

E7012E Mechatronics Lab 2

Intro to the Arduino M0 Pro (ATMEL SAMD21 MCU)

Purpose

- To test the Arduino board.
- To introduce the Arduino programming environment.
- To give training in C-programming and how to structure C-code.
- To give training in the usage of Pulse Width Modulation (PWM) to control speed and steering of the vehicles.

Preparations

Task 1. Test your Arduino

- 1.1 Create a simple LED-flash program, which makes the LED blink at approximately 10 Hz, compile and program the Arduino.
- 1.2 Increase the blinking frequency of the LED with a factor of 8.
- 1.3 Implement T1.1 and T1.2 by utilizing Timers.

Task 2. Create a codebase for the speed and steering control

- 2.1 Create the functions for SetSpeed(float mps) and SetSteering(float angle). The code shall be thoroughly commented and easy to read to pass (please target your comments having in your mind that someone that has not read the code before shall be able to understand it).

For evaluating the assignments of this lab, the students are highly suggested to bring with them their cars and test on these platforms the steering and the speed of their vehicles.