

Questions and tasks in Lecture 6

Question 6-1: At which frequency does the red/green LED blink at 1 MHz and at 4 MHz clock? (Hint: do not forget that one cycle has two phases – one forward red and one backward green!)

Bonus question: At which clock frequency has the controller to be operated to get a 1 Hz blink frequency? How can this be made electronically (search for „External clock“ in the handbook)? And at which ISP clock frequency has the controller to be programmed then? Does your hard- and software allow this (test this!)?

Questions and tasks in Lecture 6 - Continued

Task 6-2: Write a program that generates a pre-defined frequency on the speaker (calculate the compare match value from the given frequency in Milli-Hertz) and that blinks in a second rhythm. When the LED is on, change the tone to be exactly one octave higher. Test your program on the breadboard and with the simulator (by enabling the timer view).

Bonus question: What are the compare match values for the gambit tones a to g (440, 493.883, 523.251, 587.330, 659.255, 698.456 and 783.991 Hz) and how accurate can those be generated with an xtal-driven ATtiny24 at 4 MHz? Is a crystal with 4.194304 MHz a better choice in this case? Why?