

## Raspberry Pi - Diagnostic Camera on I2C Bus

When the camera is not detected, it could happen due to a loosen cable or any hardware failure. There is a technique to scan devices on an I2C bus which can be used to do a quick check on hardware problems of a Pi's camera module.

[#raspberry-pi](#) [#camera](#) [#i2c](#)

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## Table of Content

1. Hardware check
2. Software check
  - 2.1. Install I2C tools
  - 2.2. Load I2C driver
  - 2.3. Config GPIOs
  - 2.4. Scan I2C bus

### Camera I2C Address responses

Scan on the I2C Bus 0, the camera module will response on two addresses **0x10** (camera sensor) and **0x64** (camera board).

Missing one of two above addresses means that there is an hardware issue happened.

## 1. Hardware check

Run the command:

```
vcgencmd get_camera
```

which should print out **supported=1 detected=1** with a normal working camera.

If the output shows **detected=0**, check the ribbon cable first. If other camera module still works after swapping with the problem one, then do a hardware check from software interface as described below.

## 2. Software check

An interesting topic: [Camera not detected despite being plugged in](#) on the [official Raspberry forum](#) shows a method to check the connection of the camera board and the camera sensor on an I2C interface.

### 2.1. Install I2C tools

Install **i2c-tools** :

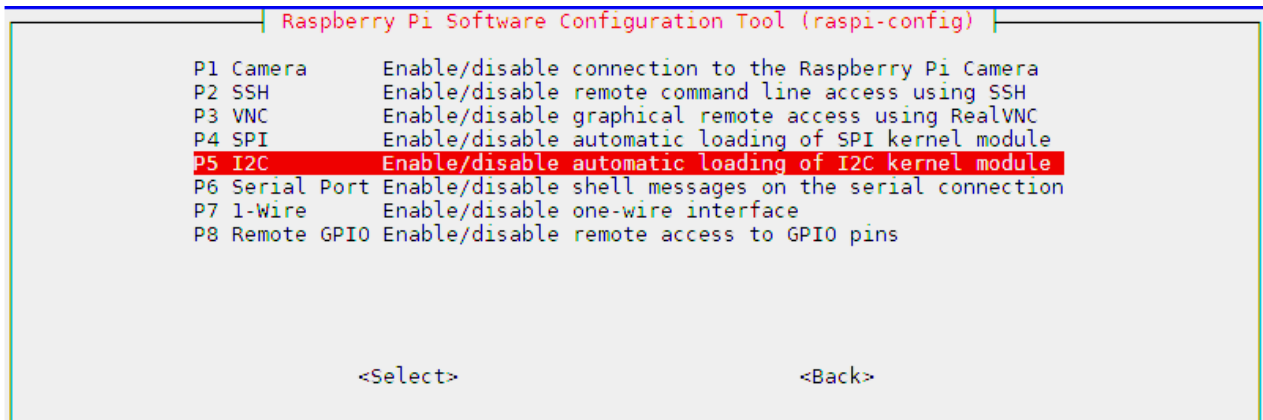
```
sudo apt install -y i2c-tools
```

This package contains a set of I2C tools for Linux: a bus probing tool, a chip dumper, register-level access helpers, EEPROM decoding scripts, and more.

```
i2cdetect      # detect I2C chips
i2cdump        # examine I2C registers
i2cget         # read from I2C/SMBus chip registers
i2cset         # set I2C registers
i2ctransfer    # send user-defined I2C messages in one transfer
```

## 2.2. Load I2C driver

It is able to permanently enable the I2C interface by running `sudo raspi-config` and enable I2C setting, or by adding `i2c-dev` declaration in the file `/etc/modules`.



*Enable I2C Interface via `raspi-config`*

However, for a quick check, just need to load driver temporarily:

```
sudo modprobe i2c-dev
```

## 2.3. Config GPIOs

### GPIO pin number

Please look at [PI GPIO](#) document for more information about setting GPIOs.

Note that GPIO number is defined in BCM2835 ARM processor, not the number printed on the Pi boards. Read more at [BCM2835 Peripherals](#).

Use `raspi-gpio get` to get the current status of GPIOs.

1. Change **GPIO0** and **GPIO1** to input /\* by default they are set to SDA0 and SCL0 \*/

```
raspi-gpio set 0 ip
raspi-gpio set 1 ip
```

2. Change the function of **GPIO28**, **GPIO29** to I2C pins out **SDA0** and **SCL0** by setting *Alternate Function 0 (A0)* on those pins.

```
raspi-gpio set 28 a0
raspi-gpio set 29 a0
```

### 3. Power on Camera by setting High on output pin **GPIO44** and **GPIO45**

```
raspi-gpio set 44 dh
raspi-gpio set 40 dh
```

## 2.4. Scan I2C bus

Run **i2cdetect** on I2C BUS 0 at **/dev/i2c-0**:

```
i2cdetect 0
```

press **Y** to continue and it should print out some numbers, for example:

```

      0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
10: 10  --  --  --  --  --  --  --  --  --  --  --  --  --  --
20:  --  --  --  --  --  --  --  --  --  --  --  --  --  --
30:  --  --  --  --  --  --  --  --  --  --  --  --  --  --
40:  --  --  --  --  --  --  --  --  --  --  --  --  --  --
50:  --  --  --  --  --  --  --  --  --  --  --  --  --  --
60:  --  --  --  --  64  --  --  --  --  --  --  --  --  --
70:  --  --  --  --  --  --  --  --  --  --  --  --  --  --
```

Consider that **i2cdetect** tries to ping every address on a bus and reports whether an address responds. If any number shows up in report, it means there is a working device at that address.



#### Camera's I2C addresses

If having **0x64**, the camera board is connected properly, there is no problem with cable and main connectors on Pi board and camera board.

If having **0x10**, it means the camera sensor has responded. there is no problem with sensor and sensor connection (a small cable between camera board and camera sensor).