



PowerFlex[®] 700S Drives with Phase II Control (3.04)

These release notes correspond to major revision (3), minor revision (4) of firmware for PowerFlex[®] 700S drives with Phase II control.

Introduction

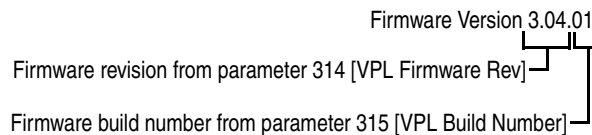
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Determining Firmware Revision Level

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_04.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.

Enhancements

This section describes the enhancements included in this revision:

DC Bus Faults Disabled for Low DC Bus Voltage Conditions (High Horsepower Drives)

All DC Bus related faults have been disabled for low DC Bus voltage conditions for high horsepower drives (frames 9 - 13). The following fault signals are now ignored during a low DC Bus voltage condition:

- Fault 26 "Ground Fault"
- Fault 67 "HiHp Bus Link Ls"
- Fault 68 "HiHP Bus CRC Er"
- Fault 66 "HiHP Bus Com Dly"
- Fault 73 "HiHP PrChrg Cntc"

Enhanced Power Circuit Communication Bus for High Horsepower Drives

The Analog to Digital (AD) conversion signal for high horsepower drives (frames 9 - 13) will now be inhibited when communication from the Power Circuit Communication Bus has not been established.

A new alarm "HiHP Bus Data" (event 79) has been added to indicate that the status of the data received by the Power Circuit Communication Bus has changed, signaling a loss of communication. The following communication data from the Power Circuit Communication Bus is monitored: Minimum Pulse Control (or minimum off time) connection, Pulse Control connection,

Simultaneous Switching Inhibit Delay (or dead time control), Clock Time selection, I/O Direction (determines the general I/O port for Inputs and Outputs).

The following parameters have been modified to support this enhancement:

- Bit 14 “NonCnfgAlarm” has been added to parameter 322 [Exception Event3]
- Bit 14 “NonCnfgAlarm” has been added to parameter 325 [Fault Status 3]
- Bit 14 “HH Bus Data” has been added to parameter 328 [Alarm Status 3]

New DC Bus Over Voltage Fault Levels for High Horsepower Drives

The DC Bus over voltage fault levels for frames 9, 10, 11, 12, and 13 have been changed to 911V dc for 400V, 480V, and 500V drives and 1200V dc for 575V, 600V, and 690V drives. When the DC Bus voltage exceeds these new levels, fault 24 “DC Bus Overvolt” will display.

New Start Inhibit for High DC Bus Voltage

A new start inhibit was added to indicate when the DC Bus voltage is above 800V dc for 480V drives and above 1100V dc for 690V drives. The drive will not start if the DC Bus voltage is above these defined limits. This inhibit feature prevents possible damage to the drive power structure if an external output short circuit exists and the DC bus voltage level is above these defined levels.

Parameter 402 [PWM Frequency] Now Cannot be Changed While Drive is Running for Frames 9 - 13

The carrier frequency (specified in parameter 402 [PWM Frequency]) for frames 9 - 13 now cannot be changed while the drive is running. A carrier frequency change while running could possibly result in IOC's or DC Bus Over Voltage faults.

Miscellaneous Parameter Changes

- Parameter 796 [Posit Gear Ratio] has been changed to be linkable.

Corrected Anomalies

This section describes the anomalies corrected in this revision:

Fast Flux up Time Calculation Correction

The Fast Flux up time was previously calculated with an incorrect equation. The equation has been corrected to yield the correct Fast Flux up time.

Fault 28 “VPL/MC Comm Fail” Anomaly

This anomaly occurred when the NVS sector for the Alarm or Fault queue was full, 3640 entries. When either sector, Alarm or Fault, was full, an erase function was initiated in task 3. However, because the erase function inhibited task 3, which monitors the VPL/MC communications, Fault 28 occurred. In this firmware version, the erase function has been moved to the background routine to correct this anomaly.

Forward and Reverse Speed Limit Revert to Defaults

When the forward and reverse speed limits (set in parameters 76 [Fwd Speed Limit] and 75 [Rev Speed Limit], respectively) were configured using the Start Up menu on the HIM, they reverted back to the default settings. This firmware version corrects this anomaly so the forward and reverse speed limits configured using the Start Up menu on the HIM are now saved and used and do not reset to the default values.

MC Firmware Fault (Event 30) on High Horsepower Drives

A “MC Firmware” fault (event 30) occurs on high horsepower PowerFlex 700S drives when the main power is removed, the DC bus voltage reaches approximately 60V dc and when the following conditions exist:

- Configured to run in V/Hz Mode
- Auxiliary Power is used

A device reset must be executed from the HIM or all power, main power and auxiliary power must be removed from the drive in order to reset this fault.

This anomaly is corrected in this firmware release.

Per Unit Volts for Low Voltage Class Drives

When parameter 403 [Voltage Class] is set to 2 - “Low Voltage” for 690V class drives, the Per Unit Volts = 575V instead of 660V and the output voltage is reduced by the ratio of 575/660. For a 575V motor the maximum voltage is 500V. If parameter 403 was set to 3 - “High Voltage” the output voltage would be 660V.

With this release of firmware, if the Voltage Class is set to “Low Voltage” for a 690V class drive, the Per Unit Volts = 660V. Thus, when parameter 403 [Voltage Class] is set to 2 - “Low Voltage” the drive output voltage is now limited to the voltage defined by parameter 1 [Motor NP Volts] (note that [Motor NP Volts] sets the value of parameter 531 [Maximum Voltage]). Even if the Voltage Class is set to the Low Voltage level, the drive will produce output voltage that is limited by the lower of either parameter 531 [Maximum Voltage] or the maximum voltage limited by the DC Bus Voltage Level and the Bus Utilization Limit (parameter 500 [Bus Util Limit]).

Position Error and Fast Interrupt Time

An intermittent position error could occur when all firmware features and Synchlink™ were used at the fast interrupt time. The position error is caused when the position loop task extended into the next interrupt cycle. This anomaly is corrected in this firmware version by using the same position data to complete all calculations even though the task is extended into the next interrupt cycle.

Position Error Detection

Previously, position error fault detection (event 85 “Position Error”) was only active when the Motion connection to the Controller was established and not when the PowerFlex 700S Position Loop was active. Position error fault detection is now active with the Motion and Position Loop functions.

Unstable Operation Above 72Hz with Hi-Resolution Feedback Devices

The C-Bus delta count criteria, used for Encoder Loss switch over, was modified based on the max speed data from the VPL. This criteria is only used for Option Port0 feedback devices to avoid unstable operation.

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.

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.

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.

DriveLogix5730 Controller Requires Restart after Uploading to CompactFlash to Reset RLogix5000

When uploading a program from a DriveLogix5730 Controller to CompactFlash, the controller requires a reset in order to restart RLogix5000.

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 is required to re-establish the asynchronous connection.

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

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

- When the auxiliary power is applied before the main power and the actual speed exceeds approximately 350 RPM. If the main power is applied to the drive before the auxiliary power is applied, the drive will operate as expected.
- If the two bridges are powered up at different times and the actual speed exceeds approximately 350 RPM. In a normal configuration this is unlikely to happen because the two bridges have the same main power source, from which they will power up at the same time.

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 Switch or a Home to Marker. You cannot Home to a Switch immediately followed by a Home to a Marker.

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.

Option Port 0 Does Not Work with High Horsepower Drives

Option Port 0 does not work with the High Horsepower drives. Therefore, Resolver, Stegmann, and Heidenhain feedback devices will not work with the High Horsepower drives.

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.

Unstable Operation in the Reverse Direction in the Field Weakening Range

Unstable operating conditions may occur if the velocity feedback is negative in the field weakening range when running the motor above twice the base speed in Field Oriented Control (FOC) or Sensorless mode.

Restrictions

The following restrictions apply to this revision of firmware:

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.

Slip Regulator Gain Preset

The Slip Regulator Gain preset can 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.

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.

Notes:



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