



PowerFlex 400 Drive Firmware Release Number (FRN) 6.01

This release note corresponds to FRN 6.01 for the PowerFlex 400 drive.

Introduction

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Enhancements

The following functions have been added or updated in firmware revision 6.01. Detailed descriptions follow.

- A dip in bus voltage within 200 ms of a Start command will now result in fault F004 [UnderVoltage] instead of fault F003 [Power Loss] in all frames.
- Excessive DC bus ripple voltage will now result in fault F017 [Input Phase Loss] instead of fault F003 [Power Loss].
- Frames E and F will now issue fault F032 [Fan Fdbck Loss] instead of fault F008 [Heatsink OvrTmp] when a loss of cooling fan feedback is detected.
- The functionality of the PWM frequency hysteresis band has been improved.

Enhancements for Frames G and H only

Firmware revision 6.01 also includes the following enhancements made to the power board firmware for frames G and H.

- Input phase loss detection has been improved.
- When a single-phase input condition is directly detected, fault F003 [Power Loss] that used to occur has been eliminated.
- When fan feedback loss is detected, the internal temperature signal will no longer indicate a drive temperature of 140 °C.



TIP: If you have upgraded a G or H frame from v5.03, a gate power board kit with new NTC should be acquired under warranty (or purchased) for the fan feedback loss enhancement to be enabled.

- When a loss of cooling fan feedback is detected, fault F008 [Heatsink OvrTmp] that used to occur has been eliminated. Instead, fan alarms have been added. If a fan fails, the drive will now display a message that corresponds to the set of fans the failed fan belongs to. The message, “FAN1”, “FAN2”, or “FAN3” will be displayed on the LCD panel accordingly.
- Two NTCs have been added, one for the choke/reactor, and the other for the power board FETs. Different drive temperature analog signals can now be sent to trigger an F008 [Heatsink OvrTmp] fault and the drive can indicate the device that is in an overtemperature condition. Now, the power board can send one of four different drive temperature signal levels to the control board to trigger the F008 fault. The specific device that triggered the fault can be determined from the value of parameter b014 [Drive Temperature]. The following indicated temperatures identify the device:
 - Output IGBTs/heatsink: Less than 115 °C
 - Power board NTC: 120 °C
 - Reactor/Choke: 125 °C
 - DC bus capacitors: 130 °C
 - Input SCRs: 135 °C

All values are ± 2 °C and these values apply to frames G and H only.

New Parameters

The following parameters are new in firmware revision 6.01.

- To monitor real-time unfiltered DC bus ripple voltage, d329 [DC Bus Ripple V] has been added to the Advanced Display group.
- To provide the option of resetting the internal frequency to 0.00 Hz when the drive is not running, A202 [MOP Reset Sel], has been added to the Advanced Program group.
- Seven more sets of fault buffer parameters (d330...d336 [Fault x Code] and their corresponding time stamp parameters (d337...d350 [Fault x Time-hr] and [Fault x Time-min]) have been added to the existing three. These new parameters are visible in the parameter lists in the DriveExplorer and DriveExecutive applications although the corresponding faults are not displayed in the diagnostics areas.
- To allow for simplified changing of the sign of the PID error, and therefore changing of the direction of the PID response, without swapping the Analog In Lo and Analog In Hi values, A201 [PID Invert Error] has been added to the Advanced Program group.
- To simplify user monitoring of PID feedback (a process variable), parameter d328 [PID Fdbk Display] has been added to the Advanced Display group.

Parameter Updates

The following parameters have been updated in firmware revision 6.01.

- An analog signal loss option of “Hold Last” has been added to parameters T072 [Analog In 1 Loss] and T076 [Analog In 2 Loss].
- To aid in locating a failed fan, cooling fans can be set to run at all times by entering a value of 3267 in parameter A196 [Testpoint Sel].

If power is cycled, the value of parameter A196 will be reset to its previous value.

- Each auxiliary start frequency parameter (R241, R244, and R247 [Aux xStart Freq]) and each auxiliary stop frequency parameter (R242, R245, and R248 [Aux x Stop Freq]) now sets the output frequency at which the corresponding auxiliary motor contactor closes and opens. Previously, the parameters set the frequency command at which the contactors closed and opened.

Corrected Anomalies

The following table lists the anomalies that have been corrected in this revision of firmware.

Function	Anomaly	Correction
PID mode	In PID mode, with a programmed non-zero minimum frequency, a negative error could cause the PID output to drop below minimum frequency, resulting in a delay in acceleration when the error turns positive again.	This anomaly has been corrected.
DC injection	Continuous mode DC injection would give no injection at all when the drive is stopped from a remote HIM or a 22-COMM-x adapter.	This anomaly has been corrected.
Load loss detection	Drive would issue a load loss fault when going into sleep mode if the load loss detection is enabled.	This anomaly has been corrected.
Analog PID reference	An analog PID reference is rescaled when the programmed minimum frequency is changed.	This anomaly has been corrected.
Analog Input Loss	All analog input loss selections now function as described in the <i>User Manual</i> the input was used as a PID reference or feedback.	Now all analog input loss selections function as described in the <i>User Manual</i> when the analog input is used as a PID reference. The drive will, however, still fault for all of the non-default options when the analog input is used as PID feedback.
Auxiliary motor mode	In auxiliary motor mode, the drive-controlled motor contactor opened immediately on a Stop command, along with the auxiliary motor contactors, regardless of the Stop mode.	Now, in auxiliary motor mode, the drive-controlled motor contactor will not open until the drive has come to a stop and the output is shut off.
Overcurrent	An interrupt timing issue had the potential to not fault the drive under overcurrent conditions. This could result in IGBT failure.	This anomaly has been corrected.
Sleep mode	When the drive was in Sleep mode, the drive output ran at 0.00 Hz.	Now, the drive output shuts off in Sleep mode.
Sleep-wake mode	Once the Sleep source fell below the Sleep level, the Sleep timer would not stop incrementing, unless the Sleep source rose above the Wake level. Similar situations existed for the Wake timer and Wake level, and when the Sleep-Wake mode was inverted.	The sleep timer will now stop incrementing and will be reset to zero if the Sleep source rises above the Sleep level before the programmed Sleep time is reached. Analogous issues for the Wake timer and Wake level, and situations when the Sleep-Wake mode was inverted were also corrected.
MOP reference	When using a MOP reference with accel time = 0.00 s and a max frequency of 60 Hz (for example), MOP increment would cause the value of parameter A142 [Internal Freq] to roll over to 59.99 Hz, and each successive MOP increment would decrease it by 0.01 Hz.	This anomaly has been corrected.

Determining Firmware Revision

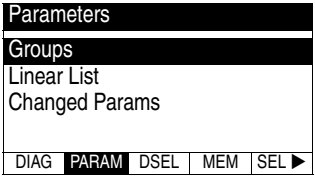

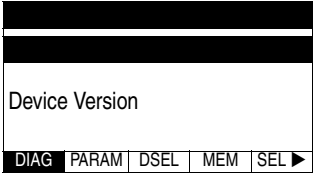


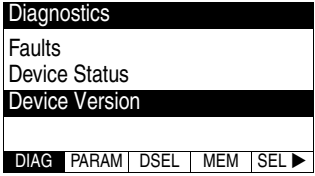
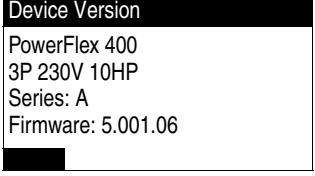
To determine the current firmware revision for a PowerFlex 400 drive, view parameter d320 [Control SW Ver].

Alternatively, you can also determine the firmware revision of the PowerFlex 400 drive using one of these methods:

- [Using the External LCD HIM \(22-HIM-**\)](#)
- [Using DriveExplorer Lite/Full](#)
- [Using DriveExecutive](#)

Important: If you're using DriveExplorer Life/Full with the 1203-USB converter, you need to update the converter firmware to FRN 1.003 or higher.

Using the External LCD HIM (22-HIM-**)

Step	Key(s)	Example Screens
1. Power up the drive. Then plug the HIM into the drive. The Parameters menu for the <u>drive</u> is displayed.		
2. Press Sel key until the Diagnostics menu is displayed.		
3. Press Down Arrow to scroll to Device Version , and then press Enter.	 and 	
The present firmware version of the drive is shown on the Firmware line.		

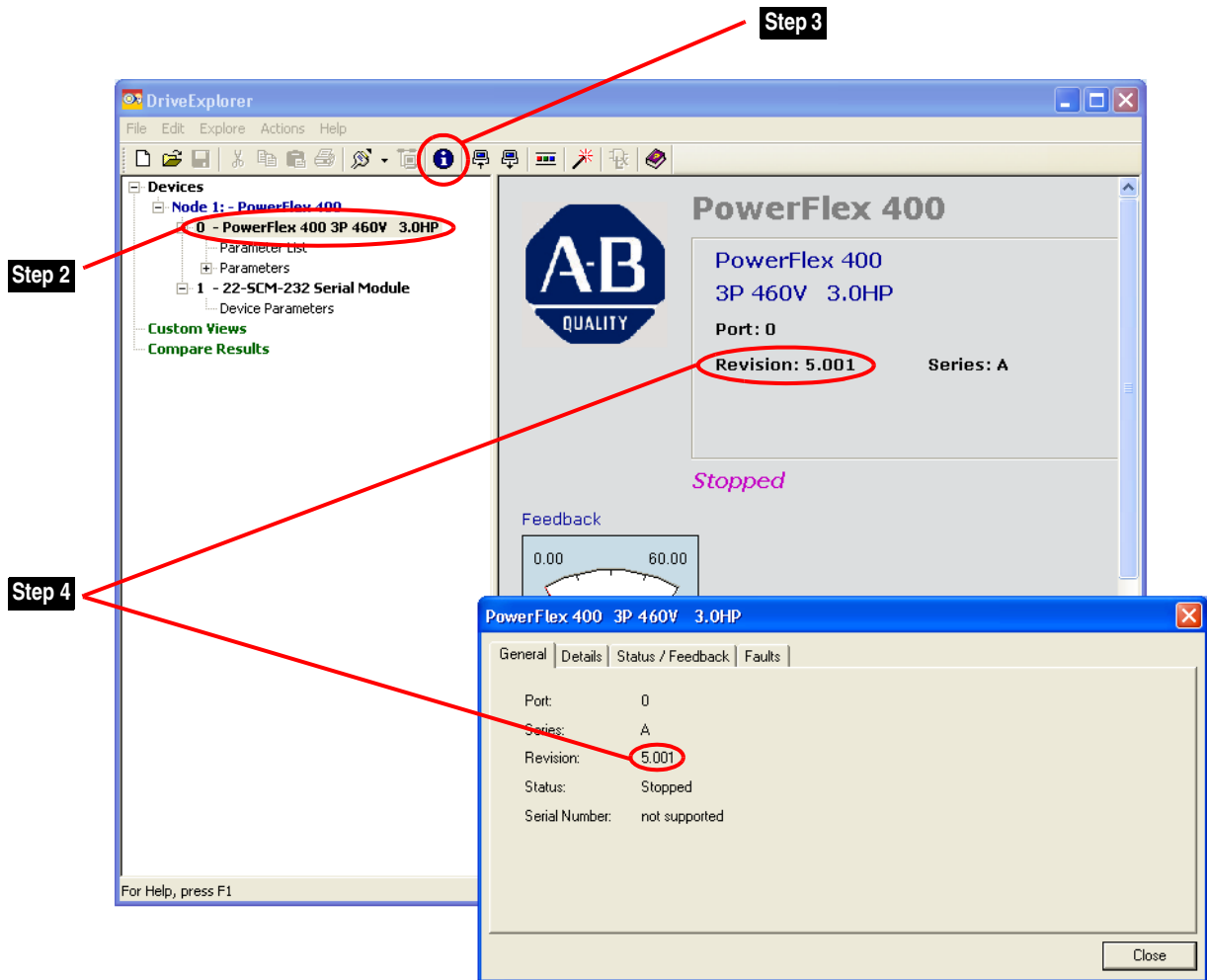
Using DriveExplorer Lite/Full

1. Launch DriveExplorer and go online with the drive via the 1203-USB or 22-SCM-232 converter.
2. In the DriveExplorer tree view, click the PowerFlex 400 item as shown in [Figure 1](#).
3. Click the information icon to display the Properties screen of the drive.

The “Revision:” field shows the present revision (for example, 5.001) of the PowerFlex 400 firmware.

▶ **TIP:** When you click the PowerFlex 400 item in DriveExplorer Lite/Full version 5.01 or higher, the adapter firmware revision is also shown in the right pane of the DriveExplorer window.

Figure 1 Using DriveExplorer to determine current firmware revision

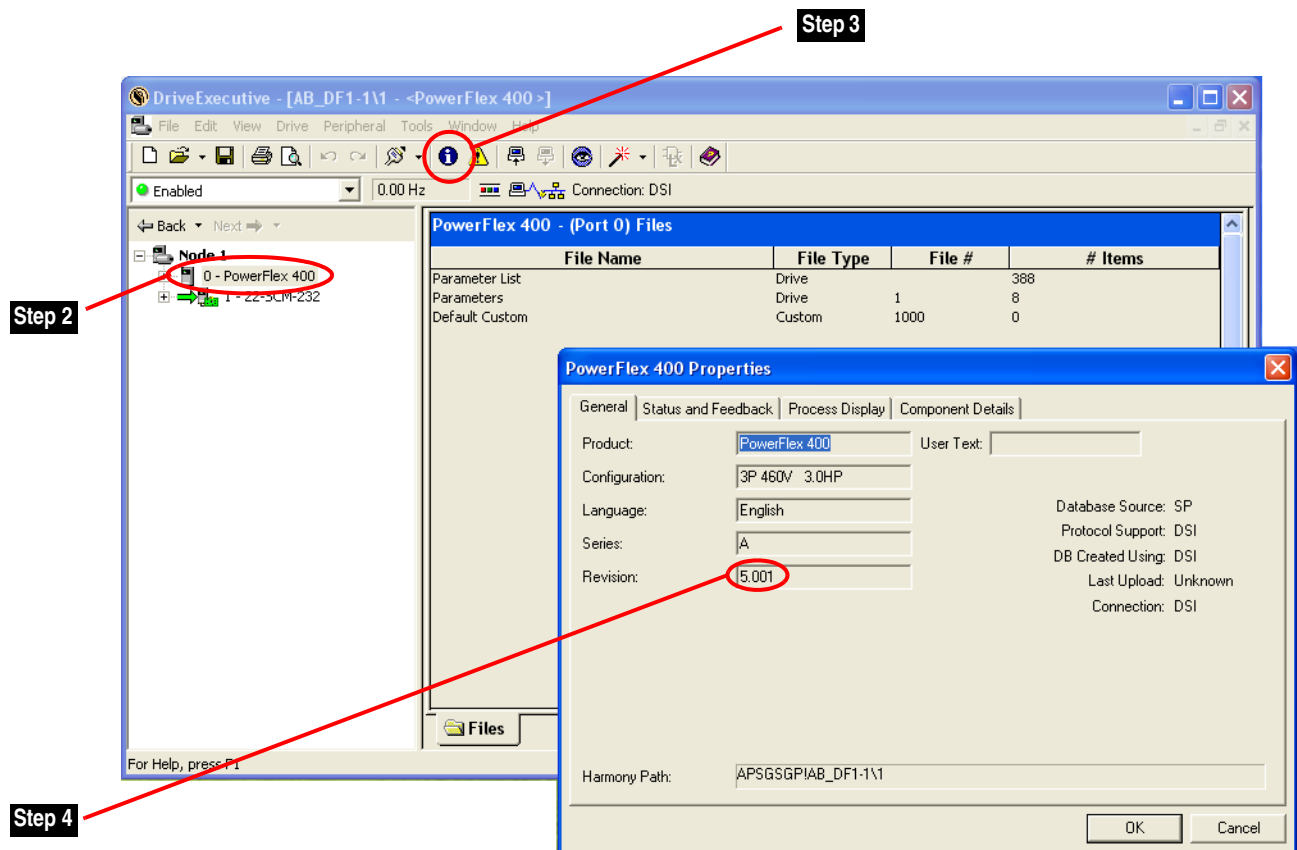


Using DriveExecutive

1. Launch DriveExecutive and go online with the drive via the 1203-USB or the 22-SCM-232 converter.
2. In the DriveExecutive tree view, click the PowerFlex 400 item as shown in [Figure 2](#).
3. Click the information icon to display the Properties screen of the drive.

The “Revision:” field shows the present revision (for example, 5.001) of the PowerFlex 400 firmware.

Figure 2 Using DriveExecutive to determine current firmware revision



Firmware Flashing

This section describes procedures to flash upgrade your drive firmware. Downloads are provided on the Allen-Bradley Web Updates site located at <http://www.ab.com/support/abdrives/webupdate>.



ATTENTION:

Important: Once a flash update has been started, do not remove drive power until the download is complete and the drive has been reset. If power is removed during Boot Flash, the drive may be permanently damaged. A drive that has been damaged in this way cannot be repaired. If power is removed during Application Flash, the drive will remain in Boot and can be reflashed.

Installing the Flash Kit

- Install the “v2.001” Flash Kit utility from the Allen-Bradley Web Updates site.

This automatically installs the latest version of the ControlFLASH utility on your computer. ControlFLASH, DriveExplorer or DriveExecutive can now be used to update the drive using the following instructions.

Using DriveExplorer Lite/Full

1. Launch DriveExplorer. Make a connection to the drive.
2. In the DriveExplorer tree view, select the appropriate drive. Then, select the Information icon.
3. On the Properties screen, click the Details tab.
4. Select “Flash Update” and follow the screen prompts until the procedure is completed and the new firmware version is displayed.

Using DriveExecutive

Important:

- 1.
- 2.
- 3.
- 4.

Using ControlFLASH

Important:

- 1.
- 2.

Restrictions

Technical Support Options

Telephone:	(1) 262.512.8176
Fax:	(1) 262.512.2222
Email:	support@drives.ra.rockwell.com
Online:	www.ab.com/support/abdrives

you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://support.rockwellautomation.com>.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this document. You can also contact a special Customer Support number for initial help in getting your module up and running:

United States	1.440.646.3434 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

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

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

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