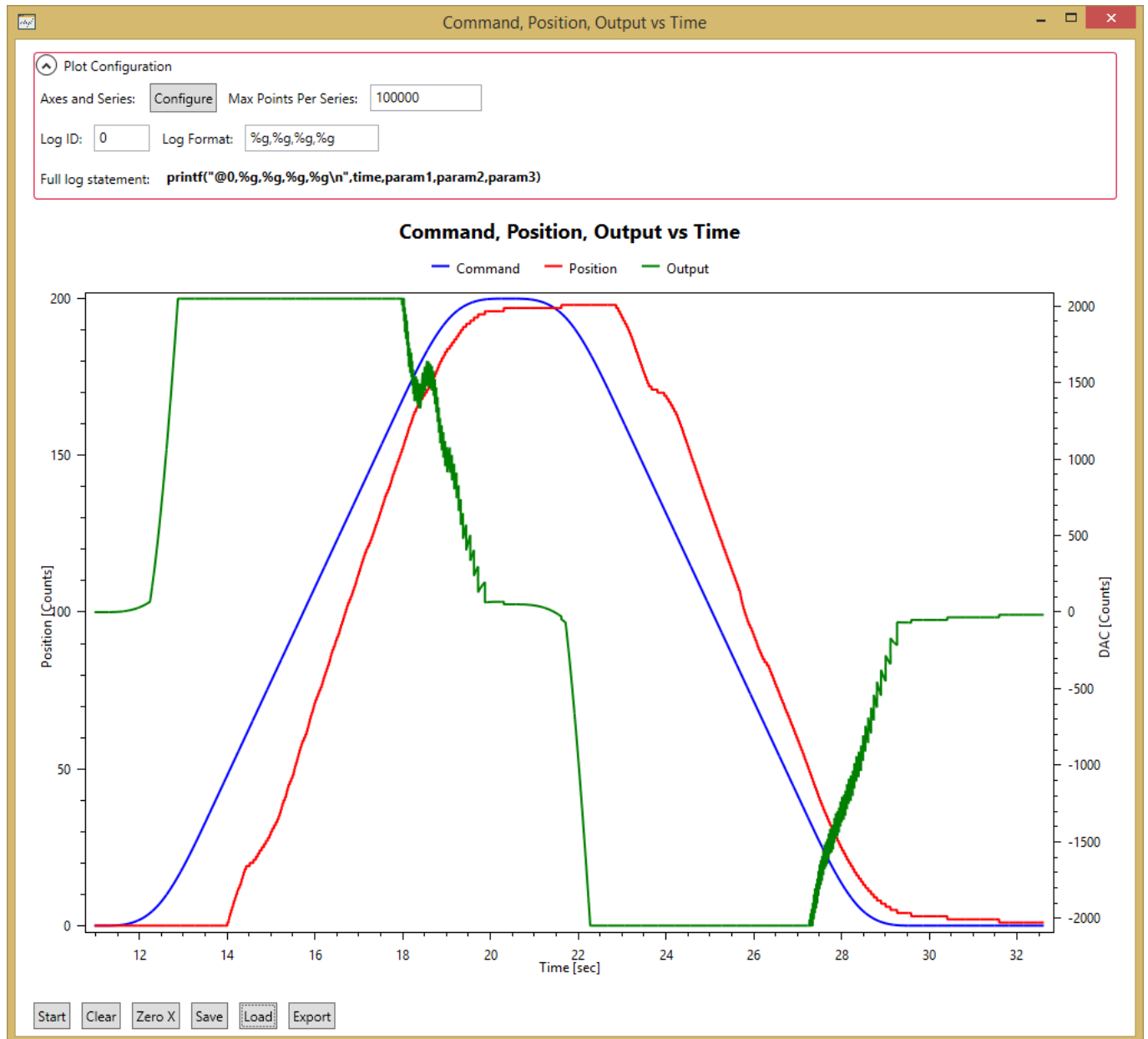


Extended Logging for Kflop

What is it?

Extended logging allows plotting of Kflop data as it's generated on the board.



Why?

Kmotion already has built in plotting, however it only allows at most 3.5 seconds of logging. For most (all?) axis tuning this is enough. However while trying to tune an axis that is both very slow (speed is in inch per hour) and with low resolution encoders (40 counts/mm) I needed more than 3.5 seconds of logging to see exactly how the axis was performing. Kmotion and the kflop already have tools to accomplish the job of logging for extended amounts of time, however it is an iterative approach. Where data is generated on the kflop, then saved to the PC, then you need to plot in another program. I wrote a little program to combine those steps, then it grew into Extended Logging for Kflop.

How it works

In either a free thread or in your forever loop you send messages from the Kflop board to the PC with the **printf** statement. The data is sent comma (',') delimited. An example log statement looks like:

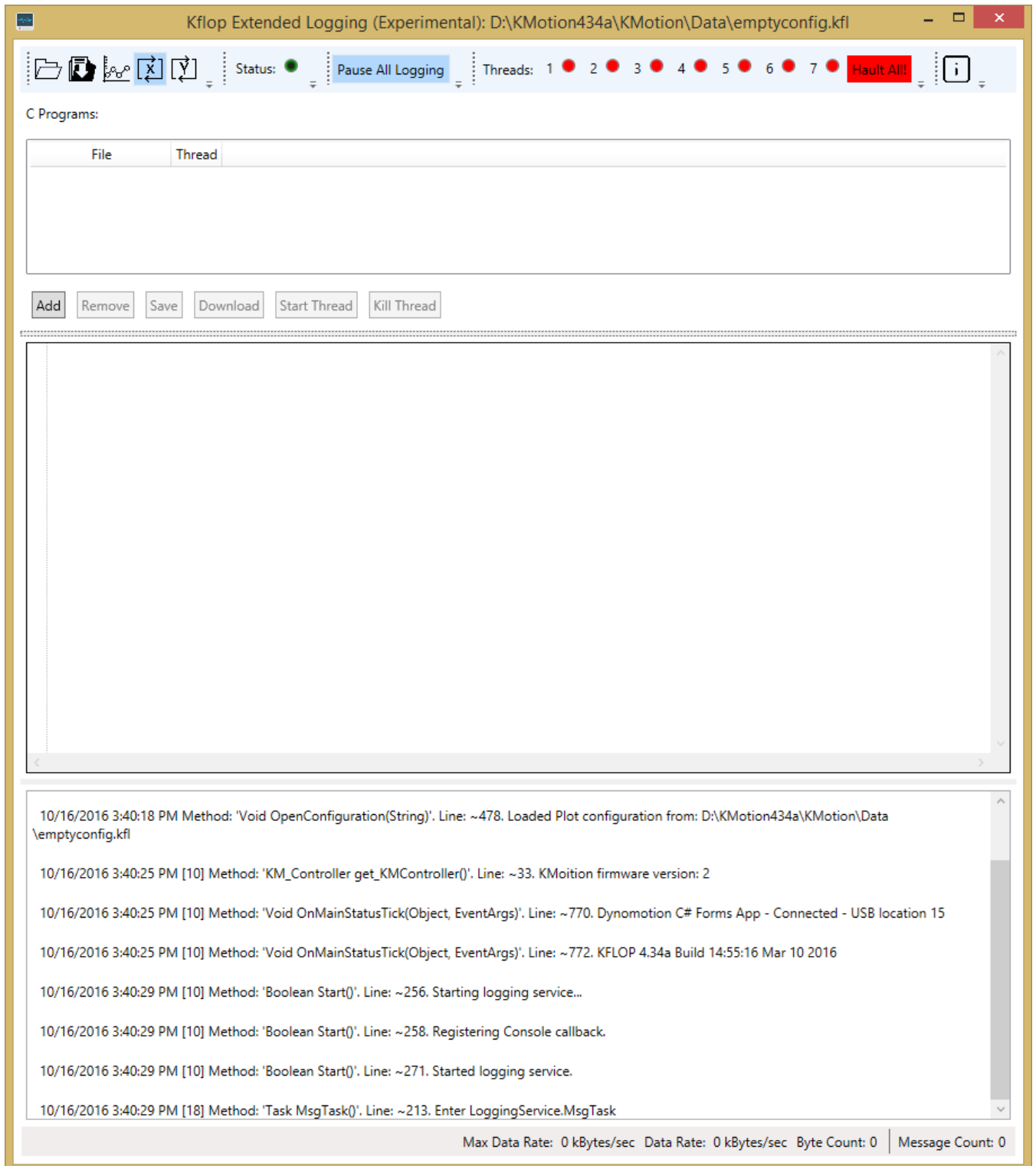
```
printf("@0,%g,%g,%g,%g\n",time,param1,param2,param3);
```

Note that each log statement begins with the "@" sign followed by a single Hex digit (to allow up to 16 unique plot statements), then the delimited data to use in plotting. Also note that each plot statement must include time (or some other counting variable) as the first parameter. This variable is used as the X axis for all plots (current limitation). To help with getting the printf statement correct the program will generate this for you after you define your plot.

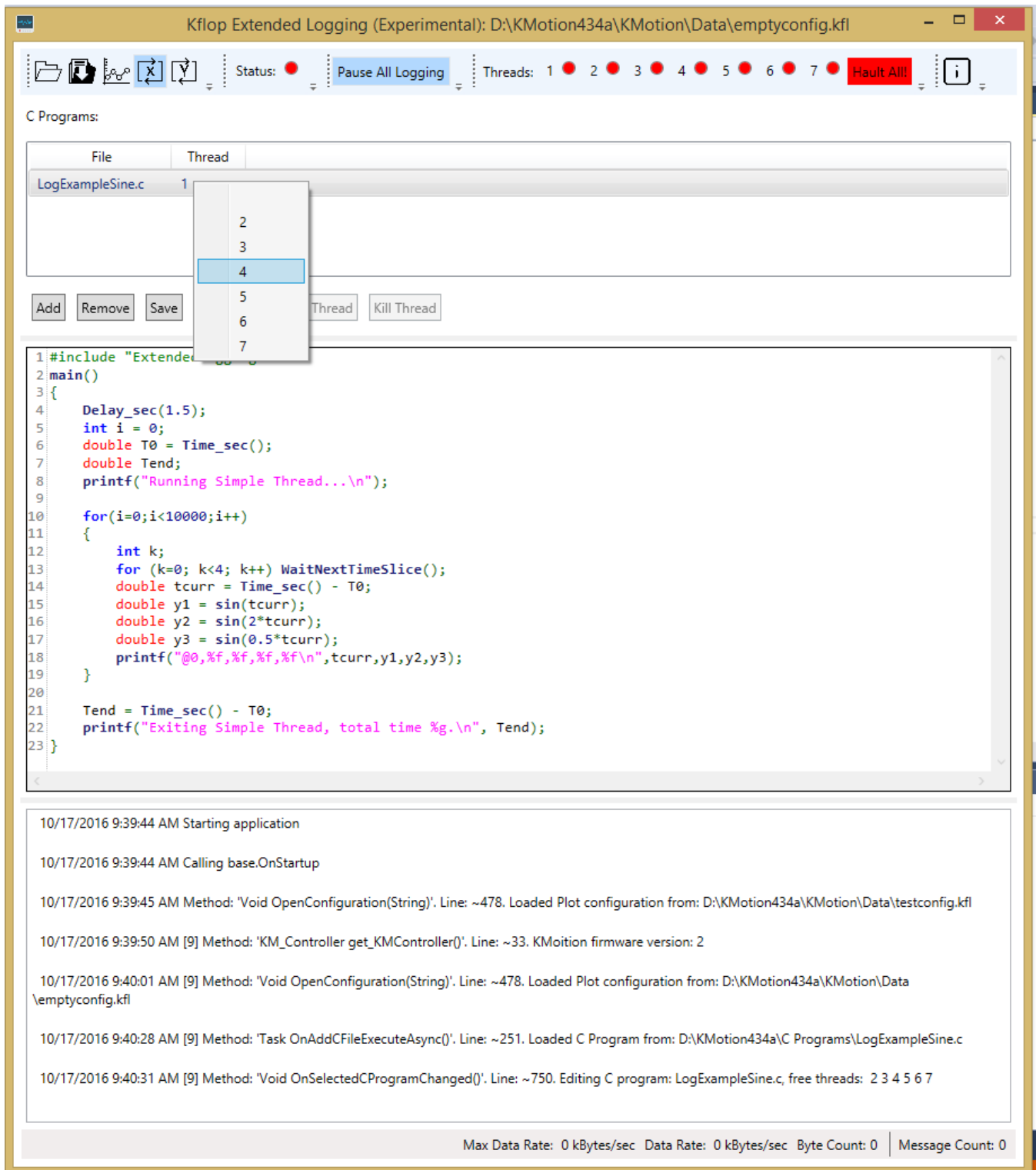
On the PC side the program monitors the console for these messages and delivers them to the plot(s) that have been configured to listen for them. Non plot messages are printed to the console so you can still use printf.

Getting Started

- Either download the binary or source. See downloading below.
- Start the program:



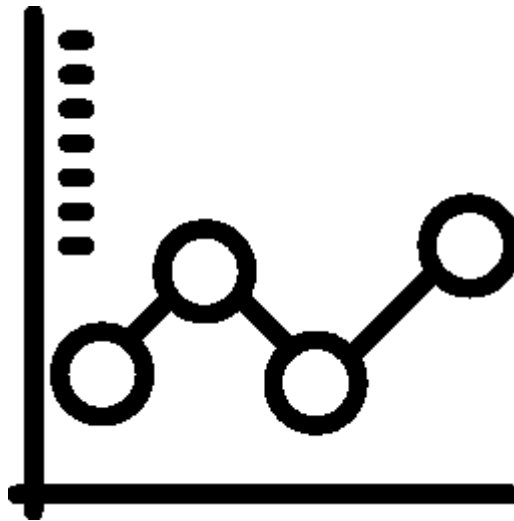
- If you are connected to the Kflop you should see the a green dot next to the word Status on the main toolbar.
- Add a C program, press the Add button, go to the KMotionVersion\C Programs folder and select LogExampleSine.c (if you downloaded the source as zip these files will be in SampleCPrograms under source). Then select it in the list. Right click the thread number to change it to something other than 1.



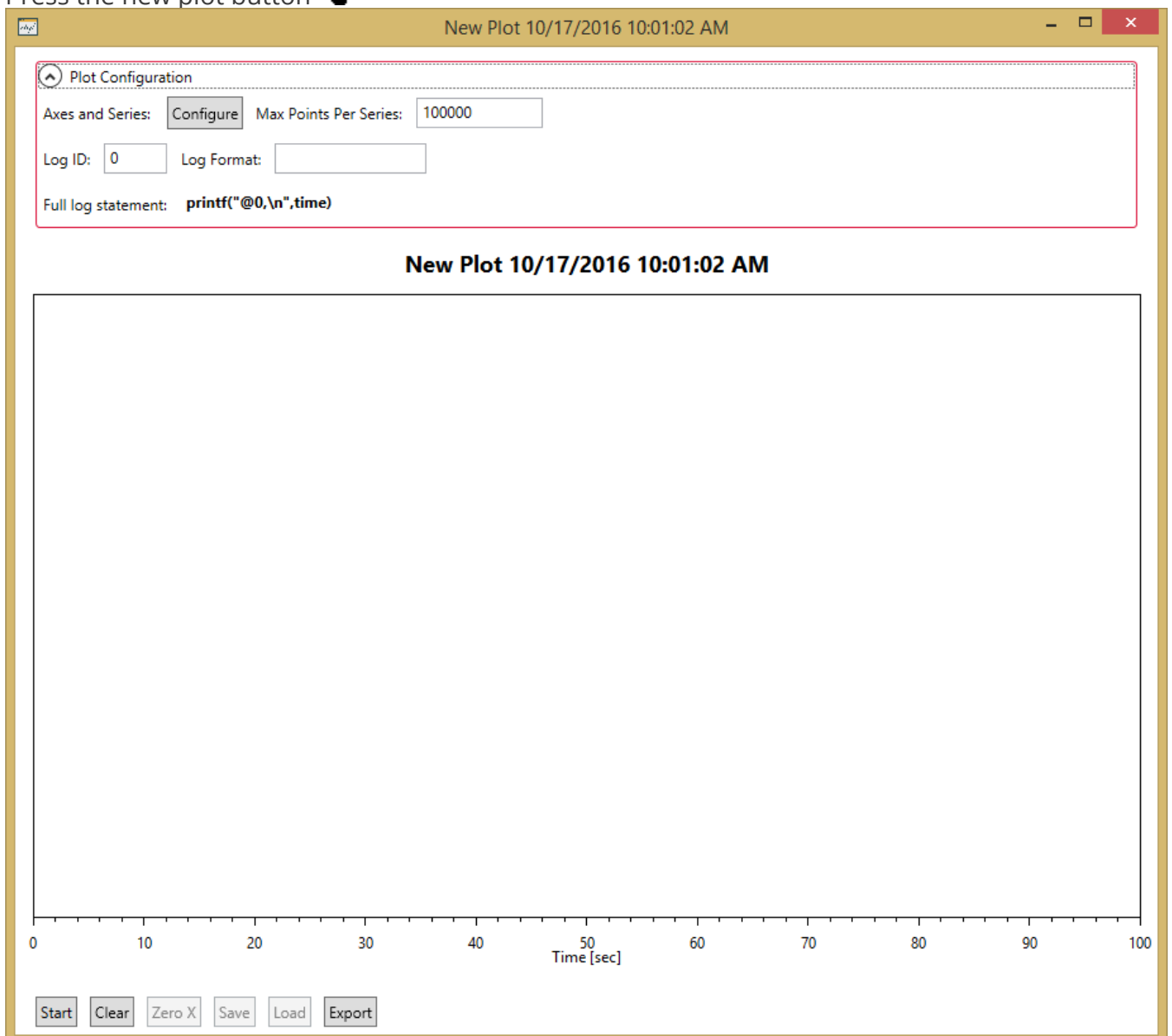
- This is a simple program which loops 10000 times calculating sine values and logging them to the PC with printf. It does this every 8 timeslices. Note the format of the printf statement. All log statements start with @ then the log id (0 in this case), then the log parameters. First log parameter is always time.

printf("@0,%f,%f,%f,%f\n",tcurr,y1,y2,y3);

- Press the download button to compile and download to the kflop.



Press the new plot button



- Press the Configure button.

Plot Axis and Series Configuration

Plot Info

Title: New Plot 10/16/2016 4:15:07 PM

Notes:

Y Axis Configuration

Title	Units	Position

Series Configuration

Title	Color	Y Axis	Result Index 1	Result Index 2	Operator

Load Save OK Cancel

- Use this screen to define your axis and series. For now press the load button to use a previously saved configuration.
- Press the Load button, and go to the KMotionVersion\Kmotion\Data directory and select the cpoVsTime.kfp (\PlotConfigTemplates in source)

Plot Axis and Series Configuration

Plot Info

Title: Command, Position, Output vs Time

Notes: my first plot

Y Axis Configuration

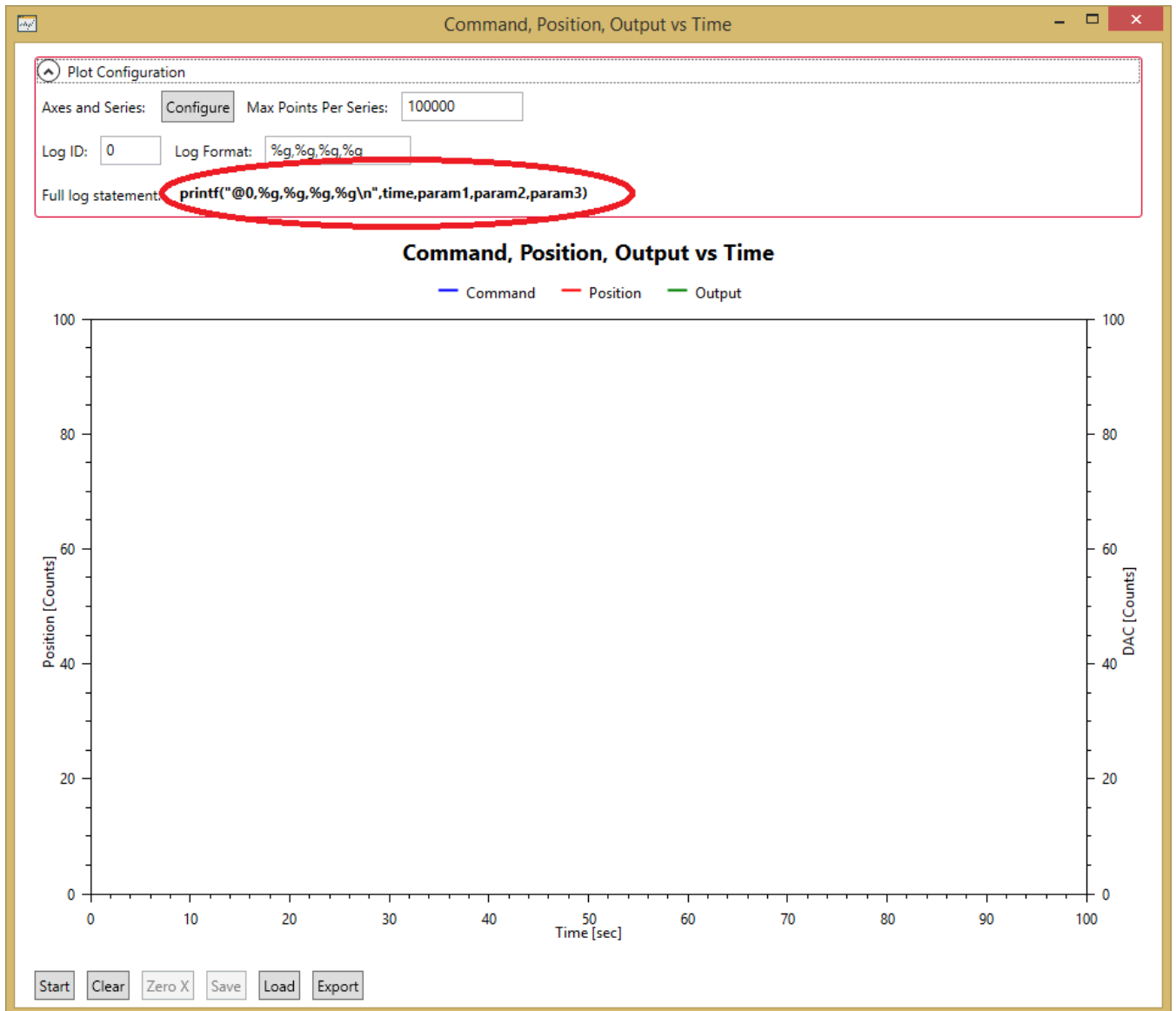
Title	Units	Position
Position	Counts	<input checked="" type="radio"/> Left <input type="radio"/> Right
DAC	Counts	<input type="radio"/> Left <input checked="" type="radio"/> Right

Series Configuration

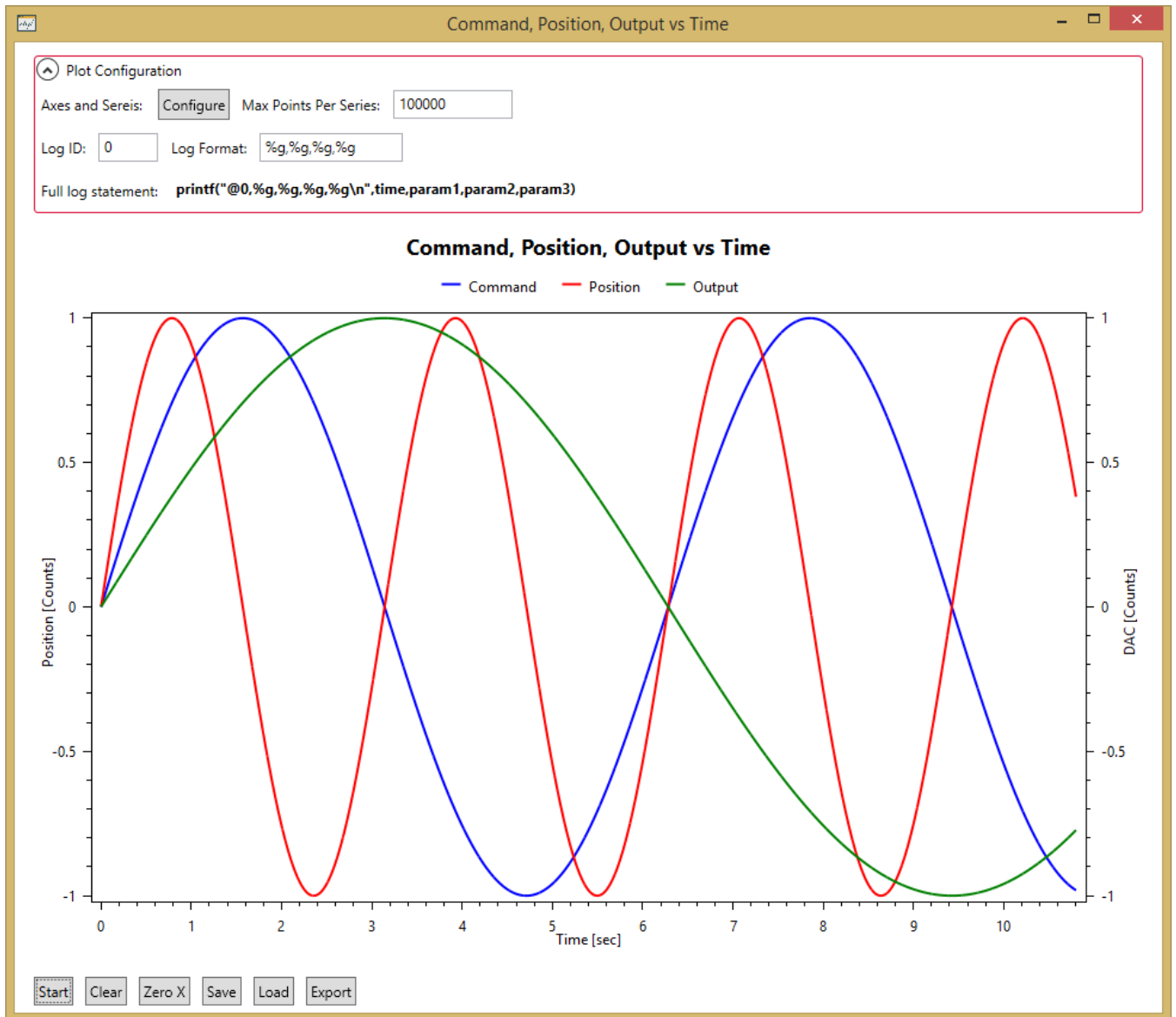
Title	Color	Y Axis	Result Index 1	Result Index 2	Operator
Command	Blue	Position	2		None
Position	Red	Position	3		None
Output	Green	DAC	4		None

Load Save OK Cancel

- Note the ResultIndex column, this configures where in the comma delimited array of the printf statement to look for the data. The index starts at zero which is the "@0", 1 is would be time, and 2 the first parameter, 3 the second... etc. Press OK. The printf statement will be generated for you.



- At this point you can either load previous saved data (including data saved in Kmotion) or log new data. To load previous data press the load button and select your comma delimited data (columns must match the format shown in the "Log Format" text box). To start a new logging session press start. Do that now.
- With the plot configured and logging started, go back to the main screen and start the LogExampleSine.c program on the kflap. You should see the plot update as data is sent to the PC, along with some status messages in the console.



- Press the Stop button on the plot, you can now save the data, and export to image.
- The Zero X button will shift the data in the x axis to start at zero.
- It's possible to have multiple plots logging at the same time, using either the same printf (same Log ID) or with different printf statements (mutiple axis etc...) ## Downloading ##

Gitclone

If you download the source using gitclone, clone the repository in \KMotion434a\PC VC Examples, then open the BuildExamples.sln and add the project file.

Zip file

There is a link above that will allow you to download a zip file with all the source. Unzip in \KMotion434a\PC VC Examples then open the BuildExamples.sln and add the project file.

Binary

https://dl.dropboxusercontent.com/u/32233852/ExtendedLoggingRedist_0.0.0.3_For_KMotion434a.zip Backup your KMotion434a directory. Unzip the file in \KMotion434a directory, this will place the

binaries in \KMotion434a\KMotion\Release, to run the program start the ExtendedLoggingKflop.exe

Written with StackEdit.