PiCopter Manual **Brendan Martin**

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# 1. Addresses

The following is a list of components and their associated protocols and hardware addresses used on the PiCopter.

|  |  |  |
| --- | --- | --- |
| **Component** | **Protocol** | **Address** |
| 9DoF Razor IMU M0 | I2C | 0x09 |
| BerryGPS | Serial | /dev/TTYAMA0 |
| BM388 Pressure Sensor | I2C | 0x77 |
| Zio 16 Servo Controller | I2C | 0x40 |
| VL53L1X | I2C | 0x29 |

# 2. Motor Connections & Operation

The quadcopter’s four (4) electronic speed controllers are connected to the Zio controller board according to the following Table.

|  |  |  |
| --- | --- | --- |
| **Motor ID** | **Zio 16 Servo Controller Channel** | **Rotation Direction** |
| 1 | 15 | CW |
| 2 | 0 | CCW |
| 3 | 4 | CW |
| 4 | 11 | CCW |

The ESC’s in use are HobbyPower 30A Brushless Speed Controllers (2-4S Lipo BEC 5V/2A) running SimonK firmware. The Zio controller board is configured to send 400 kHz PWM signals with variable pulse widths ranging from 1,000 to 2,000 milliseconds. A dead band between 1,000 and ~1,070 milliseconds is typically observed. This results in command resolution of ~1,300 steps, or pulse widths of 13 milliseconds.