Lab 5: Serial Communication

Objectives

This lab introduces serial communication. Students will observe how serial communication with the Arduino can help with troubleshooting and reading sensor data.

Materials

1) Arduino Uno

2) Makeblock Shield

3) IR Reciever Module

4) IR Remote

5) 1× RJ25 Cable

6) Wires for Building Circuits

Theory

Serial communication is the method of computer communication which involves sending one bit (a 0 or a 1) at a time. For us, this communication occurs between the computer and our Arduino through the USB cable. First, the serial communication needs to be initialized in the *void setup*() function.

```
1 Serial.begin(9600);
```

The 9600 value is the speed of data communication (or baud rate). Communication with the Arduino will only work when the baud rate in the program and serial monitor are set to the same value. To open the serial monitor, follow these steps:

• make sure the arduino is connected to the computer with the USB cable

• ensure the serial port is correctly selected (Tools → Serial Port)

• open the serial monitor (Tools → Serial Monitor)

The serial monitor can be used to debug a program, read sensor values, and other uses. There are two functions that print to the serial monitor: *print* and *println*. The *print* function prints a number or text without automatically moving to the next line. The *println* function works the same way as *print* but moves to the next line when finished.

```
1 float temp = analogRead(analogInPin);
2 Serial.print("The temperature is ");
3 Serial.println(temp, 2); // print variable with 2 decimal places & move to next line
```

Laboratory Exercises

IR remote controller

1. Connect the MakeBlock shield to the Arduino.

2. Use the RJ25 cable to connect the IR sensor to the shield. You can use one of the ports with the blue labels on the shield.
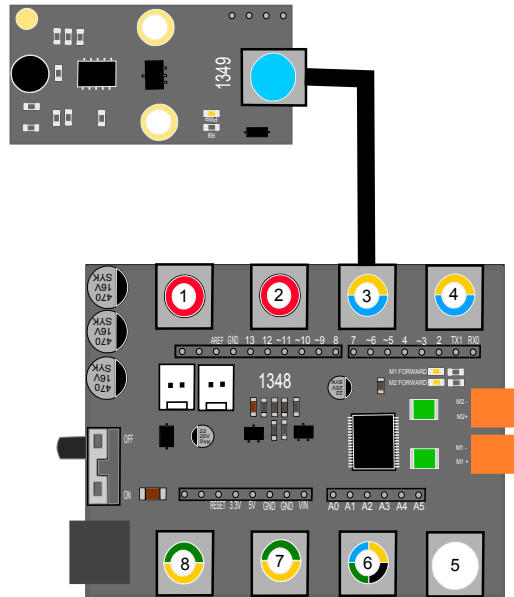

Figure 1: IR receiver

3. In sketchpad, open the TestInfaredReceiver example from the makeblock examples. In the code, change the port number to the respective port (eg: 3). Upload it to the Arduino.

4. Now try to find some use of the IR sensor for your robot. It can be moving a DC motor, turning on an LED, etc. Before starting to make it, discuss with TAs about your idea.

5. Unassemble the circuit and put every thing back in the boxes.

6. Do not leave the class before you understand all the steps of this lab.