



DriveLogix™5730 Controller Firmware Revision 16

Catalog Number 5730

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About This Publication

This publication describes enhancements and anomalies (known and corrected) for DriveLogix™5730 Controller, firmware major revision 16, minor revision 20.

When reviewing this publication, note that your controller's minor revision may be different from that of other DriveLogix5730 controllers. The contents of this publication apply to the following controller revision numbers.

- This release note refers to the DriveLogix5730 version 16.20.

The previous revisions of this publication included the following controllers and firmware revisions. The information from previous minor revisions is retained in these release notes.

- Refer to publication 20D-RN034 for the DriveLogix5730 16.04.
- Refer to publication 20D-RN033 for the DriveLogix5730 16.03.

We strongly recommend that you review the information provided regarding previous firmware revisions. We recommend that you do so because, if you are upgrading your firmware through multiple previous revisions, all of the information specific to all of the revisions is applicable.

IMPORTANT

Before updating your controller, we strongly recommend that you review information related to the most recent previous major firmware revision, revision 15, in publication 20D-RN030. Firmware release notes contain material for all minor revisions subsequent to each major revision. If your controller, for example, is at minor revision 15.3 rather than 15.5, we recommend that you download and read the latest firmware release note to be aware of information pertinent to each of these firmware upgrades before upgrading your controller to the next major revision. Previous revision release notes, that is, publication 20D-RN030, are available at:

http://literature.rockwellautomation.com/idc/groups/literature/documents/rn/20d-rn030_-en-p.pdf

Compatible Revisions of Software

To use controller revision 16.20, the following minimum software revision levels are required.

Software	Required Revision Level
RSLink Classic	2.51
RSLink Enterprise	4.00
RSLogix 5000	16.00 ⁽¹⁾
RSNetWorx for ControlNet	8.00
RSNetWorx for DeviceNet	
RSNetWorx for EtherNet/IP	

⁽¹⁾ Note that firmware revision 16.20 is compatible with RSLogix 5000, version 16.00 software. However, many of the corrected anomalies and restrictions described in these release notes are only available when firmware revision 16.20 is used with RSLogix 5000, version 16.03 software.

Determining Your Firmware Revision Level

To determine the firmware revision level for a DriveLogix controller, use RSNetWorx or RSLink software to view the properties of the node occupied by the controller.

Before You Begin

Before you upgrade your controller or RSLogix 5000 software to this revision, complete the following preliminary actions.

If	Then
Your controller is close to its limits of memory	<p>This revision may require more memory than previous revisions.</p> <ul style="list-style-type: none">• To see what components of your current project require more memory, see “Additional Memory Requirements” on page 23.• RSLogix 5000 software revision 13.0 or later lets you estimate the memory requirements of the controller offline. <p>To update to this revision, you may have to upgrade to a controller that has more memory.</p>
Your controller is connected to a DH-485 network	<p>Disconnect it from the DH-485 network <i>before</i> you update the firmware of the controller. If you update the firmware of a controller while it is connected to a DH-485 network, communication on the network may stop.</p> <p>We recommend that you use DH-485 communications as follows:</p> <ul style="list-style-type: none">• If you update the firmware of a controller while it is connected to a DH-485 network, communication on the network may stop. To prevent this, disconnect the controller from the DH-485 network before you update the firmware of the controller.• Logix5000 controllers should be used on DH-485 networks only when you wish to add these controllers to an existing DH-485 network. For new applications with Logix5000 controllers, DeviceNet, Ethernet, and ControlNet are the recommended networks.

If	Then
You are updating a DriveLogix5730 Embedded Ethernet card or a 1788 Ethernet card via the ethernet network.	<p data-bbox="386 279 1468 394">If you have ethernet traffic targeted to the DriveLogix 5730 and you are updating the firmware on the 1788 Ethernet card or the 5730 Embedded Ethernet card, the update will take longer than expected. This situation can lead to a communication time out with Control Flash. We recommend that you complete the following tasks before attempting a controller firmware upgrade.</p> <ul data-bbox="386 436 1468 940" style="list-style-type: none"> <li data-bbox="386 436 1468 531">• First, check the status of the MS (module status) LED indicator next to the ethernet port. If it is blinking red before you begin the upgrade, additional action may be required. Contact Rockwell Automation Technical Support for more information. <li data-bbox="386 562 1468 625">• Modify the Port Configuration for the ethernet card so that the Network Configuration Type is set to Static and assign a valid IP address. <li data-bbox="386 657 1468 720">• If RSWho is actively browsing the controller through an ethernet or serial connection, close the RSWho window to stop the browse. <li data-bbox="386 751 1468 814">• If other controllers are messaging to the DriveLogix5730 controller, take the other controllers off the network, or put them in program mode. <li data-bbox="386 846 1468 877">• If there are controllers consuming tags from the DriveLogix5730 controller remove them from the network. <li data-bbox="386 909 1468 940">• If there are HMI devices connected to the controller, disconnect them from the network or shut them down. <div data-bbox="427 972 1451 1612"> <div data-bbox="427 993 605 1045">IMPORTANT</div> <p data-bbox="638 993 1451 1150">If you cannot perform the tasks listed above before attempting a controller firmware upgrade, Ethernet traffic on the controller's ethernet port may cause ControlFlash to timeout during the firmware upgrade. If the timeout condition is not handled properly, you may render the ethernet port on the controller inoperable, requiring you to return the controller to Rockwell Automation for repair.</p> <p data-bbox="638 1182 1451 1276">In the event that a ControlFlash timeout occurs, the software displays an error dialog indicating that the "Target Device failed to report the new revision number," or that the upgrade "Failed to begin update to the target device."</p> <p data-bbox="638 1308 1451 1497">If the error dialogs display, check the MS LED indicator. If the indicator is flashing red, the upgrade is still in progress and should not be interrupted. Do NOT cycle power to the controller while the LED indicator is flashing red. If the upgrade completes, the controller power cycles itself and indicates the upgrade is complete with a solid green MS LED indicator. The time required to complete the upgrade is dependent on the level of Ethernet traffic.</p> <p data-bbox="638 1528 1451 1591">If the controller does not complete the upgrade, the MS LED indicator continues flashing red. In this case, contact Rockwell Automation Services & Support.</p> </div>

Enhancements

The following enhancements have been made to controller revision 16.20.

Enhancements Provided with Firmware Revision 16.20

Enhancement	Description
Radio Modem Protocol Support	With this revision, the DF1 Radio Modem protocol, already supported by SLC 500 and MicroLogix products, has been implemented and enabled in the DriveLogix controller. Legacy and Logix5000 controllers can be mixed and can support both master and slave and store and forward configurations.
Motion Planner Enhancements	Several Motion Planner enhancements have been made and enabled by this firmware revision. For more information about Motion Planner enhancements, see the Motion Planner Application Solution, publication RA-AP031 .

The following enhancements have been made in previous controller revisions.

Enhancements Provided with Previous Firmware Revisions

Enhancement	Description
Add-On Instructions	With version 16 of RSLogix 5000 programming software, you can design and configure sets of commonly used instructions to increase project consistency. Similar to the built-in instructions contained in Logix5000 controllers, these instructions you create are called Add-On Instructions (AOI). Add-On Instructions reuse common control algorithms. With AOI, you can: <ul style="list-style-type: none"> ease maintenance by animating logic for a single instance. protect intellectual property with password-protected instructions. reduce documentation development time. For more information about using Add-On Instructions, see the Logix5000 Controllers Common Procedures Reference Manual, publication 1756-UM001.
Logix5000 Firmware Supervisor	Use of the Logix5000 Firmware Supervisor with CompactLogix/DriveLogix5730 controllers and certain I/O modules enables you to program the controller to complete firmware updates using a GSV or SSV instruction. The controller uses a firmware kit loaded on a CompactFLASH card and can complete firmware updates in Program and Run modes. In GuardLogix controllers, this enhancement is available for use with standard, I/O modules.
FactoryTalk Alarms and Events	Alarms are now embedded in the controller with two new instructions, ALMD and ALMA, available in RSLogix 5000 software. These digital and analog alarm instructions are fully self-contained.
Ability to Unicast Producer/Consumer Tags on EtherNet/IP Networks	Revision 16 enables you to use RSLogix 5000 software to set Producer and Consumer tag connections to Unicast. Setting the tags to Unicast decreases the network bandwidth and simplifies Ethernet switch configuration.

Enhancements Provided with Previous Firmware Revisions

Enhancement	Description
Logix Date Base Changed to be January 1, 1970	<p>The Logix real-time clock operates as a 64-bit binary number that counts microseconds from a fixed date. Prior to version 16, the base date was January 1, 1972. Recent developments with the Common Industrial Protocol (CIP) specification have resulted in the selection of a different base date of January 1, 1970 by the Open DeviceNet Vendors Association (ODVA). With version 16, the date base that Logix uses has been changed to bring it into alignment with the CIP specification. Additionally, in support of the changes to the real-time clock, several other GSV attributes were also added: LocalDateTime, TimeZoneString, ApplyDST (daylight savings time), and DSTAdjustment.</p> <p>Generally, the date and time were accessed via the GSV instruction within a Logix program using the "DateTime" attribute, which breaks down the date and time to its various components (usec, sec, min, hour, day, month, year). Applications that use this attribute to the real-time clock should not be impacted by this change. However, the time was also available in its 64-bit form using the "CurrentValue" GSV attribute. A GSV to "CurrentValue" of wall clock was changed to the number of microseconds from the new base date. Any applications that interpreted the old 1972 64 bit number may now require a change.</p>
EtherNet/IP Reduced Heartbeat	<p>The Reduced Heartbeat feature reduces the rate at which heartbeat packets are sent from a device in an I/O connection or a Produced/Consumed connection. This feature preserves bandwidth in EtherNet/IP network installations.</p> <p>The change is automatic and requires no selection. You will notice a reduction in the packets per second used on your EtherNet/IP network for several cases including all input modules and Produce/Consume tags.</p> <hr/> <div data-bbox="591 1142 771 1192"> IMPORTANT </div> <div data-bbox="803 1142 1438 1226"> <p>If you are using a Logix controller and upgrade the controller's firmware to revision 16.x, and you are using the following adapter modules:</p> <ul style="list-style-type: none"> • 1734-AENT, POINT I/O EtherNet/IP adapter, • 1738-AENT, ArmorPoint I/O EtherNet/IP adapter, <p>you must also upgrade the adapter firmware to revision 2.003.</p> <p>Failure to upgrade your EtherNet/IP adapter firmware may impact your application if more than one Logix controller is connected to POINT or ArmorPoint I/O modules.</p> <p>For more information on using the 1734-AENT or 1738-AENT adapters with Logix controllers that have been upgraded to firmware revision 16.x or greater, see:</p> <ul style="list-style-type: none"> • POINT I/O EtherNet/IP Adapter release notes, publication 1734-RN002 • ArmorPoint I/O release notes, publication 1738-RN002 </div>

Enhancements Provided with Previous Firmware Revisions

Enhancement	Description
System Overhead Time Slice	<p>The System Overhead Time Slice (SOTS) lets you reserve a percentage of the controller processing resources for the handling of communications. Prior to this release, any unused part of the SOTS was used by the controller to resume the continuous task. This firmware revision lets you configure the unused portion of SOTS to either:</p> <ul style="list-style-type: none"> • run the continuous task (default/legacy mode), allowing for faster execution of application code. • reserve it for communications, providing for more predictable and deterministic continuous task scan time. <p>This enhancement allows the full impact of communications on the continuous task to be determined if time reserved for communications were always fully used.</p>
Programmable Jerk Control	<p>You can specify acceleration and deceleration jerk rates on single axis moves directly via operands in the instruction faceplate for S-Curve profile motion. Jerk rates for S-Curve motion can be specified as either "Units/Sec3", "% of Maximum", or a new "% of Time", letting you optimize the need for speed and smoothness. The configured maximum jerk rates are accessible programmatically via GSV/SSV instructions. Earlier revision of projects using S-Curve velocity profiles will be automatically migrated forward and prepopulate the new Jerk Operands in the MAM, MAJ, and MAS instructions with default values for Jerk rate as "100% of Time".</p>
Kinematic Transformation Instructions Added	<p>Motion control capabilities have been extended by allowing inverse and forward Kinematics transformations. This functionality is targeted for controlling robots used in packaging and pick-and-place applications.</p> <p>The native geometries supported are: 2 and 3 axes articulated-dependent and articulated-independent robot geometries, as well as configurable support for 3-axis SCARA geometries by leveraging the native geometries. To accomplish this functionality, the coordinate system configuration has been enhanced to allow selection of the coordinate system type as either Cartesian or articulated.</p> <p>Additionally, two new instructions, Motion Coordinated Transform (MCT) and Motion Calculate Transform Position (MCTP), have been added. The MCT allows "gearing" relationship to be set between two coordinated systems, for example, between a Cartesian coordinate system made by virtual axes and an articulated coordinate system that is made by the robot's real axes. Once the MCT is active, by simply programming moves on the virtual axes configured in the Cartesian coordinate system it is possible to move the robot in joint coordinates. The MCTP instruction allows the position to be transformed from that of one coordinate system to that of another coordinate system. Typically, the MCTP instruction would be used to calculate the Cartesian position from a given joint position (Forward kinematics).</p>

Enhancements Provided with Previous Firmware Revisions

Enhancement	Description
Positive and Negative Rotary Move Types for MAM Instruction	Previously, the move type of the Motion Axis Move (MAM) instruction generated a directional reversal if the deceleration distance was longer than the distance between the start point and the end point. In this release, two new rotary move types (Rotary Negative and Rotary Positive) have been added for the MAM instruction. These two move types travel in a unidirectional path to reach the end point. The unidirectional path is continued until the end point is reached even if that means additional turns or unwinds are required.
S-Curve MCS stop adjustment via Dynamics Configuration Bits	<p>Bits for user definable configuration have been added to the COORDINATE_SYSTEM data type to allow for more adjustment to the deceleration mechanism for S-Curve profile moves. The DynamicsConfigurationBits attribute allows for configuration setting for these three items:</p> <ul style="list-style-type: none"> • Reduced S-Curve stop delay • Reduced S-Curve velocity reversal • Reduced S-Curve velocity overshoot <p>This attribute can be accessed via GSV/SSV.</p>
Online Changes in Output CAM Editor	Parameter values can be changed for the output CAM profile either on the grid or by using the graphical view. Insertion and/or deletion of points while in run mode are not allowed. A new status rectangle icon has been added to the Output CAM Editor window to show the state of the control. The color of the rectangle is green when the controller is in run mode, cyan while in program mode, and gray while in the offline state.

Corrected Anomalies

These anomalies have been identified and corrected in controller firmware revision 16.20.

Anomalies Corrected in Firmware Revision 16.20

Anomaly	Description
Changing the controller mode from Run to Program is unsuccessful.	<p>When the controller mode is changed from Run to Program and an alarm instruction has a delivery state of In Progress, the controller does not change modes.</p> <p>To view the delivery state, open the Alarm Properties dialog and click the Messages tab.</p> <p>This anomaly may occur even when the controller is not connected to a FactoryTalk Alarm server.</p> <p>Lgx00075913</p>
Simultaneous branches in a Sequential Function Chart may not execute at the same time or in the same scan.	<p>When executing a simultaneous branch, it may take two scans of the routine before all of the simultaneous branches execute. It does not take more than two scans for all simultaneous branches to completely execute.</p> <p>Lgx00075143</p>
During Prescan, a Major Recoverable Fault, Type 6, Code 1, occurs.	<p>Each task programmed for a Logix controller has a Prescan Watchdog of 5 seconds. You cannot change this setting in RSLogix 5000 software.</p> <p>The fault typically occurs when these elements are present in the program:</p> <ul style="list-style-type: none"> • Add-On Instructions that use PreScan mode. • A large program with many tasks and subroutines where a majority of the application memory is used by the application code and not tags. <p>Other elements and factors may also cause the fault, however, those listed are the most common.</p> <p>When the fault occurs, the Prescan Watchdog has been exceeded. With this firmware revision, the Prescan Watchdog has been increased to 60 seconds.</p> <p>Lgx00077337</p>
Use of an ACL with other ASCII Serial Port instructions may result in a Major Non-Recoverable Fault.	<p>If an ACL instruction is executed while other ASCII instructions are active, a Major Non-Recoverable Fault may occur.</p> <p>Lgx00076857</p>
Add-On Instructions yield unexpected results.	<p>When calling an Add-On Instruction, if the data types of the tags passed into or out of the instruction do not match the parameter definitions, unexpected behavior can result.</p> <p>In the logic of an Add-On Instruction, reading a tag of type INT can also yield incorrect results.</p> <p>Lgx00075524</p>
Digital alarms (ALMD) may prematurely report an in-alarm state.	<p>The tag InAlarm reports the alarm (InAlarm=1) before the time entered in the MinDurationPRE tag expires.</p> <p>Lgx00075889</p>

The following table contains descriptions of anomalies corrected in previous firmware revisions.

Anomalies Corrected in Previous Firmware Revisions

Anomaly	Description
Controller Non-Recoverable Fault with FIFO instructions used in a program with Add-On Instructions.	<p>If an AOI is executed after a FFL or LFL instruction in a given program, the internal registers are incorrectly written to and the result is a Major Non-Recoverable Fault. For the fault to occur, all of the following must be true:</p> <ul style="list-style-type: none"> The AOI and FFL and LFL instruction must be in the same program in a Logix application. If the application has two programs defined and the AOI is in program A and the FFL or LFL are in program B no anomaly will be seen. The FFL/LFL must load a scalar type (SINT, INT, DINT, or REAL). If the source value is a structure, no anomaly will be seen. The FFL/LFL must be scanned before the AOI. If the AOI comes first in the code, no anomaly will be seen. <p>Note: The rung condition does not matter. If the required conditions exist, the fault will occur during prescan.</p> <p>Lgx00074725</p>
PanelView Plus operator terminals utilizing the serial port to communicate with the controller will not establish communication at startup.	<p>When the application on the PanelView Plus operator terminal begins to initialize communication with the controller, the controller responds with packets that exceed the 500 byte packet size. The PanelView Plus terminal then stops attempting communication with the controller. When this occurs, data is not updated on the PanelView Plus operator terminal.</p> <p>Lgx00074400</p>
LED's for Forcing not displaying correctly.	<p>The LED's for the forcing function were not displaying correctly. The firmware was altered to correct for the display. Note: The DriveLogix5730 controller does not support forcing of tags in the drive.</p> <p>Lgx 00067612</p>
Flash always requires power cycle.	<p>When the DriveLogix5730 controller is flash updated, it has to be power cycled to re-establish communications with the controller. The firmware that performs the reset recovery was modified to correct this issue.</p> <p>Lgx 00068591</p>
DriveLogix V15 to V16 Conversion resets Drive output tags to zeros.	<p>The DriveLogix5730 logic was initializing an output image to zeros. The logic was altered so this does not occur.</p> <p>Lgx 0006970</p>
Unable to flash 1788-CNCR from DriveLogix.	<p>When a 1788 card was updated via the DriveLogix5730 Embedded Ethernet, the controller required a power cycle to re-establish communications with the 1788 card. This anomaly was due to logic for resetting the 1788 card. The logic was altered to address this situation.</p> <p>Lgx 00071758</p>

Anomalies Corrected in Previous Firmware Revisions

Anomaly	Description
Extensive use of UID and UIE instructions results in a User-Task Watchdog timeout fault.	<p>If you use extensive amounts of UID and UIE instructions, when the controller is put into Run mode, a Major Recoverable Fault type 6, code 1, Task Watchdog Expired, may be logged. Attempts to clear the fault and return to Run mode are unsuccessful.</p> <p>Lgx00050393</p>
Event Task Overlap Counter registers large values after the controller is put in Run mode.	<p>If an application that uses event-based tasks is downloaded to the controller and then the controller is put into Run mode, the overlap counts for event-based tasks may exceed 800,000. This value is a false indication of task overlaps and does not affect the execution of event-based tasks.</p> <p>Lgx00058132</p>
Changes to RPI are not correlated between all workstations when multiple workstations are connected to the controller.	<p>If you are online with one controller from two or more workstations and you alter the RPI setting for an I/O connection on one workstation, the change in RPI does not register on the other workstations. The change in RPI registers only if the altered RPI program is uploaded from the controller by the other workstations.</p> <p>Lgx00070714</p>
Minor faults logged multiple times when certain instructions are used.	<p>The same minor faults, typically a minor math-overflow error, may be logged more than once, depending on the type of instructions used in the program. For example, if in a task the program contained a Multiply instruction that logged a math overflow error as a minor fault, a GSV instruction in the same program will log the same fault when it should not.</p> <p>Instructions affected include Message BTR, Message BTW, GSV, SSV, UIE, UID, STOD, STOR, STOI, PCMD, PSC, PATT, PDET, PCLF, PPD, and PRNP.</p> <p>Lgx00028500, Lgx00045361, and Lgx00045365</p>
LimitsInv and SelectLimitInv are swapped.	<p>In the High/Low Limit (HLL) instruction:</p> <ul style="list-style-type: none"> LimitsInv parameter is set when the SelectLimit is invalid. SelectLimitInv parameter is set when the HighLimit and LowLimit parameters are invalid. <p>Lgx00055977</p>
Processing of denormalized number exceptions causes a Major NonRecoverable Fault.	<p>A denormalized number is any 32-bit, floating-point value that is less than $1.75494210 \times 10^{-38}$ or greater than $-1.75494210 \times 10^{-38}$, excluding zero. Denormalized numbers typically occur when very small real numbers are divided by very large real numbers.</p> <p>This anomaly typically displays when:</p> <ol style="list-style-type: none"> The controller is handling an exception of a floating-point denormalized number in task A. Then task B begins to execute and handles an exception of a floating-point denormalized number. And, task B completes as task A begins again. <p>Lgx00057774</p>

Anomalies Corrected in Previous Firmware Revisions

Anomaly	Description
Motion Coordinated Move (MCCM) instruction may not produce a move to the specified end points.	In circular center programming mode a MCCM instruction may fail to reach the specified end point of a 180 degree Arc if the circle center is programmed incorrectly. Lgx00044813
Blended path contour may deviate beyond the confines of the programmed path.	In some very unique circumstances, when either changing velocity profile types or having drastically different acceleration and/or deceleration values on the two moves comprising a blended contour, the resultant blended path contour may deviate beyond the confines of the programmed path. Lgx00045400
MAOC instruction output remains ON when enable input is low.	An Output CAM element is configured with a Latch type of Position and Enable, and Unlatch type of Position and Enable. While the CAM element is active (the output is ON) the application sets the Unlatch Position to the value of the Latch Position. The output remains ON even if the Enable Input is dropped. For more information, see Technote 37835. Lgx00069685
In coordinated motion a rotary axis always moves.	When there is a rotary axis configured for the Coordinate System, the rotary axis makes one complete revolution even if the current command position is equal to the position in the Motion Coordinated Linear Move (MCLM) instruction. Lgx00056359
SlaveAxis.PositionCamLockStatus is reset when master axis stops/starts quickly using a Motion Axis Jog (MAJ) instruction.	When the manual jog input is cycled ON and OFF at a rapid rate, the SlaveAxis.PositionCamLockStatus gets reset and the SlaveAxis.PositionCamStatus remains set. Lgx00066064
While an axis is accelerating an MAS is initiated, a delay is experienced before the axis begins to decelerate to a stop.	This occurs with 'Stop Move' and 'Stop Jog' in combination with S-Curve velocity profiles. While an MAM or MAJ is accelerating, an MAS is initiated to stop it. Even though the deceleration rate is higher than the ones specified in the MAM or MAJ, the axis begins to slow at lower rate before decelerating at the higher rate programmed in the MAS. Lgx00055080
A Cam Profile can become locked such that an MCCP instruction can no longer update it.	This anomaly may occur if an MCSV executing in an application task is interrupted by the motion task which has a MAPC instruction currently in-process. Lgx00060094
On a uni-directional home, the .IP bit is cleared, the AxisHomedStatus attribute is set, but the .PC bit is not set.	If the home direction is uni-directional and the home offset is less than the distance to decelerated, then the axis is simply decelerated to a stop. The axis does not reverse direction to move to the home position. In this case the .PC bit of the MAH instruction is not set. The PC bit is set when the axis stops at the configured home position. Lgx00063431

Known Anomalies

This table lists known anomalies of controller revisions 16.00 . . . 16.20.

For more information about controller revisions and firmware revisions, see the “Compatible Revisions of Software” table on page 2.

Known Anomalies for Firmware Revisions 16.00 . . . 16.20

Anomaly	Description
Use of revision 16 firmware and the controller serial port results in extended program scan times.	<p>If you use firmware at revision 16, including revisions 16.02... 16.20, and the controller's serial port, the program scan time may increase. The program scan time increase in revision 16 may be two...ten times the scan time of the same program with revision 15.</p> <p>This anomaly only occurs when the controller serial port is used and there is no workaround.</p> <p>Lgx00077845</p>
Indirectly addressing an instance tag in an Add-On Instruction results in a Major Non-Recoverable Fault.	<p>When an indirectly-addressed instance tag is used instead of a directly- addressed instance tag within an Add-On Instruction, a Major Non-Recoverable Fault occurs. Typically the major fault occurs during the prescan of the controller.</p> <p>See the Restrictions section on page 20 for more information about this anomaly.</p> <p>Lgx00077261</p>
Motion Redefine Position (MRP) Error 13 for Positions within the range.	<p>You may get the error “Parameter out of Range” if the MRP is executed when:</p> <p>Current Position + MRP Position > 2^{31}/Axis Conversion Constant.</p> <p>Or</p> <p>Current Position + MRP Position < - 2^{31}/Axis Conversion Constant.</p> <p>For example, assume that the:</p> <ul style="list-style-type: none"> axis conversion constant = 120,000.0 feedback counts/1.0 unit. current command position = 17,893.0 units. <p>If you MRP with a position of five units, which exceeds 2^{31}/Axis Conversion Constant, the MRP will error.</p> <p>To work around this anomaly, move the axis to a value within the acceptable range specified above.</p> <p>Lgx00073719</p>
SSV of MotionGroup Average Scan Time causes a jump in scan time.	<p>If an SSV instruction with a value of zero is executed against the MotionGroup attribute TaskAverageScanTime, then a GSV instruction is executed. The average scan time jumps to an incorrect value. The larger the Coarse Update Period, the larger the jump will be. For example, with a Coarse Update Period of 26 ms, the average scan time value can increase to over 300 ms.</p> <p>Lgx00071520</p>

Known Anomalies for Firmware Revisions 16.00 . . . 16.20

Anomaly	Description
Axis ActualAcceleration tag is not updated for virtual axes.	<p>For the virtual axis, the Axis_tag.ActualAcceleration does not update, but the Axis_tag.CommandedAcceleration does. The actual position of a physical axis is based on actual motor feedback, which is why the virtual Actual Acceleration tag does not update on a virtual axis. To work around this anomaly, use these command-based tags:</p> <ul style="list-style-type: none"> • Virtual_Axis.CommandPosition • Virtual_Axis.CommandVelocity • Virtual_Axis.CommandAcceleration <p>Lgx00073829</p>
MCT error 61 with extended error 10 for zero length moves.	<p>You will get error 61 with extended error 10 if you execute an MCT instruction immediately after the .PC bit for a Motion Coordinated Linear Move (MCLM) or Motion Coordinated Circular Move (MCCM) is set for a zero length move, indicating that axes are moving or locked by some other operation.</p> <p>To work around this error, execute a minimum of a one-iteration delay right before executing the MCT instruction after the completion of the zero length coordinated move instruction. This delay is not necessary if the move before the MCT has any length.</p> <p>Lgx00075286</p>
Setting invalid home sequence value via SSV instruction.	<p>Do not attempt to program a set system value (SSV) instruction to set the home sequence to torque or torque marker if the drive is not a SERCOS drive. If you do so on a non-SERCOS drive, any subsequent attempt to program this attribute via an SSV will produce a minor controller fault.</p> <p>Lgx00068281</p>
Duration Cam - Latch and Unlatch Delays.	<p>Duration cams enable an application to turn an output on at a specific position and off after the configured Duration time. Latch and unlatch delays adjust the point at which an output turns on and off, regardless of axis speed.</p> <p>If you enter a latch delay, your application will adjust the point at which your output turns on. For example, a latch delay of 0.5 seconds will cause your output to turn on 0.5 seconds sooner and then remain on for the configured Duration time, in addition to the 0.5-second head start. However, using this example, currently, the total time your application's output remains on is being decreased by 0.5 seconds.</p> <p>If you enter an unlatch delay, your application will adjust the point at which your output turns off. For example, an unlatch delay of 0.5 seconds will cause your output to turn off 0.5 seconds sooner. However, using this example, currently, the total time your application's output remains on is extended by 0.5 seconds above and beyond the configured Duration time.</p> <p>If you execute a latch and unlatch delay for the identical value, no anomaly occurs, and the output will remain on for the configured Duration time.</p> <p>Lgx00068599</p>

Known Anomalies for Firmware Revisions 16.00 . . . 16.20

Anomaly	Description
When the non-volatile restore option is set to load On Corrupt Memory, the program may not restore.	<p>This anomaly typically occurs with new controllers or controllers that register a Major NonRecoverable Fault. If the non-volatile restore option is set to load On Corrupt Memory and a corrupt memory condition is detected, the controller program may not be restored.</p> <p>Lgx 00064843</p>
PI function block appears to stop executing as the output does not change and no instruction faults are logged.	<p>If the PI instruction is being used in linear mode, the following floating-point equation is used to calculate the ITerm.</p> $Kp \times Wld \times \frac{WldInput + WldInput_{n-1}}{2} \times DeltaT + ITerm_{n-1}$ <p>Due to the use of the single-precision floating point values, it may be possible, depending on the values of WLD and KP, for the ITerm value to be small enough, less than 0.0000001, to be lost when adding to the ITerm_{n-1}.</p> <p>For more information regarding the PI instruction, see the Logix5000 Process Controls and Drives Instructions User Manual, publication 1756-RM006.</p> <p>Lgx00070832</p>
Changes made to a timeout in the alarms system requires a new download of the program to controller.	<p>To verify that the timeout change is used by the controller, you must download the program to the controller after each change to the timeout variable.</p> <p>Lgx00069461</p>
The Slot Status bit for an I/O connection is slow to update if the connection is lost.	<p>When using I/O on an Ethernet network, if the connection to the network is lost at the adapter, the SlotStatusBit for that connection will not register the disconnect for 9 seconds or more.</p> <p>If you require loss-of-connection data more quickly than the 9 seconds, use the GSV instruction to monitor the entry status of the connection as it updates more quickly than the SlotStatusBit.</p> <p>Lgx00072697</p>
When the SFC instruction's Last Scan of Active Steps option is set to Automatic Reset, a Major NonRecoverable Fault occurs.	<p>An UnRecoverable Major Fault may occur when the following elements are present in the program:</p> <ul style="list-style-type: none"> • Within an SFC, a JSR instruction is used to jump to another SFC, also know as a nested SFC. • One or more of the nested SFC instructions contains Simultaneous Branches. • The Last Scan of Active Steps option (specified in the SFC Execution tab of the controller Properties dialog) is set to Automatic Reset. <p>To avoid an UnRecoverable Major Fault when these elements are present, set the Last Scan of Active Steps to Don't Scan or to Programmatic Reset.</p> <p>Lgx00072702</p>

Known Anomalies for Firmware Revisions 16.00 . . . 16.20

Anomaly	Description
A function block is initiated, either directly or indirectly by an SFC instruction, when the parent step becomes active.	<p>During the first scan of an SFC step, the Step.FS bit is set. In addition, the S:FS bit is set, which allows the logic in any associated actions to easily detect the first scan state. This behavior is useful when a subroutine that is called by multiple actions (actions that may be connected to other steps) is used. The first scan state can be detected without programming a reference to the tag of a specific step.</p> <p>Many function blocks contain internal data that must be initialized before the block can be used. One of the methods a block uses to determine if it should initialize is by evaluating the S:FS bit, which the function block identifies as the first scan following a prescan.</p> <p>Lgx00071558</p>
An SFC R action continues to post-scan on the specified action.	<p>This anomaly only occurs if the SFC Last Scan of Active Steps option is set to Programmatic Reset or Automatic Reset. When the default, Don't Scan, is set, the anomaly does not occur.</p> <p>The intention of a reset action, type R, is to terminate the execution of another action that was previously stored. When configured as described above, the reset action causes logic to execute a final scan.</p> <p>The reset action does not check to verify that an action is stored before it completes the final scan. As a result, each time the reset action is scanned, the target logic will be scanned one last time.</p> <p>Observable behaviors that may result include:</p> <ul style="list-style-type: none"> • The timer of the stored action will continue to time even though the action is no longer active. • The logic in the stored action will be executed in the configured mode. • At Automatic Reset, non-retentive outputs are cleared. • At Programmatic Reset the logic will execute. In this situation, the action logic checks for the final scan condition (action.A = 1 and action.Q = 0) and performs some shutdown operations. This is the code that will be executed. <p>Lgx00069295</p>
Attempts to download a program to a controller following a failed firmware upgrade are successful. (Failure is indicated by the OK LED indicator flashing red after the upgrade is complete.)	<p>After a firmware upgrade attempt fails during the upgrade, (for example, the cable is disconnected or communications are interrupted) the controller's OK LED indicator flashes red and any user attempts to clear the fault by toggling the controller's keyswitch are unsuccessful.</p> <p>You can download a program to the controller, place the controller in Run mode, and run the program (the RUN LED indicator displays run status). The outputs behave as specified by the program. However, when controller power is cycled, the program is lost and the controller properties indicate a firmware revision different from that most recently downloaded to the controller.</p> <p>Lgx00071250</p>

Known Anomalies for Firmware Revisions 16.00 . . . 16.20

Anomaly	Description
A 1769-L31/DriveLogix5730 firmware upgrade fails if configured at 38400 bps or higher.	When upgrading firmware on a 1769-L31/DriveLogix5730 controller, if the serial DF1 driver is configured to operate at a baud rate higher than 19200 bps, the upgrade may fail. If a flash upgrade fails, you must cycle power to the controller, reset the baud rate to 19200 bps, and initiate a new flash upgrade. Lgx00070538
Incorrect module identified as failed.	If any of the modules connected to a controller are configured to exhibit a Major Fault on Controller If Connection Fails In Run Mode, the fault log incorrectly identifies the module that lost its connection. Lgx00059960
MCT instruction .PC bit operational but not defined.	Within an MCT instruction control word there is a default .PC bit. When the MCT instruction transitions from true to false, the .PC bit may set to 1. The MCT instruction is not intended to have operation associated with this bit and we recommend that you do not use the .PC bit in your application. Lgx00073233

Restrictions

This firmware version has these restrictions:

Firmware Revision	Restriction:	Description:
16.20	Outputs controlled by an MAOC instruction can remain ON in some configurations.	This anomaly occurs when the output CAM ON window positions are redefined while the output controlled by the output CAM element is active. In some instances, the Motion Planner may not detect the off-crossing of the window and the output controlled by the output CAM element remains ON. This issue is applicable to any output point or virtual output controlled by an MAOC instruction. For more information, see Tech Note 37835.

Firmware Revision	Restriction:	Description:
16.20	Use of an indirectly-indexed tag within an Add-On Instruction instance tag is not accepted by the RSLogix 5000 program.	<p>In RSLogix 5000, version 16.00 software, if you use an indirectly-indexed array in an instance tag of an Add-On Instruction, anomalous behavior may result.</p> <p>For example, in the instruction call <code>MyAOI (AOIData [Index])</code>, the value <code>[Index]</code> selects the <code>AOIData</code> tag element used to call <code>MyAOI</code>. The use of <code>[Index]</code> results in anomalous behavior when the program is executed.</p> <p>In RSLogix 5000, version 16.03 software, and controllers firmware revision 16.20, if an indirectly-indexed tag is used in an instance tag, the edit is not accepted by the program. Instead, use a directly-indexed instance tag. For example, instead of using tag <code>MyAOI (AOIData [Index])</code>, use tag <code>MyAOI (AOIData [2])</code> or similar so that the exact element of the array is directly-indexed. The program accepts directly-indexed instance tags.</p> <p>You may continue to use indirectly-addressed tags in Add-On Instruction parameters without anomalous behavior in RSLogix 5000 software, versions 16.00 and 16.03.</p> <p>Lgx00077261</p>
16.20	Passing a User-defined Data Type (UDT) into an Add-On Instruction results in a Major Recoverable Fault or data memory corruption.	<p>An anomaly occurs when you pass a tag based on a User-defined Data Type (UDT) into an Add-On Instruction, and certain conditions are met that result in a Major Recoverable Fault or data memory corruption.</p> <p>Conditions required for Major Recoverable Fault or data memory corruption include:</p> <ul style="list-style-type: none"> • A one-dimensional array tag that is based on a UDT is passed into the Add-On Instruction. • The UDT tag contains a member that is a one-dimensional array. • Inside the Add-On Instruction, an operand address that specifies an immediate member of the UDT tag array and a variable element of the member array (for example, <code>array[0].memberArray[x]</code>) is used. <p>Examples:</p> <pre>UDT array[0].memberArray[x]</pre> <p>When the size of the UDT array is smaller than that of the memberArray and the <code>[x]</code> value of the memberArray is larger than the size of the UDT array, a Major Recoverable Fault Code 4 Type 20 occurs.</p> <pre>UDT array[0].memberArray[x]</pre> <p>When the size of the UDT array is bigger than the memberArray and the <code>[x]</code> value is smaller than the size of the UDT Array but larger than the size of the memberArray, the expected fault does not occur and the data is written to a location outside the bounds of the memberArray.</p> <p>Lgx00077270 and Lgx00076136</p>

Firmware Revision	Restriction:	Description:
16.20	Upload of Add-On Instruction With Literal Boolean Input Parameter Modifies Offline Image	<p>When an Add-On Instruction containing a literal value for one of its Boolean Input parameters is referenced from a Ladder Diagram routine, an upload of the project will modify the display of the literal value by appending a ".0". Each time the project is downloaded and re-uploaded, another ".0" is appended, so that after the second download/upload sequence, the project file will not verify and can no longer be downloaded without first editing the modified literal value. The edit may be successfully performed either online or offline. Note, however, that when editing online, because the rung is in an unverified state, the "Finalize All Edits in Program" will not operate. In this case, use of the Accept/Test/Assemble sequence of operations will allow the edit to be completed. This condition does not affect the executing image, which will continue execution using the unmodified literal value. To avoid exposure to this problem, replace the literal value with a reference to a tag having the desired value.</p> <p>Lgx00077802</p>
All	Forcing is not supported between the PowerFlex 700S and DriveLogix	The forcing values can be set for the controller inputs and outputs. However, these values will not be used by the Logix program nor will they be transmitted to the PowerFlex 700S.
All	Unsupported Motion Commands	<p>The following Logix Motion Instructions are not intended for use with DriveLogix and the PowerFlex 700S:</p> <p>Motion State (for 1756-M02AE Only)</p> <ul style="list-style-type: none"> • MDO (Motion Direct Drive On) • MDF (Motion Direct Drive Off) <p>Motion Configuration (for tuning SERCOS cards only)</p> <ul style="list-style-type: none"> • MAAT (Motion Apply Axis Tuning) • MRAT (Motion Run Axis Tuning) • MAHD (Motion Apply Hookup Diagnostics) • MRHD (Motion Run Hookup Diagnostics)
All	Power down banks of local 1769 I/O when the controller is powered down.	When powering down the controller (the host drive), also power down any banks of local 1769 I/O modules. Leaving additional banks of 1769 I/O modules powered on may result in major fault code 22 during the power-up process of the controller.

Firmware Revision	Restriction:	Description:
All	In a Tag of a User-defined Data Type, an Instruction May Write Past the End of an Array.	If you write too much data to an array that is within a user-defined data type, some instructions write beyond the array and into other members of the tag.

Example 1: Instruction Stops at the End of the Array

COP

Copy File

Source MyTag_1[0]

Dest MyTag_2[0]

Length 10

Program Tags - MainProgram1

Scope: MainProgram1

Tag Name

Type

MyTag_2

DINT[5]

MyTag_2[0]

DINT

MyTag_2[1]

DINT

MyTag_2[2]

DINT

MyTag_2[3]

DINT

MyTag_2[4]

DINT

MyTag_3

DINT

If the length is greater than the number of elements in the destination array . . .

. . . then the instruction stops at the end of the array.

Example 2: Instruction Writes Beyond the Array

COP

Copy File

Source MyTag_1.A[0]

Dest MyTag_2.A[0]

Length 10

Program Tags - MainProgram

Scope: MainProgram

Tag Name

Type

MyTag_2

My_Data_Type

MyTag_2.A

DINT[5]

MyTag_2.B

DINT

MyTag_2.C

DINT

MyTag_3

DINT

If the length is greater than the number of elements in the destination array . . .

. . . then the instruction writes data beyond the end of the array into other members of the tag. Regardless of the length specified for the instruction, it stops writing if it reaches the end of the tag.

The following instructions write beyond the array into other members of the tag:

BSL	FBC	LFL
BSR	FFL	LFU
COP	FFU	SQL
CPS	FLL	SRT
DDT	GSV	SSV

This restriction also applies to *all previous revisions*.
To prevent writing beyond the limits of the destination array, make sure that the length operand of the instruction is less than or equal to the number of elements in the array.

Known Issues

- Tasks are the basic scheduling mechanism for executing a program and are created as part of the project and program creation process. In addition to other internal tasks, the DriveLogix5730 controllers have an internal task to provide communication with the 1769 I/O modules. This task executes periodically at the Requested Packet Interval (RPI) selected in the properties of the CompactBus. If the task has not completed before it is time to execute again, a task overlap occurs. This task overlap causes the controller to declare a minor fault of Type = 6 (Task Overlap), Code = 4 (VA task).

You can use various strategies to resolve minor faults due to task watchdog timeout and/or task overlap. For more information, see RSLogix™ 5000 Online Help "Identifying and Managing Tasks".

In the case of a minor fault caused by VA task overlap, increase the RPI until the overlap no longer occurs.

- A major fault will not occur if the connection to the Compact I/O Adapter is lost. The selection for a major fault in the Compact I/O Adapter dialog box should be ignored. Also, when a Compact I/O module is selected to cause a major fault, any compact I/O module fault will cause a major fault.
- RSLogix 5000 software creates tags for modules when you add them to the I/O configuration. The 1769 module tags define configuration (C) data type members which may include attributes for alternate outputs. DriveLogix5730 does not enable local modules to use the alternate outputs. Do not configure the attributes listed below:

For digital output modules:	For analog output modules:
<ul style="list-style-type: none"> • ProgToFaultEn • ProgMode • ProgValue • FaultMode • FaultValue 	<ul style="list-style-type: none"> • CHxProgToFaultEn • CHxProgMode • CHxFaultMode • where CHx = the channel number

Any 1769 Compact I/O modules used as remote I/O modules in a DriveLogix5730 system do support the Hold Last State and User-Defined Safe State features.

Hold Last State and User-Defined Safe State Not Supported

When 1769 Compact I/O modules are used as local I/O modules in a DriveLogix5730 system, the local I/O modules do not support the Hold Last State or User-Defined Safe State features, even though you can configure these options in the programming software.

- If a local I/O module fails such that its communication to the controller is lost, or if any module is disconnected from the system bus while under power, the controller will go into the fault mode. All outputs turn off when the system bus or any module faults.

Install Revision 16

To install DriveLogix5730 controllers revision 16, download controller revision 16 at <http://support.rockwellautomation.com> and use ControlFlash software to upgrade your controller to revision 16.

Alternatively, if you have installed RSLogix 5000 version 16 and related firmware, you may not need to complete the tasks described. The AutoFlash feature of RSLogix 5000 version 16 detects if your controller firmware needs upgraded upon a program download to the controller. If a firmware upgrade is necessary, AutoFlash will initiate an update.

After you have completed your firmware upgrade, you should complete the following steps to verify that the upgrade was successful.

1. Cycle power to the controller.
2. Go online with the controller and view controller properties.
3. Verify that the firmware revision listed matches the firmware you intended to upgrade to.
4. If the controller's firmware is not correct, initiate another firmware upgrade.

For more information about errors when completing a ControlFlash upgrade, see the ControlFlash Firmware Upgrade Kit Quick Start, publication [1756-QS105](#).

Additional Memory Requirements

Revision 16.00 or later may require more memory than previous revisions (e.g., 13.x). To estimate the additional memory that your project may require, use the following table:

If you have this firmware revision (add <i>all</i> that apply):	Then add the following memory requirements to your project:		Which comes from this type of memory:	
	Component	Increase per instance	I/O (base)	Data and Logic (expansion)
15.x or earlier	Input module	4 bytes	✓	
	Produced tag	12 bytes	✓	
	Consumed tag	4 bytes	✓	
	Task	20 bytes		✓
	Program or equipment phase	24 bytes		✓
	Routine	4 bytes		✓
	Tag that uses COORDINATE SYSTEM data type	748 bytes		✓
	Tag that uses any AXIS data type	800 bytes		✓
	Serial port	1120 bytes		✓
	Project	4012 bytes		✓
14.x or earlier	Tag that uses COORDINATE SYSTEM data type	60 bytes		✓
	Tag that uses any AXIS data type	4 bytes		✓
13.x	Program	12 bytes		✓
	Task	4 bytes		✓
	User-defined data type	4 bytes		✓
	I/O module	16 bytes	✓ (8 bytes)	✓ (8 bytes)
	Produced or consumed tag	8 bytes	✓	

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Publication Title	Topic
Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001 .	Contains information specific to Add-On Instructions.
DriveLogix 5730 Controllers Revision 15 Release Notes, publication 20D-RN030 .	Describes anomalies and enhancements related to controller revision 15.
Motion Planner Application Solution, publication RA-AP031 .	Describes Motion Planner enhancements made with RSLogix 5000 software, version 16.03.
ControlLogix Combination Controller and SERCOS Interface Module Revision 16 Release Notes, publication 1756-RN642 .	Describes anomalies and enhancements specific to the 1756-L60M03SE Combination Controller and Sercos Interface Module.
Logix5000 Process Control and Drives Instructions Reference Manual, publication 1756-RM006 .	Contains information specific to the PI instruction.
Outputs Controlled by MAOC Instruction Tech Note, ID 37835	Further describes the MAOC instruction anomaly.
ControlFlash Firmware Upgrade Kit Quick Start, publication 1756-RN105 .	Contains informations about firmware upgrades, installation instructions, and error messages.
POINT I/O EtherNet/IP Adapter Release Notes, publication 1734-RN002 .	Further describes the firmware upgrade to 2.003.
ArmorPoint I/O Release Notes, publication 1738-RN002 .	Further describes the firmware upgrade to 2.003.

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

Tech Notes and other resources are available at <http://www.rockwellautomation.com/knowledgebase>.

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using its 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

Before you contact Rockwell Automation for technical assistance, we suggest you please review the troubleshooting information contained in the supporting product publications first (e.g. publications 20D-UM003, *User Manual - DriveLogix5730 Controller*, and 1756-PM001, *Logix5000 Controllers Common Procedures Programming Manual*).

If the problem persists, call your local distributor or contact Rockwell Automation in one of the following ways:

Phone	United States/Canada	1.262.512.8176 (7 AM - 6 PM CST) 1.440.646.5800 (24 hour paid support available through the TechConnect Support Program)
	Outside United States/Canada	You can access the phone number for your country via the Internet: Go to http://www.ab.com Click on <i>Support</i> (http://support.rockwellautomation.com/) Under <i>Contact Customer Support</i> , click on <i>Phone Support</i>
Internet	⇒	Go to http://www.ab.com/support/abdrives/
E-mail	⇒	support@drives.ra.rockwell.com

Be prepared to furnish the following information when you contact support:

- Product Catalog Number
- Product Serial Number
- Firmware Revision Level

New Product Satisfaction Return

Rockwell 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, it may need 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:

www.rockwellautomation.com

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