

# Camera Configuration Instructions

## 1. Supported camera list parameters

Camera Modules		Camera Type	GMSL2 Rate	Resolution	Frame Rate	Data Format	Trigger Pin
SG8-OX08DC-G2G		Monocular	6Gbps	3840x2160	30fps	RAW12	mfp7
SHW3G		Monocular	6Gbps	2064x1552	30fps	RAW12	mfp3 mfp7
SHW5G		Monocular	6Gbps	2560x1984	30fps	RAW10	mfp7
SDV11NM1		Stereo	6Gbps	2592x1944	30fps	RAW10	mfp7
Astra S56		Stereo	6Gbps	2560x1984	30fps	RAW10	mfp7
Astra S36		Stereo	6Gbps	1920x1536	30fps	UYVY	mfp7
SGX-YUV-GMSL2	SG2-IMX390C-5200-G2A-Hxxx	Monocular	6Gbps	1920x1080	30fps	UYVY	mfp7
	SG2-AR0233-5200-G2A-Hxxx	Monocular	6Gbps	1920x1080	30fps	UYVY	mfp7
	SG3-ISX031C-GMSL2-Hxxx	Monocular	6Gbps	1920x1536	30fps	UYVY	mfp7
	SG3-ISX031C-GMSL2F-Hxxx	Monocular	3Gbps	1920x1536	30fps	UYVY	mfp7
	SG5-IMX490C-5300-GMSL2-Hxxx	Monocular	6Gbps	2880x1860	30fps	UYVY	mfp8
	SG8S-AR0820C-5300-G2A-Hxxx	Monocular	6Gbps	3840x2160	30fps	UYVY	mfp7

	SHF3L	Monocular	6Gbps	1920x1536	30fps	UYVY	mfp7
	SHF3H	Monocular	6Gbps	1920x1536	60fps	UYVY	mfp7

## 2. Camera connection

Connect the camera to the ports on the adapter board.

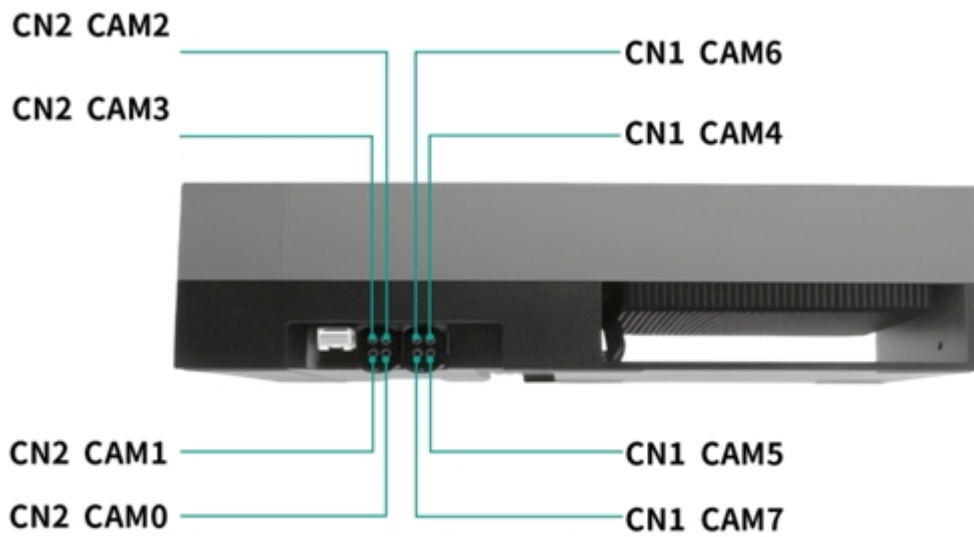
CN2 (CAM0/CAM1/CAM2/CAM3)

CN1 (CAM4/CAM5/CAM6/CAM7)

Note: Stereo camera needs an even port (CAM0/2/4/6) and the next port must be free.

The correspondence between CAM ports and device nodes is as follows:

代码块			
1	PORT	DeviceTree Node	DEV NODE
2	CN2 (CAM0)	cam_0	/dev/video0
3	CN2 (CAM1)	cam_1	/dev/video1
4	CN2 (CAM2)	cam_2	/dev/video2
5	CN2 (CAM3)	cam_3	/dev/video3
6	CN1 (CAM4)	cam_4	/dev/video4
7	CN1 (CAM5)	cam_5	/dev/video5
8	CN1 (CAM6)	cam_6	/dev/video6
9	CN1 (CAM7)	cam_7	/dev/video7



### 3. Script configuration

Prior to running `load_modules.sh`, configure the script parameters based on the "Supported camera list parameters"

#### 1. GMSL2 Rate

代码块

```
1 sudo insmod ko/max96712.ko
2 sudo insmod ko/sgcam-gmsl2.ko enable_3G_0=0,0,0,0 enable_3G_1=0,0,0,0
```

The parameters are described below:

Parameter	Description	Example
<b>enable_3G_0</b>	<p>This parameter configures the GMSL2 Rate for CAM0~CAM3.</p> <p>0: Configures the link for 6G mode.</p> <p>1: Configures the link for 3G mode.</p>	<p>For the camera combination listed below:</p> <p>CAM0: SG2-AR0233-5200-G2A</p> <p>CAM1: SG2-AR0233-5200-G2A</p> <p>CAM2: SG2-AR0233-5200-G2A</p> <p>CAM3: SG2-AR0233-5200-G2A</p> <p>CAM4: SG2-AR0233-5200-G2A</p> <p>CAM5: SG2-AR0233-5200-G2A</p> <p>CAM6: SG3-ISX031C-GMSL2F</p> <p>CAM7: SG3-ISX031C-GMSL2F</p>

<b>enable_3G_1</b>	<p>This parameter configures the GMSL2 Rate for CAM4~CAM7.</p> <p>0: Configures the link for 6G mode.</p> <p>1: Configures the link for 3G mode.</p>	<p>Driver load command:</p> <div><p>代码块</p><pre>1  sudo insmod ko/max96712.ko 2  sudo insmod ko/sgcam-gmsl2.ko    enable_3G_0=0,0,0,0    enable_3G_1=0,0,1,1</pre></div>
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2. Resolution and Trigger

<p>代码块</p> <pre>1  v4l2-ctl -d /dev/video0 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 2  v4l2-ctl -d /dev/video1 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 3  v4l2-ctl -d /dev/video2 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 4  v4l2-ctl -d /dev/video3 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 5  v4l2-ctl -d /dev/video4 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 6  v4l2-ctl -d /dev/video5 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 7  v4l2-ctl -d /dev/video6 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0 8  v4l2-ctl -d /dev/video7 -c sensor_mode=0,trig_pin=0x00020007,trig_mode=0</pre>
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The parameters are described below:

Parameter	Description	Example
<b>sensor_mode</b>	<p>This parameter configures the camera resolution.</p> <p>1.For the following modules, set the value to 0 to use the default resolution:</p> <p>SG8-OX08DC-G2G</p> <p>SHW3G</p>	<p>For the camera combination listed below:</p> <p>CAM0: SDV11NM1</p> <p>CAM1: /</p> <p>CAM2: Astra S36</p> <p>CAM3: /</p> <p>CAM4: SG2-AR0233-5200-G2A</p> <p>CAM5: SG3-ISX031C-GMSL2</p> <p>CAM6: SG5-IMX490C-5300-GMSL2</p> <p>CAM7: SG8S-AR0820C-5300-G2A</p>

	<p>SHW5G</p> <p>SDV11NM1</p> <p>Astra S56</p> <p>Astra S36</p> <p>2. For the SGX-YUV-GMSL2 series modules, configure the value based on the desired resolution:</p> <p>0: Resolution is 1920x1080</p> <p>1: Resolution is 1920x1536</p> <p>2: Resolution is 2880x1860</p> <p>3: Resolution is 3840x2160</p>	<p>The configuration command is:</p> <div> <p>代码块</p> <pre> 1  v4l2-ctl -d /dev/video0 -c     sensor_mode=0 2  v4l2-ctl -d /dev/video1 -c     sensor_mode=0 3  v4l2-ctl -d /dev/video2 -c     sensor_mode=0 4  v4l2-ctl -d /dev/video3 -c     sensor_mode=0 5  v4l2-ctl -d /dev/video4 -c     sensor_mode=0 6  v4l2-ctl -d /dev/video5 -c     sensor_mode=1 7  v4l2-ctl -d /dev/video6 -c     sensor_mode=2 8  v4l2-ctl -d /dev/video7 -c     sensor_mode=3 </pre> </div>
<b>trig_mode</b>	<p>This parameter enables or disables Slave mode.</p> <p>0: Disables Slave mode (Master mode is used).</p> <p>1: Enables Slave mode, allowing synchronization of multiple cameras using either the AGX Thor PWM signal or an external trigger signal.</p>	<p>For the camera combination listed below:</p> <p>CAM0: SG2-AR0233-5200-G2A (slave)</p> <p>CAM1: SG2-AR0233-5200-G2A (slave)</p> <p>CAM2: SG2-AR0233-5200-G2A (slave)</p> <p>CAM3: SG5-IMX490C-5300-GMSL2 (slave)</p> <p>CAM4: SG2-AR0233-5200-G2A (slave)</p> <p>CAM5: SG2-AR0233-5200-G2A (slave)</p> <p>CAM6: SG3-ISX031C-GMSL2F (slave)</p> <p>CAM7: SHW3G (master)</p>
<b>trig_pin</b>	<p>This parameter is effective only when <code>trig_mode=1</code>. It configures the trigger pins for the deserializer and serializer.</p> <p>Note that the SHW3G module requires two trigger signals and supports only external signal triggering, not AGX Thor PWM signal triggering.</p>	<p>The configuration command is:</p> <div> <p>代码块</p> <pre> 1  v4l2-ctl -d /dev/video0 -c     trig_pin=0x00020007,trig_mode=     1 2  v4l2-ctl -d /dev/video1 -c     trig_pin=0x00020007,trig_mode=     1 3  v4l2-ctl -d /dev/video2 -c     trig_pin=0x00020007,trig_mode= </pre> </div>

<div>1.SHW3G module configuration reference:  0x36723377 (Left to Right):  36: Deserializer first trigger pin = mfp6,tx_id = 3  72: Deserializer second trigger pin = mfp2,tx_id = 7  33: Serializer first trigger pin = mfp3, rx_id = 3  77: Serializer second trigger pin = mfp7, rx_id = 7  2.Other modules configuration reference:  0x00020007 (Left to Right):  0002: Deserializer trigger pin = mfp2  0007: Serializer trigger pin = mfp7</div>	<div>1 4 v4l2-ctl -d /dev/video3 -c trig_pin=0x00020008,trig_mode=1 5 v4l2-ctl -d /dev/video4 -c trig_pin=0x00020007,trig_mode=1 6 v4l2-ctl -d /dev/video5 -c trig_pin=0x00020007,trig_mode=1 7 v4l2-ctl -d /dev/video6 -c trig_pin=0x00020007,trig_mode=1 8 v4l2-ctl -d /dev/video7 -c trig_pin=0x36723377,trig_mode=0</div>
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## 4. I2C Address Mapping

For Monocular Camera

I2C Bus	Deserializer Address	Serializer Address	Sensor/ISP Address	EEPROM Address
9	0x2d	CAM0: 0x41	CAM0: 0x20	CAM0: 0x30
		CAM1: 0x42	CAM1: 0x21	CAM1: 0x31
		CAM2: 0x43	CAM2: 0x22	CAM2: 0x32
		CAM3: 0x44	CAM3: 0x23	CAM3: 0x33
12	0x29	CAM4: 0x41	CAM4: 0x20	CAM4: 0x30
		CAM5: 0x42	CAM5: 0x21	CAM5: 0x31
		CAM6: 0x43	CAM6: 0x22	CAM6: 0x32
		CAM7: 0x44	CAM7: 0x23	CAM7: 0x33

For Stereo Camera

I2C Bus	Deserializer Address	Serializer Address	Sensor0 Address	Sensor1 Address
9	0x2d	CAM0: 0x41 CAM1: / CAM2: 0x43 CAM3: /	CAM0: 0x20 CAM2: 0x22	CAM0: 0x21 CAM2: 0x23
12	0x29	CAM4: 0x41 CAM5: / CAM6: 0x43 CAM7: /	CAM4: 0x20 CAM6: 0x22	CAM4: 0x21 CAM6: 0x23