

CA378-AOIS for JetsonTX2 HDR Processing Guide

Version 1.1.3

Dated: 2018/06/15

Home Page <https://www.centuryarks.com/>

Date	Version	Comment
2018/06/15	v1.1.3	Initial Release

Before running CA 378-AOIS software, please install the following environment.

Build and install OpenCV 3.4.1

```
$ cd ~/CA378_2L_v1.1.3_L4T28.2-rc_src_build  
$ ./InstallOpenCV.sh
```

Install RAW development software

```
$ sudo apt-get update  
$ sudo apt-get install ufw  
$ sudo apt-get install v4l-utils  
$ sudo apt-get install geeqie
```

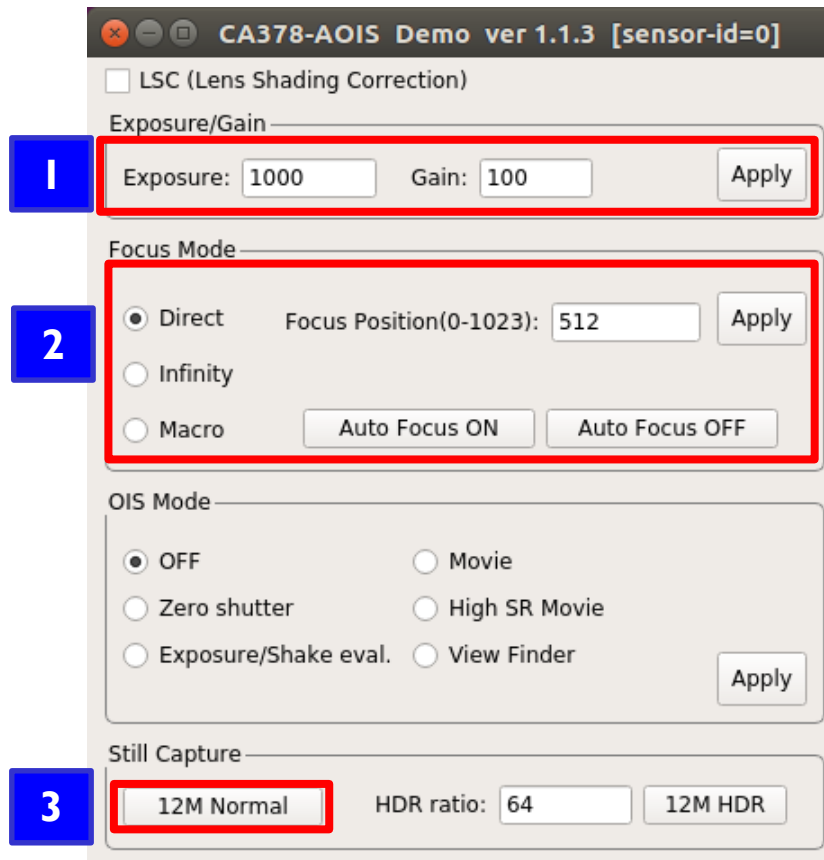
12M pixel still image capturing

Procedure of normal capturing 12M pixel still image:

1. Adjust the Exposure / Gain.
2. Adjust the focus.

(It is useful to turn on Auto Focus and turn Auto Focus OFF when focus is on)

3. Click the [12M Normal] button



CA378-AOIS Demo ver 1.1.3 [sensor-id=0]

☐ LSC (Lens Shading Correction)

Exposure/Gain

1 Exposure: 1000 Gain: 100 Apply

Focus Mode

2 ☒ Direct Focus Position(0-1023): 512 Apply

☐ Infinity

☐ Macro Auto Focus ON Auto Focus OFF

OIS Mode

☒ OFF ☐ Movie

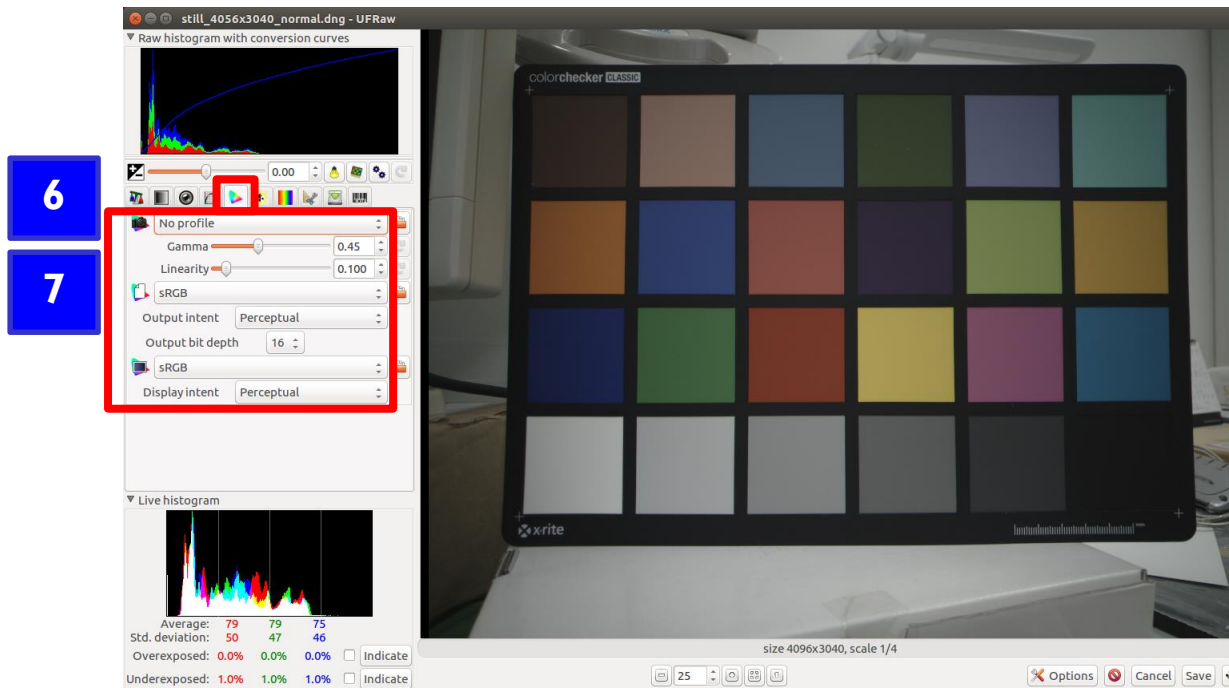
☐ Zero shutter ☐ High SR Movie

☐ Exposure/Shake eval. ☐ View Finder Apply

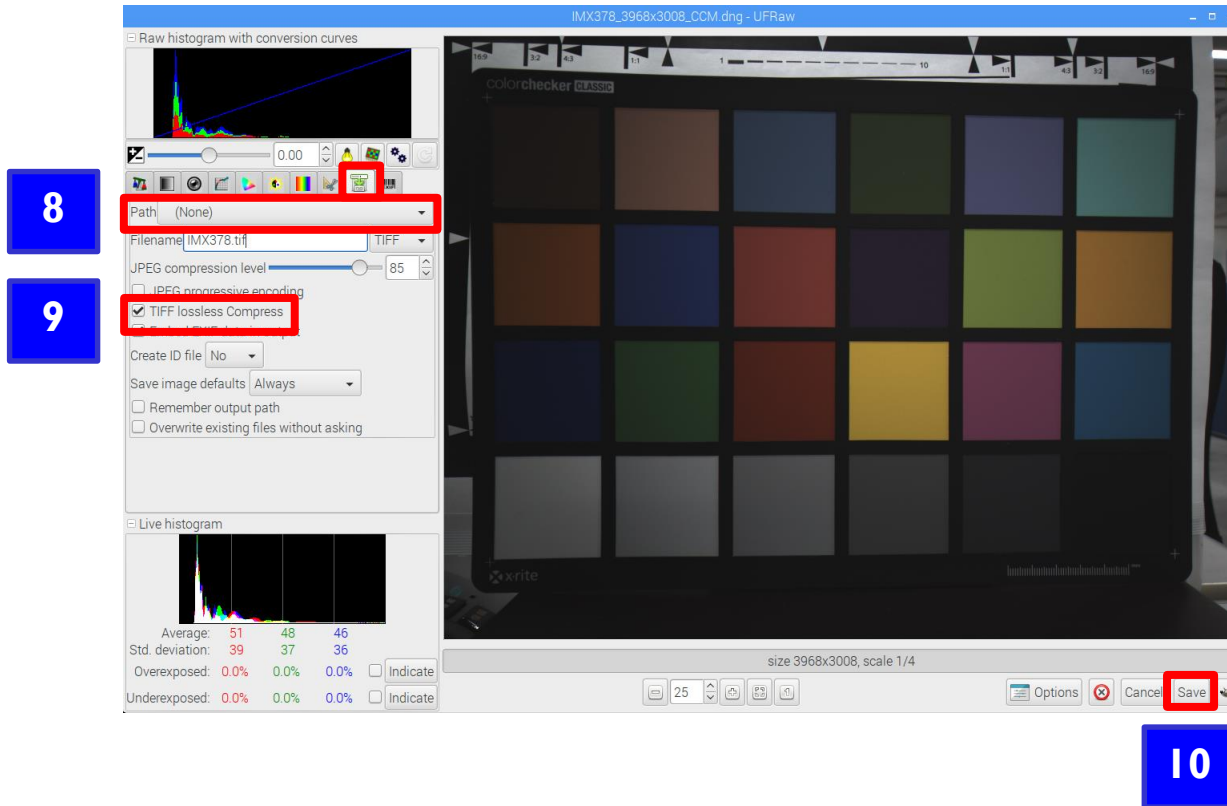
Still Capture

3 12M Normal HDR ratio: 64 12M HDR

5. UFRaw will be started when capturing is completed.
6. Set the camera profile of color management to "No profile".
7. Set Gamma to "0.45".
Set Output bit depth to "16".
Set Display to "sRGB".



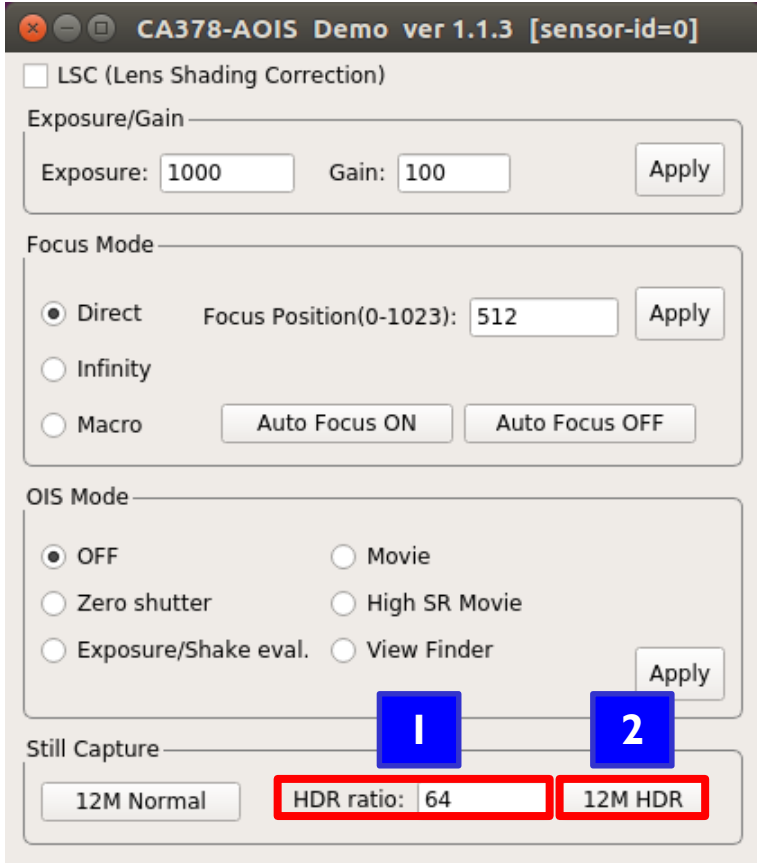
8. Change "Filename" of Save to "xxx.tif".
9. Check "TIFF lossless compress".
10. Click the [Save] button.
11. Exit UFRaw
12. Exit Demo



12M pixel still image HDR capturing

Procedure of HDR capturing 12M pixel still image:

1. Adjust the HDR ratio.
2. Click the [12M HDR] button

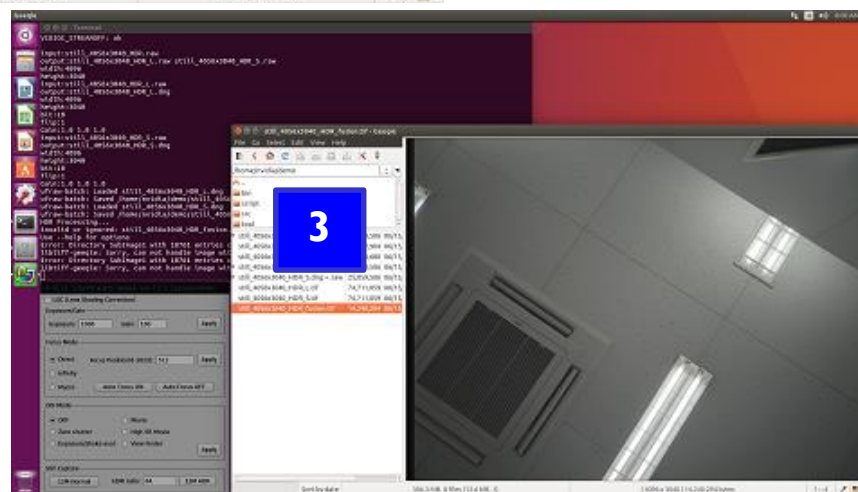
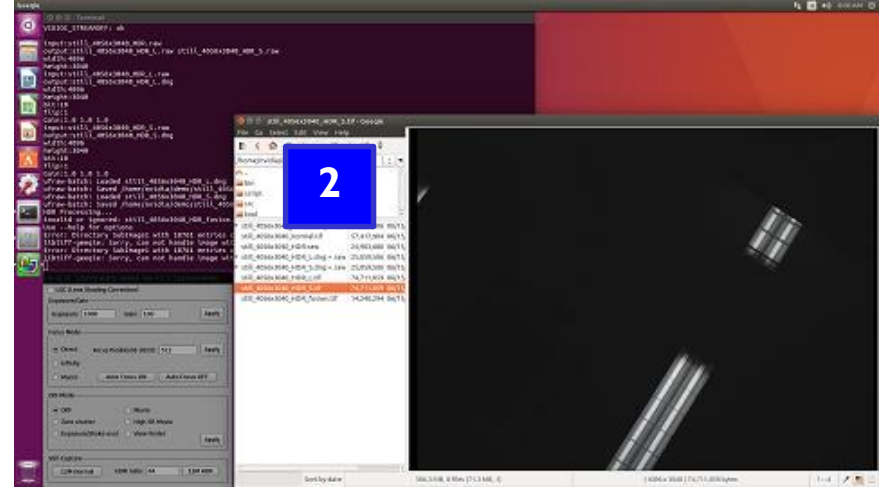
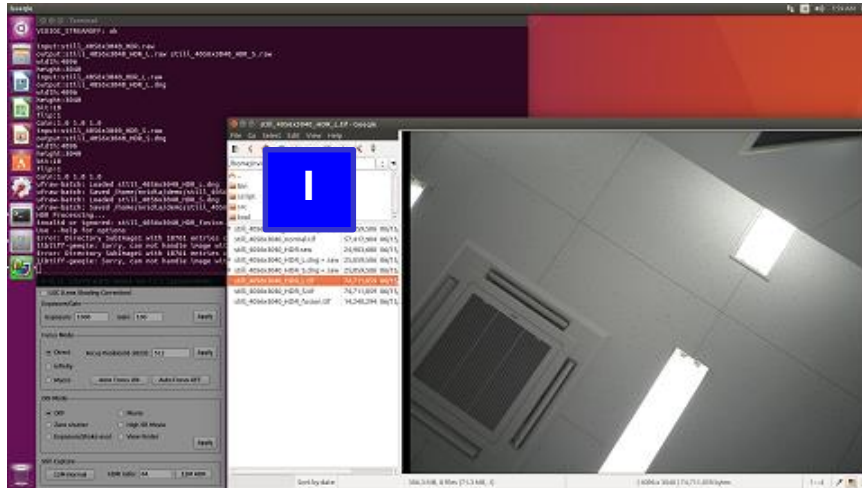


The screenshot shows the 'CA378-AOIS Demo ver 1.1.3 [sensor-id=0]' window. The 'Still Capture' section at the bottom has three buttons: '12M Normal', 'HDR ratio: 64', and '12M HDR'. The 'HDR ratio: 64' button is highlighted with a red rectangle and a blue square with the number '1' above it. The '12M HDR' button is also highlighted with a red rectangle and a blue square with the number '2' above it. Other sections include 'LSC (Lens Shading Correction)' (unchecked), 'Exposure/Gain' (Exposure: 1000, Gain: 100, Apply), 'Focus Mode' (Direct selected, Focus Position: 512, Apply, Auto Focus ON/OFF), and 'OIS Mode' (OFF selected, Movie, High SR Movie, View Finder, Apply).

Display in HDR image

The following image is saved in the “~/demo/” directory.

- (1) HDR long exposure image
- (2) HDR short exposure image
- (3) HDR tone mapping image



In case of modifying HDR's tone mapping algorithm, please change "~/demo/script/HDR.py":

```
# -*- coding: utf-8 -*-
import cv2
import numpy as np

print('HDR Processing...')

# Loading exposure images into a list
img_fn = ["still_4056x3040_HDR_L.ppm", "still_4056x3040_HDR_S.ppm"]
img_list = [cv2.imread(fn) for fn in img_fn]

# Exposure fusion using Mertens
merge_mertens = cv2.createMergeMertens()
res_mertens = merge_mertens.process(img_list)

# Convert datatype to 8-bit and save
res_mertens_8bit = np.clip(res_mertens*255, 0, 255).astype('uint8')
cv2.imwrite("still_4056x3040_HDR_fusion.ppm", res_mertens_8bit)
```

For HDR tone mapping algorithm see below.

https://docs.opencv.org/3.4.1/d3/db7/tutorial_hdr_imaging.html#gsc.tab=0