Reference Manual

PlantPAx
Distributed Control System

Rockwell Automation Library of Process Objects: PowerFlex 7000 Drive (P_PF7000)

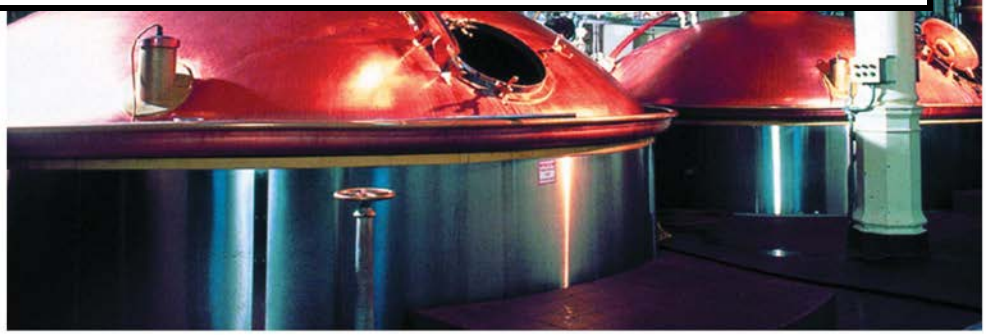
IMPORTANT This manual applies to the Rockwell Automation Library of Process Objects version 3.5 or earlier.

For Rockwell Automation Library of Process Objects version 5.0, see

- PROCES-RM200

For Rockwell Automation Library of Process Objects version 4.0 or later, use the following manuals:

- PROCES-RM013 contains logic instructions
- PROCES-RM014 contains display elements



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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).

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Notes:

This manual contains information for the PowerFlex® 7000 Drive.

Software Compatibility

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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.

Table 1 - Additional Resources

Resource	Description
PlantPAx® Distributed Control System Selection Guide, publication PROCES-SG001	Provides information to assist with equipment procurement for your PlantPAx system.
PlantPAx Distributed Control 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, which are distributed over a network.
PowerFlex 7000 Medium Voltage AC Drive (B Frame) - Classic, publication 7000-UM150	Provides general information on the PowerFlex 7000 medium voltage AC drive.
PowerFlex 7000 Medium Voltage AC Drive (B Frame) - ForGe Control (PanelView™ 550), publication 7000-UM151	Provides details on the PowerFlex 7000 medium voltage AC drive for standard and heatpipe models.
PowerFlex 7000 Medium Voltage AC Drive Air-Cooled (B Frame) - ForGe Control, publication 7000-UM202	Provides details on the PowerFlex 7000 medium voltage AC drive for heatsink and heatpipe models.
PowerFlex 7000 Medium Voltage AC Drive (ForGe Control) Troubleshooting Guide, publication 7000-TG002	Provides fault code numbers and corresponding descriptive troubleshooting information for PowerFlex 7000 medium voltage AC drive faults.
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: Interlocks with First Out and Bypass (P_Intlk) Reference Manual, publication SYSLIB-RM004	Explains how to collect (sum up) the interlock conditions that stop or de-energize a running or energized piece of equipment. Also explains how interlock conditions help to prevent a running or energized piece of equipment from starting or being energized.

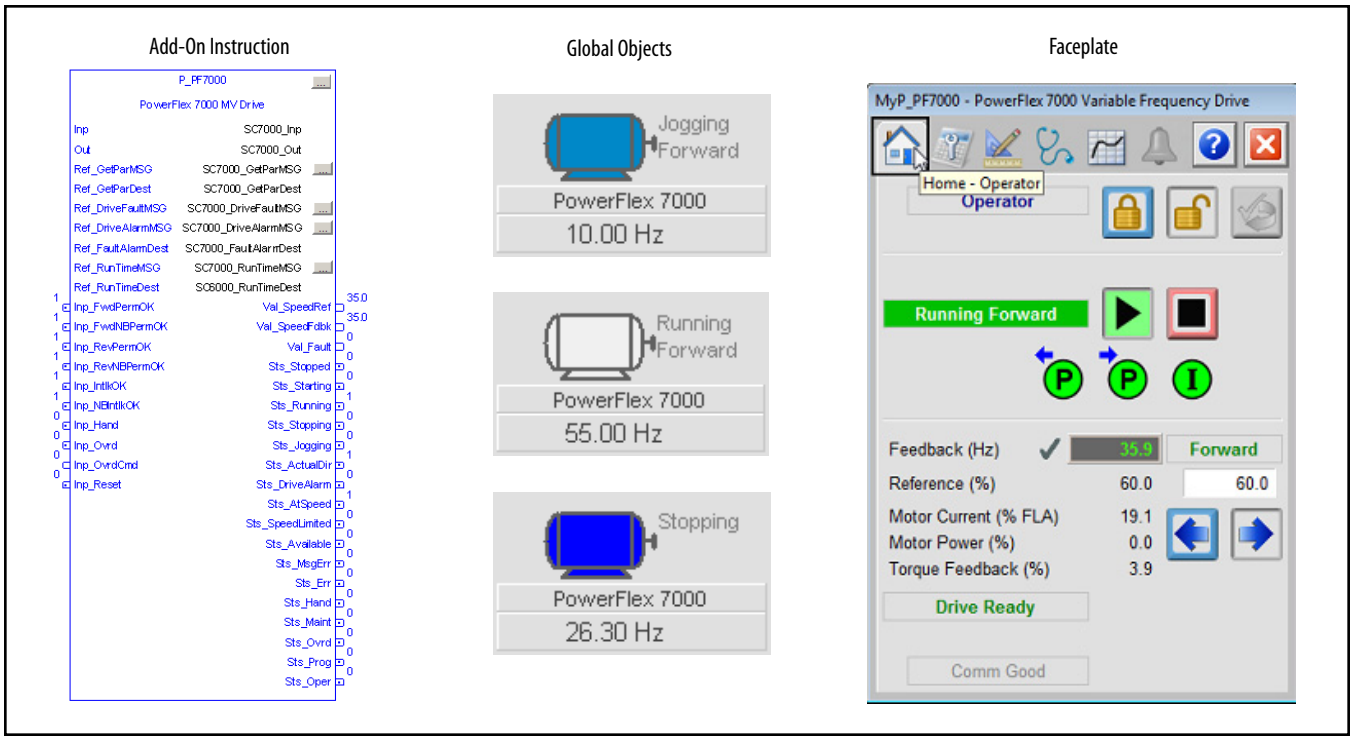
Table 1 - Additional Resources

Resource	Description
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.
Rockwell Automation Library of Process Objects: Permissives with Bypass (P_Perm) Reference Manual, publication SYSLIB-RM007	Details how to collect permissive conditions to start a piece of equipment.
Rockwell Automation Library of Process Objects: Restart Inhibit for Large Motor (P_ResInh) Reference Manual, publication SYSLIB-RM009	Explains how to help protect a large motor from damage that is caused by repeated starts.
Rockwell Automation Library of Process Objects: Run Time and Starts (P_RunTime) Reference Manual, publication SYSLIB-RM010	Explains how to accumulate the total runtime and count of starts for a motor or other equipment.

PowerFlex 7000 Drive (P_PF7000)

The P_PF7000 (PowerFlex® 7000 drive) object is used to operate one variable-speed motor by using a PowerFlex 7000 medium voltage variable frequency AC drive. The Add-On Instruction controls the drive in various modes and monitors fault conditions.

The global objects and faceplate that are shown are examples of the graphical interface tools for this Add-On Instruction.



Guidelines

Use this instruction in these situations:

- You must operate a motor that is connected to a PowerFlex 7000 variable frequency AC drive that is communicating with the controller over an EtherNet/IP network.
- This instruction is designed to work with the Studio 5000 Logix Designer® application, Version 18 and later.

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

- You need to operate a single-speed motor (running and stopped only). Use the P_Motor instruction instead.
- You need to operate a two-speed motor (fast, slow, and stopped only). Use the P_Motor2Spd instruction instead.
- You need to operate a simple reversing motor (forward, reverse, and stopped only). Use the P_MotorRev instruction instead.
- You need to operate a motor with multiple discrete speeds. You need specific logic for this motor. The P_PF7000 instruction is designed for motors with continuously variable (analog) speed, not multiple discrete speed selections. You can use the P_D4SD or P_nPos instruction for motors with multiple discrete speeds.
- You are using a drive other than the PowerFlex 7000 drive. Instead, use these Add-On Instructions:
  - P_PF755 for the PowerFlex 755 Drive, or for the PowerFlex 753 with the 20-750-ENETR EtherNet/IP interface
  - P_PF753 for the PowerFlex 753 Drive with the 20-COMM-E EtherNet/IP interface
  - P_PF52x for the PowerFlex 523 or PowerFlex 525 Drive on an EtherNet/IP network
  - P_VSD for third-party drives, drives on other networks, or via hardwired I/O

Functional Description

The P_PF7000 instruction provides the following capabilities:

- Ownership of the drive through the standard P_Mode Add-On Instruction and modes.
- Ability to start and stop the drive and motor, to control the drive speed (via speed reference), to verify whether the drive is running or stopped. You can also monitor the drive run status and speed feedback. Provides alarms and drive shutdown for Fail to Start and Fail to Stop if the feedback does not follow the commanded state within a configured amount of time.
- Reading from the drive, the instruction displays drive faults, drive alarms, conditions that inhibit starting the drive, drive predictive maintenance data, general drive status data, and a number of operating parameters.
- Ability to read a fault code from the drive and provide descriptive text of fault codes.
- Indication of Accelerating, Decelerating, At Speed, Warning, or Alarm status as received from the drive.
- Optional capability to support reversing drives, with commands for forward and reverse rotation, and display of actual rotation direction.
- Input and alarm for a drive fault condition and an output to send a drive fault reset to the drive. Provide a configurable time to pulse the drive fault reset output when a reset command is received.
- Permissives (bypassable and non-bypassable) that are conditions that enable a drive start and Interlocks (bypassable and non-bypassable) that are conditions that stop the drive and help prevent starting. Provide an alarm when an Interlock stops the drive. Provide maintenance the capability to bypass the bypassable Permissives and Interlocks.
- Maintenance personnel can disable (soft lock out) the drive. This capability is not a substitute for hard lockout/tagout (LOTO) procedures.
- Monitor an I/O fault input and alarm on an I/O fault. The I/O fault condition can optionally de-energize the outputs to the drive, requiring a reset.
- In Override mode, provide an override state input that determines if the override is to run or stop the drive (default = stop), and, if the drive is to run, an override speed reference and direction.
- The instruction provides simulation capability. Outputs to the drive are kept de-energized, but the object can be manipulated as if a working drive were present, including a basic ramp-up of speed feedback value on starting and ramp-down on stopping. The simulated ramp-up-to-speed time is configurable. This capability is often used for activities such as system testing and operator training.

Required Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. The instructions let 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_PF7000_3_5-**00**_RUNG.L5X rung import 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 Add-On Instruction has associated visualization files that provide a common user interface. These files can be downloaded from the Product Compatibility and Download Center at http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page.

IMPORTANT The visualization file dependencies require Process Library content imports to occur in a specific order as reflected in the following tables:

- Images
- Global Objects
- Standard Displays
- HMI Tags
- Macros

Images are external graphic files that can be used in displays. They must be imported for FactoryTalk® View software to use them.

Imported PNG files are renamed by FactoryTalk View software with a .bmp file extension, but retain a .png format.

Table 2 - Visualization Files: Images (.png)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
All .png files in the images folder	All .png files in the images folder	These are the common icons that are used in the global objects and standard displays for all Process Objects.

The Global Object files (.ggfx file type) in the following table are Process Library display elements that are created once and referenced multiple times on multiple displays in an application. When changes are made to a Global Object, all instances in the application are automatically updated.

Table 3 - Visualization Files: Global Objects (.ggfx)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(RA-BAS) Common Faceplate Objects	(RA-BAS-ME) Common Faceplate Objects	Global objects used on process object faceplates.
(RA-BAS) P_VSD Graphics Library	(RA-BAS-ME) P_VSD Graphics Library	Drive global object device symbols used to build process graphics.

Table 3 - Visualization Files: Global Objects (.ggfx)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(RA-BAS) Process Alarm Objects	(RA-BAS-ME) Process Alarm Objects	Global objects used for managing alarms on process object faceplates.
(RA-BAS) Process Diagnostic Objects	(RA-BAS-ME) Process Diagnostic Objects	Diagnostic global objects used on process object faceplates.
(RA-BAS) Process Faceplate Motor Objects	(RA-BAS-ME) Process Faceplate Motor Objects	Motor global objects used on process object faceplates.
(RA-BAS) Process Help Objects	(RA-BAS-ME) Process Help Objects	Global objects used for all process objects help displays.
(RA-BAS) Process Interlock Objects	(RA-BAS-ME) Process Interlock Objects	Global objects used for managing interlocks and permissives on process object faceplates.
(RA-BAS) Process Mode Objects	(RA-BAS-ME) Process Mode Objects	Global objects used for managing modes on process object faceplates.

The Standard Display files (.gfx file type) in the following table are the Process Library displays that you see at runtime.

Table 4 - Visualization Files: Standard Displays (.gfx)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(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 that is used for the object.
(RA-BAS) P_Alarm-Help	(RA-BAS-ME) P_Alarm-Help	Alarm Help information that is accessed from the P_Alarm faceplate.
(RA-BAS) P_Mode-Config	(RA-BAS-ME) P_Mode-Config	The Configuration Display used to configure the P_Mode object.
(RA-BAS) P_Mode-Help	(RA-BAS-ME) P_Mode-Help	Mode Help information that is accessed from the Help faceplate.
(RA-BAS) P_PF7000-Faceplate	(RA-BAS-ME) P_PF7000-Faceplate	The faceplate display that is used for the object.
(RA-BAS) P_PF7000-Quick	(RA-BAS-ME) P_PF7000-Quick	The Quick display that is used for the object.
(RA-BAS) Process Motor Family-Help	(RA-BAS-ME) Process Motor Family-Help	The Help display for Motor objects.
(RA-BAS) P_Intlk-Faceplate	(RA-BAS-ME) P_Intlk-Faceplate	**Optional** The interlock faceplate used for the object. Use this file if your Discrete Output has an associated P_Intlk object and you enable navigation to its faceplate from the Discrete Output faceplate.
(RA-BAS) P_Perm-Faceplate	(RA-BAS-ME) P_Perm-Faceplate	**Optional** Permissive faceplate that is used for the object. Use this file if your object has an associated P_Perm object and you enable navigation to the P_Perm faceplate from the object faceplate.
(RA-BAS) P_ResInh-Faceplate	(RA-BAS-ME) P_ResInh-Faceplate	**Optional** Restart/inhibit faceplate display that is used for the object. Use this file if your object has an associated P_ResInh object and you enable navigation to the P_ResInh faceplate from the object faceplate.
(RA-BAS) P_RunTime-Faceplate	(RA-BAS-ME) P_RunTime-Faceplate	**Optional** RunTime faceplate display that is used for the object. Use this file if your object has an associated P_RunTime object and you enable navigation to the P_RunTime faceplate from the object faceplate.

Table 4 - Visualization Files: Standard Displays (.gfx)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(RA-BAS) Process Interlock Family-Help	(RA-BAS-ME) Process Interlock Family-Help	**Optional** Interlock/permissives help display that is used for the object. Use this file if you use the P_Intlk or P_Perm faceplate.

HMI Tags are created in a FactoryTalk View ME application to support tab switching on Process Library faceplates. The HMI tags can be imported via the comma-separated values file (.csv file type) in the following table.

Table 5 - Visualization Files: HMI Tags (.csv)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
N/A	FTVME_PlantPAxLib_Tags_3_5_**xx**.csv where **xx** = the service release number.	These tags must be imported into the FactoryTalk View ME project to support switching tabs on any Process Object faceplate.

Controller Code

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

PowerFlex 7000 Drive InOut Structure

InOut parameters are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown.

Table 7 - P_PF7000 Drive InOut Parameters

Tag Name	Data Type	Description
Inp	P_PF7000_Inp	Common part of PowerFlex 7000 input assembly.
Out	P_PF7000_Out	Common part of PowerFlex 7000 output assembly.
Ref_GetParMSG	MESSAGE	Message to Get Next Drive Parameter value
Ref_GetParDest	INT	Buffer for data from Get Drive Parameter message
Ref_DriveFaultMSG	MESSAGE	Message to get last fault record.
Ref_DriveAlarmMSG		Message to get last alarm record.
Ref_FaultAlarmDest	P_PF7000_FltAlmRec	Buffer for data from fault record or alarm record message.
Ref_RunTimeMSG	MESSAGE	Message to get elapsed runtime.
Ref_RunTimeDest	LINT	Buffer for data from get elapsed runtime message.

TIP The user-defined data types (UDTs) are included in the RUNG import that brings in the P_PF7000 Add-On Instruction. See the programming example on page 29 for details.

PowerFlex 7000 Drive 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 8 - P_PF7000 Drive 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_FwdPermOK	BOOL		1	1 = Permissives OK, drive can start forward.
Inp_FwdNBPermOK	BOOL		1	1 = Non-bypassable permissives OK, drive can start forward.
Inp_RevPermOK	BOOL		1	1 = Permissives OK, drive can start reverse.
Inp_RevNBPermOK	BOOL		1	1 = Non-bypassable permissives OK, drive can start reverse.
Inp_IntlkOK	BOOL		1	1 = Interlocks OK, drive can start/run.
Inp_NBIntlkOK	BOOL		1	1 = Non-bypassable interlocks OK, drive can start/run.
Inp_IOFault	BOOL		0	Input communication status: 0 = OK 1 = Fail
Inp_Sim	BOOL		0	Simulation input. When set to 1, the instruction keeps outputs de-energized (zero) and simulates a working drive. When set to 0, the instruction operates the drive normally.
Inp_Hand	BOOL		0	1 = Request to acquire Hand mode. 0 = Release Hand mode.
Inp_Ovrd	BOOL	Mode.Inp_Ovrd	0	1 =Request to acquire Override mode. 0 = Release Override mode.
Inp_OvrdCmd	SINT		0	Override mode command: 0 = None 1 = Stop 2 = Start forward 3 = Start reverse
Inp_OvrdSpeed	REAL		0.0	Value to set speed reference in Override mode (SpeedRef engineering units).
Inp_Reset	BOOL		0	Input parameter used to programmatically reset alarms. When set to 1, all alarms requiring reset are reset.

Table 8 - P_PF7000 Drive Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
Cfg_HasJog	BOOL		0	1 = Drive jog command enabled/visible. 0 = Drive jog command not allowed.
Cfg_AllowLocal	BOOL		0	1 = Allow local Start/Stop without alarm. 0 = Start/Stop from HMI/program only.
Cfg_HasFwdPermObj	BOOL		0	1 = Tells HMI a forward permissive object (for example, P_Perm) is used for Inp_FwdPermOK and navigation to the permissive object's faceplate is enabled. **IMPORTANT:** The name of the Forward Permissive object in the controller must be this object's name with the suffix '_FwdPerm'. For example, if your P_PF7000 object has the name 'Drive123', then its Forward Permissive object must be named 'Drive123_FwdPerm'.
Cfg_HasRevPermObj	BOOL		0	1 = Tells HMI a reverse permissive object (for example, P_Perm) is used for Inp_RevPermOK and navigation to the permissive object's faceplate is enabled. **IMPORTANT:** The name of the Reverse Permissive object in the controller must be this object's name with the suffix '_RevPerm'. For example, if your P_PF7000 object has the name 'Drive123', then its Forward Permissive object must be named 'Drive123_RevPerm'.
Cfg_HasIntlkObj	BOOL		0	1 = Tells HMI an interlock object (for example, P_Intlk) is used for Inp_IntlkOK and navigation to the interlock object's faceplate is enabled. **IMPORTANT**: The name of the interlock object in the controller must be this object's name with the suffix '_Intlk'. For example, if your P_PF7000 object has the name 'Drive123', then its interlock object must be named 'Drive123_Intlk'.
Cfg_HasResInhObj	BOOL		0	1 = Tells HMI a restart inhibit object is connected, is used to accumulate data, and navigation to the restart inhibit object's faceplate is enabled. **IMPORTANT**: The name of the restart inhibit object in the controller must be this object's name with the suffix '_ResInh'. For example, if your P_PF7000 object has the name 'Drive123', then its restart inhibit object must be named 'Drive123_ResInh'.
Cfg_HasRunTimeObj	BOOL		0	1 = Tells HMI a runtime object is connected and navigation to the runtime object's faceplate is enabled. **IMPORTANT**: The name of the runtime object in the controller must be this object's name with the suffix '_RunTime'. For example, if your P_PF7000 object has the name 'Drive123', then its runtime object must be named 'Drive123_RunTime'.
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_SetTrackOvrdHand	BOOL		0	1 = Program/Operator settings track Override/Hand settings.
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_OperStopPrio	BOOL		0	1 = OCmd_Stop available in any mode. 0 = OCmd_Stop only in Operator and Maintenance modes.

Table 8 - P_PF7000 Drive Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
Cfg_OCmdResets	BOOL		0	1 = New Operator drive command resets latched shed conditions. 0 = Reset required to clear shed conditions.
Cfg_OvrdPermIntlk	BOOL		0	1 = Override ignores bypassable permissives/interlocks. 0 = Always use permissives/interlocks.
Cfg_ShedOnFailToStart	BOOL		1	1 = Stop motor and alarm on Fail to Start. 0 = Alarm only on Fail to Start. **IMPORTANT:** If a condition is configured to shed the device to the Off state on a fault, a reset is required to clear the shed fault to command the drive to a state other than Off.
Cfg_ShedOnIOFault	BOOL		1	1 = Stop motor and alarm on I/O Fault. 0 = Alarm only on I/O Fault. **IMPORTANT:** If a condition is configured to shed the device to the Off state on a fault, a reset is required to clear the shed fault to command the drive to a state other than Off.
Cfg_SimScaleEU	BOOL		0	1 = In simulation, scale Speed Ref EU to Speed Fdbk EU.
Cfg_SimScaleRaw	BOOL		0	1 = In simulation, scale Speed Ref EU to raw, then raw to Speed Fdbk EU.
Cfg_HasFailToStartAlm	BOOL	FailToStart.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_HasFailToStopAlm		FailToStop.Cfg_Exists		
Cfg_HasIntlkTripAlm		IntlkTrip.Cfg_Exists		
Cfg_HasDriveFaultAlm		DriveFault.Cfg_Exists		
Cfg_HasIOFaultAlm		IOFault.Cfg_Exists		
Cfg_FailToStartResetReqd	BOOL	FailToStart.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, PCmd_Reset, OCmd_Reset, or Inp_Reset are required to clear Alm_FailtoStart after the alarm is set and the value 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_FailToStopResetReqd		FailToStop.Cfg_ResetReqd		
Cfg_IntlkTripResetReqd		IntlkTrip.Cfg_ResetReqd		
Cfg_DriveFaultResetReqd		DriveFault.Cfg_ResetReqd		
Cfg_IOFaultResetReqd		IOFault.Cfg_ResetReqd		
Cfg_FailToStartAckReqd	BOOL	FailToStart.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_FailtoStartAck) 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_FailToStopAckReqd		FailToStop.Cfg_AckReqd		
Cfg_IntlkTripAckReqd		IntlkTrip.Cfg_AckReqd		
Cfg_DriveFaultAckReqd		DriveFault.Cfg_AckReqd		
Cfg_IOFaultAckReqd		IOFault.Cfg_AckReqd		
Cfg_FailToStartSeverity	INT	FailToStart.Cfg_Severity	1000	These parameters determine the severity of each alarm that gauges 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:** These severity priorities drive only the indication on the global object and faceplate. The Alarm 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 the FactoryTalk Alarm and Events software display commands.
Cfg_FailToStopSeverity		FailToStop.Cfg_Severity	1000	
Cfg_IntlkTripSeverity		IntlkTrip.Cfg_Severity	500	
Cfg_DriveFaultSeverity		DriveFault.Cfg_Severity	1000	
Cfg_IOFaultSeverity		IOFault.Cfg_Severity	1000	
Cfg_MinSpdRef	REAL		0.0	Minimum speed reference in engineering units (for limiting).
Cfg_MaxSpdRef	REAL		60.0	Maximum speed reference in engineering units (for limiting).
Cfg_SpeedRefRawMin	DINT		0	Speed reference minimum in drive (raw) units (for scaling).
Cfg_SpeedRefRawMax	DINT		60000	Speed reference maximum in drive (raw) units (for scaling).

Table 8 - P_PF7000 Drive Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
Cfg_SpeedRefEUMin	REAL		0.0	Speed reference minimum in Engineering units (for scaling).
Cfg_SpeedRefEUMax	REAL		60.0	Speed reference maximum in engineering units (for scaling).
Cfg_SpeedFdbkRawMin	DINT		0	Speed feedback minimum in drive (raw) units (for scaling).
Cfg_SpeedFdbkRawMax	DINT		60000	Speed feedback maximum in drive (raw) units (for scaling).
Cfg_SpeedFdbkEUMin	REAL		0.0	Speed feedback minimum in engineering units (for scaling).
Cfg_SpeedFdbkEUMax	REAL		60.0	Speed feedback maximum in engineering units (for scaling).
Cfg_SimRampT	DINT		10	Time to ramp speed feedback when in simulation (seconds).
Cfg_FailToStartT	DINT		15	Time after start to get run feedback before fault (seconds).
Cfg_FailToStopT	DINT		15	Time after stop to drop run feedback before fault (seconds).
Cfg_ResetPulseT	DINT		2	Time to pulse Out_Reset to clear drive fault.
Cfg_MaxJogT	REAL		0	Maximum jog time (seconds) 0 = Unlimited.
Cfg_OperKeep	SINT		2#0000_0000	Operator keeps control in Program mode: Bit .0 = Reference Bit .1 = Start/stop Bit .2 = Forward/reverse
Cfg_ProgKeep	SINT		2#0000_0000	Program keeps control in Operator mode: Bit .0 = Reference Bit .1 = Start/stop Bit .2 = Forward/reverse
PSet_SpeedRef	REAL		0.0	Program setting of speed reference (engineering units).
PSet_Owner	DINT		0	Program Owner Request ID (nonzero) or Release (zero).
OSet_SpeedRef	REAL		0.0	Operator setting of speed reference (engineering units).
PCmd_Start PCmd_Stop PCmd_Fwd PCmd_Rev	BOOL		0	When Cfg_PCmdClear is 1: • Set PCmd_Start to 1 to start the Drive • Set PCmd_Fwd to 1 to run the drive in the forward direction • Set PCmd_Rev to 1 to run the motor in the reverse direction • Set PCmd_Stop to 1 to stop the motor • These parameters are reset automatically When Cfg_PCmdClear is 0: • Set PCmd_Start to 1 to start the drive • Set PCmd_Rev to 0 to run the drive in the forward direction • Set PCmd_Rev to 1 to run the drive in the reverse direction • Set PCmd_Start to 0 to stop the driver • PCmd_Stop and PCmd_Fwd are not used • These parameters do not reset automatically
PCmd_Acq PCmd_Rel	BOOL	Mode.PCmd_Acq Mode.PCmd_Rel	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

Table 8 - P_PF7000 Drive 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 are 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_FailToStartAck	BOOL	FailToStart.PCmd_Ack	0	• Set PCmd_<Alarm>Ack to 1 to Acknowledge alarm • These parameters are reset automatically
PCmd_FailToStopAck		FailToStop.PCmd_Ack		
PCmd_IntlkTripAck		IntlkTrip.PCmd_Ack		
PCmd_DriveFaultAck		DriveFault.PCmd_Ack		
PCmd_IOFaultAck		IOFault.PCmd_Ack		
PCmd_FailToStartSuppress	BOOL	FailToStart.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_FailToStopSuppress		FailToStop.PCmd_Suppress		
PCmd_IntlkTripSuppress		IntlkTrip.PCmd_Suppress		
PCmd_DriveFaultSuppress		DriveFault.PCmd_Suppress		
PCmd_IOFaultSuppress		IOFault.PCmd_Suppress		
PCmd_FailToStartUnsuppress	BOOL	FailToStart.PCmd_Unsuppress	0	
PCmd_FailToStopUnsuppress		FailToStop.PCmd_Unsuppress		
PCmd_IntlkTripUnsuppress		IntlkTrip.PCmd_Unsuppress		
PCmd_DriveFaultUnsuppress		DriveFault.PCmd_Unsuppress		
PCmd_IOFaultUnsuppress		IOFault.PCmd_Unsuppress		
PCmd_FailToStartUnshelve	BOOL	FailToStart.PCmd_Unshelve	0	• Set PCmd_<Alarm>Unshelve to 1 to Unshelve alarm • These parameters are reset automatically
PCmd_FailToStopUnshelve		FailToStop.PCmd_Unshelve		
PCmd_IntlkTripUnshelve		IntlkTrip.PCmd_Unshelve		
PCmd_DriveFaultUnshelve		DriveFault.PCmd_Unshelve		
PCmd_IOFaultUnshelve		IOFault.PCmd_Unshelve		
OCmd_Start	BOOL		0	Operator command to start drive.
OCmd_Stop	BOOL		0	Operator command to stop drive.
OCmd_Jog	BOOL		0	Operator command to jog drive (not cleared by instruction if Cfg_MaxJogT = 0).
OCmd_Fwd	BOOL		0	Operator command to set direction to forward.
OCmd_Rev	BOOL		0	Operator command to set direction to reverse.
OCmd_Bypass	BOOL		0	Operator command to bypass all bypassable interlocks and permissives.
OCmd_Check	BOOL		0	Operator command to check (not bypass) all interlocks and permissives.
MCmd_Disable	BOOL		0	Maintenance command to disable drive.
MCmd_Enable	BOOL		0	Maintenance command to enable (permit to run) drive.
MCmd_Acq	BOOL	Mode.MCmd_Acq	0	Maintenance Command to Acquire Ownership (Operator/Program/Overload to Maintenance).

Table 8 - P_PF7000 Drive Input Parameters

Input Parameter	Data Type	Alias For	Default	Description
MCmd_Rel	BOOL	Mode.MCmd_Rel	0	Maintenance Command to Release Ownership (Maintenance to Operator/ Program/Overload).
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.

PowerFlex 7000 Drive 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 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 can also 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. Status 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 9 - P_PF7000 Drive 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_SpeedRef	REAL		Speed reference (target) to drive.
Val_SpeedFdbk	REAL		Speed feedback (actual) from drive.
Val_SpeedRefEUMin	REAL		Minimum of speed reference = MIN (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax).
Val_SpeedRefEUMax	REAL		Maximum of speed reference = MAX (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax).
Val_SpeedFdbkEUMin	REAL		Minimum of speed feedback = MIN (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax).

Table 9 - P_PF7000 Drive Output Parameters

Output Parameter	Data Type	Alias For	Description
Val_SpeedFdbkEUMax	REAL		Maximum of speed feedback = MAX (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax).
Val_SpeedFdbRPM	REAL		Motor speed feedback (RPM) (par 363) (datalink).
Val_TorquePctUnfilt	REAL		Motor torque feedback, unfiltered (%) (par 489) (datalink).
Val_MotorTorquePct	REAL		Motor torque (%) (par 345).
Val_MotorCurrent	REAL		Motor current (amps) (par 361).
Val_MotorCurrentPct	REAL		Motor current (% FLA) (par 340) (datalink).
Val_MotorVolts	REAL		Motor voltage, filtered (volts) (par 362) (datalink).
Val_MotorVoltsPct	REAL		Motor voltage (% of NP volts) (par 344).
Val_MotorPower	REAL		Drive output power, filtered (kW) (par 364).
Val_MotorPowerPct	REAL		Motor air-gap power (%) (par 346) (datalink).
Val_MotorOvldPct	REAL		Motor overload count (%) (par 550).
Val_DriveOvldPct	REAL		Drive overload count (%) (par 551).
Val_RectTemp	REAL		Rectifier heatsink temperature (C) (par 254).
Val_InvTemp	REAL		Inverter heatsink temperature (C) (par 252).
Val_RectVoltsPct	REAL		Measured voltage at input of rectifier bridge (%) (par 696).
Val_LineVolts	REAL		Measured voltage at input of rectifier bridge (volts) (par 324).
Val_LineVoltsPct	REAL		Estimated line input voltage (before inductor) (%) (par 135).
Val_LineCurrent	REAL		Measured drive input current (A) (par 500).
Val_LineFreq	REAL		Line frequency (Hz) (par 657).
Val_LinePower	REAL		Real power consumption by the drive (kW) (par 753).
Val_LinePowerPct	REAL		Real (active) power at input of the drive (%) (par 902).
Val_TotRunTime	REAL		Total drive elapsed runtime (hr).
Val_FaultCode	INT		Last drive fault code (enumeration).
Val_AlarmCode	INT		Last drive alarm code (enumeration).
SrcQ_IO	SINT		I/O signal source and quality.
SrcQ			Final drive signal 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)

Table 9 - P_PF7000 Drive Output Parameters

Output Parameter	Data Type	Alias For	Description
Val_Cmd	SINT		Device command: 0 = None 1 = Stop 2 = Start forward 3 = Start reverse 4 = Jog forward 5 = Jog reverse
Val_Fdbk	SINT		Device feedback: 0 = Stopped 1 = Running forward 2 = Running reverse 3 = Accelerating 4 = Decelerating
Val_Sts	SINT		Device confirmed status: 0 = None 1 = Stopped 2 = Running forward 3 = Running reverse 4 = Jogging forward 5 = Jogging reverse 6 = Stopping 7 = Starting forward 8 = Starting reverse 33 = Disabled
Val_Fault	SINT		Device fault status: 0 = None 16 = Fail to Start 17 = Fail to Stop 18 = Drive Fault 32 = I/O Fault 34 = Configuration error
Val_Mode	SINT	Mode.Val	The current mode is shown with status bits and also as an enumeration 'Val_Mode' as follows: 0 = No mode 1 = Hand 2 = Maintenance 3 = Override 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).

Table 9 - P_PF7000 Drive Output Parameters

Output Parameter	Data Type	Alias For	Description
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_Stopped	BOOL		1 = Drive requested to stop and is confirmed stopped.
Sts_Starting	BOOL		1 = Drive requested to run and awaiting run feedback.
Sts_Running	BOOL		1 = Drive requested to run and is confirmed running.
Sts_Stopping	BOOL		1 = Drive requested to stop and awaiting stopped feedback.
Sts_Jogging	BOOL		1 = Drive requested to jog.
Sts_CommandDir	BOOL		1 = Drive commanded to forward. 0 = Reverse.
Sts_ActualDir	BOOL		1 = Drive actual direction is forward. 0 = Reverse.
Sts_Accel	BOOL		1 = Drive is accelerating.
Sts_Decel	BOOL		1 = Drive is decelerating.
Sts_NotReady	BOOL		1 = Drive is not ready (cannot be started), check alarms, stops, faults.
Sts_DruveAlarm	BOOL		1 = Drive has an alarm (see drive display or manual).
Sts_AtSpeed	BOOL		1 = Drive is running at reference speed.
Sts_SpeedLimited	BOOL		1 = Speed reference setting exceeds configured maximum/minimum limit.
Sts_LogicSts	INT	2#0000_0000_0000_0000	Drive logic status word (from input assembly).
Sts_DriveSts1	INT		Drive status word 1 (par 569).
Sts_DriveSts2	INT		Drive status word 2 (par 238).
Sts_DriveNotRdy1	INT		Drive not ready flag word #1 (par 262).
STS_DriveNotRdy2	INT		Drive not ready flag word #2 (par 699).
Sts_Contactors	INT		Contactor status (par 506).
Sts_HdwOpts	INT		Hardware options (par 141).
Sts_SpecialFeat1	INT		Special features 1 (par 99).
Sts_Available	BOOL		1 = Drive available for control by automation (Program).
Sts_Bypass	BOOL		1 = Bypassable interlocks and permissives are bypassed.
Sts_BypActive	BOOL		1 = Bypassing active (bypassed or maintenance).
Sts_Disabled	BOOL		1 = Drive is disabled.
Sts_NotRdy	BOOL		1 = Instruction is not ready to run (independent of mode). - Check interlocks and permissives.

Table 9 - P_PF7000 Drive Output Parameters

Output Parameter	Data Type	Alias For	Description
Nrdy_Disabled	BOOL		1 = Device not ready due to the following: • Device disabled by Maintenance • Configuration error • Interlock not OK • Permissive not OK • Operator Stop priority command requires reset • Device failure (shed requires reset), • I/O Fault (shed requires reset) • Device tripped (Drive Fault) • Drive not ready • Device logic disabled/no mode.
Nrdy_CfgErr			
Nrdy_Intlk			
Nrdy_Perm			
Nrdy_OperPrio			
Nrdy_Fail			
Nrdy_IOFault			
Nrdy_Trip			
Nrdy_DriveNR			
Nrdy_NoMode			
Sts_MaintByp	BOOL		1 = Maintenance bypass is active, display icon.
Sts_AlmInh	BOOL		1 = Alarm is shelved, disabled, or suppressed, display icon.
Sts_MsgErr	BOOL		1 = Message error, unable to read at least one non-RPI drive parameter.
Sts_Err	BOOL		1 = Error in configuration: See detail bits for reason.
Err_Timer	BOOL		1 = Error in configuration: Invalid check or reset pulse time (use 0…2,147,483).
Err_Sim	BOOL		1 = Error in configuration: Simulation timer preset (use 0…2,147,483).
Err_Alarm	BOOL		1 = Error in configuration: Alarm minimum On time or severity.
Err_FdbkEU	BOOL		1 = Error in configuration: Speed Fdbk EU Min = Max.
Err_RefLim	BOOL		1 = Error in configuration: Speed Ref Limit Min > Max.
Err_RefEU	BOOL		1 = Error in configuration: Speed Ref EU Min = Max.
Sts_Hand	BOOL	Mode.Sts_Hand	1 = Mode is Hand (supersedes Maintenance, Override, Program, Operator).
Sts_Maint	BOOL	Mode.Sts_Maint	1 = Mode is Maintenance (supersedes Override, Program, Operator).
Sts_Ovrd	BOOL	Mode.Sts_Ovrd	1 = Mode is Override (supersedes 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_FailToStart	BOOL	FailToStart.Inp	1 = Drive failed to start.
Sts_FailToStop		FailToStop.Inp	1 = Drive failed to stop.
Sts_IntlkTrip		IntlkTrip.Inp	1 = Drive was stopped by an interlock not OK (one-shot).
Sts_DriveFault		DriveFault.Inp	1 = Drive Fault (see drive display or manual).
Sts_IOFault		IOFault.Inp	I/O Communication fault status: 0 = OK 1 = Bad
Ack_FailToStart	BOOL	FailToStart.Ack	1 = Fail to Start, Fail to Stop, Interlock Trip, Drive Fault, or I/O Fault alarm has been acknowledged.
Ack_FailToStop		FailToStop.Ack	
Ack_IntlkTrip		IntlkTrip.Ack	
Ack_DriveFault		DriveFault.Ack	
Ack_IOFault		IOFault.Ack	

Table 9 - P_PF7000 Drive Output Parameters

Output Parameter	Data Type	Alias For	Description
Alm_FailToStart	BOOL	FailToStart.Alm	1 = Drive failed to start alarm.
Alm_FailToStop		FailToStop.Alm	1 = Drive failed to stop alarm.
Alm_IntlkTrip		IntlkTrip.Alm	1 = Alarm: Drive stopped by an interlock not OK.
Alm_DriveFault		DriveFault.Alm	1 = Alarm: Drive Fault (see drive display or manual).
Alm_IOFault		IOFault.Alm	1 = I/O Fault alarm.
Sts_FailToStartDisabled	BOOL	FailToStart.Disabled	1 = Fail to Start, Fail to Stop, Interlock Trip, Drive Fault, or I/O Fault alarm has been disabled (by Maintenance).
Sts_FailToStopDisabled		FailToStop.Disabled	
Sts_IntlkTripDisabled		IntlkTrip.Disabled	
Sts_DriveFaultDisabled		DriveFault.Disabled	
Sts_IOFaultDisabled		IOFault.Disabled	
Sts_FailToStartSuppressed	BOOL	FailToStart.Suppressed	1 = Fail to Start, Fail to Stop, Interlock Trip, Drive Fault, or I/O Fault alarm has been suppressed (by Program).
Sts_FailToStopSuppressed		FailToStop.Suppressed	
Sts_IntlkTripSuppressed		IntlkTrip.Suppressed	
Sts_DriveFaultSuppressed		DriveFault.Suppressed	
Sts_IOFaultSuppressed		IOFault.Suppressed	
Sts_FailToStartShelved	BOOL	FailToStart.Shelved	1 = Fail to Start, Fail to Stop, Interlock Trip, Drive Fault, or I/O Fault alarm has been shelved (by Operator).
Sts_FailToStopShelved		FailToStop.Shelved	
Sts_IntlkTripShelved		IntlkTrip.Shelved	
Sts_DriveFaultShelved		DriveFault.Shelved	
Sts_IOFaultShelved		IOFault.Shelved	
Rdy_Start	BOOL		1 = Ready to receive OCmd for Start, Stop, Jog, Fwd, Rev, Bypass, or Check (enables HMI button).
Rdy_Stop			
Rdy_Jog			
Rdy_Fwd			
Rdy_Rev			
Rdy_Bypass			
Rdy_Check			
Rdy_Disable	BOOL		1 = Ready to receive MCmd for Disable or Enable (enables HMI button).
Rdy_Enable			
Rdy_Reset	BOOL		1 = Ready to receive OCmd_Reset (enables HMI button).
Rdy_ResetAckAll	BOOL		1 = At least one alarm or latched shed condition requires reset or acknowledgement.
Rdy_SpeedRef	BOOL		1 = Ready to receive OSet_SpeedRef (enables data entry field).
P_PF7000	BOOL		Unique parameter name for auto - discovery.

PowerFlex 7000 Drive 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 the Studio 5000 Logix Designer application. To configure, open the Instruction Logic of the Add-On Instruction instance and then open the Data Monitor on a local tag. These parameters cannot be modified by using controller logic or Logix Designer application export/import functionality.

Table 10 - Local Configuration Tags

Tag Name	Data Type	Default	Description
Cfg_Desc	STRING_40	'PowerFlex 7000 Variable Frequency Drive'	Description for display on HMI. This string is shown in the title bar of the faceplate.
Cfg_FwdText	STRING_16	'Forward'	Name for forward direction. For example: 'Up', 'Forward'.
Cfg_Label	STRING_20	'Motor Speed Control'	Label for graphic symbol displayed on HMI. This string appears on the graphic symbol.
Cfg_RevText	STRING_16	'Reverse'	Name for reverse direction. For example: 'Down', 'Reverse'.
Cfg_SpeedFdbkEU	STRING_8	'Hz'	Speed feedback engineering units for display on HMI.
Cfg_SpeedRefEU	STRING_8	'Hz'	Speed reference engineering units for display on HMI.
Cfg_Tag	STRING_20	'P_PF7000'	Tagname for display on HMI. This string is shown in the title bar of the faceplate.

Table 11 - Local Value Tags

Tag Name	Data Type	Default	Description
Val_DriveAlarmDesc	STRING_16	''	Description of drive alarm (given LastAlarmCode).
Val_DriveAlarmDT	DATETIME	{...}	Date and time last drive alarm occurred.
Val_DriveAlarmDT.Yr	DINT	0	Date and time last drive alarm occurred (year).
Val_DriveAlarmDT.Mo	DINT	0	Date and time last drive alarm occurred (month).
Val_DriveAlarmDT.Da	DINT	0	Date and time last drive alarm occurred (day).
Val_DriveAlarmDT.Hr	DINT	0	Date and time last drive alarm occurred (hour).
Val_DriveAlarmDT.Min	DINT	0	Date and time last drive alarm occurred (minute).
Val_DriveAlarmDT.Sec	DINT	0	Date and time last drive alarm occurred (second).
Val_DriveAlarmDT.uSec	DINT	0	Date and time last drive alarm occurred (microsecond).
Val_DriveFaultDesc	STRING_16	''	Description of drive fault (given LastFaultCode).
Val_DriveFaultDT	DateTime	{...}	Date and time last drive fault occurred.
Val_DriveFaultDT.Yr	DINT	0	Date and time last drive fault occurred (year).
Val_DriveFaultDT.Mo	DINT	0	Date and time last drive fault occurred (month).
Val_DriveFaultDT.Da	DINT	0	Date and time last drive fault occurred (day).
Val_DriveFaultDT.Hr	DINT	0	Date and time last drive fault occurred (hour).
Val_DriveFaultDT.Min	DINT	0	Date and time last drive fault occurred (minute).
Val_DriveFaultDT.Sec	DINT	0	Date and time last drive fault occurred (second).
Val_DriveFaultDT.uSec	DINT	0	Date and time last drive fault occurred (microsecond).

Operations

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

Modes

This instruction uses the following standard modes, which are implemented by using an embedded P_Mode Add-On Instruction.

Mode	Description
Operator	The Operator owns control of the device. Operator commands (OCmd_) and Operator settings (OSet_) from the HMI are accepted.
Program	Program logic owns control of the device. Program commands (PCmd_) and Program settings (PSet_) are accepted.
Override	Priority logic owns control of the device and supersedes Operator and Program control. Override Inputs (Inp_OvrdCmd and other Inp_OvrdXxxx values) are accepted. If so configured, bypassable interlocks and permissives are bypassed.
Maintenance	Maintenance owns control of the device and supersedes Operator, Program, and Override control. Operator commands and settings from the HMI are accepted. Bypassable interlocks and permissives are bypassed, and device timeout checks are not processed.
Hand	Hardwired logic or other logic outside the instruction owns control of the device. The instruction tracks the state of the device for bumpless transfer back to one of the other modes.
No Mode	The device is disabled and has no owner because the EnableIn input is false. The main instruction Logic routine is not being scanned. See Execution section for more information on EnableInFalse processing.

IMPORTANT Instructions with Cfg_OperKeep and Cfg_ProgKeep keep some aspects of the device operation with the operator or program regardless of whether the main mode is Program or Operator mode.

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

Alarms

This instruction uses the following alarms, which are implemented by using embedded P_Alarm and P_Gate Add-On Instructions.

Alarm Name	P_Alarm Name	P_Gate Name	Description
Drive Fault	DriveFault	None	Raised when the drive detects a fault and sets its Faulted status bit. Check the Fault Code and description to determine the cause. Issuing a Reset of this object causes a Clear Fault command to be sent to the drive in an attempt to clear the fault.
Fail to Start	FailToStart	None	Raised when the drive has and is using run feedback, an attempt is made to start the drive, and the run feedback does not indicate that the drive is running within the configured time. If Fail to Start is configured as a shed fault, the drive is stopped and a reset is required to start the drive.
Fail to Stop	FailToStop	None	Raised when the drive has and is using run feedback, an attempt is made to stop the drive, and the run feedback does not indicate that the drive stopped within the configured time.
Interlock Trip	IntlkTrip	None	Raised when the drive is running and an interlock 'not OK' condition causes the drive to stop. If interlocks are not bypassed, a bypassable interlock or a non-bypassable interlock 'not OK' condition initiates an interlock trip. If interlocks are bypassed, only a non-bypassable interlock 'not OK' condition initiates an interlock trip.
I/O Fault	IOFault	None	Raised when the Inp_IOFault input is true. This input is used to indicate to the instruction that a communication failure has occurred for its I/O. If the I/O Fault is configured as a shed fault, the drive is stopped and not permitted to start until reset.

Parameters of the P_Alarm object can be accessed by using the following convention: [P_Alarm Name].[P_Alarm Parameter].

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

Simulation

Simulation in P_PF7000 de-energizes the outputs, ignores inputs, and provides the feedback of a working drive. The simulation lets you operate the Add-On Instruction like a working drive, even if no drive is physically present.

You must set the Inp_Sim parameter in the controller to '1' to enable simulation.

The Simulation icon  is displayed at the bottom left of the Operator faceplate indicating the device is in simulation.

You can also use Cfg_SimRampT to set the time (in seconds) to ramp the speed feedback.

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

Execution

The following table explains the handling of instruction execution conditions.

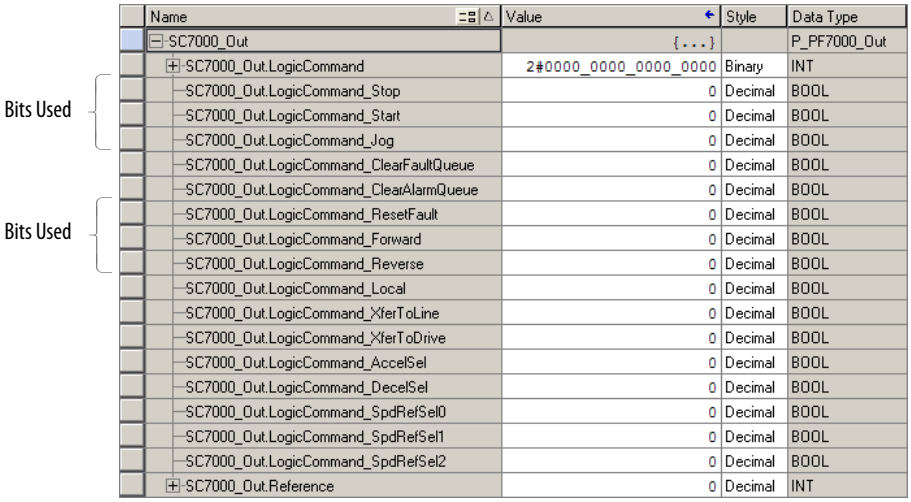
Condition	Description
EnableIn False (false rung)	Processing for EnableIn False (false rung) is handled the same as if the drive were Disabled by Command. The drive outputs are de-energized and the drive is shown as disabled on the HMI.
Powerup (prescan, first scan)	Processing of modes and alarms on Prescan and Powerup is handled by the embedded P_Mode and P_Alarm Add-On Instructions. See the specifications for details. On Powerup, the drive is treated as if it had been Commanded to Stop.
Postscan (SFC Transition)	No SFC Postscan logic is provided.

See the Logix5000™ Controllers Add-On Instructions Programming Manual, publication 1756-PM010, for more information.

Programming Example

This example uses the P_PF7000 instruction to control the motor of a planetary mixer in a concrete batch plant.

In the drive command word, the instruction uses bits .0, .1, .2, .5, .6, and .7. The instruction does not use the rest of the bits in the 'Out' reference parameter in the InOut structure. These unused bit are available for your application to use.



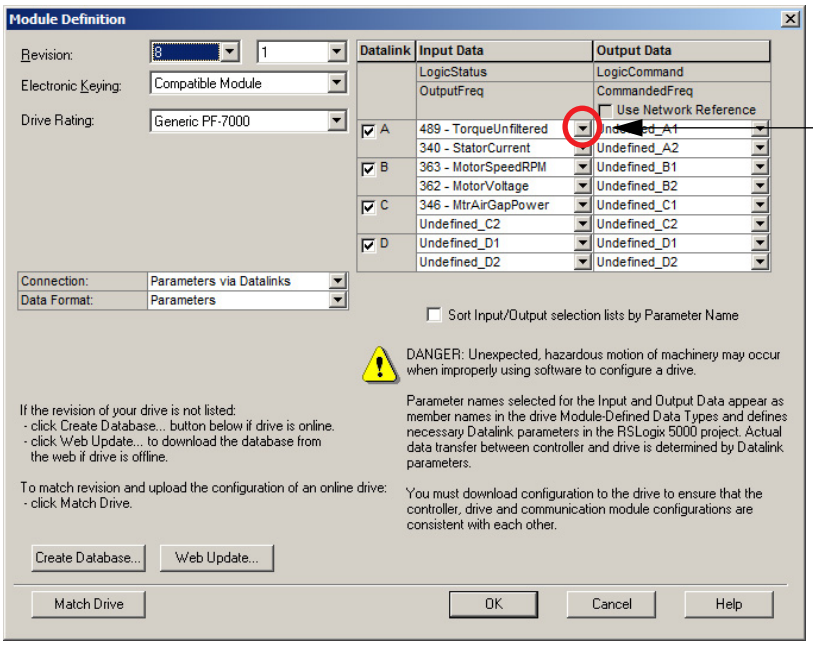
Name	Value	Style	Data Type
SC7000_Out	{...}		P_PF7000_Out
SC7000_Out.LogicCommand	2#0000_0000_0000_0000	Binary	INT
SC7000_Out.LogicCommand_Stop	0	Decimal	BOOL
SC7000_Out.LogicCommand_Start	0	Decimal	BOOL
SC7000_Out.LogicCommand_Jog	0	Decimal	BOOL
SC7000_Out.LogicCommand_ClearFaultQueue	0	Decimal	BOOL
SC7000_Out.LogicCommand_ClearAlarmQueue	0	Decimal	BOOL
SC7000_Out.LogicCommand_ResetFault	0	Decimal	BOOL
SC7000_Out.LogicCommand_Forward	0	Decimal	BOOL
SC7000_Out.LogicCommand_Reverse	0	Decimal	BOOL
SC7000_Out.LogicCommand_Local	0	Decimal	BOOL
SC7000_Out.LogicCommand_XferToLine	0	Decimal	BOOL
SC7000_Out.LogicCommand_XferToDrive	0	Decimal	BOOL
SC7000_Out.LogicCommand_AccelSel	0	Decimal	BOOL
SC7000_Out.LogicCommand_DecelSel	0	Decimal	BOOL
SC7000_Out.LogicCommand_SpdRefSel0	0	Decimal	BOOL
SC7000_Out.LogicCommand_SpdRefSel1	0	Decimal	BOOL
SC7000_Out.LogicCommand_SpdRefSel2	0	Decimal	BOOL
SC7000_Out.Reference	0	Decimal	INT

Follow these steps to import the P_PF7000 rung into your project.

1. On the Controller Organizer, add your PowerFlex drive to the I/O Configuration and name the drive.
2. Right-click the PowerFlex drive in the I/O Configuration and choose Properties.

   The Module Properties dialog box appears.
3. Click Change.

The Module Definition dialog box appears.



4. In the Input Data column, click the pull-down menu and choose a parameter for each datalink.

   Datalinks, which handle communication between the drive and controller, carry over to the Module Definition dialog box.

   The required datalinks to add to a project include the following:

   - Unfiltered Torque Current (Par 489)
   - Motor Stator Current (Par 340)
   - Motor Speed in RPM (Par 363)
   - Motor Voltage (Par 362)
   - Motor Air Gap Power (Par 346)

   The last three datalinks are not used by the instruction and are available for the user application.

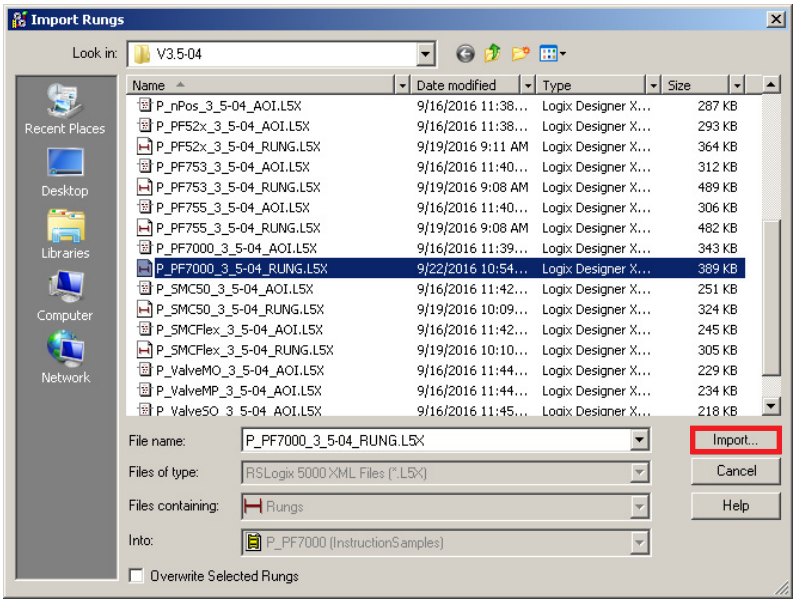
5. Click OK.

6. Under Tasks on the Controller Organizer, click + in front of Main Task.

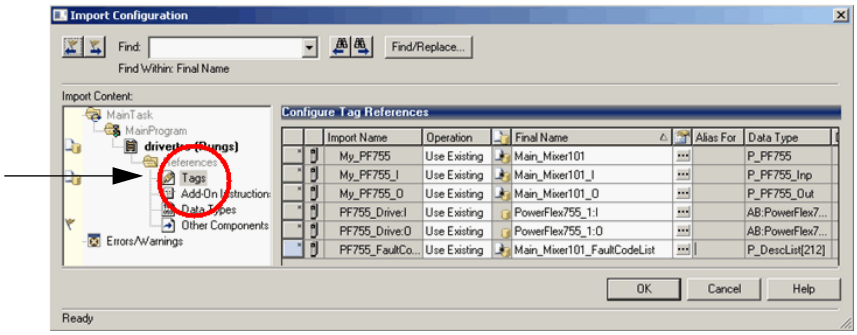
7. To open this ladder logic routine, double-click Main_Routine.

8. Right-click one of the rungs and choose Import rungs.

9. On the Import rungs dialog box, select the P_PF7000 instruction and click Import.

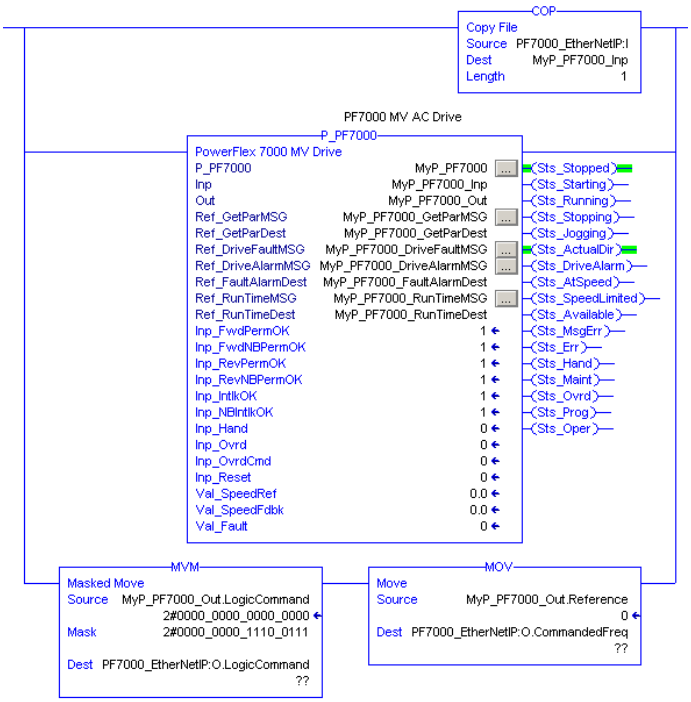


During the import process, you can name the tags for the routine in the Import Configuration dialog box.



10. Click Tags in the Import Content tree and type the names of the variables that match your process and the drive name in the Final Name column.

Your ladder logic routine now looks like the example. Observe that the tag names and the drive name are automatically placed in the instruction.



Display Elements

The P_PF7000 instruction uses the same HMI display elements that are used for the Variable Speed Drive (P_VSD) instruction.

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, with tag structures in the ControlLogix® system, aid consistency and save engineering time.

Table 12 - P_PF7000 Drive Display Elements Description

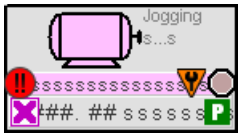
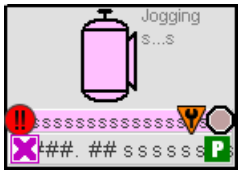
Display Element Name	Display Element	Description
GO_P_VSD_R		These display elements show the different motor positions.
GO_P_VSD_U		
GO_P_VSD_D		
GO_P_VSD_Blower_R		These display elements show the different blower positions.
GO_P_VSD_Blower_L		
GO_P_VSD_Blower_U		
GO_P_VSD_Blower_D		
GO_P_VSD_Conveyer_R		This display element illustrates a conveyer.

Table 12 - P_PF7000 Drive Display Elements Description

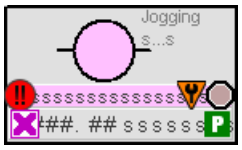
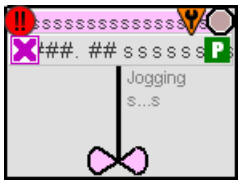
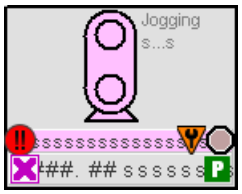
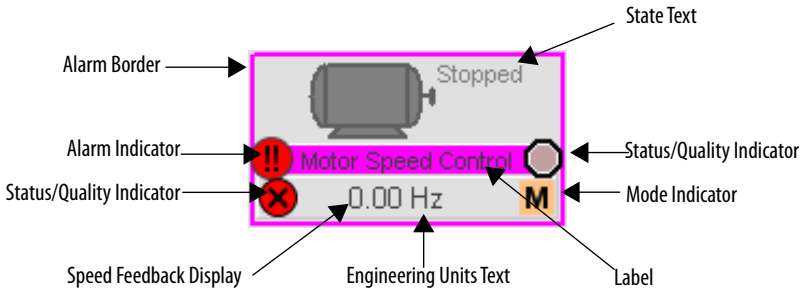
Display Element Name	Display Element	Description
GO_P_VSD_Inline_U		These display elements show the different inline motor positions.
GO_P_VSD_Inline_R		
GO_P_VSD_Inline_L		
GO_P_VSD_Inline_D		
GO_P_VSD_Pump_R		These display elements show the different pump positions.
GO_P_VSD_Pump_L		
GO_P_VSD_Pump_U		
GO_P_VSD_Agitator_D		This display element illustrates an agitator.
GO_P_VSD_Mixer_U		This display element shows a mixer.

Table 12 - P_PF7000 Drive Display Elements Description

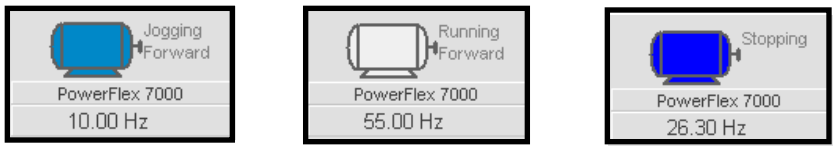
Display Element Name	Display Element	Description
GO_P_VSD_RPump_U		This display element shows a rotary gear pump.
GO_P_VSD_Fan_D		This display element shows a fan.

Common attributes of the P_PF7000 global objects include the following:

- Graphical representation of the driven equipment
- Speed feedback display with engineering units
- Status/quality indicators
- Mode indicator
- Maintenance Bypass indicator
- State
- Label
- Color changing alarm border that blinks on unacknowledged alarm
- Alarm indicator that changes color with the severity of an alarm



State Indicators



The State Indicator text changes and the display element color changes depending on the state of the drive.

Color	State
Blue	Stopping
Dark gray	Stopped
Light blue	Jogging
Blue	Starting
White	Running

Status/Quality Indicators

One of these symbols appears on the graphic symbol when the described condition is true.

Graphic Symbol	Description
	Invalid configuration.
	Data quality bad/failure.
	Data Quality degraded: uncertain, test, simulation, substitution, or out of specification.
	The input or device has been disabled.
	Device not ready to operate.
	Speed reference limited to minimum/maximum.
	Motor is at target speed.
	Drive is accelerating.
	Drive is decelerating.

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 PowerFlex 7000 Drive Instruction, the Invalid Configuration Indicator appears under the following conditions:

- The Fail to Start check time, Fail to Stop check time, Reset Pulse time, or Maximum Jog time is set to a value less than zero or greater than 2,147,483 seconds.
- The Speed Raw Minimum and Raw Maximum scaling parameters are set to the same value.
- The Speed Scaled EU Minimum and EU Maximum scaling parameters are set to the same value.
- The Maximum Speed Reference clamp value is less than the Minimum Speed Reference clamp value, or either clamp value is less than zero.
- The Simulated Speed Ramp Time is set to a value less than zero or greater than 2,147,483 seconds.
- An 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 PowerFlex 7000 Drive Instruction, the Device Not Ready indicator appears under the following conditions:

- Device has been disabled by Maintenance.
- There is a configuration error.
- An Interlock or Permissive is not OK.
- Operator state 0 priority command requires reset.
- There has been a device failure or I/O Fault and Shed requires reset.
- Device has tripped and generated a Drive Fault.
- Drive is not ready.
- Device logic is disabled or there is no mode.

Mode Indicators

One of these symbols appears on the right side of the graphic symbol to indicate the mode of the object instruction.

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

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

See 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 on the left side of the label to indicate the described alarm condition. The alarm border and label background blink if acknowledgement of an alarm condition is required. Once the alarm is acknowledged, the alarm border and label background remain the color that corresponds to the severity of the alarm.

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.

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

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 is active.

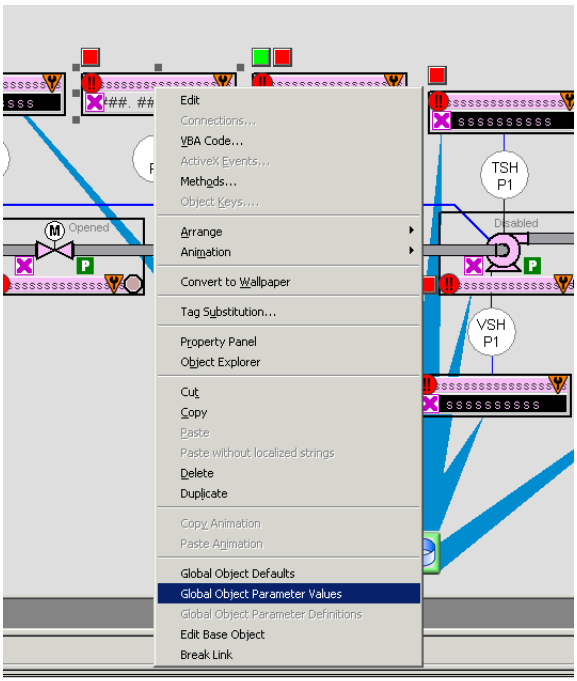
TIP When the Maintenance Bypass Indicator appears, you can find what condition was bypassed by following the indicators. Click the graphic symbol to open the faceplate. The Maintenance Bypass Indicator appears next to the appropriate tab at the top of the faceplate to guide you in finding the bypass.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

For the PowerFlex 7000 Drive Instruction, the Maintenance Bypass Indicator appears when the bypassable interlocks and permissives have been bypassed.

Using Display Elements

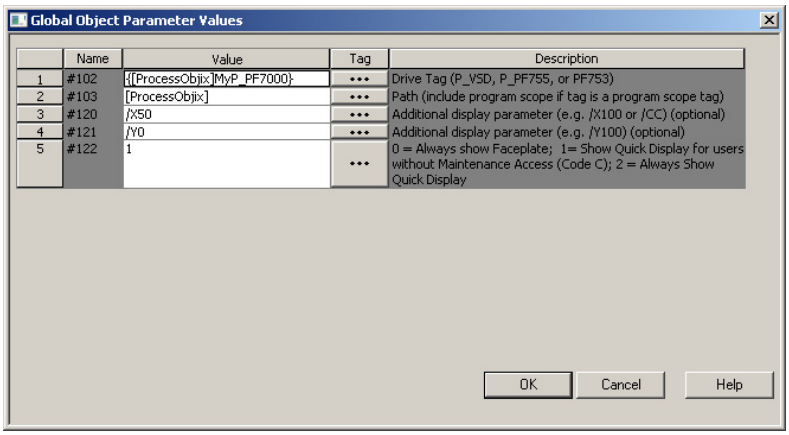
The global objects for P_PF7000 can be found in the global object file (RA-BAS) P_VSD Graphics Library.ggfx. Follow these steps to use a global object.

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.



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

TIP You can click the ellipsis (. . .) to browse and select a tag.

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

4. Click OK.

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 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

Quick Display

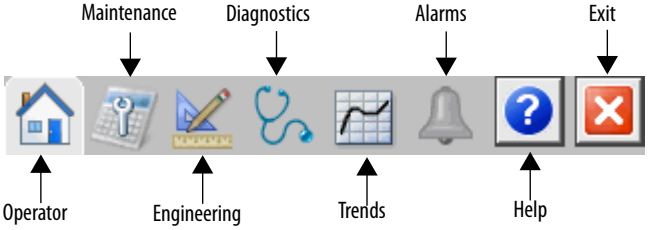
The Quick Display screen provides a means for operators to perform simple interactions with the P_PF7000 instruction instance. From the Quick Display, you can navigate to the faceplate for full access for operation, maintenance, and configuration.

Faceplate

The P_PF7000 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.



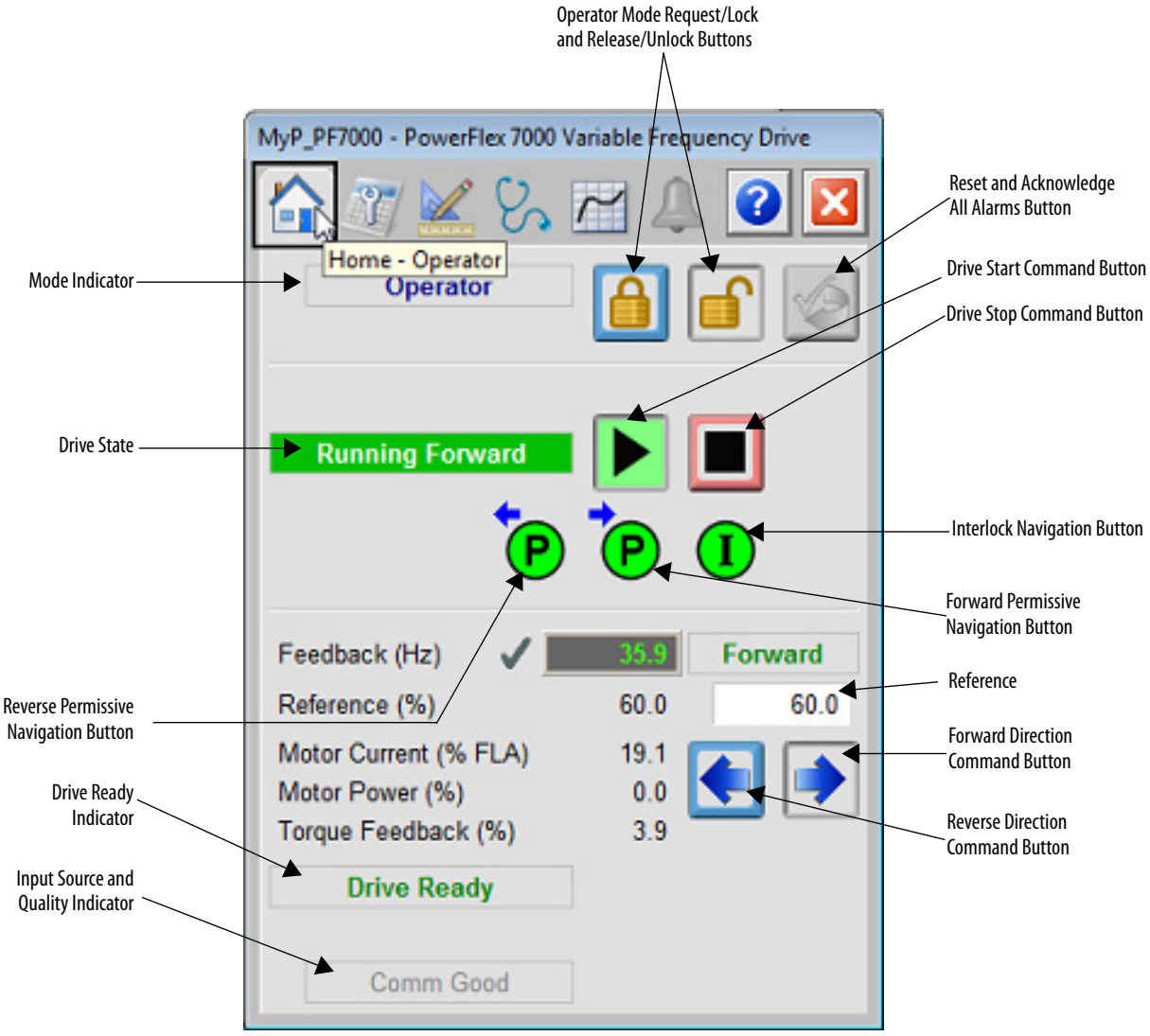
The faceplate provides the means for operators, maintenance personnel, engineers, and others to interact with the P_PF7000 instruction instance, including viewing its status and values and manipulating it through its commands and settings. When a given input is restricted via FactoryTalk View security, 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, Override, Maintenance, or Hand)
- Requested mode indicator (Appears only if the Operator or Program mode has been superseded by another mode.)
- Input Source and Quality indicator (See 'SrcQ' in the Output parameters table on page 20 for details.)
- Drive Motion State (Accelerating, Decelerating, or At Speed)
- Drive Ready indicator (Drive Ready, Drive Not Ready, or Drive Faulted)
- Actual Speed and requested speed
- Actual Direction (Appears only if the drive is configured Can Run Reverse)
- Requested Direction (Appears only if the drive is configured Can Run Reverse)
- Output current and output power
- Torque current



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

Table 13 - Operator Tab Description

Function	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 13 - Operator Tab Description

Function	Action	Security
	Click to reset and acknowledge all alarms.	Acknowledge Alarms (Code F)
	Click to select forward direction.	Normal Operation of Devices (Code A)
	Click to select reverse direction.	
	Click to open the Interlocks faceplate.	None
	Click to open the forward Permissive faceplate.	
	Click to open the reverse Permissive faceplate.	
Reference (Hz)	Type the desired speed in engineering units.	Normal Operation of Devices (Code A)

If the object is configured to have permissive and interlock objects (for example, Cfg_HasIntlkObj is true), the permissive and interlock indicators become buttons. The buttons open the faceplates of the source objects used as a permissive or interlock (often this is a P_Intlk interlock or P_Perm permissive object). If the object is not configured in this way, the permissive/interlock icons are indicators only.

The Operator tab also has a button to open the Restart Inhibit faceplate if the drive is configured to use the P_ResInh object (Cfg_HasResInh = 1). When the object is not configured to have an P_ResInh instruction, the Restart Inhibit button is not displayed.

The Operator tab also has a button to open the Runtime faceplate if the drive is configured to use the P_RunTime object (Cfg_HasRunTime = 1). When the object is not configured to have an P_RunTime instruction, the Runtime button is not displayed.

See these publications for more information:

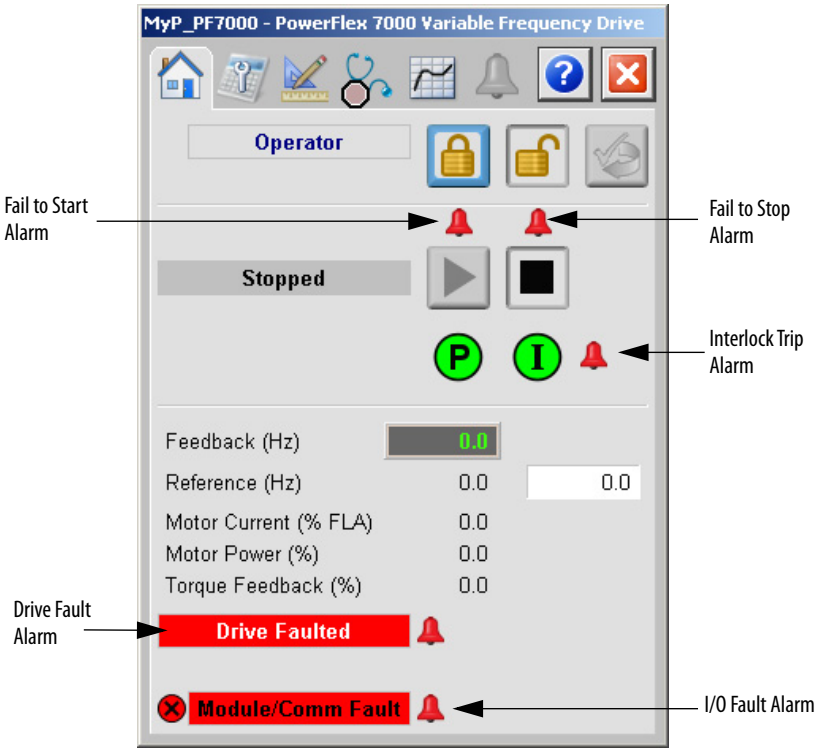
- Rockwell Automation Library of Process Objects: Interlock with First Out and Bypass (P_Intlk) Reference Manual, publication SYSLIB-RM004
- Rockwell Automation Library of Process Objects: Permissives with Bypass (P_Perm) Reference Manual, publication SYSLIB-RM007

- Rockwell Automation Library of Process Objects: Restart Inhibit for Large Motor (P_ResInh) Reference Manual, publication SYSLIB-RM009
- Rockwell Automation Library of Process Objects: Runtime and Starts (P_RunTime) Reference Manual, publication SYSLIB-RM010

One of these symbols appears to indicate the described Interlock or Permissive condition.

Permissive Symbol	Interlock Symbol	Description
		One or more conditions not OK
		Non-bypassed conditions OK
		All conditions OK, bypass active
		All conditions OK

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



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

Graphic Symbol	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)

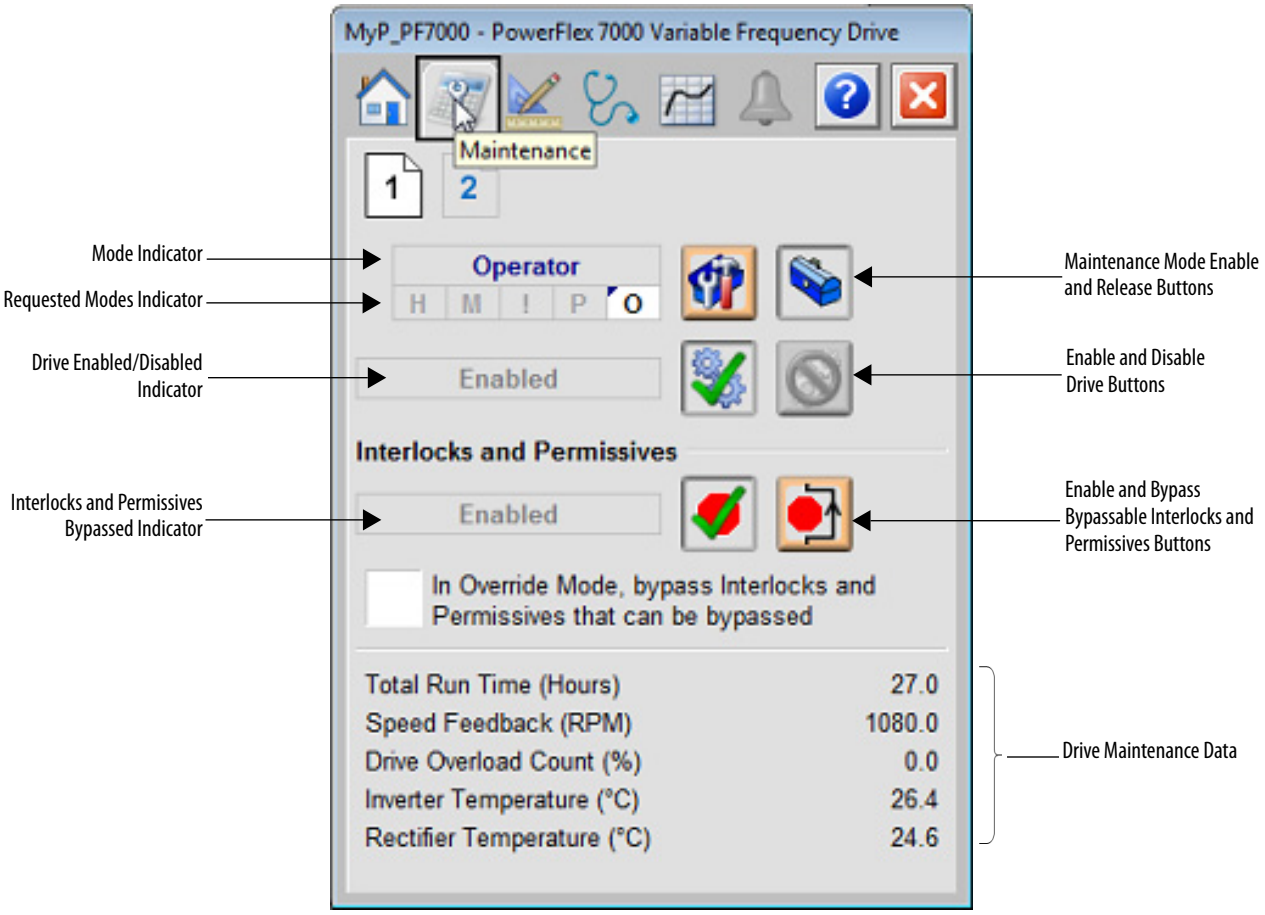
Maintenance Tab

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

Maintenance Tab Page 1

Page 1 of the Maintenance tab shows the following information:

- Current mode (Operator, Program, or Maintenance).
- Requested Modes Indicator - This display highlights the modes that have been requested. The leftmost highlighted mode is the active mode.

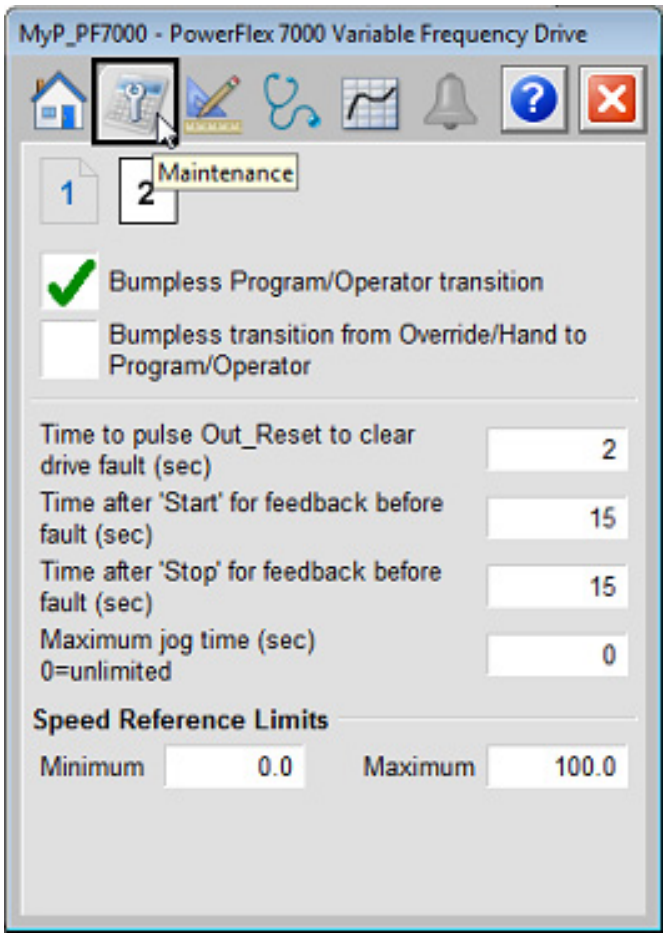


The following table shows the functions on the Maintenance tab.

Table 14 - Maintenance Tab Description

Function	Action	Security	Configuration Parameters
	Click for Maintenance mode.	Equipment Maintenance (Code C)	None
	Click to release Maintenance mode.		
	Click to enable drive.		
	Click to disable drive.		
	Click to enable checking of all interlocks and permissives.	Disable Alarms Bypass Permissives and Interlocks (Code H)	
	Click to bypass checking of bypassable interlocks and permissives.		
In Override mode, bypass Interlocks, and Permissives that can be bypassed	Check to have the bypassable interlocks and permissives bypassed in Override mode.	Engineering Configuration (Code E)	Cfg_OvrdPermIntlk

Maintenance Tab Page 2



The following table shows the functions on the Maintenance tab Page 2.

Table 15 - Maintenance Tab Page 2 Description

Function	Action	Security	Configuration Parameters
Bumpless Program/ Operator Transition	Check to have program settings, such as Speed Reference, track operator settings in Operator mode, and have operator settings track Program Settings in Program mode.	Equipment Maintenance (Code C)	Cfg_SetTrack
Bumpless Transition from Override/Hand to Program/Operator	Check to have the Program and Operator Speed Reference track the Override Speed Reference in Override mode or the actual speed in Hand mode.		Cfg_SetTrackOvrdHand
Time to pulse Out_Reset to clear drive fault (sec)	Type the amount of time to hold Out_Reset true to reset a drive fault when a reset command is received.	Configuration and Tuning Maintenance (Code D)	Cfg_ResetPulseT
Time after Start to get Run Feedback before Fault (sec)	Type the amount of time to allow for the drive's run feedback to confirm the drive has started before raising a Fail to Start alarm.		Cfg_FailToStartT

Table 15 - Maintenance Tab Page 2 Description

Function	Action	Security	Configuration Parameters
Time after Stop to drop Run Feedback before Fault (sec)	Type the amount of time to allow for the drive's run feedback to confirm the drive has stopped before raising a Fail to Stop alarm.	Configuration and Tuning Maintenance (Code D)	Cfg_FailToStopT
Maximum jog time (sec) 0 = unlimited	Type the maximum time (in seconds) that the drive can be jogged by using OCmd_Jog. **IMPORTANT:** This value stops drive jogging if HMI communication is lost during a jog.		Cfg_MaxJogT
Speed Reference Limits (Minimum and Maximum)	Type the clamping limits for the speed reference. If a speed reference outside this range is entered, the speed is clamped at these limits and Sts_SpeedLimited is asserted.		• Cfg_MaxSpdRef • Cfg_MinSpdRef

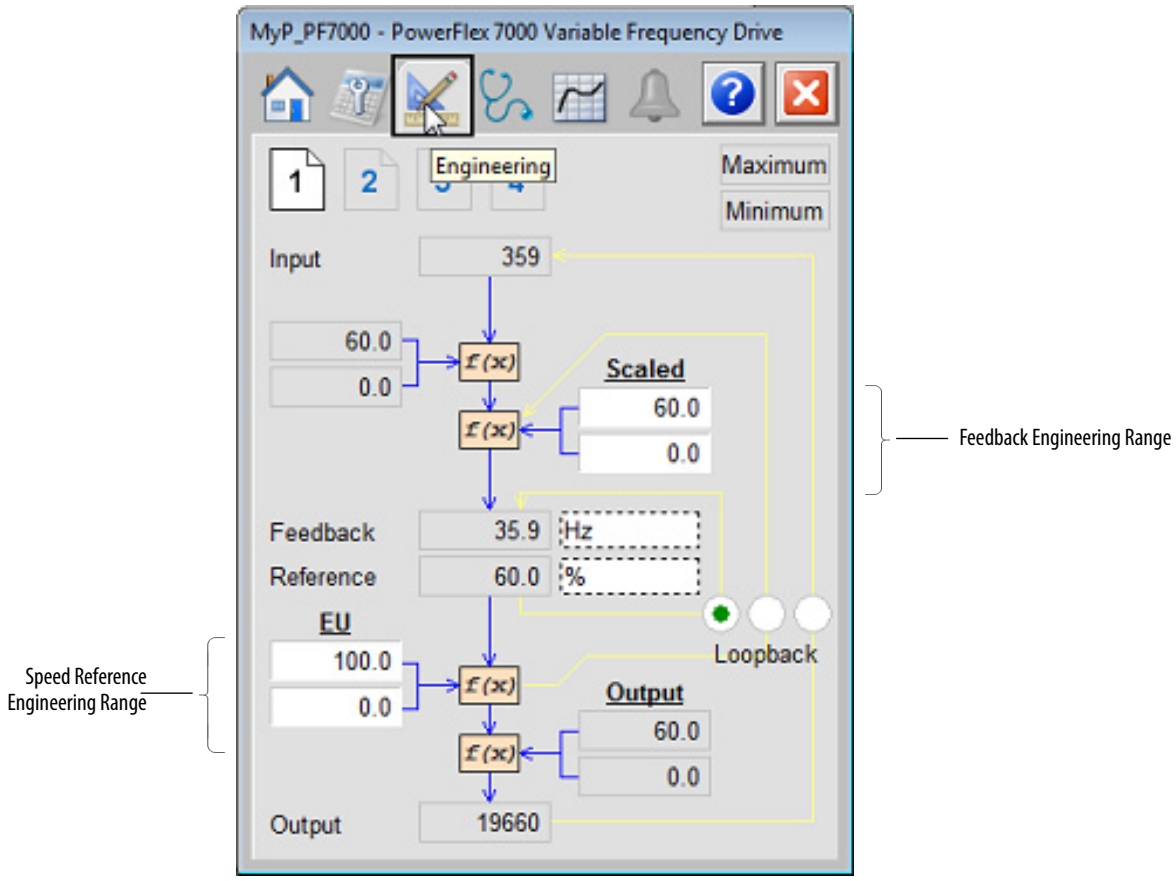
Engineering Tab

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, and for initial system commissioning or later system changes.

The Engineering tab is divided into four pages.

Engineering Tab Page 1

Page 1 of the Engineering tab lets you can configure the speed scaling for the drive.



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

Table 16 - Engineering Tab Page 1 Description

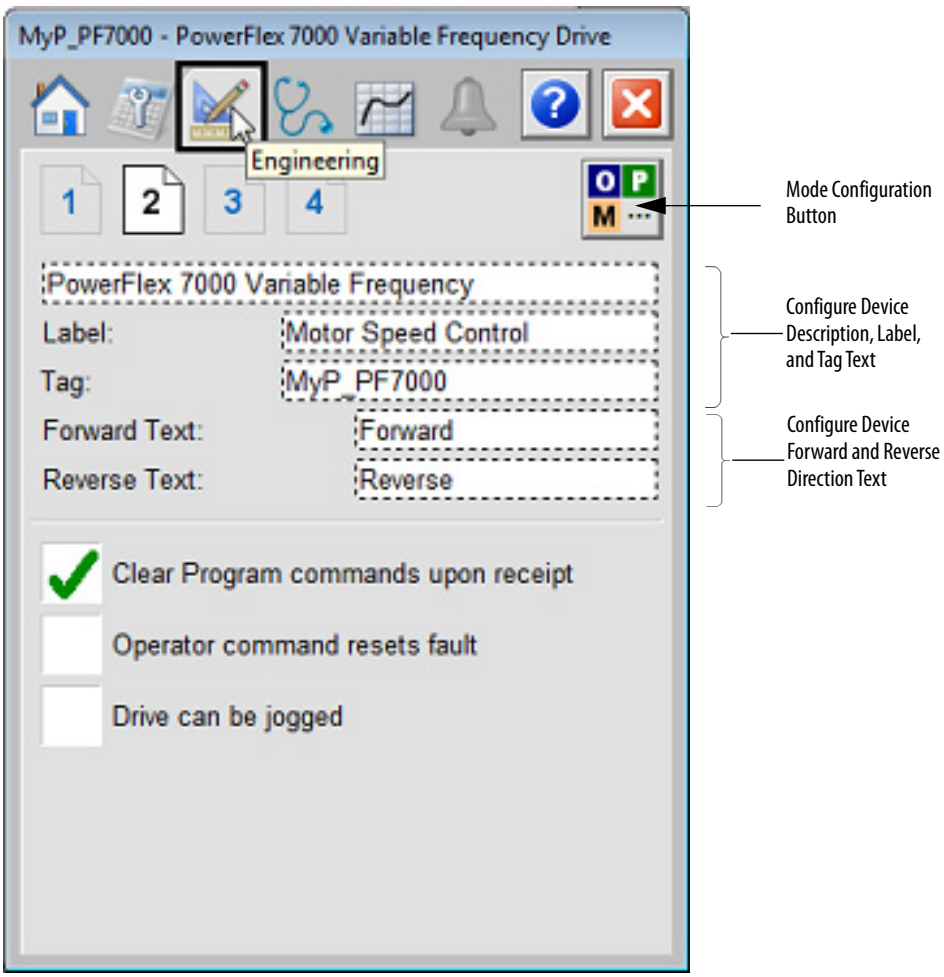
Function	Action	Security	Configuration Parameters
Feedback Maximum	Type an engineering unit value for the maximum scaled feedback from the drive.	Engineering Configuration (Code E)	Cfg_SpeedFdbkRawEUMax
Feedback Minimum	Type an engineering unit value for the minimum scaled speed feedback from the drive. (This value is usually zero.)		Cfg_SpeedFdbkRawEUMIN

Table 16 - Engineering Tab Page 1 Description

Function	Action	Security	Configuration Parameters
Reference (maximum)	Type an engineering unit for the maximum feedback reference sent to the drive.	Engineering Configuration (Code E)	Cfg_SpeedFdbkEURefMax
Reference (minimum)	Type an engineering unit for the minimum feedback reference sent to the drive.		Cfg_SpeedFdbkEURefMin
EU (for feedback)	Type the text of the engineering units (units of measure) for the speed feedback.		Cfg_SpeedFdbkEU
EU (for reference)	Type the text of the engineering units (units of measure) for the speed reference.		Cfg_SpeedRefEU

Engineering Tab Page 2

Page 2 of the Engineering tab lets you can configure the description, label, and tag.

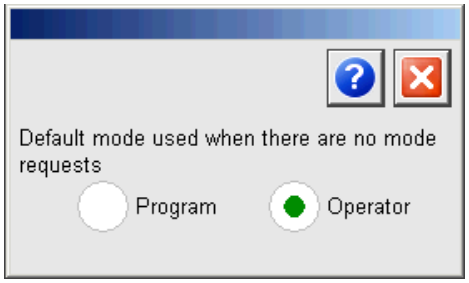


The following table lists the functions on the Engineering tab page 2.

Table 17 - Engineering Tab Page 2 Description

Function	Action	Security	Configuration Parameters
	Click to navigate to the Mode Configuration display.	None	See Mode Configuration display on page 53
Description	Type the device description to show on the faceplate title bar.	Engineering Configuration (Code E)	Cfg_Desc
Label	Type the label to show on the Graphic Symbol.		Cfg_Label
Tag	Type the tag name to show on the faceplate title bar and in the Tooltip. **IMPORTANT:** Pausing the mouse over these fields displays a tool tip with the configured Logix tag/path.		Cfg_Tag
Forward and Reverse Text	Type the text to display on the faceplate to indicate the direction of the drive.		• Cfg_FwdText • Cfg_RevText
Clear Program Commands on Receipt	Check to use Edge-triggered Program Commands (default). Clear the checkbox to use Level-triggered Program Commands.		Cfg_PCmdClear
Operator command resets fault	Check to permit the Operator Start or Stop command to reset any previous faults (I/O Fault, Fail to Start, Fail to Stop, Interlock Trip), then start or stop the motor. Clear this checkbox if a reset is required to clear faults.		Cfg_OCmdResets
Drive can be jogged	Check to enable Jog on the Operator tab so that the drive can be jogged from the faceplate.		Cfg_HasJog

Mode Configuration Display

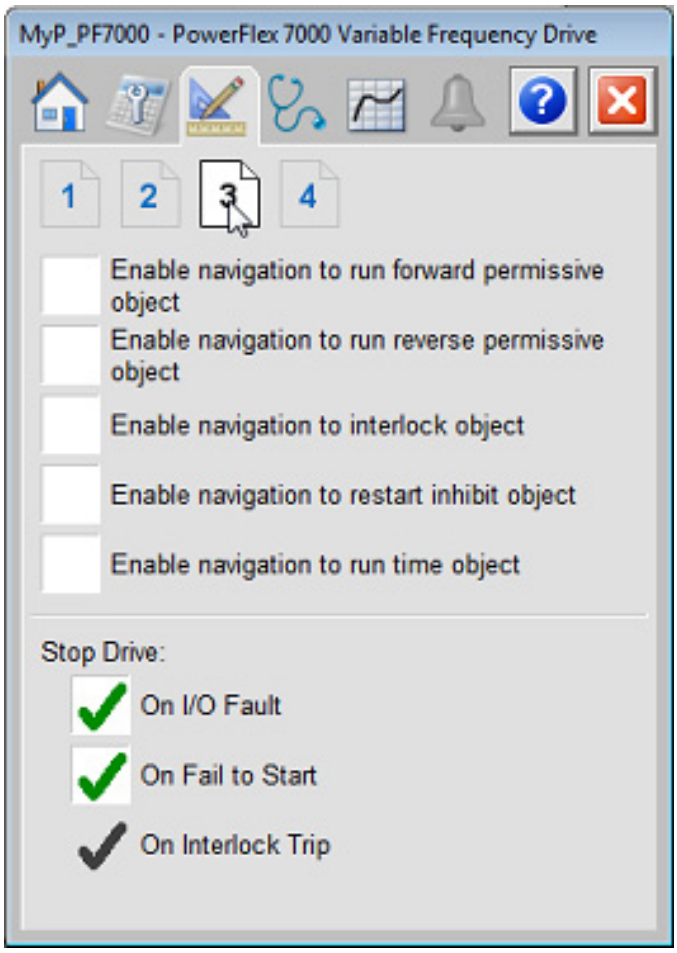


This display lets you select the default mode for the object by selecting the appropriate mode.

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 3



The following table shows the functions for the Engineering tab page 3.

Table 18 - Engineering Tab Page 3 Description

Function	Action	Security	Configuration Parameters
Enable navigation to run forward permissive object	Check if a permissive object is connected to Inp_FwdPermOK. The Permissive indicator becomes a button that opens the Forward Permissive faceplate. **IMPORTANT:** The name of the Forward Permissive object in the controller must be this object's name with the suffix '_FwdPerm'. For example, if your P_PF7000 object has the name 'Drive123', then its Forward Permissive object must be named 'Drive123_FwdPerm'.	Engineering Configuration (Code E)	Cfg_HasFwdPermObj

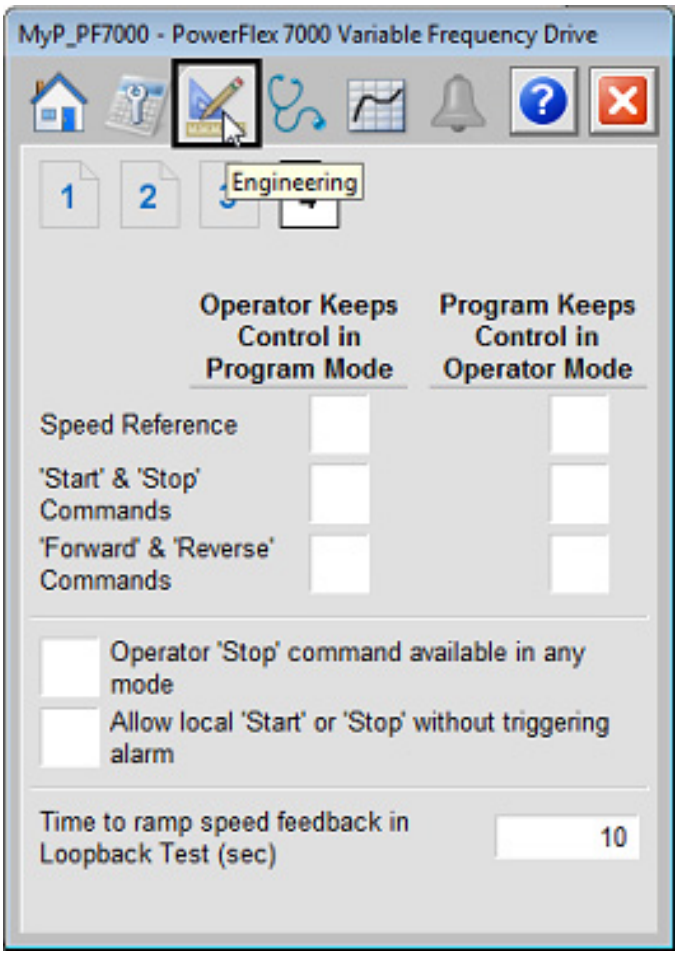
Table 18 - Engineering Tab Page 3 Description

Function	Action	Security	Configuration Parameters
Enable navigation to run reverse permissive object	Check if a permissive object is connected to Inp_RevPermOK. The Permissive indicator becomes a button that opens the Reverse Permissive faceplate. **IMPORTANT:** The name of the Reverse Permissive object in the controller must be this object's name with the suffix '_RevPerm'. For example, if your P_PF7000 object has the name 'Drive123', then its Reverse Permissive object must be named 'Drive123_RevPerm'.	Engineering Configuration (Code E)	Cfg_HasRevPermObj
Enable navigation to interlock object	Check if an interlock object is connected to Inp_IntlkOK. The Interlock indicator becomes a button that opens the interlock faceplate. **IMPORTANT:** The name of the Interlock object in the controller must be this object's name with the suffix '_Intlk'. For example, if your P_PF7000 object has the name 'Drive123', then its Interlock object must be named 'Drive123_Intlk'.		Cfg_HasIntlkObj
Enable navigation to restart inhibit object	Check if a restart inhibit object is connected. The button that opens the Restart Inhibit faceplate appears. **IMPORTANT:** The name of the Restart Inhibit object in the controller must be this object's name with the suffix '_ResInh'. For example, if your P_PF7000 object has the name 'Drive123', then its Restart Inhibit object must be named 'Drive123_ResInh'.		Cfg_HasResInhObj
Enable navigation to runtime object	Check if a runtime object is connected. The button that opens the Runtime faceplate appears. **IMPORTANT:** The name of the Runtime object in the controller must be this object's name with the suffix '_RunTime'. For example, if your P_PF7000 object has the name 'Drive123', then its Runtime object must be named 'Drive123_RunTime'.		Cfg_HasRunTimeObj
Stop Drive: On I/O Fault	When checked, if an I/O Fault condition is detected, the instruction attempts to stop the motor (sheds), an I/O Fault Status and Alarm are asserted, and the shed condition is latched until reset. When you clear the box, if an I/O Fault condition is detected, the instruction asserts the I/O Fault Status and Alarm but does not attempt to stop the drive and does not latch the shed condition.		Cfg_ShedOnIOFault

Table 18 - Engineering Tab Page 3 Description

Function	Action	Security	Configuration Parameters
Stop Drive: On Fail to Start	When checked, if a Fail to Start condition is detected, the instruction attempts to stop the motor (sheds), a Fail to Start Status and Alarm are asserted, and the shed condition is latched until reset. When you clear the box, if a Fail to Start condition is detected, the instruction asserts the Fail to Start Status and Alarm but does not attempt to stop the drive and does not latch the shed condition.	Engineering Configuration (Code E)	Cfg_ShedOnFailToStart
Stop Drive: On Interlock Trip	The motor always stops on an interlock trip. This item cannot be unchecked. It is displayed as a reminder that the Interlock Trip function always trips the motor.		None

Engineering Tab Page 4



The following table shows the functions for the Engineering tab page 4.

Table 19 - Engineering Tab Page 4 Description

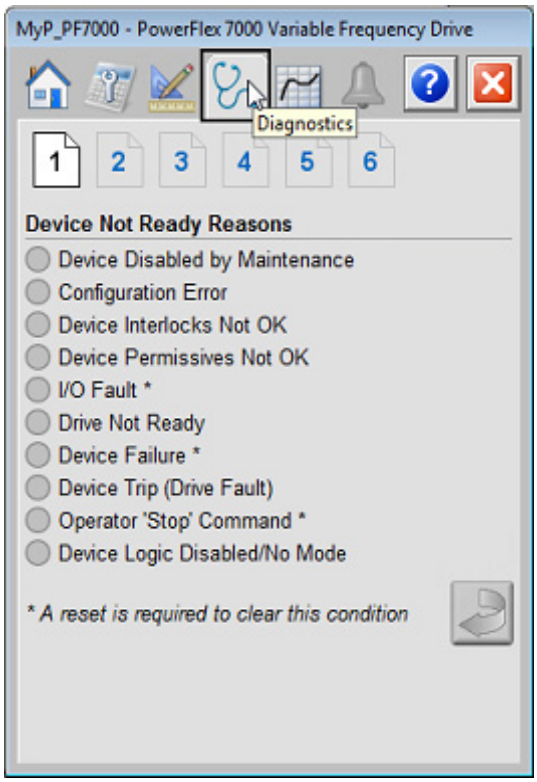
Function	Action	Security	Configuration Parameters
Speed Reference - Operator keeps Control in Program mode	Check to keep control of the drive Speed Reference with the Operator, even if the instruction is in Program mode. Clear this checkbox to have control of the drive Speed Reference follow the Instruction mode.	Engineering Maintenance (Code E)	Cfg_OperKeep.0
Speed Reference - Program keeps Control in Operator mode	Check to keep control of the drive Speed Reference with the Program, even if the instruction is in Operator mode. Clear this checkbox to have control of the drive Speed Reference follow the Instruction mode.		Cfg_ProgKeep.0
Start & Stop Commands - Operator keeps Control in Program mode	Check to keep the drive Start, Stop, and Jog (if used) commands with the Operator, even if the instruction is in Program mode. Clear this checkbox to have control of the drive Start, Stop, and Jog follow Instruction mode.		Cfg_OperKeep.1

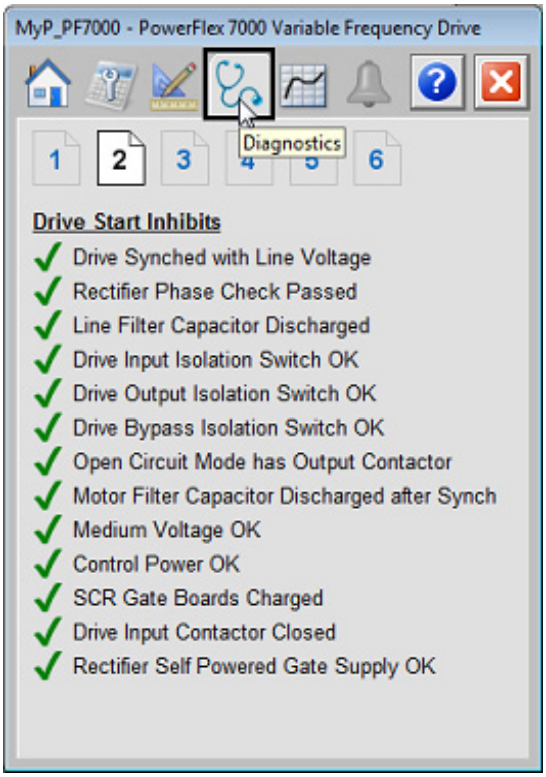
Table 19 - Engineering Tab Page 4 Description

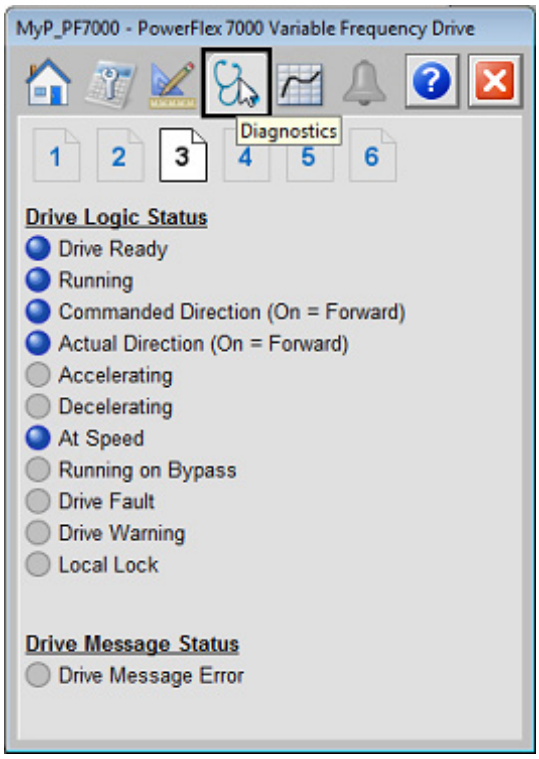
Function	Action	Security	Configuration Parameters
Start & Stop Commands - Program keeps Control in Operator mode	Check to keep control of the drive Start and Stop commands with the Program, even if the instruction is in Operator mode. **IMPORTANT**: The Program cannot Jog the drive, even if Jogging is enabled. Clear this checkbox to have control of the drive Start, Stop, and Jog follow Instruction mode.	Engineering Maintenance (Code E)	Cfg_ProgKeep.1
Forward & Reverse Commands - Operator keeps Control in Program mode	Check to keep control of the drive Forward and Reverse commands, if used, with the Operator, even if the instruction is in Program mode. Clear this checkbox to have control of the drive Forward and Reverse commands follow the Instruction mode.		Cfg_OperKeep.2
Forward Reverse Commands - Program keeps Control in Operator mode	Check to keep control of the drive Forward and Reverse commands (if used) with the Program, even if the instruction is in Operator mode. Clear this checkbox to have control of the drive Forward and Reverse commands follow the Instruction mode.		Cfg_ProgKeep.2
Operator 'Stop' command available in any mode	Check (= 1) so that the OCmd_Stop has priority and is accepted at any time. Clear this checkbox (= 0) so that the OCmd_Stop works only in Operator or Maintenance mode.		Cfg_OperStopPrio
Allow local 'Start' or 'Stop' without triggering alarm	Check (= 1) to allow local start/stop without an alarm. Clear this checkbox (= 0) to start/stop from the HMI or program only.		Cfg_AllowLocal
Time to ramp speed feedback when in Loopback Test (seconds)	Enter the time, in seconds, to ramp speed feedback when in Simulation.		Cfg_SimRampT

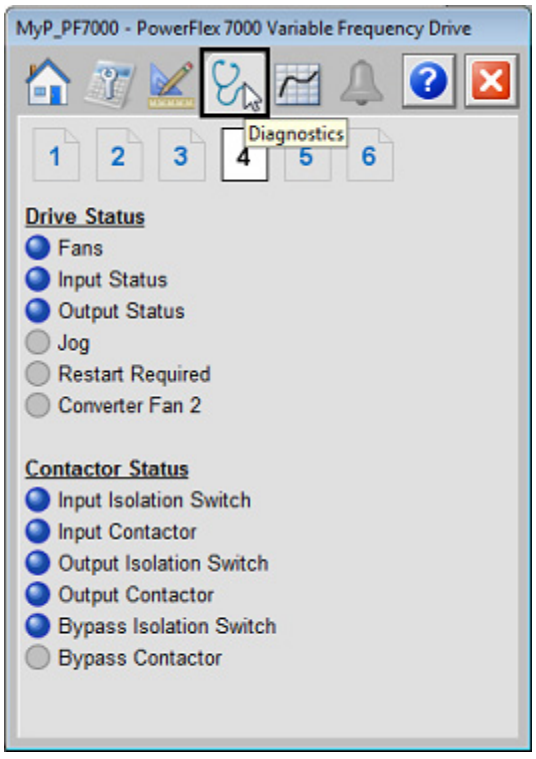
Diagnostics Tab

This tab is divided into six pages. Each page provides you with diagnostic feedback on the drive.

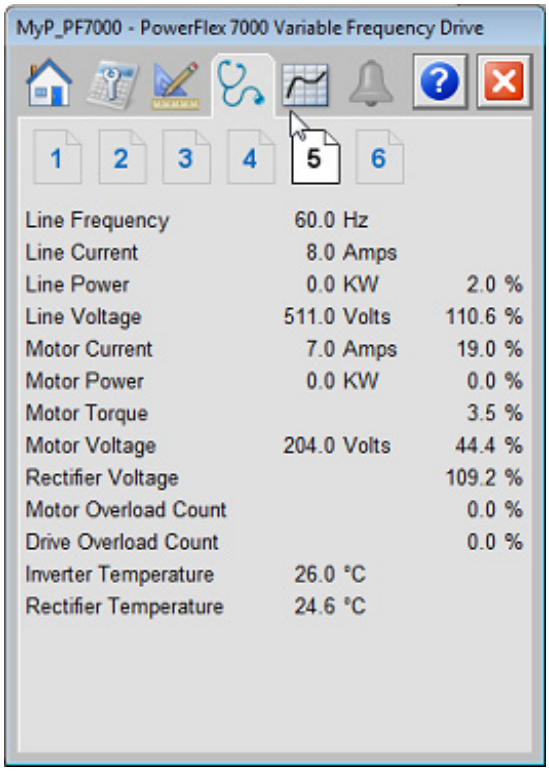


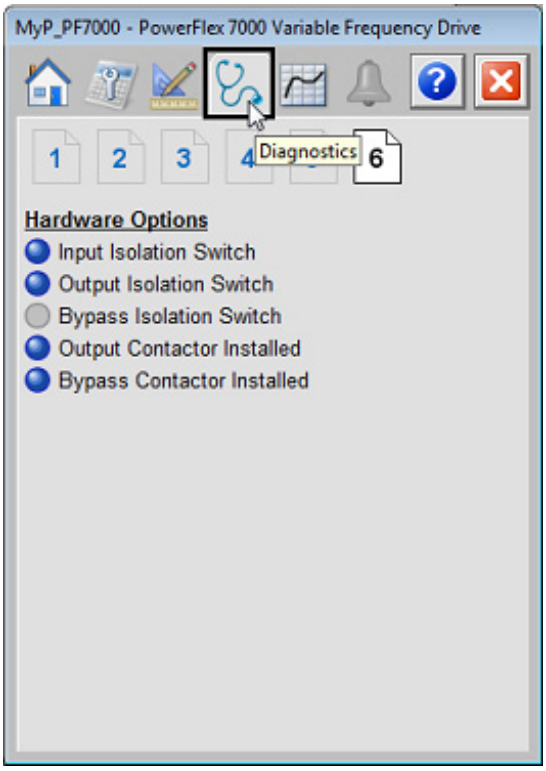






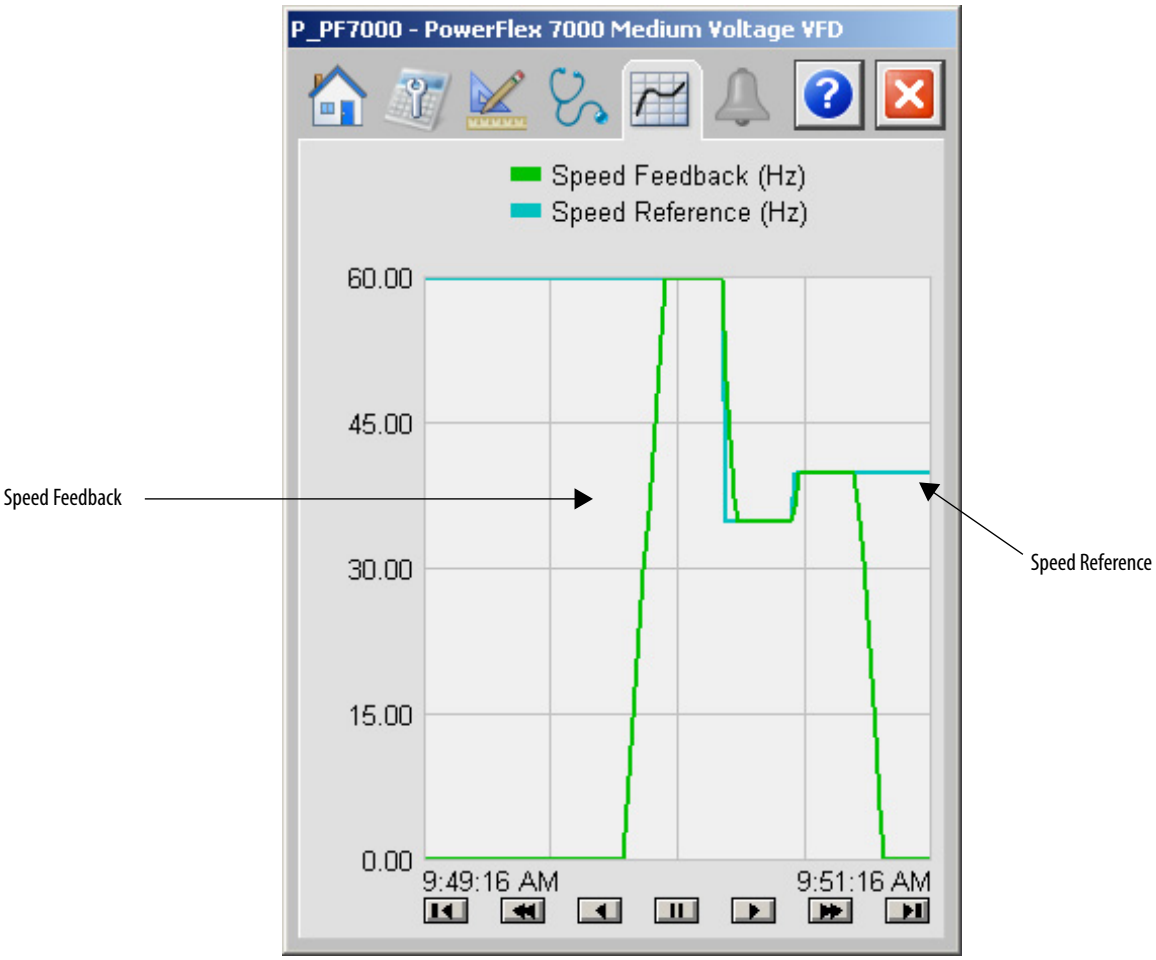
Diagnostic Pages 5 and 6.





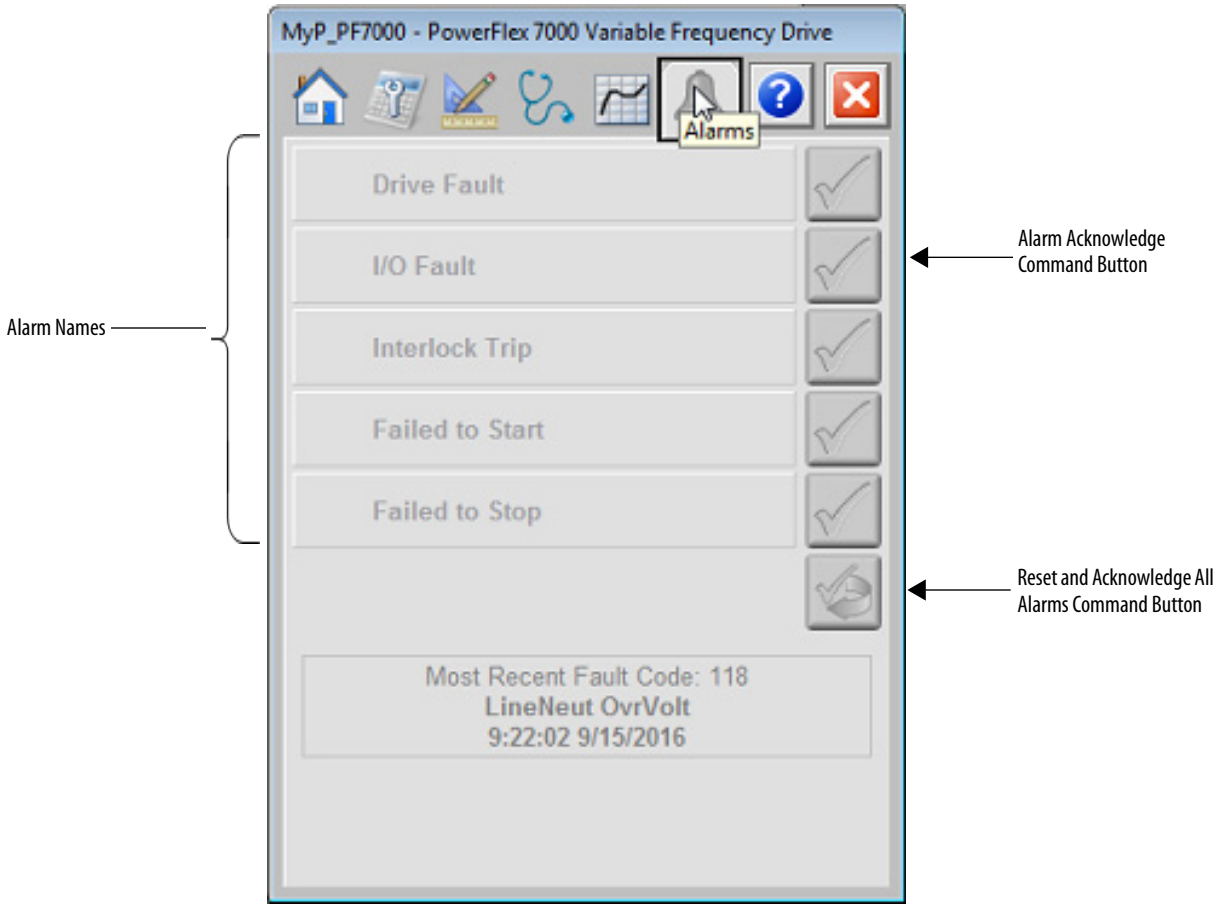
Trends Tab

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



Alarms Tab

The Alarms tab displays each configured alarm for the P_PF7000 instruction. The icon on the tab for the alarms page changes color based on the current active alarms. A blinking alarm icon indicates that one or more alarms must be acknowledged or the device must be reset.



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 severity of the highest active alarm, and the icon blinks if any alarm is unacknowledged or requires reset.

Table 20 - Alarm Severity Colors

Color	Definition
Magenta	Urgent
Red	High
Yellow	Medium

Table 20 - Alarm Severity Colors

Color	Definition
Blue	Low
White (bell icon)	Alarm has cleared but is unacknowledged
Background (Light Gray)	No alarm

The following table shows the functions on the Alarms tab.

Table 21 - Alarms Tab Description

Function	Action	Security
Alarm Name	Click an alarm name to open the associated P_Alarm faceplate.	None
	Click to acknowledge the alarm.	Acknowledge Alarms (Code F)
	Click to reset and acknowledge all alarms.	

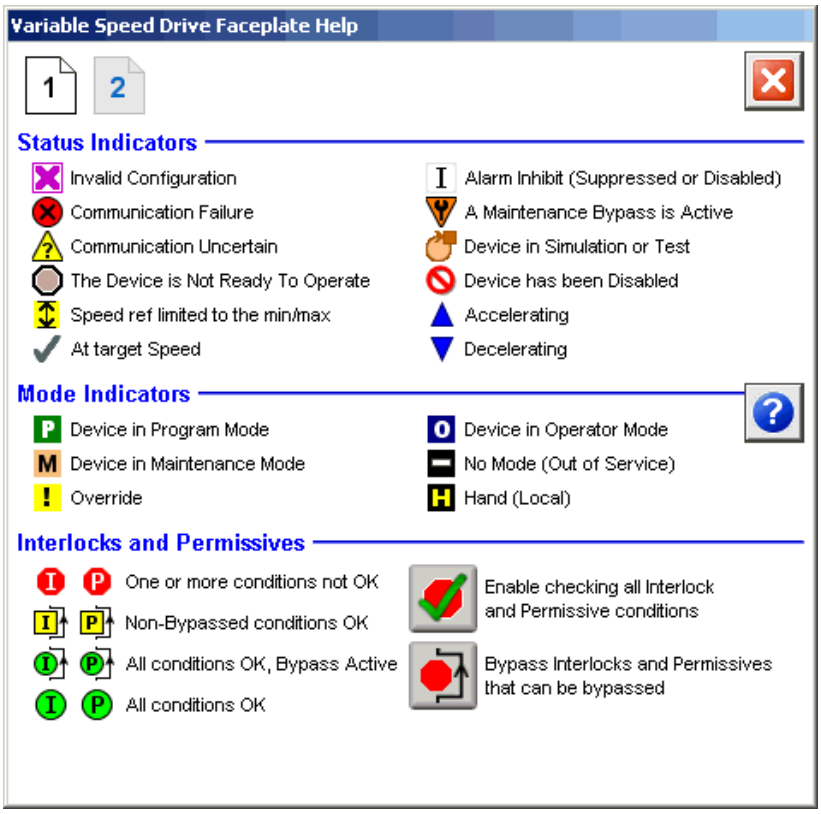
When the Reset and Acknowledge All Alarms button is enabled, the panel behind the alarm blinks, indicating the alarm requires acknowledgement or reset. The Alarm Acknowledge button is enabled if the alarm requires acknowledgment. Click the button with the check mark to acknowledge the alarm.

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

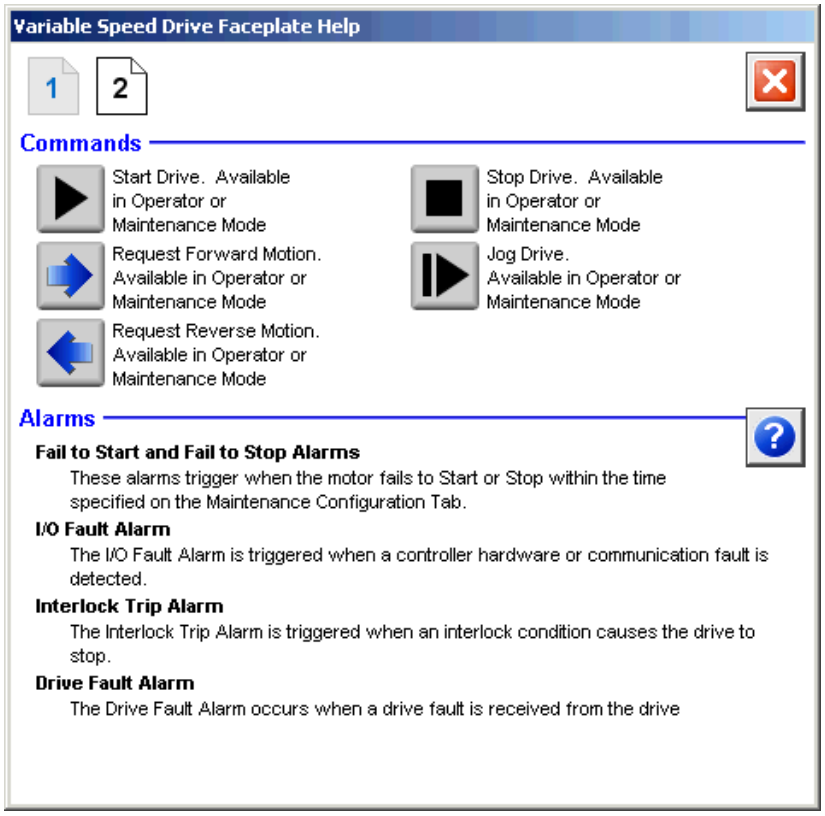
PowerFlex Drive Faceplate Help

The Faceplate Help is divided into two pages.

Faceplate Help Page 1



Faceplate Help Page 2



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
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.

New Product Satisfaction Return

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.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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