RAK12006 WisBlock PIR Module Datasheet

Overview

Description

The RAK12006 is a Pyroelectric Infrared Radial (PIR) module. It is designed to detect occupancy and motion from the infrared radiated objects. The sensor uses AM312 from Senba Sensing Technology Co., Ltd.

Features

- Digital signal processing
- Built-in filter, screen the interference by other frequency
- Schmitt Trigger Output REL
- 3.3 V Power supply
- **Module size:** 15 X 25 mm

Specifications

Overview

Mounting

The RAK12006 module can be mounted on the IO slot of the WisBlock Base board. **Figure 1** shows the mounting mechanism of the RAK12006 on a WisBlock Base module, such as the RAK5005-O.
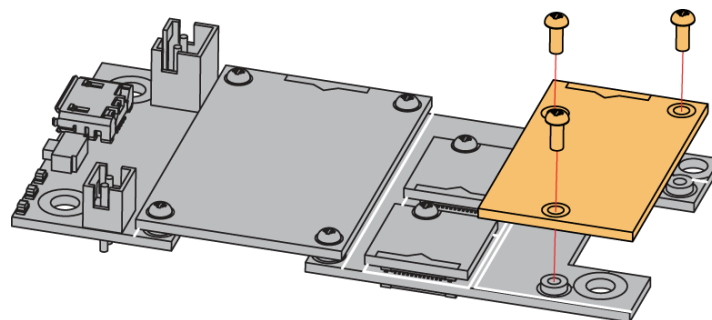

Figure 1: RAK12006 mounting mechanism on a WisBlock Base module

Hardware

The hardware specification is categorized into five parts. It shows the chipset of the module and discusses the pinouts and its corresponding functions and diagrams. It also covers the electrical and mechanical parameters that include the tabular data of the functionalities and standard values of the RAK12006 WisBlock PIR Module.

Chipset

Vendor	Part number
Senba Sensing Technology Co., Ltd	AM312

Pin Definition

The RAK12006 module has a 40-pin WisConnector that is compatible to the WisBlock Base IO Slot. The pin order of the connector and the pinout definition is shown in **Figure 2**.
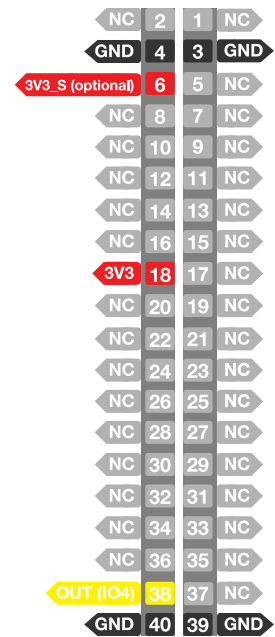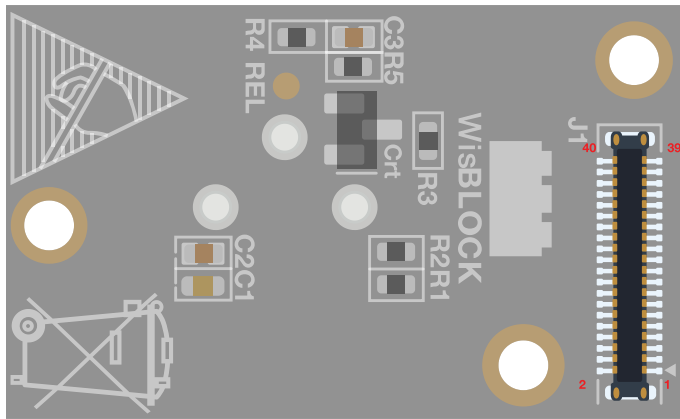
Figure 2: RAK12006 Pinout Schematic

> 📝 **NOTE**
>
> - Only **Digital OUT**, **3V3**, and **GND** are connected to WisConnector.
>
> - An optional **3V3_S** supply voltage can be used to turn ON or OFF the RAK12006 module through the IO2 pin. This can be helpful on low power application.
>
> - To disable the default **3V3** supply and use the alternative **3V3_S** supply source, the resistor jumpers R1 must be 0 Ω and R2 must be NC (not connected).

Electrical Characteristics

This section shows the maximum and minimum ratings of the RAK12006 module and its recommended operating condition. Refer to the table presented below.

Recommended Operating Condition

Symbol	Description	Min.	Nom.	Max.	Unit
VDD	Power Supply Voltage	-	3.3	-	V

Mechanical Characteristics

Board Dimensions

Figure 3 shows the mechanical dimensions of the RAK12006 Module.
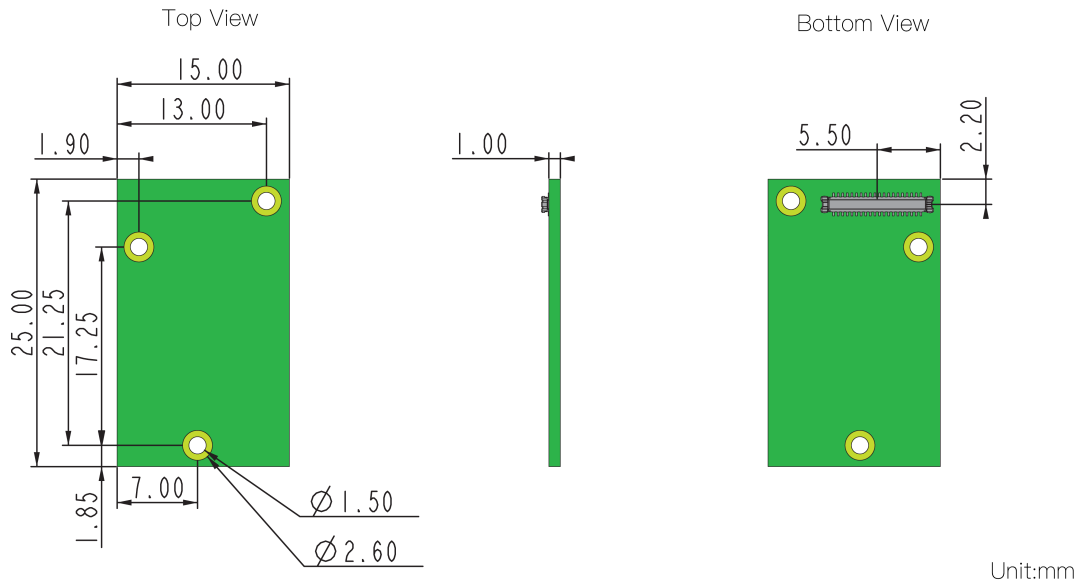
Top View

Bottom View

Unit:mm

Figure 3: RAK12006 Mechanical Dimensions
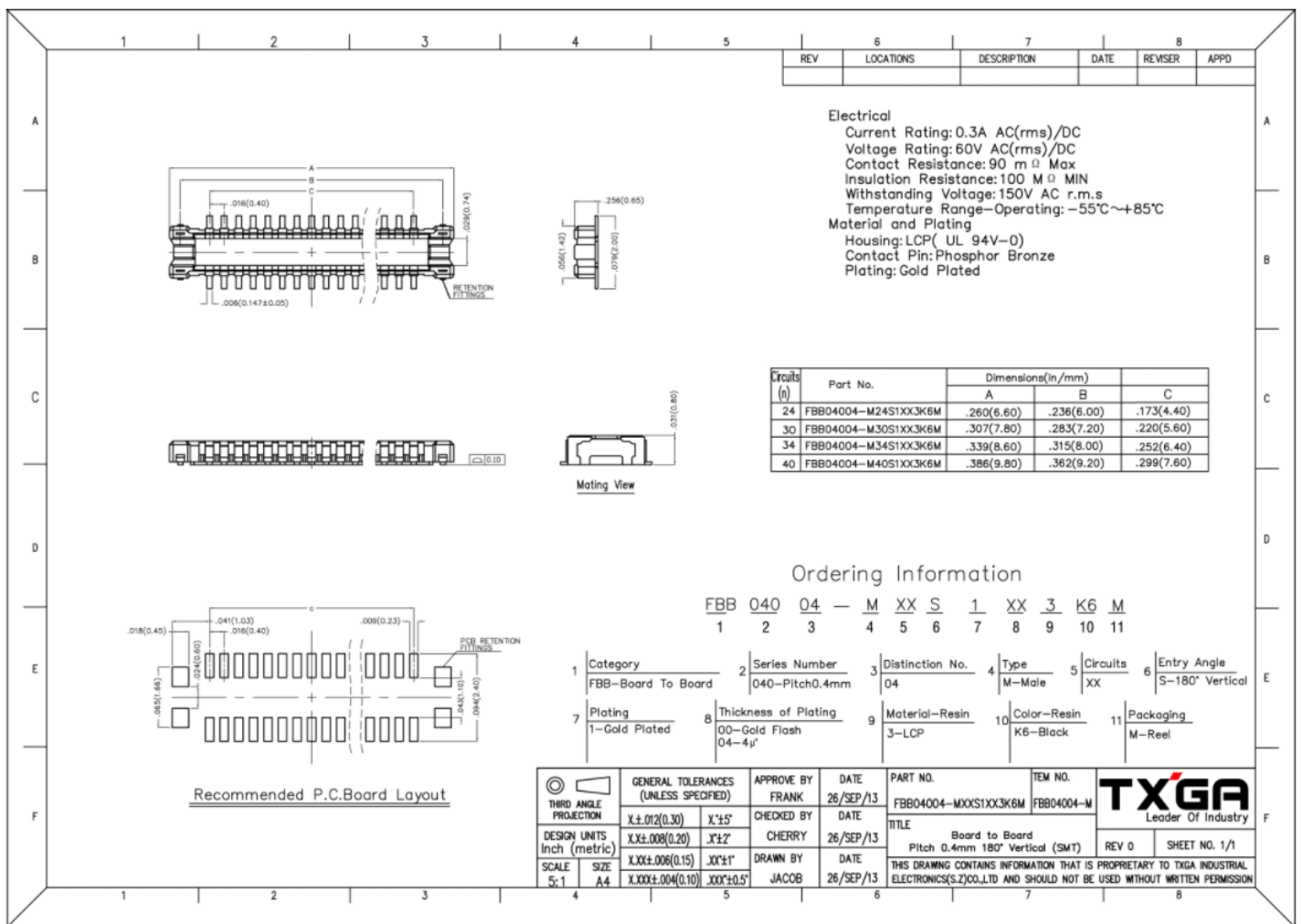
WisConnector PCB Layout

Figure 4: WisConnector PCB Footprint and Recommendations
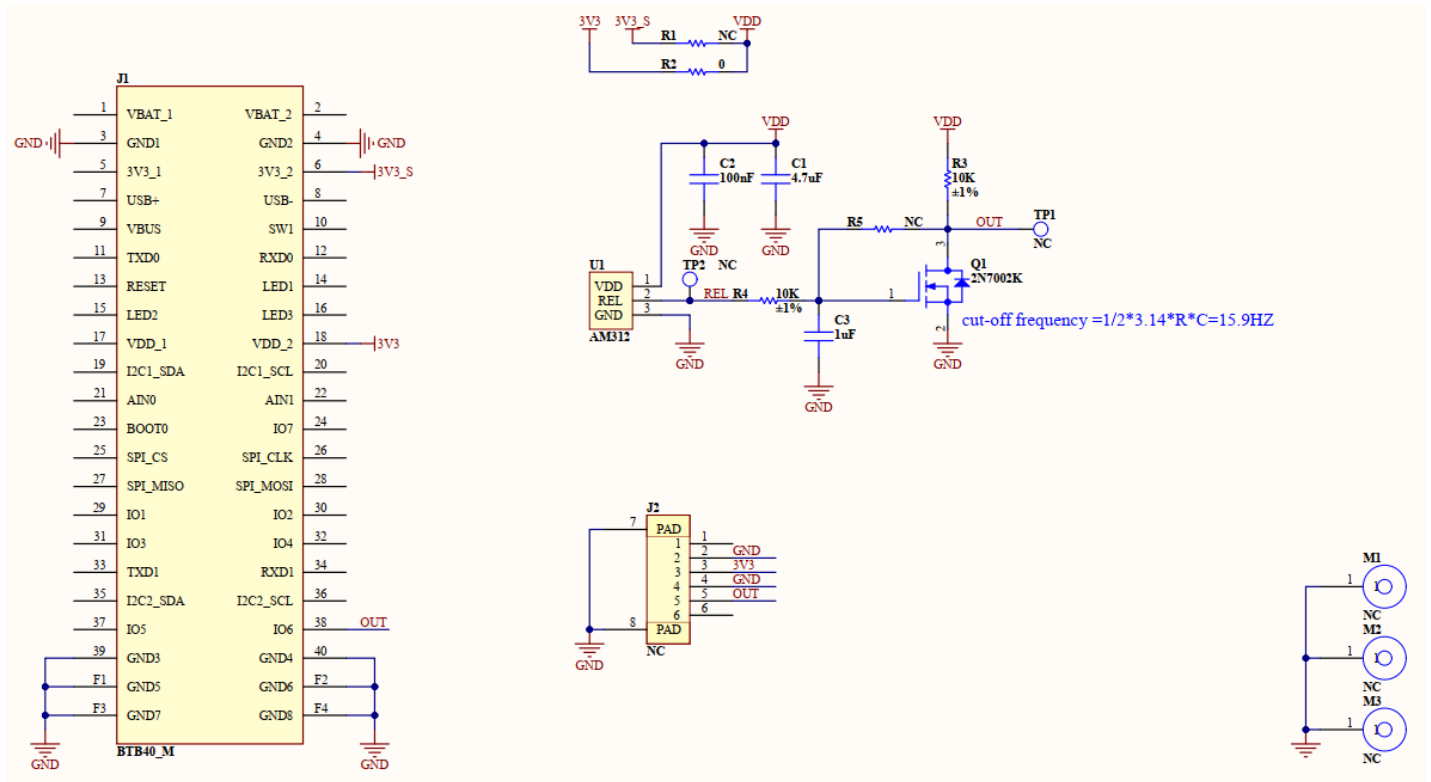
Schematic Diagram

Figure 5 shows the schematic of the RAK12006 module.

Figure 5: RAK12006 WisBlock PIR Module Schematic

RAK12006 Quick Start Guide

Prerequisite

What Do You Need?

Before going through each and every step on using the RAK12006 WisBlock module, make sure to prepare the necessary items listed below:

Hardware

- RAK12006 WisBlock PIR Module⧉
- Your choice of WisBlock Base⧉
- Your choice of WisBlock Core⧉
- USB Cable
- Li-Ion/LiPo battery (optional)⧉
- Solar charger (optional)⧉

Software

- Download and install ArduinoIDE⧉ .
- To add the RAKwireless Core boards on your Arduino board, install the RAKwireless Arduino BSP. Follow the steps in the Github repo⧉ .

Product Configuration

Hardware Setup

The RAK12006 is a Pyroelectric Infrared Radial (PIR) module. It is designed to detect occupancy and motion from infrared radiated objects. The sensor uses AM312 from Senba Sensing Technology Co., Ltd.

For more information about RAK12006, refer to the Datasheet.

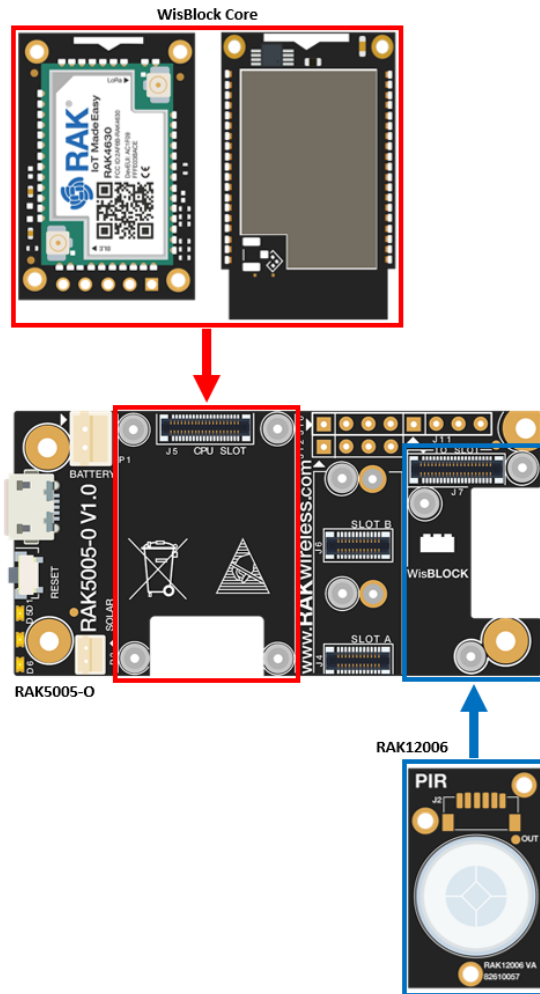**Figure 1:** RAK12006 connection to WisBlock Base

Assembling and Disassembling of WisBlock Modules

Assembling

The RAK12006 module can be mounted on the IO slot of the WisBlock Base board, as shown in **Figure 2**. Also, always secure the connection of the WisBlock module by using compatible screws.
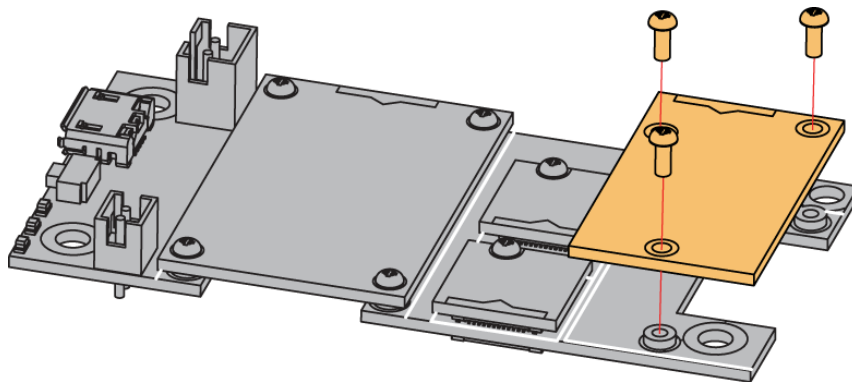

Figure 2: RAK12006 mounting connection to WisBlock Base module

Disassembling

The procedure in disassembling any type of WisBlock modules is the same.
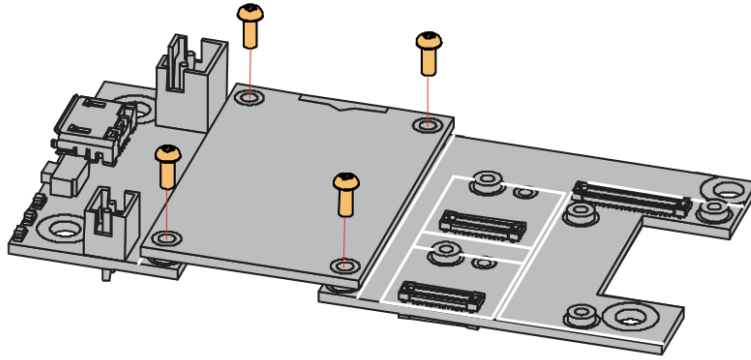
1. First, remove the screws.

Figure 3: Removing screws from the WisBlock module

2. Once the screws are removed, check the silkscreen of the module to find the correct location where force can be applied.
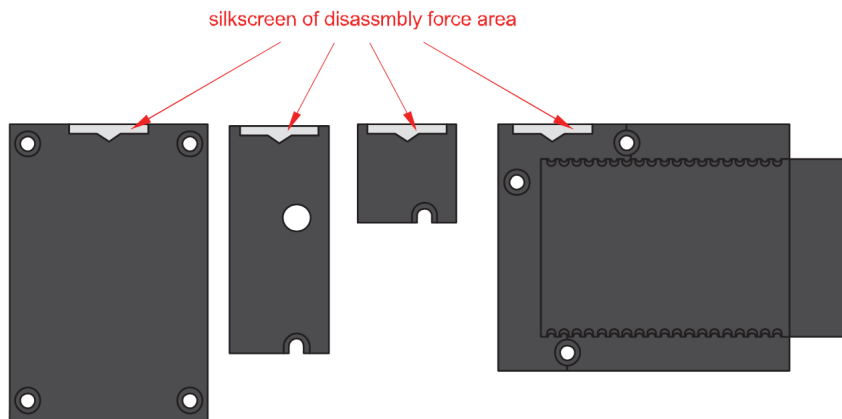

Figure 4: Detaching silkscreen on the WisBlock module

3. Apply force to the module at the position of the connector, as shown in **Figure 5**, to detach the module from the baseboard.
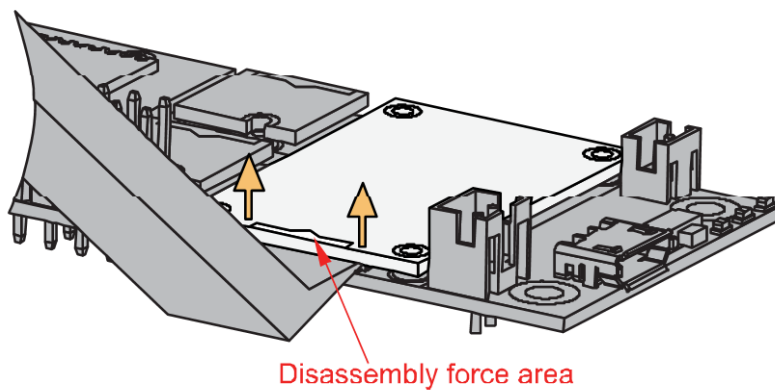

Figure 5: Applying even forces on the proper location of a WisBlock module

> 📝 **NOTE**
>
> If you will connect other modules to the remaining WisBlock Base slots, check on the WisBlock Pin Mapper ☐ tool for possible conflicts.

After all this setup, you can now connect the battery (optional) and USB cable to start programming your WisBlock Core.

Software Configuration and Example

Initial Test of the RAK12006 WisBlock Module

If you already installed the RAKwireless Arduino BSP ⧉ , the WisBlock Core and example code should now be available on the Arduino IDE.

1. You need to select first the WisBlock Core you have, as shown in **Figure 6** to **Figure 8**.
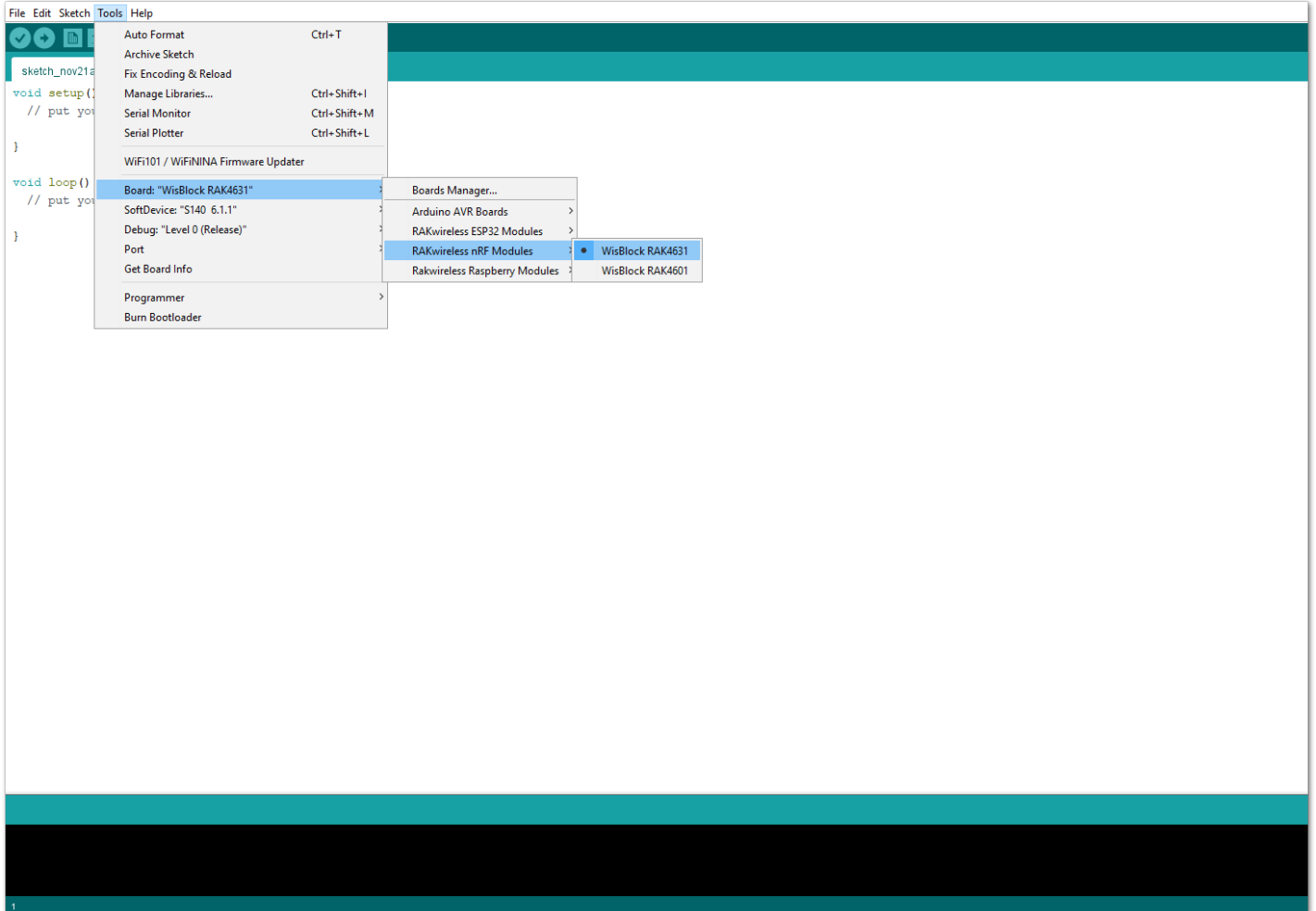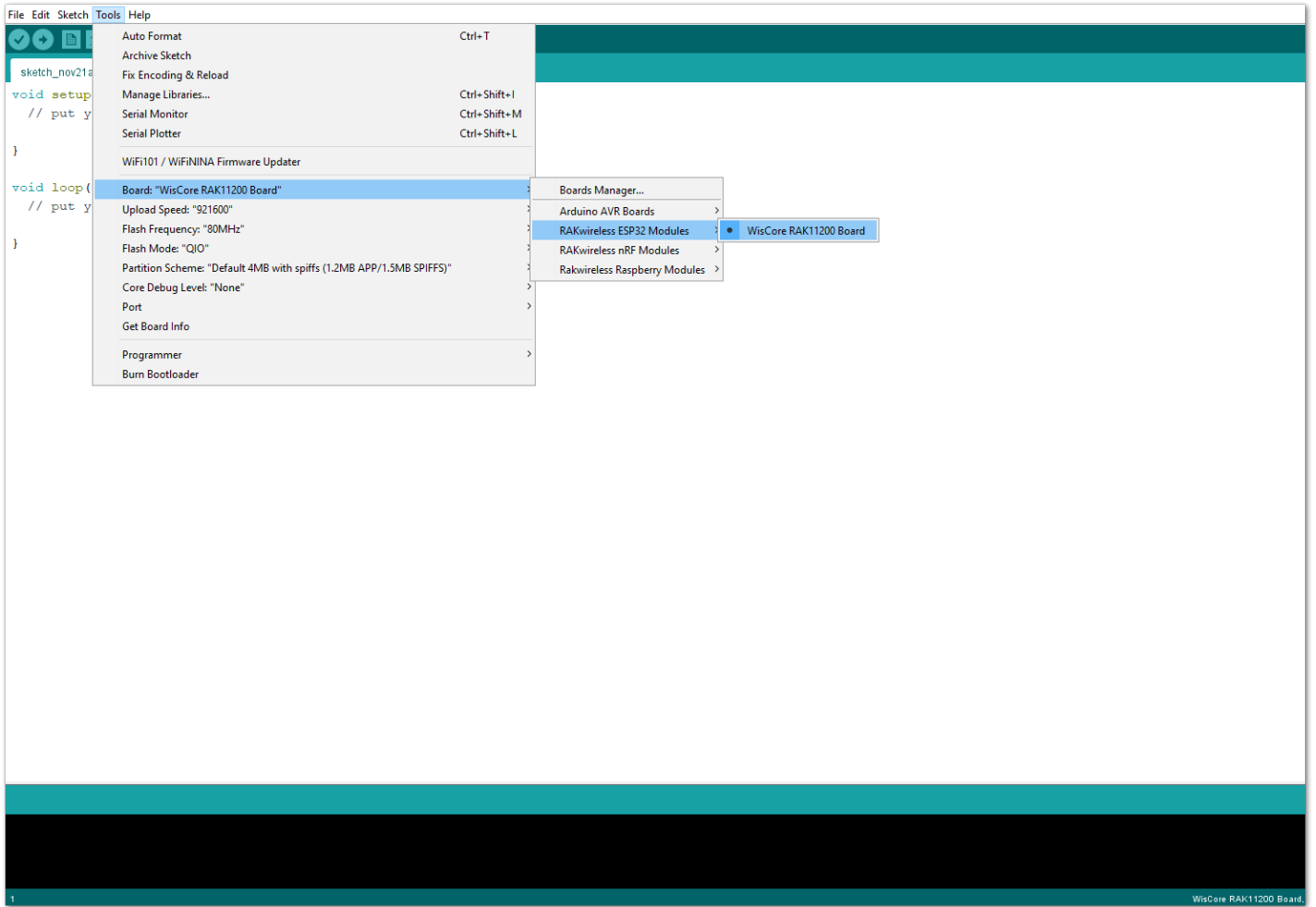

Figure 6: Selecting RAK4631 as WisBlock Core

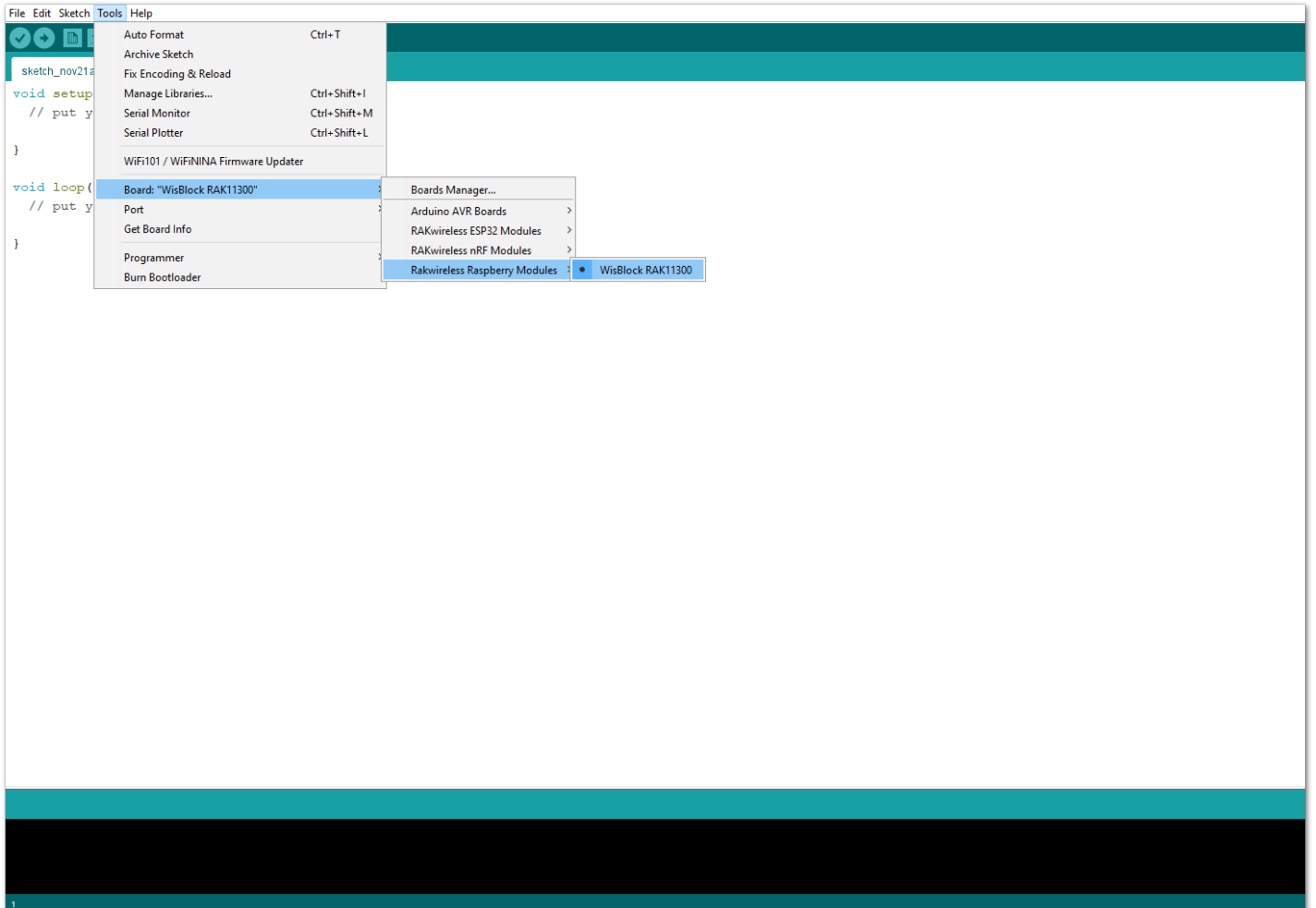**Figure 7:** Selecting RAK11200 as WisBlock Core

Figure 8: Selecting RAK11310 as WisBlock Core

2. Next, copy the following sample code into your Arduino IDE.

```c
/**
 * @file RAK12006_MotionDetection.ino
 * @author rakwireless.com
 * @brief motion detection example
 * @version 0.1
 * @date 2021-06-15
 * @copyright Copyright (c) 2021
 */
#include <Wire.h>
#define SENSOR_PIN  WB_IO6   // Attach AM312 sensor to Arduino Digital Pin WB_IO6

int gCurrentStatus = 0;         // variable for reading the pin current status
int gLastStatus = 0;            // variable for reading the pin last status

void setup()
{
    pinMode(SENSOR_PIN, INPUT);   // The Water Sensor is an Input
    pinMode(LED_GREEN, OUTPUT);  // The LED is an Output
    pinMode(LED_BLUE, OUTPUT);   // The LED is an Output
    Serial.begin(115200);
    time_t timeout = millis();
    while (!Serial)
    {
      if ((millis() - timeout) < 5000)
      {
        delay(100);
      }
      else
      {
        break;
      }
    }
    Serial.println("=======================");
    Serial.println("    RAK12006 test");
    Serial.println("=======================");
}

void loop() {

  gCurrentStatus = digitalRead(SENSOR_PIN);
  if(gLastStatus != gCurrentStatus)
  {
    if(gCurrentStatus == 0)
    {//0: detected   1: not detected
      Serial.println("IR detected ...");
     digitalWrite(LED_GREEN,HIGH);   //turn on
     digitalWrite(LED_BLUE,HIGH);
    }
    else
    {
      digitalWrite(LED_GREEN,LOW);
      digitalWrite(LED_BLUE,LOW);   // turn LED OF
    }
    gLastStatus = gCurrentStatus;
  }
  else
  {
    delay(100);
  }

}
```

3. Once the example code is open, you can now select the right serial port and upload the code, as shown in **Figure 9** and **Figure 10**.
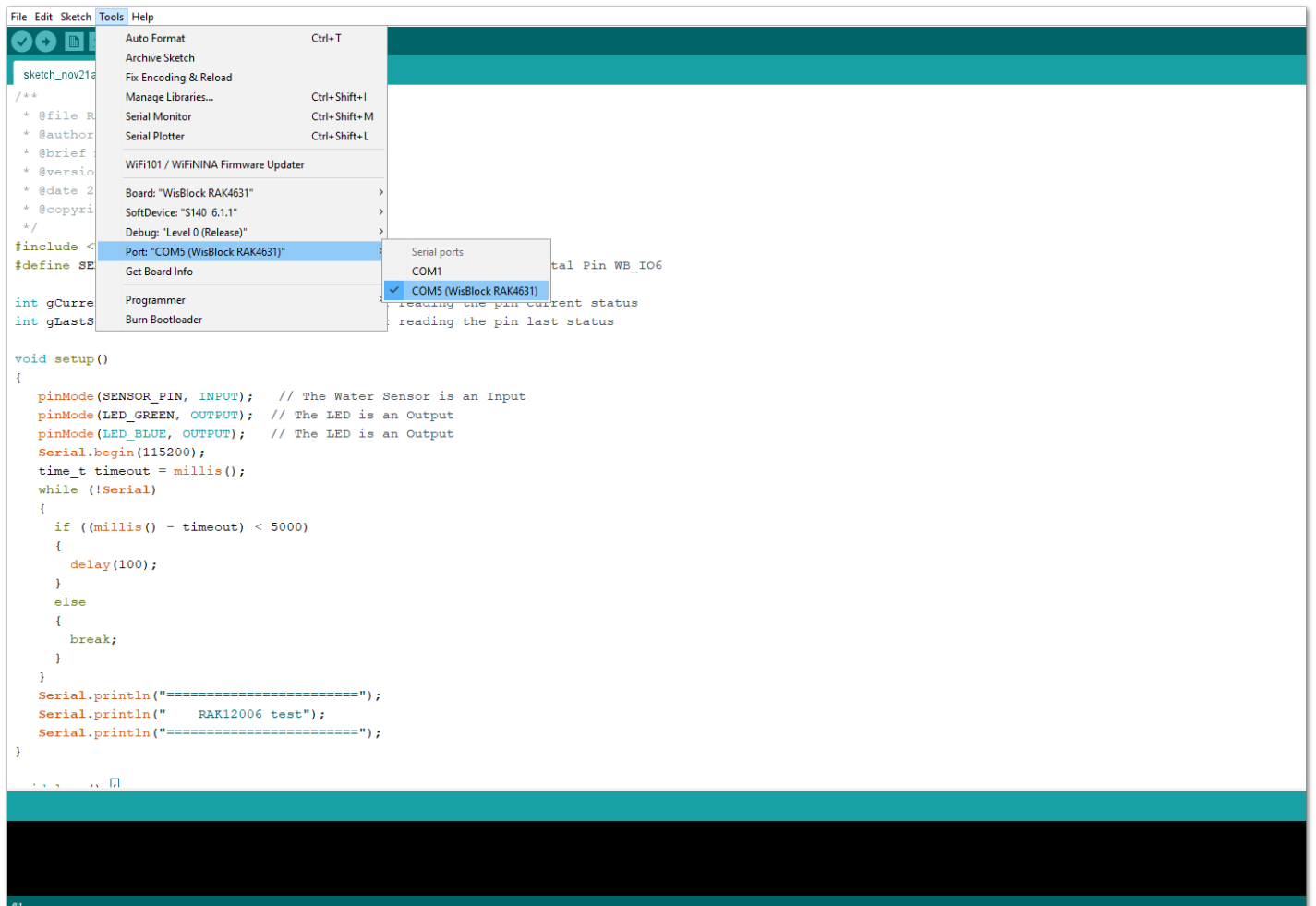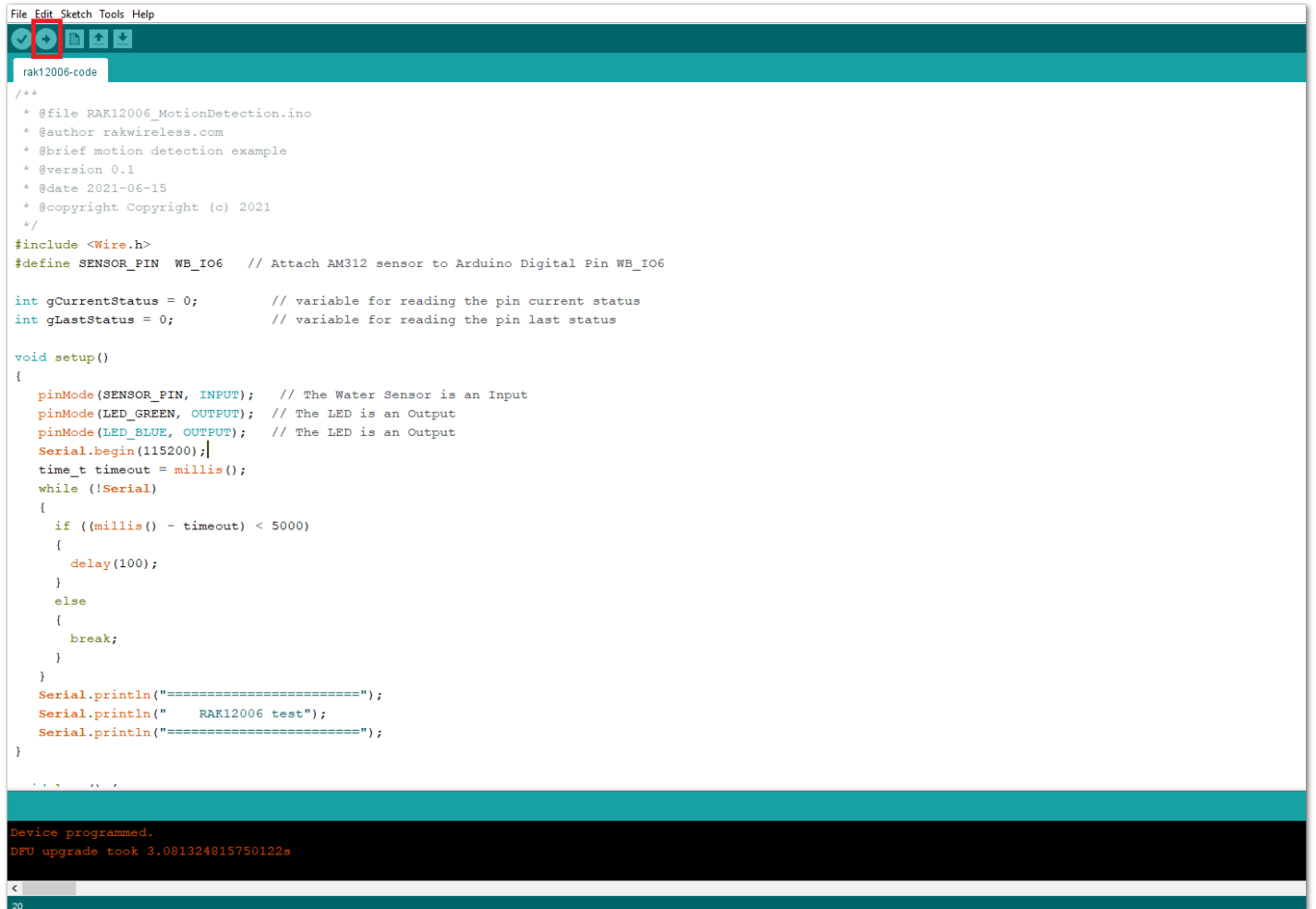
Figure 9: Selecting the correct Serial Port

Figure 10: Uploading the RAK12006 example code

4. When you successfully uploaded the example sketch, open the Serial Monitor of the Arduino IDE to see the sensor's reading logs, as shown in **Figure 11**, and you will also see the green LED and blue LED from the WisBlock Base lights up whenever it detects motion based on changes in infrared light in the environment. Therefore, your RAK12006 is properly communicating to the WisBlock core.
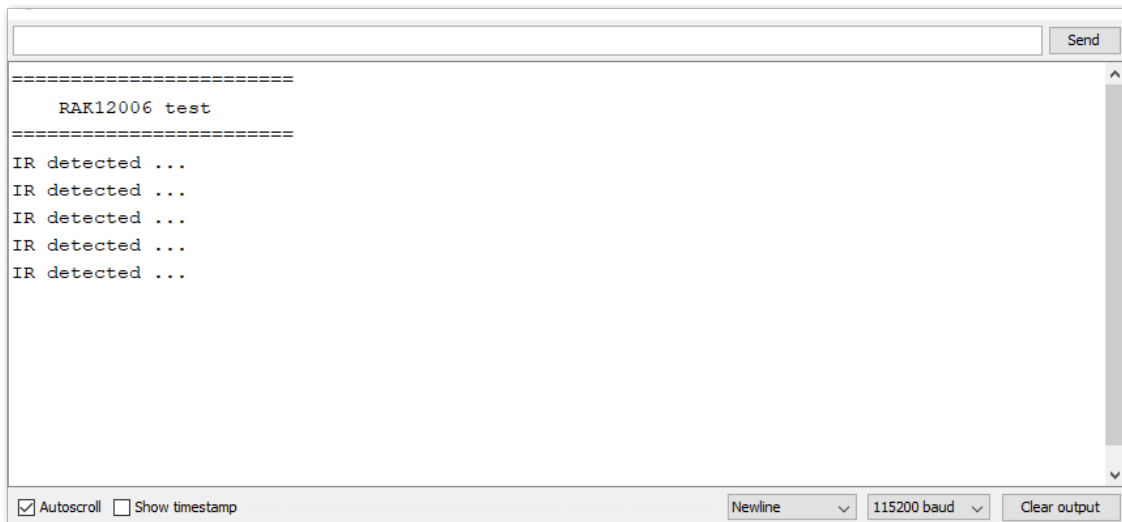

Figure 11: RAK12006 PIR detection readings

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