FPGA-Scope: A Labkit Implemented Oscilloscope
6.111 Final Project Checklist

Anartya Mandal and Kevin Linke

November 17, 2011

Data Collection (Anartya)

ADC

- AD574 12-bit ADC
- max input frequency 1kHz
- if time permits, multiple channels

ADC Controller

- tells ADC to sample with period delta-t

Samples BRAM

- stores 748 * 4 samples, each 12 bits

Data Processing (Anartya/Kevin)

Math Module (Anartya)

- measures input signal statistics
  - average voltage
  - peak-to-peak voltage
  - frequency
- trigger address
  - peak triggering
  - if time permits, edge/level triggering

Decimal Module (Kevin)

- converts statistics and delta-V to decimal
- stores decimal images and labels in numbers BRAM

Numbers BRAM (Kevin)

- stores 700 * 242 pixels, each 1 bit

Scaling Module (Kevin)

- converts samples BRAM data to a scaled waveform
- horizontal scale (delta-T) and vertical scale (delta-V) set by user
- if time permits, delta-T and delta-V may be autoset
- finds correct sample window using trigger address
- converts 12-bit samples to scaled 10-bit samples

Waveform BRAM (Kevin)

- stores 748 samples, each 10 bits

User Interface (Kevin)

Menu FSM

- takes debounced button inputs from the user

- specifies the delta-V and delta-T parameters for other modules
- button one selects delta-T, button two selects delta-V
- up and down buttons change the parameter values
- creates the image of delta-t that is stored in the delta-t BRAM.

Delta-T BRAM

- stores 100 * 34 pixels, each 1 bit

VGA Display (Kevin)

VGA Controller

- combines the numbers BRAM, the delta-t BRAM and the waveform to create display
- positions BRAMs relative to each other
- provides read warnings for other modules
- converts samples in waveform BRAM to image and adds grid-lines