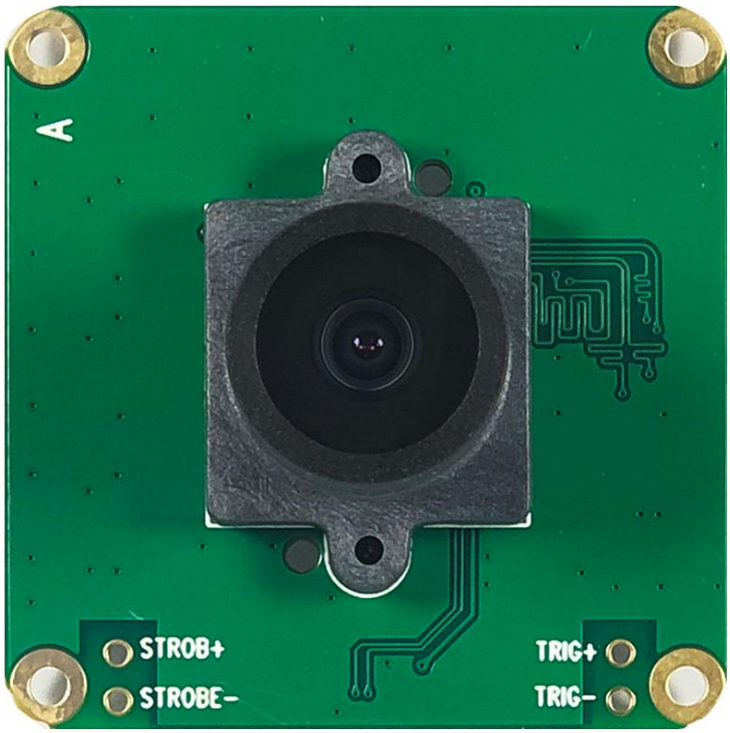
CAM-MIPIOV9281 UserManual



目录

1. General

CAM-MIPIOV9281 is a low-cost Fisheye Lens, monochrome(Black&White) global shutter camera module, designed for whole series Raspberry(P4/Pi3B+/PI3A+/PI3/CM3/CM3+). Plug into the CSI-2 Pi camera interface directly.

CAM-MIPIOV9281 module on board OmniVision's OV9281 is high-speed global shutter image sensors that bring 1-megapixel resolution to a wide range of consumer and industrial computer vision applications, including augmented reality (AR), virtual reality (VR), collision avoidance in drones, bar code scanning and factory automation. Built on OmniVision's OmniPixel®3-GS pixel technology, the OV9281 and OV9282 feature a high-speed global shutter pixel with best-in-class near-infrared (NIR) quantum efficiency (QE) to meet high-resolution and low-latency requirements.

Support 12 working mode, Suitable for various applications.

Mode	Resolution Ratio	Data Format	Frame Rate
Mode0	1280x800	Y10	120fps
Mode1	1280x800	Y8	144fps
Mode2	1280x800	Y10	EXT_TRIG
Mode3	1280x800	Y8	EXT_TRIG
Mode4	1280x720	Y10	120fps
Mode5	1280x720	Y8	144fps
Mode6	1280x720	Y10	EXT_TRIG
Mode7	1280x720	Y8	EXT_TRIG
Mode8	640x400	Y10	210fps
Mode9	640x400	Y8	253fps
Mode10	640x400	Y10	EXT_TRIG
Mode11	640x400	Y8	EXT_TRIG

2. Features

(1) CAM-MIPIOV9281 is an Industrial Camera Module for Raspberry Pi 4/3B+/3B/CM/CM+/0 W, Plug into the CSI-2 Pi camera interface directly.

(2) On-board OmniVision OV9281 Monochrome(Black&White) global shutter CMOS Sensor, 1M Pixel.Output RAW8/RAW10 choosable.Support from 640x400@253fps to 1280x800@144fps.

(3) Fully V4L2 (Video4Linux) compatible device. Support for external trigger mode, LED and flash strobe mode and gain programmable. Uses the technique of optical coupling isolation TLP281.

(4) Match a wide angle fisheye Lens. Fov(D)=148 degrees, Fov(H)=118 degrees. Focal distance is adjustable.

(5) Comes with user manual, test demo and friendly technology support. We offer custom design service.

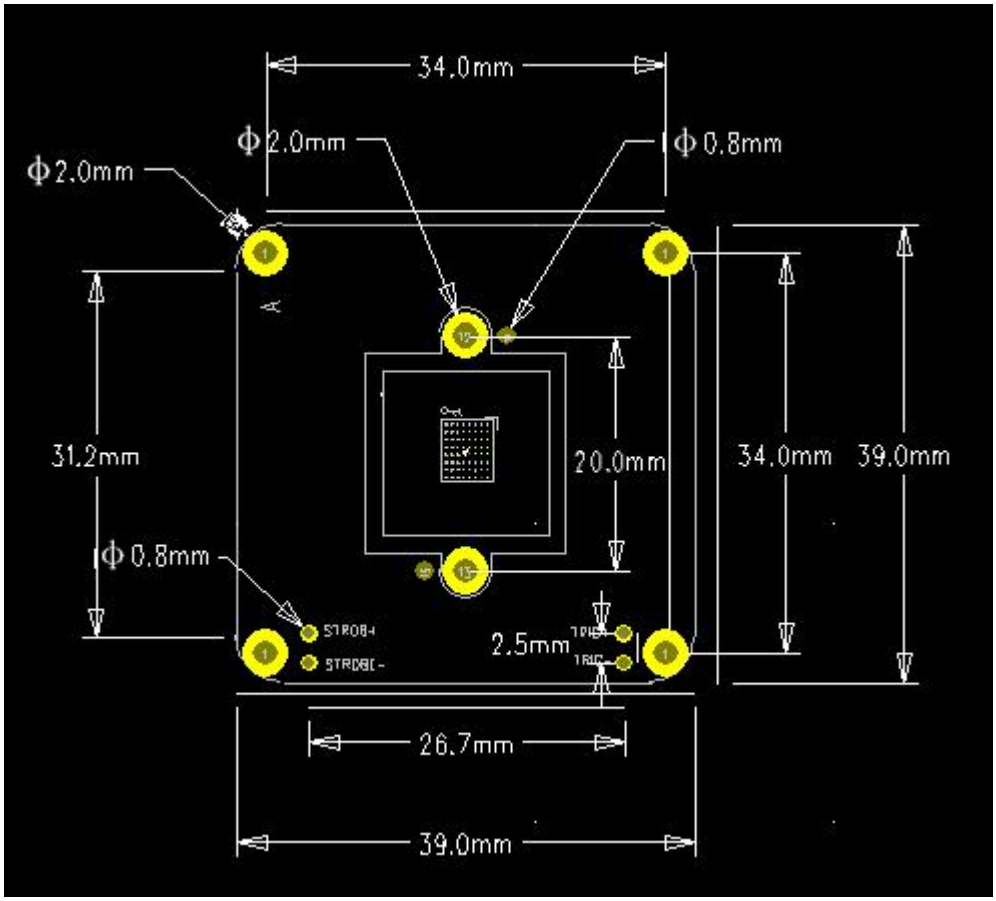
3. Hardware Description

3.1 Overview

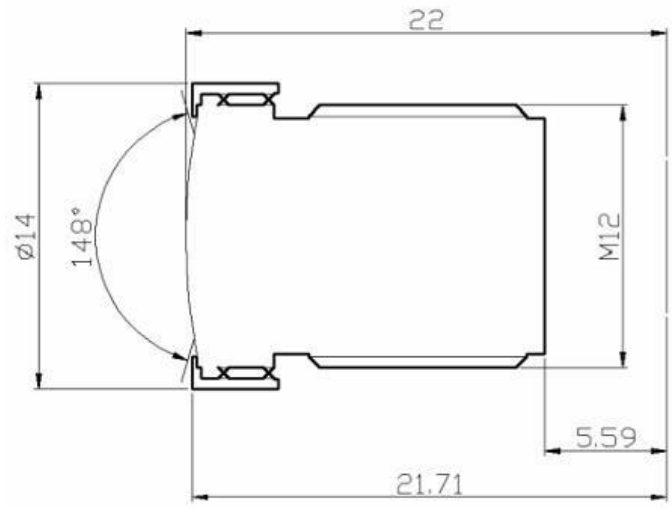
Sernor Board	
Size	39mm x 39mm
Weight	4g
Still Resolution	1 million pixels
Video Modes	Mode0: 1280x800, Y10, 120fps Mode1: 1280x800, Y8, 144fps Mode2: 1280x800, Y10, EXT_TRIG Mode3: 1280x800, Y8, EXT_TRIG Mode4: 1280x720, Y10, 120fps Mode5: 1280x720, Y8, 144fps Mode6: 1280x720, Y10, EXT_TRIG Mode7: 1280x720, Y8, EXT_TRIG Mode8: 640x400, Y10, 210fps Mode9: 640x400, Y8, 253fps Mode10: 640x400, Y10, EXT_TRIG Mode11: 640x400, Y8, EXT_TRIG
Linux integration	V4L2 driver available
Sensor	Monochrome global shutter OV9281
Sensor Resolution	1280*800 pixels
Sensor image area	3896μm x 2453μm
Pixel size	3 μm x 3 μm
Optical size	1/4"
S/N ratio	38 dB
Dynamic range	68 dB
Output interface	2-lane MIPI Interface
Output formats	8/10-bit B&W RAW
Field of view	Fov(D) = 148 degrees , Fov(H) = 118 degrees
Focal Length	2.8 mm
Focal Distance	Adjustable
TV DISTORTION	<-17%
F(N) /Aperture	2.2

3.2 Size

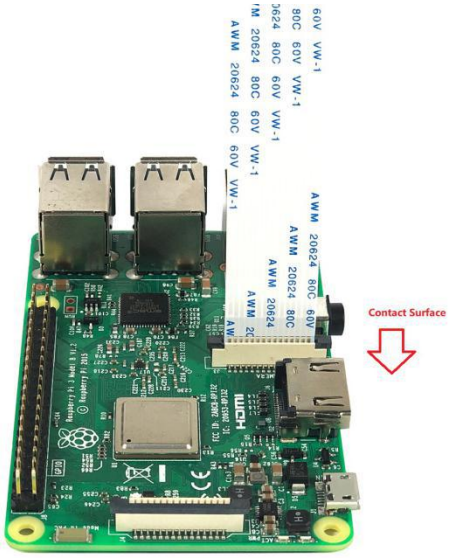
3.2.1 PCB Size

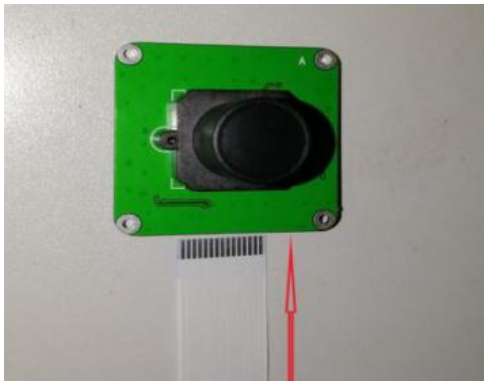


3.2.2 Len Size



3.3 Connection Of The Hardware

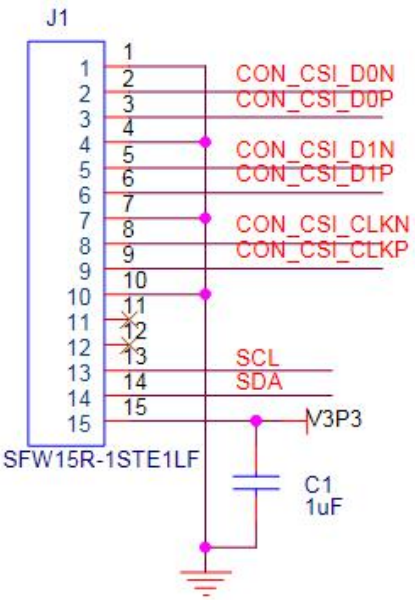




3.4 Pin-Out

3.4.1 Signal/Power Connector J1

The J1 pin map is same Raspberry Pi camera.



PIN	Symbol	Description
1	GND	Ground Pin
2	CON_CSI_D0N	Pixel Data Lane0 Negative
3	CON_CSI_D0P	Pixel Data Lane0 Positive
4	GND	Ground Pin
5	CON_CSI_D1N	Pixel Data Lane1 Negative
6	CON_CSI_D1P	Pixel Data Lane1Positive
7	GND	Ground Pin
8	CON_CSI_CLKN	Pixel Clock Output Form Sensor Negative
9	CON_CSI_CLKP	Pixel Clock Output Form Sensor Positive
10	GND	Ground Pin
11	None	None
12	None	None
13	SCL	CLK input, SIO_C of SCCB
14	SDA	DATA input,SIO_D of SCCB
15	3.3V Power	Power Supply

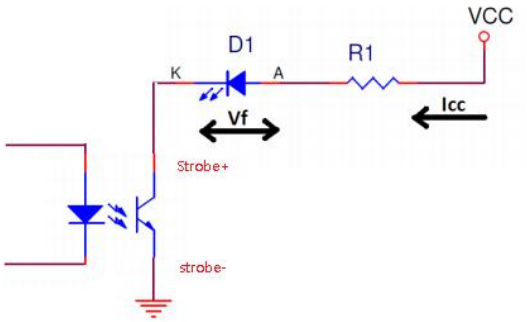
3.4.2 STROB Connector J2

(1)Pin Description

ISO FLASH

J2 PIN	Symbol
1	STROB+
2	STROB-

(2)Reference Circuit



On-board TLP281 optocoupler isolation, Notice the max collector current is 50mA.

Output Specifications

S. No	Parameter	Test Condition	Value			Unit
			Min	Typ	Max	
1	Driver Voltage (VCC)			12	24	V
2	Drive current (Icc)			10	50	mA
3	Collector Emitter Breakdown Voltage				80	V
4	Collector Emitter Saturation Voltage	Icc = 1 mA		0.1	0.2	V
5	Power Dissipation				150	mW

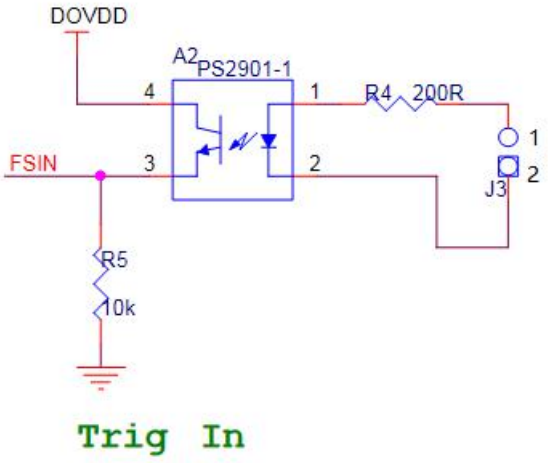
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 10mA, I_C = 1mA		0.1	0.2	V

So If the current required to drive the Flash LED is no more than 50mA
The value of series resistor: R1 = (VCC- Vf - VCE) / If
VCC: system Voltage
Vf: Forward voltage of Flash LED for current Icc
VCE: Collection Emitter voltage, typical:0.1V

If the current required to drive the flash exceeds 50mA, then it is required to drive it with the help of LED driver circuit, and LED driver circuit can be controlled by using the strobe output pin.

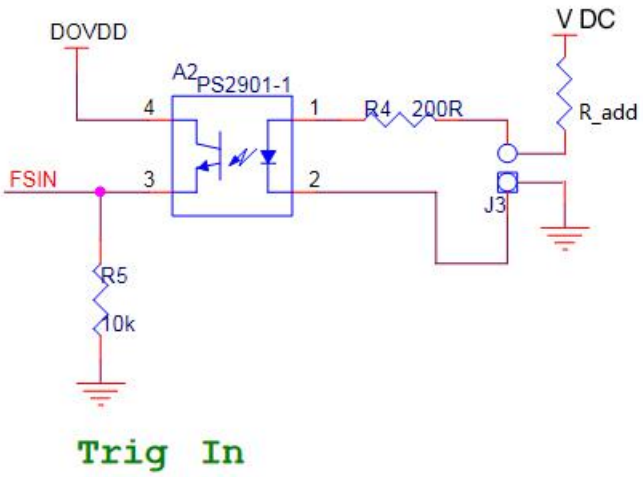
3.4.3 EXT TRIG Connector J3

(1)Pin Description



J3 PIN	Symbol	Description
1	TRIG+	3.3V-5.0V External Trigger Input
2	TRIG-	External GND

(2) Reference Circuit



For example, VCC = 12V, Vf = 1.25V

The calculations done here are based on 12VDC. Please do follow these calculations for other voltages like 24VDC.

Let's take the current through IR LED I_f = 20mA.
Voltage drop across the IR LED = 1.25V
The value of Resistor $R_1 = (V_{cc}-V_f)/I_f = (12 – 1.25)/0.02 = 537.5\ \Omega$
Wattage of resistor $R_1 > I_f^2 * R_1 = 0.02^2*537.5 = 0.215W$
Wattage of the resistor R_1 selected should be greater than 0.215W.

And there is a resistor on board(R4 = 200 Ω), So the R_add = R1 - R4 = 537.5 - 200 = 337.5 Ω

4. Software Description

4.1 Load Raspberry Pi image

Prepare a capacity of more than 8GB TF card(16Gb Class10 is better) and a card reader. Load the image file on to the SD card, using the instructions provided on the Raspberry Pi website for Linux, Mac or PC:
https://www.raspberrypi.org/documentation/installation/installing-images/README.md

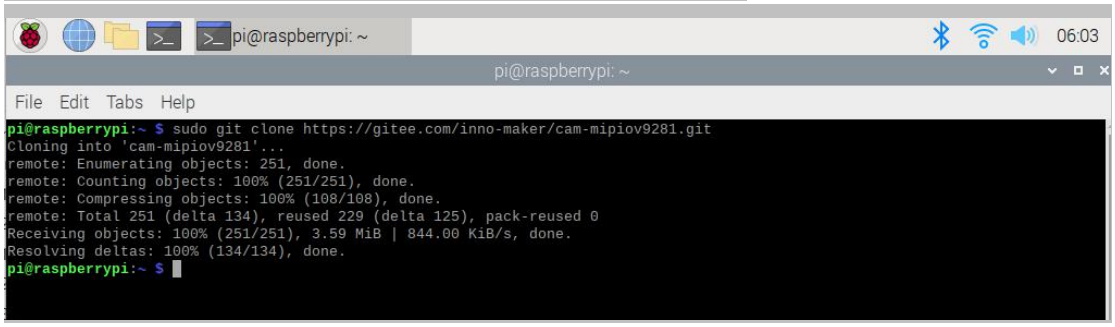
Raspbian Image download:
https://www.raspberrypi.org/downloads/

4.2 Tools/Driver Download

There are two ways to get the tools and drivers into Raspberry Pi.

Step 1: Use Raspberry Pi terminal get from github directly. And check whether is download successful. Make sure your Raspberry Pi is connect to network.

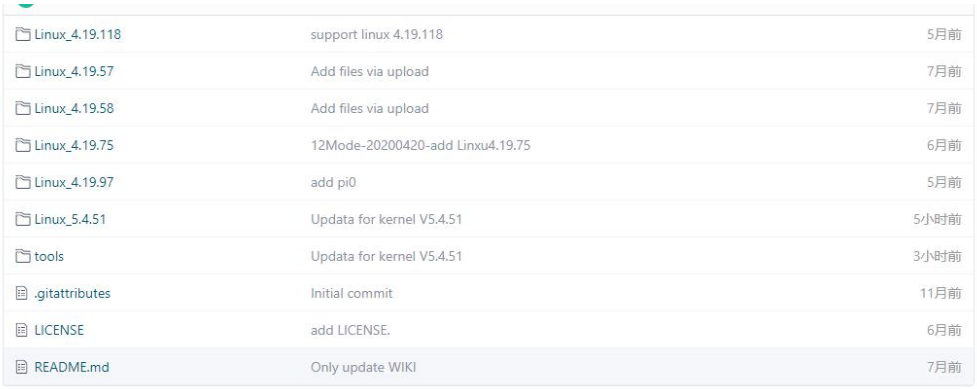
```
sudo git clone https://gitee.com/inno-maker/cam-mipiov9281.git
```



Step 2: Download it into your computer

Download from below link, and copy them to your Raspberry Pi by U disk or telnet.
https://gitee.com/inno-maker/cam-mipiov9281.git

Step 3: Packet Instructions
The are contain two parts in the link:



Linux_4.19.118	support linux 4.19.118	5月前
Linux_4.19.57	Add files via upload	7月前
Linux_4.19.58	Add files via upload	7月前
Linux_4.19.75	12Mode-20200420-add Linxu4.19.75	6月前
Linux_4.19.97	add pi0	5月前
Linux_5.4.51	Updata for kernel V5.4.51	5小时前
tools	Updata for kernel V5.4.51	3小时前
.gitattributes	Initial commit	11月前
LICENSE	add LICENSE.	6月前
README.md	Only update WIKI	7月前

Linux_4.xx.xx: Linux core version.

tools: All test demo and demo source codes

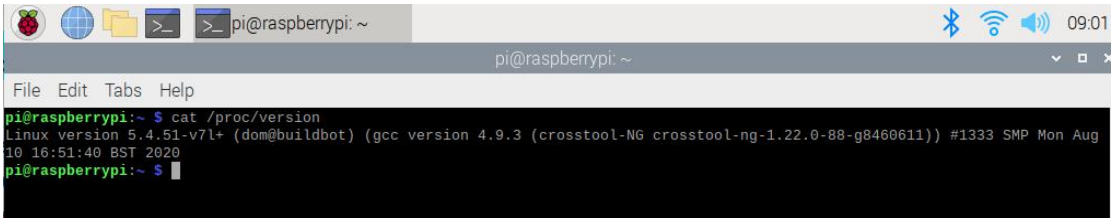
If you want to using the version earlier V5.4, please refer to the other user manual. Some functions and descriptions are different.

4.3 Check Basic Information

Check the basic information of your Raspberry Pi to choose the right driver. We take Raspberry Pi 4 + 2020-08-20-raspios-buster-armhf-full.img(Release data 2020-08-20) as an example in this document.

4.3.1 Check the kernel version of your Raspbian.

cat /proc/version



4.3.2 Check the hardware version of your Raspberry Pi

cat /proc/device-tree/model

4.4 Tools/Driver Install

Step 1: Install vim

Install vim to modify some files, .You also can modify them on your computer by use TF card reader.

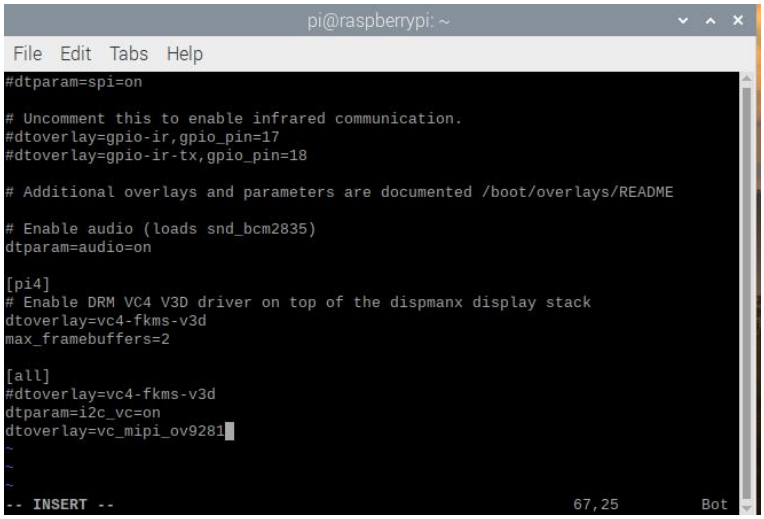
```
sudo apt-get install vim
```

Step 2: Modify 'config.txt'

```
sudo vim /boot/config.txt
```

Open 'config.txt', and then add two line in the bottom,finally save and exit.

```
dtparam=i2c_vc=on
dtoverlay=vc_mipi_ov9281
```

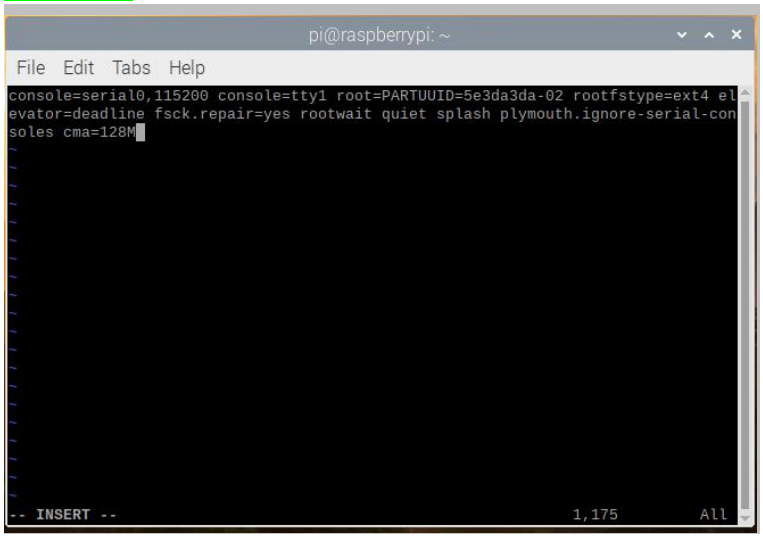


Step 3: Modify 'cmdline.txt'

```
sudo vim /boot/cmdline.txt
```

Allocate memory to GPU, add below line in the end of file, finally save and exit.

```
cma=128M
```



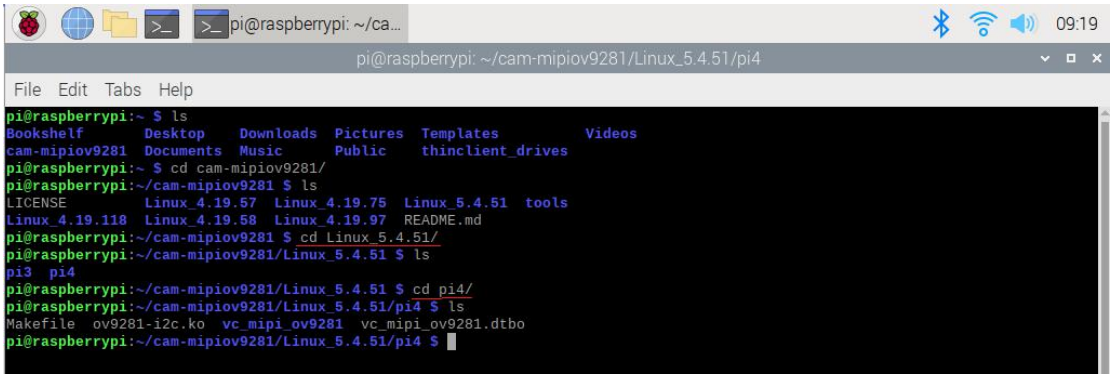
Step 5:Restart to enable the configuration

sudo reboot

Step 6:Choose the right driver to install

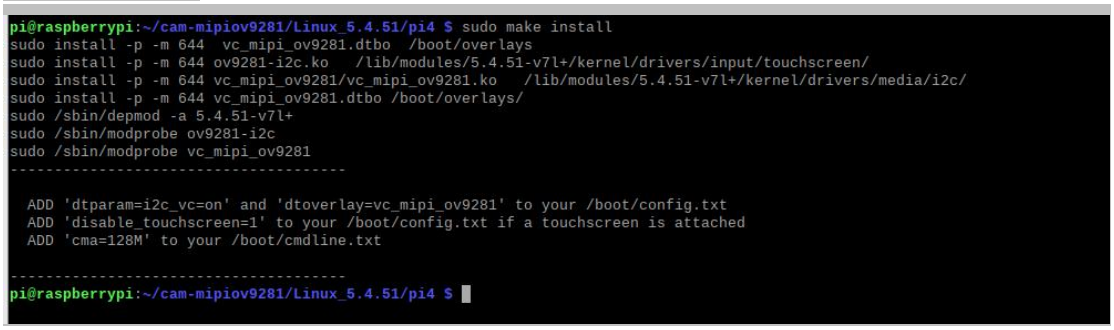
Refer to chapter 4.3, we must choose the right driver to match your Raspberry Pi hardware and system version. In this example, we choose ‘Linux version 5.4.51’ and ‘firmware-pi4’

Please double check the hardware version(Pi3 or Pi4) and Linux-Kernel are 100% match the driver version. Otherwise the camera will not works for you.



Step 7:Install and reboot

sudo make install



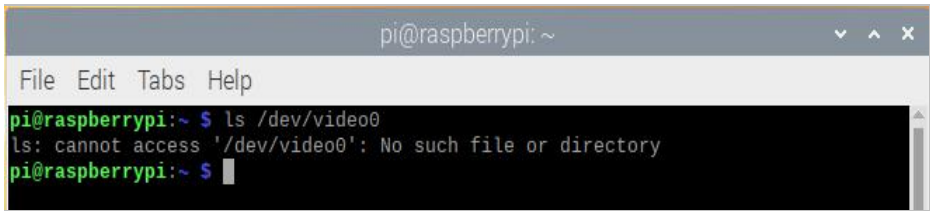
Step 8: Check the device:

Use below command to check the camera is ready,after reboot.

```
ls /dev/video0
```

Successful:

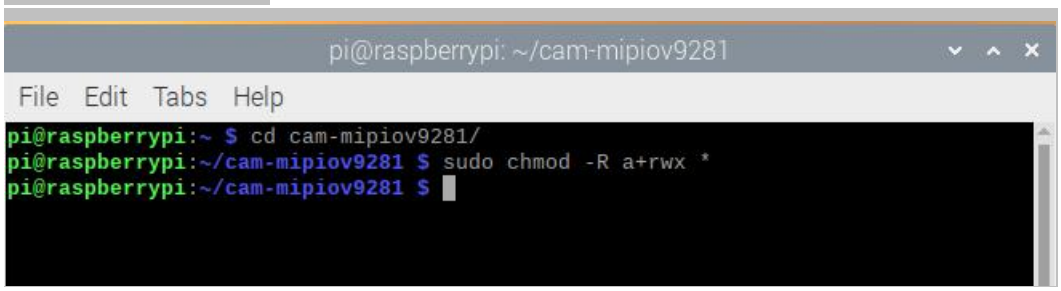
Unsuccessful:



Step 9: Chmod

Using chmod command set all the read, write, and execute permissions for these file.

```
sudo chmod -R a+rwx *
```



4.5 Setting Mode

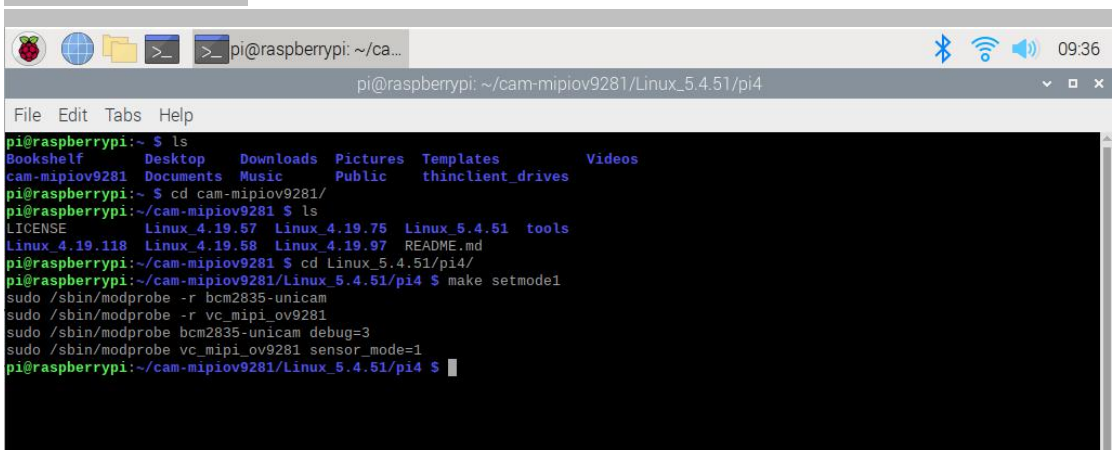
4.5.1 Set Mode

CAM-MIPIOV9281 can support below 4 working modes now. If you need other resolution/frame rate mode. Please contract us by e-mail(support@inno-maker.com).

Mode	Resolution Ratio	Data Format	Frame Rate
Mode0	1280x800	Y10	120fps
Mode1	1280x800	Y8	144fps
Mode2	1280x800	Y10	EXT_TRIG
Mode3	1280x800	Y8	EXT_TRIG
Mode4	1280x720	Y10	120fps
Mode5	1280x720	Y8	144fps
Mode6	1280x720	Y10	EXT_TRIG
Mode7	1280x720	Y8	EXT_TRIG
Mode8	640x400	Y10	210fps
Mode9	640x400	Y8	253fps
Mode10	640x400	Y10	EXT_TRIG
Mode11	640x400	Y8	EXT_TRIG

In the driver folder, use below command to set the working mode, I suggest you keep one terminal separately for easy to change the mode.

```
sudo make setmode1
```



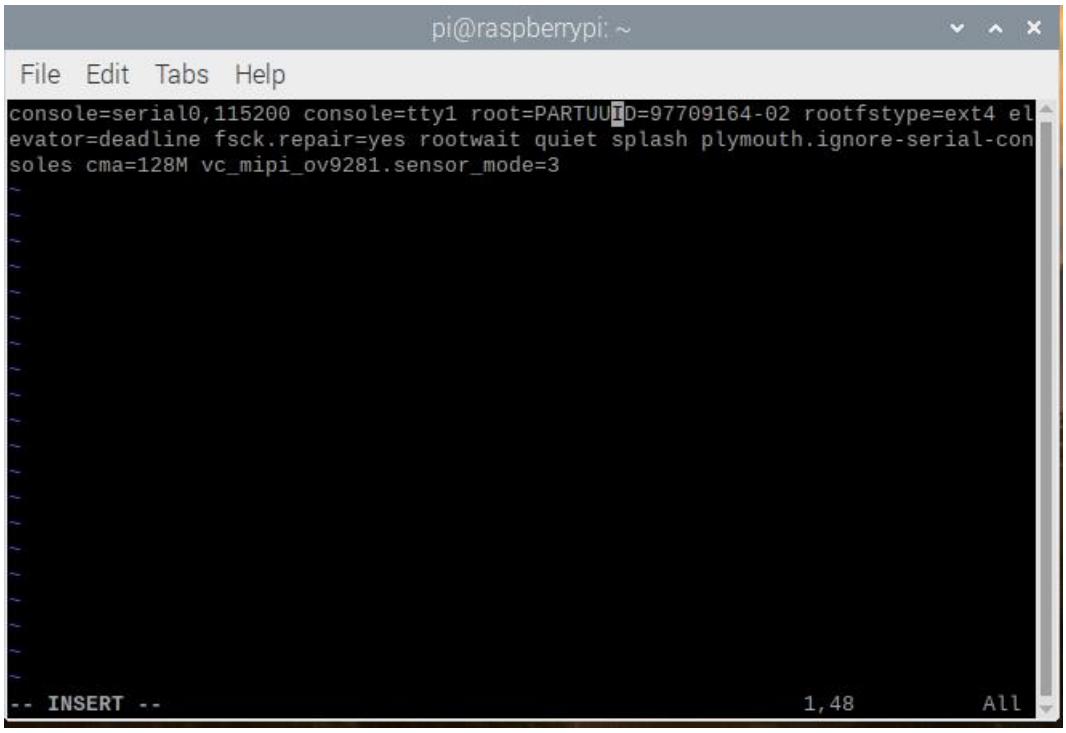
4.5.2 Change Default Mode

Step 1: Open cmdline.txt

sudo vim /boot/cmdline.txt

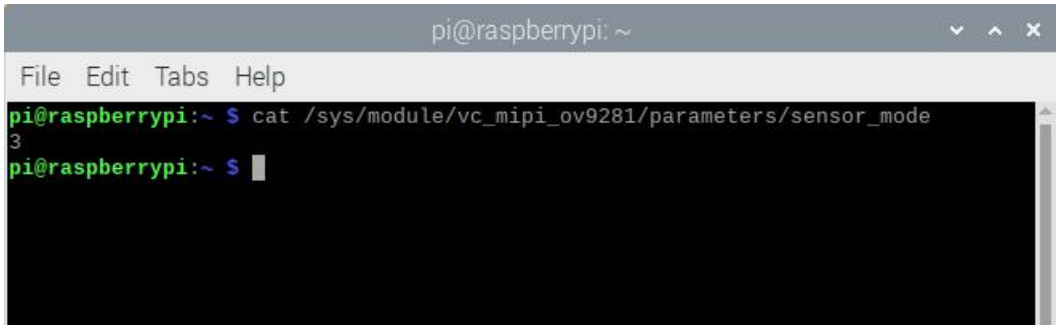
Step 2: Add default mode

vc_mipi_ov9281.sensor_mode=3



Step 3: Save and reboot, You will check the default value.

cat /sys/module/vc_mipi_ov9281/parameters/sensor_mode



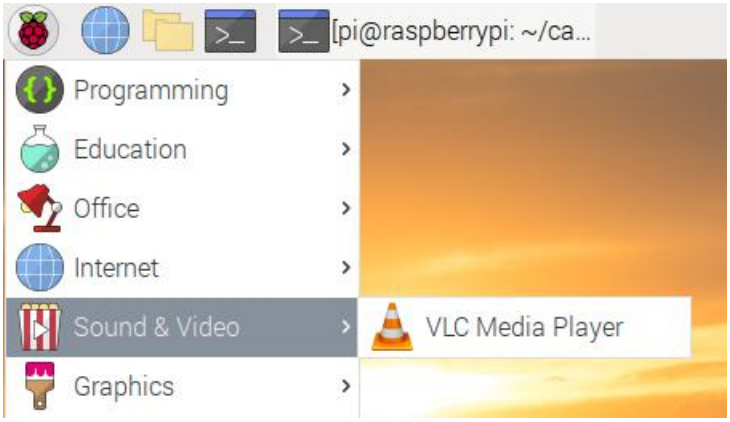
4.6 Qucik Test By VLC Tool

Step 1: Set mode 1

VLC only support the Y8 data format.

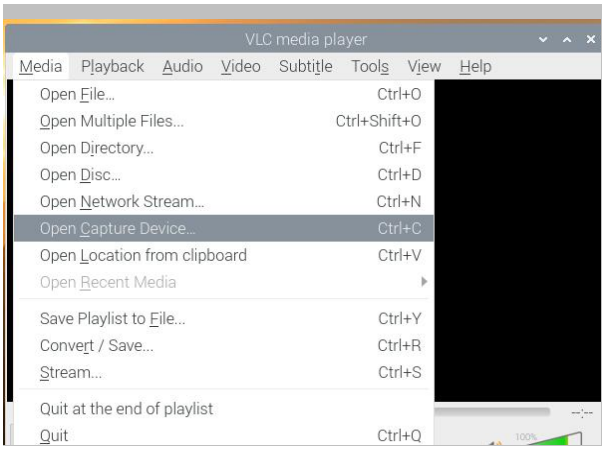
```
pi@raspberrypi:~/cam-mipiov9281/Linux_5.4.51/pi4 $ make setmode1
sudo /sbin/modprobe -r bcm2835-unicam
sudo /sbin/modprobe -r vc_mipi_ov9281
sudo /sbin/modprobe bcm2835-unicam debug=3
sudo /sbin/modprobe vc_mipi_ov9281 sensor_mode=1
pi@raspberrypi:~/cam-mipiov9281/Linux_5.4.51/pi4 $
```

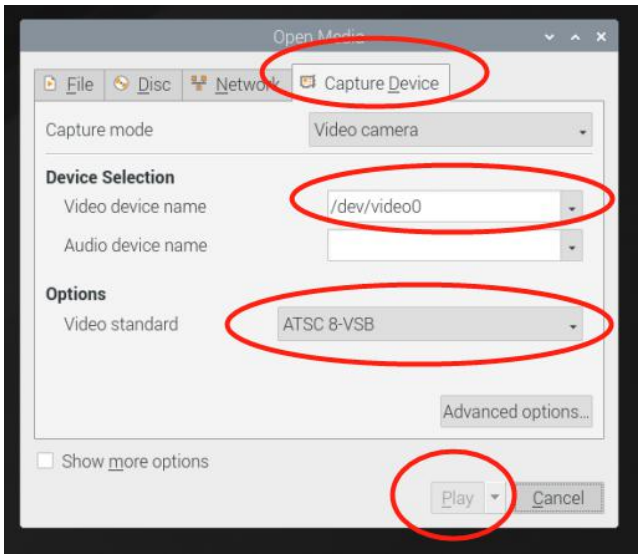
Step 2: Open VLC



Step 3: Setting VLC

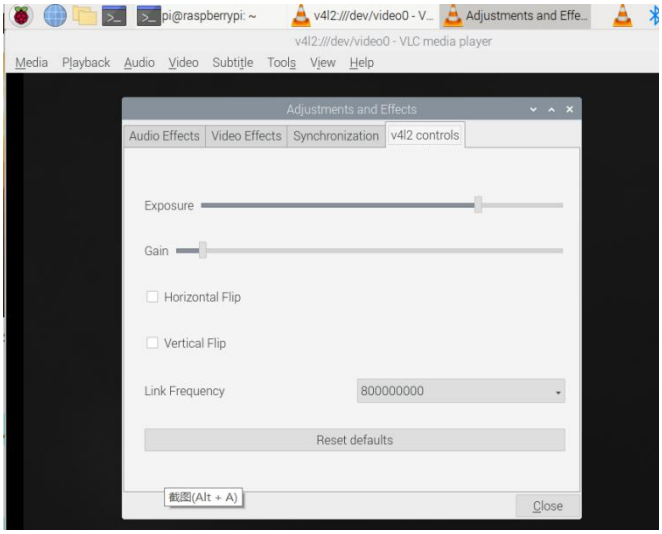
Click 'Media' → 'OpenCapture Device'→'Capture_Device', choose 'video0'. And click 'Play' you will see the image that collected by camera.





Step 4: Exposure/Gain

If you want to set the exposure and gain, click 'Tools' → 'effects and Filters' → 'V4l2 controls'



4.7 Frame Rate(fps) Test

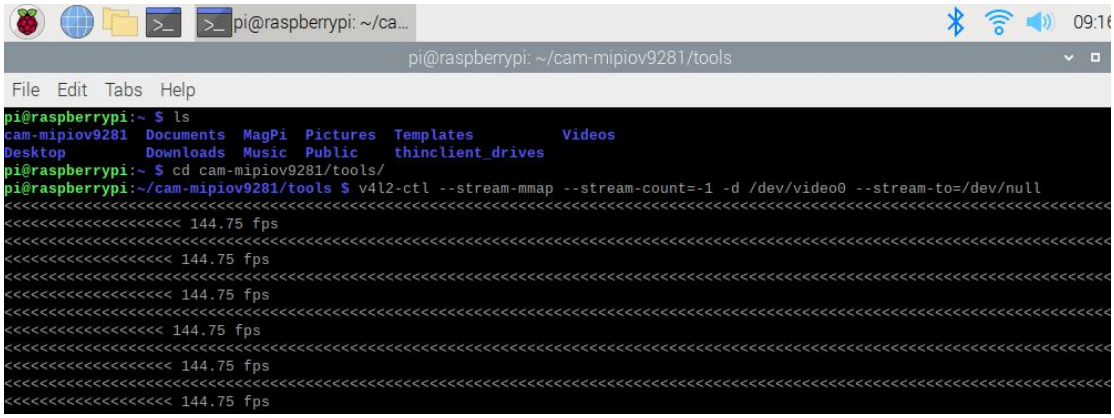
Step 1: Enter tools folder

```
cd cam-mipiov9281/tools/
```

Step 2: Start test

Use below command, you can see frames-per-second information of your camera.

```
v4l2-ctl --stream-mmap --stream-count=-1 -d /dev/video0 --stream-to=/dev/null
```



4.8 Preview Function

This preview function is only works for pi3 now, and do not support pi4. We plan to solve it in the next few months. Sorry for the inconvenience.

Step 1: Set Mode0 or Mode1 (Mode4,Mode5,Mode8,Mode9)

Refer to the Chapter 4.5

Step 2: Read vcmipidemo tool help

Enter tools folder, and read the vcmipidemo tool help.

```
./vcmipidemo-1028 --help
```

Usage: ./vcmipidemo [-s sh] [-g gain] [-f] [-a]

-s	Shutter Time. Value is from 8721ns to 8721*885ns, must be integral multiple of 8721ns . 8721xN(N =1,2,3,4,5.....855)
-g	Gain Value (0-254d)
-b	Buffer Count to use
-f	Output Capture to framebuffer /dev/fb0
-o	Output Captures to file in PGM or PPM format (openable by e.g. GIMP)
-a	Suppress ASCII capture at stdout.

Step 3: Use vcmipidemo tool.

```
./vcmipidemo-1028 -s 4135500 -g 0x88 -f >/dev/null
```

```
pi@raspberrypi:~/cam-mipiov9281/tools $ ./vcmipidemo -s 4135500 -g 0x88 -f >/dev/null
```

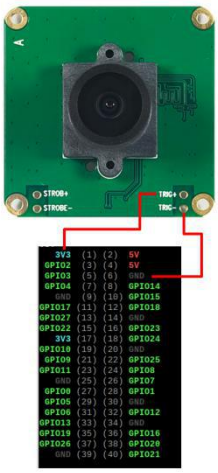
Set shutter time = 4135500ns = 8721ns * 500cnt
Set gain = 0x88 db= 136 db

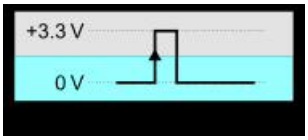
It case by the frame buffer difference between Pi3 and Pi4. Refer to the below link:
https://www.raspberrypi.org/forums/viewtopic.php?f=29&t=250564&hilit=Framebuffer+difference+in+RPi+4

4.9 Capture Function

4.9.1: Simulate the Trigger Signal

You can connect the TRIG- to the GND Pin and connect the TRIG+ to 3.3V Pin of Raspberry Pi to simulate a trigger signal. This test function will comes with repeated trigger signal sometime.





4.9.2: Y8 Date Format Capture Example

Usage: ./v4l2_capture_y8 [-s sh] [-g gain] [-h f] [-v f] [-c cnt]

-s	Shutter Time. Value is from 8721ns to 8721*885ns, must be integral multiple of 8721ns . 8721xN(N =1,2,3,4,5.....855)
-g	Gain Value (0-254d)
-h	horizen flip 1: Enable 0:Disable
-v	vertical flip 1: Enable 0:Disable
-c	capture count

Step 1: Set Mode3(Y8, EXT_TRIG)

```
make setmode3
```

Refer to the chapter 4.5

Step 2: Enter capture setting:

```
./v4l2_capture_y8 -s 4135500 -g 0x88 -h 1 -v 1 -c 5
```

Set shutter time = 4135500ns = 8721ns * 500cnt

Set gain = 0x88 db= 136 db

For more detail please use below command

```
./v4l2_capture_y8 --help
```

```
pi@raspberrypi:~/cam-mipiov9281/tools $ ./v4l2_capture_y8 -s 4135500 -g 0x88 -h
1 -v 1 -c 5
sensor_set_parameters():  Old Gain Value: 16.
sensor_set_parameters():  Requested New Gain Value: 136.
sensor_set_parameters():  New Gain Value: 136.
sensor_set_parameters():  Old Exposure Value: 5939001.
sensor_set_parameters():  Requested New Exposure Value: 5000.
sensor_set_parameters():  New Exposure Value: 8721.
sensor_set_parameters():  Old Hflip Value: 0.
sensor_set_parameters():  Requested New Hflip Value: 0.
sensor_set_parameters():  New Hflip Value: 0.
sensor_set_parameters():  Old Vflip Value: 0.
sensor_set_parameters():  Requested New Vflip Value: 0.
sensor_set_parameters():  New Vflip Value: 0.
cam_init:113, req.count: 3
cam_init:133, buffer.length: 1024000
cam_init:134, buffer.m.offset: 0
cam_init:133, buffer.length: 1024000
cam_init:134, buffer.m.offset: 1024000
cam_init:133, buffer.length: 1024000
cam_init:134, buffer.m.offset: 2048000
cam_init:161, cam init done.
cam_get_image:188, dequeue done, index: 0
cam_get_image:190, copy done.
cam_get_image:198, enqueue done.
```

Step 3: Give a trigger signal voltage to J3 connector.

```
---
14 15 15 15 15 14 13 15 15 15 14 15 14 15 15 16
cam_get_image:188, dequeue done, index: 1
cam_get_image:190, copy done.
cam_get_image:198, enqueue done.
---
18 15 15 15 15 15 15 14 15 17 14 15 14 16 14 14
cam_get_image:188, dequeue done, index: 2
cam_get_image:190, copy done.
cam_get_image:198, enqueue done.
```

Step 4: Check the formed files.

You will see two files named '00000.raw' and '00001.raw'.

```
pi@raspberrypi:~/cam-mipiov9281/tools $ ls
00000.raw  1.png  3.png         Capture1.png  gpio-sysfs   v4l2_capture_raw10  v4l2_capture_y10  v4l2_capture_y8
00001.raw  2.png  Capture0.png  Capture2.png  raw10p2raw8  v4l2_capture_raw12  v4l2_capture_y12  vcmipidemo
pi@raspberrypi:~/cam-mipiov9281/tools $
```

4.9.3: Y10 Date Format Capture Example

Usage: ./v4l2_capture_y10-16-5.4 [-s sh] [-g gain] [-h f] [-v f] [-c cnt]

-s	Shutter Time. Value is from 8721ns to 8721*885ns, must be integral multiple of 8721ns . 8721xN(N =1,2,3,4,5.....855)
-g	Gain Value (0-254d)
-h	horizen flip 1: Enable 0:Disable
-v	vertical flip 1: Enable 0:Disable
-c	capture count

Step 1: Set Mode2(Y10, EXT_TRIG)

make setmode2

Refer to the chapter 4.5

Step 2: Enter capture setting:

./v4l2_capture_y10-16-5.4 -s 4135500 -g 0x88 -h 1 -v 1 -c 5

Set shutter time = 4135500ns = 8721ns * 500cnt

Set gain = 0x88 db= 136 db

For more detail please use below command:

./v4l2_capture_y10-16-5.4 --help

```
pi@raspberrypi:~/Desktop/tools $ ./v4l2_capture_y10 -s 4135500 -g 0x88 -h 1 -v 1 -c 5
Setting Shutter Value to 4135500.
Setting Gain Value to 136.000000.
Horizen flip the captured image.
Vertical flip the captured image.
Capture 5 frame.
sensor_set_parameters():  Old Gain Value: 137.
sensor_set_parameters():  Requested New Gain Value: 136.
sensor_set_parameters():  New Gain Value: 136.
sensor_set_parameters():  Old Exposure Value: 24813.
sensor_set_parameters():  Requested New Exposure Value: 4135500.
sensor_set_parameters():  New Exposure Value: 4135500.
sensor_set_parameters():  Old Hflip Value: 1.
sensor_set_parameters():  Requested New Hflip Value: 1.
sensor_set_parameters():  New Hflip Value: 1.
sensor_set_parameters():  Old Vflip Value: 1.
sensor_set_parameters():  Requested New Vflip Value: 1.
sensor_set_parameters():  New Vflip Value: 1.
cam_init:111, req.count: 3
cam_init:131, buffer.length: 1280000
cam_init:132, buffer.m.offset: 0
cam_init:131, buffer.length: 1280000
cam_init:132, buffer.m.offset: 1282048
cam_init:131, buffer.length: 1280000
cam_init:132, buffer.m.offset: 2564096
cam_init:159, cam init done.
```

Step 3: Give a trigger signal voltage to J3 connector

```
cam_get_image:186, dequeue done, index: 0
cam_get_image:188, copy done.
cam_get_image:196, enqueue done.
---
1f 1f 1e 1c a4 1b 17 1e 1d fb 21 1d 1e 20 49 1e
cam_get_image:186, dequeue done, index: 1
cam_get_image:188, copy done.
cam_get_image:196, enqueue done.
---
19 1e 1f 1d 83 1e 17 1c 1d a9 1f 1e 1f 1a ce 1a
cam_get_image:186, dequeue done, index: 2
cam_get_image:188, copy done.
cam_get_image:196, enqueue done.
---
1d 1b 1a 1a b9 1c 15 1c 1c 6b 1e 1b 1c 1c 29 1a
```

Step 4: Check the formed files.

You will see two files named ‘00000.raw’ and ‘00001.raw’.

```
pi@raspberrypi:~/Desktop/tools $ ls
00000.raw  00001.raw  00002.raw  v4l2_capture_raw10  v4l2_capture_raw12  v4l2_capture_y10  v4l2_capture_y12  v4l2_capture_y8
```

4.10 Strobe Setting And Register Read/Write

Strobe function is also turn on by default in all modes.Strobe generates a pulse with a reference starting point at the time when the pixel array starts integration. Following a delay after the reference starting point, which is controlled by :

0x3921	PWM_CTRL_21	0x00	RW	Bit[7]: Shift direction Bit[6:0]: strobe_frame_shift[30:24]

address	register name	default value	R/W	description
0x3922	PWM_CTRL_22	0x00	RW	Bit[7:0]: strobe_frame_shift[23:16]
0x3923	PWM_CTRL_23	0x00	RW	Bit[7:0]: strobe_frame_shift[15:8]
0x3924	PWM_CTRL_24	0x05	RW	Bit[7:0]: strobe_frame_shift[7:0]

a width of strobe_frame_span[31:0] is generated.

0x3925	PWM_CTRL_25	0x00	RW	Bit[7:0]: strobe_frame_span[31:24]
0x3926	PWM_CTRL_26	0x00	RW	Bit[7:0]: strobe_frame_span[23:16]
0x3927	PWM_CTRL_27	0x00	RW	Bit[7:0]: strobe_frame_span[15:8]
0x3928	PWM_CTRL_28	0x1A	RW	Bit[7:0]: strobe_frame_span[7:0]

Step 1: Go Into The Tools Folders

```
pi@raspberrypi:~/cam-mipiov9281 $ cd tools
pi@raspberrypi:~/cam-mipiov9281/tools $ ls
 1.png          Capture2.png  'Tools code'          v4l2_capture_y8
 2.png          gpio-sysfs     v4l2_capture_raw10   vcmipidemo
 3.png          i2c_read       v4l2_capture_raw12
 Capture0.png   i2c_write      v4l2_capture_y10
 Capture1.png   raw10p2raw8    v4l2_capture_y12
pi@raspberrypi:~/cam-mipiov9281/tools $
```

Step 2: I2c tool read Register

$./i2c_read 0 0x60 [start addr of reg] [num of regs]

For example, Read value of register 0x3928

./i2c_read 0 0x60 0x3928 1

```
pi@raspberrypi:~/cam-mipiov9281/tools $ ./i2c_read 0 0x60 0x3928 1
Using i2C device /dev/i2c-0
====I2C read:<0x60> <0x3928> <0x1>====
Read i2c addr 60
addr 3928 : value 1a
pi@raspberrypi:~/cam-mipiov9281/tools $
```

Step 3: I2c tool write Register

$./i2c_write 0 0x60 [reg addr] [reg value]

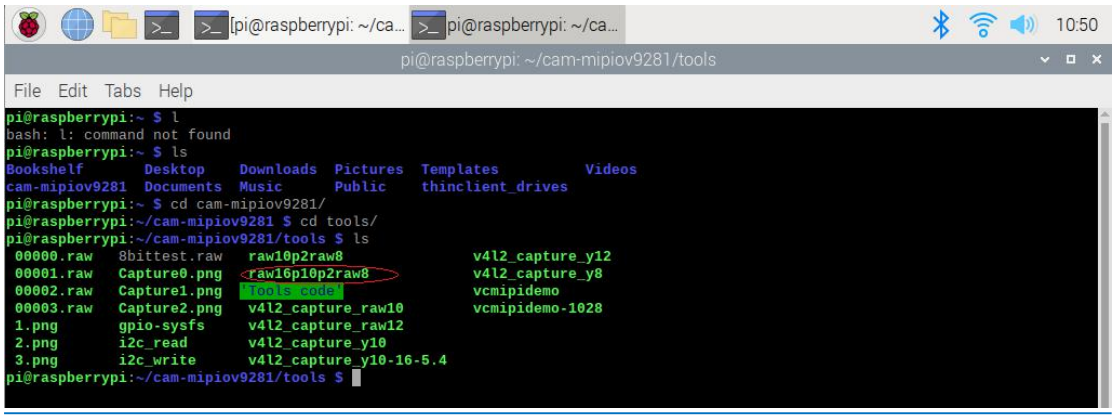
For example, Write 0x32 to register 0x3928.

./i2c_write 0 0x60 0x3928 0x32

```
pi@raspberrypi:~/cam-mipiov9281/tools $ ./i2c_write 0 0x60 0x3928 0x32
====I2C write:<0x60> <0x3928> <0x32>====
pi@raspberrypi:~/cam-mipiov9281/tools $
```

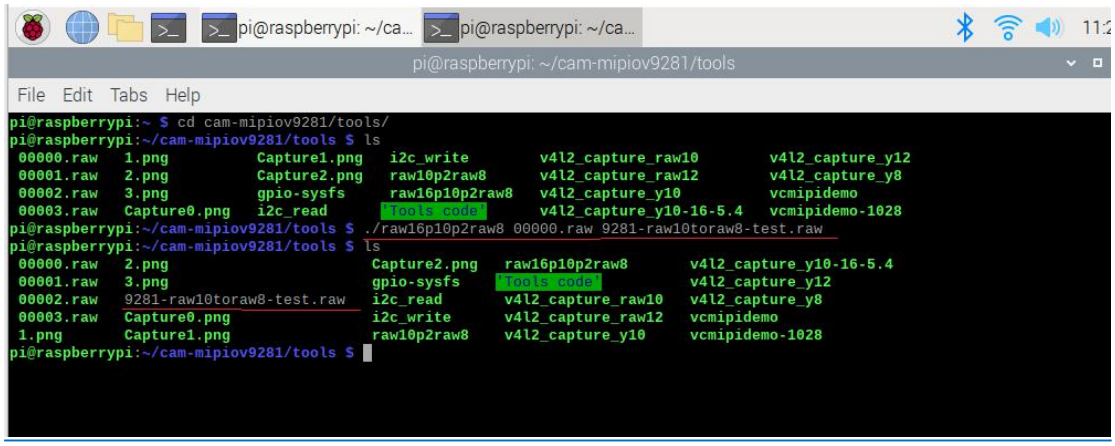
4.11 Raw 10 Change into Raw 8 And Display the image in Windows System

We provide a tools to help you change RAW10 to RAW8 in many applications.



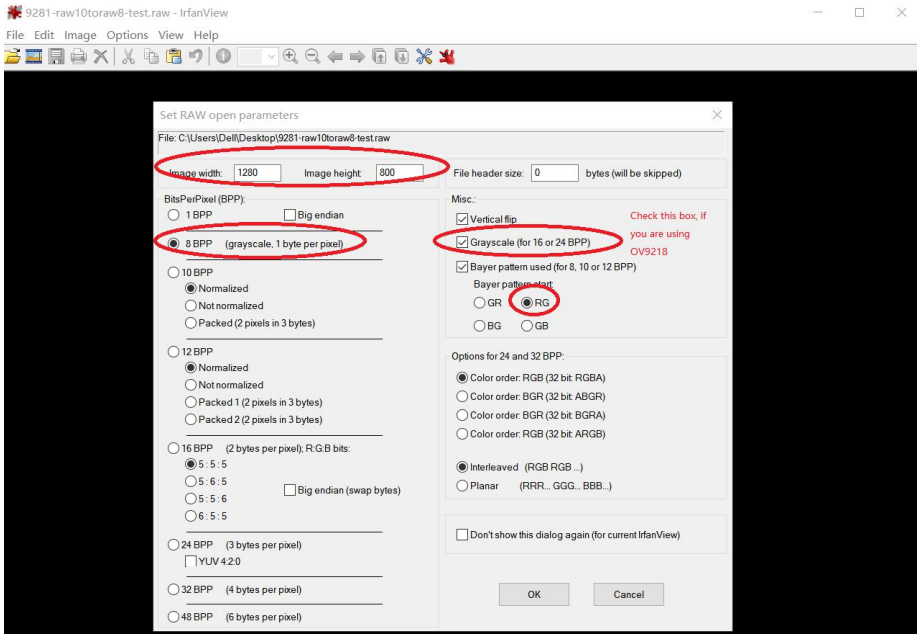
Step 1:Using the conversion tools

./raw16p10p2raw8 [raw 10 name] [raw8 name]

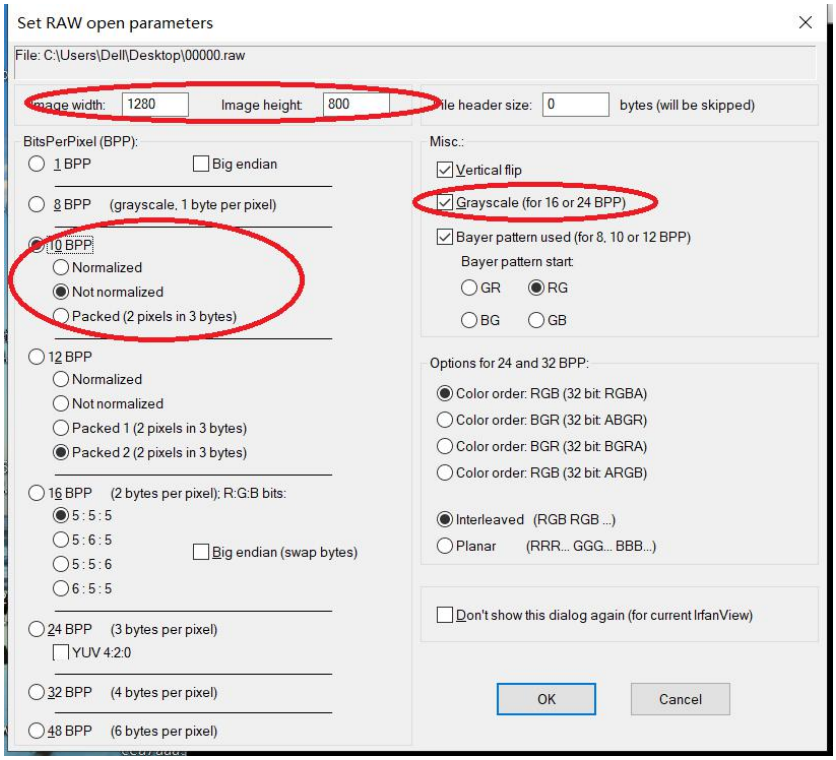


Step 2:Using the IrfanView 64 tools

Copy the '9281-raw10toraw8-test.raw' to Windows, use the IrfanView 64 set as below to get the image.

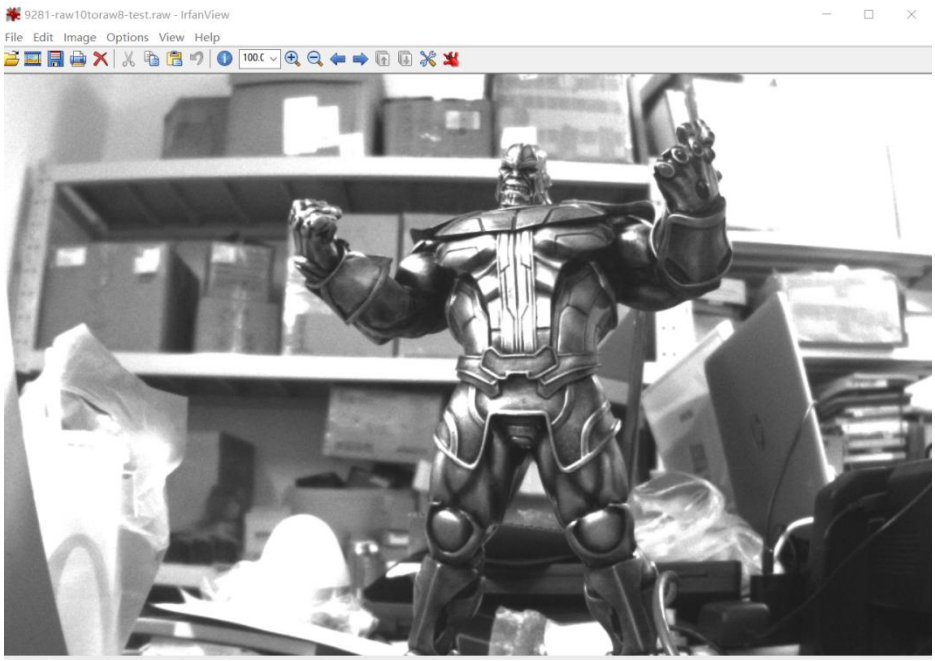


If you want to display the RAW10 image directly. Please set as below picture.



Step 3: View the results

We provide the raw10 format named '9281-raw10.raw' and raw8 format named '9281-raw10toraw8-test.raw' (After the conversion) on our wiki for you to test. below is the correct result.



5. Versions Description

Version	Description	Date	E-mail
V1.0		2020.04.02	support@inno-maker.com calvin@inno-maker.com
V1.1	(1) Add default mode setting (2) Change firmware folder structure	2020.04.08	support@inno-maker.com calvin@inno-maker.com
V1.2	(1) Added up to 12 modes (2) Add chapter 4.10, 4.11	2020.06.01	support@inno-maker.com calvin@inno-maker.com
V1.3			support@inno-maker.com calvin@inno-maker.com
V1.4	Add support for Kennel V5.4	2020.10.29	support@inno-maker.com calvin@inno-maker.com

If you have any suggestions, ideas, codes and tools please feel free to email to me. I will update the user manual and record your name and E-mail in list. Look forward to your letter and kindly share.