

[i-Nova3 + GigE]

[Installation guide]

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1. Recommended System Configuration

The following system configuration is recommended when using the camera. The specifications below are written as internally verified specifications.

- OS – Microsoft Windows 10 (64-bit), Linux (32bit/64bit/ARM64)
- CPU – i7-5th generation More than
- RAM – 8GB
- NIC – Intel Gigabit Network
- Video – graphics card that supports H265 4K hardware encoding
- Software – Microsoft Visual Studio 2013 (to compile and run example code)

2. Preparation for Camera Configuration

The following components are required to install the camera.

- Ethernet cable (Refer to [6.2. Ethernet Connector](#))
- GPIO cable (Refer to [6.3. GPIO Connector](#))
- Lens (Refer to [5.1. Attach a Lens](#))
- Interface card

3. Handling Precautions

3.1. Instrument safety instructions

- We are not responsible for any damage caused by user negligence or other equipment connection.
- Handle i-Nova3 with care. For example, be careful of strong impact or storage in an unsuitable environment.
- Do not use accessories that are not recommended as they may be dangerous.

3.2. Important safety precautions

- Please check the specifications for each product and use a power supply with the appropriate specifications.
- Keep the product away from radiators, heaters, stoves, or other products (amplifiers, etc.) and heat

sources.

- Be careful not to let flammable substances, water, or metal get inside the camera.
- Do not modify the camera or use the camera with the outer cover removed.
- Avoid using the camera in thunder or lightning storms.
- When using the camera outdoors, protect it from moisture. (rain/snow, etc.)
- Board level notes
 - Be careful to avoid electric shocks such as static electricity (ESD).
 - Use a ground (GND), etc. to cope with ESD, etc.
 - Be careful not to get plastic, vinyl, or Styrofoam into the circuit board.
 - Do not touch the parts of the circuit board with your hands or conductive devices.

3.3. Handling and cleaning

- Do not attempt to disassemble the camera.
- When replacing or removing the lens or filter, be careful not to allow water or dust to enter.
- Use a blower or lens brush to remove dust from the lens or optical filter.
- Do not disassemble the front flange.
- Clean the case with a soft, dry cloth.
- Do not use benzene, thinner, alcohol, liquid or spray-type cleaners.

3.4. Installation

Avoid installing or storing the camera in the following locations.

- Environments exposed to direct sunlight, rain or snow
- Environments with flammable or corrosive gases
- Excessive temperature or low temperature environment (recommended ambient temperature: 0 ~ 45° C)
- Wet or dusty places
- Places subject to excessive vibration or shock

- Environments exposed to strong electric or magnetic fields
- Do not point the camera at the sun or other strong light sources.
- In case of unfavorable conditions, be sure to inquire about the installation environment.

3.5. Performance and longevity

- Please configure the environment that meets the camera operation specifications. If the ambient temperature is high, the service life may be shortened due to deterioration of the parts. In that case, you also need to consider the cooling system.

3.6. Connector

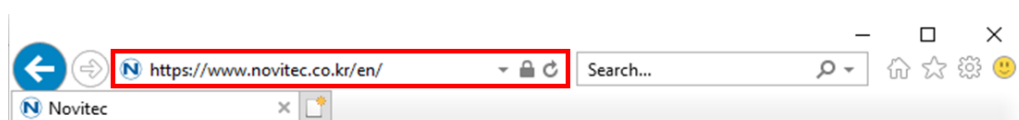
- When manufacturing the I/O connector, be careful with the connection so that the wires fit well.
- Make sure the power is off before connecting or disconnecting I/O connectors.
- To avoid damaging the connector, do not pull by the electric wire, etc.

4. How to install the software

4.1. Download the Installation File

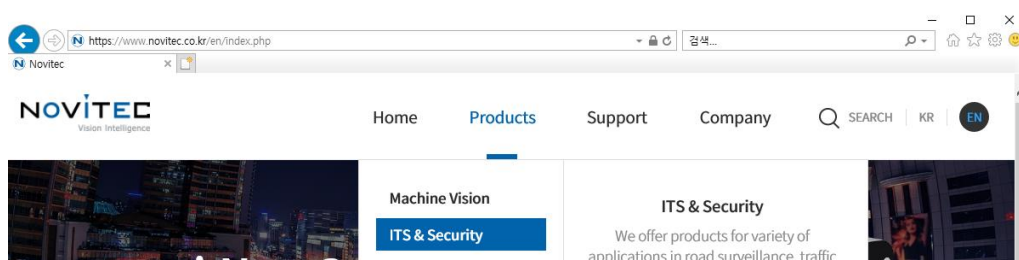
We recommend that you download and install the latest version of the SDK from the Novitec website.

- Go to the Novitec website (<https://www.novitec.co.kr/en/>).



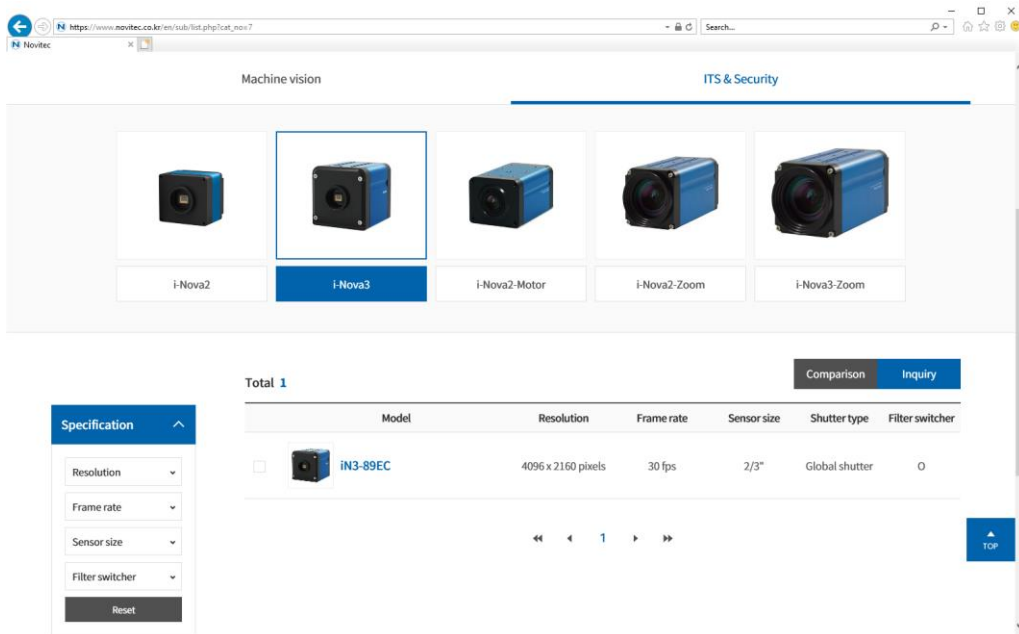
<Image> 1. Enter the website address image

- Click [ITS & Security] of [Products] in the top tab.



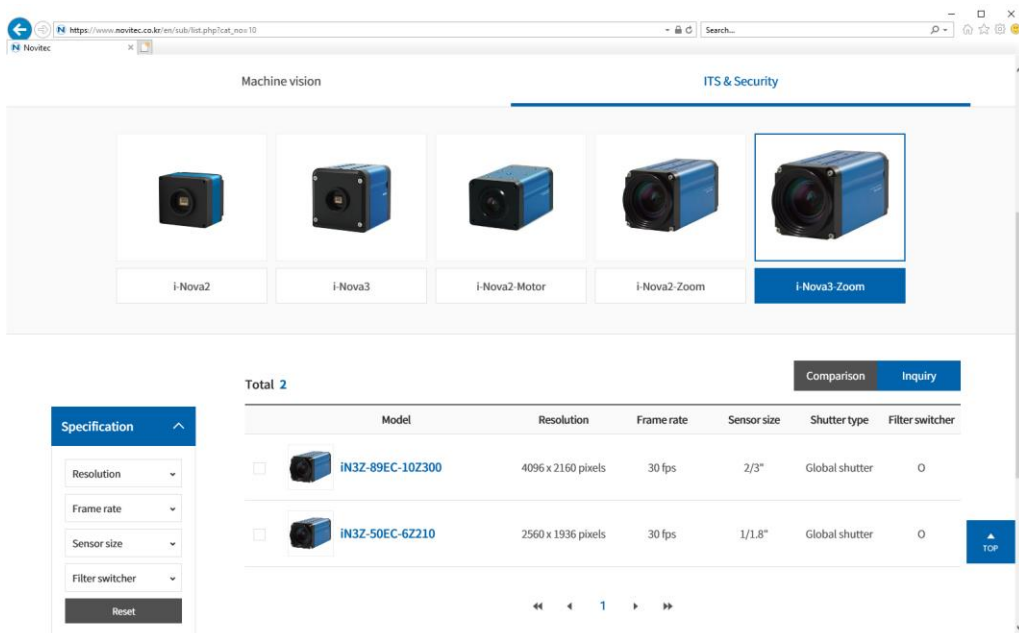
<Image> 2. Click ITS & Security image

c. Click [i-Nova3] or [i-Nova3-Zoom] in ITS & Security.



<Image> 3. Click i-Nova3 image

d. Click one of the iN3-89EC, iN3Z-89EC-10Z300, iN3Z-50EC-6Z210 in the camera list to Access the page.



<Image> 4. Click i-Nova3-Zoom image

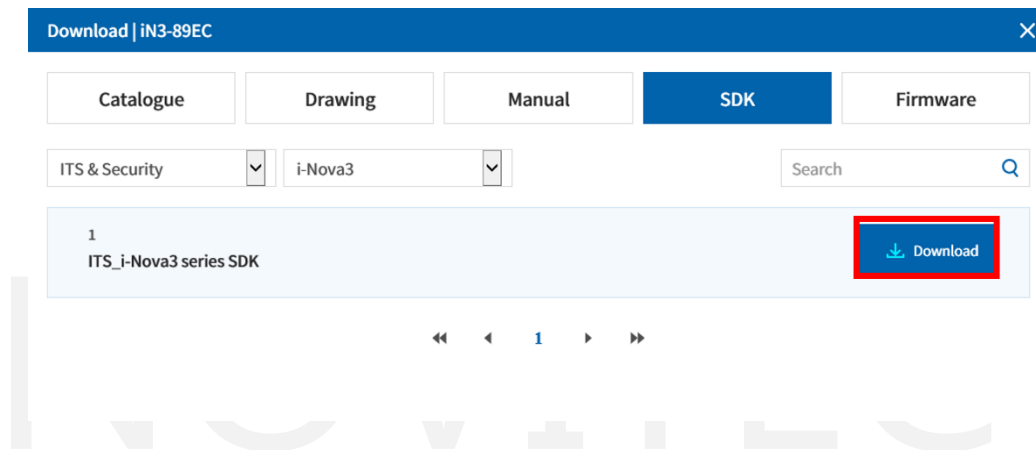
e. Click [Download] of SDK, in the download field at the bottom of the product page.

Download

Catalogue	Detailed Product Information	Download
Drawing	Detailed Product Drawing and CAD file	Download
Manual	Downloadable product Manual	Download
SDK	Downloadable Product Software Development Kit	Download
Firmware	Download Latest Product Firmware	Download

<Image> 5. Download section on product page image

f. Click [Download] of ITS_i-Nova3 series SDK to download the installation file.



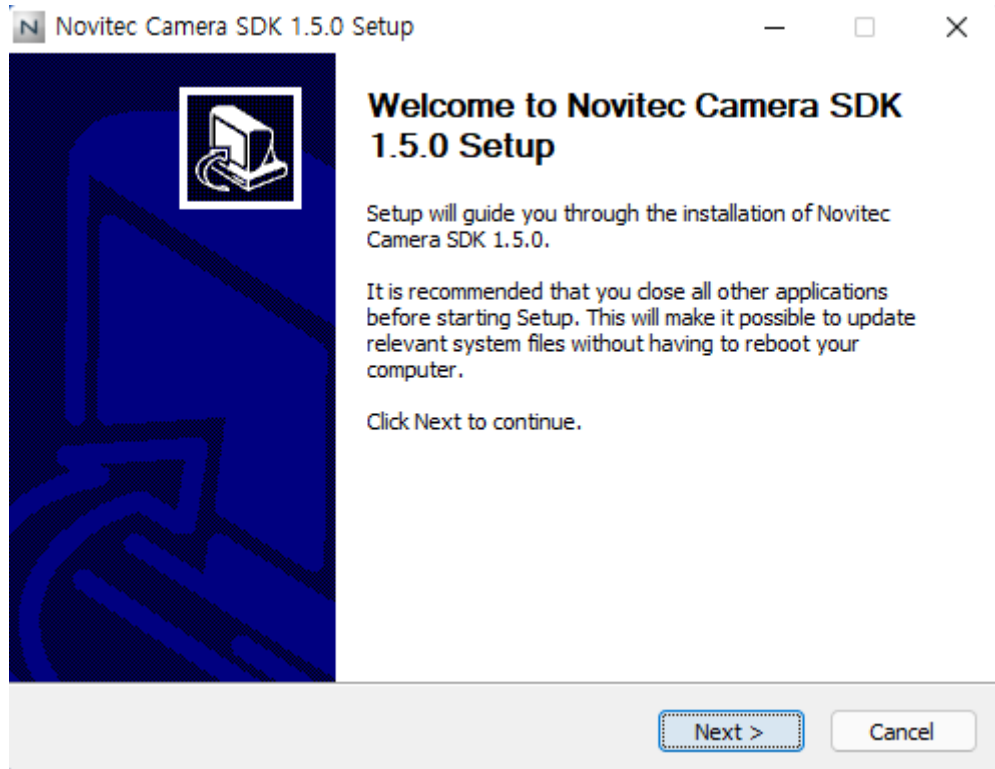
<Image> 6. SDK download window image

4.2. Install the Novitec Software

4.2.1. Windows

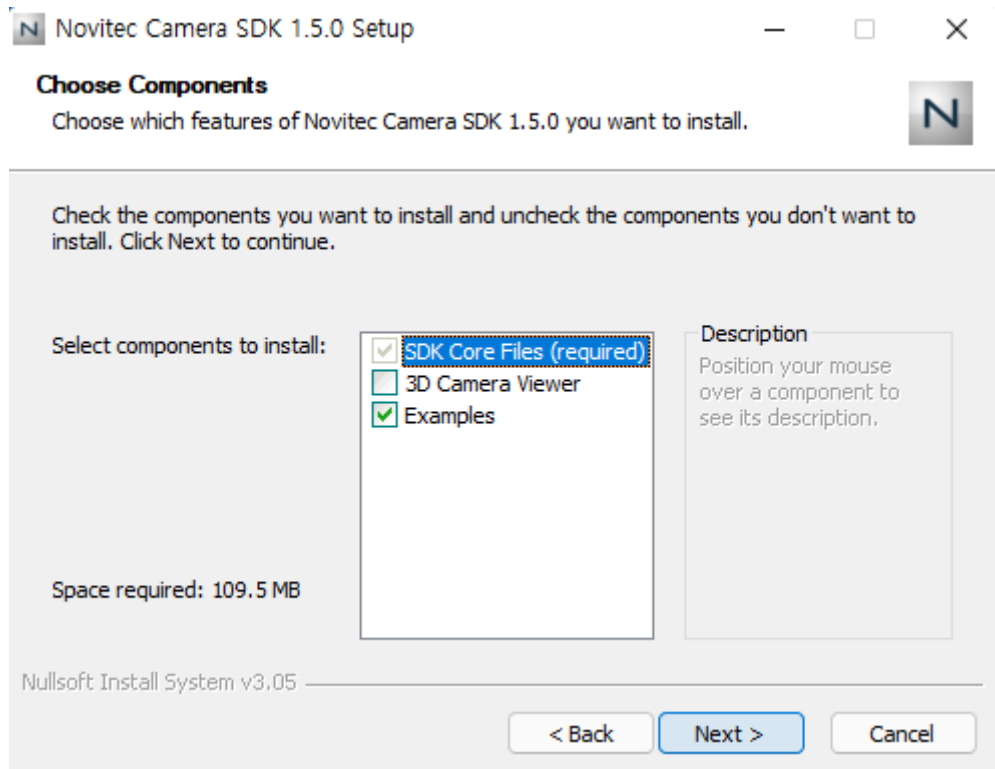
Refer to [4.1. Download Installation File](#) to prepare the installation file for Windows.

a. Execute the u-Nova SDK installation file (NovitecCameraSDK-vX.X.Xexe) and Click [Next >].



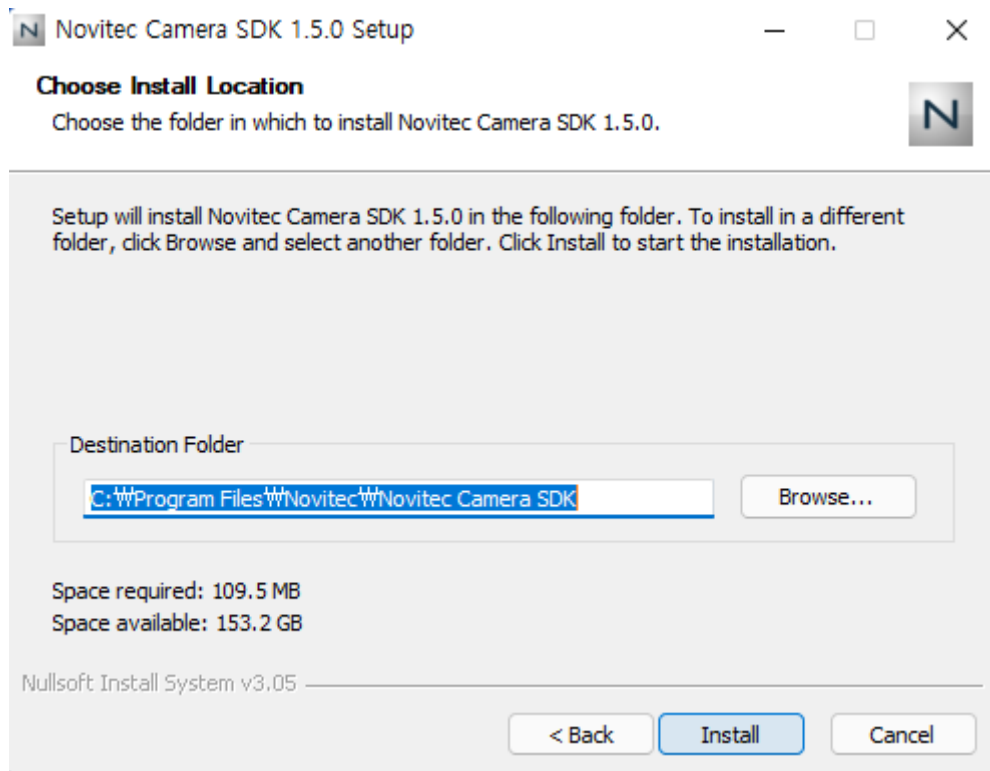
<Image> 7. Installation Startup image

b. Check "Examples" and click [Next >].

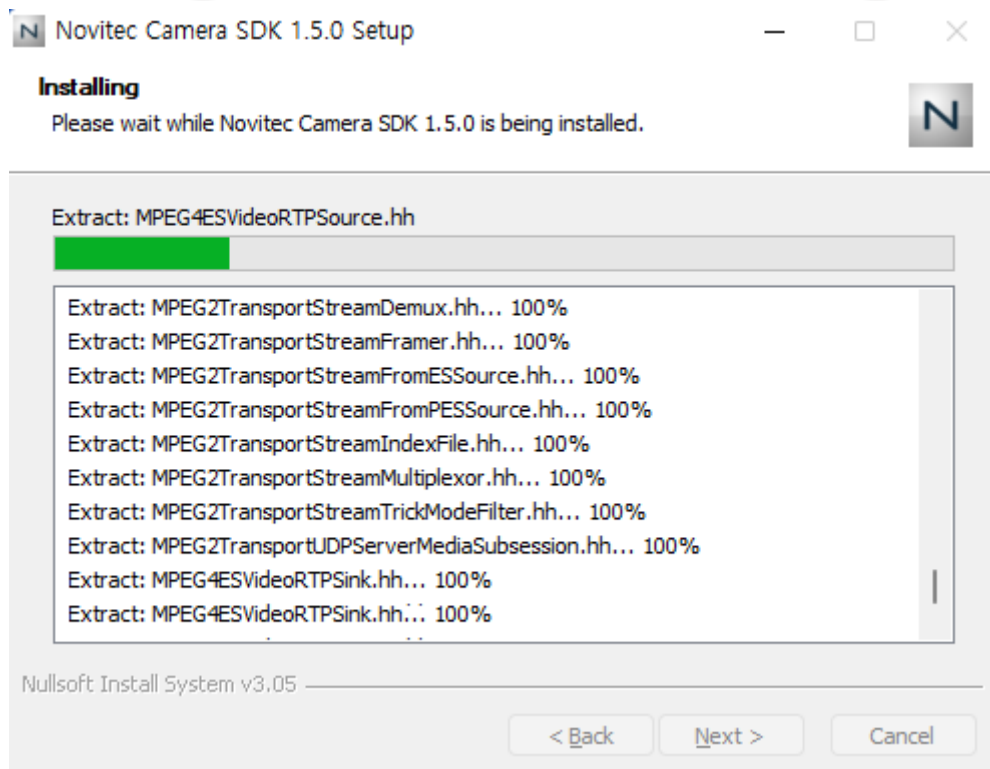


<Image> 8. Install item selection image

c. After selecting the folder to install, click [Install].

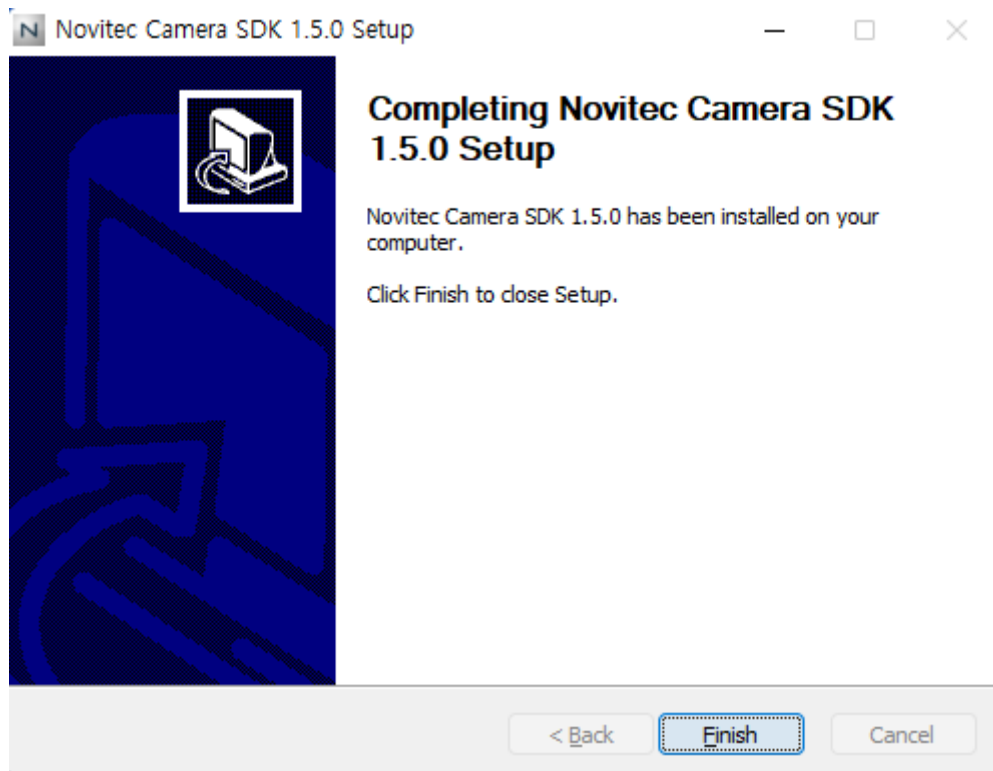


<Image> 9. Choose Install location image



<Image> 10. Installing image

d. Click [Finish] to finish the installation.



<Image> 11. Installation finish image

4.2.2. Linux

Refer to [4.1. Downloading the installation file](#) to prepare the installation file for Linux.

a. Install required libraries.

```
# sudo apt-get install libjpeg-turbo8-dev libgtk-3-dev libturbojpeg
```

b. Go to the location where you downloaded the installation file and proceed with the installation.

```
# cd Installation file location
# chmod a+x NovitecCameraSDK-vX.X.X-Linux-XXXXX.sh
# ./NovitecCameraSDK-vX.X.X-Linux-XXXXX.sh
# cd NovitecCameraSDK-vX.X.X-Linux-XXXXX/lib
# sudo su
# ln -s libnvtcam.so.1.X.X /usr/local/lib/libnvtcam.so.1
# exit
```

5. Installing the Camera

5.1. Attach a Lens

Attach the lens after removing the cap from the lens holder.

i-Nova3 has a removable 5mm C mount adapter is installed as standard, and it can be used as a CS mount by removing the adapter.

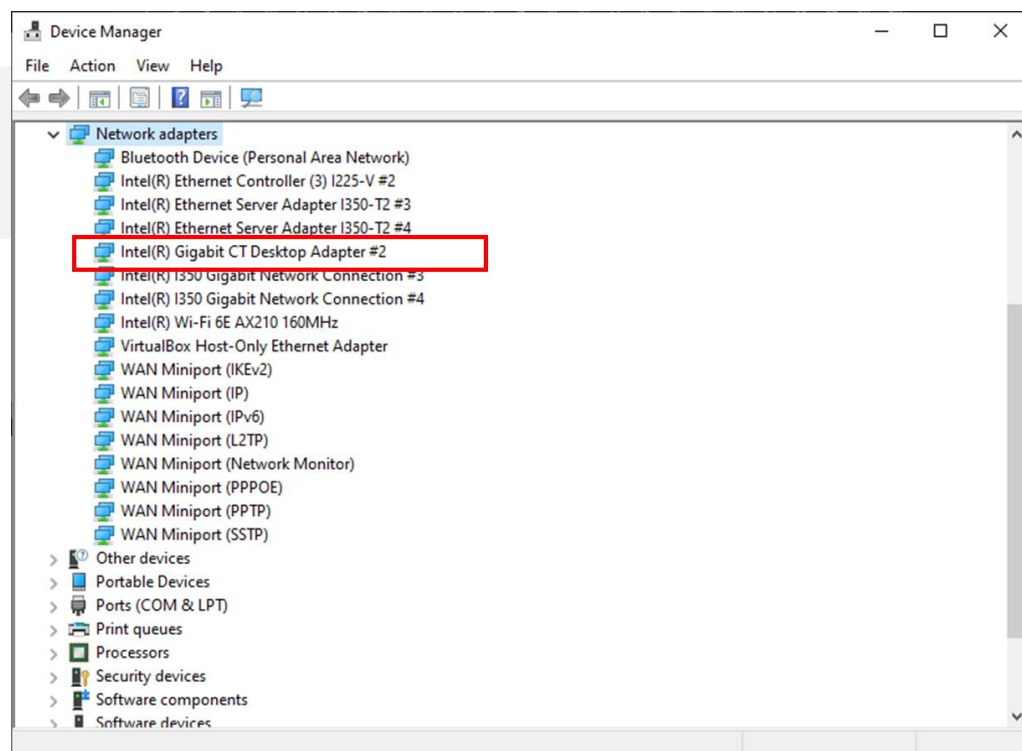
5.2. Connect the interface Card and Cable to the Camera

Ethernet cable to the camera and PC.

Recommended NIC(Network Interface Card) is refer to [1. Recommended System Configuration](#).

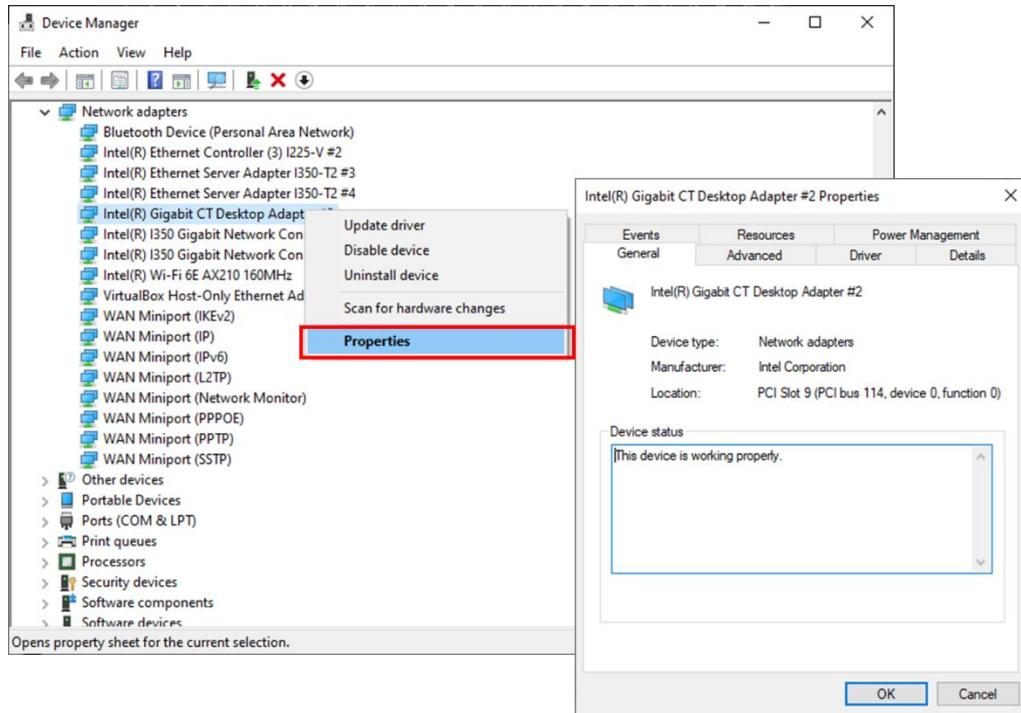
In order to acquire camera data normally, the following initial settings are required.

- a. Go to Control Panel-Device Manager-Network Adapters to check information about the NICs installed on PC.



<Image> 12. Check network adapter information image

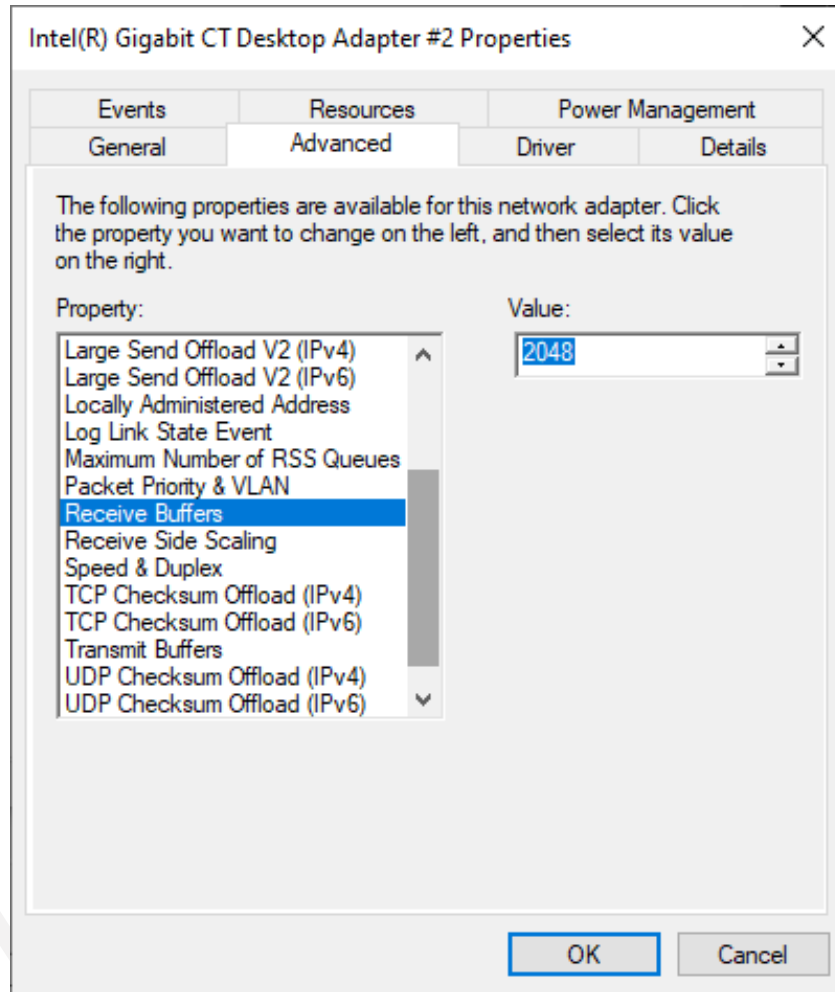
- b. Right-click the network adapter to which the camera is connected and click [Properties].



<Image> 13. Network adapter properties image

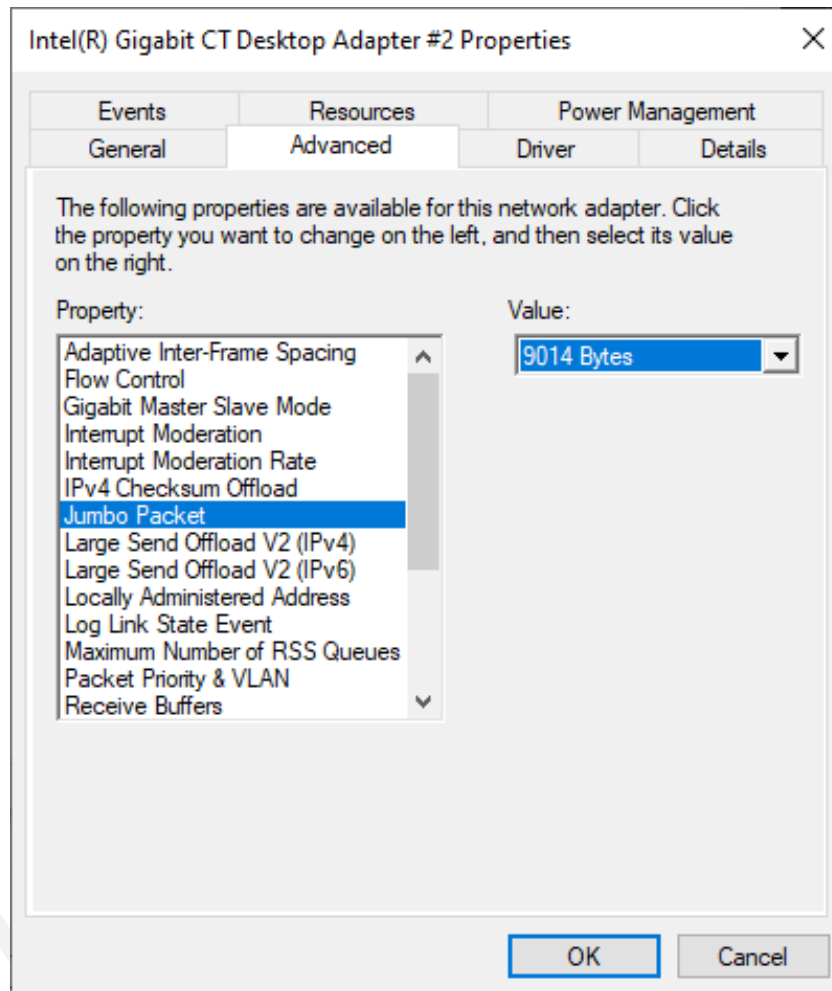
c. In the properties window, click the [Advanced] tab and set Receive buffers to the maximum value.

NOVITEC



<Image> 14. Change receive buffers size image

- d. Set Jumbo Packet to the maximum value.



<Image> 15. Jumbo Packet resizing image

5.3. Configure IP Settings

When the camera is shipped, the IP of the camera is set to be automatically assigned from DHCP.

DHCP connection fails, the IP will be set as the LLA.

When the camera is first powered on, the camera is assigned an IP in the following order:
 DHCP/Persistent/ LLA.

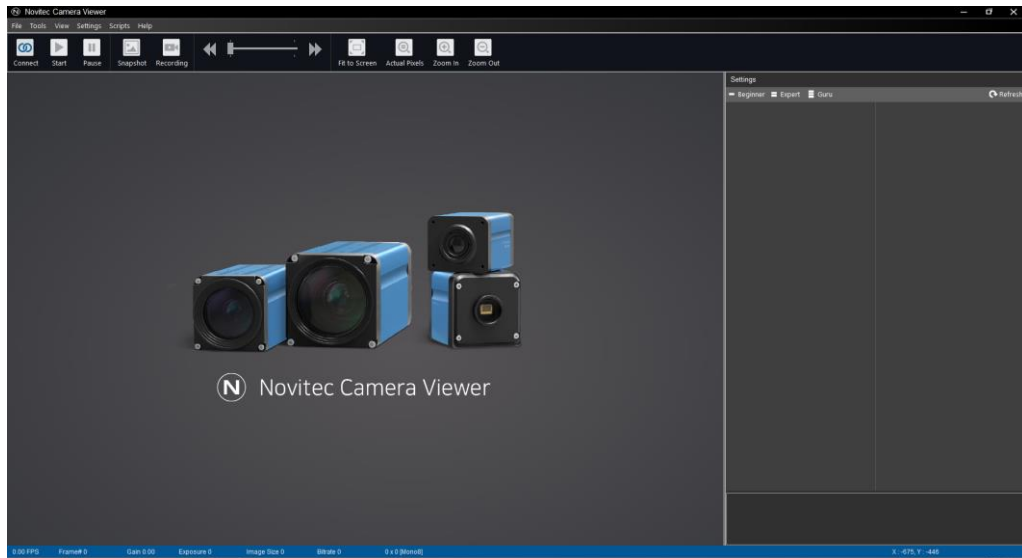
5.4. Launch Viewer

5.4.1. Windows

3 ways to launch the camera viewer.

- Click the shortcut icon of "Novitec Camera Viewer" on the desktop.
- Click Novitec - "Novitec Camera Viewer" in the Windows Start menu.

- Go to the path below in the File Explorer and run the NovitecCameraViewer.exe.
 - Default path: C:\Program Files\Novitec\Novitec Camera SDK\utils



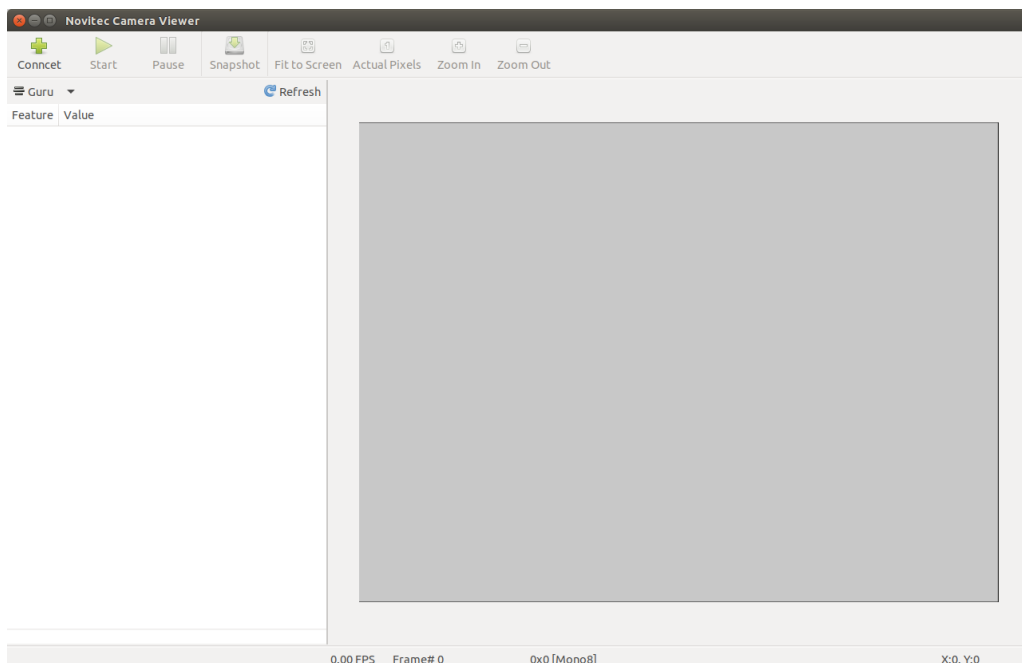
<Image> 16. Launch viewer of Windows image

5.4.2. Linux

Refer to the installation method of [4.2.2. Linux](#) and launch the viewer in the path where the viewer is installed.

```
# cd (Go to viewer installation folder)/bin
```

```
# ./ncv
```

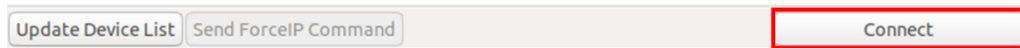


<Image> 17. Launch viewer of Linux image

camera.



Index	Model	Serial Number	F/W version	IP Address
0	i-Nova3Z-89EC	I3ZEB008	1.4.0	192.168.105.25



<Image> 23. Linux Select camera image

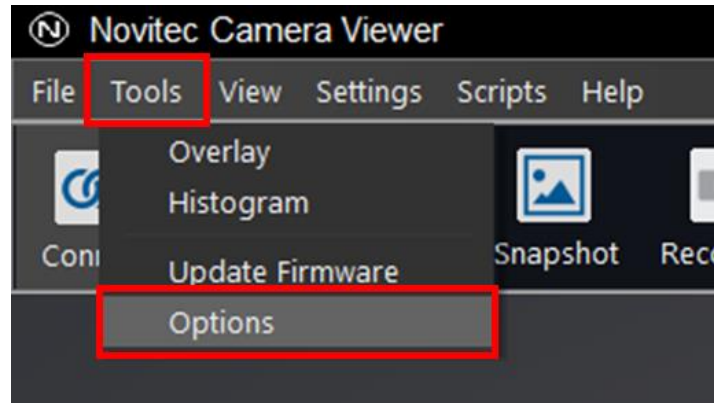
5.5.3. Set up IP temporarily

If the camera's IP and the IP band of the NIC to be connected do not match, the camera and NIC cannot be connected.

At this time, to connect the camera, you need to temporarily match the camera's IP with the NIC's IP using the viewer function.

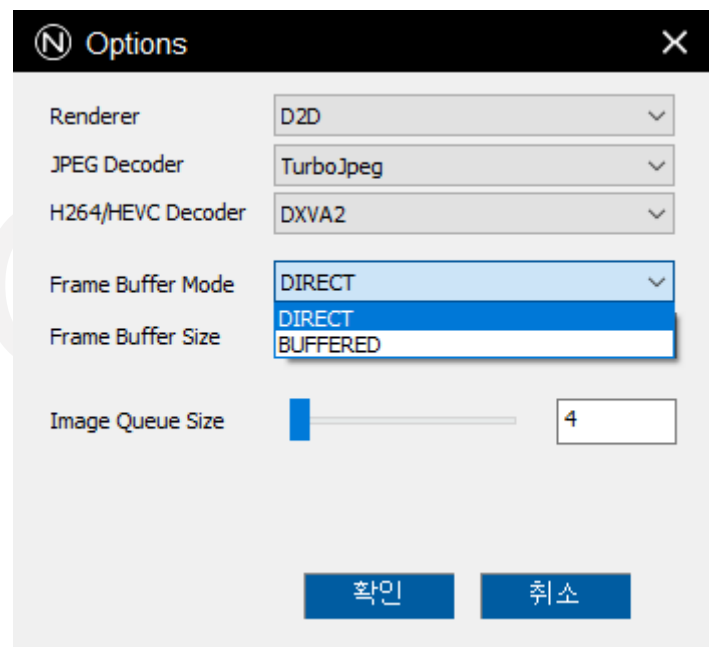
Since the temporarily changed, IP is changed to the existing IP when the camera is rebooted, it is recommended to set and use a static IP in the camera to prevent this.

- a. Select the camera to be connected in red and click [Send Force IP Command].



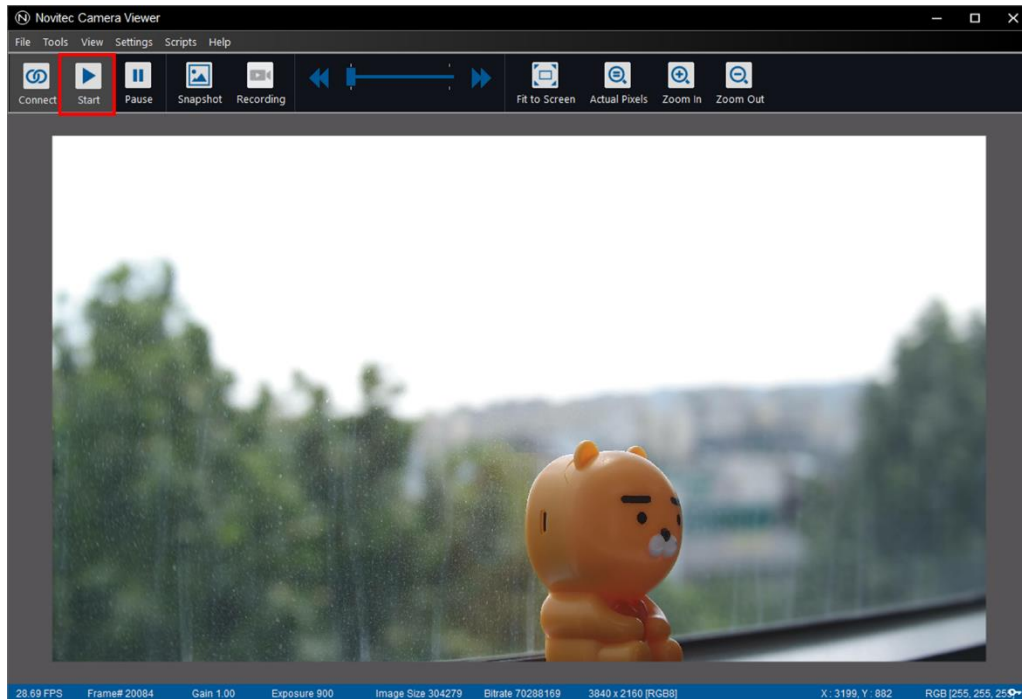
<Image> 26. Select Tools-Options image

- c. Change "Frame Buffer Mode" to [DIRECT] and click [확인].



<Image> 27. Frame Buffer Mode change image

- d. Click [Start] at the top of the viewer and check the video.
 - If the video does not play when the [Start] button is clicked, refer to [5.6.3. Initial Account Settings](#) to release video function restrictions and play video.

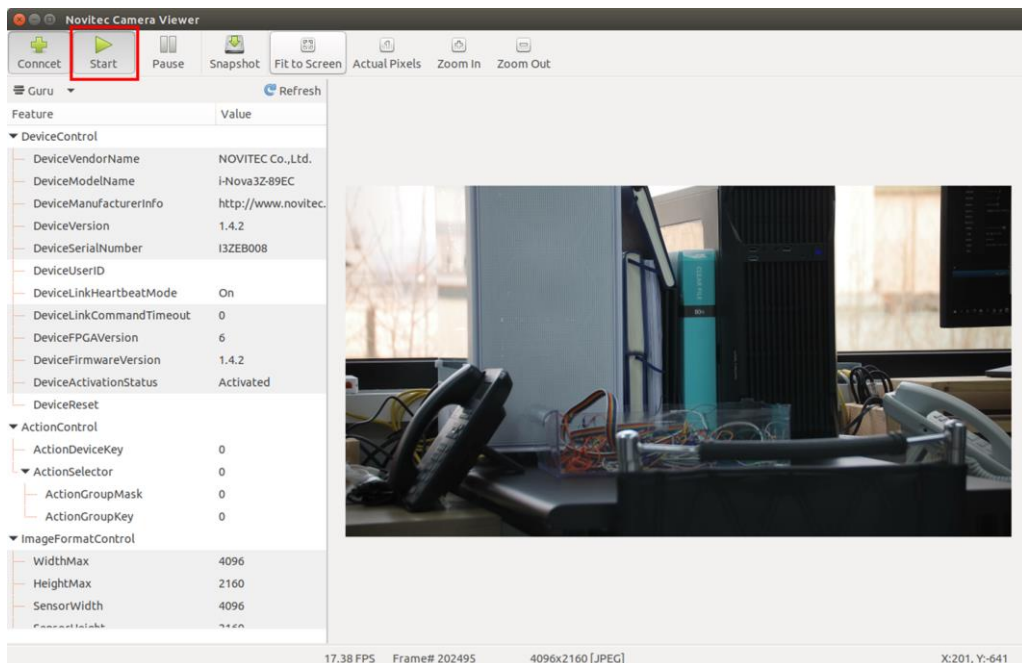


<Image> 28. Windows Running video image

5.6.2. Linux

Click [Start] at the top of the viewer and check the video.

- If the video does not play when the [Start] button is clicked, refer to [5.6.3. Initial Account Settings](#) to release video function restrictions and play video.



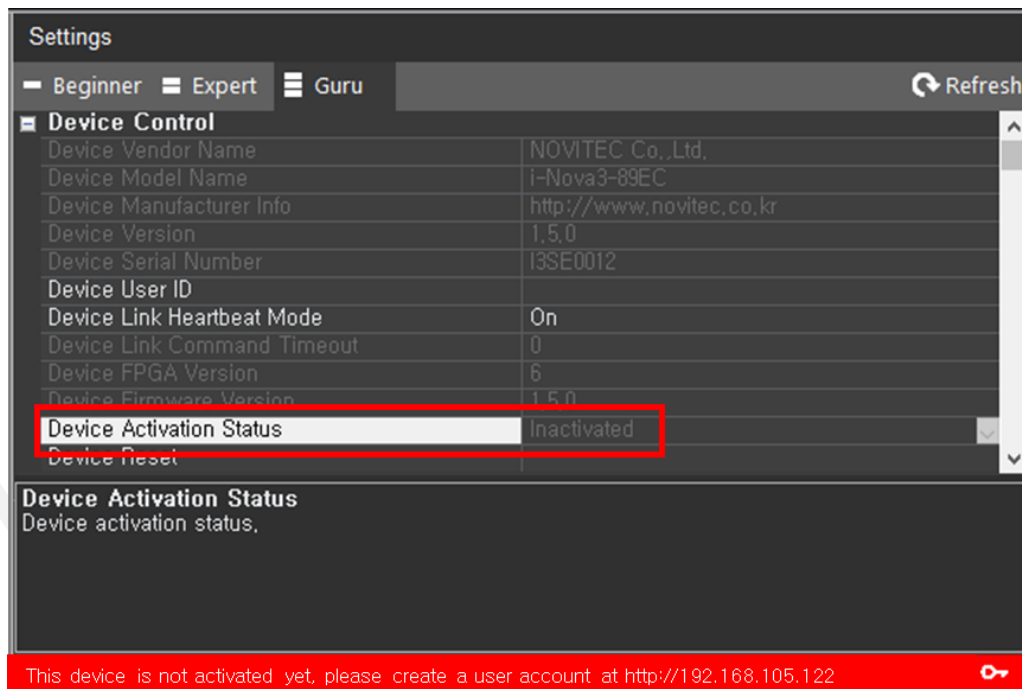
<Image> 29. Linux Running video image

5.6.3. Initial Account Settings

The camera in the initialized state has limited video transmission function.

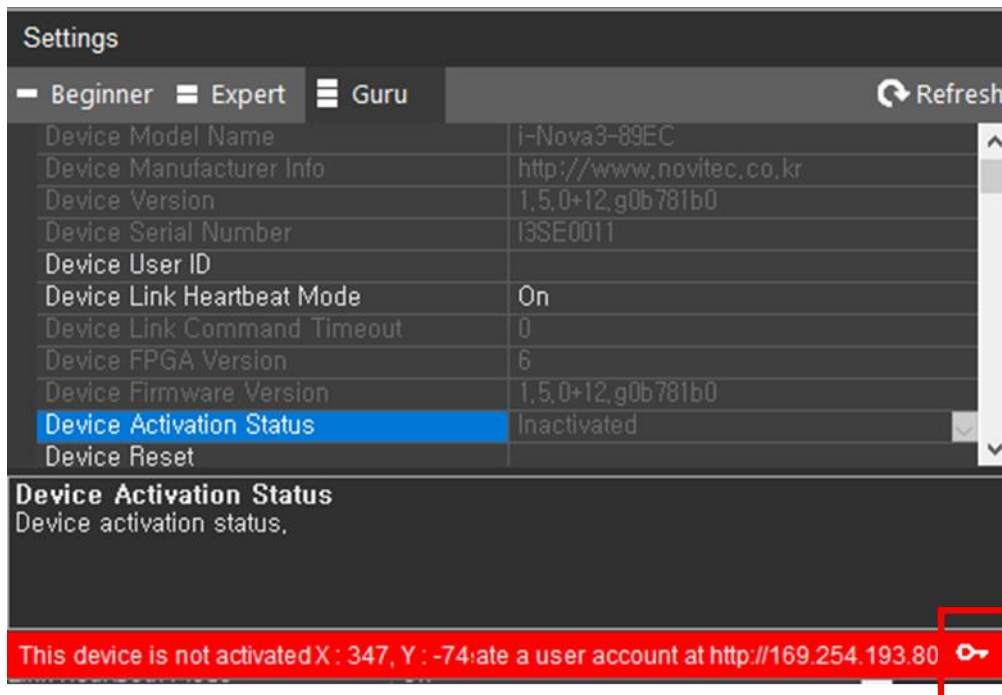
“The device is not activated yet” is displayed in red at the bottom of the viewer during video playback, and Settings-Device Control-Device Activation Status is displayed as “Inactivated”.

In order to release the feature restrictions, you need to set up an initial account in the browser as shown below.



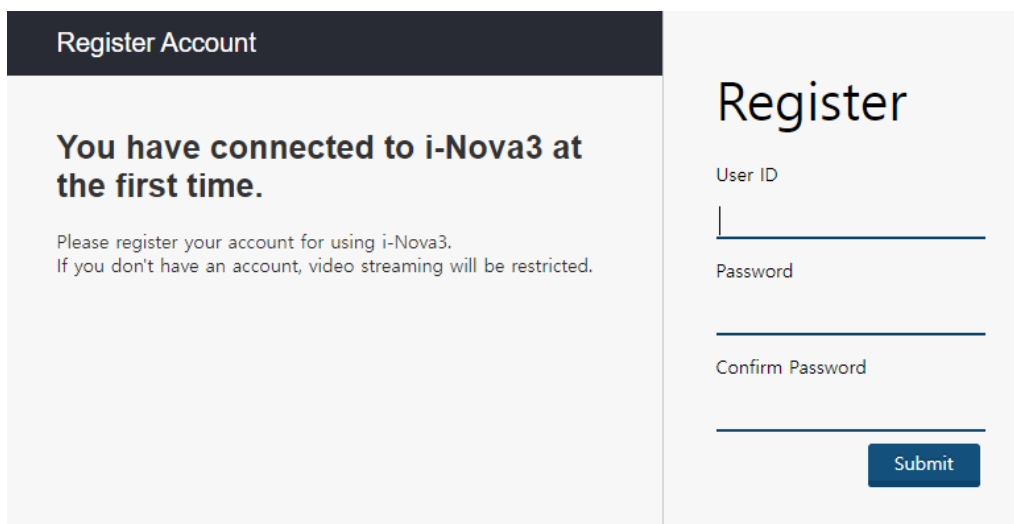
<Image> 30. Limited video function image

- a. Click the key icon displayed at the bottom of the viewer.

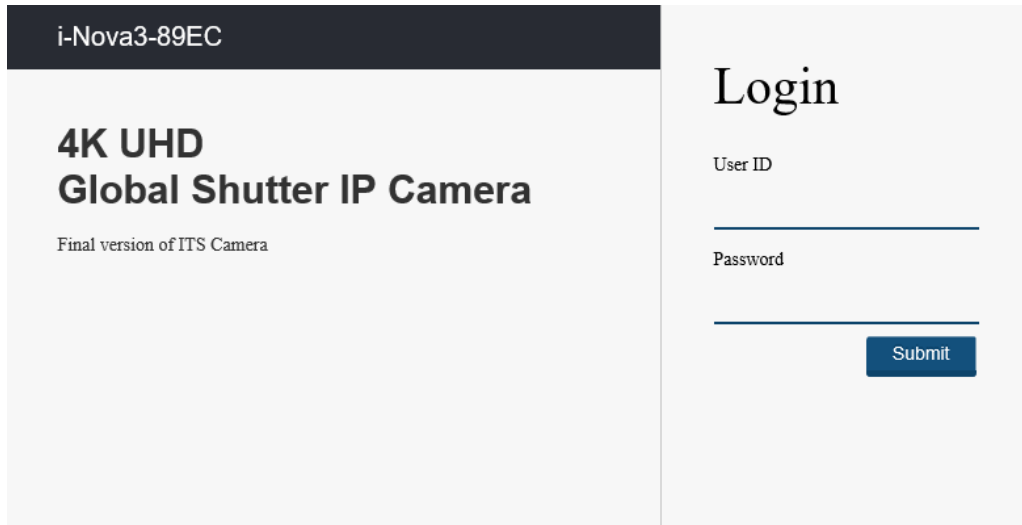


<Image> 31. Check camera's IP image

- b. When the text "You have connected to i-Nova3 at the first time." appears on the connected browser, enter the ID and password users want to use and click [Submit].
- If the phrase "4K UHD Global Shutter IP Camera" appears, the initial account setup has already been completed.

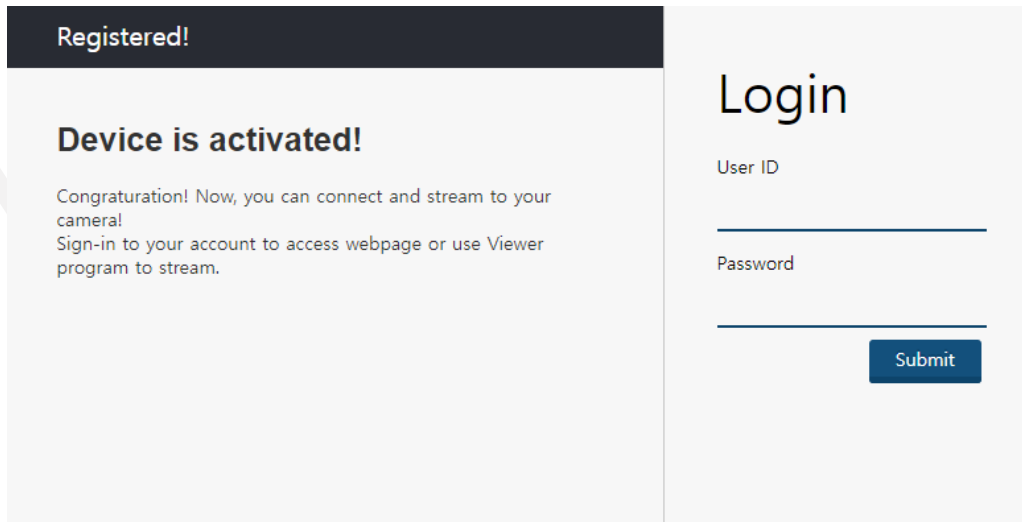


<Image> 32. Initial account image



<Image> 33. Initial account already completed image

- c. "Device is activated!" When the message appears, users can use the camera.



<Image> 34. Initial account setup completed image

6. Physical Interface

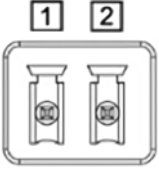
6.1. Power/Voltage

The 2-pin connector provides a power connection between the camera and the power supply.

The ideal input voltage is 12V~24V DC.

To power the camera, the 2-pin connector must be connected to the power supply.

Diagram	Pin	Function	Description

	1	Power	Camera Power (12V ~ 24V)
	2	GND	Power ground

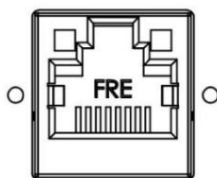
<Table> 1. Power/Voltage table

6.2. Ethernet Connector

The 8-Pin RJ-45 Ethernet jack is equipped with two M2 screw holes for secure connection.

Pin assignments conform to the RJ-45 standard.

The green LED is on when the network is connected, and the orange LED is on when data is being sent or received.




<Image> 35. RJ-45 image

6.3. GPIO Connector

The camera is equipped with a 5-pin GPIO connector on the back of the case for using external triggers or lights.

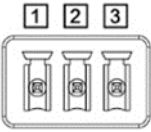
Refer to the diagram for the number of each pin.

Diagram	Pin	Function	Description
	1	Trigger In	Trigger input (3.3V ~ 24V)
	2	Out 1(TTL)	LVTTTL output
	3	GND	GND
	4	Out 2(OC)	Open collector output

	5	I/O GND(OC)	I/O GND (OC)
--	---	-------------	--------------

<Table> 2. GPIO Connector table

6.4. RS232 Connector

Diagram	Pin	Function	Description
	1	TX	Transmit Data
	2	RX	Receive Data
	3	GND	Ground

<Table> 3. RS232 Connector table

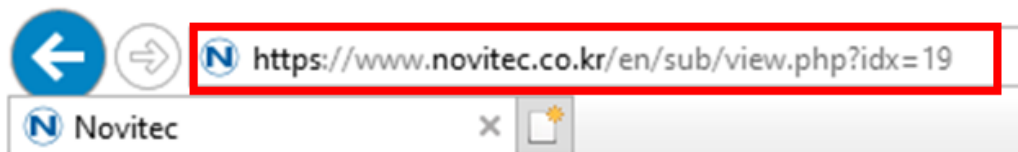
7. Troubleshooting

7.1. Upgrading Camera Firmware

Users can download the latest version of firmware from Novitec website.

- a. Go to i-Nova3 product page on Novitec website.

- i-Nova3 product page: <https://www.novitec.co.kr/en/sub/view.php?idx=19>



<Image> 36. Enter the product page address image

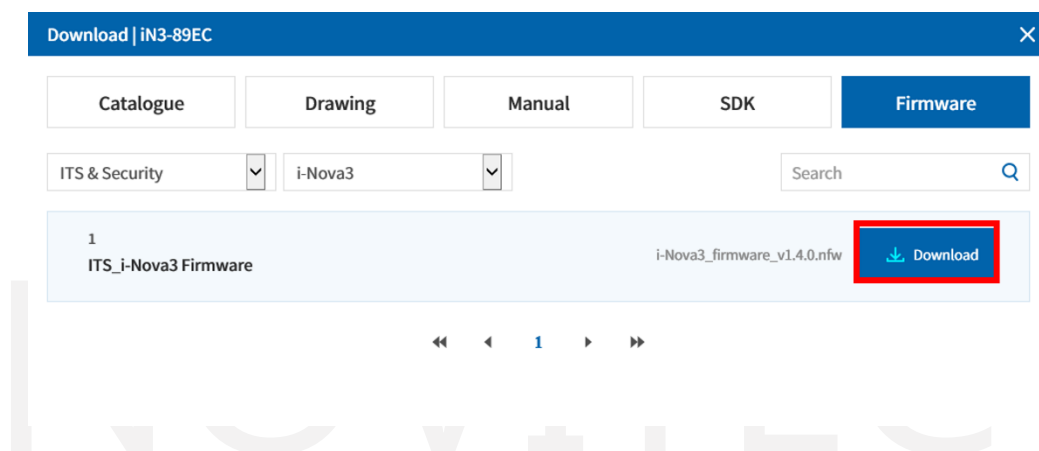
- b. Click [Download] of Firmware in the download field at the bottom.

Download

Catalogue	Detailed Product Information	Download
Drawing	Detailed Product Drawing and CAD file	Download
Manual	Downloadable product Manual	Download
SDK	Downloadable Product Software Development Kit	Download
Firmware	Download Latest Product Firmware	Download

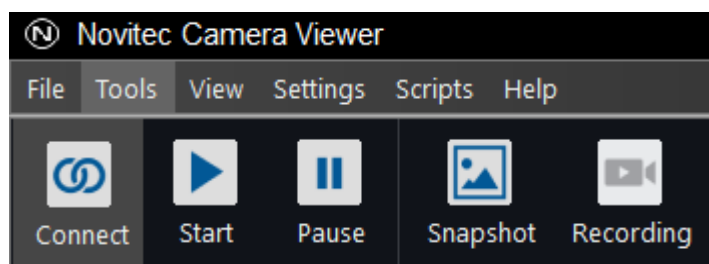
<Image> 37. Download section on product page image

c. Click [Download] of ITS_i-Nova3 Firmware to download the firmware file.



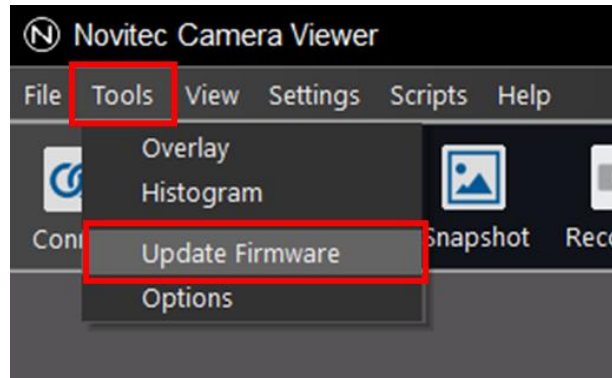
<Image> 38. Firmware download window image

d. After connecting the camera by running the Novitec Camera Viewer, click [Tools] on the top menu.



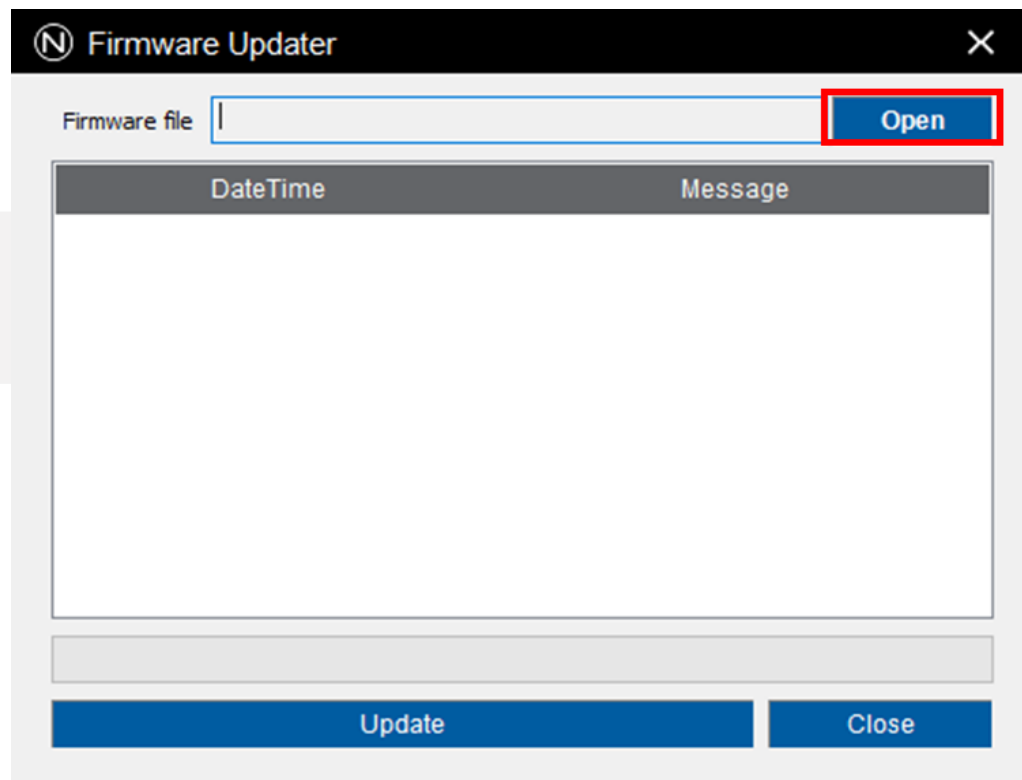
<Image> 39. Tools in the top menu bar image

e. Click [Update Firmware].



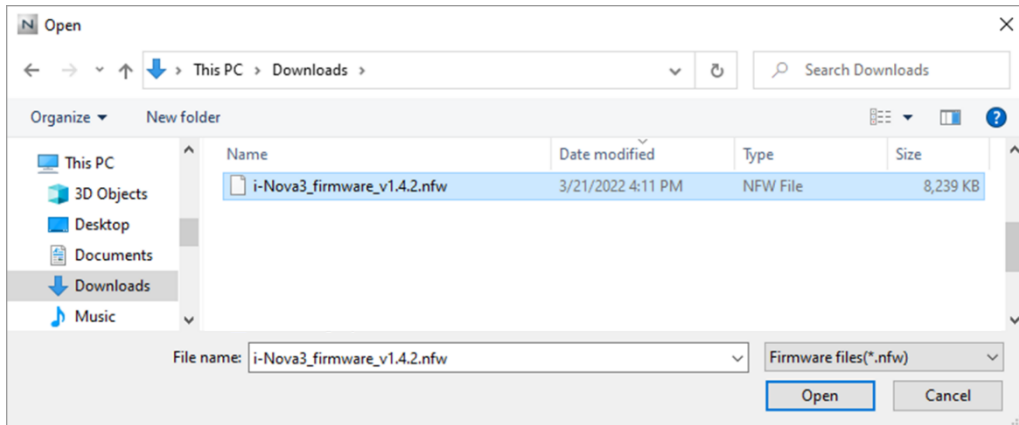
<Image> 40. Update Firmware image

f. Click [Open] in the Firmware Updater.



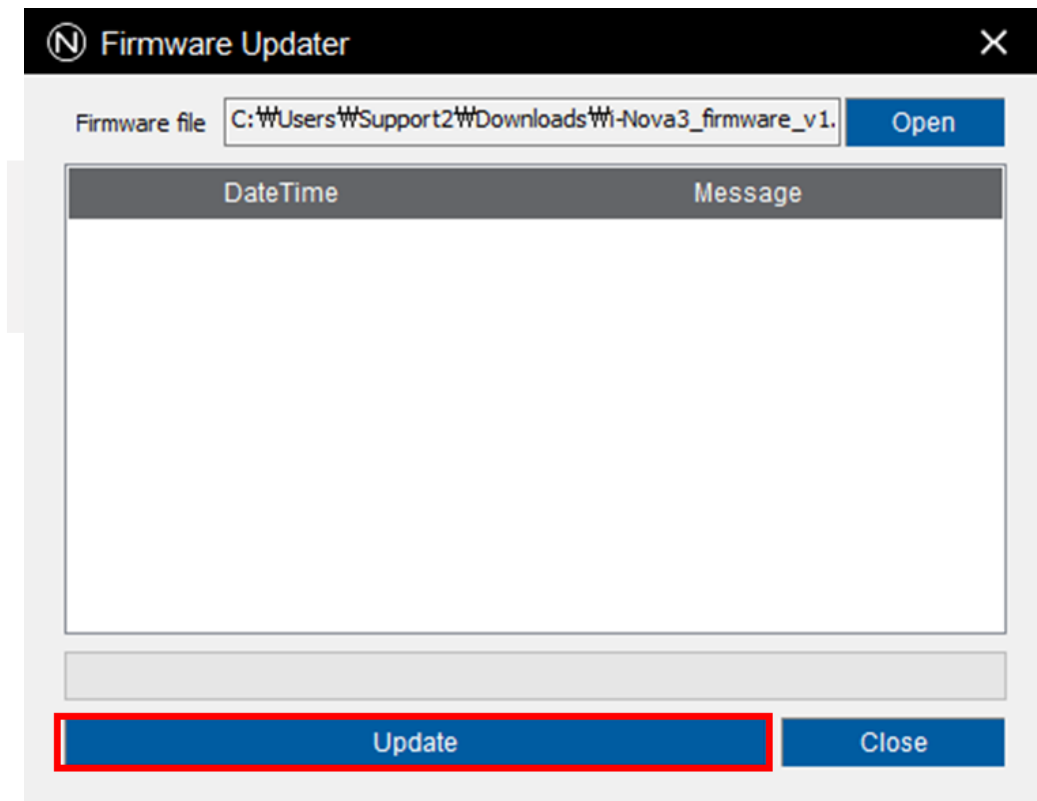
<Image> 41. Choose firmware file location image

g. Select the downloaded firmware file of i-Nova3 and click [Open].



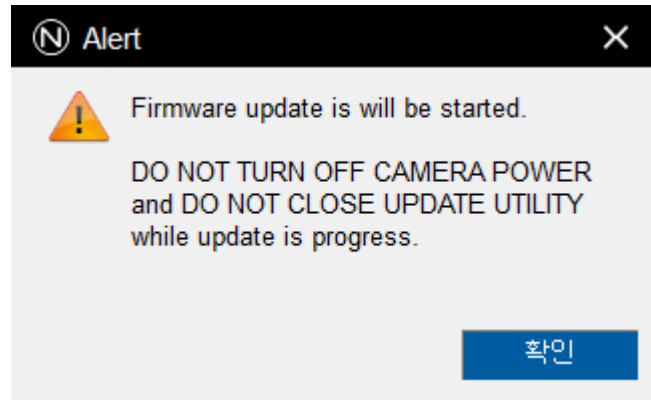
<Image> 42. Choose firmware file image

h. Click [Update].

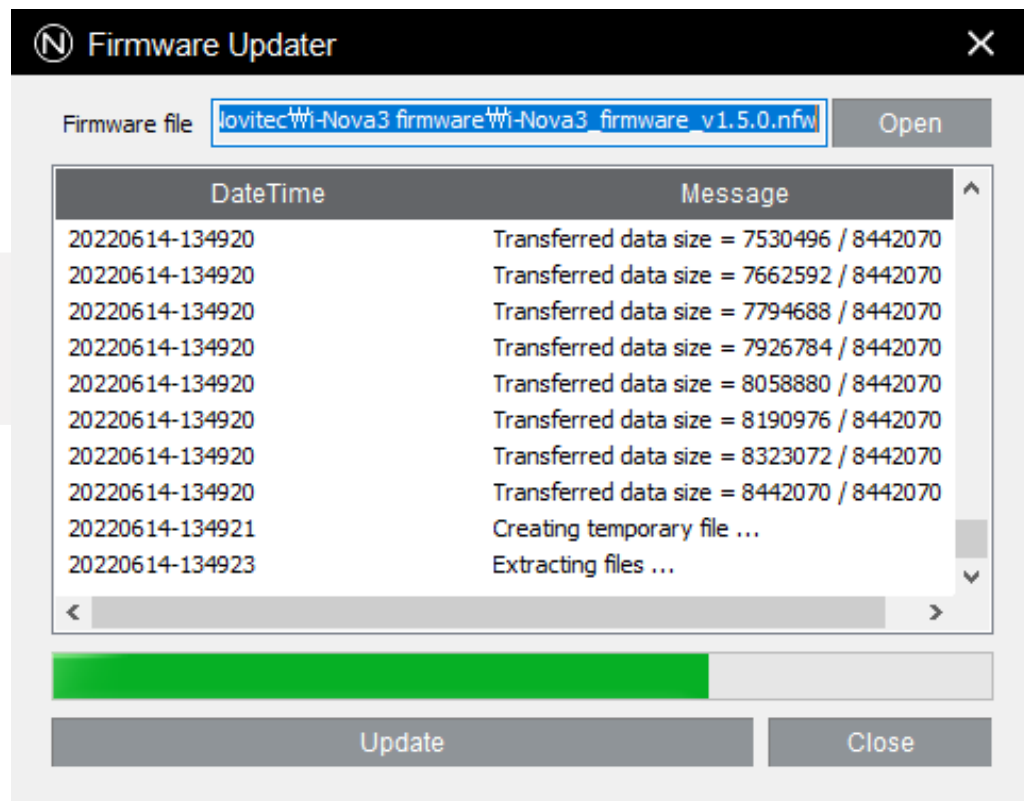


<Image> 43. Click Update image

- i. Check the cautions in the warning window and click [확인].
 - Do not turn off the camera or shut down the program until complete.

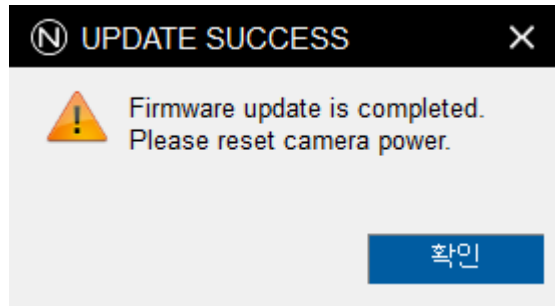


<Image> 44. Firmware update warning image



<Image> 45. Progress of firmware update image

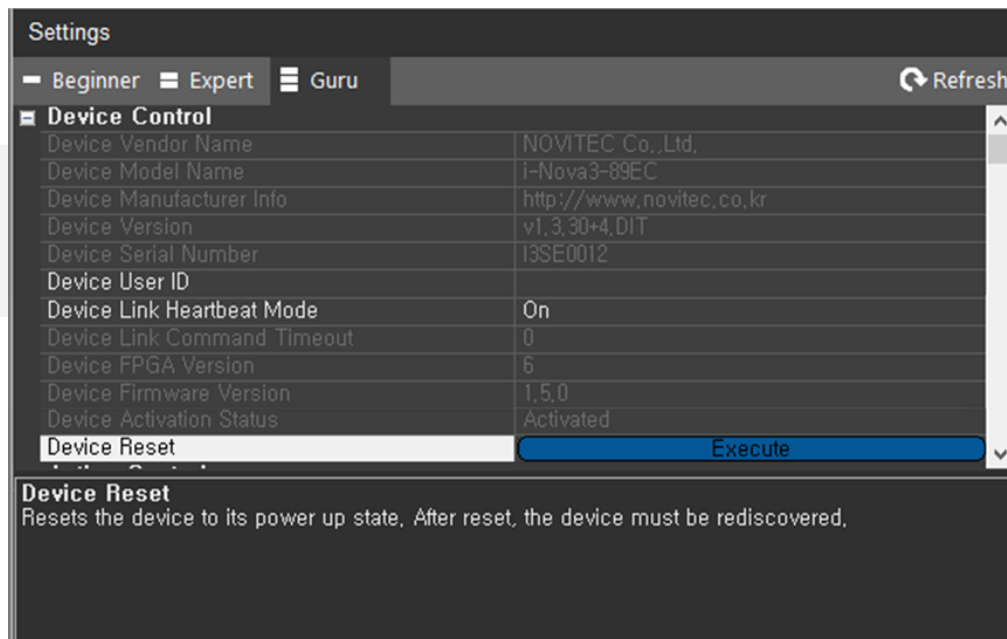
j. When the firmware update is complete, click [확인].



<Image> 46. Complete update image

k. Reboot the camera using one of the methods below do.

- Reconnect the 2-pin power connector
- Settings-Device Control-Device Reset



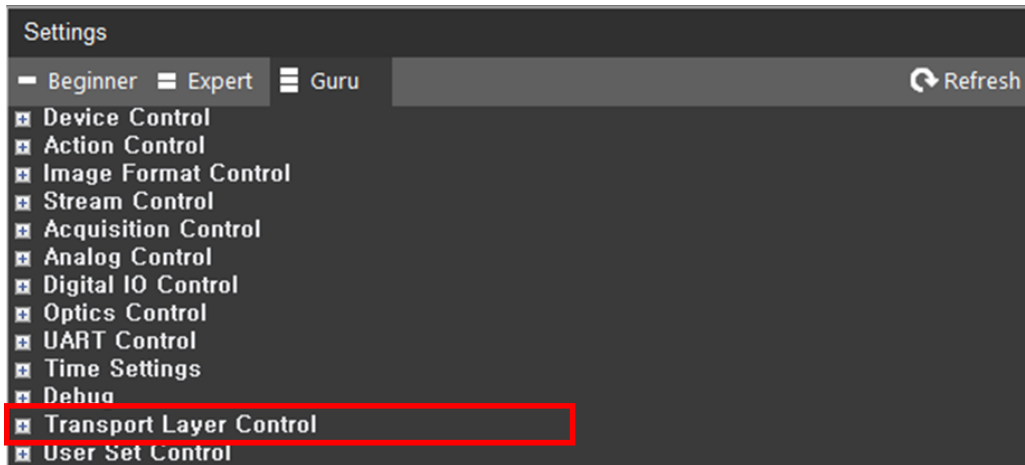
<Image> 47. Device Reset image

7.2. Camera & Interface Card (NIC) Static IP Setting

To maintain a stable connection, the camera and NIC must be set to static IP.

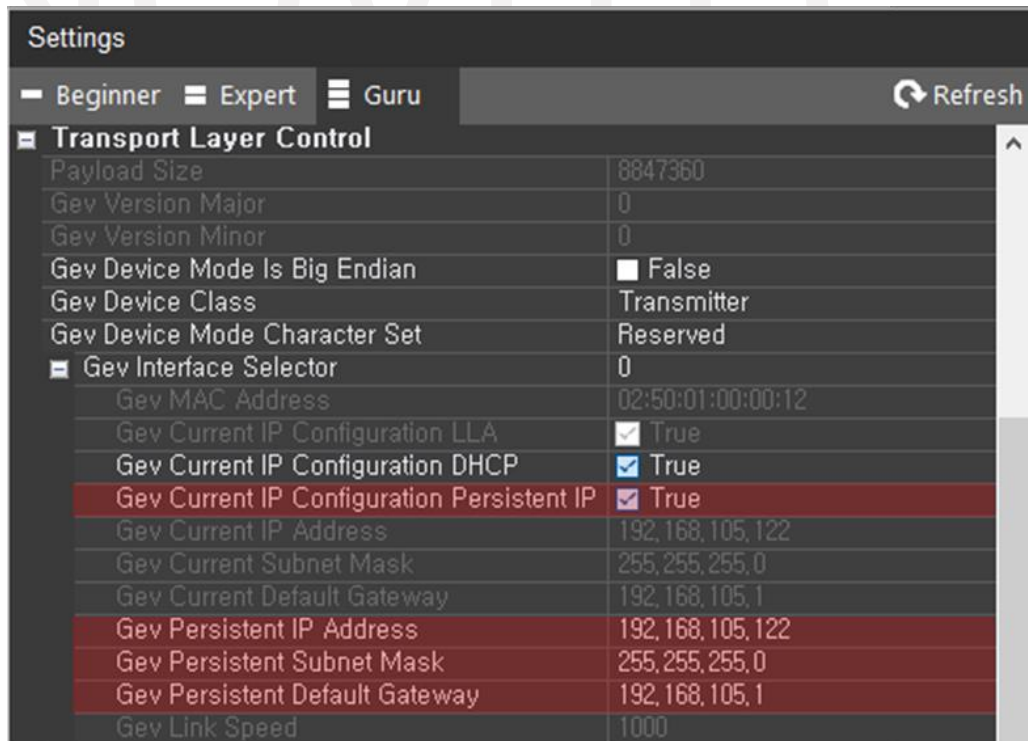
7.2.1. Camera Static IP (Persistent IP) Settings

- a. Connect the camera to the viewer with reference to [5.5. Connect the Camera.](#)
- b. Find the "Transport Layer Control" category in "Settings" on the right side of the viewer.



<Image> 48. Transport Layer Control image

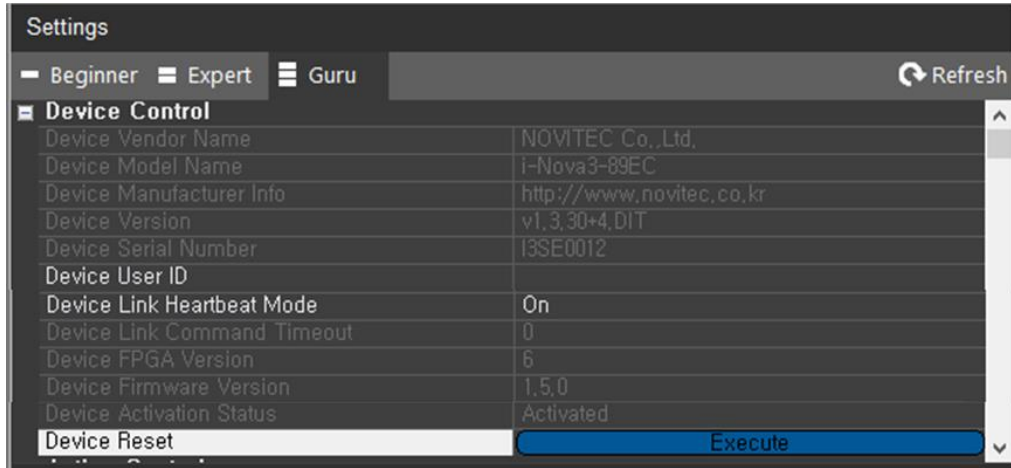
- c. Check "Gev Current IP Configuration Persistent IP" to change to [True] and enter the static IP to use referring to the following.
- Ex) Gev Persistent IP Address = 192.168.1.200 (0, 1, 255 cannot be used in the last digit.)
 - Ex) Gev Persistent Subnet Mask = 255.255.255.0
 - Ex) Gev Persistent Default Gateway = 192.168.1.1



<Image> 49. Camera static IP setting image

d. Reboot the camera using one of the methods below do.

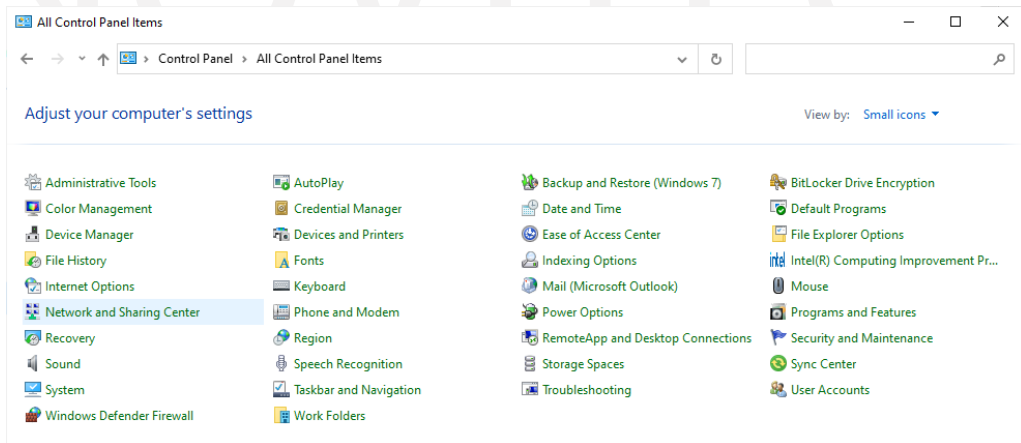
- Reconnect the 2-pin power connector
- Settings-Device Control-Device Reset



<Image> 50. Camera Reset image

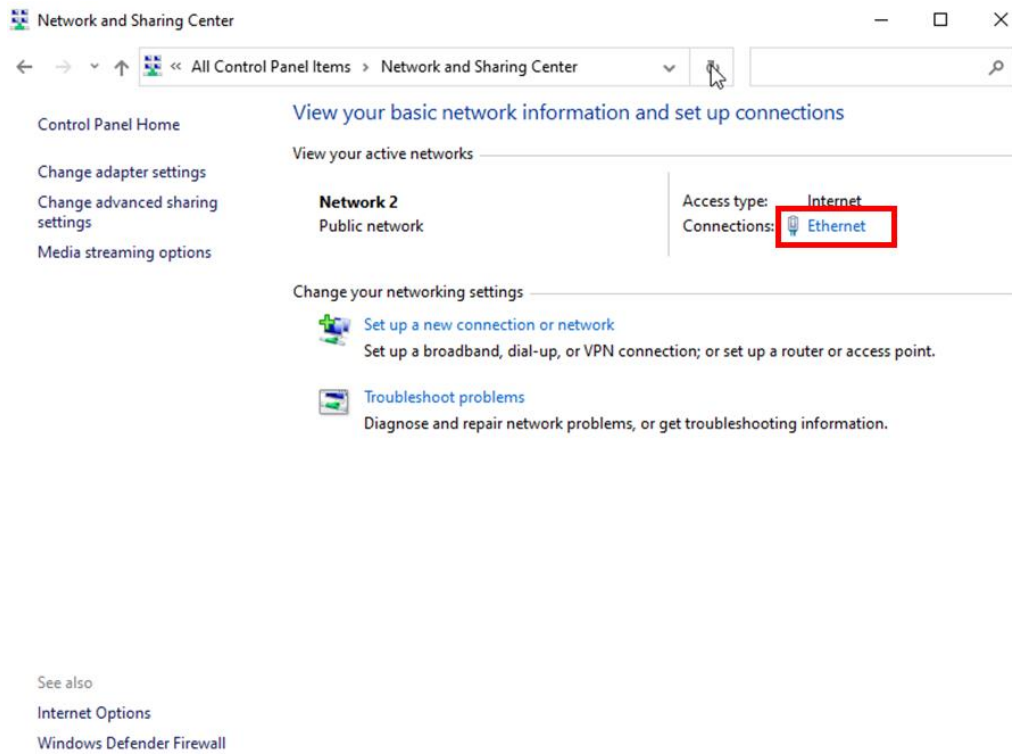
7.2.2. Interface Card (NIC) static IP settings

a. Execute [Network and Sharing Center] from the control panel.



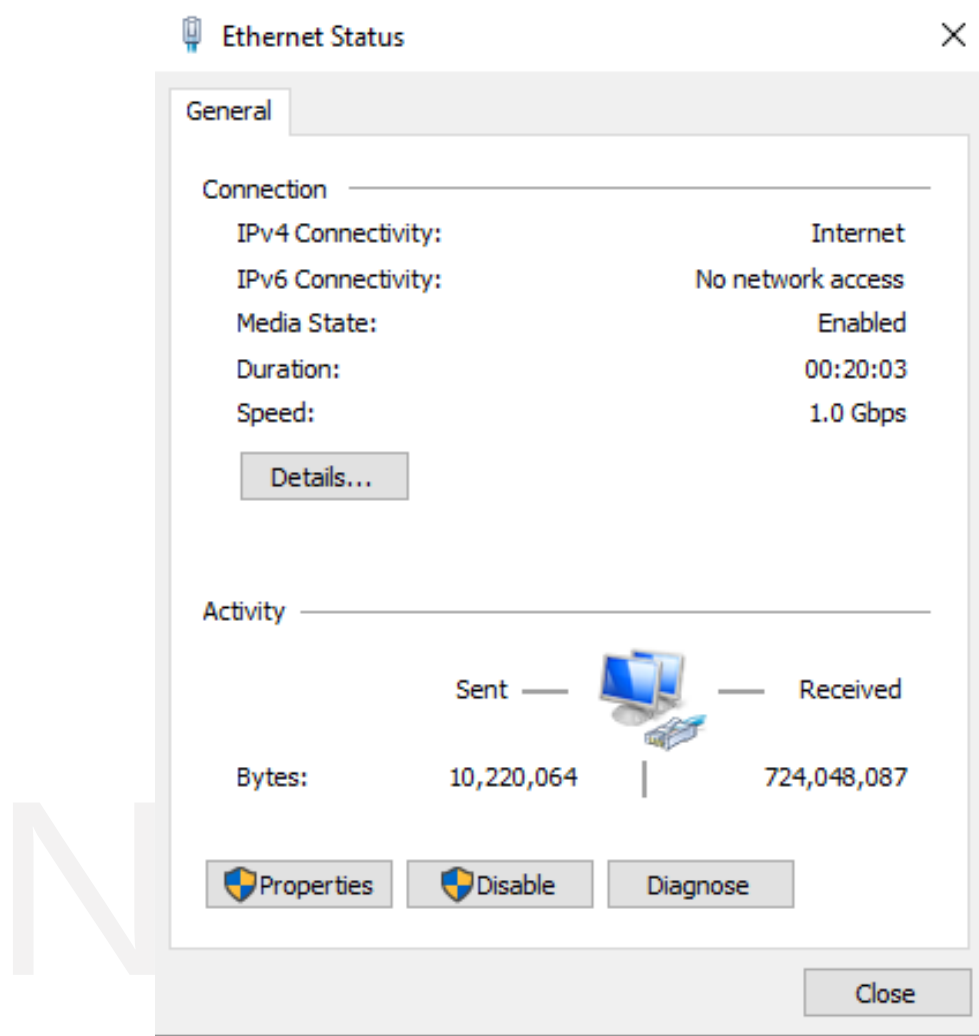
<Image> 51. Control Panel-Network and Sharing Center image

b. Click the network to which the camera is connected.



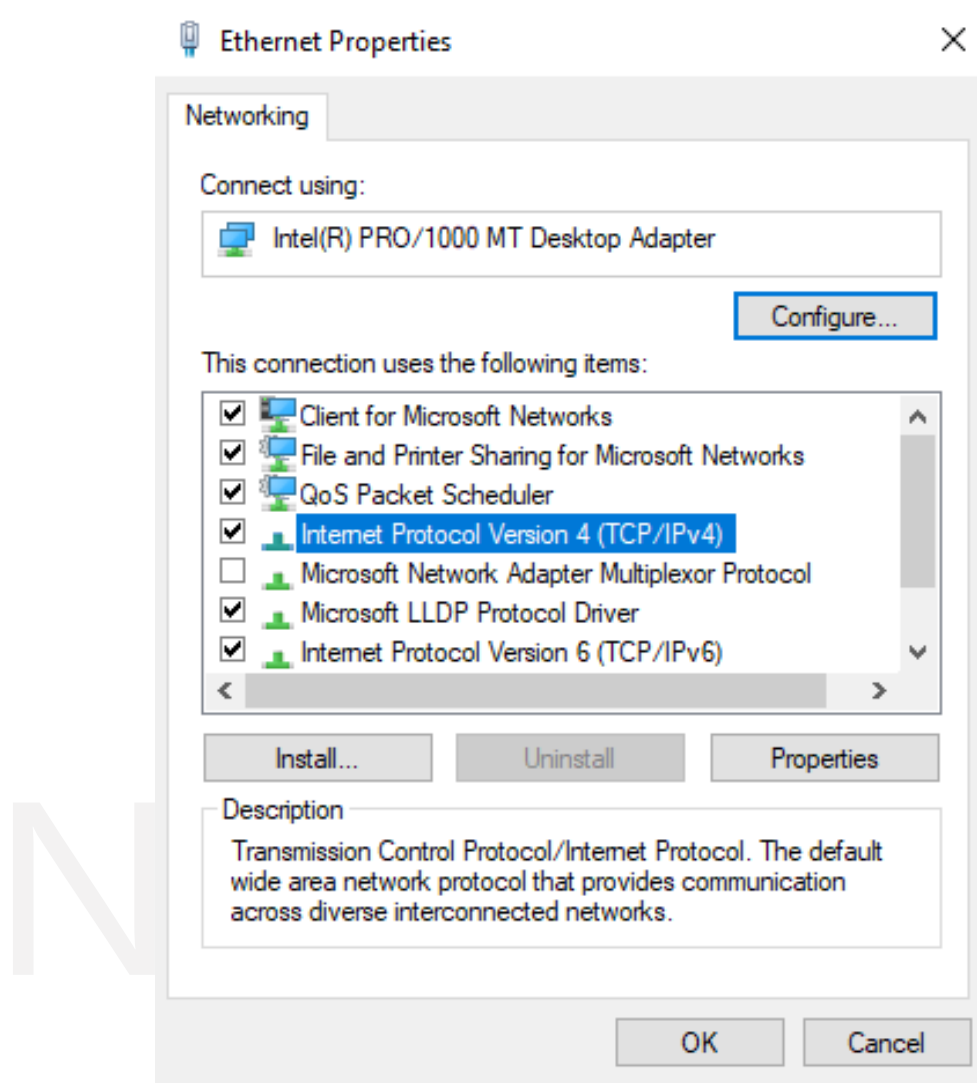
<Image> 52. network selection image

- c. Click [Properties] in the network's status.



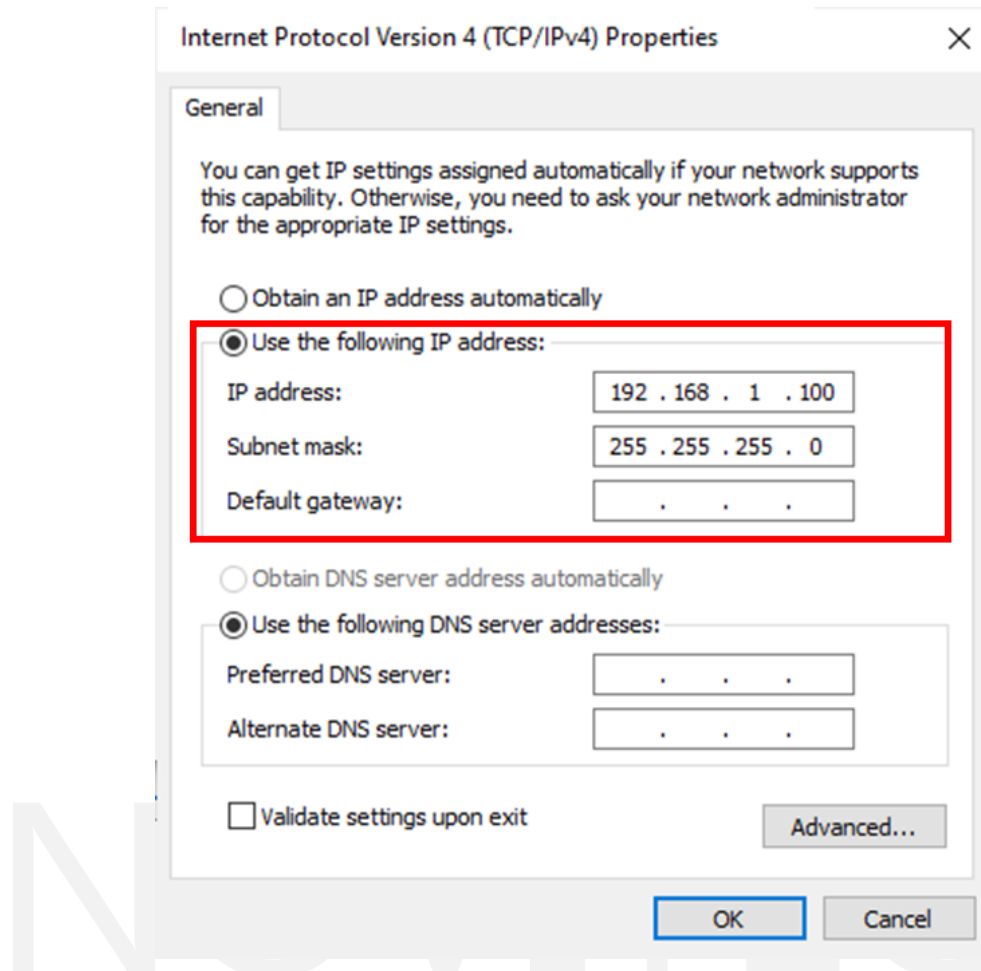
<Image> 53. Network status image

- d. Select "Internet Protocol Version 4 (TCP/IPv4)" in the network properties and click [Properties].



<Image> 54. Network properties image

- e. Check "Use the following IP address" and set the IP address and Subnet mask, etc to be used.
 - If the IP of the camera and the IP of the NIC are set identically, the two devices cannot be connected, so the third digit (Class C) must be set the same as the camera and the fourth digit(Class D) must be set differently.

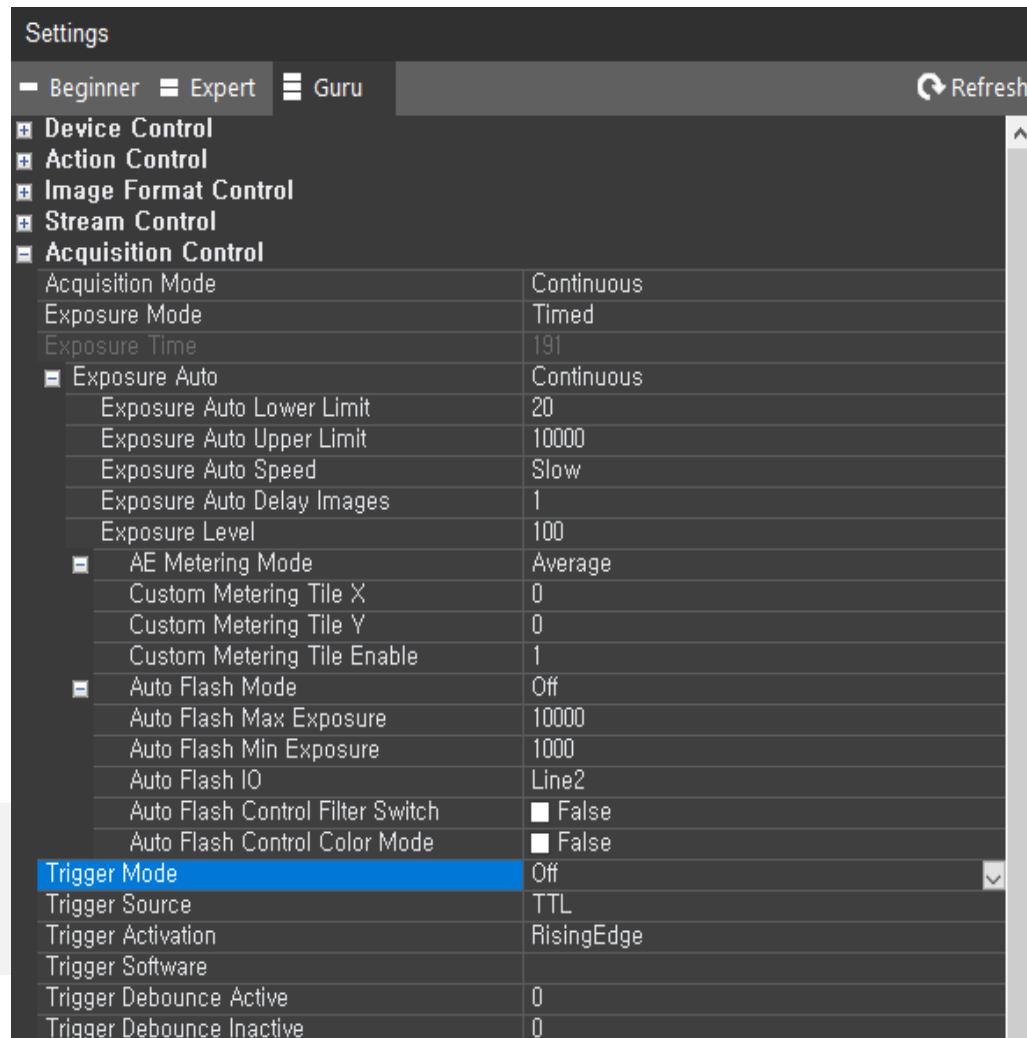


<Image> 55. PC Network Static IP Settings image

7.3. Failed to get Image

If the viewer does not get the image, refer to the following.

- If you have not set up your initial account
 - If the text "The device is not activated yet" is displayed in red at the bottom of the viewer and "Inactivated" is displayed in Settings-Device Control-Device Activation Status, the video transmission function is limited because the initial account settings have not been made.
 - Proceed to [5.6.3. Initial Account Settings](#) and you can solve the problem.
- When Trigger mode is set to On
 - Make sure Settings-Acquisition Control-Trigger Mode is set to Off.
 - If Trigger Mode is set to On, the image is output only when a trigger signal is input to the camera.



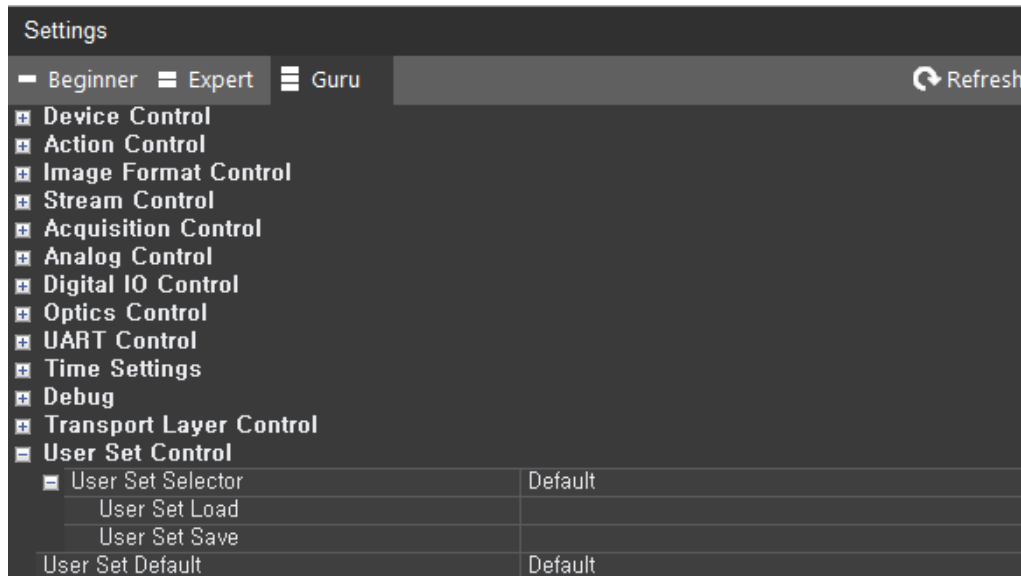
<Image> 56. Trigger Mode setting image

7.4. Settings initialized on reboot

By default, all settings are reset when the camera is rebooted.

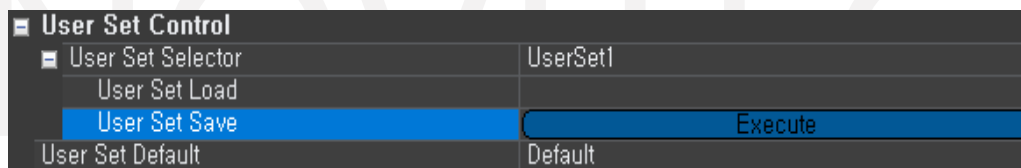
In order to save the camera's settings, users need to follow the steps below in the viewer.

- a. Find the "User Set Control" category in "Settings" on the right side of the viewer.
 - User Set Selector: Select UserSet to save or load.
 - User Set Load: Load saved values.
 - User Set Save: Save the current setting (Cannot save to the default channel).
 - User Set Default: UserSet to be applied as default when the camera is booted.



<Image> 57. User Set Control image

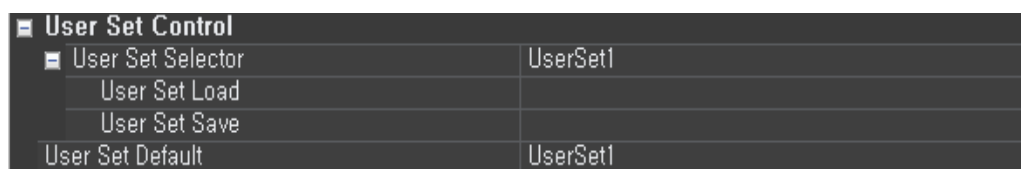
- b. After finishing all the setting you want to save to the camera, change "User Set Selector" to "UserSet" and click [Execute] in "User Set Save".



<Image> 58. User Set Save image

- c. Change "User Set Default" to "UserSet".

- The value set in "User Set Default" is saved in the camera's internal memory and does not disappear even if users change the PC.



<Image> 59. User Set Default image

7.5. Broken RTSP Image

Encoding of stream A/B/C can be selected as MJPEG, H264, H265, but transmission may be limited depending on the protocol used.

Protocol	Viewer	Available Stream	
GigE Vision (GenICam)	Novitec Camera Viewer	Stream A	MJPEG, H264, H265
RTSP	VLC player, etc.	Stream B	MJPEG, H264, H265 *In case of MJPEG, the video is broken in general viewer when using 2K or more
ONVIF	ONVIF Device Manager, Other NVR SW	Stream C	MJPEG, H264 *In case of MJPEG, the video is broken in general viewer when using 2K or more

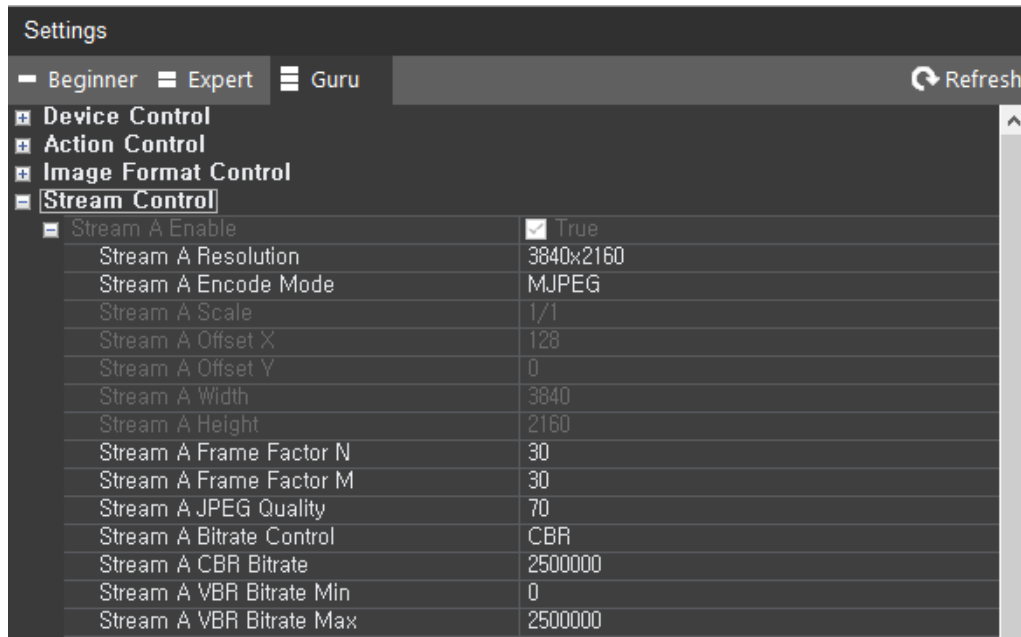
<Table> 4. Transmission limit by protocol table

If you play RTSP MJPEG with a resolution of 2K or higher, you may get an abnormal image. You can replace it with H264/H265 by referring to the following.



<Image> 60. RTSP 4K MJPEG video broken image

- a. Find category "Stream Control" in "Settings" on the right side of the viewer.
 - If the video is being played in the viewer, the setting cannot be changed, so check that the "Start" button is disabled.

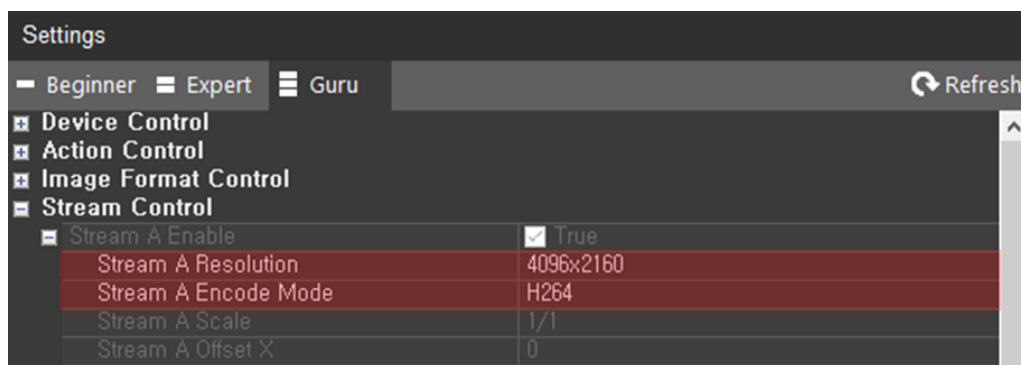


<Image> 61. Stream Control image



<Image> 62. Disable Start image

- b. Change "Stream A Resolution" to [4096x2160] and "Stream A Encode Mode" to [H264] or [H265].



<Image> 63. Change Resolution & Encode Mode image

- c. Click [Start] to apply the settings.



<Image> 64. Start activation image

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10. Revision History

Date	Version	Description	SDK / Firmware Version
2022.01.14	V1.0	Initial Version	
2022.06.17	V1.1	Change the image by applying the integrated viewer	V1.7.2 / V1.5.0
2022.07.28	V1.2	Changing web browser access method	V1.7.3 / V1.5.0

<Table> 5. Revision History table

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