

Advanced DTM Library

**Operation Using FOUNDATION Fieldbus
Communications Protocol**

Contents

| | |
|--------------------------------------|----------|
| Figures | 5 |
| Preface | 7 |
| 1. Pressure Transmitter | 9 |
| Device Overview | 11 |
| Resource Block..... | 12 |
| Overview..... | 12 |
| Configure | 14 |
| Alarms..... | 16 |
| Diagnostics..... | 17 |
| Advanced 1..... | 18 |
| Advanced 2..... | 20 |
| Pressure Transducer Block | 21 |
| Overview..... | 21 |
| Process Variable 1 | 23 |
| Process Variable 2 | 24 |
| Configure | 25 |
| Advanced..... | 26 |
| Analog Input Block | 28 |
| Overview..... | 28 |
| Block Diagram | 29 |
| Process Variables..... | 30 |
| Diagnostics..... | 31 |
| Configure | 32 |
| Alarms..... | 34 |
| Advanced 1..... | 37 |
| Advanced 2..... | 38 |
| PID Block | 40 |
| Overview..... | 40 |
| Block Diagram | 42 |
| Process Variables..... | 43 |
| Configure 1 | 45 |
| Configure 2 | 47 |
| Tuning | 49 |
| Alarms..... | 50 |
| Advanced 1..... | 53 |

| | |
|---------------------------|----|
| Advanced 2..... | 54 |
| Advanced 3..... | 56 |
| Configuration Report..... | 57 |
| Report Settings..... | 58 |
| Reference | 59 |
| Reference..... | 59 |
| Scratch Pad..... | 59 |
| Trending..... | 59 |
| Activity Log..... | 61 |





Figures

| | | |
|----|---|----|
| 1 | Sample Pressure Transmitter - Menu Structure | 10 |
| 2 | Sample Pressure Transmitter - Device Overview Screen | 11 |
| 3 | Sample Pressure Transmitter - Resource Block Overview Screen | 12 |
| 4 | Sample Pressure Transmitter - Resource Block Configure Screen | 14 |
| 5 | Sample Pressure Transmitter - Resource Block Alarms Screen | 16 |
| 6 | Sample Pressure Transmitter - Resource Block Diagnostics Screen | 17 |
| 7 | Sample Pressure Transmitter - Resource Block Advanced 1 Screen | 18 |
| 8 | Sample Pressure Transmitter - Resource Block Advanced 2 Screen | 20 |
| 9 | Sample Pressure Transmitter - Pressure Transducer Block Overview Screen | 21 |
| 10 | Sample Pressure Transmitter - Pressure Transducer Block Process Variable 1 Screen | 23 |
| 11 | Sample Pressure Transmitter - Pressure Transducer Block Process Variable 2 Screen | 24 |
| 12 | Sample Pressure Transmitter - Pressure Transducer Block Configure Screen | 25 |
| 13 | Sample Pressure Transmitter - Pressure Transducer Advanced Screen | 26 |
| 14 | Sample Pressure Transmitter - Analog Input Block Overview Screen | 28 |
| 15 | Sample Pressure Transmitter - Analog Input Block Diagram Screen | 29 |
| 16 | Sample Pressure Transmitter - Analog Input Block Process Variables Screen | 30 |
| 17 | Sample Pressure Transmitter - Analog Input Block Diagnostics Screen | 31 |
| 18 | Sample Pressure Transmitter - Analog Input Block Configure Screen | 32 |
| 19 | Sample Pressure Transmitter - Analog Input Block Alarms Screen | 34 |
| 20 | Sample Pressure Transmitter - Analog Input Block Advanced 1 Screen | 37 |
| 21 | Sample Pressure Transmitter - Analog Input Block Advanced 2 Screen | 38 |
| 22 | Sample Pressure Transmitter - PID Block Overview Screen | 40 |
| 23 | Sample Pressure Transmitter - PID Block Diagram Screen | 42 |
| 24 | Sample Pressure Transmitter - PID Block Process Variables Screen | 43 |
| 25 | Sample Pressure Transmitter - PID Block Configure 1 Screen | 45 |
| 26 | Sample Pressure Transmitter - PID Block Configure 2 Screen | 47 |
| 27 | Sample Pressure Transmitter - PID Block Tuning Screen | 49 |
| 28 | Sample Pressure Transmitter - PID Block Alarms Screen | 50 |
| 29 | Sample Pressure Transmitter - PID Block Advanced 1 Screen | 53 |
| 30 | Sample Pressure Transmitter - PID Block Advanced 2 Screen | 54 |
| 31 | Sample Pressure Transmitter - PID Block Advanced 3 Screen | 56 |
| 32 | Sample Pressure Transmitter - Configuration Report Screen | 57 |
| 33 | Sample Pressure Transmitter - Report Settings Screen | 58 |
| 34 | Sample Pressure Transmitter - Trending Screen | 60 |
| 35 | Sample Pressure Transmitter - Activity Log Screen | 61 |

Preface

This manual explains how to operate, calibrate, and configure devices with FOUNDATION Fieldbus protocol using the Device Type Manager (DTM).

The following icons are used in the DTM.

| Icon | Explanation |
|---|---|
|  | This icon indicates that all parameters are healthy. |
|  | This icon indicates that one or more parameters in the screen are updated periodically. |
|  | This icon indicates that there is an error in one or more parameters. |
|  | This icon indicates an invalid value in the screen. |

1. Pressure Transmitter

This chapter provides information on using Pressure Transmitters with FOUNDATION Fieldbus communication protocol. Additional information about this transmitter and FOUNDATION Fieldbus communication protocol is contained in the following documents.

- ◆ MI 014-900 Fieldbus Overview
- ◆ MI IDP10-F I/A Series® Pressure Transmitters IDP10 Differential Pressure with FOUNDATION Fieldbus Communication - Installation, Operation, Calibration, Configuration, and Maintenance
- ◆ MI IDP25-F/IDP50-F I/A Series® Intelligent Pressure Transmitters IDP25 and IDP50 Differential Pressure with FOUNDATION Fieldbus Communication - Installation, Operation, Calibration, Configuration, and Maintenance
- ◆ MI IAP10-F/IGP10-F I/A Series® Intelligent Pressure Transmitters IAP10 Absolute Pressure and IGP10 Gauge Pressure with FOUNDATION Fieldbus Communication - Installation, Operation, Calibration, Configuration, and Maintenance
- ◆ MI IAP20-F/IGP20-F I/A Series® Pressure Transmitters IAP20 Absolute Pressure and IGP20 Gauge Pressure with FOUNDATION Fieldbus Communication - Installation, Operation, Calibration, Configuration, and Maintenance
- ◆ MI IGP25-F/IGP50-F I/A Series® Intelligent Pressure Transmitters IGP25 and IGP50 Gauge Pressure with FOUNDATION Fieldbus Communication - Installation, Operation, Calibration, Configuration, and Maintenance

Figure 1 shows the menu structure of the DTM.

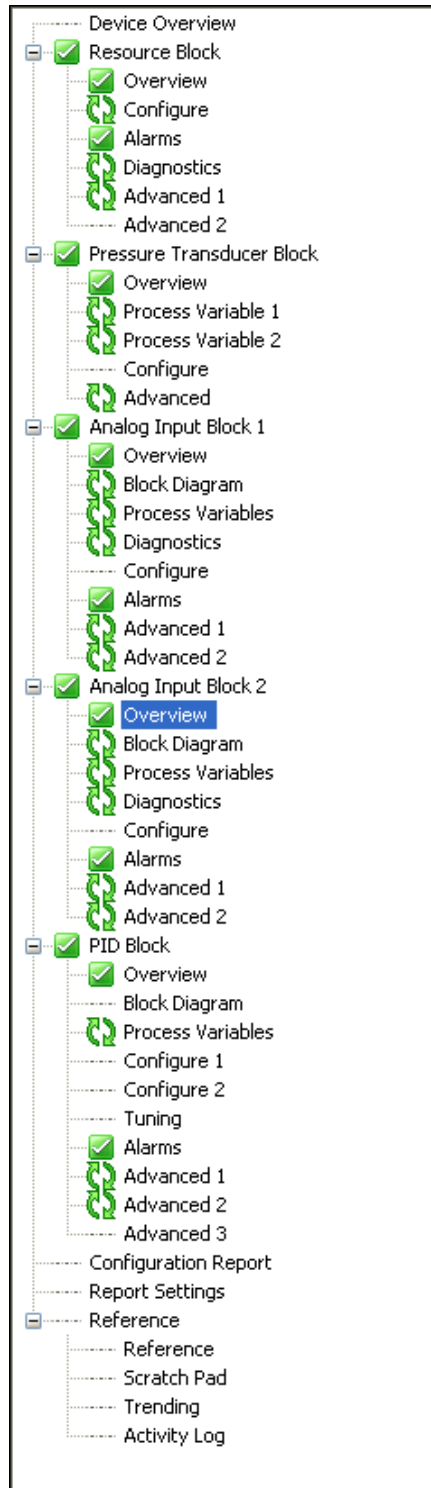


Figure 1. Sample Pressure Transmitter - Menu Structure

Device Overview

The Device Overview screen illustrates the flow of information from the Sensor to the Transducer Block, and on to the Functional Blocks through Fieldbus Network.

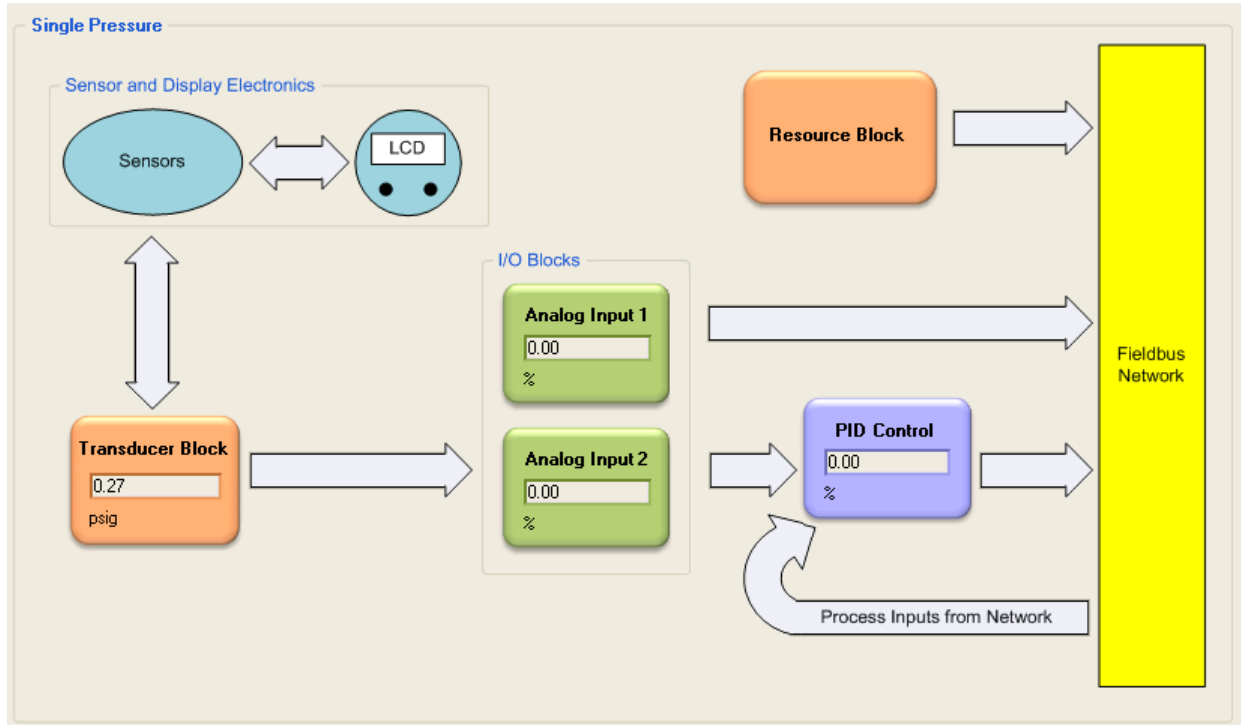


Figure 2. Sample Pressure Transmitter - Device Overview Screen

Resource Block

Overview

The Resource Block Overview screen provides information about the transmitter. It displays the status of the block alarms. It also allows you to select the block mode and permitted block modes. Finally, you can set the Tag Description in this screen.

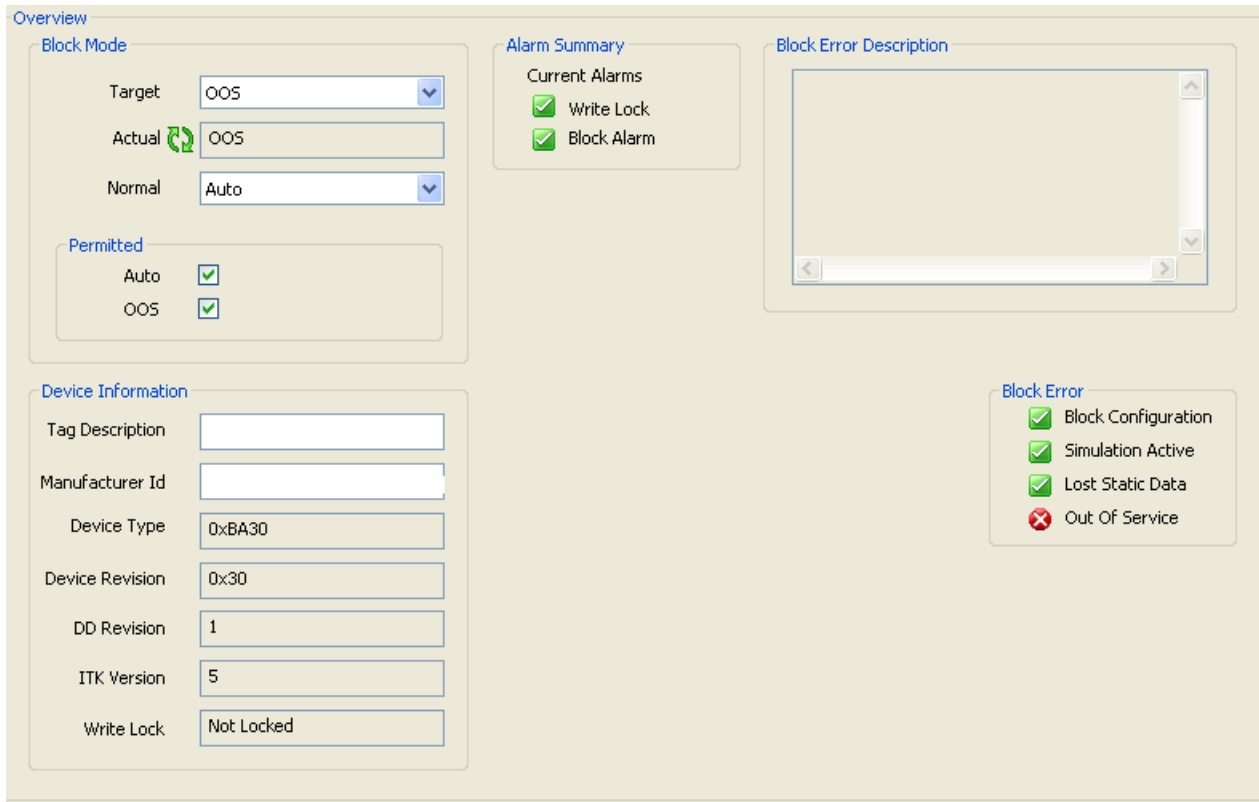


Figure 3. Sample Pressure Transmitter - Resource Block Overview Screen

| Field | Entry |
|-------------------|---|
| Block Mode | |
| Target | Select the Target mode from the drop-down list. Choose from permitted modes. |
| Actual | The Actual mode indicates what mode the block is in at the current time. The only time the Actual mode will not match the Target mode is when there is a configuration error. Out of Service in the Resource block will force the AI and PID blocks Out of Service too. |
| Normal | The Normal mode indicates what mode the Target mode and Actual modes would be in normal operation. Select one of the permitted modes from the drop-down list. |
| Permitted | Select the Auto or OOS check box to permit the corresponding Target mode. The Permitted mode is some or all of the valid Target modes that the block may operate. |

| Field | Entry |
|--------------------------------|--|
| Device Information | |
| Tag Description | Enter the tag description for the block. |
| Manufacturer Id | This is the manufacturer identification number. This identification number is used by an interface device to locate the Device Description (DD) file for the resource. |
| Device Type | This is the manufacturer's model number associated with the Instrument. |
| Device Revision | This is the manufacturer's revision number associated with the Instrument. |
| DD Revision | This is the DD revision associated with the Instrument. This DD revision number is used by an interface device to locate the DD file for the resource. The actual DD version may be any value equal or higher. |
| ITK Version | This is the major revision number of the interoperability test suite used in certifying this device as interoperable. The format and range of the version number is defined and controlled by the FOUNDATION Fieldbus. |
| Write Lock | When Write Lock is enabled, it will prevent any external change to the Static or Non-volatile data in the Function Block Application of the resource. |
| Alarm Summary | |
| | This field indicates the current alarm status associated with the Resource block. |
| Block Error Description | |
| | This field shows a detailed description of persistent errors in the block. |
| Block Error | |
| | This field indicates the error status associated with the hardware or software components associated with the Resource block. |

Configure

The Configure screen allows you to select the device parameters as shown in Figure 4.

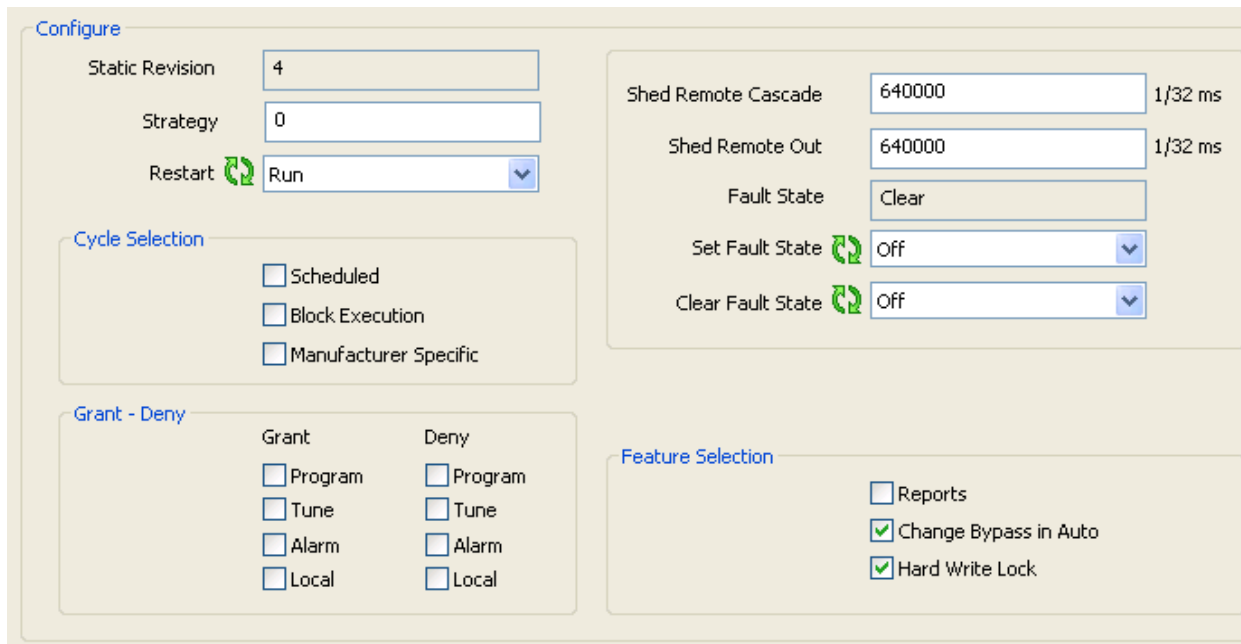


Figure 4. Sample Pressure Transmitter - Resource Block Configure Screen

| Field | Entry |
|------------------------|--|
| Configure | |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Strategy | Enter a value for Strategy. This parameter is used by a host to identify a group of blocks. |
| Restart | Select an option for Restart from the drop-down list. Choose from Run, Defaults, Resource, and Processor. Run is the default option during normal operation. Defaults sets parameters back to their initial values, except for calibration. Resource is not defined. Processor will cause the entire instrument to do a power cycle. All communication will be affected. |
| Cycle Selection | |
| Cycle Selection | Select the necessary options to set the Cycle Selection features. You can select or clear the supported block execution options: Scheduled, Block Execution, and Manufacturer Specific. |
| Grant - Deny | |
| Grant | Select the required check boxes to set the Grant options. You can select all or any of the following: Program, Tune, Alarm, and Local. These options allow you to control access of the host computer and local control panels. |
| Deny | Select the required check boxes to set the Deny options. You can select all or any of the following: Program, Tune, Alarm, and Local. Deny options may only be cleared by write commands. Deny options are set when the corresponding Grant option is cleared. |

| Field | Entry |
|--------------------------|---|
| Shed Remote Cascade | This field shows the time duration (in 1/32 of a millisecond) at which a function block with an RCAS_IN parameter, in RCAS mode, will time out if a computer fails to write to the function block RCAS_IN parameter. Shed from RCAS mode shall never happen when SHED_RCAS = 0. |
| Shed Remote Out | This field shows the time duration (in 1/32 of a millisecond) at which a function block with an ROUT_IN parameter, in ROUT mode, will time out if a computer fails to write to the function block ROUT_IN parameter. Shed from ROUT mode shall never happen when SHED_ROUT = 0. |
| Fault State | This field indicates that the Fault State condition is being simulated by the resource block. |
| Set Fault State | Select an option for Set Fault State from the drop-down list. Choose from one of the following: Off, Set. If you choose Set, the parameter automatically reverts to Off after being written. |
| Clear Fault State | Select an option for Clear Fault State from the drop-down list. Choose from one of the following: Off, Clear. If you choose Clear, the parameter automatically reverts to Off after being written. |
| Feature Selection | |
| Feature Selection | Select or clear the supported resource block options: Reports, Change Bypass in Auto, and Hard Write Lock. |

Alarms

The Alarms screen allows you to acknowledge or disable the alarms. You can also view the status of the alarm summary parameters as shown in Figure 5.

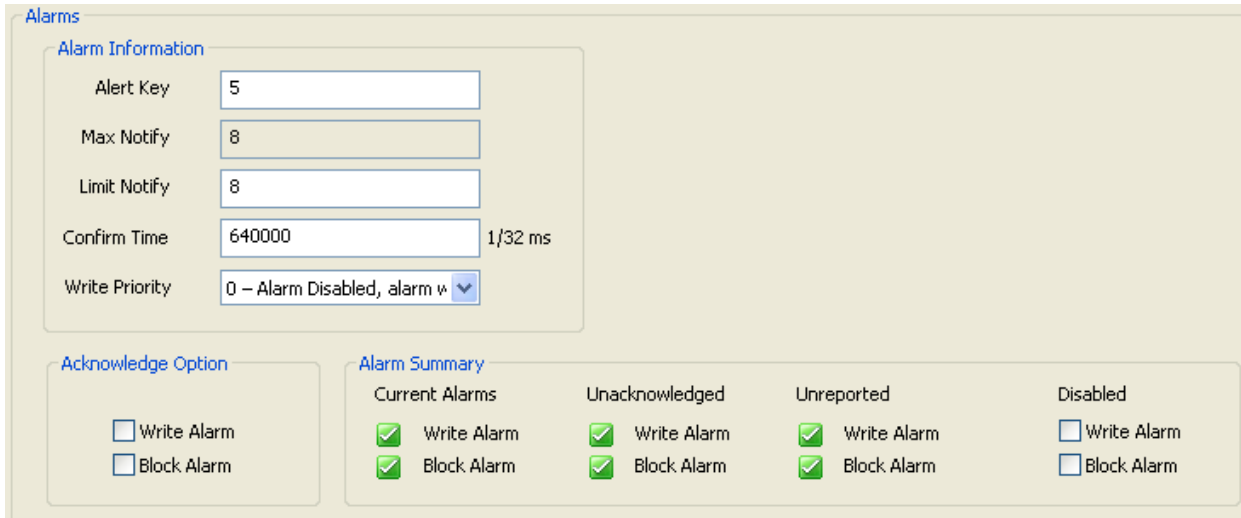


Figure 5. Sample Pressure Transmitter - Resource Block Alarms Screen

| Field | Entry |
|--------------------------|---|
| Alarm Information | |
| Alert Key | This field shows the identification number of the plant unit. This information may be used in the host for sorting alarms, etc. The value should be between 1 and 255. The initial and default value is 0. |
| Max Notify | This field shows the maximum number of alert reports that this resource can send without getting a confirmation. |
| Limit Notify | This field shows the number of alert reports that this resource is configured to, which is less than or equal to Max Notify. If it is set to zero, then no alerts are reported. |
| Confirm Time | This field shows the time (in 1/32 of a millisecond) the resource will wait for confirmation of receipt of a report before trying again. |
| Write Priority | Select an option for Write Priority from the drop-down list. Choose from one of the following: 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |

| Field | Entry |
|---------------------------|---|
| Acknowledge Option | |
| | Select the check boxes to acknowledge the Write and Block alarms automatically. |
| Alarm Summary | |
| Current Alarms | This field indicates the current alarm status. |
| Unacknowledged | This field indicates the unacknowledged alarm status. |
| Unreported | This field indicates the unreported alarm status. |
| Disabled | Select the check boxes to disable the Write and Block alarms. |

Diagnostics

The Diagnostics screen displays the device information and status as shown in Figure 6.

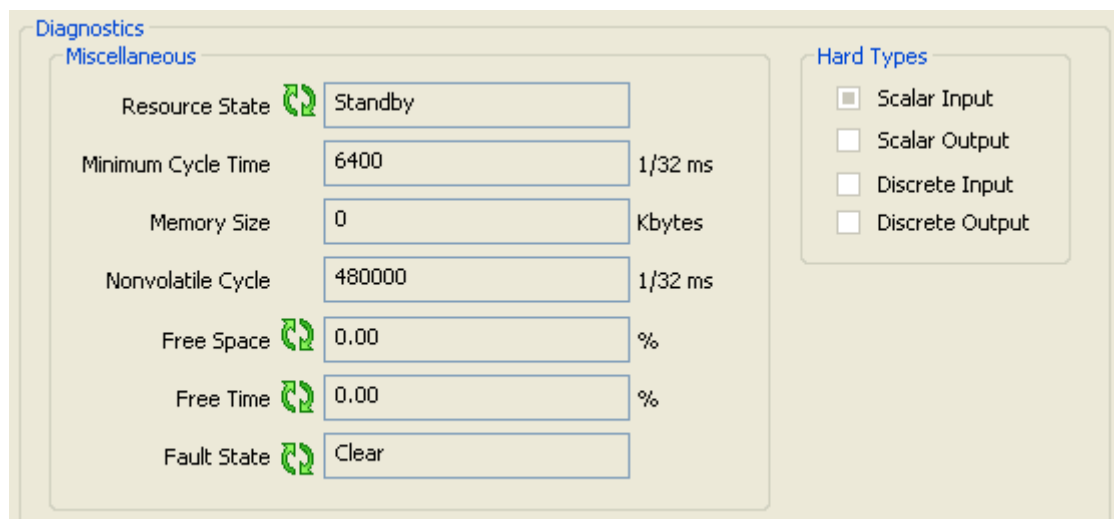


Figure 6. Sample Pressure Transmitter - Resource Block Diagnostics Screen

| Field | Entry |
|----------------------|--|
| Miscellaneous | |
| Resource State | This field shows the state of the function block. |
| Minimum Cycle Time | This field shows the time duration (in 1/32 of a millisecond) of the shortest cycle interval the resource is capable. |
| Memory Size | This field shows the available configuration memory in the resource for instantiation of function blocks. This device does not support instantiation. |
| Nonvolatile Cycle | This field shows the time interval (in 1/32 of a millisecond) specified by the manufacturer for writing copies of nonvolatile parameters to non-volatile memory. |
| Free Space | This field shows the percent of configuration memory free in the resource for instantiation of function blocks. This device does not support instantiation. |
| Free Time | This field shows the percent of time free in the resource for instantiation of function blocks. This device does not support instantiation. |
| Fault State | This field shows the fault state condition. |
| Hard Types | |
| Hard Types | The types of hardware available as channel numbers in input and output blocks. |

Advanced 1

The Advanced 1 screen displays the Update Event, Block Alarms, and Write Lock Alarm status as shown in Figure 7.

The screenshot shows the 'Advanced 1' screen with three main sections: Update Event, Write Lock Alarm, and Block Alarm. Each section contains several fields with refresh icons and dropdown menus.

- Update Event:**
 - Unacknowledged: Unacknowledged (dropdown)
 - Update State: Reported
 - Time Stamp: 2011-11-02 17:03:27.571
 - Static Revision: 3
 - Relative Index: 18
- Write Lock Alarm:**
 - Unacknowledged: Uninitialized (dropdown)
 - Alarm State: Uninitialized
 - Time Stamp: 1972-01-01 00:00:00.000
 - Subcode: Other
 - Discrete Value: State 0
- Block Alarm:**
 - Unacknowledged: Uninitialized (dropdown)
 - Alarm State: Uninitialized
 - Time Stamp: 1972-01-01 00:00:00.000
 - Subcode: Other
 - Value: 0

Figure 7. Sample Pressure Transmitter - Resource Block Advanced 1 Screen

| Field | Entry |
|---------------------|---|
| Update Event | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Update State | This field shows that the host has received alert. It automatically sets to Update Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the parameter was updated. |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Relative Index | This field shows the relative index of a parameter that was updated, or zero if more than one was updated at the same time. |
| Block Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Active Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when an alert was generated. |
| Subcode | This field shows the block error code. |
| Value | This field always shows a value of zero (0). |

| Field | Entry |
|-------------------------|---|
| Write Lock Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Update Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time the parameter was updated. |
| Subcode | This field always shows a value of zero (0). |
| Discrete Value | This field shows the value of Write Lock. |

Advanced 2

The Advanced 2 screen displays the block header information such as block tag, profile revision, and number of views as shown in Figure 8.

| Field | Value |
|-------------------------|--------------------------|
| Block Tag | RB(300) FOX-IASVT-NE26F0 |
| DD Member Id | 0 |
| DD Item ID | 0x80020AF0 |
| DD Revision | 1 |
| Profile | 0x133 |
| Profile Revision | 0x101 |
| Execution Time | 0 |
| Period of Execution | 0 |
| Number Of Parameters | 43 |
| Next FB To Execute | 0 |
| Starting Index of Views | 800 |
| Number of View 3 | 1 |
| Number of View 4 | 1 |

Figure 8. Sample Pressure Transmitter - Resource Block Advanced 2 Screen

| Field | Entry |
|-------------------------|---|
| Header Members | |
| Block Tag | This field is set by the plant engineer. This uniquely identifies this block within the control strategy. |
| DD Member Id | This field always shows a value of zero (0). |
| DD Item Id | This field identifies the block to the matching DD for a block of this type. |
| DD Revision | This field shows the revision of this block type. |
| Profile | This field uniquely identifies the functionality of this block. |
| Profile Revision | This field specifies the revision and enhancements of this block type. |
| Execution Time | This field shows the time in 1/32 ms to complete one execution. This is not used in the Resource Block. |
| Period of Execution | This field shows the minimum time in 1/32 ms between executions. This is not used in Resource Block. |
| Number Of Parameters | This field shows the total number of parameters in this block including enhanced parameters. |
| Next FB To Execute | This is not used in Resource Block. |
| Starting Index of Views | This is the index where View 1 is located, View 2 will be the next index, View 3 will be at the index after View 2. View 4's location depends on the number of View 3's, but immediately follows View 3 in index numbers. |

Pressure Transducer Block

Overview

The Pressure Transducer Block Overview screen provides you information about the sensor and transmitter measurements. The screen allows you to set target mode, normal mode, and permitted modes. You can also set the tag description for the Transducer block as shown in Figure 9.

The screenshot displays the 'Overview' screen for a Pressure Transducer Block. It is organized into several sections:

- Block Mode:** Contains three dropdown menus for 'Target', 'Actual', and 'Normal', all set to 'Auto'. Below them is a 'Permitted' section with checkboxes for 'Auto' and 'OOS', both of which are checked.
- Block Error Description:** A large empty text area for describing errors.
- Tag Description:** A text input field.
- Transducer Type:** A text input field containing 'Standard Pressure with Calibr'.
- MAU SW Revision:** A text input field containing '0. 0. 3.09'.
- SB SW Revision:** A text input field containing '0. 0. 4.04'.
- Primary Value:** A section showing a value of '0.09' in 'psig' units with a refresh icon. Below it is a status box containing 'Good NonCascade::NonSpecil'.
- Secondary Value:** A section showing a value of '23.72' in '°C' units with a refresh icon. Below it is a status box containing 'Good NonCascade::NonSpecil'.
- Third Value:** A section showing a value of '0.01' in 'kg/cm²' units with a refresh icon. Below it is a status box containing 'Good NonCascade::NonSpecil'.
- Block Error:** A list of error types with checkboxes: 'Block Configuration', 'Input Failure', 'Power Up', and 'Out Of Service'. All four are checked.

Figure 9. Sample Pressure Transmitter - Pressure Transducer Block Overview Screen

| Field | Entry |
|--------------------------------|--|
| Block Mode | |
| Target | Select the Target mode from the drop-down list. Choose from permitted modes. |
| Actual | The Actual mode indicates the current mode of the Transducer Block. The only time the Actual mode will not match the Target mode is when there is a configuration error. |
| Normal | The Normal mode indicates what mode the Target mode and Actual modes would be in normal operation. Select one of the permitted modes from the drop-down list. |
| Permitted | Select the Auto or OOS check box to permit the corresponding Target mode. The Permitted mode is some or all of the valid Target modes that the block may operate. |
| Tag Description | Enter the tag description for the block. |
| Transducer Type | This field shows the type of measurement. |
| MAU SW Revision | This field shows the MAU software revision. |
| SB SW Revision | This field shows the sensor board software revision. |
| Primary Value | |
| | This field shows the measured value and status available to Analog Input Function Blocks as channel 1. |
| Secondary Value | |
| | This field shows the measured value and status available to Analog Input Function Blocks as channel 2. |
| Third Value | |
| | This field shows the measured value and status available to Analog Input Function Blocks as channel 3. |
| Block Error Description | |
| | This field shows a detailed description of persistent errors in the block. |
| Block Error | |
| | This field shows the error status associated with this block. |

Process Variable 1

The Process Variable 1 screen displays the primary value type and allows you to set the primary value range as shown in Figure 10.

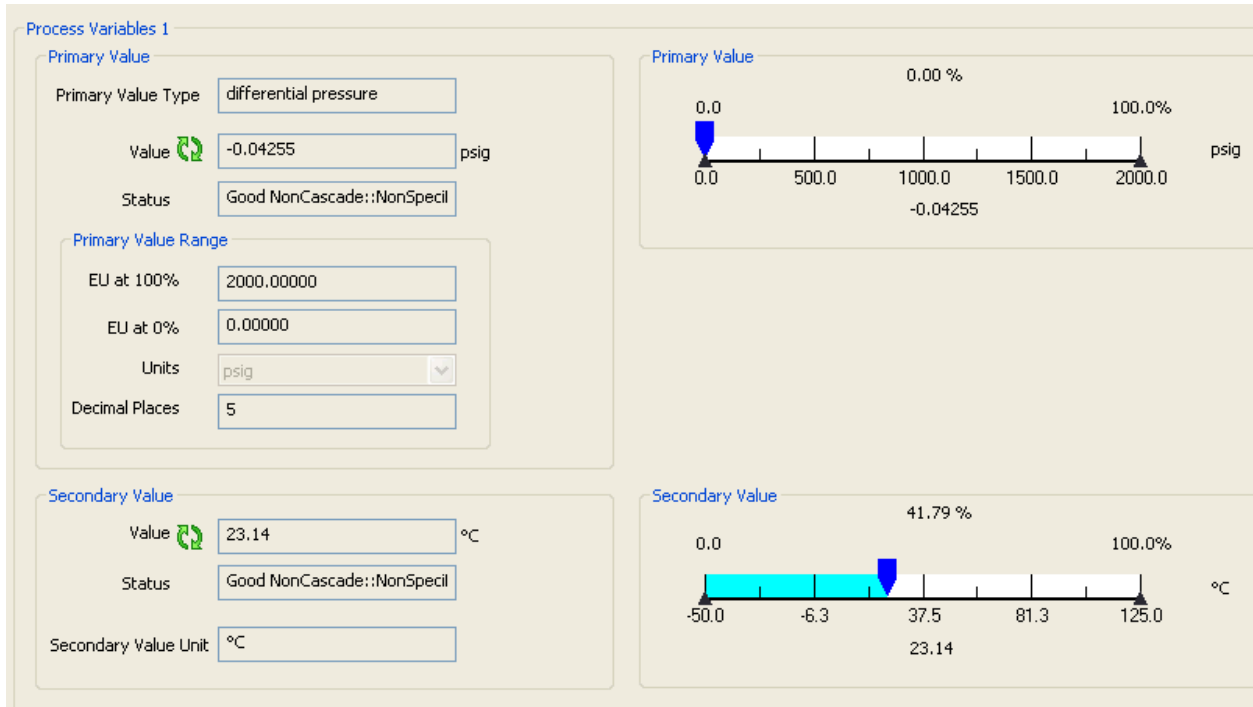


Figure 10. Sample Pressure Transmitter - Pressure Transducer Block Process Variable 1 Screen

| Field | Entry |
|----------------------------|---|
| Primary Value | |
| Primary Value Type | This field shows the measurement type of the Primary Value. |
| Value | This field shows the measured value available to Analog Input Function Blocks as channel 1. |
| Status | This field shows the status of the measured value available to the Analog Input Function Blocks as channel 1. |
| Primary Value Range | |
| EU at 100% | Enter the PV (Primary Variable) scaling high limit. |
| EU at 0% | Enter the PV scaling low limit. |
| Units | Select the Units from the drop-down list. Choose from one of the following: Pa, MPa, kPa, bar, mbar, torr, atm, psia, psig, g/cm ² , kg/cm ² , inH ₂ O, mmH ₂ O (68°F), ftH ₂ O (68°F), inHg, mmHg (0°C), cmHg, cmH ₂ O, and dy/cm ² . |
| Decimal Places | Enter the number of digits to be displayed for the Primary Value after the decimal point. |
| Secondary Value | |
| Value | This field shows the measured value available to Analog Input Function Blocks as channel 2. |
| Status | This field shows the status of the measured value available to the Analog Input Function Blocks as channel 2. |
| Secondary Value Unit | This field shows the units of Secondary Value. |

Process Variable 2

The Process Variable 2 screen displays the third value type and allows you to set the third value range scaling as shown in Figure 11.

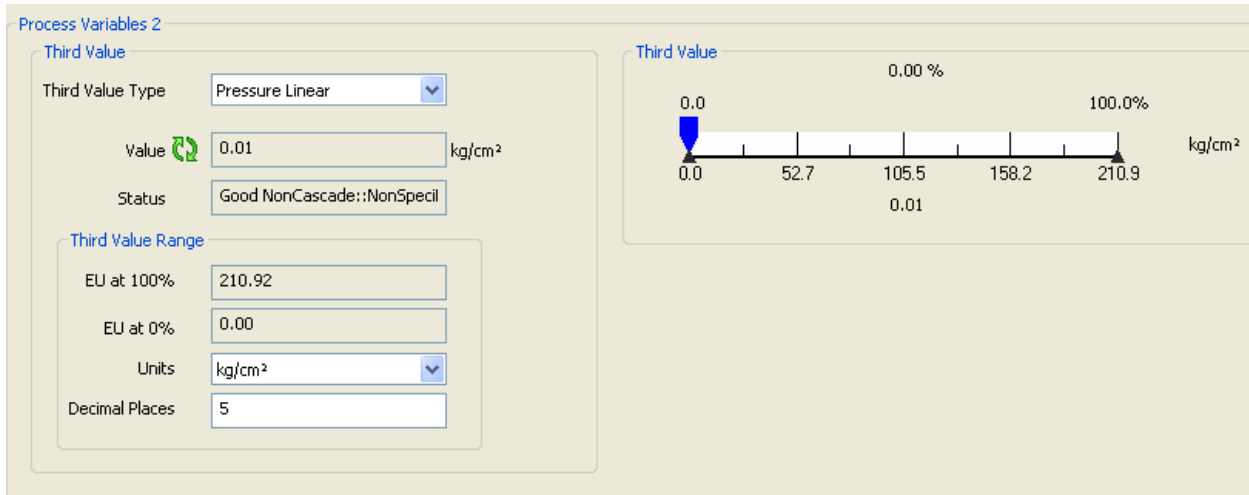


Figure 11. Sample Pressure Transmitter - Pressure Transducer Block Process Variable 2 Screen

| Field | Entry |
|--------------------------|---|
| Third Value | |
| Third Value Type | Select the Third Value Type from the drop-down list. Choose from one of the following: Pressure Linear, Flow Comp With Zero Cutoff, and Flow Comp With Linear Extrapolation. |
| Value | This field shows the measured value available to the Analog Input Function Blocks as channel 3. |
| Status | This field shows the status of the measured value available to the Analog Input Function Block as channel 3. |
| Third Value Range | |
| EU at 100% | This field shows the upper limit of the Third Value Range. |
| EU at 0% | This field shows the lower limit of the Third Value Range. |
| Units | Select the Units from the drop-down list. Choose from Pa, MPa, kPa, bar, mbar, torr, atm, psia, psig, g/cm ² , kg/cm ² , inH ₂ O, mmH ₂ O (68°F), ftH ₂ O (68°F), inHg, mmHg (0°C), cmHg, cmH ₂ O, and dy/cm ² . If the Third Value Type is Flow, the units are fixed at percent. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |

Configure

The Configure screen allows you to enter the sensor calibration parameters and set the calibration high setpoint, calibration low setpoint, strategy and sensor damping value as shown in Figure 12. It also allows you to set calibration method, calibrator information, and calibration date.

The screenshot shows the 'Configure' screen for a Pressure Transducer Block. The fields and their values are as follows:

- Alert Key: 5
- Static Revision: 5
- Strategy: 0
- Sensor Damping: 0.00 seconds (dropdown)
- Sensor Type: Strain gauge
- Sensor Serial Number: NE26F0213B 01F532B7BA 2E
- Sensor Range:
 - EU at 100%: 3000.00
 - EU at 0%: -30.00
 - Units: psig
 - Decimal Places: 0
- Sensor Calibration:
 - Method: (dropdown)
 - Who: (text input)
 - Location: (text input)
 - Date: 2011-06-08 00:00:00.000 0 C
- Calibration Highest Point: 3000.00
- Calibration Lowest Point: 0.00
- Calibration Minimum Span: 15.15
- Calibration Units: psig (dropdown)

Figure 12. Sample Pressure Transmitter - Pressure Transducer Block Configure Screen

| Field | Entry |
|---------------------------|---|
| Alert Key | Enter the identification number of the plant unit. This information may be used in the host for sorting alarms, etc. |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Strategy | Enter a value for Strategy. This parameter is used by a host to identify grouping of blocks. |
| Sensor Damping | Select the Sensor Damping time from the drop-down list. Choose from one of the following: 0.00 seconds; 0.25 seconds; 0.50 seconds; 1.00 seconds; 2.00 seconds; 4.00 seconds; 8.00 seconds; 16.0 seconds; 32.0 seconds. |
| Sensor Type | This field shows the type of sensor. |
| Sensor Serial Number | This field shows the sensor serial number. |
| Sensor Range | |
| EU at 100% | This field shows the sensor high limit value. |
| EU at 0% | This field shows the sensor low limit value. |
| Units | This field shows the units used for the Sensor Range. |
| Decimal Places | This field shows the number of digits to be displayed after the decimal point. |
| Sensor Calibration | |
| Method | Select the method of calibration from the drop-down list. Choose from one of the following: Factory Trim Standard Calibration, User Trim Standard Calibration, Factory Trim Special Calibration, or User Trim Special. |

| Field | Entry |
|---------------------------|---|
| Who | Enter the name of the person responsible for the sensor calibration. |
| Location | Enter the location where the transmitter is calibrated. |
| Date | Enter the date on which the transmitter is calibrated. |
| Calibration Highest Point | Enter the Calibration Highest Point value for the transmitter. Should be 10% above Primary Value Range if less than the maximum Sensor Range. |
| Calibration Lowest Point | Enter the Calibration Lowest Point value for the transmitter. Should be 10% below Primary Value Range if more than the Sensor Minimum value. |
| Calibration Units | Select the Units from the drop-down list. Choose from one of the following: Pa, MPa, kPa, bar, mbar, torr, atm, psia, psig, g/cm ² , kg/cm ² , inH ₂ O, mmH ₂ O (68°F), ftH ₂ O (68°F), inHg, mmHg (0°C), cmHg, cmH ₂ O, and dy/cm ² . This must match the units in the Primary Value Range during calibration. |

Advanced

The Advanced screen displays the alarm status, time stamp values, and block header description as shown in Figure 13.

Advanced

Update Event

Unacknowledged Uninitialized

Update State Uninitialized

Time Stamp 1972-01-01 00:00:00.000

Static Revision 0

Relative Index 0

Block Alarm

Unacknowledged Uninitialized

Alarm State Uninitialized

Time Stamp 1972-01-01 00:00:00.000

Subcode Other

Value 0

Header Members

| | | | |
|------------------|--------------------------|-------------------------|-------|
| Block Tag | PCD(550) FOX-IASVT-NE26F | Period of Execution | 32000 |
| DD Member Id | 0 | Number Of Parameters | 42 |
| DD Item ID | 0x2002A | Next FB To Execute | 0 |
| DD Revision | 1 | Starting Index of Views | 840 |
| Profile | 0x8115 | Number of View 3 | 1 |
| Profile Revision | 0x101 | Number of View 4 | 3 |
| Execution Time | 0 | | |

Figure 13. Sample Pressure Transmitter - Pressure Transducer Advanced Screen

| Field | Entry |
|-------------------------|--|
| Update Event | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Update State | This field shows that the host has received alert. It automatically sets to Update Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the parameter was updated. |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Relative Index | This field shows the relative index of parameter that was updated, or zero if more than was updated at the same time. |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Active Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the alert was generated. |
| Subcode | This field shows the block error code. |
| Value | This field always shows a value of zero (0). |
| Header Members | |
| Block Tag | This field is set by the plant engineer. This uniquely identifies this block within the control strategy. |
| DD Member Id | This field always shows a value of zero (0). |
| DD Item Id | This field identifies the block to the matching DD for a block of this type. |
| DD Revision | This field shows the revision of this block type. |
| Profile | This field uniquely identifies the functionality of this block. |
| Profile Revision | This field specifies the revision and enhancements of this block type. |
| Execution Time | This field shows the time in 1/32 ms to complete one execution. This is set by the manufacturer based on hardware. |
| Period of Execution | This field shows the minimum time in 1/32 ms between executions. This is set by manufacturer based on hardware. |
| Number of Parameters | This field shows the total number of parameters in this block including enhanced parameters. |
| Next FB To Execute | This is not used in a Transducer Block. |
| Starting Index of Views | This is the index where View 1 is located, View 2 will be the next index, View 3 will be at the index after View 2. View 4's location depends on the number of View 3's but immediately follows View 3 in index numbers. |

Analog Input Block

The following sections cover the DTM functionality of Analog Input Blocks 1 and 2.

Overview

The Analog Input Block Overview screen allows you to specify the block mode and output parameters as shown in Figure 14.

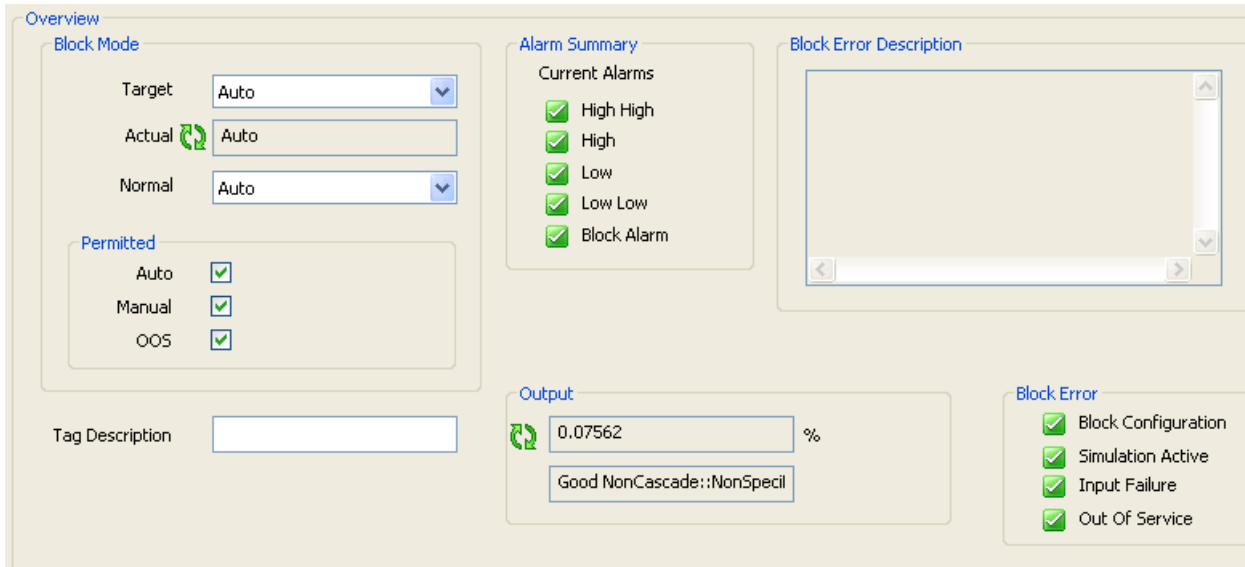


Figure 14. Sample Pressure Transmitter - Analog Input Block Overview Screen

| Field | Entry |
|--------------------------------|---|
| Block Mode | |
| Target | Select the Target mode from the drop-down list. Choose from permitted modes. |
| Actual | The Actual mode indicates what mode the block is in at the current time. The only time the Actual mode will not match the Target mode is when the block is not scheduled and if there is a configuration error. |
| Normal | The Normal mode indicates what mode the Target mode and Actual modes would be in normal operation. Select one of the permitted modes from the drop-down list. |
| Permitted | Select Auto, Manual, or OOS check box to permit the corresponding Target mode. The Permitted mode is some or all of the valid Target modes that the block may operate. |
| Tag Description | Enter the tag description for the block. |
| Alarm Summary | |
| | This field indicates the current alert status of the alarms associated with the function block. |
| Block Error Description | |
| | This field shows a detailed description of persistent errors in the block. |

| Field | Entry |
|--------------------|---|
| Output | |
| Output | This field shows the calculated primary analog value after executing the function in Auto mode. This can be edited when it is Manual mode. |
| Block Error | |
| | This field shows the error status associated with the hardware or software components associated with a block. |

Block Diagram

The block diagrams for Analog Input blocks show the analog input functioning algorithm and the flow of the input variable, and illustrates how it processes the value as shown in Figure 15.

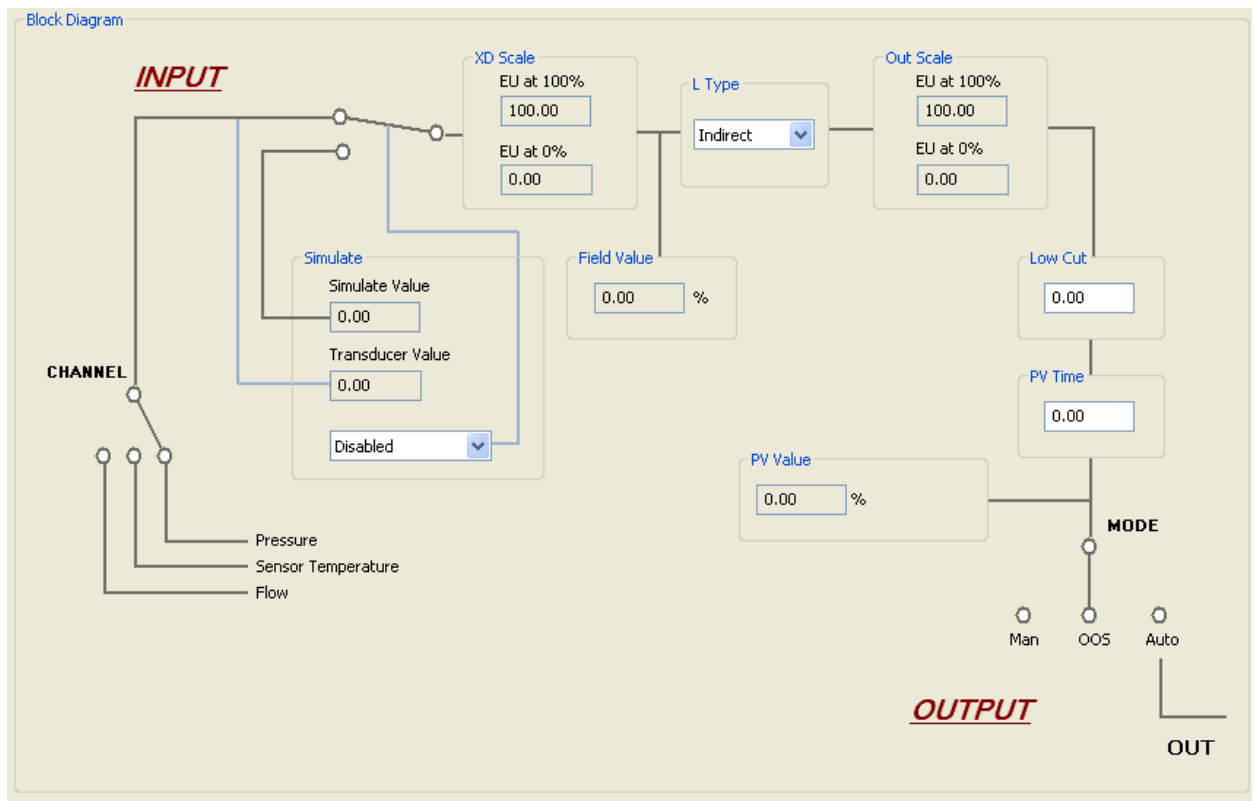


Figure 15. Sample Pressure Transmitter - Analog Input Block Diagram Screen

Process Variables

The Process Variables screen displays the primary value and field value as shown in Figure 16.



Figure 16. Sample Pressure Transmitter - Analog Input Block Process Variables Screen

| Field | Entry |
|----------------------|--|
| Primary Value | |
| Value | In the AI block, this field shows the Sensor variable after all scaling, limits and filtering are done. |
| Status | This field shows the status of the Primary Value which may reflect the mode of the AI block, or status of the input channel. |
| Field Value | |
| Value | This field shows the raw value of the field device as a percentage of the transducer scale. |
| Status | This field shows the status of the Field Value which may reflect the mode of the AI block, or status of the input channel. |

Diagnostics

The Diagnostics screen allows you to simulate the analog input value. It also displays the transducer scaled value and status as shown in Figure 17.

Figure 17. Sample Pressure Transmitter - Analog Input Block Diagnostics Screen

| Field | Entry |
|--------------------|---|
| Diagnostics | |
| Simulate | This field allows the transducer analog input to the block to be manually supplied when simulate is enabled. When simulation is disabled, the simulate value will be actual value and status. Choose from Disabled or Active. |
| Simulate | |
| Simulate Value | Enter a value for simulation. |
| Quality | Select the Quality of the simulate value from the drop-down list. Choose from one of the following: Bad, Uncertain, Good NonCascade, and Good Cascade. |
| Substatus | Select the Substatus from the drop-down list. The options available for Substatus are dependent on the options selected for Quality. |
| Limits | Select the Limits from the drop-down list. Choose from one of the following: Not Limited, Low Limited, High Limited, and Constant. |
| Transducer | |
| Transducer Value | This field shows the actual value from the active transducer channel. |
| Quality | This field shows the Quality of the value from the active transducer channel. |
| Substatus | This field shows the associated substatus of the value from the active transducer channel. |
| Limits | This field shows the associated limit status of the value from the active transducer channel. |

Configure

The Configure screen allows you to select a channel, enter the values for transducer scaling and output scaling as shown in Figure 18.



Figure 18. Sample Pressure Transmitter - Analog Input Block Configure Screen

| Field | Entry |
|---------------------------|--|
| Configure | |
| Channel | This is a logical hardware channel that is connected to this I/O block. This information defines the transducer value to be used by this block. Choose from one of the following: Pressure, Sensor Temperature, or Flow. |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Strategy | Enter a value for Strategy. This parameter is used by a host to identify grouping of blocks. |
| Low Cutoff | Enter a value for Low Cutoff. This limit is primarily used in square root processing. A value of zero percent of scale is used in block processing if the transducer value falls below this setting. This may be used to eliminate noise near zero for a flow sensor. I/O OPTS must have the Low Cutoff option enabled to use this setting. |
| Process Value Filter Time | Enter the time constant of a single exponential filter for the PV, in seconds. |
| Linearization Type | Linearization Type determines if the values passed by the transducer block to the AI block may be used directly (Direct) or if the value is in different units and must be converted linearly (Indirect), or with square root (Ind Sqr Root), using the input range defined by the transducer and the associated output range. Choose from one of the following: Direct, Indirect, and Ind Sqr Root. |
| Transducer Scale | |
| EU at 100% | This field sets the upper limit for the active transducer channel. This does not have to match the range in the associated transducer parameter. |
| EU at 0% | This field sets the lower limit for the active transducer channel. This does not have to match the range in the associated transducer parameter. |

| Field | Entry |
|---------------------|---|
| Units | Select the Units from the drop-down list. Choose from Pa, MPa, kPA, bar, mbar, torr, atm, psia, psig, g/cm ² , kg/cm ² , inH ₂ O, mmH ₂ O (68°F), ftH ₂ O (68°F), inHg, mmHg (0°C), cmHg, cmH ₂ O, dy/cm ² , °C, and %. This must match the units in the associated transducer parameter. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |
| Status Options | Select the options to modify the status of the output. You can select all or any of the following: Propagate Fault Forward, Uncertain if Limited, Bad if Limited, and Uncertain if Manual. |
| Grant - Deny | |
| Grant | Select the required check boxes to set Grant options. You can select all or any of the following: Program, Tune, Alarm, and Local. These options allow you to control access of host computer and local control panels. |
| Deny | Select the required check boxes to set Deny options. You can select all or any of the following: Program, Tune, Alarm, and Local. Deny options may only be cleared by write commands. Deny options are set when the corresponding Grant option is cleared. |
| I/O Options | |
| I/O Options | This field allows the Low Cutoff function to operate. |
| Output Scale | |
| EU at 100% | Enter the upper limit for the Output range of the AI block. |
| EU at 0% | Enter the lower limit of the Output range of the AI block. |
| Units | Select the Units from the drop-down list. Choose any valid Foundation Fieldbus unit. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |

Alarms

The Alarms screen allows you to enable or disable the alarms. You can also view the status of the alarm summary parameters as shown in Figure 19.

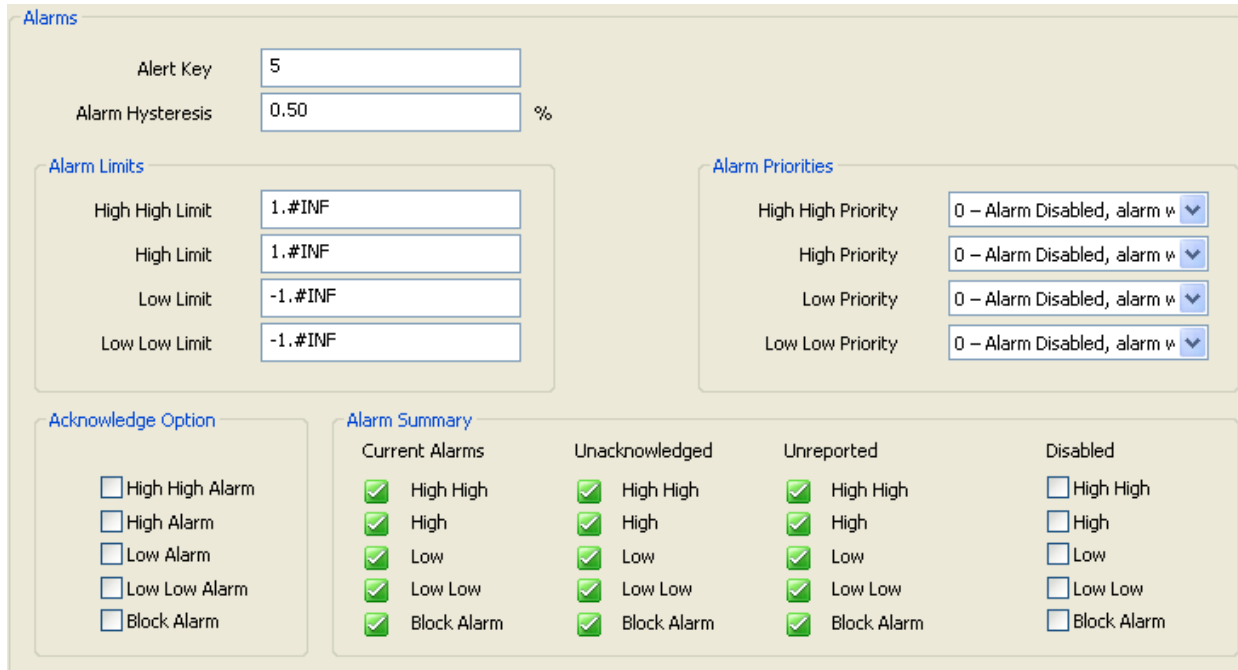


Figure 19. Sample Pressure Transmitter - Analog Input Block Alarms Screen

| Field | Entry |
|---------------------|--|
| Alarms | |
| Alert Key | This field shows the identification number of the plant unit. This information may be used in the host for sorting alarms, etc. The value should be between 1 and 255. The initial and default value is 0. |
| Alarm Hysteresis | This field indicates the PV value that must return within the alarm limits before the alarm condition clears. Alarm Hysteresis is expressed as a percent of the PV span. |
| Alarm Limits | |
| High High Limit | Set a value for High High Limit alarm. |
| High Limit | Set a value for High Limit alarm. |
| Low Limit | Set a value for Low Limit alarm. |
| Low Low Limit | Set a value for Low Low Limit alarm. |

| Field | Entry |
|-------------------------|---|
| Alarm Priorities | |
| High High Priority | <p>Select an option for High High Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| High Priority | <p>Select an option for High Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| Low Priority | <p>Select an option for Low Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |

| Field | Entry |
|----------------------|---|
| Low Low Priority | Select an option for Low Low Priority from the drop-down list. Choose from one of the following: 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| Acknowledge Option | Select one or more check boxes to automatically acknowledge alarms associated with the block: High High Limit, High Limit, Low Limit, Low Low Limit, and Block Alarm. |
| Current Alarms | This field shows the current alarm status. |
| Unacknowledged | This field shows unacknowledged alarm status. |
| Unreported | This field shows unreported alarm status. |
| Disabled | Select the required check boxes to disable alarms. Select all or any of the following: High High, High, Low, Low Low, and Block Alarm. |
| Alarm Summary | |
| Current Alarms | This field shows the current alarm status. |
| Unacknowledged | This field shows unacknowledged alarm status. |
| Unreported | This field shows unreported alarm status. |
| Disabled | Select the required check boxes to disable alarms. Select all or any of the following: High High, High, Low, Low Low, and Block Alarm. |

Advanced 1

The Advanced 1 screen displays the alarm status and time stamp values as shown in Figure 20.

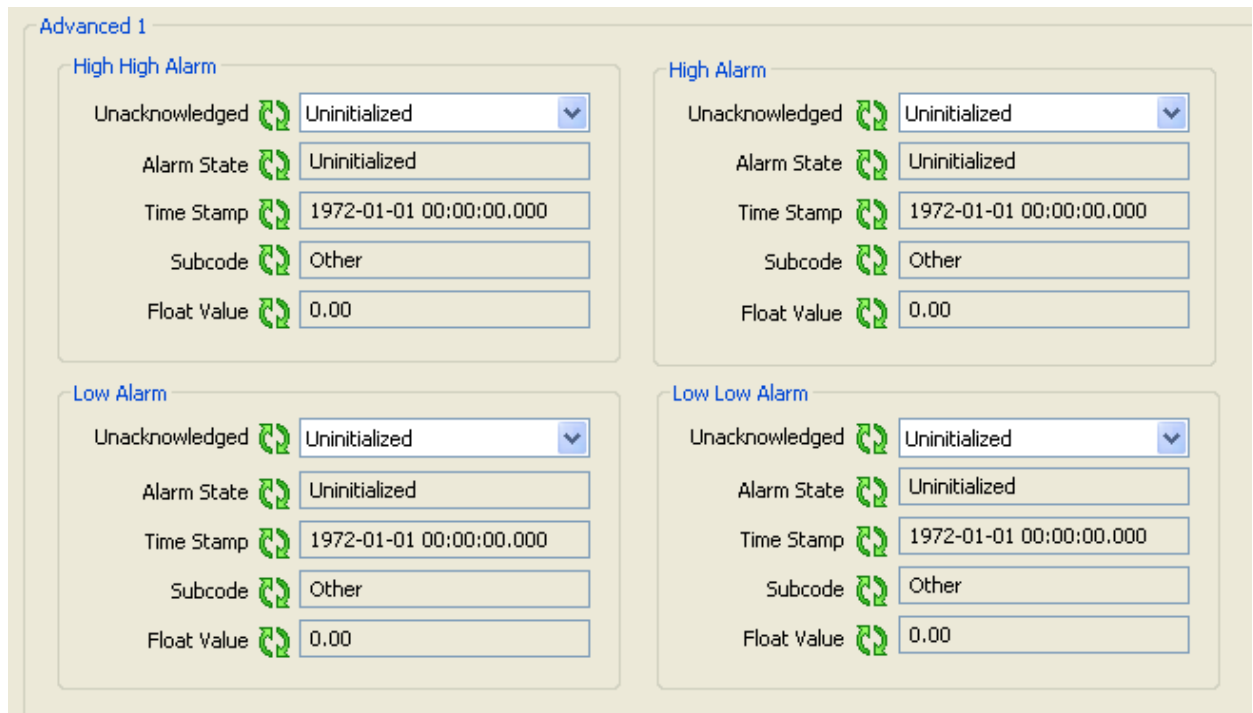


Figure 20. Sample Pressure Transmitter - Analog Input Block Advanced 1 Screen

| Field | Entry |
|---|---|
| High High Alarm/Low Alarm/High Alarm/Low Low Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Active Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when alert was generated. |
| Subcode | This field is always zero for these type of alarms. |
| Float Value | This field shows the value when the alarm was generated. |

Advanced 2

The Advanced 2 screen displays the Update Event, Block Alarm, and Header information as shown in Figure 21.

The screenshot shows the 'Advanced 2' configuration screen. It is divided into three main sections: 'Update Event', 'Block Alarm', and 'Header Members'. Each section contains several input fields with refresh icons (two circular arrows) to the left of the field labels.

- Update Event:**
 - Unacknowledged: Uninitialized (dropdown menu)
 - Update State: Uninitialized
 - Time Stamp: 1972-01-01 00:00:00.000
 - Static Revision: 0
 - Relative Index: 0
- Block Alarm:**
 - Unacknowledged: Uninitialized (dropdown menu)
 - Alarm State: Uninitialized
 - Time Stamp: 1972-01-01 00:00:00.000
 - Subcode: Other
 - Value: 0
- Header Members:**
 - Block Tag: AI(350) FOX-IASVT-NE26F0;
 - DD Member Id: 0
 - DD Item Id: 0x800201D0
 - DD Revision: 1
 - Profile: 0x101
 - Profile Revision: 0x101
 - Execution Time: 960
 - Period of Execution: 32000
 - Number Of Parameters: 38
 - Next FB To Execute: 0
 - Starting Index of Views: 810
 - Number of View 3: 1
 - Number of View 4: 1

Figure 21. Sample Pressure Transmitter - Analog Input Block Advanced 2 Screen

| Field | Entry |
|---------------------|---|
| Update Event | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Update State | This field shows that the host has received alert. It automatically sets to Update Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the parameter was updated. |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Relative Index | This field shows the relative index of parameter that was updated, or zero if more than one was updated at the same time. |
| Block Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Active Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when alert was generated. |

| Field | Entry |
|-------------------------|--|
| Subcode | This field shows the block error code. |
| Value | This field always shows a value of zero (0). |
| Header Members | |
| Block Tag | This field is set by the plant engineer. This uniquely identifies this block within the control strategy. |
| DD Member Id | This field always shows a value of zero (0). |
| DD Item Id | This field identifies the block to the matching DD for a block of this type. |
| DD Revision | This field shows the revision of this block type. |
| Profile | This field uniquely identifies the functionality of this block. |
| Profile Revision | This field specifies the revision and enhancements of this block type. |
| Execution Time | This field shows the time in 1/32 ms to complete one execution. |
| Period of Execution | This is the minimum time in 1/32 ms between executions. This is set by the manufacturer based on hardware. |
| Number of Parameters | This field shows the total number of parameters in this block including enhanced parameters. |
| Next FB To Execute | This field can be used to chain execution of function blocks together, if supported by the Cycle_Sel option in the Resource Block. |
| Starting Index of Views | This is the index where View 1 is located, View 2 will be the next index, View 3 will be at the index after View 2. View 4's location depends on the number of View 3's but immediately follows View 3 in index numbers. |

PID Block

Overview

The PID Block Overview screen allows you to select the block mode options as shown in Figure 22.

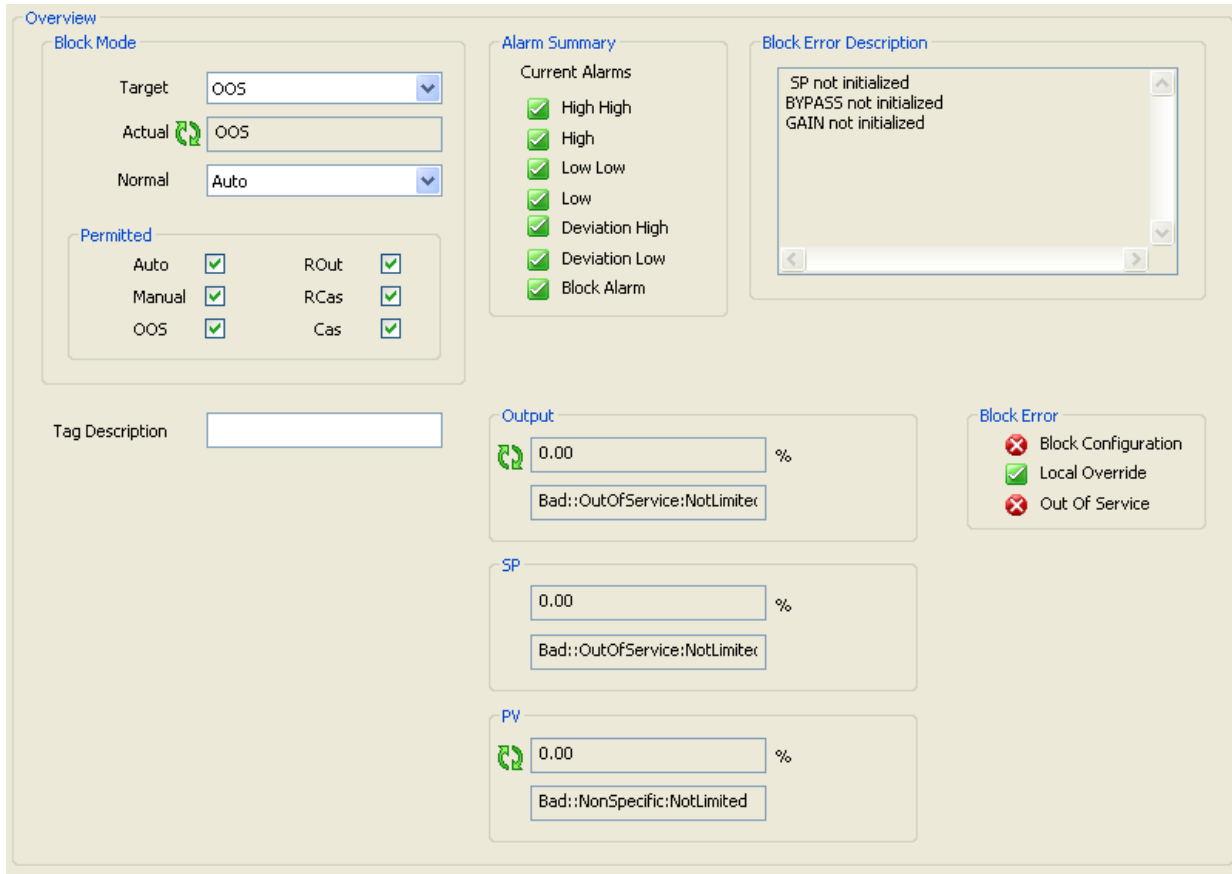


Figure 22. Sample Pressure Transmitter - PID Block Overview Screen

| Field | Entry |
|--------------------------------|---|
| Block Mode | |
| Target | Select the Target mode from the drop-down list. Choose from permitted modes. |
| Actual | The Actual mode indicates what mode the block is in at the current time. The only time the Actual mode will not match the Target mode is when the block is not scheduled and if there is a configuration error. |
| Normal | The Normal mode indicates what mode the Target mode and Actual modes would be in normal operation. Select one of the permitted modes from the drop-down list. |
| Permitted | Select the Auto or OOS check box to permit the corresponding Target mode. The Permitted mode is some or all of the valid Target modes that the block may operate. |
| Tag Description | Enter a tag description for the block. |
| Alarm Summary | |
| | This field indicates the current alert status, unacknowledged states, unreported states, and disabled states of the alarms associated with the function block. |
| Block Error Description | |
| | This field shows a detailed description of persistent errors in the block. |
| SP | |
| | This field shows the analog setpoint of this block. In CAS or RCAS modes, the SP value comes from the CAS or RCAS inputs. |
| PV | |
| | This field shows the measured process value and status associated with it. |
| Output | |
| | This field shows the calculated primary analog value after executing the function block or you can set it in Manual mode. |
| Block Error | |
| | This field shows the error status associated with the hardware or software components associated with a block. |

Block Diagram

The block diagram for PID shows the PID functioning algorithm and the flow of the input variable, and illustrates how it processes the value as shown in Figure 23.

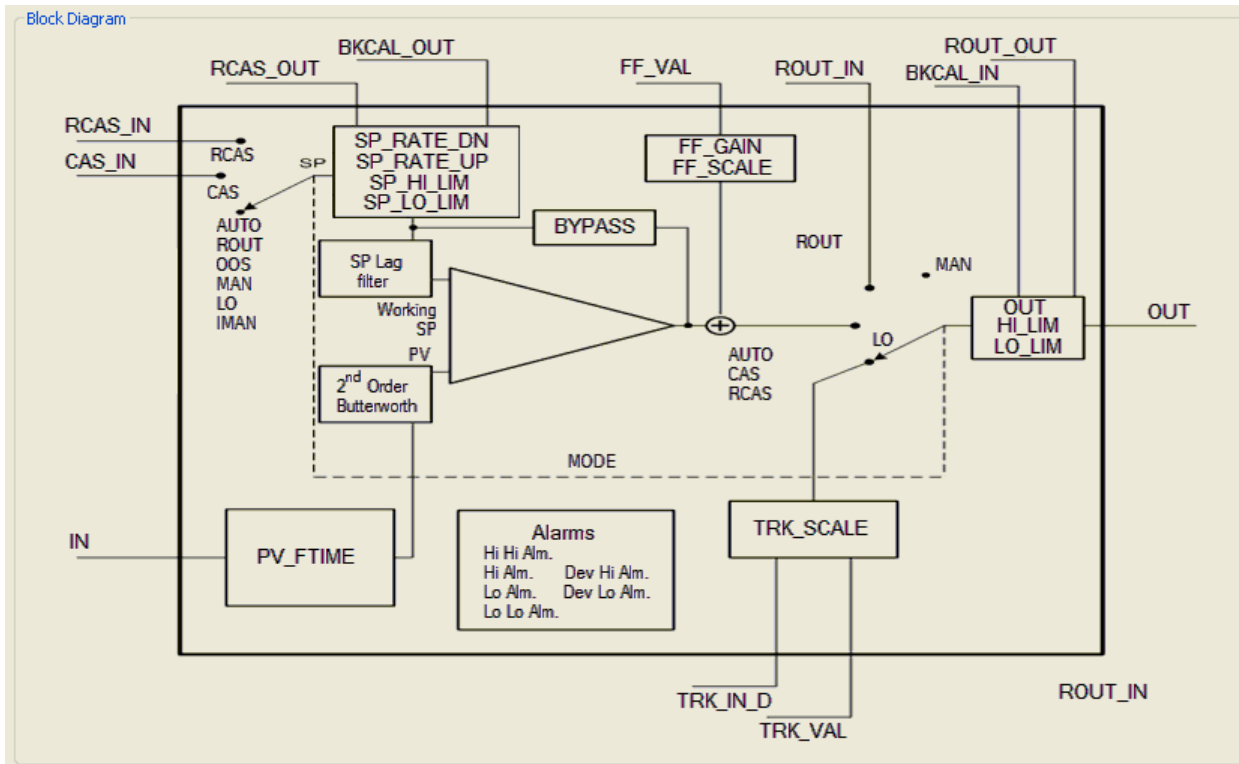


Figure 23. Sample Pressure Transmitter - PID Block Diagram Screen

Process Variables

The Process Variables screen displays the values for CAS (Cascade), RCAS (Remote Cascade), RCASIn (Remote Cascade In), and ROut (Remote Out). The screen also shows the status of each parameter as Good, Bad, and Uncertain as shown the Figure 24.

Process Variables

























| | |
|--|--|
| In Value  0.00000 % | Remote Cascade In  0.00000 % |
| Status  Bad::NotConnected:NotLimite | Status  Bad::OutOfService:NotLimite |
| Primary Value  0.00000 % | Remote Cascade Out  10.00000 % |
| Status  Bad::NotConnected:NotLimite | Status  Good_Cascade::NotInvited:N |
| Cascade In  0.00000 % | Remote Out In  0.00000 % |
| Status  Bad::NotConnected:NotLimite | Status  Bad::OutOfService:NotLimite |
| Back Cal In  0.00000 % | Remote Out Out  0.00000 % |
| Status  Bad::NotConnected:NotLimite | Status  Good_Cascade::NotInvited:N |
| Back Cal Out  10.00000 % | Track In D  Off |
| Status  Good_Cascade::NotInvited:N | Status  Bad::NotConnected:NotLimite |
| Feed Forward Value  0.00000 % | Track Value  0.00000 % |
| Status  Bad::NotConnected:NotLimite | Status  Bad::NotConnected:NotLimite |

Figure 24. Sample Pressure Transmitter - PID Block Process Variables Screen

| Field | Entry |
|--------------------------|---|
| Process Variables | |
| In Value | This is the Primary Analog Input value of the PID block. This value becomes the PV value after the PV filter. |
| Status | This field shows the status of the Input value. |
| Primary Value | This field shows the primary measured analog value for use in executing the PID block. |
| Status | This field shows the status of the primary measured analog value and with a good quality, the alarm status of the PID block. |
| Cascade In | This field shows the remote setpoint value, which must come from another Fieldbus block, or a DCS block through a defined link. |
| Status | This field shows the status of the Cascade input. |
| Back Cal In | This field shows the value from a lower block's BKCAL_OUT that is used to prevent reset windup and to initialize the control loop. |
| Status | This field shows the status of Back Cal In and synchronizes the PID initialization to current downstream conditions. |
| Back Cal Out | This field shows the value required by an upper block's BKCAL_IN so that the upper block may prevent reset windup and provide bumpless transfer to closed loop control. |
| Status | This field shows the status of the sensor output. |
| Feed Forward Value | This field shows the feed forward value. |
| Status | This field shows the status of the Feed Forward Value. |
| Remote Cascade In | This field shows the target setpoint provided by a supervisory Host to a analog control or output block. |
| Status | This field shows the status of the Remote Cascade In. |
| Remote Cascade Out | This field shows the block setpoint after ramping - provided to a supervisory Host for back calculation and to allow action to be taken under limiting conditions or mode change. |
| Status | This field shows the status of the Remote Cascade Out. |
| Remote Out In | This field shows the target output provided by a Host to the control block for use as the output (ROut mode). |
| Status | This field shows the status of the Remote Out In. |
| Remote Out Out | This field shows the block output - provided to a Host for back calculation in ROut mode and to allow action to be taken under limited conditions or mode change. |
| Status | This field shows the status of the Remote Out Out. |
| Track In D | This field shows the discrete input that is used to initiate external tracking of the block output to the value specified by TRK_VAL |
| Status | This field shows the status of the Track In D input. |
| Track Value | This field shows the value used before scaling, by the PID block when in the external tracking mode (LO). |
| Status | This field shows the status of the Track Value. |

Configure 1

The Configure 1 screen allows you to enter the set points and configure the control and status options. You can only change most of these fields when the block mode is in OOS (Out Of Service) as shown in Figure 25.

Figure 25. Sample Pressure Transmitter - PID Block Configure 1 Screen

| Field | Entry |
|-----------------------|---|
| Configure 1 | |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Strategy | Enter a value for Strategy. This parameter is used by a host to identify grouping of blocks. |
| Setpoint | This field shows the analog setpoint of this block. In CAS or RCAS modes, the SP value comes from the CAS or RCAS inputs. |
| PV Scale | |
| EU at 100% | Enter a value for PV scaling high limit. |
| EU at 0% | Enter a value for PV scaling low limit. |
| Units | Select the Units from the drop-down list. Choose from all defined Fieldbus units. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |
| Status Options | |
| Status Options | Select the necessary options to modify the status of the output or operation of the PID block. You can select all or any of the following: IFS if Bad IN, IFS if Bad CAS_IN, Use Uncertain as Good, Target to MAN if Bad IN, Target to next permitted mode if BAD CAS_IN. |
| Control Options | Select the necessary options to control the PV. This allows you to change the calculations done in a control block. |
| Grant - Deny | |
| Grant | Select the required check boxes to set Grant options. You can select all or any of the following: Program, Tune, Alarm, and Local. These options allow you to control access of host computer and local control panels. |

| Field | Entry |
|----------------|--|
| Deny | Select the required check boxes to set Deny options. You can select all or any of the following: Program, Tune, Alarm, and Local. Deny options may only be cleared by write commands. Deny options are set when the corresponding Grant option is cleared. |
| Out Scale | |
| EU at 100% | Enter a value for Out Scale high limit. |
| EU at 0% | Enter a value for Out Scale low limit. |
| Units | Select the Units from the drop-down list. Choose from all defined Fieldbus units. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |

Configure 2

The Configure 2 screen allows you to configure the shed options, track scale, FF scale, setpoint rate, setpoint limit, and output limit parameters as shown in Figure 26.

The screenshot shows the 'Configure 2' interface with the following parameters:

- Shed Options:** NormalShed_NoReturn (dropdown)
- Bypass:** Off (dropdown)
- Track Scale:**
 - EU at 100%: 100.00000
 - EU at 0%: 0.00000
 - Units: % (dropdown)
 - Decimal Places: 5
- FF Scale:**
 - EU at 100%: 100.00000
 - EU at 0%: 0.00000
 - Units: % (dropdown)
 - Decimal Places: 5
- Feed Forward Gain:** 0.00
- Process Value Filter Time:** 0.00 Sec
- Back Calculation Hysteresis:** 0.50 %
- Setpoint Rate:**
 - Setpoint Rate Down: 1.#INF PV/Sec
 - Setpoint Rate Up: 1.#INF PV/Sec
- Setpoint Limit:**
 - Setpoint High Limit: 100.00000 %
 - Setpoint Low Limit: 0.00000 %
- Output Limit:**
 - Output High Limit: 100.00000 %
 - Output Low Limit: 0.00000 %

Figure 26. Sample Pressure Transmitter - PID Block Configure 2 Screen

| Field | Entry |
|-----------------------------|---|
| Configure 2 | |
| Shed Options | Shed Options defines the action to be taken in the remote-cascade or remote-output mode timeout. The shed mode for options 3, 4, 5 and 6, will prevail, even if the Permitted attribute of the block Mode parameter does not include the specified shed mode. If the specified shed mode is not a Permitted mode, then the Configuration Error indication in Block Error will be set by the block. Select an option for Shed Options from the drop-down list. Choose from one of the following: 0 - Uninitialized; 1 - Normal shed, normal return; 2 - Normal shed, no return; 3 - Shed to Auto, normal return; 4 - Shed to Auto, no return; 5 - Shed to Manual, normal return; 6 - Shed to Manual, no return; 7 - Shed to Retained target, normal return; 8 - Shed to Retained target, no return. |
| Bypass | The normal control algorithm may be bypassed through this parameter. When bypass is set, the setpoint value (in percent) will be directly transferred to the output. To prevent a bump on transfer to or from bypass, the setpoint will automatically be initialized to the output value or process variable. Select the option for Bypass from the drop-down list. Choose from Off and On. |
| Feed Forward Gain | Enter a value for Feed Forward Gain. This is the gain that the feed forward input is multiplied by before it is added to the calculated control output. |
| Process Value Filter | Enter a value for Process Value Filter. |
| Back Calculation Hysteresis | The amount that the output must change away from its output limit before the limit status is turned off, expressed as a percent of the span of the output. |

| Field | Entry |
|-----------------------|--|
| Track Scale | |
| EU at 100% | Enter a value for track scaling high limit. |
| EU at 0% | Enter a value for track scaling low limit. |
| Units | Select the Units from the drop-down list. Choose from all defined Fieldbus units. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |
| FF Scale | |
| EU at 100% | Enter a value for feed forward scaling high limit. |
| EU at 0% | Enter a value for feed forward scaling low limit. |
| Units | Select the Units from the drop-down list. Choose from all defined Fieldbus units. |
| Decimal Places | Enter the number of digits to be displayed after the decimal point. |
| Setpoint Rate | |
| Setpoint Rate Down | In this field, enter the Setpoint Rate Down. This is the ramp rate at which downward setpoint changes are acted on in Auto mode, in PV units per second. If the ramp rate is set to zero, then the setpoint will be used immediately. For control blocks, rate limiting will apply only in Auto. |
| Setpoint Rate Up | In this field, enter the Setpoint Rate Up. This is the ramp rate at which upward setpoint changes are acted on in Auto mode, in PV units per second. If the ramp rate is set to zero, then the setpoint will be used immediately. For control blocks, rate limiting will apply only in Auto. |
| Setpoint Limit | |
| Setpoint High Limit | In this field, enter the highest possible setpoint that an operator can enter. |
| Setpoint Low Limit | In this field, enter the lowest possible setpoint that an operator can enter. |
| Output Limit | |
| Output High Limit | In this field, enter a high limit for the output. This limits the maximum output value. |
| Output Low Limit | In this field, enter a low limit for the output. This limits the minimum output value. |

Tuning

The Tuning screen allows you to enter the gain, reset, rate, and balance time for the PID block as shown in Figure 27.

The screenshot shows a 'Tuning' screen with the following parameters:

| Parameter | Value | Unit |
|--------------|--------|------|
| Gain | 0.00 | |
| Reset | 1.#INF | Sec |
| Rate | 0.00 | Sec |
| Balance Time | 0.00 | Sec |

Figure 27. Sample Pressure Transmitter - PID Block Tuning Screen

| Field | Entry |
|--------------|--|
| Gain | In this field, enter the value for Gain. This is the dimensionless value used by the block algorithm in calculating the block output. |
| Reset | In this field, enter the value for Reset. This is the integral time constant, in seconds per repeat. |
| Rate | In this field, enter the value for Rate. This is the derivative time constant, in seconds. |
| Balance Time | In this field, enter the value for Balance Time. The difference value used in the block calculation for bumpless transfer should ramp to zero in the time specified by balance time. |

Alarms

The Alarms screen allows you to enable or disable the alarms. You can also view the status of the alarm summary parameters as shown in the Figure 28.

Figure 28. Sample Pressure Transmitter - PID Block Alarms Screen

| Field | Entry |
|----------------------|---|
| Alert Key | This field indicates the identification number of the plant unit. This information may be used in the host for sorting alarms, etc. The value should be between 1 and 255. The initial and default value is 0. |
| Alarm Hysteresis | This field indicates the amount the PV must return within the alarm limits before the alarm condition clears. Alarm Hysteresis is expressed as a percent of the PV span. PV span is in PV_SCALE units in the PID block. |
| Alarm Limits | |
| High High Limit | Set a value for High High Limit alarm. |
| High Limit | Set a value for High Limit alarm. |
| Low Limit | Set a value for Low Limit alarm. |
| Low Low Limit | Set a value for Low Low Limit alarm. |
| Deviation High Limit | Set a value for high deviation alarm limit. |
| Deviation Low Limit | Set a value for low deviation alarm limit. |

| Field | Entry |
|-------------------------|---|
| Alarm Priorities | |
| High High Priority | <p>Select an option for High High Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| High Priority | <p>Select an option for High Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| Low Priority | <p>Select an option for Low Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |

| Field | Entry |
|-------------------------|--|
| Low Low Priority | <p>Select an option for Low Low Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| Deviation High Priority | <p>Select an option for Deviation High Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| Deviation Low Priority | <p>Select an option for Deviation Low Priority from the drop-down list. Choose from one of the following:</p> <ul style="list-style-type: none"> 0 - Alarm Disabled, Alarm will clear if active; 1 - Local Alarm, alarm will set or clear, but never be sent; 2 - Block Alarm priority; 3 - Advisory alarm, priority 3; 4 - Advisory alarm, priority 4; 5 - Advisory Alarm, priority 5; 6 - Advisory Alarm, priority 6; 7 - Advisory Alarm, priority 7; 8 - Critical Alarm, priority 8; 9 - Critical Alarm, priority 9; 10 - Critical Alarm, priority 10; 11 - Critical Alarm, priority 11; 12 - Critical Alarm, priority 12; 13 - Critical Alarm, priority 13; 14 - Critical Alarm, priority 14; 15 - Critical Alarm, priority 15. |
| Acknowledge Option | <p>Select one or more check boxes to automatically acknowledge alarms associated with the block: High High Limit, High Limit, Low Limit, Low Low Limit, Deviation High, Deviation Low, and Block Alarm.</p> |
| Alarm Summary | |
| Current Alarms | This field shows the current alarm status. |
| Unacknowledged | This field shows unacknowledged alarm status. |
| Unreported | This field shows unreported alarm status. |
| Alarm Summary | <p>Select the required check boxes to disable alarms. Select all or any of the following: High High, High, Low, Low Low, Deviation High, Deviation Low, and Block Alarm.</p> |

Advanced 1

The Advanced 1 screen displays the alarm status and time stamp values as shown in the Figure 29.



Figure 29. Sample Pressure Transmitter - PID Block Advanced 1 Screen

| Field | Entry |
|---|--|
| High High Alarm/Low Alarm/High Alarm/Low Low Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field gives indication that host has received alert. This automatically sets to Active Reported when not configured to communicate to host. |
| Time Stamp | This field shows the time when the alert was generated. |
| Subcode | This field is always zero for this type of alarm. |
| Float Value | This field shows the value in the associated parameter. |

Advanced 2

The Advanced 2 screen displays the status of the alarms as shown in Figure 30.

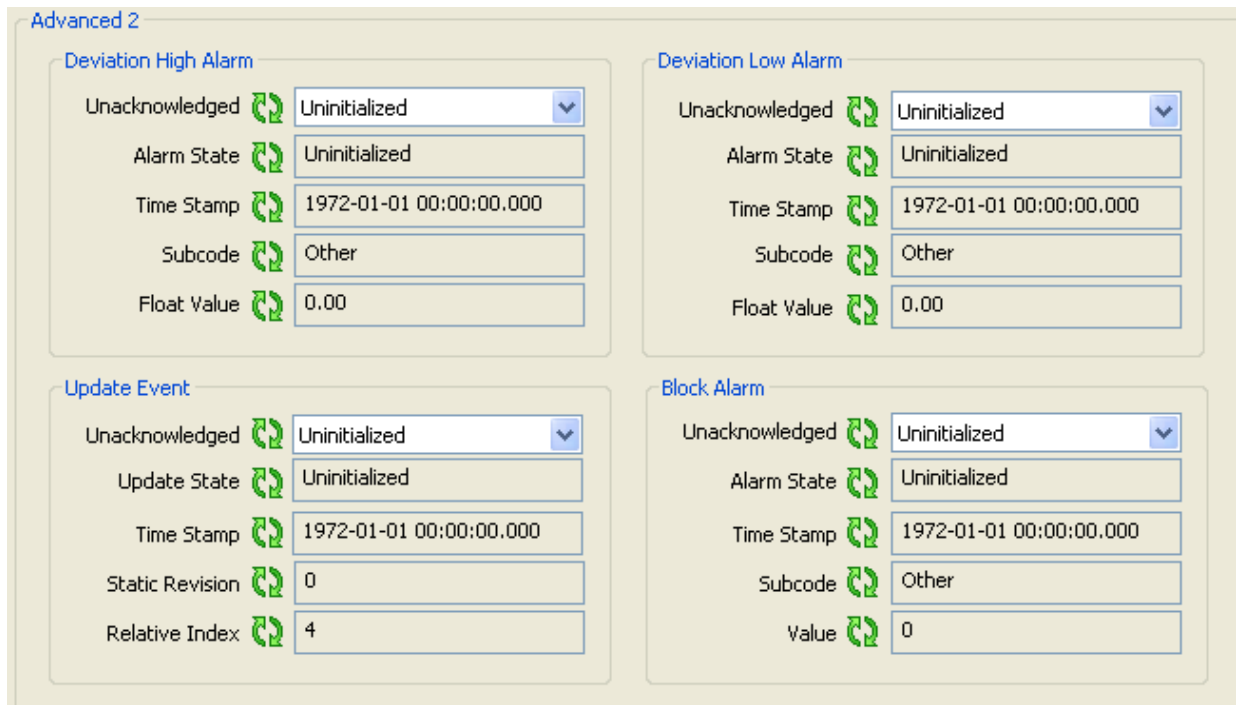


Figure 30. Sample Pressure Transmitter - PID Block Advanced 2 Screen

| Field | Entry |
|-----------------------------|---|
| Deviation High Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Active Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the alert was generated. |
| Subcode | This field is always zero for this type of alarm. |
| Float Value | Displays the value of the associated parameter. |
| Update Event | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Update Status | This field shows that the host has received alert. It automatically sets to Update Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the parameter was updated. |
| Static Revision | This field shows the Static Revision increment after a parameter is updated or transitioned. |
| Relative index | This field shows the relative index of the parameter that was updated. |
| Deviation Low Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |

| Field | Entry |
|--------------------|---|
| Alarm State | This field shows that the host has received alert. It automatically sets to Active Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when an alert is generated. |
| Subcode | This field is always zero for this type of alarm. |
| Float Value | This field displays the value of the associated parameter. |
| Block Alarm | |
| Unacknowledged | This field shows Unacknowledged on new alert, Acknowledged when acted on alert, and Uninitialized as default. |
| Alarm State | This field shows that the host has received alert. It automatically sets to Update Reported when it is not configured to communicate with the host. |
| Time Stamp | This field shows the time when the alert is generated. |
| Subcode | This field shows the block error code. |
| Value | This field always shows a value of zero (0). |

Advanced 3

The Advanced 3 screen displays the block header information such as block tag, profile revision, number of views, and so on, as shown in Figure 31.

The screenshot shows a software interface titled 'Advanced 3' with a sub-section 'Header Members'. It contains two columns of input fields with the following values:

| Field | Value |
|-------------------------|---------------------------|
| Block Tag | PID(450) FOX-IASVT-NE26FC |
| DD Member Id | 0 |
| DD Item ID | 0x800202B0 |
| DD Revision | 1 |
| Profile | 0x108 |
| Profile Revision | 0x101 |
| Execution Time | 1280 |
| Period of Execution | 32000 |
| Number Of Parameters | 67 |
| Next FB To Execute | 0 |
| Starting Index of Views | 830 |
| Number of View 3 | 1 |
| Number of View 4 | 1 |

Figure 31. Sample Pressure Transmitter - PID Block Advanced 3 Screen

| Field | Entry |
|-------------------------|---|
| Header Members | |
| Block Tag | This field is set by the plant engineer. This uniquely identifies this block within the control strategy. |
| DD Member Id | This field always shows a value of zero (0). |
| DD Item Id | This field identifies the block to the matching DD for a block of this type. |
| DD Revision | This field shows the revision of this block type. |
| Profile | This field uniquely identifies the functionality of this block. |
| Profile Revision | This field specifies the revision and enhancements of this block type. |
| Execution Time | This field shows the time in 1/32 ms to complete one execution. |
| Period of Execution | This field shows the minimum time in 1/32 ms between executions. |
| Number Of Parameters | This field shows the total number of parameters in this block including enhanced parameters. |
| Next FB To Execute | This field can be used to chain execution of function blocks together, if supported by the Cycle_Sel option in the Resource Block. |
| Starting Index of Views | This is the index where View 1 is located, View 2 will be the next index, View 3 will be at the index after View 2. View 4's location depends on the number of View 3's, but immediately follows View 3 in index numbers. |

Configuration Report

The screen shown below is a sample of the configuration report of the IAP Transmitter.

Save Print Export

FOXBORO

IAP FF DTM Configuration Report

| General | |
|---------------------|---|
| Tag Description | |
| Transducer Type | Standard Pressure with Calibration |
| MAU SW Revision | 0. 0. 3.09 |
| SB SW Revision | 0. 0. 4.04 |
| Block Mode | |
| Target | Auto |
| Actual | Auto |
| Normal | Auto |
| permitted mode | Auto,005 |
| Block Error | |
| Block Configuration | No |
| Input Failure | No |
| PowerUp | No |
| Out Of Service | No |

Figure 32. Sample Pressure Transmitter - Configuration Report Screen

| Field | Entry |
|--------|--|
| Save | Saves the configuration report as a html file. |
| Print | Prints the configuration report. |
| Export | Exports the configuration report to an Excel file. |

Report Settings

The Report Settings screen allows you to select the blocks that are displayed in the Configuration Report.

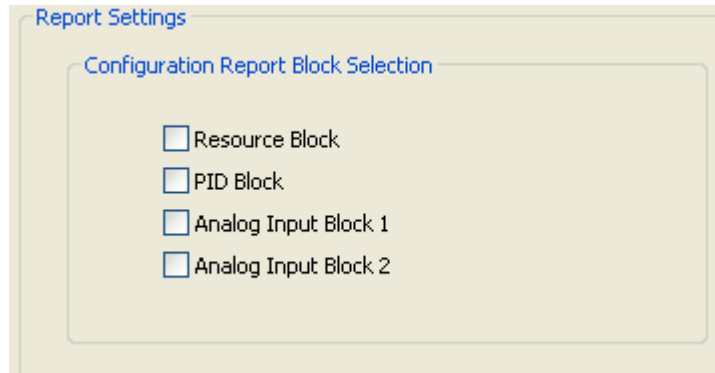


Figure 33. Sample Pressure Transmitter - Report Settings Screen

| Field | Entry |
|--------------------------------------|--|
| Configuration Report Block Selection | Select the check boxes to get the corresponding block parameters in the configuration report. You can select all or any of the following: Resource Block, PID Block, Analog Input Block 1, Analog Input Block 2. |

Reference

Reference

The Reference screen shows a list of **Online Documentation** related to the device, **Useful Links** to related information, and **Customer Service** phone, fax, email, and website information.

Scratch Pad

The scratch pad provides a place for you to record any type of information, including website links (such as www.fielddevices.foxboro.com), file links (such as “file: c:\readme.doc”), and mail links (such as <mailto:john.doe@schneider-electric.com>). These links can be activated by clicking them.

Trending

The Trending feature allows you to analyze the trends in your measurements. You can simultaneously view any two available measurements: Primary Value (Psig), Secondary Value (°C), and Third Value (Psig) as shown in Figure 34. You can change the data update frequency and the range on the left and right Y axes to suit your needs. Time is shown in hours, minutes, and seconds on the horizontal axis. You can also scroll through all three axes with the horizontal and vertical arrows on the display or by positioning your cursor on the range numbers and dragging your mouse in the desired direction.

To start recording, click **Start Recording**. The label on this button changes to **Stop Recording**. Clicking **Stop Recording** stops recording and changes the label back to **Start Recording**. **Clear** clears the measurement display. **Export** creates an Excel file that you can save for future reference.

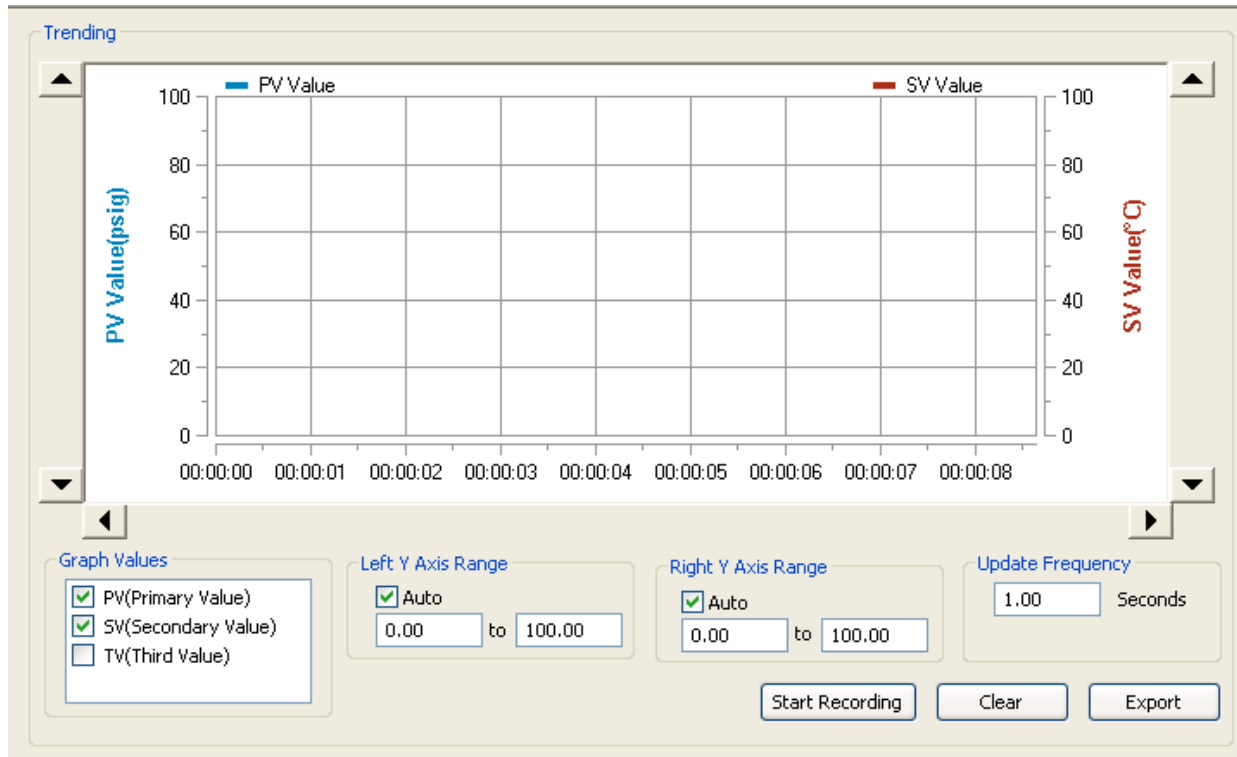


Figure 34. Sample Pressure Transmitter - Trending Screen

Activity Log

The Activity Log records any changes made to the device. The **Clear Log** button is used to clear the log; the **Export Log** button is used to create an Excel file that you can save for future reference.

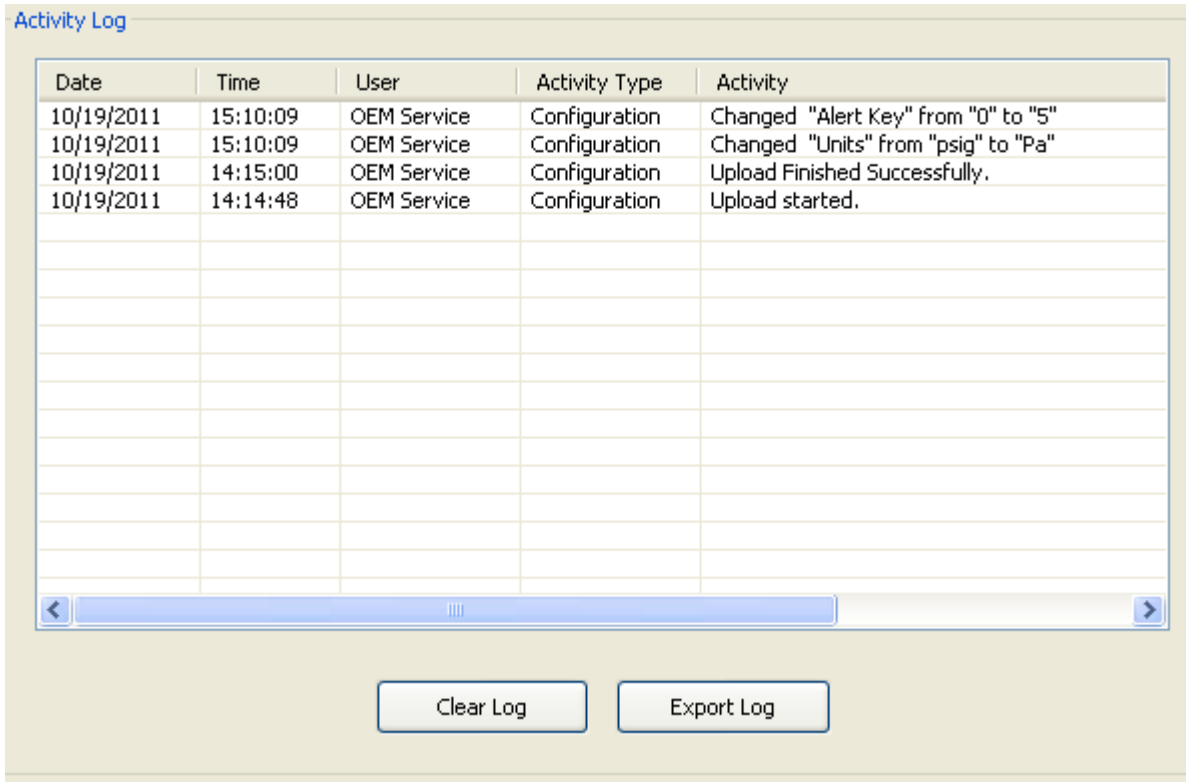


Figure 35. Sample Pressure Transmitter - Activity Log Screen

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Invensys Systems, Inc.
38 Neponset Avenue
Foxboro, MA 02035
United States of America
<http://www.fielddevices.foxboro.com>

Global Customer Support
Inside U.S.: 1-866-746-6477
Outside U.S.: 1-508-549-2424
Website: <http://support.ips.invensys.com>

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