The subject of the project is a safety lock with a combination of four characters from 1 to 4. The opening and closing mechanism is driven by an SG 90 servo drive with a maximum rotation of 180 degrees. It is controlled by a 16-bit PWM. Fill control requires setting the frequency to 50[Hz]. The maximum value to which the bits are counted is the ICR register, which is 5000.

The password is entered from the DFRobot AD Key Board (V1.0). Ten monostable buttons connected in series to 5V, are responsible for entering characters. Behind each button is a resistor of varying resistance. The voltage value is measured with an ADC. The comparison voltage is Vcc. The measurement is made with an accuracy of 8 bits 5mm LEDs indicate the correctness of the entered password. The green LED lights up when the password is correct, while the red LED lights up when the password is not correct. It is controlled by a sine signal decreasing and increasing the OCR in a for loop from 0 to 255 for an 8-bit PWM timer. When the password is correct we can close the lock by pressing the K9 button. When the password is not correct, we can reset the procedure by pressing K0.

Thanks 😊

Michal B.