Reference Manual

PlantPAx
Process Automation System

Rockwell Automation Library of Process Objects: Weigh Scale Dosing (P_DoseWS)

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.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

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, 10, 12
Changed references to Knowledgebase Answer ID 62682 to Product Compatibility and Download Center	5, 11
Visualization Files: added Important note concerning the order files are to be imported Types table - added Optional Graphic Displays section to table	11
Input Parameters table: added 'Alias For' column and aliases added MCmd_Acq and MCmd_Rel parameters 'Cfg_IOFaultSeverity' - changed level 4 alarm severity from 'Highest' to 'Urgent' changed Alarm Severity from 1…4 to 1…1000 changed descriptions for 'PCmd_Tare', 'PCmd_StartFlow', 'PCmd_StopFlow', 'PCmd_CheckTol', 'PCmd_Bump', 'PCmd_Acq', 'PCmd_Rel', 'PCmd_Lock', 'PCmd_Unlock', 'PCmd_Reset', 'PCmd_<Alarm>Ack', 'PCmd_<Alarm>Suppress', 'PCmd_<Alarm>Unsuppress', and 'PCmd_<Alarm>Unshelve'	12
Output Parameters table: added 'SrcQ_', 'Nrdy_', 'Err_', 'Ack_', and 'Alm_', parameter descriptions to bullet list added 'Alias For' column and aliases added 'Sts_ShedResetReqd' and 'Sts_MAcqRcvd' parameters changed data type for 'Val_Mode' from DINT to SINT 'Val_Notify' - changed level 4 alarm severity from 'Highest' to 'Urgent'	17
Operations - added Simulation section	23
Status/Quality Indicators table: added symbol and description for 'Device not ready to operate' and 'Device disabled' added list of conditions under which Device Not Ready indicator appears changed level 4 alarm severity from 'Highest' to 'Urgent' changed Alarm Severity from 1…4 to 1…1000	27
Faceplate - added information about contents of faceplate title bar	33
Operator faceplate - added Alarm Locations image	36
Diagnostics tab - added section	49

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

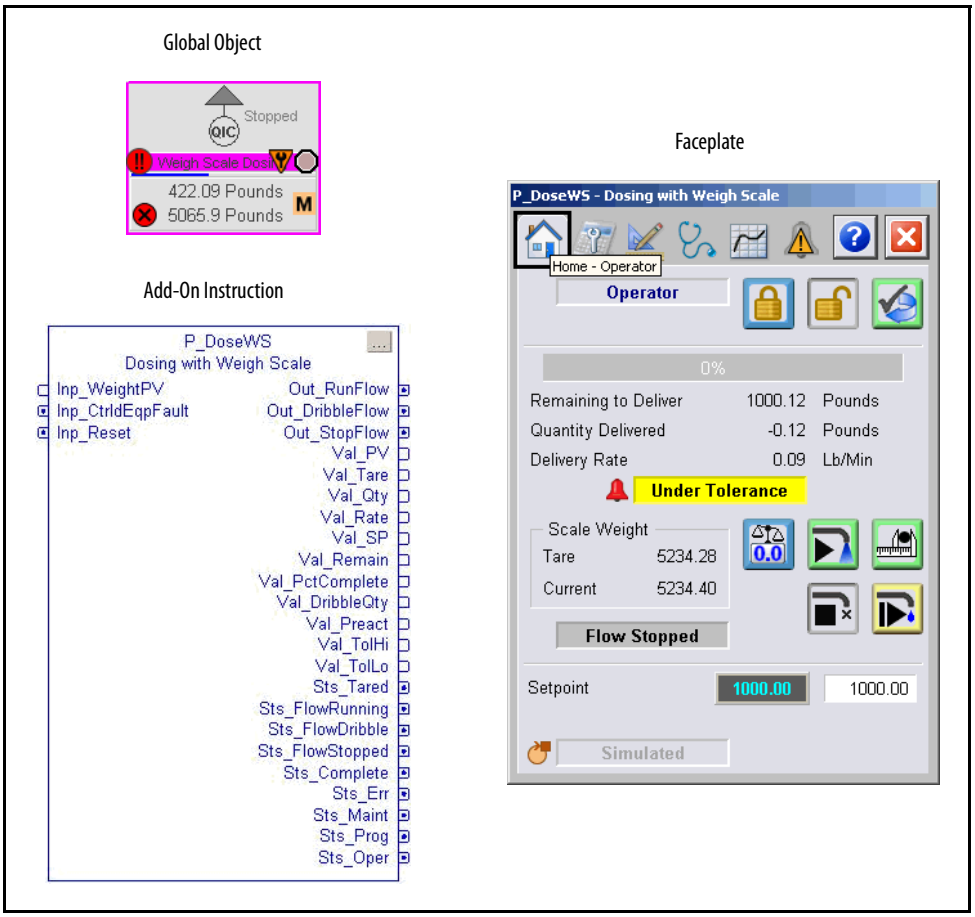
These documents contain additional information concerning related products from Rockwell Automation.

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.
Rockwell Automation Library of Process Objects: Common Alarm Block (P_Alarm) Reference Manual, publication SYSLIB-RM002	Details how to monitor an input condition to raise an alarm. Information includes acknowledging, resetting, inhibiting, and disabling an alarm. Generally the P_Alarm faceplate is accessible from the Alarms tab.
Rockwell Automation Library of Process Objects: Common Mode Block (P_Mode) Reference Manual, publication SYSLIB-RM005	Explains how to choose the Mode (owner) of an instruction or control strategy. The Mode instruction is usually embedded within other instructions to extend their functionality. It is possible to use a standalone Mode instruction to enhance a program where modes are wanted.

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.

Weigh Scale Dosing (P_DoseWS)

The P_DoseWS (Weigh Scale Dosing) Add-On Instruction controls an ingredient addition that uses a weigh scale to measure the quantity of ingredient added. The weigh scale can be on the receiving vessel (gain in weight) or on the sourcing vessel (loss in weight). The weigh scale can be connected via an analog input, device network, or other connection.



Guidelines

Use this instruction in these situations:

- You want to control basic dosing (ingredient addition) with basic features, such as bulk/dribble rate selection, preact, automatic preact adjustment, and the ability to start, pause, and resume flow.
- You are measuring the quantity of ingredient added to a destination vessel (gain in weight) or the quantity transferred from a source vessel (loss in weight) by using a weigh scale. The scale provides a weight value and can be interfaced via an analog input card, network, or other means.

Do **not** use this instruction in these situations:

- You want to measure the quantity of ingredient transferred with a flowmeter. Use the P_DoseFM instruction instead.
- You need to control precision blending. This instruction does not include capability for controlled-rate addition, such as ratio control, digital blending, or precision blending. Contact your Rockwell Automation representative for a blending solution.
- You need only a totalizer (integrator). Use the built-in TOT instruction instead.
- You need only to display a weigh scales's weight or generate high and low weight alarms. Use the P_AIn Analog Input Add-On Instruction instead.

You could need additional logic in these situations:

- You need more complicated sequencing, including special actions when restarting, aborting, or holding an addition. This sort of sequencing is a good candidate for an equipment phase. Equipment phase logic can drive the P_DoseWS instruction by using its Program mode commands and settings.
- The material transfer equipment requires complicated startup and shutdown logic. You can provide this logic separately and use the P_DoseWS outputs to trigger the logic for startup and shutdown of ingredient delivery.

Functional Description

The following diagram shows the functional characteristics of the P_DoseWS Add-On Instruction.

The P_DoseWS instruction provides the following capabilities:

- Provides linear scaling of the input weight value from raw (input card) units to engineering (display) units.
- Uses a software tare of the scale to establish the zero-quantity starting point for transfer. Once the scale is tared, the instruction checks for unrequested flow, that is, an increase or decrease in scale weight before flow is actually started, and raises a tare fault alarm if such a weight change occurs.
- Provides a rate of weight change calculation (differentiation with respect to time) to generate an inferred flow rate. The calculated rate is filtered and has a low cutoff, so the rate is reported as zero when the change in weight is only from noise on the input weight signal.
- Provides outputs to control associated equipment, such as pumps and valves to start and stop flow. The operator or the program can start the ingredient addition, then pause and resume as needed.
- Monitors the status of controlled equipment, such as pumps and valves. Flow is stopped and an alarm is raised on an equipment fault or if the equipment fails to respond as commanded.
- Monitors the weight PV input quality and communication status and provides indication of uncertain or bad weight PV. Flow is stopped and an alarm is raised on a bad PV or communication loss.
- Provides program or operator entry of a quantity to deliver (setpoint) and calculates the quantity remaining to deliver and percent complete during delivery.

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_DoseWS_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_DoseWS Visualization File Types

Application Type	File Type	FactoryTalk View SE Software	FactoryTalk View ME Software	Description
Graphics - Displays	GFX	(RA-BAS) P_DoseWS-Faceplate	(RA-BAS-ME) P_DoseWS-Faceplate	The faceplate display used for the object.
		(RA-BAS) P_DoseWS-Help	(RA-BAS-ME) P_DoseWS-Help	The P_DoseWS Help faceplate.
		(RA-BAS) P_DoseWS-Quick	(RA-BAS-ME) P_DoseWS-Quick	The Quick display used for the object.
		(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 alarm 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_DoseWS Help or P_Alarm faceplate.
		(RA-BAS) P_Mode-Help	(RA-BAS-ME) P_Mode-Help	Mode Help information that is accessed from the P_DoseWS Help faceplate.
		(RA-BAS) P_Mode-Config	(RA-BAS-ME) P_Mode-Config	Display used to set default mode.
Optional Graphic Displays		(RA-BAS) P_AIChan-Faceplate	(RA-BAS-ME) P_AIChan-Faceplate	The Channel faceplate used for the object. Use this file if your Analog Input has an associated P_AIChan object and you enable navigation to its faceplate from the Analog Input faceplate.
		(RA-BAS) P_AIChan-Help	(RA-BAS-ME) P_AIChan-Help	Channel Help information that is accessed from the P_AIChan Help faceplate. Use this file if you use the Analog Input Channel 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 Library faceplates.
		(RA-BAS) Process Faceplate Analog Objects	(RA-BAS-ME) Process Faceplate Analog Objects	Common global objects used for Process Object analog faceplates.
		(RA-BAS) Process Faceplate Misc Objects	(RA-BAS-ME) Process Faceplate Misc Objects	Common global objects used for Process Object miscellaneous faceplates.
		(RA-BAS) Process Graphics Library	(RA-BAS-ME) Process Graphics Library	Common global objects in the graphics library for this instruction.
		(RA-BAS) Process Help Objects	(RA-BAS-ME) Process Help Objects	Common global objects used for all Process Objects help displays.
		(RA-BAS) Process Mode Objects	(RA-BAS-ME) Process Mode Objects	Common global objects used for managing modes on all Process Object faceplates.

Table 2 - P_DoseWS Visualization File Types

Application Type	File Type	FactoryTalk View SE Software	FactoryTalk View ME Software	Description
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.

Weigh Scale Dosing 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.
- Command data elements (PCmd_, OCmd_, MCmd_) are used by program logic, operators, and maintenance personnel to request instruction actions.
- Setting data elements (PSet_, OSet_, MSet_) are used by program logic, operators, and maintenance personnel to establish runtime setpoints, thresholds, and so forth. Set_ data elements (without a leading P, O, or M) establish runtime settings regardless of role or mode.

Table 3 - P_DoseWS Input Parameters

Input Parameter	Data Type	Alias For	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_WeightPV	REAL		0.0	Weight from weigh scale (unscaled).
Inp_RunFdbk	BOOL		0	1 = Controlled equipment is delivering (running).
Inp_DribbleFdbk	BOOL		0	1 = Controlled equipment is delivering at dribble.
Inp_StopFdbk	BOOL		0	1 = Controlled equipment is confirmed stopped.

Table 3 - P_DoseWS Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
Inp_PVBad	BOOL		0	Bad Signal Quality/Communication Status for Inputs (1 = Bad, 0 = OK). If PV is read from an analog input, then this is normally read from the analog input channel fault status.
Inp_PVUncertain	BOOL		0	Uncertain Quality for Inputs (1 = Uncertain, 0 = OK). This is optional status for the input that can be used to drive the status of the output (Sts_PVUncertain).
Inp_CtrldEqpFault	BOOL		0	Controlled equipment device or I/O status: 0 = OK 1 = Fail
Inp_Sim	BOOL		0	Simulation input. When set to 1, the instruction simulates a working dosing action. When set to 0, the instruction controls dosing normally.
Inp_Reset	BOOL		0	Input parameter used to programatically reset alarms. When set to 1, all alarms requiring reset are reset.
Cfg_LossInWeight	BOOL		0	1 = Running reduces weight (Transfer Out). 0 = Running increases weight (Transfer In).
Cfg_HasDribble	BOOL		0	1 = Slow to dribble before complete. 0 = Run full flow until complete.
Cfg_HasEqpFdbk	BOOL		0	1 = Controlled Equipment provides Run, Dribble (if used), and Stop Feedback.
Cfg_UseEqpFdbk	BOOL		0	1 = Use run/dribble/stop feedback. 0 = Assume equipment state.
Cfg_AutoAdjPreact	BOOL		0	1 = Enable automatic adjustment of preact after each tolerance check.
Cfg_SetTrack	BOOL		1	This parameter is used to set up bumpless behavior of setting parameters when switching modes. When this parameter is 1, in Program mode the operator settings track the program settings; in Operator mode the program settings track the operator settings; and the simulation inputs match the output values (transitions are bumpless). When this parameter is 0, the operator settings and program settings are not modified by this instruction. In this case, when the mode is changed, the effective value of the setting can change depending on the program-set and operator-set values.
Cfg_HasChanObj	BOOL		0	1 = Tells HMI a Channel object (P_AIChan, etc.) is used for Inp_WeightPV. **IMPORTANT:** The name of the Channel object in the controller must be this object's name with the suffix '_Chan'. For example, if your P_DoseWS object has the name 'DoseWS123', then its Channel object must be named 'DoseWS123_Chan'.
Cfg_PCmdClear	BOOL	Mode.Cfg_PCmdClear	1	When this parameter is 1, program commands are cleared once they are acted upon. 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_ProgDefault	BOOL	Mode.Cfg_ProgDefault	0	This parameter defines the default mode. When this parameter is 1, the mode defaults to Program if no mode is being requested. When this parameter is 0, the mode defaults to Operator if no mode is being requested. **IMPORTANT:** Changing this parameter online can cause unintended mode changes.
Cfg_ShedOnEqpFault	BOOL		0	1 = Stop delivery and alarm on equipment fault. 0 = Alarm only on Equipment fault.
Cfg_HasOverTolAlm	BOOL	OverTol.Cfg_Exists	0	These parameters determine whether the corresponding alarm exists and is checked or if the alarm does not exist and is not used. When these parameters are 1, the corresponding alarm exists.
Cfg_HasUnderTolAlm		UnderTol.Cfg_Exists		
Cfg_HasTareFaultAlm		TareFault.Cfg_Exists		
Cfg_HasEqpFaultAlm		EqpFault.Cfg_Exists		

Table 3 - P_DoseWS Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
Cfg_OverTolResetReqd	BOOL	OverTol.Cfg_ResetReqd	0	These parameters determine whether a reset is required to clear the alarm status. When these parameters are 1, the alarm is latched ON when the alarm occurs. After the alarm condition returns to normal, a reset is required to clear the alarm status (for example, OCmd_Reset, Inp_Reset, or EqpFault.OCmd_Reset are required to clear Alm_EqpFault alarm after the alarm is set and the equipment returns to normal). When these parameters are 0, no reset is required and the alarm status is cleared when the alarm condition returns to normal. **IMPORTANT:** If the reset clears the alarm, it also acknowledges the alarm.
Cfg_UnderTolResetReqd		UnderTol.Cfg_ResetReqd		
Cfg_TareFaultResetReqd		TareFault.Cfg_ResetReqd		
Cfg_EqpFaultResetReqd		EqpFault.Cfg_ResetReqd		
Cfg_OverTolAckReqd	BOOL	OverTol.Cfg_AckReqd	1	These parameters determine whether an acknowledgement is required for an alarm. When these parameters are 1, the acknowledge (ack) bit is cleared when the alarm occurs. An acknowledge command (for example, PCmd_EqpFaultAck or EqpFault.OCmd_Ack) is required to acknowledge the alarm. When set to 0, the Acknowledge bit is set when an alarm occurs indicating an acknowledged alarm and no acknowledge command is required.
Cfg_UnderTolAckReqd		UnderTol.Cfg_AckReqd		
Cfg_TareFaultAckReqd		TareFault.Cfg_AckReqd		
Cfg_EqpFaultAckReqd		EqpFault.Cfg_AckReqd		
Cfg_OverTolSeverity	INT	OverTol.Cfg_Severity	750	These parameters determine the severity of each alarm. This drives the colors and symbols 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, these severity parameters drive only the indication on the global object and faceplate. The Alarms and Events definition of 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_UnderTolSeverity		UnderTol.Cfg_Severity	500	
Cfg_TareFaultSeverity		TareFault.Cfg_Severity	1000	
Cfg_EqpFaultSeverity		EqpFault.Cfg_Severity	1000	
Cfg_InpRawMin	REAL		0.0	Minimum unscaled weight input.
Cfg_InpRawMax	REAL		10000.0	Maximum unscaled weight input.
Cfg_PVEUMin	REAL		0.0	Minimum scaled weight PV input (engineering units).
Cfg_PVEUMax	REAL		10000.0	PV (Output) maximum for scaling to engineering units. **IMPORTANT:** The P_DoseWS instruction supports reverse scaling; either the raw (Input) or engineering (Scaled) range can be reversed (maximum less than minimum).
Cfg_MaxQty	REAL		1.0E+38	Maximum allowed quantity to deliver (setpoint) (engineering units).
Cfg_RateTime	REAL		1.0	Time factor for rate (60 for /min, 3600 for /hr) (seconds).
Cfg_RateFiltTC	REAL		0.1	Filter time constant (seconds) for calculated rate.
Cfg_TareFaultLim	REAL		1.0	Amount (engineering units) scale can drift after tare before starting flow without faulting.
Cfg_SettleT	REAL		1.0	Time to allow scale to settle before allowing tolerance check (seconds).
Cfg_BumpT	REAL		0.0	Bump (manual top-off) Time (seconds), 0.0 = use Bump command as a 'jog'.
Cfg_AutoAdjPct	REAL		10.0	Percentage of delivery error to auto-adjust preact (%).
Cfg_SimStartWt	REAL		0.0	Weight to start from (tare to) in simulation (engineering units).
Cfg_SimRate	REAL		1.0	Rate at which to deliver when running in simulation (engineering units/rate time).
Cfg_SimDribbleRate	REAL		0.1	Rate at which to dribble when running in simulation (engineering units/rate time).
Cfg_FaultT	DINT		10	Time for equipment feedback to follow output before fault (seconds).
Cfg_OperKeep	SINT		2#0000_0000	Operator keeps control in Program mode: Bit .0 = 1 operator keeps Start/Stop Bit .1 = 1 Operator keeps SP Bit .2 = 1 Operator keeps Dribble/preact Bit .3 = 1 Operator keeps Tolerances

Table 3 - P_DoseWS Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
Cfg_ProgKeep	SINT		2#0000_0000	Program keeps control in Operator mode: Bit .0 = 1 Program keeps Start/Stop Bit .1 = 1 Program keeps SP Bit .2 = 1 Program keeps Dribble/preact Bit .3 = 1 Program keeps Tolerances
PSet_SP	REAL		0.0	Program setting of total quantity to deliver (engineering units).
PSet_DribbleQty				Program setting of quantity to dribble (engineering units).
PSet_Preact				Program setting of quantity before total to stop flow (engineering units).
PSet_TolHi				Program setting of high (excess) tolerance limit.
PSet_TolLo				Program setting of low (shortage) tolerance limit.
PSet_Owner	DINT		0	Program owner request ID (non-zero) or Release (zero).
OSet_SP	REAL		0.0	Operator setting of total quantity to deliver (engineering units).
OSet_DribbleQty				Operator setting of quantity to dribble (engineering units).
OSet_Preact				Operator setting of quantity before total to stop flow (engineering units).
OSet_TolHi				Operator setting of high (excess) tolerance limit.
OSet_TolLo				Operator setting of low (shortage) tolerance limit.
PCmd_Tare	BOOL		0	When Cfg_PCmdClear is 1: • Set PCmd_Tare to 1 to reset the delivered quantity to 0 • This parameter is reset automatically When Cfg_PCmdClear is set to 0: • Set PCmd_Tare to 1 to reset the delivered quantity to 0 • This parameter is not reset automatically
PCmd_StartFlow	BOOL		0	When Cfg_PCmdClear is 1: • Set PCmd_StartFlow to 1 to start delivery • Set PCmd_StopFlow to 1 to stop delivery • Set PCmd_CheckTolerances to 1 to check tolerances • These parameters reset automatically When Cfg_PCmdClear is 0: • Set PCmd_StartFlow to 1 to start delivery • Set PCmd_StopFlow to 1 to stop delivery • Set PCmd_CheckTolerances to 1 to check tolerances • These parameters do not reset automatically
PCmd_StopFlow				
PCmd_CheckTol				
PCmd_Bump	BOOL		0	When PCmd_Bump is set to 1: • If the configured bump time (Cfg_BumpT) is non-zero, then bump delivery for the configured bump time – PCmd_Bump is cleared automatically • If the configured bump time (Cfg_BumpT) is zero, then bump delivery until PCmd_Bump is returned to 0 – PCmd_Bump is not cleared automatically • Cfg_PCmdClear does not affect this parameter
PCmd_Acq	BOOL	Mode.PCmd_Acq	0	When Cfg_PCmdClear is 1: • Set PCmd_Acq to 1 to Acquire • Set PCmd_Rel to 1 to Release • These parameters reset automatically When Cfg_PCmdClear is 0: • Set PCmd_Acq to 1 to Acquire • Set PCmd_Acq to 0 to Release • PCmd_Rel is not used • These parameters do not reset automatically
PCmd_Rel		Mode.PCmd_Rel		

Table 3 - P_DoseWS Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
PCmd_Lock	BOOL	Mode.PCmd_Lock	0	When Cfg_PCmdClear is 1: • Set PCmd_Lock to 1 to Lock • Set PCmd_Unlock to 1 to Unlock • These parameters reset automatically When Cfg_PCmdClear is 0: • Set PCmd_Lock to 1 to Lock • Set PCmd_Lock to 0 to Unlock • PCmd_Unlock is not used • These parameters do not reset automatically
PCmd_Unlock		Mode.PCmd_Unlock		
PCmd_Reset	BOOL		0	• Set PCmd_Reset to 1 to reset all alarms requiring reset • This parameter is always reset automatically
PCmd_OverTolAck	BOOL	OverTol.PCmd_Ack	0	• Set PCmd_<Alarm>Ack to 1 to Acknowledge alarm • The parameter is reset automatically
PCmd_UnderTolAck		UnderTol.PCmd_Ack		
PCmd_TareFaultAck		TareFault.PCmd_Ack		
PCmd_EqpFaultAck		EqpFault.PCmd_Ack		
PCmd_OverTolSuppress	BOOL	OverTol.PCmd_Suppress	0	When Cfg_PCmdClear is 1: • Set PCmd_<Alarm>Suppress to 1 to suppress alarm • Set PCmd_<Alarm>Unsuppress to 1 to unsuppress alarm • These parameters reset automatically When Cfg_PCmdClear is 0: • Set PCmd_<Alarm>Suppress to 1 to suppress alarm • Set PCmd_<Alarm>Suppress to 0 to unsuppress alarm • PCmd_<Alarm>Unsuppress is not used • These Parameters do not reset automatically
PCmd_UnderTolSuppress		UnderTol.PCmd_Suppress		
PCmd_TareFaultSuppress		TareFault.PCmd_Suppress		
PCmd_EqpFaultSuppress		EqpFault.PCmd_Suppress		
PCmd_OverTolUnsuppress	BOOL	OverTol.PCmd_Unsuppress	0	
PCmd_UnderTolUnsuppress		UnderTol.PCmd_Unsuppress		
PCmd_TareFaultUnsuppress		TareFault.PCmd_Unsuppress		
PCmd_EqpFaultUnsuppress		EqpFault.PCmd_Unsuppress		
PCmd_OverTolUnshelve	BOOL	OverTol.PCmd_Unshelve	0	• Set PCmd_<Alarm>Unshelve to 1 to Unshelve alarm • The parameter is reset automatically
PCmd_UnderTolUnshelve		UnderTol.PCmd_Unshelve		
PCmd_TareFaultUnshelve		TareFault.PCmd_Unshelve		
PCmd_EqpFaultUnshelve		EqpFault.PCmd_Unshelve		
OCmd_Tare	BOOL		0	Operator command to tare (reset delivered quantity to 0).
OCmd_StartFlow	BOOL		0	Operator commands to start delivery, stop/pause delivery, or check tolerances.
OCmd_StopFlow				
OCmd_CheckTol				
OCmd_Bump	BOOL		0	Operator command to bump delivery for under tolerance.
MCmd_Acq	BOOL	Mode.MCmd_Acq	0	Maintenance command to acquire ownership (Operator/Program/Override to Maintenance).
MCmd_Rel	BOOL	Mode.MCmd_Rel	0	Maintenance command to release ownership (Maintenance to Operator/Program/Override)
OCmd_AcqLock	BOOL	Mode.OCmd_AcqLock	0	Operator command to acquire (Program to Operator)/lock ownership.
OCmd_Unlock	BOOL	Mode.OCmd_UnlockRel	0	Operator command to unlock/release (Operator to Program) ownership.
OCmd_Reset	BOOL		0	Operator command to reset all alarms requiring reset.
OCmd_ResetAckAll	BOOL		0	Operator command to acknowledge and reset all alarms and latched shed conditions.

Weigh Scale Dosing Output Structure

Output parameters include the following:

- Output data elements (Out_) are the primary outputs of the instruction, typically used by hardware output modules; however, they can be used by other application logic.
- Value data elements (Val_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic or software packages.
- Source and Quality data elements (SrcQ_) are outputs of the instruction used by the HMI to indicate PV source and quality.
- 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.
- Not Ready data elements (Nrdy_) are bit outputs of the instruction for use by the HMI for displaying the Device Not Ready indicator. Not Ready bits can also be used by other application logic.
- 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_DoseWS 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.
Out_RunFlow	BOOL		1 = Deliver at full (fast) flow.
Out_DribbleFlow	BOOL		1 = Deliver at dribble (slow) flow.
Out_StopFlow	BOOL		1 = Stop delivery equipment.
Val_PV	REAL		Weight on scale (engineering units).
Val_Tare	REAL		Weight on scale when tare command received (engineering units).
Val_Qty	REAL		Quantity actually delivered (change in weight) (engineering units).
Val_Rate	REAL		Current delivery rate (engineering units/time).
Val_SP	REAL		Quantity to be delivered (setpoint) (engineering units).
Val_Remain	REAL		Quantity yet to deliver to reach setpoint (engineering units).
Val_PctComplete	REAL		Percent complete (for progress bar on HMI) 0.0…100.0%.
Val_DribbleQty	REAL		Quantity to be delivered at slow rate (engineering units).
Val_Preact	REAL		Quantity before SP when flow is stopped (engineering units).

Table 4 - P_DoseWS Output Parameters

Output Parameter	Data Type	Alias For	Description
Val_TolHi	REAL		Allowed quantity > or < SP (engineering units).
Val_TolLo			
Val_PVEUMin	REAL		Minimum of scaled range = MIN (Cfg_PVEUMin, Cfg_PVEUMax).
Val_PVEUMax	REAL		Maximum of scaled range = MAX (Cfg_PVEUMin, Cfg_PVEUMax).
SrcQ_IO	SINT		I/O signal source and quality.
SrcQ			Final dose source and quality. GOOD 0 = I/O live and confirmed good quality 1 = I/O live and assumed good quality 2 = No feedback configured, assumed good quality TEST 8 = Device simulated 9 = Device loopback simulation 10 = Manually entered value UNCERTAIN 16 = Live input, off-specification 17 = Value substituted at device/bus 18 = Value substituted by maintenance (Has and not Use) 19 = Shed, using last good value 20 = Shed, using replacement value BAD 32 = Signal failure (out-of-range, NaN, invalid combination) 33 = I/O channel fault 34 = I/O module fault 35 = Bad I/O configuration (for example, scaling parameters)
Val_Cmd	SINT		This shows the command being processed, returns to zero once the command secedes or fails. These values are also used for Inp_OvrdCmd: 0 = None 1 = Tare scale 3 = Start delivery 4 = Start dribble 5 = Bump 6 = Stop delivery
Val_Fdbk	SINT		This shows the input from the device: 0 = None 1 = Stopped 2 = Delivering 3 = Dribbling
Val_Sts	SINT		This is the primary status, used to show the operator the 'confirmed' device status: 0 = Power up / reset 1 = Stopped 3 = Delivering 4 = Dribbling 5 = Bumping 6 = Start delivery 7 = Start dribble 8 = Stopping 33 = Disabled
Val_Fault	SINT		This is the device fault status, used to show the operator the most severe device fault: 0 = None 17 = Equipment fault 34 = Configuration error

Table 4 - P_DoseWS Output Parameters

Output Parameter	Data Type	Alias For	Description
Val_Mode	SINT	Mode.Val	The shows the current mode of the object: 0 = No mode 2 = Maintenance 4 = Program (locked) 5 = Operator (locked) 6 = Program (unlocked, Operator is default) 7 = Operator (unlocked, Program is default) 8 = Program (unlocked, Program is default) 9 = Operator (unlocked, Operator is default)
Val_Owner	DINT		Current object owner ID (0 = not owned).
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)
Sts_Tared	BOOL		Scale tare completed, Quantity = 0.
Sts_FlowStarting	BOOL		1 = Flow is starting (Out_Run is on, feedback not showing run).
Sts_FlowRunning	BOOL		1 = Flow is running (Out_Run is on, feedback showing run).
Sts_DribbleStarting	BOOL		1 = Dribble starting (Out_Dribble is on, feedback not showing dribble).
Sts_FlowDribble	BOOL		1 = Flow is slowed to dribble (Out_Dribble is on, feedback showing dribble).
Sts_FlowStopping	BOOL		1 = Flow is stopping (Out_Stop is on, feedback not showing stopped).
Sts_FlowStopped	BOOL		1 = Flow is Stopped (Out_Stop is on, feedback showing stopped).
Sts_Bumping	BOOL		1 = Bump flow is active.
Sts_Complete	BOOL		1 = Total delivered > (SP - preact).
Sts_InTol	BOOL		1 = Total delivered is within tolerances.
Sts_Available	BOOL		1 = Dosing available for control by automation (program).
Sts_PVBad	BOOL		1 = Weight PV and rate PV quality bad (I/O fail). 0 = OK.
Sts_PVUncertain	BOOL		1 = Weight PV and rate PV quality is uncertain. 0 = OK.
Sts_NotRdy	BOOL		1 = Device is not ready to be operated.
Nrdy_CfgErr	BOOL		1 = Device Not Ready: • Configuration error • PV bad quality or communication failure • External equipment fault (fault or shed requires reset) • Device logic disabled/no mode
Nrdy_PVBad			
Nrdy_EqpFault			
Nrdy_NoMode			
Sts_MaintByp	BOOL		1 = A maintenance bypass is active, display icon.
Sts_AlmInh	BOOL		1 = One or more alarms shelved, disabled or suppressed.
Sts_Err	BOOL		1 = Error: bad configuration, see detail err bits for reason.
Err_Raw	BOOL		1 = Error: Cfg_InpRawMax = Cfg_InpRawMin.

Table 4 - P_DoseWS Output Parameters

Output Parameter	Data Type	Alias For	Description
Err_EU	BOOL		1 = Error: Cfg_PVEUMax = Cfg_PVEUMin.
Err_Rate	BOOL		1 = Error: Cfg_RateFiltTC or Cfg_RateTime invalid.
Err_Limit	BOOL		1 = Error: Cfg_TareLim inval;id (must be > 0.0).
Err_Qty	BOOL		1 = Error: Cfg_MaxQty invalid (must be > 0.0).
Err_Sim	BOOL		1 = Error: Cfg_SimDribbleRate or Cfg_SimRate invalid.
Err_Timer	BOOL		1 = Error: Cfg_BumpT (use 0.0…2,147,483.647).
Err_Alarm	BOOL		1 = Error: alarm minimum on time or severity configuration invalid.
Sts_Maint	BOOL	Mode.Sts_Maint	1 = Mode is Maintenance (supersedes Override, Program, Operator).
Sts_Prog	BOOL	Mode.Sts_Prog	1 = Mode is Program (auto).
Sts_Oper	BOOL	Mode.Sts_Oper	1 = Mode is Operator (manual).
Sts_ProgOperLock	BOOL	Mode.Sts_ProgOperLock	1 = Program or operator has requested mode lock.
Sts_NoMode	BOOL	Mode.Sts_NoMode	1 = No mode (disabled because EnableIn is **false**).
Sts_MAcqRcvd	BOOL	Mode.Sts_MAcqRcvd	1 = Maintenance acquire command received this scan.
Sts_OverTol	BOOL	OverTol.Inp	1 = Delivery out of tolerance high (excess).
Sts_UnderTol		UnderTol.Inp	1 = Delivery out of tolerance low (short).
Sts_TareFault		TareFault.Inp	1 = Scale reading moved unexpectedly since tare.
Sts_EqpFault		EqpFault.Inp	1 = Equipment fault detected.
Alm_OverTol	BOOL	OverTol.Alm	1 = Delivery out of tolerance high (excess) alarm.
Alm_UnderTol		UnderTol.Alm	1 = Delivery out of tolerance low (short) alarm.
Alm_TareFault		TareFault.Alm	1 = Warning: scale reading moved since tare.
Alm_EqpFault		EqpFault.Alm	1 = Alarm: Equipment fault (sensor or controlled equipment).
Ack_OverTol	BOOL	OverTol.Ack	1 = Over/Under Tolerance, Tare Fault, or Equipment Fault alarm acknowledged.
Ack_UnderTol		UnderTol.Ack	
Ack_TareFault		TareFault.Ack	
Ack_EqpFault		EqpFault.Ack	
Sts_OverTolDisabled	BOOL	OverTol.Disabled	1 = Over/Under Tolerance, Tare Fault, or Equipment Fault alarm disabled by maintenance.
Sts_UnderTolDisabled		UnderTol.Disabled	
Sts_TareFaultDisabled		TareFault.Disabled	
Sts_EqpFaultDisabled		EqpFault.Disabled	
Sts_OverTolShelved	BOOL	OverTol.Shelved	1 = Over/Under Tolerance, Tare Fault, or Equipment Fault alarm shelved by operator.
Sts_UnderTolShelved		UnderTol.Shelved	
Sts_TareFaultShelved		TareFault.Shelved	
Sts_EqpFaultShelved		EqpFault.Shelved	
Sts_OverTolSuppressed	BOOL	OverTol.Suppressed	1 = Over/Under Tolerance, Tare Fault, or Equipment Fault alarm suppressed by program.
Sts_UnderTolSuppressed		UnderTol.Suppressed	
Sts_TareFaultSuppressed		TareFault.Suppressed	
Sts_EqpFaultSuppressed		EqpFault.Suppressed	

Table 4 - P_DoseWS Output Parameters

Output Parameter	Data Type	Alias For	Description
Rdy_Tare	BOOL		1 = Ready for OCmd Tare, StartFlow, StopFlow, CheckTol, or Bump (enables HMI button).
Rdy_StartFlow			
Rdy_StopFlow			
Rdy_CheckTol			
Rdy_Bump			
Rdy_Reset	BOOL		1 = At least one alarm requires reset.
Rdy_ResetAckAll	BOOL		1 = At least one alarm or latched shed condition requires reset or acknowledgement.
Rdy_SP	BOOL		1 = Ready to receive OSet_SP.
Rdy_DribPre	BOOL		1 = Ready to receive OSet_DribbleQty or OSet_Preact.
Rdy_Tol	BOOL		1 = Ready to receive OSet_TolHi or OSet_TolLo.
P_DoseWS	BOOL		Unique parameter name for auto-discovery.

Weigh Scale Dosing Local Configuration Tags

Configuration parameters that are arrayed, 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_DoseWS Local Configuration Tags

Tag Name	Data Type	Default	Description
Cfg_Desc	STRING_40	'Dosing with Weigh Scale'	Description for display on HMI. This string is shown in the title bar of the faceplate.
Cfg_Label	STRING_20	'Weigh Scale Dosing'	Label for graphic symbol displayed on HMI. This string appears on the graphic symbol.
Cfg_QtyEU	STRING_8	'kg'	Engineering units for quantity for display on HMI.
Cfg_RateEU	STRING_8	'kg/sec'	Engineering units for rate (flow) for display on HMI.
Cfg_Tag	STRING_20	'P_DoseWS'	Tagname for display on HMI. This string is shown in the title bar of the faceplate.

Operations

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

Modes

The P_DoseWS instruction uses the following standard modes, implemented by using an embedded P_Mode Add-On Instruction.

Graphic Symbol	Description
Operator Mode	Control of the dosing is owned by the Operator. Operator Commands (OCmd_) and Operator Settings (OSet_) from the HMI are accepted.
Program Mode	Control of the dosing is owned by Program logic. Program Commands (PCmd_) and Program Settings (PSet_) are accepted.
Maintenance Mode	Control of the dosing is owned by Maintenance. Operator Commands and Settings from the HMI are accepted. Devices timeout checks are not processed.
No Mode	The dosing is disabled and has no owner because the EnableIn input is false. The main instruction Logic routine is not being scanned. See Execution for more information on EnableInFalse processing.

The Hand and Override (ovrd) modes are not used. (These modes are typically used by the controlled equipment.)

Refer to the Rockwell Automation Library of Process Objects: Common Mode Block (P_Mode) Reference Manual, publication SYSLIB-RM005, for more information.

Alarms

The P_DoseWS instruction uses the following alarms, implemented by using embedded P_Alarm Add-On Instructions.

Alarm	Alarm Name	Description
Over tolerance	OverTol	Raised when tolerance check is performed if the quantity delivered exceeds the setpoint by more than the high tolerance limit.
Under tolerance (warning)	UnderTol	Raised when the tolerance check is performed if the quantity delivered falls short of the setpoint by more than the low tolerance limit. **TIP:** The Bump function can be used to make up the shortage.
Equipment fault	EqpFault	Raised if the controlled equipment asserts the Inp_CtrldEqpFault input or if the equipment feedback signals fail to track the commanded state of the equipment. If configured as a shed fault, this also stops flow if it is running.
Tare fault	TareFault	Raised if the scale is tared and then drifts away from the tare weight before the start flow command is received.

Refer to the Rockwell Automation Library of Objects: Common Alarm Block (P_Alarm) Reference Manual, publication SYSLIB-RM002, for more information.

Simulation

When the P_DoseWS block is placed in simulation, it continues to generate its outputs to control equipment, but the vessel weight is ignored and a simulated weight is generated.

This operation in simulation is different from the equipment (motor, valve, drive) instructions.

WARNING: In order to avoid starting equipment during simulation, the downstream equipment instructions must be put in simulation so that their outputs are held in the SAFE state.
Failure to do this can result in personal injury or equipment damage.

Set the Inp_Sim parameter to '1' to enable simulation.

The Simulation or Loopback Test icon  is displayed at the bottom left of the faceplate to indicate the device is in simulation.

While in simulation, you can use the following parameters to control how the weight is simulated.

- Cfg_SimStartWt - when the Tare function is used, this value will be copied to the simulated scale weight. As delivery occurs, the simulated weight will increase (transfer in) or decrease (transfer out) from this point.
- Cfg_SimRate - the full rate to be used for delivery (in weight units/rate time).
- Cfg_SimDribbleRate - the rate to be used for dribble (in weight units/rate time).

When you have finished simulation, clear the Inp_Sim parameter to '0' to return to normal operation.

Execution

The following table explains the handling of instruction execution conditions.

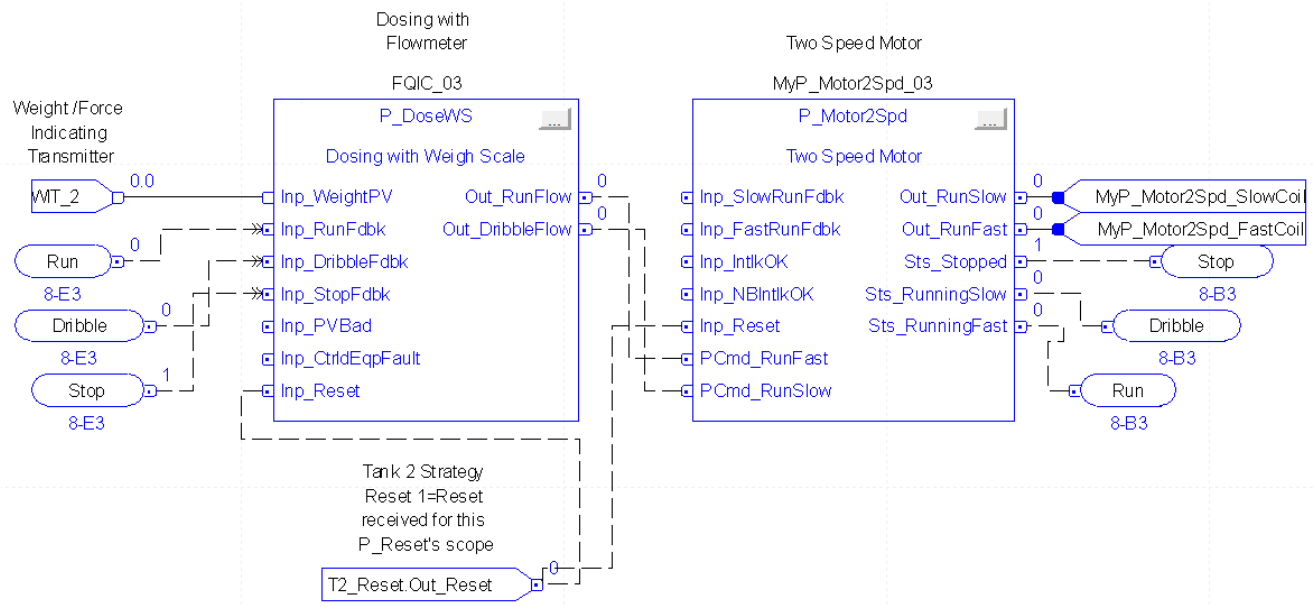
Condition	Description
EnableIn false (false rung)	Any commands received are discarded. All alarms are cleared. The mode is reported as No Mode. The displayed rate is zeroed. Outputs to controlled equipment are de-energized. Other output parameters (values and status) hold their last value.
Powerup (pre-scan, first scan)	Any commands received before first scan are discarded. Embedded P_Alarm instructions are handled in accordance with their standard powerup procedures. Refer to the reference manual for the P_Alarm instruction for more information.
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.

Programming Example

The P_DoseWS example below shows a simple configuration of the block with a two speed motor (P_Motor2Spd).

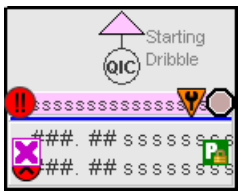
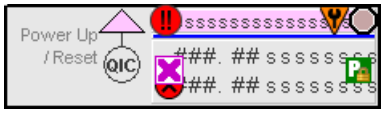
The Input to P_DoseWS (Inp_WeightPV) is taken directly from a weight/force indicating transmitter (WIT_2). The outputs of the block (Out_RunFlow and Out_DribbleFlow) are connected to the inputs to the motor PCmd_RunFast and PCmd_RunSlow, respectively. The motor status outputs stopped (Sts_Stopped), running slow (Sts_RunningSlow), running fast (Sts_RunningFast) are connected back to the P_DoseWS block as inputs Inp_StopFdbk, Inp_RunFdbk, and Inp_DribbleFdbk.



Display Elements

A display element (global object) is created once and can be referenced multiple times on multiple displays in an application. When changes are made to the original (base) object, the instantiated copies (reference objects) are automatically updated. Use of global objects, in conjunction with tag structures in the ControlLogix system, aid consistency and save engineering time.

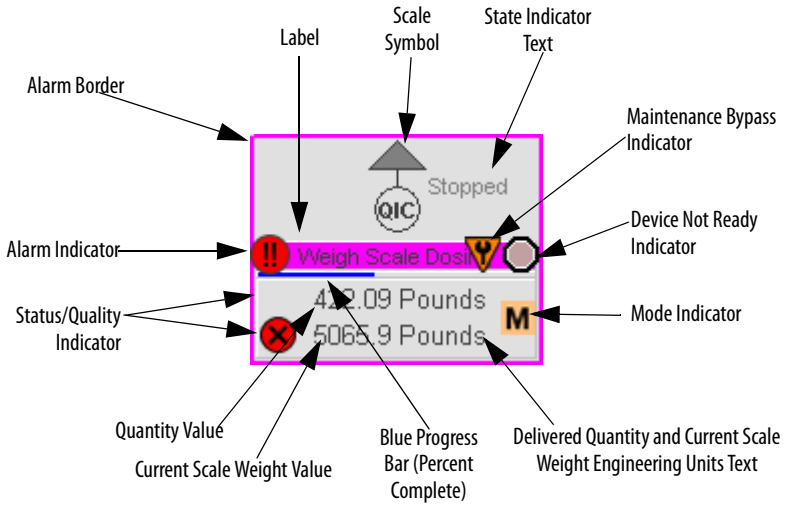
Table 6 - P_DoseWS Display Elements Description

Display Element Name	Display Element	Description
GO_DoseWS		Vertical orientation up.
GO_DoseWS1		Horizontal orientation right.
GO_DoseWS2		Horizontal orientation left.

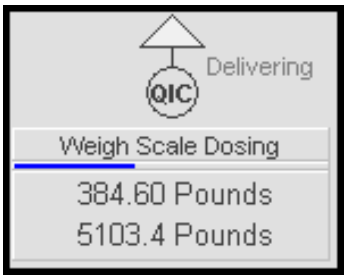
Graphic objects are provided for use on end-user process graphic displays.

Common attributes of the P_DoseWS graphic symbols include the following:

- Graphical representation of the device
- Maintenance Bypass indicator
- Status/quality indicator
- Mode indicator
- Quantity and Scale Weight values
- Label
- State text
- Progress bar (percent complete)
- Quantity and Scale Weight Engineering Units
- Color changing alarm border that blinks on unacknowledged alarm
- Alarm indicator that changes color for the severity of the alarm



The overall graphic symbol includes a touch field over it that opens the object's faceplate. In addition, pausing the pointing device over the graphic symbol displays a tooltip showing the object's configured tag and description.



Graphic Representation

The label changes color based on the highest severity alarm currently active.

Color	Alarm Severity
Light blue	Low alarm
Yellow	Medium alarm
Red	High alarm
Magenta	Urgent alarm
Gray	No active alarms

The color of the weigh scale symbol and its state text change depending on the commanded state of the controlled equipment.

Color	Flowmeter State
Dark Gray	No flow (stopped)
White	Running
Blue	Dribble
Light Blue	Bumping

Status/Quality Indicators

Each of these symbols appears when the described condition is true.

Graphic Symbol	Description
	Invalid configuration.
	Weight input quality bad (stale).
	Device not ready to operate.
	Weight input quality uncertain.
	Device disabled.
No symbol displayed	Weight input quality good and no invalid configuration entries.

TIP When the Invalid Configuration indicator appears, you can find what configuration setting is invalid by following the indicators. Click the graphic symbol to open the faceplate. The Invalid Configuration indicator appears next to the appropriate tab at the top of the faceplate to guide you in finding the configuration error. Once you navigate to the tab, the misconfigured item is flagged with this indicator or appears in a magenta box.

For the Dosing with Weigh Scale Instruction, the Invalid Configuration Indicator appears under the following conditions:

- Weight Input Raw Minimum and Raw Maximum scaling parameters are set to the same value.
- Weight Scaled engineering units Minimum and engineering units Maximum scaling parameters are set to the same value.
- Rate Filter Time Constant value is less than zero.
- Rate Time value is less than or equal to zero.
- Maximum Allowed Quantity Setpoint value is less than or equal to zero.
- Scale Tare Fault Limit value is less than zero.
- Simulation Starting Weight, Simulation Flow Rate, or Simulation Dribble Rate value is less than or equal to zero.

- Settle Time, Bump Time, Clear Pulse Time, or Equipment Fault Check Time is set to a value less than zero or greater than 2,147,483 seconds.
- Alarm Minimum On Time is set to a value less than zero or greater than 2,147,483 seconds.
- Alarm Severity is set to a value less than 1 or greater than 1000.

TIP When the Not Ready indicator appears, you can find what condition is preventing operation by following the indicators. Click the graphic symbol to open the faceplate. The Not Ready indicator appears next to the appropriate tab at the top of the faceplate to guide you in finding the condition. When you navigate to the tab, the condition preventing operation is flagged.

For the Dosing with Weigh Scale instruction, the Device Not Ready indicator appears under the following conditions:

- There is a configuration error.
- PV quality bad or communication error.
- External equipment fault and fault or shed requires reset.
- Device logic is disabled or there is no mode.

Maintenance Bypass Indicator

This symbol appears to the right of the label to indicate that a Maintenance bypass has been activated.

Graphic Symbol	Description
	A Maintenance bypass is active.
No symbol displayed	No Maintenance bypass active.

TIP When the Maintenance Bypass Indicator appears, you can find what condition was bypassed by following the indicators. Click the Graphic Symbol to open the Faceplate. The Maintenance Bypass Indicator appears next to the appropriate tab at the top of the Faceplate to guide you in finding the bypass. Once you navigate to the tab, the bypassed item is flagged with this indicator.

For the P_DoseWS Instruction, the Maintenance Bypass Indicator appears when the instruction is configured by engineering to have equipment feedback, but maintenance personnel have selected to not use the equipment feedback.

Mode Indicators

One of these symbols appears to the right of the current weight to indicate the mode of the weigh scale dosing instruction.

Table 7 - P_DoseWS Mode Indicators

Graphic Symbol	Description
Transparent	Operator mode (if the default mode is Operator and in Operator mode, the mode indicator is transparent)
	Operator mode (if the default mode is Program)
	Operator mode locked
Transparent	Program mode (if the default mode is Program and in Program mode, the mode indicator is transparent)
	Program mode (if the default mode is Operator)
	Program mode locked
	Maintenance mode
	No mode

TIP The images provided for the Operator and Program default modes are completely transparent; therefore, no mode indicators appear if the device is in its default mode. This behavior can be changed by replacing these mode indicators with images that are not completely transparent.

Refer to the Rockwell Automation Library of Process Objects: Common Mode Block (P_Mode) Reference Manual, publication SYSLIB-RM005, for more information.

Alarm Indicators

One of these symbols appears to the left of the label to indicate the described alarm condition. The alarm border and label background blink if acknowledgement of an alarm condition is required.

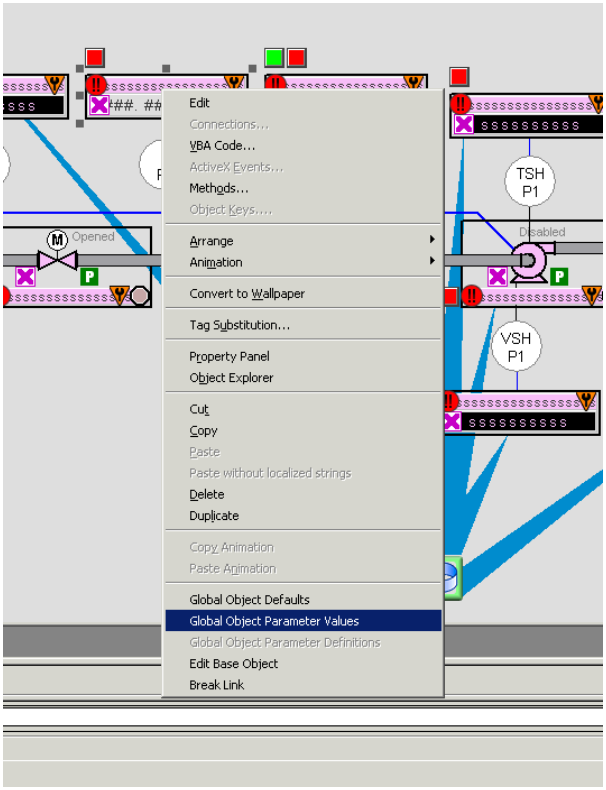
Symbol	Border and Label Background	Description
	No change in color	Alarm Inhibit: an alarm is suppressed by the Program, disabled by Maintenance, or shelved by the Operator.
	White	Return to normal (no alarm condition), but a previous alarm has not been acknowledged.
	Blue	Low severity alarm.
	Yellow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

Refer to the Rockwell Automation Library of Process Objects: Common Alarm Block (P_Alarm) Reference Manual, publication SYSLIB-RM002, for more information.

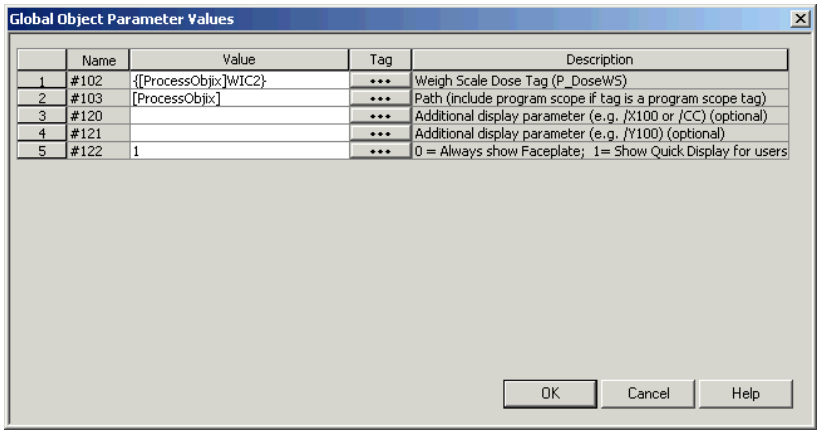
Use Global Objects

The graphic symbol for P_DoseWS can be found in the global object file (RA-BAS) Process Graphics Library.ggfx.

1. Copy the global object from the global object file and paste it in the display file.
2. In the display, right-click the global object and choose Global Object Parameter Values.



The Global Object Parameter Values dialog box appears.



The global object parameters are as follows.

Parameter	Required	Description
#102	Y	Object tag to point to the name of the associated object Add-On Instruction in the controller.
#103	Y	Path used for display navigation features to other objects. Include program scope if tag is a program scope tag.
#120	N	Additional parameter to pass to the display command to open the faceplate. Typically used to define position for the faceplate.
#121	N	Additional parameter to pass to the display command to open the faceplate. If defining X and Y coordinate, separate parameters so that X is defined by #120 and Y is defined by #121. This lets the same parameters to be used in subsequent display commands originating from the faceplate.
#122	Y	These are the options for the global object display: 0 = Always show faceplate 1 = Show Quick Display for users without Maintenance access (Code C) 2 = Always show Quick Display

3. Type the tag or value in the Value column as specified in the Description column.

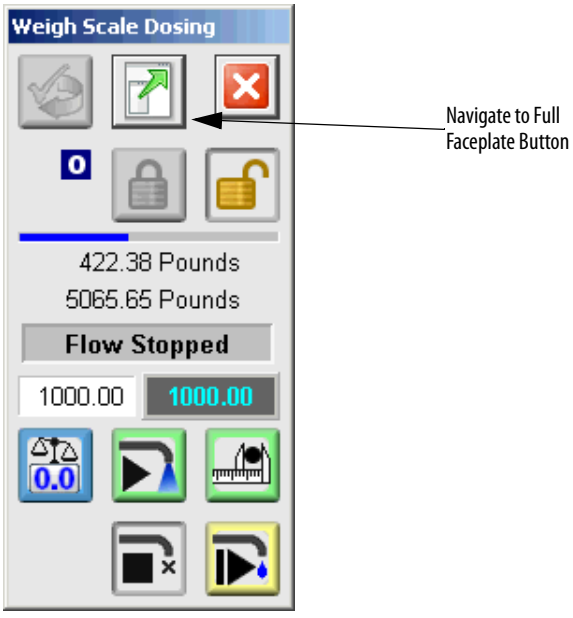
   TIP Click the ellipsis (. . .) to browse and choose a tag.

   Values for items marked '(optional)' can be left blank.

4. Click OK.

Quick Display

The Quick Display screen provides the means for operators to perform simple interactions with the P_DoseWS instruction instance. From the Quick Display, you can navigate to the faceplate for full access for operation, maintenance, and configuration.

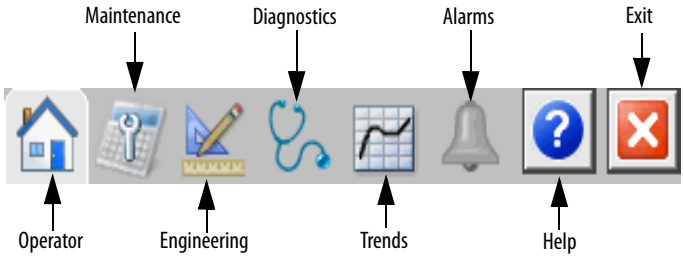


Faceplate

The weigh scale dosing faceplate consists of six tabs and each tab consists of one or more pages.

The title bar of each faceplate contains the value of local configuration tags Cfg_Tag and Cfg_Desc.

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon at the top of the faceplate to access a specific tab.



The faceplate provides the means for operators, maintenance personnel, engineers, and others to interact with the P_DoseWS instruction instance, including viewing its status and values and manipulating it through its commands and settings. When a given input is restricted via FactoryTalk View security, the required user-security code letter is shown in the tables that follow.

Operator Tab

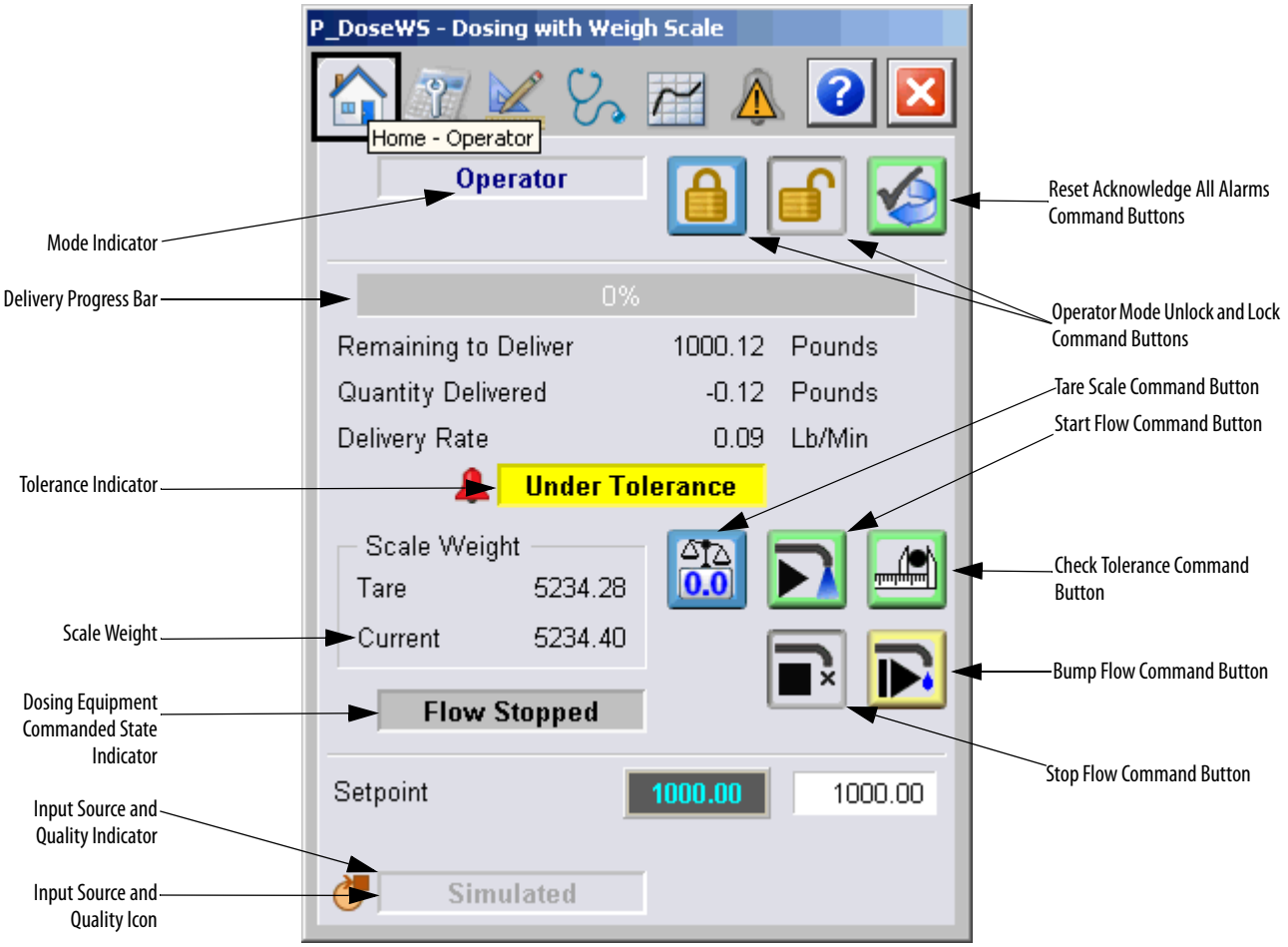
The Faceplate initially opens to the Operator ('Home') tab. From here, an operator can monitor the device status and manually operate the device when it is in Operator mode.

The Operator tab shows the following information:

- Current mode (Operator, Program, or Maintenance)
- Requested modes indicator (appears only if the Operator or Program mode has been superseded by another mode; see the Maintenance tab section for more information.)
- Delivery progress bar if delivering, or the delivery status (Tared, Complete, or Complete at Zero)
- Quantity remaining to deliver display
- Quantity delivered display
- Delivery rate display
- Tolerance check result indicator (in tolerance, over tolerance, or under tolerance; this appears after performing a tolerance check)
- Equipment commanded state indicator, for example, stopped, running, dribble, or bumping
- Quantity setpoint data entry field
- Input Source and Quality indicator (See 'SrcQ' in the Output parameters table on page 18 for details).

TIP The Tolerance Indicator shows if the delivery was in tolerance, under tolerance, or over tolerance. This indicator is visible only when a tolerance check has been requested after delivery is complete.

If a delivery is under tolerance (short) and the bump function is enabled, the operator can bump the equipment to try to make up the shortfall and bring the delivery into tolerance



The following table shows the functions on the Operator tab.

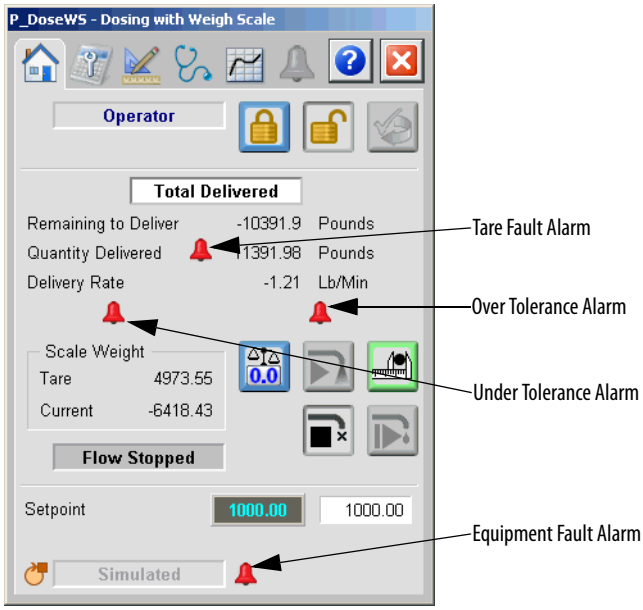
Table 8 - Operator Tab Description

Button/Field	Action	Security
	Click to release Operator mode Lock.	Manual device operation (code B)
	Click to lock in Operator mode.	
	Click to request Program mode.	
	Click to request Operator mode.	

Table 8 - Operator Tab Description

Button/Field	Action	Security
	Click to reset and acknowledge all alarms.	Acknowledge alarms (code F)
	Click to tare the scale. This sets the delivered quantity to zero.	Normal operation of devices (code A)
	Click to start or resume delivery.	
	Click to stop (pause) delivery.	
	Click to perform a tolerance check on the delivered quantity.	
	Click to bump flow. This function is used to top off a delivery that has passed the preact point but is still short of the setpoint quantity.	
Setpoint quantity	Configure the quantity to deliver.	

Alarm indicators appear on the Operator tab when the corresponding alarm occurs.



Alarm status indicators appear next to values or status indicators that are in alarm. The following table shows the meaning of alarm status indicators on the Operator tab.

Table 9 - Alarm Status Indicators

Graphic Object	Alarm Status
	In alarm (active alarm)
	In alarm and acknowledged
	Out of alarm but not acknowledged
	Alarm suppressed (by program)
	Alarm disabled (by maintenance)
	Alarm shelved (by operator)

Maintenance Tab

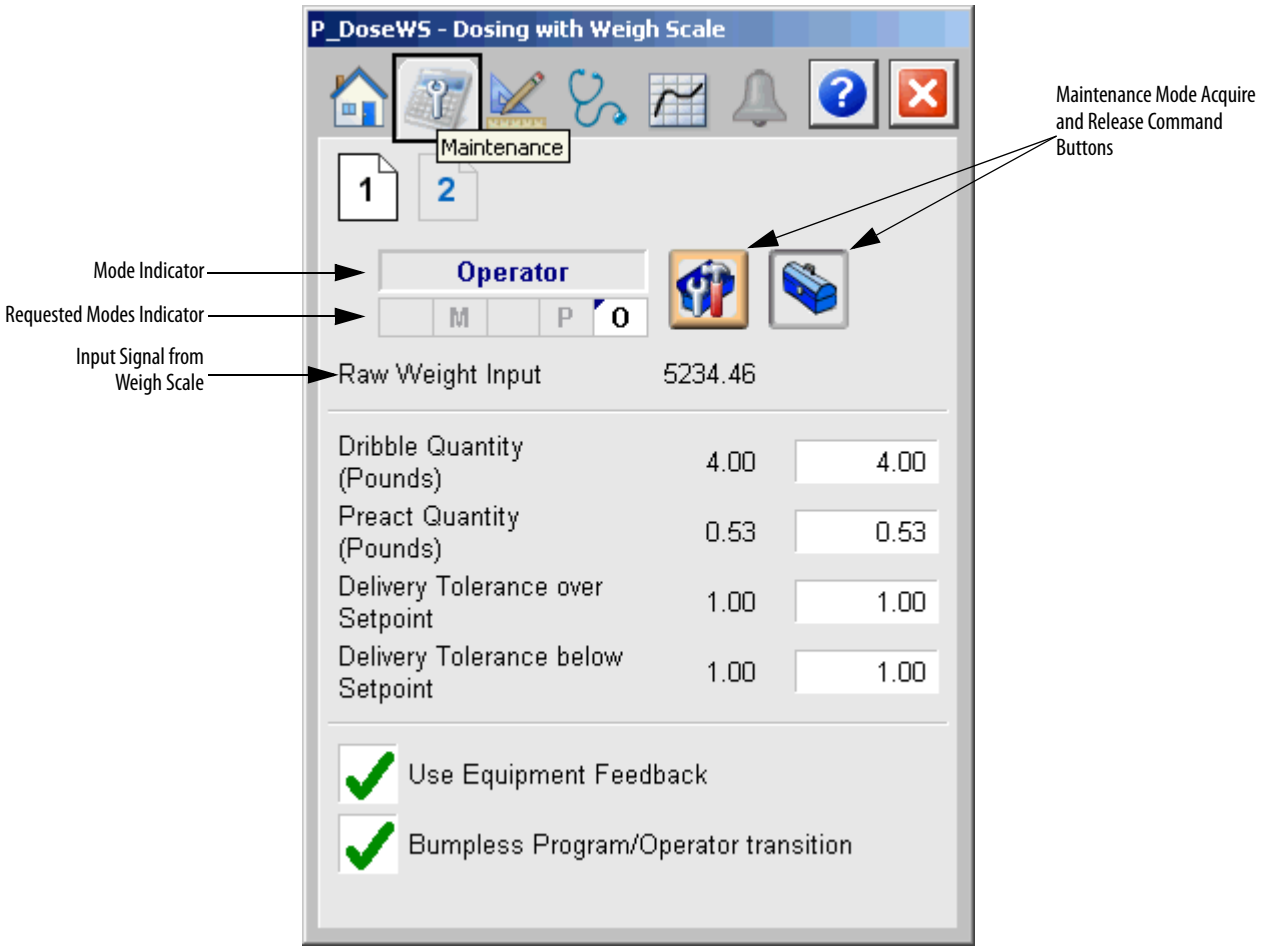
Maintenance personnel use the information and controls on the Maintenance tab to make adjustments to device parameters, troubleshoot and temporarily work around device problems, and disable the device for routine maintenance.

The Maintenance is divided into two pages.

Maintenance Tab Page 1

Page one of the Maintenance tab shows the following information:

- Current mode (Operator, Program, or Maintenance)
- Requested modes indicator highlights all of the modes that have been requested, and the left-most highlighted mode is the active mode
- Current high tolerance value
- Current low tolerance value
- Dribble quantity data entry field
- Preact quantity data entry field



The following table shows the functions on page one of the Maintenance tab.

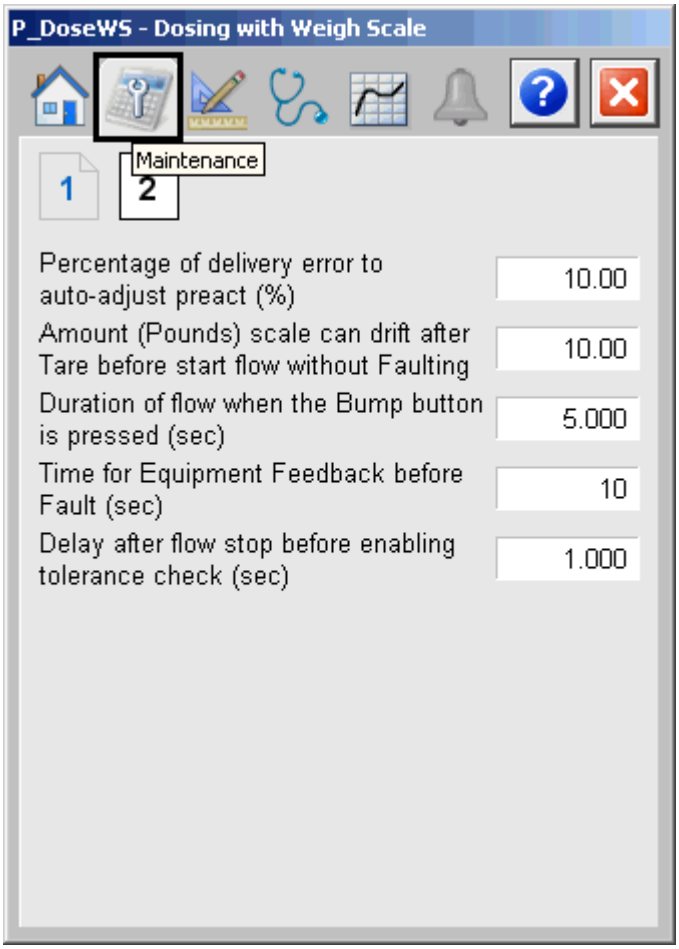
Table 10 - Maintenance Tab Page 1 Description

Button/Field	Action	Security	Configuration Parameters
	Click to request Maintenance mode.	Equipment maintenance (code C)	None
	Click to release Maintenance mode.		
Raw Weight Input (Pounds)	Click to open an upstream channel object faceplate (for example, P_AIChan). **IMPORTANT:** 'Enable navigation to Weight input object' on page 2 of the Engineering tab must be enabled for this field to be displayed. (See Engineering Tab Page 2 on page 45.)	Normal operation of Devices (code A)	
Dribble quantity (Pounds))	Configure the quantity in pounds left to deliver before switching to a reduced flow rate (dribble) for finer control of the final quantity.		
Preact quantity (Pounds)	Configure the quantity prior to reaching the setpoint before commanding the delivery equipment to stop and let the equipment react. This helps to prevent overshooting the delivery setpoint.		
Delivery Tolerance over Setpoint	Type the high tolerance threshold. When a tolerance check is initiated, if the delivered quantity exceeds the setpoint amount by more than this amount, the delivery is over tolerance; the over tolerance alarm is raised if enabled.		
Delivery Tolerance below Setpoint	Type the low tolerance threshold. When a tolerance check is initiated, if the delivered quantity falls short of the setpoint amount by more than this amount, the delivery is under tolerance; the under tolerance alarm is raised if enabled. For the Low tolerance condition, the operator can command a bump flow to try to bring the quantity delivered into tolerance.		

Table 10 - Maintenance Tab Page 1 Description

Button/Field	Action	Security	Configuration Parameters
Use Equipment Feedback	Check to use the available feedback from the delivery equipment and take the device out of Maintenance Bypass. Clear this checkbox to not use feedback from the delivery equipment and place the device in Maintenance Feedback. **IMPORTANT:** 'Delivery Equipment has Feedback' on page 2 of the Engineering tab must be enabled for this field to be visible. (See Engineering Tab Page 2 on page 45.)	Equipment maintenance (code C)	Cfg_UseEqpFdbk
Bumpless Program/ Operator Transition	Check to enable or disable bumpless program/operator transition of quantity setpoint, dribble quantity, preact and tolerance Threshold settings (tracking).		Cfg_SetTrack

Maintenance Tab Page 2



The following table lists the functions of page two of the Maintenance tab.

Table 11 - Maintenance Tab Page 2 Description

Button/Field	Action	Security	Configuration Parameters
Percentage of delivery error to auto-adjust preact (%)	Type the percentage of delivery error. When the delivery tolerance is checked, if no bump has occurred and if the delivery is in tolerance, the error (difference between delivery setpoint and actual delivery) is multiplied by this percentage and applied to the preact. This lets the preact self tune and learn the correct value of the preact over time.	Configuration & tuning maintenance (Code D)	Cfg_AutoAdjPct
Amount (Pounds) scale can drift after Tare before starting flow without faulting	Type the tare fault threshold. After the scale is tared and before flow is commanded, if the weight reported by the scale drifts from the tare weight by more than this amount, a tare fault alarm is raised.		Cfg_TareFaultLim

Table 11 - Maintenance Tab Page 2 Description

Button/Field	Action	Security	Configuration Parameters
Duration of flow when Bump is pressed (seconds)	Type the amount of time to command the controlled equipment to run flow when the bump command button is pressed. If this value is set to zero, Bump is treated like a Jog: flow starts when the button is pressed and stops when the button is released. If this value is greater than zero, flow is bumped for the configured time.	Configuration & tuning maintenance (Code D)	Cfg_BumpT
Time after output for equipment feedback before Fault (seconds)	Type the maximum allowed feedback time. If equipment feedback is being used, the instruction allows this much time after commanding the equipment for feedback to show the equipment in the commanded state before raising a fault status.		Cfg_Fault
Delay after flow stop before enabling tolerance check (seconds)	Type the amount of time in seconds after flow is stopped for the scale reading to settle before a tolerance check can be commanded.		Cfg_SettleT

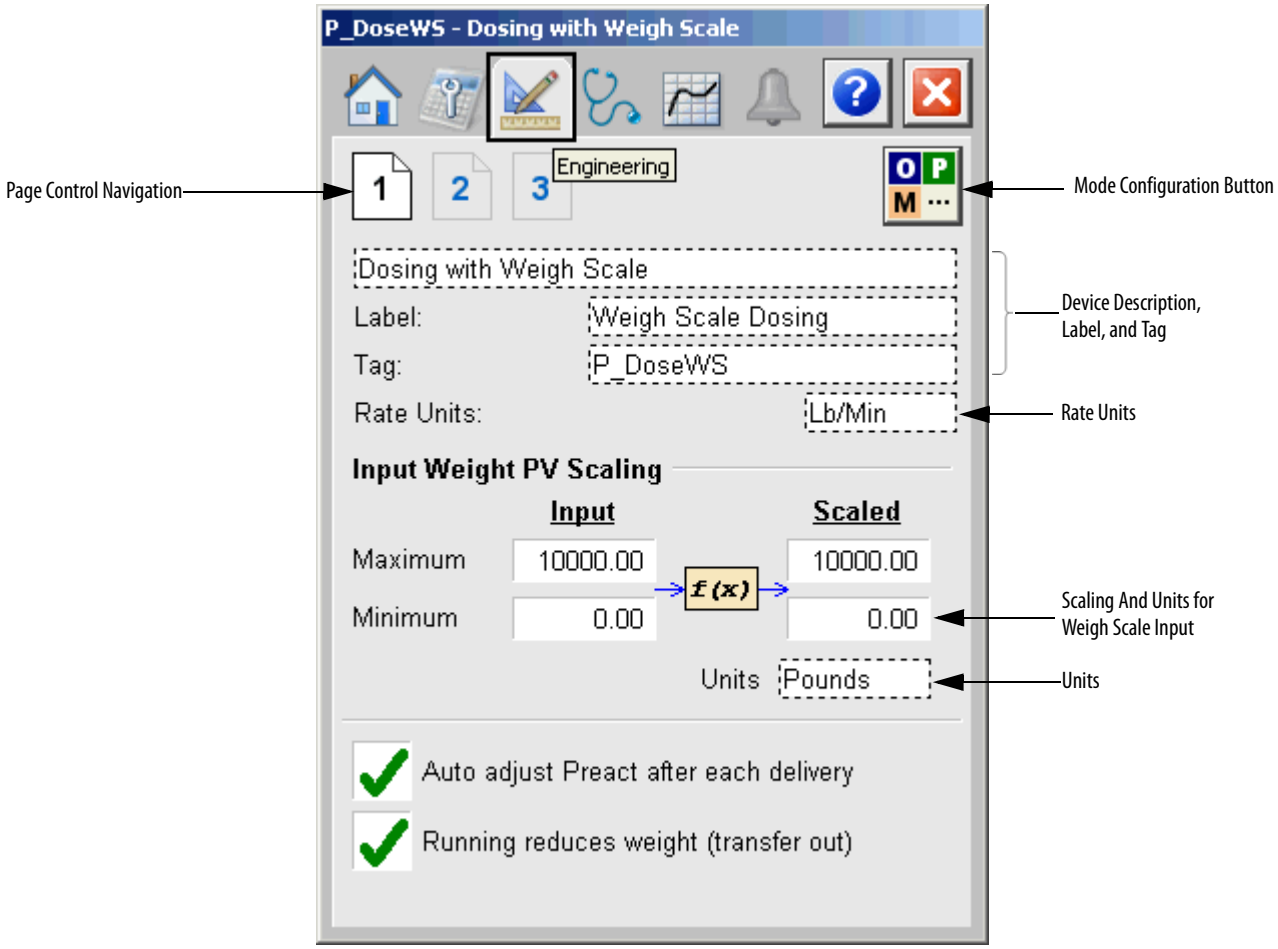
Engineering Tab

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 three pages.

Engineering Tab Page 1

On page 1 of the Engineering tab, you can configure the description, label, tag, weigh scale input scaling and units, and rate units for the device.

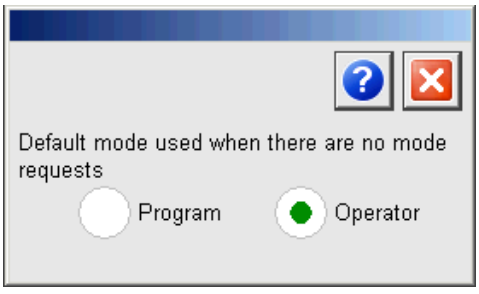


The following table lists the functions on page 1 of the Engineering tab.

Table 12 - Engineering Tab Page 1 Description

Function	Action	Security	Configuration Parameters
	Click to navigate to the Configuration Mode display.	Engineering configuration (code E)	See Mode Configuration display on page 44
Description	Type the device description to be used on the faceplate title bar.		Cfg_Desc
Label	Type the device label to be used on the graphic symbol.		Cfg_Label
Tag	Type the tagname to be used on the title bar of the operator faceplate and in the Tooltip.		Cfg_Tag
Rate units	Type the engineering units text for the rate of delivery.		Cfg_RateEU
Input Weight PV Scaling: Raw maximum and minimum input	Type the minimum and maximum values for the raw Input from the weigh scale. These values are used for scaling from raw to engineering units.		• Cfg_InpRawMin • Cfg_InpRawMax
Input Weight PV Scaling: Scaled maximum and minimum input	Type the minimum and maximum values for the scaled input from the weigh scale in engineering Units. These values are used for scaling from raw to engineering units.		• Cfg_PVEUMin • Cfg_PVEUMax
Units	Type the engineering units text for the weight from the scale.		Cfg_QtyEU
Auto adjust preact after each delivery	Check to automatically adjust the preact based on the actual vs. setpoint quantity after each successful delivery. Clear this checkbox to leave the preact as entered.		Cfg_AutoAdjPreact
Running reduces weight (transfer out)	Check if the weight on the scale decreases as delivery proceeds (material is transferred out of the vessel being weighed). Clear this checkbox if the weight on the scale increases as delivery proceeds (material is transferred into the vessel being weighed).		Cfg_LossInWeight

Mode Configuration Display

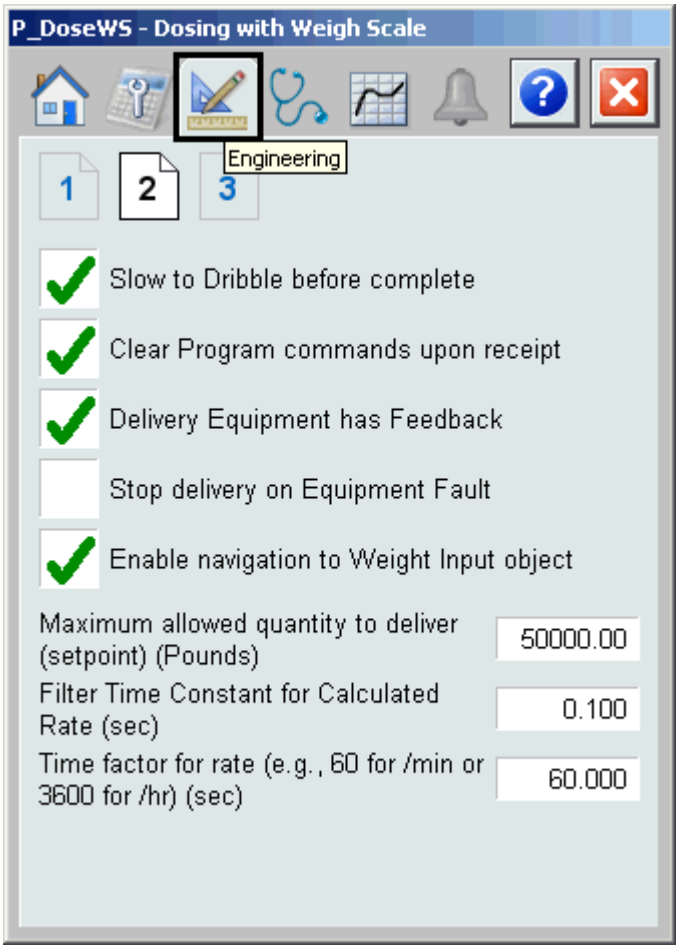


This display lets you select the default mode for the object by selecting the appropriate mode.

IMPORTANT	If no mode is being requested, changing the default mode changes the mode of the instruction.

You must have FactoryTalk View security code E to select the default mode on this display.

Engineering Tab Page 2



The following table lists the functions on page 2 of the Engineering tab.

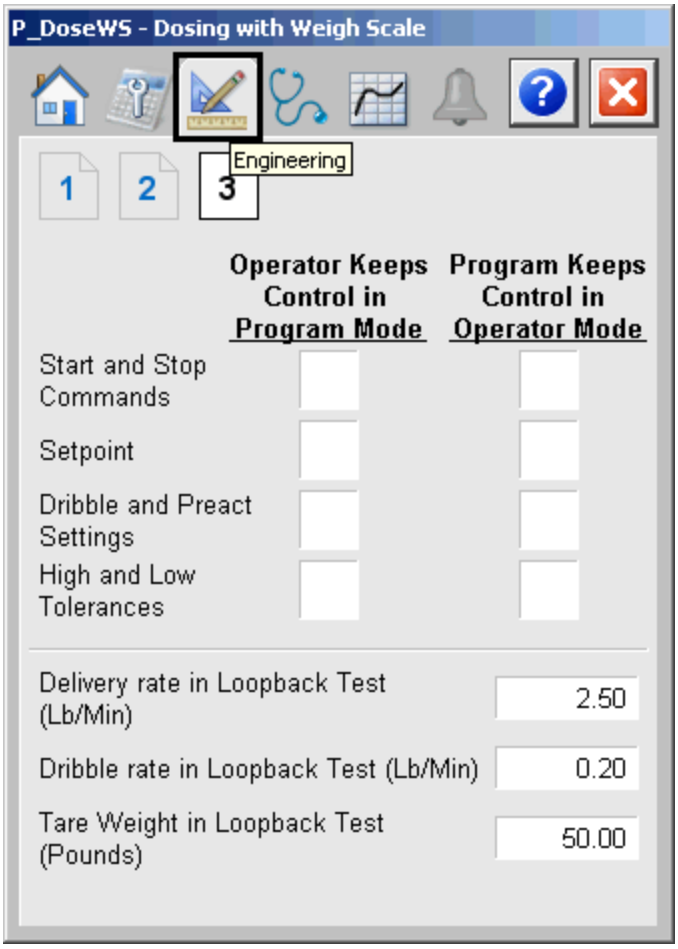
Table 13 - Engineering Tab Page 2 Description

Function	Action	Security	Configuration Parameters
Slow to dribble before complete	Check to have the equipment commanded to a slower dribble rate as delivery nears completion to improve the accuracy of quantity delivered.	Engineering configuration (code E)	Cfg_HasDribble
Clear program commands on receipt	Check to clear program commands on receipt.		Cfg_PCmdClear

Table 13 - Engineering Tab Page 2 Description

Function	Action	Security	Configuration Parameters
Delivery Equipment has Feedback	Check, if the controlled equipment provides feedback of its running, dribbling, and stopped status to this instruction. This instruction checks that the equipment is performing the commanded function and provides a status (and optional alarm) if the equipment fails to respond as commanded within a configurable time. **TIP:** The feedback fault time is configured on the Maintenance tab, page 2. When checked, 'Use Equipment Feedback' on page 1 of the Maintenance tab is available. (See Maintenance Tab Page 1 on page 38.) Clear this checkbox if the controlled equipment does not provide feedback of its status. The instruction assumes the equipment is performing the commanded function and no equipment failure-to-respond checking occurs.	Engineering configuration (code E)	Cfg_HasEqpFdbk
Stop Delivery on Equipment Fault	Check if you want the dosing instruction to attempt to stop the controlled equipment if an equipment fault is reported (Inp_CtrldEqupFault) or detected (via feedbacks). Clear this checkbox if you want the dosing instruction to keep performing its current function, even if an equipment fault occurs.		Cfg_ShedOnEqpfault
Enable navigation to Weight Input object	Check to enable navigation to the Raw Weight's Input channel object faceplate. **IMPORTANT:** The name of the Channel object in the controller must be this object's name with the suffix '_Chan'. For example, if your P_DoseWS object has the name 'DoseWS123', then its Channel object must be named 'DoseWS123_Chan'.		Cfg_HasChanObj
Maximum allowed quantity to deliver (setpoint)	Enter the maximum allowed quantity to deliver. The quantity setpoint is clamped to not exceed this value.		Cfg_MaxQty
Filter time constant for calculated rate (seconds)	Enter the filter time constant for calculated rate.		Cfg_RateFiltTC
Time factor for rate (e.g., 60 for /min or 3600 for /hr) (seconds)	Enter the time factor for rate. If the rate is in units per second, enter 1.0; if the rate is in units per minute, enter 60.0; and so on.		Cfg_RateTime

Engineering Tab Page 3



The following table lists the functions on page 3 of the Engineering tab.

Table 14 - Engineering Tab Page 3 Description

Function	Action	Security	Configuration Parameters
Operator keeps control in program mode: Start & stop commands	Check to keep control of dosing commands, such as tare and start flow, with the operator, even if the instruction is in Program mode. Clear this checkbox to have control of dosing commands follow the Instruction mode.	Engineering configuration (code E)	Cfg_OperKeep.0
Program keeps control in operator mode: Start & stop commands	Check to keep control of dosing commands, such as tare and start flow, with the program, even if the instruction is in Operator mode. Clear this checkbox to have control of dosing commands follow the Instruction mode.		Cfg_ProgKeep.0

Table 14 - Engineering Tab Page 3 Description

Function	Action	Security	Configuration Parameters
Operator keeps control in Program mode: Setpoint	Check to keep control of the setpoint quantity setting with the operator, even if the instruction is in Program mode. Clear this checkbox to have control of the setpoint quantity setting follow the Instruction mode.	Engineering configuration (code E)	Cfg_OperKeep.1
Program keeps control in Operator mode: Setpoint	Check to keep control of the setpoint quantity setting with the program, even if the instruction is in Operator mode. Clear this checkbox to have control of the setpoint quantity setting follow the Instruction mode.		Cfg_ProgKeep.1
Operator keeps control in Program mode: Dribble and preact settings	Check to keep control of the dribble and preact quantity settings with the operator, even if the instruction is in Program mode. Clear this checkbox to have control of the dribble and preact quantity settings follow the Instruction mode.		Cfg_OperKeep.2
Program keeps control in Operator mode: Dribble and preact settings	Check to keep control of the dribble and preact quantity settings with the program, even if the instruction is in Operator mode. Clear this checkbox to have control of the dribble and preact quantity settings follow the Instruction mode.		Cfg_ProgKeep.2
Operator keeps control in Program mode: High/low tolerances	Check to keep control of the high and low tolerance settings with the operator, even if the instruction is in Program mode. Clear this checkbox to have control of the high and low tolerance settings follow the Instruction mode.		Cfg_OperKeep.3
Program keeps control in Operator mode: High/low tolerances	Check to keep control of the high and low tolerance settings with the program, even if the instruction is in Operator mode. Clear this checkbox to have control of the high and low tolerance settings follow the Instruction mode.		Cfg_ProgKeep.3
Delivery rate in Loopback Test (Rate units)	Enter the normal running delivery rate that is used when the P_DoseWS instruction is in simulation (Inp_Sim = 1).		Cfg_SimRate
Dribble rate in Loopback Test (Rate units)	Enter the dribble (slow) delivery rate that is used when the P_DoseWS instruction is in simulation (Inp_Sim = 1).		Cfg_SimDribbleRate
Tare Weight in Loopback Test (Rate units)	Enter the weight that appears on the scale after a tare when the P_DoseWS instruction is in simulation (Inp_Sim = 1).		Cfg_SimStartWt

Diagnostics Tab

The Diagnostic tab provides indications that are helpful in diagnosing or preventing device problems, which can include specific reasons a device is 'Not Ready', device warnings and faults, warning and fault history, and predictive/preventive maintenance data.

The Diagnostics tab displays possible reasons the device is not ready.

The above image indicates that the PV has bad quality or there is a communication failure.

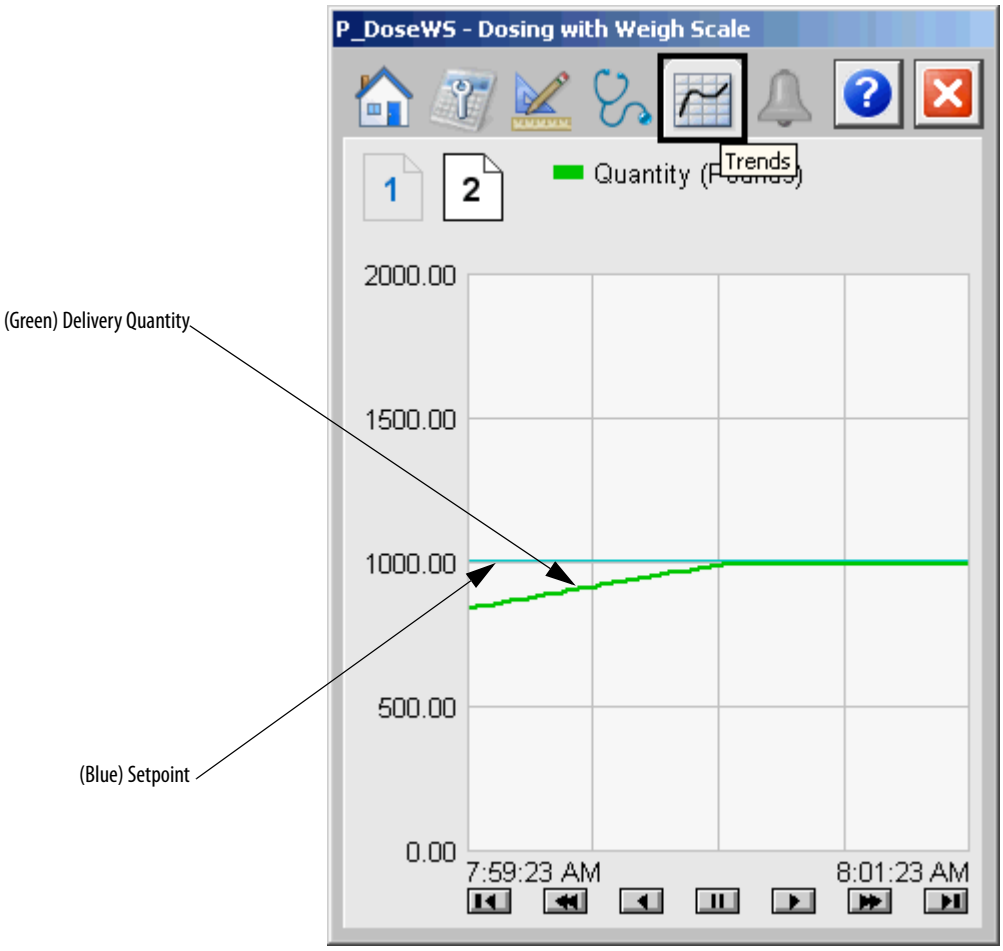
Trends Tab

The Trends Tab shows trend charts of key device data over time. These faceplate trends provide a quick view of current device performance to supplement, but not replace, dedicated historical, or live trend displays.

The Trends tab is divided into 2 pages.

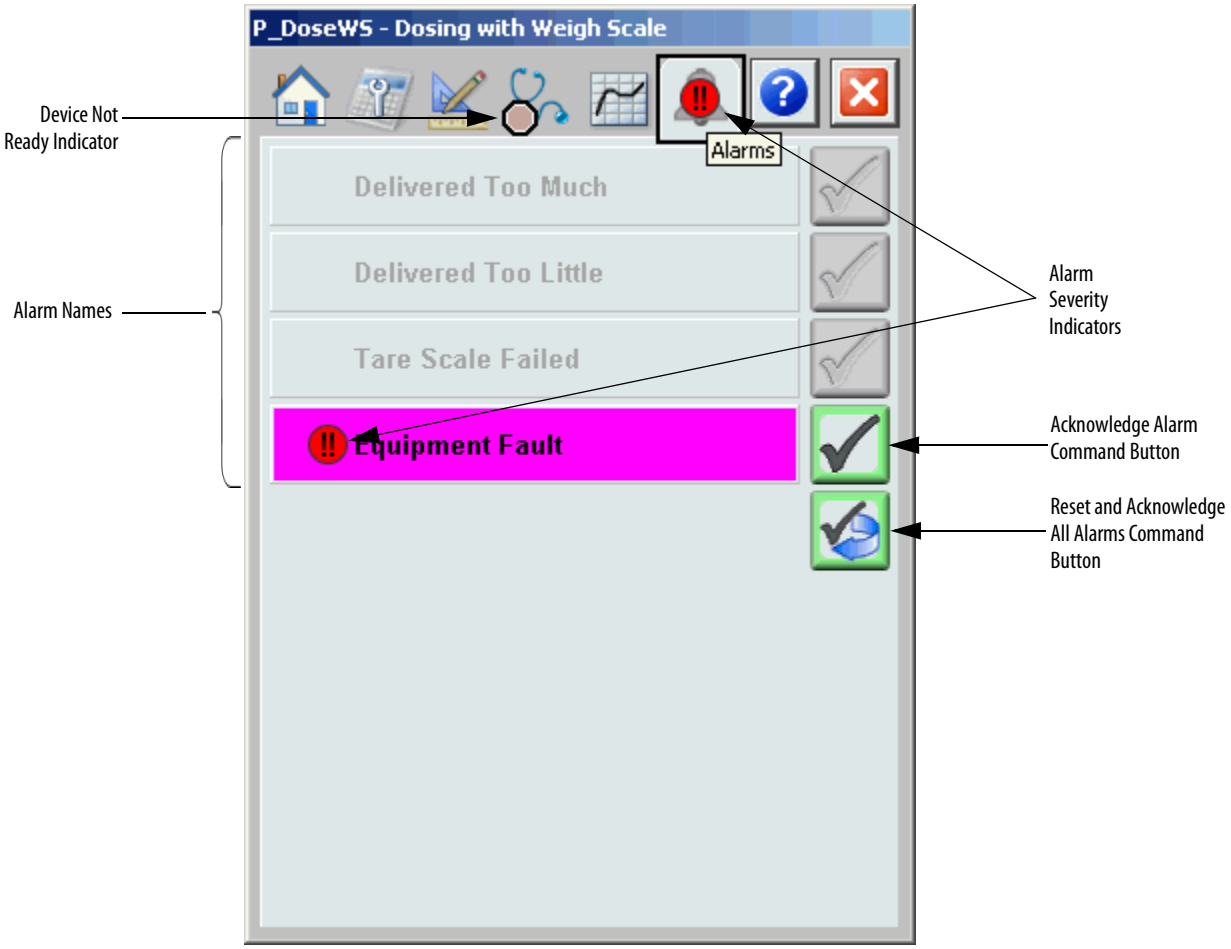
Trends Tab Page 1

Trends Tab Page 2



Alarms Tab

The Alarms Tab shows all the available alarms for the device and their current status. From here, Alarms can be acknowledged and reset. Click an alarm name to open the alarm detail faceplate for that alarm where the alarm can be shelved by the operator, disabled by maintenance, or configured by engineering.



Click 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.

If an alarm is active, the panel behind the alarm changes color to match the severity of the alarm. The color of the bell icon at the top of the faceplate shows the highest active alarm's severity, and the icon blinks if any alarm is unacknowledged or requires reset.

The following table shows the colors associated with alarm severity.

Table 15 - Alarm Severity Colors

Color	Definition
Magenta	Urgent
Red	High
Yellow	Medium
Blue	Low
White (bell icon)	All alarms have cleared, but one or more alarms are unacknowledged
Background (light gray)	No alarm

The following table shows the functions on the Alarms tab.

Table 16 - Alarms Tab Description

Button	Action	Security
	Click to acknowledge the alarm.	Acknowledge Alarms (Code F)
	Reset and acknowledge all alarms.	
Alarm Name	Click an alarm name to display the Alarm Operator faceplate.	

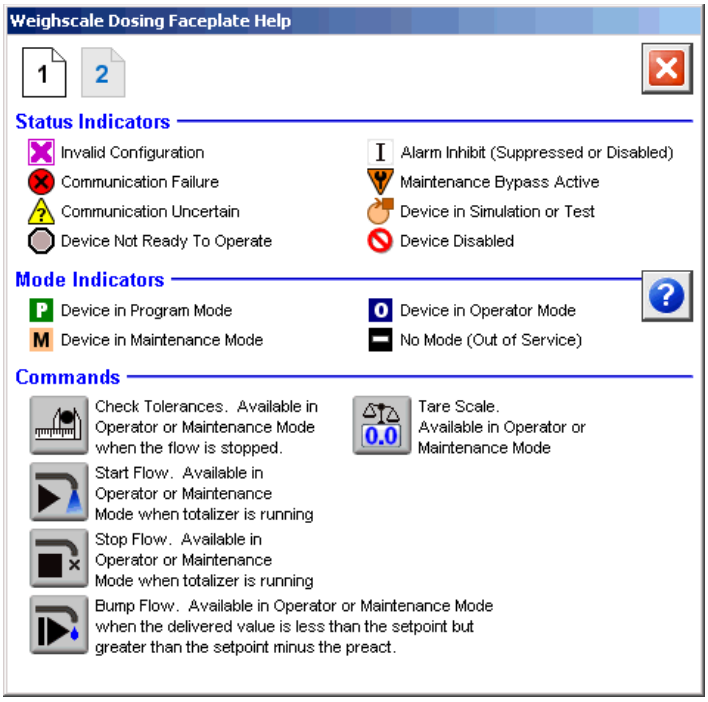
The Reset and Acknowledge All Alarms button is enabled, the panel behind the alarm blinks, and the Alarm Acknowledge button is enabled if the alarm requires acknowledgment. Click the button with the checkmark to acknowledge the alarm.

Refer to the Rockwell Automation Library of Process Objects: Common Alarm Mode (P_Alarm) Reference Manual, publication SYSLIB-RM002, for more information.

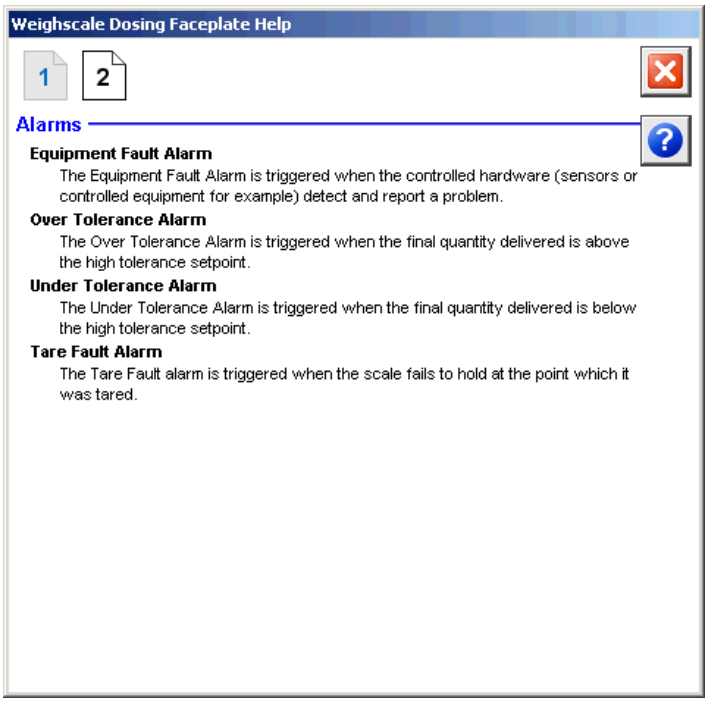
Weigh Scale Dosing Drive Faceplate Help

The Faceplate Help is divided into two pages.

Faceplate Help Page 1



Faceplate Help Page 2



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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
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

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Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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