T40xp 开发板基于 SDK 出图测试

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1、解压 SDK

说明：请在 linux 环境下解压，并解压在同一目录下。

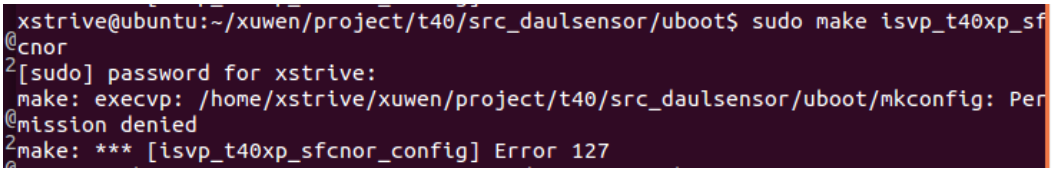
源码路径：ISVP-T40-1.1.1-20220120\software\sdk\Ingenic-SDK-T40-1.1.1-20220120\opensource

2、编译 uboot

make distclean　清除旧配置

make isvp_t40xp_sfcnor 编译：

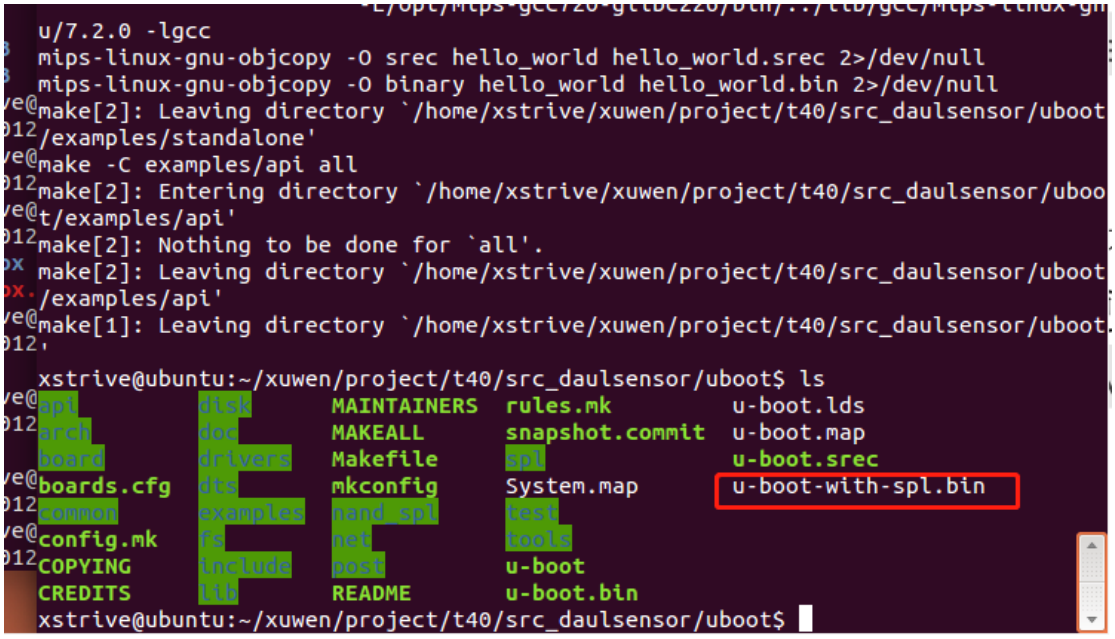
报错：



chmod –R 777　./* 给 uboot 文件增加操作权限

编译完成，生成 u-boot-with-spl.bin

chmod 777 u-boot-with-spl.bin　　修改权限



3、编译 kernel

说明：当前的硬件上使用的是 i2c1 和 i2c3 作为 sensor 的连接，确认是 dts 设备树配置是否为 i2c1 ： SDA_PA17，SCK_PA18 ， i2c3 ： SDA_PA21，SCK_PA22 。（参照开发板原理图）

路径：

kernel-4.4.94/arch/mips/boot/dts/ingenic/shark.dts

```
&i2c1 {
        pinctrl-0 = <&i2c1_pa>;
        pinctrl-names = "default";
        status = "okay";
};

&i2c2 {
        pinctrl-0 = <&i2c2_pc>;
        pinctrl-names = "default";
        status = "disable";
};

&i2c3 {
        pinctrl-0 = <&i2c3_pa>;
        pinctrl-names = "default";
        status = "okay";
};
```

kernel-4.4.94/arch/mips/boot/dts/ingenic/t40-pinctrl.dtsi

```
    i2c1_pin: i2c1-pin {
            i2c1_pa: i2c1-pa {
                    ingenic,pinmux = <&gpa 17 18>;
                    ingenic,pinmux-funcsel = <PINCTL_FUNCTION0>;
            };
            i2c1_pb: i2c1-pb {
                    ingenic,pinmux = <&gpb 17 18>;
                    ingenic,pinmux-funcsel = <PINCTL_FUNCTION1>;
            };
            i2c1_pd: i2c1-pd {
                    ingenic,pinmux = <&gpd 26 27>;
                    ingenic,pinmux-funcsel = <PINCTL_FUNCTION0>;
            };
    };
```

```
    i2c3_pin: i2c3-pin {
            i2c3_pb: i2c3-pb {
                    ingenic,pinmux = <&gpb 28 29>;
                    ingenic,pinmux-funcsel = <PINCTL_FUNCTION0>;
            };
            i2c3_pb1: i2c3-pb1 {
                    ingenic,pinmux = <&gpb 20 21>;
                    ingenic,pinmux-funcsel = <PINCTL_FUNCTION1>;
            };
            i2c3_pa: i2c3-pa {
                    ingenic,pinmux = <&gpa 21 22>;
                    ingenic,pinmux-funcsel = <PINCTL_FUNCTION2>;
            };
    };
```

第一步:使用相对配置好的板级文件 $make isvp_shark_defconfig

第二步：根据需求选择性编译 $ make menuconfig (默认就行)

第三步 ：编译内核文件 $ make uImage

如果报错，执行 $ make distclean ，然后从第一步重新开始。

备注：

报错 1：

```
  LD      arch/mips/built-in.o
  LD      arch/mips/boot/dts/brcm/built-in.o
  LD      arch/mips/boot/dts/cavium-octeon/built-in.o
  DTC     arch/mips/boot/dts/ingenic/shark.dtb
arch/mips/boot/dts/ingenic/shark.dts:3:10: fatal error: dt-bindings/input/input.
h: No such file or directory
 #include <dt-bindings/input/input.h>
          ^~~~~~~~~~~~~~~~~~~~~~~~~~~
compilation terminated.
make[2]: *** [arch/mips/boot/dts/ingenic/shark.dtb] Error 1
make[1]: *** [arch/mips/boot/dts/ingenic] Error 2
make: *** [arch/mips/boot/dts] Error 2
```

报错原因：把 linux 源码解压到 windows 下 然后再 copy 回 linux 丢失了软连接造成的。

方法: linux 下解压。

安装：apt-get install p7zip-full

解压 7z：使用方法：7z x file.7z

报错 2：

```
  SYSMAP  System.map
  OBJCOPY arch/mips/boot/vmlinux.bin
  LZMA    arch/mips/boot/vmlinux.bin.lzma
  UIMAGE  arch/mips/boot/uImage.lzma
Image Name:   Linux-4.4.94
Created:      Tue May 24 06:55:30 2022
Image Type:   MIPS Linux Kernel Image (lzma compressed)
Data Size:    2196225 Bytes = 2144.75 kB = 2.09 MB
Load Address: 80010000
Entry Point:  80478720
  LZO     arch/mips/boot/vmlinux.bin.lzo
/bin/sh: lzop: command not found
make[1]: *** [arch/mips/boot/vmlinux.bin.lzo] Error 1
make: *** [uImage] Error 2
```

安装 lzop:

sudo apt-get update

sudo apt-get install lzop

重新编译 make uImage

arch/mips/boot/下生成 uImage

4、制作文件系统

4.1 配置 flag

export CFLAGS="-O2 -muclibc"

export CPPFLAGS="-O2 -muclibc"

export CXXFLAGS="-O2 -muclibc"

export LDFLAGS="-O2 -muclibc"

export DSOFLAGS="-O2 -muclibc"

4.2 编译

make isvp_uclibc_defconfig

make -j

make install

生成_install

4.3 文件系统及驱动说明

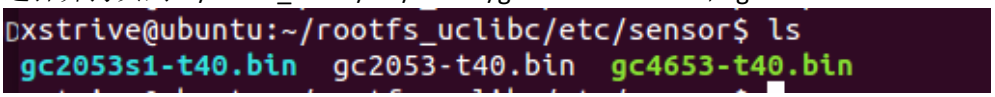
说明：建议直接使用 SDK 中的基本文件系统。

*\ISVP-T40-1.1.1-20220120\software\sdk\Ingenic-SDK-T40-1.1.1-20220120\resource\rootfs_720\root-uclibc-toolchain720.tar.bz2，解压并改名到~/rootfs_uclibc

先建/usr/samples 文件夹

mkdir ~/rootfs_uclibc/usr/samples　　挂载可读写文件系统
mkdir ~/rootfs_uclibc/usr/ext
mkdir ~/rootfs_uclibc/usr/ext/junzhen　　放驱动 ko 文件
mkdir ~/rootfs_uclibc/mnt/mtd　　挂载 config 分区

说明：SDK 自带 root-uclibc-toolchain720.tar.bz2 基本文件系统没有所需要的 isp 驱动。
说明：编译驱动参照依赖关系，按顺序编译。
参照《T40 开发指南.pdf》，编译的 ko 文件放在~/rootfs_uclibc/ext/junzhen
ISP 驱动：编译生成拷贝到 ~/rootfs_uclibc/usr/ext/junzhen/tx-isp-t40.ko
sensor 驱动：编译生成拷贝到~/rootfs_uclibc/usr/ext/junzhen/sensor_gc2053.ko
avpu 视频编码驱动：编译生成拷贝到~/rootfs_uclibc/usr/ext/junzhen/avpu.ko
图像效果文件：
路径：
*\ISVP-T40-1.1.1-20220120\software\sdk\Ingenic-SDK-T40-1.1.1-20220120\resource\sensor_settings_t40
选择并拷贝到 ~/rootfs_uclibc/etc/sensor/gc2053s1-t40.bin 和 gc2053-t40.bin



Audio 驱动：编译生成拷贝到~/rootfs_uclibc/usr/ext/junzhen/audio.ko

4.4 Squash 文件系统

若需要修磁盘分区，可在/rootfs_uclibc/etc/init.d/rcS 添加如下修改：
【
route add default gateway 192.168.0.1
mount tmpfs /tmp -t tmpfs
mount –t jffs2 /dev/mtdblock3 /usr/samples
mount –t jffs2 /dev/mtdblock4 /mnt/mtd

if [-f /usr/samples/autorun.sh]; then
/usr/samples/autorun.sh &
fi
】
mksquashfs ~/rootfs_uclibc rootfs.squashfs -b 1024k -comp xz
生成 rootfs.squashfs

4.5 jffs2 文件系统

cd ~
mkdir samples
cd samples

touch autorun.sh
autorun.sh 文件中添加如下代码：
【

```
#!/bin/sh
ifconfig eth0 up
ifconfig eth0 192.168.0.10
route add default gw 192.168.0.1 eth0
echo "nameserver 114.114.114.114" > /etc/resolv.conf
ifconfig lo up
ulimit -n 100000

#echo "1260" > /sys/class/net/eth0/mtu
export LD_LIBRARY_PATH='/usr/samples'
export PATH='/usr/bin:/usr/sbin:/bin:/sbin'
cd /usr/ext
telnetd

cd /usr/ext/junzhen
#insmod audio.ko mono_channel=1 spk_gpio=10      //设置左声道
#insmod soc-nna.ko
#insmod rtc_bm8563.ko
insmod avpu.ko
insmod tx-isp-t40.ko isp_clk=200000000
insmod sensor_gc2053_t40.ko
insmod sensor_gc2053s1_t40.ko
#insmod GobiNet.ko
```

】
mkfs.jffs2 -r ~/samples -o samples.jffs2 -e 0x8000 -s 0x1000 -n
生成 samples.jffs2

5、烧写镜像文件

将 uImage、rootfs.squashfs、samples.jffs2 拷贝到~/hisi/tftpboot
setenv serverip 192.168.0.209;setenv ipaddr 192.168.0.222;sa;
(192.168.0.209 虚拟机 ip)
说明：测试用为了方便只需要烧写 uImage ， rootfs.squashfs 和 samples.jffs2

setenv serverip 192.168.0.209;setenv ipaddr 192.168.0.222;sa;

mw.b 0x80600000 0xff 0x300000;tftpboot 0x80600000 uImage; sf probe; sf erase 0x100000 0x300000;sf write 0x80600000 0x100000 0x300000;
mw.b 0x80600000 0xff 0x1400000;tftpboot 0x80600000 rootfs.squashfs;sf probe;sf erase 0x400000 0x1400000;sf write 0x80600000 0x400000 0x1400000;
mw.b 0x80600000 0xff 0x700000;tftpboot 0x80600000 samples.jffs2;sf probe;sf erase

0x1800000 0x700000;sf write 0x80600000 0x1800000 0x700000;

设置启动参数
set bootargs console=ttyS1,115200n8 mem=128M@0x0 rmem=128M@0x8000000 init=/linuxrc rootfstype=squashfs root=/dev/mtdblock2 rw mtdparts=jz_sfc:1M(boot),3M(kernel),20M(root),7M(samples),1M(config);sa;
set bootcmd sf probe\;sf read 0x80600000 0x100000 0x300000\;bootm 0x80600000;sa;

6、驱动加载

6.1 手动加载

刚烧写的 uImage rootfs.squashfs 后，lsmod 查看加载驱动为空。

cd /usr/ext/junzhen/
ls
insmod avpu.ko
insmod tx-isp-t40.ko isp_clk=200000000
insmod sensor_gc2053_t40.ko
insmod sensor_gc2053s1_t40.ko

备注：音频驱动加载设置参数 insmod audio.ko mono_channel=1 spk_gpio=10 //设置左声道

6.2 自动加载

制作 rootfs.squashfs 之前，修改~/rootfs_uclibc/etc/init.d/rcS，修改内容见 4.4 小节。
制作 samples.jffs2 之前，修改~/samples/autorun.sh,修改内容见 4.5 小节。

7、编译 sample

Sample SDK 源码路径：
*\ISVP-T40-1.1.1-20220120\software\sdk\Ingenic-SDK-T40-1.1.1-20220120\sdk\samples\libimp-samples

注意事项：根据不同的 sensor 修改 sample-common.h 配置。
例如：t40 双 sensor 配置

```
/*****************************************  Sensor Attribute Table  *****************************************/

/* first sensor */
#define FIRST_SNESOR_NAME           "gc2053"            //sensor name (match with snesor driver name)
#define FIRST_I2C_ADDR              0x37                //sensor i2c address
#define FIRST_I2C_ADAPTER_ID            1               //sensor controller number used (0/1/2/3)
#define FIRST_SENSOR_WIDTH          1920                //sensor width
#define FIRST_SENSOR_HEIGHT         1080                //sensor height
#define FIRST_RST_GPIO              GPIO_PC(27)         //sensor reset gpio
#define FIRST_PWDN_GPIO             -1                  //sensor pwdn gpio
#define FIRST_POWER_GPIO            -1                  //sensor power gpio
#define FIRST_SENSOR_ID             0                   //sensor index
#define FIRST_VIDEO_INTERFACE           IMPISP_SENSOR_VI_MIPI_CSI0      //sensor interface type (dvp/csi0/csi1)
#define FIRST_MCLK                  IMPISP_SENSOR_MCLK1     //sensor clk source (mclk0/mclk1/mclk2)
#define FIRST_DEFAULT_BOOT          2                   //sensor default mode(0/1/2/3/4)

/* second sensor */
#define SECOND_SNESOR_NAME          "gc2053s1"          //sensor name (match with snesor driver name)
#define SECOND_I2C_ADDR             0x37                //sensor i2c address
#define SECOND_I2C_ADAPTER_ID           3               //sensor controller number used (0/1/2/3)
#define SECOND_SENSOR_WIDTH         1920                //sensor width
#define SECOND_SENSOR_HEIGHT            1080                //sensor height
#define SECOND_RST_GPIO             GPIO_PC(28)         //sensor reset gpio
#define SECOND_PWDN_GPIO            -1                  //sensor pwdn gpio
#define SECOND_POWER_GPIO           -1                  //sensor power gpio
#define SECOND_SENSOR_ID            1                   //sensor index
#define SECOND_VIDEO_INTERFACE          IMPISP_SENSOR_VI_MIPI_CSI1      //sensor interface type (dvp/csi0/csi1)
#define SECOND_MCLK                 IMPISP_SENSOR_MCLK2     //sensor clk source (mclk0/mclk1/mclk2)
#define SECOND_DEFAULT_BOOT         2                   //sensor default mode(0/1/2/3/4)

/* third sensor */
#define THIRD_SNESOR_NAME           "gc2053"            //sensor name (match with snesor driver name)
#define THIRD_I2C_ADDR              0x37                //sensor i2c address
#define THIRD_I2C_ADAPTER_ID            0                   //sensor controller number used (0/1/2/3)
#define THIRD_SENSOR_WIDTH          1920                //sensor width
#define THIRD_SENSOR_HEIGHT         1080                //sensor height
#define THIRD_RST_GPIO              GPIO_PC(17)         //sensor reset gpio
#define THIRD_PWDN_GPIO             -1                  //sensor pwdn gpio
#define THIRD_POWER_GPIO            -1                  //sensor power gpio
#define THIRD_SENSOR_ID             2                   //sensor index
#define THIRD_VIDEO_INTERFACE           IMPISP_SENSOR_VI_DVP        //sensor interface type (dvp/csi0/csi1)
#define THIRD_MCLK                  IMPISP_SENSOR_MCLK0     //sensor clk source (mclk0/mclk1/mclk2)
#define THIRD_DEFAULT_BOOT          2                   //sensor default mode(0/1/2/3/4)


/* Multimedia Camera Mode */
#define SENSOR_NUM                  IMPISP_TOTAL_TWO            //sensor total number (one/two/thr)
#define DUALSENSOR_MODE             IMPISP_DUALSENSOR_DUAL_ALLCACHED_MODE   //dualsensor mode ()
#define JOINT_MODE                  IMPISP_NOT_JOINT            //joint mode ()

#define PERSECOND_MEANS_BY_MS               1000
#define AUDIO_PERFRAME_MINIMUM_COST_BY_MS   10
#define DEFAULT_AUDIO_COST_MULTIPLIER       4
```

修改配置后再 make。
生成各个 sample 可执行文件

```
sample-dmic                         sample-ISP-flip.c
sample-dmic-aec                     sample-ISP-flip.o
sample-dmic-aec.c                   sample-IspOsd
sample-dmic-aec.o                   sample-IspOsd.c
sample-dmic.c                       sample-IspOsd.o
sample-dmic.o                       sample-IVS-unbind-move
sample-dmic-ref                     sample-IVS-unbind-move.c
sample-dmic-ref.c                   sample-IVS-unbind-move.o
sample-dmic-ref.o                   sample-LCD
sample-Encoder-h264-IVS-base-move   sample-LCD.c
sample-Encoder-h264-IVS-base-move.c sample-LCD.o
sample-Encoder-h264-IVS-base-move.o sample-OSD
sample-Encoder-h264-jpeg            sample-OSD.c
sample-Encoder-h264-jpeg.c          sample-OSD.o
sample-Encoder-h264-jpeg.o          sample-Setfps
sample-Encoder-jpeg                 sample-Setfps.c
sample-Encoder-jpeg.c               sample-Setfps.o
sample-Encoder-jpeg.o               sample-Snap-Raw
sample-Encoder-video                sample-Snap-Raw.c
sample-Encoder-video-AddSeiUDU      sample-Snap-Raw.o
sample-Encoder-video-AddSeiUDU.c    sample-Snap-YUV
sample-Encoder-video-AddSeiUDU.o    sample-Snap-YUV.c
sample-Encoder-video.c              sample-Snap-YUV.o
```

将需要测试的可执行文件拷贝到~/hisi/tftpboot/目录下，挂载到开发板

8、图像测试

8.1 carrier 使用

详见 t40 开发指南：
pc 上安装 carrier：

*\ISVP-T40-1.1.1-20220120\software\sdk\Ingenic-SDK-T40-1.1.1-20220120\resource\tools_t40\pc\Carrier-V4.0.0
Linux 下需要拷贝到开发板上：
*\ISVP-T40-1.1.1-20220120\software\sdk\Ingenic-SDK-T40-1.1.1-20220120\resource\tools_t40\bin\uclibc\carrier-server

挂载到开发板：
mount -t nfs -o nolock 192.168.0.209:/home/xstrive /opt/
cp –f /opt/hisi/tftpboot/carrier-server /usr/samples
cp –f /opt/hisi/tftpboot/sample-Encoder-video /usr/samples

双 sensor 执行：
./carrier-server --st=gc2053 --st1=gc2053s1 --sensornum=2 --dualmode=4
单 sensor 执行：
./carrier-server --st=gc2053

8.2 sample 程序测试

sample-Encoder-video 和 carrier-sever 是相互独立的程序，单独测试出视频。
运行 sample-Encoder-video ,在/tmp/生成 stream.h265 的视频文件，下载到 pc 端用 vlc 播放。

```
[root@Ingenic-uc1_1:tmp]# ls -lh
-rw-r--r--    1 root     root        4.1K Jan  1 01:27 alloc_manager_info
-rwxr-xr-x    1 root     root        6.8M Jan  1 00:00 carrier-server
-rw-r--r--    1 root     root        1.8K Jan  1 01:27 continuous_mem_info
-rw-r--r--    1 root     root          32 Jan  1 01:27 isp_tuning_func
-rw-r--r--    1 root     root          27 Jan  1 00:00 resolv.conf
-rwxr-xr-x    1 root     root           0 Jan  1 01:27 stream-0.h265
-rwxr-xr-x    1 root     root           0 Jan  1 01:27 stream-1.h265
```

8.3 常见错误及注意事项

报错 1：

```
[root@Ingenic-uc1_1:tmp]# ./sample-Encoder-h264-jpeg &
[root@Ingenic-uc1_1:tmp]# [  760.493976] probe ok ------->gc2053
[  760.497671] set sensor mclk(1) gpio
[  760.581306] -----gc2053_detect: 1116 ret = 0, v = 0x20
[  760.586763] -----gc2053_detect: 1122 ret = 0, v = 0x53
[  760.592089] gc2053 chip found @ 0x37 (i2c1) version H20211222b
[  760.598355]  Create framechan0 OK!
[  760.602255]  Create framechan1 OK!
[  760.606123]  Create framechan2 OK!
[  760.692926] probe ok ------->gc2053s1
[  760.696764] set sensor mclk(2) gpio
[  760.771310] -----gc2053s1_detect: 1116 ret = 0, v = 0x20
[  760.776914] -----gc2053s1_detect: 1122 ret = 0, v = 0x53
[  760.782422] gc2053s1 chip found @ 0x37 (i2c3) version H20211222b
[  760.788775]  Create framechan3 OK!
[  760.792600]  Create framechan4 OK!
[  760.796381]  Create framechan5 OK!
[  761.012510] gc2053 stream on
[  761.026862] gc2053s1 stream on
AL_Board_Create failed
[  761.034898] gc2053 stream off
[  761.041601] gc2053s1 stream off
```

报错 2：

```
[ 1406.372684] Hi    : 0000000b
[ 1406.375652] Lo    : 247cb120
[ 1406.378627] epc   : 800df4f0 __kmalloc+0x1c4/0x268
[ 1406.383680] ra    : c03b0f28 tisp_main_init+0x790/0xf7c [tx_isp_t40]
[ 1406.390236] Status: 14001c03 KERNEL EXL IE
[ 1406.394557] Cause : 08800010 (ExcCode 04)
[ 1406.398687] BadVA : 00000001
[ 1406.401652] PrId  : 00132100 (Ingenic XBurst@II)
[ 1406.406410] Modules linked in: sensor_gc2053s1_t40(O) sensor_gc2053_t40(O) tx_isp_t40(O) avpu(O
) audio(O)
[ 1406.416303] Process sample-Encoder- (pid: 925, threadinfo=8406e000, task=85cfc9c0, tls=77a5b790
)
[ 1406.425369] Stack : 86320000 00000780 00000438 800c3b08 c04036e4 c0440000 c0441510 00010000
         80000000 c03b0f28 00000000 00000001 0000001f 8598b100 00000000 6374652f
         6e65732f 2f726f73 30326367 742d3335 622e3034 00006e69 00000002 c0441114
         8406fba8 c03b2600 00000000 00000000 806479e8 00000017 843e8800 8023c400
         c0406db8 00000000 06480000 06320000 843e8800 8406fdf8 00000044 8023c6e0
         ...
[ 1406.462082] Call Trace:
[ 1406.464607] [<800df4f0>] __kmalloc+0x1c4/0x268
[ 1406.469327] [<c03b0f28>] tisp_main_init+0x790/0xf7c [tx_isp_t40]
[ 1406.475772] [<c040520c>] ispcore_core_ops_init+0x5f0/0xc5c [tx_isp_t40]
[ 1406.482833] [<c0400cd8>] ispcore_core_ops_ioctl+0xf0/0x19c [tx_isp_t40]
[ 1406.489878] [<c03a42e8>] tx_isp_notify+0xa8/0x104 [tx_isp_t40]
[ 1406.496109] [<c039b2f0>] subdev_sensor_ops_set_input+0x21c/0x290 [tx_isp_t40]
[ 1406.503685] [<c039c164>] subdev_sensor_ops_ioctl+0x6c/0x918 [tx_isp_t40]
[ 1406.510814] [<c0400664>] ispcore_sensor_ops_ioctl+0x84/0xb0 [tx_isp_t40]
[ 1406.517945] [<c03a5d78>] tx_isp_unlocked_ioctl+0x85c/0x273c [tx_isp_t40]
[ 1406.524974] [<800f3e8c>] do_vfs_ioctl+0x5d0/0x5e8
[ 1406.529828] [<800f3efc>] SyS_ioctl+0x58/0x9c
[ 1406.534235] [<80023d78>] syscall_common+0x30/0x54
[ 1406.539082]
[ 1406.540612]
Code: 27bd0028  8e020014  02221021 <8c450000> 41666000  30c60001  000000c0  8f84000c  8e020000
[ 1406.551007] ---[ end trace ba4f47a06312feaa ]---
 Unhandled kernel unaligned access
```

运行./carrier-server --st=gc2053 --st1=gc2053s1 --sensornum=2 --dualmode=4

报错 3：

```
Built using "LIVE555 Streaming Media": <http://www.live555.com/liveMedia/>
Built time: Jan 20 2022, 22:17:41
Sensor Type : gc2053
Senso[   66.166897] set sensor mclk(1) gpio
r1 Type : gc2053s1

Argument print:
    Main EncType = h265 = 16777217
    Main EncType = h265 = 16777217
    Main VideoWidth = 1920
    Main VideoHeight = 1080
    Second VideoWidth = 640
    Second VideoHeight = 360
    FPSNum = 25
    FPSDen = 1
    Audio = 0
    RC = CapedQuality
    cli = 1

Function usage:
        showfps: Show FPS and bitrate infomation
        osd: Switch on/off timestamp OSD
        snap: Snapshot a JPEG picture
        display: Display on LCD
Initializing...
[   66.251778] i2c i2c-1: i2c_ingenic_irq 446, I2C transfer error, ABORT interrupt
[   66.259370] i2c i2c-1: --I2C txabrt:
[   66.263097] i2c i2c-1: --I2C TXABRT[0]=I2C_TXABRT_ABRT_7B_ADDR_NOACK
[   66.269711] chip found @ 0x37 (i2c1) is not an gc2053 chip.
[   66.275500] CPU: 1 PID: 600 Comm: carrier-server Tainted: G           O    4.4.94 #1
[   66.283516] Stack : 806479ea 00000048 00000000 80650000 00000000 00000000 80074724 805d8ba7
          805597d0 00000001 00000258 80644708 c044c3c4 843d9600 c0450000 80074718
          c0450000 8023b8a4 00000000 00000000 8055ea70 8514bbd4 8514bbb8 800a56b4
          00000000 8003445c 806479e8 0000002f 8514bbd4 00000000 00000000 84100ec0
          00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
          ...
[   66.320383] Call Trace:
[   66.322917] [<8001ea54>] show_stack+0x70/0x8c
[   66.327428] [<80230fa4>] dump_stack+0x94/0xd0
[   66.332065] [<c03c6348>] isp_printf+0x74/0x88 [tx_isp_t40]
[   66.337892] [<c044a928>] gc2053_g_chip_ident+0x4cc/0x8f4 [sensor_gc2053_t40]
[   66.345316] [<c035c45c>] subdev_sensor_ops_ioctl+0x364/0x918 [tx_isp_t40]
[   66.352583] [<c03c0664>] ispcore_sensor_ops_ioctl+0x84/0xb0 [tx_isp_t40]
[   66.359758] [<c0364838>] tx_isp_sensor_register_sensor+0xc0/0xd8 [tx_isp_t40]
[   66.367371] [<c0365da4>] tx_isp_unlocked_ioctl+0x888/0x273c [tx_isp_t40]
[   66.374425] [<800f3e8c>] do_vfs_ioctl+0x5d0/0x5e8
[   66.379295] [<800f3efc>] SyS_ioctl+0x58/0x9c
[   66.383716] [<80023d78>] syscall_common+0x30/0x54
[   66.388583]
Video Input init failed
```

检查图像效果文件是否存在

```
[root@Ingenic-uc1_1:tmp]# ./sample-Encoder-h264-jpeg &
[root@Ingenic-uc1_1:tmp]# [  111.847168] i2c i2c-1: Failed to register i2c client gc2053 at 0x37 (
-16)
[  111.854294] [ subdev_sensor_ops_register_sensor:106 ] Failed to acquire subdev gc2053, deferrin
g probe
[  111.863948] CPU: 1 PID: 671 Comm: sample-Encoder- Tainted: G           O    4.4.94 #1
[  111.872037] Stack : 806479ea 00000049 00000000 80650000 00000000 00000000 80074724 805d8ba7
         805597d0 00000001 0000029f 80644708 84485020 004b0000 00000001 80074718
         00000001 8023b8a4 00000000 00000000 8055ea70 861bbc1c 861bbc00 800a56b4
         00000000 8003445c 806479e8 0000005a 861bbc1c 00000000 8616ac88 8411d880
         00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
         ...
[  111.908803] Call Trace:
[  111.911335] [<8001ea54>] show_stack+0x70/0x8c
[  111.915836] [<80230fa4>] dump_stack+0x94/0xd0
[  111.920449] [<c0406348>] isp_printf+0x74/0x88 [tx_isp_t40]
[  111.926385] [<c039c28c>] subdev_sensor_ops_ioctl+0x194/0x918 [tx_isp_t40]
[  111.933663] [<c0400664>] ispcore_sensor_ops_ioctl+0x84/0xb0 [tx_isp_t40]
[  111.940837] [<c03a4838>] tx_isp_sensor_register_sensor+0xc0/0xd8 [tx_isp_t40]
[  111.948470] [<c03a5da4>] tx_isp_unlocked_ioctl+0x888/0x273c [tx_isp_t40]
[  111.955546] [<800f3e8c>] do_vfs_ioctl+0x5d0/0x5e8
[  111.960407] [<800f3efc>] SyS_ioctl+0x58/0x9c
[  111.964824] [<80023d78>] syscall_common+0x30/0x54
[  111.969681]
[  111.977941] Error: Not Find any irq,check me drivers/irqchip/irq-ingenic-chip.c 290.
```

说明：如果 carrier-server 成为僵尸进程，再执行./carrier-server 会报下面的错误，重启设备

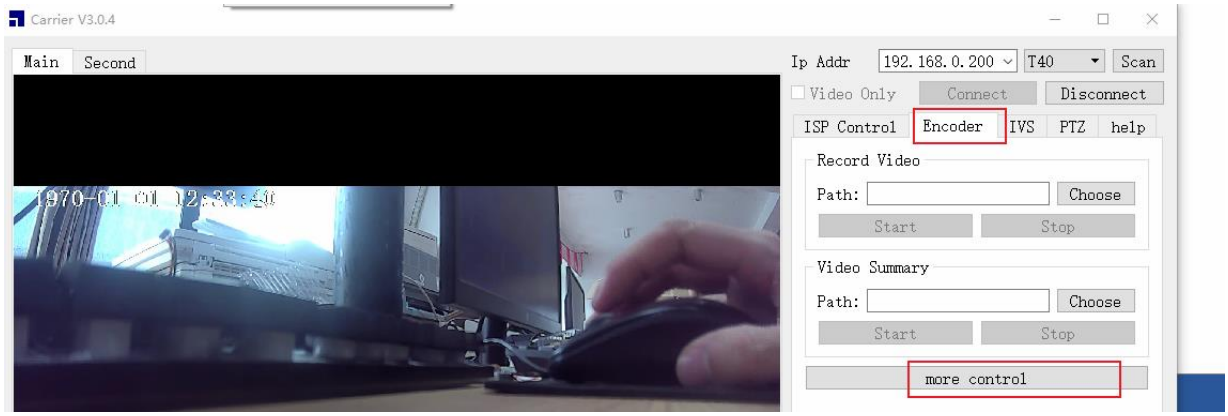
```
[  344.506731] $28    : 860ae000 860afb08 00000438 c03b0f28
[  344.512131] Hi    : 0000000b
[  344.515097] Lo    : 247cb120
[  344.518069] epc   : 800df4f0 __kmalloc+0x1c4/0x268
[  344.523123] ra    : c03b0f28 tisp_main_init+0x790/0xf7c [tx_isp_t40]
[  344.529680] Status: 14001c03 KERNEL EXL IE
[  344.534000] Cause : 08800010 (ExcCode 04)
[  344.538133] BadVA : 00000001
[  344.541099] PrId  : 00132100 (Ingenic XBurst@II)
[  344.545856] Modules linked in: sensor_gc2053s1_t40(O) sensor_gc2053_t40(O) tx_isp_t40(O) avpu(O
) audio(O)
[  344.555755] Process carrier-server (pid: 752, threadinfo=860ae000, task=86168ec0, tls=770c8790)
[  344.564734] Stack : 86040000 00000780 00000438 800c3b08 c04036e4 c0440000 c0441510 00010000
         80000000 c03b0f28 00000000 00000001 00000001 00000001 00000000 6374652f
         6e65732f 2f726f73 30326367 742d3335 622e3034 00006e69 00000002 c0441114
         860afba8 c03b2600 00000000 00000000 806479e8 00000017 843f8800 8023c400
         c0406db8 00000000 058bc000 06040000 843f8800 860afdf8 00000044 8023c6e0
         ...
[  344.601449] Call Trace:
[  344.603981] [<800df4f0>] __kmalloc+0x1c4/0x268
[  344.608700] [<c03b0f28>] tisp_main_init+0x790/0xf7c [tx_isp_t40]
[  344.615164] [<c040520c>] ispcore_core_ops_init+0x5f0/0xc5c [tx_isp_t40]
[  344.622244] [<c0400cd8>] ispcore_core_ops_ioctl+0xf0/0x19c [tx_isp_t40]
[  344.629292] [<c03a42e8>] tx_isp_notify+0xa8/0x104 [tx_isp_t40]
[  344.635535] [<c039b2f0>] subdev_sensor_ops_set_input+0x21c/0x290 [tx_isp_t40]
[  344.643131] [<c039c164>] subdev_sensor_ops_ioctl+0x6c/0x918 [tx_isp_t40]
[  344.650267] [<c0400664>] ispcore_sensor_ops_ioctl+0x84/0xb0 [tx_isp_t40]
[  344.657414] [<c03a5d78>] tx_isp_unlocked_ioctl+0x85c/0x273c [tx_isp_t40]
[  344.664454] [<800f3e8c>] do_vfs_ioctl+0x5d0/0x5e8
[  344.669312] [<800f3efc>] SyS_ioctl+0x58/0x9c
[  344.673720] [<80023d78>] syscall_common+0x30/0x54
[  344.678571]
[  344.680100]
Code: 27bd0028  8e020014  02221021 <8c450000> 41666000  30c60001  000000c0  8f84000c  8e020000
[  344.690426] ---[ end trace 4a2d0e1be0b45636 ]---
```

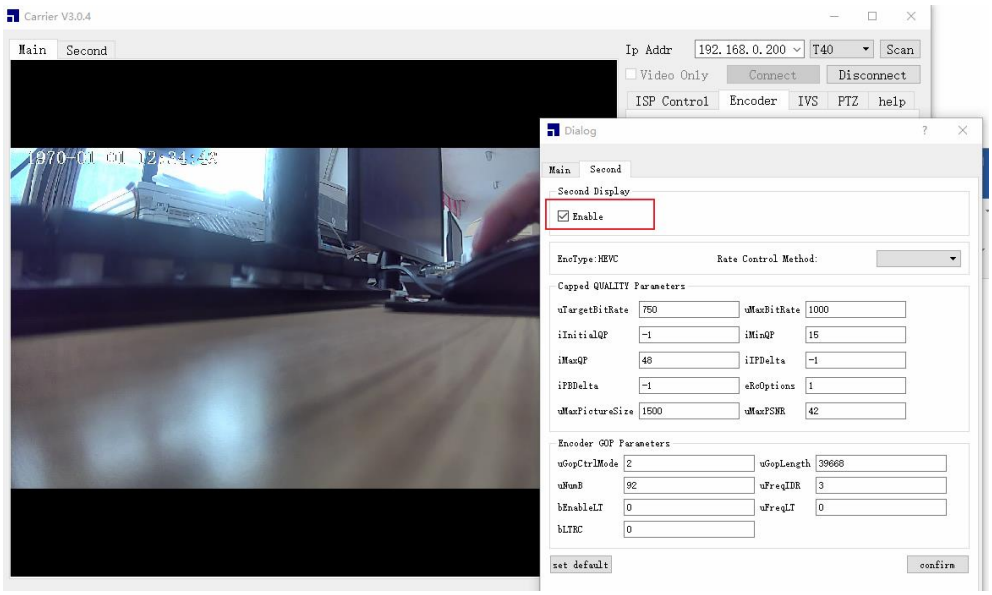
注意事项：

如果 pc 端 carrier 软件只有 second 页有图像：

(1) 检查硬件连接是否正常

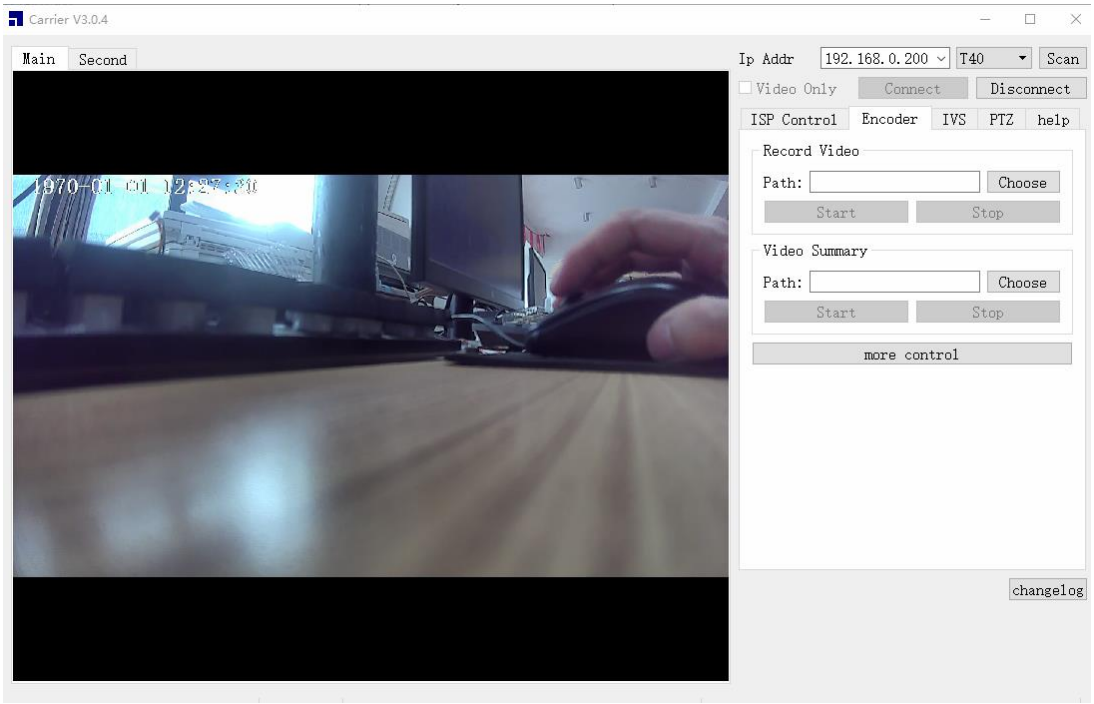
(2) 检查 pc 软件->Encoder->more control->选中 Enable

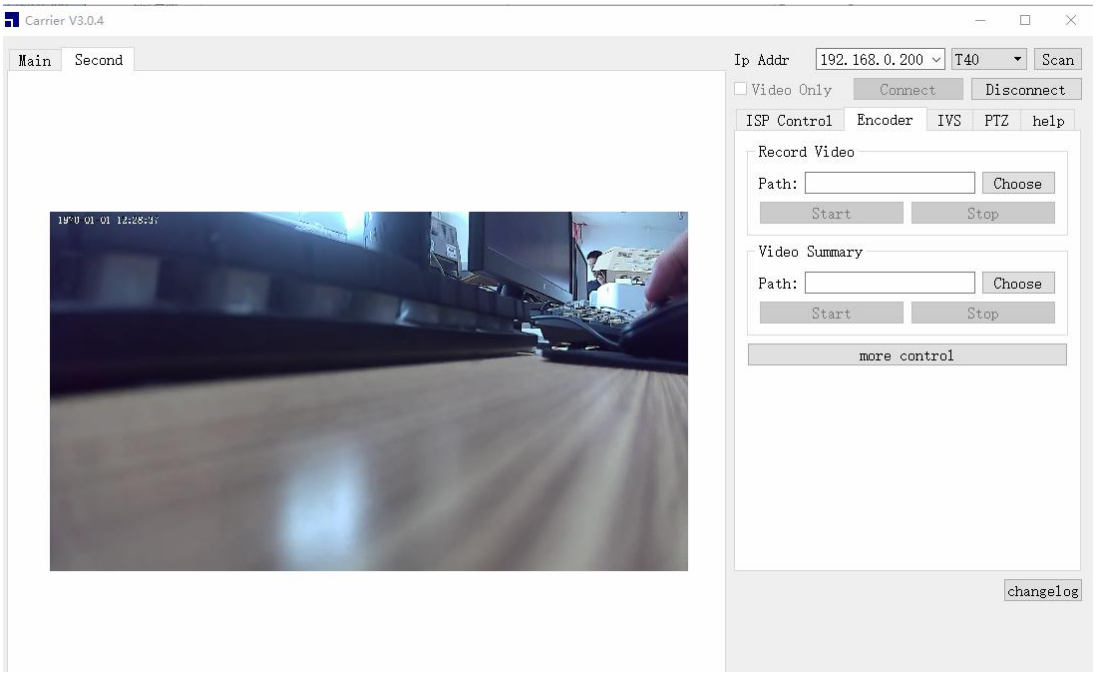




(3) 尝试重新打开 carrier 软件

正常情况 main 页和 sencod 页都有图像：




Carrier V3.0.4
Main
Second
Ip Addr
192.168.0.200
T40
Scan
Video Only
Connect
Disconnect
ISP Control
Encoder
IVS
PTZ
help
Record Video
Path:
Choose
Start
Stop
Video Summary
Path:
Choose
Start
Stop
more control
changelog