Overview

This firmware is for LI-USB30-AR0231-GMSL camera.
This firmware supports 1928 x 1256 @ 30 fps.
This camera doesn't include ISP and outputs 12-bit raw data.

Platform	Camera
1 x LI-GMSL-USB	1 x LI-AR0231-GMSL
Cable	Adapter/Carrier Board
1 x USB 3.0 Micro-B cable 1 x FAK-SMZSMZ Fakra cable	
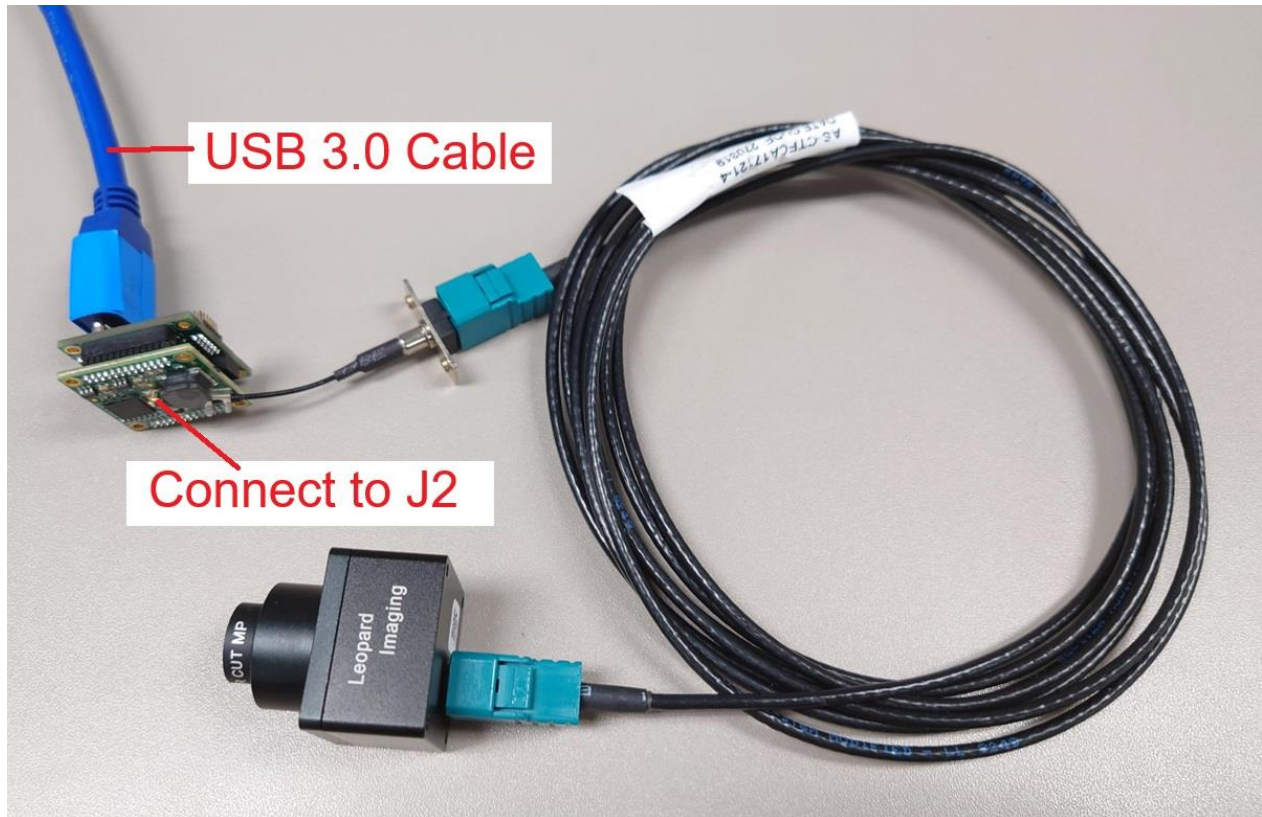
Revision	SVN version	Release Date	Author	Tested By
2024_06_13		06/13/2024		Shelby Hache
Updates				
Revision	Description			Release Date
2020_06_13	First Release			06/13/2024
Known bugs				

Setup Procedure 1/3

- Hardware:

1. LI-AR0231-GMSL x 1
2. LI-GMSL-USB Tester x 1
3. FAK-SMZSMZ Fakra cable x 1
4. USB 3.0 Micro-B cable x 1

- Hardware Setup:

Connect the camera and USB 3.0 Tester board as the picture on the first page.

- Software:

This camera kit can be tested with any one of the below software:

1. Camera tool (Windows OS)

The Camera tool can be downloaded from the link below:
https://www.dropbox.com/s/8daqfypyhnubjr5/CameraUSB30_3_2_20190622.7z?dl=0

It's better to use the 7-zip to uncompress the package:
http://www.7-zip.org/download.html

And install the software below on your PC:
https://www.dropbox.com/s/6uswl40z8rqh2et/vcredist_x86.exe?dl=0

If needed, you can also download the camera tool SDK:
https://www.dropbox.com/s/j6ccl8cvt75gu2g/USB30_CameraTool_SDK_rev1440_20190622.7z?dl=0

2. Linux Camera tool (Linux OS)

The Linux camera tool can be downloaded from link below.
https://www.dropbox.com/s/4m2efo696px9739/linux_camera_tool-master_20190624.zip?dl=0

For how to install it, please refer to the README.md in below link. (the latest version of Linux camera tool may have an issue, so please use above Linux camera tool)
https://github.com/LI01/linux_camera_tool

Please follow the README.md in GitHub to install the Linux camera tool.
There are instructions online for how to install the OpenCV on Ubuntu OS.
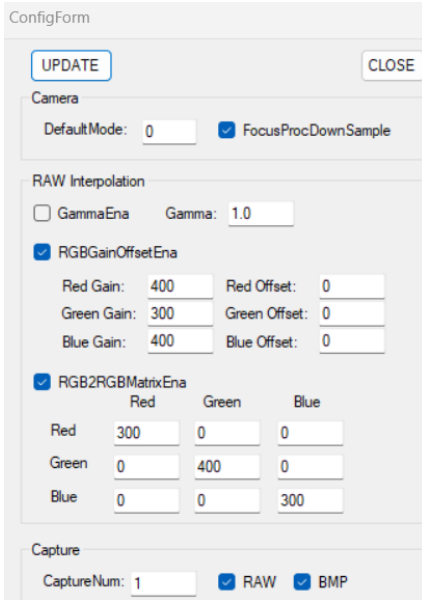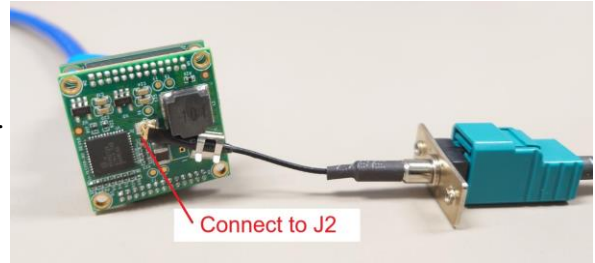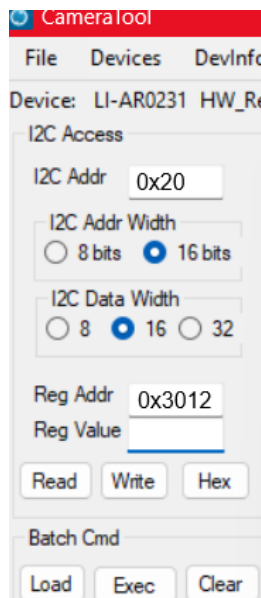Below is an example:
https://www.learnopencv.com/install-opencv-3-4-4-on-ubuntu-18-04/

Run Camera 1/3

- Camera Tool (Windows OS)

1. Connect the camera to J2 of USB 3.0 Tester.
2. Connect the camera to your PC using the USB 3.0 cable.
3. Open camera Tool.

Connect to J2

Color matrix:
You can adjust the color matrix
in Options→ Configuration

Register access function:
This camera supports register access function.
The I2C address is 0x20
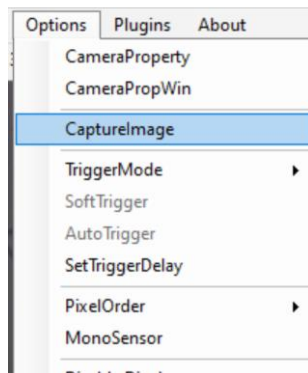0x3012 is the exposure register address.
0x305e is the gain register address.

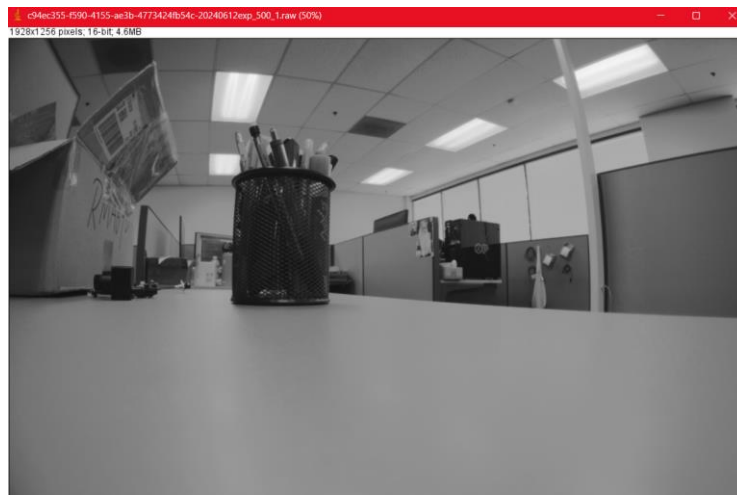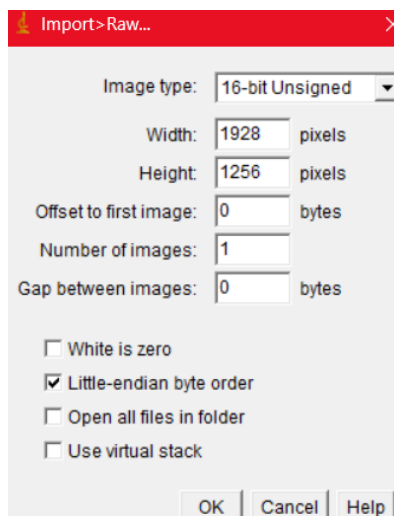You can also use BatchCmd.txt file to write/read register.

Run Camera 2/3

Capture Image:
The images can be captured by clicking Options→ CaptureImage. Two images (RAW and BMP) will be saved to PC.

The raw image can be viewed by ImageJ.
https://www.dropbox.com/s/fsvfmdy6s9ft03i/ImageJ.7z?dl=0

Note: This camera tool supports Raw-to-RGB function which will reduce the display frame rate. You can click Options→ DisableDisplay to get actual frame rate from the sensor. You can also use other regular software (like AMcap) to get higher frame rate, but the video will be green (like below) due to lack of Raw-to-RGB conversion function.
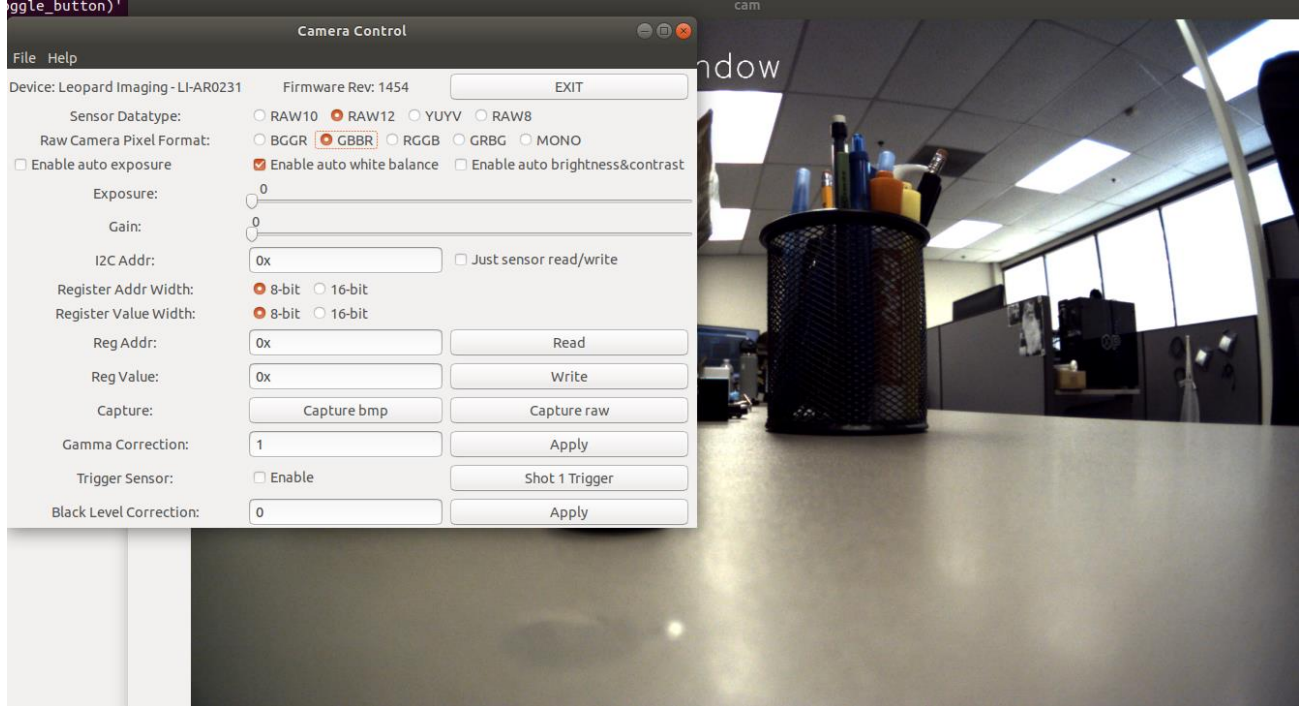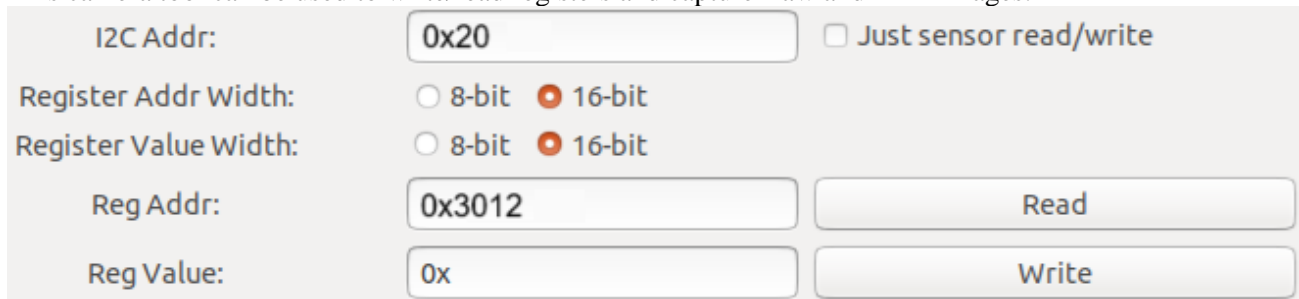
Run Camera 3/3

- Camera Tool (Linux OS)

1. Connect the camera to J1 of USB 3.0 Tester. (refer to picture in page 1)
2. Connect the camera to PC through USB 3.0 cable.
3. Open a terminal and use the command "leopard_cam" to open the camera.

Set the camera as below to get better image quality.

This camera tool can be used to write/read registers and capture Raw and BMP images.

Note: This camera doesn't include ISP and outputs RAW12 data

Firmware

This camera kit is pre-loaded with Firmware (in USB 3.0 Tester)
If there is always new firmware from Leopard Imaging, you can refer to below instructions to update them.

1. Firmware Update:

Please use the **LP_USB3_FirmwareUpdateTool** in the camera tool folder to update the firmware.

1) Click "Erase" to erase the old firmware.
2) Click "FW Update" button to select the lif file. (If the "FW_Update is unavailable, please install the WestBridge driver, check below)
3) The update process may take about 15 seconds.
4) If the process takes too long, please disconnect the USB and reconnect it to PC.
   Then try the update tool again.

——Install WestBridge:
If the camera cannot be recognized after you update the firmware, and there is a device name "WestBridge" on the Device Manager, please download the driver from the link below and install it.

https://www.dropbox.com/s/4yx2p31b7qo2gjx/WestBridge_driver.zip?dl=0

1) Right click on "WestBridge" and select Update Driver Software.
2) Choose browse my computer for driver software.
3) Click Browse, locate the driver at the downloaded and unzipped folder. (C:\temp\driver\bin\ for example)
If your PC has Win7 or later version, please select the folder "win7".
4) Click next and complete the installation process.

After install the driver, please update the firmware again.