

I2C communication

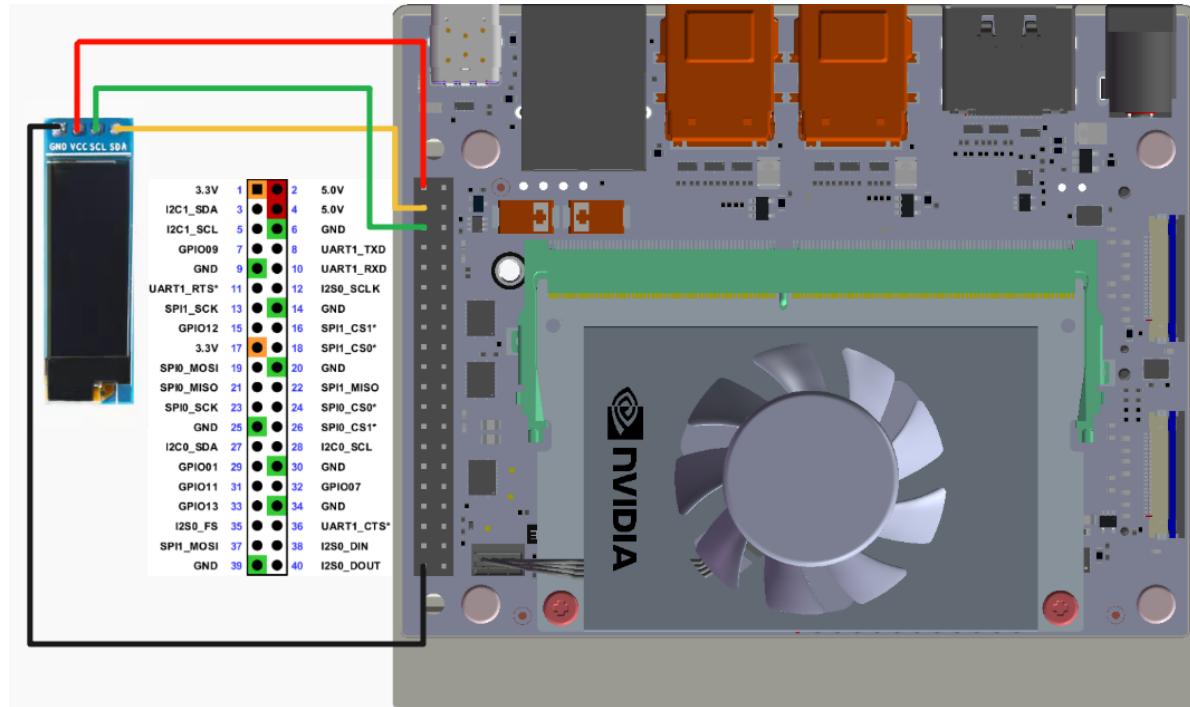
I2C communication

1. GPIO pin diagram
2. I2C test
 - 2.1. Installation dependencies
 - 2.2. I2C device
 - 2.2.1. Query I2C bus
 - 2.2.2. Query I2C device
 - 2.3. Run the program
3. Experimental results

1. GPIO pin diagram

Use 0.91-inch OLED to test the I2C communication function and connect according to the following wiring:

Note: Do not connect incorrectly or cause pin short circuits. Mistakes may cause damage to the motherboard hardware!



2. I2C test

2.1. Installation dependencies

```
sudo pip3 install smbus
sudo pip3 install Adafruit_SSD1306
```

```
jetson@yahboom:~$ sudo pip3 install smbus
[sudo] password for jetson:
Collecting smbus
  Downloading smbus-1.1.post2.tar.gz (104 kB)
    Preparing metadata (setup.py) ... done
    Building wheels for collected packages: smbus
      Building wheel for smbus (setup.py) ... done
        Created wheel for smbus: filename=smbus-1.1.post2-cp310-cp310-linux_aarch64.whl size=40787 sha256=151fc76b12c78f446a270c9d25aa55133d53a0fb7313cia40e3de8845e69fa9b5
        Stored in directory: /root/.cache/pip/wheels/42/c2/24/5c3e4f44425dfc5482f32d21d1cb894f956a72300367cd3c76
    Successfully built smbus
Installing collected packages: smbus
Successfully installed smbus-1.1.post2
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv
jetson@yahboom:~$ sudo pip3 install Adafruit_SSD1306
Collecting Adafruit_SSD1306
  Downloading Adafruit_SSD1306-1.6.2.tar.gz (5.2 kB)
    Preparing metadata (setup.py) ... done
Collecting Adafruit-GPIO>=0.6.5
  Downloading Adafruit_GPIO-1.0.3.tar.gz (24 kB)
    Preparing metadata (setup.py) ... done
Collecting adafruit-pureio
  Downloading Adafruit_PureIO-1.1.11-py3-none-any.whl (10 kB)
Collecting spidev
  Downloading spidev-3.6.tar.gz (11 kB)
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Installing backend dependencies ... done
  Preparing metadata (pyproject.toml) ... done
Building wheels for collected packages: Adafruit_SSD1306, Adafruit-GPIO, spidev
  Building wheel for Adafruit_SSD1306 (setup.py) ... done
  Created wheel for Adafruit_SSD1306: filename=Adafruit_SSD1306-1.6.2-py3-none-any.whl size=5864 sha256=d7a3469060d4cb3zaad0672079464d505d432fe59809d11fed6335bd2bdd785
  Stored in directory: /root/.cache/pip/wheels/c8/f5/70/c91035946a0d871dc525d882dfd58a63be1b5fadf0ec990568
  Building wheel for Adafruit-GPIO (setup.py) ... done
  Created wheel for Adafruit-GPIO: filename=Adafruit_GPIO-1.0.3-py3-none-any.whl size=38137 sha256=ff085700d7b7607330d
```

2.2. I2C device

During normal development, we need to find the device bus and device address where the I2C device is mounted.

2.2.1. Query I2C bus

Enter the following command in the terminal to list all busses of the device:

```
i2cdetect -l
```

2.2.2. Query I2C device

Enter the following command in the terminal to list I2C devices under the specified bus: The I2C address corresponding to oled is 0x3c

```
i2cdetect -y -r *
```

```
Activities Terminal Jan 10 11:38 MAXN NVIDIA Jetson Support Forums L4T-README >_ Terminal NVIDIA Jetson Zoo NVIDIA Jetson Developer Zone Home NVIDIA jetson@yahboom:~$ i2cdetect -l
i2c-0 i2c 3160000.i2c I2C adapter
i2c-1 i2c c240000.i2c I2C adapter
i2c-2 i2c 3180000.i2c I2C adapter
i2c-4 i2c Tegra BPMP I2C adapter I2C adapter
i2c-5 i2c 31b0000.i2c I2C adapter
i2c-7 i2c c250000.i2c I2C adapter
i2c-9 i2c i2c-2-mux (chan_id 1) I2C adapter
i2c-10 i2c i2c-2-mux (chan_id 0) I2C adapter
i2c-11 i2c NVIDIA SoC i2c adapter 0 I2C adapter
jetson@yahboom:~$ i2cdetect -y -r 0
 0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00: --
10: --
20: --
30: --
40: --
50: UU -- -- -- -- -- -- -- --
60: --
70: --
jetson@yahboom:~$ i2cdetect -y -r 7
 0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00: --
10: --
20: --
30: --
40: --
50: --
60: --
70: --
jetson@yahboom:~$
```

2.3. Run the program

`oled_i2c.py` is not included in the `jetson-gpio` library:

```
cd ~/jetson-gpio/samples/
```

```
python3 oled_i2c.py
```

3. Experimental results

After starting the program, OLED will display system information such as system CPU usage, system time, and memory usage:

```
Activities Terminal Jan 10 11:41 MAXN NVIDIA Jetson Support Forums L4T-README >_ Terminal NVIDIA Jetson Zoo NVIDIA Jetson Developer Zone Home NVIDIA jetson@yahboom:~/jetson-gpio/samples$ cd ~/jetson-gpio/samples/
jetson@yahboom:~/jetson-gpio/samples$ python3 oled_i2c.py
i2c_num= 7
[sudo] password for jetson:   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00: --
10: --
20: --
30: --
40: --
50: --
60: --
70: --
---OLED begin ok!---
```

