**Rons broomstick**

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Description automatically generated

We included wire.h because it’s a very important library for the communication with the IMU. The IMU\_ADDR is the address of the IMU to be able to communicate.

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The important variables that will be used throughout the program t oread raw data and to calculate the angles. We only needed x and z for this project as we’re looking for the pitch and roll angles.

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The read2Bytes function reads two bytes from the IMU given a registry by reading 1 byte then shifting it 1 byte to the left then reading another byte.

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Description automatically generated

This function is used for setting registry configs. It was only used once for setting the gyro config.

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Simple blink method that changes the state of the led.

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Error calculation function that should only be used when the sensor is stationary. It reads the stationary values 200 times then gets the mean of that raw data and that would be the error value that should be removed from our values later on.

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In the setup we set the pin mode for the led and begin transmission with the IMU to wake it up from its default sleep state. The we set the gyro config to 500 dps. Then we calculate stationary error and finally get the current time.

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Description automatically generated

In the loop, we first calculate elapsed time since last calculation. Then we get raw data and convert it to degrees per second and subtract the previously calculated error. Then, we convert it to degrees by integrating it or multiplying it by the elapsed time. Finally, we check if either angle has accumulated to more that 60 in which case, we rapidly brink red led and then start loop again.