

Week 05

Keel Bone Chicken Project

9/25/2025

Progress

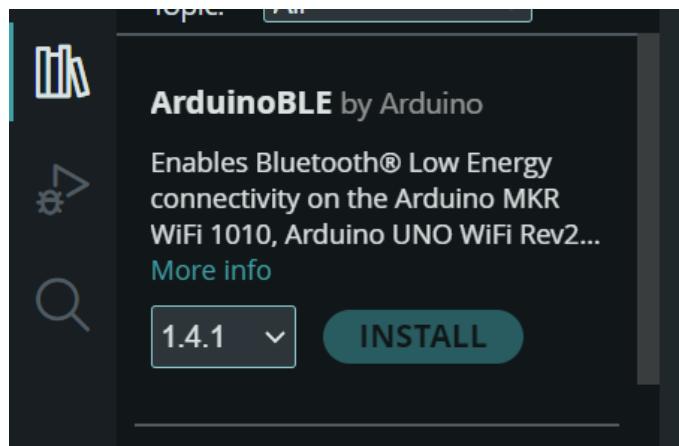
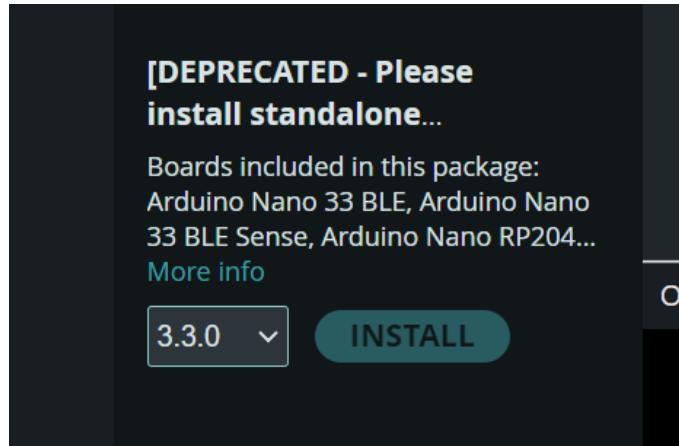
Began Arduino Programming and PCB Design

- Programming Arduino
- GitHub Organization/Formulization
- Schematic Creation
- Circuit Board Creation

Libraries Needed

Several Libraries are needed to start the Arduino code

- Install Deprecated version of Arduino Software
- Install ArduinoBLE for Bluetooth communication
- Install Arduino_BL2Y for communication to Arduino Nicla Sense ME



Tester code for Modules (Working)

Gyroscope

IMU

Temperature

Gyroscope.ino

```
1 #include <Arduino_BHY2.h>
2 #include <BQ25120A.h>
3 #include <Nicla_System.h>
4 #include <RGBled.h>
5
6 SensorXYZ gyroscope(SENSOR_ID_GYRO);
7
8 void setup() {
9   Serial.begin(115200);
10  BHY2.begin();
11  gyroscope.begin();
12}
13
14 void loop() {
15  BHY2.update();
16
17  int16_t valueX = gyroscope.x();
18  int16_t valueY = gyroscope.y();
19  int16_t valueZ = gyroscope.z();
20}
21}
```

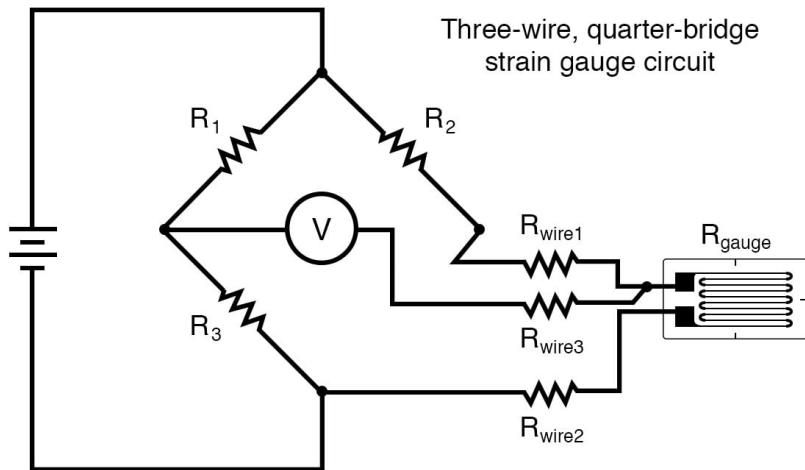
IMU

```
1 void setup() {
2   Serial.begin(9600);
3
4   while(!Serial);
5
6   if (!IMU.begin()) {
7     Serial.println("Failed to initialize IMU!");
8     while (1);
9   }
10
11  Serial.print("Accelerometer sample rate = ");
12  Serial.print(IMU.accelerationSampleRate());
13  Serial.println("Hz");
14  Serial.println();
15
16  Serial.print("Gyroscope sample rate = ");
17  Serial.print(IMU.gyroscopeSampleRate());
18  Serial.println("Hz");
19  Serial.println();
20}
21}
```

```
1 #include "Arduino_BHY2.h"
2
3 Sensor temperature(SENSOR_ID_TEMP);
4 float temperatureValue = 0;
5
6 void setup(){
7   Serial.begin(115200);
8   BHY2.begin();
9   temperature.begin();
10 }
11
12 void loop(){
13   BHY2.update();
14   temperatureValue = temperature.value();
15
16   Serial.print("Temperature :");
17   Serial.println(temperatureValue);
18 }
```

Strain Gauge

Needs to be created on the schematic



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GitHub

Organization Metric for Next ~2 Semesters

- https://github.com/NHuang58/Biomedical_Device_PCB.git

The screenshot shows the GitHub repository page for 'Biomedical_Device_PCB'. The repository is private, has 1 branch, and 0 tags. It contains 4 commits from user 'NHuang58' made 10 hours ago. The commits are:

- Documentation/Presentations: Initial Commit, 10 hours ago
- Hardware/Rev. 1: Started Work on Schematic, 10 hours ago
- README.md: Initial commit, 3 days ago

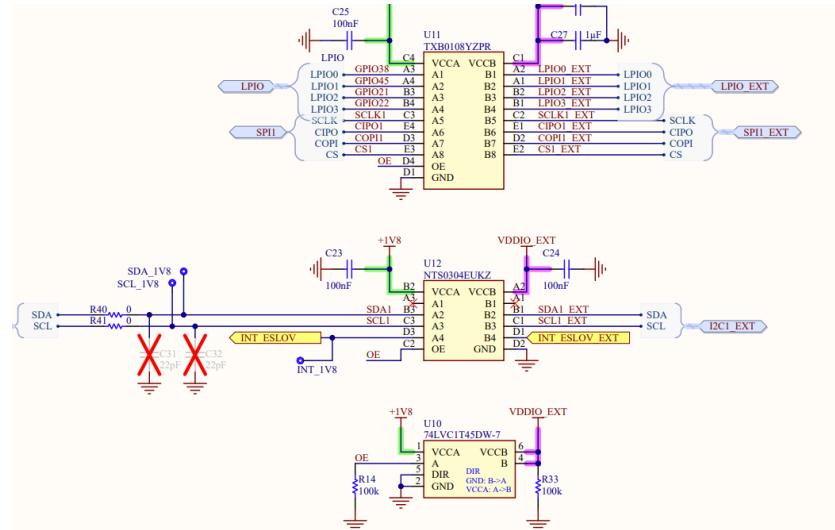
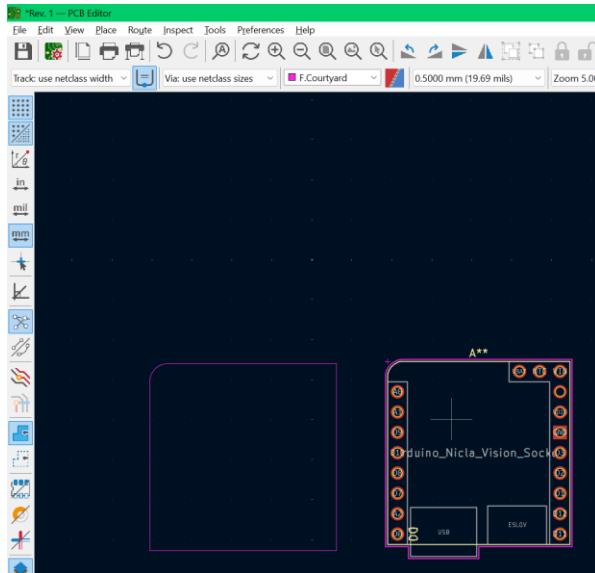
The README file content is as follows:

```
Biomedical_Device_PCB
Hardware Prototyping and Design for the Keel Bone Project pertaining the extensive housing of Chickens
```

PCB & Schematic Creation

Started developing on KiCad: <https://www.kicad.org/download/>

- Conventional Nicla Sense ME Schematics NOT available for download:
- Schematics made available online however:
<https://docs.arduino.cc/resources/schematics/ABX00050-schematics.pdf>
- Needed to create own layout within PCB editor



Thank You

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