter for the previous full week period.
  - Below the graph is a total for the last four periods previous to the one on the graph.
<table>
<thead>
<tr>
<th><strong>Daily Cycle Counter (Counts)</strong></th>
<th>Displays the cycle counter for the previous full day period. Below the graph is a total for the last four periods previous to the one on the graph.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alert Bar</strong></td>
<td>Displays the current state of the cycle counter alert. See <em>Cycle Counter A and B Alerts Tab</em> for information on how to reset.</td>
</tr>
<tr>
<td><strong>Remaining Years/Expected Day</strong></td>
<td>Display that indicate when the cycle counter is expected to go into alert.</td>
</tr>
<tr>
<td><strong>Remaining Months/Expected Day</strong></td>
<td>Display that indicate when the cycle counter is expected to go into alert.</td>
</tr>
<tr>
<td><strong>Remaining Weeks/Expected Day</strong></td>
<td>Display that indicate when the cycle counter is expected to go into alert.</td>
</tr>
<tr>
<td><strong>Remaining Days/Expected Day</strong></td>
<td>Display that indicate when the cycle counter is expected to go into alert.</td>
</tr>
</tbody>
</table>
10. Reports

There are four reports that relate directly to the SVI FF unit:

- **Configuration Report**: Accessed by choosing from the Print icon on the SVI FF toolbar and selecting Configuration Report or from the topology pane right-click menu Additional Functions.

- **Test Report**: Accessed by choosing from the Print icon on the SVI FF toolbar and selecting Test Report.

- **Diagnostic Report**: Accessed by choosing from the Print icon on the SVI FF toolbar and selecting Diagnostic Report.
Configuration Report

Use this screen to view a report of general positioner parameters, Resource and Transducer block settings and Network configuration details. Once created the report is opened in your default internet browser and is saved in HTML format in the directory indicated at the top. It can be printed to your default printer from the internet browser. If you have a pdf print driver installed, you can create a pdf of the report.

To open the report:

- Right-click the FF device in the Project pane and select Additional functions > Report and Configuration Report appears or click the print icon in the toolbar and select Configuration Report.

![Figure 116 Configuration Report](image-url)
Test Report

Use this screen to view a report of general positioner parameters, diagnostic test results with graphs and Tuning settings. Once created the report is opened in your default internet browser and is saved in HTML format in the directory indicated at the top. It can be printed to your default printer from the internet browser. If you have a pdf print driver installed, you can create a pdf of the report.

The data that appears in the diagnostic tests report is dictated by whether the unit purchased has Standard or Advanced Diagnostics. If you own a Standard Diagnostics unit, the Advanced Diagnostics fields will show NA.

To open the report:

- Click the print icon in the toolbar and select Test Report and Test Report appears.

![Figure 117 Test Report](image-url)
Diagnostic Report

Use this screen to view a report of general positioner parameters and positioner state, which is comprised of associated variable and active alerts. Once created the report is opened in your default internet browser and is saved in HTML format in the directory indicated at the top. It can be printed to your default printer from the internet browser. If you have a pdf print driver installed, you can create a pdf of the report.

To open the report:

- Click the print icon in the toolbar and select Test Report and Diagnostic Report appears.

![Step Test Graph Results](image)

**Step Test Summary Results**

<table>
<thead>
<tr>
<th>Average Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead Time Td</td>
</tr>
<tr>
<td>Time Constant T63</td>
</tr>
<tr>
<td>Double TC T86</td>
</tr>
<tr>
<td>Overshoot</td>
</tr>
<tr>
<td>Error</td>
</tr>
<tr>
<td>Stroke Time (incr.)</td>
</tr>
<tr>
<td>Stroke Time (decr.)</td>
</tr>
<tr>
<td>Velocity (incr.)</td>
</tr>
<tr>
<td>Velocity (decr.)</td>
</tr>
</tbody>
</table>

**Minimum Test Results**

| Dead Time Td | 0.09 s |
| Time Constant T63 | 0.43 s |
| Double TC T86 | 0.60 s |
| Overshoot | 1.93 % |
| Error | 0.75 % |
| Stroke Time (incr.) | 0.77 s |
| Stroke Time (decr.) |        |

**Maximum Test Results**

| Dead Time Td | 0.09 s |
| Time Constant T63 | 0.43 s |
| Double TC T86 | 0.60 s |
| Overshoot | 1.93 % |
| Error | 0.75 % |
| Stroke Time (incr.) | 0.77 s |
| Stroke Time (decr.) |        |

**Figure 118** Diagnostic Report
11. How Do I Do Offline Parameterization?

Offline Parameterization

Use the offline DTM UI when the device is not connected to the FF interface or when you don’t want to immediately work with an online device, such as:

- Offline configuration: Configuring the valve before the positioner is connected to the H1 segment. This can include:
  - Quick Start Configuration: Configuring Air Action, Remote Sensor status, Control Tuning settings, Characterization an Device Address and Tag.
  - Control Configuration: Configuring the valve behavior in normal operations
  - Fail State Configuration: Configuring the valve reaction during failures and abnormal conditions
  - Alert Configuration: Configuring the alert trigger conditions
  - Review of Configuration: Reviewing of offline RB and TB parameter configurations
  - Identification: Reviewing/recording information about the positioner, valve, actuator, etc.
  - Security: Configuring the security settings for the device or for a group of devices

Ensure once you do reconnect that you do not upload or download configuration settings that you do not want.
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12. Control Configuration

Control Configuration

Use this group of tabs to configure Resource and Transducer block for control. The Control configuration is designed for initial configuration of the positioner. It allows access to position, discrete, pressure, temperature and IP current settings in the positioner.

Position

Use Position configuration to set up the position control related parameters. Position is comprised of:

- Configuration
- Position Alarms
- Travel Alarms
- Fault State Tab

Configuration

Configuration is comprised of:

- Control Tab
- Position Limits Tab
- Position Control Tab
- Characterization Tab
Control Tab

Use this tab to configure the AO block source configuration. These settings configure where the AO block gets its `FINAL_VALUE` and `FINAL_POSITION_VALUE`, where it sources its position feedback from, where it sends these values and how long Rcas and Rout mode holds without communication before it sheds.

Figure 119  Control Configuration Position: Control Tab
Buttons and Fields

Setpoint Source

Use the pulldown to select the setpoint source. Once a choice is made a graphic appears indicating how the FINAL_VALUE and the FINAL_POSITION_VALUE:

AO: Sets the AO block as the source for FINAL_VALUE and FINAL_POSITION_VALUE as per the drawing:

![Setpoint Source Configuration: AO](image1)

Figure 120  Setpoint Source Configuration: AO

DO - Open/Close: Sets the DO block open/close integer output OUT_D and READBACK_D as the setpoint source FINAL_VALUE and FINAL_POSITION_VALUE as per the drawing:

![Setpoint Source Configuration: DO Open/Close](image2)

Figure 121  Setpoint Source Configuration: DO Open/Close
**DO - Analog**: Sets the DO block open/close boolean OUT_D and READBACK_D as the setpoint source FINAL_VALUE and FINAL_POSITION_VALUE as per the drawing:

![Setpoint Source Configuration](image)

**Source of Position Feedback**
- Final Position Value: Uses the final position value, which depends on the setpoint source configuration, for the FINAL_POSITION_VALUE.
- Working Position Value: Uses the present position value in use as feedback for the FINAL_POSITION_VALUE.

**Shed from Rcas**
Enter the time (mSec) for the Rcas to hold without communication before it sheds control.

**Shed from Rout**
Enter the time (mSec) for the Rout to hold without communication before it sheds control.

**Restart Option**
Use the pulldown list to select an option for use when clicking **Restart Device**:
- **Run**: Passive state of the parameter - No special processing
- **Restart resource**: No special processing
- **Restart with defaults**: Resets all blocks restored to their FF specified initial values.
- **Restart processor**: Performs a processor reset restart.
- **Restart with factory defaults**: Set the TB mode to OOS. This restores the TB block to factory defaults. Then FF then reports calibration error amend you must run Find Stops to clear the error. If the restore fails, the TB block error reports **Maintenance Needed**.

**Restart Device button**
Click to restart the device according to the selection in **Restart Option**.

**Travel Range**
Enter a range of travel in the units selected in **Travel Range**. This is used to calculate the Working Setpoint.

**Travel Units**
Use the pulldown to select the **Travel Range** units: %, Inch, cm, mm, deg or Rad.
Configure Setpoint Source Configuration

1. Use the Setpoint Source pulldown to select a setpoint source.
2. Use the Source of Position Feedback pulldown to select where a feedback source.
3. Enter a value (s) in Shed from Rcas and/or Shed from Rout.

Position Limits Tab

Use this tab to activate and configure the valve position limits.

Use the Position Limits parameters to limit the valve, force the valve to close tightly or open fully at specified positions, and to set the trip points of the limit switches (DI block). You can also activate a deviation warning.

The graph at the top shows the current position alert settings using different colored text and bars relative to 0 and 100%. The graphics on the tab show relative positions in both cases. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

In general, for LO, the limits established must be below LO and LO LO alert limits and for the HI, the limits established must be below HI and HI HI alert limits.

CAUTION

Position Limit parameters are powerful tools to alter the valve performance to be non-linear. Use them with caution and only when the process requires special performance.

When Tight Shutoff below is configured to a positive value, small flows are not controllable.
### Figure 123  Control Configuration Position: Position Limits Tab

**Buttons and Fields**

**Position Limits**
Parameters in this group configure set point limits.

- **Position Limits Protected**
  - Enables/disables access to the other parameters below.

- **Position Limit HI Enabled**
  - Use this checkbox to enable the HI field. Both this and Full Open Above Enabled are exclusive of each other, as it might lead to a conflict with the value configured for the other parameter’s field.

- **Position Limit HI**
  - Enter a value (%) for the position HI limit.

- **Position Limit LO Enabled**
  - Use this checkbox to enable the LO field. Both this and Full Open Above Enabled are exclusive of each other, as it might lead to a conflict with the value configured for the other parameter’s field.

- **Position Limit LO**
  - Enter a value (%) for the position LO limit.
Configure Position Limits

1. Set the Position Limits configuration by:
   a. Using the associated checkbox to enable Position Limit HI and/or Position Limit LO.
   b. Entering a value in the field associated with Position Limit HI and/or Position Limit LO.

2. Set the Cut-Offs configuration by:
   a. Using the associated checkbox to enable Full Open Above and/or Tight Shutoff Enabled.
   b. Entering a value in the field associated with Full Open Above and/or Tight Shutoff Enabled.

3. Set the Position Setpoint Rate Limits configuration by:
   a. Using the associated checkbox to enable Full Open Above and/or Tight Shutoff Enabled.
   b. Entering a value in the field associated with Full Open Above and/or Tight Shutoff Enabled.
Position Control Tab

Use this tab to configure the valve control tuning (control sets).

The position controller is a type of non-linear PID control algorithm with six standard parameters listed below, as well as Auto Tune and Custom. There are an additional eight servo tuning parameters.

![Control Configuration Position: Position Control Tab](image_url)

**Figure 124  Control Configuration Position: Position Control Tab**
**Buttons and Fields**

Show control tuning options for single acting/ Show control tuning options for double acting

Click a radio button to select type: Single Acting or Double Acting. The options below in this area become restricted to appropriate choices

Fastest (Smallest) Fast (Small) Medium Slow (Big) Slowest (Biggest) Auto Tune Custom

Enter the proportional gain in %. Common values for the controller are 50 for small valves up to 4000 for large valves.

Proportional gain P is the ratio of change of output due to proportional control action to the change in position error. Common values for the positioner are 50 for small actuators and up to 5000 for large actuators. The larger the gain the faster the valve responds with increasing tendency to overshoot. If the gain is too low friction can cause limit cycles. Air supply pressure affects this value. The position controller must be re-tuned in case of air supply pressure changes. The default value of 120 is normally changed by Auto Tune.

I

Enter an 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.

Integral time or reset time, is the time constant of integral control. Higher values of I cause less integral control action and increase loop stability. However, higher values of I increase the time to eliminate a steady-state position error. 0 turns off integral action and results in a steady-state position error. Sustained deviation can result in failsafe action if T2 is set. Therefore, 0 must be avoided for use in most applications. The default value of 15 seconds is normally changed by Auto Tune.

D

Enter a derivative time or rate time (msec) is the time constant of derivative control. Common values are 10 to 100.

Derivative time or rate time is the time constant of derivative control. Larger derivative time causes more derivative control action. 0 disables derivative action.

Padj

Enter a proportional gain.

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.
Characterization Tab

Use this tab to configure of the characterization related parameters and review the selected characterization curve on the tab. The graphical display is immediately updated to present the new characterization curve selected after any parameter change in this group.

The selected characterization curve is bold when selected.

If a standard curve is selected after the custom curve has been selected, a dialog warns that the custom points will be overwritten with the points of the standard curve. The warning dialog does not appear if the switch is between standard curves.

When a custom curve is selected, you can modify the number of characterization points. The minimum number of points is two and that makes all points non-changeable. The maximum number of points is twenty-one and there are nineteen changeable points. Non-changeable point are grayed out and their values are set to (100, 100). To change the horizontal position of the point by dragging or entering values in Input Signal.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta</td>
<td>Enter beta, which 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.</td>
</tr>
<tr>
<td>PosComp</td>
<td>Enter a 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 20, make adjustments to try to equalize the valve response. The normal value is 6. For springless actuators the value is 15.</td>
</tr>
</tbody>
</table>
| DeadZone  | Enter a dead zone value. 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 (%) helps 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%. When the valve position is within its Set Point +/- 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 helps avoid limit cycling due to the stick/slip action of the valve. In these cases the dead zone can be set at 0.1% to 5%
| NonLin    | Enter a non-linearity value, which compensates for the pneumatic dead band. Values between 0 and 20. |
Figure 125  Control Configuration Position: Characterization Tab

**Buttons and Fields**

**Graph**  
Displays the characterization curve.

**Number of Points**  
Use the pulldown to select a number of points. A custom characterization defines the relationship between the input signal and the output position of the valve. The characterization may contain up to nine XY pairs and the position is linearly interpolated between the pairs. The first position is always 0, 0 and the last position is always 100, 100. Both first and last positions indicate 0 and 100 percent and are not counted as any of the points allowed.

**Signal %**  
Enter on the top line the percent of the signal for each characterization point.

**Position %**  
Enter on the bottom line the percent of the position for each characterization point.
Create a Custom Characterization

To create a custom characterization:

1. Use the Number of Points pulldown to select a number of points and that many fields are activated below.
2. Enter values in the Setpoint (%)/Position (%) fields from lowest to highest. If there is too drastic a slope change a red asterisk (I) appears in the navigation tree. Adjust values accordingly.

Position Alarms

Use the Position Alarms tab group to set up the position Alarm related parameters.

If the position limits are enabled, a warning occurs if entering a HI or LO Alarm outside of the position limits.

The relative configuration of the Alarms with respect of position limits, cut-offs, etc. appears in the graph at the top of each tab. If Cut-Off values are disabled, they don’t appear. Color coding for the current selection for Alarm actions is as follows:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK
Deviation Alerts Tab

Use this tab to enable and configure deviation alerts.

Figure 126  Control Configuration Position Alert: Deviation Alerts Tab

Buttons and Fields

- **Enabled**: Click to enable the deviation alerts.
- **Deviation Value**: Enter the value (%).
- **Position Error (Alert Point)**: Enter a position error (%). If the Deviation Value is above this value for the seconds in **Time**, the alert is set.
- **Deadband**: Enter the percentage below the Position Error that is an allowable deadband above which an alert is set and below which it is cleared.
- **Time**: Enter the time (secs) that a deviation can occur before an alert is set.
Configure Deviation Alerts

1. Click the appropriate *Enabled* checkbox.
2. Enter the required *Deviation Value*.
3. Enter a *Position Error*.
4. Enter a *Deadband*.
5. Enter a deviation *Time*.

---

**Alert**
An active red LED indicates an unacknowledged alert,

**Historic Alert**
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
**HI and HIHI Alerts Tab**

Use this tab to enable and configure the HI and HI HI alerts.

The graph at the top shows the current position alert settings using different colored text and bars relative to 0 and 100%. The graphics on the tab show relative positions in both cases. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- □ DEVICE FAILURE - RED
- □ MAINTENANCE REQUIRED - ORANGE
- □ WARNING DATA - BROWN
- □ Current measurement value - GREEN
- □ Informational - BLACK

In general, for LO, the limits established must be below LO and LO LO alert limits and for the HI, the limits established must be below HI and HI HI alert limits.

![Control Configuration Position Alert: HI and HIHI Alerts Tab](image)

*Figure 127  Control Configuration Position Alert: HI and HIHI Alerts Tab*
**Buttons and Fields**

**HI Alert and HI HI Alert**

- **Enabled**
  Click to enable the HI Alert and activate the fields below.

- **Position**
  Displays the current valve position.

- **Alert Point**
  Enter a position (%) above which the alert is set. This value must be above Low Alert Setpoint (LO and LOLO Alerts Tab).

- **Deadband**
  Enter the percentage below the Alert Point that is an allowable deadband above which an alert is set and below which it is cleared.

- **Alert**
  An active red LED indicates an unacknowledged alert.

- **Historic Alert**
  An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

**Configure HI and HIHI Alerts**

1. Click the appropriate *Enabled* checkbox.
2. Enter the required *Position* value.
3. Enter an Alert Point.
4. Enter a *Deadband*.
LO and LOLO Alerts Tab

Use this tab to enable and configure the LO and LO LO alerts.

The graph at the top shows the current position alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

Figure 128  Control Configuration Position Alert: LO and LOLO Alerts Tab
Buttons and Fields

LO Alert and LOLO Alert

Enabled  Click to enable the LO Alert and activate the fields below.
Position  Displays the current valve position.
Alert Point  Enter a position (%) below which the alert is set. This value must be above Low Alert Setpoint (LO and LOLO Alerts Tab).
Deadband  Enter the percentage below the Position Alert Point that is an allowable deadband below which an alert is set and above which it is cleared.
Alert  An active red LED indicates an unacknowledged alert.
Historic Alert  An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

Configure LO and LOLO Alerts

1. Click the appropriate Enabled checkbox.
2. Enter the required Position value.
3. Enter an Alert Point.
4. Enter a Deadband.
Near Closed Alerts Tab

Use this tab to enable and configure the Near Closed alerts.

Buttons and Fields

Enabled
Click to enable the Near Closed Alert and activate the fields below.

Position Closed
Enter the valve for which the valve is considered closed.

Near Closed
Displays the number of hours that the valve has spent below the Position Closed value.

Alert Point
Enter a number of hours above which the alert is set.

Alert
An active red LED indicates an unacknowledged alert.

Historic Alert
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
Configure Near Closed Alerts

1. Click the Enabled checkbox.
2. Enter the required Position Closed value.
3. Enter an Alert Point.

Setpoint Timeout Alert Tab

Use this tab to enable and configure the SetPoint Timeout Alert alerts. The SetPoint Timeout alert is reported when the valve setpoint has not been updated by the AO or DO block for more than ALERT POINT time.

Figure 130  Control Configuration Position Alert: Setpoint Timeout Alert Tab

Buttons and Fields

- **Enabled**: Click to enable the SetPoint Timeout Alert and activate the fields below.
- **Time Since Last Update**: Displays the number of seconds since the last setpoint update.
Configure SetPoint Timeout Alert

1. Click the Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Maximal Detect Time value.

**Alert Point** Enter a number of seconds since the last setpoint update, above which the alert is set. This value must be at least two times the macro cycle. The macro cycle is the time for the AO block to update the setpoint.

**Maximal Detect Time** Displays the maximum time detected before the setpoint was updated. This can be used as a guide in configuring the Alert Point.

**Alert** An active red LED indicates an unacknowledged alert.

**Historic Alert** An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
Travel Alarms

Use this tab group to set up the travel alarm related parameters.

Travel Accumulation A and B Alert Tab

Use this tab to enable and configure the Travel Accumulation Alert alerts. This function keeps you aware of excessive travel patterns.

Figure 131  Control Configuration Travel Alert: Travel Accumulation A and B Alert Tab

Buttons and Fields

Travel Accumulation A Alert and Travel Accumulation B Alert

Enabled  Click to enable the Travel Accumulation A Alert and Travel Accumulation B Alert and activate the fields below.

Travel Accumulation  Displays the total percent change in travel since travel accumulation was last cleared. This value increases only when the Deadband is exceeded.
Configure Travel Accumulation Alert

1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Deadband.

**Alert Point**
Enter a position (%) below which the alert is set.

**Deadband**
Enter the percentage above which the percentage travel is accumulated towards the Travel Accumulation total.

**Alert**
An active red LED indicates an unacknowledged alert.

**Historic Alert**
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

**Reset button**
Click to reset the travel running total.
Cycle Counter A and B Alerts Tab

Use this tab to enable and configure the *Cycle Counter Alert* alerts. This function keeps you aware of excessive cycle patterns.

**Buttons and Fields**

**Cycle Counter A Alert and Cycle Counter B Alert**

- **Enabled**  
  Click to enable the *Cycle Counter A Alert* and *Cycle Counter B Alert* and activate the fields below.

- **Cycle Counter**  
  Displays the total number of cycles. This value increases only when the *Deadband* is exceeded.

- **Alert Point**  
  Enter a cycle count above which the alert is set.

- **Deadband**  
  Enter the percentage of movement above which the *Cycle Counter* is accumulated.

- **Alert**  
  An active red LED indicates an unacknowledged alert.
Configure Cycle Counter A and B Alerts

1. Click the appropriate *Enabled* checkbox.
2. Enter an *Alert Point*.
3. Enter a *Deadband*.

*Historic Alert*  
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

*Reset button*  
Click to reset the cycles running total.
Operating Time Alert Tab

Use this tab to enable and configure the Operating Time Alert alerts. This function keeps you aware of excessive operating time.

Figure 133  Control Configuration Travel Alert: Operating Time Alert Tab

Buttons and Fields

Operating Time Alert

**Enabled**
Click to enable the Operating Time Alert and activate the fields below.

**Total Operating Time**
Displays the total operating time.

**Alert Point**
Enter a time in hours above which the alert is set.

**Alert**
An active red LED indicates an unacknowledged alert.

**Historic Alert**
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
Configure Operating Time Alert

1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.

Fault State Tab

Use this tab to set a configuration in case of a transducer failure. Selected options are only valid if the valve is controllable. Detecting a critical fault, that does not allow valve control, de-energizes the actuator.

The graph at the top shows the current alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (¡) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

![Fault State Graph](image)

Figure 134  Control Configuration Position: Fault State Tab
### Buttons and Fields

<table>
<thead>
<tr>
<th>Buttons and Fields</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fault State Configuration</strong></td>
<td>Use the pulldown to select source for the fault state configuration:</td>
</tr>
<tr>
<td>- Analog output block/Discrete Outputs: Configures the outputs from the AO block or the discrete outputs from the DO block.</td>
<td></td>
</tr>
<tr>
<td>- Independent Configuration: Activates the Fault State Options field.</td>
<td></td>
</tr>
<tr>
<td><strong>Fault State Options</strong></td>
<td>Use the pulldown to configure an action to take for a transducer fault:</td>
</tr>
<tr>
<td>- Hold Last Value: Sets to hold the last value.</td>
<td></td>
</tr>
<tr>
<td>- Fail Closed: Sets to have the valve fail to closed.</td>
<td></td>
</tr>
<tr>
<td>- Fail Open: Sets to have the valve fail to open.</td>
<td></td>
</tr>
<tr>
<td>- XD_FSTATE_VAL: Sets to have the system use this value, which is entered in Fault State Value.</td>
<td></td>
</tr>
<tr>
<td><strong>Fault State Value</strong></td>
<td>Enter a value for the setpoint when a transducer fault occurs. XD_FSTATE_VAL must be selected in Fault State Options to use this field.</td>
</tr>
<tr>
<td><strong>Fault State Time</strong></td>
<td>Enter a value to hold the current position before the Fault State Value is used. XD_FSTATE_VAL must be selected in Fault State Options to use this field.</td>
</tr>
</tbody>
</table>

#### Configure Fault State

1. Use the Fault State Configuration pulldown to set the configuration source.
2. Use the Fault State Options pulldown to select the action to take on a transducer fault.
3. Enter a Fault State Value to use if XD_FSTATE_VAL is the Fault State Options choice.
4. Enter a Fault State Time to use if XD_FSTATE_VAL is the Fault State Options choice.

#### Discrete

Use this tab group to configure the Resource and Transducer blocks relationship with the DI and DO blocks.

#### Control Tab

See Control Tab.
Software Switches

Use this tab to view discrete switch status and set when the switch is considered on or off. The last values, updated from the device, appear if available.

![Software Switches Diagram](image)

**Buttons and Fields**

- **Discrete Switch 1 State Current State / Virtual Switch State 2 Current State**: Displays the status of the respective switch: On or Off. The graphic also displays whether the switch is open or closed.

- **Discrete Switch 1 Configuration / Virtual Switch 2 Configuration**: Click the radio button to configure the switch as Normally Open or Normally Closed.

- **Discrete Switch 1 Normal Function / Virtual Switch 2 Function**: Use the associated pulldown to set the switch operational trigger:
  - Disabled
  - DO block
  - Fault State
  - Not in Normal
  - Maintenance Required
  - Warning Data
  - Air Supply Alert
  - Travel Deviation Alert
  - Position HI Alert
  - Position LO Alert
  - Always Active
  - Always Inactive
  - Rest Occurred
  - Tight cutoff
Pressure

Use this tab group to configure the pressure range and pressure alerts related information.

Pressure Range

Use this tab to set the actuator supply pressure range and units.

Figure 136  Control Configuration Pressure: Pressure Range Tab

Buttons and Fields

- EU_100  Enter the upper range pressure.
- EU_0  Enter the lower range pressure.
Units

Use the Units pulldown to select:

- kPa
- psi
- bar

Change the pressure units and the recalculate the pressure related settings.

**CAUTION**

*Changing the pressure units requires a reboot of NI Configurator for conversion to take effect.*

Decimal

Use the pulldown to select the number of decimal places. For this release only 3.
Pressure Alarms

Use this set of tabs to configure the alarm settings for the supply pressure. This is comprised of three tabs:

- Supply Pressure HI Alert Tab
- Supply Pressure LO Alert Tab
- Supply Pressure LOLO Alert Tab

Supply Pressure HI Alert Tab

Use this tab to enable and configure the supply pressure HI alert.

The graph at the top shows the current pressure alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK
Figure 137  Control Configuration Pressure: Supply Pressure HI Alert Tab

**Buttons and Fields**

**Supply Pressure HI Alert**

- **Enabled** Click to enable the **Supply Pressure HI Alert** and activate the fields below.
- **Cycle Counter** Displays the current supply pressure.
- **Alert Point** Enter a supply pressure above which the alert is set.
- **Deadband** Enter the deadband around the target supply pressure that once passed clears the alert.
- **Alert** An active red LED indicates an unacknowledged alert.
- **Historic Alert** An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

**Configure Supply Pressure HI Alert**

1. Click the appropriate **Enabled** checkbox.
2. Enter an **Alert Point**.
3. Enter a **Deadband**.
Supply Pressure LO Alert Tab

Use this tab to enable and configure the supply pressure LO alert.

The graph at the top shows the current pressure alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

Figure 138  Control Configuration Pressure: Supply Pressure LO Alert Tab

Buttons and Fields

Supply Pressure LO Alert Alert

Enabled  Click to enable the Supply Pressure LO Alert and activate the fields below.
Cycle Counter  Displays the current supply pressure.
Configure Supply Pressure LO Alert

1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Deadband.

**Alert Point**
Enter a supply pressure below which the alert is set.

**Deadband**
Enter the deadband around the current supply pressure that once passed clears the alert.

**Alert**
An active red LED indicates an unacknowledged alert.

**Historic Alert**
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
Supply Pressure LOLO Alert Tab

Use this tab to enable and configure the supply pressure LOLO alert.

The graph at the top shows the current pressure alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

Figure 139  Control Configuration Pressure: Supply Pressure LOLO Alert Tab

Buttons and Fields

Supply Pressure LOLO Alert

**Enabled**  Click to enable the Supply Pressure LOLO Alert and activate the fields below.

**Cycle Counter**  Displays the current supply pressure.
Alert Point Enter a supply pressure below which the alert is set.

Deadband Enter the deadband around the current supply pressure that once passed clears the alert.

Alert An active red LED indicates an unacknowledged alert.

Historic Alert An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

Configure Supply Pressure LOLO Alert

1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Deadband.

Temperature

Use this tab group to configure the temperature alert settings.

This comprises:

- Temperature HI Alert Tab
- Temperature LO Alert Tab
**Temperature HI Alert Tab**

Use this tab to enable and configure the temperature HI alert.

The graph at the top shows the current temperature alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

---

**Figure 140** Control Configuration Temperature: Temperature HI Alert Tab

**Buttons and Fields**

*Temperature HI Alert*

**Enabled**

Click to enable the Temperature HI Alert and activate the fields below.

**Cycle Counter**

Displays the current temperature.
Configure Temperature HI Alert

1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Deadband.

**Alert Point** Enter a temperature above which the alert is set.

**Deadband** Enter the deadband around the current temperature that once passed clears the alert.

**Alert** An active red LED indicates an unacknowledged alert.

**Historic Alert** An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
Temperature LO Alert Tab

Use this tab to enable and configure the temperature LO alert.

The graph at the top shows the current temperature alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

![Temperature LO Alert Tab Diagram](image)

Figure 141  Control Configuration Temperature: Temperature LO Alert Tab

**Buttons and Fields**

Temperature LO Alert

- **Enabled**  
  Click to enable the Temperature LO Alert and activate the fields below.
- **Cycle Counter**  
  Displays the current temperature.
### Alert Point
Enter a temperature below which the alert is set.

### Deadband
Enter the deadband around the current temperature that once passed clears the alert.

### Alert
An active red LED indicates an unacknowledged alert.

### Historic Alert
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

## Configure Temperature LO Alert
1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Deadband.
IP Output

Use this tab group to set the alerts related to the current/pressure converter. This comprises:

- IP Output HI Alert Tab
- IP Output LO Alert Tab

IP Output HI Alert Tab

Use this tab to enable and configure the IP output HI alert.

The graphic shows the current IP alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

Figure 142 Control Configuration IP Output: IP Output HI Alert Tab
Buttons and Fields

IP Output HI Alert

Enabled
Click to enable the IP Output HI Alert and activate the fields below.

Cycle Counter
Displays the current IP percentage.

Alert Point
Enter an IP percent above which the alert is set.

Deadband
Enter the deadband (%) around the output that once passed clears the alert.

Alert
An active red LED indicates an unacknowledged alert.

Historic Alert
An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.

Configure IP Output HI Alert

1. Click the appropriate Enabled checkbox.
2. Enter an Alert Point.
3. Enter a Deadband.
IP Output LO Alert Tab

Use this tab to enable and configure the IP output LO alert.

The graphic shows the current IP alert settings using different colored text and bars relative to 0 and 100%. Once the alert is set, a red exclamation point (!) appears. The colors of the text and bars match the colors for Device Failure, Maintenance Required and Warning Data from the Alarms and Alerts tab:

- DEVICE FAILURE - RED
- MAINTENANCE REQUIRED - ORANGE
- WARNING DATA - BROWN
- Current measurement value - GREEN
- Informational - BLACK

**Figure 143  Control Configuration IP Output: IP Output LO Alert Tab**

**Buttons and Fields**

**IP Output HI Alert**

*Enabled*  
Click to enable the IP Output HI Alert and activate the fields below.
**Configure IP Output LO Alert**

1. Click the appropriate *Enabled* checkbox.
2. Enter an *Alert Point*.
3. Enter a *Deadband*.

**Cycle Counter**  Displays the current IP percentage.

**Alert Point**  Enter an IP percent above which the alert is set.

**Deadband**  Enter the deadband (%) around the output that once passed clears the alert.

**Alert**  An active red LED indicates an unacknowledged alert.

**Historic Alert**  An active red LED indicates all active alerts are cleared, but that all alerts (including historical) have not been cleared.
Extend RB Configuration

Use this tab to configure writeable Resource block parameters.

Figure 144   Control Configuration: Extend RB Configuration Tab

Buttons and Fields

**Show Different** Filters the tab to show only parameters that are different between the left and right columns.

**Check All Unequal Items** Places a check in next to all items with an unequal sign (≠) between the two columns.

**Current Settings** This column displays the current parameter setting. This column is active for edits.

**Saved Settings** Use the pulldown to select the settings to view in the right column:

- **Saved Settings**: The last saved settings for the DTM.
- **Default Settings**: The initial default settings.
0. Block Header

**Block Tag**
Enter the tag name of up to 32 characters. Special characters not allowed: \/:*<>\r\n
**CAUTION**
Do not change the device tagname or the node address of a device in an operating Foundation Fieldbus segment. Control linkages are lost. Do not use a leading space in a device tag name, this causes the device to become non-operational. Block tags are not used for control linkages. They can be changed without losing control linkages. However, some applications require restarting if another application changes a block tag.

2. **Tag Description**
Enter a description of the block of up to 32 characters.

3. **Strategy**
Enter a description of the grouping of blocks of up to 32 characters.

4. **Alert Key**
Enter the identification of the plant unit.

5. **Mode Block**

**Target**
Use the pulldown to select the target mode: *Auto Mode* or *Out of Service Mode*. This is the mode that the block uses as its fallback on failure. Choices limited by *Permitted* field.

**Permitted**
Use the pulldown to select the permitted mode for the block: *Auto Mode* and/or *Out of Service Mode*. If both are unchecked then there are no modes available in *Target*.

**Normal**
Use the pulldown to configure the normal operating mode: *Auto Mode* or *Out of Service Mode*. Choices limited by *Permitted* field.

14. **Grant Deny**

**Grant**
Use the pulldown to grant access to:
- *Program*: Pertains to overall program operation. Host may change mode, set-point, or output of block.
- *Tune*: Pertains to tuning operations.
- *Alert*: Pertains to alert configuration.
- *Local*: Pertains to local interface (LED) operations.
- *Operate*: Pertains to the ability to use operating parameters.
- *Service*: Pertains to the ability to use service parameters.
- *Diagnostic*: Pertains to the ability to use diagnostic parameters.
Deny

Use the pulldown to deny access to:

- Program
- Tune
- Alert
- Local
- Operate
- Service
- Diagnostic

18. Feature Sel

Use the pulldown to access a picklist with checkboxes to enable/disable the following functionalities:

- Unicode: User defined octet strings to be stored as Unicode strings.
- Reports: Device can produce alert and trend reports.
- Faultstate: Faultstate action is allowed.
- Soft Write Lock: Soft Write Lock is allowed.
- Hard Write Lock: Hard Write Lock is allowed.
- Output Readback: Output Readback is allowed.
- Direct Write: Direct Write to output hardware is allowed.
- Change Bypass in Auto: Change of BYPASS in an AUTO mode.
- MVC Reports: Configuration tools need to check for MVC support in subscribers and hosts as well as publisher and reporting devices before using this feature to optimize communications across the network.
- MVC Publ/Subscr: Configuration tools need to check for MVC support in subscribers and hosts as well as publisher and reporting devices before using this feature to optimize communications across the network.
- Mbit Alarm: If multi-bit alarms are not supported, then Block Alarms are not considered to be multi-bit alarms, and they are treated as simple alarms.

26. Shed From Rcas

Enter a value to set the time limit for loss of communication from a remote device. 0 disables. Initial value of 20 sec.

27. Shed From Rout

Enter a value to set the time limit for loss of communication from a remote device. 0 disables. Initial value of 20 sec.

29. Set FState

Use the pulldown to set Off or Set. Set causes all output function blocks to go immediately to the condition set by the Fault State Type I/O option.

30. Clear FState

Use the pulldown to set Off or Clear. Clear causes the device fault state to clear if the field condition has been corrected.

32. Lim Notify

Enter a number lower than or equal to MAX_NOTIFY, to control alert flooding. See DCS vendor recommendations for guidance with the value for this field.

The MAX_NOTIFY parameter value is the maximum number of alert reports that this resource can have sent without getting a confirmation, corresponding to the amount of buffer space available for alert messages.

33. Confirm Time

Enter the time for the block to wait for confirmation that a transmitted value is received before retrying. See DCS vendor recommendations for guidance with the value for this field.
34. **Write Lock**

Use the pulldown to engage/disengage.

The **Write Lock** parameter, if set, prevents any external change to the block's static or nonvolatile database. Block connections and calculation results proceed normally, but the configuration is locked.

When **Hard Write lock is not supported** (disabled using **Feature Sel**), then **Write Lock** can be set and cleared by writing to the **Write Lock** parameter when soft write lock is enabled in **Feature Sel**. Clearing **Write Lock** generates the discrete alert WRITE_ALM, at the **Write Priority**. Setting **Write Lock** will clear the alert, if it exists. When the soft write lock bit is not true in the features bit strings, writes to the parameter **Write Lock** is rejected by the device.

For devices that support hard write lock and have the associated **Feature Sel** attribute enabled, the parameter **Write Lock** is only an indicator of the state of write-locking. Writes to **Write Lock** will be rejected by the device. To activate write-locking, the write-lock jumper must be in the correct position, as determined by the manufacturer, and the **Hard Write** set in **Feature Sel**. When this is detected by the device, **Write Lock** is set to 2. All writes to static and non-volatile parameters are rejected by the device during this state. The configured value of **Soft Write lock** has no impact on device operation when **Hard Write lock** is enabled in **Feature Sel**.

To deactivate write locking, since **Feature Sel** is not writeable during write locking, the jumper must be changed. Once the device detects the changed jumper position write-locking is disabled and **Write Lock** is set to 1. The detection of the jumper is dependent on the manufacturer. Some manufacturers may require that the device be restarted in order to detect the jumper, while others may detect the jumper during normal device operation.

37. **Alarm Sum**

**Alarm Sum** Displays the current alert status, unacknowledged states, unreported states, and disabled states of the alerts associated with the function block.

The zero (0) state indicates alert clear, acknowledged, reported, enabled.

**Disabled** Use the pulldown list to click a checkbox, which disables the alert type:

- **Discrete Alarm Writes have been enabled**
- **High high Alarm**
- **High Alarm**
- **Low low Alarm**
- **Low Alarm**
- **Deviation high Alarm**
- **Deviation low Alarm**
- **Block Alarm**
- **Fail Alarm**
- **Off Spec Alarm**
- **Maintenance Alarm**
- **Check Alarm**
38. **ACK Option**

Use the pulldown to click a checkbox, which enables alerts associated with the block are automatically acknowledged.

- Discrete Alarm Writes have been enabled
- High high Alarm
- High Alarm
- Low low Alarm
- Low Alarm
- Deviation high Alarm
- Deviation low Alarm
- Block Alarm
- Fail Alarm
- Off Spec Alarm
- Maintenance Alarm
- Check Alarm

39. **Write Priority**

Enter a value for the priority of the alert generated by clearing the write lock [0, 15].
Extend TB Configuration

Use this tab to configure writeable transducer block parameters.

Figure 145  Control Configuration: Extend TB Configuration Tab

Buttons and Fields

- **Show Different**: Filters the tab to show only parameters that are different between the left and right columns.
- **Check All Unequal Items**: Places a check in next to all items with an unequal sign (≠) between the two columns.
- **Current Settings**: This column displays the current parameter setting. This column is active for edits.
- **Saved Settings/Default Settings**: Use the pulldown to select the settings to view in the right column:
  - Saved Settings: The last saved settings for the DTM.
  - Default Settings: The initial default settings.
Click to copy the right column settings to left (Current Settings).

Click this to write settings to the connected device based on the selection in the pull-down to the right (Default Settings or Saved Settings).

0, Block Header

Block Tag Enter the tag name of up to 32 characters. Special characters not allowed: V:*<>|

| CAUTION | Do not change the device tagname or the node address of a device in an operating Foundation Fieldbus segment. Control linkages are lost. Do not use a leading space in a device tag name, this causes the device to become non-operational. Block tags are not used for control linkages. They can be changed without losing control linkages. However, some applications require restarting if another application changes a block tag. |

2. Tag Description Enter a description of the block of up to 32 characters.

3. Strategy Enter a description of the grouping of blocks of up to 32 characters.

4. Alert Key Enter the identification of the plant unit.

5. Mode Block

Target Use the pulldown to select the target mode: Auto Mode, Manual Mode and/or Out of Service Mode. This is the mode that the block uses as its fallback on failure. Choices limited by Permitted field.

Permitted Use the pulldown to select the permitted mode for the block: Auto Mode, Manual Mode or and/or Out of Service Mode. If both are unchecked then there are no modes available in Target.

Normal Use the pulldown to configure the normal operating mode: Auto Mode, Manual Mode and/or Out of Service Mode. Choices limited by Permitted field.

14. Position Limits

HI Enabled Use the pulldown to enable/disable the Limit HI field

LO Enabled Use the pulldown to enable/disable the Limit LO field.

Limit HI Enter a value for Limit HI field. Same parameters as the Position Limit tab.

Limit LO Enter a value for Limit LO field. Same parameters as the Position Limit tab.

Rate HI Enabled Use the pulldown to enable/disable the Rate HI field.

Rate LO Enabled Use the pulldown to enable/disable the Rate HI field.

Limit Rate Enter a value for the Position Limit Rate point
15. Final Value Cut Off HI

**Enabled**
Use the pulldown to enable/disable the position limit for the *Full Open Above* field.

**Point HI**
Enter a value for the position limit *Full Open Above* point.

16. Final Value Cut Off LO

**Enabled**
Use the pulldown to enable/disable the position limit for the *Tight Shutoff* field.

**Point LO**
Enter a value for the position limit *Tight Shutoff* point.

18. Activate Control Set

Use the pulldown to select the default control set for the block:

- Single Acting + Fastest (Smallest)
- Single Acting + Fast (Small)
- Single Acting + Medium
- Single Acting + Slow (Big)
- Single Acting + Slowest (Biggest)
- Custom
- Double Acting + Fast (Small)
- Double Acting + Slow (Big)
- Do Nothing

See *Position Control Tab*.

20. Custom Control Set

**P**
Enter a value for *P*. See *Control Tab* for a full explanation of this value.

**I**
Enter a value for *I*. See *Control Tab* for a full explanation of this value.

**D**
Enter a value for *D*. See *Control Tab* for a full explanation of this value.

**Padj**
Enter a value for *Padj*. See *Control Tab* for a full explanation of this value.

**Beta**
Enter a value for *Beta*. See *Control Tab* for a full explanation of this value.

**Position Compensation**
Enter a value for *PosComp*. See *Control Tab* for a full explanation of this value.

**Dead Zone**
Enter a value for *Dead Zone*. See *Control Tab* for a full explanation of this value.

**Non Linear**
Enter a value for *NonLin*. See *Control Tab* for a full explanation of this value.

22. Travel Calibration

**Cal Location**
Enter a notation for where the last calibration was done.

**Cal Date**
Click the calendar and enter the date of the last calibration.

**Cal Who**
Enter a notation for who did the last calibration.

23. Travel Range

Enter a value of full range for the range of travel.
**Units Index**

Use the pulldown to select the units for Range:
- Inch
- cm
- mm
- deg
- Rad
- %

26. Deviation Alert

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Point</td>
<td>Enter an value for the alert to occur. See Deviation Alerts Tab for a full</td>
</tr>
<tr>
<td></td>
<td>explanation of fields.</td>
</tr>
<tr>
<td>Dead Band</td>
<td>Enter a dead band range. See Deviation Alerts Tab for a full explanation of</td>
</tr>
<tr>
<td></td>
<td>fields.</td>
</tr>
<tr>
<td>Time</td>
<td>Enter a time before an alert is set. See Deviation Alerts Tab for a full</td>
</tr>
<tr>
<td></td>
<td>explanation of fields.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Use the pulldown to enable/disable this alert. See Deviation Alerts Tab for</td>
</tr>
<tr>
<td></td>
<td>a full explanation of fields.</td>
</tr>
</tbody>
</table>

27. Position HIHI Alert

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Point</td>
<td>Enter an value for the alert to occur. See HI and HIHI Alerts Tab for a full</td>
</tr>
<tr>
<td></td>
<td>explanation of fields.</td>
</tr>
<tr>
<td>Dead Band</td>
<td>Enter a dead band range. See HI and HIHI Alerts Tab for a full explanation</td>
</tr>
<tr>
<td></td>
<td>of fields.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Use the pulldown to enable/disable this alert. See HI and HIHI Alerts Tab</td>
</tr>
<tr>
<td></td>
<td>for a full explanation of fields.</td>
</tr>
</tbody>
</table>

28. Position HI Alert

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Point</td>
<td>Enter an value for the alert to occur. See HI and HIHI Alerts Tab for a full</td>
</tr>
<tr>
<td></td>
<td>explanation of fields.</td>
</tr>
<tr>
<td>Dead Band</td>
<td>Enter a dead band range. See HI and HIHI Alerts Tab for a full explanation</td>
</tr>
<tr>
<td></td>
<td>of fields.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Use the pulldown to enable/disable this alert. See HI and HIHI Alerts Tab</td>
</tr>
<tr>
<td></td>
<td>for a full explanation of fields.</td>
</tr>
</tbody>
</table>

29. Position LO Alert

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Point</td>
<td>Enter an value for the alert to occur. See LO and LOLO Alerts Tab for a full</td>
</tr>
<tr>
<td></td>
<td>explanation of fields.</td>
</tr>
<tr>
<td>Dead Band</td>
<td>Enter a dead band range. See LO and LOLO Alerts Tab for a full explanation</td>
</tr>
<tr>
<td></td>
<td>of fields.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Use the pulldown to enable/disable this alert. See LO and LOLO Alerts Tab</td>
</tr>
<tr>
<td></td>
<td>for a full explanation of fields.</td>
</tr>
</tbody>
</table>

30. Position LOLO Alert

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Point</td>
<td>Enter an value for the alert to occur. See LO and LOLO Alerts Tab for a full</td>
</tr>
<tr>
<td></td>
<td>explanation of fields.</td>
</tr>
<tr>
<td>Dead Band</td>
<td>Enter a dead band range. See LO and LOLO Alerts Tab for a full explanation</td>
</tr>
<tr>
<td></td>
<td>of fields.</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>Use the pulldown to enable/disable this alert. See <em>LO and LOLO Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>31. Travel Accumulation A Alert</strong></td>
<td><strong>Alert Point</strong> Enter an value for the alert to occur. See <em>Travel Accumulation A and B Alert Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Dead Band</strong></td>
<td>Enter a dead band range. See <em>Travel Accumulation A and B Alert Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>Use the pulldown to enable/disable this alert. See <em>Travel Accumulation A and B Alert Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>32. Travel Accumulation B Alert</strong></td>
<td><strong>Alert Point</strong> Enter an value for the alert to occur. See <em>Travel Accumulation A and B Alert Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Dead Band</strong></td>
<td>Enter a dead band range. See <em>Travel Accumulation A and B Alert Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>Use the pulldown to enable/disable this alert. See <em>Travel Accumulation A and B Alert Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>34. Cycle Counter A Alert</strong></td>
<td><strong>Alert Point</strong> Enter an value for the alert to occur. See <em>Cycle Counter A and B Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Dead Band</strong></td>
<td>Enter a dead band range. See <em>Cycle Counter A and B Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>Use the pulldown to enable/disable this alert. See <em>Cycle Counter A and B Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>35. Cycle Counter B Alert</strong></td>
<td><strong>Alert Point</strong> Enter an value for the alert to occur. See <em>Cycle Counter A and B Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Dead Band</strong></td>
<td>Enter an value for the alert to occur. See <em>Cycle Counter A and B Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>Use the pulldown to enable/disable this alert. See <em>Cycle Counter A and B Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>39. Near Closed Alert</strong></td>
<td><strong>Position Closed</strong> Enter an value for the alert to occur. See <em>Near Closed Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Alert Point</strong></td>
<td>Enter an value for the alert to occur. See <em>Near Closed Alerts Tab</em> for a full explanation of fields.</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>Use the pulldown to enable/disable this alert. See <em>Near Closed Alerts Tab</em> for a full explanation of fields.</td>
</tr>
</tbody>
</table>
41. Setpoint Timeout Alert

**Alert Point**
Enter an value for the alert to occur. See *Setpoint Timeout Alert Tab* for a full explanation of fields.

**Enabled**
Use the pulldown to enable/disable this alert. See *Setpoint Timeout Alert Tab* for a full explanation of fields.

42. Fault State

**Configuration**
Use the pulldown to select the configuration type. See *Fault State Tab* for a full explanation of fields.

**Options**
Use the pulldown to select the configuration type. See *Fault State Tab* for a full explanation of fields.

**Value**
Enter a *Fault State Value*. See *Fault State Tab* for a full explanation of fields.

**Time**
Enter a *Fault State Time*. See *Fault State Tab* for a full explanation of fields.

43. Characterization Selection

**Type**
Use the pulldown to select a characterization type. See *Characterization Tab* for a full explanation of fields.

45. Custom Characterization

**Number of Points**
Use the pulldown to select a number of points for a Custom characterization type. See *Characterization Tab* for a full explanation of fields.

46. Custom Characterization Points
Click the button to access a dialog for entering Custom characterization points. See *Characterization Tab* for a full explanation of fields.

47. Readback Select

**Select**
Use the pulldown to select a readback type. See *Characterization Tab* for a full explanation of fields.

51. Pressure Range

**Units Index**
Use the pulldown to select the pressures units. See *Pressure Range* for a full explanation of fields.

**Decimal**
Use the pulldown to select the decimal places. See *Pressure Range* for a full explanation of fields.

52. Supply Pressure HI Alert

**Alert Point**
Enter an value for the alert to occur. See *Supply Pressure HI Alert Tab* for a full explanation of fields.

**Dead Band**
Enter an value for the alert to occur. See *Supply Pressure HI Alert Tab* for a full explanation of fields.
**Enabled**

Use the pulldown to enable/disable this alert. See *Supply Pressure Hi Alert Tab* for a full explanation of fields.

### 53. Supply Pressure LO Alert

**Alert Point**
Enter an value for the alert to occur. See *Supply Pressure LO Alert Tab* for a full explanation of fields.

**Dead Band**
Enter an value for the alert to occur. See *Supply Pressure LO Alert Tab* for a full explanation of fields.

**Enabled**

Use the pulldown to enable/disable this alert. See *Supply Pressure LO Alert Tab* for a full explanation of fields.

### 54. Supply Pressure LOLO Alert

**Alert Point**
Enter an value for the alert to occur. See *Supply Pressure LOLO Alert Tab* for a full explanation of fields.

**Dead Band**
Enter an value for the alert to occur. See *Supply Pressure LOLO Alert Tab* for a full explanation of fields.

**Enabled**

Use the pulldown to enable/disable this alert. See *Supply Pressure LOLO Alert Tab* for a full explanation of fields.

### 62. Temperature HI Alert

**Alert Point**
Enter an value for the alert to occur. See *Temperature HI Alert Tab* for a full explanation of fields.

**Dead Band**
Enter an value for the alert to occur. See *Temperature HI Alert Tab* for a full explanation of fields.

**Enabled**

Use the pulldown to enable/disable this alert. See *Temperature HI Alert Tab* for a full explanation of fields.

### 63. Temperature LO Alert

**Alert Point**
Enter an value for the alert to occur. See *Temperature LO Alert Tab* for a full explanation of fields.

**Dead Band**
Enter an value for the alert to occur. See *Temperature LO Alert Tab* for a full explanation of fields.

**Enabled**

Use the pulldown to enable/disable this alert. See *Temperature LO Alert Tab* for a full explanation of fields.

### 65. IP HI Alert

**Alert Point**
Enter an value for the alert to occur. See *IP Output HI Alert Tab* for a full explanation of fields.

**Dead Band**
Enter an value for the alert to occur. See *IP Output HI Alert Tab* for a full explanation of fields.

**Time**
Enter an *IP HI Alert Time*. See *IP Output HI Alert Tab* for a full explanation of fields.

**Enabled**

Use the pulldown to enable/disable this alert. See *IP Output HI Alert Tab* for a full explanation of fields.
66. IP LO Alert

Alert Point
Enter an value for the alert to occur. See IP Output LO Alert Tab for a full explanation of fields.

Dead Band
Enter an value for the alert to occur. See IP Output LO Alert Tab for a full explanation of fields.

Time
Enter an IP LO Alert Time. See IP Output LO Alert Tab for a full explanation of fields.

Enabled
Use the pulldown to enable/disable this alert. See IP Output LO Alert Tab for a full explanation of fields.

73. UI Custom Configuration

Custom 1 Configuration/Custom 2 Configuration
Use the pulldown to select a value for one of the custom fields. See LCD Display for a full explanation of fields.

82. Discrete Switch 1

Direction
Use the pulldown to select the state that the switch trips to based on the Function field: Normal Open or Normal Close. This sets the default conditions. These are same parameters as on the Switches tab.

Function
Use the pulldown list to select the condition that trips the switch:

- Disabled
- DO Block
- Fault State
- Not in Normal
- Maintenance Required
- Warning Data
- Air Supply Alert
- Travel Deviation Alert
- Position HI Alert
- Position LO Alert
- Always Active
- Always Inactive
- Reset Occurred
- Tight cutoff

83. Discrete Switch 2

Direction
Use the pulldown to select the normal state: Normal Open or Normal Close.
Function
Use the pulldown list to select the condition that trips the switch:
- Disabled
- DO Block
- Fault State
- Not in Normal
- Maintenance Required
- Warning Data
- Air Supply Alert
- Travel Deviation Alert
- Position HI Alert
- Position LO Alert
- Always Active
- Always Inactive
- Reset Occurred
- Tight Cutoff

84. UI Access Control

Lock Level
Use the pulldown to select the Local Buttons Lock Level access. See Parameters Change Access for a full explanation of fields.

85. UI Language
Use the pulldown to select the UI Language:
- English
- French
- Spanish
- Portuguese
- Japanese
- Italian
- German

89. Open Stop Adjustment
Enter a value for the Open Stop Adjustment value. See Find Stops for a full explanation.

90. Setpoint Source
Use the pulldown to select the Setpoint Source access. See Control Tab for a full explanation of fields.

94. Alert Action
Map to RB
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

Deviation Alert
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

Position HI
Alert
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

Position LO
Alert
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.
**Position LOLO Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Setpoint Timeout Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Near Close Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Travel Accumulation A Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Travel Accumulation B Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Cycle Counter A Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Cycle Counter B Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Operating Time Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Supply Pressure HI Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Supply Pressure LO Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Supply Pressure LOLO Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Temperature HI Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**Temperature LO Alert**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**IP Drive Current Alert HI**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**IP Drive Current Alert LO**
Use the pulldown to set this option, See Alarms and Alerts for a full explanation of fields.

**99. Operating Time Alert**

**Alert Point**
Enter an value for the alert to occur. See Alarms and Alerts for a full explanation of fields.
Enabled

Use the pulldown to enable/disable this alert. See Alarms and Alerts for a full explanation of fields.

102. Actuator 1

Actuator Manufacturer
Enter the name of the manufacturer.

Actuator Model Number
Enter the model number.

Actuator Serial Number
Enter the serial number.

103. Actuator 2

Actuator Type
Enter the actuator type.

Actuator Size
Enter the actuator size.

Actuator Rotary Moment ARM
Enter the Actuator Rotary Moment ARM.

Actuator Effective Area
Enter the effective area.

104. Actuator 3

Shutoff DP
Enter vendor or installation specific data.

Handwheel
Enter vendor or installation specific data.

Air Action
Use the pulldown to select the Air Action.

Relay Type
Use the pulldown to select the type (see vendor specific documentation):

- Standard Rely: Double or Single Acting
- High Capacity: Single Acting
- Relay C - Special App: Single Direct
- Relay B - Special App: Single Reverse
- Lo Bleed - Relay A or C: Double or Single Direct
- Lo Bleed - Relay B: Single Reverse
- Lo Bleed - Relay C: Single Direct
- Lo Bleed - Relay B - Special App: Single Reverse

Maximum Supply Pressure
Enter the maximum actuator supply pressure. See EU_100 on Pressure Range tab.

Maximum Control Supply Pressure
Enter the maximum value for the actuator pressure in control. See Pressure on Supply Pressure HI Alert Tab tab.
Minimum Control Supply Pressure

Enter the minimum value for the actuator pressure in control. See Pressure on Supply Pressure LO Alert Tab tab.

105. Actuator Information

Descriptor

Enter a descriptor. See Descriptor on Valve tab.

Message

Enter a message related to the actuator. See Message on Valve tab.

Date

Enter a date for when information was input. See Date on Valve tab.

Specification Sheet

Enter a name from the specification sheet. See Specification Sheet on Valve tab.

106. Valve Identification

Valve Manufacturer Identification

Enter the valve manufacturer ID. See Valve Manufacturer ID on Valve tab.

Valve Model Number

Enter the valve model number. See Valve Model Number on Valve tab.

Valve Serial Number

Enter the valve serial number. See Valve Serial Number on Valve tab.

107. Valve Service

Service

Enter the valve service type. See Valve Service on Valve tab.

PID Number

Enter the valve PID number. See Valve PID Number on Valve tab.

108. Valve Body 1

Valve Type

Use the pulldown to select the Valve Type. See Valve Type on Valve tab.

Body Size

Enter the Body Size. See Body Size on Valve tab.

Packing

Enter a description of the Packing. See Packing on Valve tab.

Plug Type

Enter a description of the Plug Type. See Plug Type on Valve tab.

Seat Ring Type

Enter a description of the Seat Ring Type. See Seat Ring Type on Valve tab.

109. Valve Body 2

Characteristic

Enter valve service information [32 characters],

Leakage Class

Enter valve service information [32 characters],

110. Valve Body 3

Flow Action

Enter valve service information [32 characters],

Rated ADJ CV

Enter valve service information [32 characters],

111. Valve Information

Same As Actuator

Use the pulldown to choose to set the fields to the same as the actuator.
### 112. Booster

- **Descriptor**: Enter a descriptor. See *Descriptor* on *Valve* tab.
- **Message**: Enter a message related to the valve. See *Message* on *Valve* tab.
- **Date**: Enter a date for when information was input. See *Date* on *Valve* tab.
- **Spec Sheet**: Enter a name from the specification sheet. See *Specification Sheet* on *Valve* tab.

#### Manufacturer
- **Enter the manufacturer.**

#### Model
- **Enter the model number.**

#### Qty
- **Enter the number of boosters (32 maximum).**

### 113. Accessory

- **Solenoid**: Enter the solenoid data.

#### Remote Sensor
- Use the pulldown to select *Internal* or *Remote* as the default sensor type.

### 118. ADVANCED

- **Enter the default keys. These are the Device Access keys from Security.**
Alarms and Alerts

Use this tab to:

- Select whether the Resource or Transducer block report alerts and alerts.
- Configure the severity of an Alert Type by assigning it a level, which include:
  - Device Failure: The device has failed and needs immediate attention.
  - Maintenance Required: The device is still working but requires immediate attention. The device will continue to operate and will not proceed to failed state.
  - Warning Data: Device data indicates an operational problem.
  - Not Reported: The alert is not reported to the block for use.

![Control Configuration Alerts and Alerts Tab](image-url)

**Figure 146** Control Configuration Alerts and Alerts Tab
### Buttons and Fields

<table>
<thead>
<tr>
<th>Button/Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation Alert</td>
<td>Difference between working setpoint and working position. TRUE if ( \text{DEVIATION_VALUE} ) is bigger than ( \text{DEVIATION_ALERT_POINT} ) for ( \text{DEVIATION_TIME} ). FALSE if ( \text{DEVIATION_VALUE} ) is smaller than ( (\text{DEVIATION_ALERT}+\text{DEVIATION_DEADBAND}) ).</td>
</tr>
<tr>
<td>Position HI HI Alert</td>
<td>True if position is above ( \text{ALERT_POINT} ) and is not below ( (\text{ALERT_POINT}-\text{DEADBAND}) ).</td>
</tr>
<tr>
<td>Position HI Alert</td>
<td>True if the position value is above the HI Alert Point. Must be set above ( \text{POSITION_LO_ALERT} ).</td>
</tr>
<tr>
<td>Position LO Alert</td>
<td>True if the position value is below the LO Alert Point. Must be set below ( \text{POSITION_HI_ALERT} ).</td>
</tr>
<tr>
<td>Position LOLO Alert</td>
<td>True if the position value is below the LOLOL Alert Point. Must be set below ( \text{POSITION_LO_ALERT} ).</td>
</tr>
<tr>
<td>Set Point Timeout Alert</td>
<td>True if ( \text{TIME_SINCE_UPDATE} ) is above Alert Point. The setpoint update alert is reported only if the valve setpoint has not been updated by the AO or DO block for more than ( \text{ALERT_POINT} ) time.</td>
</tr>
<tr>
<td>Near Closed Alert</td>
<td>True if ( \text{NEAR_CLOSED} ) is above Alert Point. The near closed alert is reported only if the valve had been working with a valid set point and in auto mode for at least 1000 macro cycles (the sum of all counters in ( \text{POSITION_HISTOGRAM.TOTAL} ) will be more than 1000). Only enable if the tight shut off is not enabled.</td>
</tr>
<tr>
<td>Travel Accumulation A Alert/Travel Accumulation B Alert</td>
<td>True if the ( \text{TRAVEL_ACCUMULATION} ) is above Alert Point. Totalized change in travel in %, since the ( \text{TRAVEL_ACCUMULATION} ) was cleared. The value increments when the magnitude of the change exceeds the ( \text{DEADBAND} ).</td>
</tr>
<tr>
<td>Cycle Counter A Alert/Cycle Counter B Alert</td>
<td>True if the ( \text{CYCLE_COUNTER} ) is above Alert Point. Number of times the travel changes the direction.</td>
</tr>
<tr>
<td>Supply Pressure HI Alert</td>
<td>True if the ( \text{SUPPLY_PRESSURE} ) is below the Alert Point. True if the ( \text{SUPPLY_PRESSURE} ) is above ( \text{ALERT_POINT} ) and not below ( (\text{ALERT_POINT}-\text{DEADBAND}) ).</td>
</tr>
<tr>
<td>Supply Pressure LO Alert</td>
<td>True if the ( \text{SUPPLY_PRESSURE} ) is below the Alert Point. True if the ( \text{SUPPLY_PRESSURE} ) is below ( \text{ALERT_POINT} ) and not above ( (\text{ALERT_POINT}+\text{DEADBAND}) ).</td>
</tr>
<tr>
<td>Supply Pressure LOLO Alert</td>
<td>True if the ( \text{SUPPLY_PRESSURE} ) is below the Alert Point. True if the ( \text{SUPPLY_PRESSURE} ) is below ( \text{ALERT_POINT} ) and not above ( (\text{ALERT_POINT}+\text{DEADBAND}) ).</td>
</tr>
<tr>
<td>Temperature HI Alert</td>
<td>True if ( \text{TEMPERATURE} ) is above the Alert Point. True if the ( \text{TEMPERATURE} ) is above ( \text{ALERT_POINT} ) and not below ( (\text{ALERT_POINT}-\text{DEADBAND}) ).</td>
</tr>
</tbody>
</table>
Configure Alerts and Alerts

1. Click either **Map to RB** or **Report in TB**.
2. Click a radio button in each alert line to assign the alert level.

<table>
<thead>
<tr>
<th>Alert Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature LO Alert</td>
<td>True if TEMPERATURE is below the Alert Point. True if the TEMPERATURE is below ALERT_POINT and not above (ALERT_POINT+DEADBAND).</td>
</tr>
<tr>
<td>IP Drive Current HI Alert</td>
<td>True when CURRENT is above the Alert Point.</td>
</tr>
<tr>
<td>IP Drive Current LO Alert</td>
<td>True when CURRENT is below the Alert Point.</td>
</tr>
<tr>
<td>Sensor Failure Alert</td>
<td>True for any sensor failure.</td>
</tr>
<tr>
<td>Processor Alert</td>
<td>True for any processor alert.</td>
</tr>
<tr>
<td>Valve Control Alert</td>
<td>True for any valve control alert.</td>
</tr>
<tr>
<td>Commissioning Alert</td>
<td>True if Find Stops fails.</td>
</tr>
<tr>
<td>Air Supply Alert</td>
<td>True if there is a low air supply alert.</td>
</tr>
<tr>
<td>Supporting Hardware Alert</td>
<td>True if any hardware alert is set.</td>
</tr>
</tbody>
</table>
LCD Display

Use this tab to set the LCD language and to customize the LCD to display one or two additional values.

Figure 147 Control Configuration LCD Display Tab
**Buttons and Fields**

**LCD Language**  Use the pulldown to select a language:
- [ ] English
- [ ] French
- [ ] Spanish
- [ ] Portuguese
- [ ] Japanese
- [ ] Italian
- [ ] German

**Custom Configuration**

**Custom 1**

**Custom 2**

**Configuration**

**Configure LCD Display**

1. Use the LCD Language pulldown to select a language.
2. Use either or both of the Custom Configuration pulldown lists to set a value for LCD display.
13. Security

Security

The DTM has default security settings as follows:

- Maintenance and Planning Engineer levels have full access to configure and write parameters.
- Operator and Observer levels have read access to the parameters.
- Administrators can configure these security settings and save the settings to *.sec file.

Use these tabs (available to administrator level users only), Administrative Privileges only, to set up:

- Access to the device from the local UI (LCD Display) or from the FF (Write Access) ([Device Access])
- Access to change parameters ([Parameters Change Access])
- Access to download parameters ([Parameters Download Access])
- Access to the user interfaces ([User Interface Access])
- Access to the procedures and methods ([Procedures and Methods])
- System-wide configuration for the security ([System Security Settings])
- DTM Licensing ([License])
Device Access

Use this tab to control access to the:

- Buttons on the FF device, and to
- FF write privilege.

Figure 148  Security: Device Access Tab
Buttons and Fields

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

- **Allow Local Buttons**: Buttons on the SVI FF are enabled.
- **Lock Out Local Cal - Config.**: You can use the buttons to perform operations in Normal mode and Manual mode, however they will not function in Configure or Calibrate mode.
- **Lock Out Local Manual**: You can examine variables in Normal mode but cannot put the valve in Manual mode (and therefore cannot go to Calibrate or Configure modes).
- **Lock Out All Buttons**: The buttons are disabled.

**WARNING**

Changing the Application to Normal mode may switch the TB to MAN or AUTO mode and move the valve. It may be dangerous if someone is still working with the valve.

FF Write Lock
Locks/unlocks any changes to the permanent database. Write access selection restricts the access to the device from the FF, from the local LCD UI and the using the DD.

Device Access Configuration buttons
Click a radio button to select the device access level:

- **Standard**: Leaves only Key 9 active for use.
- **Advanced**: Leaves only Key 9 active for use.
- **Custom**: Leaves all keys active for use.

You can input any value for Key 1 to 8 and the key generator tool automatically creates the 9th key.

Key 1 ... Key 14
Enter the hex code for each active Key field.
Parameters Change Access

Use this tab to assign change privileges to the four pre-defined operational levels:

- **Observer**: You can only observe the current process and does not have a password.
- **Operator**: You can observe and manage the current process. You can check the current status of the device, modify set values and check if the device is functioning, perform a complete diagnosis, watch the actual status and parameter set as well as the current process variables. This level requires a password.
- **Maintenance**: You can perform all necessary maintenance operations including device exchange, calibration, adjustment, download verified parameter sets, modify a subset of parameters online or offline, perform device-specific online operations and upload the complete parameter set. This level requires a password.
- **Planning Engineer**: You are a fully authorized user. This level requires a password.

![Security: Parameter Change Access Tab](image-url)
If the same parameter is appears on more than one tab, its settings will be the same on each tab. When the parameter is configured to be read only, you cannot modify that parameter in Offline or in Online mode.

Buttons and Fields

Quick Start  See Quick Start Configuration for field explanations.
Control  See Control Tab for field explanations.
Position Limits  See Position Limits Tab for field explanations.
Position Control  See Position Alarms for field explanations.
Characterization  See Characterization Tab for field explanations.
Deviation Alert  See Deviation Alerts Tab for field explanations.
HI and HIHI Alerts  See HI and HIHI Alerts Tab for field explanations.
LO and LOLO Alerts  See LO and LOLO Alerts Tab for field explanations.
Near Closed Alert  See Near Closed Alerts Tab for field explanations.
Setpoint Timeout Alert  See Setpoint Timeout Alert Tab for field explanations.
Travel Accumulation A and B  See Travel Accumulation A and B Alert Tab for field explanations.
Cycle Counter A and B Alert  See Cycle Counter A and B Alerts Tab for field explanations.
Operating Time Alert  See Operating Time Alert Tab for field explanations.
Fault State  See Fault State Tab for field explanations.
Discrete - Control  See Discrete for field explanations.
Discrete - Software Switches  See Software Switches for field explanations.
Pressure Range  See Pressure Range for field explanations.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Pressure HI Alert</td>
<td>See Supply Pressure HI Alert Tab for field explanations.</td>
</tr>
<tr>
<td>Supply Pressure LO Alert</td>
<td>See Supply Pressure LO Alert Tab for field explanations.</td>
</tr>
<tr>
<td>Supply Pressure LOLO Alert</td>
<td>See Supply Pressure LOLO Alert Tab for field explanations.</td>
</tr>
<tr>
<td>Temperature HI Alert</td>
<td>See Temperature HI Alert Tab for field explanations.</td>
</tr>
<tr>
<td>Temperature LO Alert</td>
<td>See Temperature LO Alert Tab for field explanations.</td>
</tr>
<tr>
<td>IP HI Alert</td>
<td>See IP Output HI Alert Tab for field explanations.</td>
</tr>
<tr>
<td>IP LO Alert</td>
<td>See IP Output LO Alert Tab for field explanations.</td>
</tr>
<tr>
<td>Alert Action</td>
<td>See Alarms and Alerts for field explanations.</td>
</tr>
<tr>
<td>LCD Display</td>
<td>See LCD Display for field explanations.</td>
</tr>
<tr>
<td>Valve</td>
<td>See Valve for field explanations.</td>
</tr>
<tr>
<td>Network Settings</td>
<td>See Network Settings for field explanations.</td>
</tr>
<tr>
<td>Extended RB Configuration</td>
<td>See Extend RB Configuration for field explanations.</td>
</tr>
<tr>
<td>Extended TB Configuration</td>
<td>See Extend TB Configuration for field explanations.</td>
</tr>
</tbody>
</table>
Parameters Download Access

Use this tab to assign download access privileges to the four pre-defined operational levels. See Parameters Change Access for a listing of cross references to field explanations and for a description of user levels.

**NOTE**

If the same parameter is appears on more than one tab, its settings will be the same on each tab.

When a parameter is disabled for download, the download procedure will NOT request to change the parameter in the device.

![Security: Parameter Download Access Tab](image)
User Interface Access

Use this tab to assign user interface access privileges (menu selections) to the four pre-defined operational levels. See *Parameters Change Access* for a description of user levels.

**NOTE**

*Positioner information is not changeable.*

---

Figure 151  Security: User Interface Access Tab
### Buttons and Fields

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick Start</td>
<td>See <a href="#">Quick Start Configuration</a> for field explanations.</td>
</tr>
<tr>
<td>Device States</td>
<td>See <a href="#">Device States</a> for field explanations.</td>
</tr>
<tr>
<td>Calibration</td>
<td>See <a href="#">Calibration</a> for field explanations.</td>
</tr>
<tr>
<td>Configuration</td>
<td>See <a href="#">Control Configuration</a> for field explanations.</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>See <a href="#">Diagnostics</a> for field explanations.</td>
</tr>
<tr>
<td>Identification</td>
<td>See <a href="#">Identification</a> for field explanations.</td>
</tr>
</tbody>
</table>
Procedures and Methods

Use this tab to assign procedures and methods access privileges to the four pre-defined operational levels. See *Parameters Change Access* for a description of user levels.

**NOTE**

If the same procedure/method appears on more than one tab, its settings will be the same on each tab.

Buttons and Fields

- **FDT Functions**
  See *Network Settings* for field explanations.

- **Procedures**
  See *Calibration* for field explanations.
System Security Settings

Use this tab to load or save security settings in binary file (file format is .sec).

Saving a security settings file creates a template for the security settings, which is usable on their devices. An administrator can save the security settings in an encrypted file and load that file in other DTM instances when they are open.

These security settings are independent from the default DTM security settings of the DTM. The default DTM settings are loaded only once during the lifetime of the DTM - when it is created for the first time without any saved data. After that, when the DTM is saved, the default security settings are not applicable.

The user-configured security settings load any time the DTM is created after the initial start.

Figure 153 Security: System Security Settings Tab
**Buttons and Fields**

Click this button to save settings to the SVI FF Data folder.

Click this button to load settings from the SVI FF Data folder.

**Load Security Settings**

1. Click ![Load Security Settings from File](image) and a dialog appears.

   ![Image of Load Security Settings from File dialog]

   **Figure 154 Load Security Settings from File**

2. Navigate to the correct file and click **Open**.
Save Security Settings

1. Click \[ \text{Save Security Settings to File} \] and a dialog appears.

2. Navigate to the correct directory, rename if necessary and click \text{Save}.

**Figure 155  Save Security Settings to File**
Log Configuration

Use this tab to:

- Add log files for use in monitoring and analyzing system operations.
- Configure connection and transaction timeout settings.
- Configure the data target directory.

Figure 156 Log Configuration

Buttons and Fields

Time Out Settings

- **Connect Request**: Enter the number of seconds for the system to attempt a connection request before timing out.
- **Transaction Request**: Enter the number of seconds for the system to attempt a transaction request before timing out.
Disconnect Request

Enter the number of seconds for the system to attempt a disconnection request before timing out. A good value for this is 10 seconds to facilitate a reasonable disconnect time.

Error Log Settings

Log Level

Use the pulldown to select the type of data to save to the log file:

LOG_LEVEL_ERROR: Gathers events that are definitely problems for investigation. This is not connected to an alert creation.

LOG_LEVEL_WARNING: Gathers events that might be an issue for review.

LOG_LEVEL_INFO: Gathers information about normal operation.

LOG_LEVEL_TRACE: Gathers events leading up to errors and warnings.

Log Location

Click to navigate to a directory, or enter a path, to which to save the log file.

Max File Length

Enter a number of bytes for the maximum file size. After this point the older log information is backed up into another log file to maintain this size.

Saved Data Settings

Storage location for all DTM

Click to navigate to a directory, or enter a path, to which to save DTM data. This includes all diagnostic data and test results for SVI FF DTM.

Actual Location

Displays the present data storage location.

Apply All button

Click this button to apply changes made on this tab.
License

See Registration.
14. Identification

Identification

Use this set of tabs to view and configure information about a positioner and related valve, including:

- Positioner
- Valve
- Network Settings
- Contact and Order
- Defaults
Positioner

Use this tab to view basic revision data for positioner software and hardware.

![Positioner Tab](image)

Figure 157 Identification: Positioner Tab

**Buttons and Fields**

- **Manufacturer ID**: Displays the ID from the device settings.
- **Device Type**: Displays the type from the device settings.
- **Device Revision**: Displays the ID from the device settings.
- **DD Revision**: Displays the DD revision from the device settings.
- **Software Revision**: Displays the software revision from the device settings.
- **Software Revision APP**: Displays the application processor software revision from the device settings.
Valve

Use this tab to configure a wide range of valve and actuator related data. In ValVue the project automatically saves this data. It must be saved manually in non-Masoneilan DTMs.

**Buttons and Fields**

**Actuator Information**

For all fields not listed below, refer to Actuator Information in *Extend TB Configuration.*
Network Settings

Use this tab to set the positioner networks settings and set whether it is a link master or not.

Figure 159   Identification: Network Settings Tab

Buttons and Fields

Device Tag     Use this field to change the tag name.
Change PD Tag button

Device Address  Displays the address.
Change Address button

Click once you have entered a new Device Tag to update it on the system. When you click the button, a dialog appears for confirmation.

Click once you have entered a new Device Address to update it on the system. When you click the button, a dialog appears for confirmation.
Device ID

Enter the ID.

Link Master Configuration

Click a radio button to determine if the device is a:

- Basic Device: An FF device that functions on an H1 segment.
- Link Master: An FF device that functions on an H1 segment. Additionally, an LM class device has a capability to work as the Link Active Scheduler (LAS).

Restart Device

Click once you have changed the Link Master Configuration to update it on the system.

T1

Enter a preset value for the system management step timer.

T2

Enter a preset value for the system management set address sequence timer.

T3

Enter a preset value for the set address wait timer.
Contact and Order

Use this tab to enter information about the local representative, the order number for the positioner, actuator and valve and to attach PDF or text document with the order information.

The text document is shared to a common location for all DTMs - e.g. shared drive on the server.

This location for these documents is set during the installation of the DTM. The location for these documents appears in the log information of find stops/autotune/diagnostic tests.

Figure 160 Identification: Contact Order Tab

Buttons and Fields

Contact Information

Company Name
Enter the company name.

First Name
Enter the first name of the company contact.
**Attach Order Information File**

1. Click **Attach Order Information File ...** and a dialog appears.

![Attach Order Information File](image)

**Figure 161 Attach Order Information File**

2. Navigate to the required file, click **Open** and the file is attached.
Defaults

Use this tab to identify the source of default valve parameter settings. The existing source for default data appears and a new source can be selected.

Control configuration starts with default parameter values. By default, these parameters are stored in an XML file (extension .sviff), and are installed with the DTM installation.

You can:

- Reload the default settings (Load Values).
- Load a different file by browsing the disk and selecting a different file (Load Values).
- Store the current configuration (Save Values to File).

Figure 162 Identification: Defaults Tab
**Buttons and Fields**

Click this button to load default values from file (.sviff). See *Load Values*. This can also access another non-default saved settings file. Use *User Interface Access Defaults* to control the user rights to this button.

Click this button to save present values as default values to file or as another group of non-default settings. See *Save Values to File*. Use *User Interface Access Defaults* to control the user rights to this button.

The default name is set to the tag of the device. If the default name is changed, the new name is preserved.

**Load Values**

1. Click **Load From ...** and the dialog appears.

![Figure 163 Load Default Data File](image)

2. Navigate to the required directory, click **Open** and the values are loaded. These can be verified on the various *Control Configuration* tabs.
Save Values to File

1. Click **Save To ...** and the dialog appears.

2. Navigate to the required directory, click **Save** and the values are saved.

**Figure 164  Save Default Data File**
15. Continuous Valve Diagnostics Concept

Since its introduction about 20 years ago, FOUNDATION fieldbus has been well accepted by customers for the opportunity it provides for device diagnostics. The device health and status are even more important for the final control elements used in a controlled process – positioners, and analog and discrete output devices.

This document describes the diagnostic features integrated in the SVI FF positioner and provides some guidelines how they can be used in applications.

Introduction

Evaluation of the valve/positioner state requires:

1. Appropriate conditions to collect informative data
2. Data collection
3. Data processing

Different measures to estimate the valve health may require different conditions, rate of data collection and often put special requirements on the amount of data collected and speed of data processing. In order to provide the best information, the SVI FF provides three different diagnostic approaches:

- **Off Line Diagnostics**: Off Line diagnostics are used when the application process is not running. Off-line diagnostics procedure execution requires significant changes of valve setpoint, which disturbs the application process.

- **On Line Diagnostics**: On Line diagnostic procedures collect data while the valve is running and do not disturb the application process. Special tools are used to collect the data from the valve, evaluate performance and present the information.

- **Continuous diagnostics**: Gives a detailed descriptions on how continuous diagnostics can be used for estimation of the device status.
Off Line Diagnostics

Off Line diagnostics are used when the application process is not running. Off-line diagnostics procedure execution requires significant changes of valve setpoint, which disturbs the application process.

When Off Line diagnostic procedures are executed, the data is collected in the SVI FF positioner at a very high rate (e.g. between 10 and 60 times per second) and then it is uploaded and presented by the SVI FF DTM.

Step Test

Step test evaluates how the positioner is responding on a request to change in the set point significantly for a short time. It gives a good measure of the actuator/valve speed.

Ramp Test

Ramp test measures the relationship between the set point and actual actuator/valve position, when the setpoint is changed at a limited rate.

Signature

Valve Signature provides a relationship between the actuator pressure and the actuator/valve actual position.

On Line Diagnostics

On Line diagnostic procedures collect data while the valve is running and do not disturb the application process. Special tools are used to collect the data from the valve, evaluate performance and present the information.

DTM

The SVI FF DTM can provide a basic level of online diagnostic by presenting the data from the positioner in numeric or graphical form. You can also export the data for further analysis with external tools.

Valve Aware

Valve Aware provides advanced diagnostic procedures. It collects data from the positioner on a regular basis and stores it for further evaluation without any human interaction. The processing and storage power provided by the contemporary computers detects:

- Change in valve/positioner friction
- Stick slip in the valve
- Changes in dynamic behavior, etc.
Continuous Diagnostics

Continuous diagnostics are executed in the device and continuously evaluate the status of the positioner, the actuator and the valve. The diagnostics described in this section are implemented in the firmware or in the positioner hardware. Resource and Transducer blocks are used to implement and report the results of the calculations. The problem detection algorithms are running continuously and provide immediate notification for detected events. The SVI FF positioner can detect two basic groups of events:

- Problems in the positioners performance
- Problems in the actuator/valve control

Positioner Diagnostics

Positioner diagnostics are used to evaluate the state of the positioner itself. The positioner is designed so that it continues to communicate on the fieldbus if the detected problem so allows. A limited number of severe failures detected in the hardware and the positioner may not be able to report when a failure is detected. In this case, the positioner continues to control the valve if possible. If control of the valve is not possible, the positioner de-energizes its output, driving the valve to de-energized position, as defined by the actuator.

Processor Failure

Failures in the processor program execution are reported in this group of alerts. Examples of this kind of failure include:

- Program execution failure detected by a watch dog
- Program memory failure
- NV memory failure, etc.

Sensor Failure

This failure is reported when the diagnostic procedures detects problem in the supporting sensors, embedded in the positioner. These are:

- Supply pressure sensor
- Temperature sensor, etc.

Valve Control

Problems detected with valve control are reported in this group. If the actual position cannot be driven to follow the setpoint, a valve control failure is reported. There may be multiple reasons for this failure:

- Problem with the supply pressure
- Obstacle in the valve movement, etc.
Commissioning

This problem is reported if the positioner has not been calibrated. The Find Stops procedure must be executed to clear the problem. If the positioner is shipped installed on the valve, it is factory calibrated and this problem won't occur.

Air Supply

This problem is reported if the supply pressure is out of the spec (most likely too low).

Supporting Hardware

This problem is reported if a failure in one of the supporting accessories is detected:

- Local LCD display
- Remote Position Sensor, etc.

Valve/Actuator Diagnostics

The SVI FF positioner collects information from multiple sensors. This information is used to evaluate the quality of valve and actuator control and the working conditions.

Valves and applications may have significant differences in the expected behavior – e.g. small valves usually are fast and are able to reduce the error between the setpoint and actual position within seconds, valve wear may be significantly impacted by the content and temperature of the fluid being processed or by the material used to make the valve.

To adjust to the variety of applications, SVI FF positioners provide a set of parameters, which can be modified to adjust to the specifics of the process being controlled. Adjustable alert points and dead bands (where applicable) are provided for the monitored parameters and can be modified from default settings to reflect the specifics of the application.

An alert is set when the monitored value crosses the point defined by the Alert Point and stays active until the alert is cleared or the monitored value is restored to within the expected limits. Dead band can be used to avoid multiple notifications for the same event.

CAUTION: In the Transducer Block each alert has an Active and Historical bit. Active bit presents the current state of the condition. Historical bit indicates whether the condition occurred in the past. Both are user clearable.

For each alert the SVI FF provides two additional parameters:

- Historic Alert – a flag indicating if the alert happened since the alert has been cleared.
- Alert Counter – a counter indicating how many times the alert happened in the past.
Deviation

Deviation alert is set if the error between the set point and actual position is bigger than the alert limit for the time defined in the alert configuration.

Deviation error can be caused by high valve friction, improper valve tuning, obstacle in the valve movement, etc.

Position

Position alerts are set if the actual valve position is out of the expected alert limit. The alert is cleared when the position is within the limits again (including Dead band).

Position alert is used to detect if the valve is in a Tight Open or Tight Close condition, to detect position sensor slippage or valve plug wear.

If the alert is set to detect a Tight Open or Tight Close condition, the alert count is used to understand how many times the Tight Open or Tight Close was activated.

SVI FF allows configuration of the following position alerts:

- HI HI
- HI
- LO
- LO LO

Travel Accumulation Alert

Accumulated travel is a good indication for valve wear. SVI FF provides two alerts, which are used to report two different conditions:

- Travel Accumulation A
- Travel Accumulation B

Combined with the travel accumulation trend, this alert is used to schedule valve maintenance procedures.

Cycle Counter

Cycle Counter is another good indication for valve usage and the SVI FF provides two alerts, which are used to report two different conditions:

- Cycle Counter A
- Cycle Counter B

Combined with the Cycle Counter Trend, this alert is used to schedule valve maintenance procedures.
Set Point Timeout

When the Transducer block is in Auto mode, a new setpoint is expected from the FOUNDATION fieldbus protocol on a regular basis. This alert is used to detect FF communication problems.

Supply Pressure

Having a steady source of air is essential for the valve/positioner performance. The actual value of the supply pressure is monitored and an alert is set if it is out of the limits. The following limits provide different alerts:

- HI Alert triggered by HI Alert Limit
- LO Alert triggered by LO Alert Limit
- LO LO Alert triggered by LO LO Alert Limit

Temperature

Temperature alerts monitor the positioner temperature and can generate a separate alert if the temperature crosses the High or the Low limit.

IP Current

IP current is used by the pressure control loop to regulate the actuator pressure. Two alerts are user configurable for the application:

- HI IP Current
- LO IP Current

When the valve is in steady state the IP current is in the middle of the expected working range, balancing the supply and exhaust of pressure to the actuator. Having very high or very low values of IP current for long time may be indication of a problem in the pressure control loop – e.g. relay degradation.

Working Time

Working Time is another good indication for valve usage. The SVI FF provides an alert, which is used to report when the valve has been working longer than the value indicated in the Working Time Alert Limit.

Combined with the Travel Accumulation and Cycle Accumulation, this alert is used to schedule valve maintenance procedures.
Supporting Information for Diagnostic Configuration

The SVI FF provides a set of unique parameters, which can assist in diagnostic configuration.

Alert Counters

Alert Counters were briefly discussed in the previous section. A total of 25 counters are provided (one for each alert) to register each alert’s occurrences.

The Alert Counters are writable – You can clear all or each counter individually. Clearing the alert counters may be useful if the alert configuration is changed.

Transducer Block Mins and Maxs

A set of parameters are provided in the Transducer block to register the maximum and minimum value of most dynamic parameters. The extreme values are cleared if the valve is rebooted. Valve Position Values Monitored though IP Current Related Values Monitored provides the values being monitored in various areas.

<table>
<thead>
<tr>
<th>114-POSITION EXTREMES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 FINAL_VALUE_MAX</td>
<td>Max value of Position Setpoint</td>
</tr>
<tr>
<td>2 FINAL_VALUE_MIN</td>
<td>Min value of Position Setpoint</td>
</tr>
<tr>
<td>3 FINAL_POS_VALUE_MAX</td>
<td>Max value of Actual Position</td>
</tr>
<tr>
<td>4 FINAL_POS_VALUE_MIN</td>
<td>Min value of Actual Position</td>
</tr>
<tr>
<td>5 WORKING_SP_MAX</td>
<td>Max value of Characterized Position Setpoint</td>
</tr>
<tr>
<td>6 WORKING_SP_MIN</td>
<td>Min value of Characterized Position Setpoint</td>
</tr>
<tr>
<td>7 WORKING_POS_MAX</td>
<td>Max value of Characterized Actual Position</td>
</tr>
<tr>
<td>8 WORKING_POS_MIN</td>
<td>Min value of Characterized Actual Position</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRESSURE EXTREMES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SUPPLY_PRESSURE_MAX</td>
<td>Max value of the Supply Pressure</td>
</tr>
<tr>
<td>2 SUPPLY_PRESSURE_MIN</td>
<td>Min value of the Supply Pressure</td>
</tr>
<tr>
<td>3 ACTUATOR_A_MAX</td>
<td>Max value of the Actuator A Pressure</td>
</tr>
<tr>
<td>4 ACTUATOR_A_MIN</td>
<td>Min value of the Actuator A Pressure</td>
</tr>
<tr>
<td>5 ACTUATOR_B_MAX</td>
<td>Max value of the Actuator B Pressure</td>
</tr>
</tbody>
</table>
### Table 2 Pressure Related Values Monitored

<table>
<thead>
<tr>
<th></th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>ACTUATOR_B_MIN Min value of the Actuator B Pressure</td>
</tr>
<tr>
<td>7</td>
<td>PILOT_MAX Max value of the Pilot Pressure</td>
</tr>
<tr>
<td>8</td>
<td>PILOT_MIN Min value of the Pilot Pressure</td>
</tr>
</tbody>
</table>

### Table 3 Temperature Related Values Monitored

<table>
<thead>
<tr>
<th>TEMPERATURE_EXTREMES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TEMPERATURE_MAX</td>
<td>Max value of the temperature in the positioner</td>
</tr>
<tr>
<td>2 TEMPERATURE_MIN</td>
<td>Min value of the temperature in the positioner</td>
</tr>
</tbody>
</table>

### Table 4 IP Current Related Values Monitored

<table>
<thead>
<tr>
<th>IP_CURRENT_EXTREMES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 IP_CURRENT_MAX</td>
<td>Max value of the IP current</td>
</tr>
<tr>
<td>2 IP_CURRENT_MIN</td>
<td>Min value of the IP current</td>
</tr>
</tbody>
</table>
Alert Log

The SVI FF keeps a log of the detected diagnostic events embedded in the firmware. The last 32 events are logged in the event log, which can be used to understand the sequence of diagnostic events. For example:

1. Event --> Low supply pressure
2. Event --> Position deviation
3. Event --> Position LO
4. Event --> Position LO LO

A timestamp is provided for each event. The time for the event depends on the time distributed on the fieldbus.

When the SVI FF DTM is used to read the events, the DTM extends the number of listed events as it does not overwrite the oldest existing events when it reaches the 33rd event (Device vs. DTM Event Log).

![Device vs. DTM Event Log](image)

Figure 165  Device vs. DTM Event Log
Application Specific Categorization

The SVI FF provides another level of configuration, which allows mapping of diagnostic events to one of the following categories of actions:

- **Device Failure** – You need to take immediate action – the device is failing or may be failing at any moment.
- **Device Needs Maintenance Now** – You need to schedule maintenance procedure now.
- **Device Needs Maintenance Soon** – You should schedule maintenance procedure.
- **No Action** – You have decided that no action should be taken if this alert condition is detected.

*Configuration for ALERT_ACTION Parameter* illustrates the default configuration for the ALERT_ACTION parameter.

![Configuration for ALERT_ACTION Parameter](image)

Figure 166 Configuration for ALERT_ACTION Parameter

You can modify the alert actions related to valve and actuator diagnostic events. As indicated in *Configuration for ALERT_ACTION Parameter*, the positioner specific alert actions are not configurable – they are hard wired to the corresponding notification.
The transducer BLOCK_ERR parameter is used to show the mapping results. For the hosts that do not support Transducer blocks, a special configuration is provided, so that the report is duplicated in resource BLOCK_ERR parameter. This is done though the Alert Action parameter configured to map to the Resource block.

**Reporting Diagnostic Condition to the Host**

All parameters related to the diagnostic alerts are described in the DDs and can be read by the host at any moment. The SVI FF DTM also provides a detailed graphical presentation about the current and historic diagnostic conditions detected by the device.

Monitoring a significant number of parameters and conditions can create a significant traffic on the bus and may not be convenient. To avoid this, the SVI provides several levels of simplification, which allows reporting the device status to the operator in the plant, but also provides additional details to the device specialists.

**Diagnostic Events Reported by Block Error**

Setting the parameters in the Block Error parameter provides a good level of abstraction. The detected failure is mapped to one of the bits in BLOCK ERR as follows:

- Device Needs Maintenance Now
- Device Needs Maintenance Soon
- NV Memory Failure, etc.

All hosts monitor the errors reported by the BLOCK_ERR parameter and the information is immediately indicated to the operator with the level of urgency required.

For the hosts that do not support Transducer blocks, the diagnostic indication is duplicated in the resource BLOCK_ERR parameter.

Some DCSs monitor the status of the BLOCK_ERR parameter and automatically generate notification alarms to the operator. Similar device status alarms are also generated if the communication to the device is disturbed or if the DCS detects other device failures.
This approach provides a simple and reliable way to monitor the device status. The Block Error parameter is part of the Resource or Transducer block dynamic views and most hosts read the dynamic parameters on a regular basis.

The BLOCK_ERR parameter reports also FF standard errors, including:

- Block Configuration
- Simulate Active
- Memory Failure
- Static Data Lost, etc.

The disadvantage of this approach is that it creates additional traffic on the bus - the host is polling the device on a regular basis.
Diagnostic Events Reported by Alarms

In hosts, that support Foundation Fieldbus alarms, the standard block alarm (provided through BLOCK_ALM parameter) is reported when a failure is detected in the device. The block alarm is used for all configuration, hardware, connection failure or system problems in the block and in this case also reports the diagnostic events detected by the positioner. The first alert to become active sets the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the sub code has changed.

Diagnostic Events Reported by Alarms illustrates how BLOCK_ALM is generated when a problem is detected in the SVI FF positioner.

If the failures, detected in the positioner, are mapped to the Resource block, the standard for resource block alarm summary (ALARM_SUM) parameter can be used to enable or disable the alarm notifications.
The SVI FF supports multi-bit alarm notification, which allows for reporting multiple simultaneous alarms, such as Block Alarm/Block Error. Each alarm of a multi-bit alarm is referred to as a bit-alarm. Support for multi-bit alarms is specified using the Resource block FEATURES and FEATURES_SEL parameters. When not selected, the behavior of a multi-bit alarm parameter is the same as that specified for the simple alarm parameter behavior of the Block Alarm parameter.

The device status reported through block alarms provides significantly less traffic on the bus – the alarm is reported only when the diagnostic condition is detected.

The BLOCK_ALARM is generated when other standard FF errors are detected, including:

- Block Configuration
- Simulate Active
- Memory Failure
- Static Data Lost, etc.

In practice you must pay special attention to the way alarms are processed by the application. Often, a single device failure triggers a set of application and device alarms (sometimes referred as alarm explosion) and it may be difficult to find the source of the event. Client/Server services are often used to provide additional information.
Diagnostic Events Reported According to **FF-912 Field Diagnostic Profile Specification**

**FF-912 – Field Diagnostic Profile** specification was created recently to enhance and standardize the device status reporting to the host. It creates a single group of parameters to aggregate all device status and diagnostics so that a Host system can integrate this information into its infrastructure.

*Basic Field Diagnostic* from the FF Specification illustrates the basic Field Diagnostic.

The SVI FF monitors the specific conditions, as described in *Continuous Diagnostics*. These conditions are classified by the corresponding MAPs in four different categories and indicated in four different parameters:

- Fail – FD_FAIL_ACTIVE
- Off Spec - FD_OFFSPEC_ACTIVE
- Maintenance Required – FD_MAINT_ACTIVE
- Check Required – FD_CHECK_ACTIVE.

You can then filter the detected condition (FD_XXX_MASK) and the SVI FF populates the corresponding alarm.

The standard Field Diagnostics Profile allows diagnostic conditions to be polled or to be reported as multi-bit alarms if the host system supports that specification.
Host Field Diagnostic Profile Parameters illustrates how Field Diagnostic Profile parameters can be used in host that polls for diagnostic conditions.

Figure 170  Host Field Diagnostic Profile Parameters
If the host supports alarms, it can create a publisher subscriber connection to receive alarm notifications when an interesting diagnostic condition is detected. *SVI FF Response to Detected Conditions* illustrates how SVI FF reports the detected conditions.

Multiple conditions may be reported when device status is reported by Field Diagnostics parameters at the same time.
Discrete Switch Configuration

The SVI FF has a discrete switch (contact) DS1, which can be used to drive external equipment (up to 24V/1A). Discrete Switch 1 can be activated if one of the following diagnostic conditions is detected:

- A failure in position control algorithm and the actuator is in Fault (de-energized) State
- The position control algorithm is not In Normal state
- Device Need Maintenance Soon
- Device Needs Maintenance Now
- Air Supply Alert – HI, LO or LOLO alert condition is active
- Travel Deviation Alert
- Position HI Alert
- Position LO Alert
- Position control algorithm has been re-initialized
- Tight cutoff is active

This switch can be used (with minimal external equipment – e.g. one solenoid and no additional logic) to keep the valve in place when the supply pressure drop or when the valve position is above the High Limit and Hi Position Alert is reported.

Processing to DI Block

If you want to detect a discrete condition, but do not want to drive the external contact, a Virtual Switch, VS2, is available in the SVI FF device. VS2 can be configured in a similar way as Discrete Switch 1, the difference being that no physical contact changes - just an internal boolean.

Discrete Switch DS1 or Virtual Switch VS2 can be provided on the fieldbus and additional actions can be taken by the DCS application. For more information see the table Channels for Discrete Input Blocks in the SVI FF Function Blocks Instruction Manual (GEA31248).

Conclusion

The SVI FF provides a comprehensive mechanism for positioner self-diagnostics and an extensive number of user-configurable procedures for valve and actuator diagnostics.

The detected conditions can be reported to the host in multiple ways, providing flexibility and easy integration of the SVI FF positioner in any host application.
16. Configuring Frame Application to Work with the SVI FF DTM

Applicable To:

- FF, Registration Module, PRM 3.10, PRM 3.02, FieldMate 2.03, FieldMate 2.01, PACTWare 3.6 or other DTMs

Topic: Software

Problem: When trying to access the licensing functionality an error message appears. This occurs as the SVI FF DTM has .net compatibility issues with some of frame applications.

![Registration dll Error](image)

Figure 172  Registration dll Error
Solution:

Each product commonly used in conjunction with the SVI FF DTM and each version has a unique solution, which are given in the following sections.

- **PRM 3.10**
- **PRM 3.02**
- **FieldMate 2.03**
- **Fieldmate 2.01**
- **PACTware 3.6 or Above**

**PRM 3.02**

1. Open the PRM3.02 installation folder; default path is C:\PRM\Program.
2. Open the FMFdtContainer.exe.config using Notepad. Change:
   - `<startup>`
   - `<supportedRuntime version="v1.1.4322"/>`
   to
   - `<startup useLegacyV2RuntimeActivationPolicy="true">`
   - `<supportedRuntime version="v4.0"/>`
   and save the file.
3. Launch DTM works in PRM3.02 again and the registration dialog successfully opens.

**PRM 3.10**

1. Open the PRM3.10 installation folder; default path is C:\PRM\Program.
2. Open the FMFdtContainer.exe.(036D1490-387B-11D4-86E1-00E0987270B9).config using Notepad. Change:
   - `<startup>`
   - `<supportedRuntime version="v1.1.4322"/>`
   to
   - `<startup useLegacyV2RuntimeActivationPolicy="true">`
   - `<supportedRuntime version="v4.0"/>`
   and save the file.
3. Launch DTM works in PRM3.10 again and the registration dialog successfully opens.

**PRM 3.02**

1. Open the PRM3.02 installation folder; default path is C:\PRM\Program.
2. Open the `FMFdtContainer.exe.config` using Notepad. Change:

```xml
<startup>
<supportedRuntime version="v1.1.4322"/>
</startup>
```

to

```xml
<startup useLegacyV2RuntimeActivationPolicy="true">
<supportedRuntime version="v4.0"/>
</startup>
```

and save the file.

3. Launch DTM works in PRM3.02 again and the registration dialog successfully opens.

**FieldMate 2.03**

This procedure uses *FieldMate Basic R2.03.00 Lite Edition* as example.

1. Open the *FieldMate 2.03* installation folder; default path is `C:\FM\Program`.

2. Open the `FMFdtContainer.exe.(036D1490-387B-11D4-86E1-00E0987270B9).config` using Notepad. Change:

```xml
<startup>
<supportedRuntime version="v1.1.4322"/>
</startup>
```

to

```xml
<startup useLegacyV2RuntimeActivationPolicy="true">
<supportedRuntime version="v4.0"/>
</startup>
```

and save the file.

3. Launch DTM works in *FieldMate* and the registration dialog successfully opens.

**Fieldmate 2.01**

1. Open the *FieldMate 2.01* installation folder; default path is `C:\FM\Program`.

2. Open the `FMFdtContainer.exe.config` using Notepad. Change:

```xml
<startup>
<supportedRuntime version="v1.1.4322"/>
</startup>
```

to

```xml
<startup useLegacyV2RuntimeActivationPolicy="true">
<supportedRuntime version="v4.0"/>
</startup>
```

and save the file.

3. Launch DTM works in *FieldMate* and the registration dialog successfully opens.
PACTware 3.6 or Above

1. Open the PACTware 3.6 installation folder; default path is C:\Program Files\PACTware Consortium\PACTware 3.6\App.

2. Open the PACTware.exe.config using Notepad. Change:
   `<startup>
   <supportedRuntime version="v1.1.4322"/>
   ` to
   `<startup useLegacyV2RuntimeActivationPolicy="true">
   <supportedRuntime version="v4.0"/>
   ` and save the file.

3. Restart PACTware 3.6, launch registration from SVI FF DTM and the registration dialog successfully opens.
17. Using ValVue 3 and the SVI FF DTM to Change Link Master Configuration

This section gives instructions for changing the Link Master configuration of an SVI FF from Link Master to Basic Device or vice versa. This is useful if another device on the segment has been designated the Link Master or when the SVI FF is selected as the Primary or Secondary Master.

Most DCS systems control/change the Link Master configuration of the device according to network settings. We recommend to follow that procedure; therefore, this procedure is not often used.

Instructions

WARNING

This procedure should be done before the valve is put in service. If done later:

- If the positioner is the active link master, switching to basic device will stop the control.
- Take all necessary steps to protect a running process and personnel. This procedure impacts on a running process.
- Isolate the valve if it is in service.
- Ensure the Resource and Transducer blocks are in OOS mode.

1. Ensure you have taken all precautions in the Warning above.

2. Open ValVue 3, select the required SVI FF device and connect.
3. Select **Security > Procedures and Methods** and Figure 173 appears.

![Figure 173 Procedures and Methods](image1)

4. Click all boxes for **Restart Device**.

5. Select **Security > Parameter Change Access** and Figure 174 appears.

![Figure 174 Parameter Change Access](image2)

**NOTE**

To assign these privileges a person with ValVue 3 Administrator privileges.
See the ValVue 3 software user manual (GEA31426 Masoneilan Products
ValVue 3 Software Manual) or the online help.

6. Select **Network Settings** and then **Link Master Configuration**.
7. Select **Identification > Network Settings** (Figure 175). To access this tab you must have **Planning Engineer** level privileges.

8. Change from **Basic** to **Link Master** by:
   a. Putting Resource block and Transducer block in OOS by clicking **OOS** in the icon bar for both.
   
   ![Network Settings](image)
   
   **Figure 175 Network Settings**
   
   b. Clicking the **Link Master** radio button and the message in Figure 176 appears.
   
   ![Change Link Master Configuration](image)
   
   **Figure 176 Change Link Master Configuration**
   
   c. Clicking **OK**.

9. Select **Identification > Network Settings** and **Restart Device** button.

   **NOTE**  
   To avoid accidental changes in the Link Master configuration, change user privileges back after the procedure is complete.

10. Restore original security settings.
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18. Advanced Usage

Technology to Maximize Savings and Process Performance

This section shows examples of techniques for achieving superior process results by using ValVue with SVI FF to simplify maintenance and to achieve the benefits of SVI FF’s advanced diagnostics capabilities. It is assumed that you are using HART® communications with a modem and ValVue.

Tight Shutoff Application to Protect from Seat Erosion

Program the Tight Shutoff feature to prevent valve seat erosion using the full actuator force to eliminate damaging leakage. At a position setpoint of 2%, for example, this function allows full thrust to occur when the input signal is less than 2%. This solves a common cause of valve repair. Do not use tight shutoff if it is necessary to throttle the valve at very small flows.

Tight Shutoff Application to High Pressure Liquid Letdown Valve Trim

When staged trim is used in High Pressure Liquid Letdown Valves, adjust the Tight Shutoff to move the valve from the seat to begin throttling at the minimum operable CV level. Using the tight shut-off feature in SVI FF prevents valve seat damage that can occur when throttling at clearance flows. See recommended Tight Shutoff settings in Table 5. Adjust Tight shutoff using front panel pushbuttons, with ValVue or a HART® communicator.

Table 5  Tight Shutoff Parameters for High Pressure Liquid Letdown Trim

<table>
<thead>
<tr>
<th>Masoneilan Valve Type</th>
<th>Valve Trim Type</th>
<th>Set Tight Shutoff</th>
<th>Positioner Characteristics</th>
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<tr>
<td>Lincoln Log</td>
<td>Any</td>
<td>15%</td>
<td>Linear</td>
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<td>Varilog</td>
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<td>Class V Shutoff</td>
<td>2%</td>
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# DIRECT SALES OFFICE LOCATIONS

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