Piccolo F28069 controlSTICK
Quick Start Guide

This quick start guide walks through setting up the GUI and what it demonstrates, with a short troubleshooting section.

There are also instructions on upgrading/installing CCSv4 (you must have v4.2.1 or later for F2806x support) as well as setting up a CCS project.

Setup the controlSTICK Hardware

- Plug in the controlSTICK to an open USB port.

- If this is your first time using a C2000 tool, there will be three hardware install prompts. Direct the installer to the "Drivers" folder on the DVD to locate the driver files. You may need to identify if your system is running an AMD64 or Intel (i386) processor and choose the appropriate directory.

Starting the F28069 GUI

The kit comes with a GUI which provides a convenient way to evaluate the functionality of the F28069 device without needing to learn and configure the underlying project software or install CCStudio.

The GUI requires Microsoft .NET framework 3.5 SP1 or higher to run. Please ensure that this software is installed prior to running this program. Microsoft .NET v4 web installer

- Double-click the file F28069_controlSTICK.exe
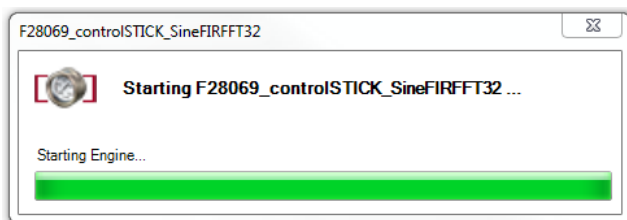
- Once the GUI has loaded, it will automatically identify and connect to your F28069 controlSTICK and parameter updates will be enabled.
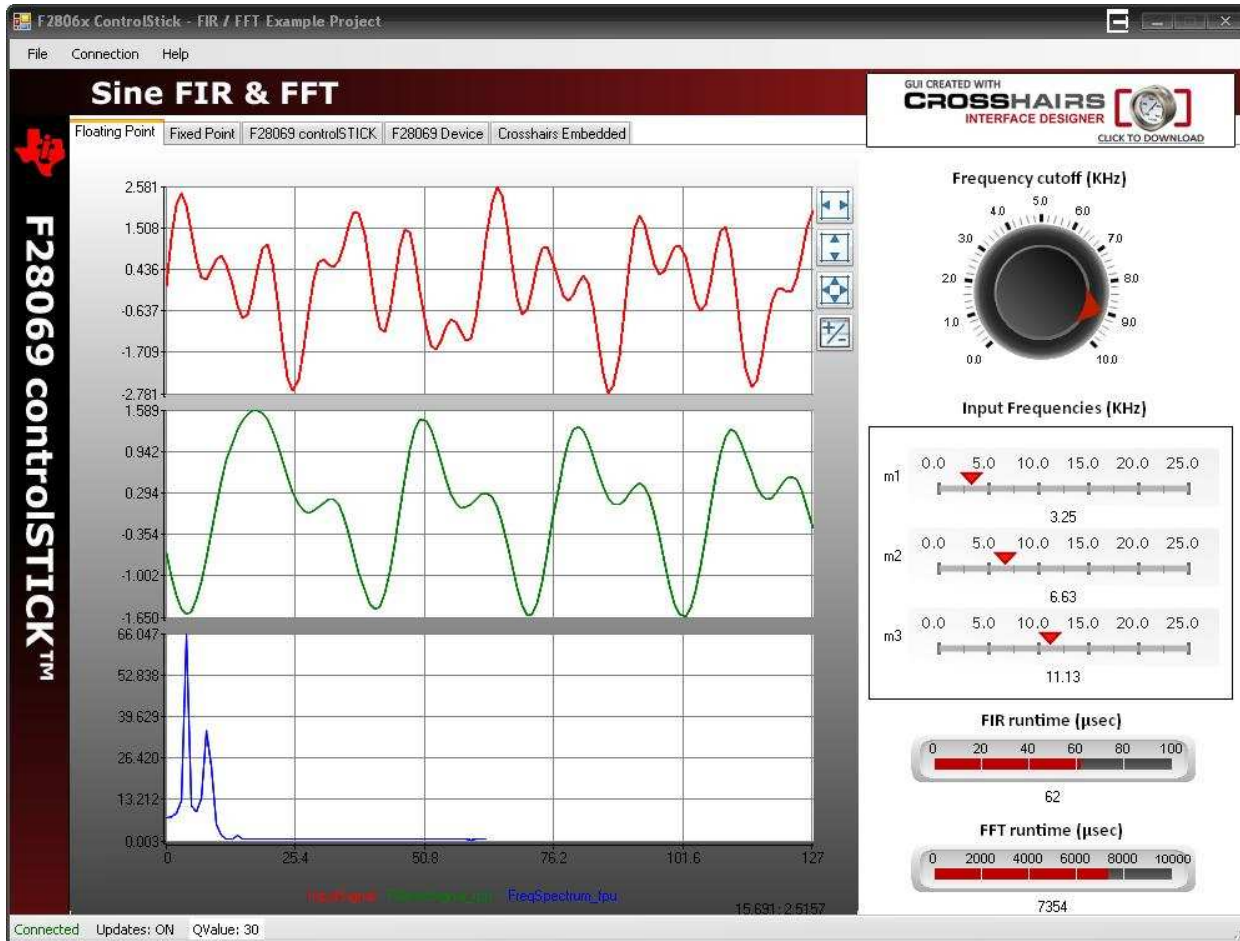
The GUI is divided into five parts as shown below

- **Floating Point**, which is the default screen, configures the example application to use the FPU of the F28069 to perform its calculations.

- **Fixed Point** uses the IQMath library and fixed point calculations.

- The F28069 controlSTICK and F28069 Device tabs contain useful information about the F28069 controlSTICK and its features as well as features common to the F28069 architecture. The Crosshairs Embedded tab provides information on Crosshairs Embedded and the Interface Designer tool which was used to design and deploy this GUI application.

Using the F28069 GUI and Switching Modes of Operation

The application is a FIR and FFT example that is capable of running in both floating and fixed point mode. By default, the application will be running in floating point mode but may easily be switched to fixed point mode by clicking the Fixed Point tab.

The components available are similar for both floating and fixed point mode. In each mode, the graph shows three curves:

- InputSignal – Generated combined signal of three sinusoidal waveforms generated by the Input Frequency sliders
- FilteredSignal_fpu – FIR filtered signal that eliminates all frequencies above the cutoff frequency. Input to the FFT
- FreqSpectrum_fpu – FFT result. Shows the signal in the frequency domain. Spikes in the graph indicate the signal frequencies that make up the input signal.

The knob labeled Frequency Cutoff (KHz) controls the frequency cutoff for the FIR filter.
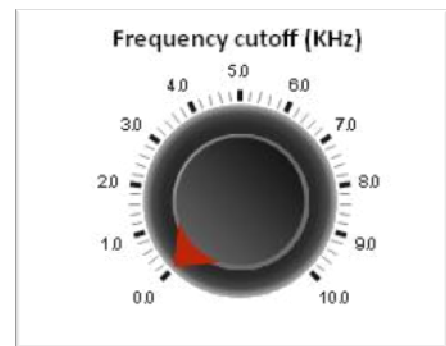
There are three input frequency slider controls that will let you adjust three input frequencies. These three sliders (labeled m1, m2 and m3) are tied to FreqMult1, FreqMult2 and FreqMult3 in the example application. The spikes in the frequency spectrum graph should correspond to the frequencies set by these multipliers provided they haven't been filtered by the FIR filter.
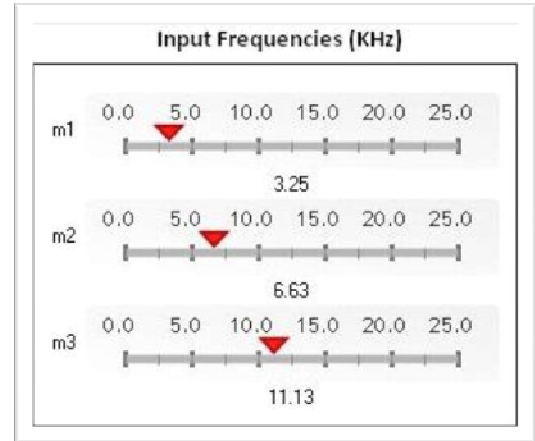
Finally, there are two bar graphs that show the FIR and FFT runtime currently measured in the application. Notice the difference in these graphs when switching from Floating point to Fixed point mode.
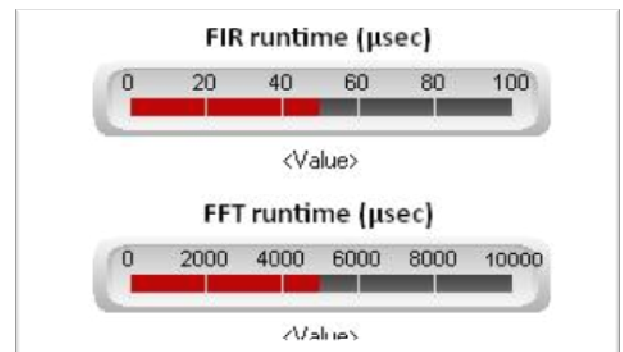
Troubleshooting

If the GUI has difficulty communicating with the F28069 controlSTICK, it is possible that the serial-to-USB was not enabled by default. Please follow the steps below in order to enable the virtual serial port:

- Connect the F28069 controlSTICK to an available USB port on your machine
- Open the Windows Device Manager and expand the Universal Serial Bus Controllers section
- For each of the TI XDS100 entries, open the properties dialog and select the Advanced tab. Click to enable Load VCP as shown below
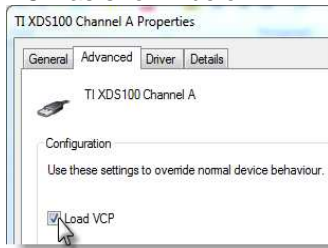

- Close the Windows Device Manager and unplug the F28069 controlSTICK
- Re-connect the F28069 controlSTICK you may be prompted to install drivers, located in the "Drivers" folder
- To verify a successful install, open the Windows Device Manager and verify that two new serial ports are shown under the Ports (COM & LPT) section

Reloading the Flash with the proper .out

If you modify the example application (add or remove variables or otherwise change the code) you will have to update the deployed GUI for changes to be reflected there.

1. Open CCS, switch to the debug perspective
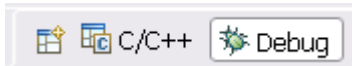
2. Launch the target configuration (see below on how to setup a target config)
3. Go to **Target** in the menu bar and then click **Connect Target**
4. Once connected go to **Target** and click on **Load Program**
5. In the pop up menu, browse through the directory and find the **RT-SineFIRFFT32.out** file; it should be in the **~GUI** folder in the F28069 controlSTICK directory
6. If you alter the location of graph or control variables in the example project you will have to recompile the GUI using the interface designer from Crosshairs Embedded

Modifying the F28069 GUI

You can easily modify the existing GUI or create your own by downloading the Interface Designer tool from http://www.crosshairsembedded.com.

Installing CCS V4 and software

- Insert the Code Composer DVD into your PC

- Navigate to the "setup_ccs4" directory and run the setup program to install CCSv4.2.1
    - o If upgrading from an existing CCSv4 version prior to 4.2, uninstall your existing CCSv4 first to ensure that no conflicts occur
    - o If you already have CCSv4.2.1 installed, navigate to the "extras" folder and install the two executables into your CCSv4 installation directory

**Run Your First F28069 Program with Code Composer Studio v4**

- Go to www.ti.com/c2000 to install the F28069 controlSTICK projects via controlSUITE.
    - o Click on the controlSUITE tab, download, and run the installer
    - o Click "Typically Installation" to automatically select and install the latest software versions.
- Check the Automatic Updates box if you are interested in installing the automatic update feature of controlSUITE. If not, you can check for updates manually. Click "Next" to view a summary and complete the installation.

- Open up Code Composer Studio 4

- A dialog box will appear asking to select a workspace, a workspace is the primary location where your projects and settings will be stored. Ensure that the "Use as default" checkbox is unchecked. Specify a workspace location and click OK

- Navigate to "Import Existing CCS/CCE Eclipse Project" in the Project menu
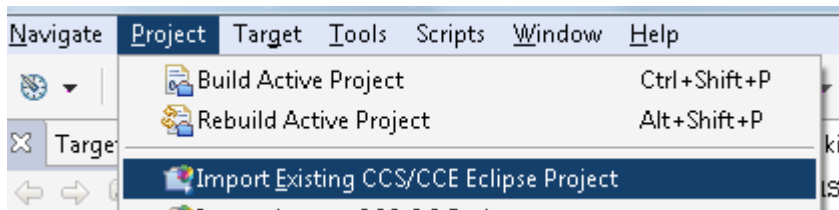
- Select the radio button "Select Root Directory" and click "Browse". Navigate to C:\TI\controlSUITE\development_kits\F28069 controlSTICK\Timer – BlinkingLED and check the box marked "BlinkingLED" and click Finish

- Right click on the BlinkingLED in the "C/C++ Project" pane and select New -> Target Configuration File

www.ti.com/controlsuite
www.ti.com/c2000
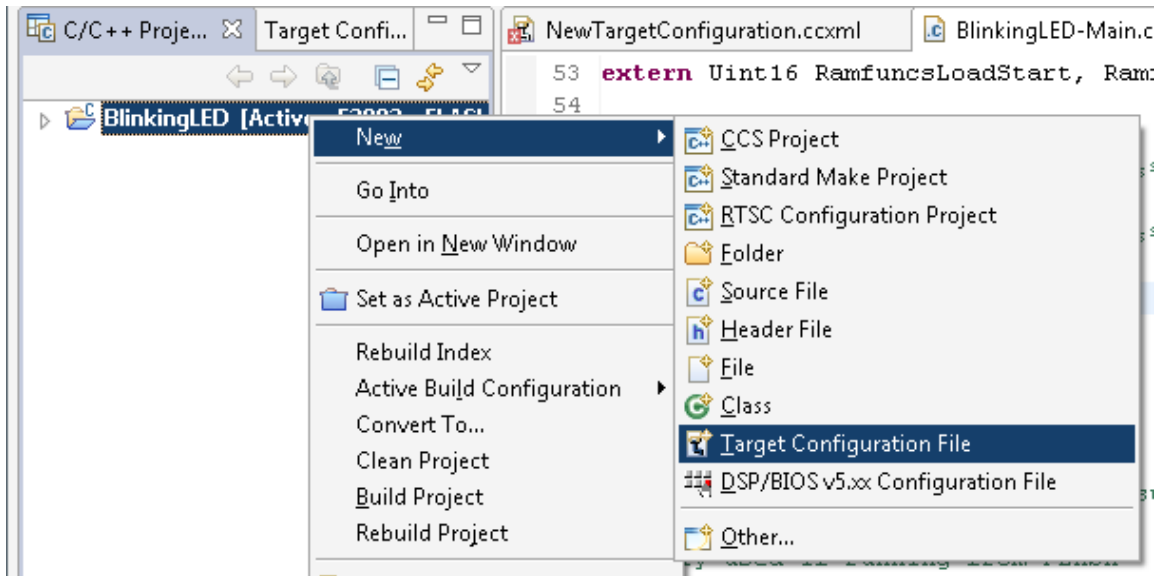
- Name the file, select "Use Shared Location", and click "Finish".

- Under "Connection" select "Texas Instruments XDS100v1 USB Emulator", select the device "controlSTICK – F28069" , and click "Save"
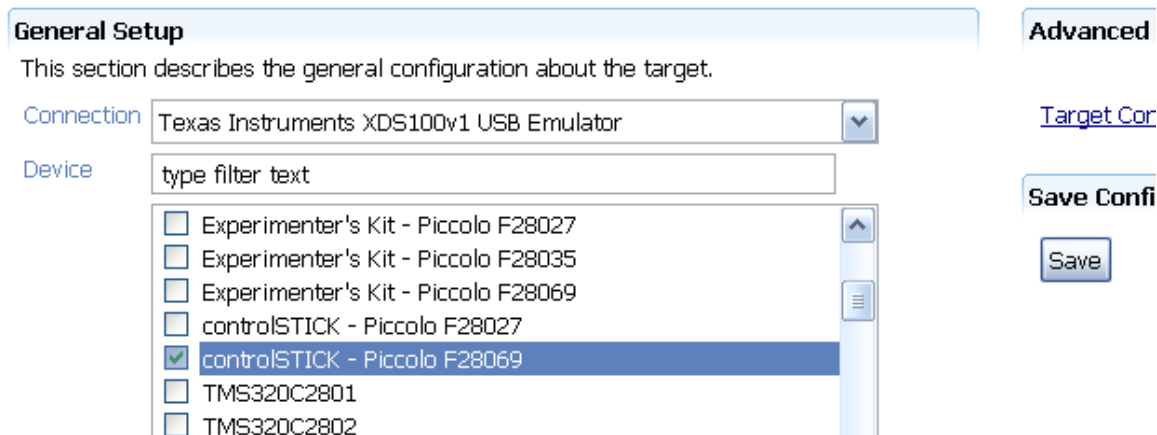
- Click the on the bug button. CCS will automatically build the project, switch to the Debug perspective, connect to

  the device, load the program and run to main.

- Click the run (arrow) icon in the Debug View to run the Program.

- For more information on CCS V4 and the controlSTICK please see: controlSTICK Examples Overview found in C:\TI\controlSUITE\development_kits\F28069 controlSTICK\~Docs