

0x0c17b00 [0,0]

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<https://milkv.io/docs/duo/overview>

Duo S

<https://milkv.io/docs/duo/getting-started/duos>

```
[Thu Jan 23 16:32:35 2025] usb 3-3.3.4.4: new high-speed USB device number 28 using xhci_hcd
[Thu Jan 23 16:32:36 2025] usb 3-3.3.4.4: device descriptor read/64, error -71
[Thu Jan 23 16:32:36 2025] usb 3-3.3.4.4: New USB device found, idVendor=3346, idProduct=1009, bo
[Thu Jan 23 16:32:36 2025] usb 3-3.3.4.4: New USB device strings: Mfr=1, Product=2, SerialNumber=
[Thu Jan 23 16:32:36 2025] usb 3-3.3.4.4: Product: RNDIS
[Thu Jan 23 16:32:36 2025] usb 3-3.3.4.4: Manufacturer: Cvitek
[Thu Jan 23 16:32:36 2025] usb 3-3.3.4.4: SerialNumber: 0123456789
[Thu Jan 23 16:32:36 2025] rndis_host 3-3.3.4.4:1.0 eth0: register 'rndis_host' at usb-0000:00:14
[Thu Jan 23 16:32:36 2025] usbcore: registered new interface driver rndis_host
[Thu Jan 23 16:32:36 2025] rndis_host 3-3.3.4.4:1.0 enx7af49fe45082: renamed from eth0
```

```
dpavlin@nuc:/nuc/milkv-duo$ sudo dhclient enx7af49fe45082
```

```
dpavlin@nuc:/nuc/milkv-duo$ /sbin/ifconfig enx7af49fe45082
enx7af49fe45082: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.42.94 netmask 255.255.255.0 broadcast 192.168.42.255
    inet6 fe80::78f4:9fff:fee4:5082 prefixlen 64 scopeid 0x20<link>
    ether 7a:f4:9f:e4:50:82 txqueuelen 1000 (Ethernet)
    RX packets 7 bytes 816 (816.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 31 bytes 6008 (5.8 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
dpavlin@nuc:/nuc/milkv-duo$ ssh root@192.168.42.1.
```

```
The authenticity of host '192.168.42.1. (192.168.42.1)' can't be established.
ED25519 key fingerprint is SHA256:sfqq5/VjPb++J6gD4Q8/JxUn6u2geewQcqwIjJHiF4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:809: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.42.1.' (ED25519) to the list of known hosts.
root@192.168.42.1.'s password: ### milkv
[root@milkv-duo]~#
```

```
[root@milkv-duo]~# cat /proc/cpuinfo
processor      : 0
hart         : 0
```

```
isa          : rv64imafdvcsu
mmu          : sv39
```

```
[root@milkv-duo]~# uname -a
Linux milkv-duo 5.10.4-tag- #1 PREEMPT Thu Jun 6 14:28:13 CEST 2024 riscv64 GNU/Linux
[root@milkv-duo]~# free
              total        used          free      shared  buff/cache   available
Mem:           330960        22516        296692         148       11752       300580
Swap:              0              0              0
```

buildroot

```
dpavlin@nuc:/nuc/milkv-duo/duo-buildroot-sdk$ ./build.sh milkv-duos-sd
```

```
...
```

```
create partition mounting points and move systems to read-write partitions
[TARGET] br-rootfs-pack
make -C /nuc/milkv-duo/duo-buildroot-sdk/buildroot-2021.05 milkv-duos-sd_musl_riscv64_defconfig B
make[1]: Entering directory '/nuc/milkv-duo/duo-buildroot-sdk/buildroot-2021.05'
GEN      /nuc/milkv-duo/duo-buildroot-sdk/buildroot-2021.05/output/milkv-duos-sd_musl_riscv64/Ma
#
# configuration written to /nuc/milkv-duo/duo-buildroot-sdk/buildroot-2021.05/output/milkv-duos-s
#
make[1]: Leaving directory '/nuc/milkv-duo/duo-buildroot-sdk/buildroot-2021.05'
/nuc/milkv-duo/duo-buildroot-sdk/buildroot-2021.05/utils/brmake -j16 -C /nuc/milkv-duo/duo-buildr
2025-01-24T13:36:30 >>> host-util-linux 2.36.2 Building
Done in 10s (error code: 2)
make: *** [Makefile:597: br-rootfs-pack] Error 2
Error: Build board milkv-duos-sd failed!
dpavlin@nuc:/nuc/milkv-duo/duo-buildroot-sdk$
```

huh, Debian sid build doesn't work. Build with docker and Ubuntu 22.04 works.

```
docker run --privileged -itd --name duodocker -v $(pwd):/home/work milkvtech/milkv-duo:latest /bi
docker exec -it duodocker /bin/bash -c "cd /home/work && cat /etc/issue && ./build.sh milkv-duos-
```

Duo 256M

debian

<https://community.milkv.io/t/debian-images-for-duo256-duos/1715>

<https://github.com/Fishwaldo/sophgo-sg200x-debian>

persisatnt cdc ncm mac address

```
[root@milkv-duos]~# grep -C 2 c0:ff /etc/run_usb.sh
if [ "$CLASS" = "ncm" ] ; then
# FIXME dpavlin
echo c0:ff:e0:00:00:44 >$CVI_GADGET/functions/$CLASS.usb$FUNC_NUM/host_addr
```

```
ln -s $CVI_FUNC/ncm.usb$FUNC_NUM $CVI_GADGET/configs/c.1
fi
```

- isb rom mode

```
dpavlin@nuc:/nuc/milkv-duo/duo-buildroot-sdk-v2/build$ ./tools/cv181x/usb_dl/rom_usb_dl/cv181x_rol
fip_path: /nuc/milkv-duo/duo-buildroot-sdk-v2/build/fip.bin
CV181X USB download start
Connecting to ROM
```

camera

raspberry pi camera

It does not work as well as gc2083

```
[root@milkv-duo]/mnt/data# uname -a
Linux milkv-duo 5.10.4-tag- #1 SMP PREEMPT Mon Dec 9 10:20:52 CST 2024 aarch64 GNU/Linux
[root@milkv-duo]/mnt/data# ls -al
total 28
drwxr-xr-x 2 root root 4096 Dec  6 2024 .
drwxr-xr-x 6 root root 4096 Dec  6 2024 ..
lrwxrwxrwx 1 root root   21 Dec  6 2024 sensor_cfg.ini -> sensor_cfg_GC2083.ini
-rw-r--r-- 1 root root  262 Dec  6 2024 sensor_cfg_GC2083.ini
-rw-r--r-- 1 root root  259 Dec  6 2024 sensor_cfg_OV5647_J1.ini
-rw-r--r-- 1 root root  259 Dec  6 2024 sensor_cfg_OV5647_J2.ini
-rw-r--r-- 1 root root  263 Dec  6 2024 sensor_cfg_SC035HGS.ini
-rw-r--r-- 1 root root  259 Dec  6 2024 sensor_cfg_SC200AI.ini
```

```
root@milkv-duo]~# i2cdetect -y 1
Warning: Can't use SMBus Quick Write command, will skip some addresses
  0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
```

```
00:
10:
20:
30: -- -- -- -- -- -- -- --
40:
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60:
70:
```

```
[root@milkv-duo]~# i2cdetect -y 2
Warning: Can't use SMBus Quick Write command, will skip some addresses
  0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
```

```
00:
10:
20:
30: -- -- -- -- -- -- 36 --
40:
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60:
70:
```

```
[root@milkv-duo]~# cd /mnt/data/
[root@milkv-duo]/mnt/data# ls
sensor_cfg.ini          sensor_cfg_OV5647_J1.ini  sensor_cfg_SC035HGS.ini
sensor_cfg_GC2083.ini  sensor_cfg_OV5647_J2.ini  sensor_cfg_SC200AI.ini
[root@milkv-duo]/mnt/data# grep 36 *
```

```

sensor_cfg_OV5647_J1.ini:sns_i2c_addr = 36
sensor_cfg_OV5647_J2.ini:sns_i2c_addr = 36

# this is error prodced on v2 sdk which doesn't work

[root@milkv-duo]/mnt/system/usr/bin# ./sample_sensor_test
[sys_vi_init]-59: MMF Version:7d0dea0a1-64bit
[SAMPLE_COMM_SNS_ParseIni]-2168: Parse /mnt/data/sensor_cfg.ini
[parse_source_devnum]-1761: devNum = 1
[parse_sensor_name]-1842: sensor = OV_OV5647_MIPI_2M_30FPS_10BIT
[parse_sensor_busid]-1871: bus_id = 3
[parse_sensor_i2caddr]-1882: sns_i2c_addr = 36
[parse_sensor_mipidev]-1893: mipi_dev = 0
[parse_sensor_laneid]-1904: Lane_id = 2, 0, 1, -1, -1
[parse_sensor_pnswap]-1915: pn_swap = 0, 0, 0, 0, 0
[sys_vi_init]-70: Parse complete
[sys_vi_init]-129: set VBpool [0] 1920:1080, BlkCnt= 3, Size = 3133440
family ID request : receive error
ISP Vipipe(0) Allocate pa(0x962f1000) va(0x0x7f9bba3000) size(284104)
stSnsrMode.u16Width 1920 stSnsrMode.u16Height 1080 30.000000 wdrMode 0 pstSnsObj 0x5dcd00
[SAMPLE_COMM_VI_StartMIPI]-494: sensor 0 stDevAttr.devno 0
[sys_vi_init]-163: vi init failed. s32Ret: 0xffffffff !

[root@milkv-duo]/mnt/data# ln -sf sensor_cfg_OV5647_J2.ini sensor_cfg.ini

# this is working output on v1 sdk

[root@milkv-duo]~# /mnt/system/usr/bin/sensor_test
[sys_vi_init]-41: MMF Version:7e0cc6a08-musl_riscv64
[SAMPLE_COMM_SNS_ParseIni]-1950: Parse /mnt/data/sensor_cfg.ini
[parse_source_devnum]-1605: devNum = 1
[parse_sensor_name]-1686: sensor = OV_OV5647_MIPI_2M_30FPS_10BIT
[parse_sensor_busid]-1714: bus_id = 2
[parse_sensor_i2caddr]-1725: sns_i2c_addr = 36
[parse_sensor_mipidev]-1736: mipi_dev = 0
[parse_sensor_laneid]-1747: Lane_id = 5, 3, 4, -1, -1
[parse_sensor_pnswap]-1758: pn_swap = 0, 0, 0, 0, 0
[SAMPLE_PLAT_SYS_INIT]-72: common pool[0] BlkSize 3133440
ISP Vipipe(0) Allocate pa(0x97b1f000) va(0x0x3fda046000) size(291120)
stSnsrMode.u16Width 1920 stSnsrMode.u16Height 1080 30.000000 wdrMode 0 pstSnsObj 0xef898
[SAMPLE_COMM_VI_StartMIPI]-483: sensor 0 stDevAttr.devno 0
awbInit ver 6.8@2021500
0 R:1400 B:3100 CT:2850
1 R:1500 B:2500 CT:3900
2 R:2300 B:1600 CT:6500
Golden 1024 1024 1024
WB Quadratic:0
isWdr:0
19700101 02:29:34.620 2892 E isp setNoiseProfile:3460 Noise profile get fail. Please check
ViPipe:0,==OV5647 1080P 30fps 10bit LINE Init OK!
*****
cvi_bin_isp message
gerritId:      36403          commitId:      c69c5863e
md5:          cab880835a2ad5184de5ed7762404b84
sensorNum     1
sensorName0   22087

PQBIN message
gerritId:      80171          commitId:      5c9d8fc5d
md5:          ba5a510e093ad42db6788e6c2d13169e
sensorNum     3
sensorName0   2053

author:        wanqiang.he   desc:          æ å æ $CV1812H_GC2083_RGB_mode_V1.0.0
createTime:   2023-08-04 16:48:08version:           V1.1
tool Version: v3.0.5.24      mode:

```

```

*****
sensorName(0) mismatch, mwSns:22087 != pqBinSns:2053
[SAMPLE_COMM_ISP_Thread]-95: ISP Dev 0 running!
0 R:1165 B:3087 CT:2688
1 R:1464 B:2327 CT:3937
2 R:1974 B:1613 CT:7225
Golden 1464 1024 2327
wdrLEOnly:1
[main]-578: ---Basic-----
[main]-579: 1: dump vi raw frame
[main]-580: 2: dump vi yuv frame
[main]-581: 3: set chn flip/mirror
[main]-582: 4: linear wdr switch
[main]-583: 5: AE debug
[main]-584: 6: sensor dump
[main]-585: 7: sensor proc
[main]-586: 255: exit
[main]-587: input your choice: 255
ISP Vipipe(0) Free pa(0x97b1f000) va(0x0x3fda046000)

[root@milkv-duo]~# camera-test.sh

```

This only works with original v1 version of sdk
<https://github.com/milkv-duo/duo-buildroot-sdk/releases>

gc2083

```

[root@milkv-duos]~# i2cdetect -y 3
Warning: Can't use SMBus Quick Write command, will skip some addresses
    0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:
10:
20:
30: -- -- -- -- -- -- -- 37
40:
50: -- -- -- -- -- -- -- -- -- -- -- -- --
60:
70:

[root@milkv-duos]~# ls -al /mnt/data/sensor_cfg.ini
lrwxrwxrwx 1 root root 21 Jan  1 00:01 /mnt/data/sensor_cfg.ini -> sensor_cfg_GC2083.ini

[root@milkv-duos]~# which camera-test.sh
/mnt/system/usr/bin/camera-test.sh

[root@milkv-duos]~# cat /mnt/system/usr/bin/camera-test.sh
#!/bin/sh

export LD_LIBRARY_PATH=/mnt/system/lib

sample_vi_fd /mnt/cvimodel/scrfd_768_432_int8_1x.cvimodel

```

run yolo model

```

[root@milkv-duos]~# ./sample_vi_od yolov3 yolov3.cvimodel

[SAMPLE_COMM_SNS_ParseIni]-1950: Parse /mnt/data/sensor_cfg.ini
[parse_source_devnum]-1605: devNum = 1

```

```

[parse_sensor_name]-1686: sensor = GCORE_GC2083_MIPI_2M_30FPS_10BIT
[parse_sensor_busid]-1714: bus_id = 3
[parse_sensor_i2caddr]-1725: sns_i2c_addr = 37
[parse_sensor_mipidev]-1736: mipi_dev = 0
[parse_sensor_laneid]-1747: Lane_id = 2, 0, 1, -1, -1
[parse_sensor_pnswap]-1758: pn_swap = 0, 0, 0, 0, 0
MMF Version:7e0cc6a08-musl_riscv64
Create VBPool[0], size: (3110400 * 3) = 9331200 bytes
Create VBPool[1], size: (3110400 * 3) = 9331200 bytes
Create VBPool[2], size: (2359296 * 1) = 2359296 bytes
Total memory of VB pool: 21021696 bytes
Initialize SYS and VB
Initialize VI
ISP Vipipe(0) Allocate pa(0x9680e000) va(0x0x3fbd57e000) size(291120)
stSnsrMode.ul6Width 1920 stSnsrMode.ul6Height 1080 25.000000 wdrMode 0 pstSnsObj 0x3fbe3d0860
[SAMPLE_COMM_VI_StartMIPI]-483: sensor 0 stDevAttr.devno 0
awbInit ver 6.8@2021500
0 R:1400 B:3100 CT:2850
1 R:1500 B:2500 CT:3900
2 R:2300 B:1600 CT:6500
Golden 1024 1024 1024
WB Quadratic:0
isWdr:0
ViPipe:0,===GC2083 1080P 30fps 10bit LINE Init OK!===
*****
cvi_bin_isp message
gerritId:      36403          commitId:      c69c5863e
md5:          cab880835a2ad5184de5ed7762404b84
sensorNum     1
sensorName0   2083

PQBIN message
gerritId:      80171          commitId:      5c9d8fc5d
md5:          ba5a510e093ad42db6788e6c2d13169e
sensorNum     3
sensorName0   2053

author:        wanqiang.he   desc:          æ å æ $CV1812H_GC2083_RGB_mode_V1.0.0
createTime:   2023-08-04 16:48:08version:          V1.1
tool Version: v3.0.5.24      mode:
*****
sensorName(0) mismatch, mwSns:2083 != pqBinSns:2053
[SAMPLE_COMM_ISP_Thread]-95: ISP Dev 0 running!
Initialize VPSS
-----VPSS[0]-----
Input size: (1920x1080)
Input format: (19)
VPSS physical device number: 1
Src Frame Rate: -1
Dst Frame Rate: -1
-----CHN[0]-----
Output size: (1920x1080)
Depth: 1
Do normalization: 0
Src Frame Rate: -1
Dst Frame Rate: -1
-----
-----CHN[1]-----
Output size: (1920x1080)
Depth: 1
Do normalization: 0
Src Frame Rate: -1
Dst Frame Rate: -1
-----
Bind VI with VPSS Grp(0), Chn(0)

```

```
Attach VBPool(0) to VPSS Grp(0) Chn(0)
Attach VBPool(1) to VPSS Grp(0) Chn(1)
Initialize VENC
venc codec: h264
venc frame size: 1920x1080
Initialize RTSP
rtsp://169.254.72.208/h264
prio:0
version: 1.4.0
yolove416opt Build at 2024-12-03 01:10:02 For platform cv181x
Max SharedMem size:8306688
Enter TDL thread
Enter encoder thread
0 R:1165 B:3087 CT:2688
1 R:1464 B:2327 CT:3937
2 R:1974 B:1613 CT:7225
Golden 1464 1024 2327
wdrLEOnly:1
obj count: 0, take 473.42,width:1920 ms
obj count: 2, take 474.43,width:1920 ms
^Chandle signal, signo: 2
Exit encoder thread
Exit TDL thread
destroy middleware
ISP Vipipe(0) Free pa(0x9680e000) va(0x0x3fbd57e000)
stop VPSS (0)
[root@milkv-duos]~#
```

tdl

<https://milkv.io/docs/duo/application-development/tdl-sdk/tdl-sdk-introduction>