Reference Manual

PlantPAx
Process Automation System

Rockwell Automation Library of Process Objects: Common Alarm Block (P_Alarm)

Version 3.1





Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Notes:

This document is updated throughout for version 3.1 of the Rockwell Automation Library of Process Objects. Changes for this revision are marked by change bars shown in the right margin.

Software Compatibility and Content Revision

Table 1 - Summary of Changes

Topic	Page
Changed title from 'PlantPAx Library of Process Objects' to 'Rockwell Automation Library of Process Objects'	Front Cover
Changed version of Rockwell Automation Library of Process Objects from 3.0 to 3.1	5, 12
Changed references to Knowledgebase Answer ID 62682 to Product Compatibility and Download Center	5, 12
Added paragraph describing alarm test	10
Visualization Files - added Important note concerning the order in which files should be imported	12
Input Parameters table: added MCmd_Test parameter changed Alarm Severity from 1…4 to 1…1000	13
Output Parameters table: added ''Err_', 'Alm_', and 'Ack_' parameter descriptions to bullet list added 'Alias For' column and added aliases	15
Operations - added Simulation section	17
Operator tab: added Alarm Test button icon to image added alarm test description to description table	 23 24
Engineering tab - changed Alarm Severity on page 1 to text input from 1…1000	26

For the latest compatible software information and to download the Rockwell Automation Library of Process Objects, see the Product Compatibility and Download Center at http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page.

For general library considerations, see Rockwell Automation Library of Process Objects, publication PROCES-RM002.

Additional Resources

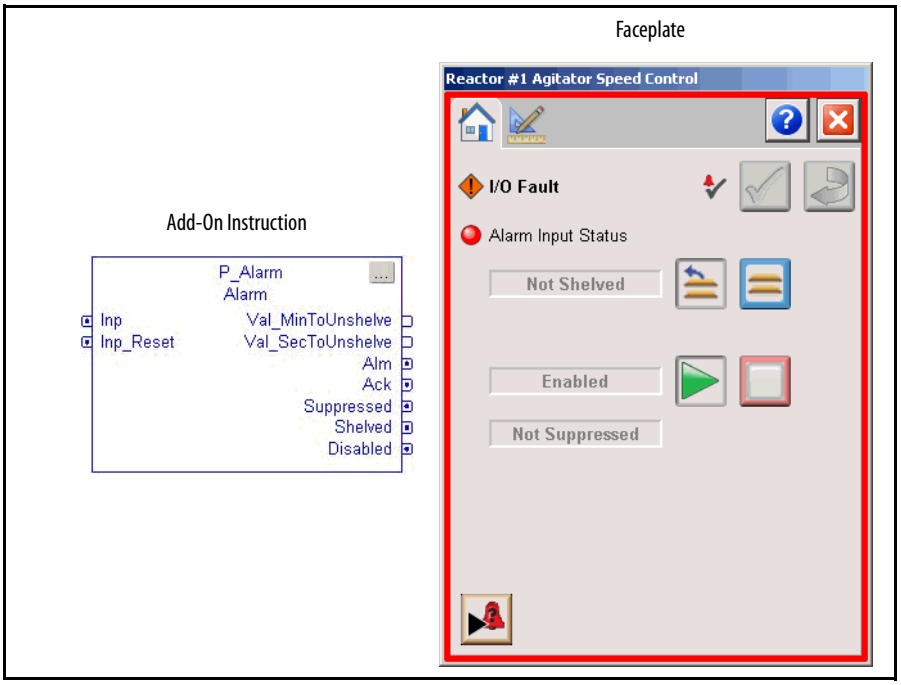
These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PlantPAx Process Automation System Selection Guide, publication PROCES-SG001	Provides information to assist with equipment procurement for your PlantPAx system.
PlantPAx Process Automation System Reference Manual, publication PROCES-RM001	Provides characterized recommendations for implementing your PlantPAx system.
Rockwell Automation Library of Process Objects, publication PROCES-RM002	Provides general considerations for the PlantPAx system library of process objects.
FactoryTalk View Machine Edition User Manual, publication VIEWME-UM004	Provides details on how to use this software package for creating an automation application.
FactoryTalk View Site Edition User Manual, publication VIEWSE-UM006	Provides details on how to use this software package for developing and running human-machine interface (HMI) applications that can involve multiple users and servers, distributed over a network.
Logix5000™ Controllers Add-On Instructions Programming Manual, publication 1756-PM010	Provides information for designing, configuring, and programming Add-On Instructions.

You can view or download publications at http:/www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Common Alarm Block (P_Alarm)

The P_Alarm (Common Alarm Block) Add-On Instruction is used to provide notification to operators of abnormal conditions or events. This instruction handles Alarm Acknowledgement, Alarm Reset, Alarm Shelving/Disabling, and Alarm Suppression (for FactoryTalk Alarm and Events).



Guidelines

Use this instruction in these situations:

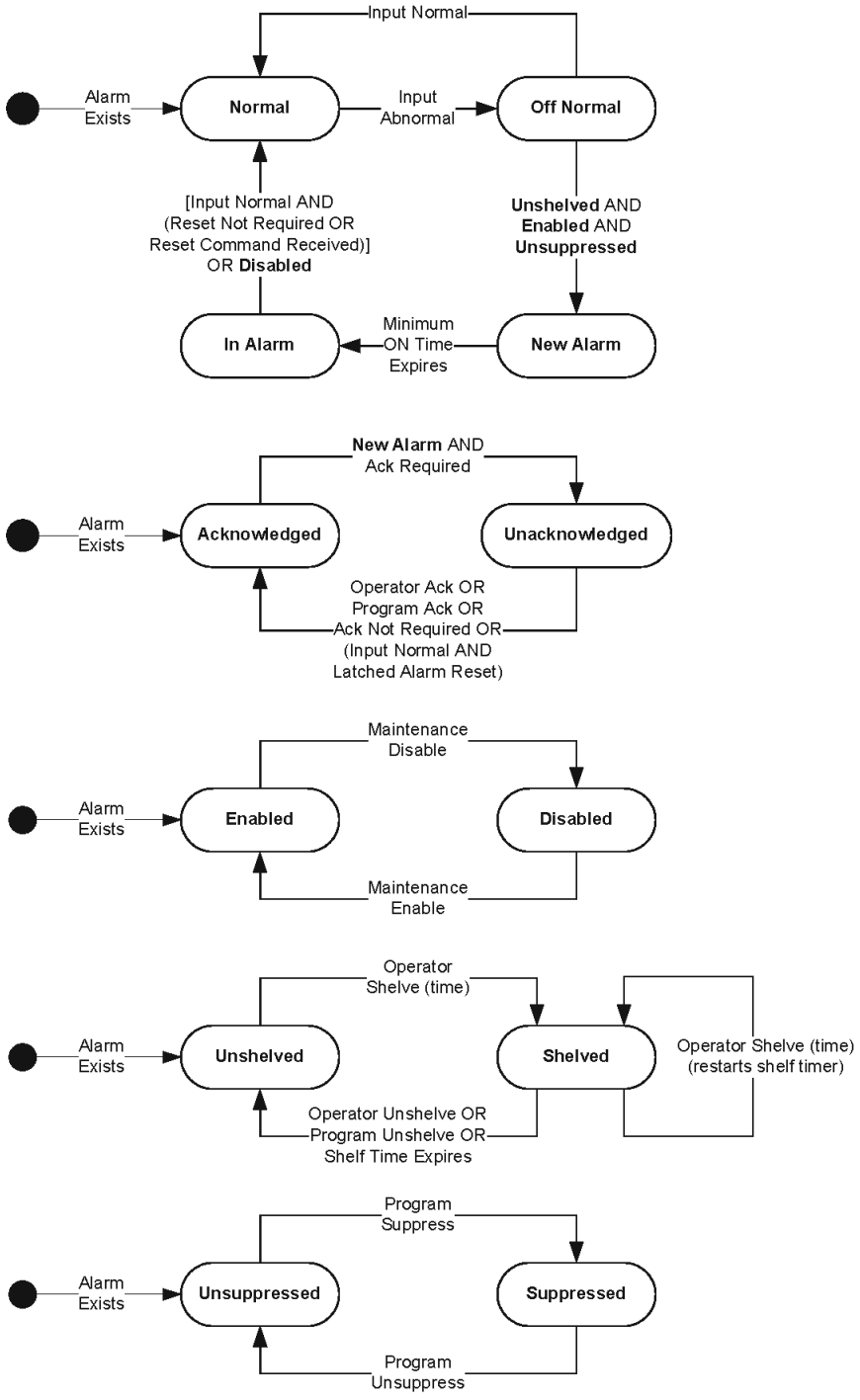
- You are developing your own Add-On Instruction and you want it to generate one or more alarms that are compatible with the alarm strategy for the Process Add-On Instructions. Use an instance of the P_Alarm instruction embedded within your Add-On Instruction for each alarm condition.
- You have a condition in your logic (outside of any Add-On Instruction) that you want to generate an alarm. Use the P_Alarm instruction standalone within your program logic.

IMPORTANT P_Alarm supports the following:

- Alarm
- Configurable minimum in-alarm time
- Alarm latching with Operator or Program Reset
- Operator or Program Acknowledge
- Operator Shelve with timer for automatic unshelve
- Maintenance Disable
- Program Suppress
- Engineer or Program configure to exist

Functional Description

The state diagram below shows how a P_Alarm instruction instance behaves as an alarm occurs, is acknowledged, clears, and is reset, depending on the instruction's configuration.



The primary operations of the P_Alarm instruction include the following:

- Raise an alarm when the input is true.
- Make sure the alarm stays on for a configurable minimum time or until reset, even if the input condition clears.
- Perform an alarm test when the Alarm Test button is clicked. When the Alarm Test button is clicked, the selected alarm is triggered for the minimum alarm time. Having a test function for an alarm allows the configuration of the alarm in the alarm subsystem (FactoryTalk Alarms and Events tag alarm server) to be tested without having to trigger the process condition that generates the alarm. It also lets the user verify alarm configuration values such as message, severity, color, audible alarming, and so on.
- Handle Alarm Acknowledge commands from the HMI or from other logic. The requirement for acknowledgement is configurable. If acknowledgement is required, a new alarm clears the acknowledged status and an Acknowledge command is required to set the status. If acknowledgement is not required, the alarm is automatically acknowledged.
- Handle Alarm Reset commands from the HMI or from other logic. The requirement for reset is configurable. If reset is required, the alarm Input sets the Alarm condition, and it is latched in until the alarm Input is clear and a Reset command is received. If reset is not required, the Alarm condition clears when the input clears and the minimum alarm on time expires.

  TIP An Add-On Instruction that contains one or more embedded P_Alarm instances provides a single Reset command that is forwarded to the contained P_Alarm instances. This same reset command can also be used to clear latched fault conditions or otherwise reset the containing instruction.

- Handle Maintenance Disable and Enable commands, Program Suppress and Unsuppress commands, and Operator Shelve and Unshelve commands. Providing separate commands and status for these functions lets automatic logic suppress an alarm at certain operating sequence points, while maintenance personnel can independently disable the alarm or the operator can temporarily shelve the alarm. When the operating sequence unsuppresses the alarm at the appropriate step, the Maintenance Disable or Operator Shelve is still in effect.

IMPORTANT The P_Alarm object has output parameters that are directly written by the HMI or alarm server to be compatible with FactoryTalk Alarms and Events (tag-based) alarms and FactoryTalk View ME alarms. Output parameters directly written by the HMI are the following:

- Ack (Acknowledgment, set by the HMI when the Alarm is Acknowledged)
- Disabled (set by the HMI) to disable the Alarm, cleared to enable the Alarm
- Shelved (set by the HMI) when it is not displaying the Alarm, cleared when unshelved

For FactoryTalk Alarm and Events Tag alarms, set the HMI options to Acknowledge Required and Not Latched. (FactoryTalk View ME alarms are not configurable with those options.) The P_Alarm instruction handles automatic acknowledgement (Cfg_AckReqd = 0) and latching (Cfg_ResetReqd = 1).

FactoryTalk View ME alarms are not configurable for Acknowledgment Not Required, so the P_Alarm instruction handles automatic acknowledgement when configured with Cfg_AckReqd = 0.

When an alarm is Disabled by Maintenance, the following occurs:

- The Alarm Status (Alm) clears immediately.
- If the alarm is unacknowledged, it must still be acknowledged.

When an alarm is Shelved by Operator or Suppressed by Program, the following occurs:

- The alarm is not cleared until the input condition clears, and new alarms are prevented from occurring.
- If the alarm is latched, it must still be reset (after the input condition clears).
- If the alarm is unacknowledged, it must still be acknowledged.

When an alarm is configured to not exist by Engineering, the following occurs:

- The Alarm Status (Alm) is cleared immediately.
- If the alarm is unacknowledged, it is immediately acknowledged.
- In preparation for being configured to exist again, the following occurs:
  - Any alarm inhibits (Disabled, Suppressed, Shelved) are cleared.
  - All Program and Operator commands are cleared (every scan).
  - All timers (shelf timer, minimum on timer) are reset.

Required Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

Controller File

The P_Alarm_3_1-**00**_AOI.L5X Add-On Instruction must be imported into the controller project to be used in the controller configuration. The service release number (boldfaced) can change as service revisions are created.

Visualization Files

The following files for this Add-On Instruction can be downloaded from the Product Compatibility and Download Center at http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page.

IMPORTANT Files must be imported in the following order: image files, then global object files, and then graphic files. This order is required to properly configure the visualization files.

Table 2 - P_Alarm Visualization File Types

Application Type	File Type	FactoryTalk View SE Software	FactoryTalk View ME Software	Description
Graphics - Displays	GFX	(RA-BAS) Common-AnalogEdit	N/A	Faceplate used for analog input data entry. The FactoryTalk View ME faceplates use the native analog input data entry so no file is required.
		(RA-BAS) P_Alarm-Faceplate	(RA-BAS-ME) P_Alarm-Faceplate	The faceplate display used for the object.
		(RA-BAS) P_Alarm-Help	(RA-BAS-ME) P_Alarm-Help	P_Alarm Help information that is accessed from the P_Alarm Help faceplate.
Graphics - Global Objects	GGFX	(RA-BAS) Common Faceplate Objects	(RA-BAS-ME) Common Faceplate Objects	Common global objects used on all Process Object faceplates.
		(RA-BAS) Process Alarm Objects	(RA-BAS-ME) Process Alarm Objects	Global objects used for alarming on Process Object faceplates.
		(RA-BAS) Process Help Objects	(RA-BAS-ME) Process Help Objects	Global objects used for help on Process Objects help displays.
Graphics - Images	PNG	All .png files in the images folder	All .png files in the images folder	These are the common icons used in the global objects and faceplates for all Process Objects. When PNG graphic formats are imported they are renamed like a BMP file but retain a PNG format.
HMI Tags	CSV	N/A	FTVME_PlantPAxLib_Tags_3_1_**00**.csv(1)	These tags must be imported into the FactoryTalk View ME project to support switching tabs on any Process Object faceplate.

(1) The service release number (boldfaced) can change as service revisions are created.

Controller Code

This section describes the parameter references for this Add-On Instruction.

Common Alarm Block/Input Structure

Input parameters include the following:

- Input data elements (Inp_) are typically used to connect field inputs from I/O modules or signals from other objects.
- Configuration data elements (Cfg_) are used to set configurable capabilities and features of the instruction.
- Commands (PCmd_, OCmd_, MCmd_) are used by program logic, operators, and maintenance personnel to request instruction actions.

Table 3 - P_Alarm Input Parameters

Input Parameter	Data Type	Default	Description
EnableIn	BOOL	1	**Ladder Diagram:** If the rung-in condition is true, the instruction's Logic routine executes. If the rung-in condition is false, the instruction's EnableInFalse routine executes. **Function Block Diagram:** If true, or not connected, the instruction's Logic routine executes. If the parameter is exposed as a pin and wired, and the pin is false, the instruction's EnableInFalse routine executes. **Structured Text:** No effect. The instruction's Logic routine executes.
Inp	BOOL	1	Alarm condition input 1 = alarm.
Inp_Reset	BOOL	0	Input parameter used to programatically reset alarms. When set to 1, an alarm requiring reset is reset.
Cfg_Exists	BOOL	1	1 = Alarm configured to exist. 0 = Does not exist, don't scan.
Cfg_ResetReqd	BOOL	0	1 = Reset required to clear alarm.
Cfg_AckReqd	BOOL	1	1 = Acknowledge required for alarm.
Cfg_AllowShelve	BOOL	1	1 = Allow operator to shelve alarm.
Cfg_AllowDisable	BOOL	1	1 = Allow maintenance to disable alarm.
Cfg_PCmdClear	BOOL	1	When this parameter is 1, program commands are cleared once they are acted on. When set to 0, program commands remain set until cleared by the application program logic. **IMPORTANT:** Clearing this parameter online can cause unintended program command execution.
Cfg_Severity	INT	750	This parameter determines the severity of the alarm. This drives the color and symbol that are used to indicate alarm status on the faceplate and global object. The following are valid values: 1…250 = Low 251…500 = Medium 501…750 = High 751…1000 = Urgent **IMPORTANT:** For FactoryTalk View software, version 7.0, this severity parameter drives only the indication on the global object and faceplate. The Alarms and Events definition severity drives the color and symbol that is used on the alarm banner and alarm summary as well as the value returned by FactoryTalk Alarms and Events display commands.
Cfg_AlmMinOnT	DINT	5	Minimum time alarm output stays on (seconds).
Cfg_MaxShelfT	INT	480	Auto unshelve after being shelved this long (minutes) (type zero for maximum).
PCfg_AllowExist	BOOL	1	1 = Alarm can be configured to exist. 0 = Other configurations make alarm meaningless.
PCmd_Reset	BOOL	0	• Set PCmd_Reset to 1 to reset all alarms requiring reset • This parameter is always reset automatically

Table 3 - P_Alarm Input Parameters

Input Parameter	Data Type	Default	Description
OCmd_Reset	BOOL	0	Operator command to reset latched alarm.
PCmd_Ack	BOOL	0	• Set PCmd_Ack to 1 to Acknowledge alarm • The parameter is reset automatically
OCmd_Ack	BOOL	0	Operator command to acknowledge alarm.
PCmd_Suppress PCmd_Unsuppress	BOOL	0	When Cfg_PCmdClear is 1: • Set PCmd_Suppress to 1 to suppress alarm • Set PCmd_Unsuppress to 1 to unsuppress alarm • These parameters reset automatically When Cfg_PCmdClear is 0: • Set PCmd_Suppress to 1 to suppress alarm • Set PCmd_Suppress to 0 to unsuppress alarm • PCmd_Unsuppress is not used • These Parameters do not reset automatically
PCmd_Unshelve	BOOL	0	• Set PCmd_Unshelve to 1 to Unshelve alarm • The parameter is reset automatically
OCmd_Unshelve	BOOL	0	Operator command to unshelve alarm (allows new alarm).
OCmd_Shelve	BOOL	0	Operator command to shelve alarm (inhibits new alarm).
MCmd_Disable	BOOL	0	Maintenance command to disable alarm (force Alarm to 0).
MCmd_Enable	BOOL	0	Maintenance command to enable alarm.
MCmd_Test	BOOL	0	Maintenance command to test alarm (issued for minimum alarm time).

Common Alarm Block/Output Structure

Output parameters include the following:

- Value data elements (Val_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic.
- Status data elements (Sts_) are bit outputs of the instruction for use by the HMI. Status bits also can be used by other application logic.
- Error data elements (Err_) are outputs of the instruction that indicate a particular configuration error. If any Err_ bit is set. then the Sts_Err configuration error summary status is set and the Invalid Configuration indicator is displayed on the HMI.
- Alarm data elements (Alm_) are outputs of the instruction that indicate a particular alarm has occurred.
- Acknowledge data elements (Ack_) are outputs of the instruction that indicate the corresponding alarm has been acknowledged.
- Ready data elements (Rdy_) are bit outputs of the instruction used by the HMI to enable or disable command buttons and setting entry fields.

Table 4 - P_Alarm Output Parameters

Output Parameter	Data Type	Alias For	Description
EnableOut	BOOL		Enable Output: The EnableOut signal is not manipulated by this instruction. Its output state always reflects EnableIn input state.
Val_Notify	SINT		Current alarm level and acknowledgement (enumeration): 0 = No alarm 1 = Alarm cleared: a reset or acknowledge is required 2 = Low (acknowledged) 3 = Low (unacknowledged) 4 = Medium (acknowledged) 5 = Medium (unacknowledged) 6 = High (acknowledged) 7 = High (unacknowledged) 8 = Urgent (acknowledged) 9 = Urgent (unacknowledged)
Val_MinToUnshelve	DINT		Number of minutes until this alarm unshelves itself (mmm:ss).
Val_SecToUnshelve	DINT		Number of seconds until this alarm unshelves itself (mmm:ss).
Alm	BOOL	Com_AE.0	Alarm output 1 = In alarm.
Ack	BOOL	Com_AE.1	Alarm acknowledged status: 1 = Ack received.
Suppressed	BOOL	Com_AE.3	1 = Alarm has been suppressed by program (not visible on HMI).
Shelved	BOOL	Com_AE.6	1 = Alarm has been shelved by operator (inhibits new alarm).
Disabled	BOOL	Com_AE.9	1 = Alarm has been disabled by maintenance (is not sent).
Sts_AlmInh	BOOL		1 = Alarm has been shelved, disabled or suppressed, display **I** icon.
Sts_Err	BOOL		1 = Error in config: see detail Err_ bits for reason.
Err_Timer	BOOL		1 = Error in config: Invalid timer preset (use 0…2,147,483).
Err_Severity	BOOL		1 = Error in config: Invalid Severity (use 1…4).

Table 4 - P_Alarm Output Parameters

Output Parameter	Data Type	Alias For	Description
Rdy_Reset	BOOL		Ready to receive OCmd Reset, Ack, Shelve, or Unshelve (enables button).
Rdy_Ack			
Rdy_Shelve			
Rdy_Unshelve			
Rdy_Disable	BOOL		Ready to receive MCmd_Disable or Enable (enable button).
Rdy_Enable			
Rdy_Test	BOOL		Ready to receive MCmd_Test (enables button).
P_Alarm	BOOL		Unique Parameter name for auto-discovery.

Common Alarm Block/Local Configuration Tags

Configuration parameters that are array, string, or structure data types cannot be configured as parameters for Add-On Instructions. Configuration parameters of these types appear as local tags to the Add-On Instruction. Local tags can be configured through the HMI faceplates or in RSLogix 5000 software by opening the instruction logic of the Add-On Instruction instance and then opening the data monitor on a local tag. These parameters cannot be modified by using controller logic or RSLogix 5000 software export/import functionality.

Table 5 - P_Alarm Local Configuration Tags

Tag Name	Data Type	Default	Description
Cfg_Cond	STRING_20	'Alarm Condition'	Alarm Condition Text (for example, High-High PV).
Cfg_Tag	STRING_20	'P_Alarm'	Tagname for display on HMI. This string shows in the title bar of the faceplate.
Com_AE	Int		
Com_AE.0		0	Alarm to AE
Com_AE.1		1	Acknowledged from AE status, Ack to AE Control
Com_AE.2		0	Not used
Com_AE.3		0	Shelved from AE Status
Com_AE.4		0	Shelve to AE Control
Com_AE.5		0	Unshelve to AE Control
Com_AE.6		0	Suppressed from AE Status, suppress to AE Control
Com_AE.7		0	Not used
Com_AE.8		0	Unsuppress to AE Control
Com_AE.9		0	Disabled from AE Status, Disable to AE Control
Com_AE.10		0	Not used
Com_AE.11		0	Enable to AE Control
Com_AE.12		0	Not used
Com_AE.13		0	Not used
Com_AE.14		0	Not used
Com_AE.15		0	Not used

Operations

This section describes the primary operations for Add-On Instructions.

Modes

The Alarm Add-On Instruction has no Modes. It has Program, Operator, and Maintenance commands, but because this object controls no equipment, these are accepted from each source at any time.

Alarms

P_Alarm objects are often embedded within another Process Object, for example P_AIn. When embedded, the Parameters of the P_Alarm objects can be accessed by using [P_Alarm Name].[P_Alarm Parameter].

Simulation

The P_Alarm Add-On Instruction does not have a Simulation capability.

Execution

The following table explains the handling of instruction execution conditions.

Condition	Description
EnableIn False (false rung)	Processing for EnableIn False (False Rung) is handled the same as the main Logic Routine except that the state of Inp (the Input) is inverted. This lets the P_Alarm Add-On Instruction in a ladder diagram instance have its input mapped by using the rung condition instead of using a separate branch or rung. Set the input to 1 when using the on-rung mapping. See Implementation by Using the EnableIn False Feature on page 19.
Powerup (prescan, first scan)	No powerup, prescan or first scan handling is required or provided. The internal timers reset on powerup, but the outputs are retained through a power cycle or run - program - run cycle.
Postscan (SFC transition)	No SFC postscan logic is provided.

Refer to the Logix5000 Controllers Add-On Instructions Programming Manual, publication 1756-PM010, for more information on Add-On Instruction execution condition handling.

Standalone versus Embedded in Other Add-On Instructions

This instruction can be used standalone, with the abnormal condition simply written or wired to the Input (Inp) pin, or it can be embedded within another Add-On Instruction to provide Alarming for some condition. For example, a Motor instruction can have P_Alarm Add-On Instructions for Failure to Start, Failure to Stop, and other conditions.

When embedded within another Add-On Instruction, the following commands and configuration parameters are wired in or aliased from the containing object:

- Inp: Alarm condition input
- Inp_Reset: Alarm reset
- PCmd_Reset: Program command to reset the alarm
- PCmd_Ack: Program command to acknowledge the alarm
- PCmd_Suppress: Program command to suppress the alarm
- PCmd_Unsuppress: Program command to unsuppress the alarm
- PCmd_Unshelve: Program command to unshelve the alarm
- Cfg_AckReqd: Acknowledge Required configuration
- Cfg_ResetReqd: Reset Required configuration
- Cfg_MinOnT: The minimum amount of time (in seconds) the alarm must be help in the alarm state (kept in the operator's view) when it occurs
- Cfg_Severity: Alarm Severity 0-250 = Low, 251-500 = Medium, 501-750 = High, 751-1000 = Urgent
- Cfg_Exists: 1 if alarm needs to be processed, 0 if alarm is not used and alarm logic needs to be skipped
- PCfg_AllowExist: 1 if alarm is allowed to exist, 0 if other configuration parameters render the alarm meaningless and it cannot occur. For example, if a motor is configured to have no run feedback, its Fail to Start and Fail To Stop alarms cannot occur and so are not allowed to exist

The following output parameters need to be wired out or aliased to status bits of the containing object to make the signals available for other logic:

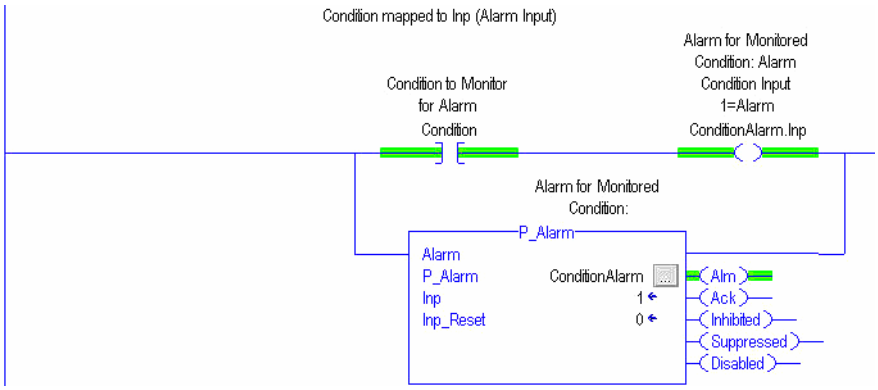
- Alm: Alarm status
- Ack: Acknowledgement status
- Disabled: Alarm Disabled status
- Shelved: Alarm Shelved status
- Suppressed: Alarm Suppressed status

IMPORTANT All of the above parameters are the targets of Alias Parameters in the containing Add-On Instruction. Acknowledge, disabled, shelved, and suppressed must be configured as read/write in RSLogix 5000 software, version 18 or later, for proper operation of alarms with the FactoryTalk Alarms and Events server tag-based alarms.

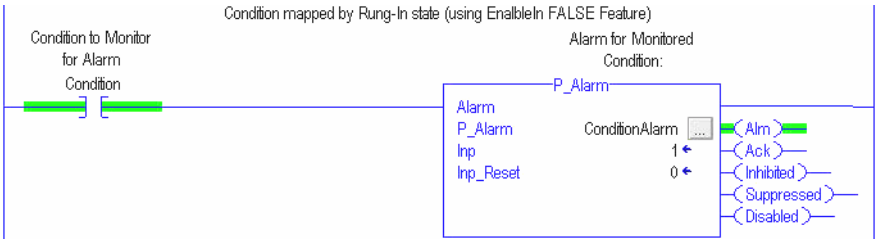
Implementation by Using the EnableIn False Feature

For the convenience of ladder diagram programmers, the P_Alarm instruction can be used in a ladder diagram routine with the input condition carried by the Rung-In condition instead of being mapped on a separate branch.

The following illustration shows normal implementation with the input condition mapped to Inp on a separate branch.



The following illustration shows the EnableIn False implementation with the input condition mapped to the P_Alarm instruction by using the Rung-In state.

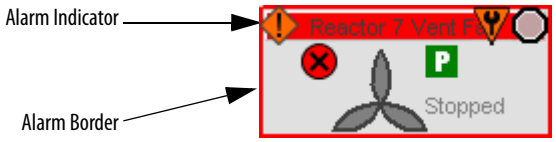


The Rung-In condition determines whether the Add-On Instruction's normal code (Logic routine) is executed or its EnableIn False code (EnableInFalse routine) is executed. In the P_Alarm instruction, the EnableIn False code is identical to the Logic code, except it uses the inverse of the Inp signal for processing. To use the Rung-In mapping, method, set Inp to 1 (its default value). When the rung is True, Inp (= 1) is treated as True (not inverted, in alarm), and when the rung is False, Inp (=1) is treated as False (inverted, not in alarm).

Graphic Symbols

The P_Alarm instruction is usually used within other device instructions to provide alarm functions. This section describes the alarm indicators that typically appear on the containing instructions' graphic symbols.

A single alarm indicator appears on a device's graphic symbol when any of its alarms are active, or when any alarms are shelved, disabled, or suppressed. The graphic symbol has a color-changing alarm border that blinks on unacknowledged alarm.



In an active alarm condition, the color of the alarm bell symbol indicates the highest active-alarm severity, and the alarm border and label background blink if acknowledgement of any alarm condition is required.

Table 6 - Alarm Indicators

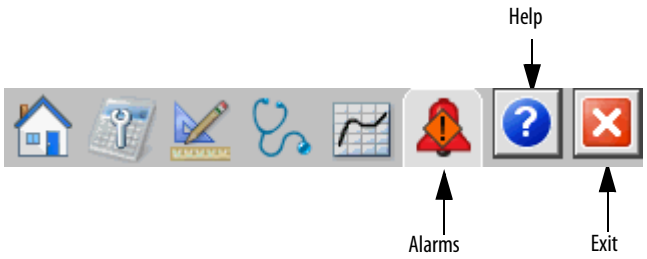
Symbol	Border and Label Background	Description
	No change in color	Alarm Inhibit: an alarm is suppressed by the Program, disabled by Maintenance, or shelved by the Operator.
	White	Return to normal (no alarm condition), but a previous alarm has not been acknowledged.
	Blue	Low severity alarm.
	Yellow	Medium severity alarm.
	Red	High severity alarm.
	Magenta	Urgent severity alarm.
No symbol	No change in color	No alarm or alarm inhibit condition, and all alarms are acknowledged.

Device Faceplate

Some device faceplates include an Alarms tab from where the P_Alarm faceplate can be called. The P_Alarm faceplate title bar contains the value of the local configuration tag (Cfg_Desc) of the AOI from which P_Alarm was called.

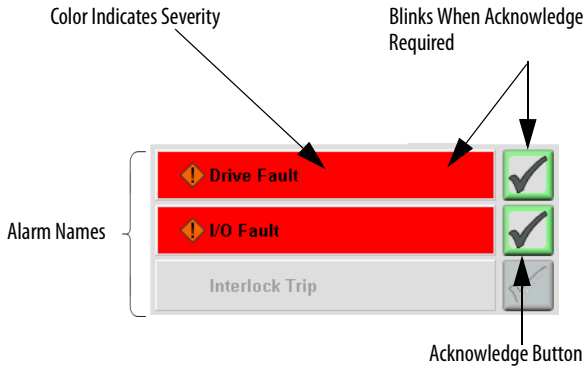
For example, if the P_Alarm Operator faceplate were opened by clicking on an alarm name in P_PF753, the description displayed in the P_Alarm faceplate title bar would be the same as the description used in P_PF753. (See the P_Alarm faceplate on page 25.)

The tab icons at the top of the faceplate are used to navigate to the Alarms tab. The Alarms tab icon is animated, using the same colors as the Alarm Indicator on the device's graphic symbol.



Alarms Tab

On the Alarms tab of a device or other Add-On Instruction faceplate, there is an Alarm Display panel and an Alarm Acknowledge Command button for each alarm. Each Alarm Display panel changes color according to the alarm's severity and the appropriate severity icon appears when the alarm is active. If the alarm must be acknowledged, the panel and background blinks and the Alarm Acknowledge Command button becomes active.



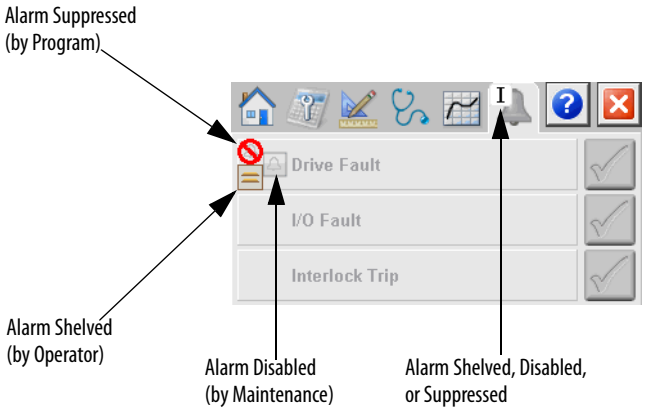
Click on an alarm name to open the P_Alarm faceplate for that alarm. From the P_Alarm faceplate, you can configure and perform additional operations on the alarm.

The alarm severity associated with the color of each bar is shown in the table.

Table 7 - Alarm Color Definitions

Color	Severity
Magenta	Urgent
Red	High
Yellow	Medium
Blue	Low
Background (Light Gray)	No alarm

The Alarm Display bar also has indicators to show when the alarm is disabled, shelved, or suppressed.



The Alarms tab of a device or instruction with alarms includes an Alarm Acknowledge Command button for each alarm and a Reset and Acknowledge All Alarms Command button that resets all of the alarms.

Table 8 - Alarm Tab Descriptions

Button	Action	Security Required
Alarm Names	Click an alarm name to open the associated P_Alarm faceplate.	Normal Operation of Devices (Code A)
	Click to acknowledge the alarm.	Acknowledge Alarms (Code F)
	Click to reset and acknowledge all alarms.	

Each Alarm Acknowledge button is enabled if the corresponding Alarm requires acknowledgement.

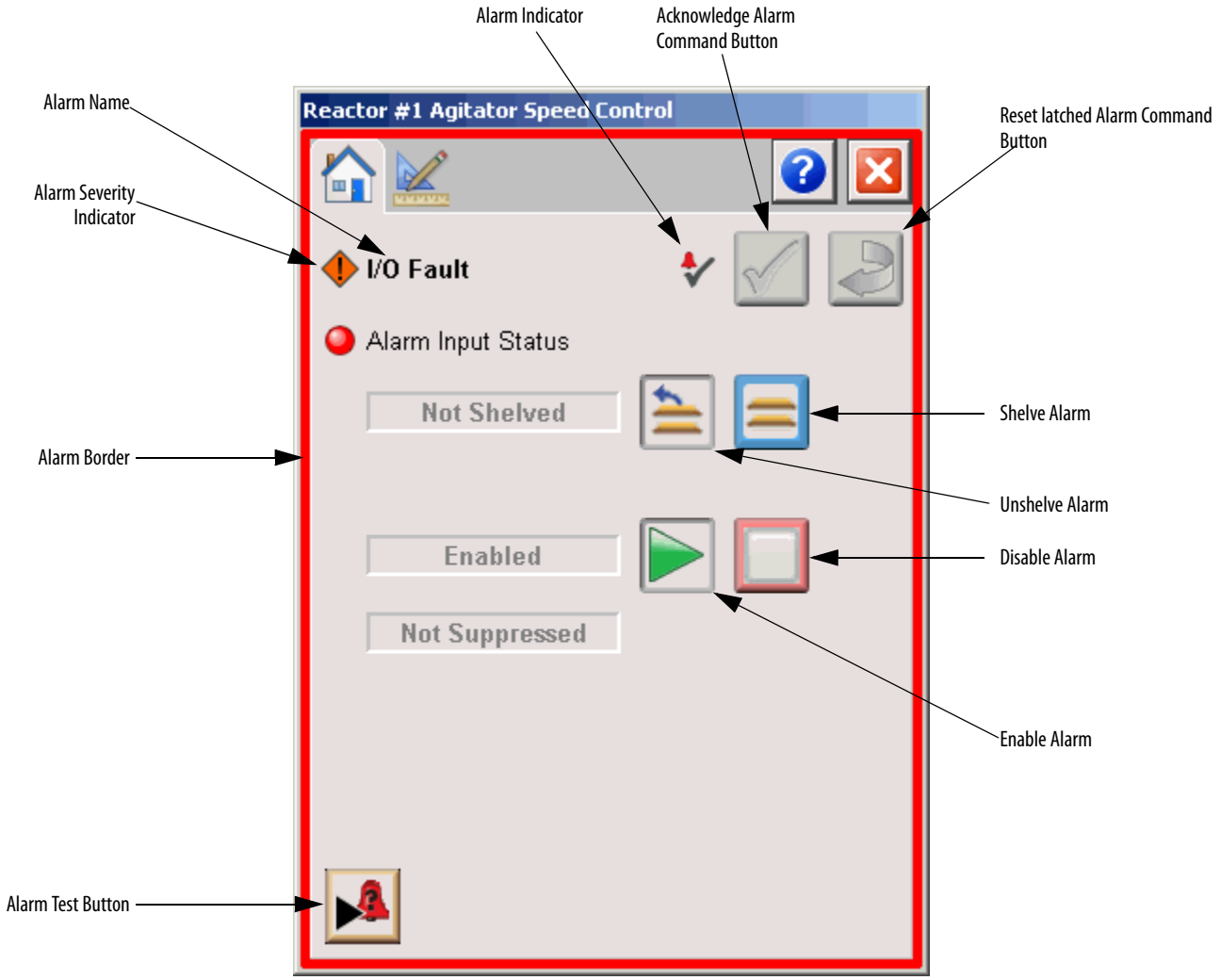
The Reset and Acknowledge All Alarms button is enabled if any Alarm requires reset or acknowledgement. If there are multiple alarms, click the Reset and Acknowledge All Alarms button to reset or acknowledge all of them.

Alarm Faceplate

Click on an alarm name on the device faceplate to open the alarm faceplate for that alarm.

Operator Tab

The Operator tab of the Alarm faceplate lets the operator shelve or unshelve the alarm, and lets maintenance personnel enable, disable, or test the alarm. The following figure shows the Operator tab in an alarm condition.



The Operator tab shows the following information:

- Name of the alarm represented by the Operator tab
- Alarm severity
- Current alarm state
- Shelved/unshelved state
- Enabled/disabled state
- Suppressed/unsuppressed state
- Alarm input status

The following table shows the functions included on the Operator tab.

Table 9 - Operator Tab Description

Function	Action	Security
	Click to unshelve alarm.	Acknowledge Alarms (Code F)
	Click to shelve alarm.	
	Click to reset latched alarms.	
	Click to acknowledge the alarm.	
	Click to disable the alarm.	Disable Alarms Bypass Permissives and Interlocks (Code H)
	Click to enable the alarm.	
	Click to initiate alarm test.	

The following table shows the alarm status symbols used on the Operator tab.

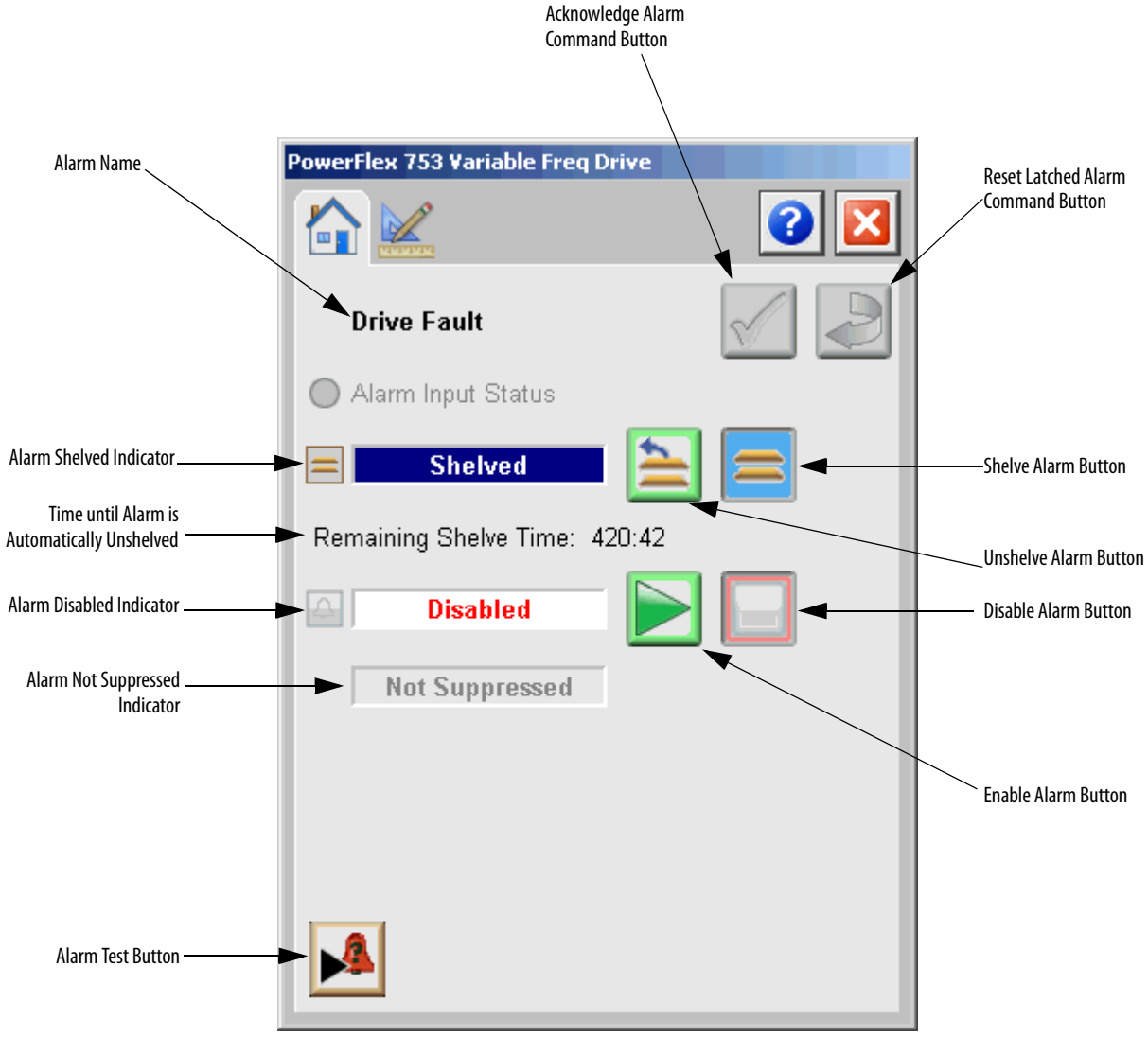
Table 10 - Operator Tab Alarm Status

Graphic Symbol	Alarm Status
	In Alarm (Active Alarm).
	In Alarm and Acknowledged.
	Out of Alarm but not Acknowledged.

Table 10 - Operator Tab Alarm Status

Graphic Symbol	Alarm Status
	Alarm Suppressed (by Program)
	Alarm Disabled (by Maintenance).
	Alarm Shelved (by Operator).

The following figure shows the Operator tab in a non-alarm condition with the alarm shelved and disabled.



Engineering Tab

The Engineering tab provides access to device configuration parameters and ranges, options for device and I/O setup, displayed text, and faceplate-to-faceplate navigation settings, for initial system commissioning or later system changes.

The Engineering tab is divided into two pages.

Engineering Tab Page 1

On this Engineering page you can configure the Alarm Condition text.

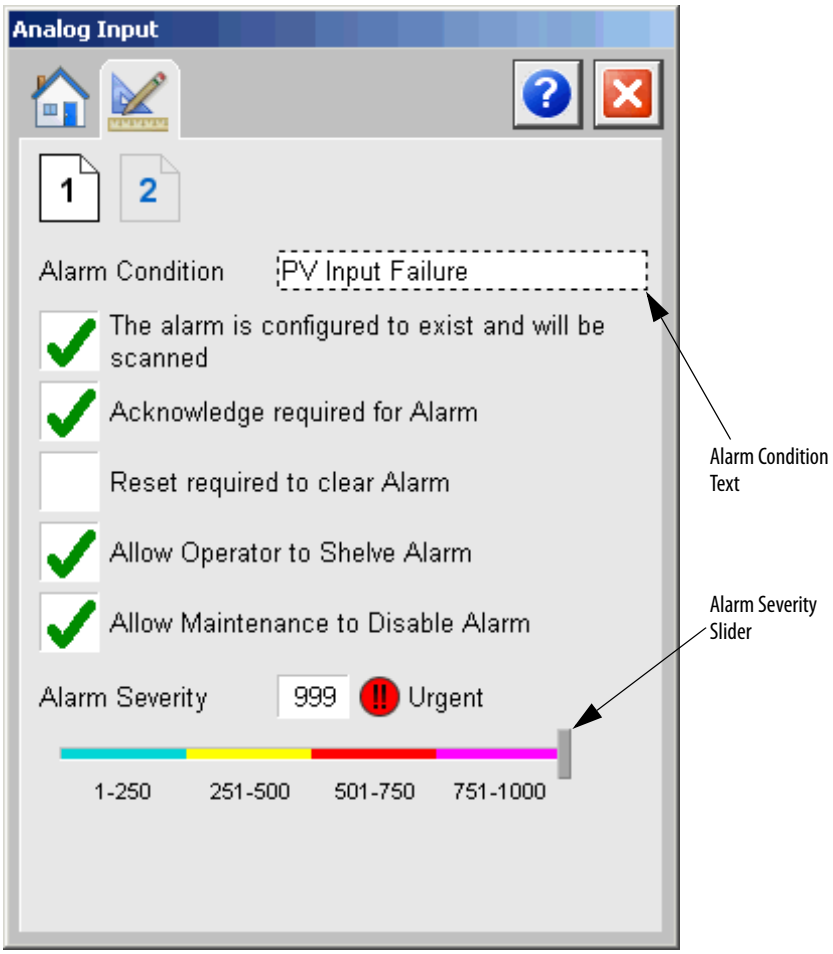


Table 11 - Engineering Tab Page 1 Description

Function	Action	Security	Configuration Parameters
Alarm Condition	Type the alarm description to show on the Operator faceplate.	Engineering Configuration (Code E)	Cfg_Cond
The alarm is configured to exist and will be scanned	Check to have the alarm exist for the device and be scanned.		Cfg_Exists

Table 11 - Engineering Tab Page 1 Description

Function	Action	Security	Configuration Parameters
Acknowledge required for alarm	Check to require acknowledgement of the alarm. **IMPORTANT:** If using FactoryTalk View Alarm and Events, the corresponding FactoryTalk View Alarm Acknowledge Required must be checked (set to 1).	Engineering Configuration (Code E)	Cfg_AckReqd
Reset required to clear alarm	Check to require a reset to clear the alarm status. **IMPORTANT:** If using FactoryTalk View Alarms and Events, do not check 'Latched' as the controller handles the alarm reset within this instruction.		Cfg_ResetReqd
Allow operator to shelve alarm	Check to let the operator shelve this alarm.		Cfg_AllowShelve
Allow maintenance to disable alarm	Check to let maintenance personnel disable this alarm.		Cfg_AllowDisable
Alarm Severity	Choose the priority for this alarm by sliding the Alarm Severity slider or typing: 1…250 for Low 251…500 for Medium 501…750 for High 751…1000 for Urgent.		Cfg_Severity

Engineering Tab Page 2

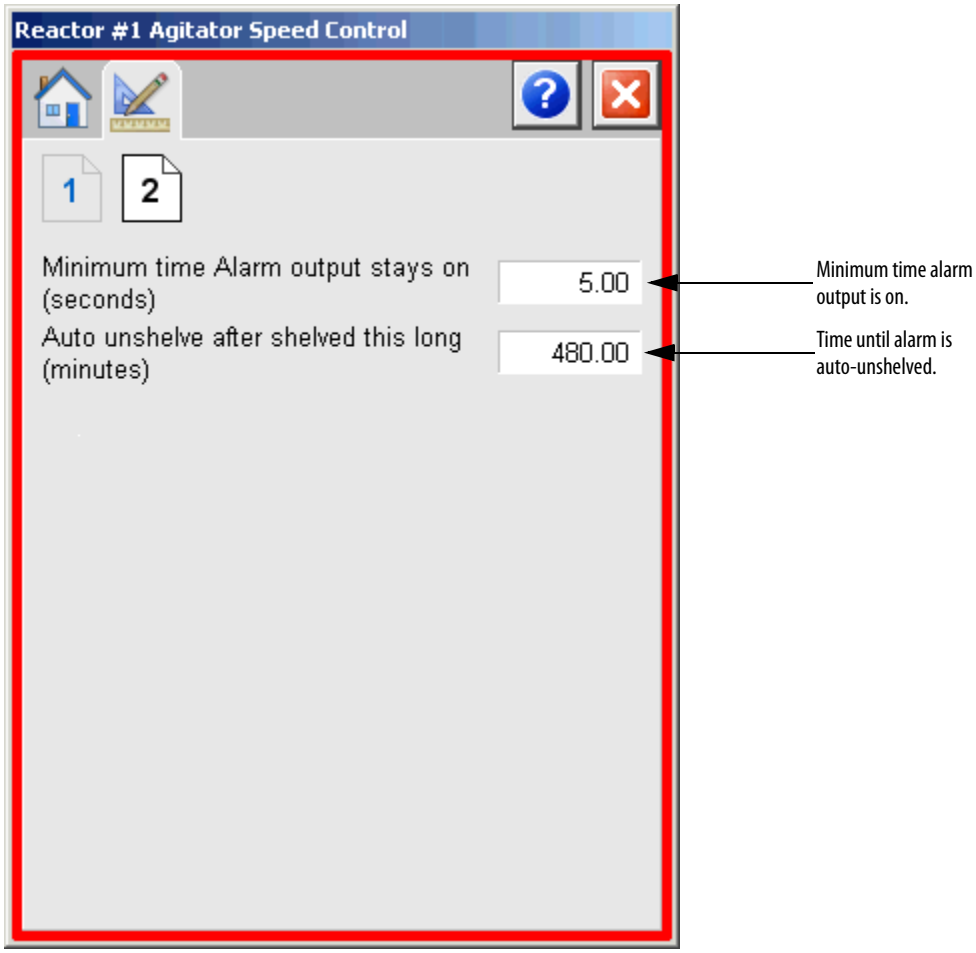
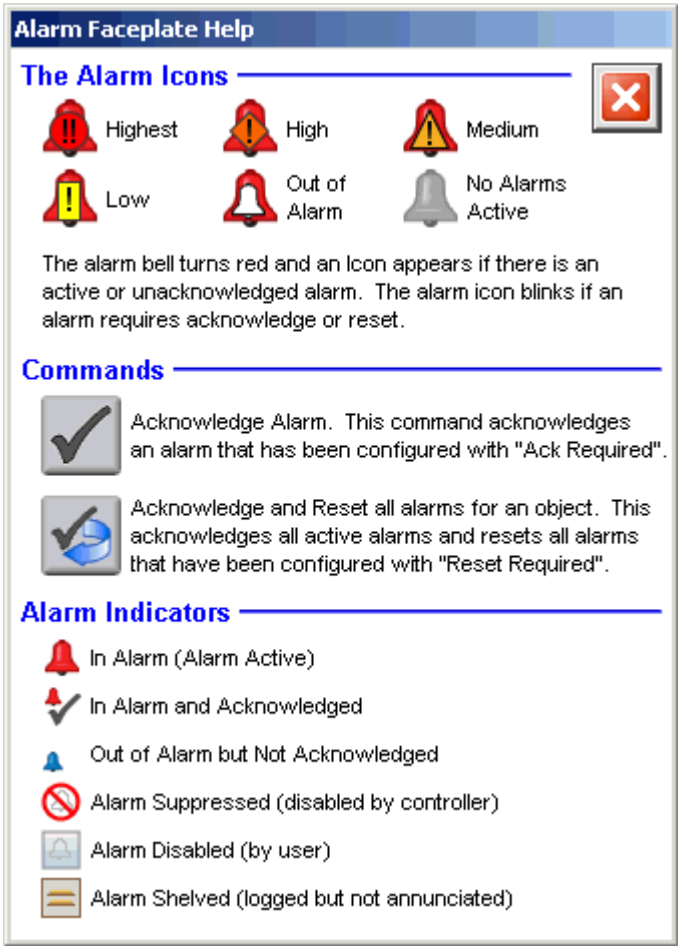


Table 12 - Engineering Tab Page 2 Description

Function	Action	Security	Configuration Parameters
Minimum time alarm output stays on	Enter the number of seconds the alarm output stays on.	Engineering Configuration (Code E)	Cfg_MinAlmOnT
Auto unshelve after this long	Enter the number of minutes after which the alarm is automatically unshelved.		Cfg_MaxShelfT

Alarm Faceplate Help

The Alarm Faceplate Help page describes the alarm icons, commands, and indicators.



Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
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Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

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