

September 18, 2017

Project II

MicroBlaze System

In the previous mini-project you we were able to implement the MicroBlaze SOC (System-on-Chip) processor. The MicroBlaze is a complicated digital system that would take days or months to implement in Verilog/VHDL. Fortunately, Vivado and SDK from Xilinx allows the user to put together a soft processor with the features required for a particular project in hours. This allows the embedded processor engineer to prototype and test a system in a very short time.

In our path towards implementing an embedded control system, we now need to be able to read a digital or analog signal. Because we will be dealing with one state variable, we need to be able to read a signal into our MicroBlaze processor, and also be able to output a signal, which will be our control signal. Figure 1 describes a simple embedded control system with its components: a) a command signal, which can be modeled with DIP switches, b) a control signal issued by the embedded processor to the plant, c) a measurement of the signal output of the plant which also need to be fed-back to the embedded processor.

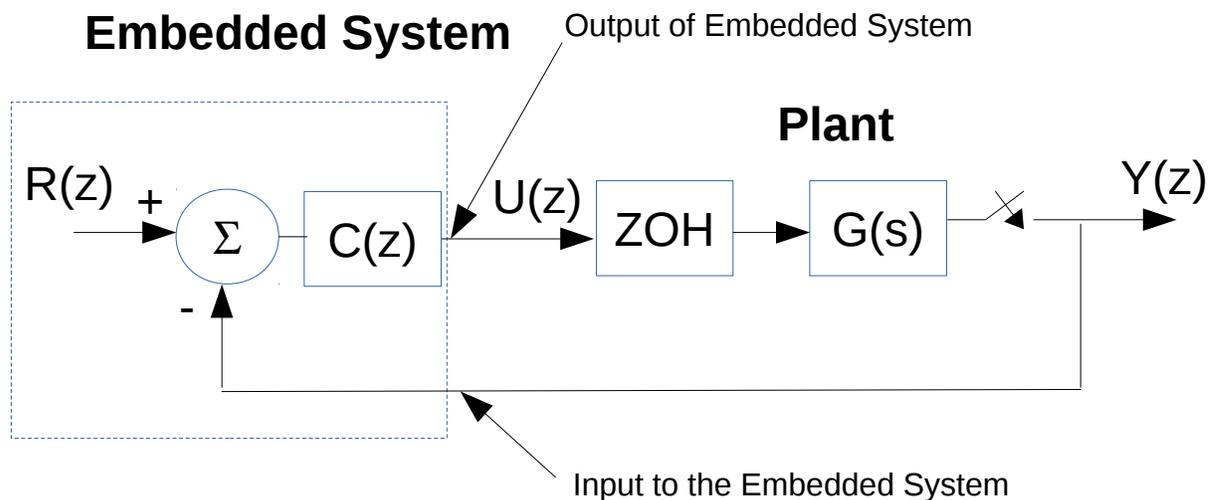


Figure 1. A Simple Control System

Deliverables:

- * Demonstrate the implementation of reading a digital and analog signal into MicroBlaze on an Arty board. A simple demonstration would be to read the value and display it on the computer screen.
- * Write a 2-3 page report describing in your own words, the procedure you followed to implement the microprocessor/microcontroller. Document problems you encountered, and how you solved them. Your report should be in the IEEE standard format.