

Real Time Systems (TTK4147) –

Exercise 3: AVR32 UC3

Exercise 4: AVR32 FreeRTOS

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Today

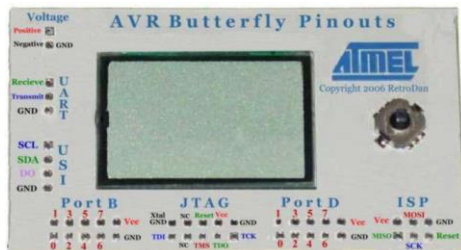
- Overview next four exercises
- Hardware
- Latency analysis
- Exercise 3 specifics
- Exercise 4 specifics
- Hardware setup

Next four exercises:

- Latency analysis (response time) for four different systems:
 - Exercise 3: No OS (Microcontroller)
 - Exercise 4: FreeRTOS (Microcontroller)
 - Exercise 5: Linux (PC)
 - Exercise 6: Xenomai (PC)

Hardware ex 3 and 4:

- Shown in pictures below:
 - AVR Butterfly evaluation tool (BRTT)
 - Atmel JTAGICE mkII
 - Atmel AT32UC3A3256 microcontroller
- Cables to connect these together
- Handed out at the beginning of the exercise



Latency analysis ex. 3 and ex. 4

- Latency is the time delay between the stimulus and the desired outcome.
- Analyze a system on a microcontroller
- Measurement device: BRTT
- BRTT: Generates stimuli via GPIO ports for the MC and measures the delay between the stimuli and the outcome (generated at MC's GPIO ports) and reports the results

Exercise 3 specifics:

- No OS
- ASF (Atmel Software Framework)
- Response techniques:
 - Busy wait
 - Interrupt
 - Big-while

Exercise 4 specifics:

- FreeRTOS
- Every test/response signal is handled by a FreeRTOS task
- Priority based preemptive scheduling policy, round robin for tasks of equal priority
- Response Techniques:
 - Busy wait
 - Periodic polling
- With additional low priority CPU intensive task

Hardware setup

