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| Overview | |
| This driver is for LI-AR0234-STEREO-GMSL2 camera and Nvidia Jetson Orin Developer kit.  This driver supports two LI-AR0234-STEREO-GMSL2 cameras.  This driver supports 1920x1200@30fps,1920x1200@60fps and 960x600@120fps .  This driver is based on R34.1.1 (Jetpack 5.0.1). | |
| Download link | |
| <https://www.dropbox.com/sh/1f7lmbm2uc3g2ao/AACxLw3dcDzk3qq7BmpamtSRa?dl=0> | |
| Platform | Camera |
| Nvidia Jetson AGX Orin Developer kit | 2 x LI-AR0234-STEREO-GMSL2 |
| Cable | Adapter/Carrier Board |
| 1 x 4-in-1 Fakra cable | 1 x E3653-A03 |
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| Revision | | SVN version | Release Date | Author | Tested by | |
| 2022\_06\_16 | |  | 06/16/2022 | Xingxing Gu |  | |
| Updates | | | | | | |
| Revision | Description | | | | | Release Date |
| 2022\_06\_16 | First release based on R34.1.1. | | | | | 06/16/2022 |
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| Known bugs | | | | | | |
| 1. IMU still cannot work. 2. If you only have one hawk camera, you can only connect port 1 3. Orin isp not working yet. | | | | | | |

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| Setup Procedure |
| **Hardware:**  1. Nvidia Jetson AGX Orin Developer Kit x 1  2. E3653-A03 x 1  3. LI-AR0234CS-STEREO-GMSL2 x 2  4. 4-in-1 Fakra cable x 1  5. USB 3.0 Type-C cable x 1 (for flashing OS image)  6. Monitor with HDMI cable x 1  7. Keyboard and Mouse (with USB hub) x 1  **Driver installation:**  1. Download the R34.1.1 OS Image (from link below) to your Ubuntu OS on Intel x64 Host PC (we are using Ubuntu 18.04, virtual machine is fine) and follow the l4t\_quick\_start\_guide to install the Jetpack to Orin.  R34.4.1 OS Image: <https://www.dropbox.com/sh/xkn3e0gp9q5mm4x/AABpxtWnWY9lVJBIGcUpjFKna?dl=0>  2. Copy the tegra234-p3701-0000-p3737-0000.dtb to the /boot/dtb/kernel\_tegra234-p3701-0000-p3737-0000.dtb in your Orin platform.  cp tegra234-p3701-0000-p3737-0000.dtb /boot/dtb/kernel\_tegra234-p3701-0000-p3737-0000.dtb  2.1 Copy the tegra194-p2888-0001-p2822-0000.dtb to the /boot/dtb/kernel\_tegra194-p2888-0001-p2822-0000.dtb in your Xavier platform.  cp tegra194-p2888-0001-p2822-0000.dtb /boot/dtb/kernel\_tegra194-p2888-0001-p2822-0000.dtb  3. Reboot AGX Orin/Xavier kit.  4. Open a terminal and do below commands. The 2 .ko files can be downloaded from the link in first page.  insmod ar0234 .ko  insmod max96712 .ko  5. Then do below command to get live video output.  nvgstcapture-1.0  Note: Please make sure two cameras are connected to cable 1 and 2. |

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| Run Camera |
| 1. Argus software  Download the Multimedia package from link below and copy it to Orin.  <https://www.dropbox.com/s/qz0ey3ygvb6a6nj/jetson_multimedia_api.tar.gz?dl=0>  Open a terminal, do  sudo apt-get update  sudo apt-get install cmake libgtk-3-dev libjpeg-dev libgles2-mesa-dev libgstreamer1.0-dev  Uncompress the tgz file.  tar zxvf jetson\_multimedia\_api.tgz  Under jetson\_multimedia\_api/argus/cmake, do  cmake ..  make  sudo make install  Do "argus\_camera --device=0” to get the video.  2. Gstreamer  gst-launch-1.0 nvarguscamerasrc sensor-id=0 ! 'video/x-raw(memory:NVMM), width=(int)1920, height=(int)1200, framerate=30/1' ! nvvidconv flip-method=0 ! 'video/x-raw, format=(string)I420' ! xvimagesink -e  3. v4l2-ctl capture raw  v4l2-ctl -V --set-fmt-video=width=1920,height=1200,pixelformat=RG10 --set-ctrl bypass\_mode=0 --stream-mmap --stream-count=1 --stream-to=ar0234cs.raw -d /dev/video0  Note:  1）The 0 can be changed to 1 to run other cameras.  Cable 0 ---- video0 and video0  Cable 1 ---- video2 and video1  2）Please use below commands to install v4l2.  sudo apt-get update  sudo apt-get install v4l-utils |

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| Note 1/2 |
| 1. If you would like to install the Jetpack 5.0.1 but don’t want to re-flash the whole OS image, you can uncheck the Jetson OS and install the Jetson SDK components only. |

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| Note 2/2 |
| 2. Compile the driver  If you would like to re-compile the driver, please follow below steps.  Download the driver code and Tool chain from links below.  Kernel code: <https://www.dropbox.com/s/n16mgdzqc746qns/kernel_src.tbz2?dl=0>  GCC ToolChain: <https://www.dropbox.com/sh/ftsrav3v1bvbvn0/AADVENbmkjqf7nXynWJ7M43Ua?dl=0>  Compile the kernel under 64 bit Ubuntu OS on Intel x64 PC. (Virtual machine is fine. We are using Ubuntu 16.04 64 bit OS)  1) Copy compile tool aarch64--glibc--stable-final.tar.xz to /opt, and unzip it    sudo tar xpf aarch64--glibc--stable-final.tar.xz    2) Copy kernel\_src.tbz2 and two patch files to /usr/src  sudo tar xpf kernel\_src.tbz2  sudo chown -R <user\_name> kernel  sudo chown -R <user\_name> hardware  patch -p0 < ar0234\_gmsl2\_hawk\_max96712\_34.1.1\_Orin\_20220616\_dtbs.patch  patch -p0 < ar0234\_gmsl2\_hawk\_max96712\_34.1.1\_Orin\_20220616\_kernel .patch  Note: <user\_name> is the user name of your Ubuntu OS. For example: sudo chown -R leopard kernel  3) To install the tool in the currently open window, execute  sudo apt-get install flex  sudo apt-get install bison  4) Compile in the currently open window, execute  export CROSS\_COMPILE\_AARCH64\_PATH=/opt/aarch64--glibc--stable-final  ./nvbuild.sh -o $PWD/kernel\_out/  Note: /opt/ is the installation path where the compiler is decompressed  You will get ar0234 .ko under /$PWD/kernel\_out/drivers/media/i2c/ and tegra234-p3701-0000-p3737-0000.dtb under /$PWD/kernel\_out/arch/arm64/boot/dts/nvidia/tegra234-p3701-0000-p3737-0000.dtb. |