

## Stable Release Changes KFLOP/KMotion

Versions 4.33 -> 4.34 08/15/2018

### Test Release Changes KFLOP/KMotion Versions 4.33 -> 4.34a 03/09/2016

#### General

All Projects upgraded for Visual Studio Community 2015

Note there may be an issue with a Microsoft bug in the new Universal C Run Time Library. The release of Visual Studio 2015 now places the control of the UCRT within Windows and Windows Update.

Unfortunately, some versions installed by Windows Update had a major bug breaking most all Windows VS2015 MFC Applications. The bug involves not handling/terminating single digit strings properly. I.e. entering single digit values into dialog screens (ie 0) results in mixing of the digit with previous strings. The bug resides in a Microsoft library named ucrtbase.dll usually located in within the Windows directory (ie. SysWOW64). Running Windows Update should now fix the problem. Unfortunately, some systems have Windows Update Failures and do not get the fixed library. To manually modify this file special security permissions (TrustedInstaller) are normally required. To manually update the library, use Administrator privileges to change Ownership of the file from TrustedInstaller to your account, then allow write/modify privileges to yourself to the file. Always make sure your system is backed up before making such changes to the OS.

7-10-15 ucrtbase.dll bad

10-30-15 (and later) ucrtbase.dll good

Many projects have changes to avoid new Warnings generated by VS 2015

#### USB Drivers

Now signed and cross signed by Microsoft

#### KFLOP

Fix Timing Bug (resulting in Signature error) with Konnect when Axis 6 is disabled and NO\_INPUT\_MODE or ADC\_MODE

Document in KMotionDef.h SnapAmp ADCs

// SNAP AMP 0 ADC values

// 0,1 Side A Coils Currents A and C

// 2,3 Side B Coils Currents A and C

// 4,5 = Supply Voltages side A and B

// 6,7 = Temperature side A and B

// SNAP AMP 1 ADC values

// 8,9 Side A Coils Currents A and C

// 10,11 Side B Coils Currents A and C

// 12,13 = Supply Voltages side A and B

// 14,15 = Temperature side A and B

KMotionCNC now allows individual Jog Button/Gamepad Jog Speed Overrides from KFLOP

case PC\_COMM\_GET\_JOG\_OVERRIDE\_X:

case PC\_COMM\_GET\_JOG\_OVERRIDE\_Y:

case PC\_COMM\_GET\_JOG\_OVERRIDE\_Z:

case PC\_COMM\_GET\_JOG\_OVERRIDE\_A:

case PC\_COMM\_GET\_JOG\_OVERRIDE\_B:

```
case PC_COMM_GET_JOG_OVERRIDE_C:
case PC_COMM_SET_JOG_OVERRIDE_X:
case PC_COMM_SET_JOG_OVERRIDE_Y:
case PC_COMM_SET_JOG_OVERRIDE_Z:
case PC_COMM_SET_JOG_OVERRIDE_A:
case PC_COMM_SET_JOG_OVERRIDE_B:
case PC_COMM_SET_JOG_OVERRIDE_C:
```

### **KMotionCNC/GCode Interpreter**

Kinematic Soft Limits – Kinematic class may now limit travel in CAD Space for cases where actuator limits aren't appropriate

GCodeViewer Option (Include ABC Angles) to properly show tool ABC Angle. When setting ABC Axes to Degrees with zero radius and this option on the GCodeViewer Setup Screen, the tool will show an articulated angle.

Fix Buffered/Synchronized I/O Wait Action for bit till 1. Bug caused wait on bit 0 rather than specified bit. Wait till 0 worked ok

JogStep now works properly for nonlinear kinematics

External KMotionCNC “automation” added where external programs like Measure Fiducials can send Windows Messages to read position, move, etc

6 Axis Gcode “Smoothing has been added”. Select GCode, Right Click, Transform Sel, 6 Axes Smooth. Value will determine the number of recursive times the paths will be subdivided and smoothed (3 point weighted average).

Fix Bug for Fixture Offsets with B Axis

Arc Radius Tolerance – Tool Setup - Trajectory Planner now allows option to set the allowed tolerance for arcs with different radius at the beginning vs the end of the arc.

Allow Button/MCode Actions to specify .out (compiled binaries) for C Programs.

Now Checks for Axes Disabled and reports error at end of GCode Execution if Axes somehow disabled

Fix bug with Arcs in Lathe Diameter Mode

Fix bug where angular feed rates were violated when pure angle changes are mixed with non-pure angle motions

### **Coordinated Motion/Kinematics**

New CKinematics5AxisGimbalAB class added. This class is designed for systems with a tool that can be swiveled about the Z axis and also tilted (about the X axis when the swivel angle is zero). TCPC (Tool center point control) is performed so that the tool tip position is maintained as the AB angles change

New CKinematicsGeppetto class added. This class is designed for a 6 axes cable robot. TCPC (Tool center point control) is performed so that the tool tip position is maintained as the ABC angles change

int CKinematics::RemapForNonStandardAxes() – allows Kinematic module to re-map Angular Axes for purposes of the GCode Viewer. For example the Kinematics5AxisGimbleAB has the B axis rotating about the Z axis which would normally be C.

Fix StraightFeedAccel where specified Acceleration Limit was being ignored.

### **KMotionDLL**

GetToken calls now allow passing of ID String that can be useful if the Token is never released. The ID String can identify the last caller who didn't properly release the token  
Improve Status Efficiency with multiple FTDI devices. New method for List Devices much faster. Reduces issues/conflicts with FTDI non-Dynomotion devices

### **KMviaVB**

PackToFlash Parameter appropriately re-named

### **KMotion\_dotNet**

Fix exception bug in formatting of KFLOP Error message regarding invalid response

### **.NET Interface**

Expose function to reload Geo Correction table KinematicsReadGeoTable

### **SimpleFormsCS Example**

Add test of Communicating to 2nd Board

### **Measure Fiducials Example**

Many changes regarding 6 axis cable robot (Geppetto) example. Machine Vision added to measure x,y,z, and theta and create an automatic 4 axis geometric calibration table

### **KFLOP C Program Examples**

Expand OutputToPWM\_sign\_mag.c to 3 axes  
Add AdjustSoftLimits.c + AdjustSoftLimitsTest.c  
Add ArcVoltageFRO.c Example  
Add CoordinatedMotionWithFeedHold.c Example  
Add CoordMotionInKFLOPTestOctagon.c Example  
Add Spindle GearBoxFactor.c Example  
Add MPGServiceSmoothHardwareEnc.c + InitWithServiceMPG.c Examples  
Add InitKStep3AxisSlave.c Example  
Add ServiceKconnectPWMfromS.c Software PWM to Analog Example  
Add MaxOutputLimitedBySpeed.c Limits Torque by limiting Output based on Bemf  
Add MeasureEncoderFrequency.c to measure frequency of encoder input  
Add MessageBoxCount.c Example to show a Job Run Counter  
Add MPGSmoothNoWrap.c With software encoder wrapping prediction disabled  
Add SimpleHomeHardStop.c Example to home by detecting hardstop causing following error  
Add SpindleMach3JogsCWCCW.c Example  
Add ToolChanger/Linear4ToolHolders/Linear4ToolHolders Rev 2.c

## **Test Release Changes KFLOP/KMotion Versions 4.33a -> 4.34b 10/03/2016**

### **KMotionCNC Screen Editor Added**

See video:

[https://www.youtube.com/watch?v=l6d\\_AYTptVQ](https://www.youtube.com/watch?v=l6d_AYTptVQ)

See wiki article:

[http://www.dynomotion.com/wiki/index.php?title=KMotionCNC\\_Screen\\_Editor](http://www.dynomotion.com/wiki/index.php?title=KMotionCNC_Screen_Editor)

### **General**

Installer Changed to install .NET 4.62 and VS2015 redistributables if not detected as required for .NET Examples including KMotionCNC Screen Editor

### **KFLOP**

Protect against Program User FLASH wrap around causing loss of Boot sector (Brick KFLOP)

### **KMotionCNC**

New Screen Script Action for User Buttons may now invoke Screen Script files

GViewer Ortho/Perspective View Option

Access Tool Setup Screens from Right Click Title bar

KMotionCNC Command Line Profile Specification with new /c filename option

Fix Large Jog Step Abort functionality

Default Directories Changed for Setup, Vars, and Tool Table to local Data Directory to make upgrading easier

Tool Image Preview Folder Change Bug fixed

Added message GUI Button waiting on C Program taking a long time to complete.

Fix Bug regarding P Q R GCode words passed inappropriately to persist variables for User Button Actions

Some dpi awareness added helpful for use with 4K Monitors – Button bitmaps scaled appropriately

Transform G-Code handles larger size and reports errors

Fix issue with GViewer Halting in Metric mode with Tool selected with non-zero tool length

Set Next Line Resume Issues Fixed issue #

Fix Issue with Set Next Statement starting with improper G0 mode

Fix "step" button for angular axes to be in degrees when appropriate

Restore Gamepad Run/Halt button functionality

## **KMotion.exe**

Update Step Response Plot automatically whenever new Data is loaded

Fix Configuration Screen cell formatting

## **Coordinated Motion/Kinematics/Trajectory Planner**

Fix Trajectory Planner/Segment Buffer Bug when first segment requires multi-pass look-ahead optimization and cannot be optimized on first optimization pass resulting in no motion until segment buffer wraparound and consequently large quantity of lost motion and large discontinuity. Basically when no rapid and complex trajectory path at the very beginning of motion. Likely to occur when using "Set Next Statement" into an area of short segments.

Fix Kinematic (CAD Space vs Actuator Space) Soft Limits (negative/positive reversed)

## **Dynomotion VB.net Example**

Fix Clear abort between subsequent runs

Limit the amount of Status displayed on the Screen rather than growing indefinitely in size

## **SimpleFormsCS Example**

Update Example of KMotionCNC Automation Open GCode File to pass a Unicode String

## **TCC67 Compiler**

Fixed Compiler problem when converting double to integer only first 20 bits of resolution was used instead of up to 32

Fixed Compiler problem when converting double to float only first 20 bits of resolution was used instead of up to 32

Fixed Compiler problem when converting unsigned integer to double was actually doing signed conversion

## **KFLOP C Program Examples**

Added KFLOPGetEditControlDouble.c Screen Designer KFLOP from KMotionCNC screen controls

Added KFLOPGetEditControlText.c Screen Designer KFLOP from KMotionCNC screen controls

Added KFLOPtoDROLabelTest.c Screen Designer KFLOP to KMotionCNC screen controls

Added Add.c Screen Designer C Program Add Demo/Example

Properly include "CS0\_Flushed=TRUE;" in the Coordinated Motion Examples

Added ReExecuteCoordMotionBuffer.c (how to re-execute coordinated motion segments from KFLOP that were previously run from Host).

Fix Bug in Home Slaved Example

Fix Bug/Simplify \FlashNonVolatile\ReadSavedData.c

Added HobbyServoPWM.c to control RC type hobby servos

Added DetachStepDirGeneratorsFromGPIO.c

### **GCode Examples**

GCode Example of G41 Tool Radius Compensation in internal (concave) corners

### **Help**

Update 458 Page Printable PDF Manual to 2016 equivalent of V4.33

Mach3 Swap order of steps 6 and 7 of procedure

Added Mach3 setup description of how to Enable Axes in Config Ports and Pins and disable EStop

## **Test Release Changes KFLOP/KMotion Versions 4.33b -> 4.34c 10/23/2016**

### **KMotionCNC Screen Editor**

Add Screen Editor Radio Button Type with HotKey Capability

Add Screen Editor Vertical Bar Graph capability VertBar - Var defines float variable 0-1 to set bar height

Enhance Toggle Button Type to properly toggle. For "Var" setting greater than 0 the button Displays and Toggles the Corresponding IO Bit (set to -1 to disable I/O Action)

Fix issue with CTRL-SHIFT-ALT Hotkeys

Add button to clear HotKey entry

Fix Modifying multiple controls style at the same time

New Video on adding an Instantaneous Rate Display

<https://youtu.be/w-bKvqXCd0Q>

### **ExtendedLogging Example**

Very Flexible and Highly Configurable C# WPF Data collection and Plotting Program contributed by Greg Carter. Makes use of NuGet support Packages for very polished look. Helpful for tuning slower systems over longer time periods or more data/axes channels than KMotion Step Response Screen allows.

Master Source code here:

<https://gitlab.com/Greg9504/ExtendedLoggingKflop>

Source and executable is included in the Installation so it can run out-of-the box from Start Menu.

Greg's Video demo: (sorry a bit of hum in a few places).

<https://youtu.be/BisZrkeGMLM>

### **General**

Fix Installer Start Menu bug KMotionXXX

Place FTD2XX.dll in the \KMotion\Release Directory for the case where KFLOP USB drivers are not installed

### **KFLOP**

Protect against Program User FLASH wrap around causing loss of Boot sector (Brick KFLOP)

### **KMotionCNC/Interpreter**

Remove whitespace after comma in embedded GCode Commands of (CMD, XXXXXX) (BUF, XXXXXX) (USR, XXXXXX)

Fix GCode Edit Window Crash using Find or Find\Replace broken in previous Version when Resource IDs were renumbered.

Support new Screen Editor features listed above

### **SimpleFormsCS Example**

Fix Bug with USB Data Rate Measurement Test

### **KMotion.Net Console**

Fix issue with GCode Interpreter example disposing objects before Interpreter Finished

### **KFLOP C Program Examples**

Added HaltNextLineKMotionCNC.c

Added ShowInstantVelocityDROBar.c

KflopToKMotionCNCFunctions.c Added function void WriteVarFloat(int persist\_var, float v)

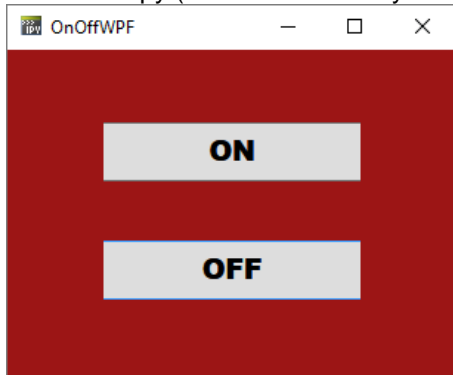
### **KMotionDLL/KMotionServer**

KMotionDLL will now launch KMotionServer.exe from same location KMotionDLL is located

### **IronPython .net WPF Example**

Simple IronPython .net WPF GUI Example to Control KFLOP with only 16 lines of code (+9 .axml)

OnOffWPF.py (Invoke with RunPythonOnOffWPF.bat)



Install IronPython 2.7.6.2 from:

<http://ironpython.net/download/>

Also install: Python Tools for Visual Studio 2015



## **Test Release Changes KFLOP/KMotion Versions 4.33c -> 4.34d 10/31/2016**

### **KMotionCNC Screen Editor**

GViewer Control Added (GViewer now possible to be on main dialog face rather than separate window)

ToolBar buttons changed to normal buttons so they can be customized like all buttons

3 Tab Screen set Example Added showing new GViewer Control

DualPane3AxisSplit.scr

DualPane3AxisCode.scr

DualPane3AxisView.scr

Fix Crash when trying to Subtract nothing from the current selection (Ctrl - Click in empty space)

Fix Crash sometimes writing Backup File (Windows still thought it was open for some reason)

When loading (older) Screen Script files insert newly added controls as hidden controls so they can be accessed

New Video Showing Split/Full/Hidden GViewer Display on Main Dialog Face:

<https://youtu.be/VkBhYpyGpNU>

### **KMotionCNC**

New GViewer Control Support

Add KFLOP to KMotionCNC RRO (Rapid Rate Override) functionality with new PC\_COMM\_SET\_RRO\_INC and PC\_COMM\_SET\_RRO commands

### **General**

Update Virtual Com Port Driver Procedure

## **Test Release Changes KFLOP/KMotion Versions 4.33d -> 4.34e 11/07/2016**

### **KMotionCNC Screen Editor**

KMotionCNC Screen Editor supports changing main screen style. New boolean Screen Script

"Main:"options:

"Caption:" "MaxBox:" "MinBox:" "ResizeFrame:" "Maximize:"

Video demo:

[https://youtu.be/R44F0\\_uploA](https://youtu.be/R44F0_uploA)

### **KMotionCNC**

Show new buttons and GViewer Control un-hidden for blank Custom Screen base

Avoid re-display of GViewer Window when Screens Change if GViewer configured display on Startup

Add Warning message if KMotionScreenEditor starts syncing with non-custom screen in effect

Fix bug regarding Bitmap Button filenames changing to absolute paths and not remaining relative to default directory

Fix issue with configuration screen face changing when new screens are displayed

Fix some tool tips

### **Screens**

Maximized, Title bar-less, 1024x768 compatible Full Screen Example Screens

DualPane3AxisSplit1024x768

DualPane3AxisView1024x768

DualPane3AxisCode1024x768

### **KFLOP**

Fix USB hang (if not connected) when starting up in DoRS232Cmds mode

Expose RS232 FIFO Buffers in KMotionDef.h

### **KMotion.exe**

Fix Issue with Recovery not always working

## **Test Release Changes KFLOP/KMotion Versions 4.34e -> 4.34f 12/05/2016**

### **General**

Change Apps/Dlls to use XP Platform so they can still run under Windows XP

### **KMotionCNC Screen Editor**

Add Momentary Button to Activate Bit based on Var Value

Add GCode Editor Control Read Only option Var = -1 no change, 0 = read only (with right click override),  
1 = read/write.

2 = read only no override

Fix initial sync of Caption/MaxBox/MinBox/ResizeFrame/maximize when Main Tab not initially selected

### **KMotionCNC/GCode Interpreter/Coordmotion Libraries**

GCode Interpreter expanded from 6 to 8 Axes. U V words supported.

Added Trajectory Planner Settings for UV Axes

Add emc\_UV.var Example to save UV variables/offsets also

Add GCode Editor syntax highlighting for GCode U V words

New "Save Always" option on Edit Fixtures Dialog. Defaults to enabled, Checks for Offsets/Variables Changes every 1 second and saves to disk on any changes.

Fix Feedrate/Spindle Speed Bar Graphic drawing out of bounds

Fix Peck Drill Cycle Pecking up to initial z plane instead of clearance plane (R)

Added GCode Interpreter Radius Compensation Mode Entry Move. EMC\_COMP\_ENTRY\_STYLE vs FANUC\_COMP\_ENTRY\_STYLE.

See:

[http://www.dynomotion.com/wiki/index.php?title=Internal/concave\\_Path\\_Tool\\_Radius\\_Compensation\\_Example\\_G41/G42](http://www.dynomotion.com/wiki/index.php?title=Internal/concave_Path_Tool_Radius_Compensation_Example_G41/G42)

Offsets rounded to 4 decimals in mm Mode and 6 digits in Inches Mode

### **Screens**

SetTwoValues.scr Example to set two values in KFLOP

### **KFLOP**

Fix issue with Soft limits not being honored when MoveExp called while feedhold released

### **KMotion.exe**

Main Window Size and Position persistence

Restore Lines Viewed in C Program Editor and any Selection when switching C Program Threads

Force KFLOP Menu Option always on

**C Program Examples**

Add Mark's MPGSMoother.c example

## **Test Release Changes KFLOP/KMotion Versions 4.34f -> 4.34g 12/13/2016**

### **General**

Fix File Open/Close Dialogs Crash when running Windows XP by targeting projects for older Windows XP

### **KMotionCNC Screen Editor**

Add style DualButton type to allow changing button bitmaps where the bitmaps change based on running state. The Feedhold and Cycle Start/Halt are forced to this style.

### **KMotionCNC/GCode Interpreter/Coordmotion Libraries**

Added Tolerance parameter for allowing Arc Radius being smaller than half the distance from the start of Arc to End of Arc when specifying Arcs using R mode. Tool Setup – Trajectory Planner – Arc radius small Tol

Single Step now invokes same Special Action as Cycle Start

## **Test Release Changes KFLOP/KMotion Versions 4.34g -> 4.34h 12/14/2016**

### **General**

Fix File Open/Close Dialogs Crash when running Windows XP by targeting projects for older Windows XP  
(Again 2<sup>nd</sup> try)

## **Test Release Changes KFLOP/KMotion Versions 4.34h -> 4.34i 5/7/2017**

### **Trajectory Planner**

Limit Break Angle to 179 degrees as full reversals shouldn't be rounded and cause errors.

Kinematics Class for 5 Axis BC Trunnion Type Table added. CKinematics5AxisTableBC.

### **KMotionCNC Screen Editor**

Main XYZABC DRO's now support customizing Font, Size, and Background Color

GCode Edit Window now supports Font and Font Size customization

Main KMotionCNC now supports Background Bitmap

Image Buttons, Labels now do proper Alpha Blending with Background color or Bitmap

Dual Labels Type added for F (Feed Rate) and S (Spindle) bitmaps which show customizable and different bitmaps based on Feed Rate mode (Threading) or CSS mode that properly Alpha Blend with Background. 32 bit png bitmap files with alpha added (SR.png SRCSS.png FR.png FR32.png)  
Better error reporting of missing bitmaps

Radio Buttons, Edit Controls, CheckBox Controls, DropDown Controls now support resizing, fonts, colors, international text.

Feed Rate Override and Spindle Rate Override background color/bitmap fixed

Test Screens Test1.scr and Test2.scr added

MomentaryToggle.scr example added

Background bitmap res/Images/tillable-metal-textures-8.jpg added

Graphical symbols within Screen Editor now displays International Text by using and requiring OpenTK.Compatibility.dll

If KMotionCNC not running when Launched then KMotionCNC from Release Folder is Launched rather than Debug Folder

### **C Program Examples**

DoPCNoWait, DoPCIntNoWait, MsgBoxNoWait Functions added to KflopToKMotionCNCFunctions.c

CheckTripStates.c Example added for determining Independent Motion Trip States

Modulo360.c – for resetting angular axes that rotate multiple revolutions back toward zero

OutputToPWM3axisSignMag.c Added

PrintRigidTapParams.c – example for use with G84 Rigid Tapping

\\RS232\\ModBus\\DVP-PLC MODBUS-56IN-46OUT 170102.c Modbus example Added

## **KMotionCNC**

Support for Screen Editor Changes noted above

G84 – Rigid Tapping now supported. See wiki

[http://www.dynomotion.com/wiki/index.php?title=Rigid\\_Tapping\\_G84\\_Setup\\_and\\_Use](http://www.dynomotion.com/wiki/index.php?title=Rigid_Tapping_G84_Setup_and_Use)

GCode Viewer Right/Left Mouse click sets focus so Mouse Zoom Wheel works on Split Screen under Windows XP

G95 - GCode Interpreter G95 Units per Rev Support. Allows G1 G2 G3 motion synchronized to Spindle

Trajectory Planner Negative Resolution Supported

GCode Interpreter Set Next Statement Improvements

## **KFLOP**

KFLOP open write file using 'a' append mode



## **Test Release Changes KFLOP/KMotion Versions 4.34i -> 4.34j 9/28/2017**

### **Trajectory Planner**

Fix unnecessary motion buffer flush on G43/G49 tool length offset changes required only for complex kinematics. This eliminates small pauses in certain circumstances.

### **KMotionCNC Screen Editor**

DualPane3AxisSplitVars.scr – example to display GCode Vars

Add DualPane3AxisSplitJogRate.scr Example

Fix KMotionCNC CCW M4 Threading

On Screen Jog Speed Example that updates only when Screen Values Change using EditScreenCount. EditScreenCount in KFLOP can be used to notify KFLOP that some Edit Control Value Changed

Fix issue with Action Messages to Checkboxes checking/unchecking the checkbox but not changing underlying variable.

Persist Edit Controls between sessions

Increase spare edit controls from 20 to 40

Allows a new Action/Script Type called WinMsg (which allows a button to send a standard Windows Message to any Control). The way Microsoft Windows fundamentally works is everything (Buttons, Dialogs, etc...) is a "Window" that can receive messages to do things. Initially we just support sending Button Check or Uncheck messages.

Buttons can send WinMsgs when pushed or Labels can send WinMsgs when Loaded.

Edit Controls now only set Text when the Edit Control is completely empty. This should allow you to specify the initial text when the Screen is first loaded, but then that text or any text entered by the Operator should persist when switching screens. The Same Edit Control must be used on all possible screens for the same thing (even if hidden or shown).

New feature in KMotionCNC Screen Editor - Copy/Paste. This can be used to copy all the settings for one control to another control (except its XY position). To do this select the source control then "copy" then select a single target control and select "paste". Copy/paste can also be used to configure a set of identical controls on one screen script to another screen script. To do this select one or more controls on the source screen and select "copy". Then load/read the new screen and without selecting anything select "copy" the same controls as selected in the source screen will be configured in the same exact manner in the destination screen.

Properly Terminate String messages passed to KMotionCNC App (Fixed invalid Check WinMsg on some PCs)

### **C Program Examples**

New example of WatchdogStatusRequests.c to watch communication to KFLOP

## **KMotionCNC**

Fix issue with GCode Viewer Colors along path (unmatched OpenGL glBegin(GL\_LINE\_STRIP)/glEnd)

Add Confirm Program Exit Option

Add M47 Repeat GCode File Loop

Don't Persist FRO and SSO Edit Controls Cache Control IDs and Names for better performance

Improve DRO and Jog update rate in Simulate mode with no KFLOP Connected

Fix Configurable Program Exit Action

Fix G85 Canned Cycle to retract only to R height

Add test example GCode for canned cycle G85

Fix GViewer plotting with Angular Radius Mode with large Angle changes (subdivide lines so they become proper paths in space)

Added Special capability for feed holding during a Tap Cycle

On Feed hold during Tap Cycle Feedhold sets Var0 in Tap Program to -2, 0 to release feedhold

Fix bug where CSS was being set in Simulation mode G96/G97 cause problem simulating with no hardware connection

Fix bug sending some blank command Script lines to KFLOP while Jogging (small waste of USB Bandwidth)

## **Geometric Correction**

Fix typos in Help Example Description

## **KNozz**

Added KNozz Nozzle/Bed Heater Documentation

## **KFLOP**

KMotionDef.h – fix comment Channel Number range to 0-7

## **KMotion.exe**

Fix issue with KMotion Command line option to select a specific board

## **Help**

A number of Help Screens updated

## **Test Release Changes KFLOP/KMotion Versions 4.34j -> 4.34k 1/13/2018**

### **KFLOP**

Fix issue with false auto-detection of Kanalog due to noise on boot up

### **Trajectory Planner**

Fix Bug with corner rounding with mixture of pure Angled Moves with non-pure Angled moves

### **Kinematics**

Add 5AxisTableAC Kinematics

Add 5AxisGimbalCB Kinematics

Fix Kinematics RTCP Metric Tool Table bug

### **KMotionCNC Screen Editor**

Hotkeys now support Momentary mode for FeedHold Forward/Reverse and other buttons

If the MDI control or the Send Button aren't visible then don't execute MDI on Enter

Add button to check for same Hot Key assigned to multiple controls

Interpreter InvokeAction now uses Worker Thread for calls from buttons to release GUI Thread. This allows C Programs called from Use Buttons to perform GUI operations such as MessageBoxes

### **C Program Examples**

Snap Amp 2 Stepper Example – \SnapAmp\SnapAmp 2 Steppers.c

KNozz C Example Controls Heaters, Calibrated Temperature, MCode to set Set Points  
\KNozz\KNozzControlTempsMCode.c

Added KNozz Analog Spindle Example \Knozz\Spindle\_S\_KNozz.c

Added MPGServiceSmoothHardwareEncFiltered.c – 3<sup>rd</sup> order low pass filtered Steps for much smoother operation

### **KMotionCNC / Gcode Interpreter**

Add Unary Negative to GCode Expressions that do not require brackets

Fix "Error Executing GCode" when Halting while Interpreter finishes.

Add G43.4 to turn on RTCP G49 turns off

Fix Rigid Tap Feedhold/Resume Issue

Fix KMotionCNC Jog Step Button having inadvertent effect on UV axes

Spindle SRO Scroll Slider only sends SRO and Spindle Speed if not busy or Scroll Released for smoother scrolling

## **.NET**

Fix bug regarding GetUserDataDouble() when persist variables are negative integers

C++ / .NET Libraries fix set GCode Interpreter Set Origin Offsets regarding Index=0 for G92 Offset

Expose GCode Interpreter Worker Thread ID so .NET Libraries can avoid throwing Exceptions that will not be handled

## **Dynomotion VB.net Example**

Fix VB Coordinated Motion Buffer Example Screen Label from "Execute Now" to more appropriate "Add to Buffer"

## **PureC**

New Pure C++ Example that calls KMotion\_dotNet\_Interop Library directly with C calls without any MFC requirement. This technique can be used with Borland C where MFC and .NET aren't supported.

## **SimpleGCodeWPF**

New Simple C# WPF .NET Example – shows Simple methods to Launch/FeedHold/Halt/Abort GCode with Status and Exception handling.

## **Extended Logging Example**

Converted markdown readme to pdf for more convenient reading

## **Help**

KMotionCNC - Updated the "Using Multiple Configurations" section

KMotion - Changes to the "Configuration and FLASH screen": Replaced "KMotion" with "KFLOP" (or KMotion.exe), new screenshots etc.

KNozz Fixed J1 Label

Correct and add wording on KNozz Analog Output

Update Kanalog RS232 Status

Fix typo on GCode Quickstart menu regarding G96/97

Corrected a paragraph in the "Preemptive Multitasking" section.

Updated 4-axis to 6-axis (MoveX,Y,Z,A,B,C)

Corrected "SoftLimPos" and "SoftLimNeg" to "SoftLimitPos" and "SoftLimitNeg"

.NET Help File Updated

## Test Release Changes KFLOP/KMotion Versions 4.34k -> 4.34 8/15/2018

### KMotionCNC

Fix bug with Clear/Set DROs with huge DRO values (when rounding involves more than 9 significant digits)

Fix error with displayed CSS Spindle speed when in Diameter mode

Fix problem introduced in V434k when invoking Actions from Screen Button.

### KMotionCNC Screen Editor

Scale a selected group of controls for a different screen size. See:

[http://www.dynomotion.com/wiki/index.php?title=KMotionCNC\\_Screen\\_Editor#Scaling\\_an\\_Entire\\_Screen\\_or\\_Portion\\_of\\_a\\_Screen](http://www.dynomotion.com/wiki/index.php?title=KMotionCNC_Screen_Editor#Scaling_an_Entire_Screen_or_Portion_of_a_Screen)

### KFLOP

Add new function to allow Flashing non volatile data with no console messages which can be used without any USB connection.

```
int ProgramFlashNoMessages(volatile char *src0, int Length, volatile char *dest0);  
//Quietly Programs Flash source address of data, length in 16-bit words, dest add  
must be on 64KByte block (returns 0 success)
```

### .NET

Help now available on-line in browser HTML format available here:

[http://dynomotion.com/KMotion\\_dotNet/Docs/Help/html/N\\_KMotion\\_dotNet.htm](http://dynomotion.com/KMotion_dotNet/Docs/Help/html/N_KMotion_dotNet.htm)

### Help

KMotion/KMotionCNC internal Help system uses now Internet Explorer 9.0 emulation for better rendering, javascript, and capabilities.

Many corrections and additions