STEREOLABS

Application Notes – GMSL I/O

ZED-X with Xavier NX DevKit

For ZED-X and ZED-XM – Version 2.0

Introduction :

This document is designed to assist users for the installation and connection of the **STEREOLABS** GMSL capture card (https://store.stereolabs.com/products/gmsl2-adapter) and the **NVIDIA Xavier NX DevKit** (https://developer.nvidia.com/embedded/learn/get-started-jetson-xavier-nx-devkit)

Requirements :

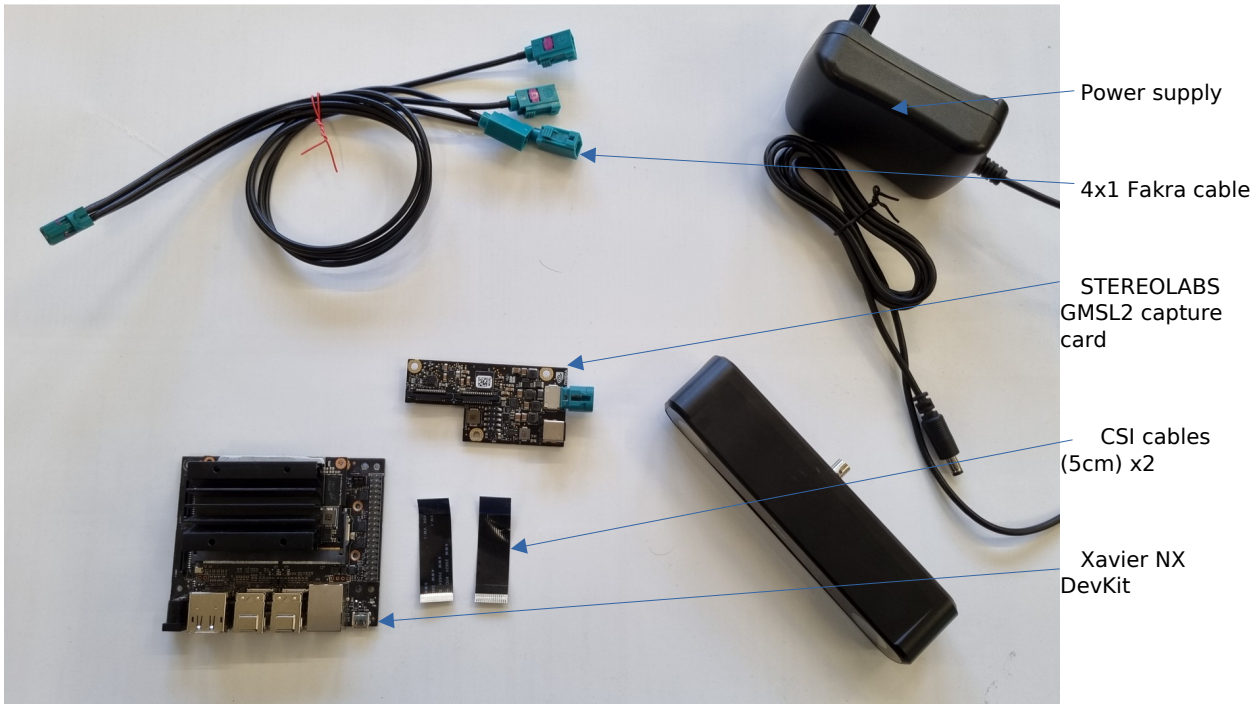
- NVIDIA Xavier NX DevKit , flashed with Jetpack 5.0 to 5.1.1 (35.1, 35.2, 35.3)
- Stereolabs GMSL2 capture card with 4x1 Fakra cable (included with the board)
- 2 MIPI 15pin 1mm Pitch CSI cable (not included) *
- 12V-19V power input (Jack) to power the GMSL2 capture card (not included)
- 12V power input (Jack) to power the Xavier NX

Warning : Make sure the boards are not powered during installation.

(*) : 15pin CSI cable must not be mistaken with DSI cable where the active pin connection are on the same side. On CSI, the 15pins are on the opposite side when looking at the flat cable.

Ex Sourcing : https://www.uctronics.com/ribbon-fpc-15-pin-flat-cable-15cm-for-raspberry-pi-camera-p-1839l.html

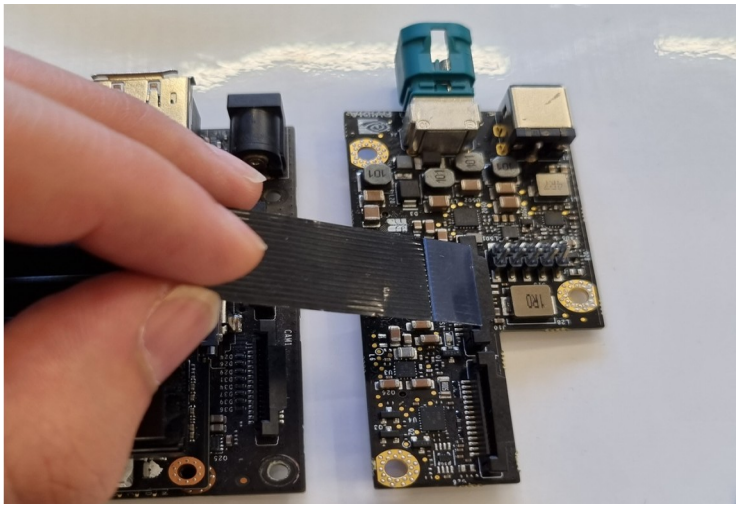
MIPI cables transmit video signals. If the length increase, the video signal will be noisy. Max length recommended is 15cm.



Cabling :

Step 1 :

Connect the CSI cable at each MIPI 15pin port of the Carrier board. Make sure the correct side is plugged in for each port.



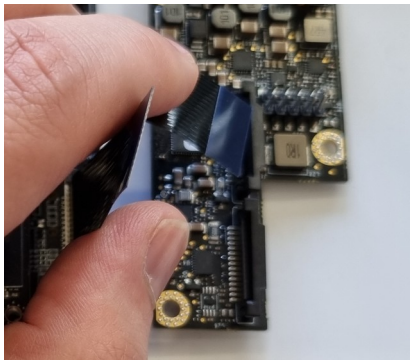
Warning : Inverting the side might damage the carrier board or the capture card

Both MIPI cables must be connected to have access to 2 x ZED-X on the capture card.

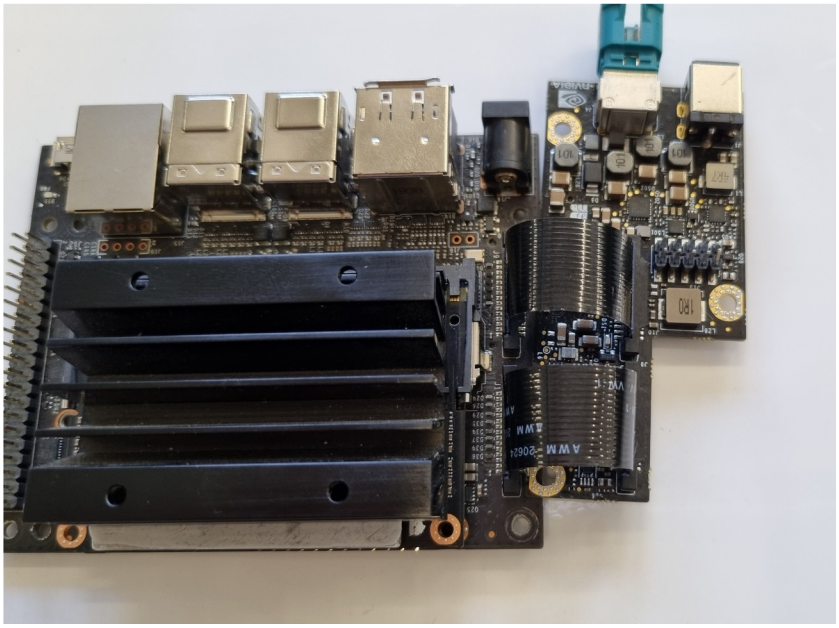
Step 2 :

Connect the CSI cable to the capture card. Make sure that J9/CAM0 is connected to the centered MIPI port of the GMSL2 capture card.
J1/CAM1 must be connected to the MIPI port close to the edge.

Make sure to respect the side of the MIPI pins, according to the following picture

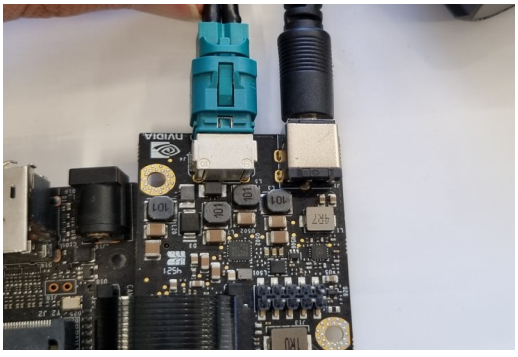


Once connected, the setup should look like as in the following picture :



Step 3 :

Connect the FAKRA 4x1 cable to the GMSL2 capture card, then the ZED-X cameras .
Note that GMSL2 cameras must be ideally plugged before booting up. If it is not the case, you can restart the zed_x_daemon that will be installed by the driver in the next section.



Once cables are connected, plug the power for the GMSL2 capture card (12V-19V) so that cameras will be powered through the FAKRA cable (PoC).

Then connect the power and an optional HDMI/Keyboard for the J401. Wait for boot up.

Driver Installation :

Note : The driver used in the following section is for JP5.1 / L4T35.2 Xavier NX DevKit is supported from JP5.0 to JP5.1.1.

The driver is provided by the deb package that contains :
- the driver files (.ko)*
- the dtb file (.dtb)*
- the zed_x_daemon that loads and restart the driver if necessary

To install the driver, simply execute the following command :

$ sudo dpkg -i stereolabs-zedx_0.5.3-MAX96712-L4T35.2_arm64.deb

Note : You might need to install libqt5core5a if not already installed. Use the following command :
$ sudo apt install libqt5core5a

The following log should appear in the terminal window

Reboot the Jetson so that DTB and driver are applied.
When rebooted, the LED on the capture card should be green.

```
user@NXL4T35:~/Documents$ sudo dpkg -i stereolabs-zedx_0.5.3-MAX96712-L4T35.2_ar
m64.deb
[sudo] password for user:
(Reading database ... 154359 files and directories currently installed.)
Preparing to unpack stereolabs-zedx_0.5.3-MAX96712-L4T35.2_arm64.deb ...
Unpacking stereolabs-zedx (0.5.3-MAX96712-L4T35.2) over (0.5.3-MAX96712-L4T35.2)
 ...
Setting up stereolabs-zedx (0.5.3-MAX96712-L4T35.2) ...
Detected DTB to update : tegra194-p3668-0001-p3509-0000
user@NXL4T35:~/Documents$
```

You can type the following command to check that the driver is correctly loaded :

$ sudo dmesg | grep zedx

Depending on the number of cameras connected, the log should be similar to the following picture :

```
ser@ubuntu:~/Pictures$ sudo dmesg | grep zedx
[sudo] password for user:
   17.994344] zedx 30-0018: Driver Version : v0.5.3
   17.994352] zedx 30-0018: Probing v4l2 sensor.
   17.994503] zedx 30-0018: tegracam sensor driver:video0_v2.0.6
   25.823794] zedx 30-0018: zedx_links_check: 1 link(s) detected
   28.712969] zedx 30-0018: Single ZED-X camera detect success
   28.940046] zedx 30-0018: zedx_set_frame_rate: Unsupported value
   29.269348] tegra-camrtc-capture-vi tegra-capture-vi: subdev zedx 30-0018 bound
   29.270592] zedx 30-0018: Detected ZED-X sensor
   29.270804] zedx 30-0010: Driver Version : v0.5.3
   29.270808] zedx 30-0010: Probing v4l2 sensor.
   29.271069] zedx 30-0010: tegracam sensor driver:video1_v2.0.6
   29.278707] zedx 30-0018: zedx_open: Accessing the camera
   29.379025] zedx 30-0010: zedx_links_check: 1 link(s) detected
   29.603859] zedx 30-0010: zedx_set_frame_rate: Unsupported value
   29.933821] tegra-camrtc-capture-vi tegra-capture-vi: subdev zedx 30-0010 bound
```

Note : 2 devices are bound (Left and Right) for a single ZED-X camera

ZED SDK Installation :

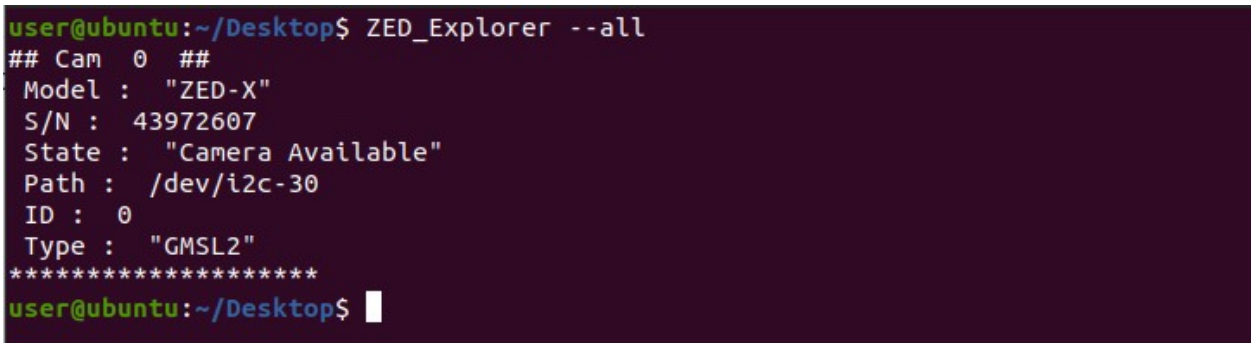
The ZED SDK v4.X are compatible with ZED-X/ZED-XM. The installation is similar to previous version.
You can find the latest version available on our website :
https://www.stereolabs.com/developers/release/

No changes is required to have the ZED-X/ZED-XM working on your existing code.
If it is the only camera connected, it will automatically detect the camera and open it.

You can use ZED Explorer to list the available camera with :

$ ZED_Explorer --all

Depending on the number of cameras connected, the log should be similar to the following picture :



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