seli MOD504 Module Camera Instruction Manual

Contents

seli MOD504 Module Camera

Introduction

This high-quality 12.3MP camera module adopts Sony’s IMX477R chip and requires a C or CS-mount lens to work. It is compatible with NVIDIA Jetson Nano series and Raspberry Pi CM3 compute module. The camera module offers higher resolution (12.3MP) and higher sensitivity (nearly 50% larger area per pixel for improved low-light performance) than IMX219 cameras, which can be used in industrial and consumer applications.

Features

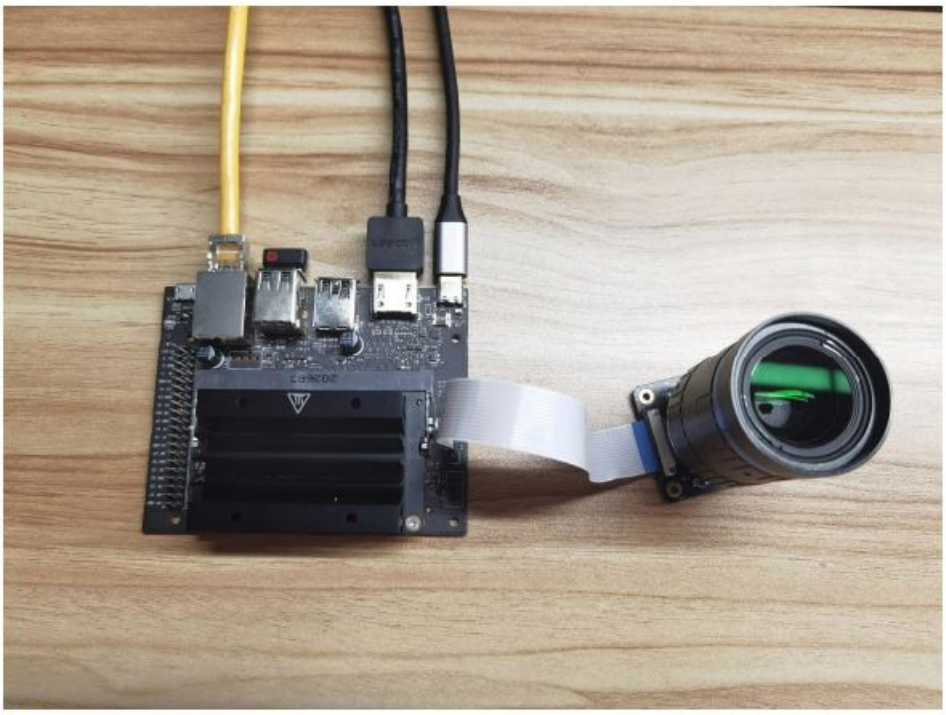
- Sony IMX477R sensor with 12.3MP high resolution
- Larger area per pixel for improved low-light performance
- Back-illuminated sensor architecture for improved sensitivity
- Support for different C- and CS-mount lens

Specification

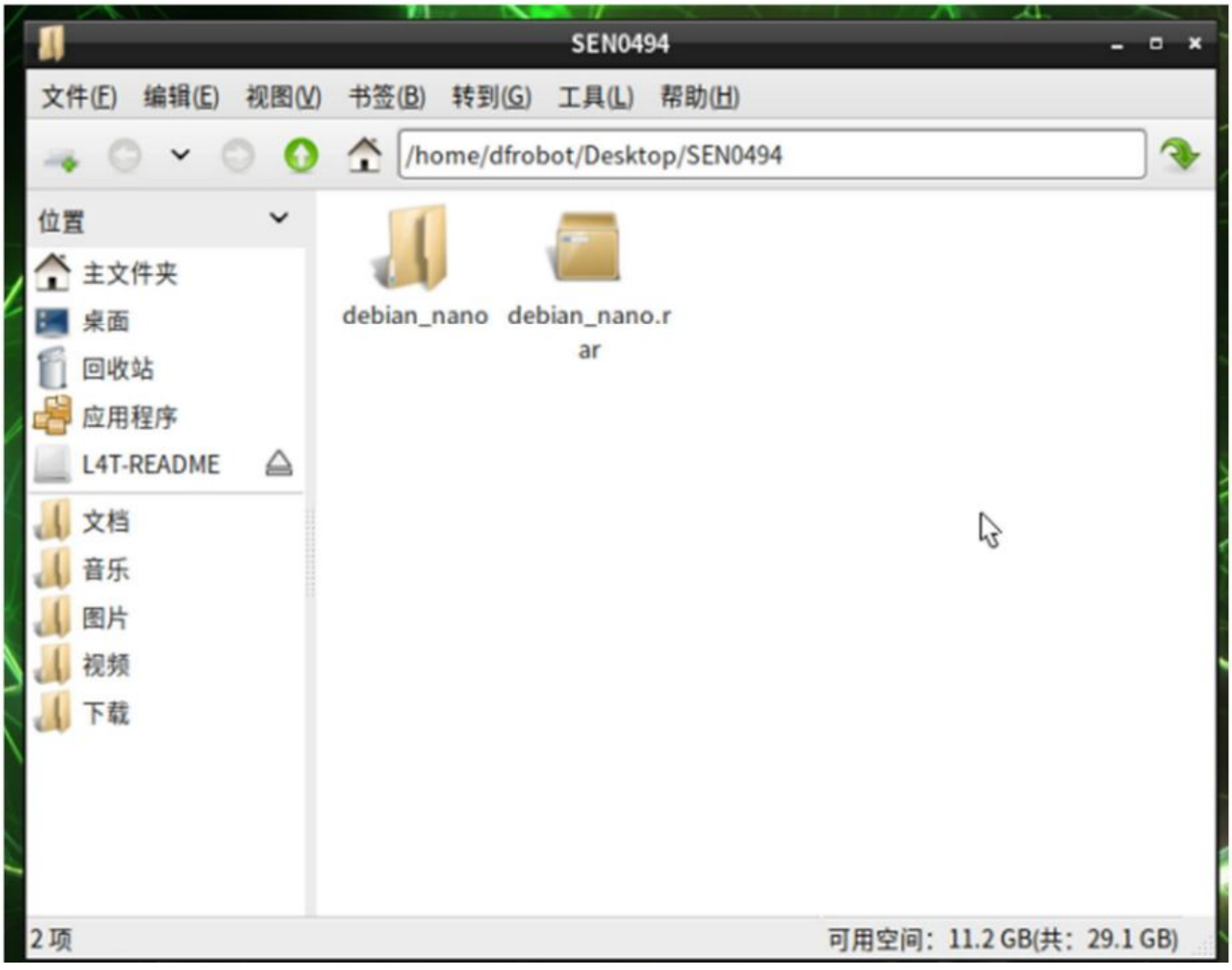
- Sensor Model: Sony IMX477R
- CMOS Diagonal Length: 7.9mm
- Resolution: 12.3 million pixels (4056×3040)
- Single Pixel Size: 1.5μm(H)×1.55μm(V)
- Output Format: RAW12/10/8, COMP8
- Back Focal Length: adjustable
- Lens Standard: C-mount/CS-mount (supporting C/CS connecting ring)
- l Infrared Filter: integrated

Settings for Jetson Nano Requirements

- Hardware
- Jetson Nano
- Telephoto Lens x1 (or FIT0829)
- 12.3MP Camera Module x1
- Wires
- Step 1. Connect the camera, lens and Jetson Nano correctly, then power on the Jetson Nano module



- Step 2. Download the Debian software pack of Jetson Nano and unzip to Jetson Nano.



- Step 3. Input the following commands to install Debian

```
# Enter the debian_nano file
cd ....../debian_nano/jetpack-4.5/
sudo apt-get install --reinstall ./nvidia-l4t-kernel 4.9.201-tegra-32.5.0-
20210115145440_arm64.deb
sudo apt-get install --reinstall ./nvidia-l4t-kernel-dtbs_4.9.201-tegra-32.5.0-202
10115145440_arm64.deb
```

- Step 4. Revise the file /boot/extlinux/extlinux.conf to make the changes take effect.
  - For Jetson Nano developer kit version B01 and Jetson Nano 2GB developer kit, please replace the contenct in the file /boot/extlinux/extlinux.conf with the following:

```
TIMEOUT 30
DEFAULT primary

MENU TITLE L4T boot options

LABEL primary
    MENU LABEL primary kernel
    LINUX /boot/Image
    INITRD /boot/initrd
    APPEND ${cbootargs} quiet root=/dev/mmcblk0p1 rw rootwait rootfstype=ext4
console=ttyS0,115200n8 console=tty0 fbcon=map:0 net.ifnames=0
    FDT /boot/tegra210-p3448-0000-p3449-0000-a02.dtb
```

```
    INITRD /boot/initrd
    APPEND ${cbootargs} quiet root=/dev/mmcblk0p1 rw rootwait rootfstype=ext4
console=ttyS0,115200n8 console=tty0 fbcon=map:0 net.ifnames=0
    FDT /boot/tegra210-p3448-0000-p3449-0000-b00.dtb
```

  - For Jetson Nano Developer Kit version A02, please replace it with the following:

```
TIMEOUT 30
DEFAULT primary

MENU TITLE L4T boot options

LABEL primary
    MENU LABEL primary kernel
    LINUX /boot/Image
    INITRD /boot/initrd
    APPEND ${cbootargs} quiet root=/dev/mmcblk0p1 rw rootwait rootfstype=ext4
console=ttyS0,115200n8 console=tty0 fbcon=map:0 net.ifnames=0
    FDT /boot/tegra210-p3448-0000-p3449-0000-a02.dtb
```

- Step 5. The module needs to be restarted for the changes to make effect.

```
sudo reboot
```

Settings for Jetson Xavier NX

The way to set Jetson Xavier NX is basically the same as that of the Jetson Nano.

- Step 1. Connect the camera, lens and Jetson Xavier NX correctly, then power on the Jetson Nano module.
- Step 2. Download the Debian software pack of Jetson Xavier NX and unzip to Jetson Xavier NX.
- Step 3. Input the following commands to install Debian

```
# Enter the debian_nano file
cd ....../debian_nx/jetpack-4.5/
sudo apt-get install --reinstall ./nvidia-l4t-kernel_4.9.201-tegra-32.5.0-
20210115151051_arm64.deb
sudo apt-get install --reinstall ./nvidia-l4t-kernel-dtbs_4.9.201-tegra-32.5.0-202
10115151051_arm64.deb
```

- Step 4. Revise the file /boot/extlinux/extlinux.conf to make the changes take effect.
  - Replace the contents of /boot/extlinux/extlinux.conf with the following

```
TIMEOUT 30
DEFAULT primary

MENU TITLE L4T boot options

LABEL primary
    MENU LABEL primary kernel
    LINUX /boot/Image
    INITRD /boot/initrd
    APPEND ${cbootargs} quiet root=/dev/mmcblk0p1 rw rootwait rootfstype=ext4
console=ttyTCU0,115200n8 console=tty0 fbcon=map:0 net.ifnames=0
    FDT /boot/tegra194-p3668-all-p3509-0000.dtb
```

- Step 5. The module needs to be restarted for the changes to make effect.

```
sudo reboot
```

Shooting Commands

1. Real-time screen
   - 1920×1080

```
SENSOR_ID=0 # 0 for CAM0 and 1 for CAM1 ports
FRAMERATE=60 # Framerate can go from 2 to 60 for 1920x1080 mode
gst-launch-1.0 nvarguscamerasrc sensor-id=$SENSOR_ID ! "video/x-raw(memory:NVMM),w
idth=1920,height=1080,framerate=$FRAMERATE/1" ! nvvidconv ! nvoverlaysink
```

   - Press Ctrl+C to end.
   - 4032×3040

```
SENSOR_ID=0 # 0 for CAM0 and 1 for CAM1 ports
FRAMERATE=30 # Framerate can go from 2 to 30 for 4032x3040 mode
gst-launch-1.0 nvarguscamerasrc sensor-id=$SENSOR_ID ! "video/x-raw(memory:NVMM),w
idth=4032,height=3040,framerate=$FRAMERATE/1" ! nvvidconv ! "video/x-raw(memory:NV
MM),width=1920,height=1080,framerate=$FRAMERATE/1" ! nvoverlaysink
```

   - Press Ctrl+C to end.
2. Record video in MP4
   - 1920×1080

```
SENSOR_ID=0 # 0 for CAM0 and 1 for CAM1 ports
FRAMERATE=60 # Framerate can go from 2 to 60 for 1920x1080 mode
gst-launch-1.0 -e nvarguscamerasrc sensor-id=$SENSOR_ID ! "video/x-raw(memory:NVMM
),width=1920,height=1080,framerate=$FRAMERATE/1" ! nvv4l2h264enc ! h264parse ! mp4
mux ! filesink location=rpi_v3_imx477_cam$SENSOR_ID.mp4
```

- Press Ctrl+C to end.
- 4032×3040

```
SENSOR_ID=0 # 0 for CAM0 and 1 for CAM1 ports
FRAMERATE=30 # Framerate can go from 2 to 30 for 4032x3040 mode
gst-launch-1.0 -e nvarguscamerasrc sensor-id=$SENSOR_ID ! "video/x-raw(memory:NVMM
),width=4032,height=3040,framerate=$FRAMERATE/1" ! nvv4l2h264enc ! h264parse ! mp4
mux ! filesink location=rpi_v3_imx477_cam$SENSOR_ID.mp4
```

- Press Ctrl+C to end.

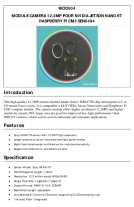
3. Shoot in JPEG
   - 1920×1080

```
SENSOR_ID=0 # 0 for CAM0 and 1 for CAM1 ports
FRAMERATE=60 # Framerate can go from 2 to 60 for 1920x1080 mode
NUMBER OF SNAPSHOTS=20
gst-launch-1.0 -e nvarguscamerasrc num-buffers=$NUMBER OF SNAPSHOTS sensor-id=$SEN
SOR_ID ! "video/x-raw(memory:NVMM),width=1920,height=1080,framerate=$FRAMERATE/1"
! nvjpegenc ! multifilesink location=%03d_rpi_v3_imx477_cam$SENSOR_ID.jpeg
```

   - 4032×3040

```
SENSOR_ID=0 # 0 for CAM0 and 1 for CAM1 ports
FRAMERATE=30 # Framerate can go from 2 to 30 for 4032x3040 mode
NUMBER OF SNAPSHOTS=20
gst-launch-1.0 -e nvarguscamerasrc num-buffers=$NUMBER_OF_SNAPSHOTS sensor-id=$SEN
SOR_ID ! "video/x-raw(memory:NVMM),width=4032,height=3040,framerate=$FRAMERATE/1"
! nvjpegenc ! multifilesink location=%03d_rpi_v3_imx477_cam$SENSOR_ID.jpeg
```

Documents / Resources

	seli MOD504 Module Camera [pdf] Instruction Manual MOD504 Module Camera, MOD504, Module Camera