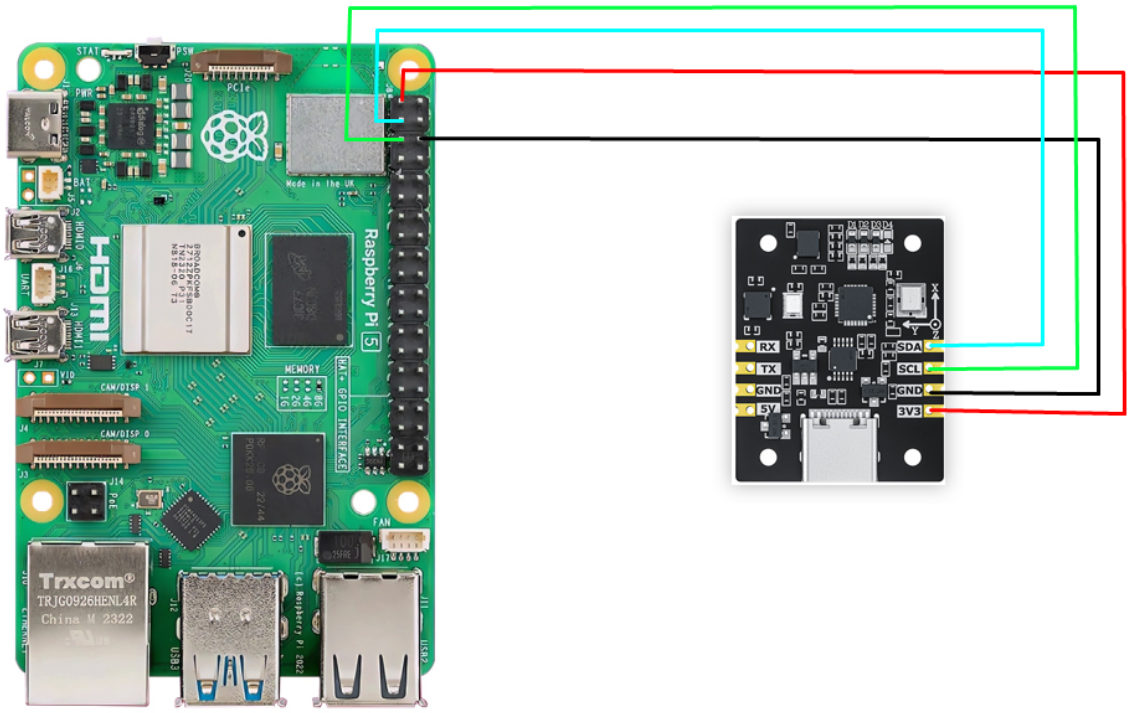
Viewing IMU Data on Raspberry Pi

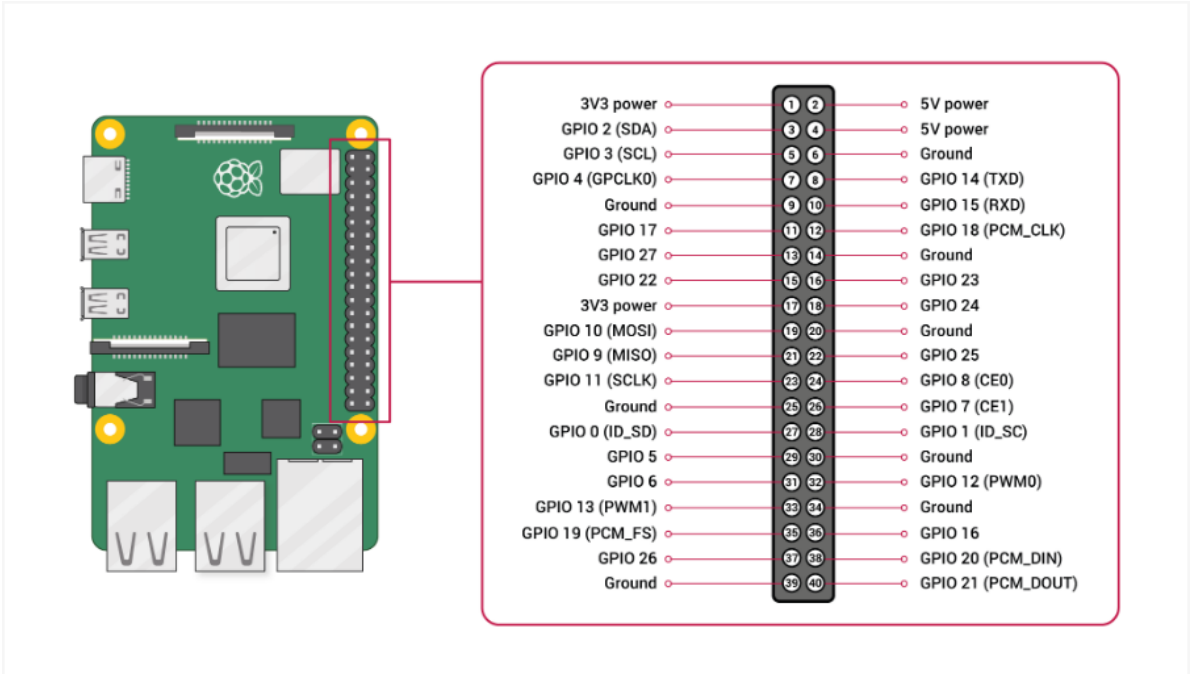
1. Connecting the Device

This tutorial uses a Raspberry Pi 5 motherboard and the official 64-bit image as an example.

Connect the IMU attitude sensor to the I2C port of the Raspberry Pi 5 as shown in the diagram below.



IMU Attitude Sensor	Raspberry Pi 5 (Physical Pins)
SDA	3
SCL	5
GND	GND
3.3V	3.3V



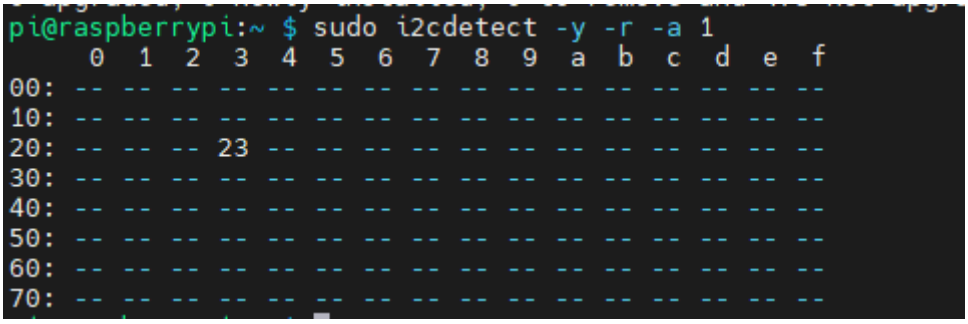
2. Check Device Status

First, install I2Ctool. Enter the following in the terminal:

```
sudo apt-get update
sudo apt-get install -y i2c-tools
```

Check I2C Devices

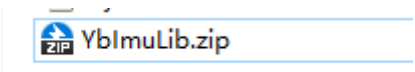
```
sudo i2cdetect -y -r -a 1
```



3. Installing the Driver Library

3.1 Downloading the Python Driver Library File

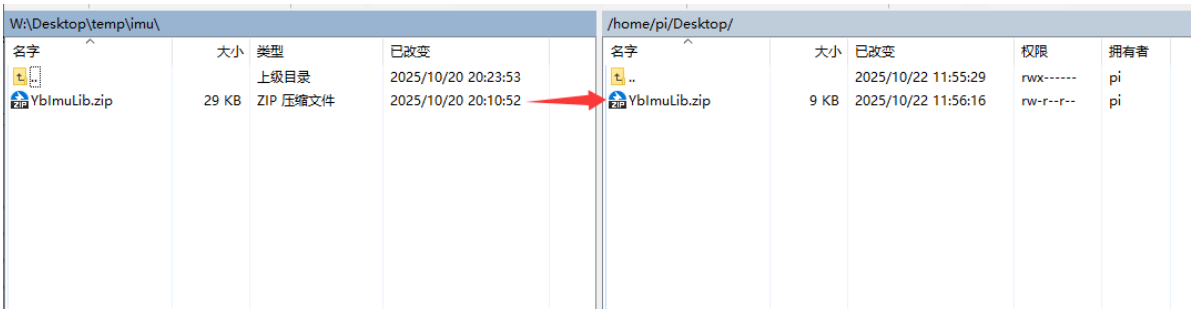
The latest version of the driver library, named YbImuLib.zip, is provided in the data folder.



3.2 Transferring Files

Drag the driver library compressed 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
```

```
pi@raspberrypi:~ $ cd ~/Desktop && ls
YbImuLib.zip
pi@raspberrypi:~/Desktop $
```

Unzip the file

```
unzip YbImuLib.zip
```

```
pi@raspberrypi:~/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
pi@raspberrypi:~/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
```

```
pi@raspberrypi:~/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 Raspberry Pi 5, and then run the command

```
python3 YbImu_ReadData_I2C.py
```

```
pi@raspberrypi:~/Desktop $ python3 YbImu_ReadData_I2C.py
Firmware version: 0.0.9
Press Ctrl+C to exit the program.
------ Sensor Data ------
Acceleration [g]:       x= 0.000, y= 0.931, z=-0.256
Gyroscope [rad/s]:      x= 0.000, y= 0.000, z= 0.000
Magnetometer [uT]:      x=-31.251, y=-19.483, z= 48.390
Quaternion:             w=-0.28648, x=-0.38907, y=-0.69087, z=-0.53468
Euler Angle [deg]:      roll= 104.98, pitch=-1.16, yaw= 121.95
Barometer:              height= 0.00 m, temperature= 0.00 °C
                        pressure= 0.00000 Pa, pressure_diff= 0.00000 Pa
-------------------------
```

Note: The above data reads are from a 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

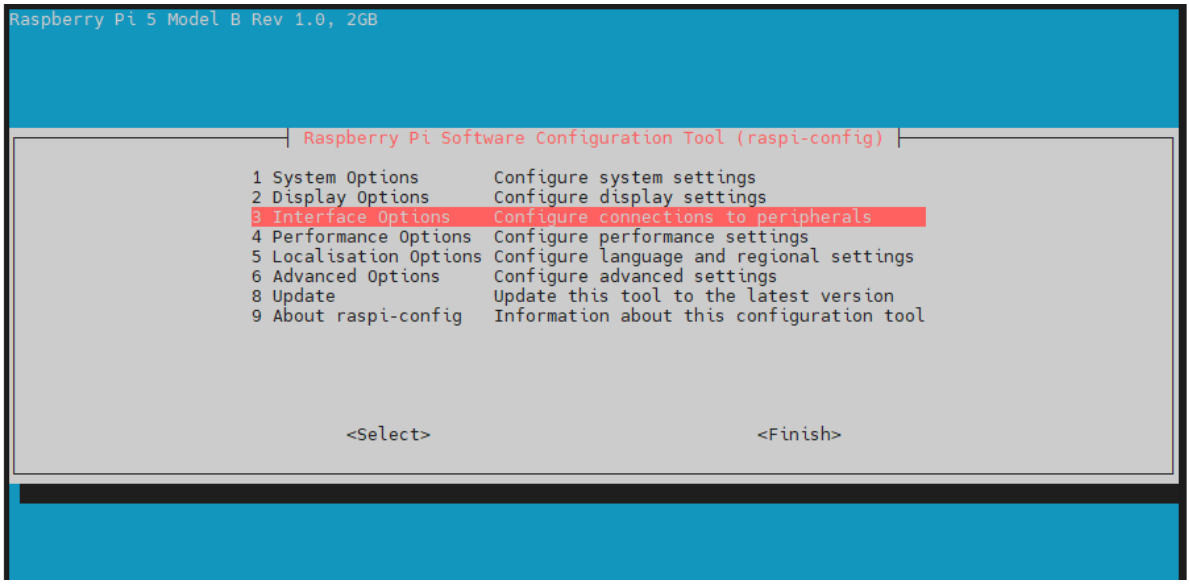
The I2C pins on the Raspberry Pi 5 need to be enabled beforehand.

To enable raspi, follow these steps:

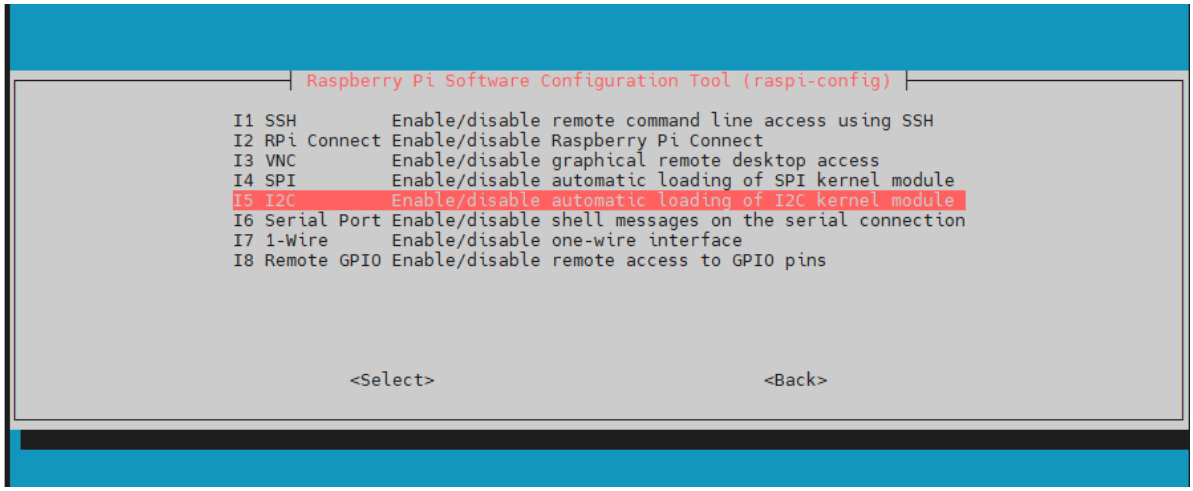
Run the command in the terminal:

```
sudo raspi-config
```

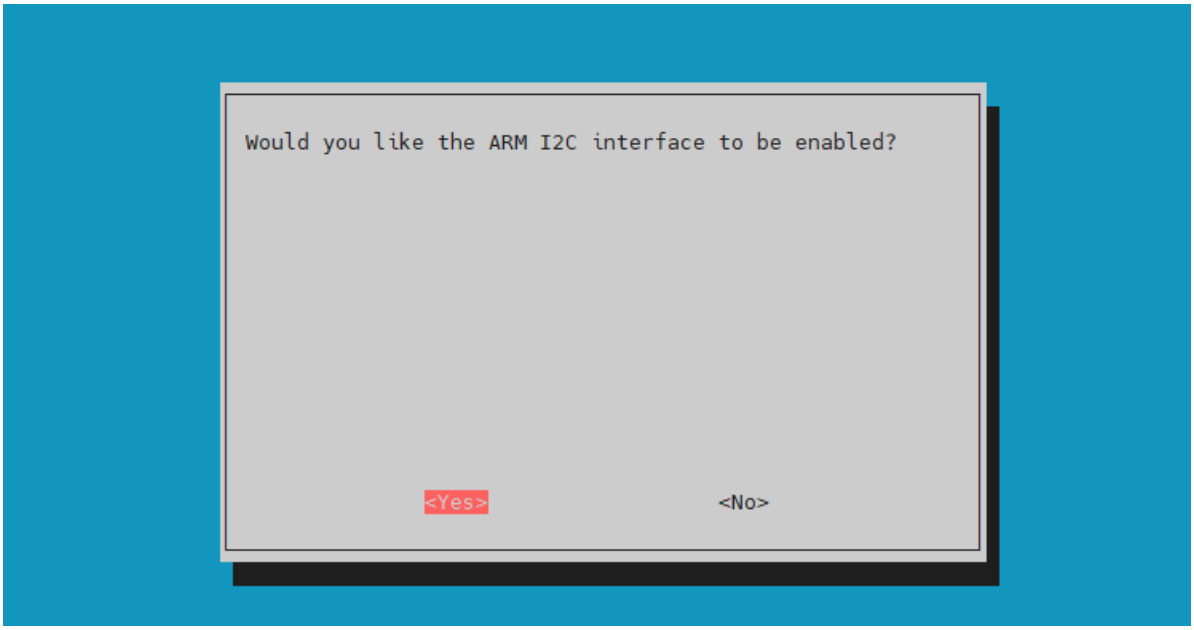
Use the arrow keys to select the desired option and press Enter.



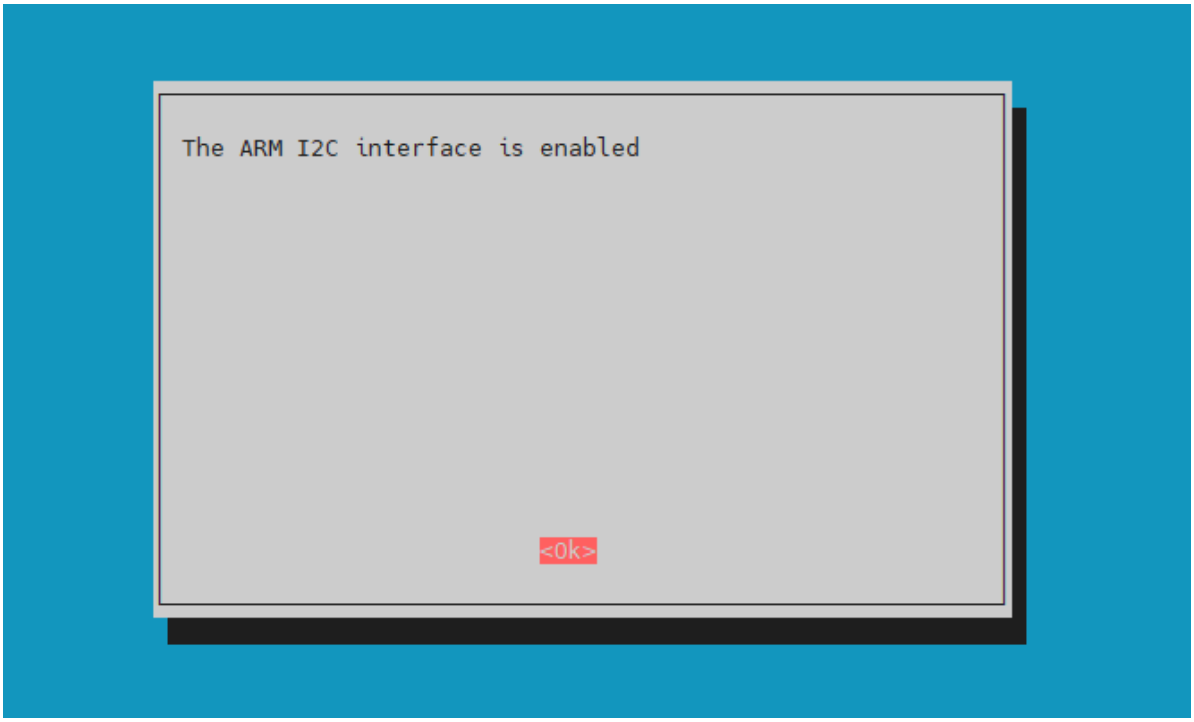
Select I2C and press Enter.



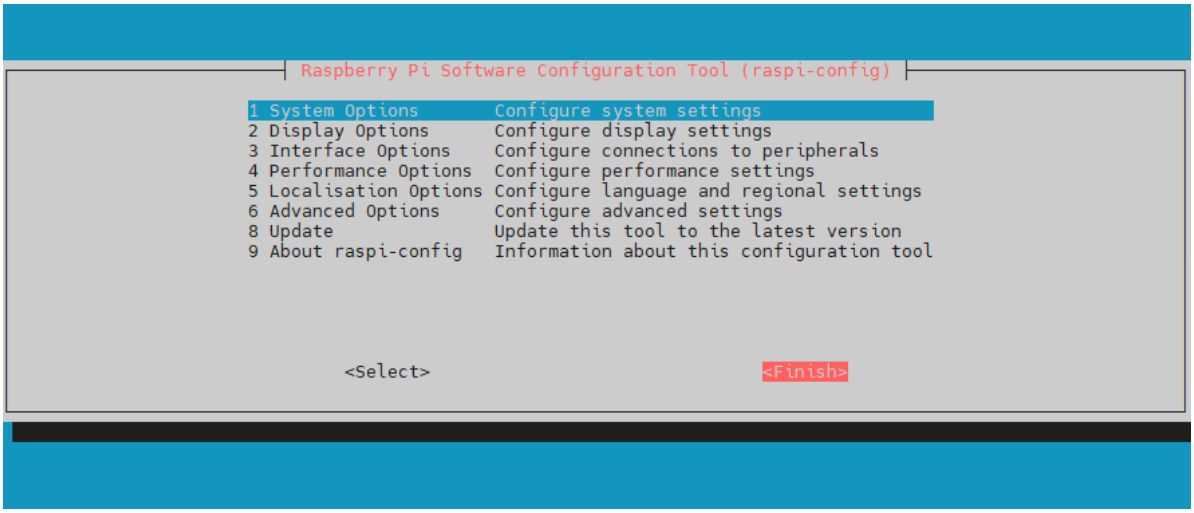
After selecting I2C, press Enter, use the arrow keys to select Yes, and then press Enter to confirm.



Press Enter to confirm.



Use the arrow keys to select Finish, then press Enter to exit the configuration.


Raspberry Pi Software Configuration Tool (raspi-config)
1 System Options Configure system settings
2 Display Options Configure display settings
3 Interface Options Configure connections to peripherals
4 Performance Options Configure performance settings
5 Localisation Options Configure language and regional settings
6 Advanced Options Configure advanced settings
8 Update Update this tool to the latest version
9 About raspi-config Information about this configuration tool
<Select>
<Finish>