Viewing IMU Data with RDK

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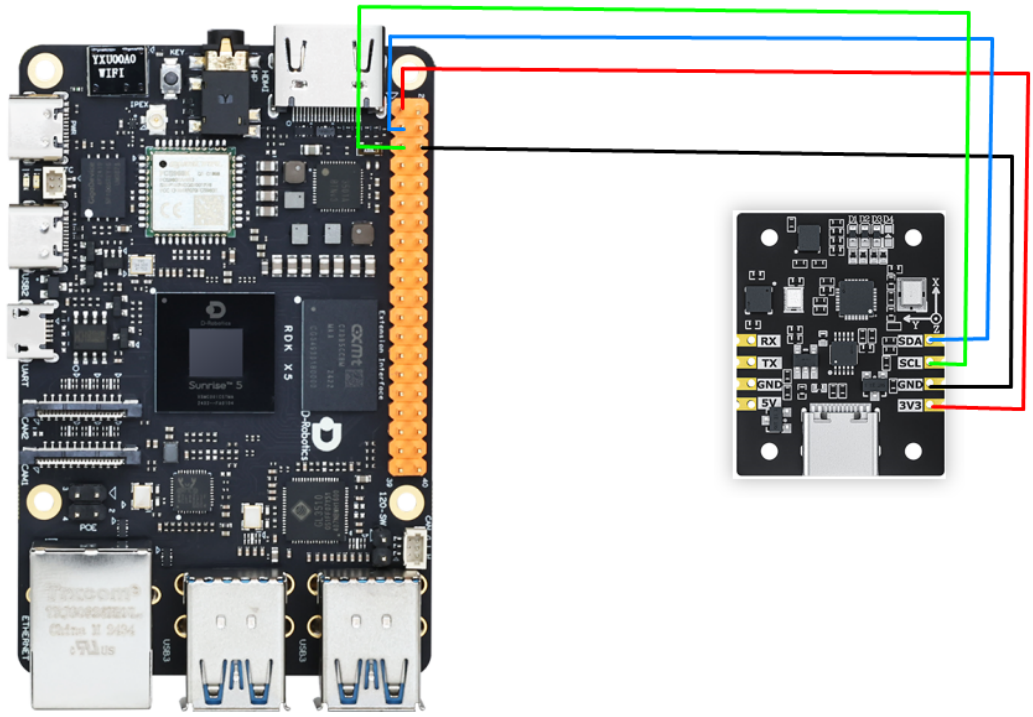
1. Connecting the Device

This tutorial uses RDK x5 motherboard version 3.3.3 as an example.

Connect the IMU attitude sensor to the I2C interface of the RDK X5 motherboard as shown in the diagram below.



IMU Attitude Sensor	RDK X5 (Physical Pins)
SDA	3
SCL	5
GND	GND
3.3V	3.3V

2. Check Device Status

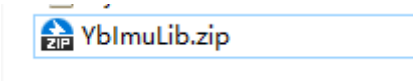
Check I2C Device

```
python3 /app/40pin_samples/test_i2c.py
```

3. Install Driver Library

3.1 Download the Python driver library file

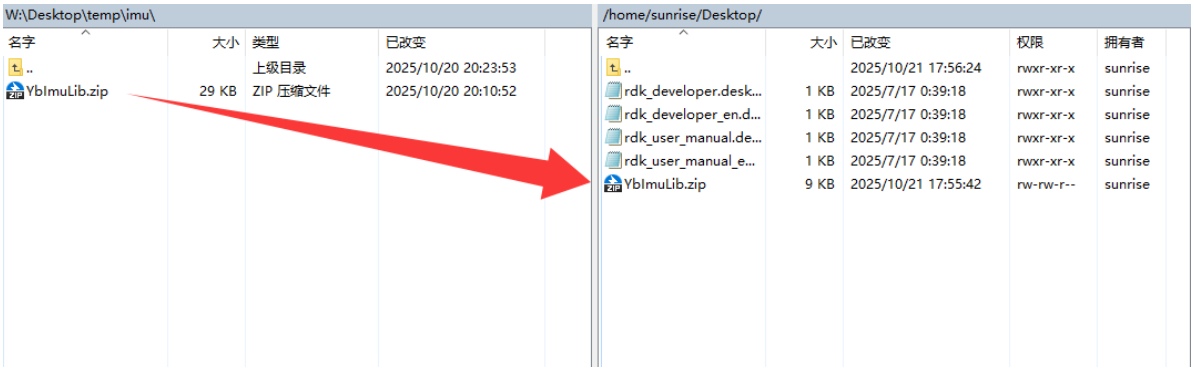
The latest version of the driver library, named YbImuLib.zip, is provided in the data folder.



3.2 Transferring files

Drag the compressed driver library file onto the Jetson desktop using WinSCP software.

The driver library file can be deleted after successful installation.



If you are unfamiliar with using WinSCP to transfer files, please refer to the following webpage for detailed WinSCP installation and operation instructions:

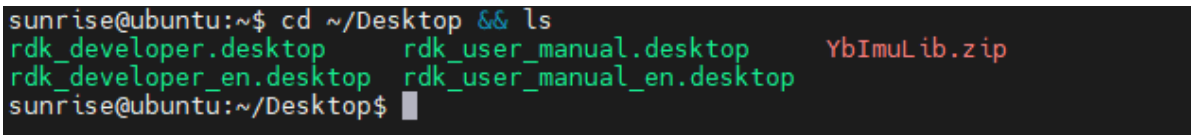
File Transfer

3.3 Installing Driver Libraries

Open the terminal on your Jetson Nano and enter the following command to extract the files.

Access the desktop and check if the file exists; the target file is highlighted in the red box.

```
cd ~/Desktop && ls
```



Unzip the file

```
unzip YbImuLib.zip
```

```
sunrise@ubuntu:~/Desktop$ unzip YbImuLib.zip
Archive:  YbImuLib.zip
   creating: YbImuLib/
  inflating: YbImuLib/.gitignore
  inflating: YbImuLib/README.md
  inflating: YbImuLib/setup.py
   creating: YbImuLib/YbImuLib/
  inflating: YbImuLib/YbImuLib/__init__.py
  inflating: YbImuLib/YbImuLib/YbImuI2cLib.py
  inflating: YbImuLib/YbImuLib/YbImuSerialLib.py
sunrise@ubuntu:~/Desktop$
```

Enter the driver library folder

```
cd YbImuLib
```

Run the installation command. If you see the installation version number displayed at the end, the installation was successful. This command will overwrite any previously installed Rosmaster_Lib driver library.

```
sudo python3 setup.py install
```

```
sunrise@ubuntu:~/Desktop$ cd YbImuLib
sunrise@ubuntu:~/Desktop/YbImuLib$ sudo python3 setup.py install
running install
```

Install required libraries

```
sudo pip3 install pyserial
sudo pip3 install smbus2
```

4. View IMU data

Refer to **3.2 File Transfer**, use WinSCP to transfer the **YbImu_ReadData_I2C.py** file to the Jetson, and then run the command

```
python3 YbImu_ReadData_I2C.py
```

```
sunrise@ubuntu:~/Desktop$ python3 YbImu_ReadData_I2C.py
Firmware version: 0.0.9
Press Ctrl+C to exit the program.
------ Sensor Data ------
Acceleration [g]:       x=-0.125, y= 0.258, z= 0.950
Gyroscope [rad/s]:      x=-0.048, y=-0.014, z= 0.016
Magnetometer [uT]:      x= 12.500, y=-25.929, z=-3.882
Quaternion:             w=-0.88124, x=-0.09011, y=-0.07982, z=-0.45337
Euler Angle [deg]:      roll= 13.39, pitch= 3.38, yaw= 54.69
Barometer:              height= 0.00 m, temperature= 0.00 °C
                        pressure= 0.00000 Pa, pressure_diff= 0.00000 Pa
-------------------------
```

Note: The above data reads are for the 9-axis IMU. Data from the 6-axis IMU is not included (no magnetometer or barometer data). Data from the 9-axis IMU is not included (no barometer data).

5. Precautions

When using the RDK X3 motherboard, the I2C bus number needs to be modified according to the actual situation. The modification location is shown in the image below. It is usually bus number 1.

```python
#!/usr/bin/env python3

"""
请先确保YbImuLib已正确安装 / Please make sure YbImuLib is properly installed
"""

import time
from YbImuLib import YbImuI2c


# I2C bus number, corresponding to /dev/i2c-<bus> / I2C 总线号，对应 /dev/i2c-<bus>
I2C_BUS = 0

# Interval between data prints in seconds / 数据打印间隔（秒）
READ_INTERVAL = 0.1


def create_i2c_device() -> YbImuI2c:
    """Create an I2C IMU instance.

        创建 I2C IMU 实例
    """
```