



# **LIPSedge™ L210u / L215u**

**High-Res Structured-Light Camera**

**User's Manual**

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June 2026  
Revision 1.0



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**June 2026**

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# Revision History

| Revision | Description                                                                            | Date       |
|----------|----------------------------------------------------------------------------------------|------------|
| 1.2.3    | Content refactoring                                                                    | 2026/6/15  |
| 1.2.2    | Modified images in pg. no 20 and 52                                                    | 2025/12/01 |
| 1.2.1    | Modified the naming of Samples from pages 53 to 59.                                    | 2024/08/01 |
| 1.2      | Add the Linux x64& Jetson arm64 installation guide in Chapter3 3.1-B & Chapter3 3.1-C. | 2024/04/19 |
| 1.1      | Re-Modified the User Guide Frame                                                       | 2024/03/08 |
| 1.0      | New Release                                                                            | 2023/10/24 |

# 1. Package & Hardware Overview

## 1.1 Package Overview

### A. Packing List

This section applies to LIPSedge™ L210u/ L215u **ONLY**. The packing list serves as a reference for package contents. If anything is missing, contact [info@lips-hci.com](mailto:info@lips-hci.com). For technical specifications, refer to *LIPSedge™ L210u/ L215u datasheet*.

| No. | Item                                                                          | Qty. |
|-----|-------------------------------------------------------------------------------|------|
| 1.  | LIPSedge™ L210u / L215u High-Res Structured-Light Camera                      | 1    |
| 2.  | LIPSedge™ L210u / L215u 3D High-Res Structured-Light Camera Quick Start Guide | 1    |
| 3.  | USB 2.0 Y-Cable                                                               | 1    |

### B. Camera Accessories

The following supplementary options facilitate the installation process but are **NOT** included in the package. Prepare the following accessories before proceeding to the installation process:

- **Camera tripod:** Secures the camera to a stable position.
- **PC / laptop:** LIPSedge™ L Series operates on PC / laptops with 7th Generation 7th Generation Intel® Core™ i5 Processors.

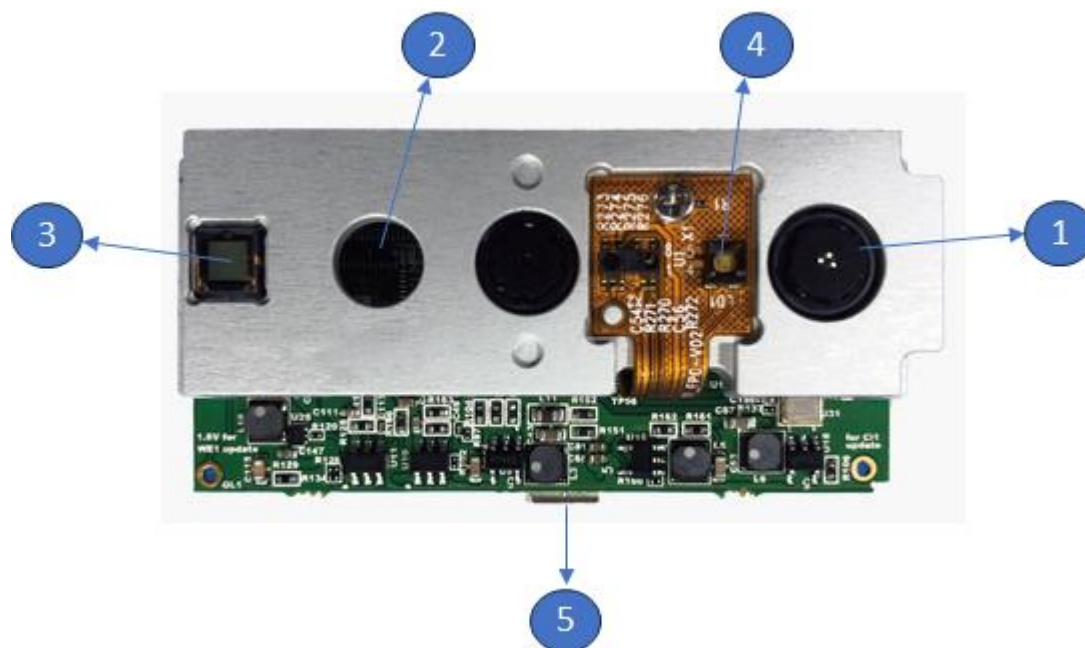
### C. Supplementary Options

This section is **NOT** applicable to this model.

## 1.2 Hardware Overview

### A. Hardware Features

#### LIPSedge™ L210u



| No. | Key Component          | Description                                                  |
|-----|------------------------|--------------------------------------------------------------|
| 1.  | <b>NIR sensor</b>      | Receives the IR image                                        |
| 2.  | <b>RGB sensor</b>      | Receives the RGB image                                       |
| 3.  | <b>NIR illuminator</b> | Projects NIR structured dots light                           |
| 4.  | <b>Flood Projector</b> | Emits uniform, flat IR light to enhance lightness            |
| 5.  | <b>Micro USB Port</b>  | Provides power input and data output to the host PC / laptop |

**Note:** Do **NOT** obscure or block the openings of the camera's optical components to ensure the optimal performance of the camera.

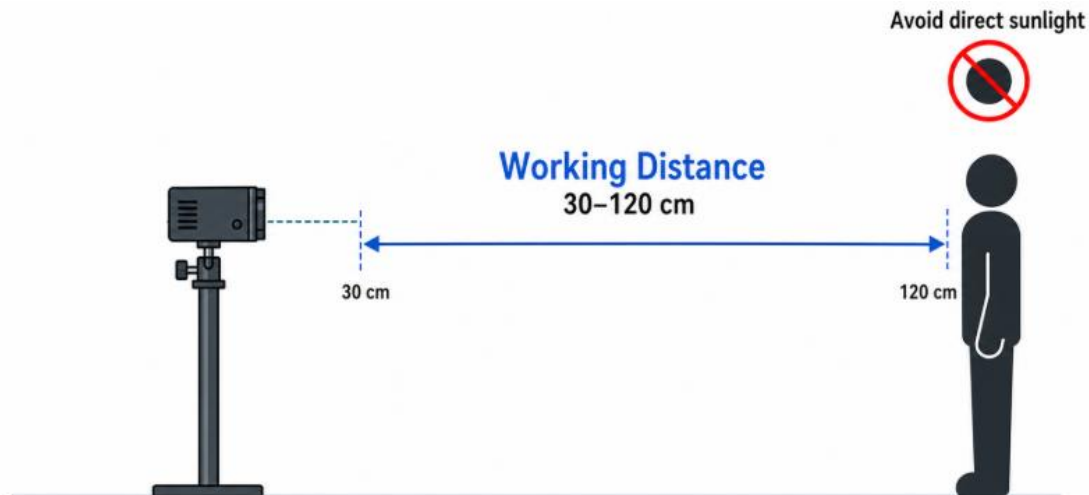
## LIPSedge™ L215u



| No.                                                                                                                                         | Key Component          | Description                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------|
| 1.                                                                                                                                          | <b>NIR sensor</b>      | Receives the IR image                                        |
| 2.                                                                                                                                          | <b>RGB sensor</b>      | Receives the RGB image                                       |
| 3.                                                                                                                                          | <b>NIR illuminator</b> | Projects NIR structured dots light                           |
| 4.                                                                                                                                          | <b>Flood Projector</b> | Emits uniform, flat IR light to enhance lightness            |
| 5.                                                                                                                                          | <b>Micro USB Port</b>  | Provides power input and data output to the host PC / laptop |
| 6.                                                                                                                                          | <b>M3 * 4 mm * 2</b>   | Major mount holes                                            |
| 7.                                                                                                                                          | <b>Tripod mount</b>    | Mounts the camera onto the tripod                            |
| <b>Note:</b> Do <b>NOT</b> obscure or block the opening of the camera's optical components to ensure the optimal performance of the camera. |                        |                                                              |

## B. Hardware Installation

For optimal recognition results, follow these requirements when installing your LIPS camera.

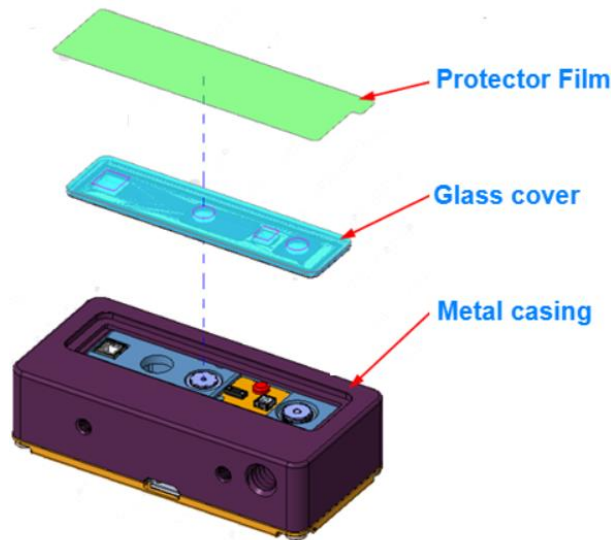


- **Working Distance:** Install the camera approximately **40 - 120 cm** from the recognition target, depending on the working range for different scenarios. To adjust the camera's working range, refer to *Working Range Settings*.
- **Camera Position:** Install the camera on a **tripod** facing the recognition target. Note that LIPS Corp. does **NOT** provide a tripod within the package, and you must get your tripod for hardware installation.
- **Illumination:** **AVOID** installing the camera at places under **direct sunlight** or with an illumination level **above 1000 lux**.



## C. Camera Connection

**WARNING:** A thin layer of film is applied to the camera lens for protective purposes when shipped. Remove the film **ONLY** when you are ready to use the camera. Keeping the thin film while streaming may cause the image quality to decrease.



1. Plug the **Micro B** end of the USB-Y cable to the LIPS Camera.



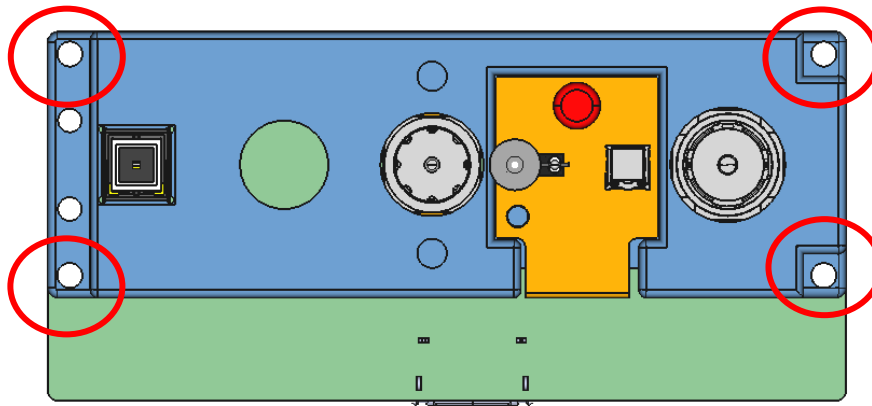
2. Plug both **Type-A** end of the USB-Y cable to your **PC / laptop**.



## D. Mounting Options

LIPSedge™ L Series camera supports a bracket mount, enabling you to secure the camera to a load-bearing structure, such as a wall or a pole surface.

Once the SLiM protection is in place, secure the bracket mount to the desired load-bearing structure using four M16 screws inserted through the four Ø 1.7 fixing holes illustrated in the figure below:



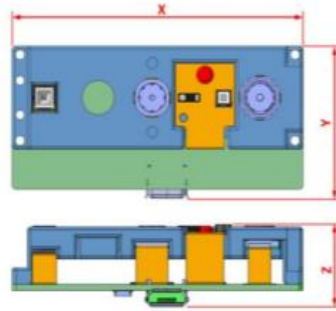
---

**Note:** Do **NOT** obscure or block the openings of the camera's optical components to ensure the optimal performance of the camera.

---

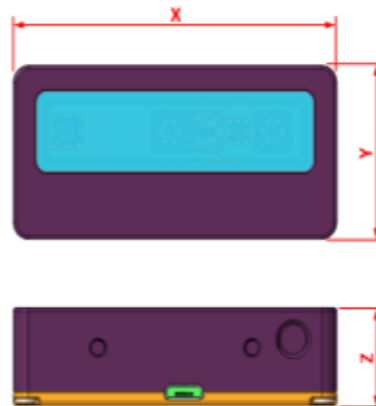
## E. Hardware Dimensions

### LIPSedge™ L210u



| Dimension | MIN  | NOM  | MAX  | TOLERANCE | UNIT |
|-----------|------|------|------|-----------|------|
| X         | 53.8 | 54   | 54.2 | ±0.2      | mm   |
| Y         | 26.3 | 26.6 | 26.9 | ±0.3      | mm   |
| Z         | 13.9 | 14.3 | 14.7 | ±0.4      | mm   |

### LIPSedge™ L215u

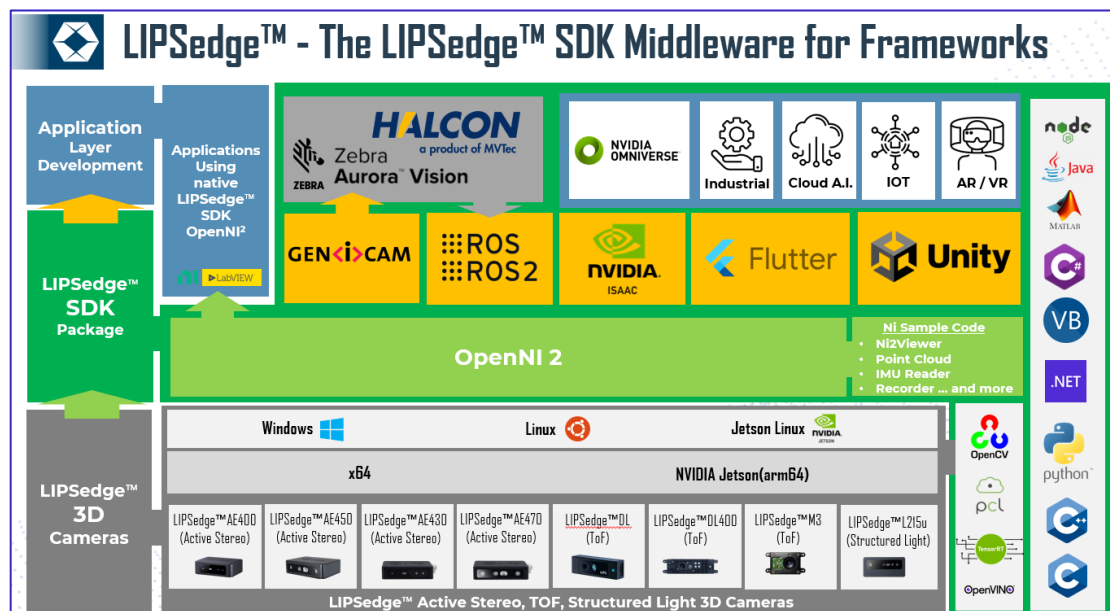


| Dimension | MIN  | NOM  | MAX  | TOLERANCE | UNIT |
|-----------|------|------|------|-----------|------|
| X         | 57.7 | 63   | 63.3 | ±0.3      | mm   |
| Y         | 29.9 | 30.2 | 30.5 | ±0.3      | mm   |
| Z         | 16.7 | 17   | 17.3 | ±0.3      | mm   |

## 2. SDK Structure

LIPS 3D camera / SDK offers a system for developing depth-sensing applications. As the LIPS system architecture illustrates, the system is comprised of the **hardware layer** and the **software layer**.

The hardware layer oversees data capture, transfer, and processes. In the software layer, the captured data is fetched by the LIPS SDK (Software Development Kit) on the OS environment. Depending on the project complexity, wrappers and third-party utilities may be engaged before the data is eventually presented in the application layer for business applications.



The core of the system, the LIPS SDK, is comparable to a toolbox full of software modules comprised of middleware, libraries, wrappers and API, and miscellaneous programming languages / platforms for application development. With extensive wrapper support, LIPS SDK enables developers to access bottom layer data with APIs, thus eliminating the hassle of changing third-party functions. The result is a highly effective project scoping, monitoring, and execution workflow compatible with the fast-pacing AIoT market and machine vision demands.

## 3. SDK Installation

### 3.1 Platforms

#### A. Windows Installation (x64)

##### a. SDK Installation

To access the SDK, visit [3D Depth Camera SDK Free Download | LIPSedge™ SDK \(lips-hci.com\)](https://www.lips-hci.com) and procure the package for the preferred version, framework, and compatible operating system.

1. Visit [LIPSedge™ SDK](https://www.lips-hci.com) website.
2. Under **LIPSedge™ Camera SDK**, select SDK file to download the installation file based on the preferred version, framework, and compatible operating system.

Note: For each LIPSedge™ 3D Camera User Manual refer to the respective product document

- Video Presentation ([Link](#))

#### Download the LIPSedge™ SDK as below

**v1.1.1**

- [Windows](#)
- [Linux](#)

Release Notes

- [Release Note](#)

**v1.1.0**

**v1.02**

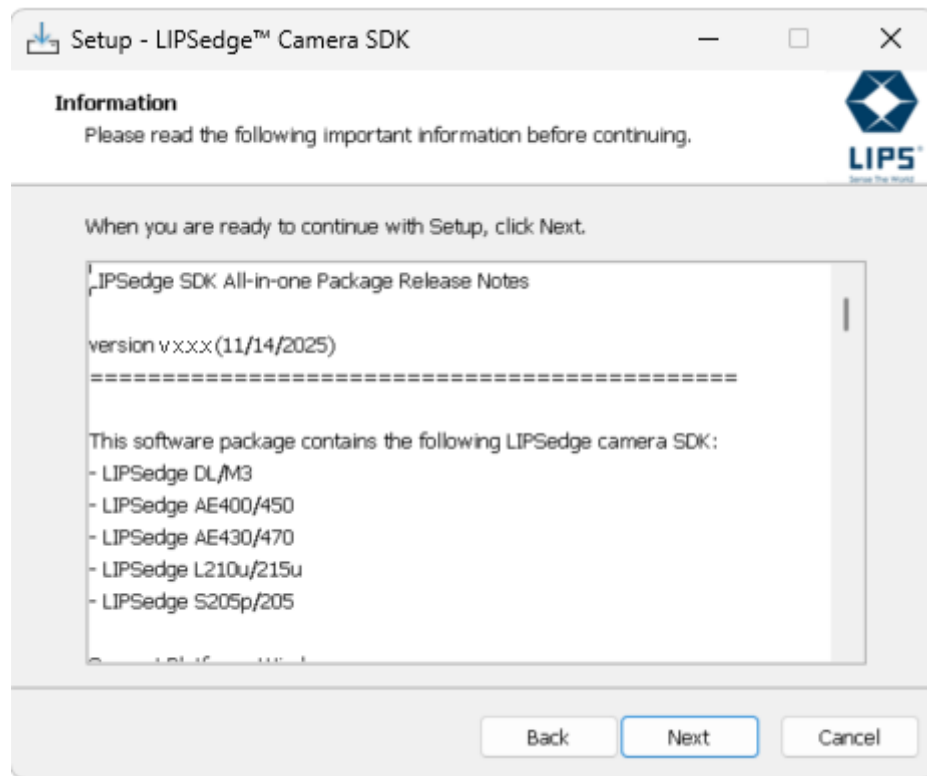
3. Extract and execute the downloaded file.

| Desktop                                                                                                               |             |                   |
|-----------------------------------------------------------------------------------------------------------------------|-------------|-------------------|
| Name                                                                                                                  | Type        | Date modified     |
|  LIPSedge-Camera-SDK-Win64-1.X.X.exe | Application | 2023/9/27 2:11 PM |

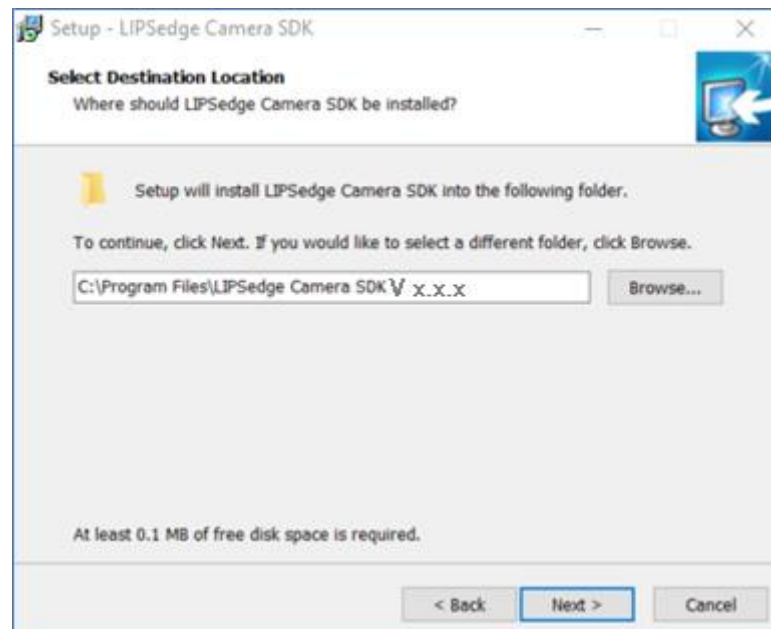
4. Click **Next**.



5. Click **Next**.

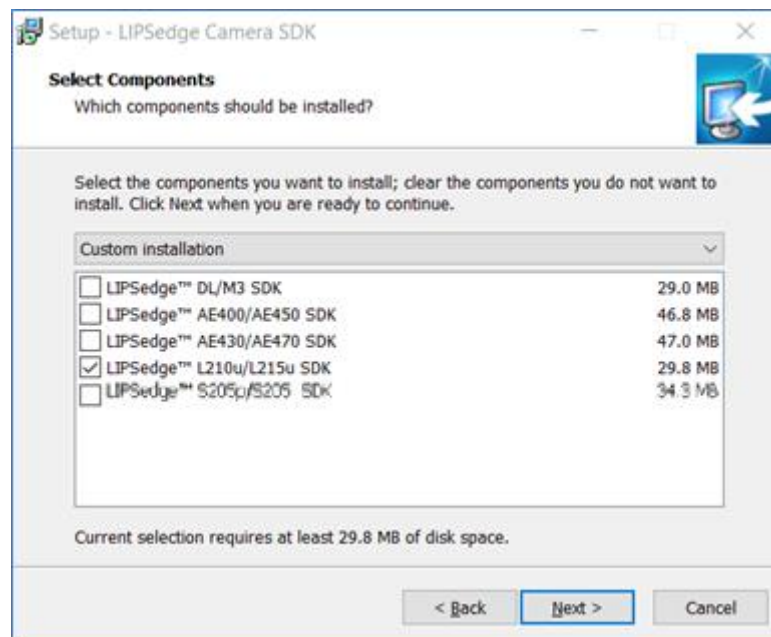


6. Select the **SDK installation location** and click **Next**.

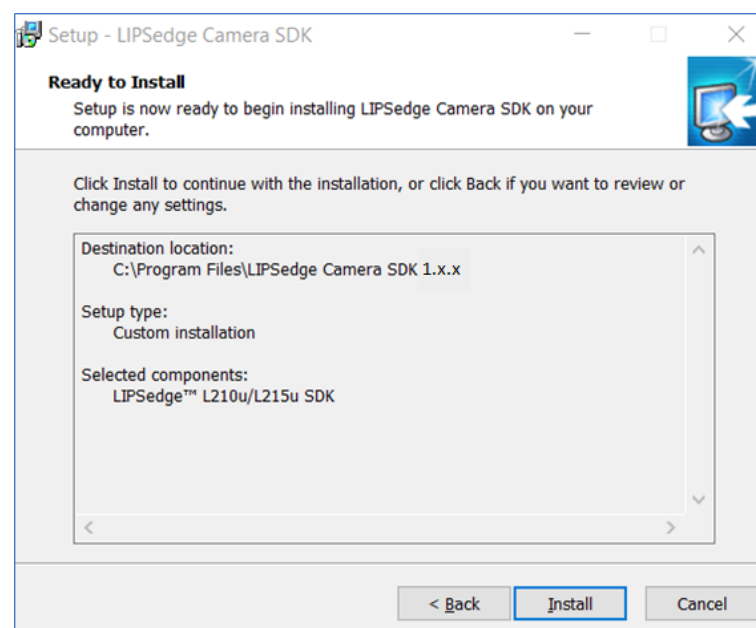




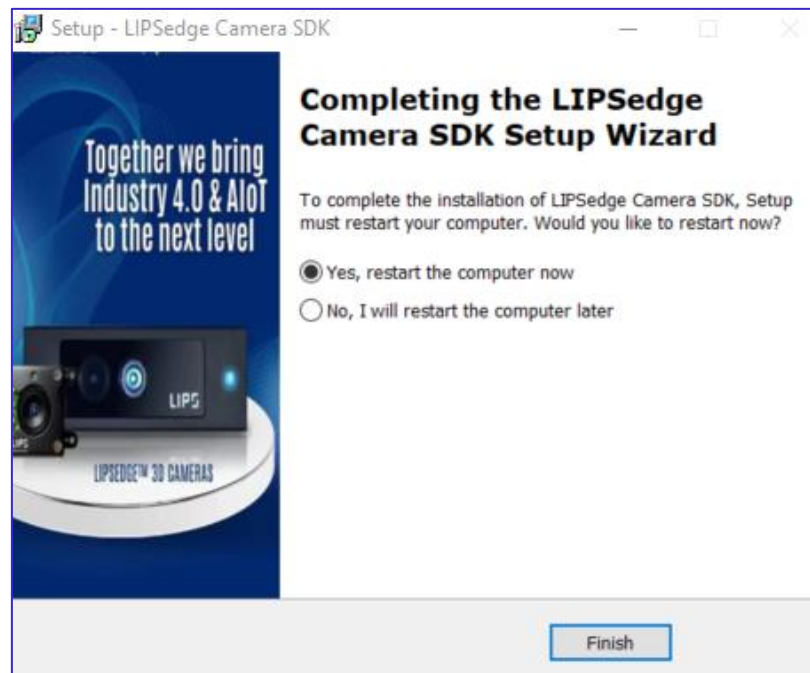
7. From the top menu, select the type of installation for the host PC: In this case, it is recommended to select **Custom Installation > LIPSedge™ L210u / L215u SDK**.
  - **Full Installation:** Install all LIPSedge™ SDKs with all system dependencies for all available LIPSedge™ camera models.
  - **Compact Installations:** Install LIPSedge™ SDK with minimum system dependencies for the chosen model.
  - **Custom Installation:** Install LIPSedge™ SDK with limited functionality for the chosen model.



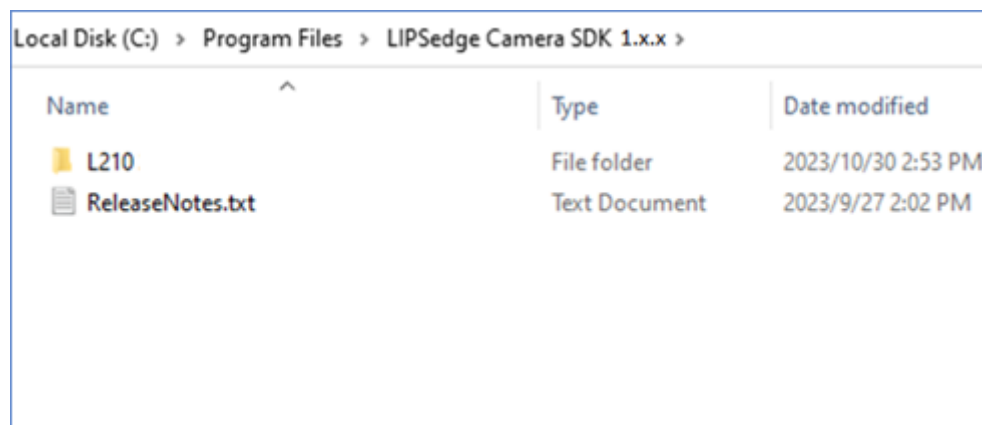
8. Click **Install**.



9. Click **Finish**.



10. Once the installation is successful, the LIPSedge™ SDK and its relevant components are accessible at C:\Program Files\LIPSedge Camera SDK 1.x.x.



11. The LIPSedge™ SDK is also accessible from the desktop shortcut.



## 12. The desktop shortcut folder contains:

| Name                                                                                                                 | Date modified      | Type              | Size |
|----------------------------------------------------------------------------------------------------------------------|--------------------|-------------------|------|
|  DepthViewer                        | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
|  Download LIPSedge™ SDK             | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
|  LIPS® Developer Resources          | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
|  lips-hci.com                       | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
|  PointCloudViewer                   | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
|  Programming API for C++            | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
|  ReleaseNotes.txt                   | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
|  Run LIPSedge™ SDK Samples          | 11/27/2025 3:06 PM | Shortcut          | 3 KB |
|  Run LIPSedge™ SDK Tools            | 11/27/2025 3:06 PM | Shortcut          | 3 KB |
|  SDK Contents                       | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
|  SDK Samples for C++                | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
|  SDK Samples on GitHub              | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
|  Software Wrappers on GitHub        | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
|  Uninstall LIPSedge™ L210 SDK 1.1.0 | 11/27/2025 3:06 PM | Shortcut          | 2 KB |

- **Browse LIPSedge SDK Samples:** A link to [LIPS Corp.'s GitHub, for example applications](#)
- **Browse LIPSedge SDK Wrappers:** Link to [LIPS Corp.'s GitHub for the supported wrapper's source code.](#)
- **Download Latest SDK:** Link to [LIPS Corp's official website for the latest SDK](#)
- **LIPS tools source code:** Contains a series of executable tools and the source code of these tools.
- **lips-hci.com:** Link to LIPS Corp's official website.
- **DepthViewer:** An image viewer for streaming RGB / depth images. Refer to *Chapter3 3.1-A-c.*
- **OpenNI2 Programming API:** A link to OpenNI API's programming guide.
- **Release Notes:** Announcement of the latest feature.
- **Run LIPS tools:** Contains a series of executable tools.
- **Uninstall LIPSedge™ SDK:** A quick uninstallation link for LIPSedge™ SDK.

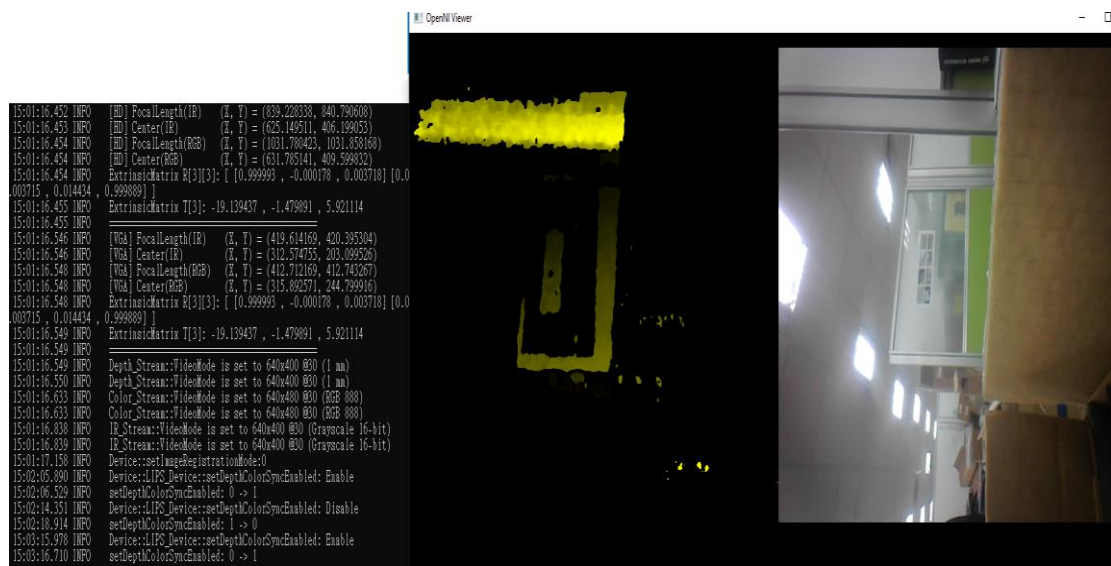
## b. Camera Access

The LIPSedge™ L210u / L215u SDK enables the LIPSedge™ L210u / L215u camera to stream live 3D, RGB, and point-cloud images efficiently. The SDK supports a **single stream**.

1. Go to **LIPSedge™ AE400\_AE450 SDK > OpenNI2 > Tools** and start **DepthViewer**.

| Name               | Date modified     | Type                  | Size      |
|--------------------|-------------------|-----------------------|-----------|
| OpenNI2            | 7/19/2024 2:35 PM | File folder           |           |
| <b>DepthViewer</b> | 7/1/2024 6:37 PM  | Application           | 232 KB    |
| glut64.dll         | 2/23/2024 5:07 PM | Application exten...  | 267 KB    |
| lips-ae400-toolkit | 7/11/2024 4:29 PM | Application           | 377 KB    |
| OpenNI             | 2/23/2024 5:24 PM | Configuration sett... | 1 KB      |
| OpenNI2.dll        | 6/18/2024 8:11 PM | Application exten...  | 311 KB    |
| PointCloudViewer   | 6/28/2024 6:26 PM | Application           | 415 KB    |
| RawFileViewer      | 6/28/2024 1:18 PM | Application           | 603 KB    |
| realsense2.dll     | 7/11/2024 4:28 PM | Application exten...  | 21,132 KB |
| realsense2-gl.dll  | 7/11/2024 4:15 PM | Application exten...  | 2,554 KB  |
| rs-depth-quality   | 7/11/2024 4:29 PM | Application           | 17,077 KB |

2. Upon activation, a **Status Window** and a **Viewer Window** both pop



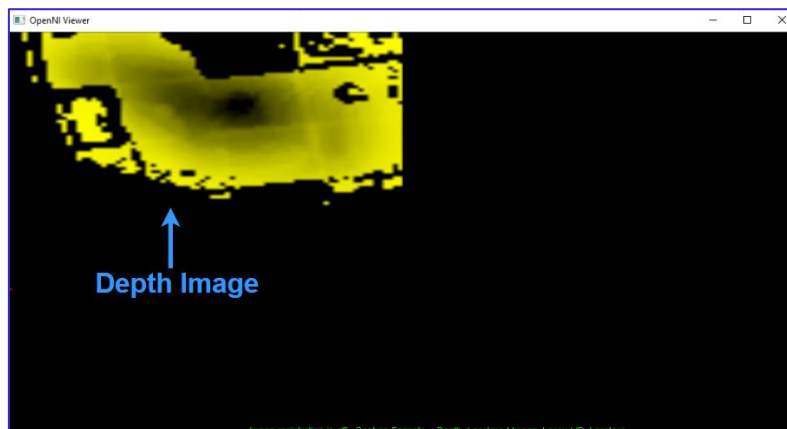
- The **Status Window** displays the camera information, such as SDK build version, SDK time stamp, camera ID, and status.

```

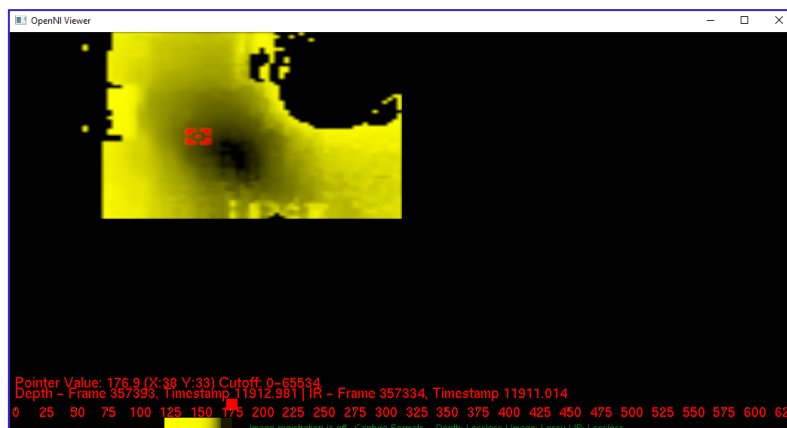
15:01:14.597 INFO Using OpenM12 Module Driver!
15:01:14.600 INFO Using OpenM12 Module Device!
15:01:14.600 INFO Local driver config is used.
15:01:14.601 INFO version: 1.6.0.0
15:01:16.075 INFO serial number: 2500T91C20033
15:01:16.357 INFO firmware version: 0023.221017.E0.22113
15:01:16.357 INFO ----- Config Values -----
15:01:16.358 INFO debug.logLevel = 3
15:01:16.359 INFO -----
15:01:16.452 INFO [HD] FocalLength(IR) (X, Y) = (839.228338, 840.790608)
15:01:16.453 INFO [HD] Center(IR) (X, Y) = (625.149511, 406.199053)
15:01:16.454 INFO [HD] FocalLength(RGB) (X, Y) = (1031.780423, 1031.858168)
15:01:16.454 INFO [HD] Center(RGB) (X, Y) = (631.785141, 409.599832)
15:01:16.454 INFO ExtrinsicMatrix R[3][3]: [ [0.999993, -0.000178, 0.003718] [0.000232, 0.999896, -0.003715, 0.014434, 0.999889] ]
15:01:16.455 INFO ExtrinsicMatrix T[3]: [-19.139437, -1.479891, 5.921114]
15:01:16.455 INFO -----
15:01:16.546 INFO [VGA] FocalLength(IR) (X, Y) = (419.614169, 420.395304)
15:01:16.546 INFO [VGA] Center(IR) (X, Y) = (312.574755, 203.099526)
15:01:16.548 INFO [VGA] FocalLength(RGB) (X, Y) = (412.712169, 412.743267)
15:01:16.548 INFO [VGA] Center(RGB) (X, Y) = (315.892571, 244.799916)
15:01:16.548 INFO ExtrinsicMatrix R[3][3]: [ [0.999993, -0.000178, 0.003718] [0.000232, 0.999896, -0.003715, 0.014434, 0.999889] ]
15:01:16.549 INFO ExtrinsicMatrix T[3]: [-19.139437, -1.479891, 5.921114]
15:01:16.549 INFO -----
15:01:16.550 INFO Depth_Stream:VideoMode is set to 640x400 @30 (1 mm)
15:01:16.550 INFO Depth_Stream:VideoMode is set to 640x400 @30 (1 mm)
15:01:16.633 INFO Color_Stream:VideoMode is set to 640x480 @30 (RGB 888)
15:01:16.633 INFO Color_Stream:VideoMode is set to 640x480 @30 (RGB 888)
15:01:16.838 INFO IR_Stream:VideoMode is set to 640x400 @30 (Grayscale 16-bit)
15:01:16.839 INFO IR_Stream:VideoMode is set to 640x400 @30 (Grayscale 16-bit)
15:01:17.158 INFO Device::setImageRegistrationMode:0
15:02:05.890 INFO Device::LIPS_Device::setDepthColorSyncEnabled: Enable
15:02:06.529 INFO setDepthColorSyncEnabled: 0 -> 1
15:02:14.351 INFO Device::LIPS_Device::setDepthColorSyncEnabled: Disable
15:02:18.914 INFO setDepthColorSyncEnabled: 1 -> 0
15:03:15.978 INFO Device::LIPS_Device::setDepthColorSyncEnabled: Enable
15:03:16.710 INFO setDepthColorSyncEnabled: 0 -> 1

```

- The **Viewer Window** displays the Depth image on the screen.



- Press **[p]** to activate the **pointer mode**. The meter below shows the depth data of the given point marked by the indicator.





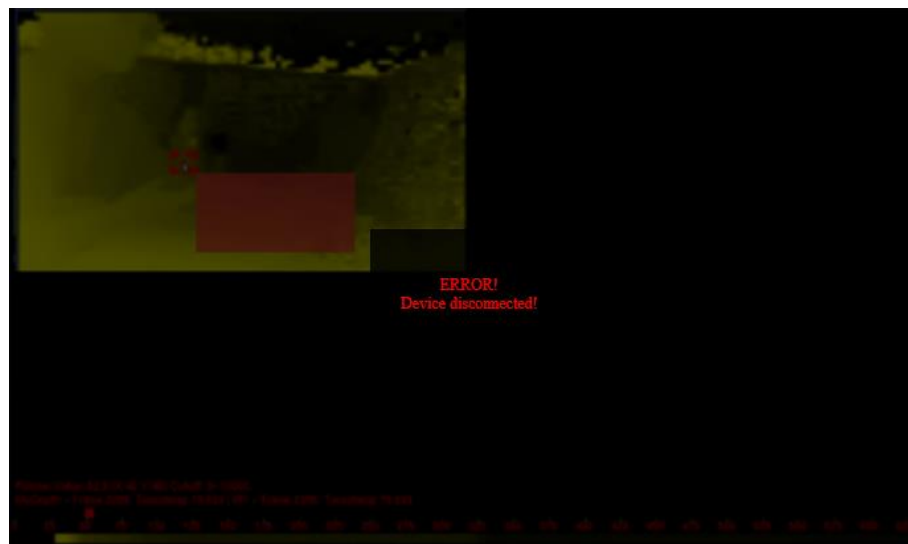
6. Measure the distance by dragging a mouse cursor from point1 to point2 as below.



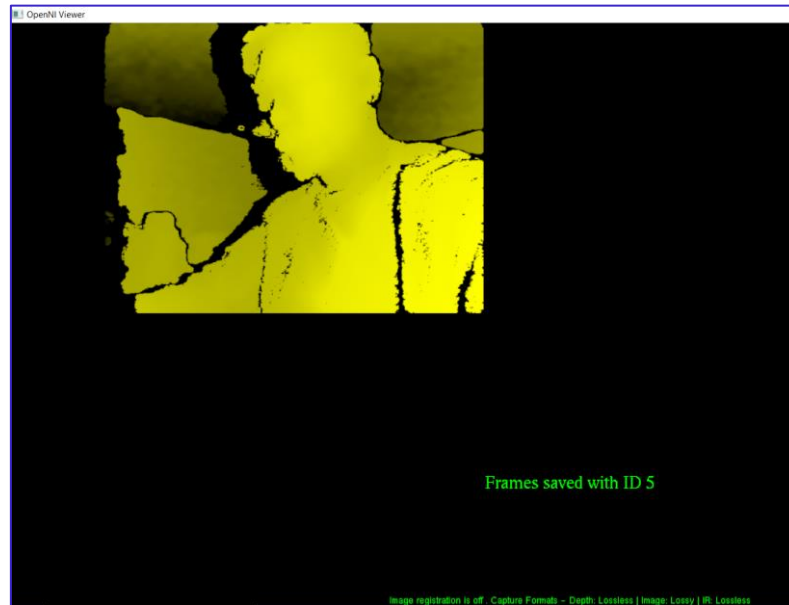
7. Optionally press F to maximize/minimize the viewer's window.

---

**Note:** If, for any reason, the USB cable is forcibly removed while DepthViewer is functioning, an **ERROR! The device disconnected** message appears on the screen. To resume live streaming, re-plug the USB cable.



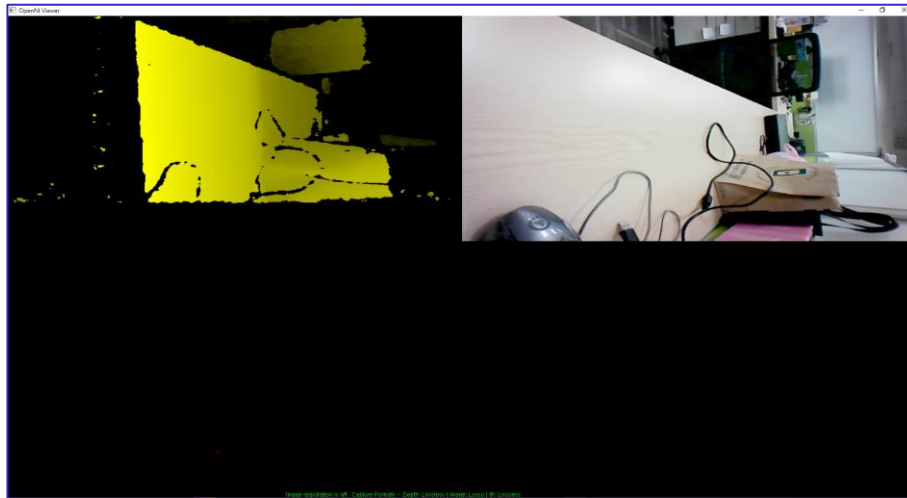
8. Press C to capture the current screen as a raw format file. Go to LIPSedge™ L210 SDK > OpenNI2 > Tools and drag the captured image file to the RawFileViewer.exe to access the raw format file. For details, refer to *Chapter5 5.1-E*.



## c. DepthViewer Settings

DepthViewer relies on hotkeys, which are listed in the help menu, to control its functionality and adjustments. By default, the menu in DepthViewer is hidden to provide an unobstructed viewing experience. To access this menu, press Shift + ?.

### Default – The help menu hidden



### The help menu displayed





The help menu provides the following functionalities:

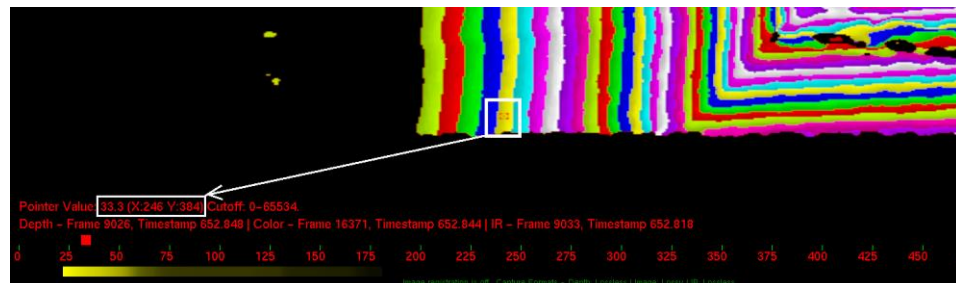
### General

- ◆ **Show / Hide Help Screen [Shift + ?]:** Shows the **Help Screen** which contains the description of keyboard shortcuts with their functions.
- ◆ **Esc:** Exits DepthViewer.+

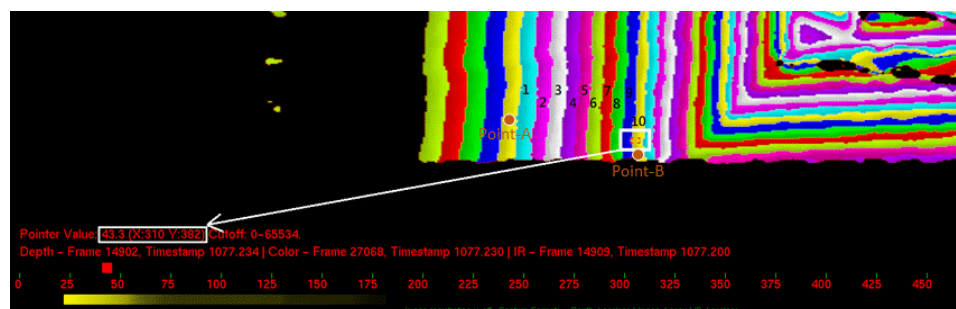
### Preset

- ◆ **Presets:** Displays the depth/color images in 11 styles. Press the hotkey mentioned by the screen hint to select the image styles. By default, depth/color images are displayed **Side By Side**. In this example, LIPS Corp. demonstrates a way to assess the depth image quality using the psychedelic depth style with the pointer mode [p].
  - **Psychedelic depth [3]:** Visualizes the depth images in a psychedelic style, aiding in the evaluation of image capturing presentation and quality.

33.3 represents the depth value from the camera lens to the object.  
(The unit is cm.)

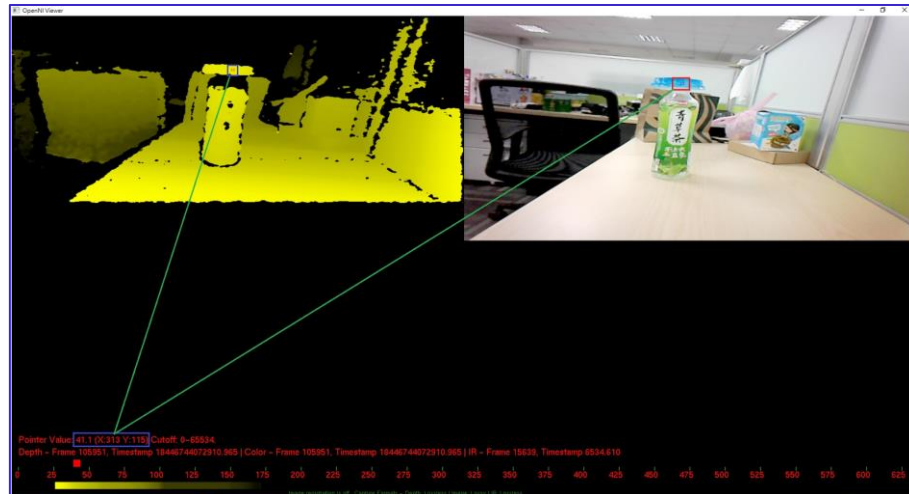


There will be 9 intervals from one color area to the same one-color area, and each interval means 1cm unit. This means the depth value will increase by 10cm from one color area to the same one-color. For example, the depth value will become 43.3 from Point A to Point B.



## Display

- ◆ **Pointer Mode On / Off [p]:** Enables **Pointer Mode** to show a red dot, which indicates the depth value (unit: mm), representing the distance from the camera lens to the object at a specific point on the image.



- ◆ **Full Screen On / Off [f]:** Displays the camera images in full screen or turns the full screen display off.
- ◆ **Reset IR histogram [h]:** Clears the IR histogram.
- ◆ **Show / hide help screen [shift+?]:** Shows the **Help Screen** which contains the description of keyboard shortcuts with their functions.

## Device

- ◆ **Depth-Color Frame Sync [y]:** Synchronize the timing between depth/color images.
- ◆ **Depth-IR Frame Sync [u]:** Synchronize the timing between depth/color images.
- ◆ **Zoom crop on/off [z]:** Enable/disable a cropping mode that magnifies the displayed area, focusing on a specific image region.
- ◆ **Mirror All [m]:** Flips the streaming image horizontally for every stream.
- ◆ **Reset all croppings [/]:** Reset the cropping area previously assigned.
- ◆ **Toggle Auto Exposure [a]:** Automatically adjusts exposure settings for optimal image quality.
- ◆ **Toggle AWB [q]:** Enables or disables automatic white balance adjustment.
- ◆ **Increase Exposure [e]:** Raises the camera's exposure level for brighter images.
- ◆ **Decrease Exposure [E]:** Lowers the camera's exposure level for darker images.

- ◆ **Increase Gain [g]:** Enhances image brightness by increasing the camera's gain.
- ◆ **Decrease Gain [G]:** Reduces gain to control image brightness.
- ◆ **Toggle Close Range [x]:** Toggles between close-range and default focus settings.
- ◆ **Toggle Image Registration [i]:** Activates or deactivates image registration.
- ◆ **IR Emitter On / Off [t]:** Turns the infrared emitter on or off for depth image capture.

### Player

- ◆ **Pause / Resume [Space]:** Pauses the playback of the recording or resumes playback.
- ◆ **Read one Frame [;]:** This function appears only when the playback is paused. Click to load the playback image of the next frame.

### Capture

- ◆ **Start [s]:** Assign a path for saving the recording files and recording images.
- ◆ **Start (5 sec delay) [d]:** Recording images 5 seconds upon clicking this function.
- ◆ **Stop [x]:** Stops recording camera image.
- ◆ **Capture current frame only [c]:** Saves the current frame as an image file.

## d. IP Address Configuration

This section does **NOT** apply to **LIPSedge™ L210u / L215u** since a web interface is unavailable for these models.

## B. Linux / Ubuntu / Jetson Installation

### a. SDK Installation

To access the SDK, visit [3D Depth Camera SDK Free Download | LIPSedge™ SDK \(lips-hci.com\)](https://www.lips-hci.com) and procure the package for the preferred version, framework, and compatible operating system.

1. Visit [LIPSedge™ SDK](https://www.lips-hci.com) website.
2. Select the installation file based on the compatible operating system and download the installation file.

Note: For each LIPSedge™ 3D Camera User Manual refer to the respective product document

- Video Presentation ([Link](#))

### Download the LIPSedge™ SDK as below

**v1.1.1**

- [Windows](#)
- [Linux](#)

Release Notes

- [Release Note](#)

**v1.1.0**

**v1.02**

3. Start **terminal** and go to **the installation file's location**.
4. Change the **installation file's access permissions**. Here, **Version 1.1.1** is used as an example. Enter the version downloaded in the previous steps.

```
chmod +x LIPSedge-Camera-SDK-Linux-<version>.run
```

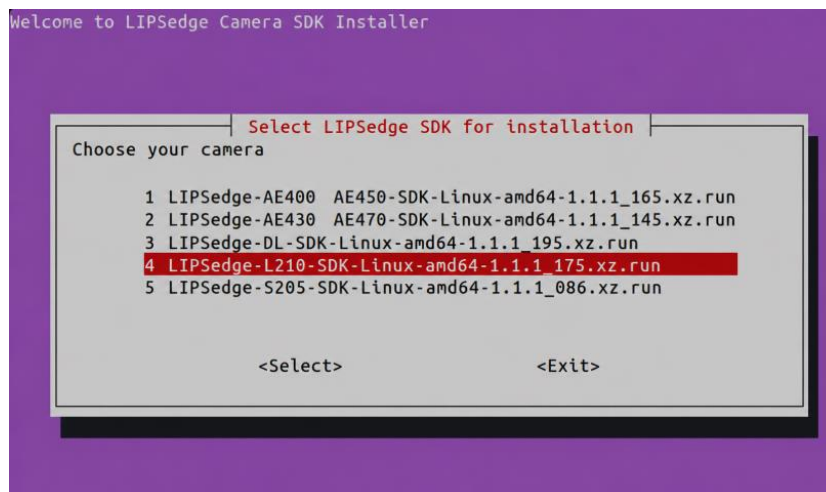
```
lips@lips-Inspiron-7570:~$ chmod +x LIPSedge-Camera-SDK-Linux-amd64_v1.1.1.run
lips@lips-Inspiron-7570:~$
```

5. Execute the installation file.

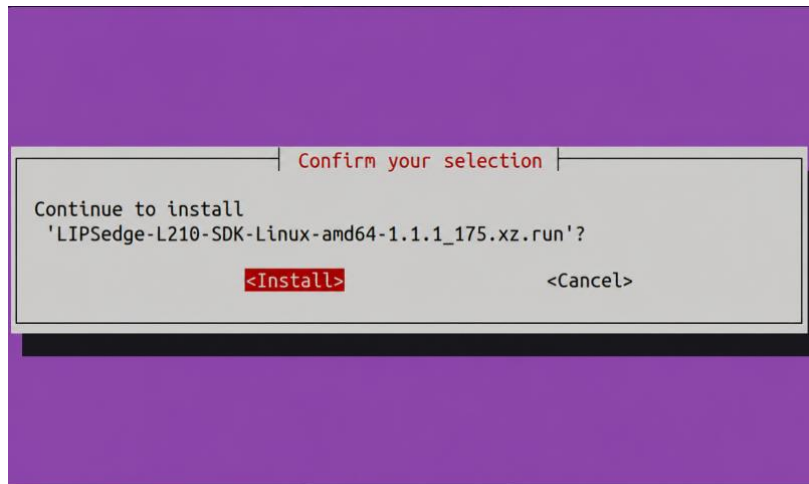
```
./LIPSedge-Camera-SDK-Linux-<version>.run
```

```
lips@lips-Inspiron-7570:~$ ./LIPSedge-Camera-SDK-Linux-amd64_v1.1.1.run
Creating directory LIPSedge-Camera-SDK-Linux-amd64_v1.1.1
Verifying archive integrity... 100% MD5 checksums are OK. All good.
Uncompressing LIPSedge Camera SDK Package v1.1.1 for Linux amd64 51%
```

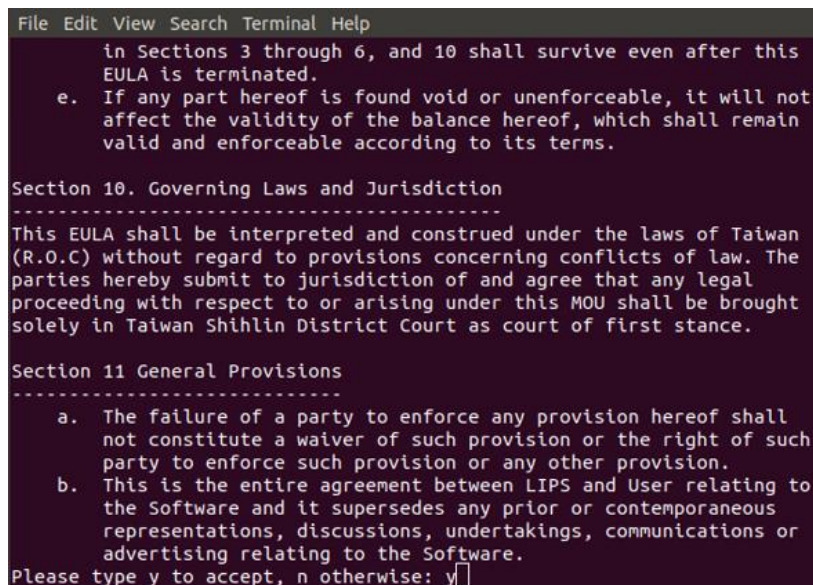
6. LIPSedge™ SDK supports various LIPSedge™ cameras, select the intended model for LIPSedge™ SDK installation.



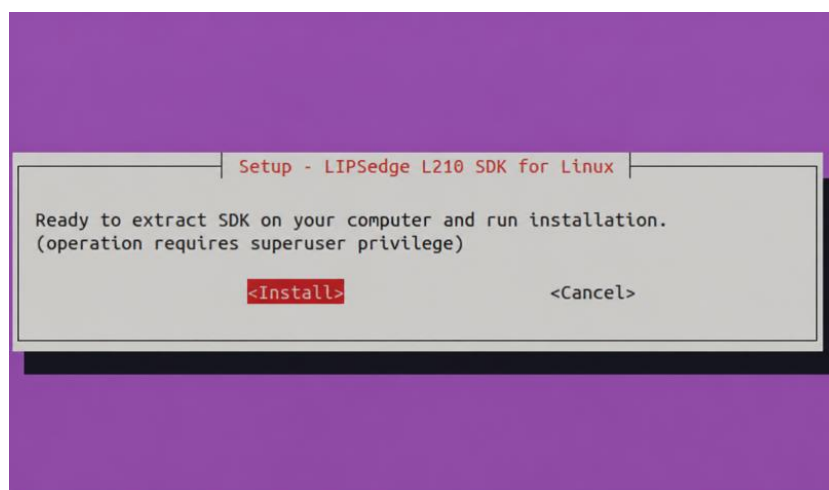
7. Select **Install**.



8. Press **Y**.



9. Select **Install**.





10. Once the installation is successful, the Terminal will prompt a **DONE!** message.

```
Building dependency tree... Done
Reading state information... Done
You might want to run 'apt --fix-broken install' to correct these.
The following packages have unmet dependencies:
 lipsedge-sdk-0 : Depends: libtbb2 but it is not installed
E: Unmet dependencies. Try 'apt --fix-broken install' with no packages (or specify a solution).

install udev rule - OK

install LIPSedge-L210 driver to system OpenNI2 (package libopenni2-0 and libopenni2-dev) - OK

LIPSedge-L210 SDK is extracted to 'LIPSedge-L210-SDK-Linux-amd64-1.1.1_175'

Enter the SDK folder:
$ cd LIPSedge-L210-SDK-Linux-amd64-1.1.1_175

Tips: source OpenNIDevEnvironment to get OPENNI2 include/lib path for development
DONE!
lips@lips-Inspiron-7570:~$
```

11. The LIPSedge™ SDK and its relevant components are then accessible at the **installation location**. In this example, the installation location is `./home`. For the folder content, refer to similar content in *Chapter3 3.2-A*.

| Name                 | Size      |
|----------------------|-----------|
| bin                  | 1 item    |
| Documentation        | 1 item    |
| Include              | 23 items  |
| LIPSedgeSamples      | 11 items  |
| NOTICES              | 15 items  |
| Redist               | 3 items   |
| Tools                | 18 items  |
| Wrappers             | 5 items   |
| EULA_LIPS_SDK.txt    | 9.3 kB    |
| install.sh           | 7.6 kB    |
| OpenNI-CHANGES.txt   | 19.4 kB   |
| OpenNIDevEnvironment | 254 bytes |
| OpenNI-LICENSE.txt   | 11.4 kB   |



## b. Camera Access

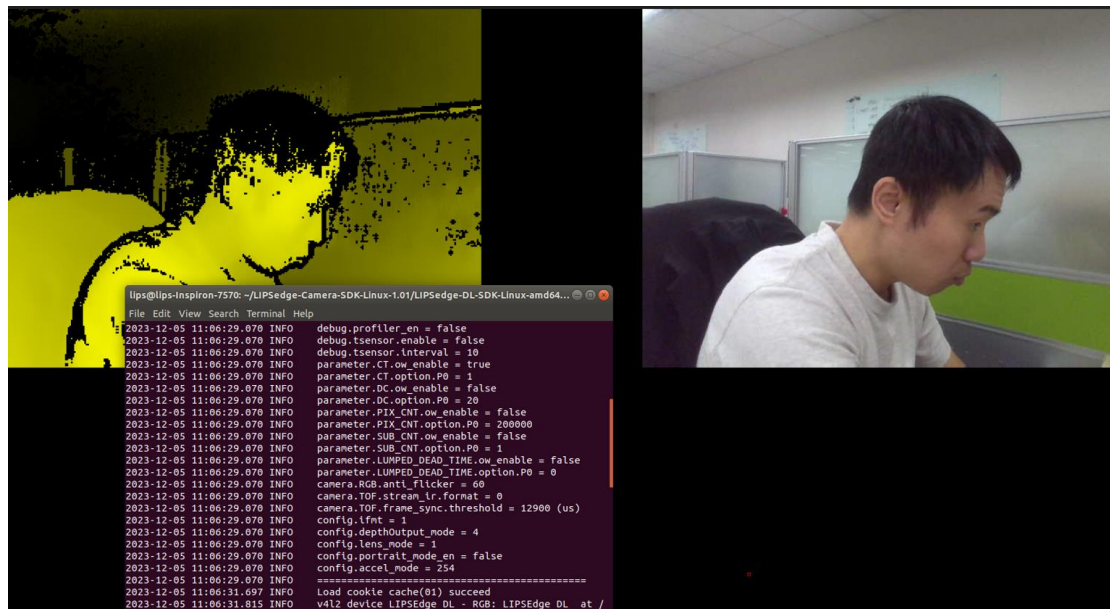
LIPSedge™ L210u / L215u SDK utilizes DepthViewer, OpenNI's signature tool, for examining and assessing the quality of depth, RGB, and point cloud images. **Refer to Chapter 3.1-A-b for details.**

1. Go to LIPSedge-Camera-SDK-Linux-<version>/LIPSedge-<Model>-SDK-Linux-<version>/Tools and type the following command:

```
./DepthViewer
```

```
lips@lips-Inspiron-7570:~$ cd LIPSedge-Camera-SDK-Linux-amd64_v1.1.1/LIPSedge-S205-SDK-Linux-amd64-1.1.1_086/Tools/
lips@lips-Inspiron-7570:~/LIPSedge-Camera-SDK-Linux-amd64_v1.1.1/LIPSedge-S205-SDK-Linux-amd64-1.1.1_086/Tools$ ./DepthViewer
```

2. Upon activation, a **Status Window** and a **Viewer Window** both pop



### c. DepthViewer Settings

DepthViewer relies on hotkeys listed in the help menu to control its functionality and adjustments. The hotkey functions for the DepthViewer of the Linux version are identical to its Windows counterpart. Refer to *Chapter3 3.1-A-c* for details.

### d. IP Address Configuration

This section does **NOT** apply to **LIPSedge™ L210u / L215u** since a web interface is unavailable for these models.

## C. Other OS (by request)

Other OS support by request.

## 3.2 SDK Knowledge Base

The LIPSedge™ L210u / L215u SDK consists of two main components: OpenNI2 and **other dependent files**. Except for the OpenNI2 folder, all the rest of the files are dependent files.

### A. SDK Folder Structure

#### a. Windows

| Name              | Type          | Date modified     |
|-------------------|---------------|-------------------|
| NOTICE            | File folder   | 2023/10/4 2:57 PM |
| OpenNI2           | File folder   | 2023/10/4 2:57 PM |
| EULA_LIPS_SDK.txt | Text Document | 2023/9/11 7:09 PM |
| LIPS.ico          | Icon          | 2023/9/11 7:09 PM |
| ReleaseNotes.txt  | Text Document | 2023/9/26 5:23 PM |
| unins000.dat      | DAT           | 2023/10/4 2:57 PM |
| unins000.exe      | Application   | 2023/10/4 2:57 PM |

- **NOTICE:** Dependent libraries necessary for LIPSedge™ L210u / L215u SDK functionality. Do NOT modify or delete the folder content.
- **OpenNI2:** OpenNI-related files essential for camera integration and function control, including system configuration files and example applications.
- **Auxiliary files:** Supplementary information for the LIPSedge™ L210u / L215u SDK.
  - **EULA\_LIPS\_SDK.txt:** The end user agreement.
  - **LIPS.ico:** LIPS Corp.'s icon, which appears during application operation.
  - **ReleaseNotes:** Announcement of the latest feature.
- **Uninstallation components:** Run unins000.exe for uninstallation. Note that unins000.dat must be present.

## [OpenNI2 Folder]

The SDK package for LIPSedge™ L210u / L215u provides a comprehensive set of files and folders to support camera integration and development. These resources include OpenNI C++ API documentation, header files, libraries for compilation, sample applications, system files, and essential information such as licenses and release notes.

| Name             | Type          |
|------------------|---------------|
| Documentation    | File folder   |
| Include          | File folder   |
| Lib              | File folder   |
| LIPSedgeSamples  | File folder   |
| Redist           | File folder   |
| Tools            | File folder   |
| CHANGES.txt      | Text Document |
| LICENSE          | File          |
| NOTICE           | File          |
| ReleaseNotes.txt | Text Document |

- **Documentation:** Contains essential OpenNI C++ API documentation.
- **Include:** Contains essential OpenNI C++ headers. These headers can be checked along with the associated library files to facilitate development.
- **Lib:** Contains library files, specifically OpenNI2.lib, and realsenses2.lib. These libraries are used in conjunction with MS Visual Studio C++ for compilation.
- **LIPSedgeSamples:** Contains a series of executable tools and the source code of these tools.
- **Redist:** Contains network configuration files, camera drivers, and system files necessary for image streaming.
- **Tools:** Holds captured frames from example programs and other camera configuration files.
- **CHANGES:** The change log for OpenNI.
- **LICENSE:** Contains information about the licensing terms for the SDK.
- **NOTICE:** Contains copyright and attribution notices relevant to the OpenNI components.
- **ReleaseNotes:** The latest system requirements for OpenNI.

## b. Linux

In LIPSedge™ L210u / L215u SDK for the Linux system, the folders are structured so that the OpenNI2 and dependency files are **adjacent to the application that requires these external resources**. Go to `./home/LIPSedge-Camera-SDK-Linux-<version>/LIPSedge-<model>_SDK-Linux-<version>/Tools` for OpenNI C++ API documentation, header files, libraries for compilation, sample applications, system files, and essential information such as licenses and release notes.

| Name                 | Size      |
|----------------------|-----------|
| bin                  | 1 item    |
| Documentation        | 1 item    |
| Include              | 23 items  |
| LIPSedgeSamples      | 11 items  |
| NOTICES              | 15 items  |
| Redist               | 3 items   |
| Tools                | 18 items  |
| Wrappers             | 5 items   |
| EULA_LIPS_SDK.txt    | 9.3 kB    |
| install.sh           | 7.6 kB    |
| OpenNI-CHANGES.txt   | 19.4 kB   |
| OpenNIDevEnvironment | 254 bytes |
| OpenNI-LICENSE.txt   | 11.4 kB   |

- **bin:** Consists of the USB driver files for the LIPS camera.
- **Documentation:** Contains essential OpenNI C++ API documentation.
- **Include:** Contains essential OpenNI C++ headers. These headers can be checked along with the associated library files to facilitate development.
- **LIPSedgeSamples:** Contains a series of executable tools and the source code of these tools.
- **NOTICE:** Contains copyright and attribution notices relevant to the OpenNI components.
- **Redist:** Contains network configuration files, camera drivers and system files necessary for image streaming.
- **Tools:** Holds captured frames from example programs and other camera configuration files.

- **Wrappers:** Contains essential wrapper files that provide language-specific interfaces for integrating the SDK into supported applications.
- **EULA\_LIPS\_SDK.txt:** The end user agreement.
- **Install.sh:** In cases where the Linux / Ubuntu SDK installation was aborted, execute install.sh to install the SDK.
- **OpenNI-CHANGES.txt:** The change log for OpenNI.
- **OpenNIDevEnvironment:** The OpenNI2 development environment and configuration files for application development.
- **OpenNI-LICENSE.txt:** Contains information about the licensing terms for OpenNI.
- **ReleaseNotes:** The latest system requirements for OpenNI.



## B. SDK Setting Configuration

In addition to the OpenNI2 settings, the camera profile settings are also available for adjustment in the **LIPSedge-L210.json** file, written in key / value pairs. To modify the SDK settings, edit LIPSedge-L210.json file in the following location:

| Location |                                                |
|----------|------------------------------------------------|
| Windows  | C:/LIPSedge™ DL SDK path/Tools/OpenNI2/Drivers |
| Linux    | C:/LIPSedge™ DL SDK path/Tools/OpenNI2/Drivers |

Open **LIPSedge-L210.json** with **administrator privilege**. Users can change the settings for different applications. Below is the interface of LIPSedge-L210.json.

```
"debug": {
  "logLevel": "verbose",
  "defaultRes": "VGA",
  "showFPS": {
    "enable": false,
    "interval": 10
  }
},
"config": {
  "version": "1.6.3"
},
"post-processing":
{
  "bilateral-filter":
  {
    "enable": true,
    "debug": false,
    "sigma-spatial": 40,
    "sigma-spatial_help": "scope 1 to 100",
    "sigma-range": 21,
    "sigma-range_help": "scope 1 to 100"
  }
}
```

## a. Debug

- Loglevel:

Do **NOT** change this parameter.

```
"logLevel": "verbose",
```

- defaultRes:

Adjusts the camera resolution. 2 parameters are available: **VGA (640p)** / **HD (1080p)**.

```
"defaultRes": "VGA",
```

- ShowFPS:

Adjust the value (**True / False**) for the **enable** parameter to display FPS on-screen. By default, the parameter is set as false.

```
"showFPS": {
  "enable": false,
```

- interval:

Show the current FPS on the screen at a regular interval (seconds). For example, 10 represents displaying the FPS for every 10 seconds.

```
"showFPS": {
  "enable": false,
  "interval": 10
```

## b. Post-Processing

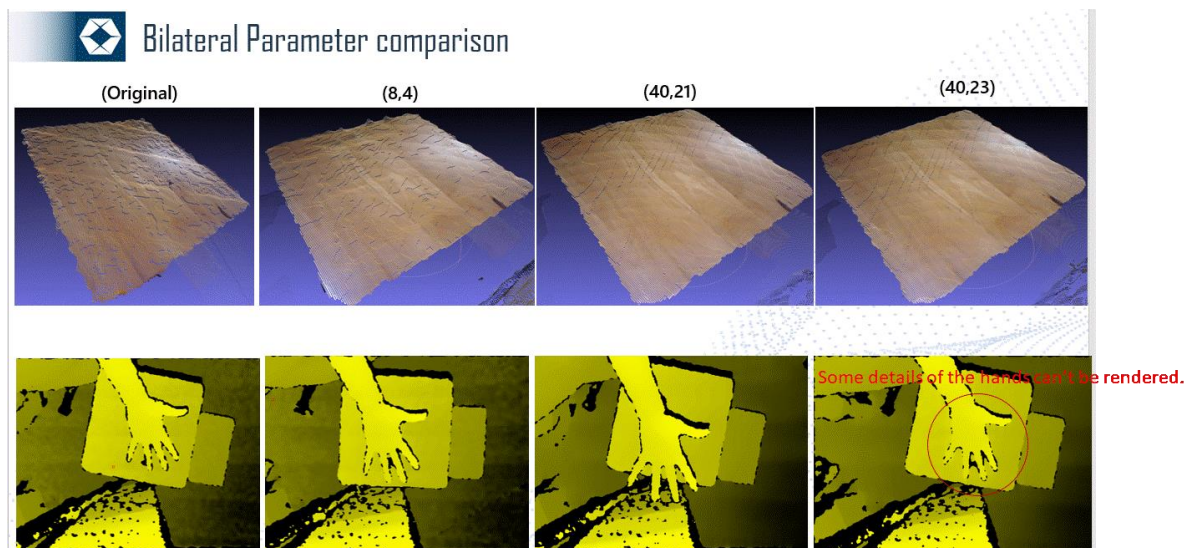
- Enable:

If users key in “True”, then the bilateral filter will be turned on, and the parameters will be implemented by the default setting below.

```
"sigma-spatial": 40,  
"sigma-spatial_help": "scope 1 to 100",  
"sigma-range": 21,  
"sigma-range_help": "scope 1 to 100"
```

If users key in “False”, the bilateral filter will be turned off.

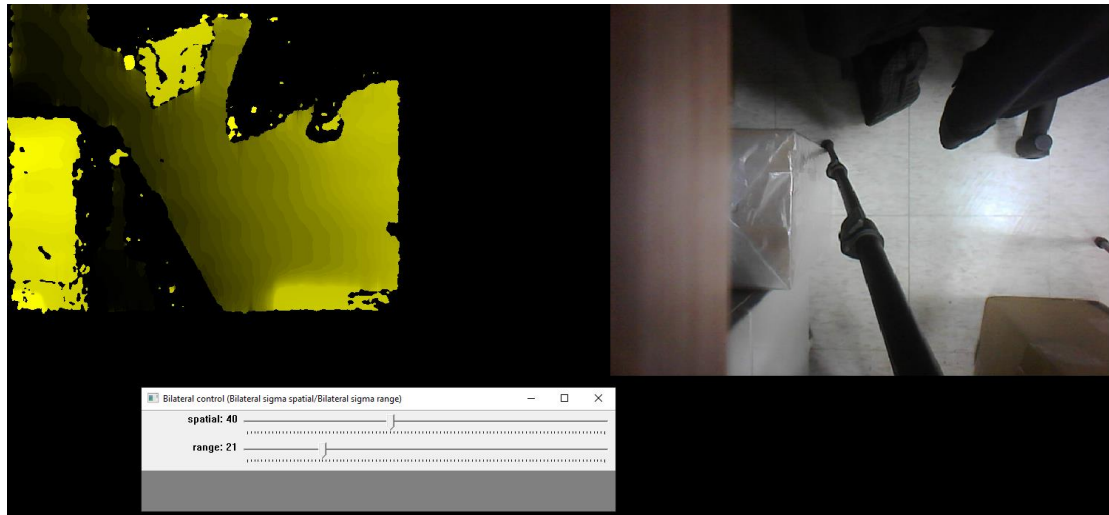
As per the report below, the default setting(40,21) can denoise better than the original setting (which means turning off the bilateral filter).



- **Sigma Spatial:** filter kernel size, increasing it can smooth larger features.
- **Sigma Range:** minimum edge amplitude to be considered, increasing it, the bilateral filter gradually approximates Gaussian blur.

- Debug:

If users key in “True” in enable & debug, then the UI of bilateral-filter will be turned on as below; users can see the result of the image by adjusting the parameters.



If users key in “False”, then the UI of the bilateral filter will be turned off.

## c. Camera Web Interface

This section does **NOT** apply to **LIPSedge™ L210u / L215u** since a web interface is unavailable for these models.

## 4. APIs

LIPSedge™ L210u / L215u SDK is integrated with OpenNI APIs. The key strength of this robust framework lies in its effortless access to the camera's internal parameters, empowering developers to delve deep into raw data and tailor applications to specific functionalities. Developers can access the programming guide for the API at: **/LIPSedge[Model]-SDK/Documentation.**

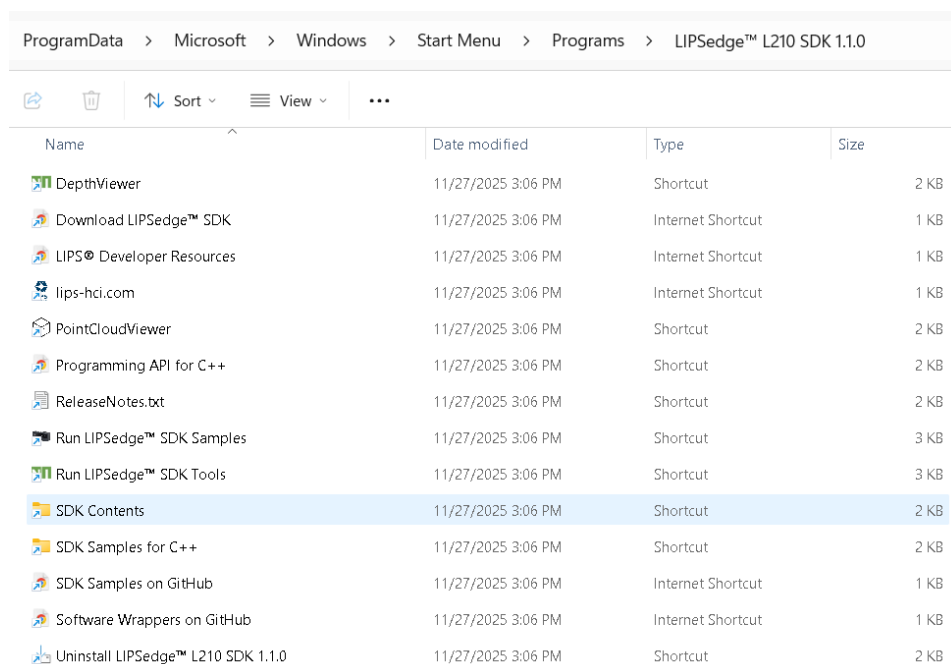


1. **Main Page:** This tab provides a clear overview of the OpenNI API, including a quick installation guide, introduction of the coding conventions, legal documents, and the release notes.
2. **Related Pages:** This tab provides a selection of the information that is related to OpenNI.
3. **Namespaces:** This tab provides users with a hierarchical structure of namespaces that categorize the specific functionalities of the API.
4. **Classes:** This tab dives deeper into each individual class within the OpenNI API, outlining its properties and methods to enable developers to fully understand and utilize each element.
5. **Files:** This tab provides a description of the source code files that make up the OpenNI API.

## 5. Tools

LIPSedge™ L210u / L215u SDK provides a series of executable tools and their source code essential for visualization, data capture, camera parameters acquisition et cetera to facilitate the development of applications and solutions for LIPSedge™ L210u / L215u cameras. These tools and their system components are placed in the following folder:

- **Run LIPS tools Source code:** Contains a series of executable tools; users can refer to **Chapter 5.1 Samples codes** for reference.
- **LIPS tools source code:** Contains a series of the source code of these tools. Users can refer to **Chapter 5.2 Compilation** for reference. These codes can also be downloaded from the link below for the latest updates: <https://github.com/lips-hci/LIPSedge-sdk-samples>.



| Name                               | Date modified      | Type              | Size |
|------------------------------------|--------------------|-------------------|------|
| DepthViewer                        | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
| Download LIPSedge™ SDK             | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
| LIPS® Developer Resources          | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
| lips-hci.com                       | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
| PointCloudViewer                   | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
| Programming API for C++            | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
| ReleaseNotes.txt                   | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
| Run LIPSedge™ SDK Samples          | 11/27/2025 3:06 PM | Shortcut          | 3 KB |
| Run LIPSedge™ SDK Tools            | 11/27/2025 3:06 PM | Shortcut          | 3 KB |
| SDK Contents                       | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
| SDK Samples for C++                | 11/27/2025 3:06 PM | Shortcut          | 2 KB |
| SDK Samples on GitHub              | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
| Software Wrappers on GitHub        | 11/27/2025 3:06 PM | Internet Shortcut | 1 KB |
| Uninstall LIPSedge™ L210 SDK 1.1.0 | 11/27/2025 3:06 PM | Shortcut          | 2 KB |

## 5.1 Sample codes

### A. CameraParameterViewer

A simple OpenNI2 tool to query supported video modes and list camera intrinsic/extrinsic parameters.

1. In **Bin**, start **Cameraparameter.exe**.

| Name                  | Date modified      | Type                  | Size   |
|-----------------------|--------------------|-----------------------|--------|
| OpenNI2               | 7/26/2024 10:23 AM | File folder           |        |
| CameraCenterViewer    | 6/18/2024 8:11 PM  | Application           | 17 KB  |
| CameraParameterViewer | 6/28/2024 1:18 PM  | Application           | 33 KB  |
| CameraSimpleViewer    | 7/1/2024 10:51 AM  | Application           | 361 KB |
| OpenNI                | 2/23/2024 5:07 PM  | Configuration sett... | 1 KB   |
| OpenNI2.dll           | 6/18/2024 8:11 PM  | Application exten...  | 311 KB |
| PointCloudViewer      | 6/28/2024 6:26 PM  | Application           | 409 KB |
| RawFileViewer         | 6/12/2024 2:08 PM  | Application           | 354 KB |

2. Provides detailed camera parameters for depth, IR, and color cameras.

```

C:\Program Files\LIPSedge Camera SDK\X_X_X\L
Fx: 387.424744
Fy: 386.486694
Cx: 327.046783
Cy: 240.241409
HFOV: 79.10
VFOV: 63.68
Distortion Coeffs:
Radial: k1 k2 k3 k4
        -0.056398 0.060609 0.000000
Tangential: p1 p2
            -0.000463 0.000328
Extrinsic Parameters:
Extrinsic from "Color" To "Depth" :

```



## B. Ni2CenterRead

A simple OpenNI2 console program to show depth value at center point of frame.

1. In **Bin**, click **CameraCenterViewer**.

| Name                  | Date modified      | Type                  | Size   |
|-----------------------|--------------------|-----------------------|--------|
| OpenNI2               | 7/26/2024 10:23 AM | File folder           |        |
| CameraCenterViewer    | 6/18/2024 8:11 PM  | Application           | 17 KB  |
| CameraParameterViewer | 6/28/2024 1:18 PM  | Application           | 33 KB  |
| CameraSimpleViewer    | 7/1/2024 10:51 AM  | Application           | 361 KB |
| OpenNI                | 2/23/2024 5:07 PM  | Configuration sett... | 1 KB   |
| OpenNI2.dll           | 6/18/2024 8:11 PM  | Application exten...  | 311 KB |
| PointCloudViewer      | 6/28/2024 6:26 PM  | Application           | 409 KB |
| RawFileViewer         | 6/12/2024 2:08 PM  | Application           | 354 KB |

2. A simple OpenNI2 console program to show depth value at center point of frame.

```

C:\Program Files\LIPSEdge Camera SDK V X.X.X.L ...
network setting is found at network.json
Read local network config.
[1 - 1696571885535705] 0
[2 - 1696571885598398] 0
[3 - 1696571885657896] 0
[4 - 1696571885718331] 0
[5 - 1696571885779117] 0
[6 - 1696571885840109] 0
[7 - 1696571885899929] 0
[8 - 1696571885959931] 0
[9 - 1696571886019631] 0
[10 - 1696571886079505] 0
[11 - 1696571886140021] 0

```

## C. Ni2EventBasedViewer-gl (Coming soon)

OpenNI2 device management by event-driven design.

1. In **Bin**, click **Ni2EventBasedViewer-gl**.

| Name                       | Type                   | Date modified      |
|----------------------------|------------------------|--------------------|
| OpenNI2                    | File folder            | 2023/11/3 10:56 AM |
| LIPSCameraMatrix.exe       | Application            | 2023/9/26 4:41 PM  |
| Ni2CenterRead.exe          | Application            | 2023/9/22 3:23 PM  |
| Ni2EventBasedViewer-gl.exe | Application            | 2023/9/22 3:23 PM  |
| Ni2PointCloud-gl.exe       | Application            | 2023/9/22 3:23 PM  |
| Ni2RawViewer-gl.exe        | Application            | 2023/9/21 7:11 PM  |
| Ni2SimpleViewer-gl.exe     | Application            | 2023/9/22 3:23 PM  |
| OpenNI.ini                 | Configuration settings | 2023/9/22 7:24 PM  |
| OpenNI2.dll                | Application extension  | 2023/9/22 3:01 PM  |

2. The Ni2EventBasedViewer-gl provides notifications when the device becomes disconnected.

```

----- DeviceDisconnect -----
Vendor : LIPS
Name : edge
VID/PID: 2df2 / 213
URL : \\?\usb#vid_2df2&pid_0213#200901010001#{a5dcbf10-6530-11d2-901f-00c04fb951ed}

2023-10-02 14:21:46.631 INFO Device disconnected: LIPS edge (\\?\usb#vid_2df2&pid_0213#200901010001#{a5dcbf10-6530-11d2-901f-00c04fb951ed})
IR stream stopped.
Depth stream stopped.
Color stream stopped.
2023-10-02 14:21:47.637 INFO Release camera resources
Device closed.

```

3. When users reconnect the device, the system promptly re-establishes the connection, granting access to streaming for Depth, IR, and RGB data once again.

```

+++++++ DeviceConnect ++++++++
Vendor : LIPS
Name : edge
VID/PID: 2df2 / 213
URL : \\?\usb#vid_2df2&pid_0213#200901010001#{a5dcbf10-6530-11d2-901f-00c04fb951ed}
+++++++

2023-10-02 14:27:01.675 INFO Device connected: LIPS edge (\\?\usb#vid_2df2&pid_0213#200901010001#{a5dcbf10-6530-11d2-901f-00c04fb951ed})

===== DeviceStateChange =====
Vendor : LIPS
Name : edge
VID/PID: 2df2 / 213
URL : \\?\usb#vid_2df2&pid_0213#200901010001#{a5dcbf10-6530-11d2-901f-00c04fb951ed}
State : DEVICE_STATE_OK
=====

```

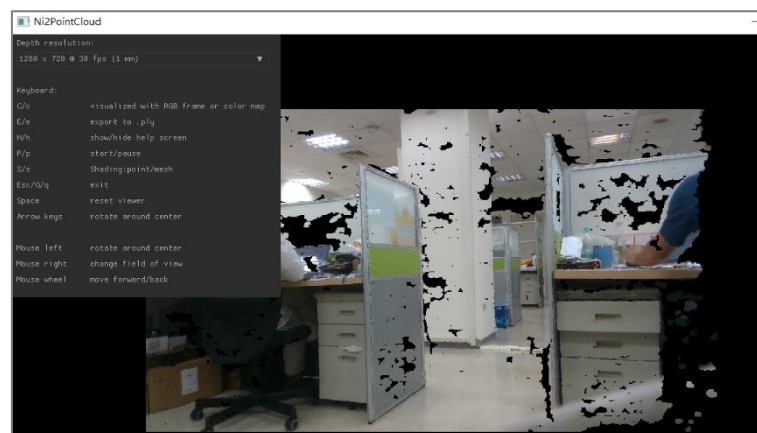
## D.PointCloudViewer

Includes another OpenNI2 sample for 3D point cloud visualization through OpenGL.

1. In **Bin**, click **PointCloudViewer**

| Name                  | Date modified      | Type                  | Size   |
|-----------------------|--------------------|-----------------------|--------|
| OpenNI2               | 7/26/2024 10:23 AM | File folder           |        |
| CameraCenterViewer    | 6/18/2024 8:11 PM  | Application           | 17 KB  |
| CameraParameterViewer | 6/28/2024 1:18 PM  | Application           | 33 KB  |
| CameraSimpleViewer    | 7/1/2024 10:51 AM  | Application           | 361 KB |
| OpenNI                | 2/23/2024 5:07 PM  | Configuration sett... | 1 KB   |
| OpenNI2.dll           | 6/18/2024 8:11 PM  | Application exten...  | 311 KB |
| PointCloudViewer      | 6/28/2024 6:26 PM  | Application           | 409 KB |
| RawFileViewer         | 6/12/2024 2:08 PM  | Application           | 354 KB |

2. A simple viewer application using OpenGL to display point-cloud frames.

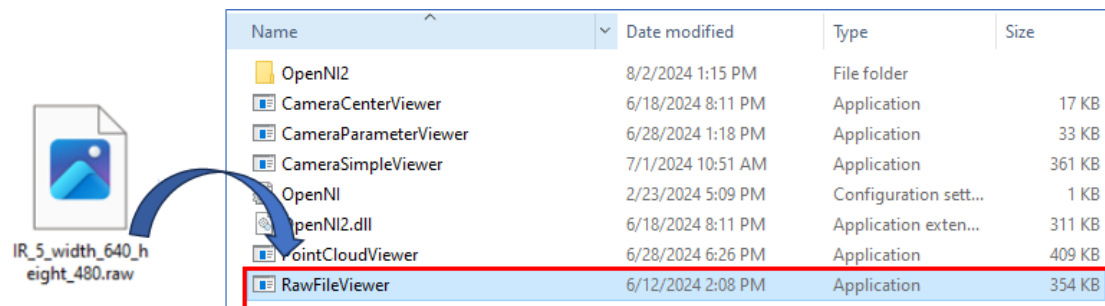


## E. RawFileViewer

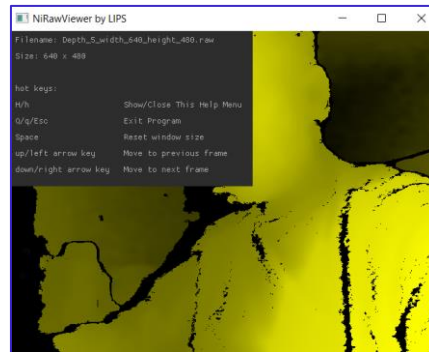
A tool for reading OpenNI2 frames captured in raw data format. To achieve this:

| Name                  | Date modified      | Type                  | Size   |
|-----------------------|--------------------|-----------------------|--------|
| OpenNI2               | 7/26/2024 10:23 AM | File folder           |        |
| CameraCenterViewer    | 6/18/2024 8:11 PM  | Application           | 17 KB  |
| CameraParameterViewer | 6/28/2024 1:18 PM  | Application           | 33 KB  |
| CameraSimpleViewer    | 7/1/2024 10:51 AM  | Application           | 361 KB |
| OpenNI                | 2/23/2024 5:07 PM  | Configuration sett... | 1 KB   |
| OpenNI2.dll           | 6/18/2024 8:11 PM  | Application exten...  | 311 KB |
| PointCloudViewer      | 6/28/2024 6:26 PM  | Application           | 409 KB |
| RawFileViewer         | 6/12/2024 2:08 PM  | Application           | 354 KB |

1. Start DepthViewer. Make sure the camera is properly configured and connected.
2. Press C and the current image will be captured.
3. Go to **LIPSedge™ L210 SDK > OpenNI2 > Tools**.
4. Drag a raw image file to the RawFileViewer-gl.

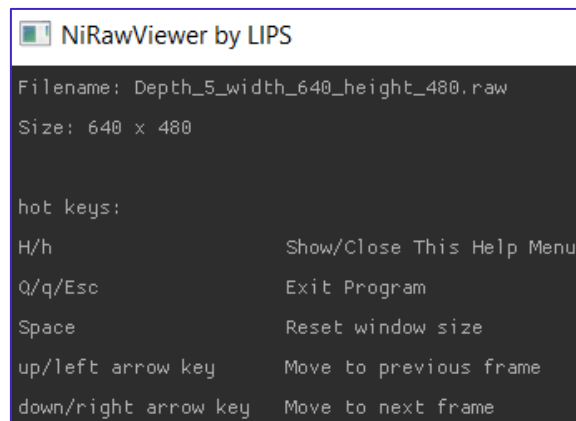


5. The raw image file will be displayed.



6. Users can navigate through the image with the following hotkeys:

- **H / h**: Displays / turn off the help menu.
- **Q / q / Esc**: Exit NiRawViewer-gl.
- **Space**: Reset adjusted window size to its original resolution.
- **Up / Left arrow key**: Displays the previous frame.
- **Down / Right arrow key**: Displays the next frame.



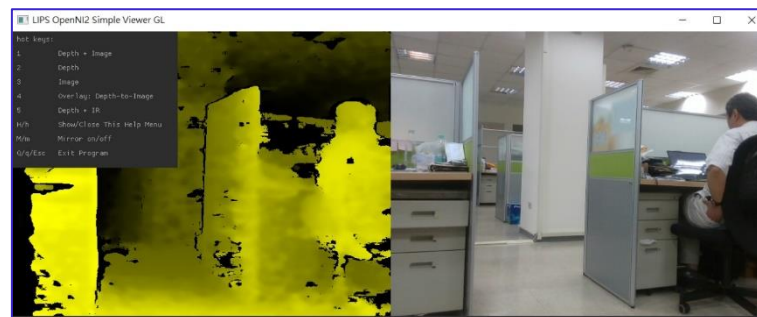
## F. CameraSimpleViewer

A simplified version of DepthViewer using OpenCV to display Depth/IR/Color frames.

### 3. In **Bin**, click **CameraSimpleViewer**

| Name                  | Date modified      | Type                  | Size   |
|-----------------------|--------------------|-----------------------|--------|
| OpenNI2               | 7/26/2024 10:23 AM | File folder           |        |
| CameraCenterViewer    | 6/18/2024 8:11 PM  | Application           | 17 KB  |
| CameraParameterViewer | 6/28/2024 1:18 PM  | Application           | 33 KB  |
| CameraSimpleViewer    | 7/1/2024 10:51 AM  | Application           | 361 KB |
| OpenNI                | 2/23/2024 5:07 PM  | Configuration sett... | 1 KB   |
| OpenNI2.dll           | 6/18/2024 8:11 PM  | Application exten...  | 311 KB |
| PointCloudViewer      | 6/28/2024 6:26 PM  | Application           | 409 KB |
| RawFileViewer         | 6/12/2024 2:08 PM  | Application           | 354 KB |

### 4. A simplified version of DepthViewer using OpenCV to display Depth/IR/Color frames.



## 5.2 Compilation

**Examples application's source code:** The source code of the executable tools in LIPSedgeSamples. Refer to *Chapter5 5.1 Samples codes*. In cases where the source code is corrupted, LIPS Corp. provides the source code on LIPS Corp.'s GitHub.

| Application name       | Source code                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------|
| LIPSCameraMatrix       | <a href="#">LIPSedge-sdk-samples/LIPSCameraMatrix at main · lips-hci/LIPSedge-sdk-samples · GitHub</a>       |
| Ni2CenterRead          | <a href="#">LIPSedge-sdk-samples/Ni2CenterRead at main · lips-hci/LIPSedge-sdk-samples · GitHub</a>          |
| Ni2EventBasedViewer-gl | <a href="#">LIPSedge-sdk-samples/Ni2EventBasedViewer-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub</a> |
| Ni2PointCloid-gl       | <a href="#">LIPSedge-sdk-samples/Ni2PointCloud-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub</a>       |
| Ni2RawViewer-gl:       | <a href="#">LIPSedge-sdk-samples/Ni2RawViewer-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub</a>        |
| Ni2SimpleViewer-cv     | <a href="#">LIPSedge-sdk-samples/Ni2SimpleViewer-cv at main · lips-hci/LIPSedge-sdk-samples · GitHub</a>     |
| Ni2SimpleViewer-gl:    | <a href="#">LIPSedge-sdk-samples/Ni2SimpleViewer-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub</a>     |



## 6. Supported Language & Wrappers

LIPSedge™ L210u / L215u SDK supports various programming Languages/ Libraries/ Frameworks to enhance the development project. These programming language-based SDK and libraries/ frameworks are available at [LIPS-HCI · GitHub](#).

| Type      | Name           | Description                                                   | GitHub Link                      |
|-----------|----------------|---------------------------------------------------------------|----------------------------------|
| Language  | <b>Python3</b> | Support Python3                                               | <a href="#">python3 · GitHub</a> |
|           | <b>.NET</b>    | Support for .NET languages with examples in C#                | <a href="#">.NET GitHub</a>      |
|           | <b>C#</b>      | Support C#                                                    | Coming Soon.                     |
|           | <b>Java</b>    | Support Java                                                  | Coming Soon.                     |
| Library   | <b>OpenCV</b>  | Integration with OpenCV computer-vision library               | <a href="#">OpenCV GitHub</a>    |
|           | <b>PCL</b>     | Integration with Point Cloud Library                          | Coming Soon.                     |
| Framework | <b>ROS</b>     | Integration with Robot Operating System (ROS)                 | Coming Soon.                     |
|           | <b>ROS2</b>    | Integration with Robot Operating System 2 (ROS 2)             | Coming Soon.                     |
|           | <b>ISAAC</b>   | Support NV Isaac robot platform as depth camera data provider | Coming Soon.                     |
|           | <b>Halcon</b>  | Integration with HALCON development environment               | Coming Soon.                     |

## 7. Application & Middleware Supports

In addition to the LIPSedge™ L210u / L215u, LIPS Corp. also offers a diverse range of advanced 3D cameras and comprehensive solutions that cater to various imaging and sensing requirements. For details, refer to the following chapter:

### 7.1 Applications

LIPS Corp. offers a wide range of advanced 3D camera kits. These offerings encompass various technologies to cater to diverse imaging and sensing requirements. For details, refer to. <https://www.lips-hci.com/>.

- LIPSMetric™
- LIPSense™

### 7.2 Middleware

LIPS Corp. offers exclusive middleware solutions. These solutions encompass various technologies to cater to diverse imaging and sensing requirements. For details, refer to. <https://www.lips-hci.com/>.

- LIPSMetric™
- LIPSense™

## 8. SDK Tutorial

LIPS Corp. provides extensive support for a variety of SDKs. LIPS Corp.'s GitBook tutorial offers practical examples and applications with hands-on guidance based on the following platforms:

| Name           | Description                                                                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C++</b>     | <a href="https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview">https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview</a>     |
| <b>Python</b>  | <a href="https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-1">https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-1</a> |
| <b>Java</b>    | <a href="https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-2">https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-2</a> |
| <b>OpenCV</b>  | <a href="https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-3">https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-3</a> |
| <b>GenICam</b> | <a href="https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/genicam">https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/genicam</a>       |
| <b>ROS</b>     | <a href="https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-4">https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-4</a> |

## 9. Appendix (Private by owner)

### 9.1 Regulatory Compliance Notice



### FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

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**Caution:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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## FCC Label Notice



This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.



## CE Compliance

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



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