Technical University of Cluj-Napoca

BLUETOOTH CONTROL ON LAB EXPERIMENTAL ROBOT

Student: Gui Andreea-Maria

Group: 30431 / 1

Laboratory Assistant: Attila Fuzes

1. Theme of the project

The theme of the project is the remote control of the experimental robot from to laboratory using a Bluetooth module.

2. Material used

The materials needed to make my project functional are:

- The experimental robot itself (from which, I needed the functionality of IC2 communication, of the servo motor, of both DC motors and of the sonar sensor as well)
- The Bluetooth module for Arduino (in my case, HC-50 model)
- The Logic Level Shifter
- All the connection wires
- 4 Batteries
- A mobile with Bluetooth and Arduino Remote Control application installed

3. Implementation

I started with the physical connection. In order to do this, I connected the HC-50 Bluetooth module to the Logic Level Shifter in the following way: RX sensor to LV3, TX sensor to LV4, and Vcc sensor to LV and GND sensor to GND shifter.

From the sensor to the Arduino Uno board, I connected the GND sensor to the ground of the board and the Vcc sensor to the 3.3 Arduino Board.

From the Logic Level Shifter to the Arduino Board, I connected the HV3 to pin 12 (the TX) and HV4 to pin A5 (the RX), and HV to 5 V Arduino Uno.

Concerning the code for the project, I used the code offered in the laboratory 9 examples as milestone. To that code, I added the functionality of the SoftwareSerial.h library (needed for the Bluetooth module) and I initiated the sonar sensor as NewPing.

The Baude rate for the SoftwareSerial mySerial was set to 9600. Using this transmission, the system received from the mobile application using the Bluetooth module one character at a time ('R' – right, 'F' – forward, 'L'

– left, 'B' – backward, 'S' -stop). This controlled the DC motors and made the experimental robot move in a certain direction.

For the Servo motor, I created 3 functioning modes – one when we have to give the angle, one that moves the motor 180 degrees with an increment of 10 and one that makes right-left shifts with an angle from 20 to 80 degrees.

As far as the sonar sensor is concerned, I read the values it conveys and display them in the Serial. When the distance is less than 25 centimeters, the experimental robot stops by itself.

4. Results

Now, the experimental robot can be controlled via Bluetooth and can go Forward or Backward, turn Right or Left and Stop. If there is an obstacle at less than 25 centimeters in front of it, it stops and avoids the impact.