SVI™ FF DTM Software

Online Help Manual (Rev. C)

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™ software** version 3.61 or higher
    - 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.valves.bakerhughes.com.

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Contents

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1. Introduction

SVI FF DTM Introduction

The **Masoneilan™** 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.

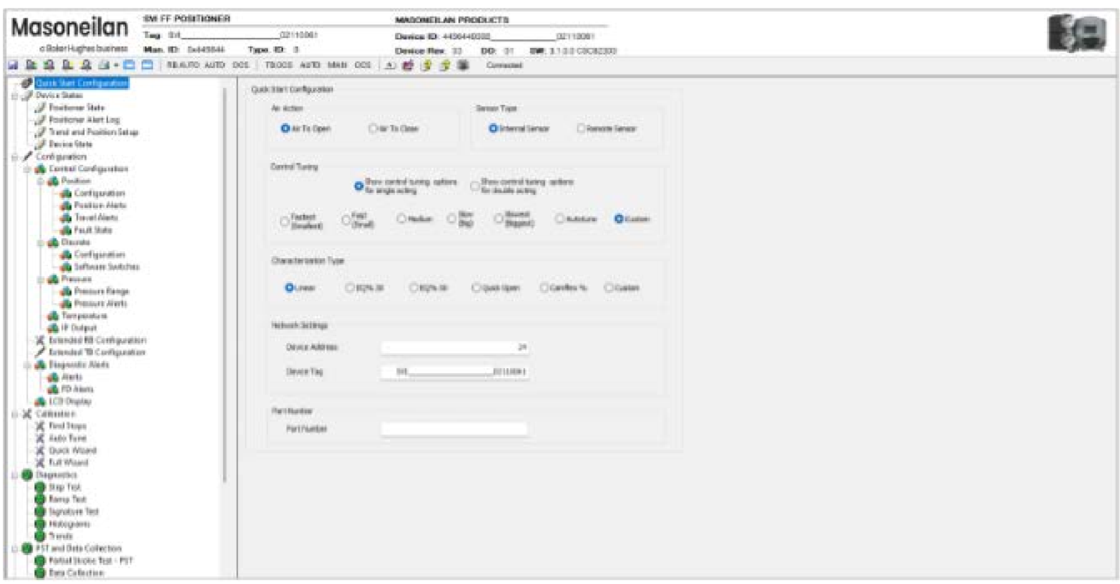


Figure 1 – SVI FF DTM

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

Feature	Sub-feature	Advanced	Standard
Device States	Positioner State	X	X
	Positioner Alert Log	X	X
	Trend and Position Setup	X	–
	Device State	X	X
Configuration	Control Configuration	X	X
	Extended RB Configuration	X	–
	Extended TB Configuration	X	–
	Diagnostic Alerts	X	X
	LCD Display	X	X
Calibration	Find Stops	X	X
	Auto Tune	X	X
	Quick Wizard	X	–
	Full Wizard	X	–
Diagnostics	Step Test	X	–
	Ramp Test	X	–
	Signature Test	X	–
	Histograms	X	–
	Trends	X	–
Partial Stoke Test - PST		X	X
Data Collection		X	X
Identification		X	X
Security		X	–
Print		X	X
Write Notes		X	X

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
- Perform PST test and Data Collection

FF Function Blocks

FF contains the following function blocks:

Block Type	Description	Supported Modes
AO (Analog Out) block	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.	RCas, Cas, Auto, Man, (LO), (IMAN), O/S
TB (Transducer) block	Located between hardware I/O (actuator, sensor) and AO/ DI func-tion blocks. This block passes the control signal from the AO func-tion block to the I/P module to control the valve position. It represents all the functionality of the electronic interface to the physical valve.	Auto, O/S
DI (Discrete Input) block (two available)	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.	Auto, Man, O/S
SPLT (Output Splitter) block	Provides the capability to drive two control outputs from a single input. Each output is a linear function of some portion of the input.	Cas, Auto, (IMAN), O/S

PID block	Offers PID process control function.	ROut, RCas, Cas, Auto, Man, (LO), (IMAN), O/S
Resource block	Manages the information needed by the fieldbus network management including block scheduling and device identification, etc.	Auto, O/S
DO (Discrete Output) block (two available)	Provides a discrete value to generate a discrete output signal.	O/S, LO, Iman, Man, Auto, Cas, RCas
AI (Analog Input) block (three available)	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.	O/S, Man, Auto
MAI (Multiple Analog Input) block	Provides a way to receive eight analog variables from other modules or physical inputs.	O/S, Man, Auto
IS (Input Selector) block	Provides four analog inputs that are selected by an input parameter or according to a criterion as first good, maximum, minimum, middle and average.	O/S, Man, Auto
AR (Arithmetic) block	Calculates some pre-defined equations ready for use in applications as flow compensation, HTG, ratio control and others.	O/S, Man, Auto
CS (Control Selector) block	Selects among highest, lowest, or average of two or three inputs (from other blocks). Provides balanceless transfer of signals.	O/S, IMan, Man, Auto

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 Baker Hughes 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://valves.bakerhughes.com/resource-center*

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 31426 Masoneilan Products ValVue 3 Software Manual.
- 31030 SVI FF Digital Positioner Quick Start Guide
- 31031 SVI FF Digital Positioner Instruction Manual
- 31457 SVI FF Bench Quick Start Manual.
- 32766 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 Baker Hughes at software.reg@bakerhughes.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.

Note: 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.

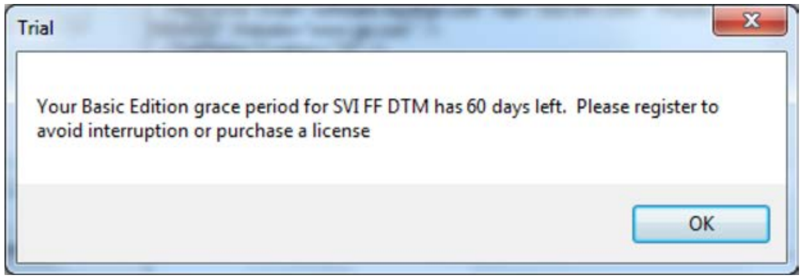


Figure 2 – Trial Registration Dialog: Newly Installed

After 30 days, you get the following trial dialog:

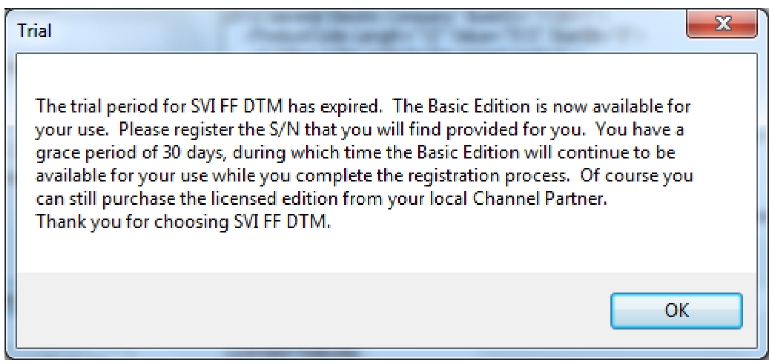
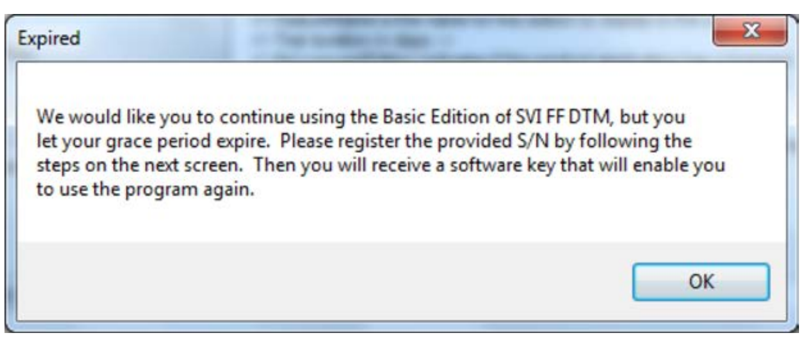


Figure 3 – Trial Period Down to 30 Days

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 Baker Hughes at software.reg@bakerhughes.com.
- *Activate License* - Required before use or at the end of the 30 day trial period.

• *Upgrade the Product* - Upgrade the product. Contact Masoneilan to discuss upgrade features options. You need to contact sales to purchase a license. Contact Baker Hughes at software.reg@bakerhughes.com.

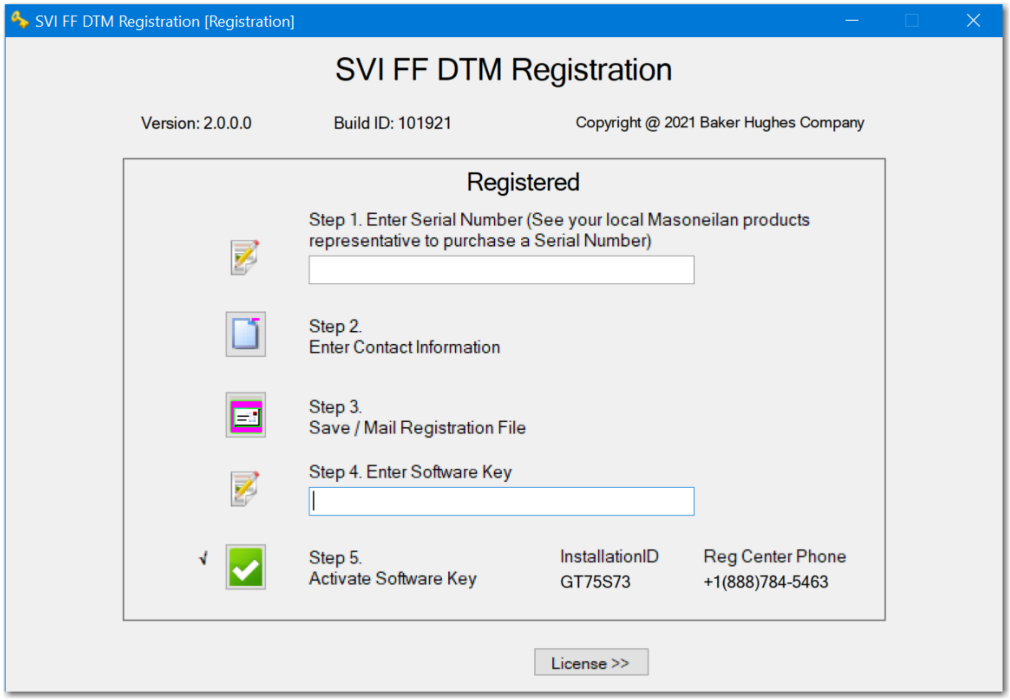


Figure 4 – SVI FF DTM Registration

Register the Product

To register the product:

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

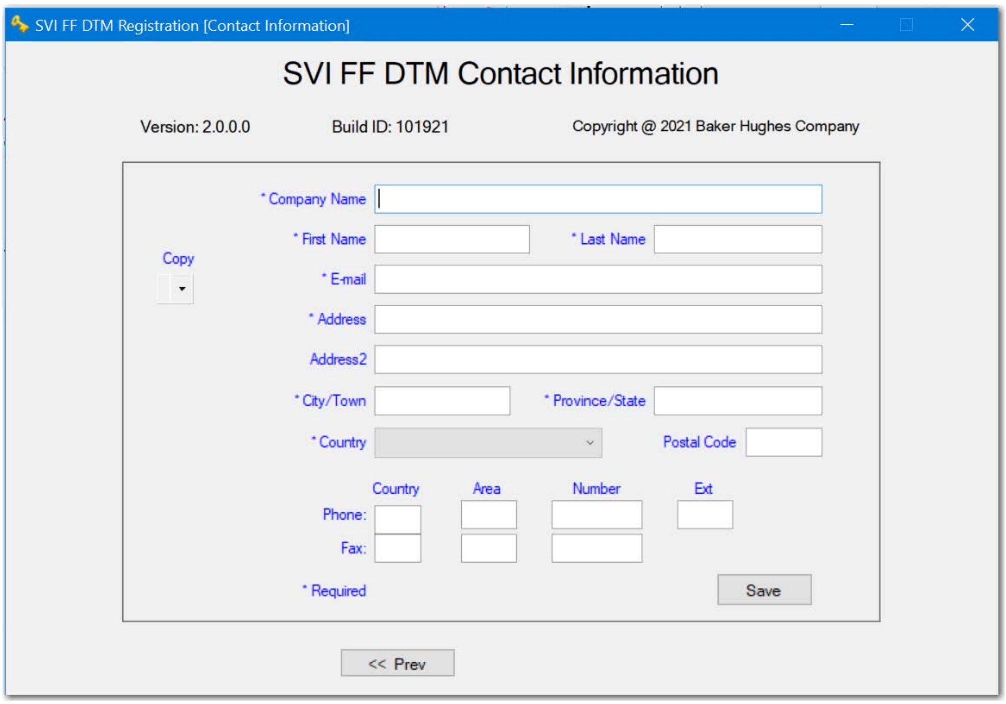


Figure 5 – Contact Information

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

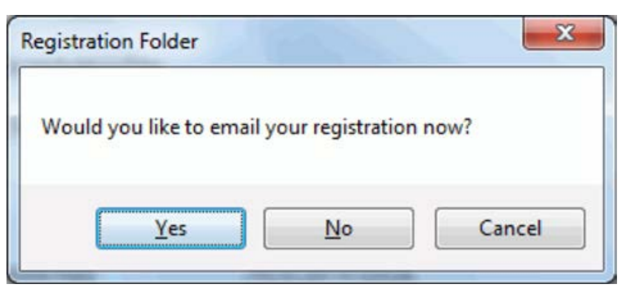


Figure 6 – Email Registration

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*.

Activate License

To activate the license:

1. Enter the emailed software key in *Step 4*.
2. Click  and *Included Features* appears.

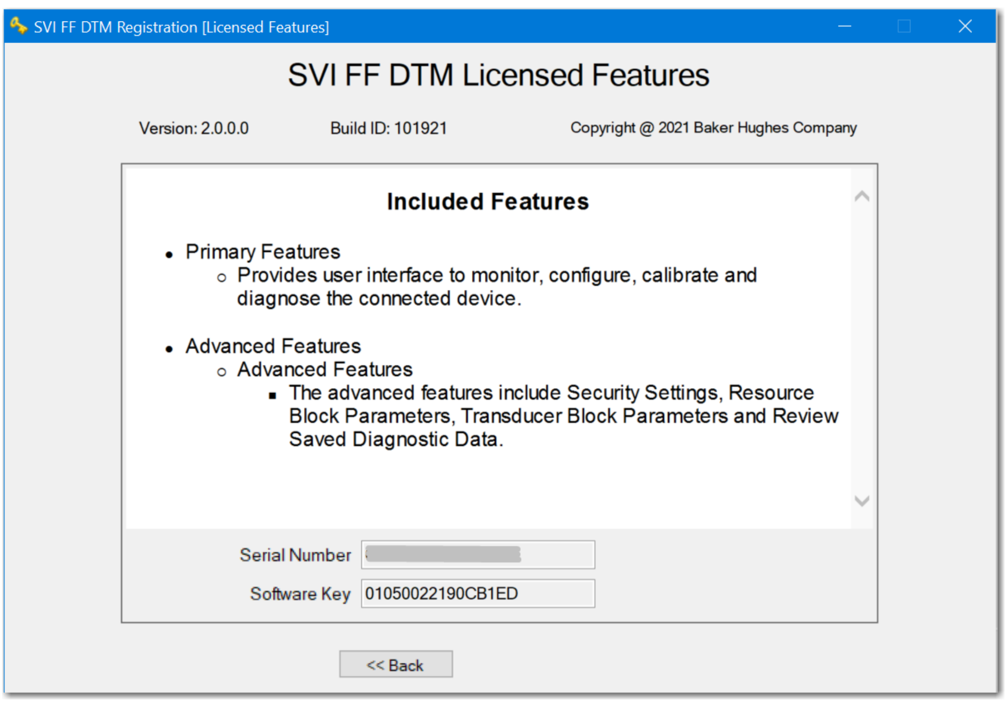


Figure 7 – Included Features

3. Click **Close**.

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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 (31031).

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:

- Windows Server® 2008 R2 SP1, Windows Server® 2008 SP2, Windows Server® 2012, Windows Server® 2016, Windows® 7 sp1, Windows® 8.0 or Windows® 10
- 4 G of RAM
- Microsoft .NET Framework 2.0 SP2, Microsoft .NET Framework 4.0 FULL, and Microsoft .NET Framework 3.5 SP1
- 10 GB of free hard disk space
- Foundation Fieldbus power supply and power conditioner, with terminators
- Additional fieldbus devices that are installed on the bus segment, optional
- An available serial communication port or USB port

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*.

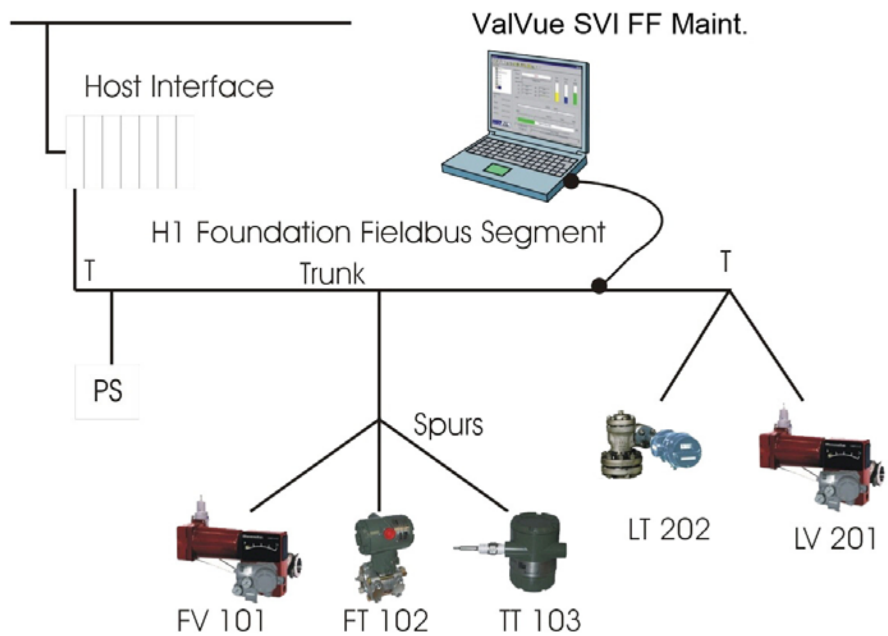

Figure 12 – SVI FF Reference Model Fieldbus Segment

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.

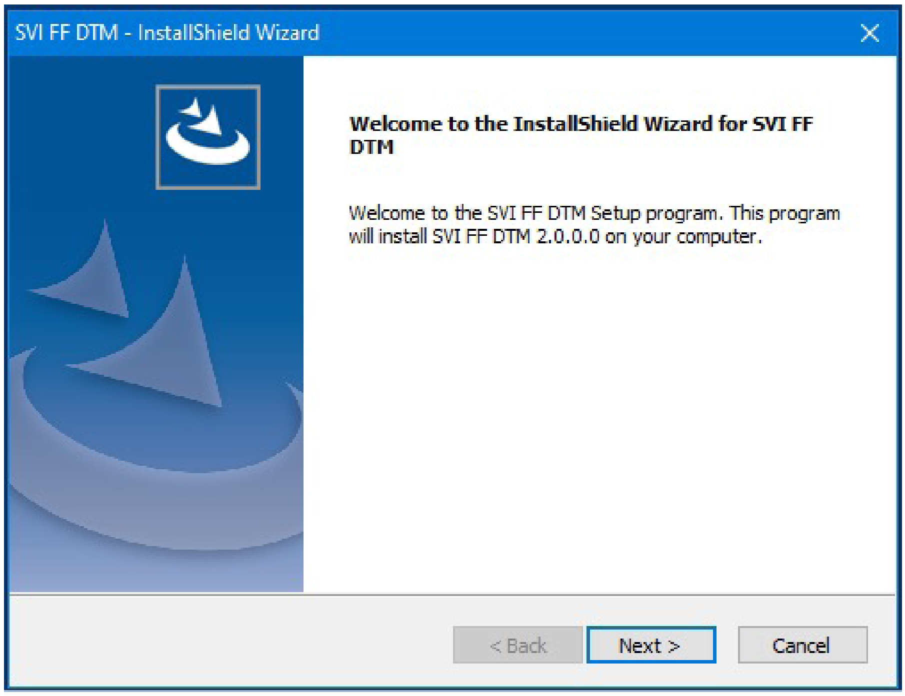

Figure 13 – SVI FF DTM Install Welcome Screen

2. Click **Next** and *SVI FF DTM License Screen* appears.

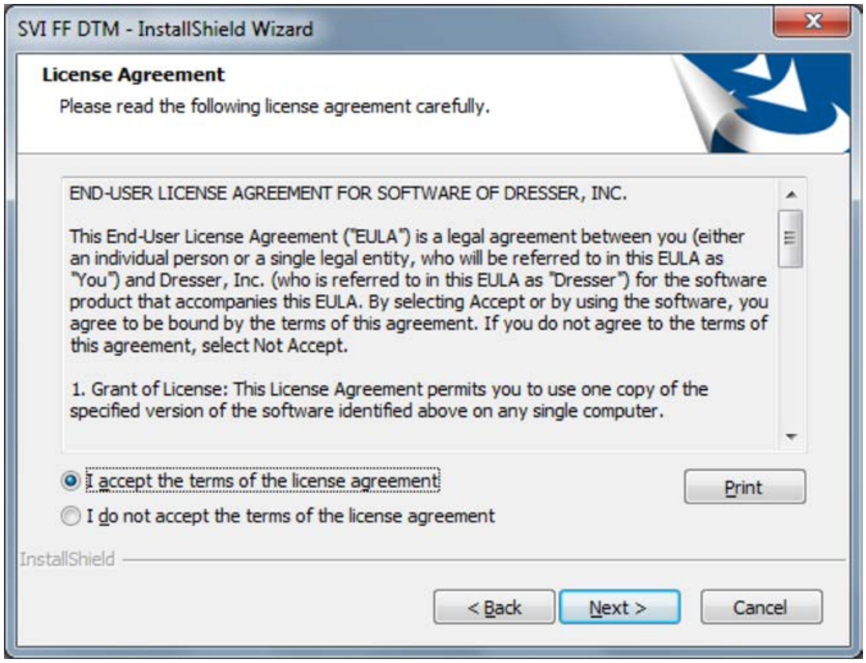

Figure 14 – SVI FF DTM License Screen

3. Click **I accept the license**....., **Next**

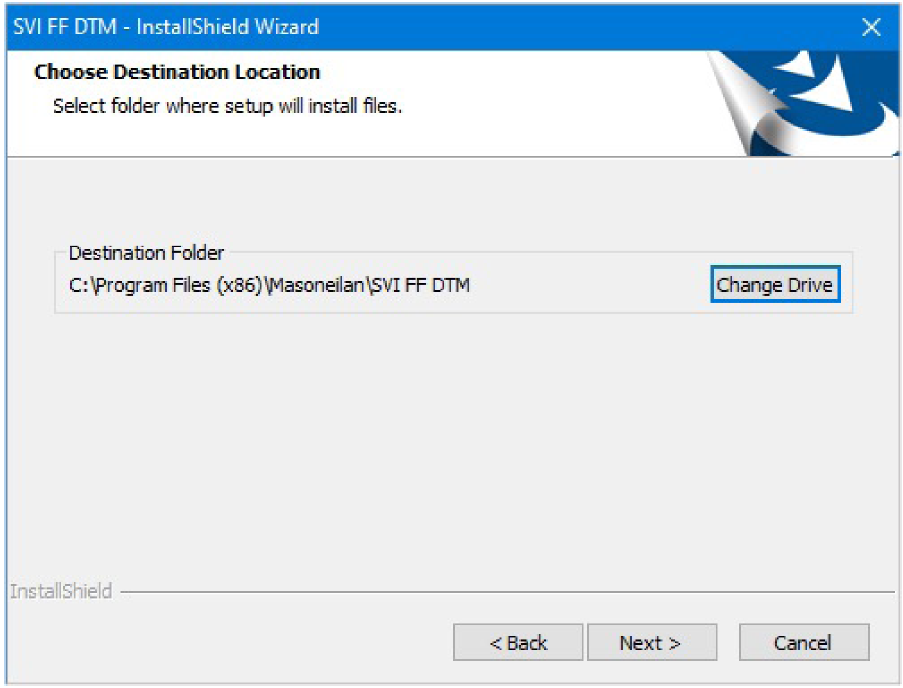

Figure 16 – SVI FF DTM Choose Destination Folder Screen

5. Click **Change** and navigate to the target directory or just click **Next** and *FF DTM Ready to Install the Program Screen* appears.

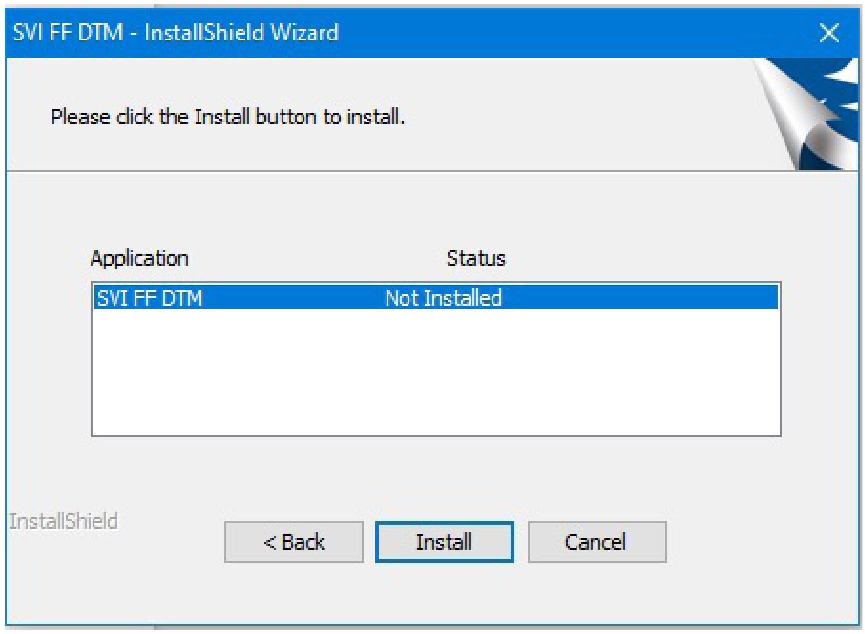

Figure 17 – FF DTM Ready to Install the Program Screen

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

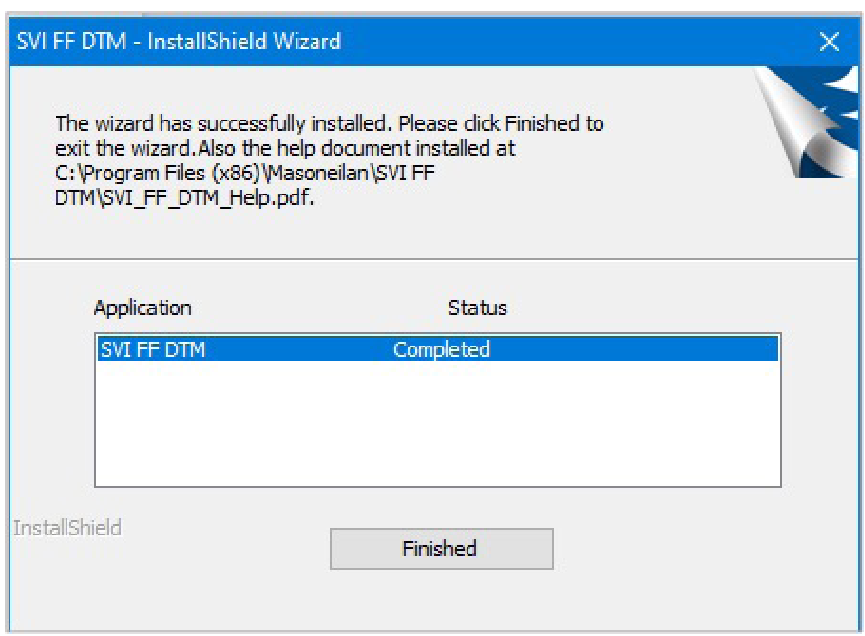

Figure 18 – FF DTM Finish Screen

7. Click **Finish**.

Failure to Communicate

If the PC (using a modem) fails to communicate with the SVI I 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.

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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.

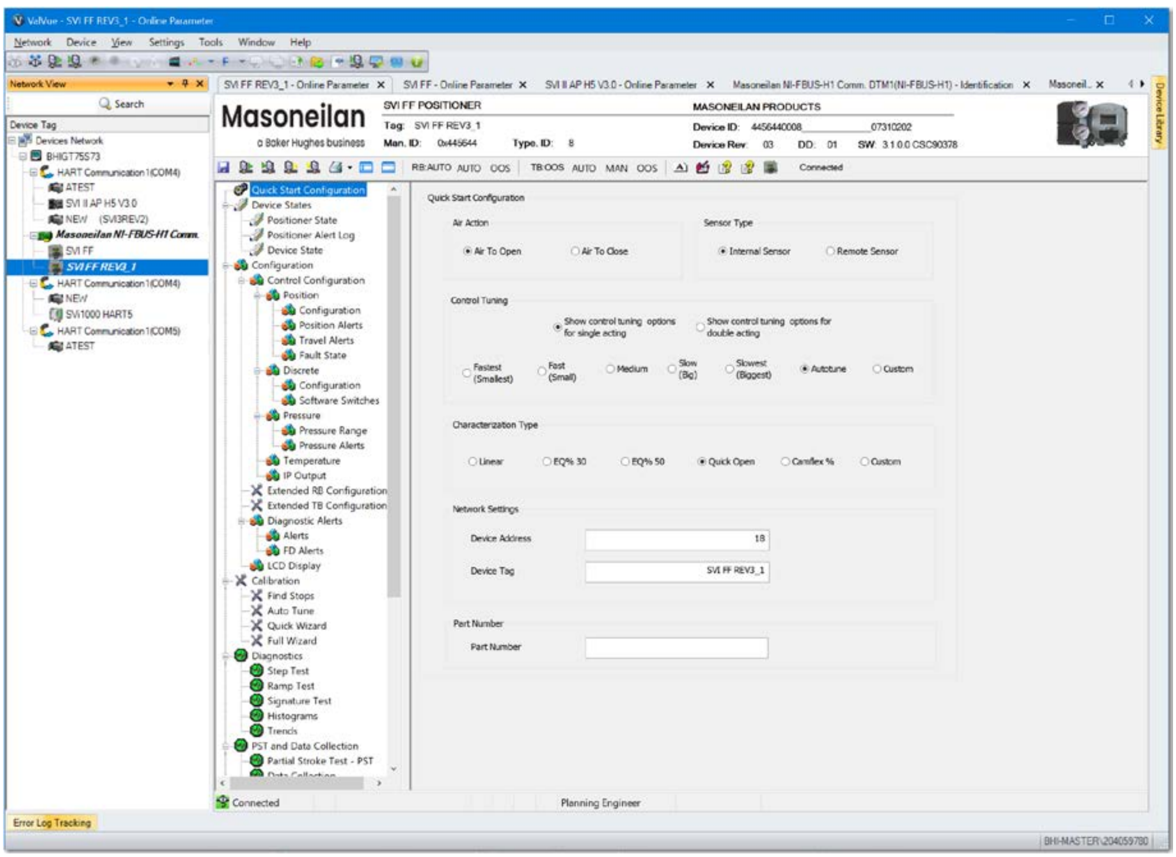


Figure 19 – SVI FF DTM Quick Start

Note: 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

Identification Area displays the positioner and software information , including device PD-Tag, Device ID, Manufacturer ID, Device Type, Device Revision, DD revision and Software version.

Figure 20 – Tag Display Area

Icon Bar

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

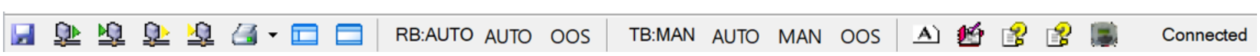
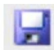


Figure 21 – Icon Bar

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.

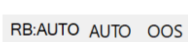

Downloads the settings from the selected tab.


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

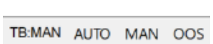
Note
The data that appears in the diagnostic tests report is dictated by whether the unit purchased has Standard or Advanced Diagnostics. If you own a Standard Diagnostics unit, the Advanced Diagnostics fields will show NA.


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.

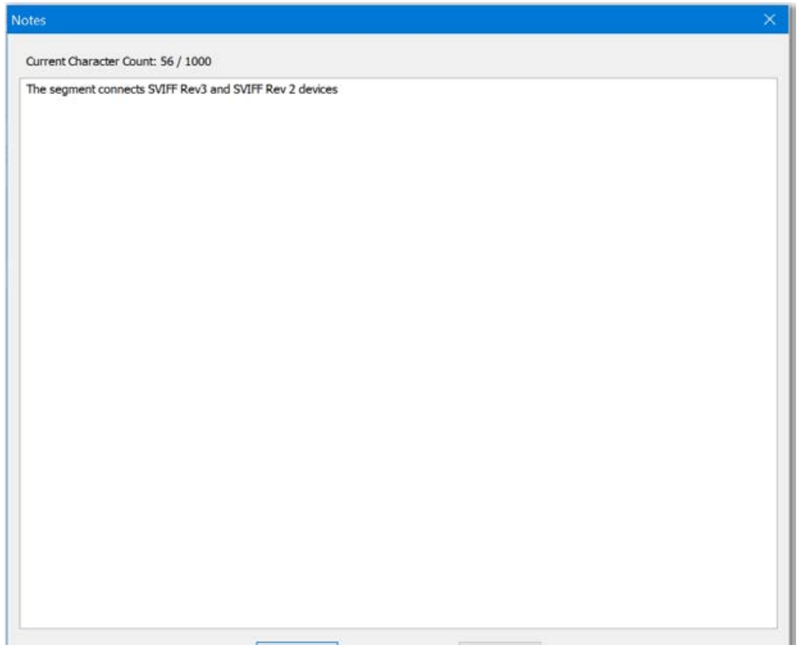


Figure 22 – Write Note

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

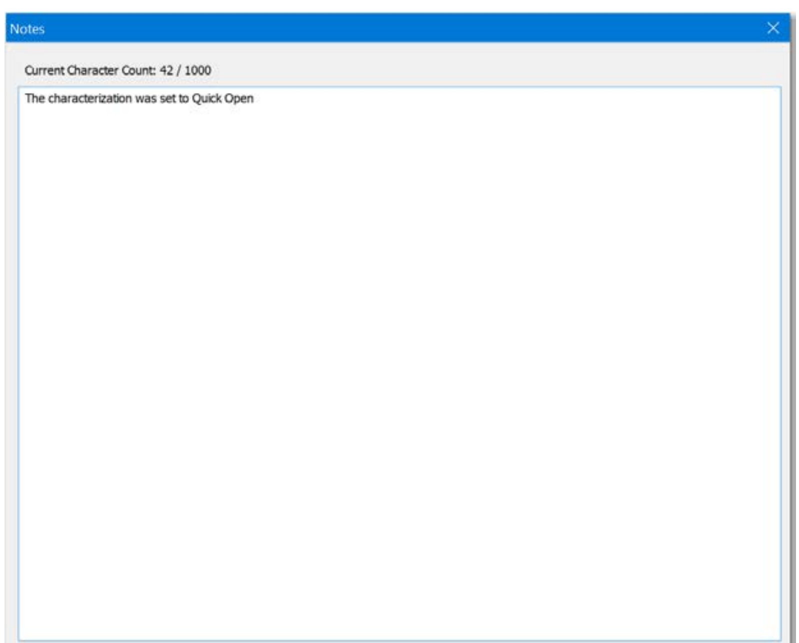


Figure 23 – Write Note For Device

Opens the DTM-related help.

Opens the device-related manual.

Opens the *About SVI FF* dialog.

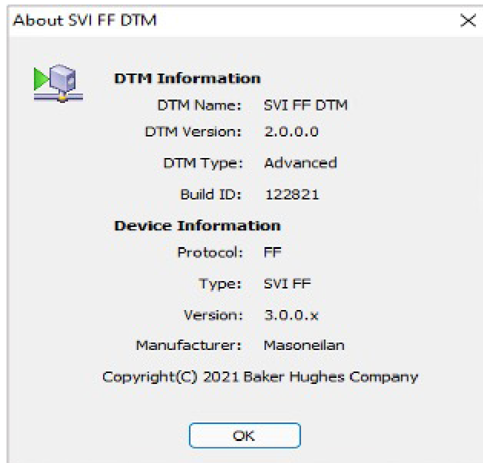


Figure 24 – About SVI

FF Displays the connection status.

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.

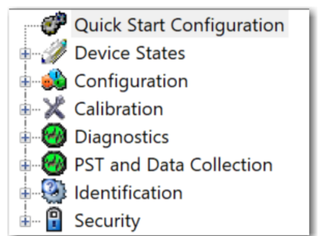


Figure 25 – SVI FF DTM Online Parameterization Directory Tree

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*).
  - Diagnostics Alerts include alert severity configuration, and FD Alert configuration and monitoring
  - 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*).
- *PST and Data Collection* - Two tabs (with sub-tabs) for performing PST test, Data collection, and uploading data triggered by device automatically.
- *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.

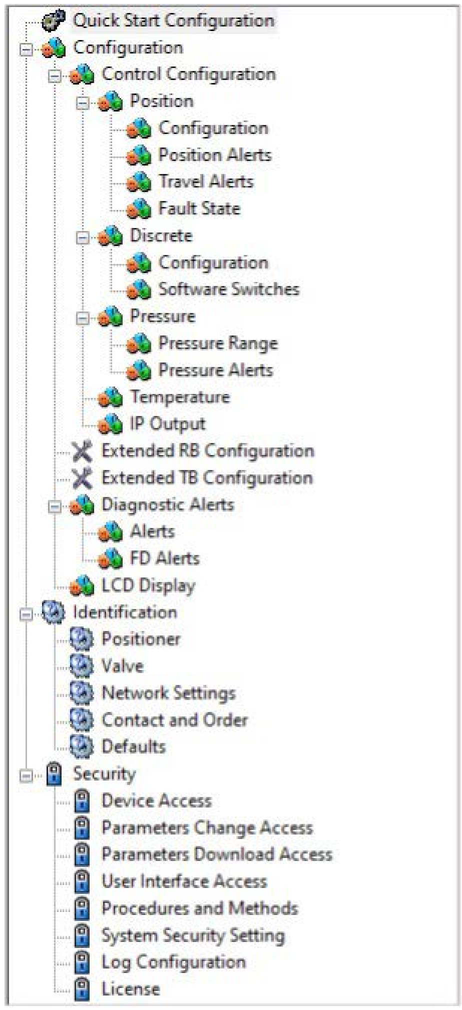


Figure 26 – SVI FF DTM Offline Parameterization Directory Tree

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*).
- *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*).
- Alerts (*Alerts*).
- FD Alerts (*FD Alerts*).

• *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.

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5. How Do I Do Offline Parameterization?

Offline Parameterization

CAUTION

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

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

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6. 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 live connected. 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 an 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
  - Diagnostic Alert Configuration: Configuring the alert trigger condition, and FD alerts per NE-107 standard.
  - Review of Configuration: Reviewing of 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).
- PST and Data Collection (For SVIFF REV3 only): Configuring/running PST and Data Collection, and managing test result.
- 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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7. Quick Start Configuration

From Quick Start Configuration screen you can rapidly setup the SVI FF by configuring some basic parameters.

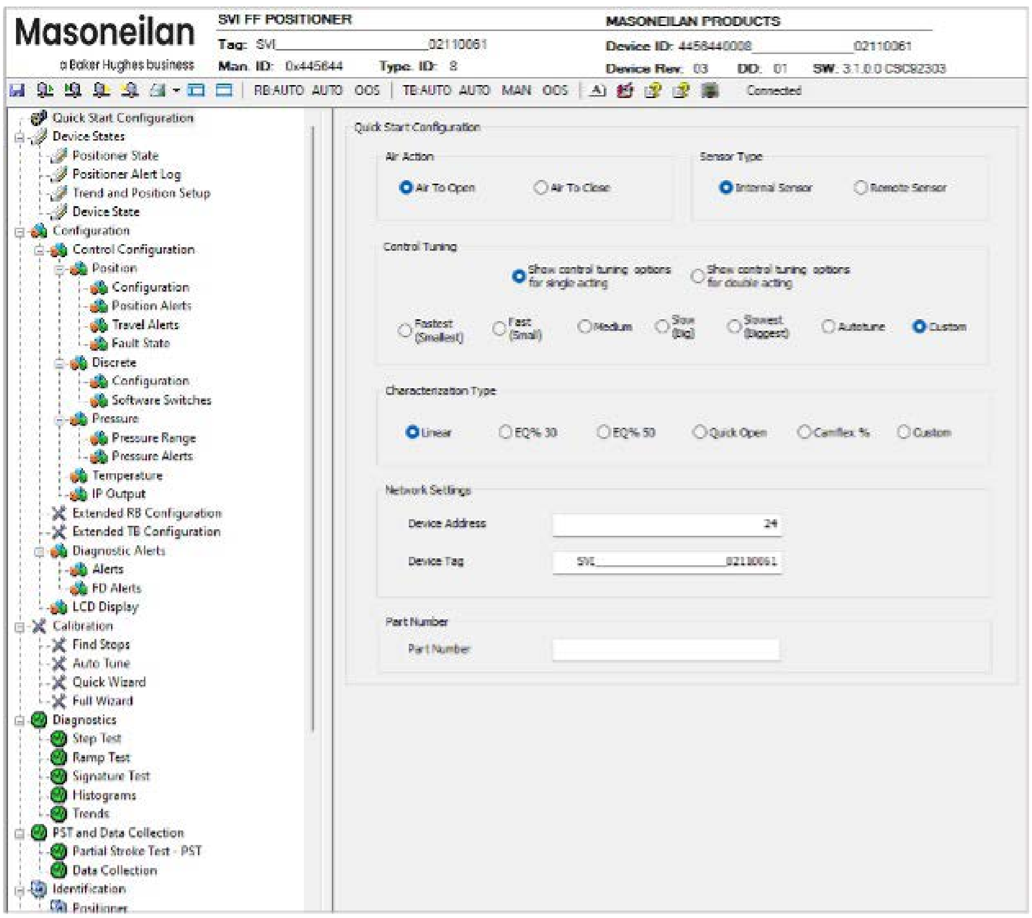
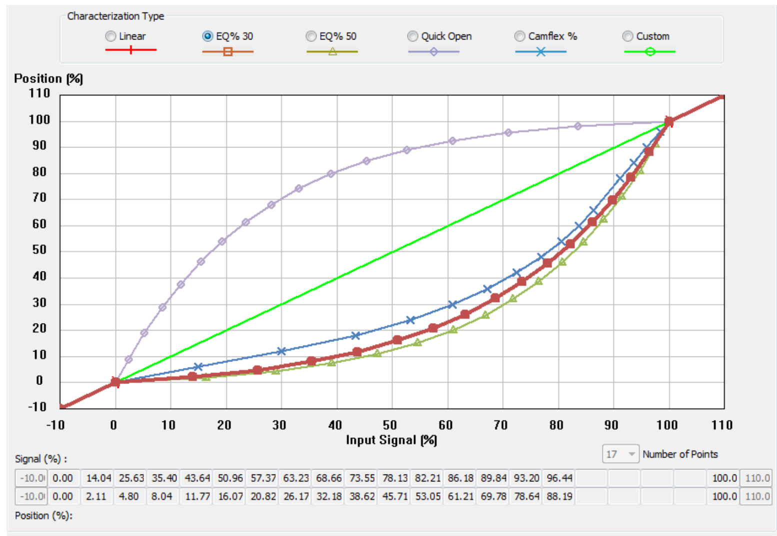


Figure 46 – Quick Start Configuration

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

Valve Position %



Input Signal %

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.

Network Settings

Device Address Enter the device address.

Device Tag Enter the tag.

Part Number

Part Number Enter the part number.

Run the Quick Start Configuration

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.

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8. 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.

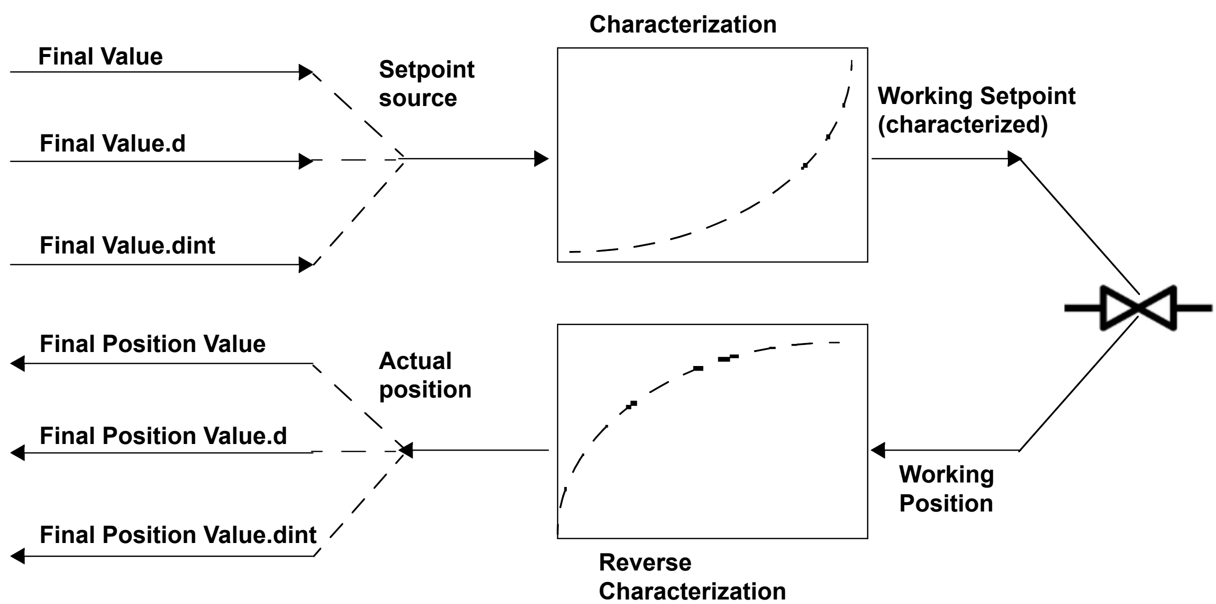


Figure 48 – ValVue SVIFF Setpoint to Position Schema

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

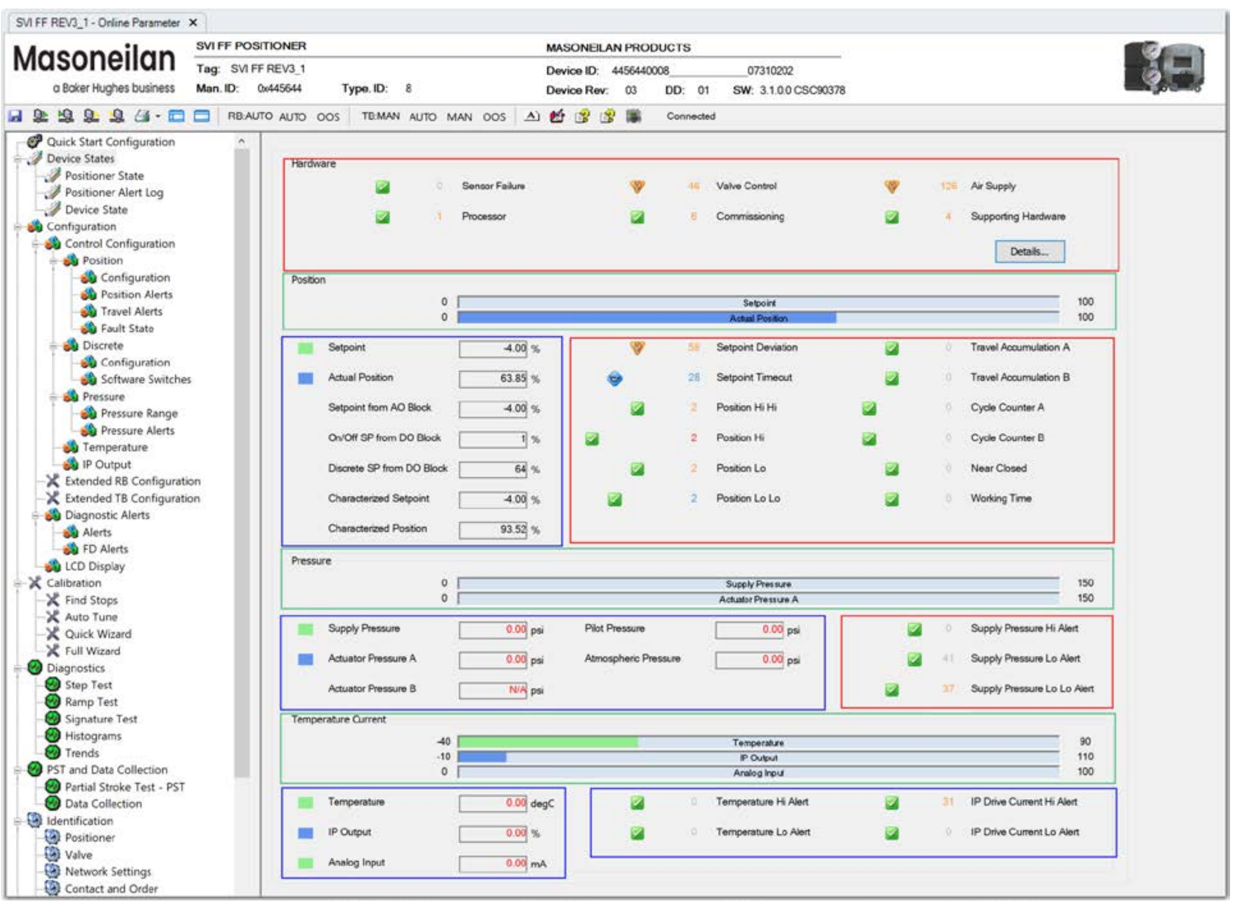


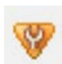
Figure 49 – Positioner State

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.

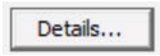
Processor Indicates a processor failure. If the processor failure is persistent, replace the positioner.

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 during the comissioning.

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 present control state and contains a button to set the state back to Normal.

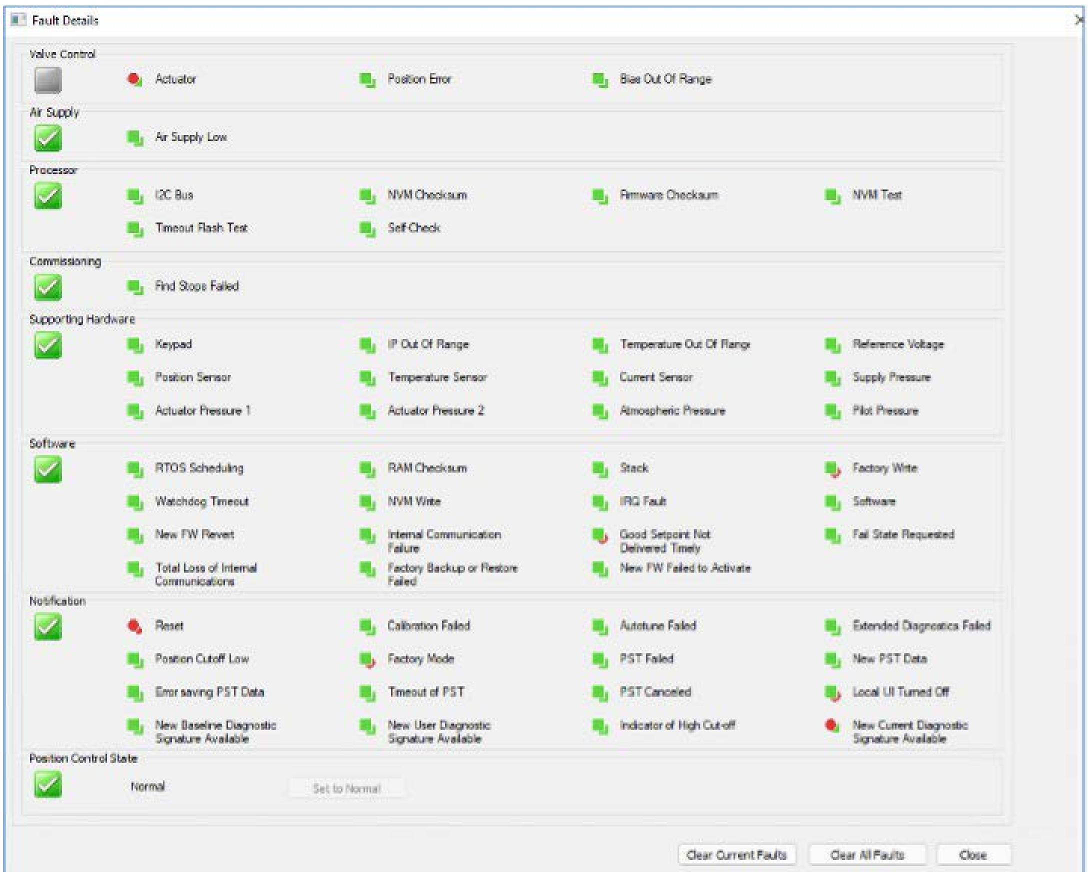


Figure 50 – Fault Details

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 decharacterization.

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	*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.

Supply Pressure Bar Graph	Displays a bar graph of the detected supply pressure.
Actuator Pressure A Bar Graph	Displays the detected actuator pressure.
Supply Pressure	Displays the detected supply pressure.
Actuator Pressure A/ Actuator Pressure B	Displays the detected actuator pressure.
Pilot Pressure	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
Atmospheric Pressure	Displays the detected atmospheric pressure.
Supply Pressure HI Alert	Indicates there is a *Supply Pressure HI* alert set. See *Supply Pressure HI Alert Tab*.
Supply Pressure LO Alert	Indicates there is a *Supply Pressure LO* alert set. See *Supply Pressure LO Alert Tab*.
Supply Pressure LOLO Alert	Indicates there is a *Supply Pressure LOLO* alert set. See *Supply Pressure LOLO Alert Tab*.
	Temperature / Current
Temperature Bar Graph	Displays the current detected temperature in a bar graph.
IP Output Bar Graph	Displays the detected *IP Output* current in a bar graph.
Analog Input Bar Graph	Display the current reading from Analog Input in bar graph.
Temperature	Displays the current detected temperature.
IP Output	Displays the detected *IP Output* current.
Analog Input	Displays the current value of Analog Input, in mA.

Temperature HI Alert / Temperature LO Alert	Indicates there is a *Temperature* alert set. See *Temperature HI Alert Tab* or *Tempera-ture LO Alert Tab*.
IP Current HI Alert/ IP Current LO Alert	Indicates there is a *IP Current* alert set. See *IP Output HI Alert Tab* or *IP Output LO Alert Tab*.

Positioner Alert Log

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

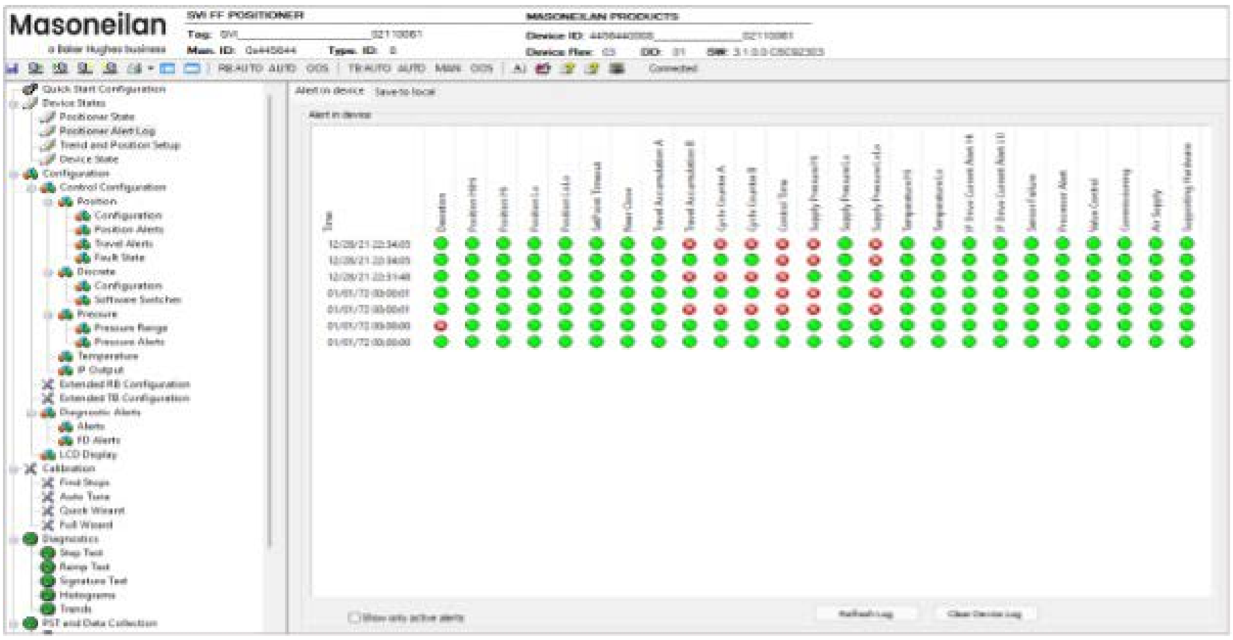


Figure 51 – Positioner Alert Log

Buttons and Fields

Alert in device	Shows a list of alert that are stored in the device.
Save to local	Shows a list of alerts that are stored in local file.
Show only active alerts	Click to filter out inactive alerts.
Refresh Log	Click to get latest alert state.
Clear Device Log	Click to clear the device's saved log file.
Clear Saved Log	Click to clear the alters that are stored in local 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*).

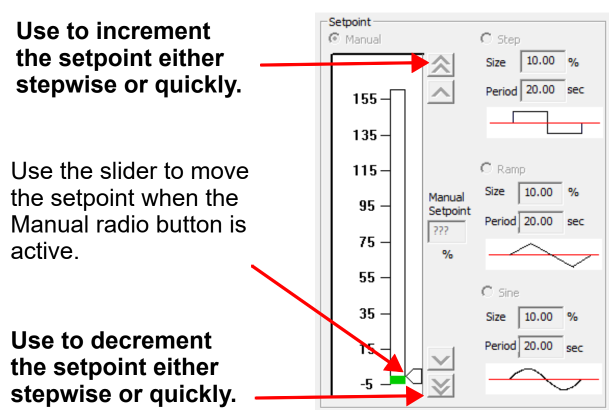


Figure 53 – Setpoint Adjustment

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*

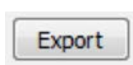
Create a Setpoint Functionality: Manual

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 

   and a *Save As* dialog appears.
3. Navigate to the required directory and click **Save**.

Configuration and States for SVI FF R2 only

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.

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

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.

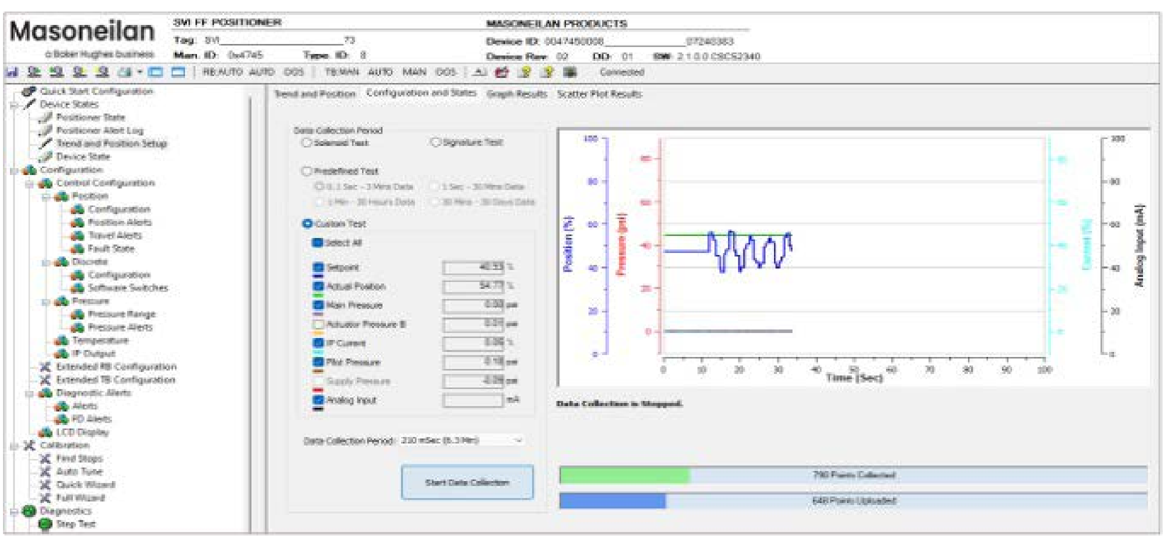


Figure 54 – Configuration and States

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.

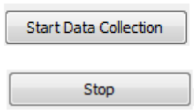
Custom Test — Select this radio button to run a test where you can configure the setpoint and/or the actual position and set the *Data Collection Period*.

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.

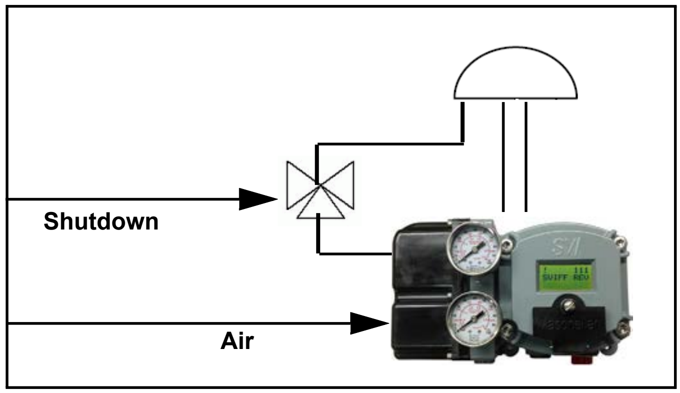


Figure 55 – General Diagram: Solenoid Test Setup

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.

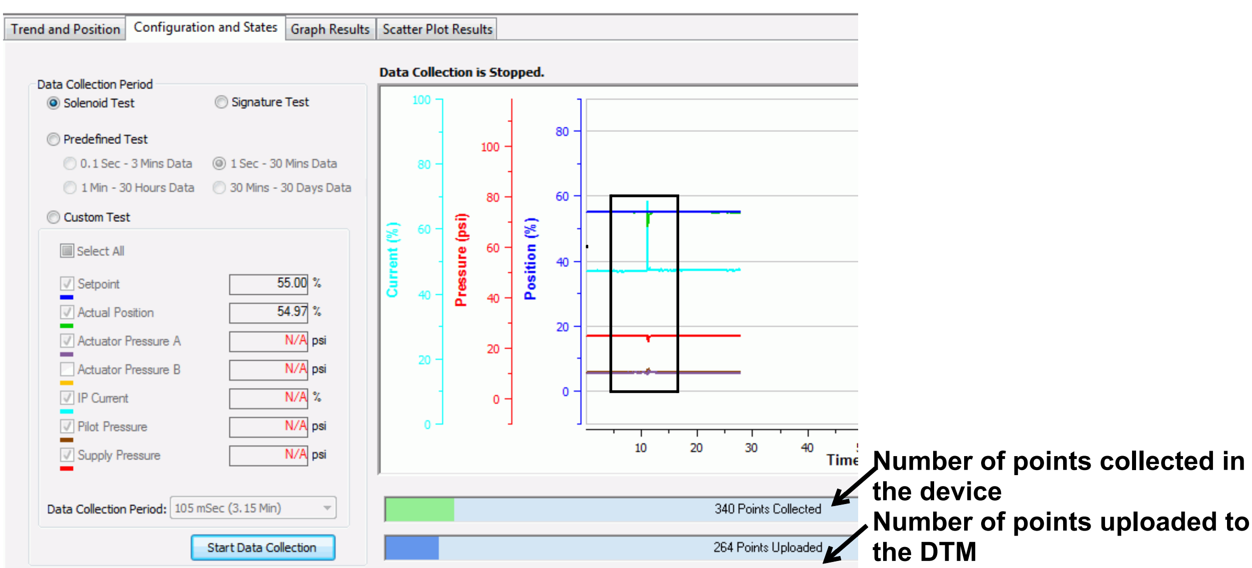


Figure 56 – Solenoid Test

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.

Use the check boxes to add/ remove traces from the graph

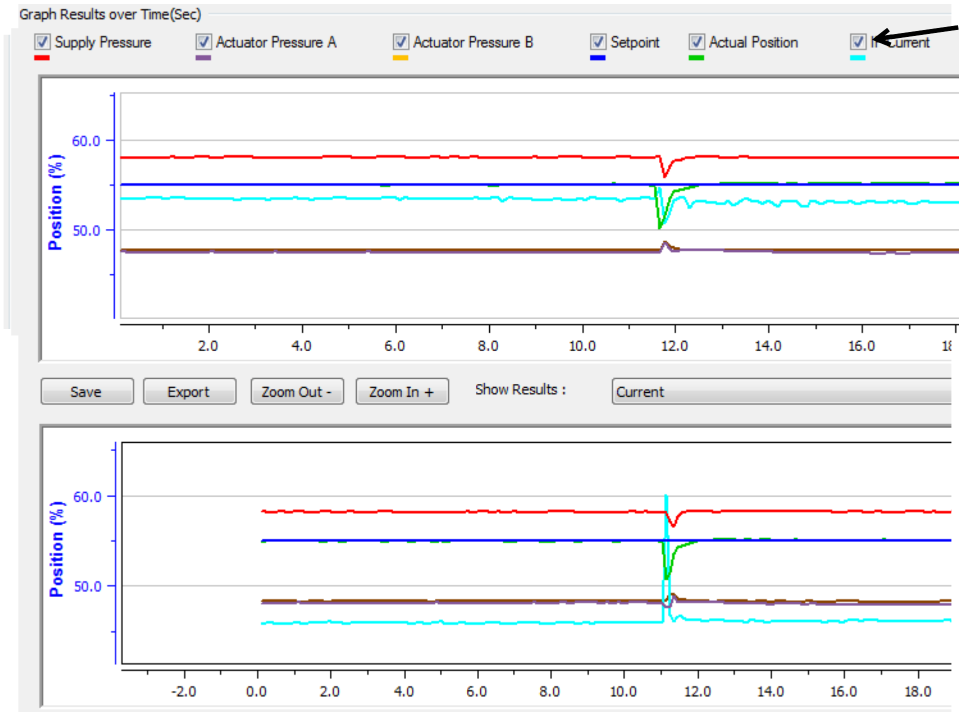
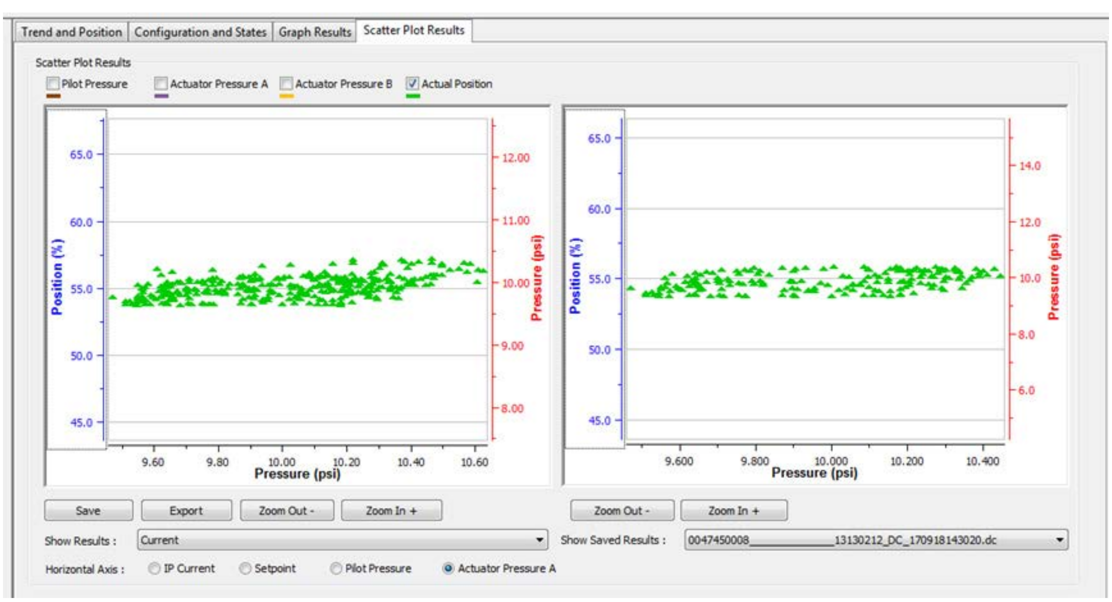


Figure 57 – Graph Results Tab: With a Comparison Curve Added

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.



Use the pulldowns to select historical curves

Figure 58 – Scatter Plots Results

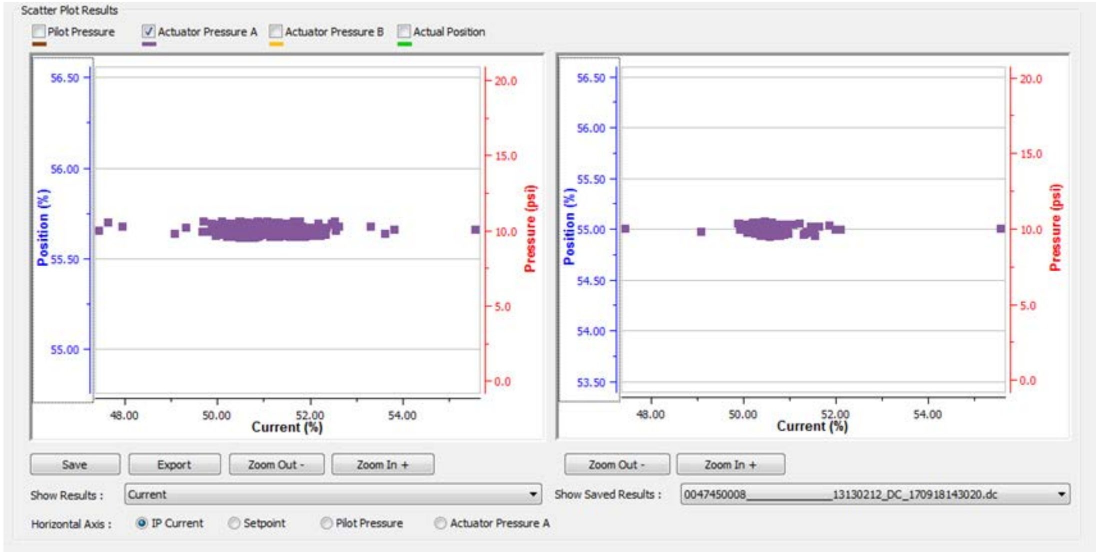


Figure 59 – Scatter Plots Results II

Solenoid Test: Short vs. Long Burst

You can do a text 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.

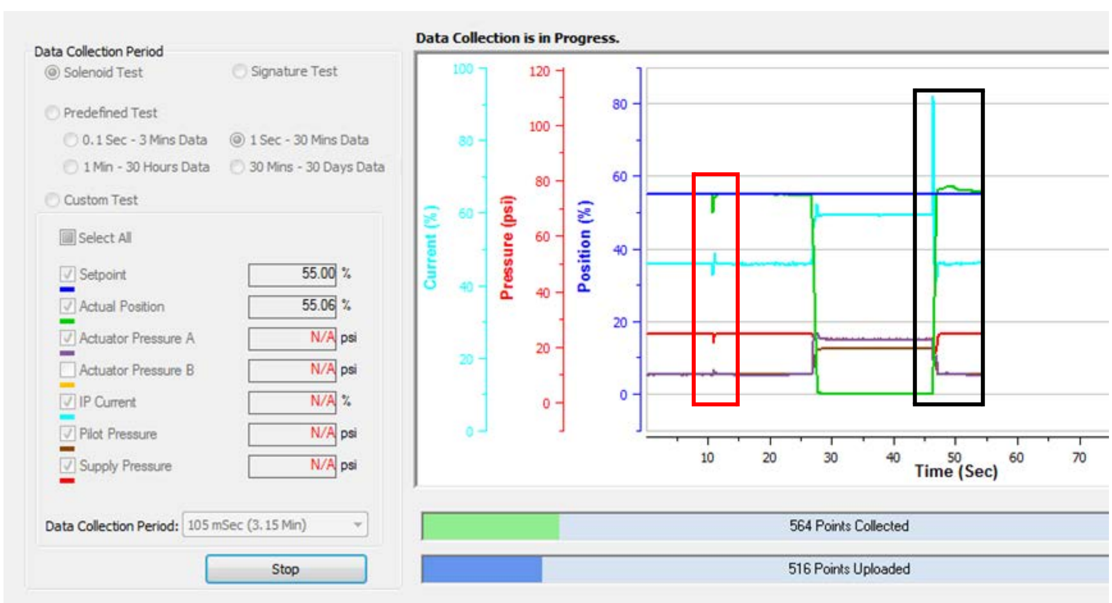


Figure 60 – Short Burst and Long Burst Solenoid Test

Run a Signature Test

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

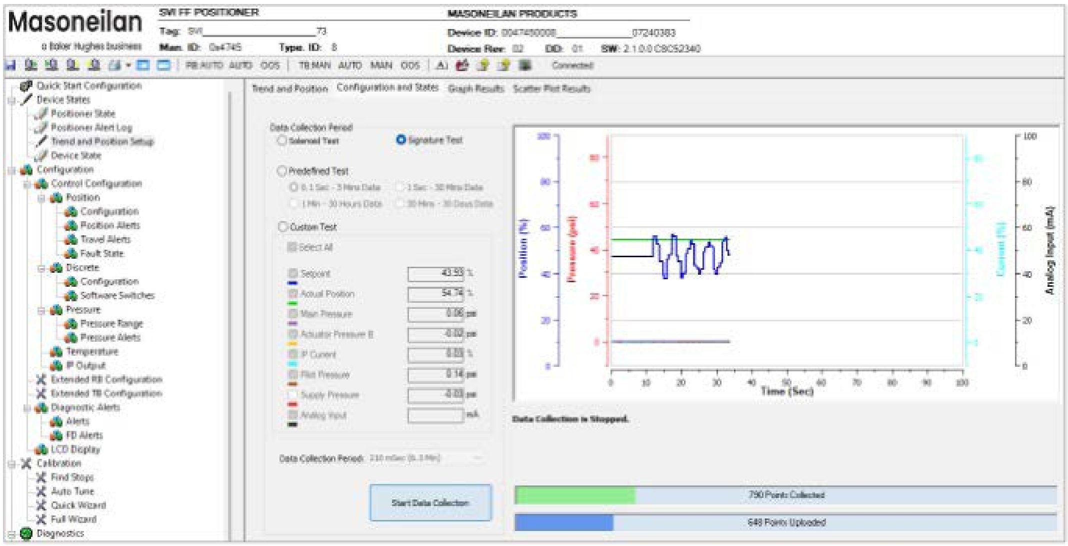


Figure 61 – Signature Test

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 57 for a scatter plots discussion.

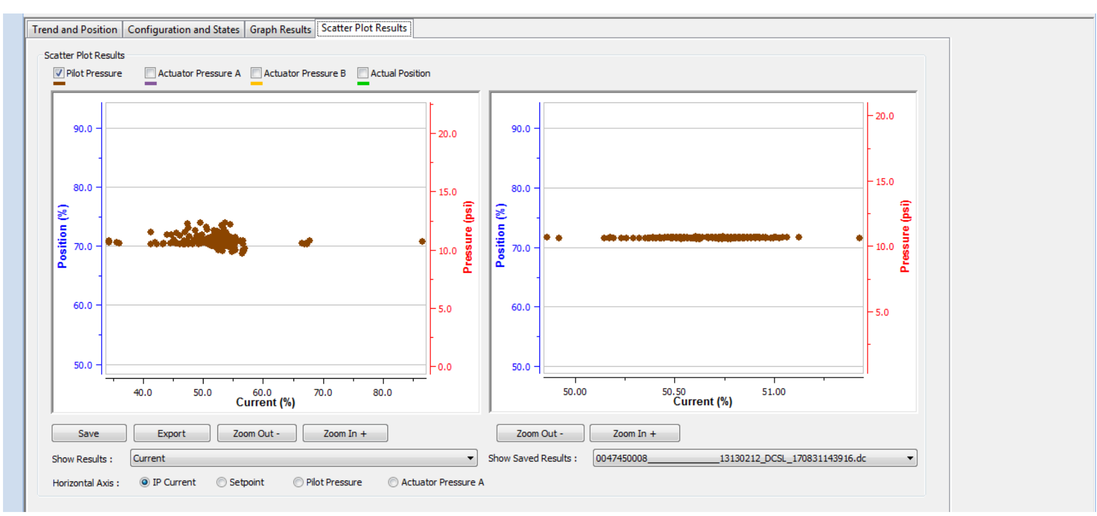


Figure 62 – Scatter Plots

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.

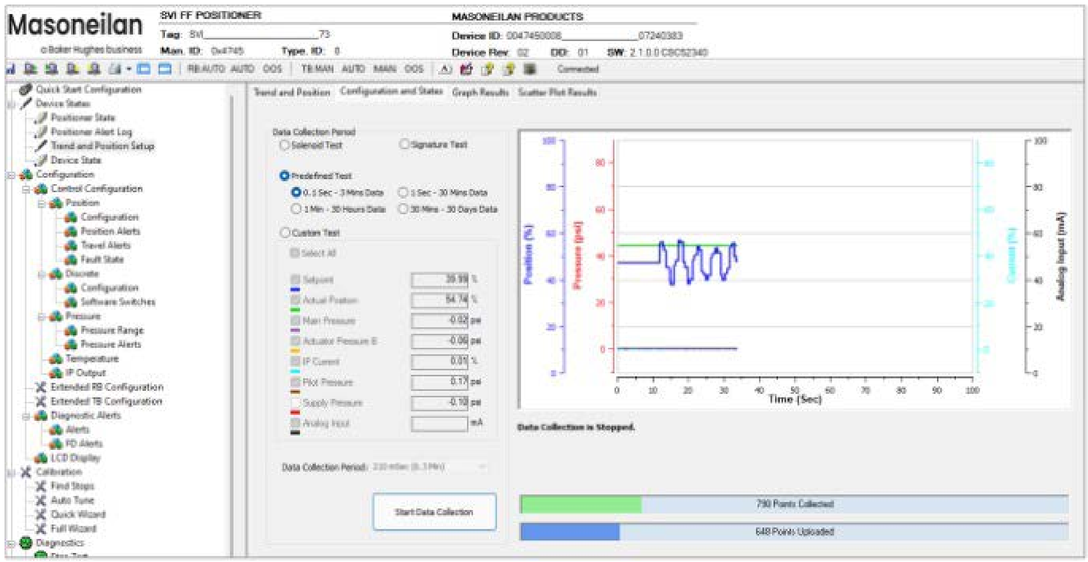


Figure 63 – Predefined Test

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.

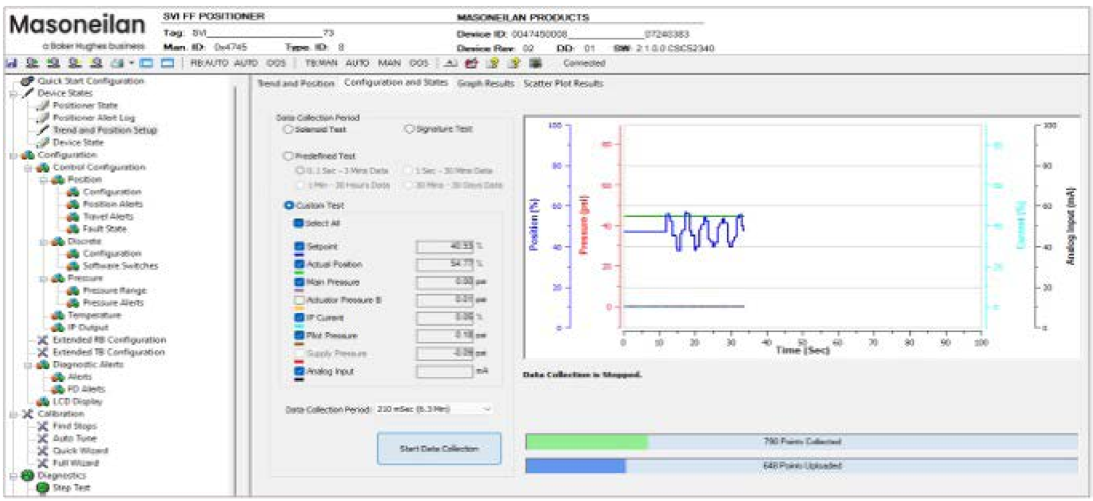


Figure 64 – Custom Test

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

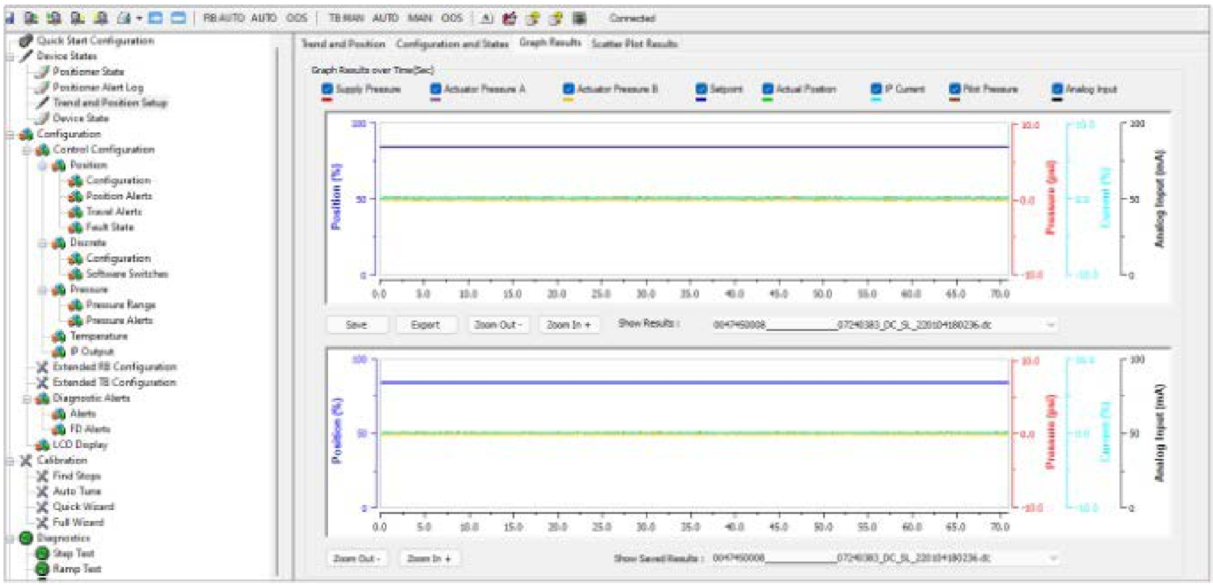


Figure 65 – Graph Results

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.

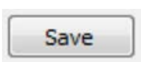
Position vs. *Time (sec)* vs. *Pressure* graph

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.

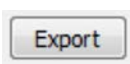
Use the checkboxes above the graph to activate/deactivate the following traces:

- 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 green line represents the *Actual Position*.
- The light blue line represents the *IP Current*.
- The brown line represents the *Pilot Pressure*.
- The black line represents the *Analog Input*.



Save

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

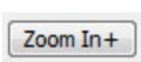


Export

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

Zoom Out -

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



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.

Scatter Plot Results

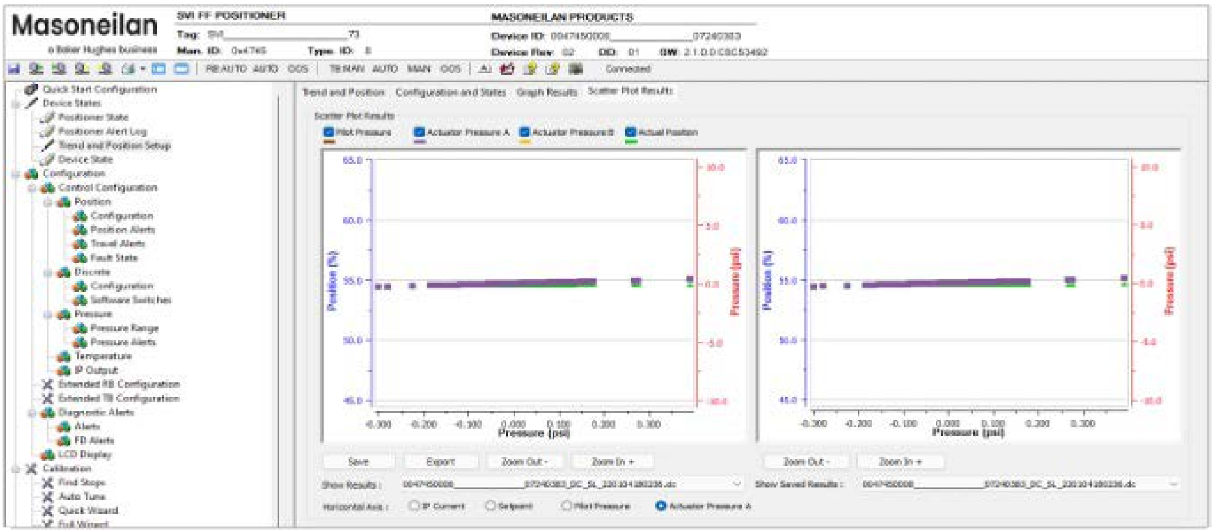
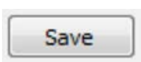
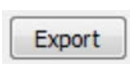
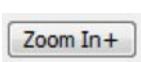


Figure 66 – Scatter Plots Results

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.

Position vs. *Time (sec)* vs. *Pressure* graph	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 time. - *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*.
 *Save*	Click to save the results. You can load back the result in the selection *Show Saved Result*.
 *Export*	Exports the results as a .csv file. See *Export Step Test Results* for instructions.
 *Zoom Out -*	Toggles the view out according to preset values to two times.
 *Zoom In +*	Toggles the view in according to preset values to 50%.
Show Results	*Show Results* 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.
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.

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.

Note: For information on particular parameters and operations refer to FOUNDATION fieldbus documents FF890-FF984.

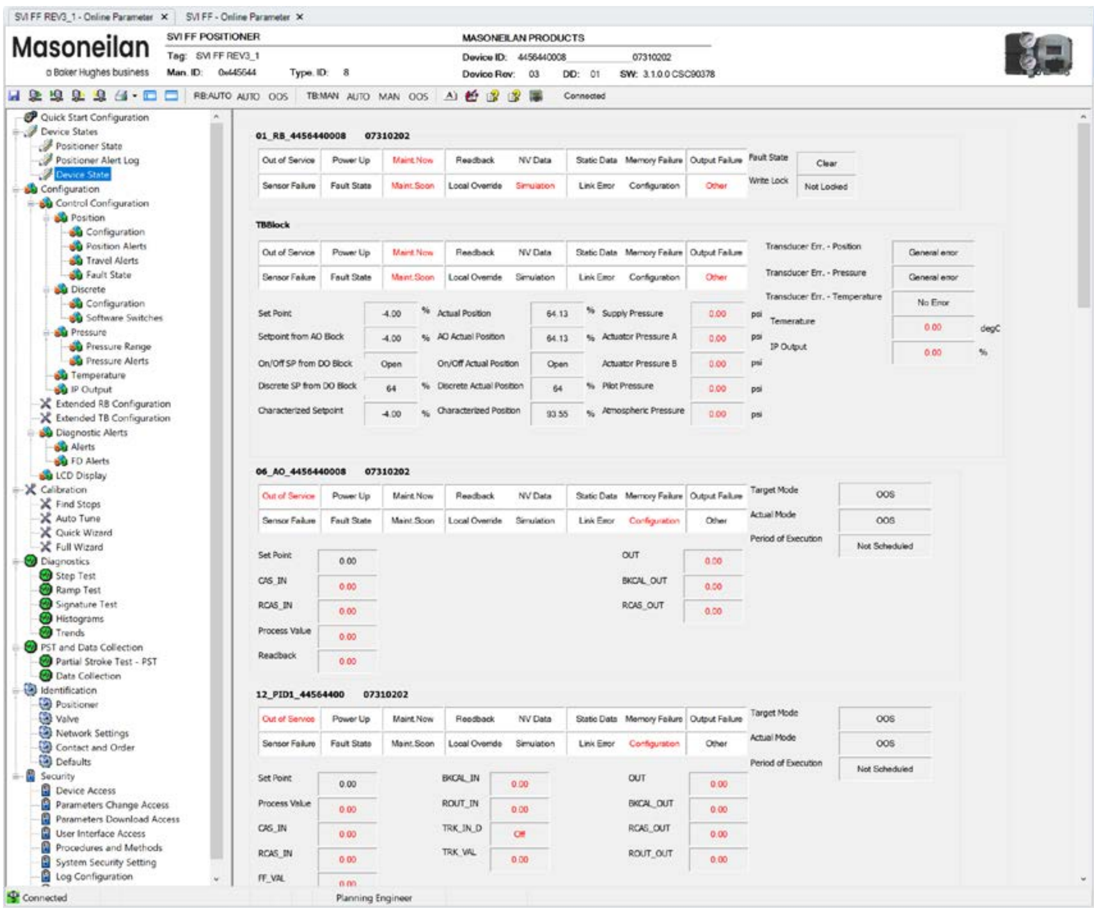


Figure 67 – Device State

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
Setpoint	Displays the present TB block working setpoint,
Setpoint from AO Block	Displays the last setpoint value output from the AO block.
On/Off Setpoint from DO Block	Indicates whether the setpoint is coming from the DO block.
Discrete Setpoint from DO Block	Indicates whether the setpoint is coming from the DO block.
Characterized Setpoint	Displays the characterized setpoint.
Actual Position	Displays the present TB block position.
AO Actual Position	Displays the present AO block position.
On / Off Actual Position	Displays whether or not the TB block is using actual position. Actual discrete valve position, provided to DO block as boolean.
Discrete Actual Position	Displays the present TB block actual position from DO block.
Characterized Position	Displays the characterized position.
Supply Pressure	Displays the present TB block supply pressure.
Actuator Pressure A / Actuator Pressure B	Displays the present TB block actuator pressures.
Pilot Pressure	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.
Atmospheric Pressure	Displays the present TB block atmospheric pressure.

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

Setpoint	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.

AO: Analog Output 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

CHANNEL	Displays the configured measurement channel.
OUT_D	Displays the primary discrete value calculated as a result of executing the function 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.

AI1: AI! Block Tag / AI2: AI2 Block Tag / AI3: AI3 Block Tag

CHANNEL	Displays the configured measurement channel.
OUT	Displays the 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.

MAI: MAI Block Tag

CHANNEL	Displays the configured measurement channel.
OUT_1 ....OUT_8	Displays the a block output required by the OS and analog calculate blocks.
Target Mode	Displays the target mode.
Actual Mode	Displays the actual block mode.
Period of Execution	Displays the period of the last block execution.

IS: IS Block Tag

IN_1 ... IN_4	Displays the block input value.
DISABLE_1 .... DISABLE_4	Displays the value of the parameter to switch off the input from use.
OP_SELECT	Displays the status of a forced input on a settable parameter.
OUT	Displays the block output value.
SELECTED	Displays the integer indicating the selected input number.
Target Mode	Displays the target mode.
Actual Mode	Displays the actual block mode.
Period of Execution	Displays the period of the last block execution.

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... BKCALSEL_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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9. 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.

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

$$\textit{Tight Open}_{New} = \textit{Open Stop Adjustment}_{Previous} / \textit{Open Stop Adjustment}_{New} \times \textit{Tight Open}_{Previous}$$

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.

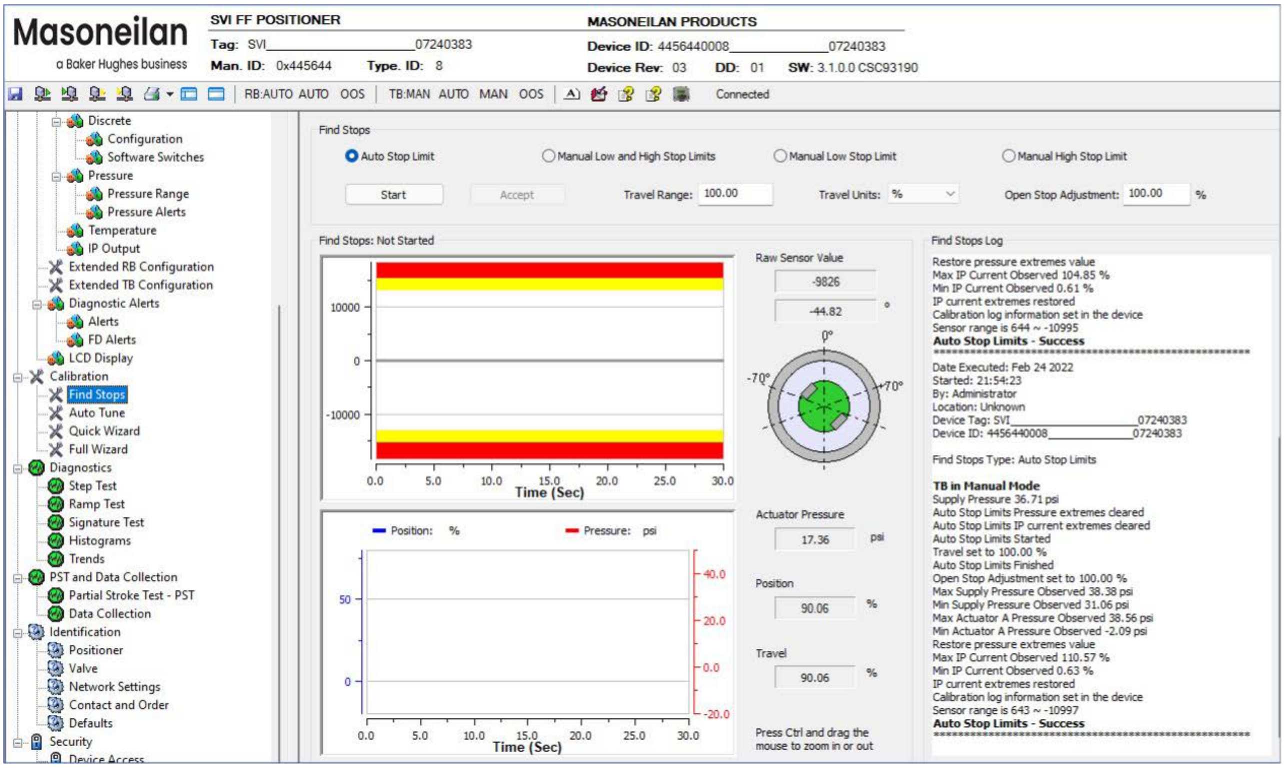


Figure 68 – Calibration Find Stops

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 pres-sure. 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 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.

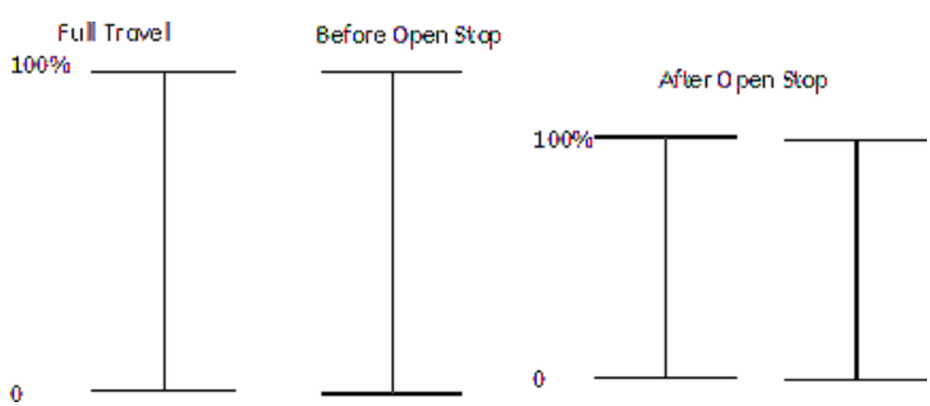
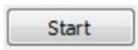


Figure 69 Open Stop Adjustment Diagram

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

Tight Open $_{New}$ ***= Open Stop Adjustment*** $_{Previous}$ ***/Open Stop Adjustment*** $_{New}$ ***xTight Open*** $_{Previous}$

$$\text{Tight Open}_{New} = \text{Open Stop Adjustment}_{Previous} / \text{Open Stop Adjustment}_{New} \times \text{Tight Open}_{Previous}$$



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.

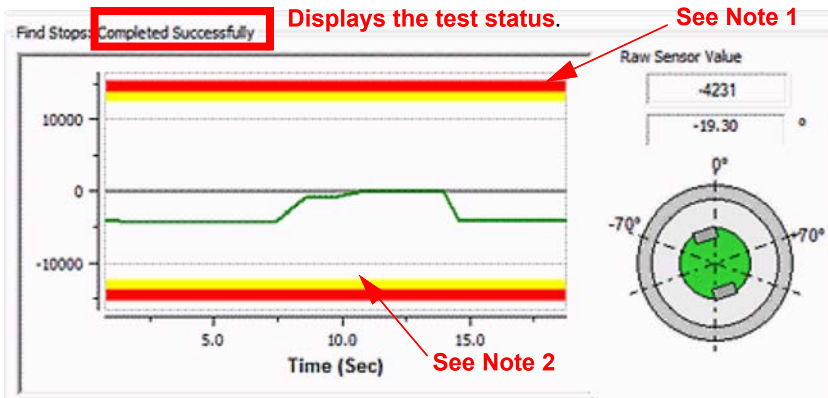


Figure 70 – Counts versus Time Graph

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.

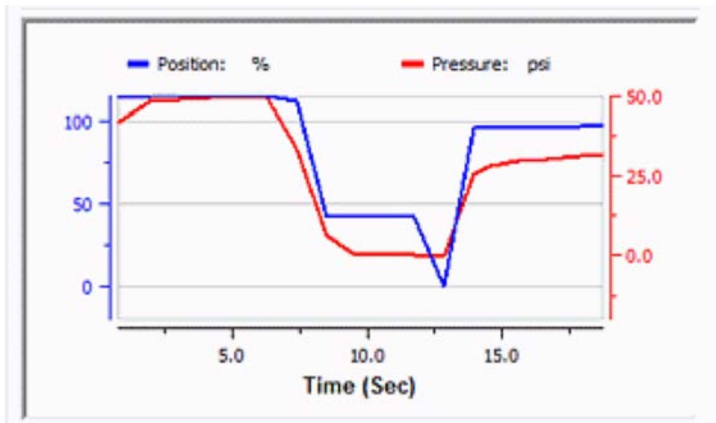


Figure 71 – Pressure versus Time Graph

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*.

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

$$\textit{Tight Open}_{New} = \textit{Open Stop Adjustment}_{Previous} / \textit{Open Stop Adjustment}_{New} \times \textit{Tight Open}_{Previous}$$

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.

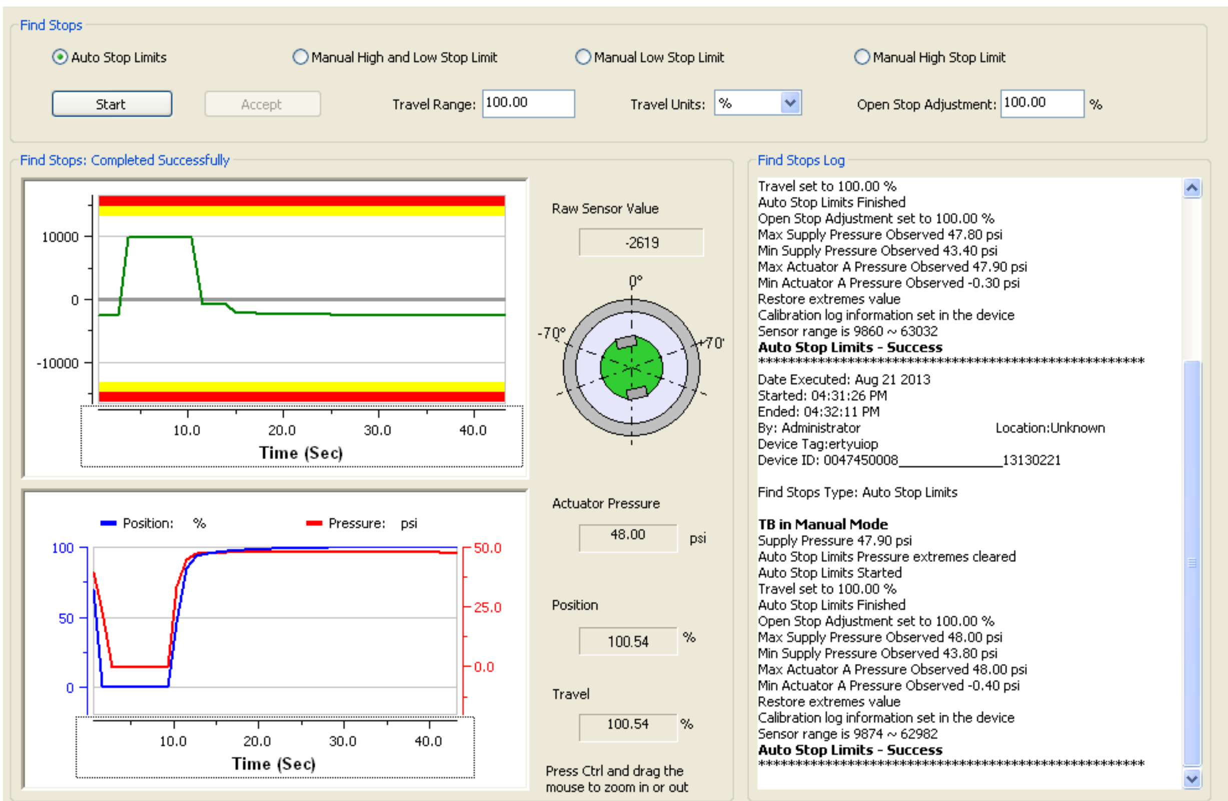


Figure 72 – Auto Stop Limits Results: Succeeded

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.

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:

   $$\textit{Tight Open}_{New} = \textit{Open Stop Adjustment}_{Previous} / \textit{Open Stop Adjustment}_{New} \, x \, \textit{Tight Open}_{Previous}$$

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.

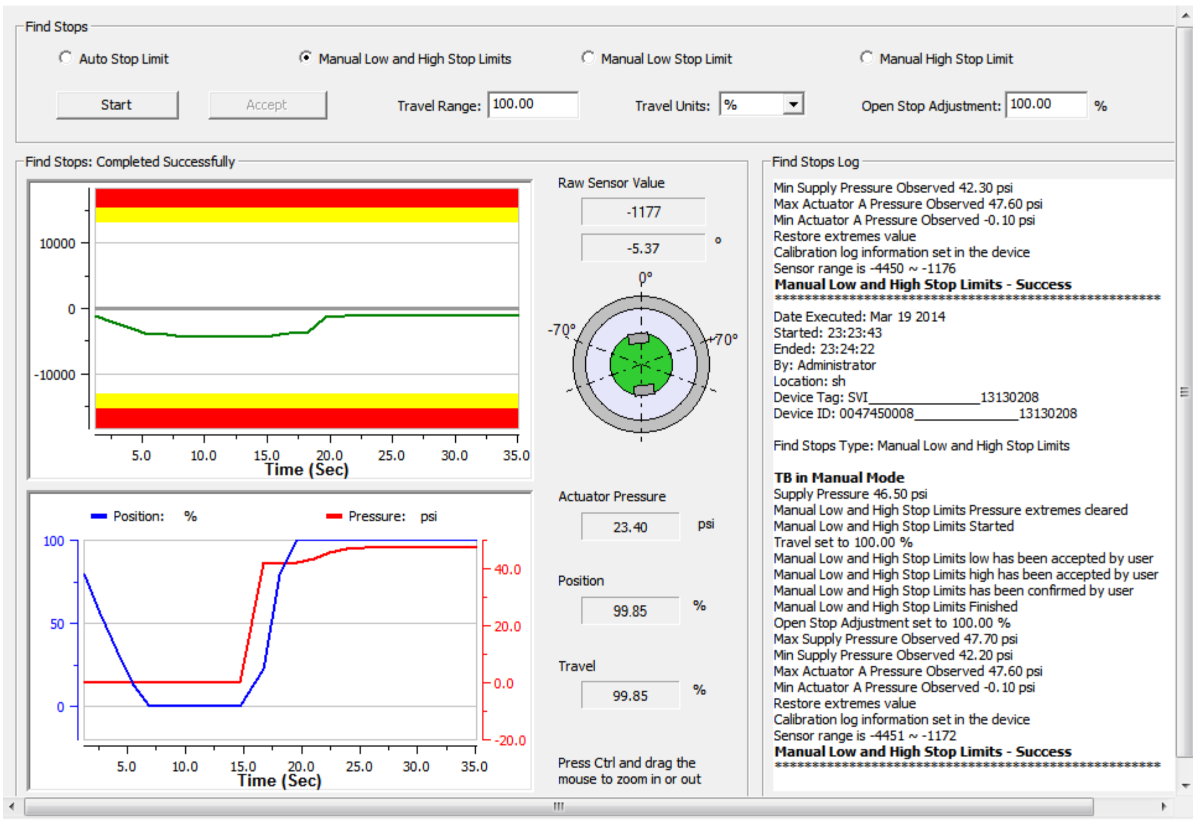


Figure 73 – Manual Low and High Stop Limits Results: Succeeded

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 and High Stop Limits Results: Succeeded*) and if the test fails a list of reasons.

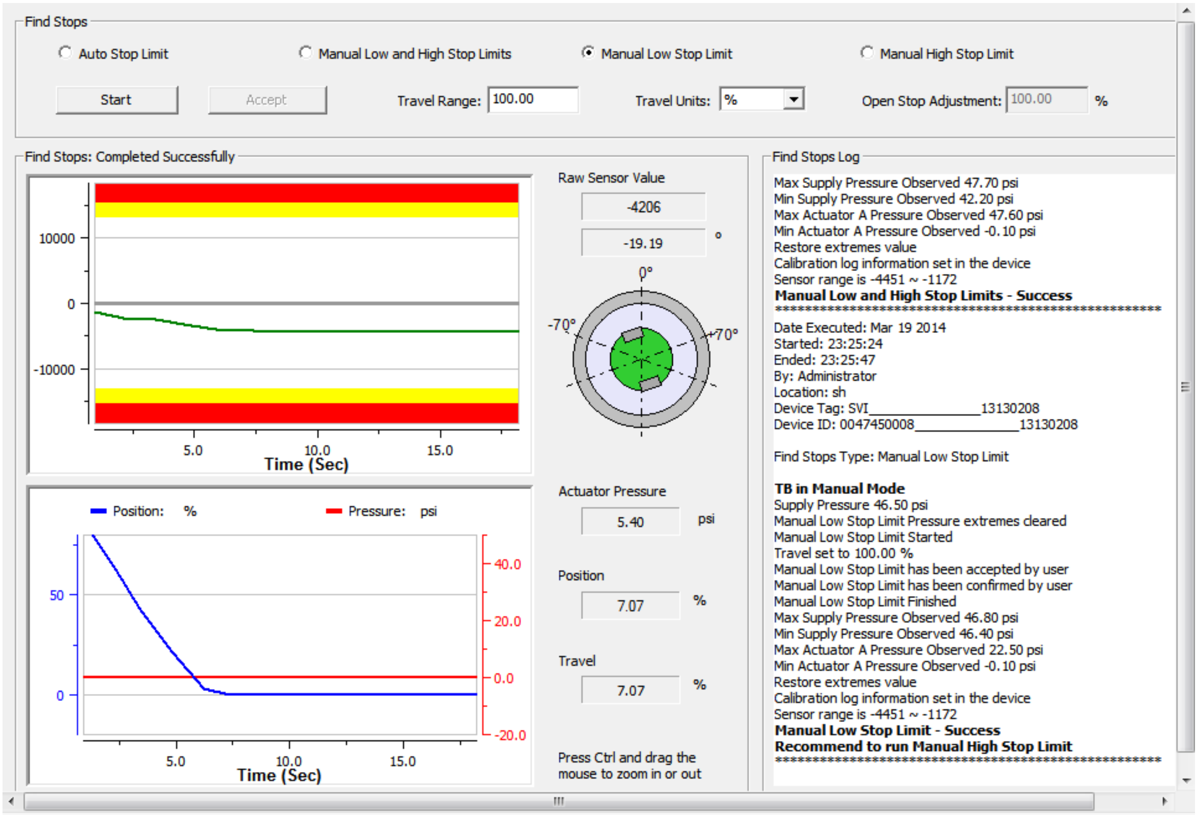


Figure 74 – Manual Low Stop Limits Results: Succeeded

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 

, 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.

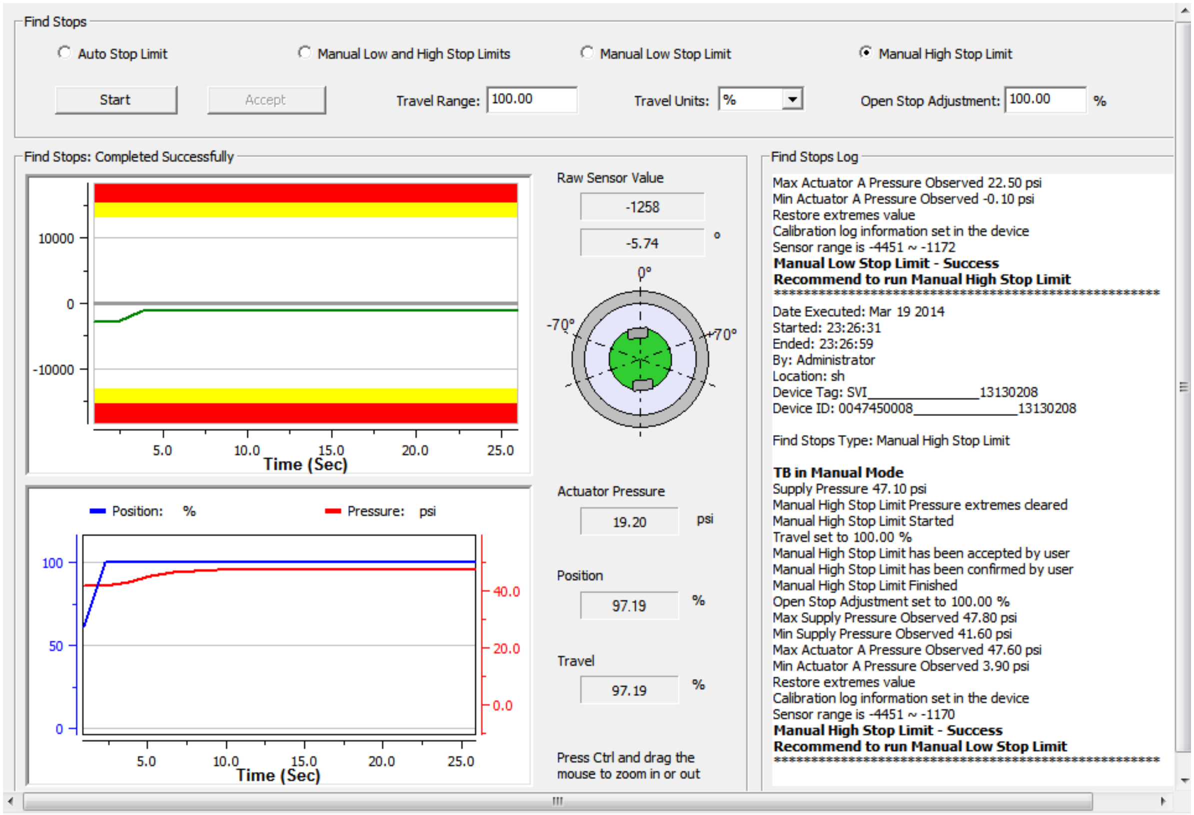


Figure 75 – Manual High Stop Limits Results: Succeeded

9. Click 

.

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.

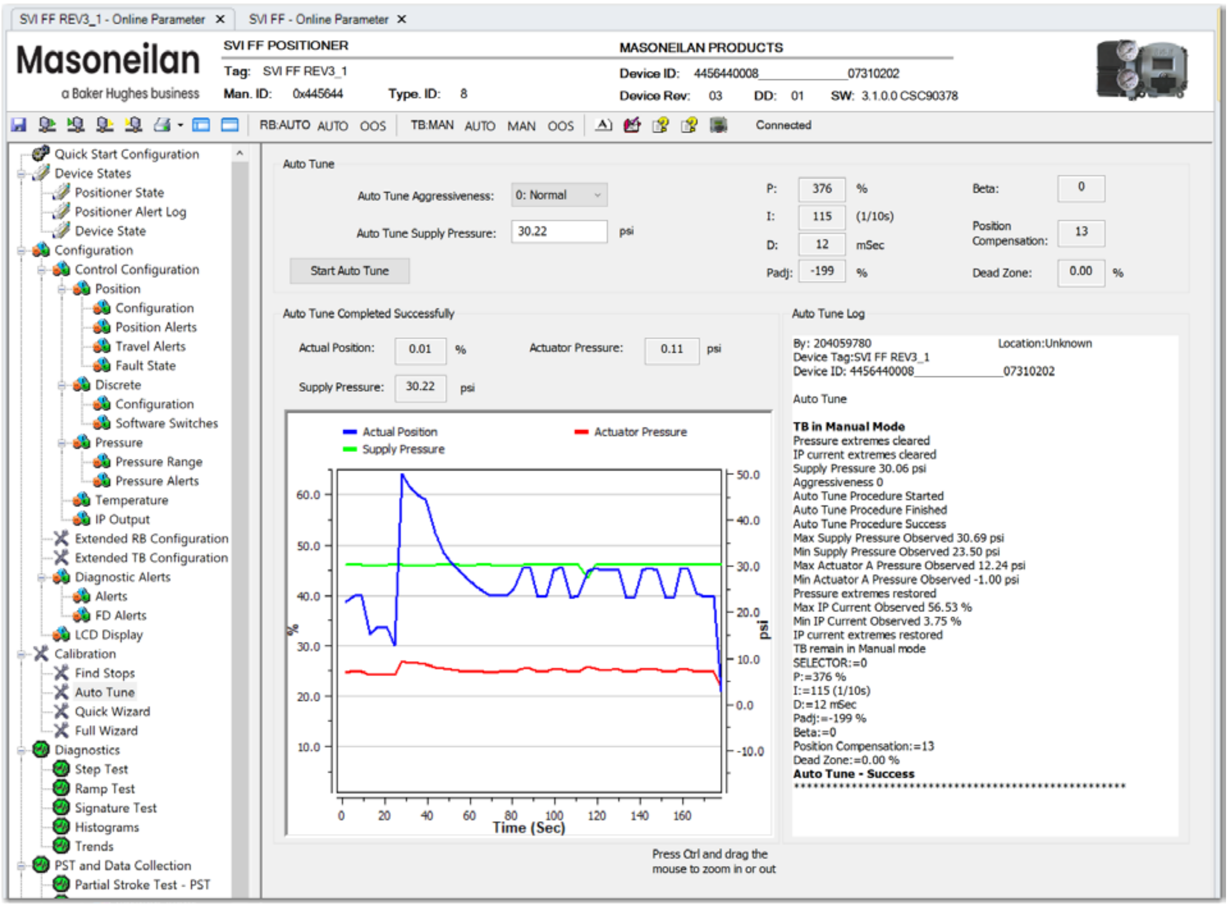


Figure 76 – Calibration Auto Tune

Buttons and Fields

Auto Tune

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*.
Auto Tune	Progress messages appear in this area.
Actual Position	Dynamically displays the position as a percent of the configured range.

Supply Pressure	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*.
Actuator A Pressure / Actuator B Pressure	Displays the detected pressure is the user-configured units. *Actuator Pressure A* and *B* are combined into *Actuator Pressure*. For single acting, this equals *Actuator Pressure A*. For double acting, this is equal to the difference between *Actuator Pressure A* and *B*.
Position vs. Time Graph	Displays the time-based results during the Auto Tune procedure: • Left axis displays a scale for the position (blue trace). • Right axis displays the actuator (red and orange traces) and supply pressures (green 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.
Auto Tune Log	Displays test information for completed tests.

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.*

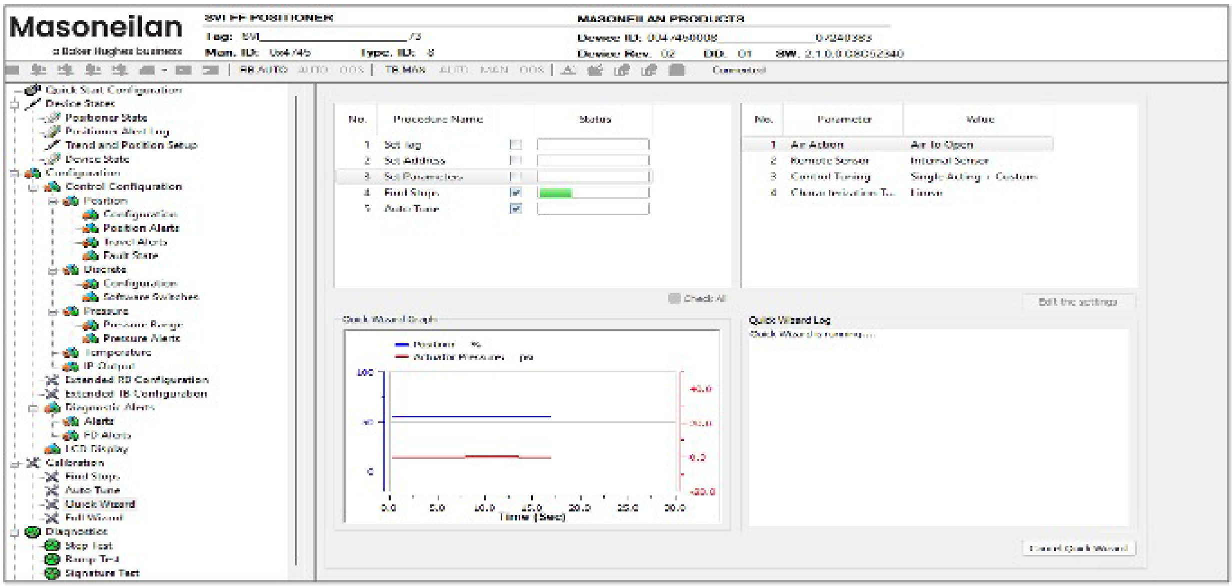


Figure 77 – Quick Wizard Configuration

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.*
- *Saves 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.

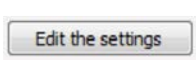
Check All — Click the checkbox to select/deselect all *Procedure Name* items. Prameter Area

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 button — Click the button and you are taken to the Quick Start Configuration Tab where the values are input. Return to the *Quick Wizard* tab to continue the process.

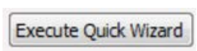
Quick Wizard Graph — Displays a graph of *%* (percentage of the procedure complete) vs. *Time* with *Supply Pressure* (red) and *Position* (blue) traces during the *Quick Wizard* procedure.

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. A Quick Setup Wizard report will be generated.
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.

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.*

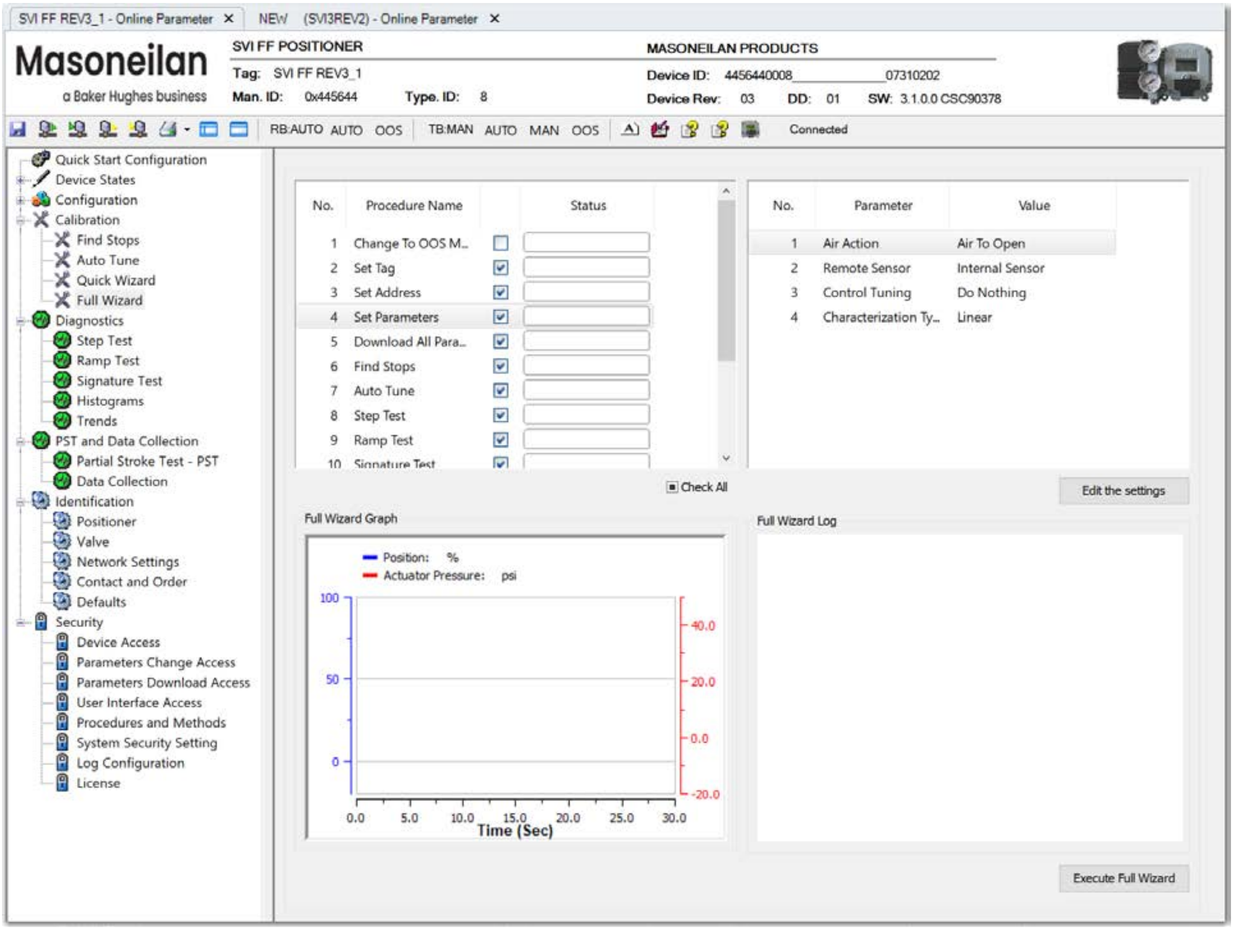


Figure 78 – Full Wizard Configuration

Buttons and Fields

Procedure Area

No. Displays the number of the procedure.

Procedure Name and checkbox — Displays the procedure as listed on the tab where fields are configured. Use the check-box to activate the procedure for use by the wizard.

Status — Displays a progress bar during execution for each selected item.

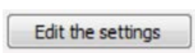
Check All — Click the checkbox to select/deselect all *Procedure Name* items. Parameter Area

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.



Edit the settings button — 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.

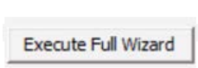
Full Wizard Graph — Displays a graph of *%* (percentage of the procedure complete) vs. *Time* with *Supply Pressure* (red) and *Position* (blue) traces during the *Quick Wizard* procedure.

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.



Execute Full Wizard button — 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 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.

10. 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.*

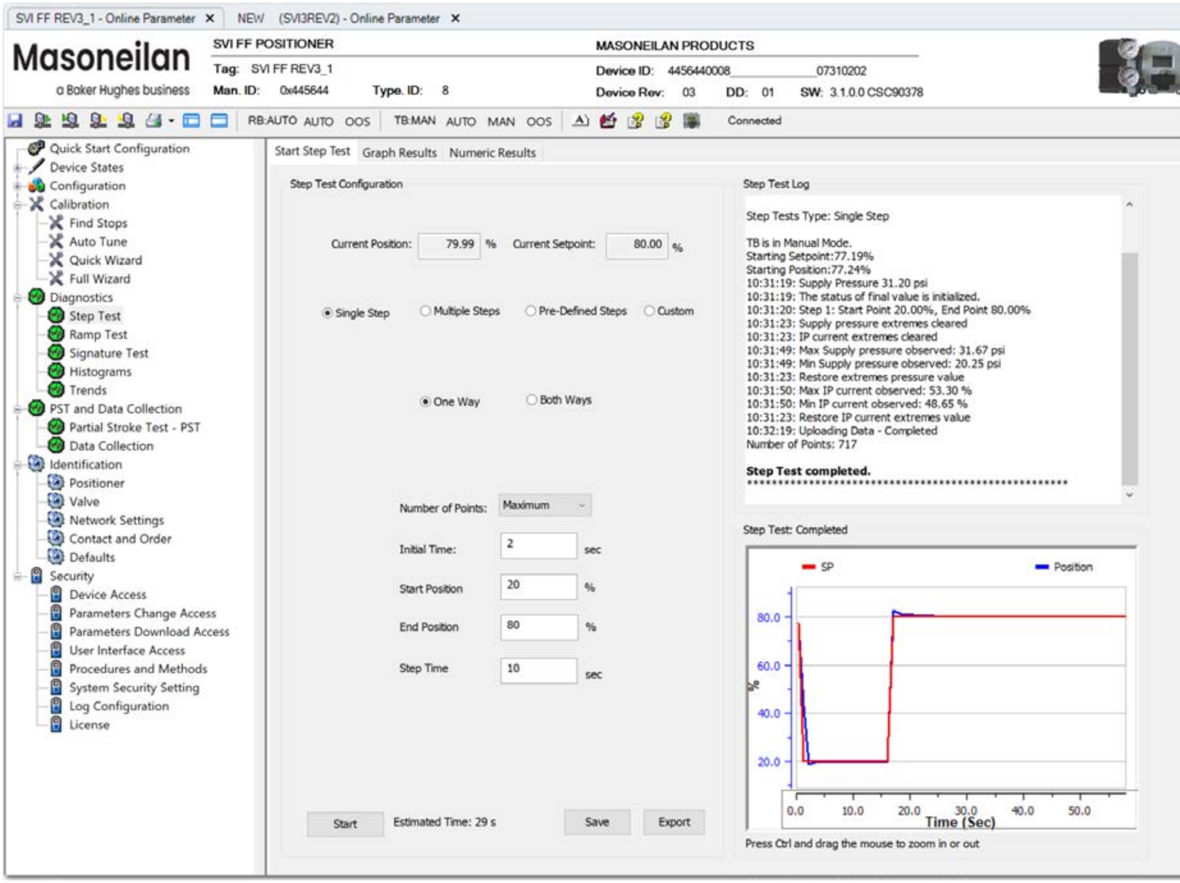


Figure 79 – Diagnostics Start Step Test

Procedure Area

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

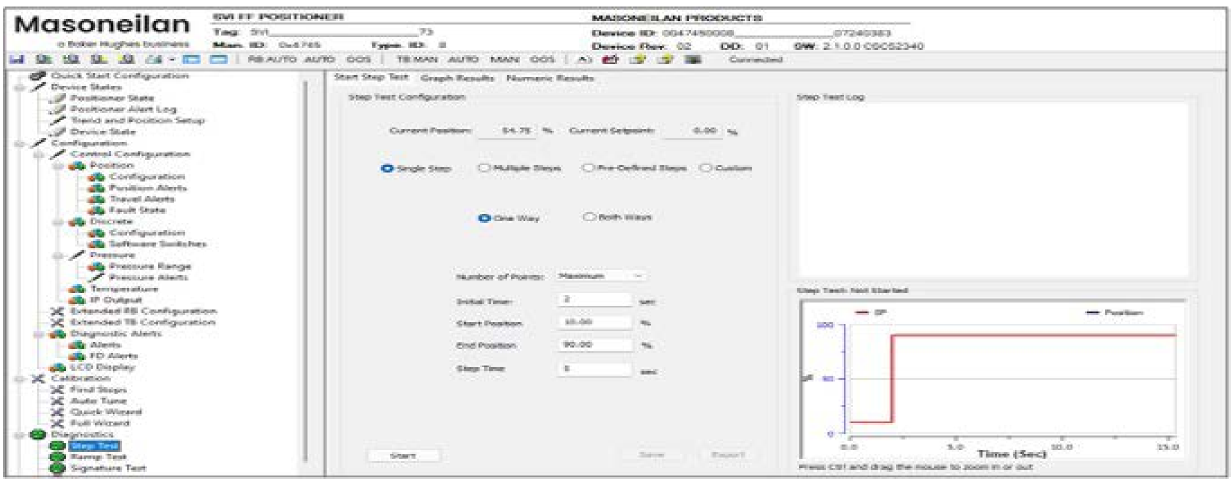


Figure 80 – Diagnostics Start Step Test

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

The *Step Test Log* begins displaying test data. The results appear.

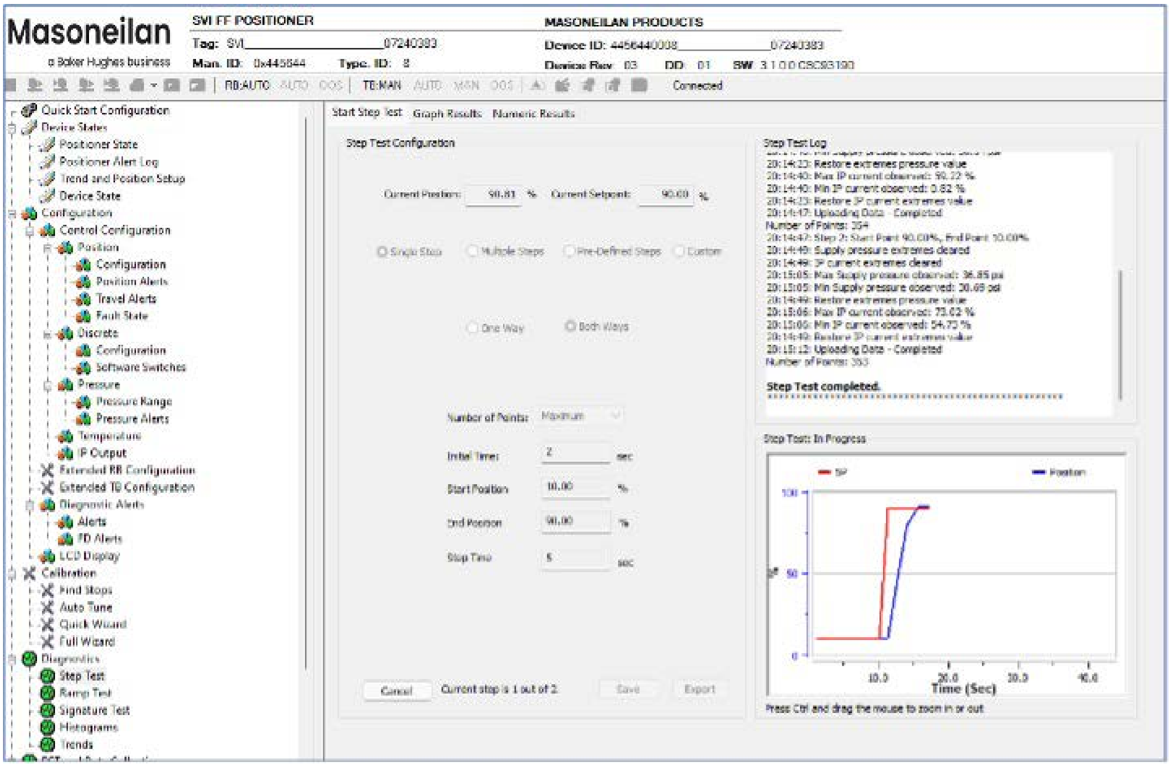


Figure 81 – Diagnostics Step Test Complete: Single Step Both Ways

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.

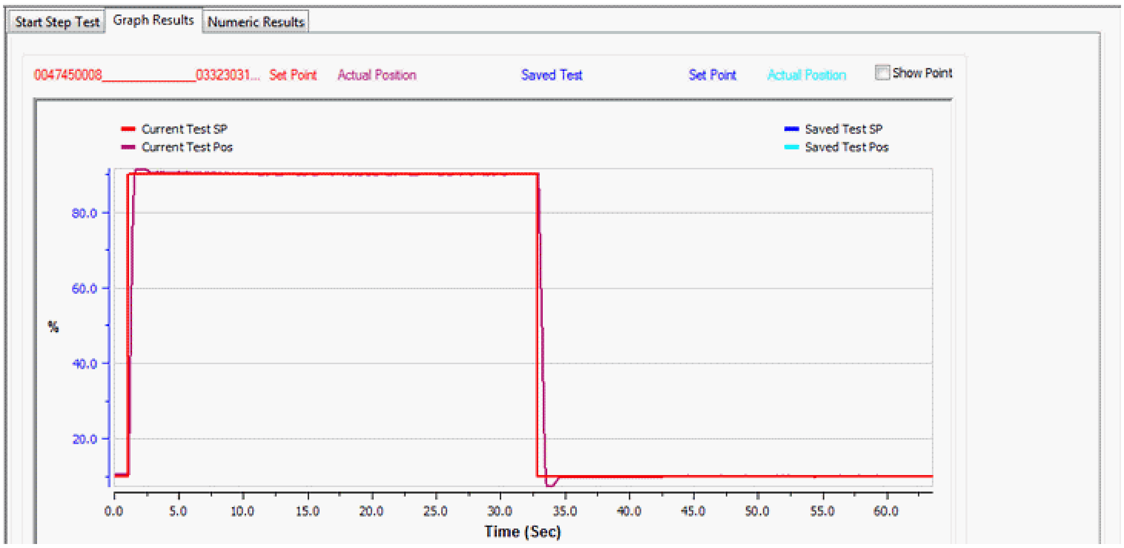


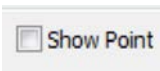
Figure 82 – Single Step Both Ways Graph Results

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.

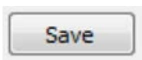
% vs. *Time (sec)* graph

• Left axis displays a scale for the percentage of step complete.
• Bottomaxis 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**.**



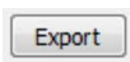
Show Point

• Toggles the appearance of the data points on/off.



Save

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

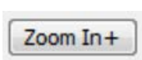


Export

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

Zoom Out -

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



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.

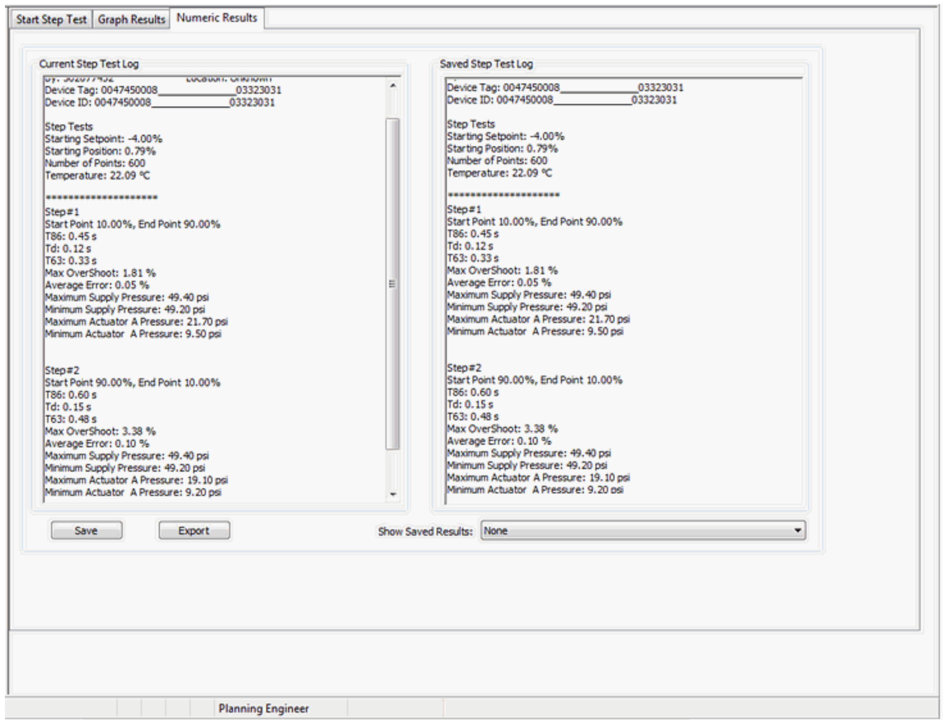
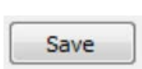
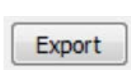


Figure 83 – Single Step Both Ways Numeric Results

Buttons and Fields

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

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**.

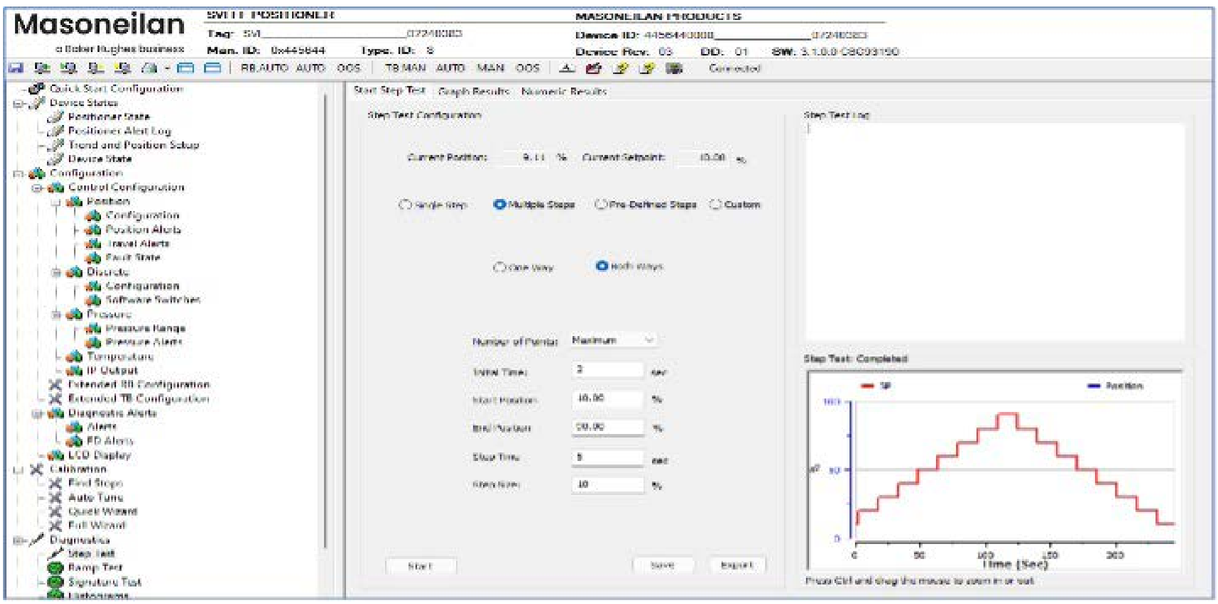


Figure 84 – Diagnostics Start Step Test: Multiple Steps

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

The *Step Test Log* begins displaying test data. The results appear.

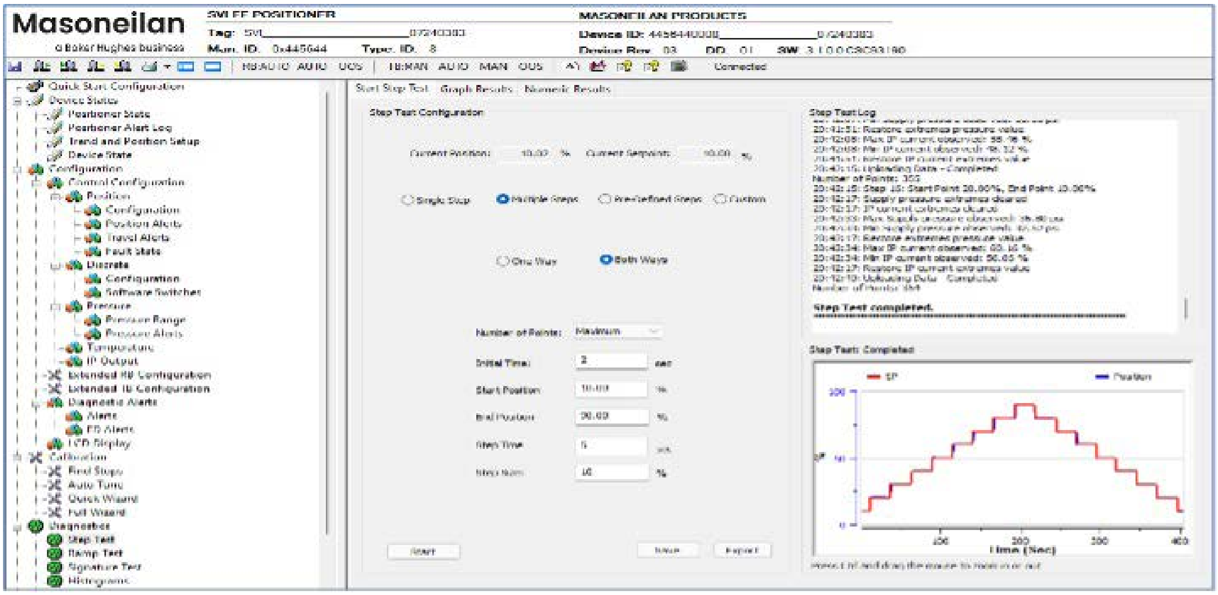


Figure 85 – Diagnostics Step Test Complete: Multiple Steps Both Ways

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.

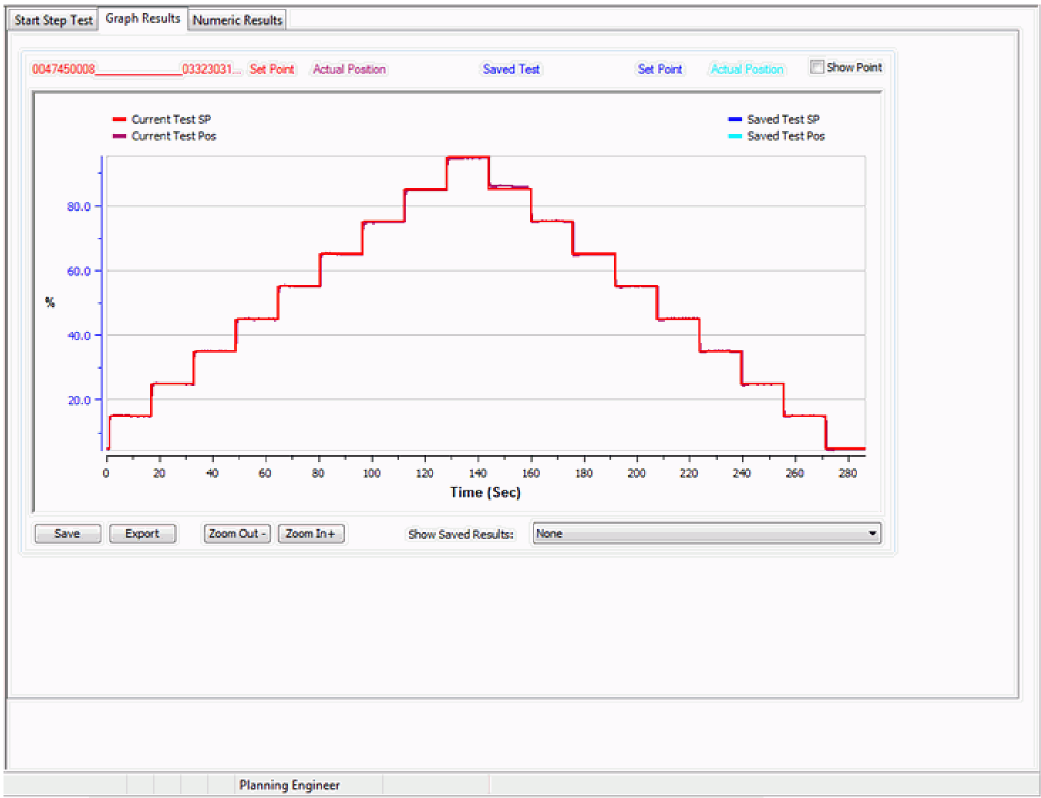


Figure 86 – Multiple Steps Graph Results

Multiple Steps Numeric Results

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

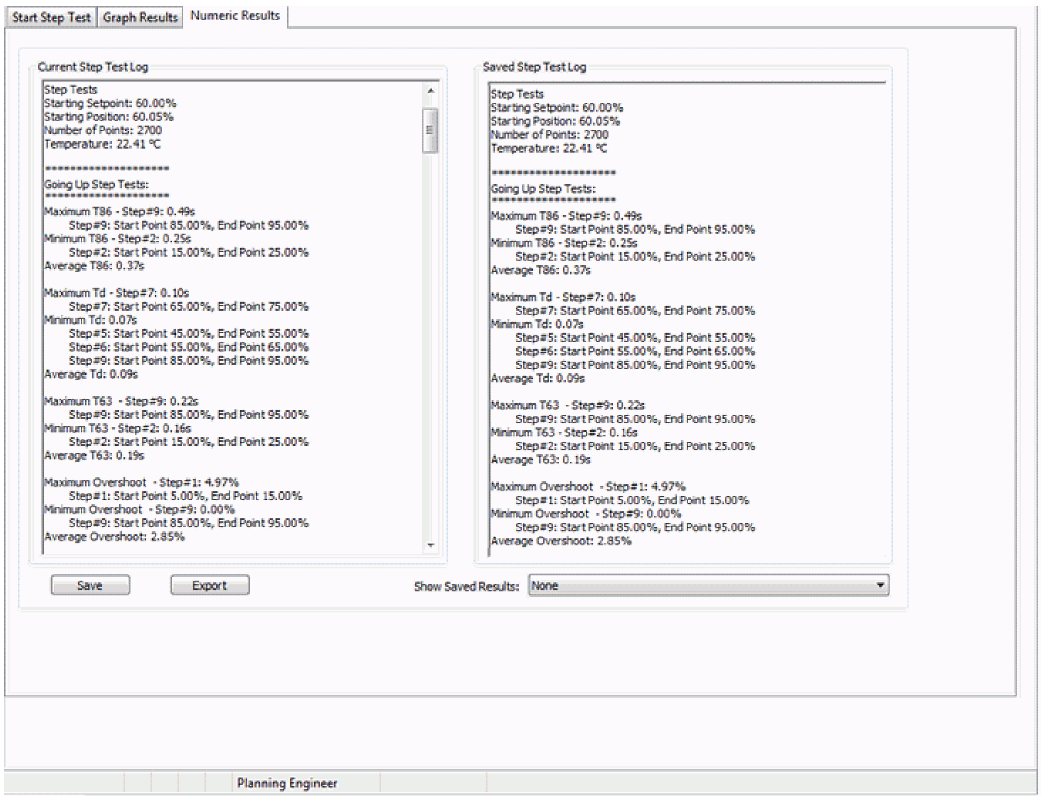


Figure 87 – Multiple Steps Numeric Results

Run Pre-Defined Steps

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 **Pre-Defined Steps**.

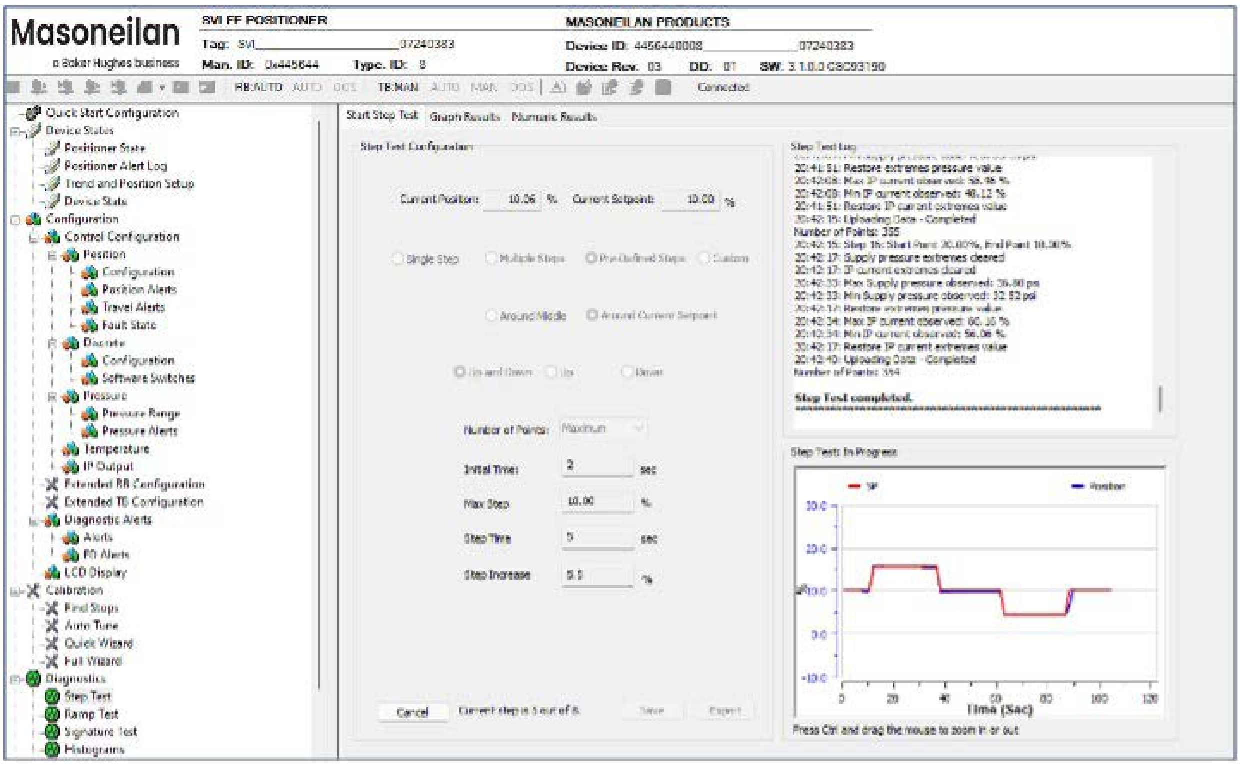


Figure 88 – Diagnostics Start Step Test: Pre-Defined Steps

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

The current step in process appears and the *Step Test Log* begins displaying test data. The results appear.

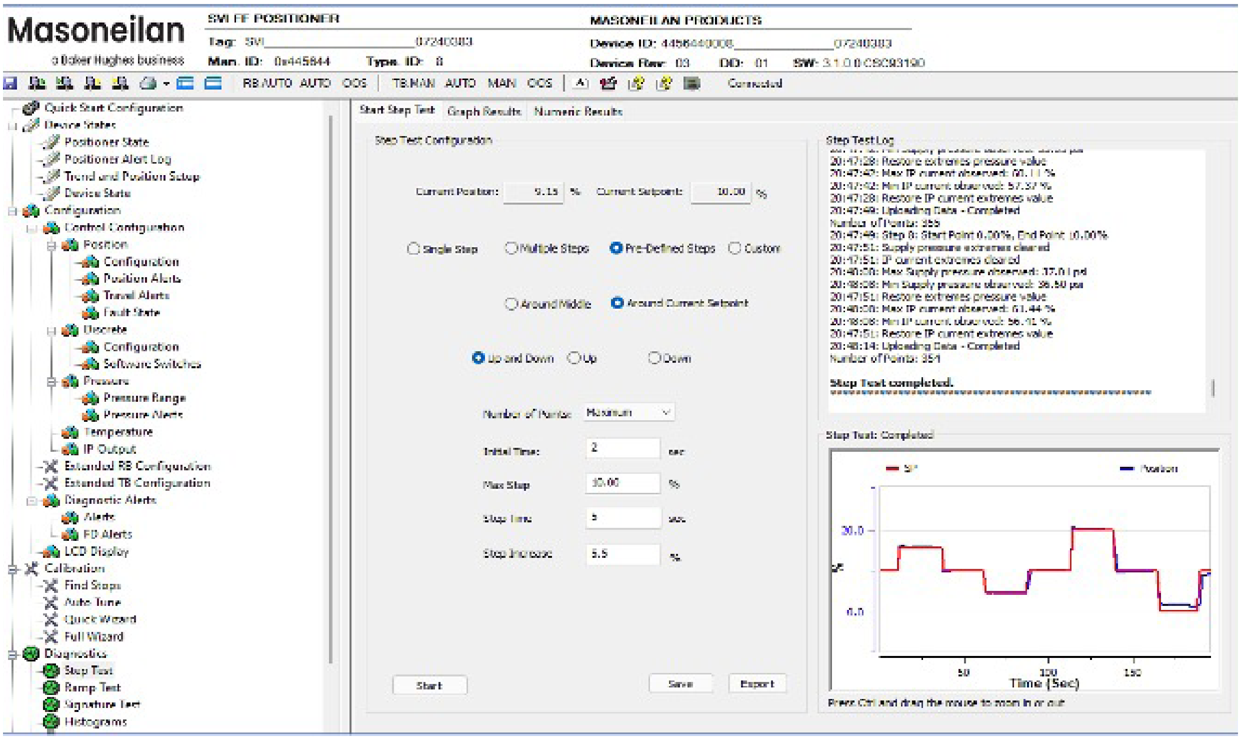


Figure 89 – Diagnostics Step Test Complete: Pre-Defined Steps Around Middle

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.

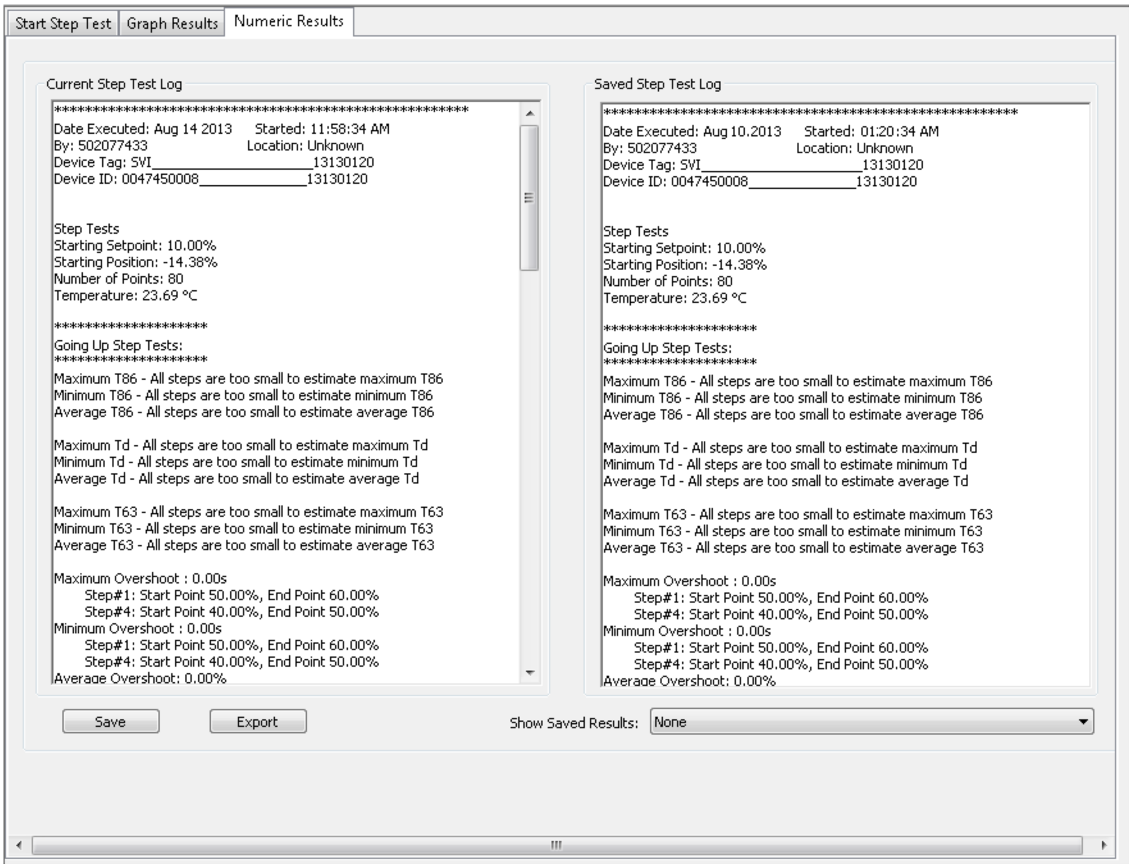


Figure 91 – Pre-Defined Steps Numeric Results

Run Custom: Step Test

CAUTION

Procedures (e.g. Find 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**.

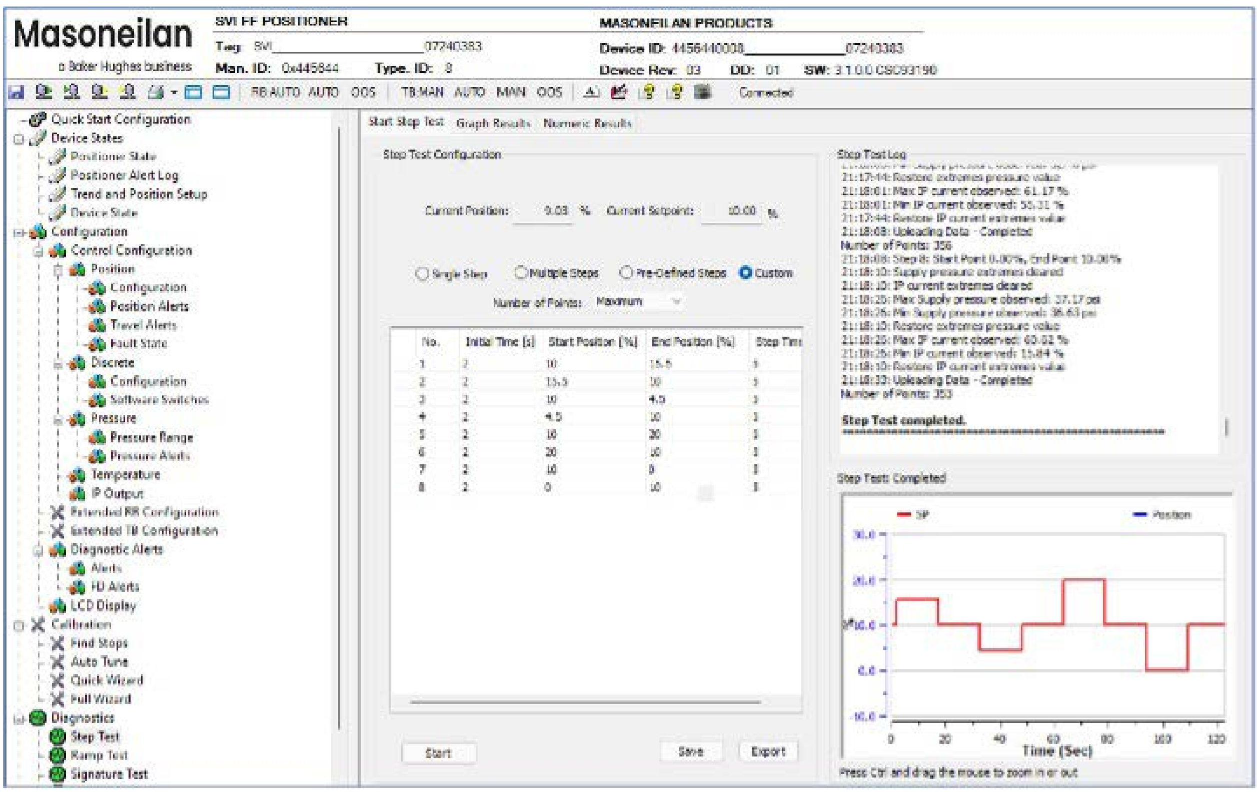


Figure 92 – Diagnostics Start Step Test: Custom Step

3. Enter values for *No., Initial Time*, *Start Position*, End Position, and *Step Time*

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

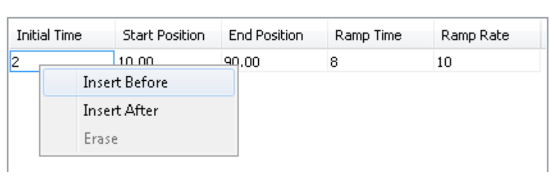


Figure 93 – Custom Step Test Manage Rows

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 current step in process appears and the *Step Test Log* begins displaying test data. The results appear.

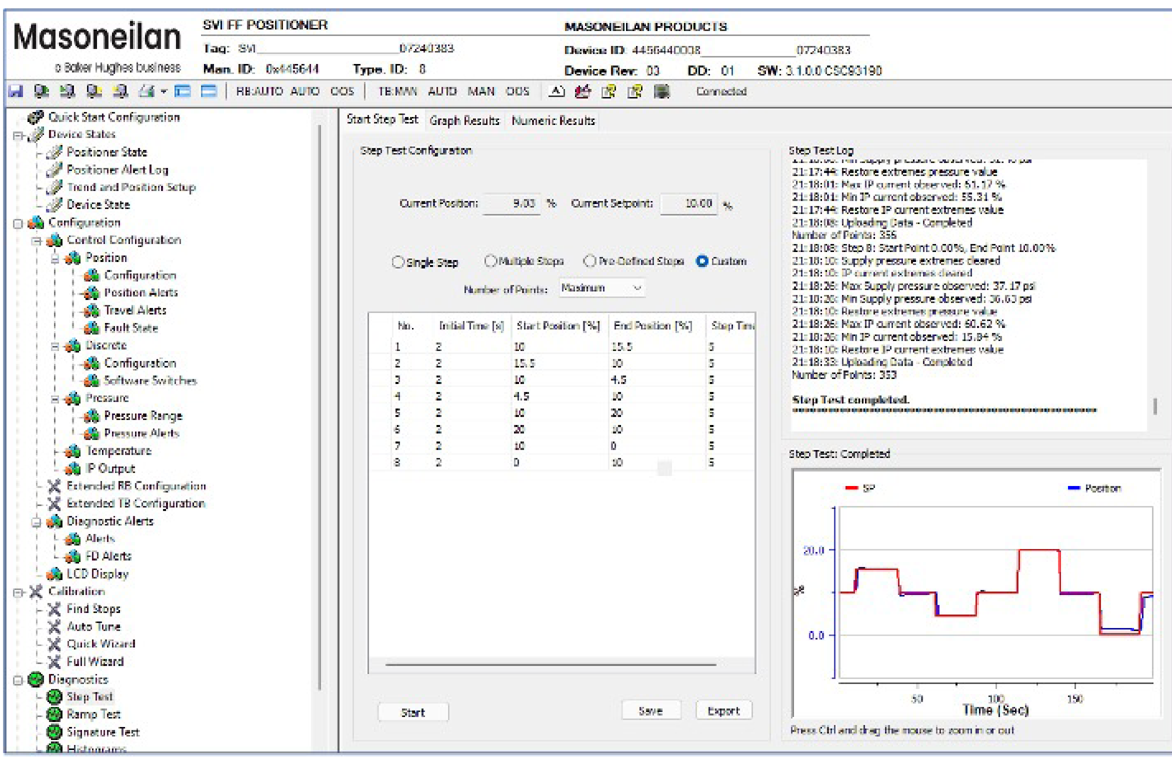


Figure 94 – Diagnostics Step Test Complete: Custom Step

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

Custom Step Graph Results

See *Single Step Graph Results* for further explanation.

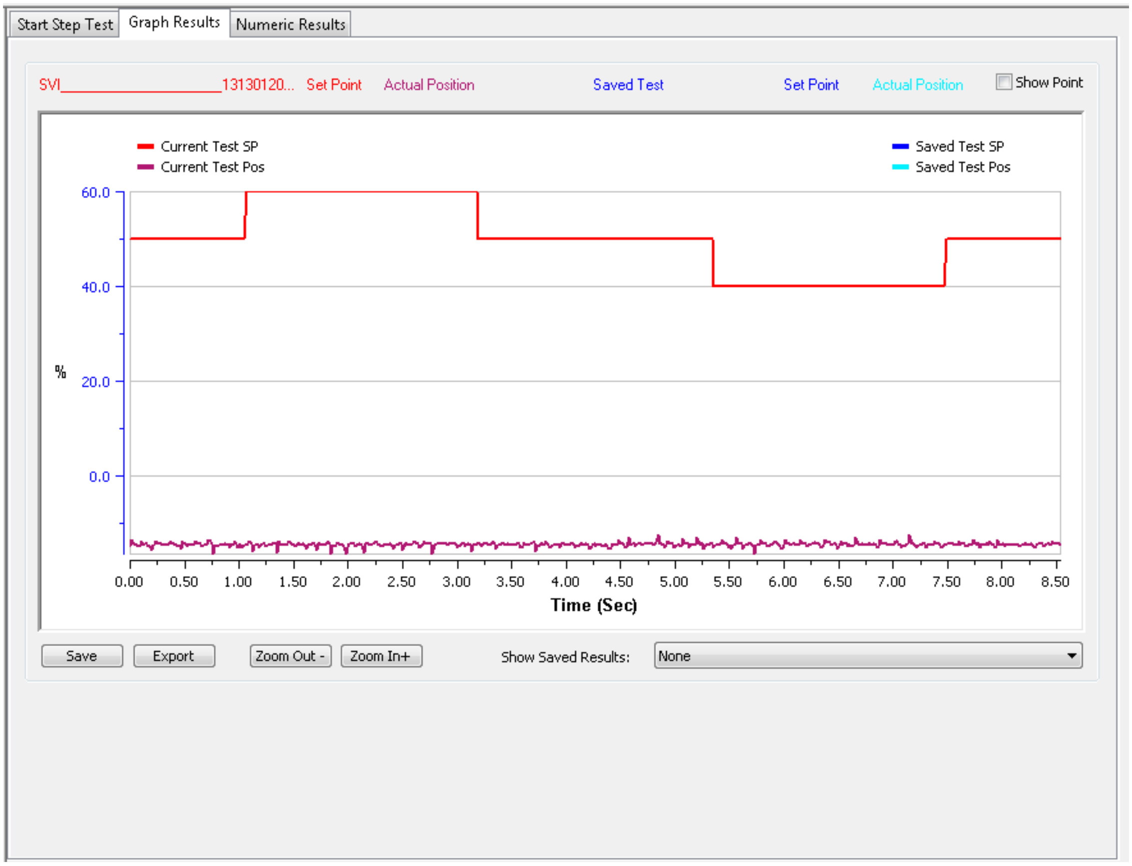


Figure 95 – Custom Step Graph Results

Custom Step Numeric Results

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

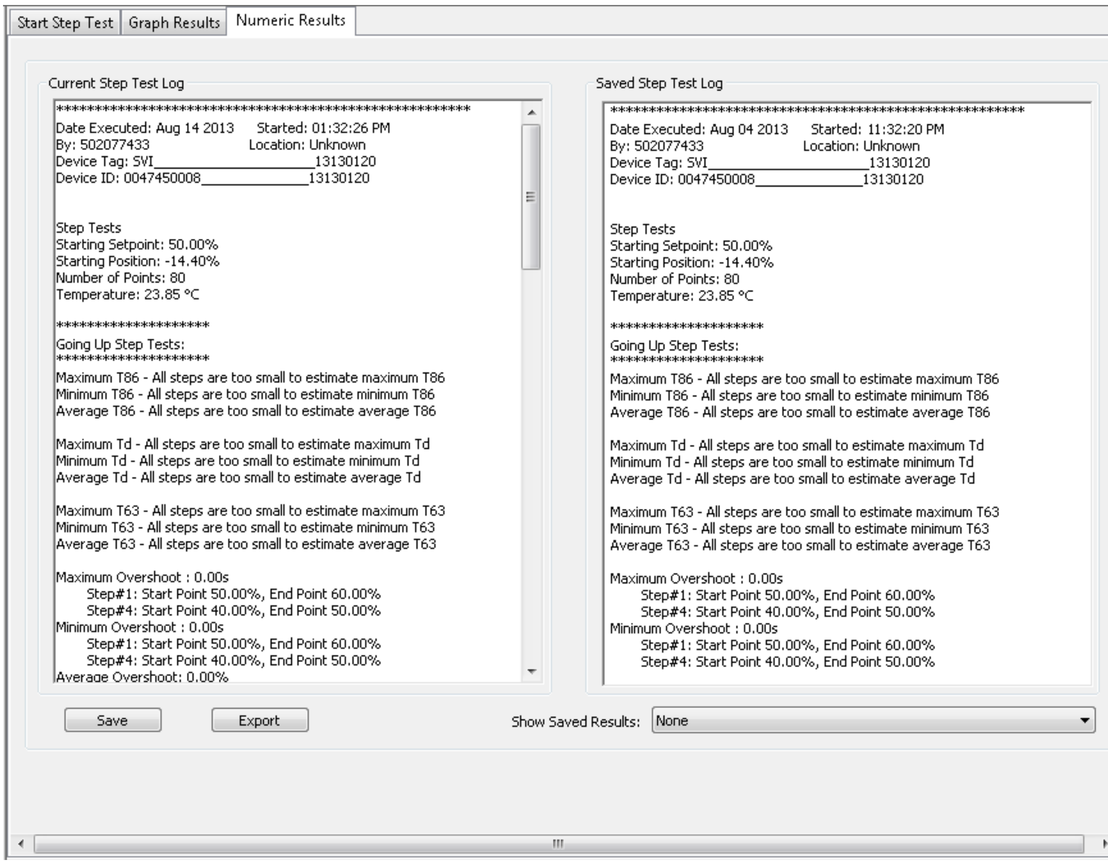


Figure 96 – Custom Step Numeric Results

Save Step Test Results

See *Save Step Test Results*.

Export Step Test Results

See *Export Step 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.*

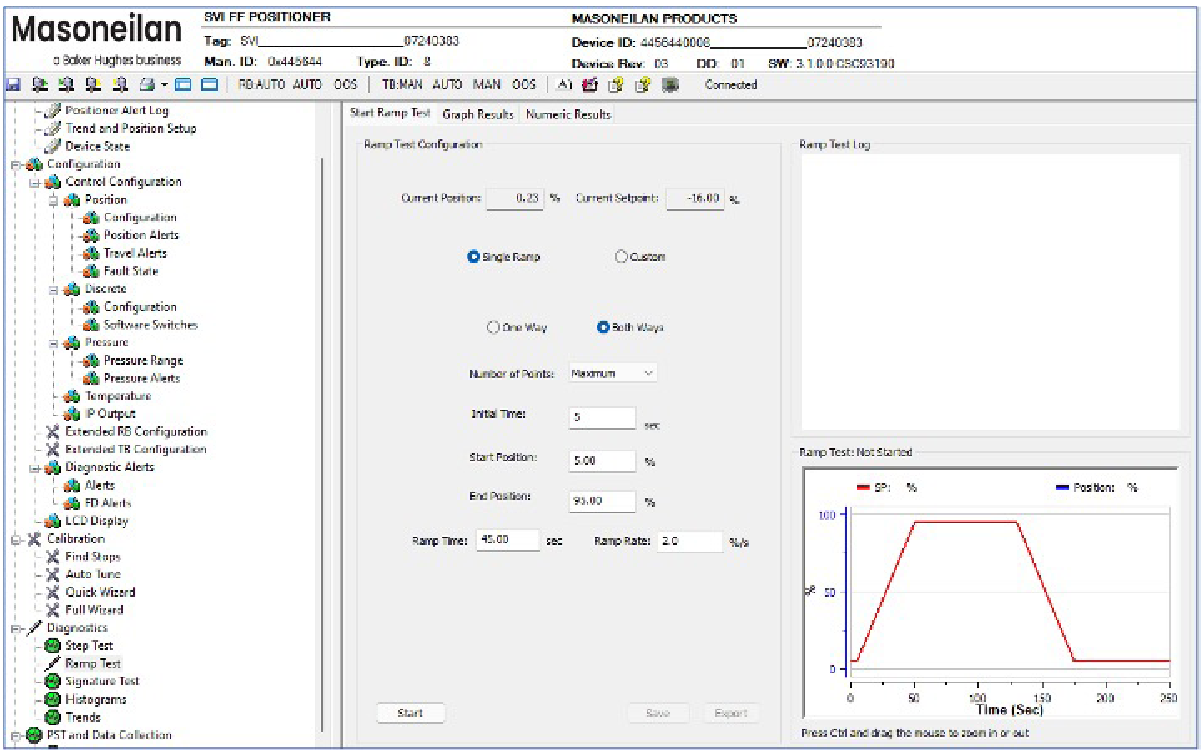


Figure 97 – Diagnostics Start Ramp Test

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.

Ramp Test Type	Use the radio buttons to select the test type: • *Single Ramp*: Displays fields to configure a *One Way* or *Two Way* test. See *Run a Single Step 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. The Setpoint from another function block or remote application can also be limited to change at a configurable ramp rate.
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.
Start	Click to start the test. Updates appear in the *Ramp Test Log*.
Save	Click to save the results. You can load back the result in the selection *Show Saved Result* in *Graph*/*Numeric* tabs.
Export	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**.

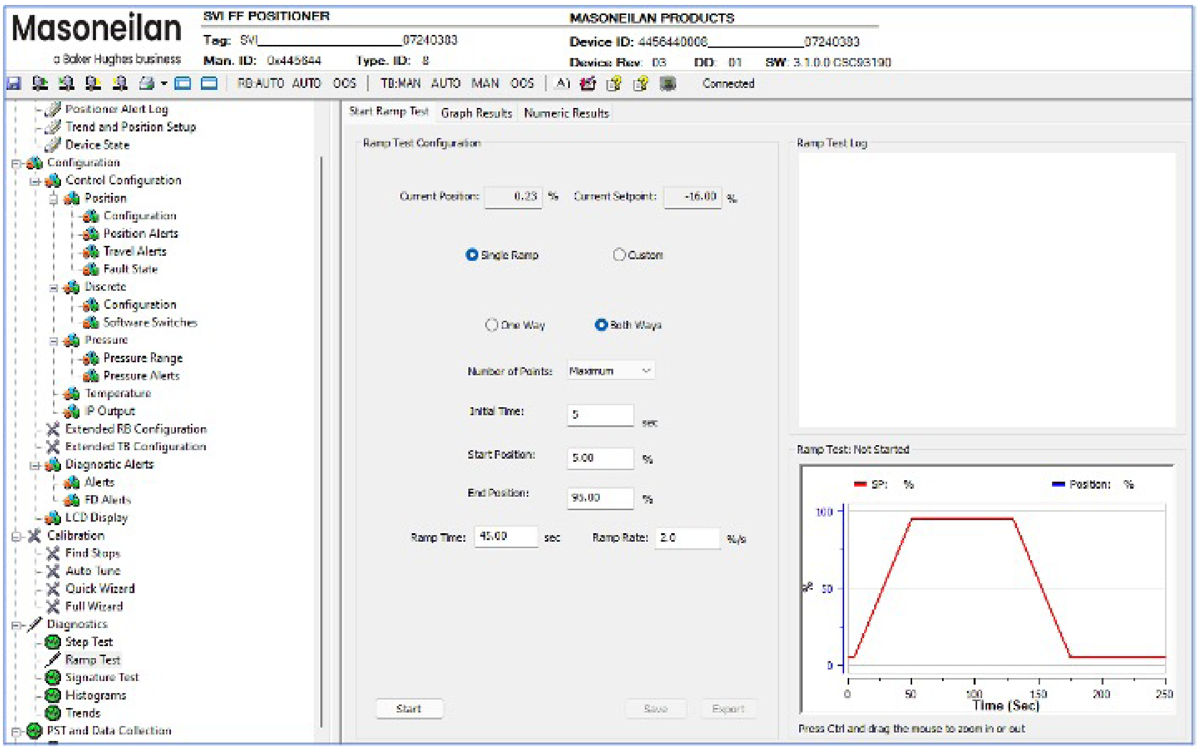
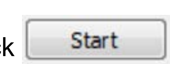


Figure 98 – Diagnostics Start Ramp Test

3. Click **One Way** or **Both Ways**.
4. Enter values for *Initial Time*, *Start Position*, *End Position*, *Ramp Time*, *Ramp Rate* and click  .
   The *Ramp Test Log* begins displaying test data.

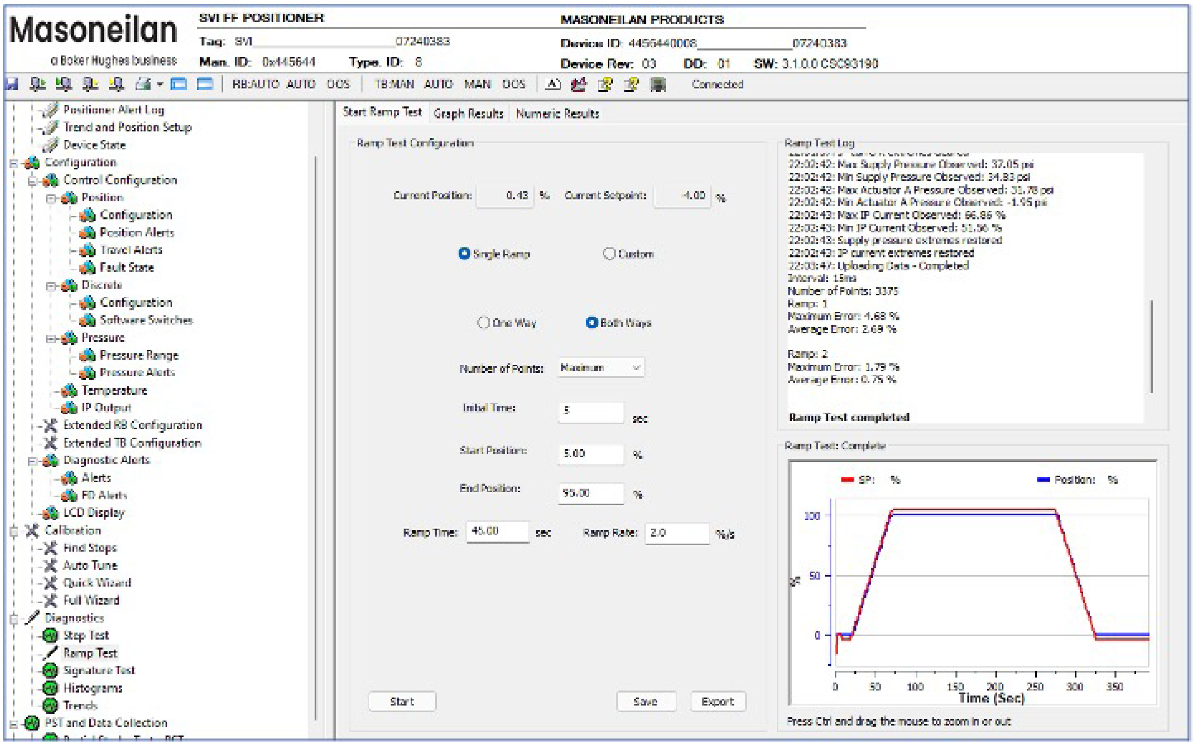


Figure 99 – Diagnostics Ramp Test Complete: Single Ramp Both Ways

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.

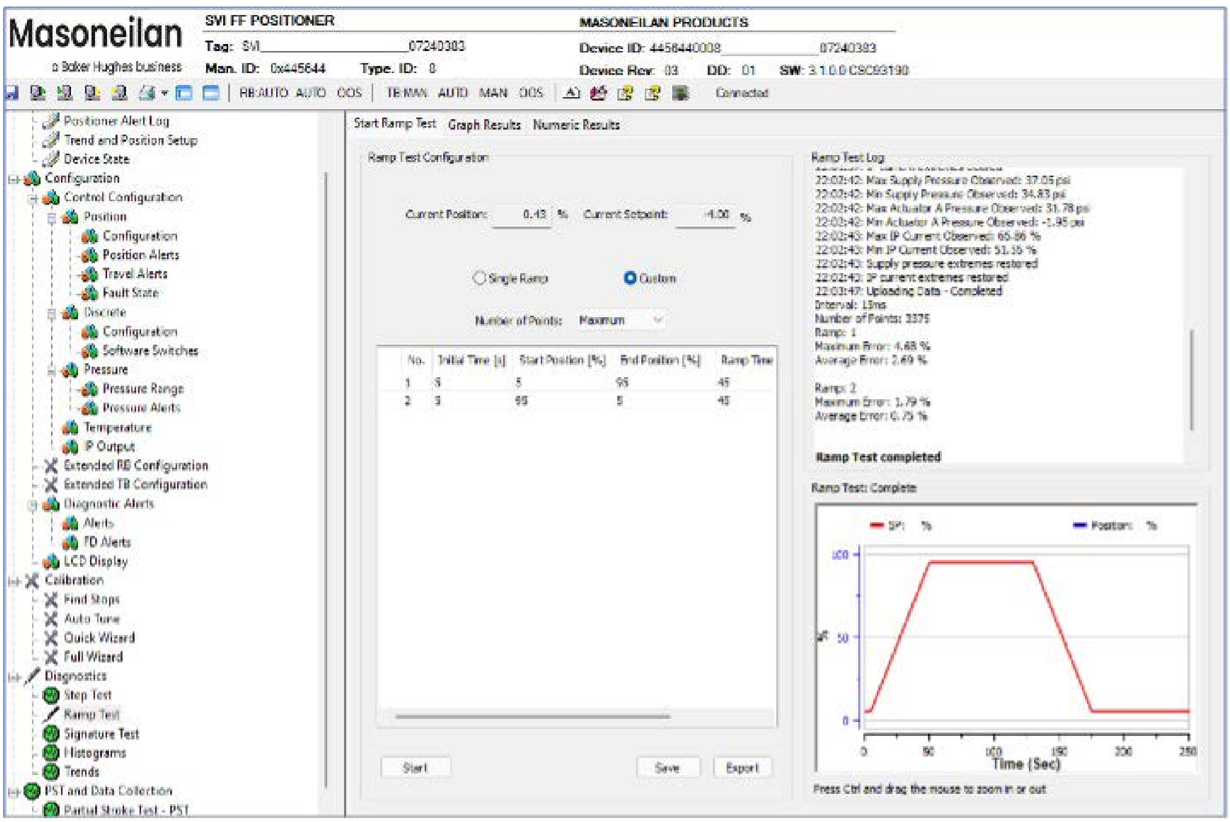


Figure 100 – Diagnostics Start Custom Test

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

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

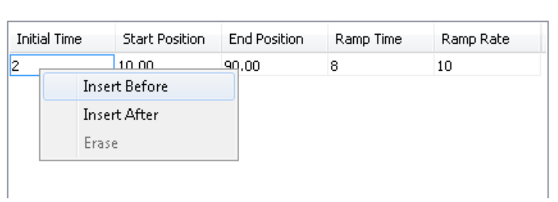


Figure 101 – Custom Ramp Test Manage Rows

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 *Ramp Test Log* begins displaying test data.

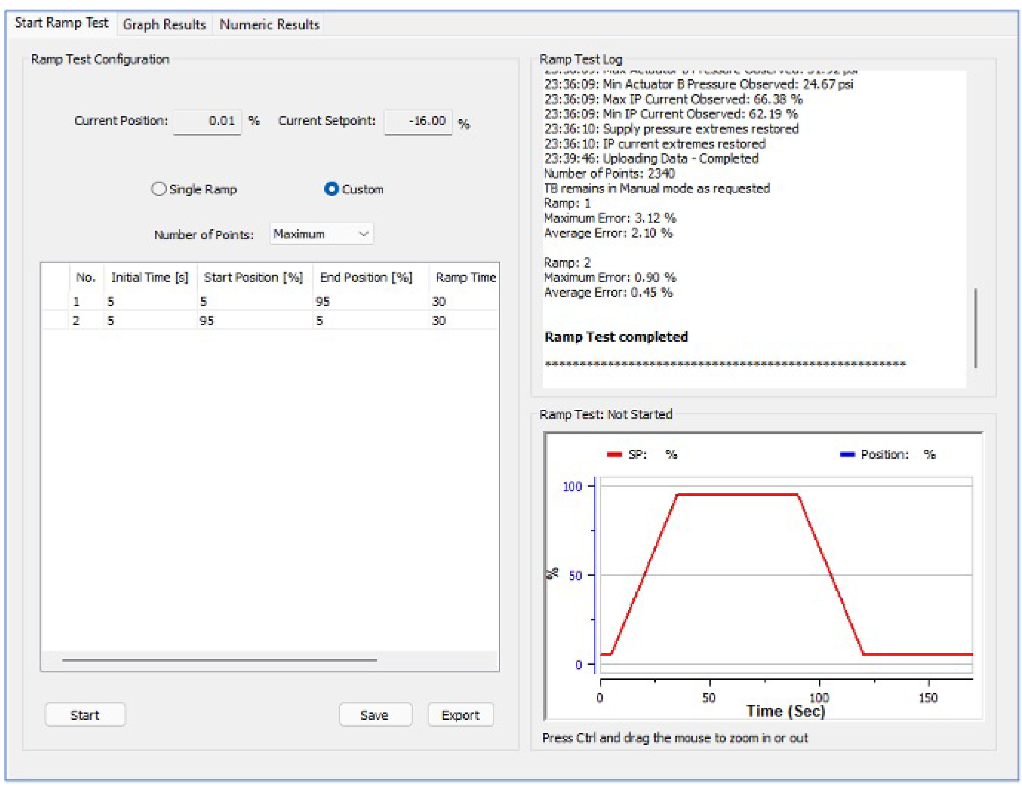


Figure 102 – Diagnostics Ramp Test Complete: Custom

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.

Figure 103 – Diagnostics Ramp Test 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.

Unit name

Displays the name of the SVI FF unit.

Setpoint

Displays the setpoint.

Actual Up

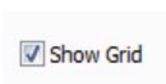
Shows the distance up for valve position.

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.

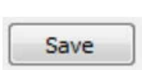
Setpoint vs. Error graph

Displays a graph of the setpoint versus the calculated error.

AP (Actual Position) vs. Setpoint or Time graph

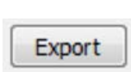
Displays a graph of the valve position versus the setpoint or versus time.

- 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.

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.

Save Ramp Test Results

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

Export Ramp Test Results

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

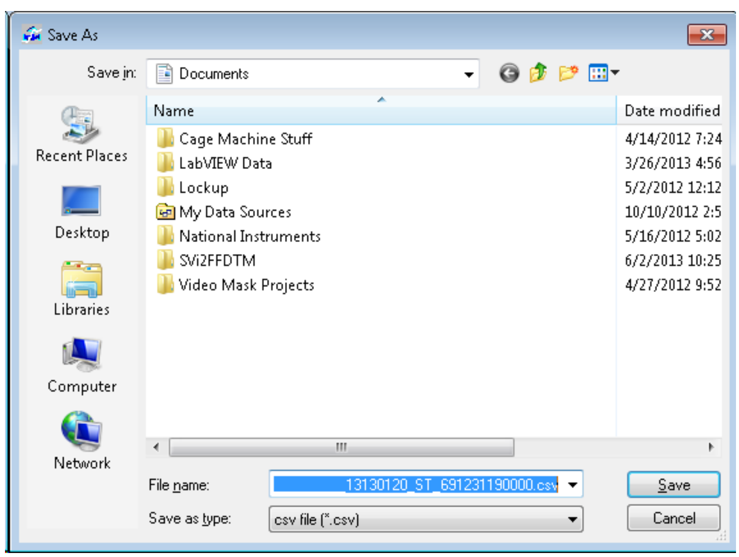


Figure 104 – Export Test Results

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

Diagnostics Ramp Test Numeric Results

Use this tab to view log results.

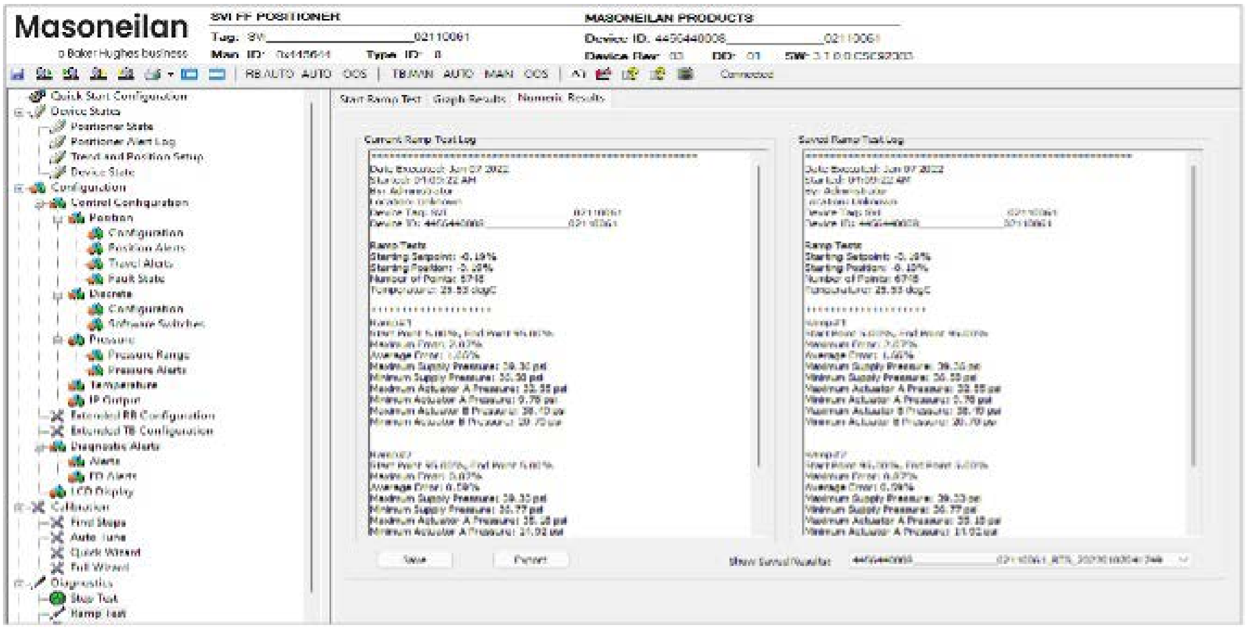
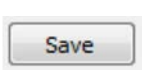
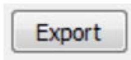


Figure 105 – Diagnostics Ramp Test Numeric Results

See *Save Ramp Test Results* and *Export Ramp Test Results*.

Buttons and Fields

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 Step 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.

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*).

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

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

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.

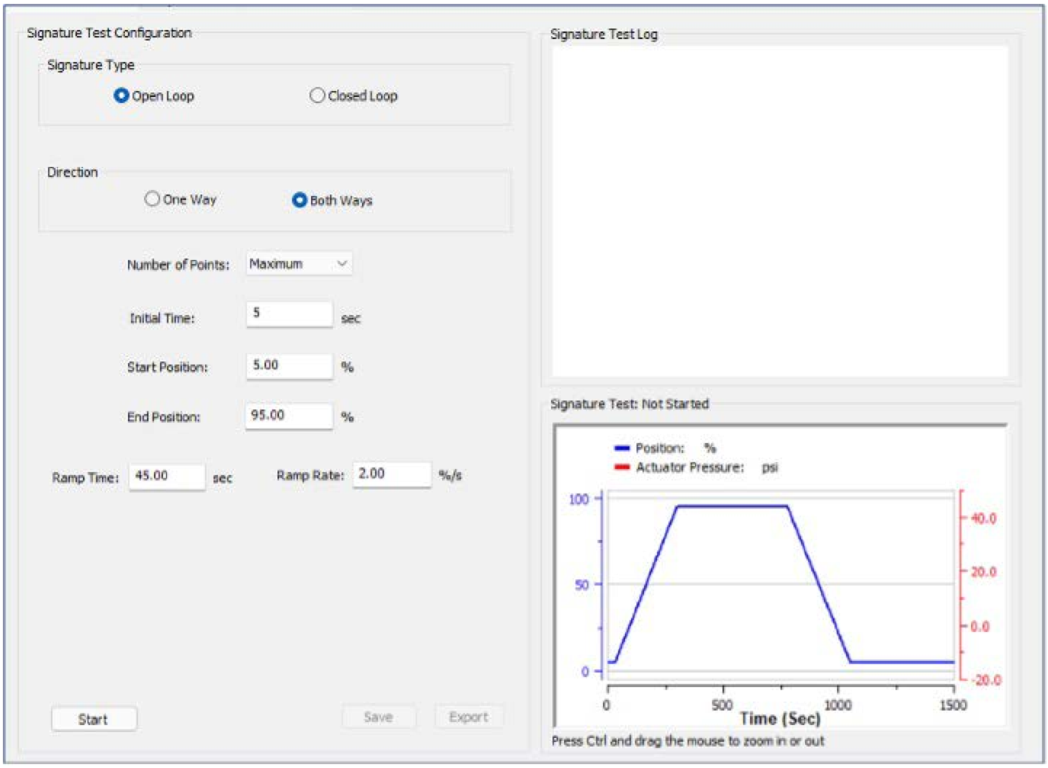


Figure 106 – Diagnostics Start Signature Test

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 a 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. The Setpoint from another function block or remote application can also be limited to change at a configurable ramp rate.
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.
Start	Click to start the test. Updates appear in the *Signature Test Log*.
Save	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*.
Export	Click and a dialog appears to export the results to an Excel file. See *Export Signature Test Results.*

Run Loop 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 **Open** or **Closed Loop**.

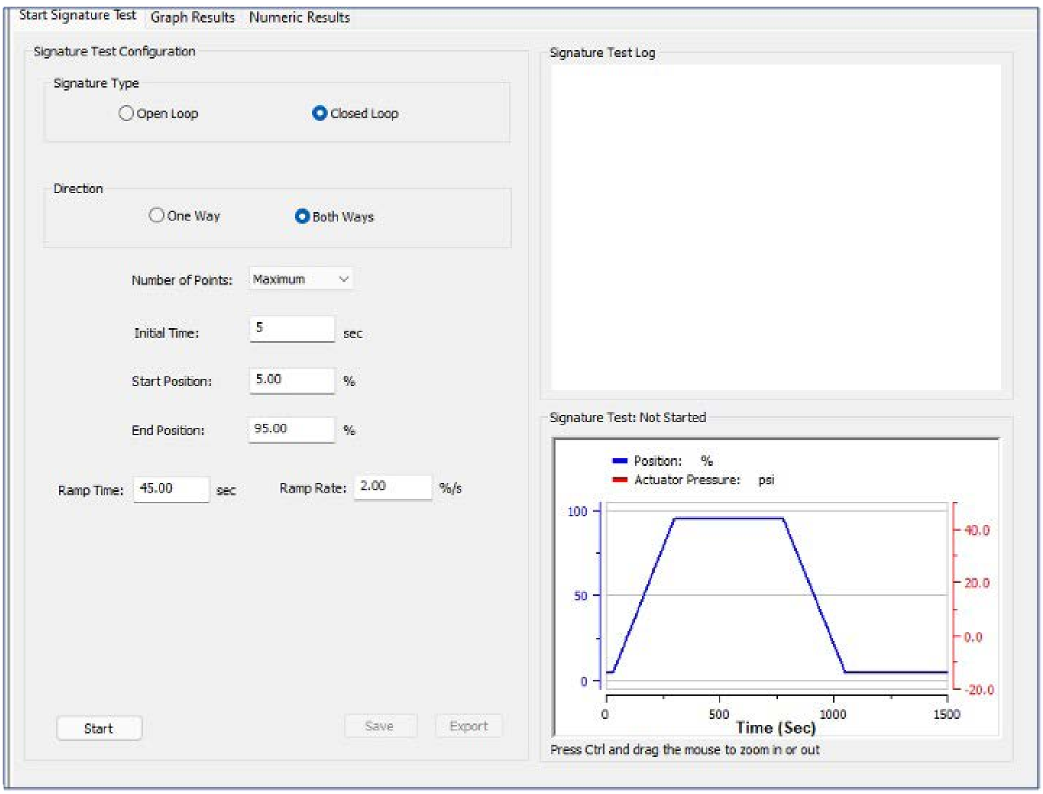
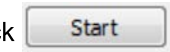


Figure 107 – Diagnostics Start Closed Loop Test

3. Click **One Way** or **Both Ways**.

4. Use the pulldown to select the number of points to gather.

5. Enter values for *Start Position*, *End Position*, *Ramp Time*, *Ramp Rate* and click .

   The *Estimated Time* appears and the *Signature Test Log* begins displaying test data.

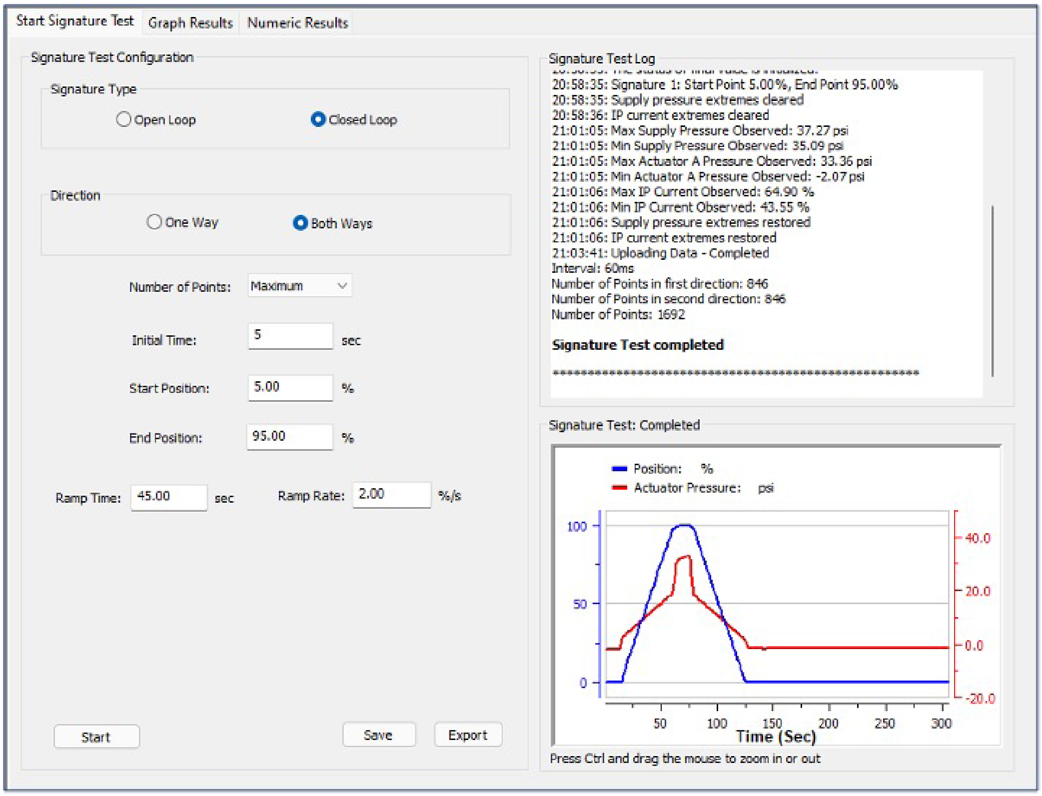


Figure 108 – Diagnostics Signature Test Complete: Closed Loop Both Ways

   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.

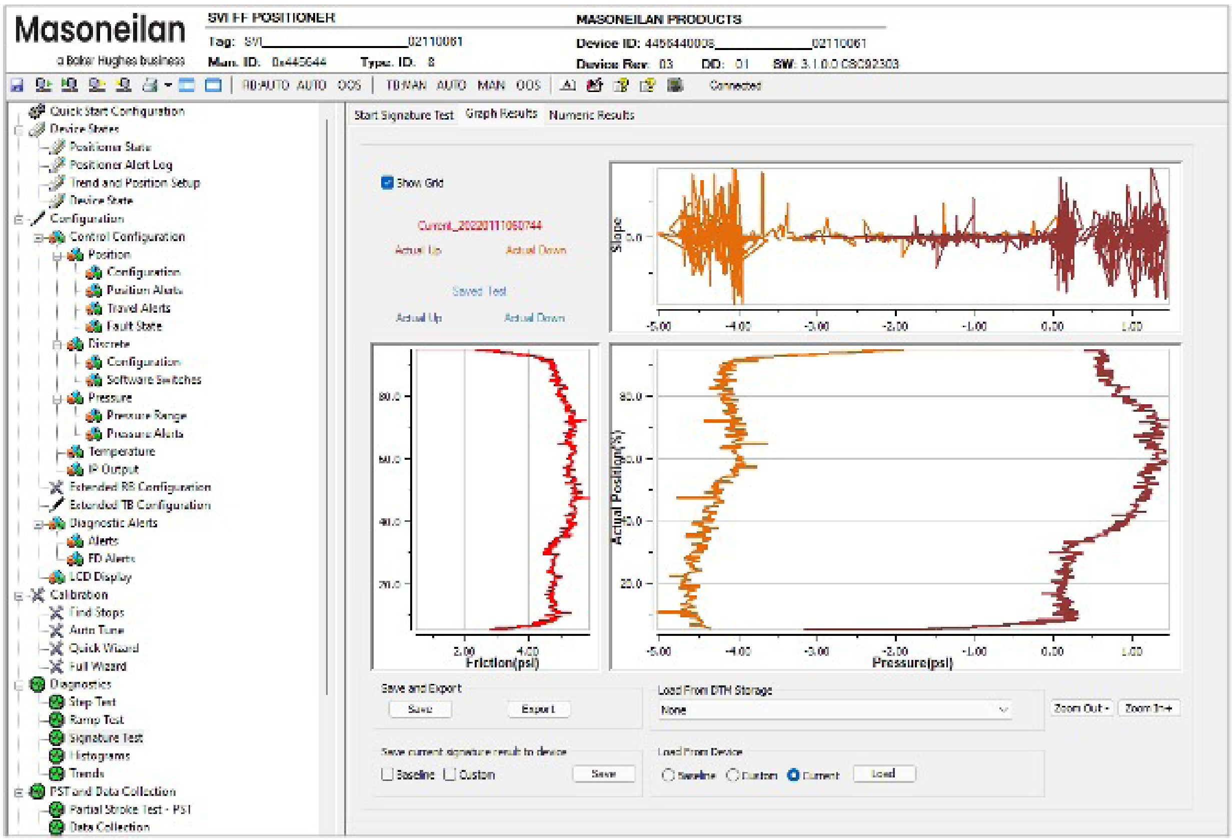


Figure 109 – Diagnostics Signature Test Graph Results

Buttons and Fields

General Graph functionality	All graphs have some common functionality, including:

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.

Show Grid

Toggles the grid on for all three graph areas.

Actual Up

Shows the distance up for valve position.

Actual Down

Shows the distance down for valve position.

Actual Position vs *Friction (kPa)*

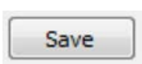
Displays a graph of actual position versus friction.

Slope vs. *Pressure*

Displays a graph of the slope of the pressure curve versus pressure.

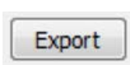
AP (Actual Position) vs. Setpoint or Time graph

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.

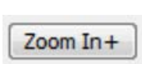


Export

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

Zoom Out -

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



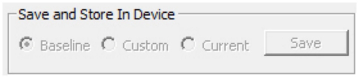
Zoom In +

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.

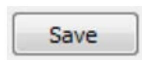
Save and Store In Device



Radio buttons

Click one of the radio buttons to select the type:

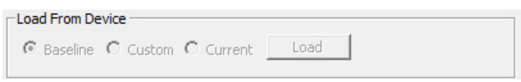
- *Baseline*: Saves the result as a baseline curve in the device. You can load a saved signature test from device to the UI and compare to the current test.
- *Custom*: Saves the result as a custom curve in the device. This can be accessed for use at a later time.
- *Current*: Saves the result as the current curve for use by the device.
  Save Current is only available for SVI FF REV02/REV01 device.
  SVI FF REV03 device can automatically save the results as current curve, so no Save Current radio button for REV03 device.

Once selected, click 

.

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

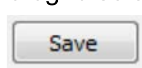
Load From Device



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 

.

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 Signature Test Results*.

Export Signature Test Results

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

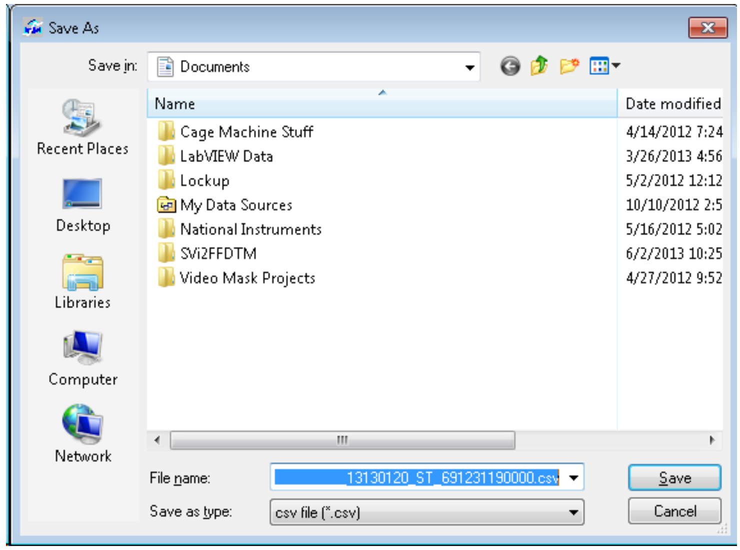
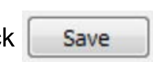


Figure 110 – Export Test Results

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

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Diagnostics Signature Test Numeric Results

Use this tab to view log results.

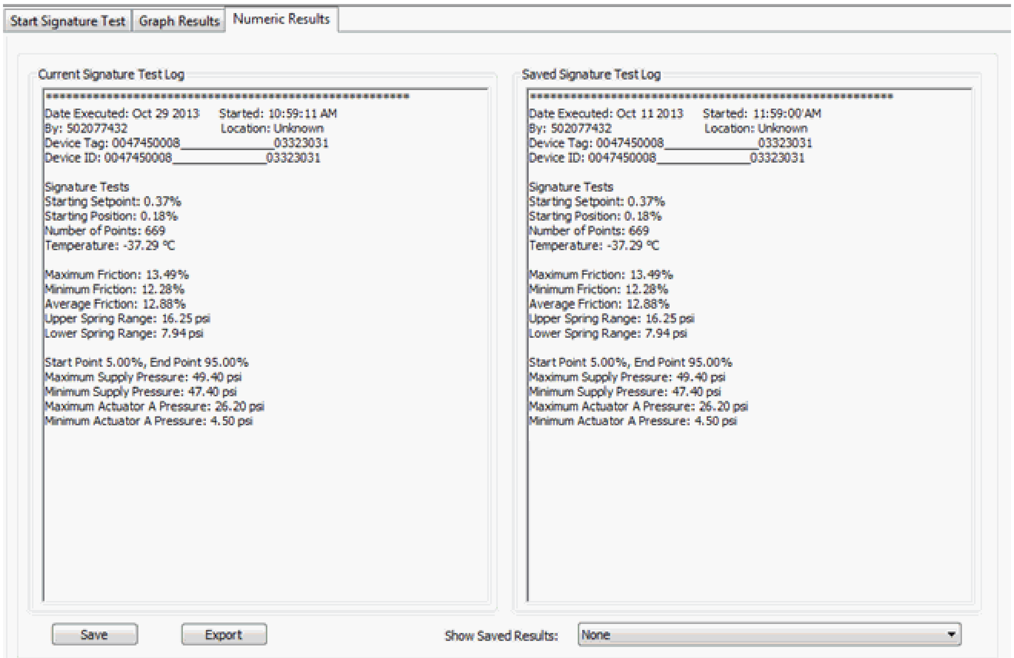
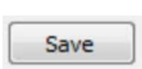
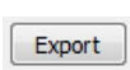


Figure 111 – Diagnostics Signature Test Numeric Results

See *Save Signature Test Results* and *Export Signature Test Results*.

Buttons and Fields

Currents Ramp Test Log	Displays the results from a current step test. These results can be saved or exported.
Savee 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 Signature Test Results* for instructions.
Show Saved Results	Use the pulldown to select a results file and the graph is populated. See *Signature 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.

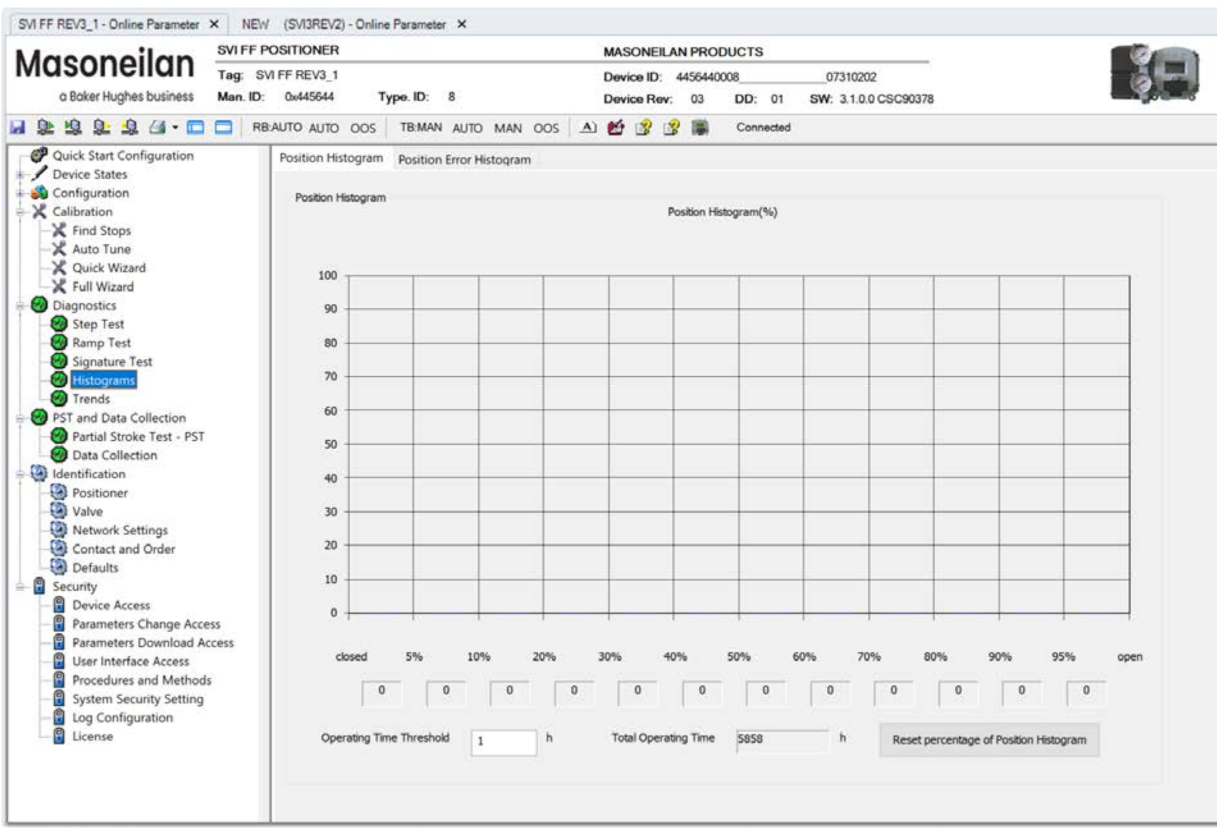


Figure 112 – Diagnostics Position Histogram: Position Histogram Tab

Buttons and Fields

Position Histogram (%)	Display a trace of the position histogram.
Closed - 5%.....95% Open	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.
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.
Total Operating Time	Displays the running operating time for the positioner since the last reset or start of operations.
	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.

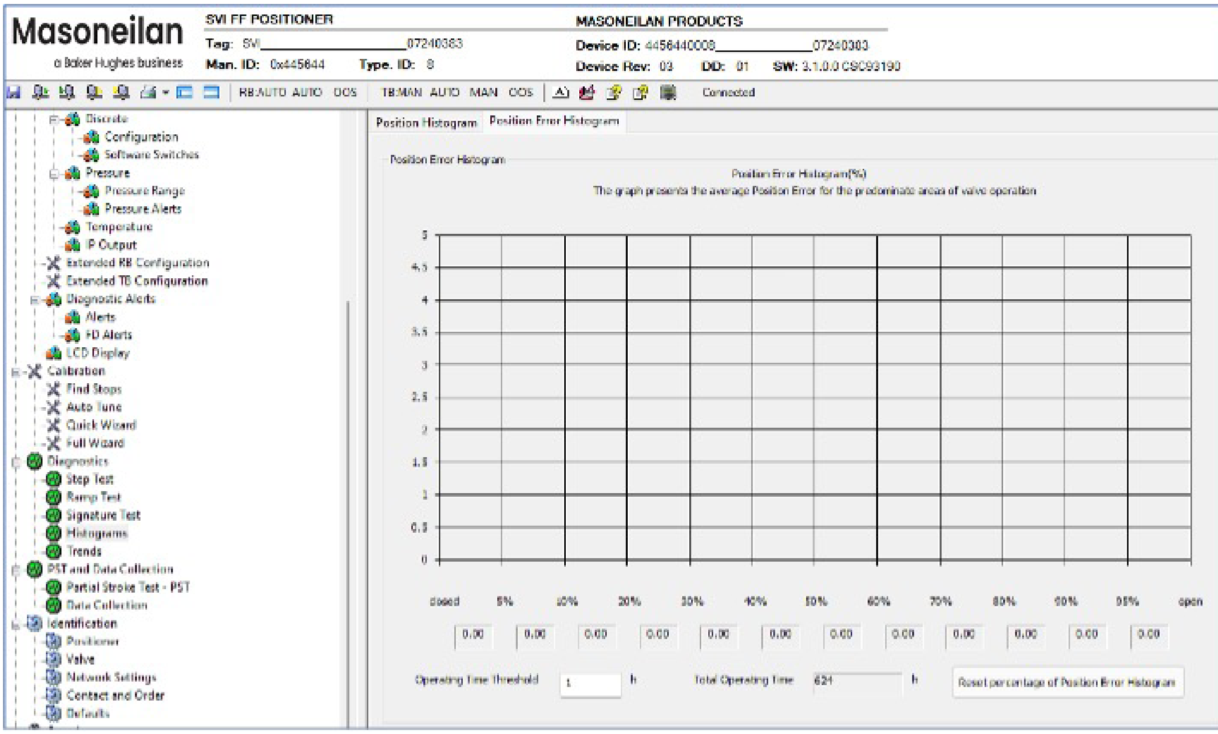


Figure 113 – Diagnostics Position Histogram: Position Error Histogram Tab

Buttons and Fields

Position Histogram (%)	Display a trace of the position error histogram.
Closed - 5%.....95% Open	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.
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.
Total Operating Time	Displays the running operating time for the positioner since the last reset or start of operations.
Reset percentage of Position Error Histogram	Click this button to reset the data collection. This can be used, for example, if the valve has been serviced.

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.

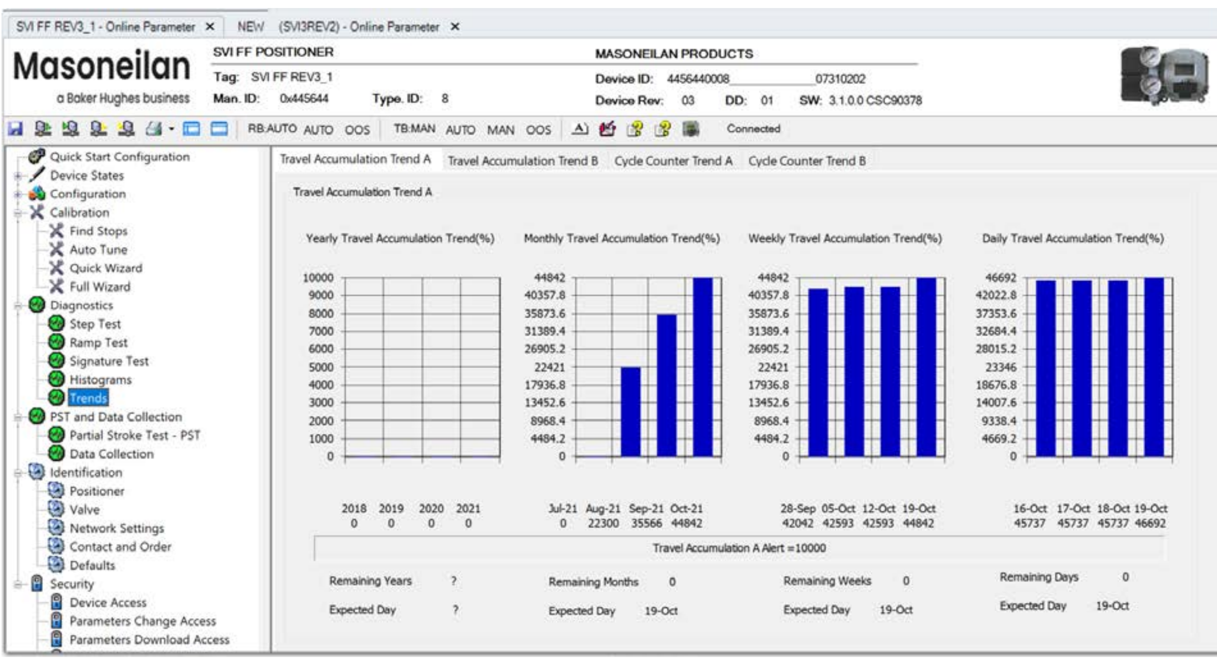


Figure 114 – Diagnostics Trend Information Presentation: Travel Accumulation Trend A Tab

Buttons and Fields

Yearly Travel Accumulation Trend (%)	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.
Monthly Travel Accumulation Trend (%)	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.
Weekly Travel Accumulation Trend (%)	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.
Daily Travel Accumulation Trend (%)	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.
Alert Bar	Displays the current state of the accumulated travel alert. See *Travel Alarms* for information on how to clear alarms.
Remaining Years/ Expected Day	Display that indicates when the travel accumulation is expected to go into alert.
Remaining Months/ Expected Day	Display that indicates when the travel accumulation is expected to go into alert.
Remaining Weeks/ Expected Day	Display that indicates when the travel accumulation is expected to go into alert.
Remaining Days/ Expected Day	Display that indicates when the travel accumulation is expected to go into alert.

Cycle Counter Trend A and B

Use these two tabs to track valve cycle trends.

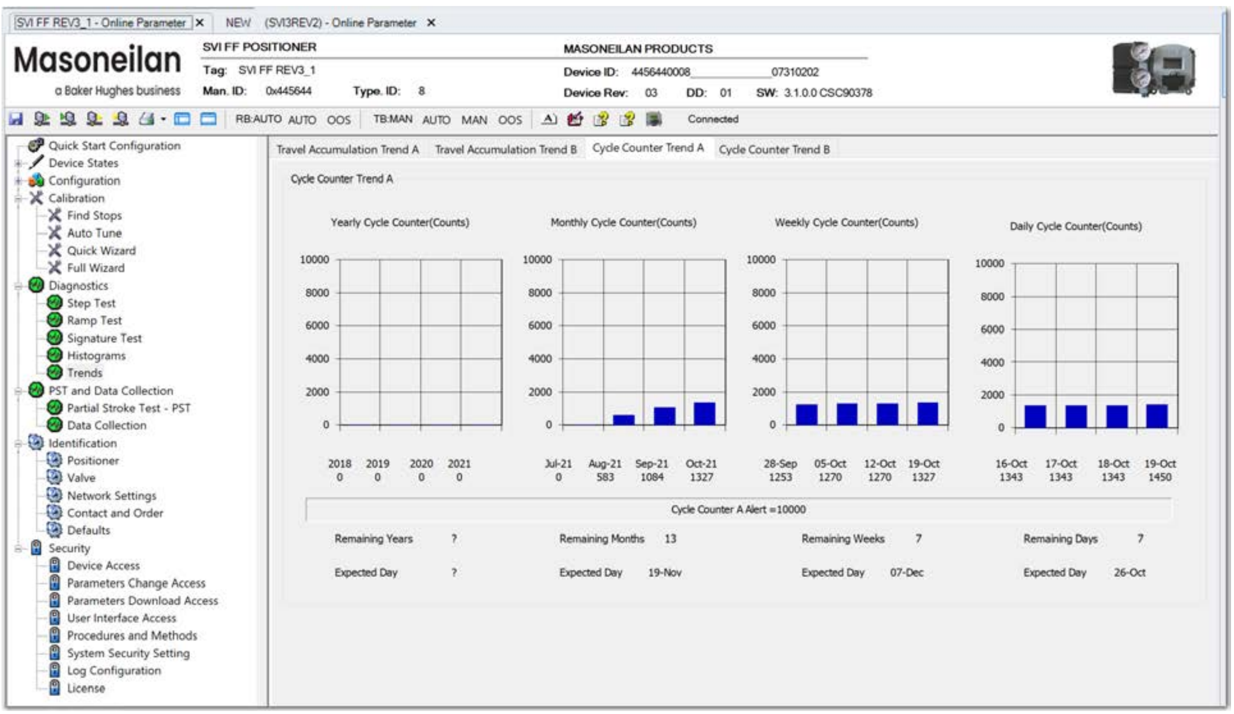


Figure 115 – Diagnostics Trend Information Presentation: Cycle Counter Trend A Tab

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.

Daily Cycle Counter (Counts)	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.
Alert Bar	Displays the current state of the cycle counter alert. See *Cycle Counter A and B Alerts Tab* for information on how to reset.
Remaining Years/ Expected Day	Display that indicate when the cycle counter is expected to go into alert.
Remaining Months/ Expected Day	Display that indicate when the cycle counter is expected to go into alert.
Remaining Weeks/ Expected Day	Display that indicate when the cycle counter is expected to go into alert.
Remaining Days/ Expected Day	Display that indicate when the cycle counter is expected to go into alert.

11. PST and Data Collection

Partial Stroke Tests

Introduction

The Partial Stroke Test (PST) is initially introduced for emergency shutdown valves. It is used to evaluate the valve capability to open or close after a long period of service.

Recently the Partial Stroke test applications are also done in control valves. This document describes the implementation of the Partial Stroke Test in SVI FF positioner. Partial Stroke Test (PST) attempts to move the valve by applying a pattern of setpoint changes to a setpoint captured at start of the process. While the setpoint is set, PST runs data collection in the positioner.

PST variables

PST contains several pre-configured variables. Below is the introduction of each variables

PST Trigger

PST Triggers	Description
Trigger on Demand	PST can be manually triggered when the trigger is enabled
Trigger by DI Switch	PST can be triggered by asserting the physical DI switch • Disable: Disable the trigger • Switch open: PST will be triggered by switch on • Switch closed: PST will be triggered by switch closed
Trigger by AI Input	PST can be triggered by asserting the physical AI input • Disable: Disable the trigger • Trigger on below threshold: PST will be triggered when AI input value is less than AI trigger input threshold • Trigger on above threshold: PST will be triggered when AI input value is more than AI trigger input threshold
Physical AI Trigger Input	Threshold for AI trigger. Initial value is 12 mA

PST Variables

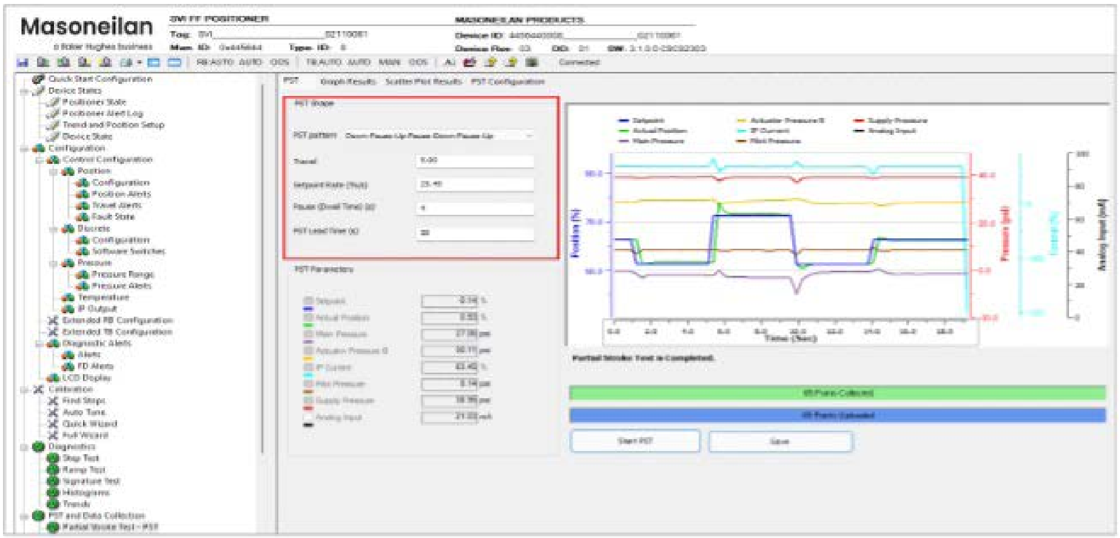
PST Variables	Valid Range	Description
PST Pattern		The predefined sequences of up/down strokes of the PST: • Down-Pause-Up • Down-Pause-Up-Pause-Down • Down-Pause-Up-Pause-Down-Pause-Up • Up-Pause-Down • Up-Pause-Down-Pause-Up • Up-Pause-Down-Pause-Up-Pause-Down
Travel	(0.1%, 30%)	Magnitude of partial stroke
Setpoint Rate (%/s)	(0.19%/s,199.99%/s)	Rate of setpoint change in a partial stroke
Setpoint change threshold (%)	(0.01 %, 10.01%)	If process setpoint changes more than threshold, PST is aborted
PST Leadtime	(0s,60s)	Time before the first stroke
PST PAUSE (Dwell Time) (s)	(2s,60s)	The Steady time at the end of the ramp. PST spends this pause time between consecutive strokes
Pilot Pressure change threshold (PSI)	(0 PSI, 150 PSI)	If pilot pressure changes more than threshold, at the end of lead time, PST is aborted
Actuator Pressure change threshold (PSI)	(0 PSI, 150 PSI)	If actuator pressure changes more than threshold, at the end of lead time, PST is aborted
Max time of PST Completion(s)	(5s,300s)	If running time exceeds this Max time, PST is aborted
Freeze options		When PST is running, it is managing the setpoint and valve position
Parameters to Collect	8 variables	Specifies which variables are collected during PST • Working Position • Main Pressure • Pilot Pressure • Supply Pressure • Actuator Pressure B • Working Setpoint • I/P Current • Analog Input

PST Execution

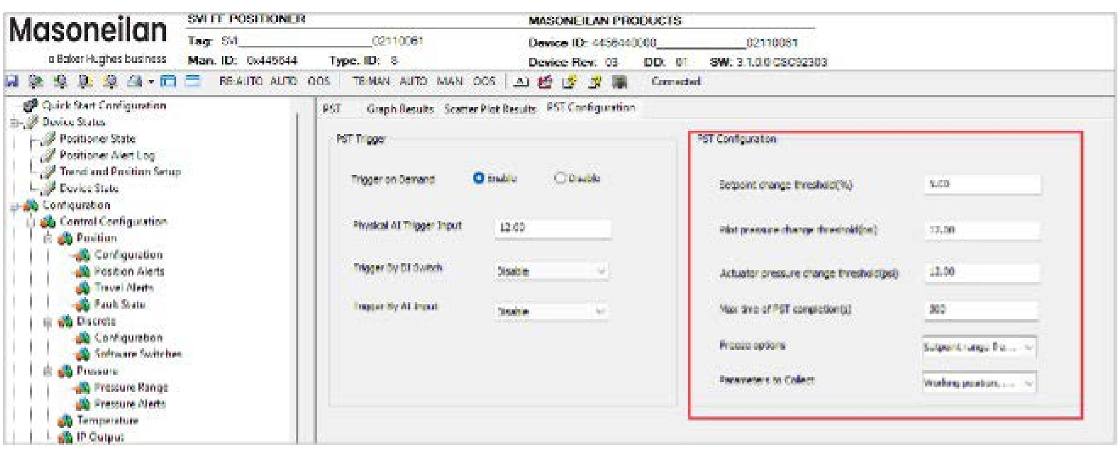
Configuration for PST

Before starting a PST on SVI FF device, several configurations need to be done:

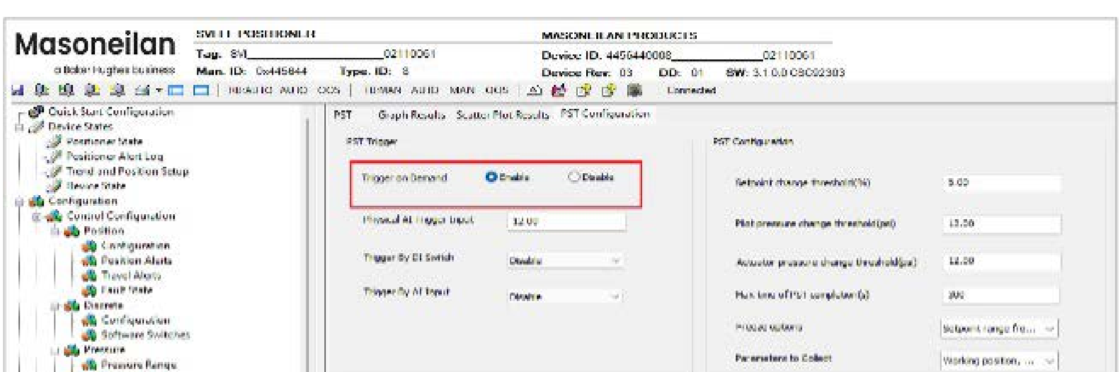
- Set PST Shape that includes PST pattern, PST travel, Setpoint Rate, Pause time and PST Lead time on PST tab



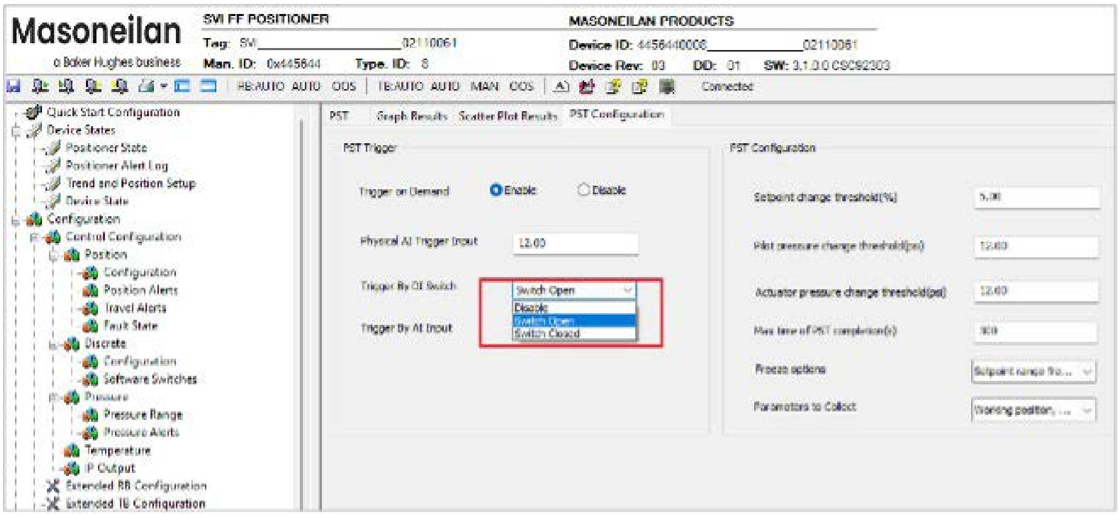
- Set PST threshold, Max time of PST completion and Parameters to Collect on PST Configuration tab



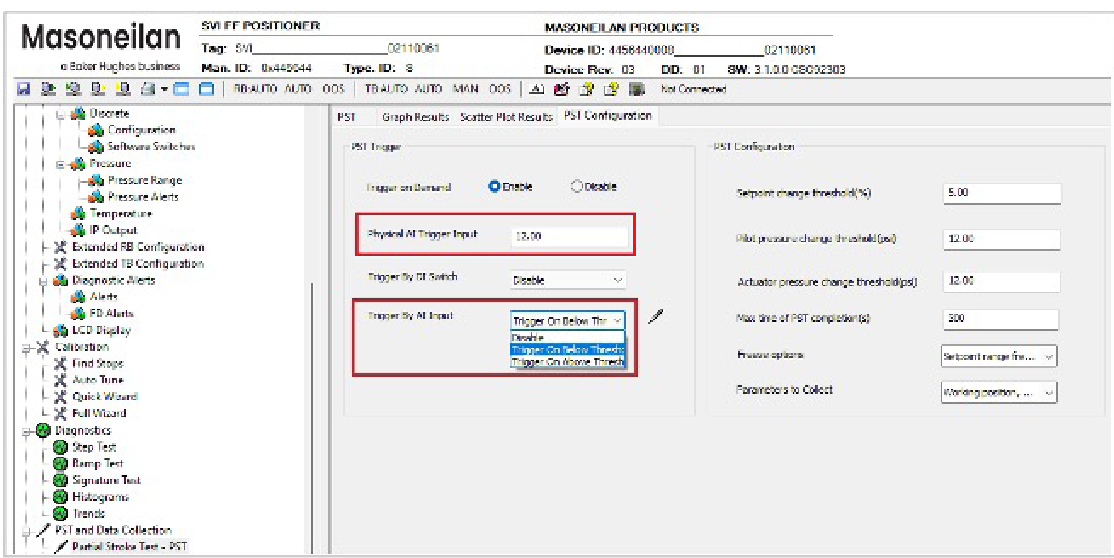
- Turn on PST trigger
  - For PST is run by demand, please set “Trigger on Demand” as Enable



- For PST is auto triggered by physical DI switch, please set PST trigger as “Switch Open” or “Switch Closed”

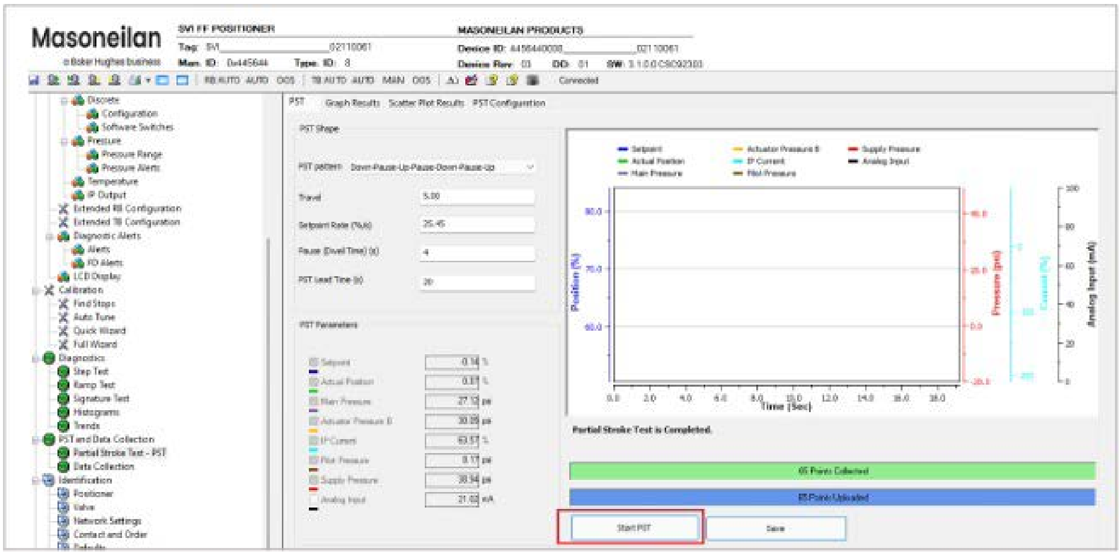


- For PST is auto triggered by physical AI Input, please set a threshold for “Physical AI Tigger Input” and enable “Tigger on below threshold” or “Tigger on above threshold”.

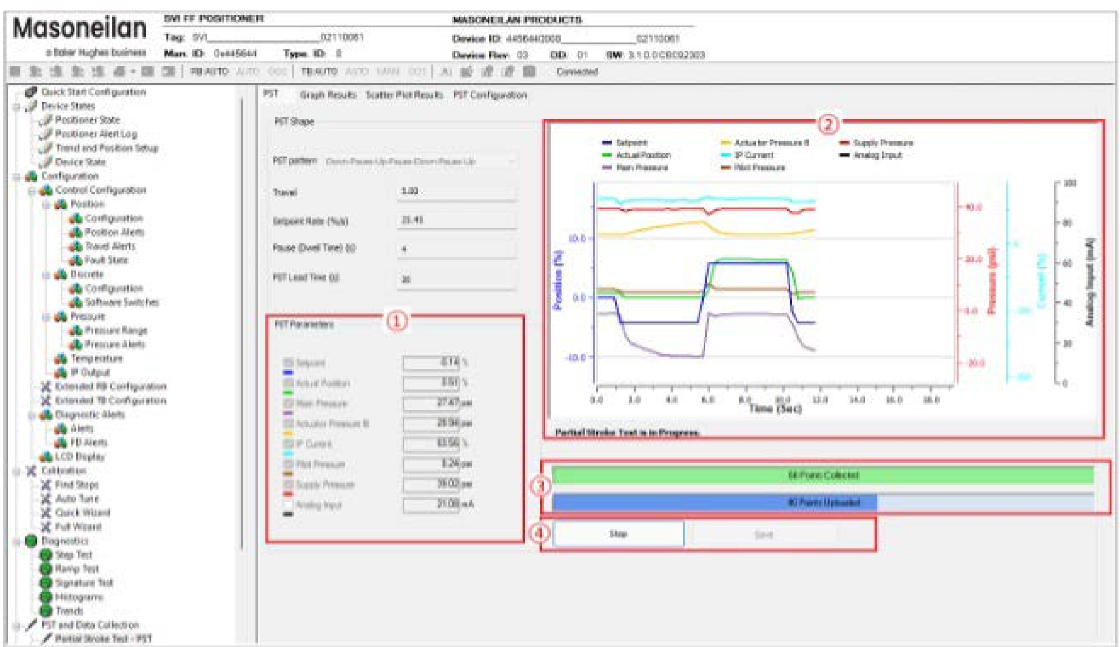


Run PST on demand

Go to PST tab-> Click “Start PST” button to start a PST process.



Starting PST will also trigger a data collect process in the device. The data collection can capture total 8 variables during PST running. User can use SVI FF DTM to load the collected data from the device and check whole PST process.



Area 1: To display the value of device variables. The variable with “√” sign indicates that this variable will be captured by the device during PST process

Area 2: shows the trend for each device variable during PST process, and the status of PST process

Area 3: Green bar shows currently how many data has been collected in the device
Blue bar shows how many data has been uploaded to the DTM

Area 4: Stop button to cancel PST process
Save button to save the PST data in local after the test completed

NOTE: Running PST on demand requests TB mode is in manual or auto mode

PST is auto triggered by physical DI switch

When the state of DI switch changes, SVI FF device will automatically trigger a PST procedure and collect the PST data in the device data buffer.

PST is auto triggered by physical AI Input

When Analog Input value is less than the threshold or more than the threshold, SVI FF device will automatically run a PST process and collect the PST data in the device data buffer.

NOTE: To start PST from a physical input (DI or AI), the signal must be

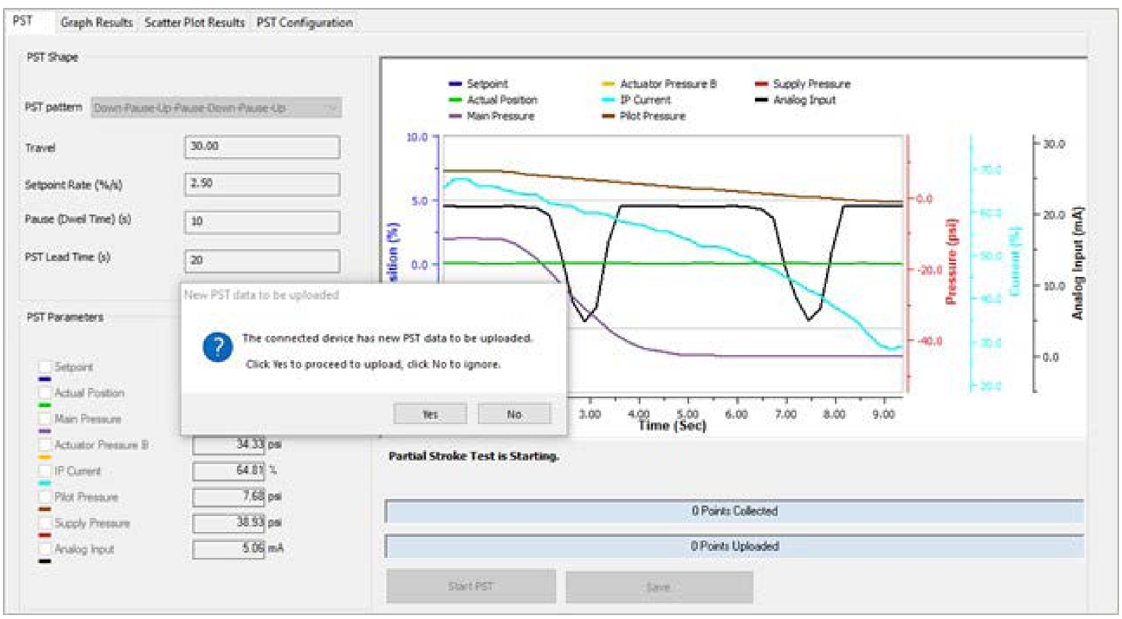
• De-asserted for at least 1 s

• Asserted for at least 10 s

• TB mode is in Auto mode

Auto load PST data to DTM

SVI FF device may have run PST automatically or from other PC applications before connecting DTM to it. When the DTM connects to the device, PST page will pop up to let user upload new PST data.



Click Yes - to proceed uploading

Click No - to ignore the new PST data

PST Result

DTM uses Graph Result and Scatter Plot Result to present the PST data after all the data is loaded to the DTM. For detail, please refer to PST and Data Collection Results.

Data Collection

Introduction

Valve diagnostics and predictive diagnostics depends on real-time data, which is too slow and intermittent while polling. So, there is a need in buffering high-speed data in the device and retrieving the buffer. Real-time data collection can be used on demand, on some internal or external trigger.

Data collection doesn't change any process variables. It just collects pre-specified device variables in a buffer until max specified number samples are collected or the buffer becomes full.

Data Collection Configuration

Data Collection contains several pre-configured variables. Below is an introduction of each of the components

Data Collection Trigger Configuration

Data Triggers	Description
Trigger on Demand	Data Collection can be manually triggered when the trigger is enabled
Trigger by TB Alert	Data Collection can be triggered by TB alerts
Trigger by DI Switch	Data Collection can be triggered by asserting the physical DI switch • Disable: Disable the trigger • Switch open • Switch closed
Trigger by AI Input	Data Collection can be triggered by asserting the physical AI input • Trigger on below threshold • Trigger on above threshold • Trigger on between threshold
Tigger by Position Deviation	Data Collection can be triggered by position deviation
Tigger by Pressure Deviation	Data Collection can be triggered by pressure deviation
Tigger by Setpoint Deviation	Data Collection can be triggered by setpoint deviation

Data Collection Configuration

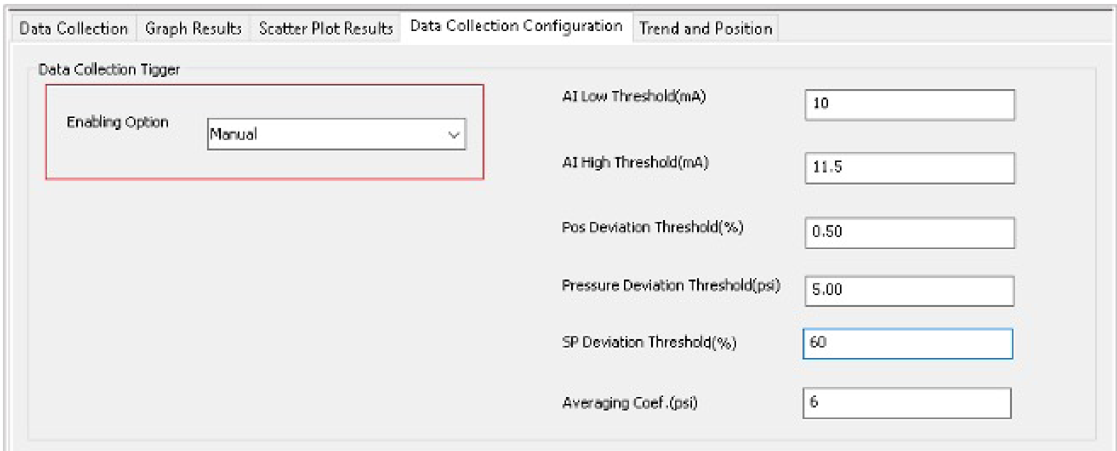
Data Collection Configuration	Valid Range	Description
Base Rate	15ms and 60ms	Period of sampling
Skip Count	(0,65536)	Number of samples skipped between recorded samples
Max Samples	(0, 65535)	Max number of samples to collect. 0 means unlimited by the buffer capacity
Number of Pre-Samples	(0, 65535)	Samples before trigger to include in total samples. For temporary configuration it is ignored
Parameters to Collect	8 variables	Specifies which variables are collected: • Working Position • Main Pressure • Pilot Pressure • Supply Pressure • Actuator Pressure B • Working Setpoint • I/P Current • Analog Input
AI Low Threshold (mA)	(0,23.1)	Physical AI threshold below which data sampling is activated
AI High Threshold (mA)	(0,23.1)	Physical AI threshold above which data sampling is activated
Position Deviation Threshold (%)	(0.01,100.01)	Position Deviation threshold above which data sampling is activated
Pressure Deviation Threshold (PSI)	(0,150)	Pressure Deviation threshold above which data sampling is activated
SP Deviation Threshold (%)	(0.01,100.01)	Set point Deviation threshold above which data sampling is activated
Average Coefficient	(0.01, 30.01)	Average work Coefficient

Run Data Collection

Data collection can be triggered either on demand or automatically.

Data Collection triggered on demand

• Enable Manual trigger on Data Collection Configuration tab before running Data Collection



• SVI FF DTM provides four types of tests to run Data Collection

Solenoid Test:

Runs a test where user can test using a very brief pulse the action of an installed solenoid without removing the valve from 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 from four predetermined test cycles:

0.1 sec - 3 Mins Data:	Collects data every 0.1 seconds for three minutes.
1 Sec - 30 Mins Data:	Collects data once every a 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.

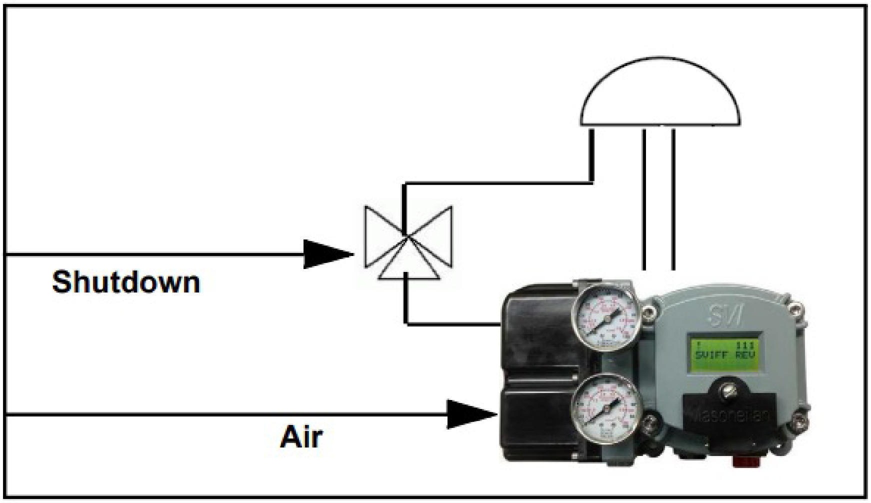
In each case, the left-hand number represents the time interval at which data points are collected and the right-hand number is the overall test duration.

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.

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 air into the atmosphere. Following Diagram: Solenoid Test Setup shows a general configuration for a solenoid test.



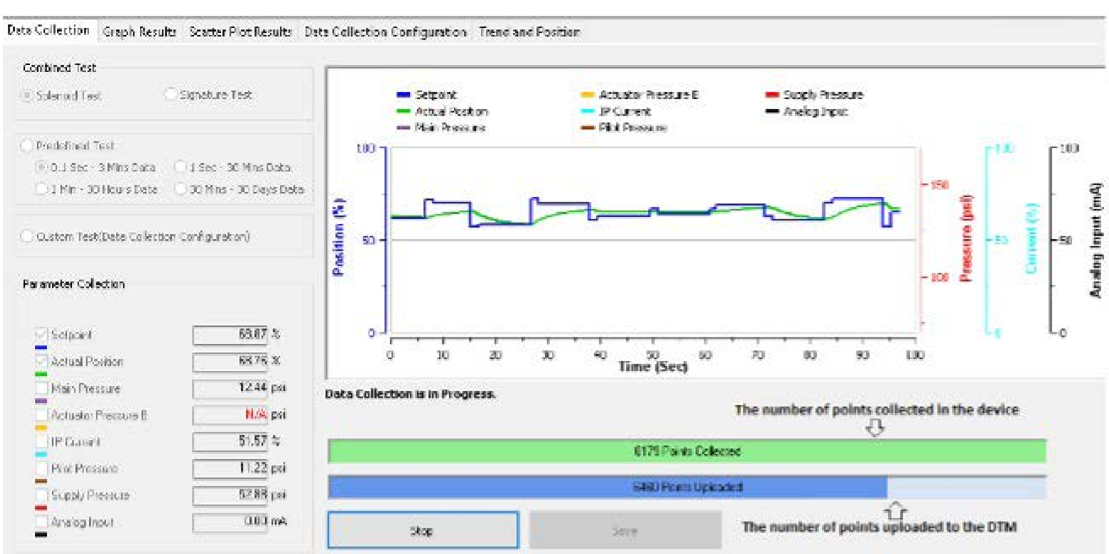
Solenoid Test Setup

On DTM Data Collect Tab:

1. Click the Solenoid Test radio button.

2. Click  . The data in the graph begins updating. Data collection captures the data with following configuration.

Base Rate	Skip Count	Max Samples	Parameters to Collect
15 ms	0	0	Working Position Working Setpoint



Parameter Collection	To display the value of device variables. The variable with "√" sign indicates that this variable will be captured by the device
Parameter Trend	Shows the trend for each device variable during the data collection, and the status of data collection process
Progress bar	Green bar shows currently how many data has been collected in the device Blue bar shows how many data has been uploaded to the DTM
Stop/Save button	Stop button to cancel data collection Save button to save the collected data in local

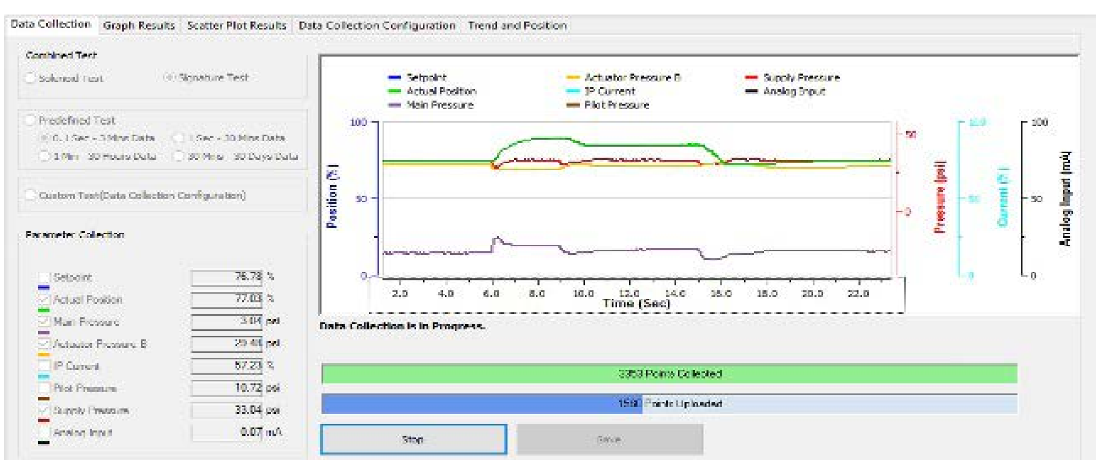
Run a Signature Test

Use Signature test to ensure that the pressure/position relationship is consistent.

On DTM Data Collect Tab:

1. Click the Signature Test radio button
2. Click **Start Data Collection** . The data in the graph begins updating.
   Data collection captures the data with following configuration.

Base Rate	Skip Count	Max Samples	Parameters to Collect
15 ms	0	0	Working Position Main Pressure Supply Pressure Actuator Pressure B



Parameter Collection	To display the value of device variables. The variable with "√" sign indicates that this variable will be captured by the device
Parameter Trend	Shows the trend for each device variable during the data collection, and the status of data collection process
Progress bar	Green bar shows currently how many data has been collected in the device Blue bar shows how many data has been uploaded to the DTM
Stop/Save button	Stop button to cancel data collection Save button to save the collected data in local

Run a Predefined Test

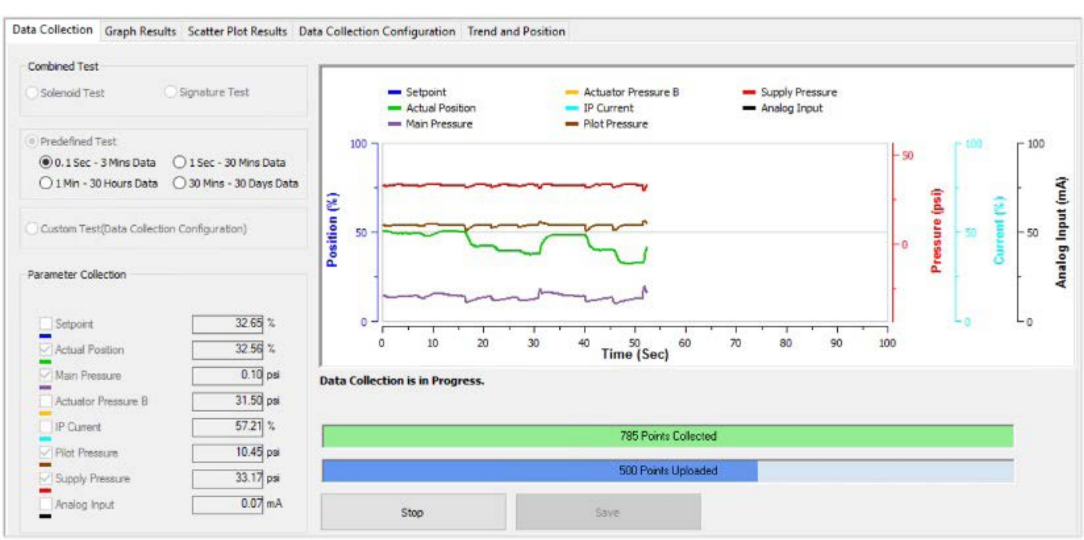
Use Predefined Test to analyze valve performance for longer period. For example

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

On DTM Data Collect Tab:

1. Click the Predefined Test radio button.
2. Click Start Data Collection . The data in the graph begins updating.
   Data collection captures the data with following configuration.

Collection Period	Base Rate	Skip Count	Max Samples	Parameters to Collect
0.1 sec - 3 Mins Data	15 ms	6	1800	Working Position Main Pressure Pilot Pressure Supply Pressure
1 Sec - 30 Mins	15 ms	66	1800	Working Position Main Pressure Pilot Pressure Supply Pressure
1 Min - 30 Hours	60 ms	999	1800	Working Position Main Pressure Pilot Pressure Supply Pressure Actuator Pressure B Working Setpoint I/P Current Analog Input
30 Mins - 30 Days	60 ms	29999	1440	Working Position Main Pressure Pilot Pressure Supply Pressure Actuator Pressure B Working Setpoint I/P Current Analog Input



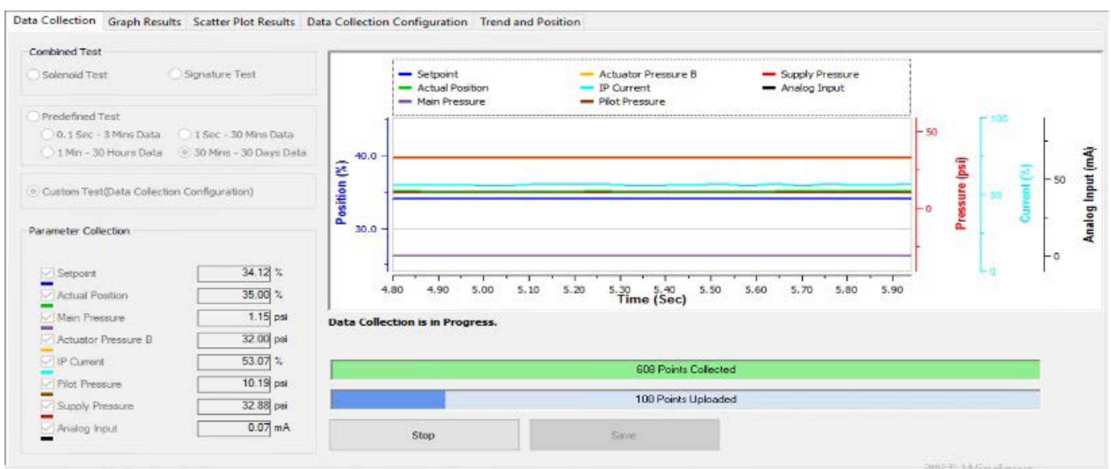
Parameter Collection	To display the value of device variables. The variable with “√” sign indicates that this variable will be captured by the device
Parameter Trend	Shows the trend for each device variable during the data collection, and the status of data collection process
Progress bar	Green bar shows currently how many data has been collected in the device Blue bar shows how many data has been uploaded to the DTM
Stop/Save button	Stop button to cancel data collection Save button to save the collected data in local

Run Custom Test

Use Custom Test to detect Fast variations in setpoint and actual position, Cycling and Tuning issues.

1. Set configuration in “Configuration for On Demand Data Collection” area on tab
2. Click the Custom Test radio button on Data Collection Tab
3. Click 

. The data in the graph begins updating.

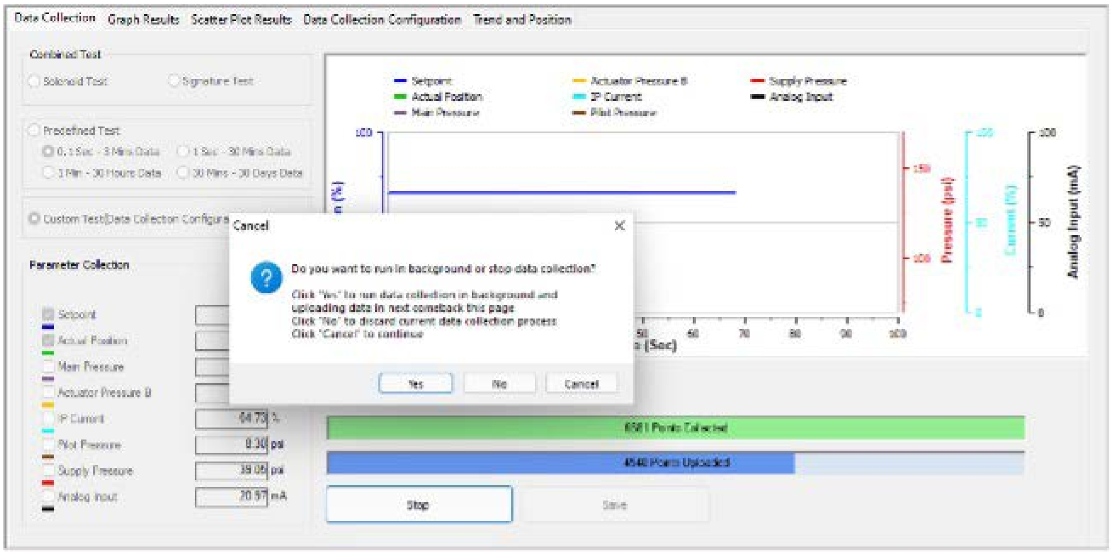


Parameter Collection	To display the value of device variables. The variable with “√” sign indicates that this variable will be captured by the device
Parameter Trend	Shows the trend for each device variable during the data collection, and the status of data collection process
Progress bar	Green bar shows currently how many data has been collected in the device Blue bar shows how many data has been uploaded to the DTM
Stop/Save button	Stop button to cancel data collection Save button to save the collected data in local

NOTE: Running Data Collection on demand requests TB mode is in manual or auto mode

Stop Data Collection

When Data Collection is started, user can stop the process by clicking Stop button. A Cancel message window will pop up for user to confirm this action.



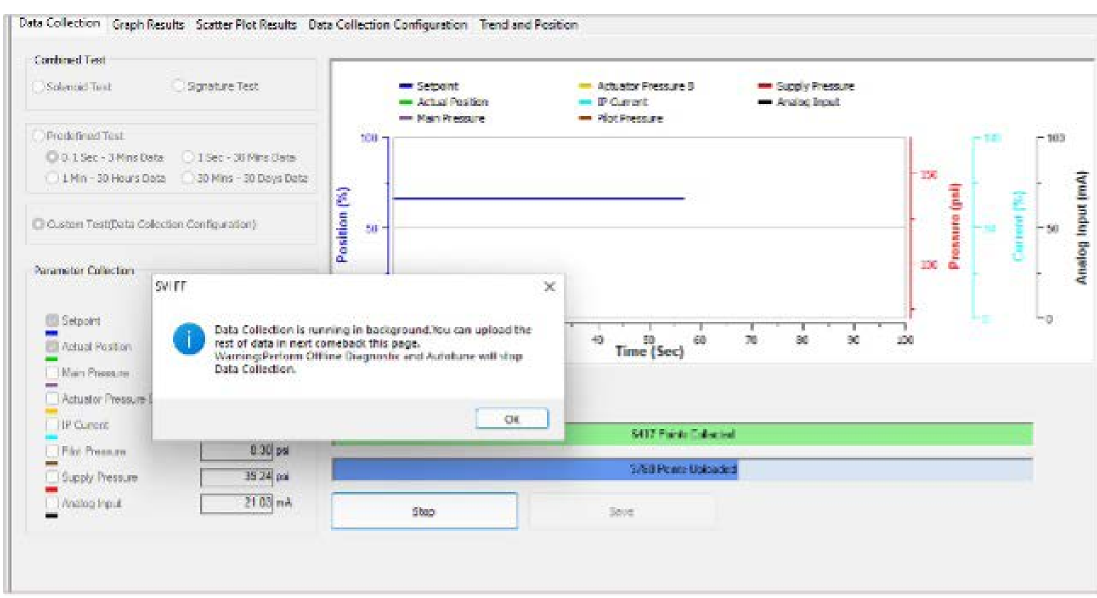
Choose No: Data Collection process will be stopped, and the collected data will be discarded

Choose Yes: Data Collection process will not be stopped, DTM will run the process in background

Choose Cancel: Cancel stopping Data Collection, continue the process on current page

Run Data Collection in background

When Data Collection is started, user can leave Data Collection page and run the process in the background. A message pops up "Data Collection is running in background. You can upload rest of data when the next comeback." when the user switches to other page.

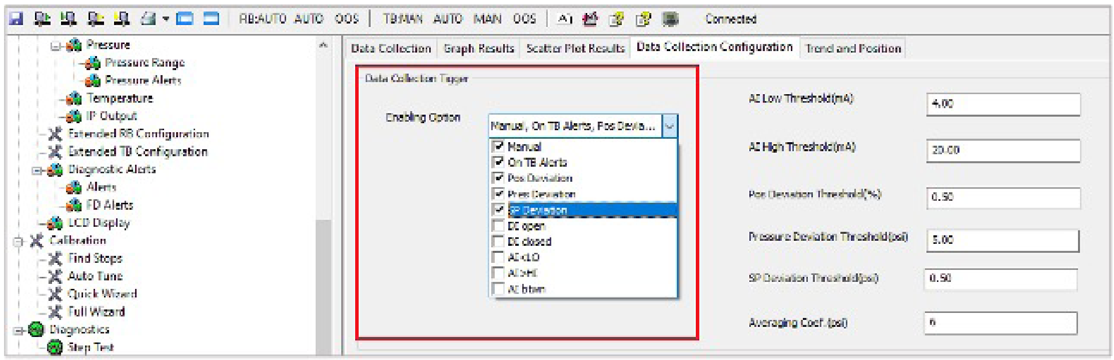


Auto Data Collection

There are several events that can trigger Data collection in SVI FF device. Before auto Data Collection works, user needs to turn on auto triggers, set the threshold and configure the data collection settings.

Enable data collection triggers

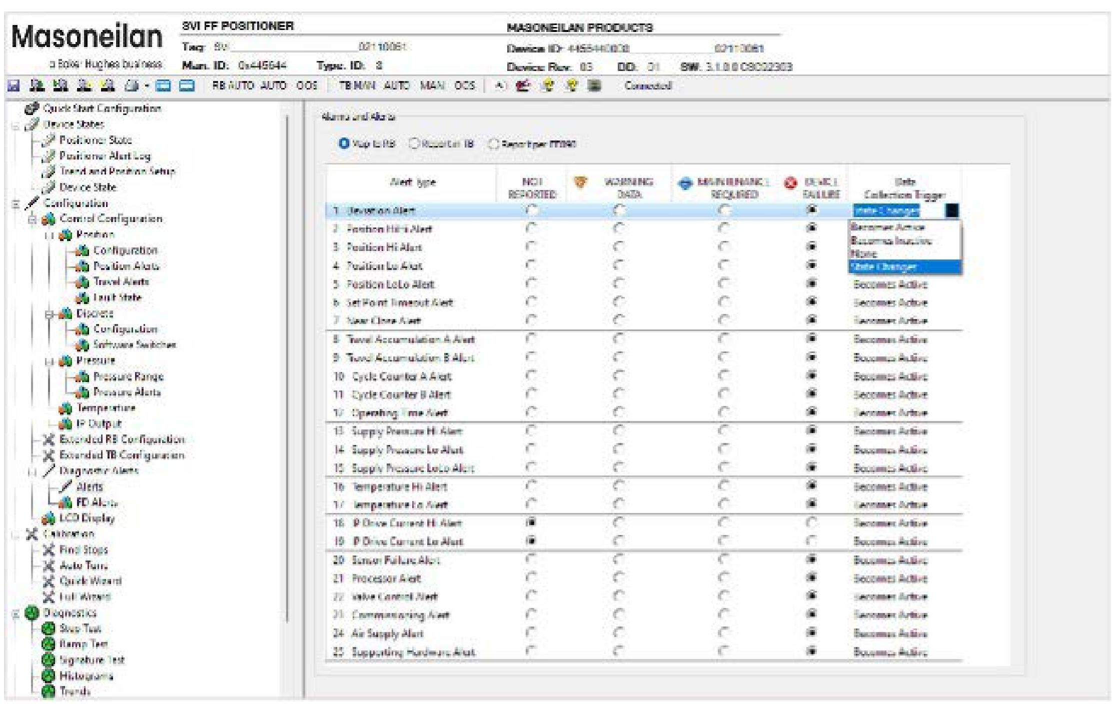
Open Data Collection Configuration page-> Enable the trigger for auto data collection



- Trigger by TB Alerts

  A Data collection process can be triggered by a TB alert.

On DTM Alarms and Alerts page user needs to configure how the TB alert triggers Data Collection process. The Data collection can be triggered when an alert becomes active or inactive or when the alert state changes.



- Trigger on Position Deviation

  A Data collection process can be triggered when the distance between setpoint and valve position is more than the threshold.

- Trigger on Pressure Deviation

  A Data collection process can be triggered when the pressure deviation is more than the threshold.

• Trigger on Setpoint Deviation

A Data collection process can be triggered when the distance between setpoint and valve position is more than the threshold.

• Trigger on DI Open

A Data collection process can be triggered by switch open.

• Trigger on DI Close

A Data collection process can be triggered by switch close

• Trigger on AI < LO

A Data Collection process can be triggered when Analog input value is less than low threshold

• Trigger on AI > HI

A Data Collection process can be triggered when Analog input value is bigger than high threshold.

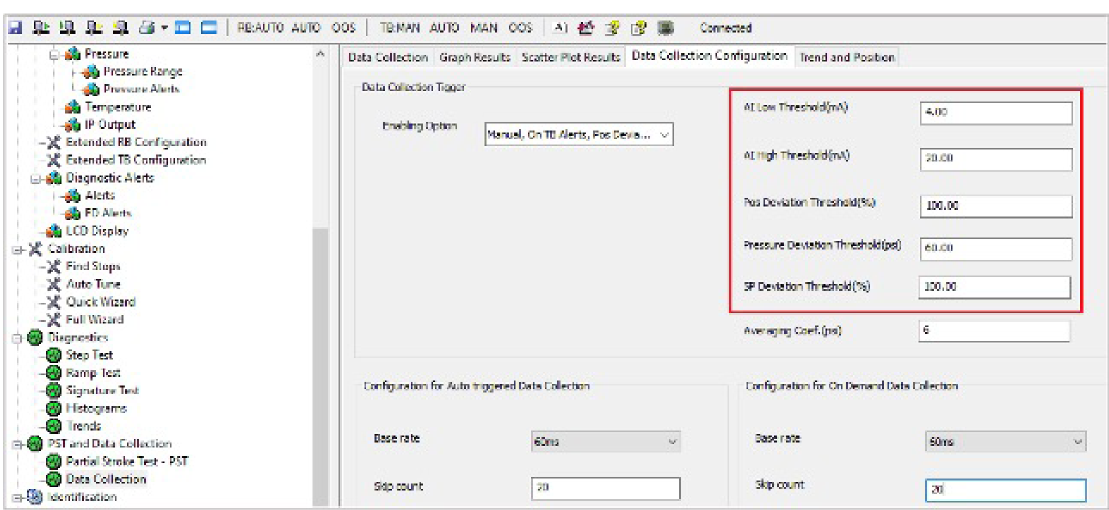
• Trigger on AI Between

A Data Collection process can be triggered when Analog input value is between low and high threshold.

Threshold for auto trigger

Open Data Collection Configuration page-> Set a value for:

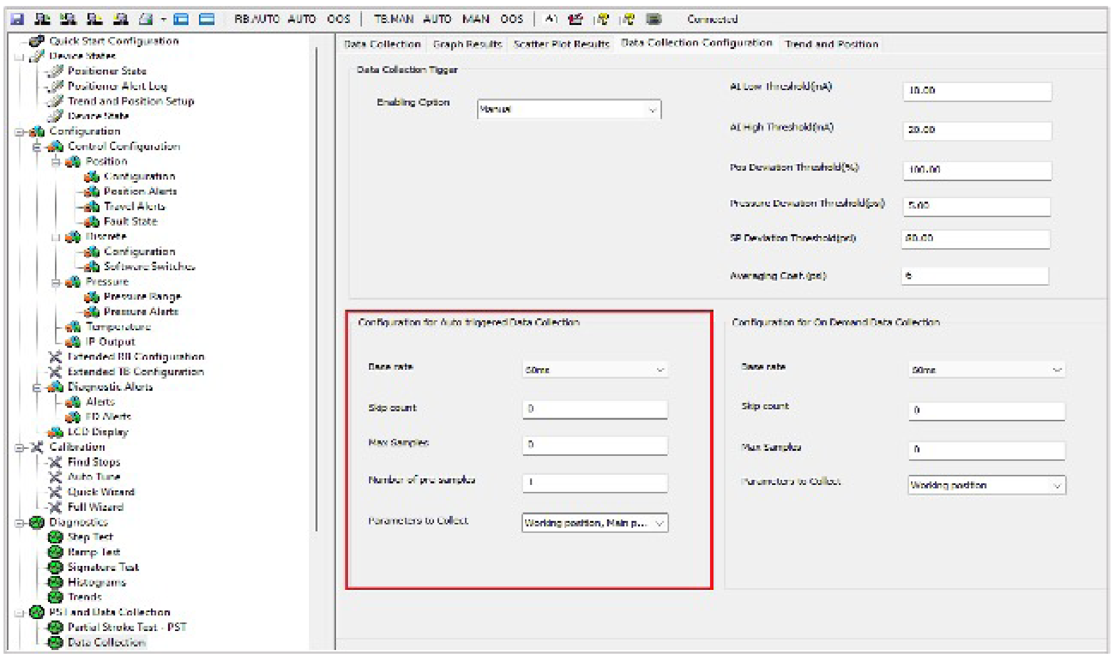
- AI Low Threshold
- AI HIGH Threshold
- Pos Deviation Threshold
- Pressure Deviation Threshold
- SP Deviation Threshold



Configuration for Auto Data Collection

Open Data Collection Configuration page-> Configure the settings below for Auto Data Collection.

- Base Rate: The period of the sampling
- Skip Count: Number of samples skipped between recorded samples
- Max Samples: Max number of samples to record
- Number of Pre-samples: Samples before trigger to include in total samples
- Parameters to collect: The variables are collected



NOTE: To start PST from a physical input (DI or AI), the signal must be:

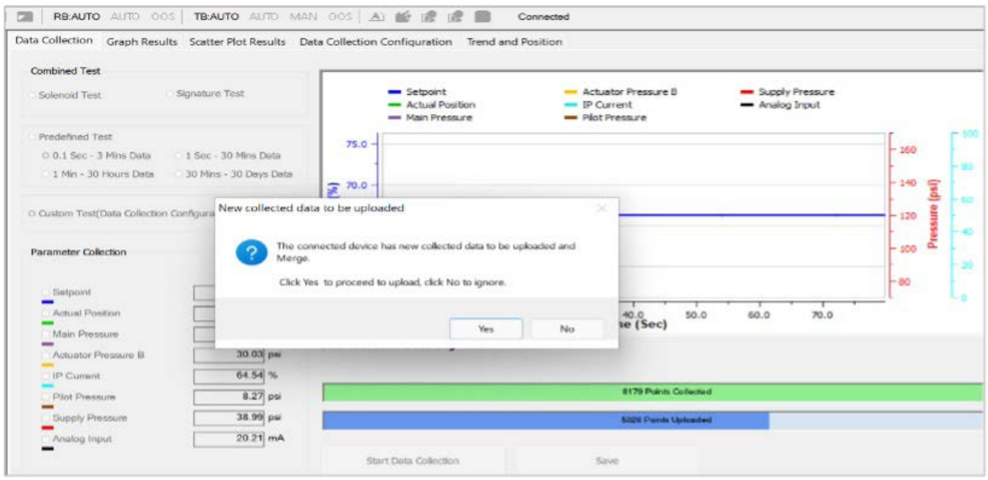
• De-asserted for at least 1 s
• Asserted for at least 10 s
• TB mode is in Auto mode

Data Merge

Data collection process may have automatically started in the device or be running in the background. When opening Data collection page, DTM will compare the local data with the data that is collected in the device. If the local data is different than the device data, a dialog as below will pop up to confirm with the user.

Choose Yes: Upload and merge the data to the DTM

Choose No: Discard the data



Data Collection demonstration using Trend and Position

User can use Trend and Position to move valve and then Start Data collection to verify data collection result.

• Go to Trend and Position Page to move valve. Refer to Trend and Position Setup

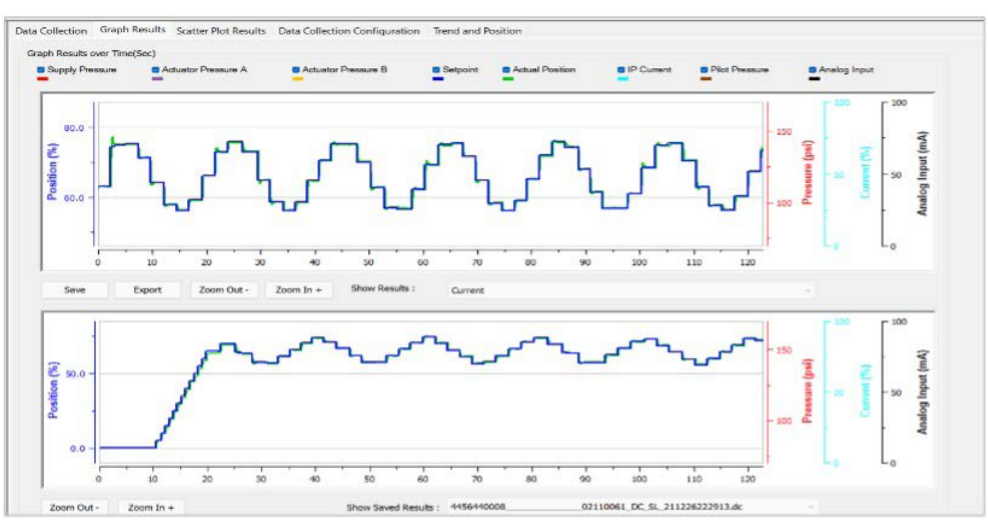
• Switch to Data Collection Tab to start Data Collection

• When Data Collection completes, use Graph Results and Scatter Plot Result to verify

PST and Data Collection Results

DTM presents the Data Collection Result and PST by UI of Graph Result and Scatter Plot Result after measurement data is uploaded.

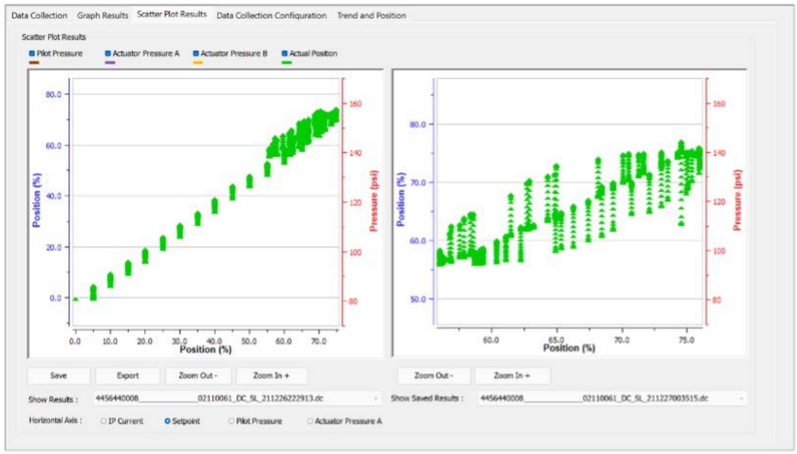
Graph Results



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/ Current/Analog Input 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 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 green line represents the Actual Position. • The light blue line represents the IP Current. • The brown line represents the Pilot Pressure. • The back line represents the Analog Input.
Save	Click to save the results. You can load back the result in the selection Show Saved Result.
Export	Exports the results as a .csv file.
Zoom Out -	Toggles the view in according to preset values to 50%.
Zoom In +	Toggles the view out according to preset values to two times.
Show Saved Results	Use the pulldown to select a results file and the graph is populated.

Scatter Plot 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, 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 scale for
  - 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 brown line represents the Pilot 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 green line represents the Actual Position.

Save

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

Export

Exports the results as a .csv file.

Zoom Out -

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

Zoom In +

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

Show Saved Results

Use the pulldown to select a results file and the graph is populated.

12. 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**.

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SVI FF Configuration Report

Smart Valve Interface Test Results

Device Tag:	SVI FF REV3_1	**Date and Time:**	Oct 19, 2021, 10:42:05 AM
Device ID:	4456440008________________07310202	**Author:**	204059780
Version:	2.0.0.0		

General Information

Positioner	
Manufacturer ID	0x445644 - 0x445644
Device Type	0x0008 - SVI FF
Device Revision	03
Min DD Revision	01
Firmware Revision	3.1.0.0 CSC90378
Device Address	18

Model Number	
Manufacturer ID	
Pneumatic Train	
Pneumatics Relay Type	
Display	
Housing	
Communications	
Options	

Actuator	
Manufacturer ID	
Model Number	
Serial Number	
Style	Single Acting
Fail Action	Valve Closed - Self-closing (air to open)
Type	Spring-diaphragm
Size	6
Rotary Moment	n/a
Effective Area	60
Max Supply Pr.	100.00 psi
Pr. Control High	13.20 psi
Pr. Control Low	3.57 psi
Message	
Date Info	01012012
Spec Sheet	

Figure 116 – Configuration Report

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.

Note: 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.

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SVI FF Test Report

Smart Valve Interface Test Results

Device Tag:	SVI FF REV3_1	**Date and Time:**	Oct 19, 2021, 10:45:22 AM
Device ID:	4456440008_____________07310202	**Author:**	204059780
Version:	2.0.0.0		

General Information

Positioner	
Manufacturer ID	0x445644 - 0x445644
Device Type	0x0008 - SVI FF
Device Revision	03
Min DD Revision	01
Firmware Revision	3.1.0.0 CSC90378
Device Address	18

Model Number	
Manufacturer ID	
Pneumatic Train	
Pneumatics Relay Type	
Display	
Housing	
Communications	
Options	

Actuator	
Manufacturer ID	
Model Number	
Serial Number	
Style	Single Acting
Fail Action	Valve Closed - Self-closing (air to open)
Type	Spring-diaphragm
Size	6
Rotary Moment	n/a
Effective Area	60
Max Supply Pr.	100.00 psi
Pr. Control High	13.20 psi
Pr. Control Low	3.57 psi
Message	
Date Info	01012012
Spec Sheet	

Figure 117 – Test Report

Diagnostic Report

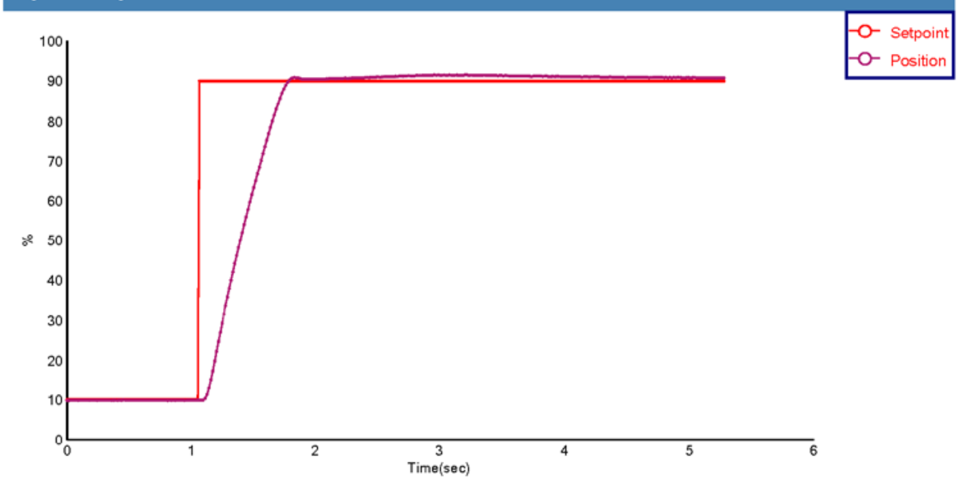
Use this screen to view a report of general positioner parameters and positioner state, which is comprised of associated variable and active alerts. Once created the report is opened in your default internet browser and is saved in HTML format in the directory indicated at the top. It can be printed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

Step Test Graph Results



Step Test Summary Results

Average 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.)	
Velocity (incr.)	129.29 %/s
Velocity (decr.)	

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 – Test Report

Positioner State

Dynamic Variables	
Setpoint	80.00 % Good
Actual Position	80.05 % Good
Setpoint from AO Block	80.00 % Good
On/Off SP from DO Block	0 % Good
Discrete SP from DO Block	0 % Good
Characterized Setpoint	80.00 % Good
Characterized Position	80.05 % Good
Supply Pressure	29.28 psi Good
Actuator Pressure A	12.94 psi Good
Actuator Pressure B	N/A
Temperature	19.13 degC Good
IP Output	51.43 % Good

Hardware Alerts: 0 Active Alerts		
Sensor Failure	Good	0
Valve Control	Good	49
Air Supply	Good	133
Processor	Good	1
Commissioning	Good	6
Supporting Hardware	Good	4

Temperature/Current Alerts: 0 Active Alerts		
Temperature Hi Alert	Good	0
Temperature Lo Alert	Good	0
IP Drive Current Hi Alert	Good	31
IP Drive Current Lo Alert	Good	0

Position Alerts: 1 Active Alerts		
Setpoint Deviation	Good	60
Setpoint Timeout	Maintenance Required	29
Position Hi Hi	Good	3
Position Hi	Good	3
Position Lo	Good	2
Position Lo Lo	Good	2
Travel Accumulation A	Good	0
Travel Accumulation B	Good	0
Cycle Counter A	Good	0
Cycle Counter B	Good	0
Near Closed	Good	0
Working Time	Good	0

Diagnostic Report

This page intentionally left blank.

13. 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 it 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.

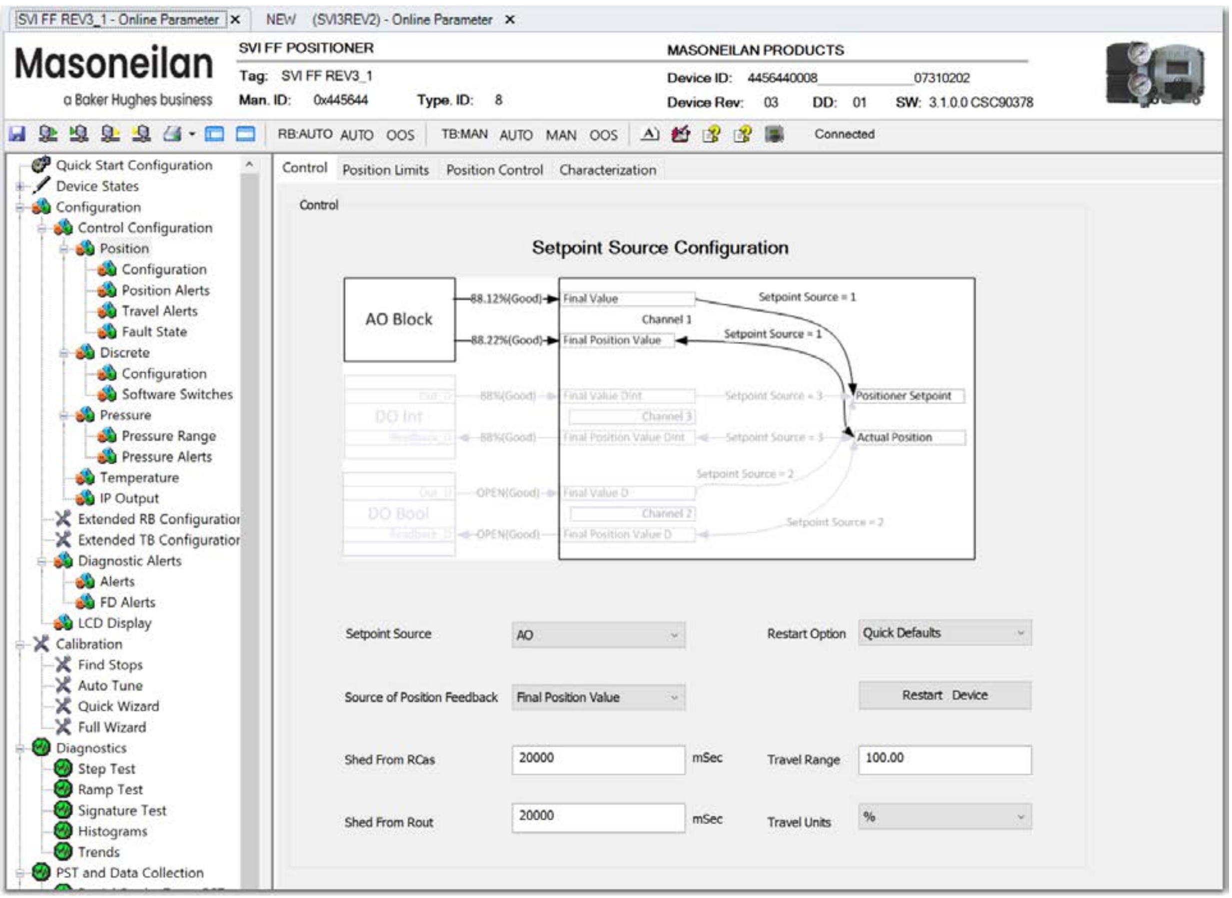


Figure 119 – Control Configuration Position: Control Tab

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:

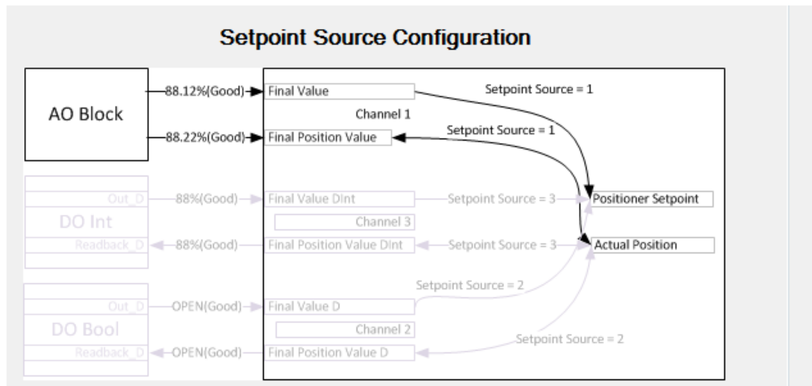


Figure 120 – Setpoint Source Configuration: AO

- *DO - Open/Close*: Sets the DO block open/close integer output OUT_D and READ-BACK_D as the setpoint source FINAL_VALUE and FINAL_POSITION_ VALUE as per the drawing:

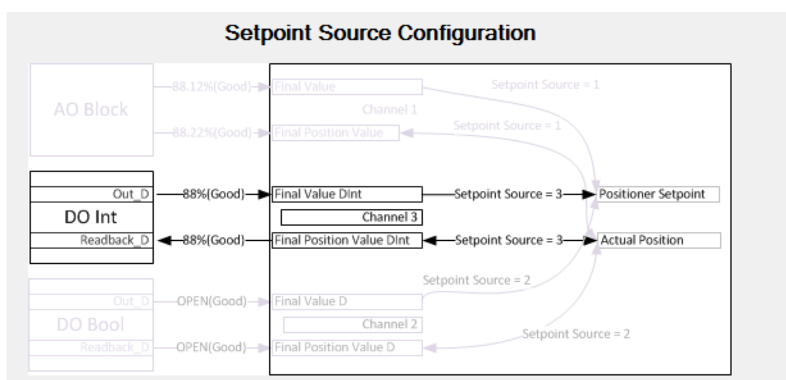


Figure 121 – Setpoint Source Configuration: DO Open/Close

- *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:

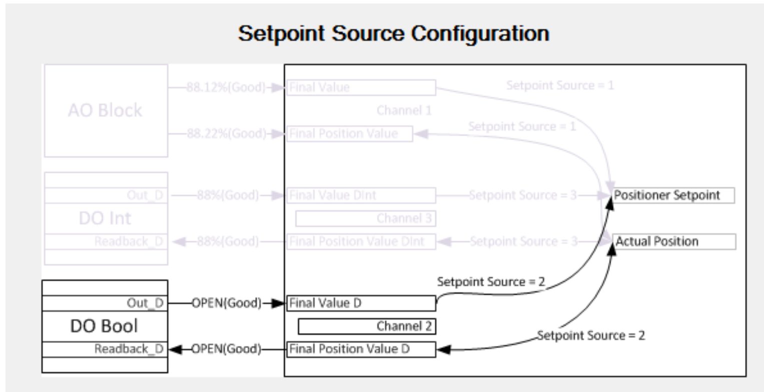


Figure 122 – Setpoint Source Configuration: DO Analog

Buttons and Fields

Source of Position Feedback	Use the pulldown to select whether the source of the position feedback to the resource block is the: • *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 is sheds control.
Shed from Rout	Enter the time (mSec) for the *Rout* to hold without communication before is 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*: Restart resource as though power fail had occurred using NVM values • *Restart with defaults*: Resets all blocks are restored to their FF specified initial values. • *Restart processor*: Performs a processor reset and 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*. • *Quick Default:* Init some block parameters to sensible default values. Requires RB in OOS mode
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 *Diagnostic 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 above 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.

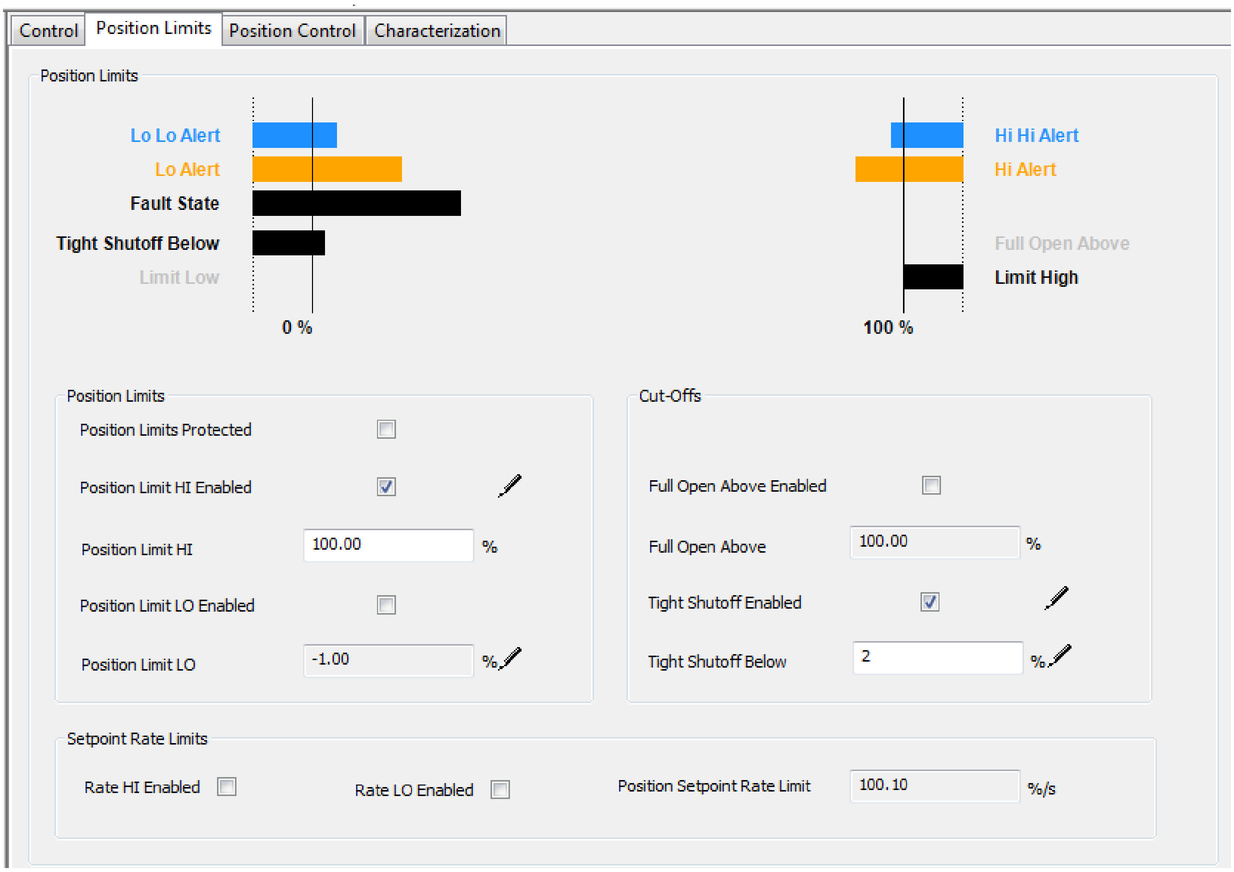


Figure 123 – Control Configuration Position: Position Limits Tab

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.

	Cut-Offs **Parameters in this group configure the point, after which the valve is fully energized or de-energized.**
Full Open Above Enabled	Use this checkbox to enable the *Full Open Above* field. Both this and *Position High Enabled* are exclusive of each other, as it might lead to a conflict with the value configured for the other parameter's field
Full Open Above	Enter a *Full Open Above* value (%).
Tight Shutoff Enabled	Use this pulldown to enable the *Tight Shutoff Below* field. Both this and *Position LO Enabled* are exclusive of each other, as it might lead to a conflict with the value configured for the other parameter's field
Tight Shutoff Below	Enter a Enter a *Full Open Above* value (%).
	Setpoint Point Rate Limits
Rate HI Enabled	Use this pulldown to enable the rate HI limit when the setpoint is higher.
Rate LO Enabled	Use this pulldown to enable the rate LO limit when the setpoint is lower.
Position Setpoint Rate Limit	Enter a Enter a *Position Setpoint Rate Limit* value (%).

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.

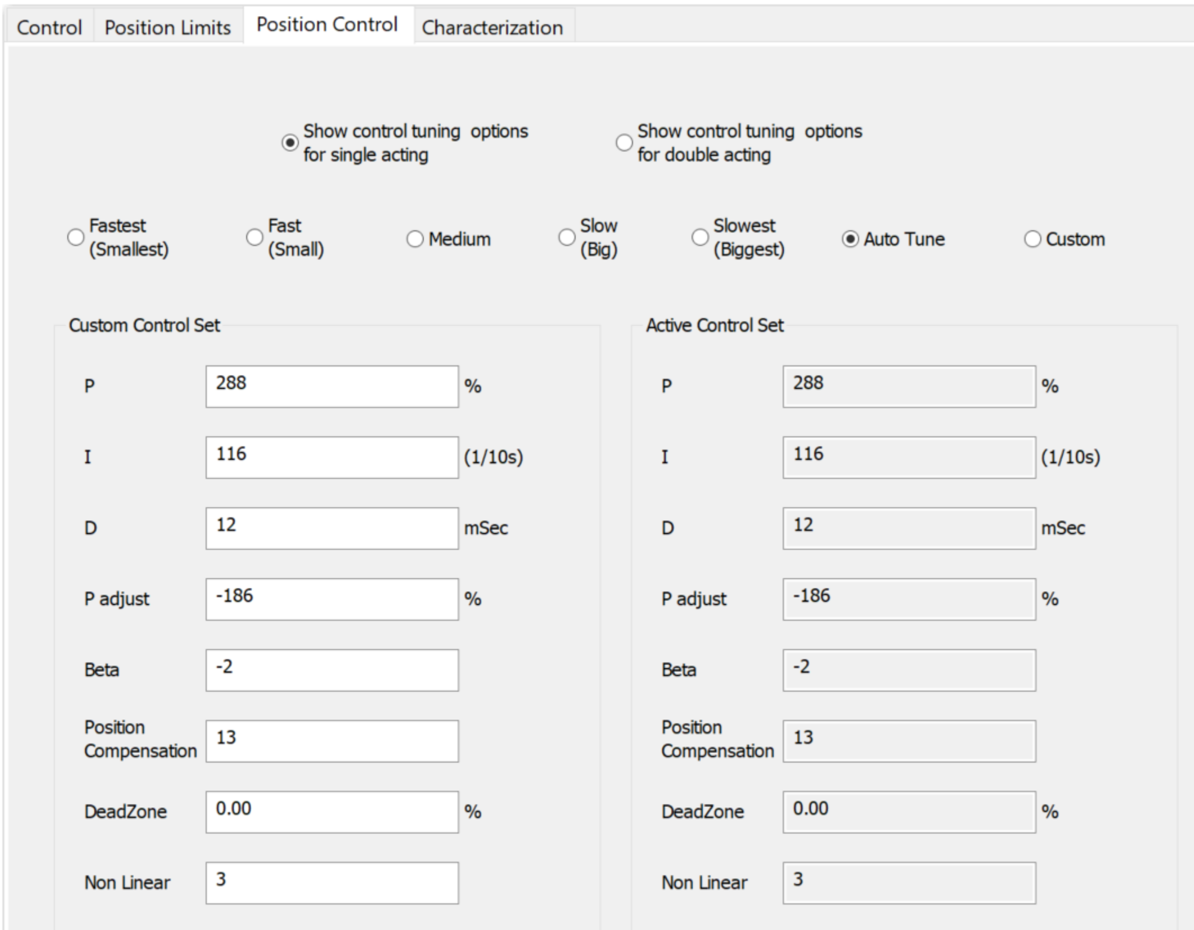


Figure 124 – Control Configuration Position: Position Control Tab

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*	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. A *Custom* control set with invalid PID parameters is rejected by the system.
P	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.

Beta	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.
PosComp	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.
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.

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 the 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*.

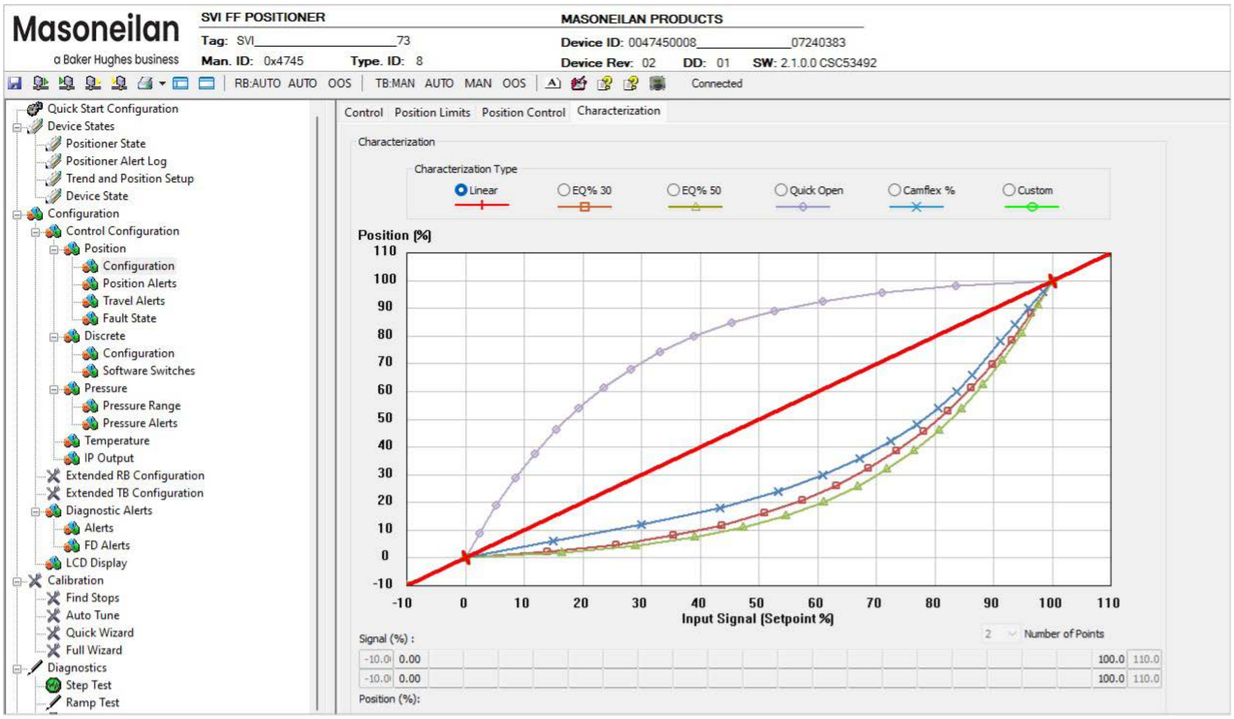


Figure 125 – Control Configuration Position: Characterization Tab

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 (*!*) appears in the navigation tree. Adjust values accordingly.

Position Alerts

Use the *Position Alerts* tab group to set up the position Alerts related parameters.

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

The relative configuration of the Alarms with respect of position limits, cutoffs, 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.

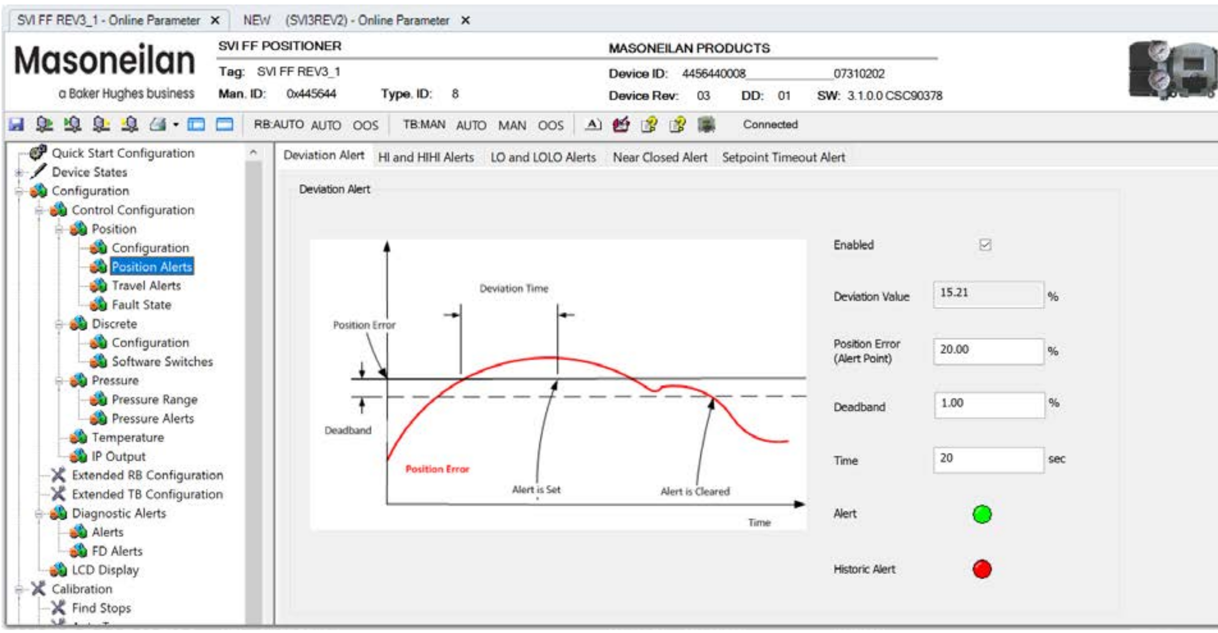


Figure 126 – Control Configuration Position Alert: Deviation Alerts Tab

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.

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 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*.

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 above HI and HI HI alert limits.

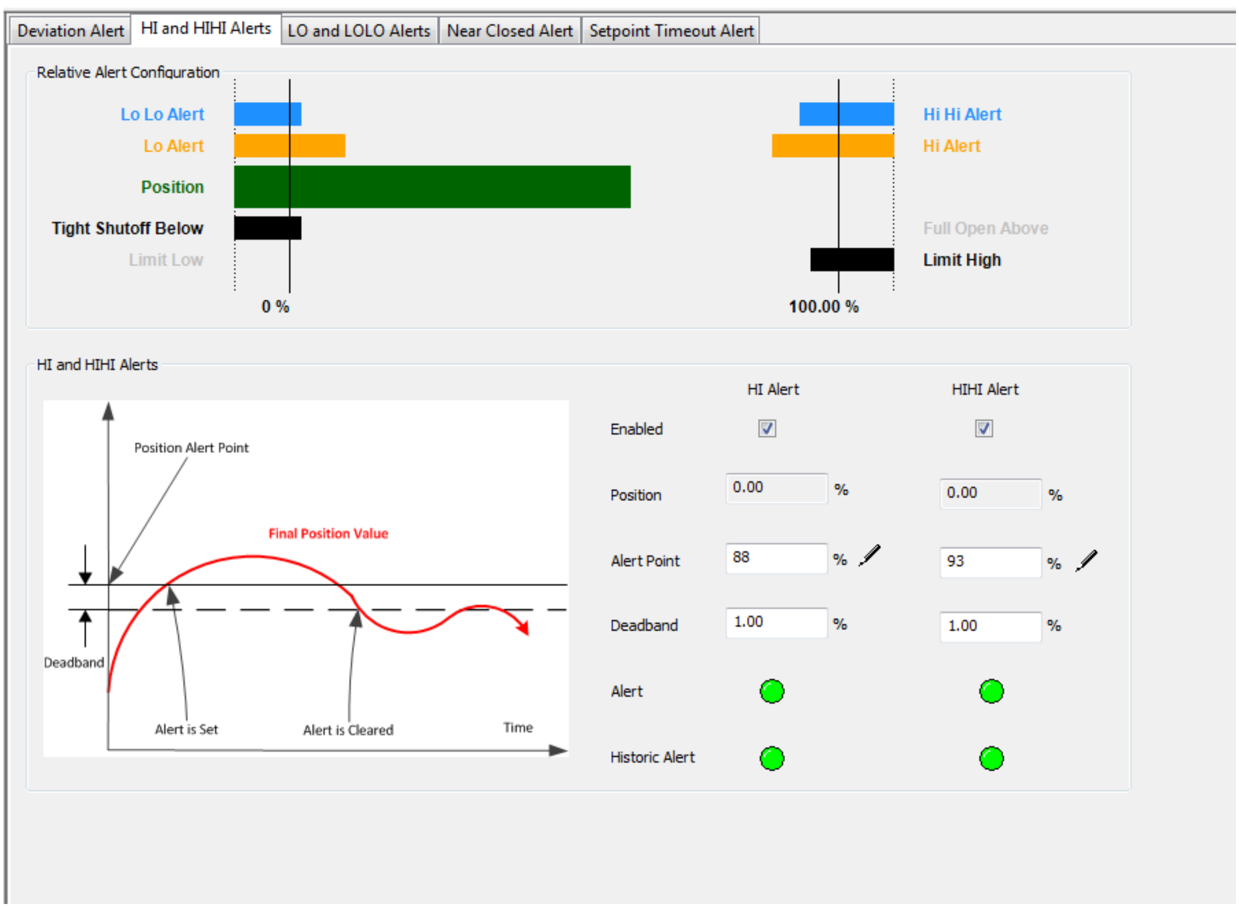


Figure 127 – Control Configuration Position Alert: HI and HIHI Alerts Tab

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

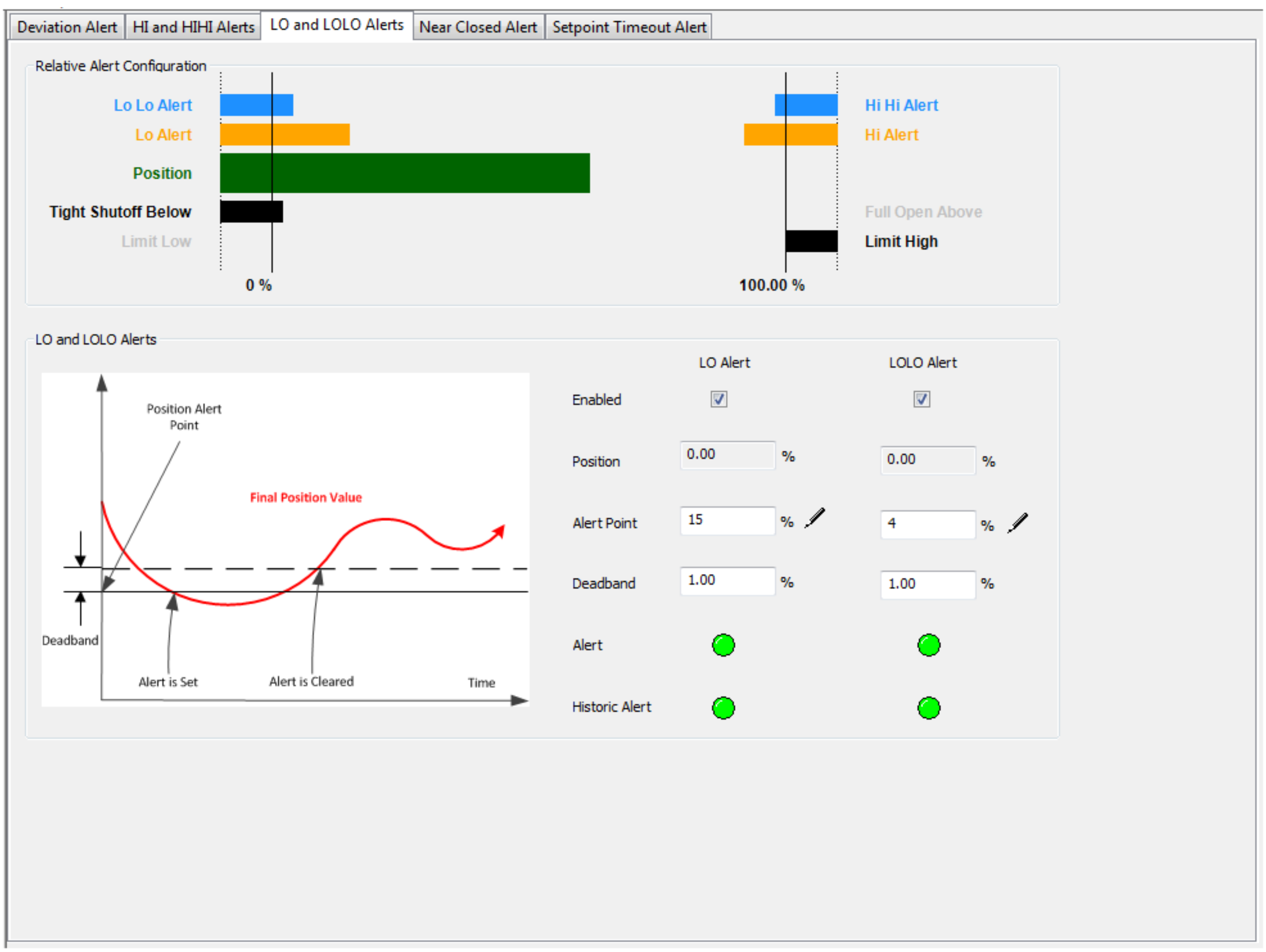


Figure 128 – Control Configuration Position Alert: LO and LOLO Alerts Tab

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 (%) above which the alert is set. This value must be below *High Alert Setpoint (HI and HIHI Alert 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.

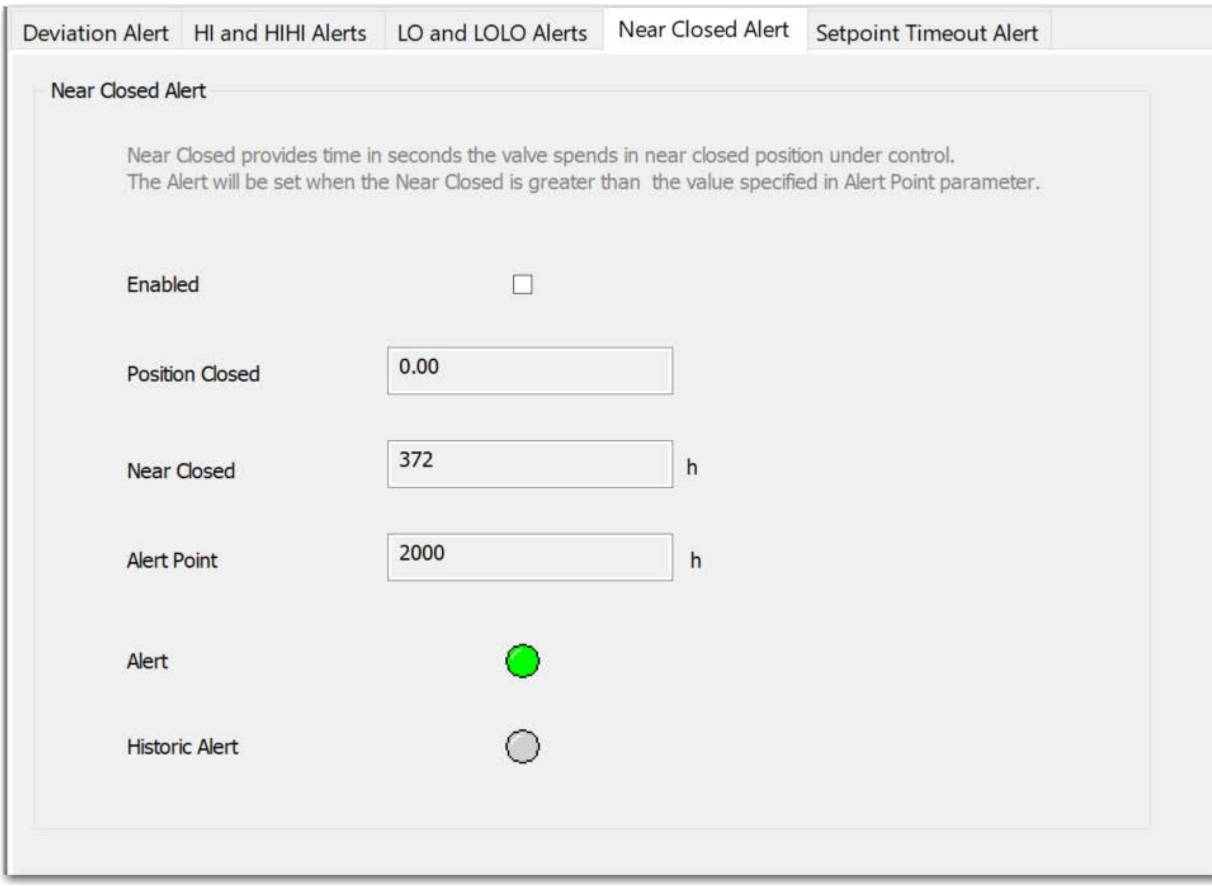


Figure 129 – Control Configuration Position Alert: Near Closed Alerts Tab

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.

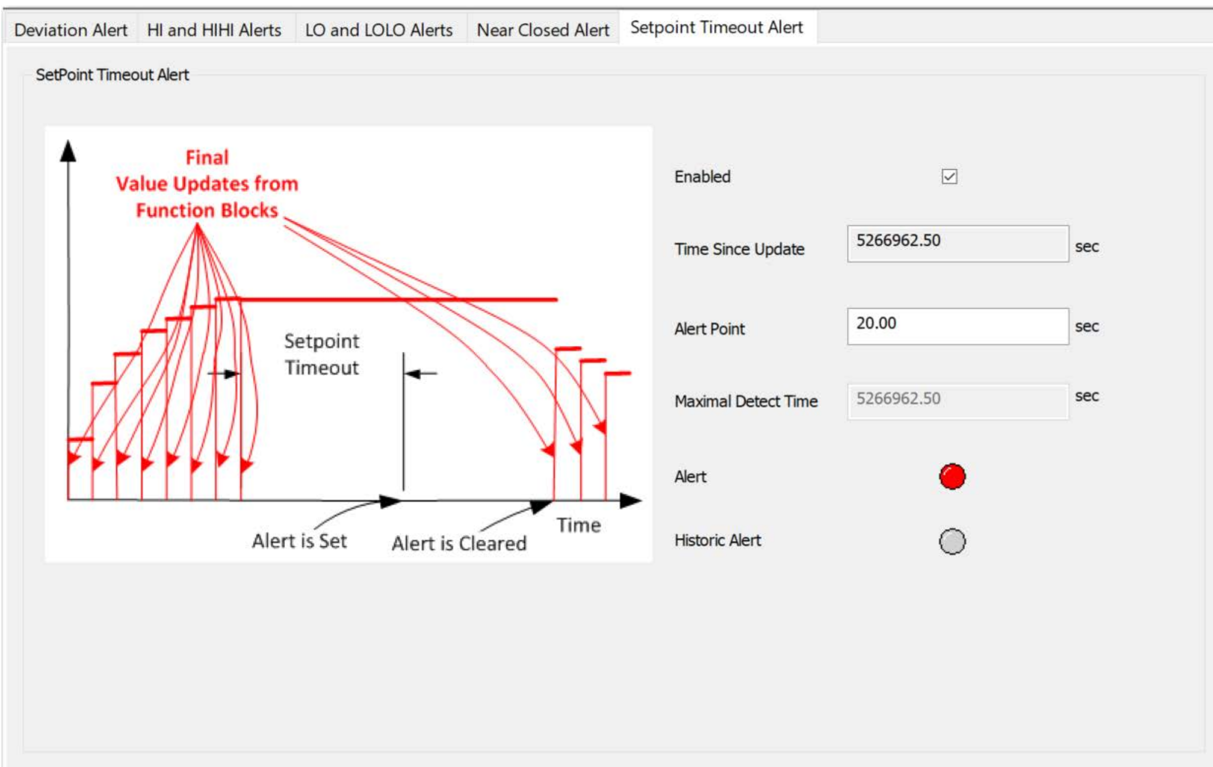


Figure 130 – Control Configuration Position Alert: Setpoint Timeout Alert Tab

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.

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.

Configure SetPoint Timeout Alert

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

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.

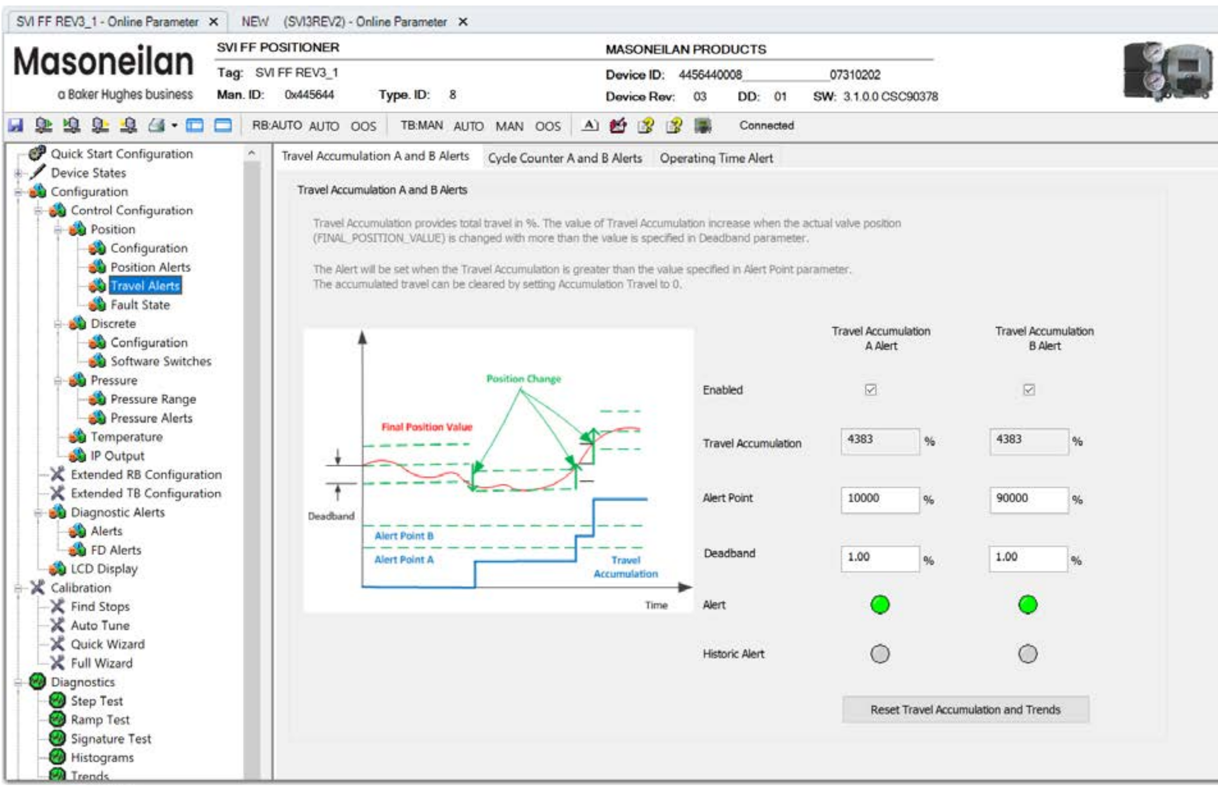
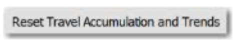


Figure 131 – Control Configuration Travel Alert: Travel Accumulation A and B Alert Tab

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.

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 Travel Accumulation and its Trend

Configure Travel Accumulation Alert

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

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.

Figure 132 – Control Configuration Travel Alert: Cycle Counter A and B Alert Tab

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.

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

Click to reset the total number of Cycle Counter and its Trend

Reset button

Configure Cycle Counter A and B Alerts

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

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.

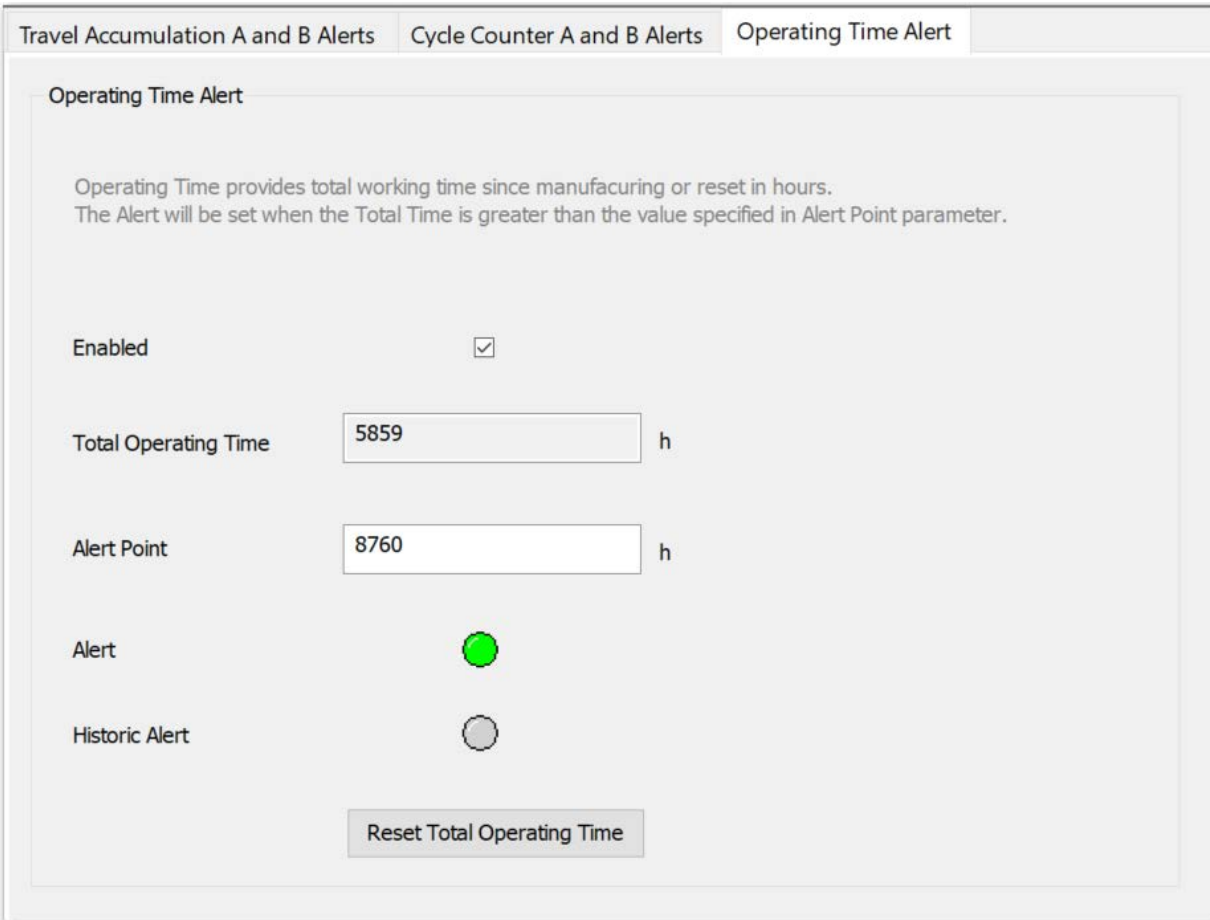
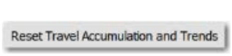


Figure 133 – Control Configuration Travel Alert: Operating Time Alert Tab

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
 *Reset* button	Click to reset Total Operating Time

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

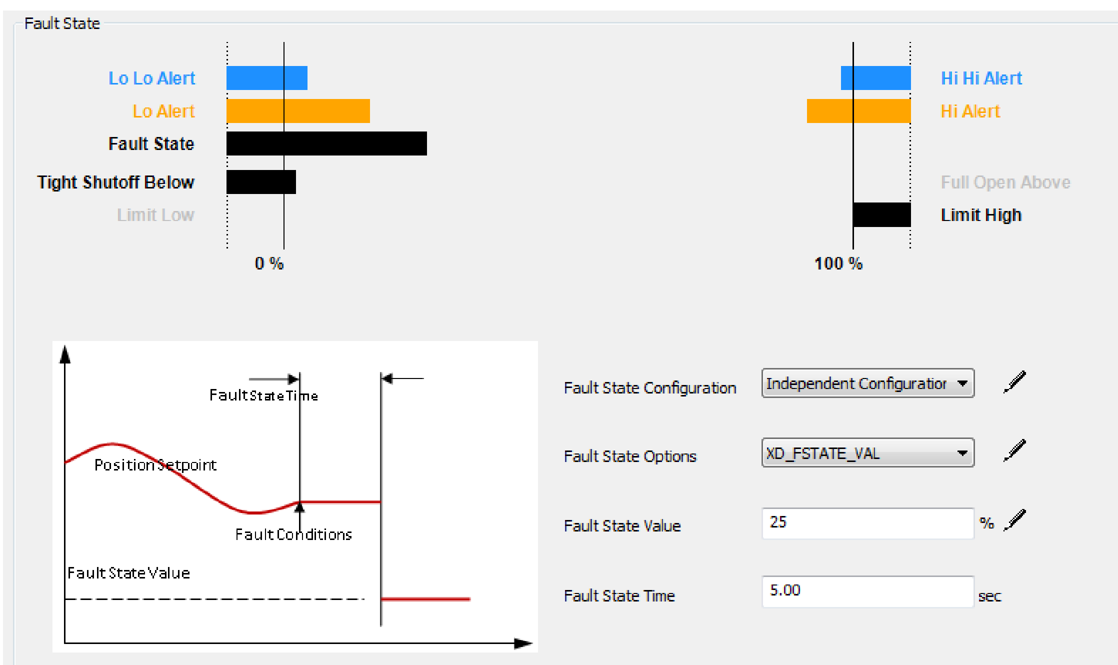


Figure 134 – Control Configuration Position: Fault State Tab

Buttons and Fields

Fault State Configuration	Use the pulldown to select source for the fault state configuration: *Analog output block/Discrete Outputs*: Configures the outputs from the AO block or the discrete outputs from the DO block. *Independent Configuration*; Activates the *Fault State Options* field.
Fault State Options	Use the pulldown to configure an action to take for a transducer fault: *Hold Last Value*: Sets to hold the last value. *Fail Closed*: Sets to have the valve fail to closed. *Fail Open*: Sets to have the valve fail to open. *XD_FSTATE_VAL*: Sets to have the system use this value, which is entered in *Fault State Value*.
Fault State Value	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.
Alert	Enter a value to hold the current position before the Fault State Value is used. *XD_F-STATE_VAL* must be selected in *Fault State Options* to use this field.
DO FB/User Request	Request from DO with CHANNEL=CH_DO_FAULT or from user
Request from FB	Request from FB controlling FINAL_VALUE_x per setpoint source
Time to FState	Time in s until activation of Failed State if requested by FB

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

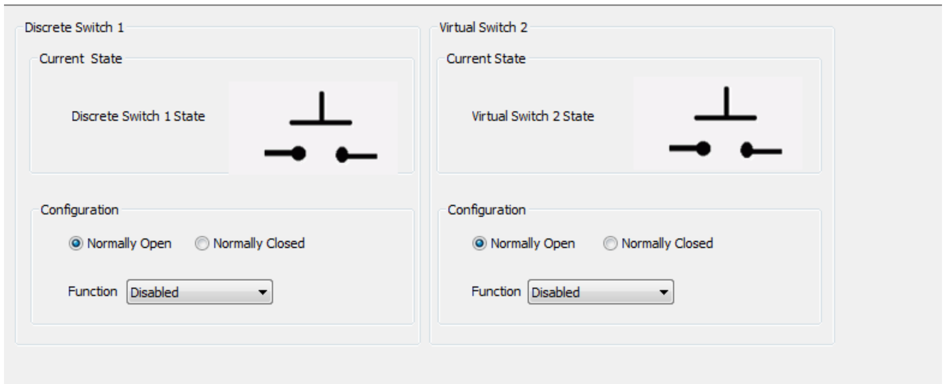


Figure 135 – Control Configuration Discrete: Software Switches Tab

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 Switch2 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.

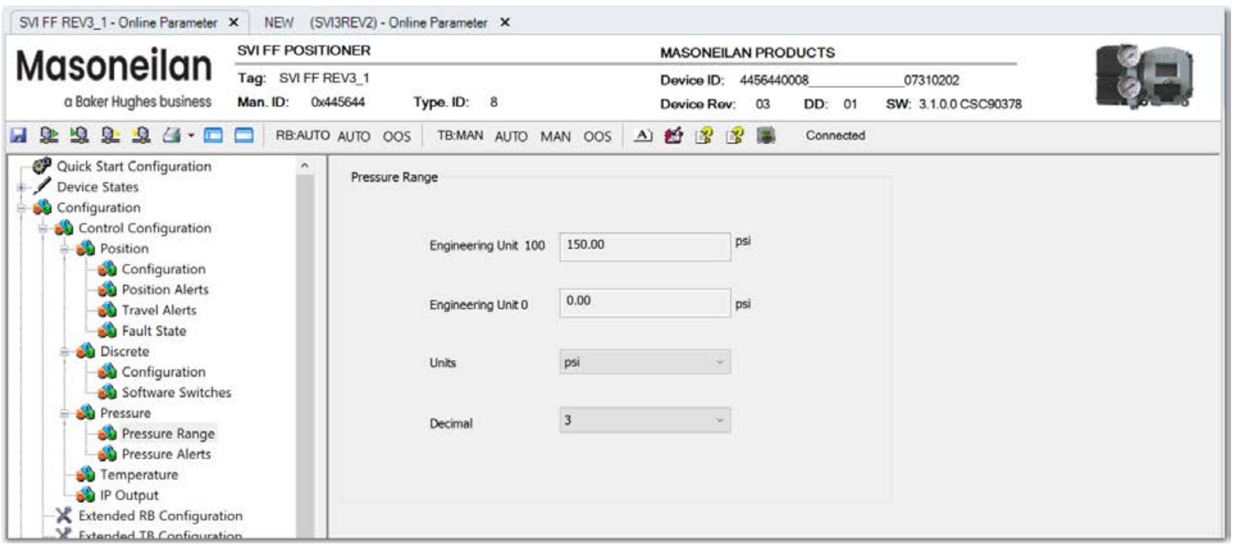


Figure 136 – Control Configuration Pressure: Pressure Range Tab

Buttons and Fields

EU_100	Enter the upper range pressure.
EU_0	Enter the lower range pressure.

Buttons and Fields

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

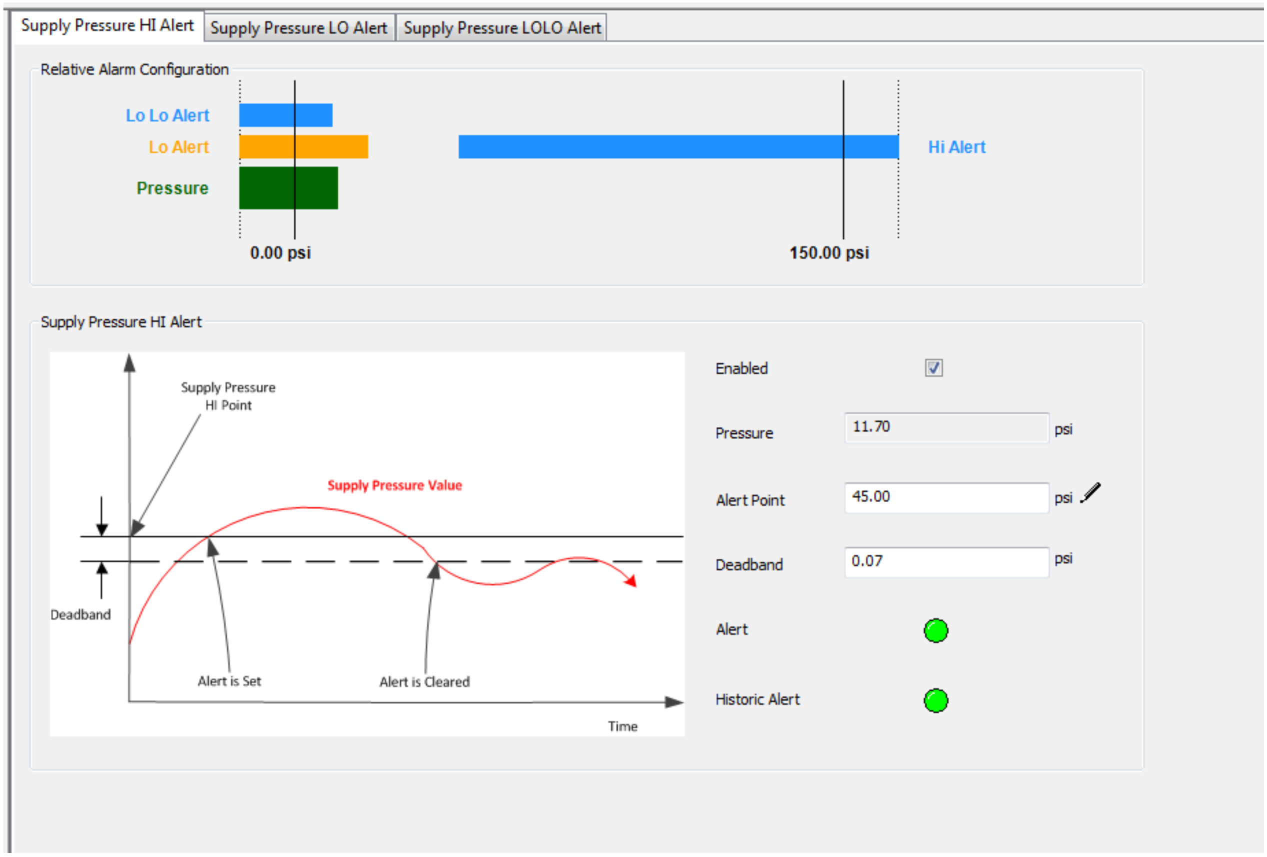


Figure 137 – Control Configuration Pressure: Supply Pressure HI Alert Tab

Buttons and Fields

Supply Pressure HI Alert

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

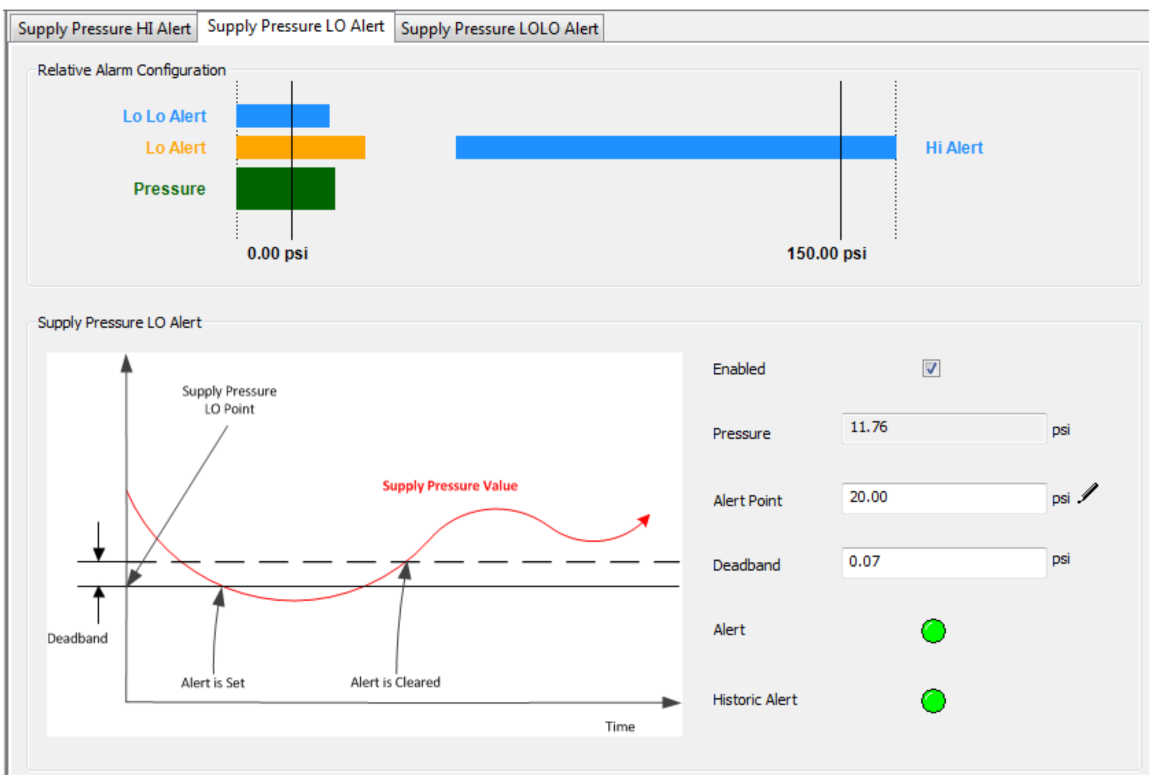


Figure 138 – Control Configuration Pressure: Supply Pressure LO Alert Tab

Buttons and Fields

	Supply Pressure LO Alert
Enabled	Click to enable the *Supply Pressure LO Alert* and activate the fields below
Pressure	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 LO Alert

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

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

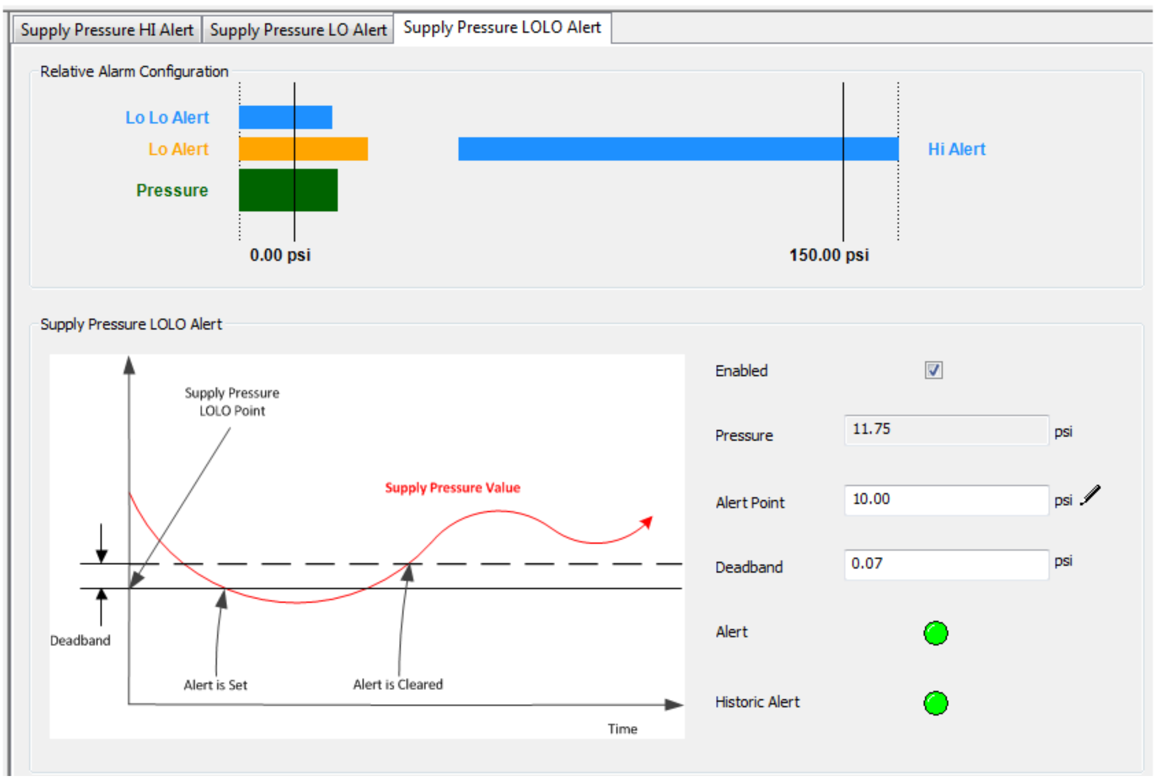


Figure 139 – Control Configuration Pressure: Supply Pressure LOLO Alert Tab

Buttons and Fields

	Supply Pressure LOLO Alert
Enabled	Click to enable the *Supply Pressure LOLO Alert* and activate the fields below.
Pressure	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.
Temperature	Displays the current temperature.

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.

Configure Temperature HI Alert

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

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

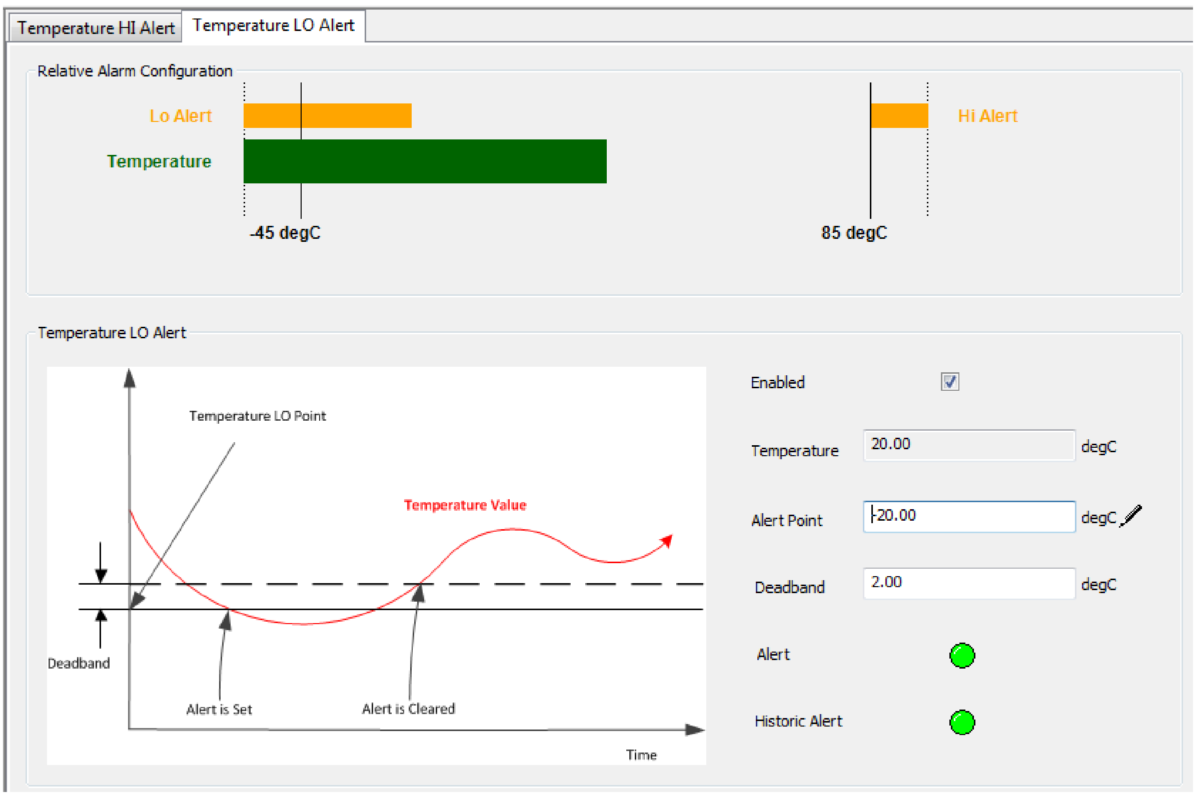


Figure 141 – Control Configuration Temperature: Temperature LO Alert Tab

Buttons and Fields

	Temperature LO Alert
Enabled	Click to enable the *Temperature LO Alert* and activate the fields below.
Temperature	Displays the current temperature.

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.

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

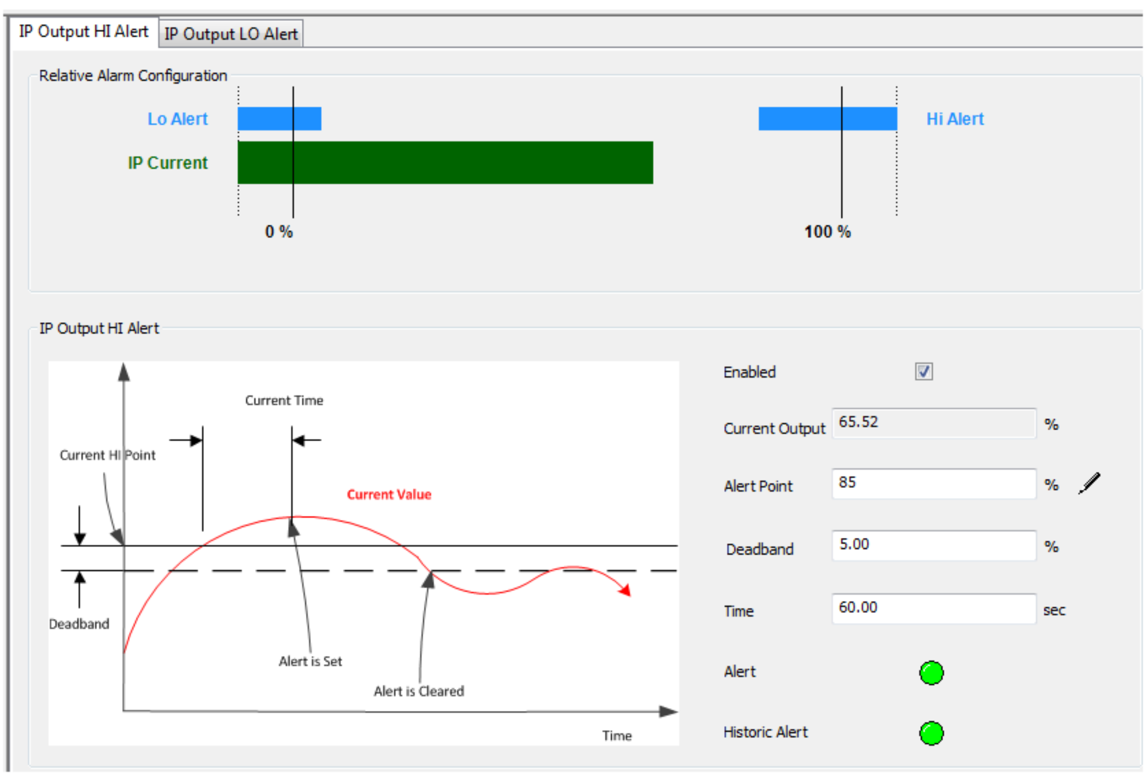


Figure 142 – Control Configuration IP Output: IP Output HI Alert Tab

Buttons and Fields

	IP Output HI Alert
Enabled	Click to enable the *IP Output HI Alert* and activate the fields below.
Current Output	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

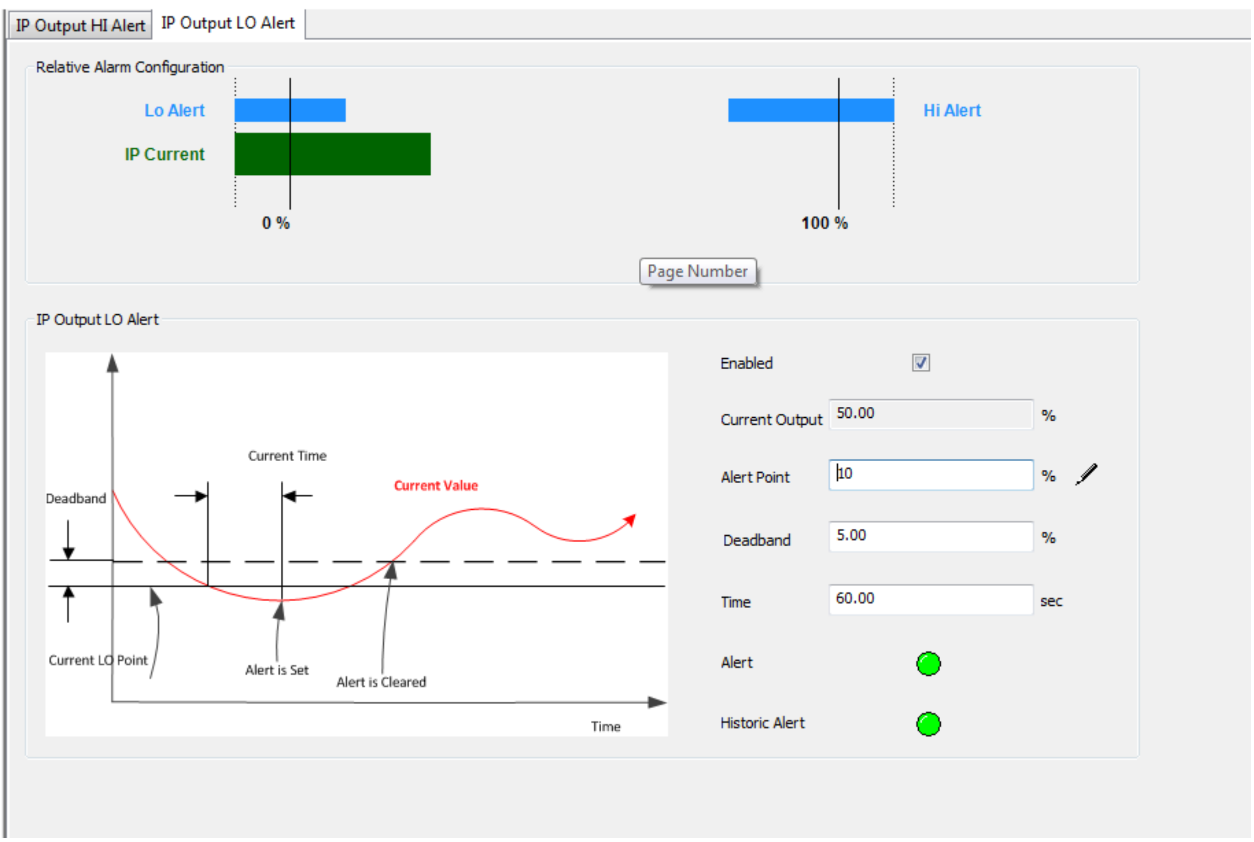


Figure 143 – Control Configuration IP Output: IP Output LO Alert Tab

Buttons and Fields

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

Current Output	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 LO Alert

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

Extend RB Configuration

Use this tab to configure writeable Resource block parameters.

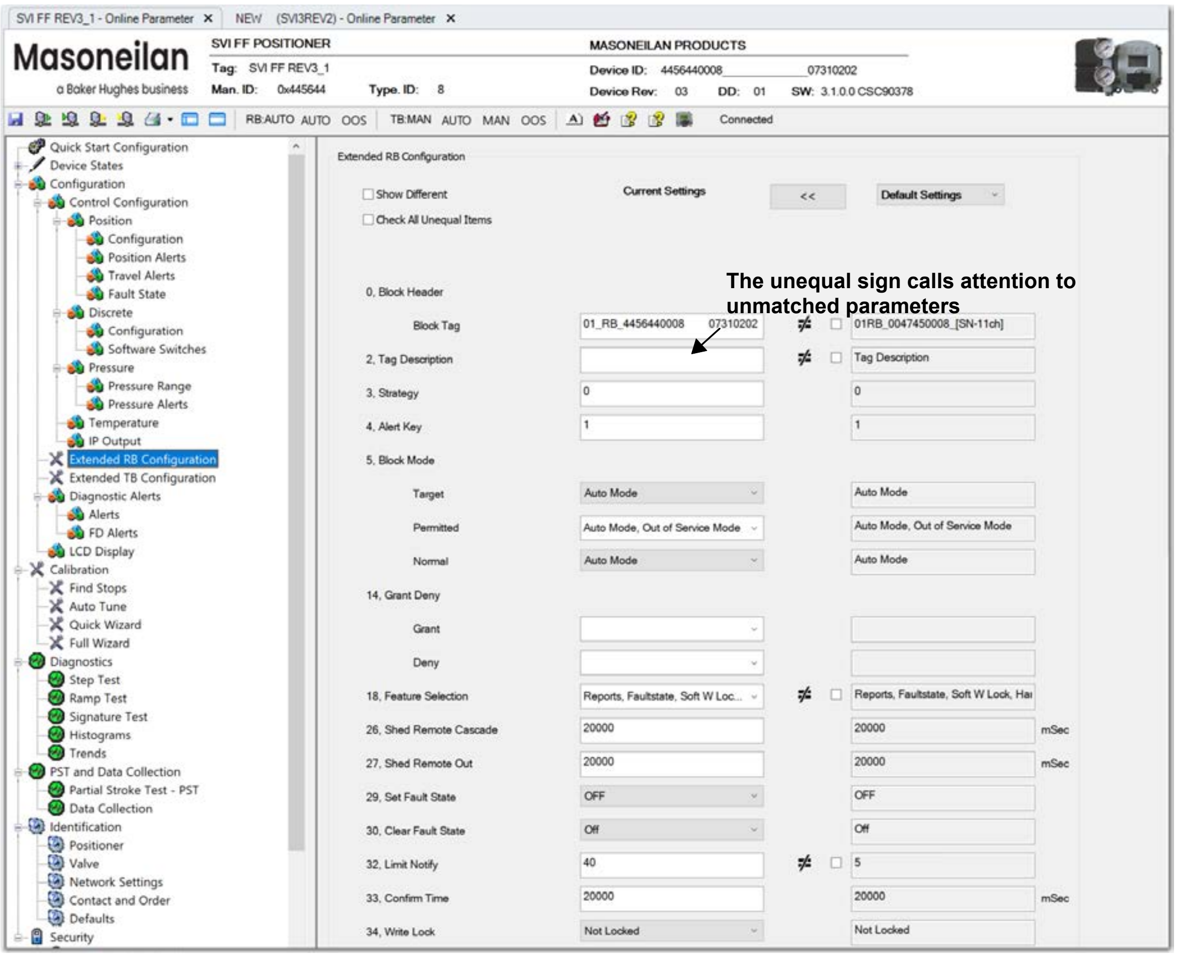


Figure 144 – Control Configuration: Extend RB Configuration Tab

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/ 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: \/:*<>¦”

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 imme-
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 nor-mally, 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* attri-bute 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 that 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].
47. Failed Map	This parameter maps conditions to be detected as active for Failed alarm category.
48. Off Specification Map	This parameter maps conditions to be detected as active for Off Specification alarm category.
49. Maintenance Map	This parameter maps conditions to be detected as active for Maintenance alarm category.
50. Check Function Map	This parameter maps conditions to be detected as active for Check Function alarm category.
51. Failed Mask	This parameter allows the user to suppress any single or multiple conditions that are active, in Failed category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e., inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e., allow broadcast of a condition.
52. Off Specification Mask	This parameter allows the user to suppress any single or multiple conditions that are active, in Off Specification category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e., inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e., allow broadcast of a condition.
53. Maintenance Mask	This parameter allows the user to suppress any single or multiple conditions that are active, in Maintenance category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e., inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e., allow broadcast of a condition.
54. Check Function Mask	This parameter allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e., inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e., allow broadcast of a condition.
59. Failed Priority	This parameter allows the user to specify the priority of Failed alarm category.
60. Off Specification Priority	This parameter allows the user to specify the priority of Off Specification alarm category.
61. Maintenance Priority	This parameter allows the user to specify the priority of Maintenance alarm category.
62. Check Function Priority	This parameter allows the user to specify the priority of Check Function alarm category.
63. Field Diagnostics Simulate Enable/ Disable	This parameter allows the conditions to be manually supplied when simulation is enabled. When simulation is disabled both the diagnostic simulate value and the diagnostic value track the actual conditions.

Extend TB Configuration

Use this tab to configure writeable transducer block parameters.

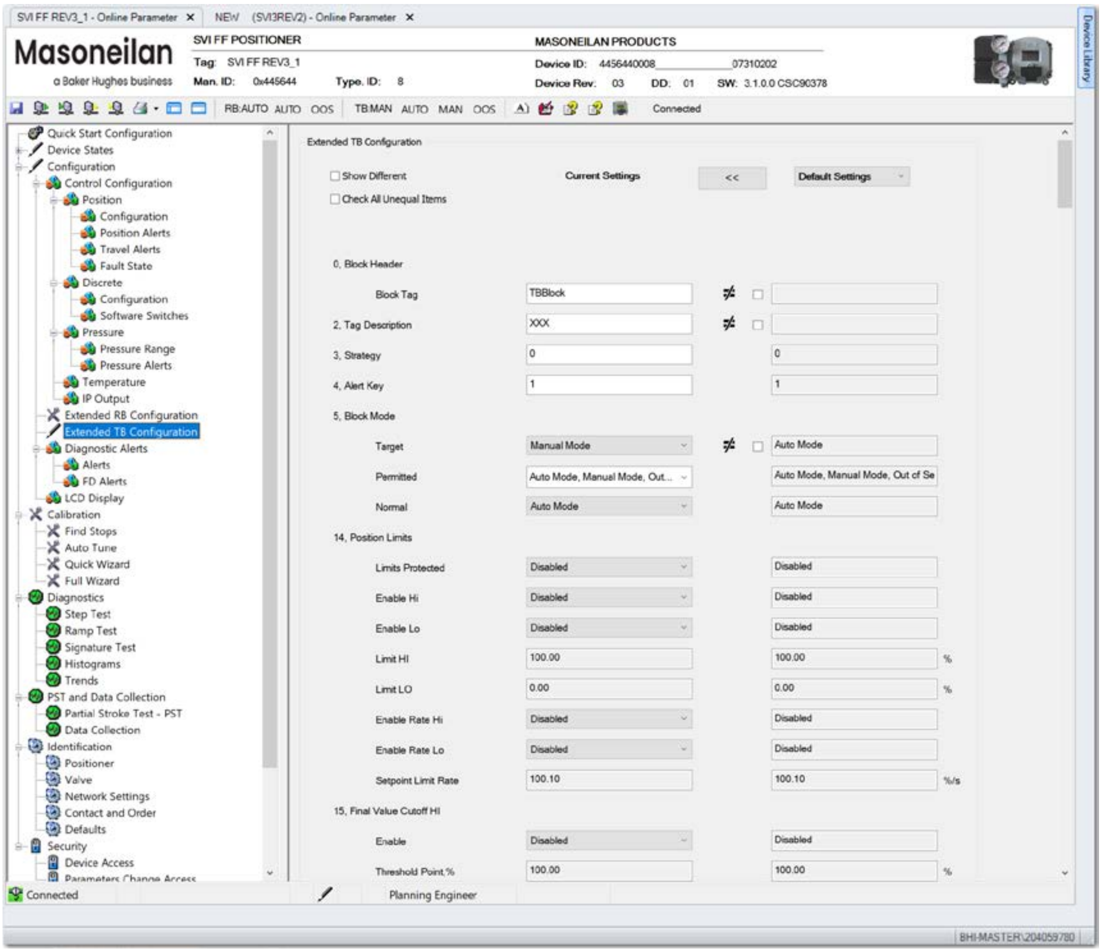
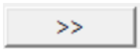


Figure 145 – Control Configuration: Extend TB Configuration Tab

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: \/:*<>¦”
	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	*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

Alert Point	Enter an value for the alert to occur. See *Deviation Alerts Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *Deviation Alerts Tab* for a full explanation of fields.
Time	Enter a time before an alert is set. See *Deviation Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *Deviation Alerts Tab* for a full explanation of fields.

27. Position HIHI Alert

Alert Point	Enter an value for the alert to occur. See *HI and HIHI Alerts Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *HI and HIHI Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *HI and HIHI Alerts Tab* for a full explanation of fields.

28. Position HI Alert

Alert Point	Enter an value for the alert to occur. See *HI and HIHI Alerts Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *HI and HIHI Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *HI and HIHI Alerts Tab* for a full explanation of fields.

29. Position LO Alert

Alert Point	Enter an value for the alert to occur. See *LO and LOLO Alerts Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *LO and LOLO Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *LO and LOLO Alerts Tab* for a full explanation of fields.

30. Position LOLO Alert

Alert Point	Enter an value for the alert to occur. See *LO and LOLO Alerts Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *LO and LOLO Alerts Tab* for a full explanation of fields.

Enabled	Use the pulldown to enable/disable this alert. See *LO and LOLO Alerts Tab* for a full explanation of fields.

31. Travel Accumulation A Alert

Alert Point	Enter an value for the alert to occur. See *Travel Accumulation A and B Alert Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *Travel Accumulation A and B Alert Tab* for a full explanation of fields.
Time	Enter a time before an alert is set. See *Deviation Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *Travel Accumulation A and B Alert Tab* for a full explanation of fields.

32. Travel Accumulation B Alert

Alert Point	Enter an value for the alert to occur. See *Travel Accumulation A and B Alert Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *Travel Accumulation A and B Alert Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *Travel Accumulation A and B Alert Tab* for a full explanation of fields.

34. Cycle Counter A Alert

Alert Point	Enter an value for the alert to occur. See *Cycle Counter A and B Alerts Tab* for a full explanation of fields.
Dead Band	Enter a dead band range. See *Cycle Counter A and B Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *Cycle Counter A and B Alerts Tab* for a full explanation of fields.

35. Cycle Counter B Alert

Alert Point	Enter an value for the alert to occur. See *Cycle Counter A and B Alerts Tab* for a full explanation of fields.
Dead Band	Enter an value for the alert to occur. See *Cycle Counter A and B Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *Cycle Counter A and B Alerts Tab* for a full explanation of fields.

39. Near Closed Alert

Position Closed	Enter an value for the alert to occur. See *Near Closed Alerts Tab* for a full explanation of fields.
Alert Point	Enter an value for the alert to occur. See *Near Closed Alerts Tab* for a full explanation of fields.
Enabled	Use the pulldown to enable/disable this alert. See *Near Closed Alerts Tab* for a full explanation of fields.

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.

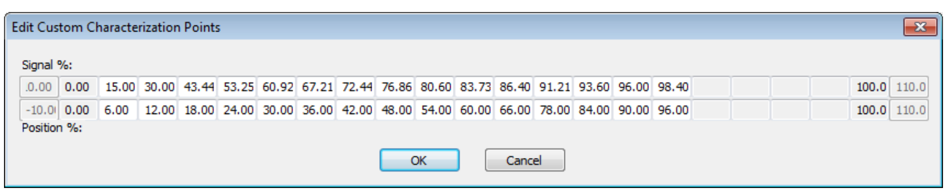
43. Characterization Selection

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 — 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 *Near Closed Alerts 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. Open Stop Adjustment	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 HIHI Alert	Use the plldown 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	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.

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.

112. Booster

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.

120. Partial Stroke Test Trigger

Trigger on Demand	PST can be manually triggered when the trigger is enabled.
Trigger by DI Switch	PST can be triggered by asserting the physical DI switch.
Trigger by AI Input	PST can be triggered by asserting the physical AI input.
Physical AI trigger Input	Threshold for AI trigger. Initial value is 12 mA.

121. Partial Stroke Test

PST Setpoint Change Threshold	If process setpoint changes more than threshold, PST is aborted.
Travel	Magnitude of partial stroke.
Setpoint Rate	Rate of setpoint change in a partial stroke.
PST Pilot Pressure Change Threshold	If pilot pressure changes more than threshold from end of lead time, PST is aborted.
PST Actuator Pressure Change Threshold	If actuator pressure changes more than threshold at end of lead time, PST is aborted.
Pause (Dwell Time). s	The Steady time at the end of the ramp. PST spends this pause time between consecutive strokes.
PST Lead Time. s	Time before the first stroke.
Max Time of PST Completion. s:	If running time exceeds this Max time, PST is aborted.
Parameter to collect:	Specifies which variables are collected during PST.
Free Option	When PST is running, it is managing the setpoint and valve position.
PST Stroke Pattern	The predefined sequences of up/down strokes of the PST.

122. Data Collection Config Perm

Base Rate	Period of sampling.
Skip Count	Number of samples skipped between recorded samples.
Parameter to Collect	Specifies which variables are collected during Data Collection.
Max Samples	Max number of samples to collect. 0 means unlimited by the buffer capacity.
Number of pre-samples	Samples before trigger to include in total samples.

123. Data Collection Trigger

Enable Option	Turn on Data Collection triggers.
AI Low Threshold	A Data Collection process can be triggered when Analog input value is less than low threshold.
AI High Threshold	A Data Collection process can be triggered when Analog input value is bigger than high threshold.
Pos Deviation Threshold	A Data collection process can be triggered when the distance between setpoint and valve position is more than the threshold.
Pressure Deviation Threshold	A Data collection process can be triggered when the pressure deviation is more than the threshold
SP Deviation Threshold	A Data collection process can be triggered when the setpoint deviation is more than the threshold.
Average Coefficient	Average work Coefficient

126. Data Collection Temp

Base Rate	Period of sampling.
Skip Count	Number of samples skipped between recorded samples.
Parameter to Collect	Enter a date for when information was input. See *Date* on *Valve* tab.
Max Samples	Max number of samples to collect. 0 means unlimited by the buffer capacity

Diagnostic Alerts

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.

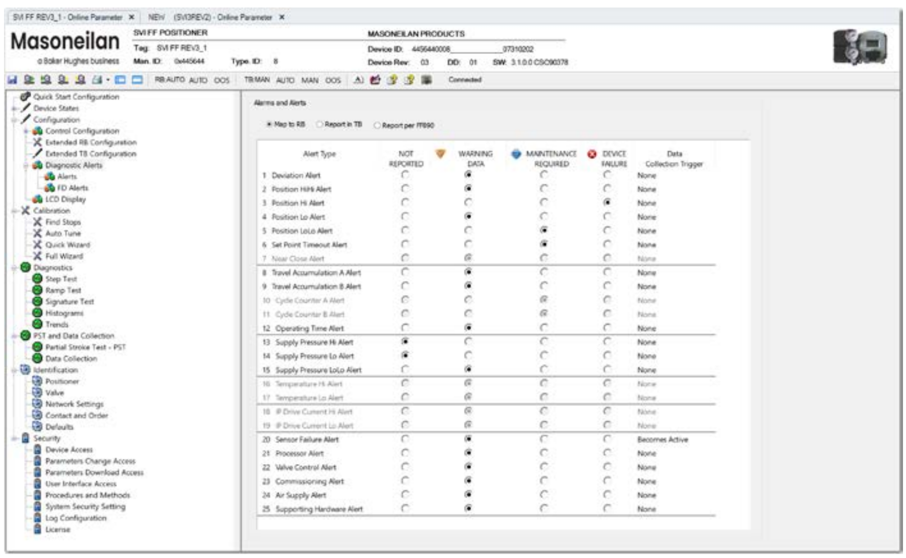


Figure 146 – Diagnostics Alert Configuration

Buttons and Fields

Deviation Alert	Difference between working setpoint and working position. TRUE if DEVIATION VALUE is bigger than DEVIATION_ALERT_POINT for DEVIATION_TIME. FALSE if DEVIATION_VALUE is s maller than (DEVIATION_ALERT+DEVIATION_DEADBAND).
Position HIHI Alert	True if position is above ALERT_POINT and is not below (ALERT_POINT-DEADBAND).
Position HI Alert	True if the position value is above the HI Alert Point. Must be set above POSITION_LO_ALERT.ALERT_POINT.
Position LO Alert	True if the position value is above the HI Alert Point. Must be set above POSITION_LO_ALERT.ALERT_POINT.
Position LOLO Alert	True if the position value is below the LOLOL Alert Point. Must be set below POSTION_LO_ALERT.ALERT_POINT.
Set Point Timeout Alert	True if 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 ALERT_POINT time.
Near Closed Alert	True if 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 POSITION_HISTOGRAM.TOTAL will be more than 1000). Only enable if the tight shut off is not enabled.
Travel Accumulation A Alert/Travel Accumulation B Alert	True if the TRAVEL_ACCUMULATION is above Alert Point. Totalized change in travel in %, since the TRAVEL_ACCUMULATION was cleared. The value increments when the magnitude of the change exceeds the DEADBAND.
Cycle Counter A Alert/Cycle Counter B Alert	True if the CYCLE_COUNTER is above Alert Point. Number of times the travel changes the direction.
Supply Pressure HI Alert	True if the SUPPLY_PRESSURE is below the Alert Point. True if the SUPPLY_PRESSURE is above ALERT_POINT and not below (ALERT_POINT-DEADBAND).
Supply Pressure LO Alert	True is the SUPPLY_PRESSURE is below the Alert Point. True if the SUPPLY_PRESSURE is below ALERT_POINT and not above (ALERT_POINT+DEADBAND).
Supply Pressure LOLO Alert	True if the SUPPLY_PRESSURE is below the Alert Point. True if the SUPPLY_PRESSURE is below ALERT_POINT and not above (ALERT_POINT+DEADBAND).
Temperature HI Alert	True if TEMPERATURE is above the Alert Point. True if the TEMPERATURE is above ALERT_POINT and not below (ALERT_POINT-DEADBAND).

Temperature LO Alert	True if TEMPERATURE is below the Alert Point. True if the TEMPERATURE is below ALERT_POINT and not above (ALERT_POINT+DEADBAND).
IP Drive Current HI Alert	True when CURRENT is above the Alert Point.
IP Drive Current LO Alert	True when CURRENT is below the Alert Point.
Sensor Failure Alert	True for any sensor failure.
Processor Alert	True for any processor alert.
Valve Control Alert	True for any valve control alert.
Commissioning Alert	True if Find Stops fails.
Air Supply Alert	True if there is a low air supply alert.
Supporting Hardware Alert	True if any hardware alert is set.

Configure Alerts

1. Choose **Map to RB**, **Report in TB** or **Report per FF890** which is for SVI FF REV03 device.
2. Click a radio button in each alert line to assign the alert level.

Field Diagnostic Alert

Use this tab to simulate/monitor/configure field diagnostic alert (FD_ALERT)

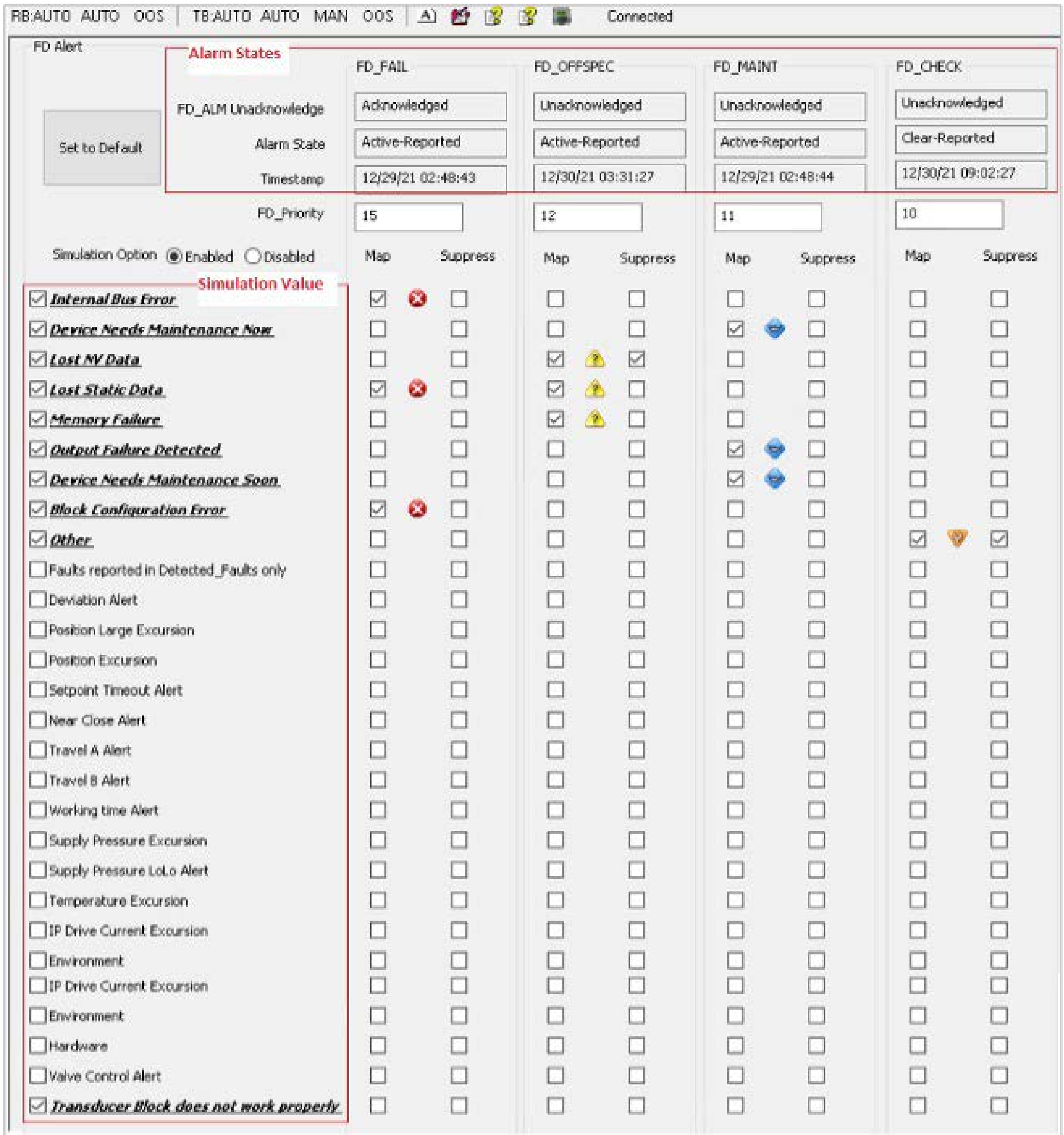


Figure 146.1 – FD Alert Monitor and Configuration

- Enable Simulation option

  The FD_SIMULATE parameter is provided for simulating of diagnostic conditions. When Simulation Option is enabled, diagnostic conditions may be simulated by setting the corresponding bit in FD Alert Parameters.

  When Simulation Option is disabled, the FD Alert Parameters show actual alert status. A FD_Alert is active if its Check box is checked.

  NOTE: Simulation Option is visible only when the device is in simulation mode. User can make device into simulation mode through local UI.

- Simulate a diagnostic condition

  Check or uncheck alert parameters to turn on/off FD_Alert active status.

- Map: To configure how to report an active FD_Alert. An active alarm can be reported into four alarm categories, based on the impact of the condition to the health of the device:

  - *Failure (FD_FAIL)*: The field device provides a non-valid output signal due to device malfunction.

  - *Out of Specification (FD_OFFSPEC):* The field device operates out of the specification.

  - *Maintenance Required (FD_MAINT):* The field device is still able to provide a valid output signal but is about to lose functionality.

  - *Check Function (FD_CHECK):* The field device is temporarily non-valid due to some type of maintenance activity.

- Suppress the conditions

  Suppress configuration allows user to suppress any single or multiple active alert , in current category:

  - Turning on Suppress- Mask active alert condition, not allow alert to report to Host system

  - Turning off Suppress- Unmask the alert condition, allow broadcast of an active alert

- Specify the priority for current alarm category. Valid range of priority is 0-15.

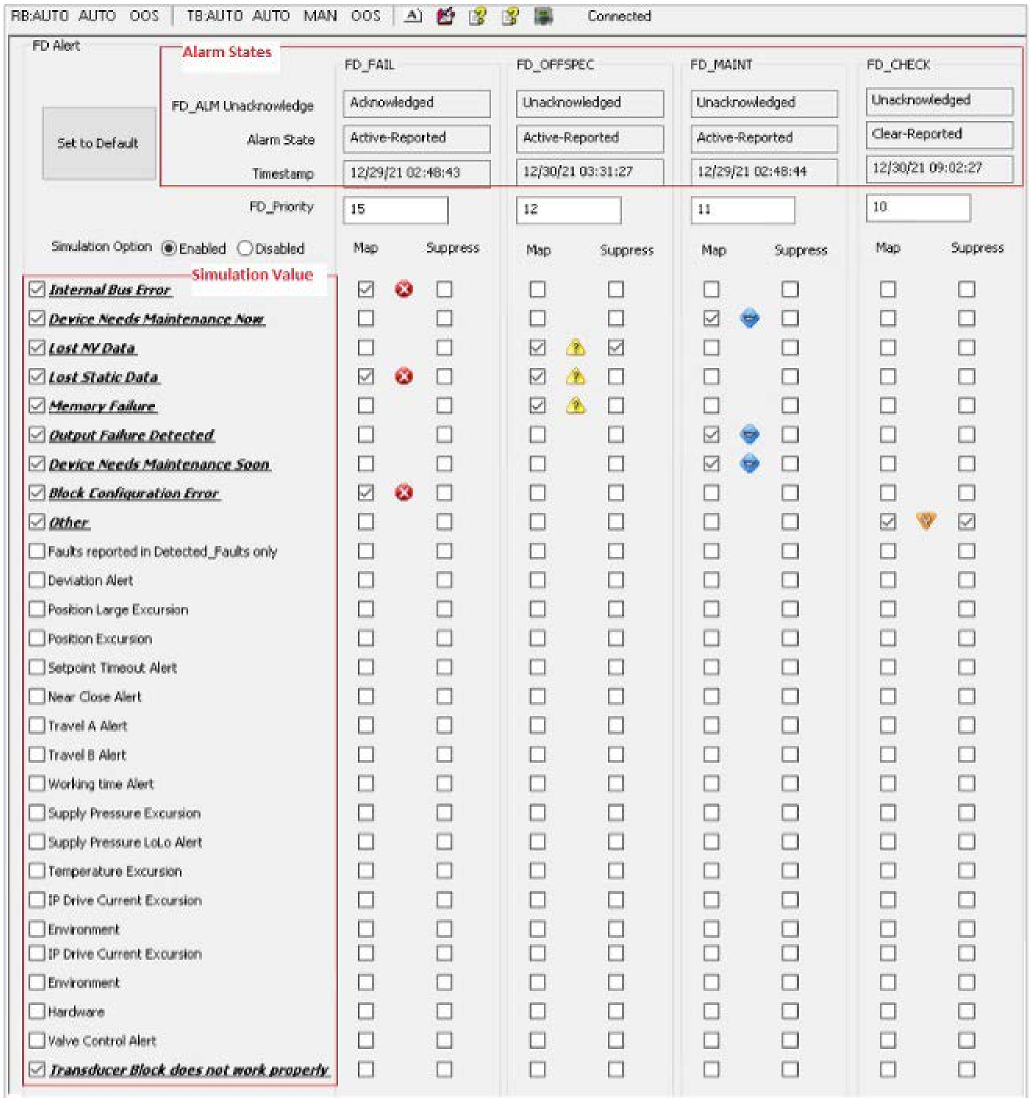
- Alarm States

  This area displays the change of FD_FAILED_ALARM, FD_MAINT_ALARM, FD_OFFSPEC_ALARM, and FD_CHECK_ALARM

	FD_FAILED_ ALARM	**FD_MAINT_ ALARM**	**FD_OFFSPEC_ ALARM**	**FD_CHECK_ ALARM**
ALM_Unacknowledge	Presents whether the alarm is acknowledged by user when a new alarm occurs			
Alarm State	Presents whether an alarm is active or whether it has been reported			
Time stamp	The time when a change in alarm was detected. The time stamp will stay same constant until the alarm confirmation has been received			

- Set to Default

  When Set to Default button is clicked, the FD_Alert user interface will be set to default setting. The use “Download Selected Tabs” or “Download All Parameters to Device” to write default setting to device.



LCD Display

Use this tab to set the LCD language and to customize the LCD to display one or two additional values.

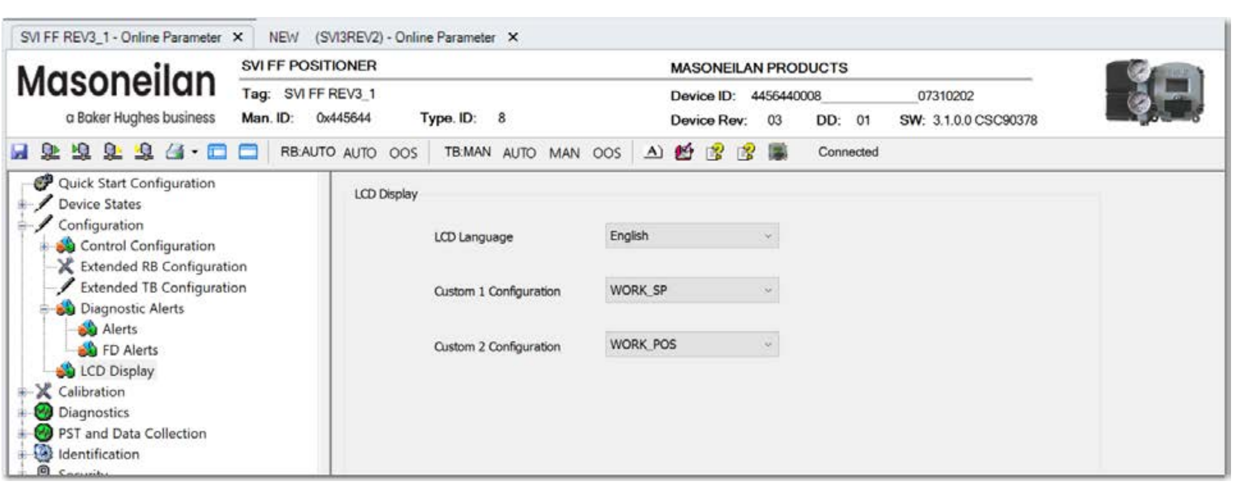


Figure 147 – Control Configuration LCD Display Tab

Buttons and Fields

LCD Language	Use the pulldown to select a language: • *English* • *French* • *Spanish* • *Portuguese* • *Japanese* • *Italian* • *German*
Custom 1 Configuration/ Custom 2 Configuration	Use the pulldown to select a value to display on the LCD.

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.

14. 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*)
- Log Configuration (*Log Configuration*)
- DTM Licensing (*License*)

Device Access

Use this tab to control access to:

- The buttons on the FF device
- FF write privilege
- FF device diagnostic level

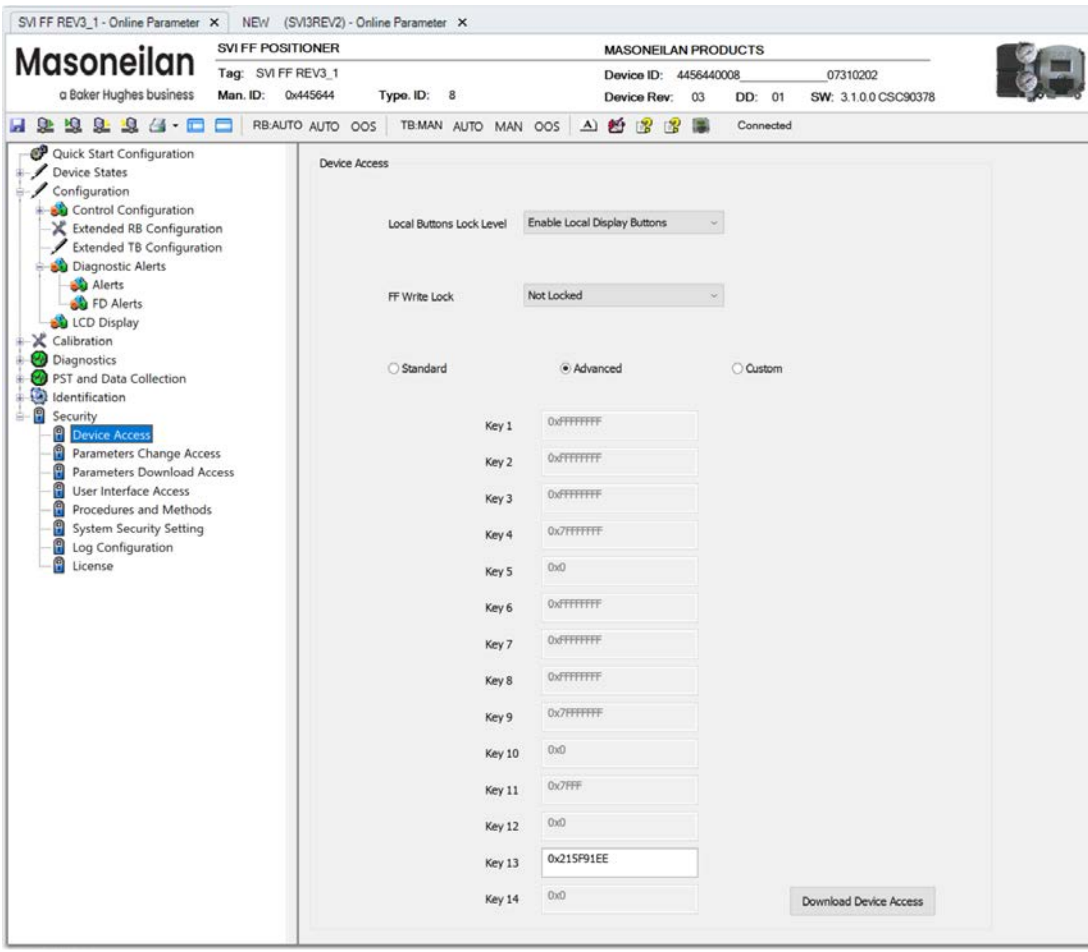


Figure 148 – Security: Device Access Tab

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 soft-ware or a handheld. It may, however, be desirable after initial setup to lock the but-tons so that the SVI FF parameters cannot be inadvertently changed from the buttons. Several levels of locks are provided:

- *Enable Local Display Buttons*: Buttons on the SVI FF are enabled.
- *Disable Local Methods Execution.*: You can use the buttons to perform operations in Normal mode and Manual mode, however they will not function in Configure or Calibrate mode.
- *Disable Local Methods and Clear Error*: You can examine variables in Normal mode but cannot put the valve in Manual mode (and therefore cannot go to Calibrate or Configure modes).
- *Disable Local Display 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 13* active for use.
- *Advanced*: Leaves only *Key 13* active for use.
- *Custom*: Leaves all keys active for use.

You can input any value for Key 1 to 12 and the key generator tool automatically creates the 13th 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.
- *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 diagno-sis, watch the actual status and parameter set as well as the current process variables.
- *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.
- *Planning Engineer*: You are a fully authorized user.

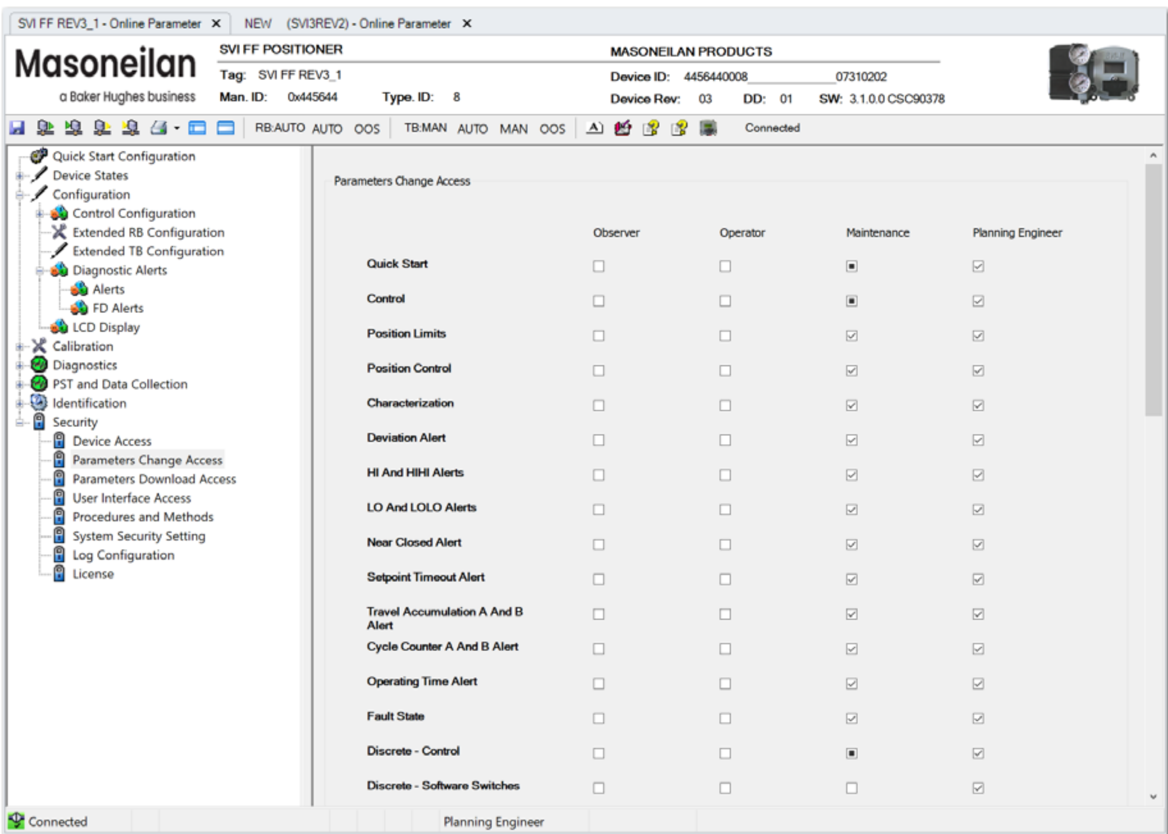


Figure 149 – Security: Parameter Change Access Tab

Note: 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. w
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.

Supply Pressure HI Alert	See *Supply Pressure HI Alert Tab* for field explanations.
Supply Pressure LO Alert	See *Supply Pressure LO Alert Tab* for field explanations.
Supply Pressure LOLO Alert	See *Supply Pressure LOLO Alert Tab* for field explanations.
Temperature HI Alert	See *Temperature HI Alert Tab* for field explanations.
Temperature LO Alert	See *Temperature LO Alert Tab* for field explanations.
IP HI Alert	See *IP Output HI Alert Tab* for field explanations.
IP LO Alert	See *IP Output LO Alert Tab* for field explanations.
Alert Action	See *Diagnostic Alerts* for field explanations.
FD_Alerts	See *FD_Alerts* for field explanations
LCD Display	See *LCD Display* for field explanations.
Valve	See *Valve* for field explanations.
Network Settings	See *Network Settings* for field explanations.
Extended RB Configuration	See *Extend RB Configuration* for field explanations.
Extended TB Configuration	See *Extend TB Configuration* for field explanations.
PST:	See *Partial Stroke test - PST* for field explanations
Data Collection	See *Data Collection* for field explanations

Parameters Download Access

Use this tab to assign download access privileges to the four pre-defined operational levels. See *Parameter Download 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.

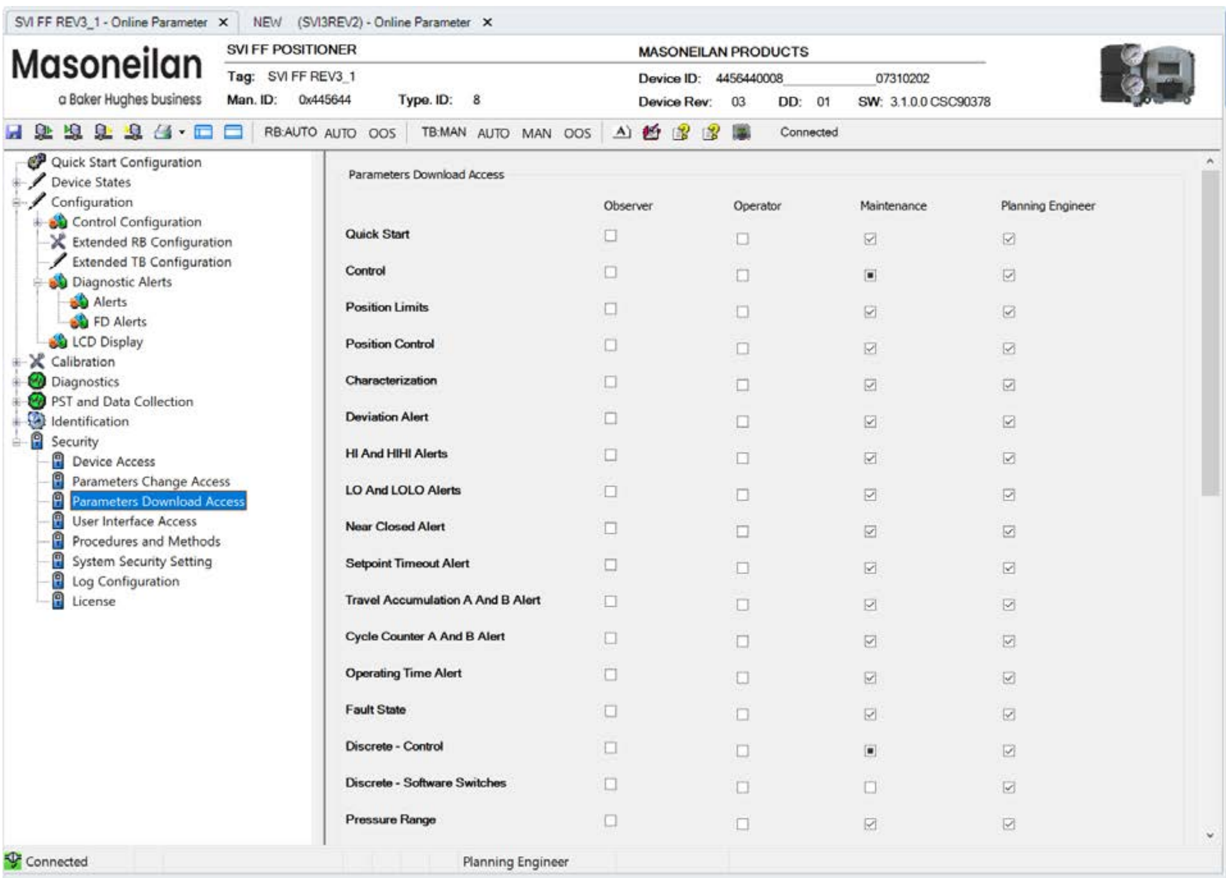


Figure 150 – Security: Parameter Download Access Tab

User Interface Access

Use this tab to assign user interface access privileges (menu selections) to the four pre-defined operational levels.

Note: Positioner information is not changeable.

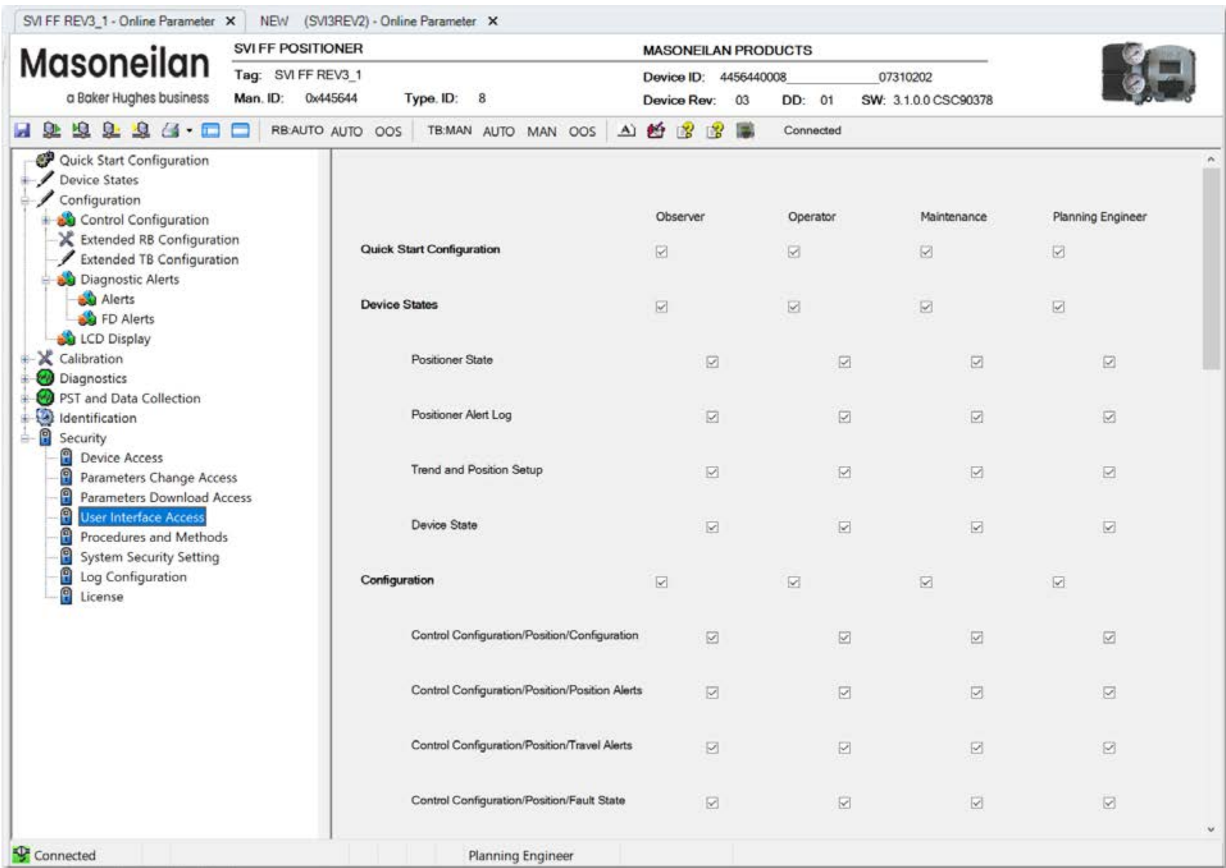


Figure 151 – Security: User Interface Access Tab

Buttons and Fields

Quick Start	See *Quick Start Configuration* for field explanations.
Device States	See *Device States* for field explanations.
Calibration	See *Calibration* for field explanations.
Configuration	See *Control Configuration* for field explanations.
Diagnostics	See *Diagnostics* for field explanations.
Identification	See *Identification* for field explanations.

Procedures and Methods

Use this tab to assign procedures and methods access privileges to the four pre-defined operational levels.

Note: If the same procedure/method appears on more than one tab, its settings will be the same on each tab.

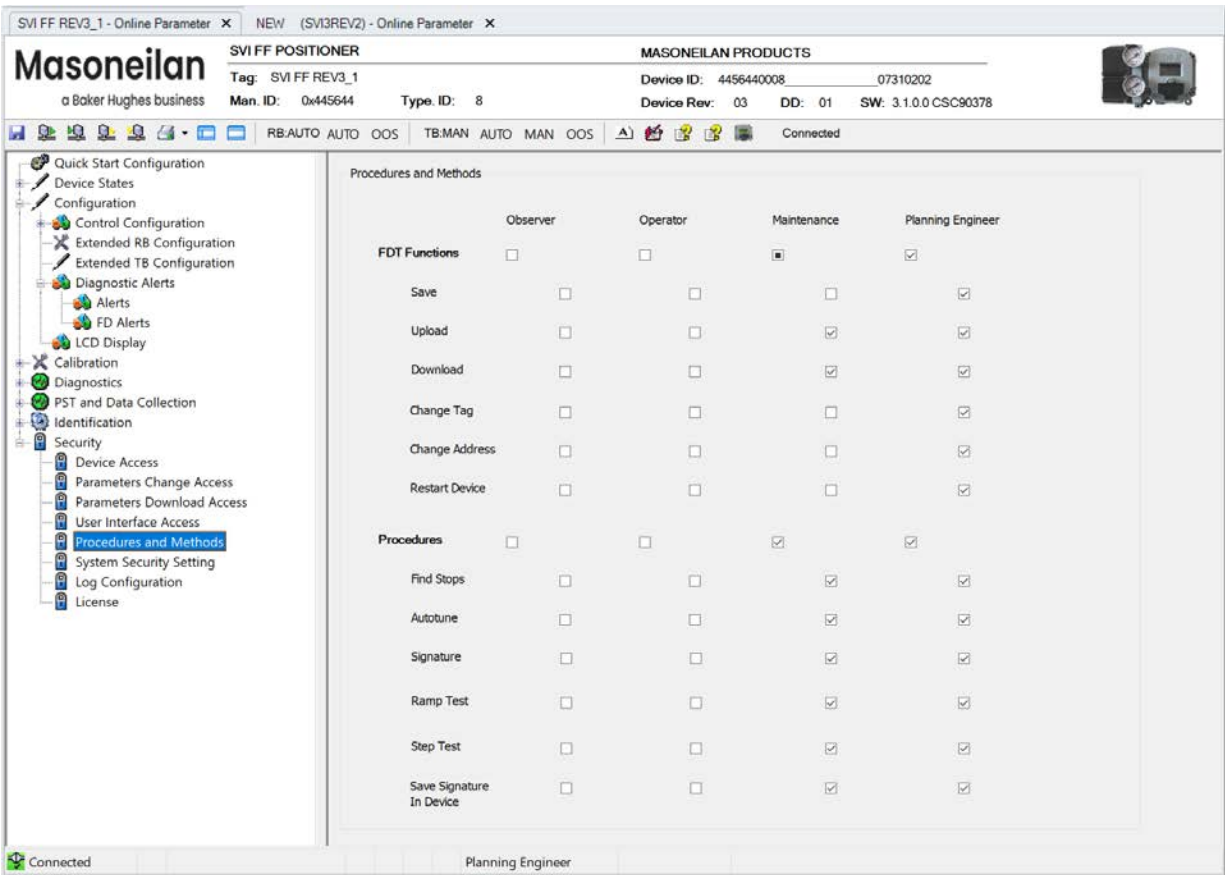


Figure 152 – Security: Procedures and Methods Tab

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.

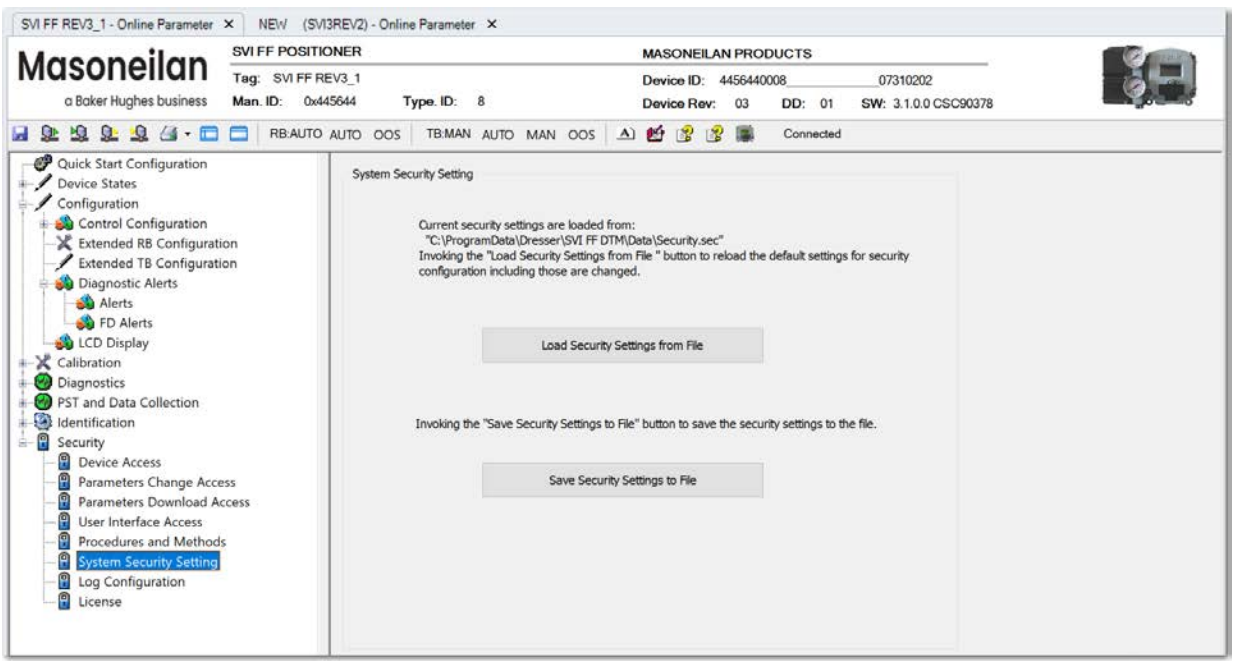
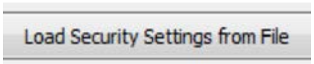
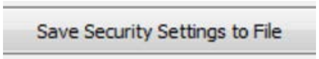


Figure 153 – Security: System Security Settings Tab

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 

and a dialog appears.

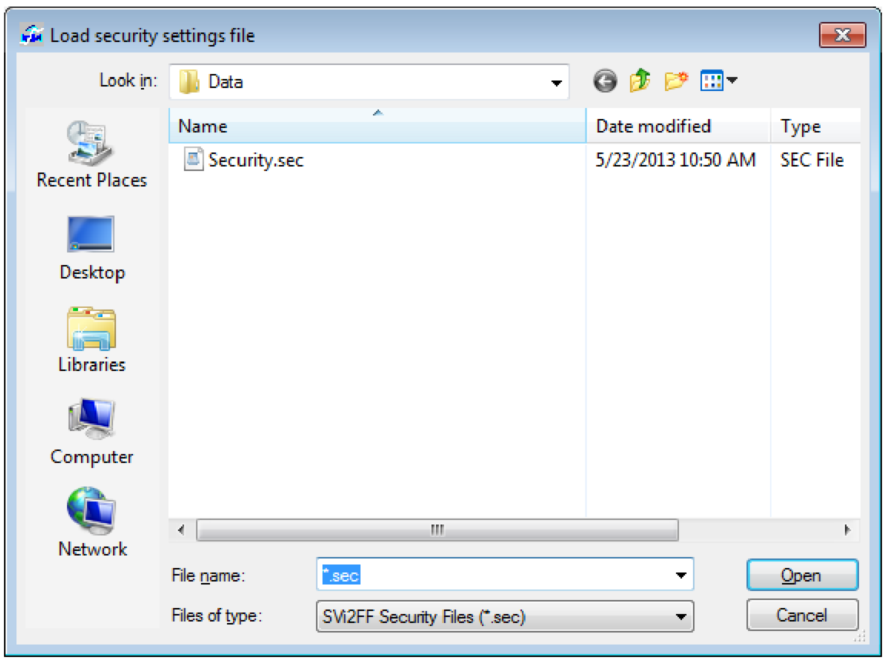


Figure 154 – Load Security Settings from File

2. Navigate to the correct file and click **Open**.

Save Security Settings

1. Click **Save Security Settings to File** and a dialog appears.

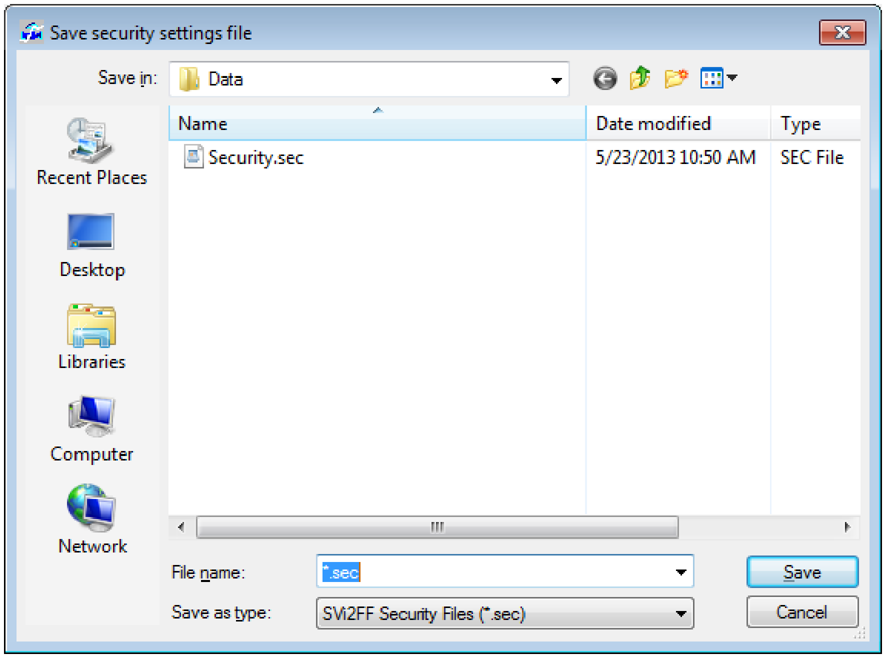


Figure 155 – Save Security Settings to File

2. Navigate to the correct directory, rename if necessary and click **Save**.

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.

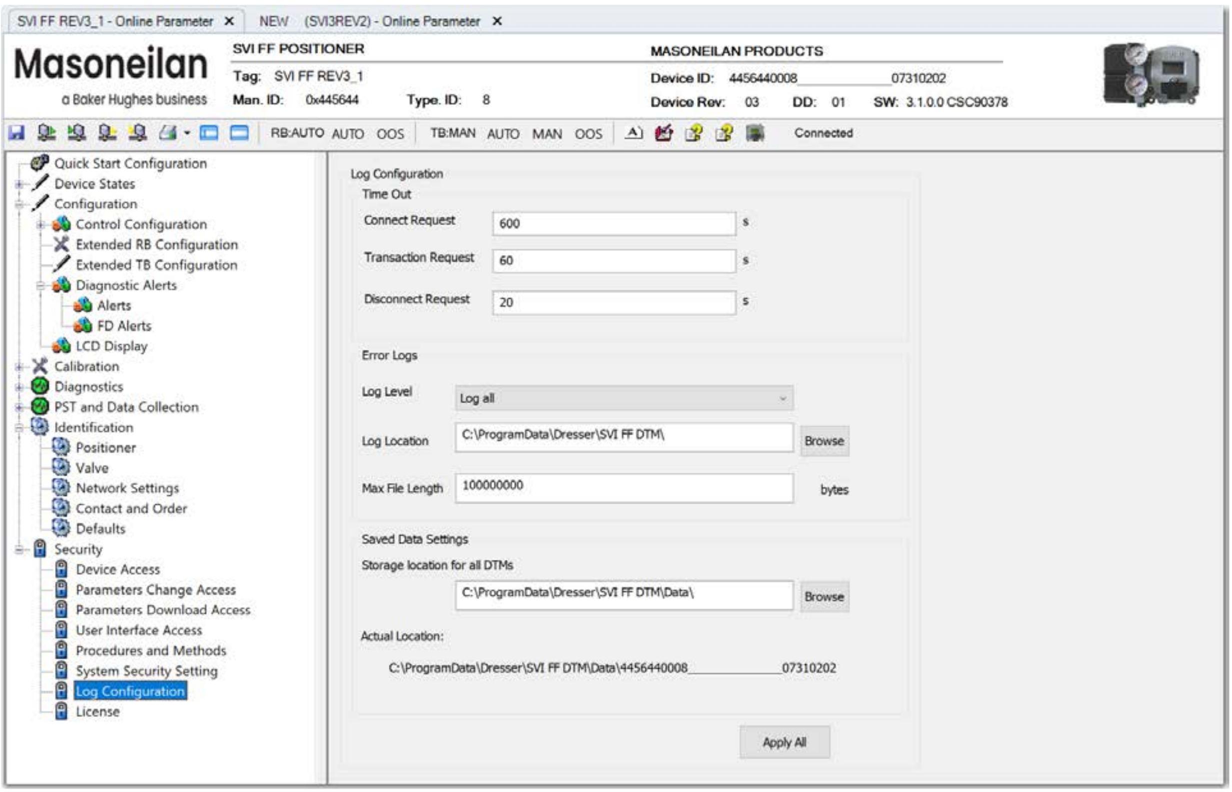


Figure 156 – Log Configuration

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 sec-onds 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:

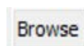
LOG_LEVEL_ERROR: Gathers events that are definitely problems for investigation. This is not connected to an alert creation.

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 

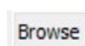
navigate to a directory, or enter a path, to which to save the log file.

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

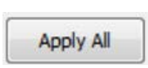
Storage location for all DTMs

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 DTMs.

Actual Location

Displays the present data storage location.



Apply All button

Click this button to apply changes made on this tab.

License

See *Registration*.

15. 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.

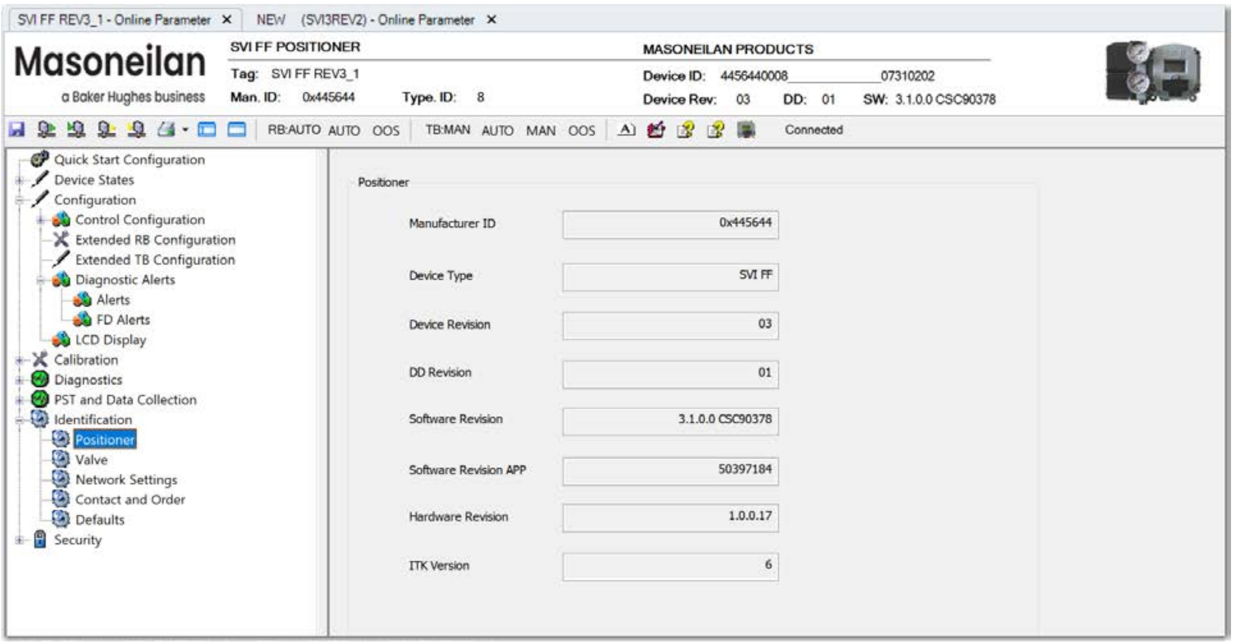


Figure 157 – Identification: Positioner Tab

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 software 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.

Hardware Revision	Displays the revision from the device settings.
ITK Revision	Displays the revision from the device settings. Displays the version of the Interoperability Tester used by the Fieldbus Foundation in certifying the device as interoperable.

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.

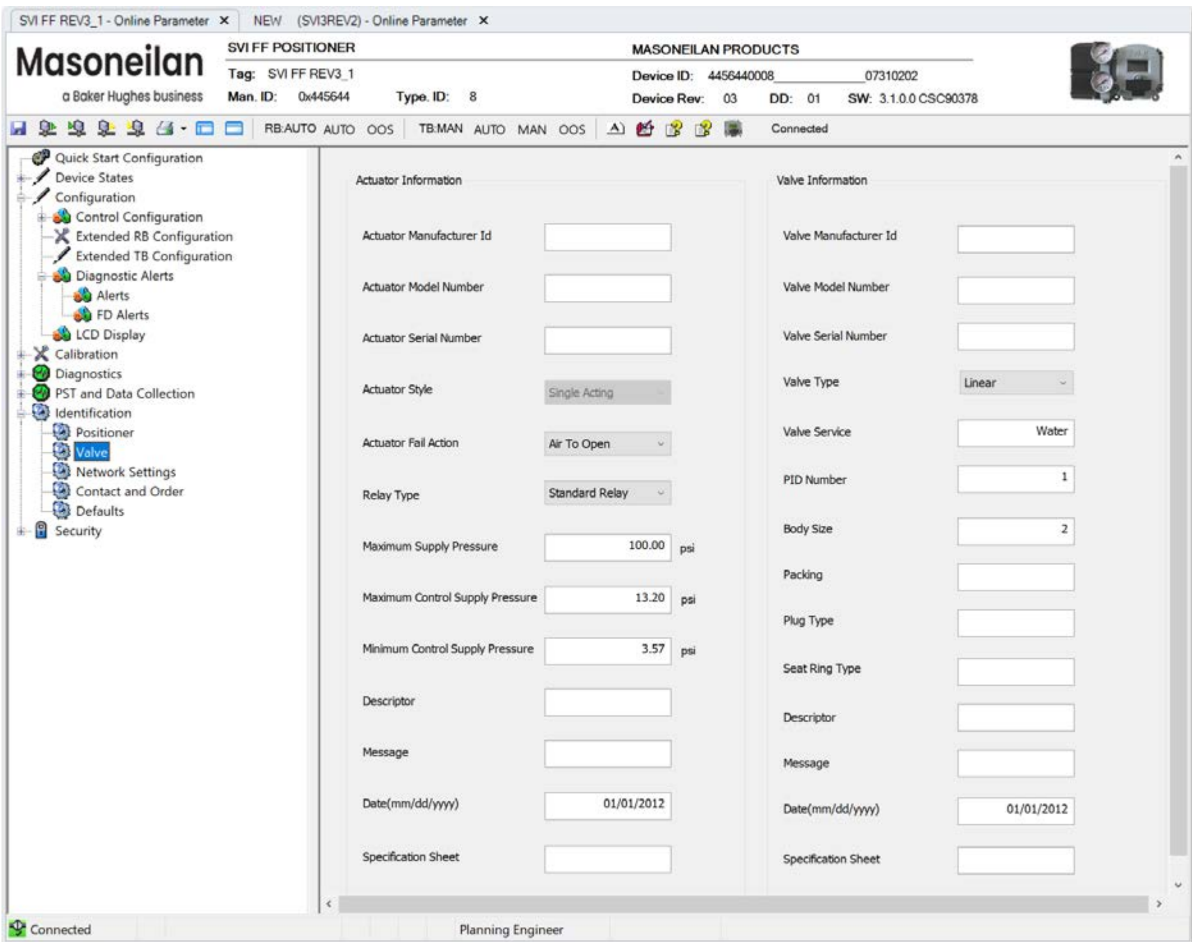


Figure 158 – Identification: Valve Tab

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.

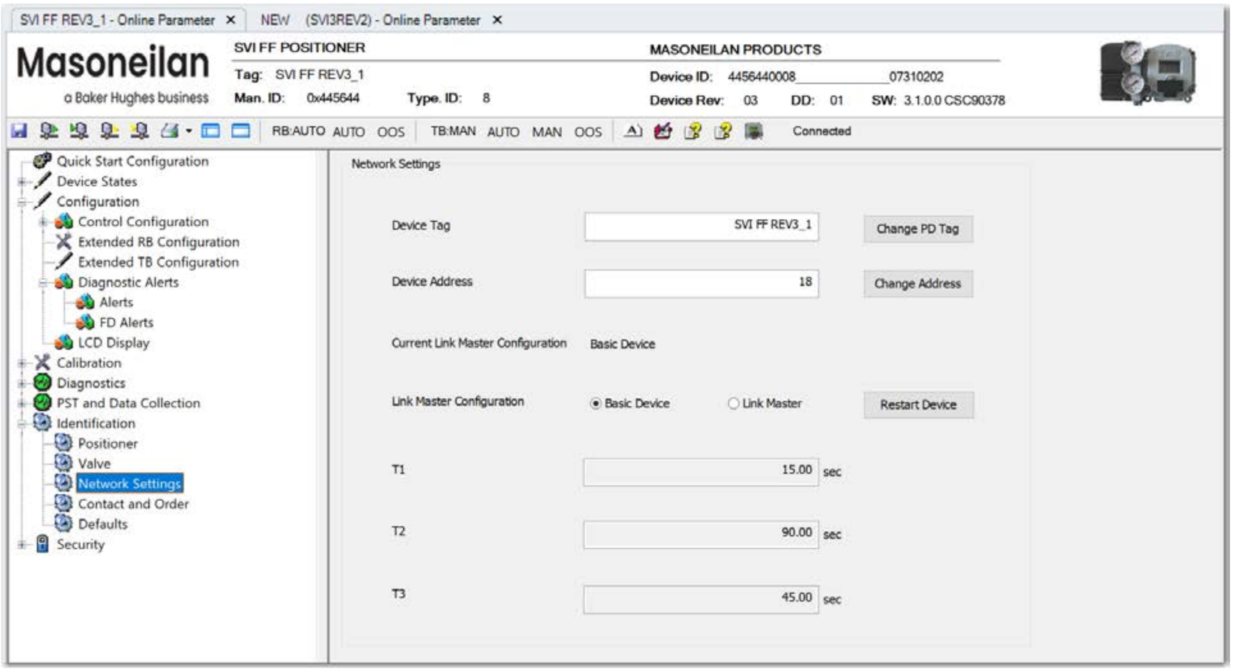
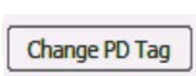


Figure 159 – Identification: Network Settings Tab

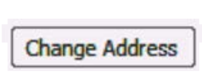
Buttons and Fields

Device Tag — Use this field to change the tag name.



Change PD Tag button — 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.

Device Address — Displays the address.



Change Address button — 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 button — 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**.**

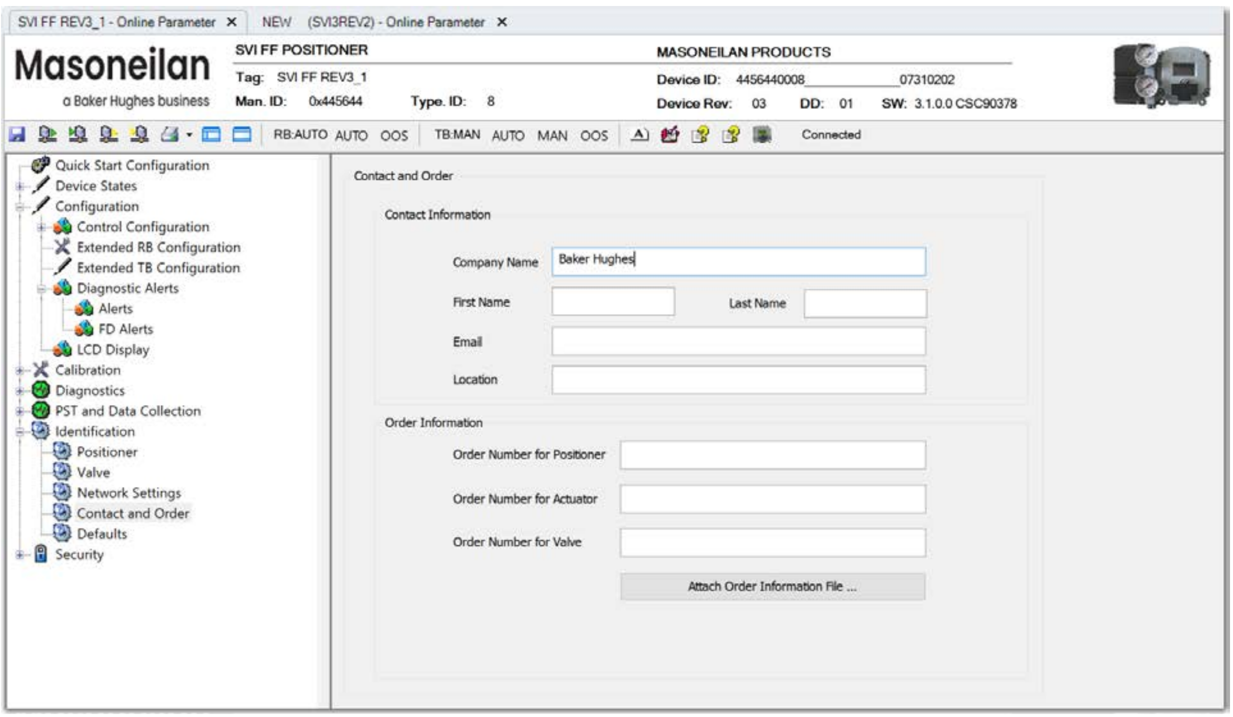


Figure 160 – Identification: Contact Order Tab

Buttons and Fields

Contact Information

Company Name	Enter the company name.
First Name	Enter the first name of the company contact.

Last Name	Enter the last name of the company contact.
Email	Enter the email for the company contact.
Location	Enter a location for the contact.
	Order Information
Order Number for Positioner	Enter the order number.
Order Number for Actuator	Enter the order number.
Order Number for Valve	Enter the order number.
Attach Order Information File ...	Click to open an attach an information file. You can attach any type of source file for reference. See *Attach Order Information File*.

Attach Order Information File

1. Click Attach Order Information File ... and a dialog appears.

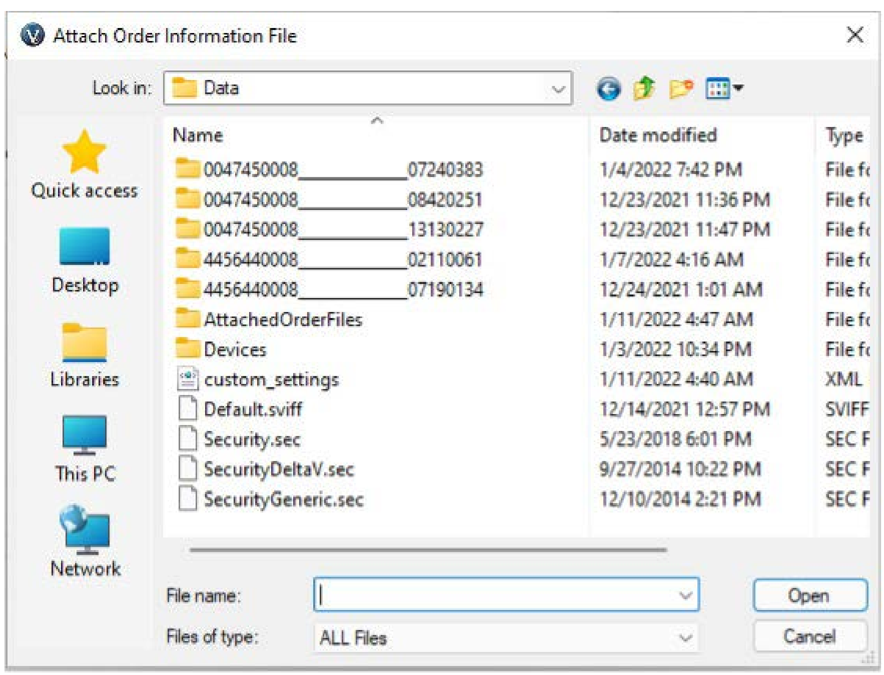


Figure 161 – Attach Order Information File

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 is 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*).

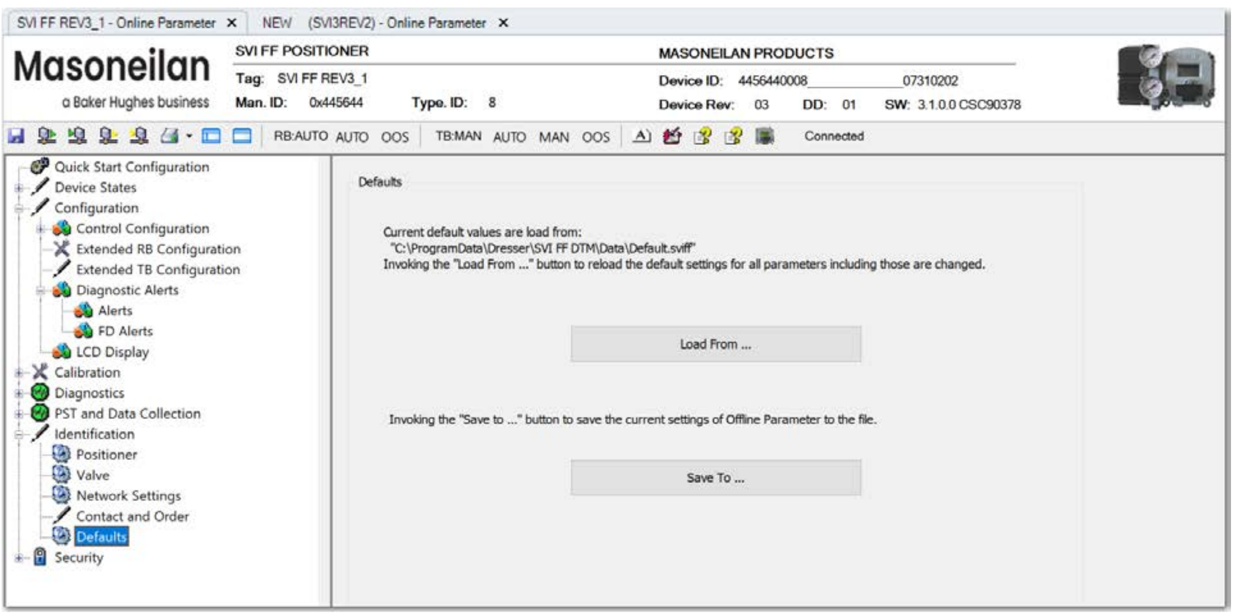
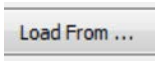
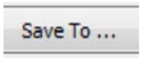


Figure 162 – Identification: Defaults Tab

Buttons and Fields



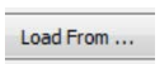
Click this button to load default values from file (.sviff). See *Load Values*. This can also access another non-default saved settings file. Use *User Interface Access Defaults* to control the user rights to this button.



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  and the dialog appears.

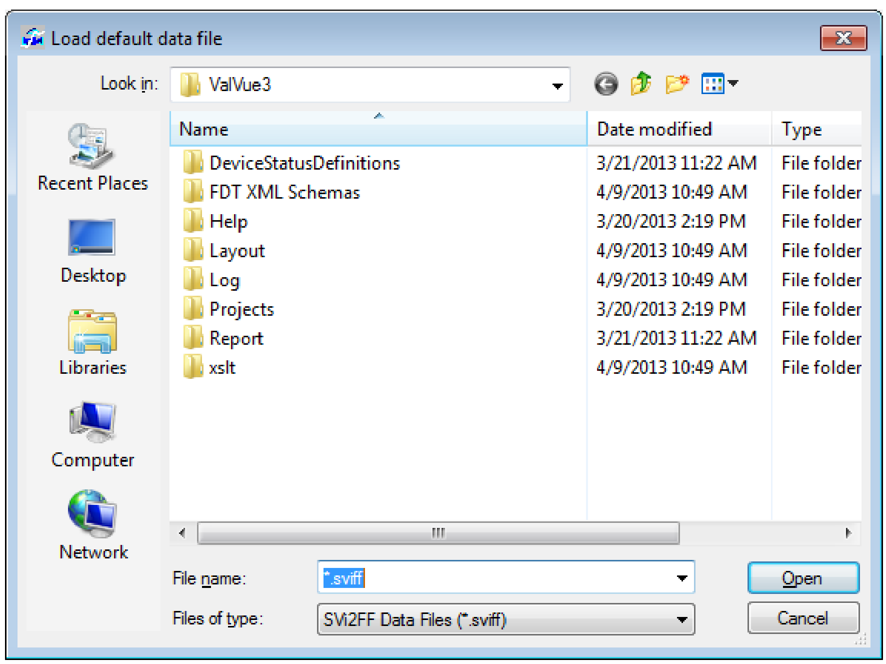


Figure 163 – Load Default Data File

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.

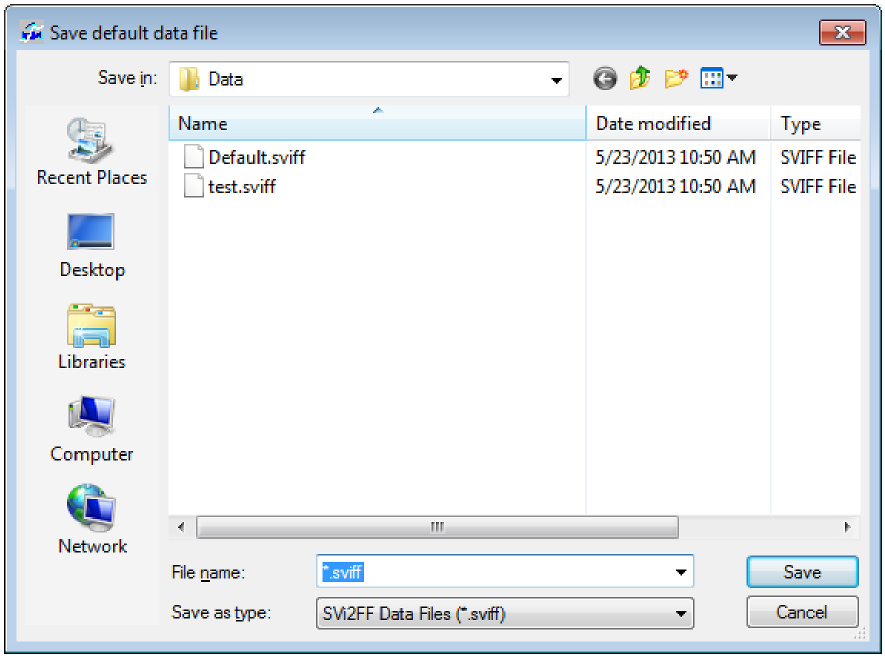


Figure 164 – Save Default Data File

2. Navigate to the required directory, click **Save** and the values are saved.

16. 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:

- *Offline Diagnostics*: Off Line diagnostics are used when the application process is not running. Offline diagnostics procedure execution requires significant changes of valve setpoint, which disturbs the application process.
- *Online 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.

Offline Diagnostics

Offline diagnostics are used when the application process is not running. Offline diagnostics procedure execution requires significant changes of valve setpoint, which disturbs the application process.

When Offline 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.

Online Diagnostics

Online 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 that 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 is 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 1 Valve Position Values Monitored

	114-POSITION_EXTREMES	DESCRIPTION
1	FINAL_VALUE_MAX	Max value of Position Setpoint
2	FINAL_VALUE_MIN	Min value of Position Setpoint
3	FINAL_POS_VALUE_MAX	Max value of Actual Position
4	FINAL_POS_VALUE_MIN	Min value of Actual Position
5	WORKING_SP_MAX	Max value of Characterized Position Setpoint
6	WORKING_SP_MIN	Min value of Characterized Position Setpoint
7	WORKING_POS_MAX	Max value of Characterized Actual Position
8	WORKING_POS_MIN	Min value of Characterized Actual Position

Table 2 Pressure Related Values Monitored

	PRESSURE_EXTREMES	DESCRIPTION
1	SUPPLY_PRESSURE_MAX	Max value of the Supply Pressure
2	SUPPLY_PRESSURE_MIN	Min value of the Supply Pressure
3	ACTUATOR_A_MAX	Max value of the Actuator A Pressure
4	ACTUATOR_A_MIN	Min value of the Actuator A Pressure
5	ACTUATOR_B_MAX	Max value of the Actuator B Pressure

Table 2 Pressure Related Values Monitored

6	ACTUATOR_B_MIN	Min value of the Actuator B Pressure
7	PILOT_MAX	Max value of the Pilot Pressure
8	PILOT_MIN	Min value of the Pilot Pressure

Table 3 Temperature Related Values Monitored

	TEMPERATURE_ EXTREMES	DESCRIPTION
1	TEMPERATURE_MAX	Max value of the temperature in the positioner
2	TEMPERATURE_MIN	Min value of the temperature in the positioner

Table 4 IP Current Related Values Monitored

	IP_CURRENT_ EXTREMES	DESCRIPTION
1	IP_CURRENT_MAX	Max value of the IP current
2	IP_CURRENT_MIN	Min value of the IP current

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*).

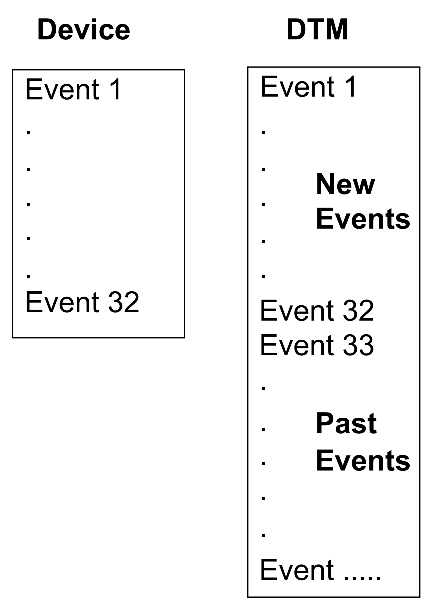


Figure 165 – Device vs. DTM Event Log

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.

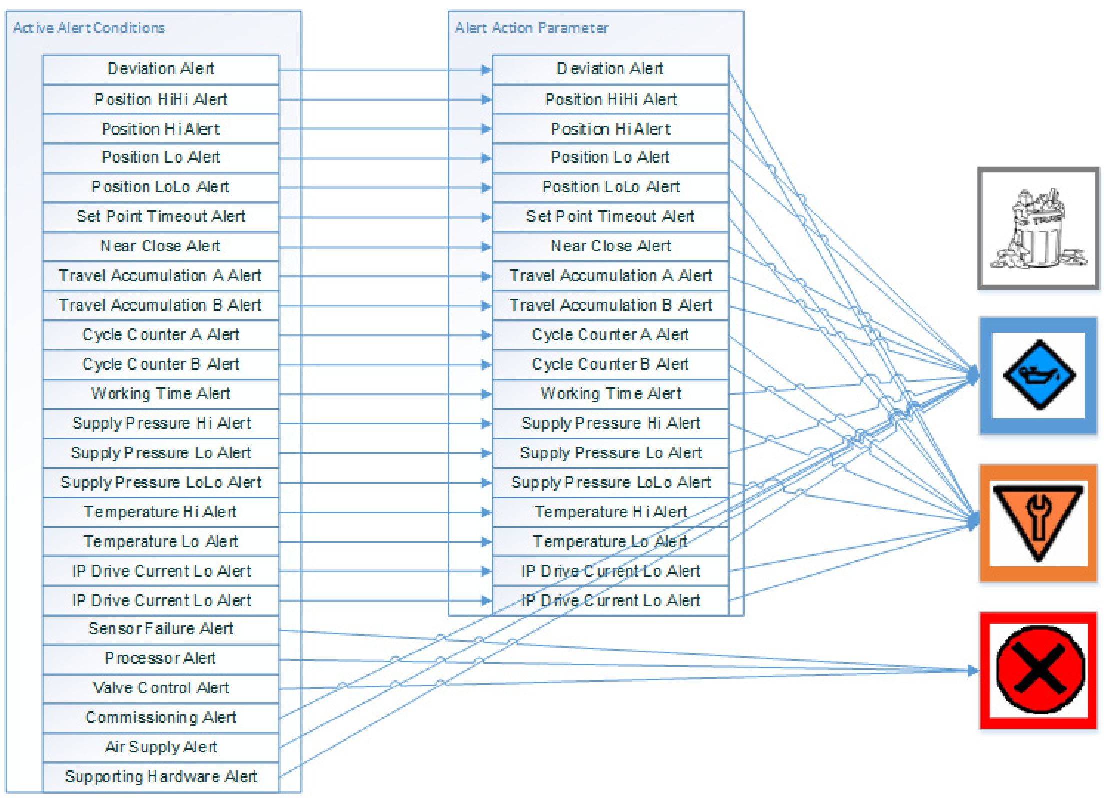


Figure 166 – Configuration for ALERT_ACTION Parameter

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.

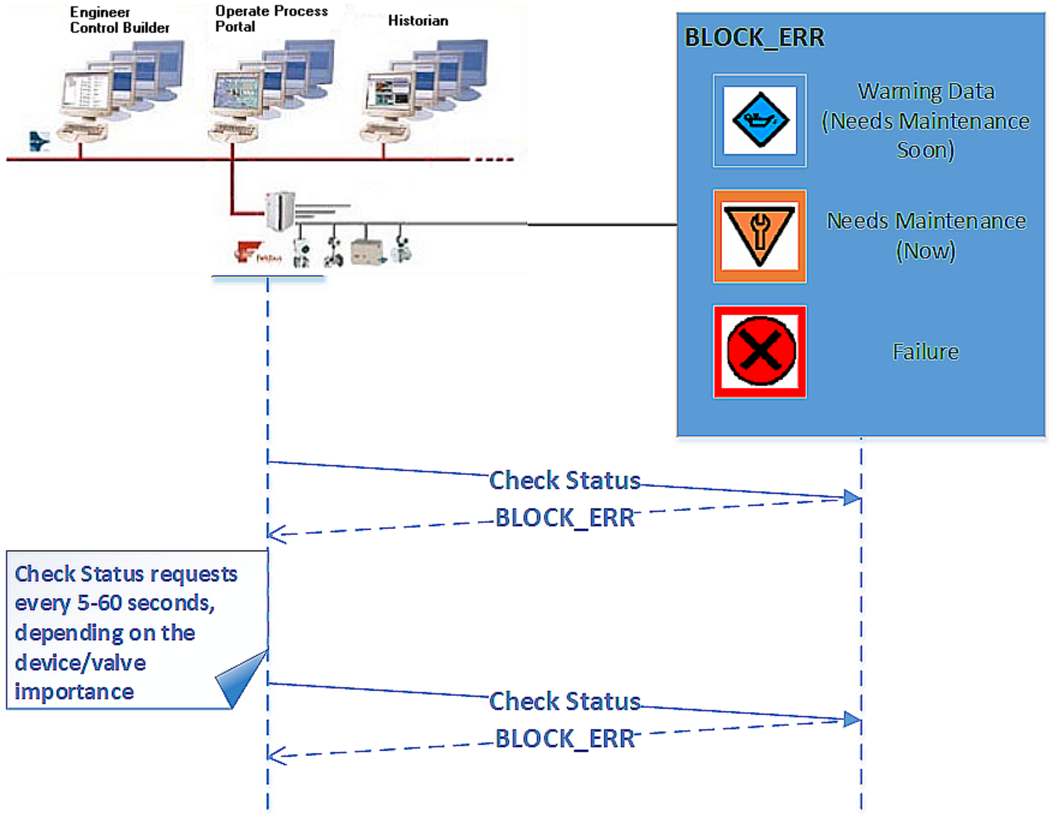


Figure 167 – Diagnostic Events Block Errors

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.

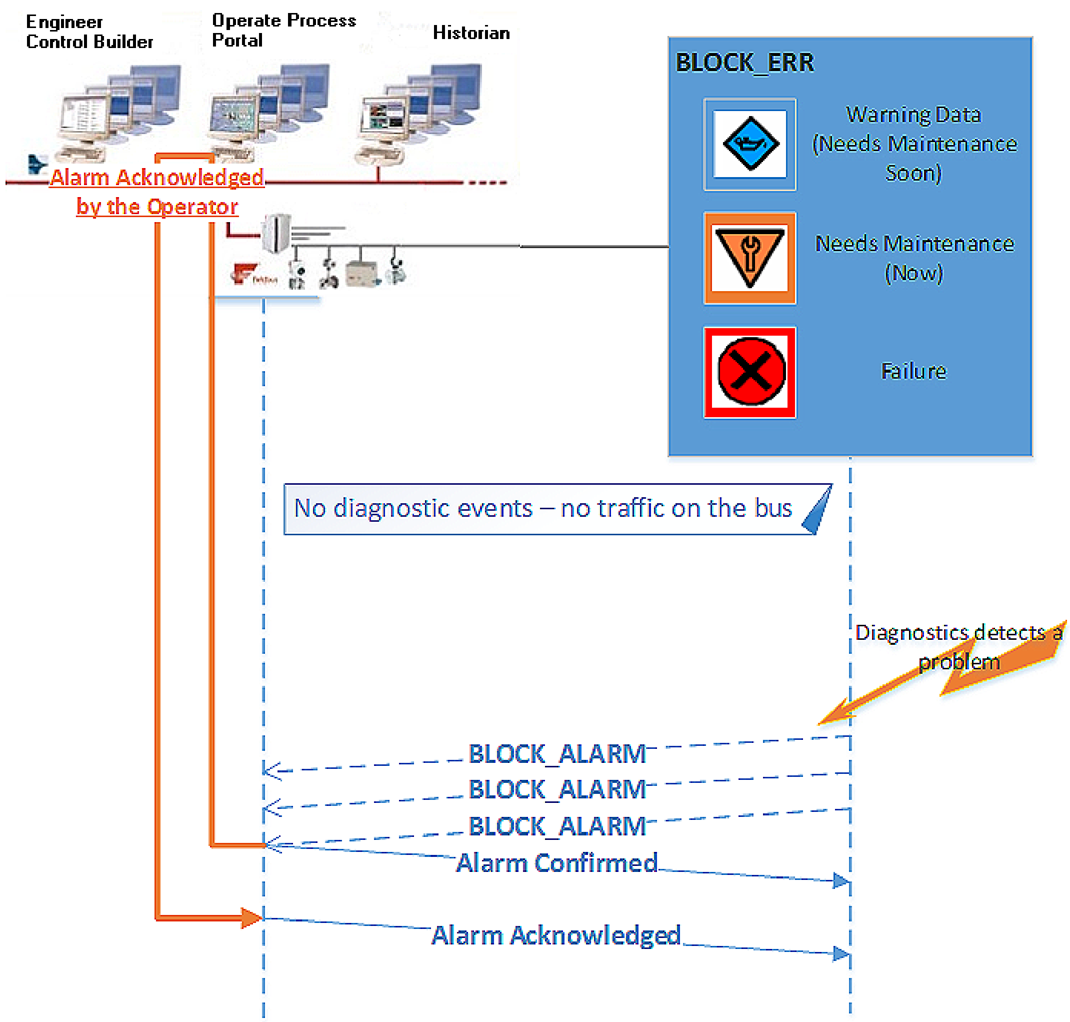


Figure 168 – Diagnostic Events Reported by Alarms

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.

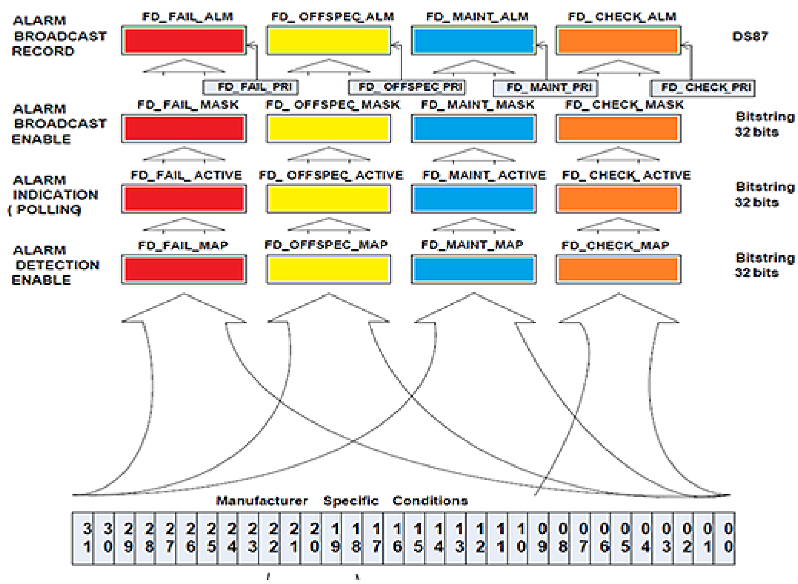


Figure 169 – Basic Field Diagnostic

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.

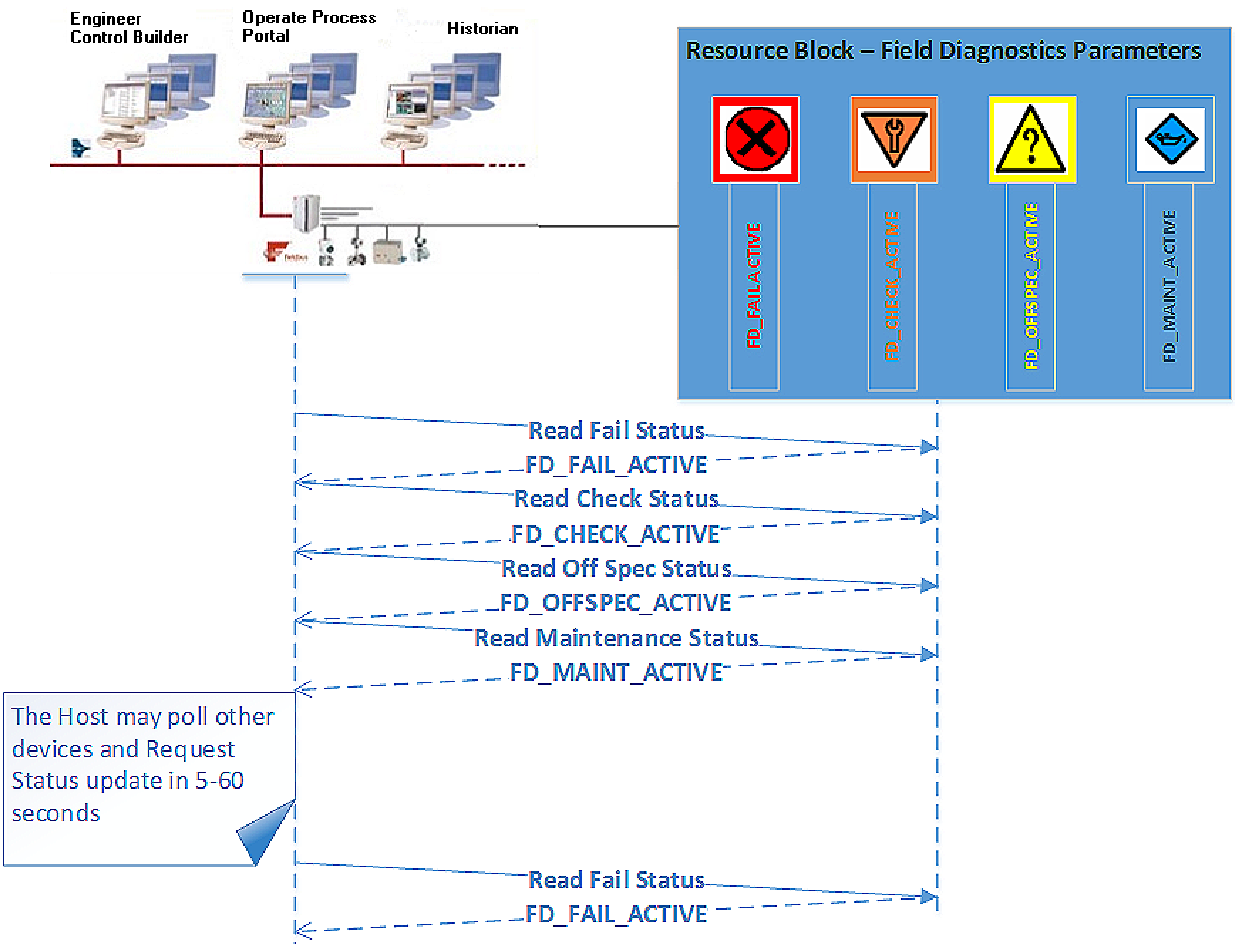


Figure 170 – Host Field Diagnostic Profile Parameters

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.

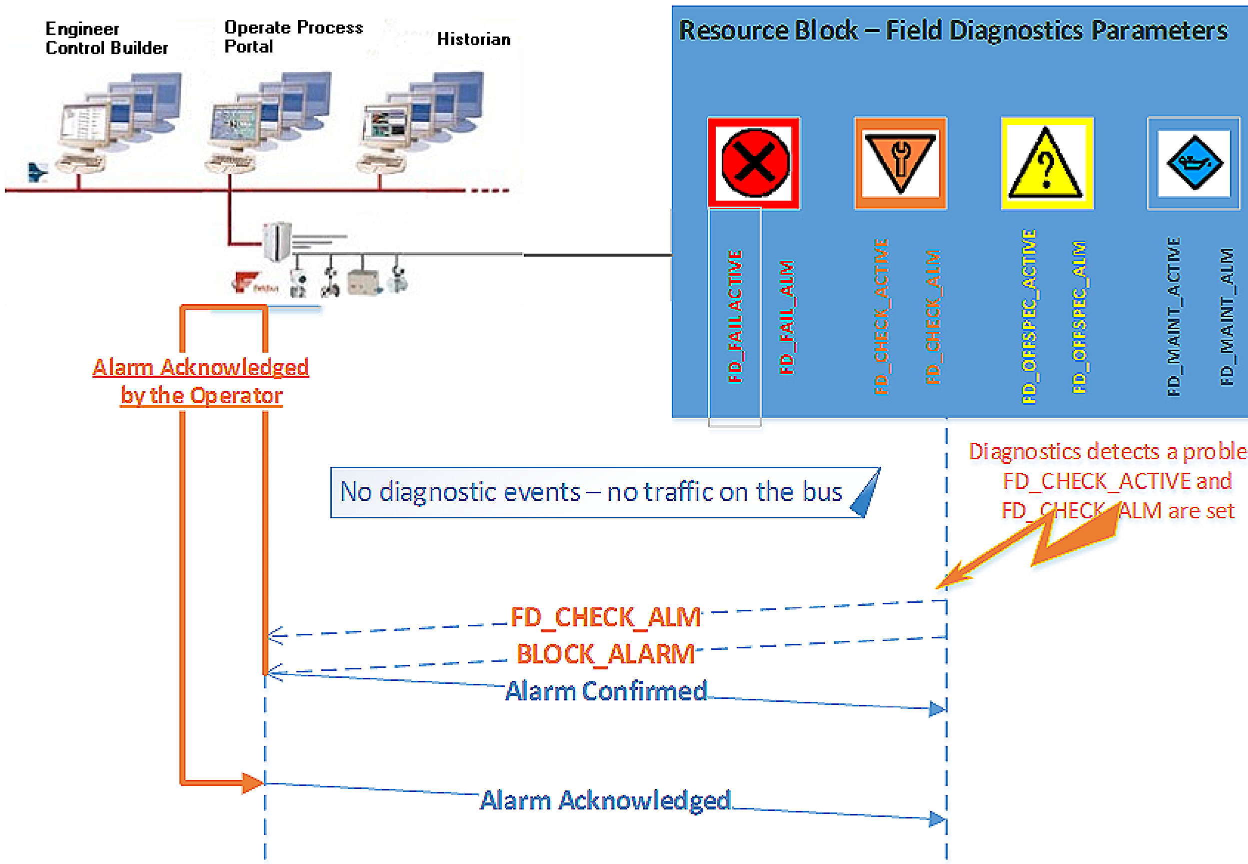


Figure 171 – SVI FF Response to Detected Conditions

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* (31248).

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.

17. 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.

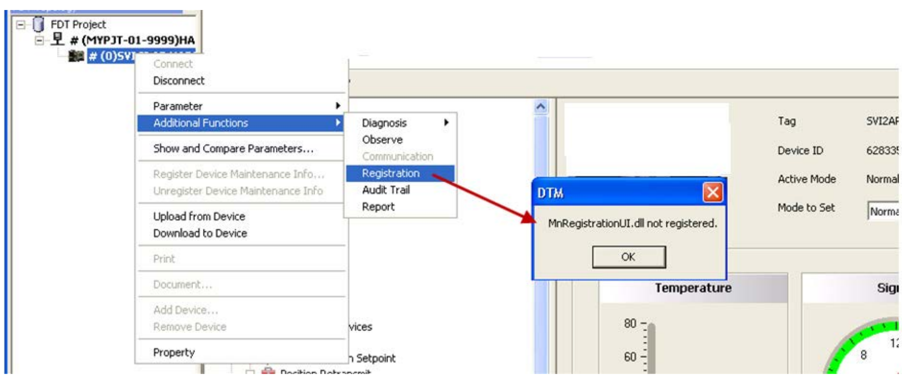


Figure 172 – Registration dll Error

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:

   <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.

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:

   <startup>

   <supportedRuntime version=”v1.1.4322”/> to

   <startup useLegacyV2RuntimeActivationPolicy=”true”>

   <supportedRuntime version=”v4.0” />

   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:

   <startup>

   <supportedRuntime version=”v1.1.4322”/> to

   <startup useLegacyV2RuntimeActivationPolicy=”true”>

   <supportedRuntime version=”v4.0” />

   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 *PACTware3.6*, launch registration from SVI FF DTM and the registration dialog successfully opens.

18. 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

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 proce-dure 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.

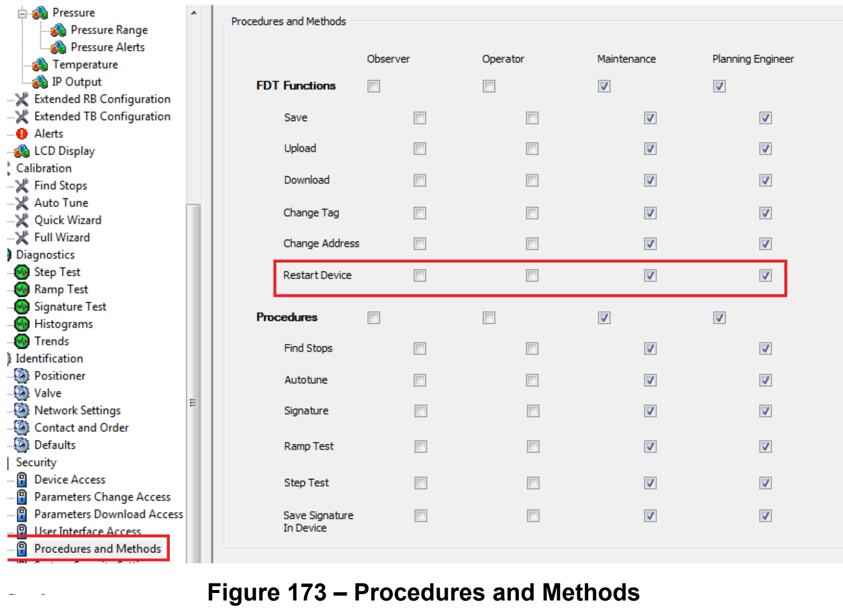


Figure 173 – Procedures and Methods

4. Click all boxes for *Restart Device*.
5. Select **Security > Parameter Change Access** and Figure 174 appears.

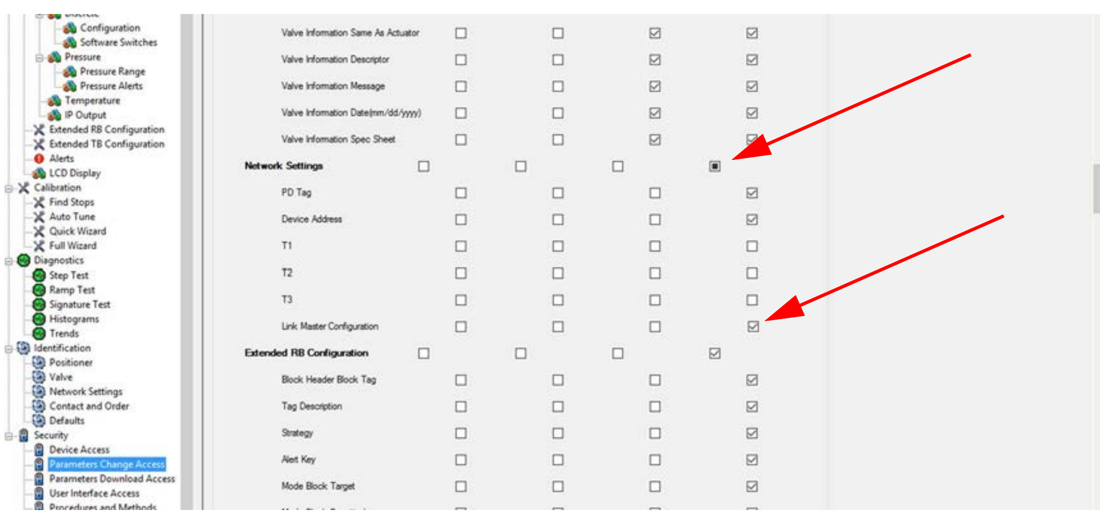


Figure 174 – Parameter Change Access

Note: To assign these privileges a person with ValVue 3 Administrator privileges. See the ValVue 3 software user manual (31426 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 be 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.

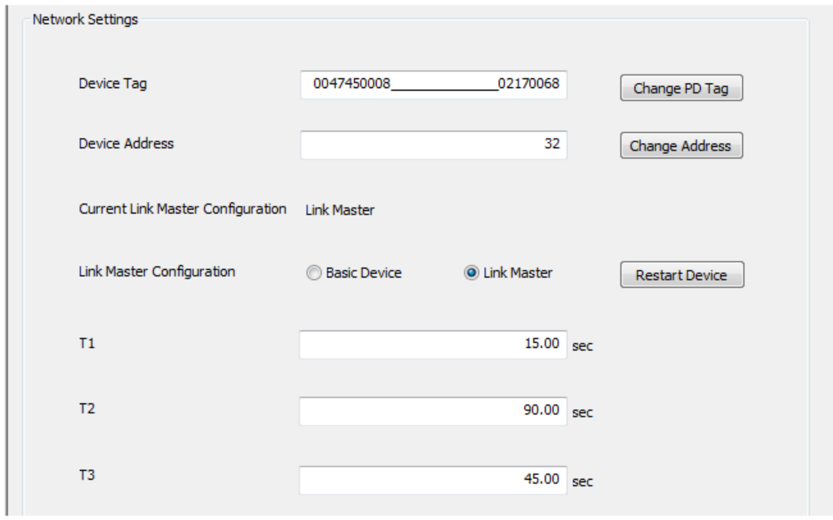


Figure 175 – Network Settings

   b. Clicking the **Link Master** radio button and the message in Figure 176 appears.

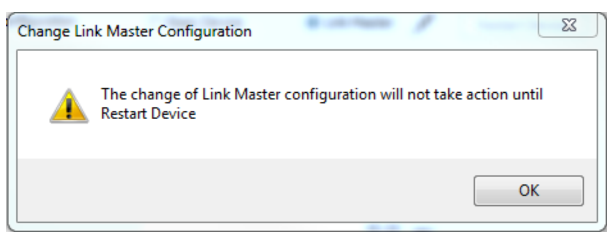


Figure 176 – Change Link Master Configuration

   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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19. 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

Masoneilan Valve Type	Valve Trim Type	Set Tight Shutoff	Positioner Characteristics
Lincoln Log	Any	15%	Linear
41000 VRT Type S	Partial Stack	6%	Linear
41000 VRT Type S	Full Stack	3.5%	Linear
41000 VRT Type C	Cage	6%	Linear
28000	Varilog	5%	Linear
Any	Class V Shutoff	2%	Linear

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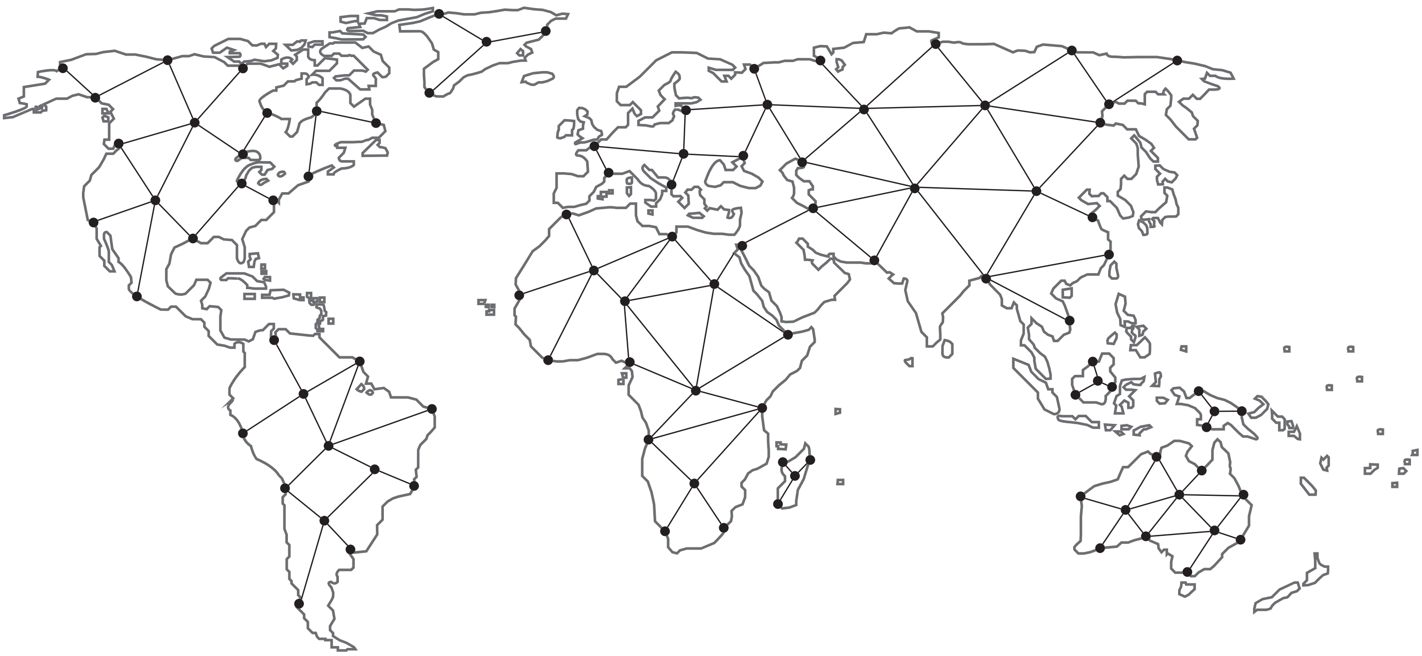
valves.bakerhughes.com/contact-us



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