Pi PIR Motion Sensor Tutorial

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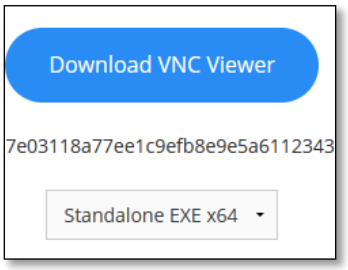
Grove ToF Sensor Sensor Documentation

Grove Time of Flight Distance Sensor (ToF) laser-ranging lidar sensor

https://www.seeedstudio.com/Grove-Time-of-Flight-Distance-Sensor-VL53L0X.html

RealVNC Viewer

RealVNC viewer allows us to remotely control the Raspberry Pi in headless mode.



1. Go to https://www.realvnc.com/en/connect/download/viewer/
2. Download the VNC Viewer Standalone EXE anywhere you want to run the program from. You don't have to install it.
3. Double Click **VNC Viewer**.
4. Type in the IP address of your robot → Click **Connect**.

Tutorial 1: Install the Grove Library

1. Shutdown the Pi. (Do not connect sensors when the Pi has power.)
2. Plug the ToF sensor into an I2C Port.
3. Mount the sensor on a sensor mount.

4. Powerup the Pi.
5. Open a terminal.
6. Install the Grove Library.

```
# Change to the pi user home directory
cd ~
# Clone the grove.py code
git clone https://github.com/Seeed-Studio/grove.py
cd grove.py
# Python3 install grove library
sudo pip3 install .
# Install tof library
sudo pip3 install rpi-vl53l0x
```

Tutorial 2: Hello ToF Distance Sensor

1. Open a terminal. Type in the following commands.

```
# Change to your home folder.
cd ~
# Run the sample program that came with the grove library
python3 grove.py/grove/grove_time_of_flight_distance.py
```

2. Move your hand in front of the sensor. The distance readings should change.

Tutorial 3: ToF Distance Sensor

Let's measure some distance!

1. Copy the pir example program to our home folder.

```
# Change to your home directory
cd ~
# Copy the sample file to your home directory as tof.py
cp grove.py/grove/grove_time_of_flight_distance.py tof.py
# Use geany to edit the tof.py file
geany tof.py
```

Let's modify some code on the original program to display inches.

```
59      while True:
60          st = vl53.wait_ready()
61          if not st:
62              continue
63
64          # Read millimeters from sensor
65          mm = vl53.get_distance()
66          # Convert to inches
67          inches = mm * 0.0393701
68          print(f"Distance = {mm:,.0f} mm  {inches:.0f} in")
69
70          time.sleep(0.5)
```

Run the program: **python3 tof.py**

Move your hand back and forth in front of the sensor.