Electronics II
exercise 5

Deadline: Wed 28.2.2024 16:00

External modules

Task 1 – IR remote (1p)

Detect which button of the IR remote controller is pushed and write it to the serial port.

Task 2 – Stepper motor (1+1p) [Arduino]

a) Make the stepper motor rotate back and forth in full rotations. Attach some sort of a temporary pointer on the motor so the rotations are easier to see.

b) Make an IR remote -controlled stepper motor with the following controls: two buttons which rotate the motor clockwise or counterclockwise when the button is being pressed and two buttons which increase/decrease the speed.

Optional: Bind the full rotations on two remote buttons as well to make demoing easier.

You might want to use some other library than "Stepper" as it can be a bit slow.

Do not connect the motor straight to Arduino 5V as the inducted voltage spikes may damage the electronics. Use the power supply module to power everything except the Arduino. Remember to connect power supply and Arduino grounds. Example circuit in ELEGOO V2 materials "2.24 Stepper Motor".

Task 3 – LCD (1p) [Arduino]

Make your favorite poem scroll on the LCD. Backlight the screen and make the contrast adjustable with a potentiometer.

Task 4 – RTC (1+1p) [Arduino]

a) Set the RTC to the correct time and display the time and date on the LCD.

b) Mod your code from the previous problem so that the microcontroller is in power-down mode (Sleep (arduino.cc)), and it updates the time on the LCD only when a button is pressed.

Estimate roughly how much is the average current consumption. How long would a 1000mAh battery last with and without the power-down mode? Consider only the current consumption of the microcontroller.