

Rockwell Automation Library of Process Objects: PowerFlex 523/525 Variable Frequency Drives (P_PF52x)

Version 3.5

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



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:

Software Compatibility and Content Revision

Table 1 - Summary of Changes

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| Visualization Files: Global Objects (.ggfx) - Process Diagnostic Objects | 10 |

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 2 - 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, distributed over a network. |
| PowerFlex® 520-series AC Drives Specification, publication 520-TD001 | Shows the specifications and certifications for the PowerFlex 520-series AC drives. |
| PowerFlex 520-Series Adjustable Frequency AC Drive User Manual, publication 520-UM001 | Provides information on using the PowerFlex 520-Series Adjustable Frequency AC Drives. |
| Logix5000™ Controllers Add-On Instructions Programming Manual, publication 1756-PM010 | Provides information for designing, configuring, and programming Add-On Instructions. |
| Rockwell Automation Library of Process Objects: Common Alarm Block (P_Alarm) Reference Manual, publication SYSLIB-RM002 | Details how to monitor an input condition to raise an alarm. Information includes acknowledging, resetting, inhibiting, and disabling an alarm. Generally the P_Alarm faceplate is accessible from the Alarms tab. |
| Rockwell Automation Library of Process Objects: 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 or prevent it from starting or being energized. |
| Rockwell Automation Library of Process Objects: Common Mode Block (P_Mode) Reference Manual, publication SYSLIB-RM005 | Explains how to select the Mode (owner) of an instruction or control strategy. The Mode instruction is usually embedded within other instructions to extend their functionality. It is possible to use a standalone Mode instruction to enhance a program where modes are wanted. |

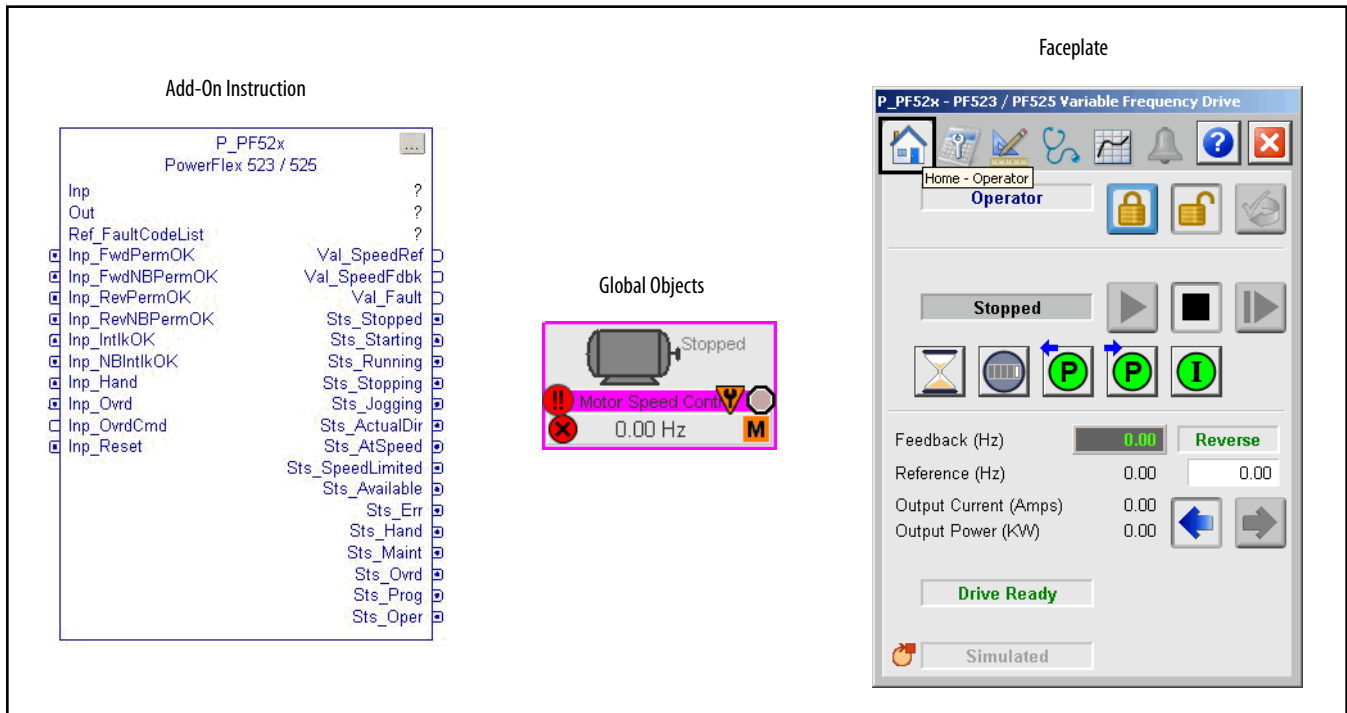
Table 2 - Additional Resources

| Resource | Description |
|---|---|
| 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 protect a large motor from damage 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 run time and count of starts for a motor or other equipment. |

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

PowerFlex 523/525 Variable Frequency Drives (P_PF52x)

The P_PF52x (PowerFlex® 523/525 Variable Frequency Drives) object is used to control and monitor a PowerFlex 523 variable-frequency drive with optional EtherNet/IP Interface. The P_PF52x can also control and monitor a PowerFlex 525 variable-frequency drive with embedded or optional add-on EtherNet/IP Interface.



Guidelines

Use this instruction to monitor and control a motor that uses an Allen-Bradley® PowerFlex 523 or PowerFlex 525 variable frequency drive interfaced via EtherNet/IP. This instruction provides for collecting and displaying diagnostic information from the drive by using configured datalinks on the EtherNet/IP interface.

Do not use this instruction with other Allen-Bradley drive families. There are dedicated Add-On Instructions for the PowerFlex 753 variable frequency drive that use the 20-COMM-E EtherNet/IP interface (P_PF753), and for the PowerFlex 753 or 755 variable frequency drive that uses the built-in or add-on 20-750-series EtherNet/IP interfaces (P_PF755). It is highly recommended that other Allen-Bradley (or non-Allen-Bradley) drive families use the P_VSD generic Variable Speed Drive Add-On Instruction.

Functional Description

The P_PF52x instruction provides the following capabilities:

- Starting, stopping, jogging of the drive, and setting speed reference and direction
- Monitoring of run feedback, display of actual drive status, including acceleration, deceleration, direction, and speed
- Detection of Failure to Start, Failure to Stop, and Drive Fault
- Monitoring of Permissive conditions to allow starting
- Monitoring of Interlock conditions to stop/prevent starting
- Simulation, providing feedback of a working drive while the outputs are disabled
- Monitoring I/O communication faults
- Alarms for Fail to Start, Fail to Stop, Interlock Trip, Drive Fault, and I/O Fault
- Option to automatically reset faults and alarms when an operator commands the motor to start or stop
- Supports HMI 'breadcrumbs' for Alarm Inhibited, Bad Configuration, Not Ready, and Maintenance Bypass Active
- 'Available' status for use by automation logic to know whether a motor can be controlled by other objects

Required Drive Configuration

| | |
|------------------|--|
| IMPORTANT | 'User Choice' Datalinks are not used by this Add-On Instruction and can be left unused or set up for your application. |
|------------------|--|

Be certain to set up the drive Datalinks as follows:

- Input Assembly
 - Drive Status (standard)
 - Output Frequency (standard)
 - Datalinks:
 1. Fault 1 Code (Par 007)
 2. Output Current (Par 003)
 3. Output Power (Par 017)
 4. User choice
- Output Assembly
 - Drive Logic Command (standard)
 - Frequency Command (Speed Reference) (standard)
 - Datalinks:

All four output datalinks are user choice

Required Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. With this code, you can 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_PF52x_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

This 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 | <p>The visualization file dependencies require Process Library content imports to occur in a specific order as reflected in the following tables:</p> <ul style="list-style-type: none"> • 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 to make use of them.

When PNG files are imported, they are renamed by FactoryTalk View with a .bmp file extension, but retain a .png format.

Table 3 - 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 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 4 - 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. |

Table 4 - Visualization Files: Global Objects (.ggfx)

| FactoryTalk View SE Software | FactoryTalk View ME Software | Description |
|--|---|---|
| (RA-BAS) P_VSD Graphics Library | (RA-BAS-ME) P_VSD Graphics Library | Drive global object device symbols used to build process graphics. |
| (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 5 - 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 managing alarms 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_PF52x-Faceplate | (RA-BAS-ME) P_PF52x-Faceplate | The faceplate that is used for the object |
| (RA-BAS) P_PF52x-Quick | (RA-BAS-ME) P_PF52x-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. |

Table 5 - Visualization Files: Standard Displays (.gfx)

| FactoryTalk View SE Software | FactoryTalk View ME Software | Description |
|--|---|---|
| (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. |
| (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 may be imported via the comma-separated values file (.csv file type) in the following table.

Table 6 - 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 523/525 Variable Frequency Drives 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 8 - P_PF52x Drive InOut Parameters

| Tag Name | Data Type | Description |
|-------------------|---------------|---|
| Inp | P_PF52x_Inp | Common part of PowerFlex 52x input assembly. |
| Out | P_PF52x_Out | Common part of PowerFlex 52x output assembly. |
| Ref_FaultCodeList | P_DescList[1] | Array tag that contains a list of fault codes (DINT) and their descriptions (STRING). |

When the P_PF52x instruction is instantiated using the RUNG import, the “PF525_FaultCodeList” tag shown in the following image, is included in the import and created if it does not already exist. This tag is also included in the Template applications that are included in the Library download.

| Name | Value | Data Type | Description |
|----------------------|-------|--------------------|--|
| PF75x_FaultCodeList | {...} | P_DescList[212] | PowerFlex 753 / 755 Fault Codes and Descriptions |
| PF525_FaultCodeList | {...} | P_DescList[61] | PowerFlex 525 VFD Fault Codes and Descriptions |
| PF700S_FaultCodeList | {...} | P_DescList[80] | PowerFlex 700S VFD Fault Codes and Descriptions |
| PF753_EtherNetIP:I | {...} | AB:PowerFlex753... | |
| PF753_EtherNetIP:O | {...} | AB:PowerFlex753... | |
| PF755_EtherNetIP:I | {...} | AB:PowerFlex755... | |
| PF755_EtherNetIP:O | {...} | AB:PowerFlex755... | |

To display fault code messages in P_PF52x, enter the name of the Fault Code List tag (first column) in the P_PF52x Ref_FaultCodeList parameter.

Each fault code list has preset codes and descriptions for translating fault code numbers that are received from the drive to human-readable drive fault descriptions.

| Name | Value | Style | Data Type | Description |
|-----------------------------|--|---------|----------------|----------------------------------|
| PF525_FaultCodeList | {...} | | P_DescList[61] | PowerFlex 525 VFD Fault Codes |
| PF525_FaultCodeList[0] | {...} | | P_DescList | PowerFlex 525 VFD Fault Codes |
| PF525_FaultCodeList[0].Code | 0 | Decimal | DINT | Code / Description List Entry Co |
| PF525_FaultCodeList[0].Desc | 'Check drive manual for this fault code' | | STRING_40 | Code / Description List Entry De |
| PF525_FaultCodeList[1] | {...} | | P_DescList | PowerFlex 525 VFD Fault Codes |
| PF525_FaultCodeList[1].Code | 2 | Decimal | DINT | Code / Description List Entry Co |
| PF525_FaultCodeList[1].Desc | 'Auxiliary Input' | | STRING_40 | Code / Description List Entry De |
| PF525_FaultCodeList[2] | {...} | | P_DescList | PowerFlex 525 VFD Fault Codes |
| PF525_FaultCodeList[2].Code | 3 | Decimal | DINT | Code / Description List Entry Co |
| PF525_FaultCodeList[2].Desc | 'Power Loss' | | STRING_40 | Code / Description List Entry De |
| PF525_FaultCodeList[3] | {...} | | P_DescList | PowerFlex 525 VFD Fault Codes |
| PF525_FaultCodeList[3].Code | 4 | Decimal | DINT | Code / Description List Entry Co |
| PF525_FaultCodeList[3].Desc | 'Under Voltage' | | STRING_40 | Code / Description List Entry De |
| PF525_FaultCodeList[4] | {...} | | P_DescList | PowerFlex 525 VFD Fault Codes |

For a complete list of Fault Codes for the PowerFlex 523/525 Variable Frequency Drives, refer to the PowerFlex 520-series Adjustable Frequency AC Drives User Manual, publication [520-UM001](#).

PowerFlex 523/525 Variable Frequency Drives 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 9 - P_PF52x Drive Input Parameters

| Input Parameter | Data Type | Alias For | Default | Description |
|-----------------|-----------|---------------|---------|---|
| EnableIn | BOOL | | 1 | <p>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.</p> <p>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.</p> <p>Structured Text: No effect. The instruction's Logic routine executes.</p> |
| Inp_FwdPermOK | BOOL | | 1 | 1 = Permissives OK, drive can start Forward. |
| Inp_FwdNBPermOK | BOOL | | 1 | 1 = Permissives (those that cannot be bypassed) 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, motor 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 Fwd 3 = Start Rev |
| Inp_OvrdSpeed | REAL | | 0.0 | Value to set Speed Reference in Override mode (SpeedRef engineering units). |
| Inp_Reset | BOOL | | 0 | 1 = Reset drive fault conditions and latched Alarms. |

Table 9 - P_PF52x Drive Input Parameters

| Input Parameter | Data Type | Alias For | Default | Description |
|---------------------|-----------|----------------------|---------|--|
| Cfg_HasReverse | BOOL | | 0 | 1 = Drive can be run reverse. 0 = Forward only. |
| 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_PF52x object has the name 'PF52x123', then its Forward Permissive object must be named 'PF52x123_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_PF52x object has the name 'PF52x123', then its Reverse Permissive object must be named 'PF52x123_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_PF52x object has the name 'PF52x123', then its Interlock object must be named 'PF52x123_Intlk'. |
| Cfg_HasResInhObj | BOOL | | 0 | 1 = Tells HMI a restart inhibit object (for example, P_ResInh) is connected 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_PF52x object has the name 'PF52x123', then its Restart Inhibit object must be named 'PF52x123_ResInh'. |
| Cfg_HasRunTimeObj | BOOL | | 0 | 1 = Tells HMI a runtime object (for example, P_RunTime) 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_PF52x object has the name 'PF52x123', then its runtime object must be named 'PF52x123_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: <ul style="list-style-type: none"> • In Program mode the operator settings track the program settings. • In Operator mode the program settings track the operator settings. • 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_SetTrackOvrHand | BOOL | | 0 | 1 = Program/Operator settings track Override/Hand mode 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. |

Table 9 - P_PF52x Drive Input Parameters

| Input Parameter | Data Type | Alias For | Default | Description |
|--------------------------|-----------|---------------------------|---------|---|
| Cfg_OperStopPrio | BOOL | | 0 | 1 = OCmd_Stop has priority, accepted any time. If OCmd_Stop stops the drive in a mode other than Maintenance or Operator, a reset is required to start. 0 = OCmd_Stop only in Operator or Maintenance mode. |
| Cfg_OCmResets | BOOL | | 0 | 1 = New Operator drive command resets fault. 0 = Reset required to clear fault. |
| Cfg_OvrPermIntlk | BOOL | | 0 | 1 = Override ignores Bypassable Permissive/ Interlock. 0 = Always use Permissive/ Interlock. |
| 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 Stopped state on a fault, a reset is required to clear the shed fault. The drive can now be commanded to a state other than Stopped. |
| 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 Stopped state on a fault, a reset is required to clear the shed fault. The drive can now be commanded to a state other than Stopped. |
| Cfg_SimScaleEU | BOOL | | 0 | If Cfg_SimScaleEU = 1, in simulation, scale Speed Ref engineering units to Speed feedback engineering units. If Cfg_SimScaleRaw = 1, in simulation, scale Speed Ref engineering units to raw, then raw to Speed feedback engineering units. If both of these parameters are zero, the simulated speed reference is ramped to the simulated speed feedback without scaling. |
| Cfg_SimScaleRaw | | | | |
| 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, OCmd_Reset, Inp_Reset, or Drivefault.OCmd_Reset are required to clear Alm_DriveFault alarm 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_FailAck or Fail.OCmd_Ack) is required to acknowledge the alarm. When set to 0, the Acknowledge bit is set when an alarm occurs indicating an acknowledged alarm and no acknowledge command is required. |
| Cfg_FailToStopAckReqd | | FailToStop.Cfg_AckReqd | | |
| Cfg_IntlkTripAckReqd | | IntlkTrip.Cfg_AckReqd | | |
| Cfg_DriveFaultAckReqd | | DriveFault.Cfg_AckReqd | | |
| Cfg_IOFaultAckReqd | | IOFault.Cfg_AckReqd | | |

Table 9 - P_PF52x Drive Input Parameters

| Input Parameter | Data Type | Alias For | Default | Description |
|-------------------------|-----------|--------------------------|-------------|--|
| Cfg_FailToStartSeverity | INT | FailToStart.Cfg_Severity | 1000 | <p>These parameters determine the severity of each alarm. The severity drives the color and symbol that are used to indicate alarm status on the faceplate and global object.</p> <p>The following are valid values:</p> <p>1...250 = Low</p> <p>251...500 = Medium</p> <p>501...750 = High</p> <p>751...1000 = Urgent</p> <p>IMPORTANT: For FactoryTalk View software version 7.0, these severity parameters drive the indication only on the global object and faceplate. The Alarms and Events definition of severity drives the color and symbol that is used on the alarm banner and alarm summary. The definition also drives the value returned by FactoryTalk Alarms and Events display commands.</p> |
| Cfg_FailToStopSeverity | | FailToStop.Cfg_Severity | | |
| Cfg_IntlkTripSeverity | | IntlkTrip.Cfg_Severity | 250 | |
| Cfg_DriveFaultSeverity | | DriveFault.Cfg_Severity | 1000 | |
| Cfg_IOFaultSeverity | | IOFault.Cfg_Severity | | |
| 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 | | 6000 | Speed Reference Maximum in Drive (raw) Units (for scaling). |
| 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 | | 6000 | 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 (seconds). |
| Cfg_MaxJogT | REAL | | 0.0 | Maximum jog time (seconds, 0 = unlimited). |
| Cfg_OperKeep | SINT | | 2#0000_0000 | 1 = Operator keeps control in Program mode: Bit .0 = Reference Bit .1 = Start/Stop Bit .2 = Forward/Reverse |
| Cfg_ProgKeep | SINT | | 2#0000_0000 | 1 = 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). |

Table 9 - P_PF52x Drive Input Parameters

| Input Parameter | Data Type | Alias For | Default | Description |
|----------------------------|-----------|-----------------------------|---------|---|
| PCmd_Start | BOOL | | 0 | When Cfg_PCmdClear is 1: <ul style="list-style-type: none">Set PCmd_Start to 1 to start the DriveSet PCmd_Fwd to 1 to run the drive in the forward directionSet PCmd_Rev to 1 to run the motor in the reverse directionSet PCmd_Stop to 1 to stop the driveThese parameters are reset automatically When Cfg_PCmdClear is 0: <ul style="list-style-type: none">Set PCmd_Start to 1 to start the driveSet PCmd_Rev to 0 to run the drive in the forward directionSet PCmd_Rev to 1 to run the drive in the reverse directionSet PCmd_Start to 0 to stop the drivePCmd_Stop and PCmd_Fwd are not usedThese parameters do not reset automatically |
| PCmd_Stop | | | | |
| PCmd_Fwd | | | | |
| PCmd_Rev | | | | |
| PCmd_Acq | BOOL | Mode.PCmd_Acq | 0 | When Cfg_PCmdClear is 1: <ul style="list-style-type: none">Set PCmd_Acq to 1 to AcquireSet PCmd_Rel to 1 to ReleaseThese parameters reset automatically When Cfg_PCmdClear is 0: <ul style="list-style-type: none">Set PCmd_Acq to 1 to AcquireSet PCmd_Acq to 0 to ReleasePCmd_Rel is not usedThese parameters do not reset automatically |
| PCmd_Rel | | Mode.PCmd_Rel | | |
| PCmd_Lock | BOOL | Mode.PCmd_Lock | 0 | When Cfg_PCmdClear is 1: <ul style="list-style-type: none">Set PCmd_Lock to 1 to LockSet PCmd_Unlock to 1 to UnlockThese parameters reset automatically When Cfg_PCmdClear is 0: <ul style="list-style-type: none">Set PCmd_Lock to 1 to LockSet PCmd_Lock to 0 to UnlockPCmd_Unlock is not usedThese parameters do not reset automatically |
| PCmd_Unlock | | Mode.PCmd_Unlock | | |
| PCmd_Reset | BOOL | | 0 | <ul style="list-style-type: none">Set PCmd_Reset to 1 to reset all alarms that require resetThis parameter is always reset automatically |
| PCmd_FailToStartAck | BOOL | FailToStart.PCmd_Ack | 0 | <ul style="list-style-type: none">Set PCmd_<Alarm>Ack to 1 to Acknowledge alarmThe parameter is 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: <ul style="list-style-type: none">Set PCmd_<Alarm>Suppress to 1 to suppress alarmSet PCmd_<Alarm>Unsuppress to 1 to unsuppress alarmThese parameters reset automatically When Cfg_PCmdClear is 0: <ul style="list-style-type: none">Set PCmd_<Alarm>Suppress to 1 to suppress alarmSet PCmd_<Alarm>Suppress to 0 to unsuppress alarmPCmd_<Alarm>Unsuppress is not usedThese 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 | | |

Table 9 - P_PF52x Drive Input Parameters

| Input Parameter | Data Type | Alias For | Default | Description |
|--------------------------|-----------|---------------------------|---------|---|
| PCmd_FailToStartUnshelve | BOOL | FailToStart.PCmd_Unshelve | 0 | <ul style="list-style-type: none"> Set PCmd_<Alarm>Unshelve to 1 to Unshelve alarm The parameter is 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 interlocks and permissives that can be bypassed. |
| 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 (allow to run) drive. |
| MCmd_Acq | BOOL | Mode.MCmd_Acq | 0 | Maintenance command to acquire ownership (Operator/Program/Override to Maintenance). |
| MCmd_Rel | BOOL | Mode.MCmd_Rel | 0 | Maintenance command to release ownership (Maintenance to Operator/Program/Override). |
| OCmd_AcqLock | BOOL | Mode.OCmd_AcqLock | 0 | Operator command to acquire (Program to Operator)/lock ownership. |
| OCmd_Unlock | BOOL | Mode.OCmd_UnlockRel | 0 | Operator command to unlock/release (Operator to Program) ownership. |
| OCmd_Reset | BOOL | | 0 | Operator command to reset all alarms that require reset and trigger a drive reset if the drive is faulted. |
| OCmd_ResetAckAll | BOOL | | 0 | Operator command to acknowledge and reset all alarms and latched Shed conditions. |

PowerFlex 523/525 Variable Frequency Drives 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 that is 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 10 - P_PF52x Drives 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 (Speed Reference engineering units). |
| Val_SpeedFdbk | REAL | | Speed Feedback (actual) from drive (Speed Feedback engineering units). |
| Val_SpeedRefRaw | REAL | | Copy of Speed Reference Output (in Raw units) for faceplate. |
| Val_SpeedFdbkRaw | REAL | | Copy of Speed Feedback Input (in Raw units) for faceplate. |
| Val_SpeedRefEUMin | REAL | | Minimum of Speed Reference = Min (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax). (Engineering units) |
| Val_SpeedRefEUMax | REAL | | Maximum of Speed Reference = Max (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax). (Engineering units) |
| Val_SpeedFdbkEUMin | REAL | | Minimum of Speed Feedback = Min (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax). (Engineering units) |
| Val_SpeedFdbkEUMax | REAL | | Maximum of Speed Feedback = Max (Cfg_SpeedFdbkEUMin, Cfg_SpeedFdbkEUMax). (Engineering units) |
| Val_LastFaultCode | DINT | | Last drive fault code (enumeration). |
| Val_OutCurrent | REAL | | Drive output current (Amps). |
| Val_OutPower | REAL | | Drive output power (kW). |

Table 10 - P_PF52x Drives Output Parameters

| Output Parameter | Data Type | Alias For | Description |
|------------------|-----------|-----------|---|
| SrcQ_IO | SINT | | I/O signal source and quality. |
| SrcQ | | | Final drive status source and quality: GOOD 0 = I/O live and confirmed good quality 1 = I/O live and assumed good quality 2 = No feedback configured, assumed good quality TEST 8 = Device simulated 9 = Device loopback simulation 10 = Manually entered value UNCERTAIN 16 = Live input, off-specification 17 = Value substituted at device/bus 18 = Value substituted by maintenance (Has and not Use) 19 = Shed, using last good value 20 = Shed, using replacement value BAD 32 = Signal failure (out-of-range, NaN, invalid combination) 33 = I/O channel fault 34 = I/O module fault 35 = Bad I/O configuration (for example, scaling parameters) |
| Val_Cmd | SINT | | 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 = Powerup/Unknown 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 |

Table 10 - P_PF52x Drives Output Parameters

| Output Parameter | Data Type | Alias For | Description |
|------------------|-----------|-----------|---|
| 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). |
| 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 is waiting run for feedback. |
| Sts_Running | BOOL | | 1 = Drive requested to run and is confirmed running. |
| Sts_Stopping | BOOL | | 1 = Drive requested to stop and is waiting for 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_AtSpeed | BOOL | | 1 = Drive is running at reference speed. |
| Sts_SpeedLimited | BOOL | | 1 = Speed Reference setting exceeds configured Max/Min limit. |
| Sts_Digin1 | BOOL | | Drive Digital Input 1 Status |
| Sts_Digin2 | BOOL | | Drive Digital Input 2 Status |
| Sts_Digin3 | BOOL | | Drive Digital Input 3 Status |
| Sts_Digin4 | BOOL | | Drive Digital Input 4 Status |
| Sts_Available | BOOL | | 1 = Drive available for control by automation (Program). |
| Sts_Bypass | BOOL | | 1 = Interlocks and Permissives that can be bypassed are bypassed. |
| Sts_BypActive | BOOL | | 1 = Bypassing active (Bypassed or Maintenance). |
| Sts_Disabled | BOOL | | 1 = Drive is disabled. |
| Sts_NotRdy | BOOL | | 1 = Motor is Not Ready to Run (independent of mode), check interlocks and permissives. |

Table 10 - P_PF52x Drives Output Parameters

| Output Parameter | Data Type | Alias For | Description |
|------------------|-----------|-----------------------|--|
| Nrdy_Disabled | BOOL | | 1 = Device Not Ready: <ul style="list-style-type: none"> • 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 = A Maintenance Bypass is active, display icon. |
| Sts_Almlnh | BOOL | | 1 = An alarm is Shelved, Disabled or Suppressed, display icon. |
| 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_FdbkRaw | BOOL | | 1 = Error in configuration: Speed feedback raw minimum = maximum. |
| Err_FdbkEU | BOOL | | 1 = Error in configuration: Speed feedback engineering units minimum = maximum. |
| Err_RefLim | BOOL | | 1 = Error in configuration: Speed Ref Limit minimum > maximum. |
| Err_RefEU | BOOL | | 1 = Error in configuration: Speed Ref engineering units minimum = maximum. |
| Err_RefRaw | BOOL | | 1 = Error in configuration: Speed Ref Raw minimum = maximum. |
| Sts_Hand | BOOL | Mode.Sts_Hand | 1 = Mode is Hand (supersedes Operator, Program, Override, and Maintenance). |
| Sts_Maint | BOOL | Mode.Sts_Maint | 1 = Mode is Maintenance (supersedes Operator, Program, and Override). |
| Sts_Ovrd | BOOL | Mode.Sts_Ovrd | 1 = Mode is Override (supersedes Operator and Program). |
| Sts_Prog | BOOL | Mode.Sts_Prog | 1 = Mode is Program (automatic). |
| 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 Comm Fault Status: 0 = OK 1 = Bad |

Table 10 - P_PF52x Drives Output Parameters

| Output Parameter | Data Type | Alias For | Description |
|---------------------------|-----------|------------------------|--|
| Alm_FailToStart | BOOL | FailToStart.Alm | 1 = Drive Fail to Start alarm. |
| Alm_FailToStop | | FailToStop.Alm | 1 = Drive Fail 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. |
| 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 | |
| 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_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 | |
| 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 | |
| Rdy_Start | BOOL | | 1 = Ready to receive OCmd: Start, Stop, Jog, Forward, Reverse, 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 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 Acknowledged. |
| Rdy_SpeedRef | BOOL | | 1 = Ready to receive OSet_SpeedRef (enables data entry field). |
| P_PF52x | BOOL | | Unique Parameter Name for auto-discovery. |

PowerFlex 523/525 Variable Frequency Drives Local Configuration Tags

Configuration parameters that are array, string, or structure data types cannot be configured as parameters for Add-On Instructions. Configuration parameters of these types appear as local tags to the Add-On Instruction. Local tags can be configured through the HMI faceplates or in Studio 5000 Logix Designer® application. Open the instruction logic of the Add-On Instruction instance and then open the Data Monitor on a local tag to accomplish this configuration. These parameters cannot be modified by using controller logic or Logix Designer export/import functionality.

Table 11 - P_PF52x Drive Local Configuration Tags

| Tag Name | Data Type | Default | Description |
|-----------------|-----------|--|---|
| Cfg_Desc | STRING_40 | 'PF523/PF525 Variable Frequency Drive' | Description for display on HMI. This string is shown in the title bar of the faceplate. |
| Cfg_Digin1Txt | STRING_20 | 'Digital Input 1' | Name for digital input 1 label. |
| Cfg_Digin2Txt | STRING_20 | 'Digital Input 2' | Name for digital input 2 label. |
| Cfg_Digin3Txt | STRING_20 | 'Digital Input 3' | Name for digital input 3 label. |
| Cfg_Digin4Txt | STRING_20 | 'Digital Input 4' | Name for digital input 4 label. |
| Cfg_FwdText | STRING_16 | 'Forward' | Name for forward direction, for example, 'Up' or 'Forward'. |
| Cfg_Label | STRING_20 | 'Motor Speed Control' | Label for graphic symbol that is displayed on HMI. This string appears on the graphic symbol. |
| Cfg_RevText | STRING_16 | 'Reverse' | Name for reverse direction, for example, 'Down' or '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_PF52x' | Tag name for display on HMI. This string is shown in the title bar of the faceplate. |

Operations

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

Modes

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

Table 12 - Modes

| 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_OvrCmd and other Inp_OvrDxxx 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 will cause 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 in order 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 usually 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 the P_PF52x Add-On Instruction disables the normal output and provides the feedback of a working drive

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, and indicates that the device is in simulation.

You can also use the following parameters in simulation:

- Cfg_SimScaleEU to scale Speed Reference engineering units to Speed Feedback engineering units
- Cfg_SimScaleRaw to scale Speed Reference engineering units to raw and then raw to Speed Feedback engineering units
- Cfg_SimRampT to set the time in seconds to ramp 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 their 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. |

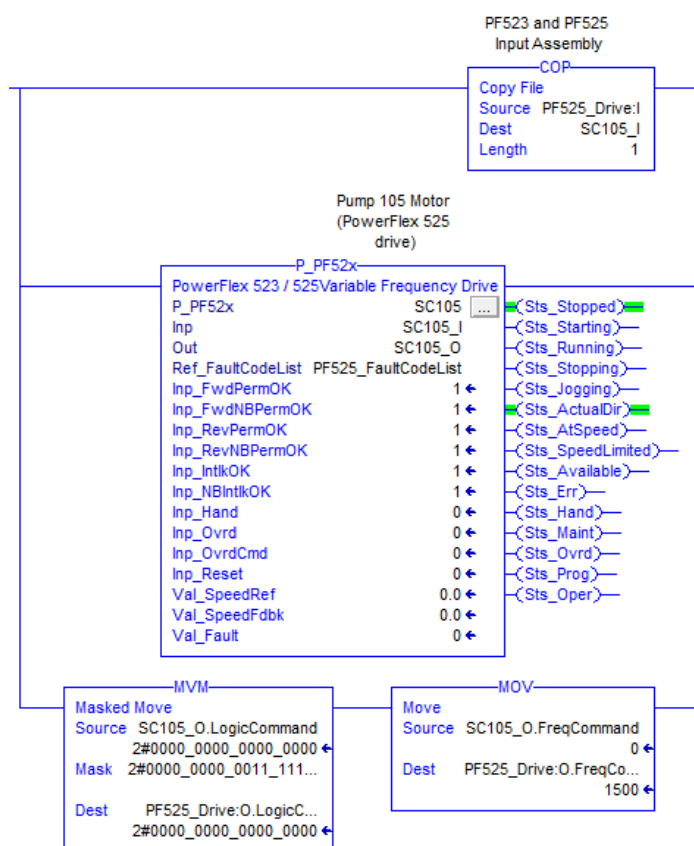
See the Logix5000 Controllers Add-On Instructions Programming Manual, publication [1756-PM010](#), for more information.

Programming Example

The following example shows the P_PF52x in ladder context. Here, ladder logic is used to copy the drive input data from the input assembly tag to a buffer tag of type P_PF52x_Inp.

Next, the P_PF52x Add-On Instruction executes.

Finally, the drive command bits used by the P_PF52x instruction and the drive speed reference are copied out to the drive. A buffer tag of type P_PF52x_Out is used.



Display Elements

The P_PF52x 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 13 - P_PF52x Drive Display Elements Description

| Display Element Name | Display Element | Description |
|----------------------|-----------------|---|
| GO_P_VSD_R | | These display elements show the different motor positions (right, up, and down). |
| GO_P_VSD_U | | |
| GO_P_VSD_D | | |
| GO_P_VSD_Blower_R | | These display elements show the different blower positions (right, left, up, and down). |
| GO_P_VSD_Blower_L | | |
| GO_P_VSD_Blower_U | | |
| GO_P_VSD_Blower_D | | |
| GO_P_VSD_Conveyer_R | | |

Table 13 - P_PF52x Drive Display Elements Description



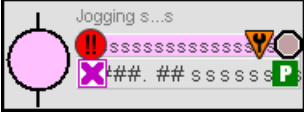






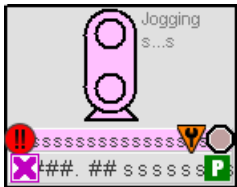

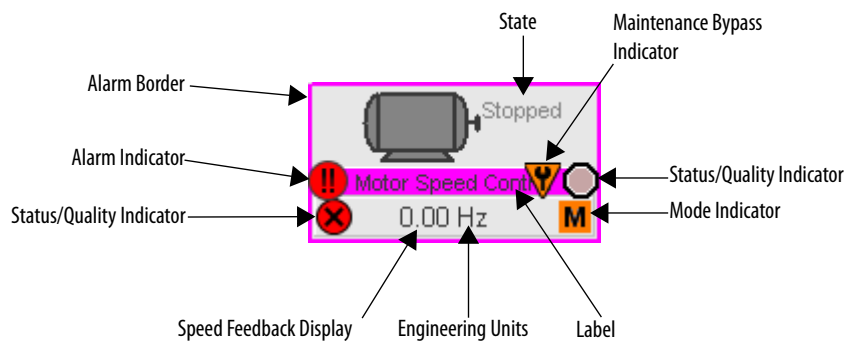
| Display Element Name | Display Element | Description |
|----------------------|---|---|
| GO_P_VSD_Inline_U |  | These display elements show the different inline motor positions (up, right, left, and down). |
| GO_P_VSD_Inline_R |  | |
| GO_P_VSD_Inline_L |  | |
| GO_P_VSD_Inline_D |  | |
| GO_P_VSD_Pump_R |  | These display elements show the different pump positions (right, left, and up). |
| GO_P_VSD_Pump_L |  | |
| GO_P_VSD_Pump_U |  | |
| GO_P_VSD_Agitator_D |  | |
| GO_P_VSD_Mixer_U |  | This display element shows a mixer in the up position. |

Table 13 - P_PF52x Drive Display Elements Description

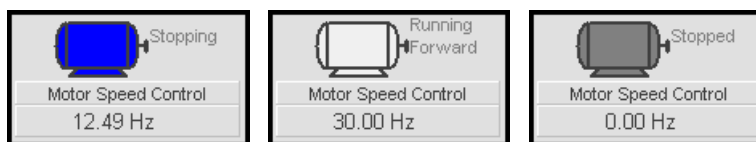
| Display Element Name | Display Element | Description |
|----------------------|---|---|
| GO_P_VSD_RPump_U |  | This display element shows a rotary gear pump in the up position. |
| GO_P_VSD_Fan_D |  | This display element shows a fan in the down position. |

Common attributes of the P_PF52x 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
- Alarm border that changes color and 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 help you find 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 523/525 Variable Frequency Drives 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 Feedback Raw Minimum and Raw Maximum scaling parameters are set to the same value.
- The Speed Feedback Scaled Engineering Units Minimum and Engineering Units Maximum scaling parameters are set to the same value.
- The Speed Reference Raw Minimum and Raw Maximum scaling parameters are set to the same value.
- The Speed Reference Scaled Engineering Units Minimum and Engineering Units 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 help you find the condition. When you navigate to the tab, the condition preventing operation is flagged.

For the PowerFlex 523/525 Variable Frequency Drives 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 Stop Priority command requires reset.
- There is a Device Failure or I/O Fault and Shed requires reset.
- The device has been tripped resulting in a Drive Fault.
- Drive not ready.
- Device logic 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 and the alarm border and label background change color. 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.

TIP

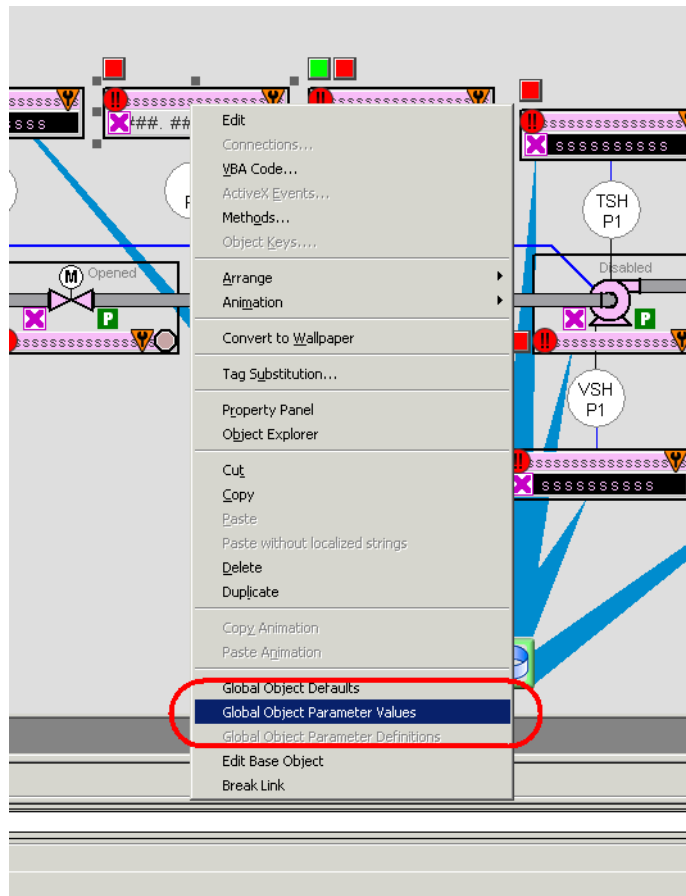
When the Maintenance Bypass Indicator appears, you can find what condition was bypassed by following the indicators. Click the graphic symbol to open the faceplate. The Maintenance Bypass Indicator appears next to the appropriate tab at the top of the faceplate to help you find the bypass. Once you navigate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

For the PowerFlex 523/525 Variable Frequency Drives Instruction, the Maintenance Bypass Indicator appears when interlocks and permissives that can be bypassed have been bypassed.

Using Display Elements

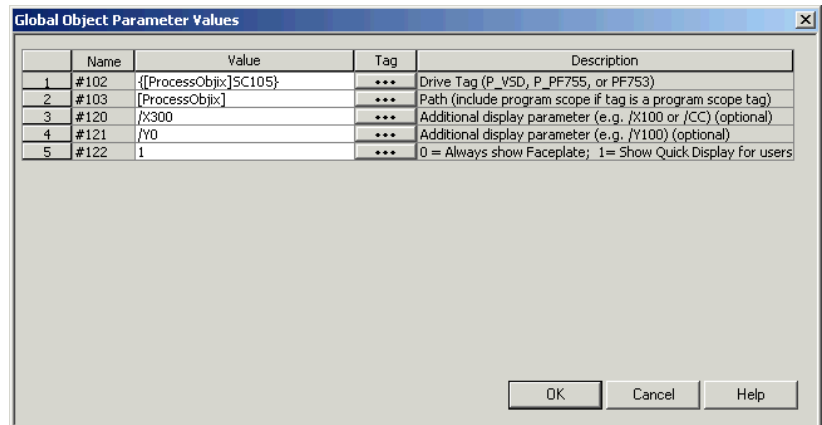
The global objects for P_PF52x can be found in the global object file (RA-BAS) P_VSD Graphics Library.ggfx for FactoryTalk View SE. Follow these steps to use a global object.

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.



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 that is 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. When you define the X and Y coordinate, separate parameters so that #120 defines X and #121 defines Y. This definition lets the same parameters be used in subsequent display commands that originate from the faceplate. |
| #122 | Y | The options for the global object display are as follows: 0 = Always show faceplate 1 = Show Quick Display for users without Maintenance access (Code C) 2 = Always show Quick Display |

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

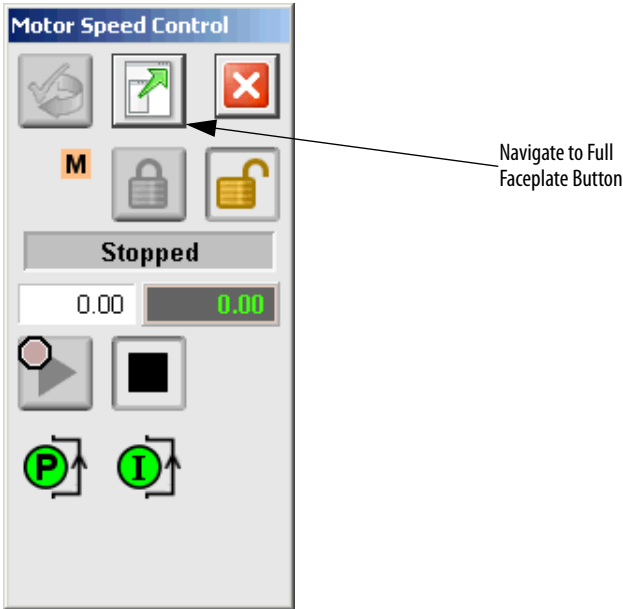
TIP You can click the ellipsis (...) to browse and select a tag.

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

4. Click OK.

Quick Display

The Quick Display screen provides the means for operators to perform simple interactions with the P_PF52x instruction instance. From the Quick Display, you can navigate to the faceplate for full access for operation, maintenance, and configuration.



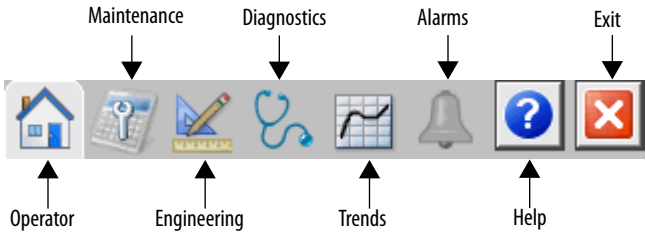
Faceplate

The P_PF52x faceplate consists of six tabs and each tab consists of one or more pages.

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

| Tag - Description |
|-------------------|
|-------------------|

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.



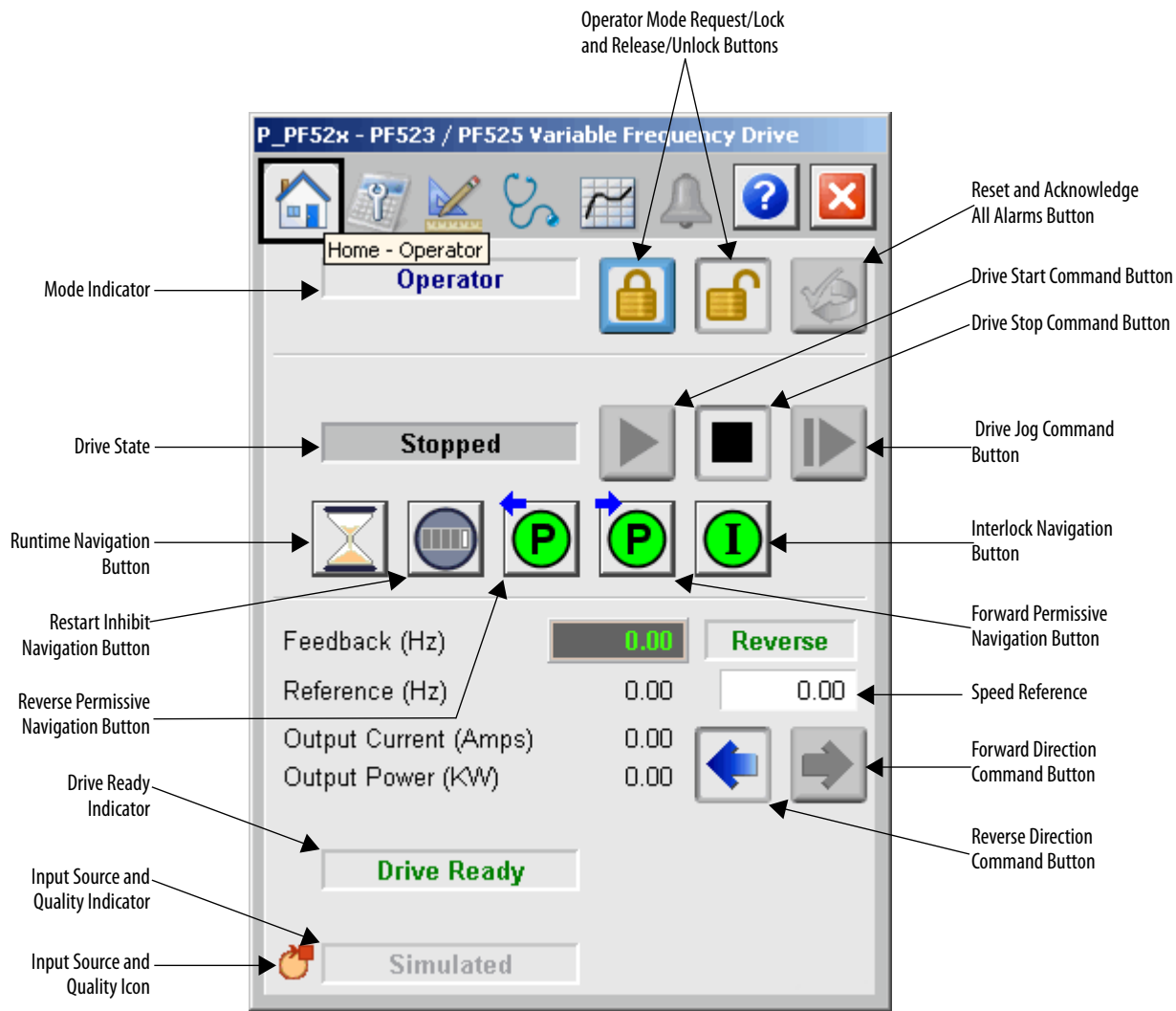
The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the P_PF52x instruction instance. You can also view its status and values and manipulate it through its commands and settings. When a given input is restricted via FactoryTalk View security, the 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)
- Drive State (Stopping, Stopped, Starting, Running, Disable, or I/O Fault)
- 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 and requested direction (appears only if the drive is configured to allow running in reverse)
- Input Source and Quality indicator (See 'SrcQ' in the Output parameters table on [page 20](#) for details)



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

Table 14 - 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 14 - Operator Tab Description

| Function | Action | Security |
|---|--|--------------------------------------|
|  | Click to reset and acknowledge all alarms. | Acknowledge Alarms (Code F) |
|  | Click to Start drive. | Normal Operation of Devices (Code A) |
|  | Click to Stop drive. | |
|  | Click to Jog drive. | |
|  | Click to select forward direction. | |
|  | Click to select reverse direction. | |
|  | Click to open Reverse Permissive faceplate. | None |
|  | Click to open Forward Permissive faceplate. | |
|  | Click to open Interlock faceplate. | |
|  | Click to open runtime faceplate. | |
|  | Click to open Restart Inhibit faceplate. | |
| Reference (Hz) | Type the desired speed in engineering units. | |

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

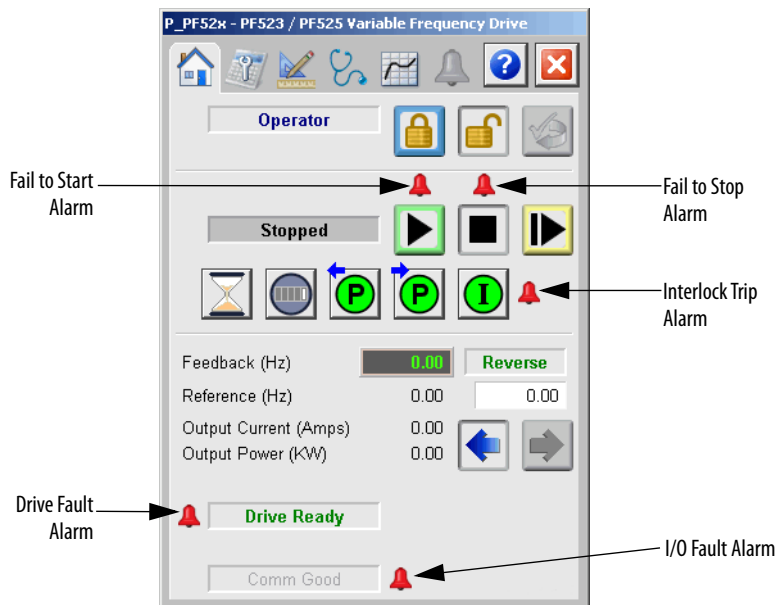
See these publications for more information:

- 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.

Table 15 - Operator Tab Alarm Status

| Graphic Symbol | Alarm Status |
|---|---|
|  | In Alarm (Active Alarm) |
|  | In Alarm and Acknowledged |
|  | Out of Alarm but not Acknowledged |
|  | Alarm Suppressed (by Program) (Alarm is logged but not displayed) |
|  | Alarm Disabled (by Maintenance) |
|  | Alarm Shelved (by Operator) |

Maintenance Tab

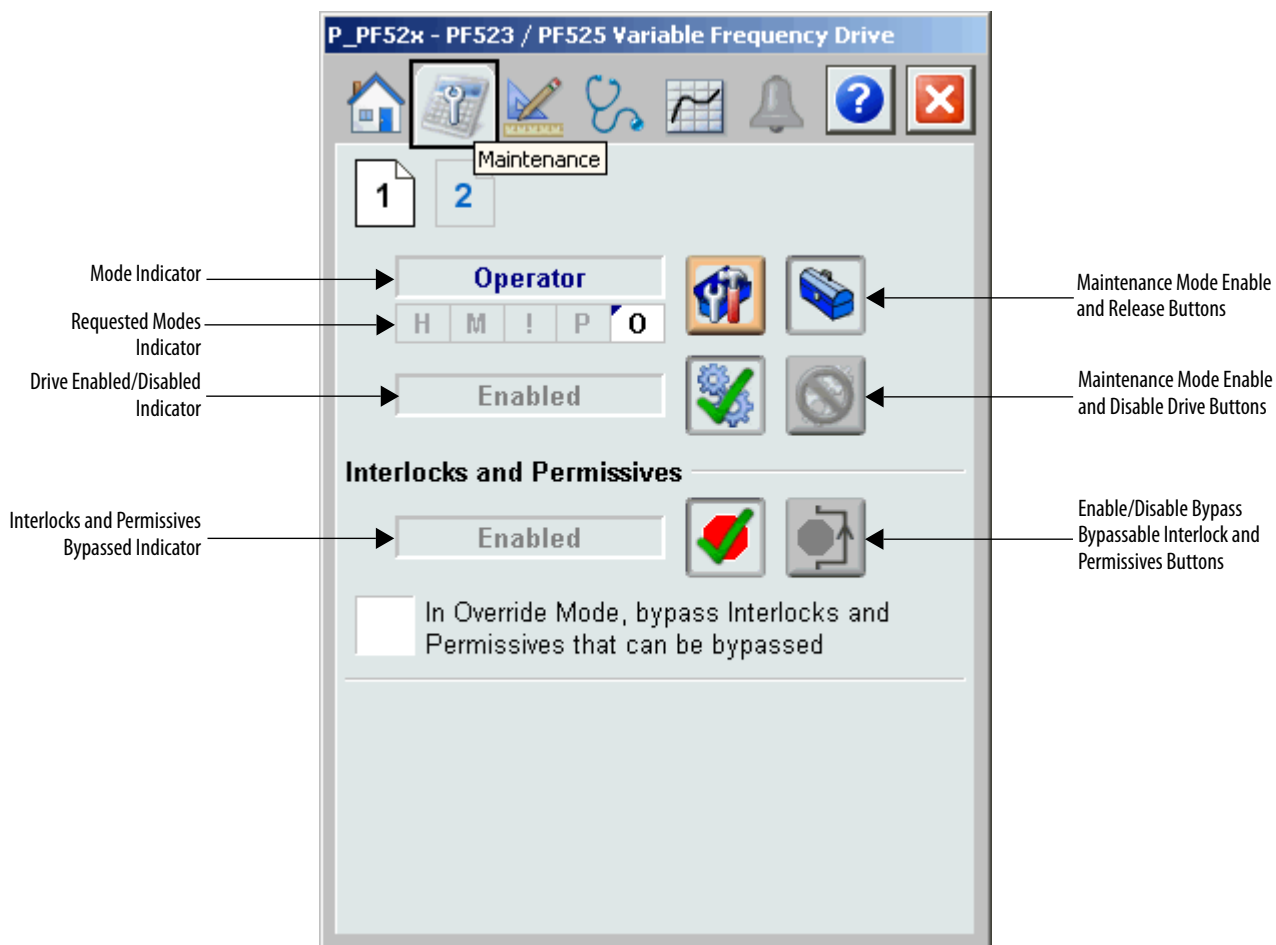
Maintenance personnel use the information and controls on the Maintenance tab to adjust device parameters. They also troubleshoot and temporarily work around device problems, and disable the device for routine maintenance.

The Maintenance tab is divided into two pages.

Maintenance Tab Page 1







Page 1 of the Maintenance tab shows the following information:

- Current mode (Operator, Program, Override, Maintenance, or Hand).
- Requested modes Indicator - This display highlights all modes that have been requested. The leftmost highlighted mode is the active mode.
- Whether the motor is enabled or disabled.
- Interlock and Permissive Bypassed/Enabled indicator.



The following table shows the functions on page 1 of the Maintenance tab.

Table 16 - Maintenance Tab Page 1 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) | None |
|  | Click to bypass checking of interlocks and permissives that can be bypassed. | | |
| In Override mode, bypass Interlocks and Permissives that can be bypassed | Check to have the interlocks and permissives that can be bypassed, bypassed in Override mode. | | Cfg_OvrPermIntlk |

Maintenance Tab Page 2

P_PF52x - PF523 / PF525 Variable Frequency Drive

Home Maintenance Parameters Diagnostics Alarms Help Close

1 2

☒ Bumpless Program/Operator Transition

☐ Bumpless Transition from Override/Hand to Program/Operator

Time to pulse Out_Reset to clear drive fault (sec)

Time after 'Start' for feedback before Fault (sec)

Time after 'Stop' for feedback before Fault (sec)

Maximum jog time (sec)
0=unlimited

Speed Reference Limits

Minimum Maximum

The following table shows the functions on page 2 of the Maintenance tab.

Table 17 - 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_SetTrackOvrHand |
| Time to pulse Out_Reset to clear drive fault (seconds) | 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' for Feedback before Fault (seconds) | Type the amount of time for the drive's run feedback to confirm that the drive has started before raising a Fail to Start alarm. | | Cfg_FailToStartT |

Table 17 - Maintenance Tab Page 2 Description

| Function | Action | Security | Configuration Parameters |
|---|---|---|--|
| Time after 'Stop' for Feedback before Fault (seconds) | Type the amount of time for the drive's run feedback to confirm that the drive has stopped before raising a Fail to Stop alarm. | Configuration and Tuning Maintenance (Code D) | Cfg_FailToStopT |
| Maximum jog time (seconds) 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 Sfs_SpeedLimited is asserted. | | <ul style="list-style-type: none"> • Cfg_MaxSpdRef • Cfg_MinSpdRef |

Engineering Tab

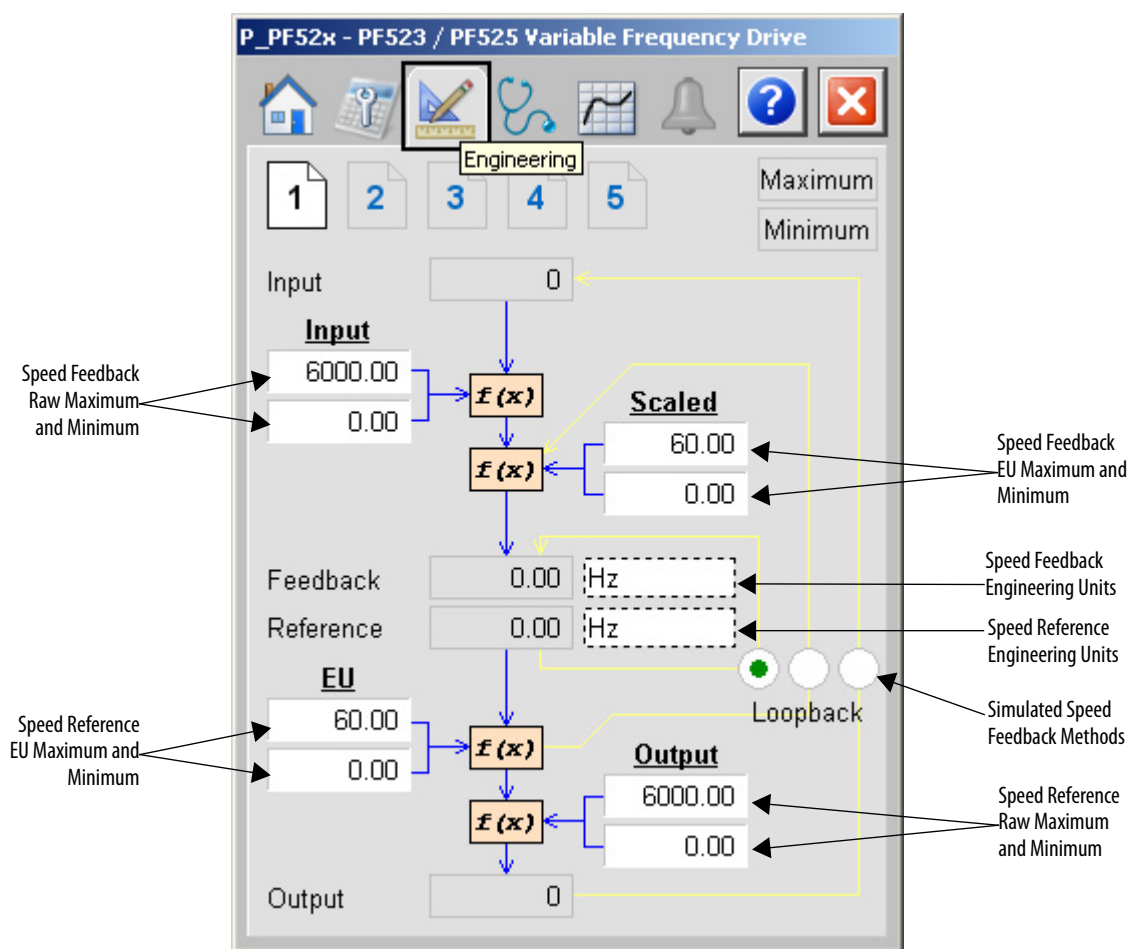
The Engineering tab provides access to device configuration parameters and ranges, options for device and I/O setup, displayed text, and faceplate-to-faceplate navigation settings, and for initial system commissioning or later system changes.

The Engineering tab is divided into five pages.

Engineering Tab Page 1

Page one of the Engineering tab is used to set the Speed Reference (output) scaling, from user Engineering Units used on the faceplate (typically Hz, RPM, or percent) to Raw Units (counts) sent to the drive. Page 1 is also used to set the Speed Feedback (input) scaling, from Raw Units as received from the drive (counts) to Engineering Units for display (typically Hz, RPM, or Percent).

Check the manual for your drive to determine what count sent to the drive corresponds to your maximum speed reference. Also check what count received from the drive corresponds to your maximum speed feedback.



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

Table 18 - Engineering Tab Page 1 Descriptions

| Function | Action | Security | Configuration Parameters |
|---|--|------------------------------------|--|
| Speed Feedback Raw Maximum/Minimum | Type the raw input count that corresponds to the maximum and minimum (This value is usually zero.) speed feedback from the drive | Engineering Configuration (Code E) | <ul style="list-style-type: none"> • Cfg_SpeedFdbkRawMax • Cfg_SpeedFdbkRawMin |
| Speed Feedback EU Maximum/Minimum | Type the engineering unit value for the maximum and minimum (usually zero) speed feedback from the drive. Do not enter a negative value for reversing drives. Reversing is handled separately. | | <ul style="list-style-type: none"> • Cfg_SpeedFdbkEUMax • Cfg_SpeedFdbkEUMin |
| Speed Feedback Engineering Units | Type the text of the units of measure of the scaled speed feedback. (Often Hz, RPM, or Percent.) | | Cfg_SpeedFdbkEU |
| Speed Reference Engineering Units | Type the text of the units of measure of the scaled speed reference. (Often Hz, RPM, or Percent.) | | Cfg_SpeedRefEU |
| Speed Reference EU Maximum/Minimum | Type the engineering unit value for the maximum and minimum (usually zero) speed reference sent to the drive. Do not enter a negative value for reversing drives. Reversing is handled separately. | | <ul style="list-style-type: none"> • Cfg_SpeedRefEUMax • Cfg_SpeedRefEUMin |
| Speed Reference Raw Maximum/Minimum | Type the raw output count that corresponds to the maximum and minimum (This value is usually zero.) speed reference sent to the drive. | | <ul style="list-style-type: none"> • Cfg_SpeedRefRawMax • Cfg_SpeedRefRawMin |
| Simulated Speed Feedback Method Selection | Click the Simulation option (left, middle, or right) that corresponds to how the speed feedback for the drive is to be determined from the speed reference when the drive is being simulated (Inp_Sim = 1). Click the left option to copy the speed reference in engineering units to the speed feedback. (The simulated feedback is ramped to act like a drive that is accelerating or decelerating.) Use this option if the speed reference and speed feedback use the same scaling parameters Click the middle option to scale the simulated feedback from the speed reference engineering unit range to the speed feedback engineering unit range. Use this setting if the speed reference and speed feedback have different engineering ranges. For example, percent for reference and Hz for feedback), but the maximum reference (for example, 100%) corresponds to the maximum feedback (for example, 3600 RPM). Click the right option to scale the speed reference to raw units, copy the speed reference in raw units to speed feedback raw units, and scale to speed feedback engineering units. Use this setting if the reference and feedback ranges do not correspond. | | <ul style="list-style-type: none"> • Cfg_SimScaleEU • Cfg_SimScaleRaw |

Engineering Tab Page 2

P_PF52x - PF523 / PF525 Variable Frequency Drive

1 2 3 **Engineering** 4 5

Mode Configuration Display Button (OPM)

Configure Device Description, Label, and Tag Text

Configure Device Forward and Reverse Direction Text

PF523 / PF525 Variable Frequency

Label: Motor Speed Control

Tag: P_PF52x

Forward Text: Forward

Reverse Text: Reverse

Digital Input 1: Digital Input 1

Digital Input 2: Digital Input 2

Digital Input 3: Digital Input 3

Digital Input 4: Digital Input 4

☒ Clear Program Commands upon receipt

☐ Operator Command resets fault

☒ Drive can be jogged

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

Table 19 - Engineering Tab Page 2 Description


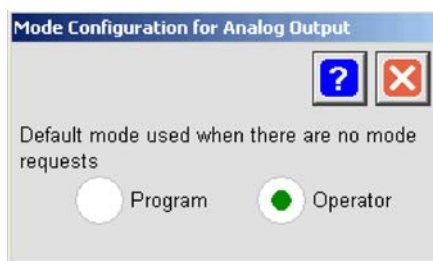
| Function | Action | Security | Configuration Parameters |
|---|--|------------------------------------|---|
|  | Click to navigate to the Mode Configuration display. | None | See Mode Configuration display on page 51 . |
| Drive Description | Type a Description of the drive that appears in the title bar of the faceplate. | Engineering Configuration (Code E) | Cfg_Desc |
| Label | Type a Label for the drive that appears on the graphic symbol. | | Cfg_Label |
| Tag | Type a Tag for the drive. The tag appears in the faceplate title bar and in the Tooltip. | | Cfg_Tag |
| Forward text | Type a name for forward direction. | | Cfg_FwdText |
| Reverse Text | Type a name for reverse direction. | | Cfg_RevText |
| Digital Input 1 through Digital Input 4 | Type names for the digital inputs. | | Cfg_Digin1Txt through Cfg_Digin4Txt |

Table 19 - Engineering Tab Page 2 Description

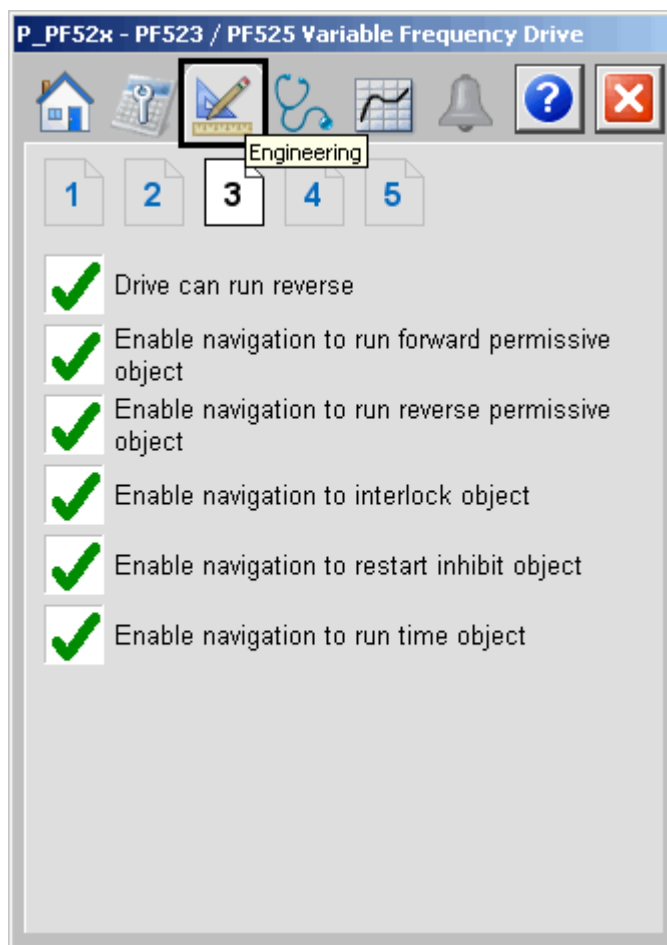
| Function | Action | Security | Configuration Parameters |
|-----------------------------------|---|------------------------------------|--------------------------|
| Clear Program Commands on Receipt | Check to have the P_PF52x instruction clear Program commands (PCmd) as soon as they are received (default). | Engineering Configuration (Code E) | Cfg_PCmdClear |
| Operator command resets fault | Check to have a new operator drive command reset faults. Clear this checkbox if a reset is required to clear faults. | | Cfg_OCmdResets |
| Drive can be jogged | Check to make the Jog command button visible on the Operator tab and enable the drive to 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 on page 3 of the Engineering tab.

Table 20 - Engineering Tab Page 3 Description

| Function | Action | Security | Configuration Parameters |
|--|--|------------------------------------|--------------------------|
| Drive can run reverse | Check to make the forward and reverse direction command buttons visible on the Operator tab and enable the drive to run forward or reverse. | Engineering Configuration (Code E) | Cfg_HasReverse |
| 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 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_PF52x object has the name 'Drive123', then its Forward Permissive object must be named 'Drive123_FwdPerm'. | | Cfg_HasFwdPermObj |

Table 20 - Engineering Tab Page 3 Description

| Function | Action | Security | Configuration Parameters |
|--|---|------------------------------------|--------------------------|
| Enable navigation to run reverse permissive object | <p>Check if a permissive object is connected to Inp_RevPermOK. The Permissive indicator becomes a button that opens the permissive faceplate.</p> <p>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_PF52x object has the name 'Drive123', then its Reverse Permissive object must be named 'Drive123_RevPerm'.</p> | Engineering Configuration (Code E) | Cfg_HasRevPermObj |
| Enable navigation to interlock object | <p>Check if an interlock object is connected to Inp_IntlkOK. The Interlock indicator becomes a button that opens the interlock faceplate.</p> <p>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_PF52x object has the name 'Drive123', then its Interlock object must be named 'Drive123_Intlk'.</p> | | Cfg_HasIntlkObj |
| Enable navigation to restart inhibit object | <p>Check if a restart inhibit object is connected. The button that opens the Restart Inhibit faceplate appears.</p> <p>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_PF52x object has the name 'Drive123', then its Restart Inhibit object must be named 'Drive123_ResInh'.</p> | | Cfg_HasResInhObj |
| Enable navigation to runtime object | <p>Check if a runtime object is connected. The button that opens the runtime faceplate appears.</p> <p>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_PF52x object has the name 'Drive123', then its runtime object must be named 'Drive123_RunTime'.</p> | | Cfg_HasRunTimeObj |

Engineering Tab Page 4

P_PF52x - PF523 / PF525 Variable Frequency Drive

Engineering

1 2 3 4 5

Stop Drive:

☒ On I/O Fault

☒ On Fail to Start

☒ On Interlock Trip

| | Operator Keeps Control in Program Mode | Program Keeps Control in Operator Mode |
|--------------------------------|--|--|
| Speed Reference | <input type="checkbox"/> | <input type="checkbox"/> |
| 'Start' & 'Stop' Commands | <input type="checkbox"/> | <input type="checkbox"/> |
| 'Forward' & 'Reverse' Commands | <input type="checkbox"/> | <input type="checkbox"/> |
| Output Datalink Commands | <input type="checkbox"/> | <input type="checkbox"/> |

The following table shows the functions on page 4 of the Engineering tab.

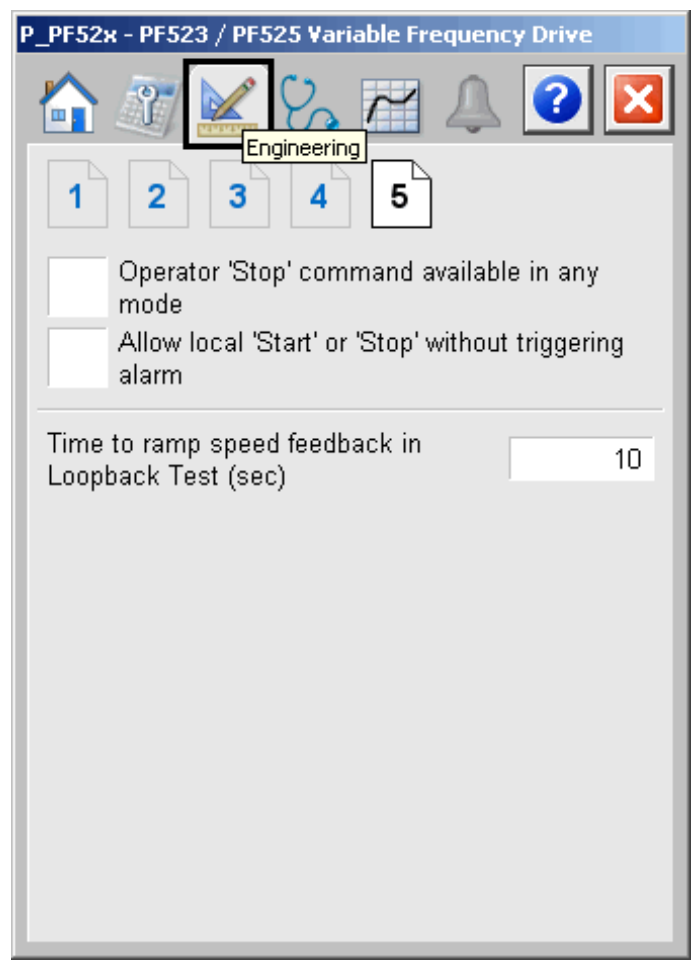
Table 21 - Engineering Tab Page 4 Description

| Function | Action | Security | Configuration Parameters |
|------------------------------|--|------------------------------------|--------------------------|
| Stop Drive on I/O Fault | Check to stop the drive if an I/O Fault is detected. After the I/O Fault clears, a reset is required before the drive can be started. Clear this checkbox to show only the I/O Fault Status/Alarm and not stop the drive if an I/O Fault is detected. | Engineering Configuration (Code E) | Cfg_ShedOnIOFault |
| Stop Drive on Fail to Start | Check to stop the drive on a failure to start. A reset is required before another start can be attempted. Clear this checkbox to show only the Fail to Start status and alarm on a failure to start. The outputs are not changed, so the instruction continues to attempt to start the motor. | | Cfg_ShedOnFailToStart |
| Stop Drive on Interlock Trip | The drive always stops on an Interlock trip. This item cannot be cleared. It is displayed as a reminder that the Interlock Trip function always stops the drive. | | None |

Table 21 - 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 Configuration (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 |
| 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. | | 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 |
| Output Datalink Commands - Program keeps Control in Operator mode | Check to keep control of the Datalink commands with the Operator even if the instruction is in Program mode. Clear this checkbox to have control of the Datalink commands follow the Instruction mode. | | Cfg_OperKeep.3 |
| Output Datalink Commands - Program keeps Control in Operator mode | Check to keep control of the Datalink commands with the Program even if the instruction is in Operator mode. Clear this checkbox to have control of the Datalink commands follow the Instruction mode. | | Cfg_ProgKeep.3 |

Engineering Tab Page 5



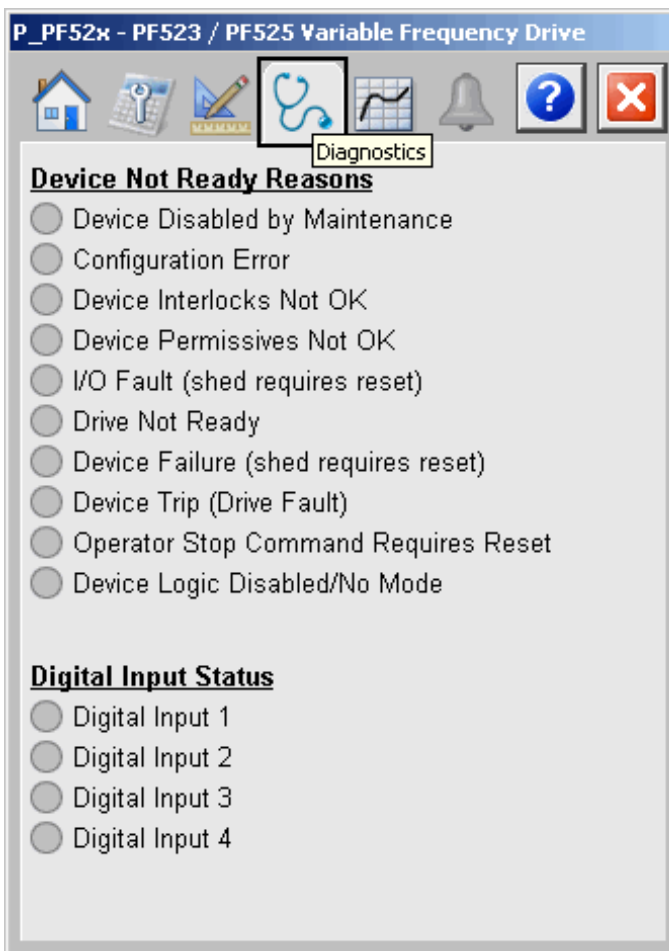
The following table shows the functions on page 5 of the Engineering tab.

Table 22 - Engineering Tab Page 5 Description

| Function | Action | Security | Configuration Parameters |
|--|---|----------|--------------------------|
| Operator 'Stop' command available in any mode | Check (= 1) so that the OCmd_Stop has priority and is accepted at any time regardless of instruction mode. Clear this checkbox (= 0) so that the OCmd_Stop works only in Operator or Maintenance mode. IMPORTANT: If OCmd_Stop is used to stop the drive in a mode other than Operator or Maintenance, a reset is required before the drive can be started. | | Cfg_OperStopPrio |
| Allow local 'Start' or 'Stop' without triggering alarm | Check (= 1) to let local circuits start/stop the drive without an alarm. Clear this checkbox (= 0) to start/stop the drive from the HMI or program only. | | Cfg_AllowLocal |
| Time to ramp speed feedback in Loopback Test (seconds) | Type the time, in seconds, to ramp speed feedback when in Simulation. | | Cfg_SimRampT |

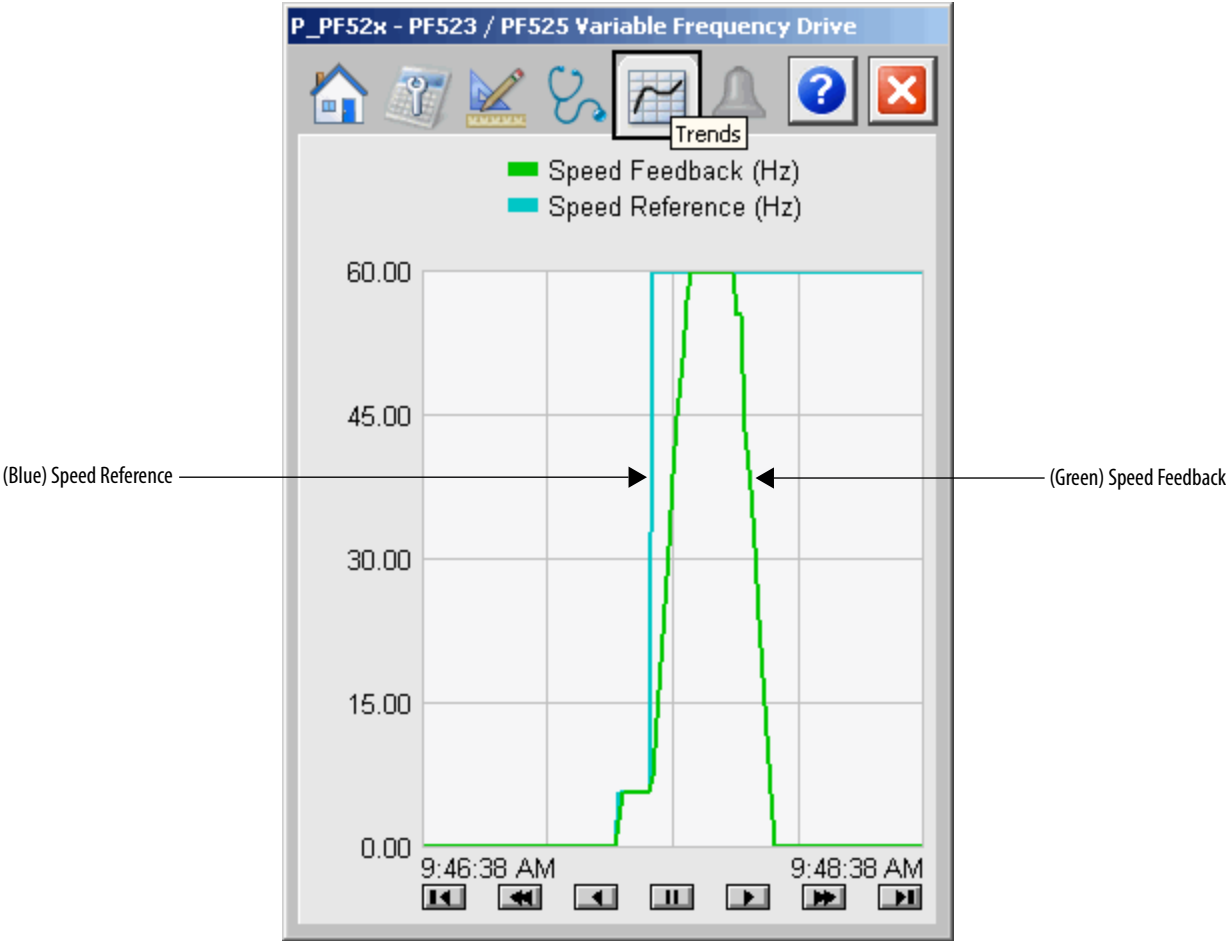
Diagnostics Tab

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



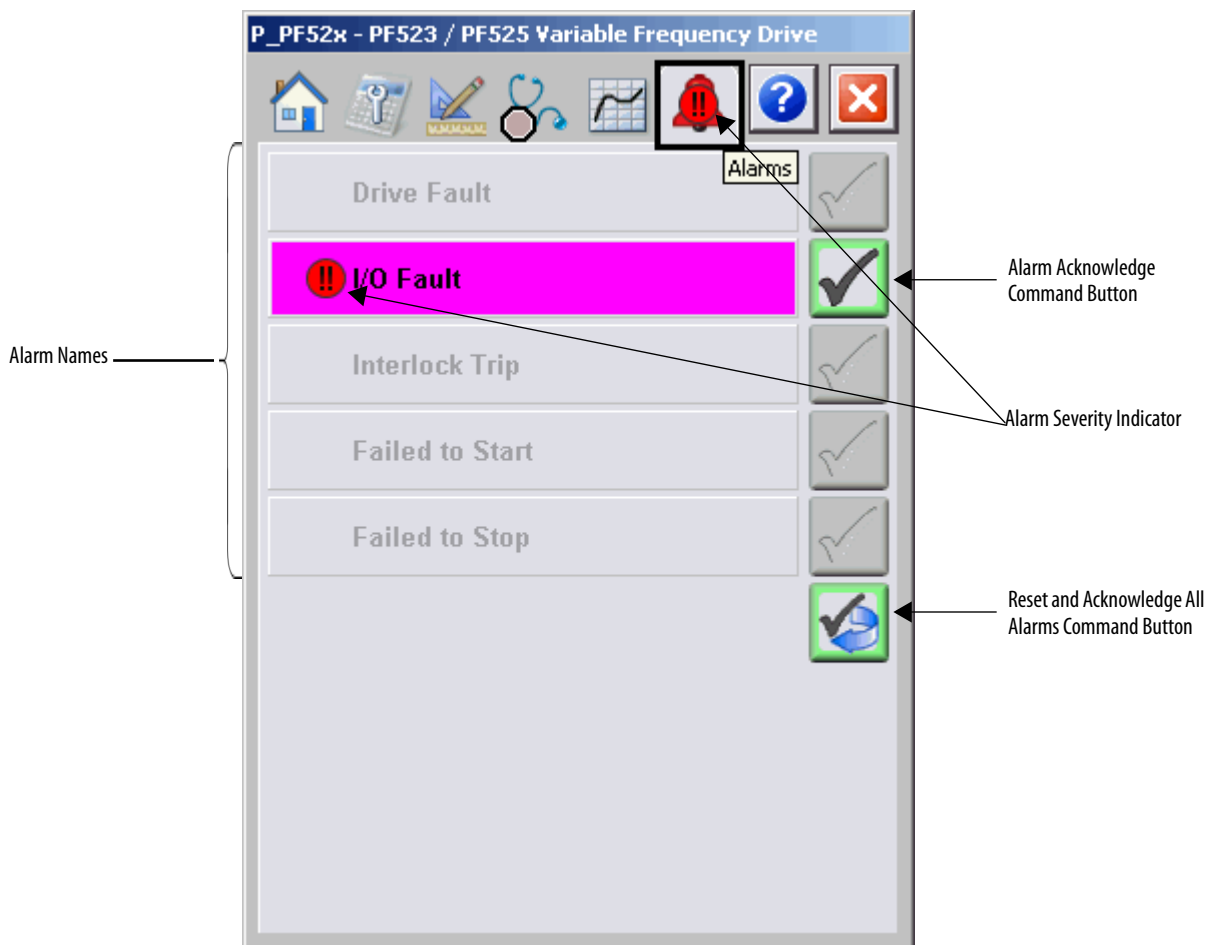
Trends Tab

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



Alarms Tab

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



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



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

Table 23 - Alarm Severity Colors

| Color | Definition |
|-------------------------|---|
| Magenta | Urgent |
| Red | High |
| Yellow | Medium |
| 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 24 - 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. | |

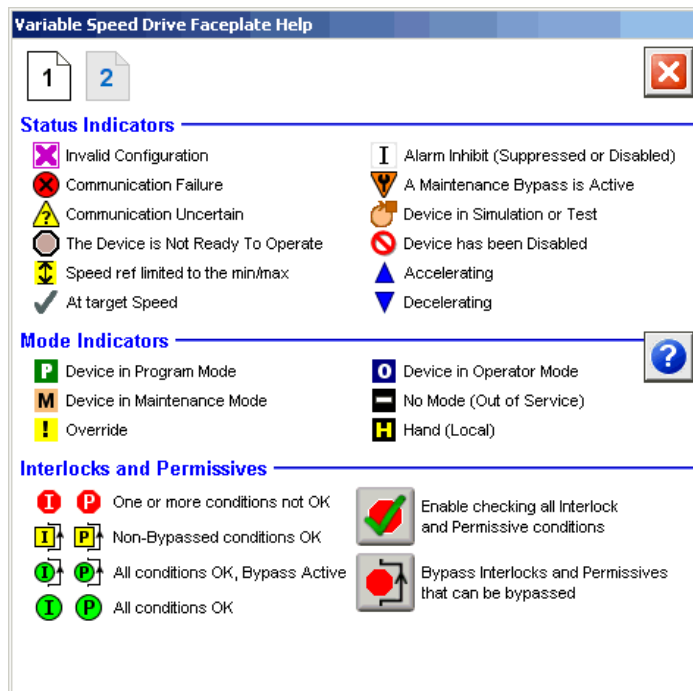
When the Reset and Acknowledge All Alarms button is enabled, the panel behind the alarm blinks, indicating the alarm requires acknowledgement or reset. The Alarm Acknowledge button is enabled if the alarm requires acknowledgment. Click the button with the check mark to acknowledge the alarm.

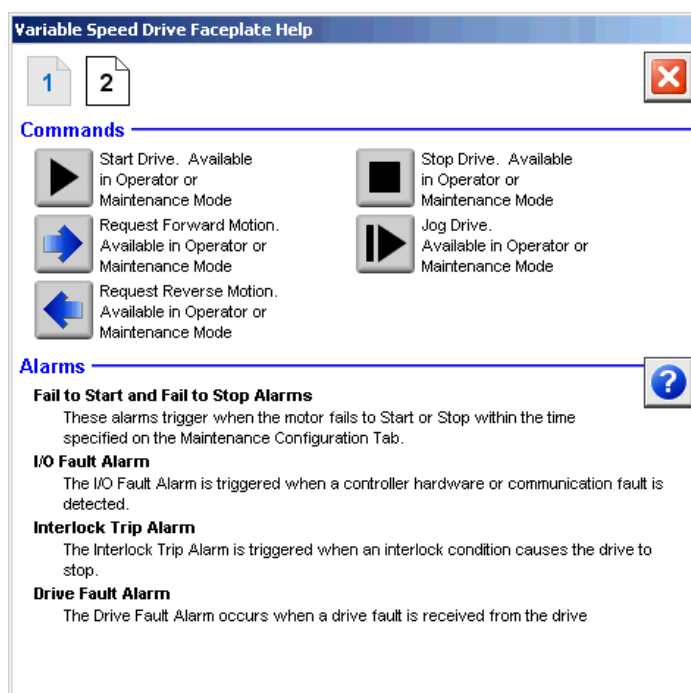
See Rockwell Automation Library of Process Objects: Common Alarm Block (P_Alarm) Reference Manual, publication [SYSLIB-RM002](#), for more information.

PowerFlex 523/525 Variable Frequency Drives Faceplate Help

The Faceplate Help is divided into two pages.

Faceplate Help Page 1



Faceplate Help Page 2

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| | |
|---------------------------------|--|
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| | |
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