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. Ie. 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 angel 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 ServiceKonnectPWMfromS.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