PowerFlex® 700S Drives with Phase II Control (3.05)

These release notes correspond to major revision (3), minor revision (5) of firmware for PowerFlex® 700S drives with Phase II control.

Introduction

The following information is included in this document:

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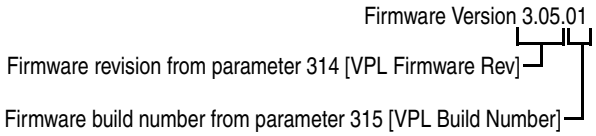
Determining Firmware Revision Level

To determine the firmware version for a PowerFlex 700S drive, view parameters 314 [VPL Firmware Rev] and 315 [VPL Build Number]. The firmware version is the combination of the data in these parameters.

Example:



Firmware Upgrades

This section describes procedures for upgrading your firmware:

When updating firmware version 1.xx to version 2.xx or higher, boot code v1.06 must be flashed into the drive. Use the following procedure to upgrade the boot code along with the application code:

Upgrading from version 1.12 (or before 2.xx release)

1. Flash 700S2bt01_06.bin using 1203-SSS Series B and HyperTerminal.
2. Cycle the power (automatically).
3. HIM displays "No System Application..." error message - ignore this error.
4. Flash 700S2ap03_05.bin using 1203-SSS Series B and HyperTerminal.
5. Cycle the power (automatically).
6. HIM displays as normal.

If upgrading firmware version after version 2.xx (i.e., v2.03), upgrading the application firmware only is required.

Enhancement

This section describes the enhancement included in this revision:

Added Permanent Magnet Motor Operation to PowerFlex 700L Drives

The PowerFlex 700L drive now has the ability to select Permanent Magnet Control via the Start Up menu or by setting parameter 485 [Motor Ctrl Mode] to a value of 2 “PMag motor”.

Corrected Anomalies

This section describes the anomalies corrected in this revision:

Drive Homing Did Not Always Complete When Linked to a Parameter

The value of a parameter linked to the “Find Home” function was restored to its initial value of "1", which caused the Homing routine to be re-initialized, even though the Homing function correctly recognized either the switch or marker and returned to home position. This firmware release corrects this anomaly.

DriveLogix5730 Controller Required a Restart After Uploading the RSLogix5000 Program to CompactFlash

When uploading a program from a DriveLogix5730 Controller to CompactFlash, the controller required a reset in order to restart the RSLogix5000 program. This anomaly was corrected with DriveLogix5730 Controller firmware version 15.05.

DriveLogix Version 15.xx May Not Respond to MSO Command

DriveLogix firmware v15.xx may not respond to the MSO command. This is a result of losing the asynchronous connection which causes a “Logix Timeout” (fault 62) in the PowerFlex 700S Phase II drive. This fault can be reset, but the asynchronous connection is not re-established (i.e., parameter 690 [Motn Cnct Status], bit 4 “Asynch Cnct” is set to “0”). A power cycle was required to re-establish the asynchronous connection. This anomaly was corrected with DriveLogix5730 Controller firmware version 15.05.

Frame 12 Drives Experienced Unstable Operation and Trip on IOC, Over Speed, or Over Load Faults

Frame 12 drives could experience unstable operation and an Instantaneous Over Current (IOC), Over Speed or Over Load fault under the following conditions:

- When the auxiliary power was applied before the main power and the actual speed exceeded approximately 350 RPM. If the main power was applied to the drive before the auxiliary power was applied, the drive operated as expected.
- If the two bridges were powered up at different times and the actual speed exceeded approximately 350 RPM. In a normal configuration this was unlikely to happen because the two bridges had the same main power source, from which they power up at the same time.

This anomaly was corrected with version 3.05 of PowerFlex 700S Phase II firmware.

Improved Torque Accuracy Around Zero Speed

The PowerFlex 700S Phase II drive was producing torque at a level slightly higher than desired, near zero speed. This anomaly was corrected with this version of firmware.

Option Port 0 Did Not Work with High Horsepower Drives

Option Port 0 did not work with the High Horsepower drives. Therefore, the Resolver, Stegmann, and Heidenhain feedback devices did not work with the High Horsepower drives. This anomaly was corrected with version 3.05 of PowerFlex 700S Phase II firmware.

Phase Locked Loop Produced an Unexpected Position Command

The position value input to the Phase Locked Loop (PLL) was not being properly initialized under all conditions. The only exception was when the drive was first powered up and the position value was set to zero. For all other conditions, the drive rotated the motor to correct the position error.

Because the PLL works on delta counts, the first delta position after enabling PLL could be very large if the position reference did not happen to equal the internal "old position reference" of the PLL. Therefore, the PLL output could command the drive to maximum speed to correct for the position error.

The anomaly was corrected in this firmware release.

Slip Regulator Gain Preset

The Slip Regulator Gain preset could only be set with the drive in the stop mode. In previous firmware versions the drive had to be in the run mode to preset the Slip Gain. With version 3.05 of PowerFlex 700S Phase II firmware, the Slip Regulator Gain can be set whenever the Slip Regulator is off.

Unstable Operation in the Reverse Direction in the Field Weakening Range

Unstable operating conditions could occur if the velocity feedback was negative in the field weakening range when running the motor above twice the base speed in Field Oriented Control (FOC) or Sensorless mode. This anomaly was corrected with version 3.05 of PowerFlex 700S Phase II firmware.

Known Anomalies

This firmware revision contains the following known anomalies:

"Block Write Error" During DriveExplorer Parameter Down Load

When using DriveExplorer to down load parameters from DriveExecutive to a PowerFlex 700S drive, a "Block Write Error" communication error can occur. This is an intermittent anomaly.

For example: The parameters from a PowerFlex 700S drive were uploaded to DriveExecutive where they were restored to factory defaults. Down loading the parameters from DriveExecutive via DriveExplorer to the PowerFlex 700S drive resulted in the "Block Write Error" communication error.

Clearing the "Find Home" Bit in Parameter 741 [Position Status]

If bit 24 "Find Home" in parameter 740 [Position Control] is set, bit 15 "Homed" in parameter 741 [Position Status] remains set until a start command is issued. The "Homed" bit is only cleared when the "Find Home" bit is re-asserted.

DC Bus Overvoltage Fault (Fault 24) for High Horsepower Drives

A DC Bus overvoltage fault may occur for high horsepower drives when executing a flying start within 2 seconds of a commanded stop with no or light loads.

Minimum and Maximum Speed Reference Values Limited

Parameter 30 [Min Spd Ref Lim] does not allow positive values and parameter 31 [Max Spd Ref Lim] does not allow negative values.

Motion Registration Input Limited to Digital Input 1 or Registration Input 0

The Registration input to the drive is limited to Digital Input 1 and Registration Input 0. Therefore, the RSLogix MAR (Motion Arm Registration) instruction will not function properly if Registration Input 1 is used.

Parameter 554 [LED Status] Not Functioning Properly

Parameter 554 [LED Status], bit 15 "DL ComActive", does not work.

Save to EEPROM via HIM on High Horsepower Drives

Initiating a save to EEPROM via the HIM can possibly cause High Horsepower drives to experience a Fault 71 “HiHp Drv Ovrload” if the save function is initiated while the motor is turning.

SynchLink Does Not Reset Properly When “SL Reset” Bit is Set

Setting bit 3 “SL Reset” of parameter 904 [SL Node Cnfg] in PowerFlex 700S Phase II drives does not appear to reset SynchLink properly for DriveLogix Motion control. A power cycle is required to reset SynchLink so that the CST master is set and DriveLogix Motion control works or to reset the Timekeeper.

Trend Functions May Cause Drive to Stop Running

When using the trend functions, a PowerFlex 700S drive may stop running. The power to the drive must be cycled in order to correct this condition. If the DriveLogix option is present the 5730 controller may lose its program.

Restrictions

The following restrictions apply to this revision of firmware:

Current Draw Down with Multi-Motor Drive Operation

When using a PowerFlex 700S drive to run multiple motors, the drive must be sized in order to provide the total current required to run the connected motors plus the current required to line start any disconnected motors. If the drive’s total current rating is not capable of providing the total current described above, the motor speed may slow, possibly to zero, and re-accelerate the motors back to the set speed when line starting a disconnected motor.

Homing to a Switch and Then to a Marker Not Functional Without DriveLogix

When using the Homing function with a PowerFlex 700S Phase II drive without DriveLogix, you can either Home to a Switch or Home to a Marker. You cannot Home to a Switch immediately followed by a Home to a Marker.

Operating Mode Configuration Parameters Should Not be Changed

The following parameters should not be changed by a user:

- 510 [FVC Mode Config]
- 511 [FVC2 Mode Config]
- 512 [PMag Mode Config]
- 513 [V/Hz Mode Config]

Position Control Bits Not Available for Controller

The following bits were added to parameters 740 [Position Control] and 741 [Position Status] as part of the Position Control Static Assembly for firmware version 3.01.

- [Position Control]
  - bit 24 "Find Home"
  - bit 25 "Pos Redefine"
  - bit 26 "Home Dir"
  - bit 27 "Return Home"
  - bit 28 "Home Switch"
  - bit 29 "Home Marker"
- [Position Status]
  - bit 13 "Home Required"
  - bit 14 "Homing"
  - bit 15 "Homed"

However, these bits were not added to the Controller side of the Static Assembly. Therefore, the controller cannot connect to these bits when using the Position Control Communication Format. If it is necessary to have a Controller connect to these bits, the User Defined or Custom User Defined Communication format must be used.

Speed Limited Adjustable Torque (SLAT) Bits Not Available for Controller

Bits 7 "SLAT Minimum" and 8 "SLAT Maximum" were added to parameter 110 [Speed/TorqueMode] as part of the Speed Control Static Assembly for firmware version 3.01. However, these bits were not added to the Controller side of the Static Assembly. Therefore, the controller cannot connect to bits 7 and 8 when using the Speed Control Communication Format. If it is necessary to have a Controller connect to these bits, the User Defined or Custom User Defined Communication format must be used.

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using our products. At http://support.rockwellautomation.com, 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	1.440.646.3223 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 tests all of our 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:

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 return procedure.

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