PowerFlex 70 Drive with Enhanced Control (Revision 3.002)

These release notes correspond to Major Revision 3.002 of firmware for the PowerFlex 70 Drive with the Enhanced Control option.

Enhancements

The following parameters have been added or updated with firmware version 3.002. Detailed descriptions follow.

Parameter	Number	Description
[Torque Estimate]	015	New
[Motor OL Mode]	050	New
[Mtr OL Trip Time]	221	New
[Drive Status 3]	222	New
[Status 3 @ Fault]	223	New
[Spd Err Filt BW]	448	New
[Fiber Control]	620	New
[Fiber Status]	621	New
[Sync Time]	622	New
[Traverse Inc]	623	New
[Traverse Dec]	624	New
[Max Traverse]	625	New
[P Jump]	626	New
[Stop/Brk Mode A/B]	155, 156	Updated
[Start Inhibits]	214	Updated
[Last Stop Source]	215	Updated
[Digital Inx Sel]	361-366	Updated
[Digital Outx Sel]	380, 384	Updated

- New “Fibers Application” features. These features include Synchronized Speed Change and Traverse/P-Jump. A Fiber Functions Application file was added. The new Parameters in this file are:
  - parameter 620, [Fiber Control]
  - parameter 621, [Fiber Status]
  - parameter 622, [Sync Time]
  - parameter 623, [Traverse Inc]
  - parameter 624, [Traverse Dec]
  - parameter 625, [Max Traverse]
  - parameter 626, [P Jump]
- Added Options 58 “Sync Enable,” and 59 “Traverse Ena,” to the Digital Input selections.
- A new stop mode, Fast Braking, has been added to parameter 155, [Stop Mode A] and 156 [Stop Mode B]. This mode is similar to DC braking in that a programmed current is output and the motor/load rotational energy is converted to heat inside the motor. The current is AC (instead of DC) which provides a faster stop.

- Parameter 15, [Torque Estimate] was added, as well as an option for use as an analog output.
- The maximum value of Parameter 44, [Motor NP RPM] was increased to 30,000 RPM, from a previous value of 24,000 RPM.
- Motor Overload Memory Retention has been added to meet 2005 NEC Motor Overtemp. Parameter 50, [Motor OL Mode] enables parameter 220, [Motor OL Count] to maintain its value through a drive reset.
- Options have been added to [Digital Outx Sel] for "Manual Mode" and "Fast Brake." These have also been added to [Drive Status 3], providing indication that a device has "Manual" control of the Speed Reference, and that a "Fast Brake" stop is in progress.
- Changes were made to the MOP function so that if parameter 194, [Save MOP Ref], bit 1, "At Stop" = 0, than parameter 11, [MOP Frequency] is set to zero at the end of a stop, instead of when a Stop is initiated.
- Parameter 223, [Status 3 @ Fault] now includes a status bit for "Fast Braking."
- Safe Off Status, indicating a de-energization of the Safe Off circuit, will now be indicated in parameter 214, [Start Inhibits] and 215 [Last Stop Source].
- Several Diagnostic parameters have been added. These include;
  - Parameter 448, [Spd Err Filt BW]
  - Parameter 547, [Ki Fast Braking]
  - Parameter 548, [Kp Fast Braking]
  - Parameter 549, [Flux Braking %]
  - Parameter 552, [Dead Time Comp]
  - Parameter 553, [Flux Down Rate]
- Diagnostic Items were added for:
  - 37 Junction Temp
  - 39 Grn Warn Level
  - 40 In Phase LossLvl
- New DPI Configuration Class, which will allow a Copycat of configuration from a PowerFlex 70 Standard to a PowerFlex 70 Enhanced Control.
- Several changes added for V16 Premier Integration to support external tools, such as ADR.

Corrected Anomalies

This section describes the anomalies corrected in this revision:

Function	Anomaly	Correction
Analog Output Selections	When FVC control was added to the PF70EC, several related Analog Output selections were added to the manual, but the code for these functions was not implemented.	Code has been implemented for the following Analog Output options; 14, "Commanded Torque" 15, "MtrTrqCurRef" 19, "Torque Est" In addition, errors in the Lo and Hi value table were corrected.
Encoder Loss	In V/Hz and SVC modes, the drive would trip when attempting to start into a spinning motor. In FVC Vector mode, the drive would trip when attempting to hold zero speed.	This issue has been corrected.

Function	Anomaly	Correction
Offline Default Values	In earlier versions, all PowerFlex 70EC drives reported offline default values regardless of drive rating.	In v3.002, the "Offline Default" values for the following parameters are based on drive ratings. 26 41 44 47 63 71 91 107 148 203 27 42 45 55 69 72 94 119 151 542 28 43 46 62 70 82 97 121 158
Parameter 24, [Commanded Torque]	Parameter 24, [Commanded Torque] would read 100% when the drive was stopped.	This issue has been corrected.
Parameter 56, [Compensation]	The User Manual incorrectly stated that bit 7, "PWMFreqLock" was a valid selection. The previous firmware release did not have this selection.	Bit 7 "PWMFreqLock" is now a valid selection.
Parameter 117, [Trim In Select]	Option 10 "Master Ref" was previously a valid selection.	The text for option 10 has been changed to "Reserved."
Parameter 213, [Speed Ref Source]	Option 25 "Jog Speed2" was not a valid selection.	It is now a valid selection for [Speed Ref Source].
PTC	The PTC code was enclosed in an analog fault code that would not run if parameter 190 [Direction Mode] = 1, "Bipolar."	The PTC Check now runs regardless of parameter 190, [Direction Mode] or 324 [Analog In Loss].
Reverse Disable	If parameter 190 [Direction Mode] = 2, "Reverse Disable," overspeed trips would occur if the drive was set to FVC control.	The code in Process Speed Limit was changed to allow for parameter 83, [OverSpeed Limit] to go to a negative value for normal speed regulator undershoot.
S-Curve	While in S-Curve, switching from accel to decel, with a decel time longer than accel time, could cause the speed to overshoot.	This issue has been corrected.
Skip Bands	Several issues existed with Skip Bands.	The Skip Band code was re-worked to correct these issues.
Speed/Torque Mode Control via Digital Inputs	Options 31, 32 and 33 in parameters 361-366, [Digital In 1-6] displayed ENUM text of "Reserved."	The Enum text now displays "Spd/Torque Mode 1-3."
Speed Trim % Error from Analog In	When an Analog Input was selected as the trim source and trim was set to "%," the actual trim added was too high by 10000/4096 = 2.44x.	The gain calculation for Speed Trim % has been corrected.
MWh values	In previous revisions, the watt-hour values would increase when motoring and regenerating.	The watt-hour calculations have been modified to decrease while regenerating, and increase while motoring. This calculation will be used for parameter 9 [Elapsed MWh], 14 [Elapsed kWh], D5 Life MegaWatt Hr, and D9 Life MW Fraction.

Determining Firmware Revision Level

To determine the current firmware version for a PowerFlex 70 Drive, view parameter #29 [Control SW Ver].

Firmware Upgrade Procedure

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. For a detailed explanation of the flash procedure, refer to http://www.ab.com/support/abdrives/powerflex70/firmware/index.html.

ATTENTION: Risk of drive damage exists if drive power is removed during the Boot Flash segment of the upgrade/download. To guard against damage, Do Not Remove Power to the drive until the download is complete and the drive has been reset.

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.

1. Remove/disconnect any HIMs before proceeding.
2. Install the **"v3.002 Flash Kit"** 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 ControlFLASH

Important: This method requires RSLinx.

1. Launch ControlFLASH (if it is not already running).
2. Follow the screen prompts until the flash procedure is completed and the new firmware version is displayed.

Using DriveExplorer Lite/Full

1. Exit the ControlFLASH program (if it is running) and launch DriveExplorer. Make a connection to the drive.
2. In the DriveExplorer treeview, select the appropriate drive. Then select the Information icon.
3. On the Properties screen, select 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: This method requires RSLinx.

1. Exit the ControlFLASH program (if it is running) and launch DriveExecutive. Make a connection to the drive.
2. In the DriveExecutive treeview, select the appropriate drive. Then select the Information icon.
3. On the Properties screen, select "Component Details."
4. Select "Flash Update" and follow the screen prompts until the procedure is completed and the new firmware version is displayed.

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