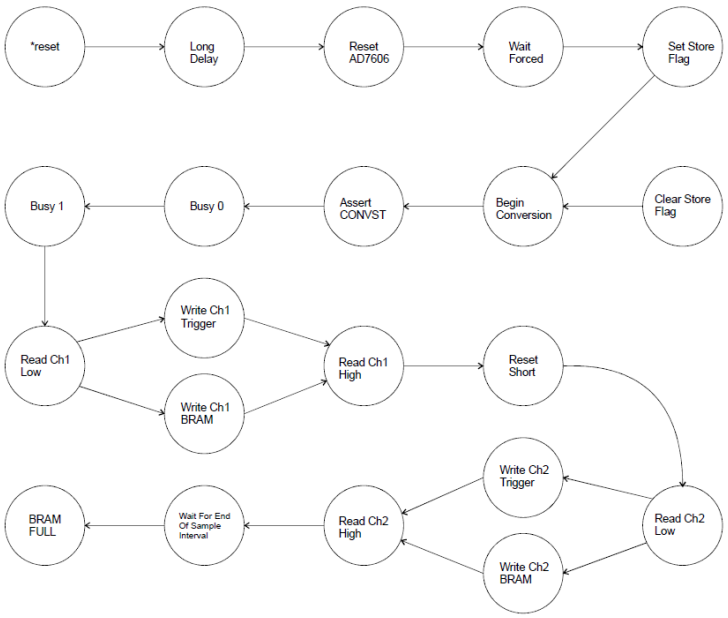
EENG 498 – Embedded Systems II

Acquire To HDMI

The control unit with all the states and missing a few transition arcs.



Signal	Source	Meaning
FULL	Datapath: BRAM Counter	0 = BRAM is not full 1 = BRAM is full
SAMPLE	Datapath: Sample Interval Counter	0 = Sample interval is not over 1 = Sampling interval is over
TRIGGER	Datapath: AND gate	0 = No trigger event 1 = Trigger event has occured
STORE	Datapath: SR Latch	0 = Do not store AD7606 samples in BRAM 1 = Store Ad7606 samples into BRAM
FORCED	Acquire: Button Process	0 = Trigger event starts acquisition of sample into BRAM 1 = User will start acquisition of samples into BRAM with button press
SINGLE	Acquire Button Process	0 = User has not pressed button to start acquisition 1 = User has pressed button to start acquisition of samples into BRAM

full, forced \ trig, store	0 0	0 1	1 1	1 1
0 0				
0 1				
1 1				
1 0				

The status word bits come from both the datapath and the acquireToHdmi module. All of these signals are used on the transition arcs in the control unit.

Timing related status	SAMPLE, SHORT, LONG
Event related	CH1_TRIGGER, CH2_TRIGGER, SINGLE, FULL
Mode related	FORCED, STORE_TO_BRAM, AD7606_BUSY

Use these conditions on the arcs, but make sure they are defined in the datapath or acquireToHdmi components.

When in FORCED mode the control unit will wait in WAIT_FORCED_STATE until a button is pressed (SINGLE)
When not in FORCED mode, trigger mode, samples are acquired until the CH1_TRIGGER is true
The STORE flip flop in the datapath control is samples are stored in the BRAM or Trigger registers

Control Word Table

State	21	20	19	18	17	16	15	14	13	12	11	10	9,8	7,6	5,4	3,2	1,0
	CLEAR_STORE_FLAG	SET_STORE_FLAG	TRIG_CH2_WRITE	TRIG_CH1_WRITE	CONVERSION_PLUS_READOUT	SAMPLE_TIMER_ROLLOVER	DATA_STORAGE_CH2_WRITE	DATA_STORAGE_CH1_WRITE	CONVST	RD	CS	RESET_AD7606	DATA_STORAGE_COUNTER	SAMPLING_COUNTER	SAMPLING_RATE_SELECT	LONG_DELAY_COUNTER	SHORT_DELAY_COUNTER
	0 hold	0 hold	0 hold	0 hold	0 idle		0 hold	0 hold					00 Hold	00 Hold	11 = LOWEST	00 Hold	00 Hold
	1 clear	1 set	1 load	1 load	1 conv read	1 smple intrval	1 load	1 load					01 Load	01 Load	10 = LOW	01 Load	01 Load
													10 Inc	10 Inc	01 HIGH	10 Inc	10 Inc
													11 Reset	11 Reset	00 =HIGHEST	11 Reset	11 Reset
RESET																	
LONG_DELAY																	
RSET AD7606																	
WAIT FORCED																	
SET STORE																	
CLEAR STORE																	
BEGIN CONV																	
ASSRT CONV																	