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2. Abstract

People will always look for gadgets that make their life more easier. For this we had some fun exploring the XMC2GO and we tried to implement at a smaller scale something that vehicles are using today.

3. Introduction, project aims and objectives

In this project we implemented a *Parking Sensor* who is using an ultrasonic ranging module to calculate the distance between car and obstacle and depending on what values the sensor gets, a RGB LED will be turned on with corresponding colour. To activate this module we use an infrared sensor who verifies if an obstacle stands in the way.

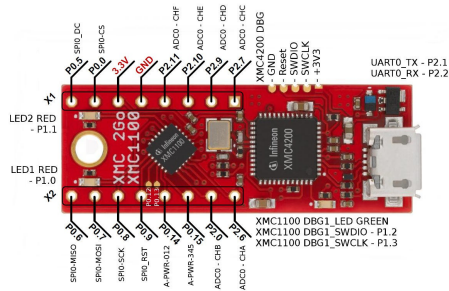
4. System overview

To develop this project we chose to use a XMC2Go development board from Infineon along with an infrared sensor Flying Fish – MH, an ultrasonic ranging module HC-SR04 and three RGB LEDs. The XMC2Go is intended for small devices which need processing power and small consumption (wearable devices). We wanted to illustrate in this project the simplicity and also the power of this board. This project can show how can three different events can be treated at the same time. The basic idea is Threading.

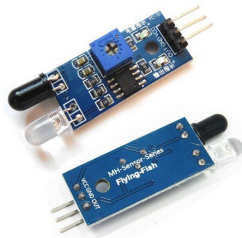
First we need to activate the infrared sensor by setting an obstacle for 5 seconds on his direction and for deactivating we let the obstacle for 10 seconds on his direction. Once activated the infrared sensor sends a signal to ultrasonic ranging module who will determine the range of the object. Those three RGB LEDs will lighten depending if the range is lower or higher.

5. Components used

1x XMC 2GO



- 1x 5V Light Detector analog/digital 'Flying Fish – MH Sensor Series'



- 1x Ultrasonic Ranging Module HC- SR04



- 10x connection wires
- 1x breadboard
- 1x mini-usb cable
- 3x RGB LEDs

6. Software

For implementation we used Arduino 1.8.4.

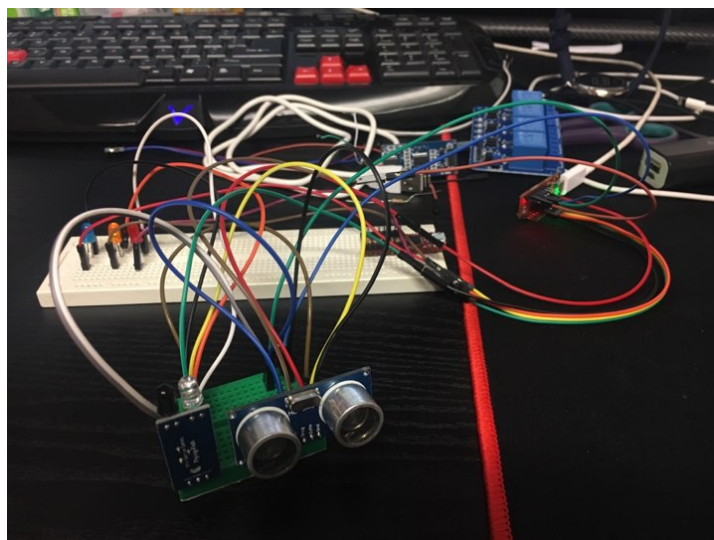
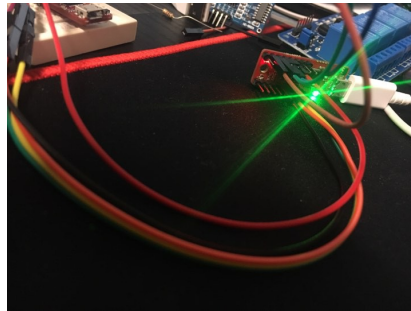
The most important part of the code is presented:

```
c = digitalRead(infraRed);
if (c!=0){
digitalWrite(14, HIGH);} // turn the LED on (HIGH is the voltage level)
else{
    // wait for a second
```

```
digitalWrite(14, LOW);} // turn the LED off by making the voltage LOW
distance = ultrasonic.distanceRead(CM);
if ( distance <= 2 ){
digitalWrite(Ora, LOW);
digitalWrite(Blue, LOW);
digitalWrite(Red, HIGH);}
else if ( distance > 2 && distance <= 4 ){
digitalWrite(Red, LOW);
digitalWrite(Blue, LOW);
digitalWrite(Ora, HIGH);}
else if (distance >6){
digitalWrite(Red, LOW);
digitalWrite(Ora, LOW);
digitalWrite(Blue, HIGH);}
}
```

7. Project results & applications

After testing the output of sensor we get the results we expected for.



8. Reference

https://www.infineon.com/cms/en/product/evaluation-boards/kit_xmc_2go_xmc1100_v1/
<http://www.micropik.com/PDF/HCSR04.pdf>

<https://defendtheplanet.net/2016/01/01/5v-light-detector-analog-digital-flying-fish-mh-sensor-series/>