

[g-Nova3D + GigE Interface]

[Installation guide]

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NOVITEC

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 g-Nova3D 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

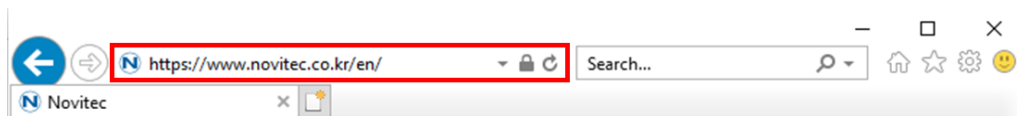
- When manufacturing the I/O connector, be careful with the connection so that the wires fit well.
- Make sure the power is off before connecting or disconnecting I/O connectors.
- To avoid damaging the connector, do not pull by the electric wire, etc.

4. How to install the software

4.1. Download the Installation File

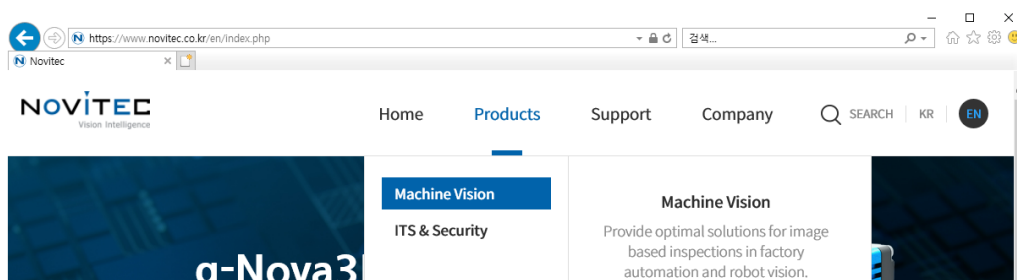
We recommend that you download and install the latest version of the SDK from the Novitec website.

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



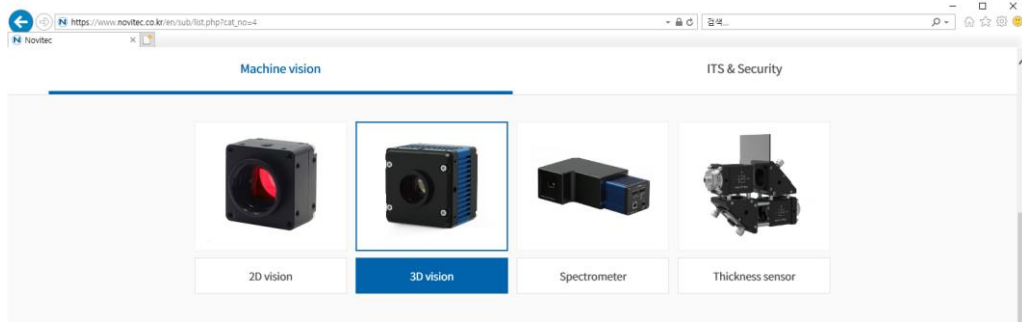
<Image> 1. Enter the website address image

- b. Click [Machine Vision] of [Products] in the top tab.






<Image> 2. Click Machine Vision image

c. Click [3D vision] in Machine Vision.



<Image> 3. Click 3D vision image

d. Click gN3D-13M in the camera list to Access the page.

	Model	Resolution	Frame rate	Sensor size	Shutter type	Sensor type
<input type="checkbox"/>	 Swing3D L-Model	1280 x 1024 pixels	> 1.3 Million 3D points	2/3"	Global shutter	Mono
<input type="checkbox"/>	 Swing3D S-Model	1280 x 1024 pixels	> 1.3 Million 3D points	2/3"	Global shutter	Mono
<input type="checkbox"/>	 gN3D-13M	1280 x 1024 pixels	32,160 profiles @ 1280 x 32 pixels	2/3"	Global shutter	Mono

<Image> 4. Click gn3D-13M image

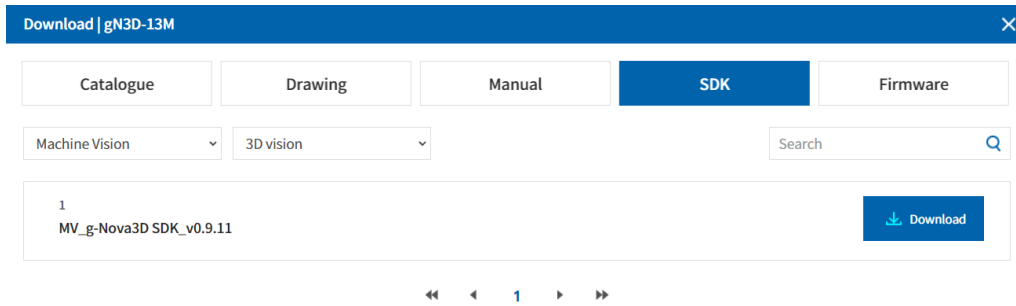
e. Click [Download] of SDK, in the download field at the bottom of the product page.

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



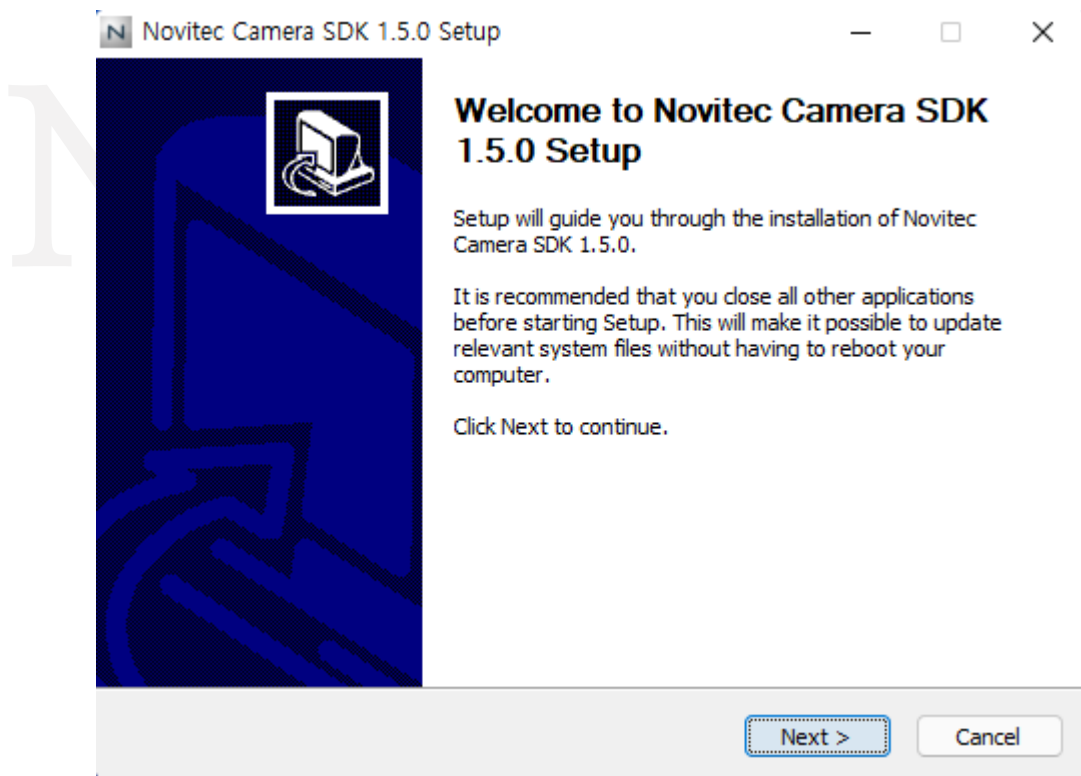
<Image> 6. SDK download window image

4.2. Install the Novitec Software

4.2.1. Windows

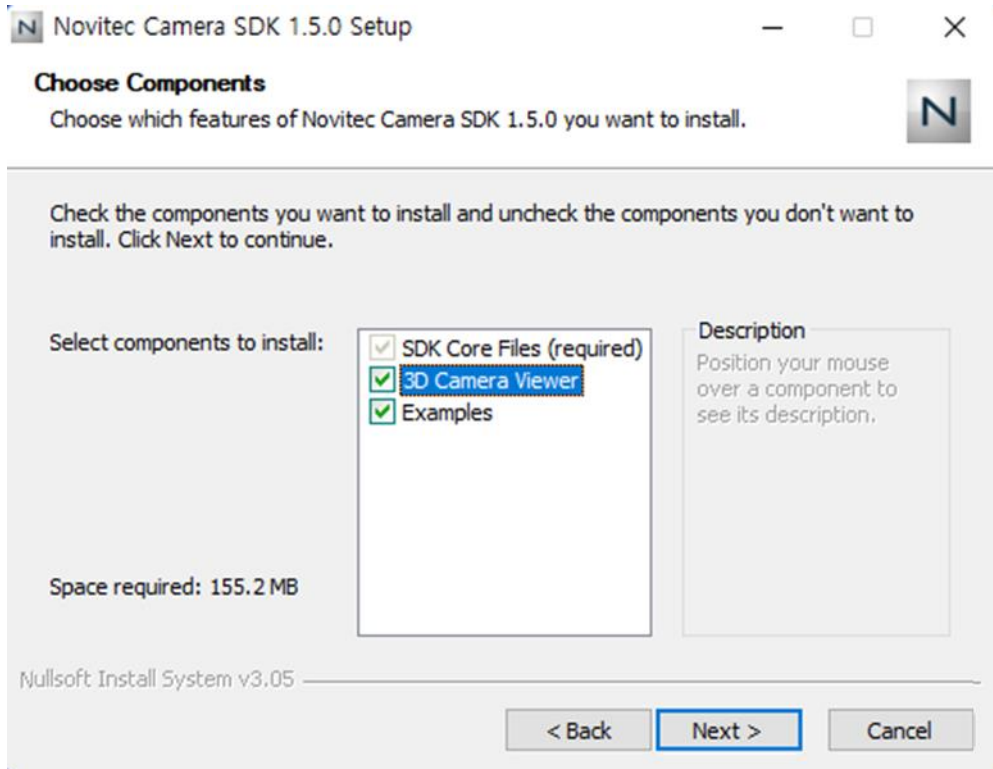
Refer to [4.1. Download Installation File](#) to prepare the installation file for Windows.

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



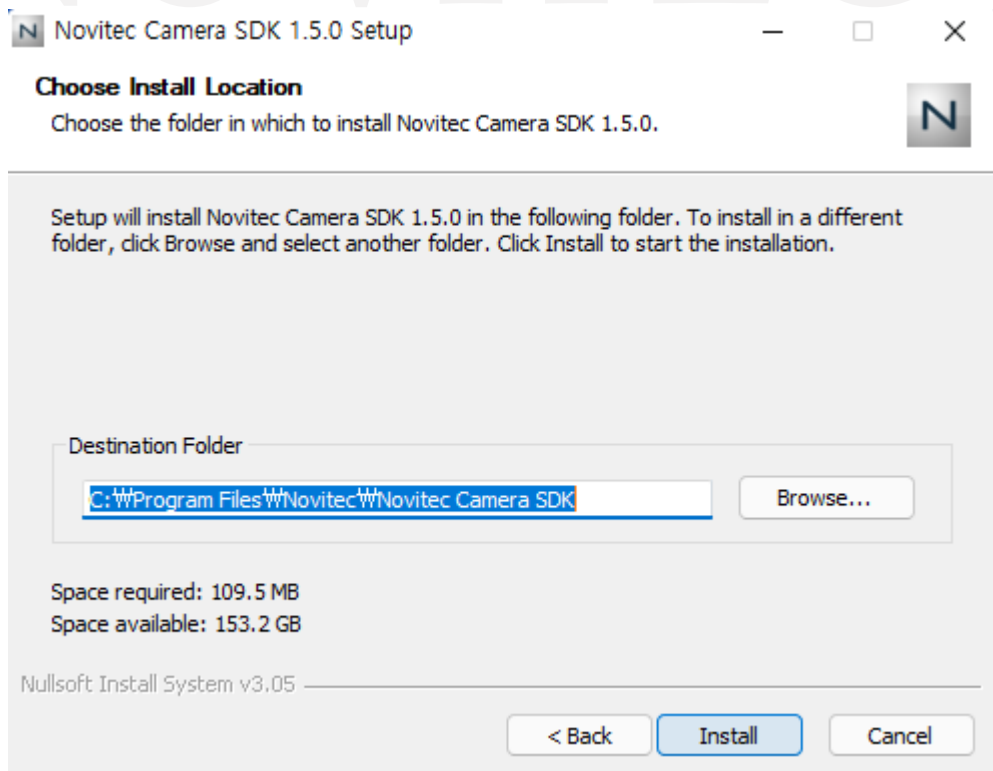
<Image> 7. Installation Startup image

- b. Check "3D Camera Viewer", "Examples" and click [Next >].

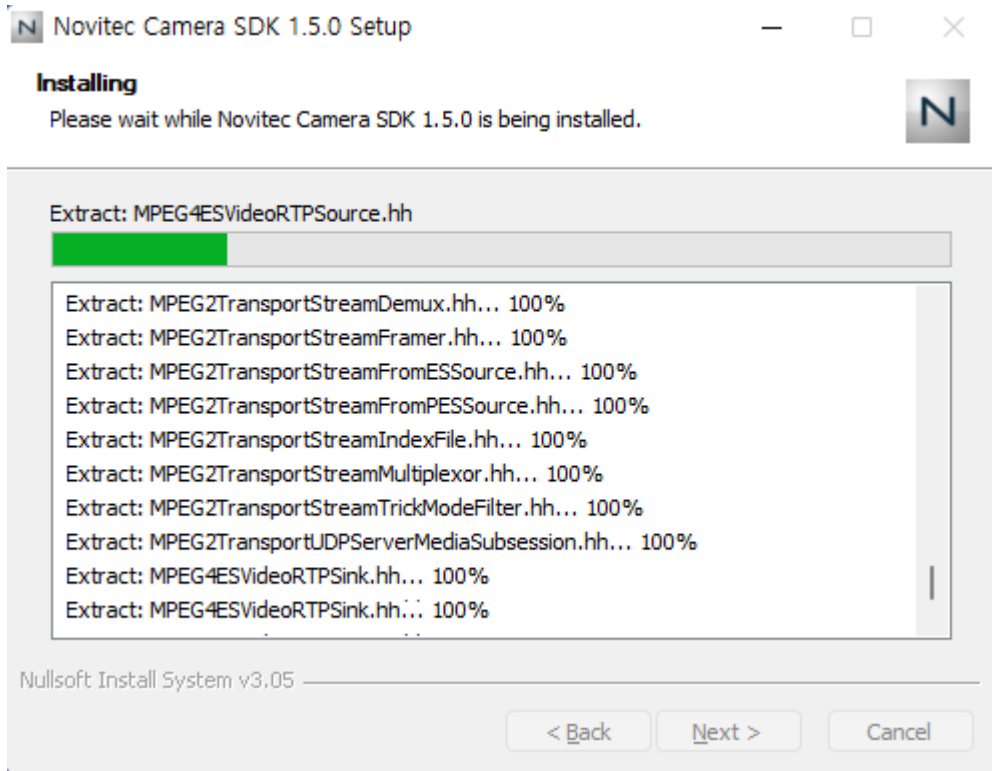


<Image> 8. Install item selection image

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

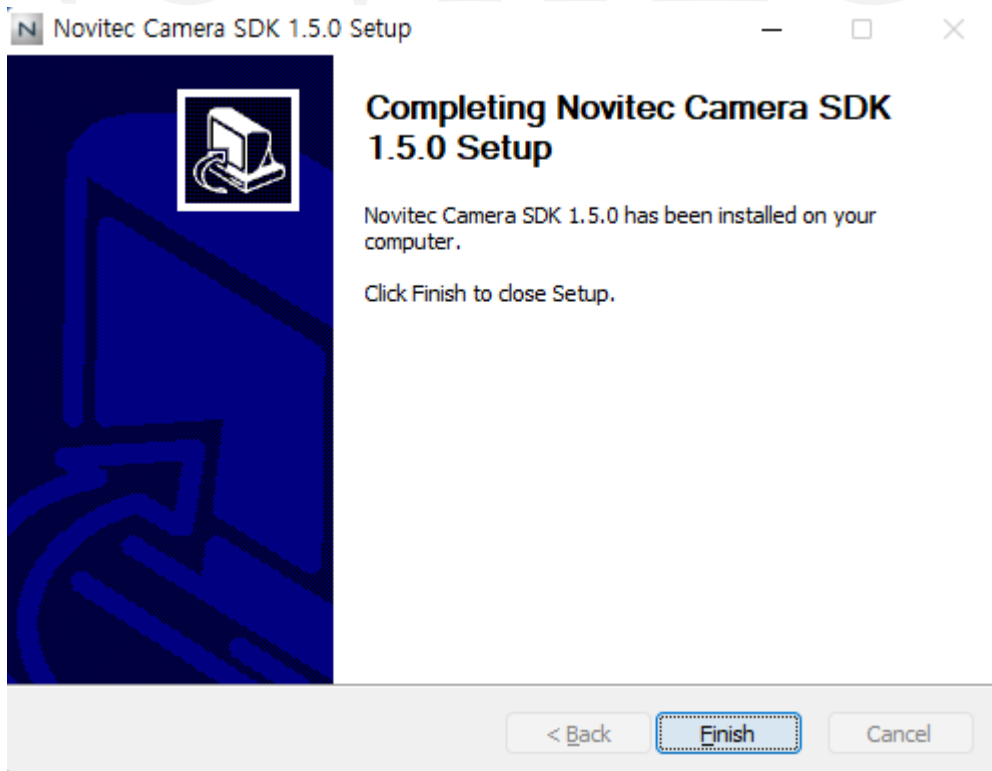


<Image> 9. Choose Install location image



<Image> 10. Installing image

d. Click [Finish] to finish the installation.



<Image> 11. Installation finish image

5. Installing the Camera

5.1. Attach a Lens

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

g-Nova3D has a removable 5mm C mount adapter is installed as standard, and it can be used as a CS mount by removing the adapter.

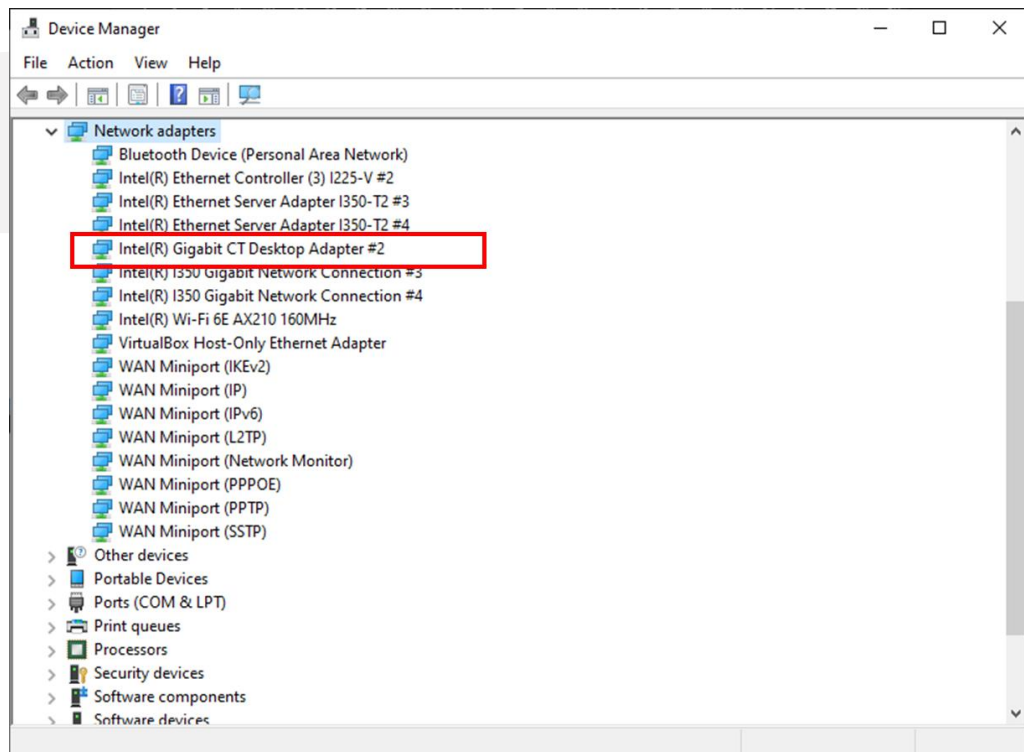
5.2. Connect the interface Card and Cable to the Camera

Ethernet cable to the camera and PC.

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

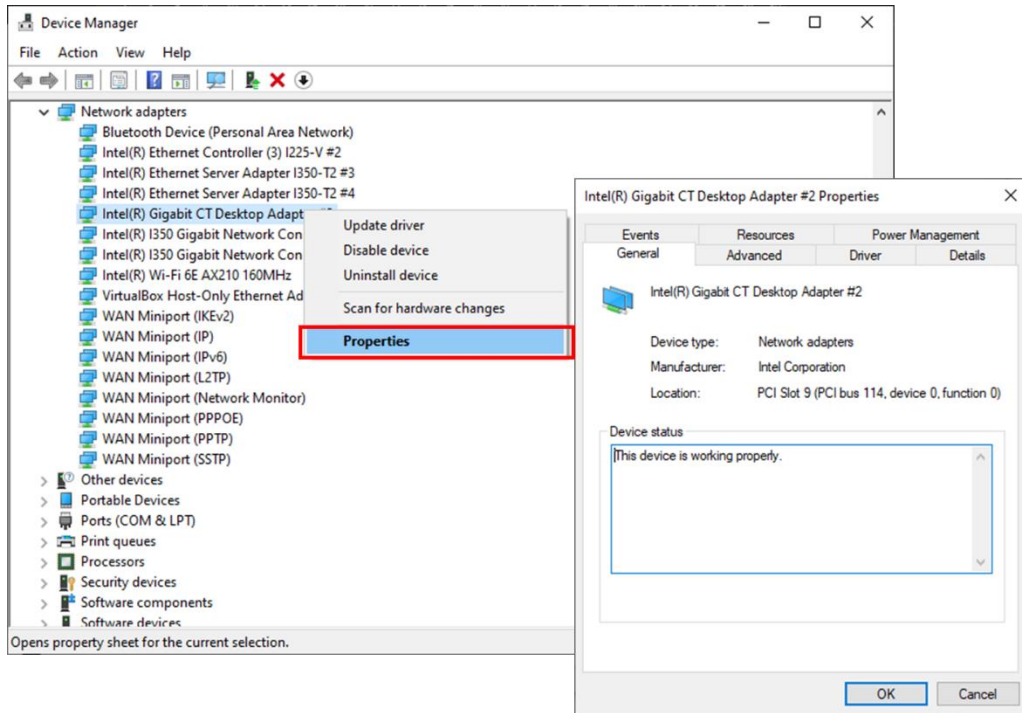
In order to acquire camera data normally, the following initial settings are required.

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



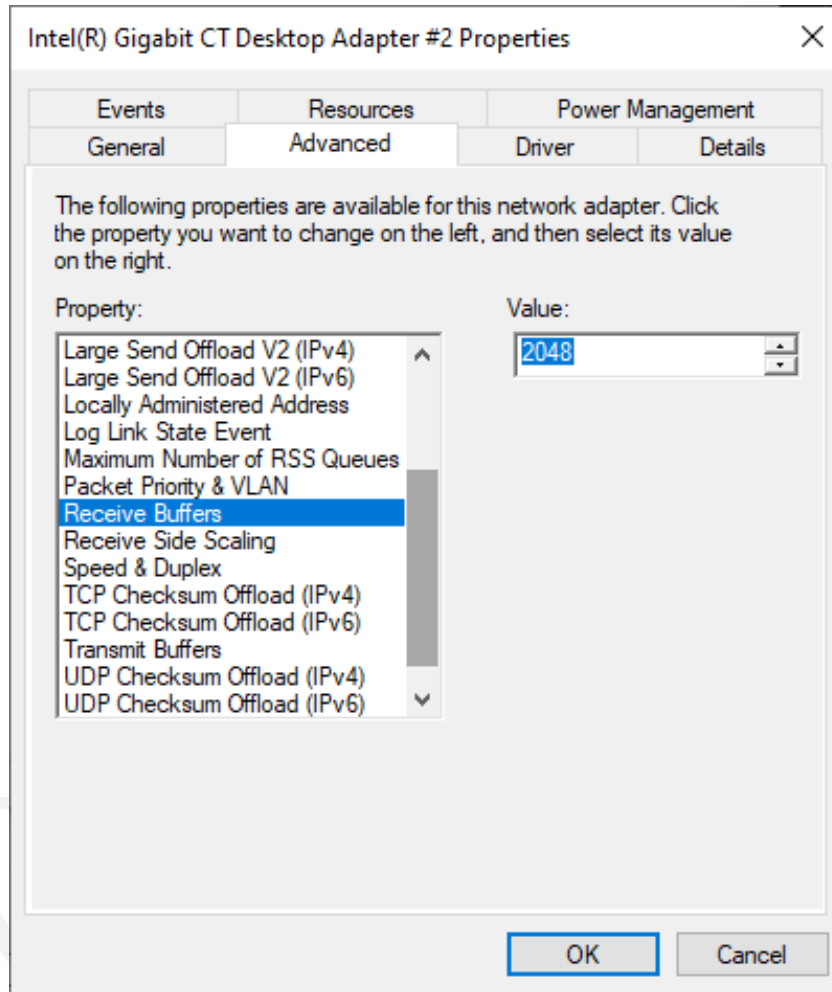
<Image> 12. Check network adapter information image

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



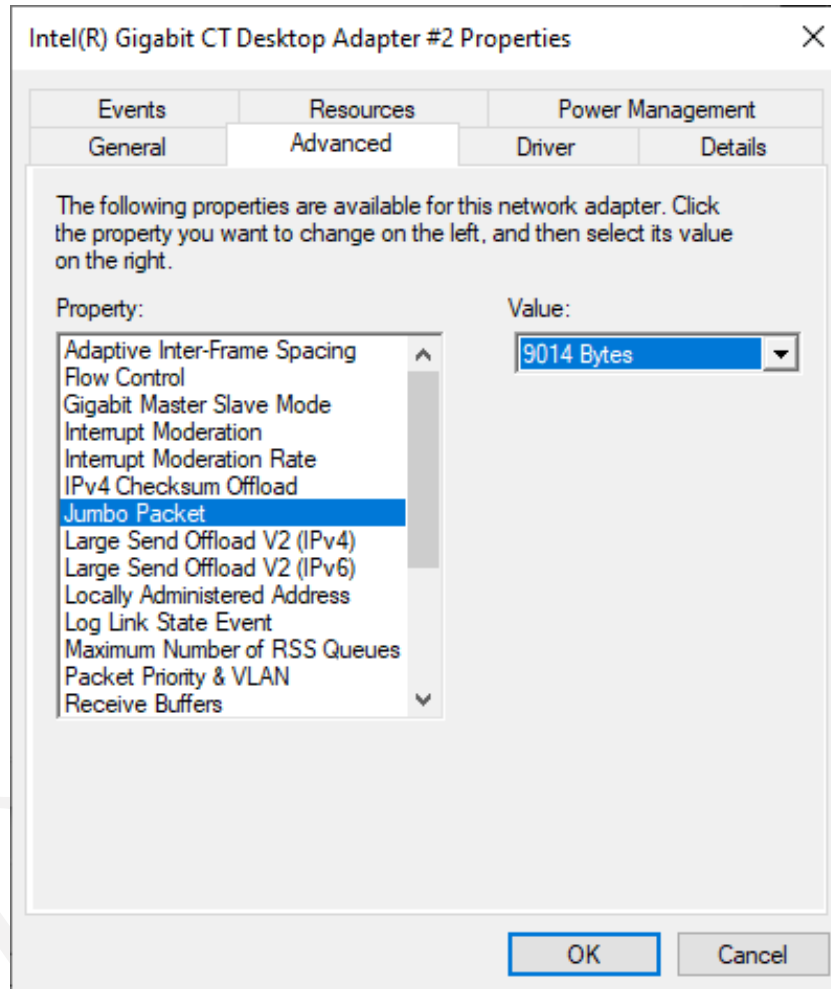
<Image> 13. Network adapter properties image

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



<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.

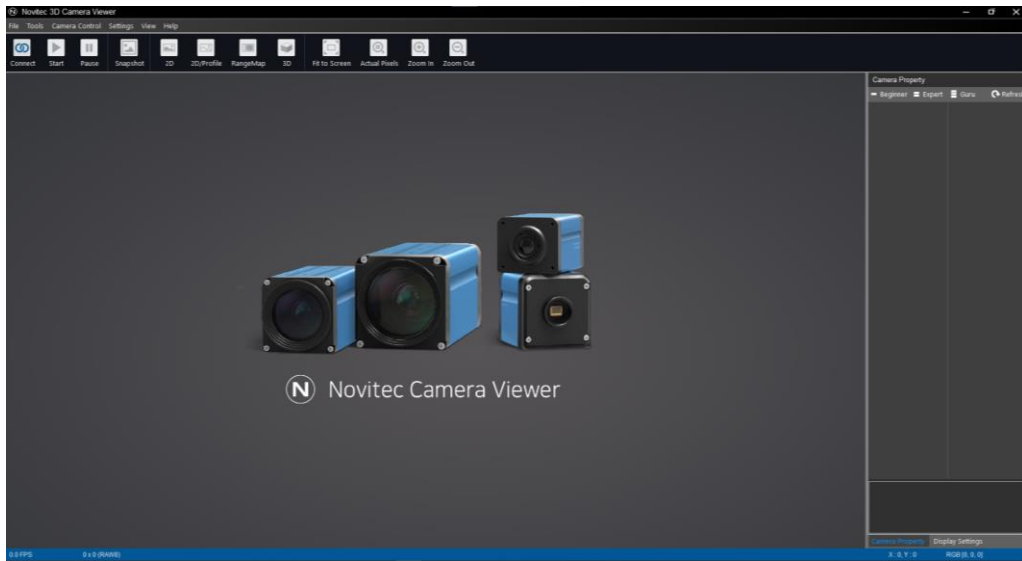
5.4. Launch Viewer

5.4.1. Windows

3 ways to launch the camera viewer.

- Click the shortcut icon of "Novitec 3D Camera Viewer" on the desktop.
- Click Novitec - "Novitec 3D Camera Viewer" in the Windows Start menu.
- Go to the path below in the File Explorer and run the Novitec3DCameraViewer.exe.

- Default path: C:\Program Files\Novitec\Novitec Camera SDK\utils



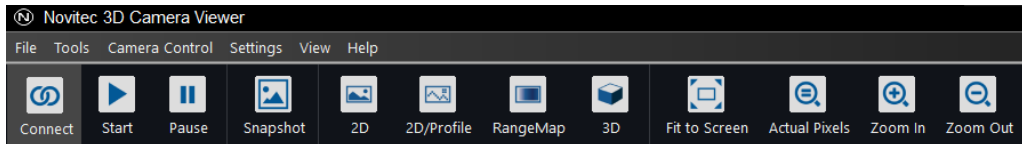
<Image> 16. Launch viewer of Windows image

5.5. Connect the Camera

To use the camera, the user must connect the camera to the viewer.

5.5.1. Windows

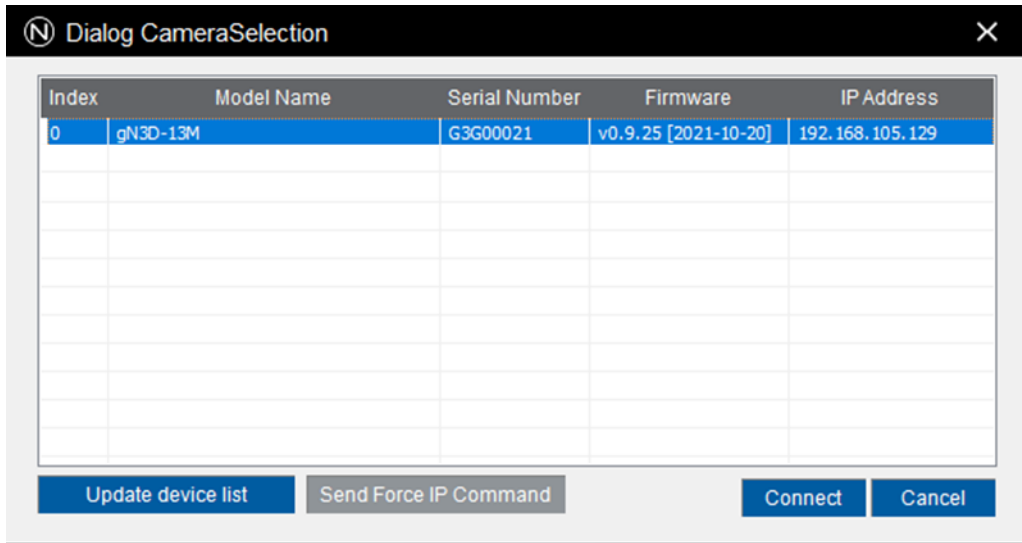
- a. Click [Connect] at the top of the viewer.



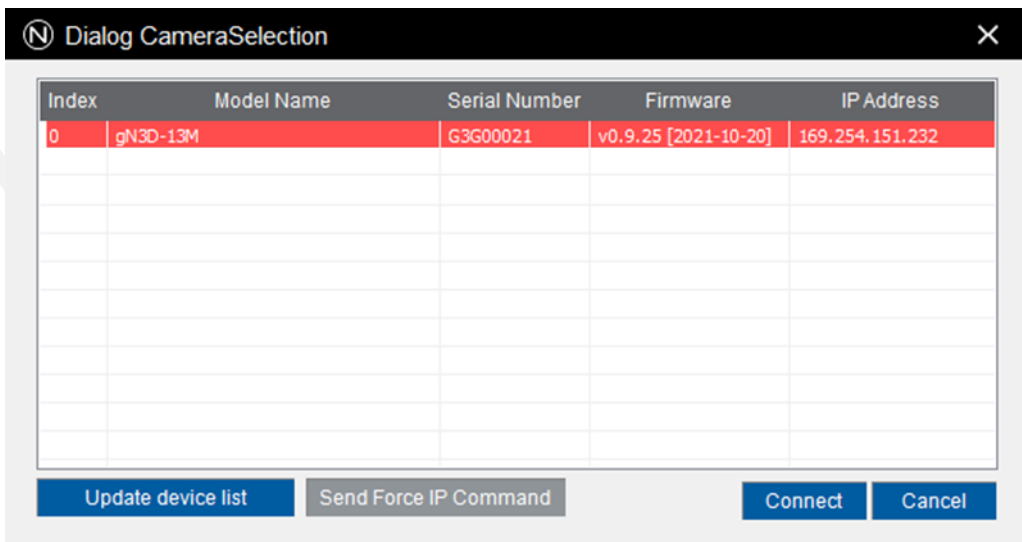
<Image> 17. Connect the Camera image

- b. Check the model name and serial number of the camera connected to the PC, select the camera in the list, and click [Connect].

- If the camera is displayed in red and not connected Refer to [5.5.2. Set up IP temporarily.](#)

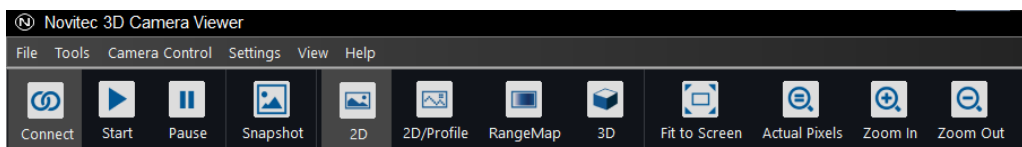


<Image> 18. Select camera image



<Image> 19. Red mark when connection is not possible image

c. Check that [Connect] at the top is activated in blue.



<Image> 20. Status of Connect after camera selection image

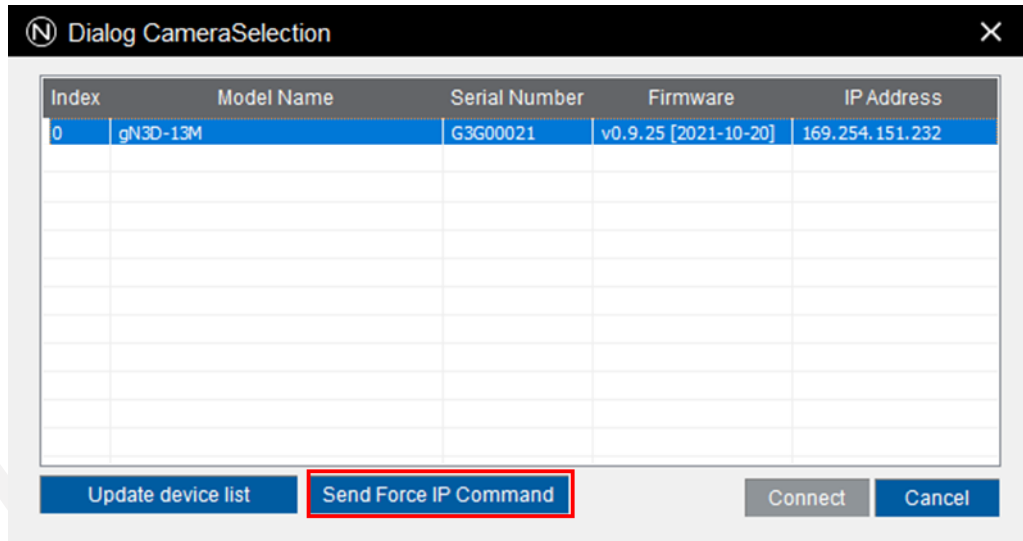
5.5.2. Set up IP temporarily

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> 21. If the camera IP band is different image

- b. After confirming that the red mark disappears due to the IP change of the camera, refer to [5.5. Connect the Camera](#) to proceed to the next step.

5.6. Get the Image

5.6.1. Windows

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 [5.6.2. Initial Account Settings](#) to release video function restrictions and play video.



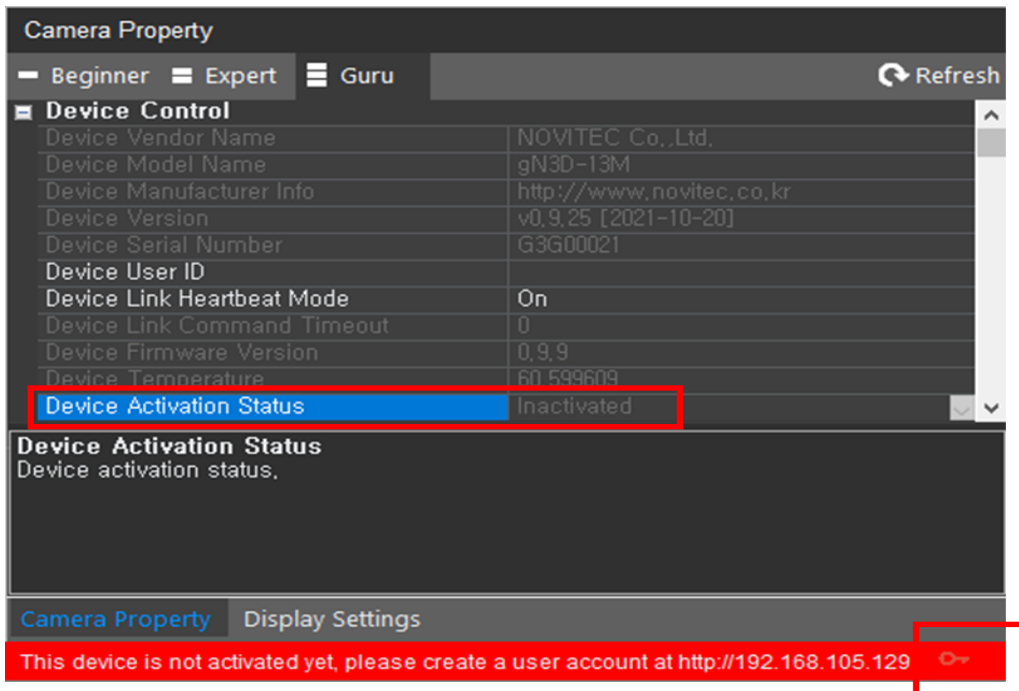
<Image> 22. Windows Running video image

5.6.2. Initial Account Settings

In the initialized state, the video transmission function is limited.

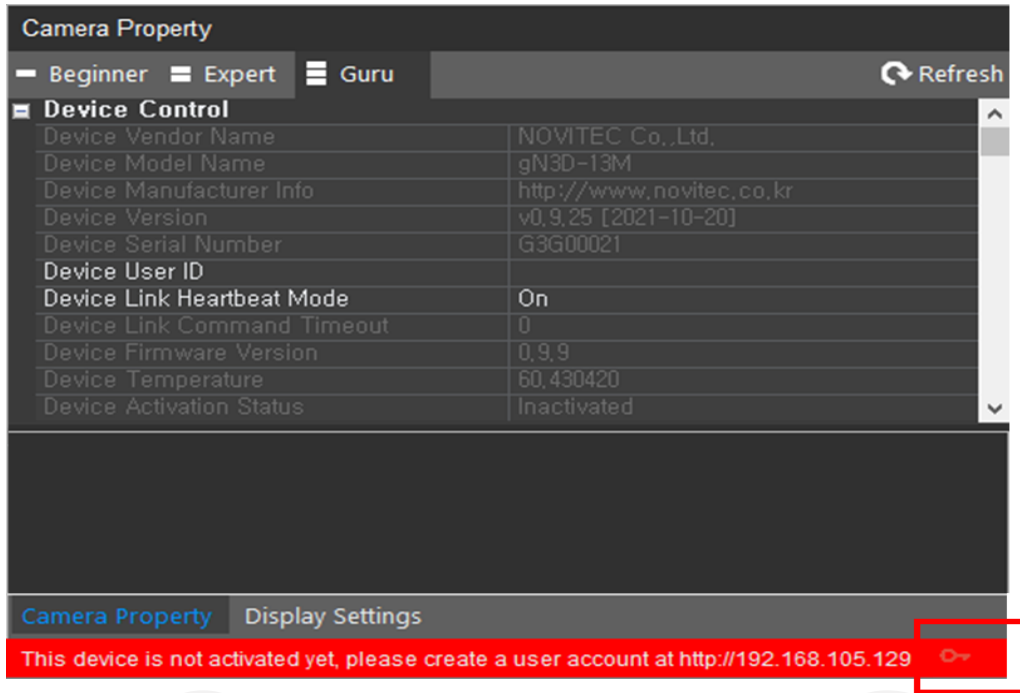
If the video transmission function is restricted, "The device is not activated yet" is displayed with a red key icon in the lower right corner of the viewer during video playback, and Settings-Device Control-Device Activation Status is displayed as "Inactivated".

In order to release the function restrictions, you must proceed with the initial account settings as follows.



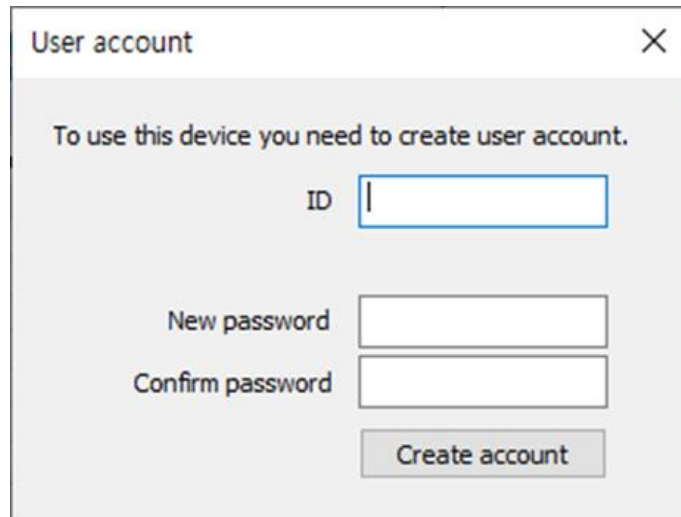
<Image> 23. Limited video function image

- a. With the camera connected by referring to 5.5. [Connect the Camera](#), click the red key at the bottom of the viewer

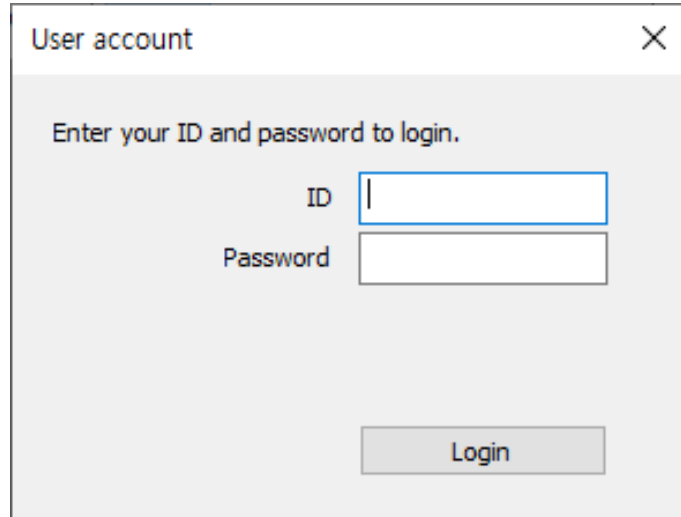


<Image> 24. before user account activation image

- b. When the User account pop-up window appears, enter the ID and password to be used and click the [Create account] button at the bottom.
- If "Enter your ID and password to login" appears, the camera has already completed initial account setup.

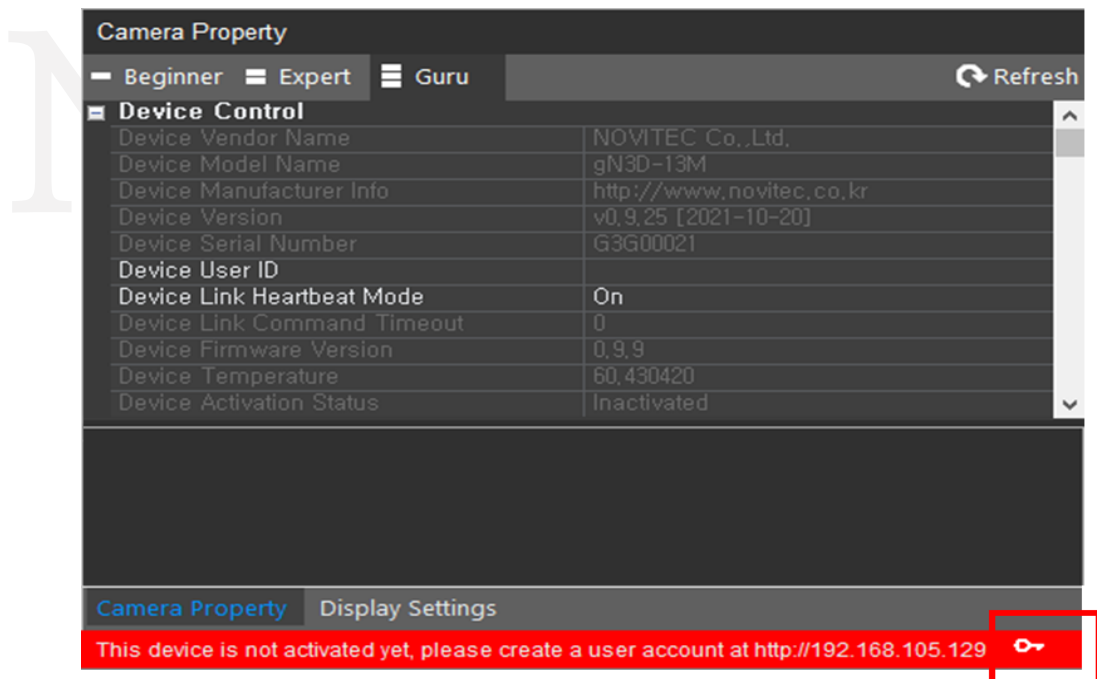


<Image> 25. Initial account input image



<Image> 26. Initial account already completed image

- c. When the pop-up window disappears after creating an account and the key shape is displayed in white, an account has been created and the video transmission function is activated.



<Image> 27. Successful account activation after initial account input image

- d. While the account is active, disconnect the camera and connect it again to use it.

6. Physical Interface

6.1. Power/Voltage

The 12-pin connector provides a power connection between the camera and the power supply.

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

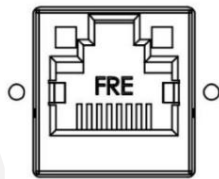
To supply power to the camera, you need to check the information on the connected [12-pin connector](#) and connect it to the power supply.

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.



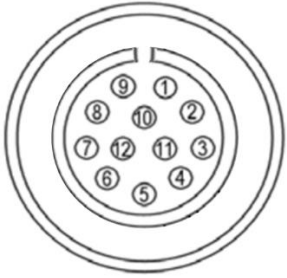
<Image> 28. RJ-45 image

6.3. GPIO Connector

The camera is equipped with a 12-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	GND	Power ground
	2	Camera Power	Camera Power (12~24V)
	3	Strobe out	Strobe Out

	4	ENC In A+	Encoder Input A+
	5	ENC IN A-	Encoder Input A-
	6	IO Power	IO Power
	7	Trigger In-	Frame Trigger Input
	8	-	-
	9	Trigger In	Line Trigger Input
	10	ENC IN B+	Encoder Input B+
	11	ENC IN B-	Encoder Input B-
	12	IO GND	IO ground

<Table> 1. GPIO Connector table

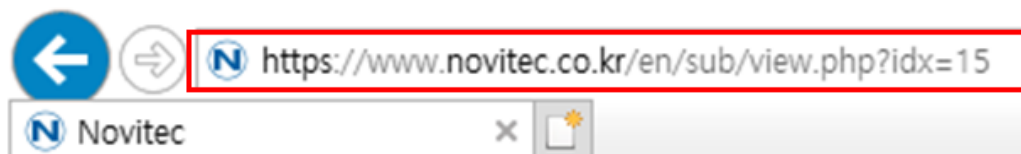
7. Troubleshooting

7.1. Upgrading Camera Firmware

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

a. Go to g-Nova3D product page on Novitec website.

- g-Nova3D product page: <https://www.novitec.co.kr/en/sub/view.php?idx=15>



<Image> 29. Enter the product page address image

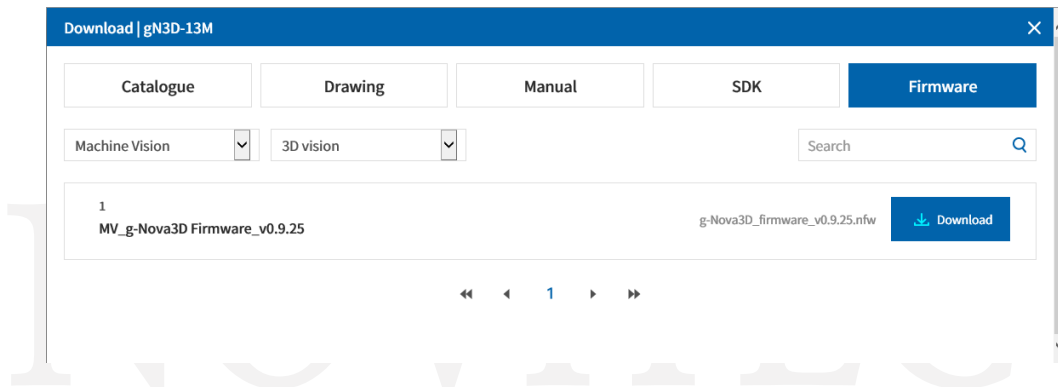
b. Click [Download] of Firmware in the download field at the bottom.

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

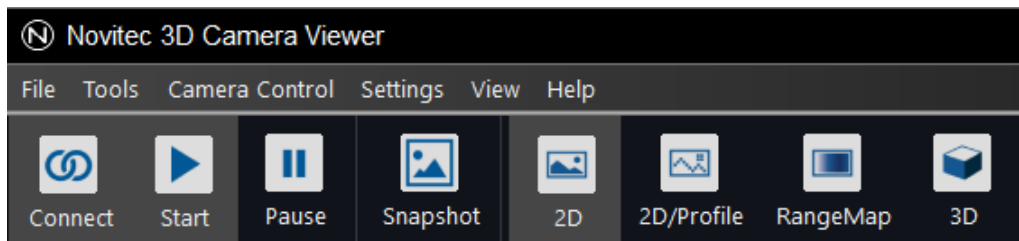
<Image> 30. Download section on product page image

c. Click [Download] of MV_g-Nova3D Firmware to download the firmware file.



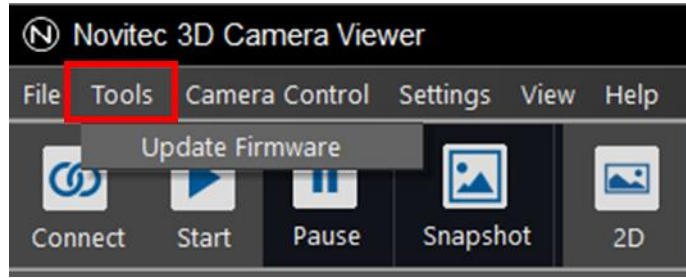
<Image> 31. Firmware download window image

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



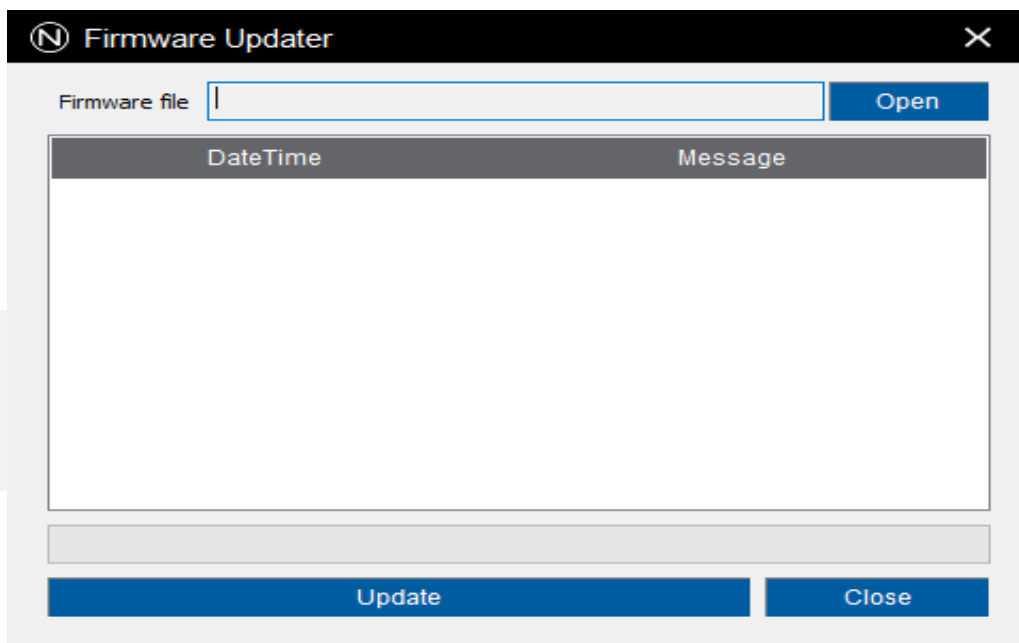
<Image> 32. Tools in the top menu bar image

e. Click [Update Firmware].



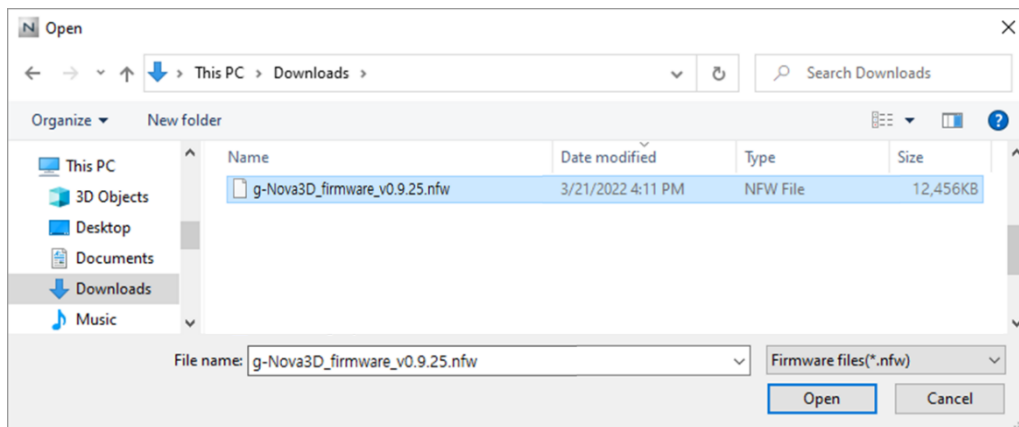
<Image> 33. Update Firmware image

f. Click [Open] in the Firmware Updater.



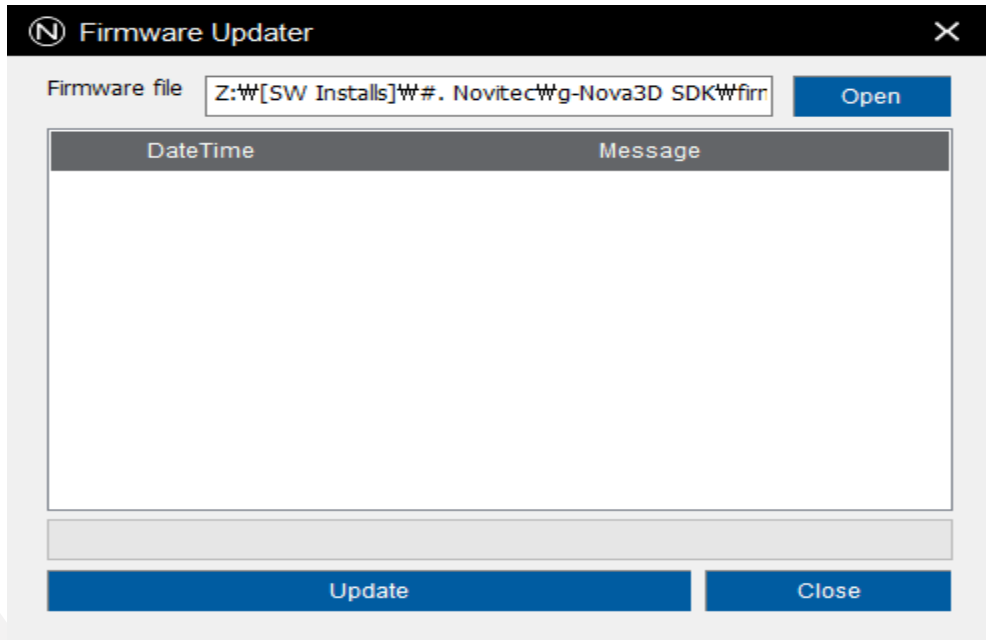
<Image> 34. Choose firmware file location image

g. Select the downloaded firmware file of g-Nova3D and click [Open].



<Image> 35. Choose firmware file image

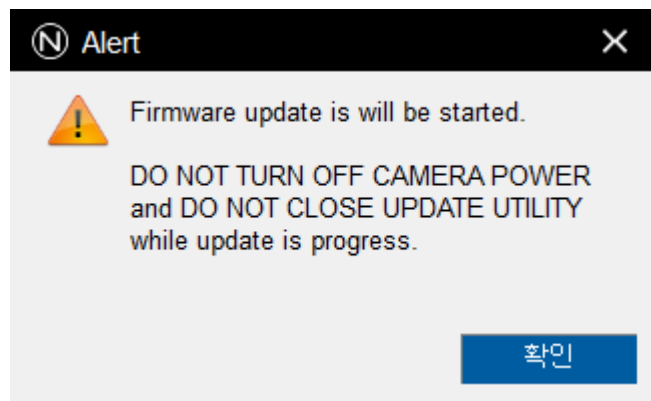
h. Click [Update].



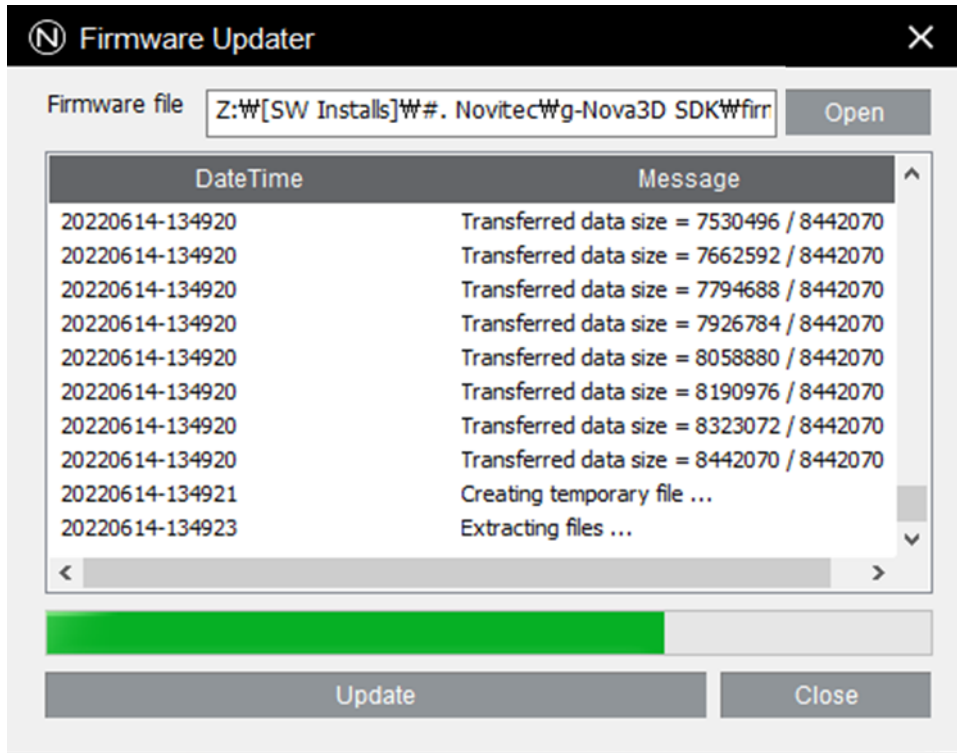
<Image> 36. Click Update image

i. Check the cautions in the warning window and click [확인].

- Do not turn off the camera or shut down the program until complete.

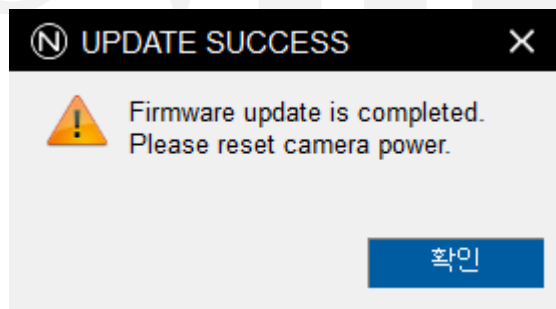


<Image> 37. Firmware update warning image



<Image> 38. Progress of firmware update image

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



<Image> 39. Complete update image

- k. Turn the camera power off and reboot the camera.

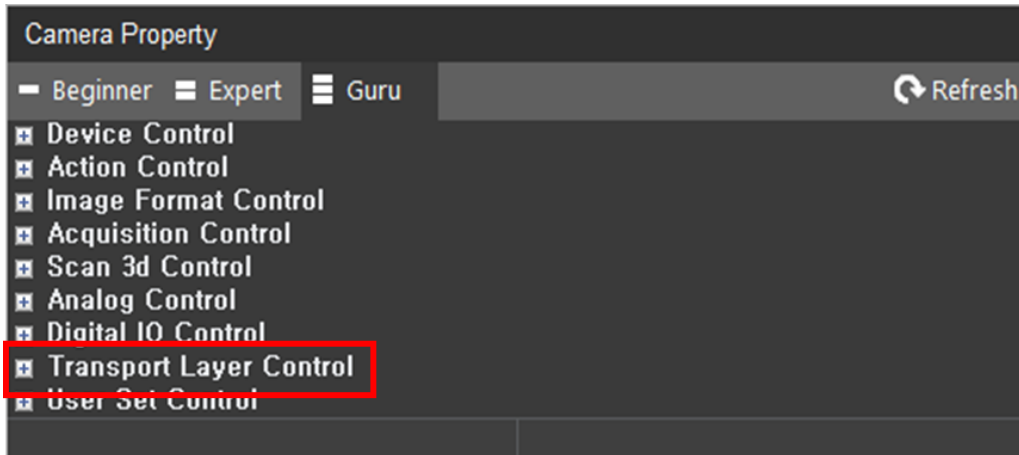
7.2. Camera & Interface Card (NIC) Static IP Setting

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](#).

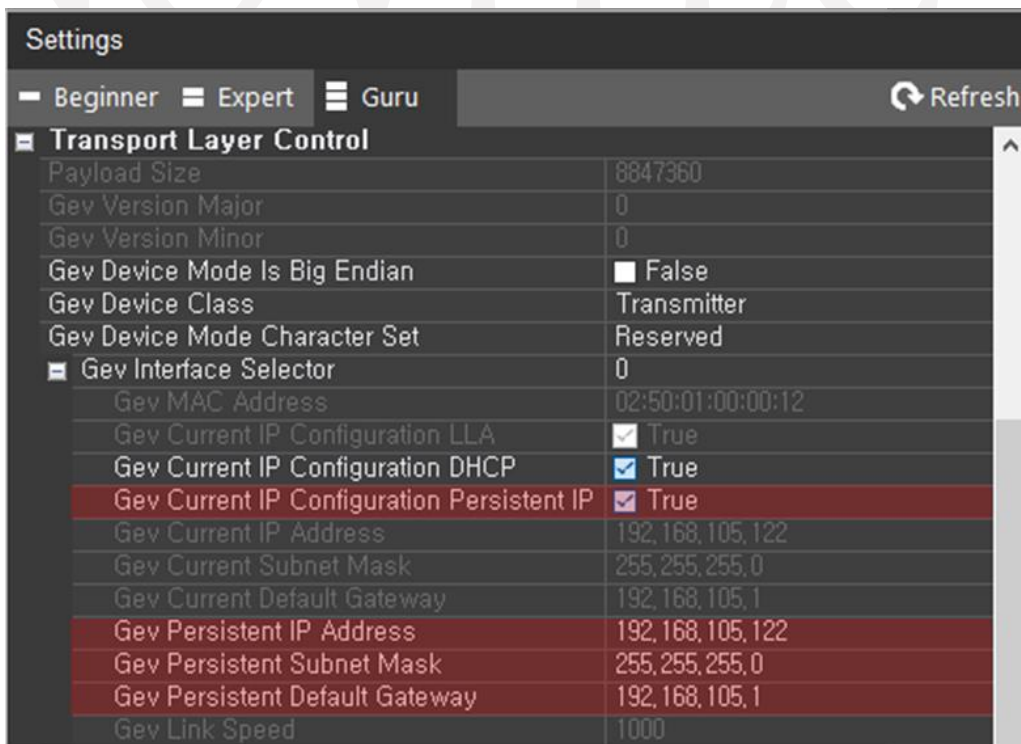
b. Find the "Transport Layer Control" category in "Settings" on the right side of the viewer.



<Image> 40. 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

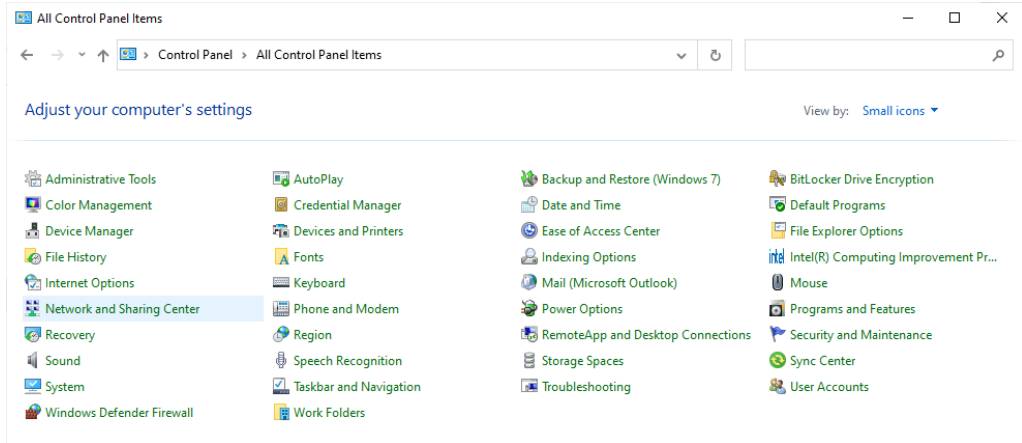


<Image> 41. Camera static IP setting image

d. Turn the camera power off and reboot the camera.

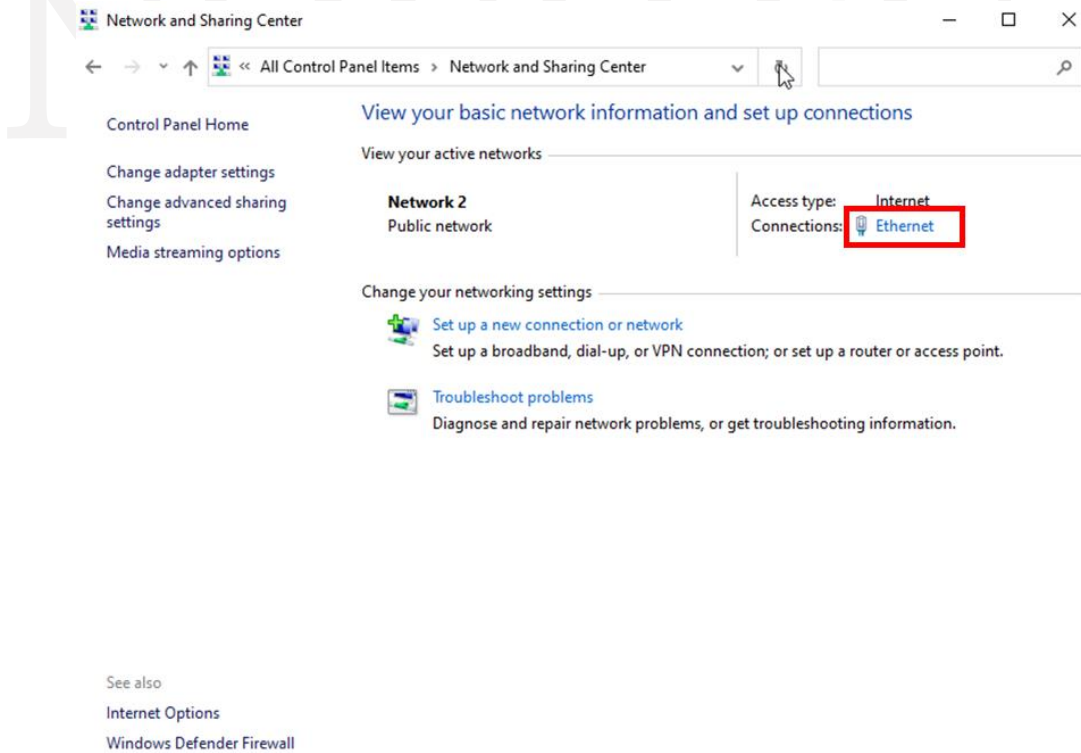
7.2.2. Interface card (NIC) static IP settings

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



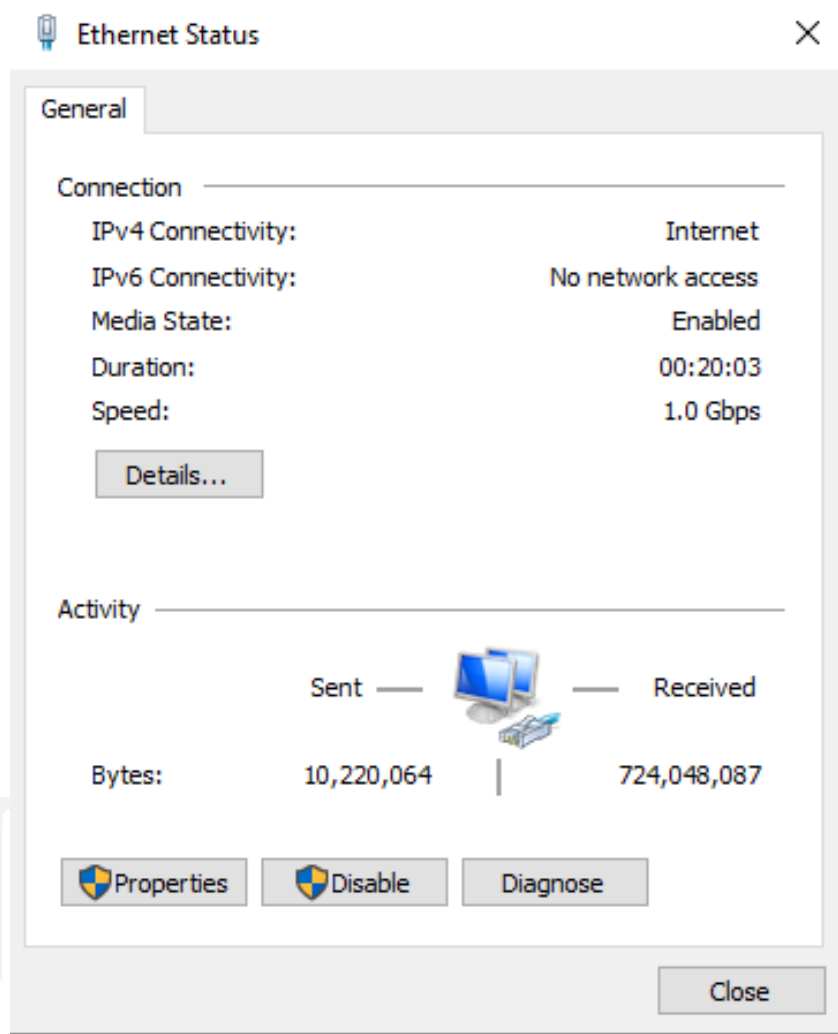
<Image> 42. Control Panel-Network and Sharing Center image

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



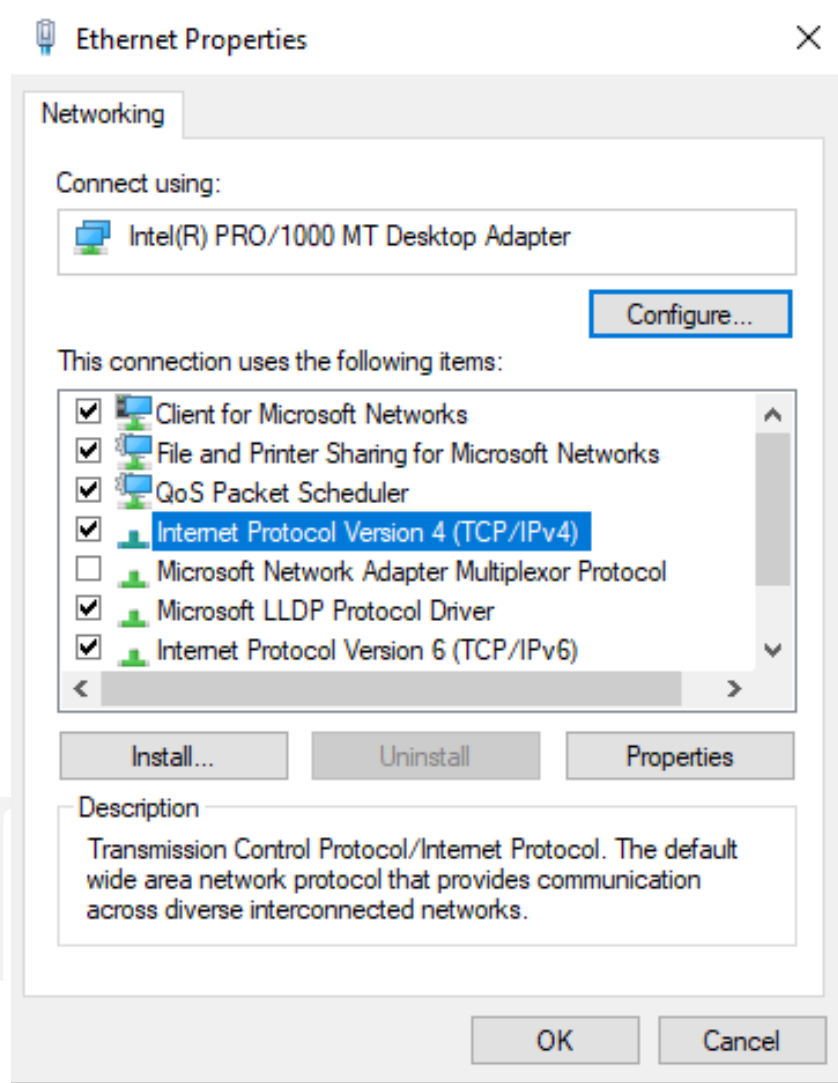
<Image> 43. network selection image

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



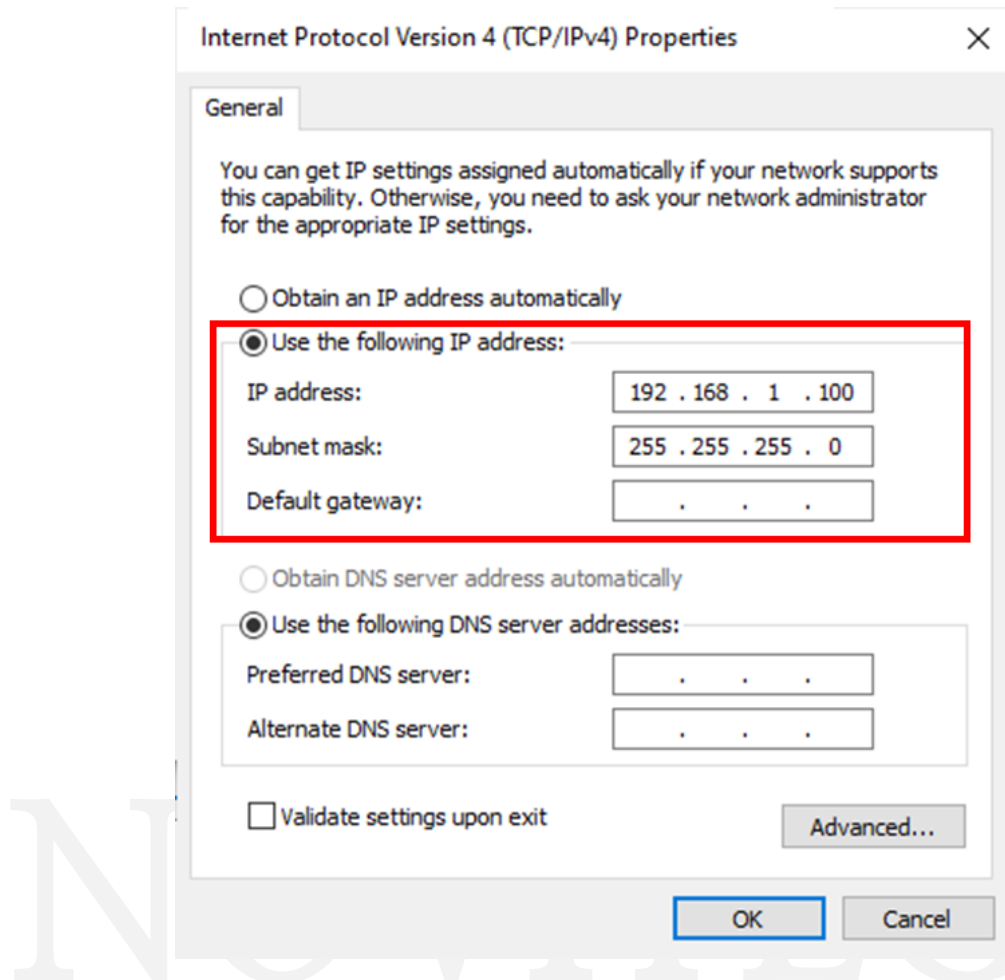
<Image> 44. Network status image

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



<Image> 45. 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.



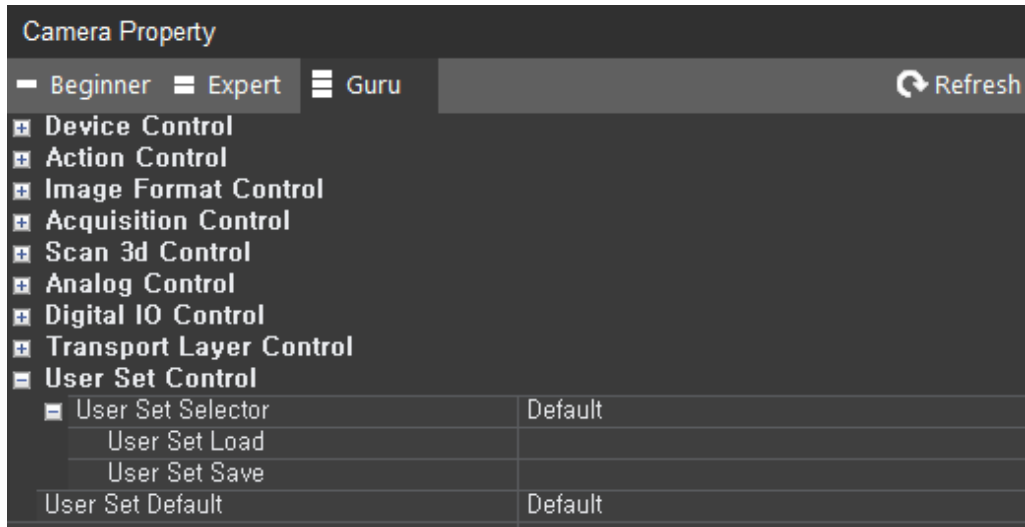
<Image> 46. PC Network Static IP Settings image

7.3. Settings initialized on reboot

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

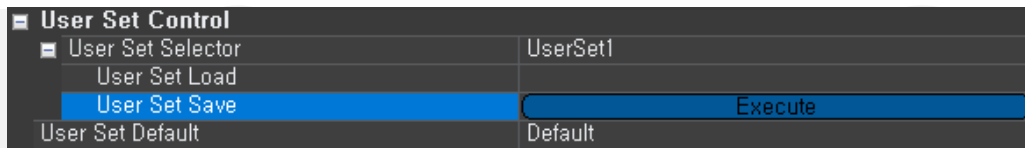
In order to save the camera's settings, users need to follow the steps below in the viewer.

- 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> 47. User Set Control image

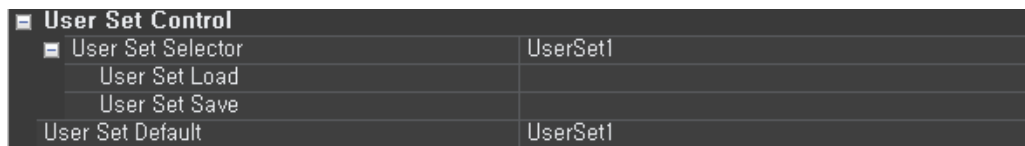
- b. After finishing all the setting you want to save to the camera, change "User Set Selector" to "UserSet" and click [Execute] in "User Set Save".



<Image> 48. 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> 49. User Set Default 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

<Table> 2. Revision History table

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