I2C Communication interface

The I2C interface consists of 2 pins:

- SCL, also known as the clock pin.
- SDA, also known as the data pin.

With these two connections, and a power supply, it is possible to get data from a variety of sensors measuring physical parameters.

I2C function calls

p.I2C.Scan()

```
def I2CScan()
scan the I2C bus, and return a list of addresses that responded

  return: list of numbers between 0-127.
```

p.I2C.writeBulk()

```
def I2CWriteBulk(address,bytestream)
write a set of bytes to an I2C address

  address: Address of I2C slave device. 0-127
  bytestream: list of bytes to write
  return: True if success.
```

p.I2C.readBulk()

```
def I2CReadBulk(address,register,total_bytes)
write a set of bytes to an I2C address

  address: Address of I2C slave device. 0-127
  register: The starting address in the I2C slave device from where
bytes are to be read
  total_bytes: Total number of bytes to read
  return: bytes, timeout
  "ignore contents if timeout==True"
```

Monitor I2C Sensors

> ℹ️ **List of I2C sensors supported thus far (Minimal data logging. Configuration options available for some)**

- MS5611 : 24 bit pressure and temperature sensor. Can resolve 15cm height variations
- BMP280 : Pressure and temperature Sensor
- BME280: Humidity measurement
- TSL2561/BH1750: Light intensity sensor
- MPU6050: 3 Axis Accelerometer, 3 axis Angular velocity (Gyro)
- MPU9250 : 9-DOF sensor Accel/Gyro/Magnetic Fields
- VL53L0X : Distance measurement (LIDAR)
- MLX90614: Passive IR temperature sensor
- AD8232 : ECG instrumentation amplifier
- with 3 electrodes
- AD9833: Precision Sine Wave generator
- Dual AD9833 with 3V output
- AD9833: Precision Sine Wave generator
- Single output. 0.6V P2P
- Servo Motors via SQ1, SQ2, or PCA9685
- AHT10: Humidity Sensor
- MAX44009; Visible Spectrum Luminosity sensor
- QMC5883L/HMC5883L : 3 Axis Magnetometer
- ML8511 : UV sensor
- MAX30100: Heart rate and pulse oximetry
- INA219 : High Side Current Sensing
- ADS1115 : 16 bit , 4 channel voltmeter
- TCS34725 : RGB Color sensor
- ADXL345: 3 axis accelerometer
- SR04 : Distance sensor (Sound based)

Luminosity sensor(TSL2561) Example

A light sensor is being monitored with the flash of the camera enabled. As the camera approaches the sensor, the readings go up. Not a very clever example. TODO.

Project Example with TSL2561 light sensor: Malus Law