

Practice of April 7, 2016 – DC Motor 2 : PWM and encoder

Continuation the control of DC motor Logidule.

To programming the input-output, continue to use the direct access to the microcontroller registers (P1DIR, P1OUT, P1IN, P1REN, P2...).

1) Implement the program `Va-et-vient.c`

Take preferably version of on Moodle, to have good definitions.

2) Add in the main loop `while(1)` instructions to make **PWM**.

Tip : make this loop contain a single delay of 40us. Give to the PWM cycle 256 times the duration of the loop.

Rewrite the programme **back-and-forth at 50%** speed.

3) Add the reading of the position with the **encoder**. Programm the algorithm :

« if a bit has changed

 if X equals oldX then increment the position

 otherwise decrement the position »

Display the two least significant bits of the variable `Position` on the 2 red and green LEDs of the Launchpad.

Tests can be done at speed zero, turning the motor by hand and observing the LEDs.

4) Write a program that performs the following movements when pressing the push-button :

- ahead during 1 second at maximum speed for a possible release of the limit switch

- forth at 25% speed to get the limit switch

- ahead for 1 a turn of the toothed wheel at 50% speed.

Tip: to make your program more readable, place the instructions that run the PWM in a procedure and the instructions for reading the encoder in another procedure.