

EE/TE 4385

Lab 2: Sinwave Generation and LabVIEW DSP Integration

Lab Report Due: 9/06/06, 2PM

Lab 2a. Sinwave Generation

The objective of this project is to generate 1000Hz sinewave by using look-up table. Assume that the sampling frequency, f_s , is 8000Hz.

1. Download source file from the lab web side
2. Open a new project named Lab2a in CCSstudio.
3. Your source code is `sine.c`. You need to modify the source code to perform the sinusoid generation.
4. Examine provided source code and note the line
 - a. `float sine_array[8] = {...}`
 - b. This is where you need to insert sine samples for one period.
5. Generate and plot one period of sinewave consisting of 8 data samples in MATLAB. Record the matlab figure window for your report and sample values for your lab report.
6. Add source files to the project (if they are not already added):
 - a. `sine.c`
 - b. `Lab02.cmd` (Linker command file)
 - c. `vector.asm` (Interrupt vector table)
7. Add necessary library files to the project:
 - a. `C:\ti\c6000\cgtools\lib\rts6700.lib"`
 - b. `C:\ti\c6000\bios\lib\cs16713.lib"`
 - c. `C:\ti\c6000\dsk6713\lib\dsk6713bsl.lib"`
8. Build and run your project to verify the output on the oscilloscope. You need to connect the right audio output of TI DSK to the oscilloscope. Optionally you can connect to the amplified speaker to listen since the frequency is audible. Record the oscilloscope screen for your lab report.
9. Use the same method to generate 750 Hz sinwave. What do you need to change? Include your results in the lab report

Lab 2b. LabVIEW DSP Integration Lab:

This lab will show how to combine LabVIEW and TI DSP implementation. The lab is based on Combined LabVIEW DSP Implementation example available in LabVIEW examples directory.

1. Start LabVIEW.
2. Copy gain and shared folder from Examples → DSPTest → dsk6713 → file under LabVIEW 8.0 directory into your myprojects directory.
3. Open Gain → Gain_dsk6713.vi in its new location.
4. The Gain example uses LabVIEW signal generation to create a waveform and applies a waveform gain factor in TI DSP to the generated waveform. Then, the generated waveform is read into LabVIEW for viewing from TI DSP.
5. Display the Block Diagram to inspect the blocks
6. Using RTDX technology, the example sends the waveform to the **cinput** channel of the target code and sends the waveform gain to the **cgain** channel of the target code. The

22. Use the **Delay** control on the front panel to change the delay of the signal LabVIEW generates. Record the graph window for few examples of frequency and delay values for your lab report.
23. Interpret the actual delay amount that corresponds to delay index on the LabVIEW delay slider in your lab report.