

# Experiment - 8

(Working with MPU - 9250 sensor)

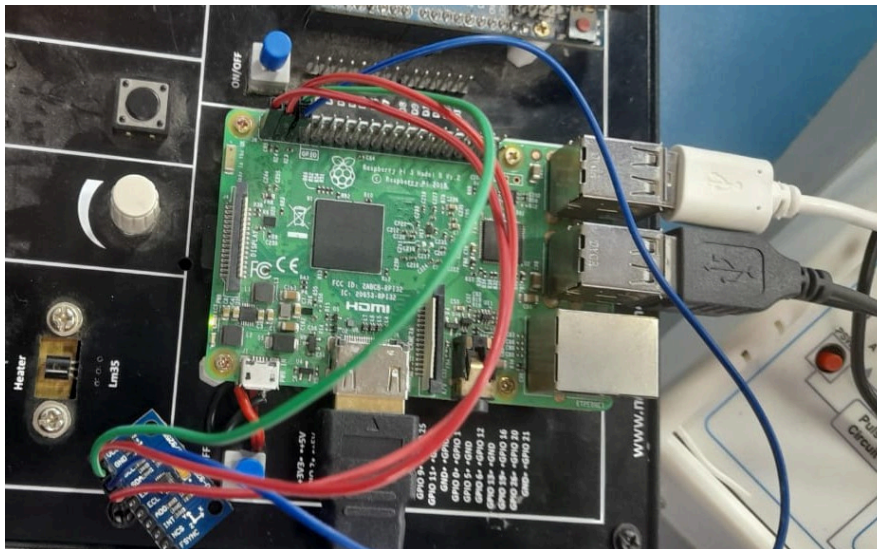
**Aim** = To connect Raspberry pie 4 microcontroller with MPU - 9250 to get the data of acceleration, angular velocity and magnetic field.

## Equipments Required:

1. Raspberry Pi-4 Microcontroller Board
2. VGA cable, VGA to Hdmi and Hdmi to micro-usb cables.
3. MPU-9250 sensor
4. Jumper wires
5. Monitor
6. Mouse
7. Keyboard

## Methodology:

Circuits connections are shown below. In below connection VCC of MPU-9250 is connected to 3.3V pin of raspberry pie board and both ground pins are connected together, SDA pin and SCL pins of MPU-9250 are connected to GPIO-2 and GPIO-3 pins of raspberry pie 4 board.



**Results:-** The drive link which contains the video of results (output data from accelerometer, gyroscope and magnetometer) is :- [Drive link](#)

**Conclusion:-** We learnt about the working of MPU-9250 and also learnt how to make its connection with raspberry pie, we also understood the code which helps to link MPU9250

and raspberry pie 4 board to obtain data of acceleration, angular velocity and magnetic field around sensor.

Some of its applications of this sensor are for balancing and stabalisation of robots, drones and UROVs, recognize specific gestures for smart home control, Track acceleration, deceleration, and tilts in automobiles, **ADAS (Advanced Driver-Assistance Systems)** in which we use orientation data for lane departure warnings or stability control

**Code:-** The code is written in THONNY software as shown below:-

```
import time
from mpu9250_jmdev.registers import *
from mpu9250_jmdev.mpu_9250 import MPU9250

# Create an MPU9250 instance
mpu = MPU9250(
    address_ak=AK8963_ADDRESS,
    address_mpu_master=MPU9050_ADDRESS_68, # In case the MPU9250 is connected to
    another I2C device
    address_mpu_slave=None,
    bus=1,
    gfs=GFS_1000,
    afs=AFS_8G,
    mfs=AK8963_BIT_16,
    mode=AK8963_MODE_C100HZ)

# Configure the MPU9250
mpu.configure()

while True:
    # Read the accelerometer, gyroscope, and magnetometer values
    accel_data = mpu.readAccelerometerMaster()
    gyro_data = mpu.readGyroscopeMaster()
    mag_data = mpu.readMagnetometerMaster()

    # Print the sensor values
    print("Accelerometer:", accel_data)
    print("Gyroscope:", gyro_data)
    print("Magnetometer:", mag_data)

    # Wait for 1 second before the next reading
    time.sleep(1)
```