

[i-Nova2 Series]

# [User Manual]

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## 1. About this document

### 1.1. Purpose of the document

An explanatory document for the i-Nova2 Series. For information necessary for programming, please refer to the software API document, which is a separate document, and the Example project provided as a sample.

### 1.2. Content of the document

At the beginning of the manual, there is an introduction to the camera and an explanation of the viewer program. Please refer to Chapter 11 for detailed specification information for each camera. The next chapter introduces camera information and general information.

Camera information includes the following

- Camera information
- Sensor information
- Filter and lens
- How to connect the initial camera

General information includes:

- Precautions for using the camera
- Software tool for i-Nova2
  - C# Client Viewer
  - Web Browser
- Trouble shooting

## 2. Important information

### 2.1. Instrument safety instructions

- We are not responsible for any damage caused by user negligence or other equipment Connection.
- Please handle the camera with care. strong shock or please be careful when storing in an unsuitable environment.
- Please do not use accessories that are not recommended as they may be dangerous.

### 2.2. Operation considerations

#### 2.2.1. Important safety precautions

- Please check the specifications for each product and use a power supply with the appropriate specifications.
- Avoid heat sources such as radiators, motors, direct sunlight, and fire.
- Avoid flammable substances, water, or be careful not to let metal get inside the camera.
- Do not modify the camera or use the camera with the outer cover removed.
- Avoid thunder. Stop using the camera when lightning strikes.
- 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 ground (GND), etc. to handle ESD, etc.
    - Avoid contacting with plastic or vinyl, be careful not to get Styrofoam, etc.
    - Do not touch the components of the circuit board with your hands or conductive devices.

#### 2.2.2. Handling and cleaning

- Do not attempt to disassemble the camera.
- When changing the lens and filter, be careful not to let water or dust enter the camera.
- 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 the cleaners which contain benzene, thinner, or alcohol. Also do not use the spray cleaners.



### 2.2.3. Installation

Avoid installing or storing the camera in the following locations.

- Direct sunlight, or rain or the environment exposed to the eye.
- Environments with flammable or corrosive gases
- Excessive temperature or low temperature environment (recommended ambient temperature: 0 to 45 °C)
- Wet or dusty places
- Places subject to excessive vibration or shock
- Environments exposed to strong electric or magnetic fields
- Do not place the camera at the sun or other strong light sources. Environment
- In case of unfavorable conditions, be sure to inquire about the installation environment before installation.

### 2.2.4. 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.

### 2.2.5. I/O Connector

- When wiring 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 the I /O connector.
- To avoid damaging the connector, do not pull by holding the electric wire, etc.

### 2.2.6. Using a C-Mount adaptor ring

All i-Nova models are compatible with CS-mount lenses. However, if a C-Mount lens adaptor (extension ring) is attached, C-mount lenses can be used.



<Image> 1. i-Nova mount (CS) and extension ring (CS to C)

### 3. Camera introduction



&lt;Image&gt; 2. i-Nova2 Standard Series



&lt;Image&gt; 3. i-Nova2 Compact Series



&lt;Image&gt; 4. i-Nova2-Zoom Series



&lt;Image&gt; 5. i-Nova2-Motor Series

Product Name	Model	Sensor	Zoom range	Built-in Lenses	(Ext.) DC iris	Filter Switcher	YUV
i-Nova2 Standard	iN2-32SC	Sony (IMX265)	-	-	○	○	○
i-Nova2 Standard	iN2-23SC	Sony (IMX392)	-	-	○	○	○
i-Nova2-Zoom	iN2Z-32SC-6Z210	Sony (IMX265)	6-210mm	○	-	○	○
i-Nova2 Compact	iN2-23SC-C	Sony (IMX392)	-	-	-	-	-
i-Nova2-Compact	iN2-23SC-C	On-Semi (AR0234)	-	-	-	-	-
i-Nova2-Motor	iN2M-23SC-6M22	Sony (IMX392)	6-22mm	○	-	○	-
i-Nova2-Motor	iN2M-23SC-5M50	Sony (IMX392)	5-50mm	○	-	○	-
i-Nova2-Motor	iN2M-23OC-6M22	On-Semi (AR0234)	6-22mm	○	-	○	-
i-Nova2-Motor	iN2M-23OC-5M50	On-Semi (AR0234)	5-50mm	○	-	○	-

&lt;Table&gt; 1. i-Nova2 simple specifications

For detailed specifications for each camera and sensor, refer to Chapter 11.

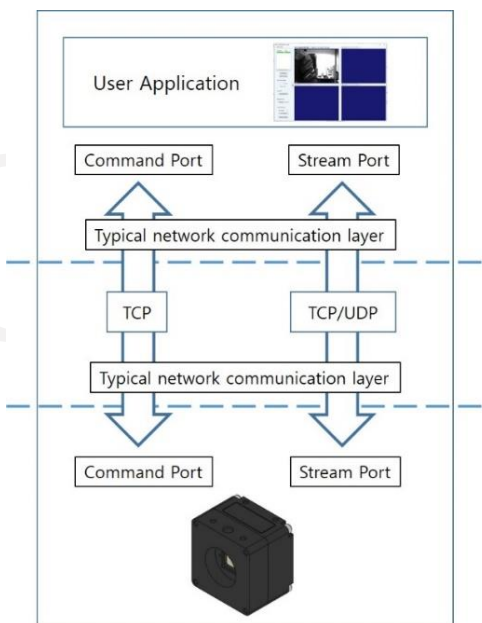
### 3.1. About i-Nova2

i-Nova2 is an Ethernet camera that can be used in various environments and is the optimal solution for various environments such as ITS. In addition to the multi-trigger function, the Bracket Mode, which allows you to set up to 4 separate exposure times and gains for each frame obtained in succession, is basically supported, minimizing misrecognition of rapidly changing environments or specific objects.

i-Nova2 is a 100/1000Mbps interface camera that can transmit 1920 x 1080 resolution color video at 30FPS for JPEG, H.264 and at 15FPS for YUV420 output.

### 3.2. i-Nova2 Software Concept

Using TCP/UDP communication, you can control the camera and acquire video frames using Novitec Protocol. There is no need to install a separate driver and there are no restrictions on the operating system and language being used as long as TCP/IP is available.



<Image> 6. software concept

## 4. Quick start

### 4.1. Support protocol

#### 4.1.1. Novitec protocol

Camera control and video can be acquired using Novitec API protocol, which uses TCP/UDP communication. So, you can use the camera in any language/OS that can use TCP/UDP communication. Samples provided on the SDK are C#/C++/ Python.

#### 4.1.2. RTSP/ONVIF protocol

You can acquire H.264/ MJPEG streaming video using the RTSP/ONVIF protocol.

## 4.2. Windows

### 4.2.1. System Requirements

- Microsoft Windows 7/8/10 (32-bit, 64-bit)
- Any OSes with TCP/IP

The example code written in C++/C# is for Windows. Also, some C++ code for Linux and Python code is available. If your environment is not included in the SDK but supports TCP/IP, you can still communicate with the camera by writing code. Please refer to the API protocol document.

### 4.2.2. Hardware

Your PC must have an Ethernet adaptor to communicate with the camera.

It is recommended to use the latest version of the Ethernet driver.

### 4.2.3. Installing i-Nova2 SDK

- ① Download the SDK and decompress to a desired location. (There is no Installer.)
  - ② Check the file has been successfully decompressed.
- The folders bin, bin64, doc, and example must exist.
- ③ The bin folder includes some executables such as ClientCSharp, ClientMFC.
  - ④ You can check the i-Nova2 API and manual documents in the doc folder.
  - ⑤ You can check the source code of the tools such as ClientCSharp and ClientMFC in the example folder.

### 4.2.4. Camera connection

- i-Nova2 models are shipped with DHCP enabled in default, so it is not a static IP when first connected.
- When you run a viewer program such as ClientCSharp, you can check the IP as shown below.



<Image> 7. C# Client Viewer

If the network does not have a DHCP server, the IP address range of the PC's network adapter must be changed to match the camera in order to connect to the camera. Network connections are described in detail in Chapter 10.

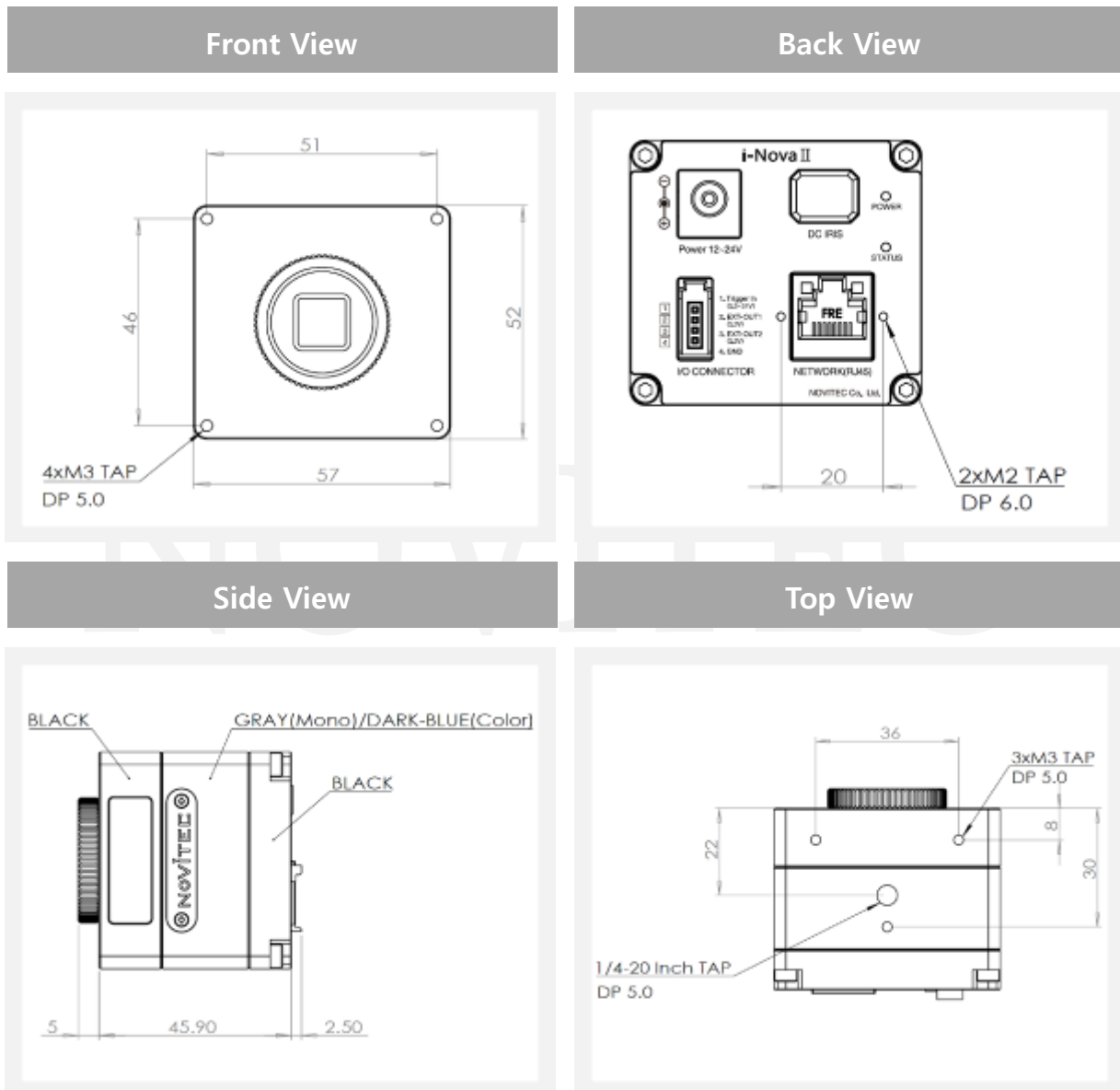
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## 5. Technical data i-Nova2 (Standard / Zoom / Compact / Motor)

### 5.1. Dimensions

#### 5.1.1. i-Nova2 Standard model

i-Nova2 Standard is a basic model with no built-in lenses. You can set any C or C-Mount lenses and DC iris can be used. It also supports PoE (Power over Ethernet).

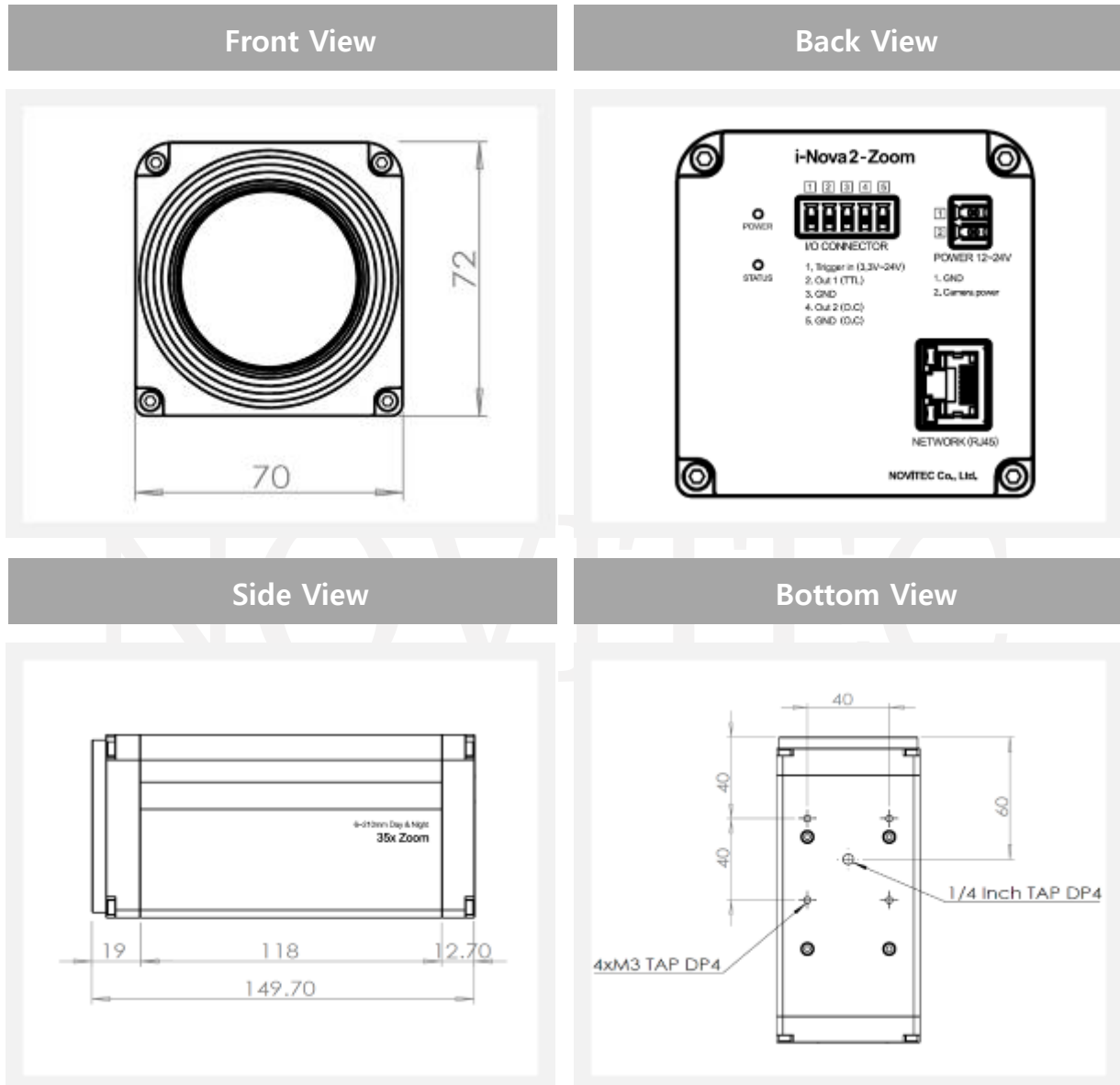


<Image> 8. i-Nova2 Standard dimension view

### 5.1.2. i-Nova2-Zoom model

i-Nova2-Zoom has a built-in motorized lens with zoom, focus and iris control. It has all the other standard functions as in i-Nova2 models.

The Zoom, Focus and Iris are controllable remotely with our API.

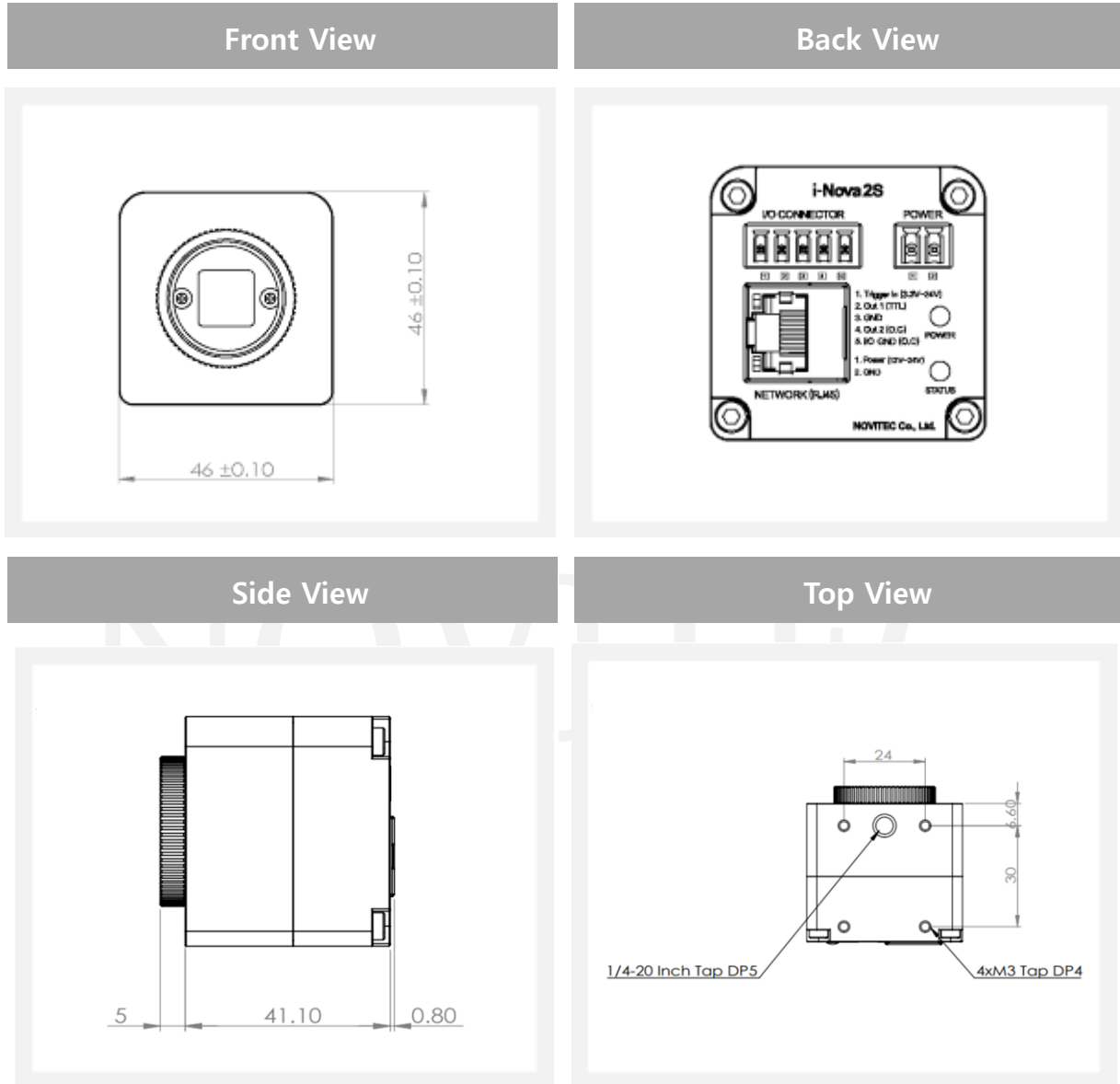


<Image> 9. i-Nova2-Zoom dimension view

Power or I/O connectors are standard. Please be sure to check the model and the other one.

### 5.1.3. i-Nova2 Compact model(Sony Sensor)

i-Nova2 Compact does not include an IR-Cut Filter, it is the smallest among i-Nova2 models and contains essential functions among the functions that users need.

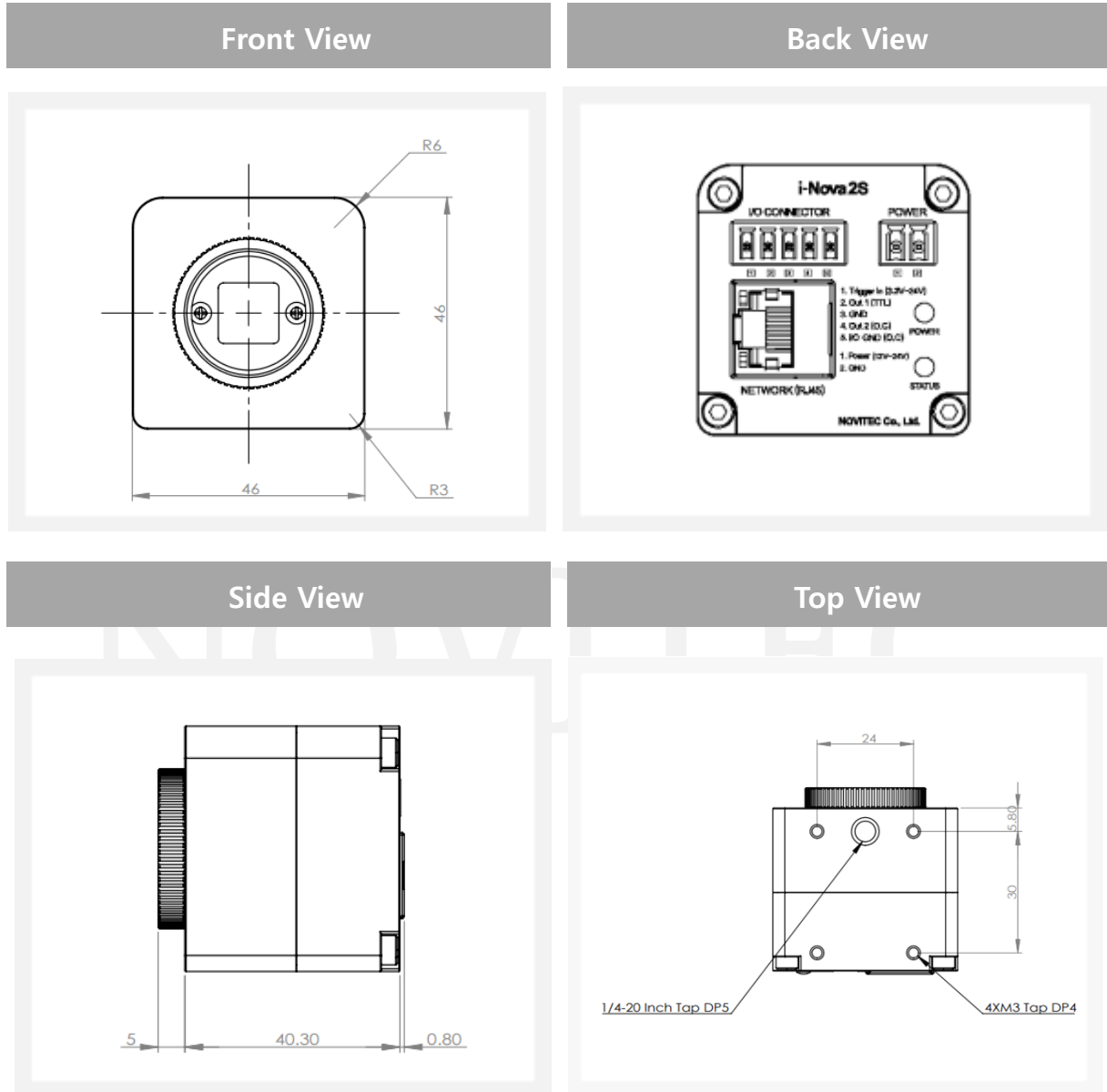


<Image> 10. i-Nova2 Compact (Sony Sensor) dimension view



### 5.1.4. Nova2 Compact model (On-Semi Sensor)

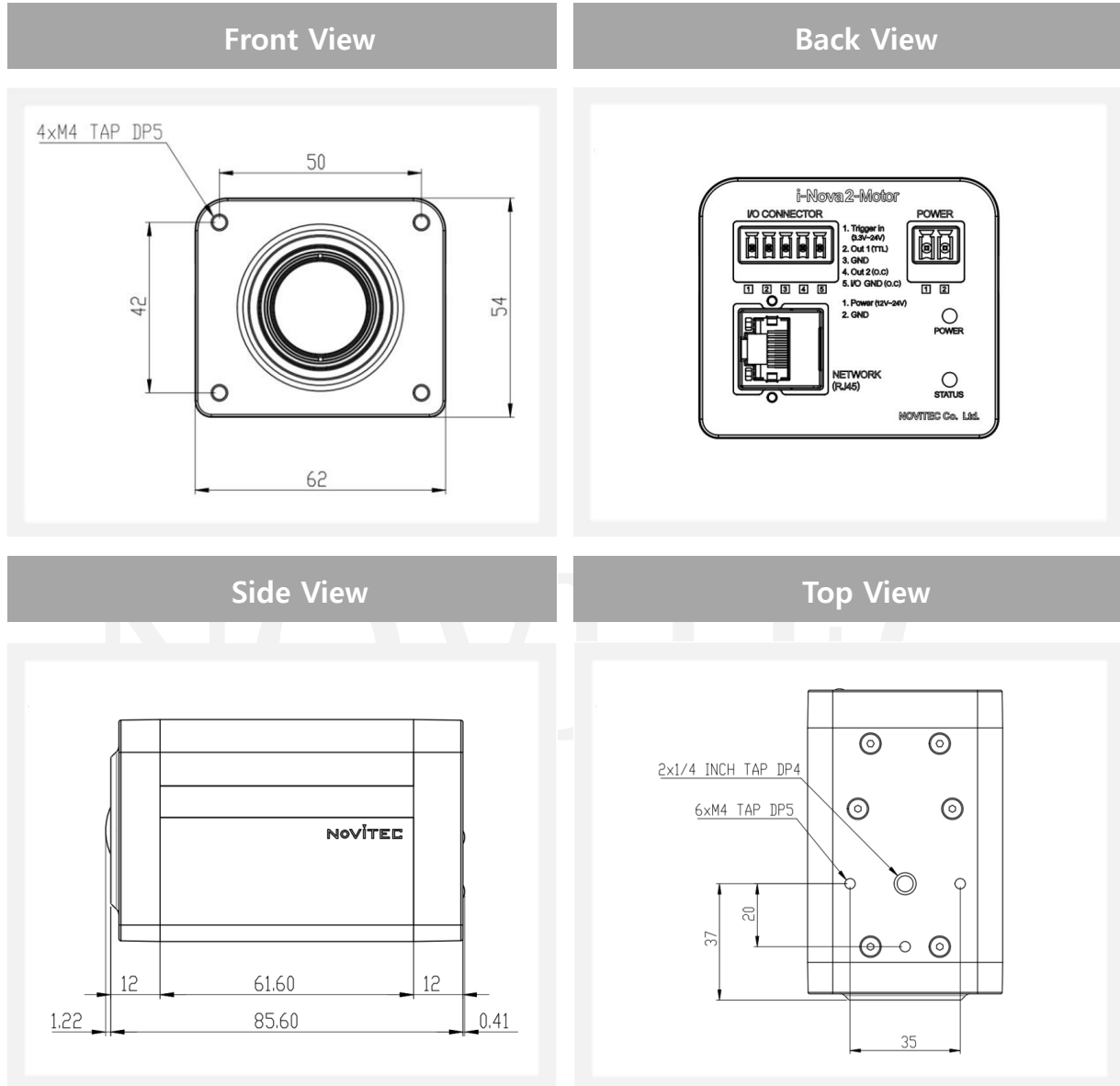
i-Nova2 Compact does not include an IR-Cut Filter, it is the smallest among i-Nova2 models and contains essential functions among the functions that users need.



<Image> 11. i-Nova2 Compact (On-Semi Sensor) dimension view

### 5.1.5. i-Nova2-Motor model (Focal length: 6 ~ 22 mm)

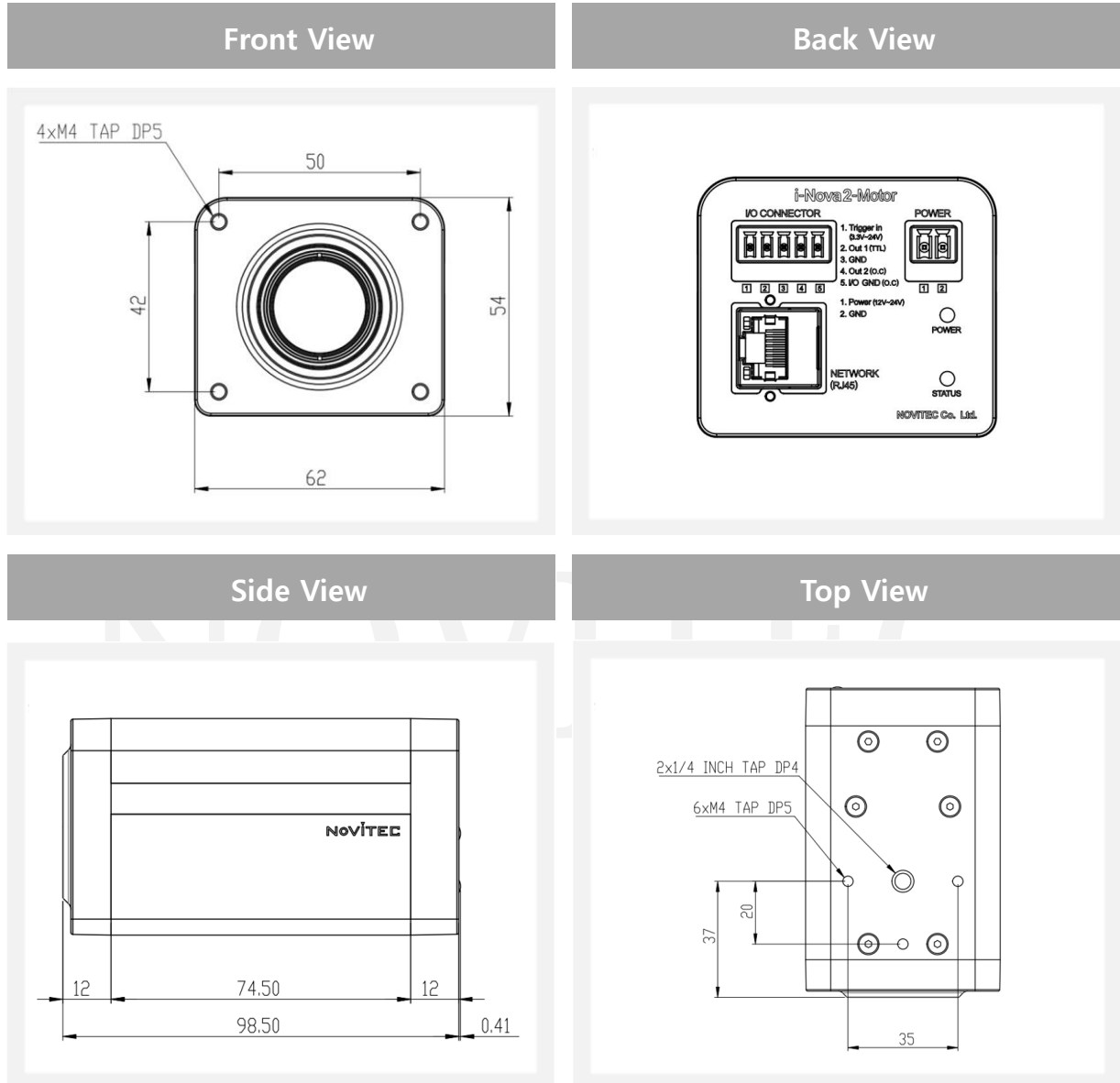
The i-Nova2-Motor model has a built-in motorized zoom lens, so there is no need to manually handling the lens when adjusting the zoom and focus.



<Image> 12. i-Nova2-Motor (6~22) dimension view

### 5.1.6. i-Nova2-Motor model (Focal length: 5 ~ 50 mm)

This model has the same specification with the above model except the range of the zoom focal length is different and it has the different camera dimensions.



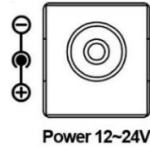
<Image> 13. i-Nova2-Motor (5~50) dimension view

## 5.2. Connectors

### 5.2.1. i-Nova2 Standard model

#### 5.2.1.1. Power connector

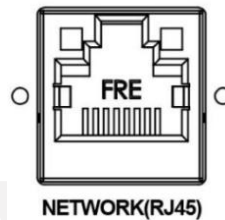
Typical 12 ~ 24 V, 1-Pin DC Jack (inner 2.1mm, outer 5.5mm) is used.



<Image> 14. 1Pin DC Jack connector

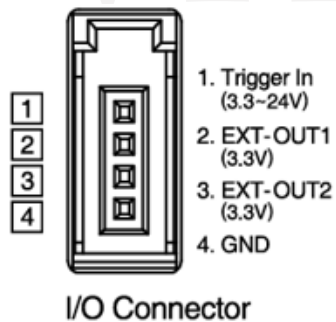
#### 5.2.1.2. Network connector

Supports 100/1000 M bps, using a common RJ45 connector.



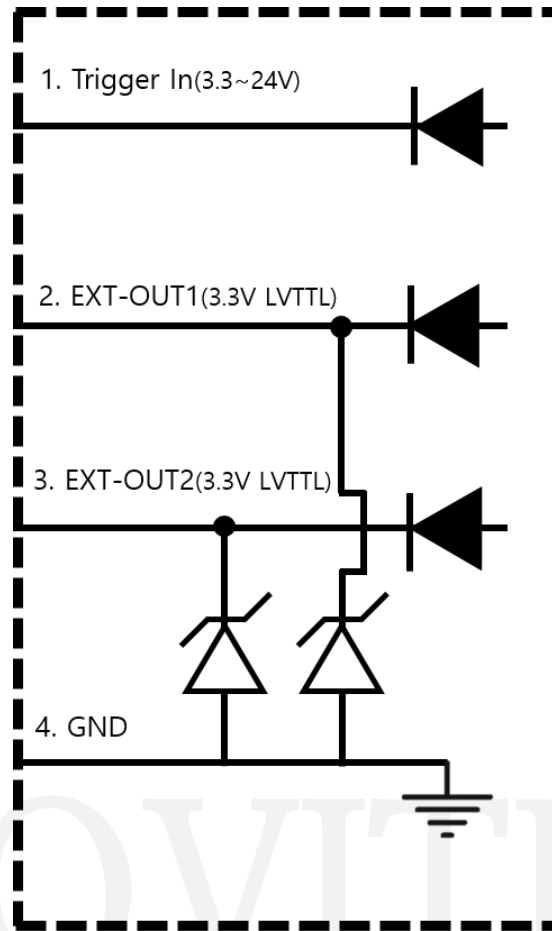
<Image> 15. Network connector (RJ45 type)

#### 5.2.1.3. GPIO connector



<Image> 16. 4Pin mini clamp socket connector

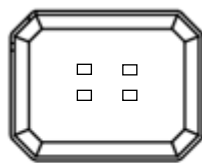
GPIO internal circuit is as below, Strobe signal output port can be changed using Novitec protocol in i-Nova viewer. (Default is EXT-OUT1 port)



<Image> 17. i-Nova2 standard GPIO circuit

#### 5.2.1.4. DC iris connector

Common DC iris connector and is controlled by an OP AMP output.



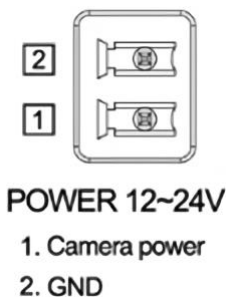
**DC IRIS**

<Image> 18. DC iris connector

### 5.2.2. i-Nova2-Zoom, Compact, Motor model

#### 5.2.2.1. Power connector

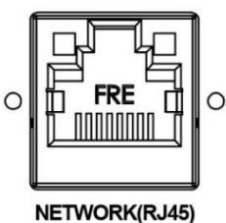
The above models are powered by 12 ~ 24 V DC, with a 2-Pin Screw terminal block.



<Image> 19. Power connector

#### 5.2.2.2. Network connector

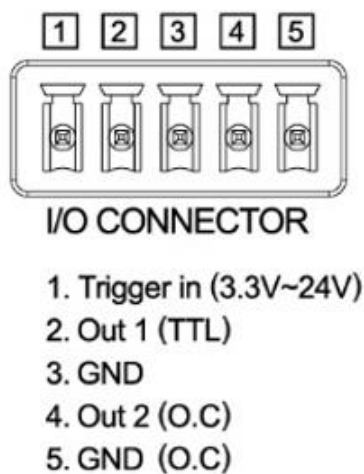
RJ45 connector and supports 100/1000 Mbps.



<Image> 20. Network connector (RJ45 type)

#### 5.2.2.3. GPIO connector

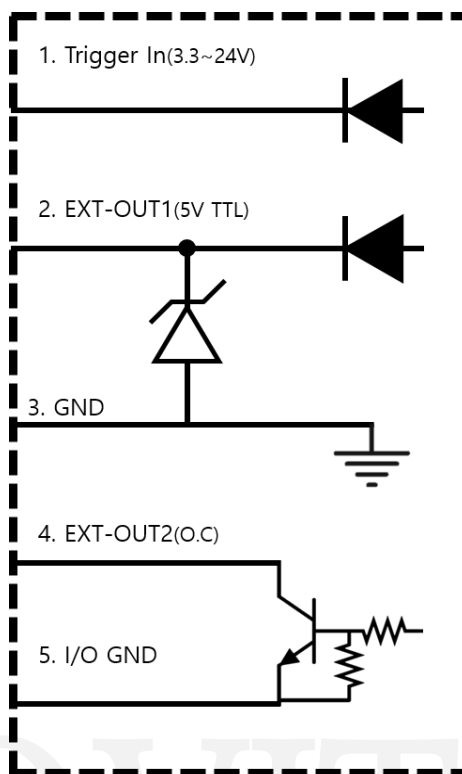
Trigger IN, Strobe OUT (light), etc. on the back of the camera There is a GPIO port (5Pin Screw terminal block) for control. Out port can be controlled separately using Novitec protocol.



<Image> 21. GPIO connector

GPIO internal circuit is as shown below, Strobe signal output port can be changed using

Novitec protocol. (Default is EXT-OUT1 TTL port)



<Image> 22. GPIO circuit

Port 2 and 3 are for TTL signal. If you are using a light system with TTL flash signal input, you can use these ports.

To drive the signal with open collector, you need to use ports 4 and 5. In this case, to clearly indicate the HIGH signal and the LOW signal, a pull-up resistor must be used. Please refer to the following for the pull-up resistor value.

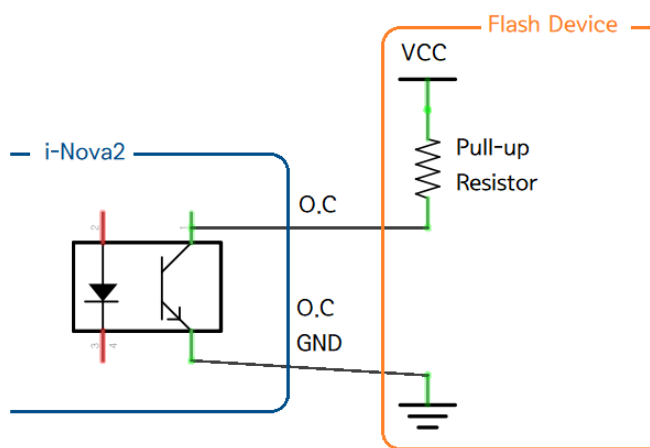
iN2-23SC-C				
High (V)	Low(V)	Rising(tr) (us)	Falling(tf) (us)	Pull-up Resistor (kΩ)
5	0.65	18	0.5	2.2
12	0.88	18	0.72	3.6
24	One	20	One	4.7

iN2M-23SC-6M22				
High (V)	Low(V)	Rising(tr) (us)	Falling(tf) (us)	Pull-up Resistor (kΩ)
5	0.65	24	0.6	2.2

12	0.88	26	0.86	3.6
24	One	22	1.16	4.7

<Table> 2. Pull-up Resistor Table

Also, when using an open collector, please be noted that the signal is inverted. For example, when the GPIO output is high level, the output is connected to ground, so the output becomes low. Conversely, if the GPIO output is low level, the circuit is cut, and the output becomes high because of the pull-up resistor.



<Image> 23. Open Collector

## 6. Filter

Filters out light in some wavelength bands that are input to the sensor, we are dealing with various types of filters for various effects, such as the use of only receiving light in a specific wavelength band.

### 6.1. IR cut filter

Image sensors have sensitivity to some invisible light (near infrared light) to humans thus colors may look different. To compensate for this, a filter that filters out light in the infrared region is used. In the case of i-Nova2 Standard, i-Nova2-Zoom, and i-Nova2-Motor models, a filter switcher is installed to switch between the IR-cut filter and bare glass.

### 6.2. Band pass filter

For acquiring the image of the object to be photographed by highlighting it from the sensor, by irradiating illumination of a specific wavelength band, this filter is used for purposes such as acquiring images in the corresponding wavelength band.

i-Nova2-Compact has a model with a 735nm band pass filter installed. It can also use other band-pass filters.



For other accessories, please contact sales@novitec.co.kr.

## 7. Using the Viewer

### 7.1. C Sharp Client

Here we explain how to use our C# viewer. Please note that the C++/MFC viewer also follows the same UI configuration as C#.

#### 7.1.1. Main Window



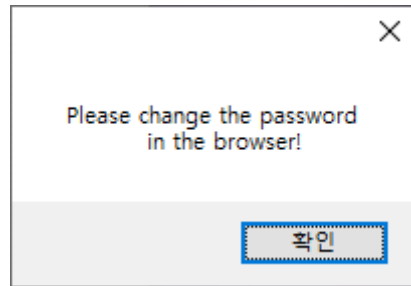
<Image> 24. C# Viewer in SDK

#### 7.1.1.1. IP Address Check

##### <Image> 23. C # Viewer in SDK ①

The IP address of i-Nova can be found in the network and the network address information of the PC.

- For security reasons, cameras that have not changed the default password will have a red background color in this list and cannot use Connect and Stream. Please change your password in your browser.



<Image> 25. Default password error pop up

### 7.1.1.2. Connection Information

#### <Image> 23. C # Viewer in SDK ②

The i-Nova selected from the list or entered manually IP is displayed, UI related to camera connection is included.

- Connect
  - Connect to the selected i-Nova. When connected normally, the background color changes to green.
- Browser
  - Open the browser page of the selected i-Nova camera.

### 7.1.1.3. Camera Control

#### <Image> 23. C # Viewer in SDK ③

Displays the control of the connected camera or the video stream of the selected camera on the screen.

- Camera Control
  - Opens the dialog menu related to camera motion control.
  - The command port must be properly connected.
- JPEG Stream – TCP/UDP
  - Displays the JPEG image stream acquired using TCP/UDP communication on the screen.
  - Please refer to the API Manual for details on the difference between TCP/UDP.

### 7.1.1.4. Image Data Information

#### <Image> 23. C # Viewer in SDK ④

Information about the video stream displayed on the screen is displayed.

- TCP Stream

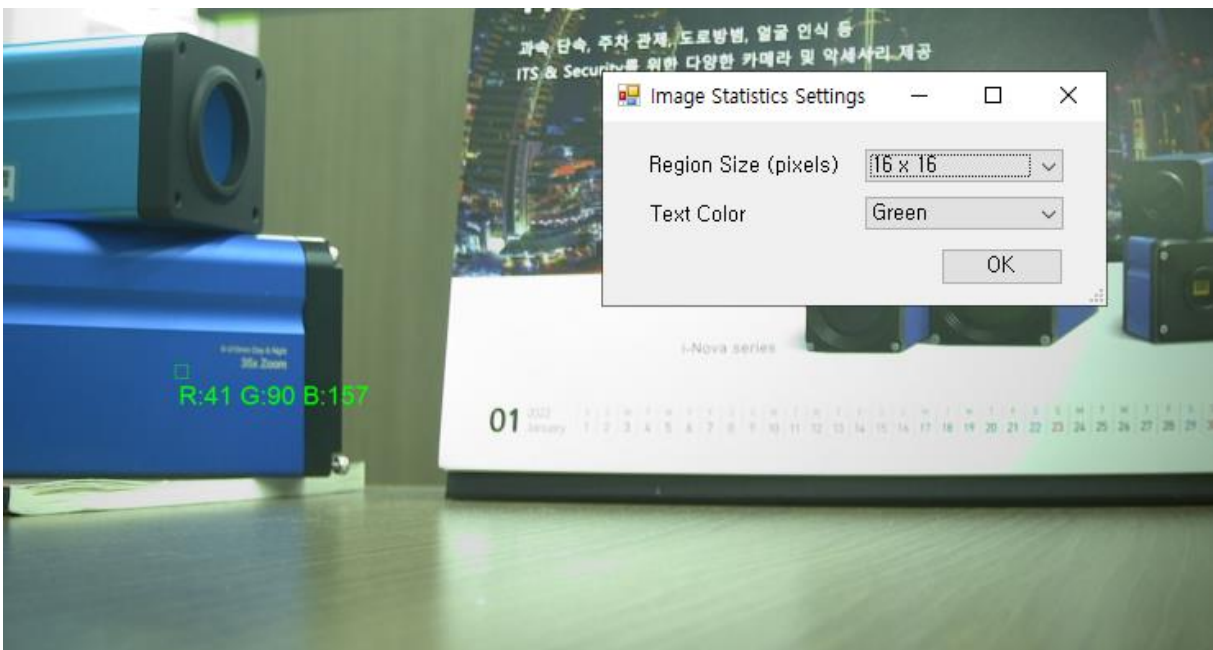
- Frame rate, Image size, bitrate
- UDP Stream
  - Frame rate, bitrate, Frame count, H/W Trigger count, Error count, Image size, Current Exposure, Current Gain
- Displays the serial number of the camera and the currently applied firmware version.

#### 7.1.1.5. Other Controls

<Image> 23. C # Viewer in SDK ⑤

Other helpful features are located here.

- Show Intensity / Setting



<Image> 26. Show Intensity and Setting

- You can see the color information on the clicked part in the video.
  - ◆ The size of pixels to get the information, letter the color can be changed by pressing the setting button.

■ Focus helper / Setting



<Image> 27. Focus helper and setting

- Information about the area in focus of the image is expressed as a graph.
- The green bar indicates the current focus of that rectangular area.
- A higher height means a better fit.
- The red bar indicates how far away from the previous focus, it disappears after a certain amount of time.
  - ◆ The area used for focus calculation can be changed by pressing the setting button.
  - ◆ The focus is relative to the environment. For reference only.

- Show ALC Area



<Image> 28. Show ALC Area

- A Displays the X, Y, Width, and Height areas set by LC Area on the screen.
- Fit to screen
  - Resize the image to fit the viewer or display it at its original size.
- Save image
  - Save the last acquired image.
  - The storage location is saved in My Pictures/ i-Nova\_(i-Nova IP address ) folder.

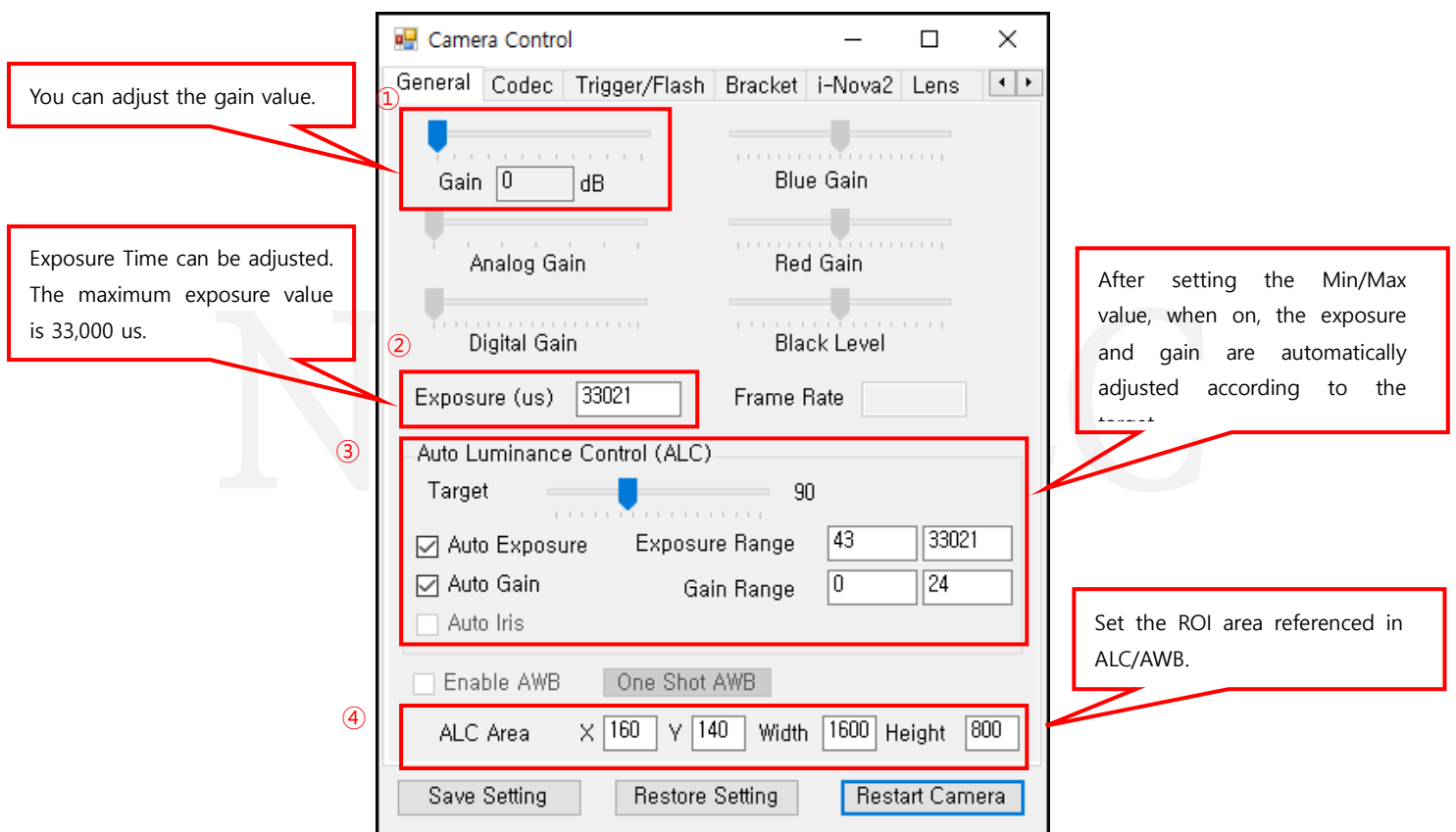
### 7.1.2. Camera Control screen

You can control i-Nova's detailed settings which are categorized to General, Codec, Trigger/Flash, Bracket, Register, and special functions for each model. The settings can be saved to the camera with the Save Setting button so that they can be used even after rebooting.

When setting by entering a number, after you finish typing, you must **press Enter** to send the command normally.

#### 7.1.2.1. General Tab

You can change general video settings, adjust brightness, exposure time, and set ALC on/off.



<Image> 29. Camera General control tab

- Brightness control (Gain -amplification)

<Image> 28. Camera General control tab ①

- Gain: You can adjust the brightness by adjusting the Gain.
- If the Gain value is set too high, the noise is also amplified, so an appropriate value should be used.

- Exposure time adjustment

<Image> 28. Camera General control tab ②

- Exposure Time: You can adjust the exposure time. It can be set by changing the value used by the

sensor.

The unit is microseconds.

- Adjust Auto

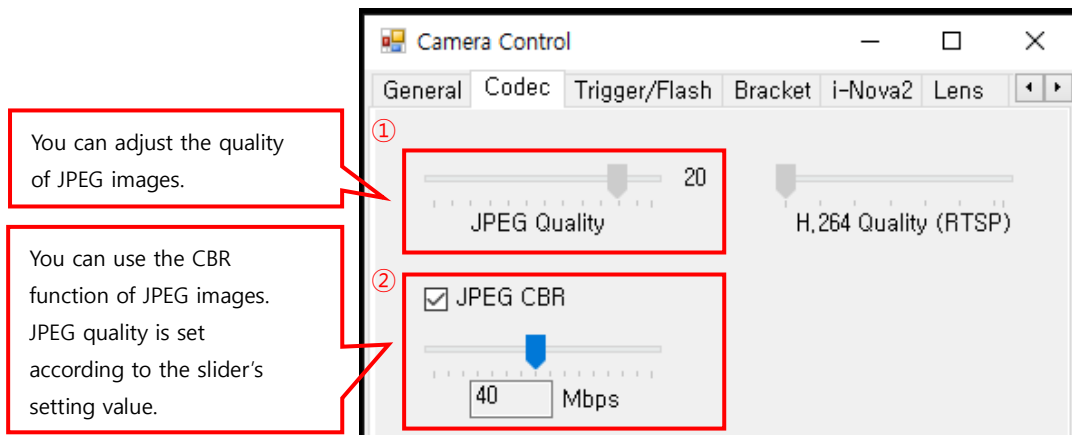
Luminance Control (ALC) <Image> **28. Camera General control tab** ③

This function automatically adjusts the image brightness (Exposure, Gain).

- AEC (Exposure): This is an automatic exposure setting function. It is automatically adjusted according to the target value between the minimum and maximum values set by the user.  
The set value  
can be applied by changing the value actually used by the sensor that is close to the value set by the user.
  - AGC (Gain): This is an automatic gain setting function. It is automatically adjusted according to the target value between the minimum and maximum values set by the user.
  - Target: Auto Set the image brightness target value to be set. According to the set target brightness value Exposure and Gain are automatically adjusted  
It is the value before Gamma is applied, so it may be brighter than the actual brightness value.
- ALC Area  
<Image> **28. Camera General control tab** ④  
This specifies the ROI area to which LC is applied.

### 7.1.2.2. Code Tab

You can apply the quality setting or CBR option of the video.



<Image> 30. Codec control tab

- JPEG Quality

<Image> 29. codec \_ See control tab ①

You can adjust the quality of JPEG images.

The higher the setting value, the clearer the image can be obtained. The size of the image also increases accordingly.

If the size of the image is exceeded, the frame rate will be lower than the set frame rate and frame drop will occur. Therefore, please adjust the JPEG quality appropriately.

- JPEG CBR (Constant Bitrate)

<Image> 29. codec \_ See control tab ②

JPEG bit rate. If you adjust the slider after checking, you can stabilize the FPS by setting the output bandwidth that matches the value and correcting the JPEG Quality value.

When CBR is On, the JPEG Quality slider bar is disabled and not used.



### 7.1.2.3. Trigger / Flash Tab

Supports 3 types of image acquisition mode according to external trigger signal.

Supports Strobe Light On/Off Mode.

It is a SW Trigger that can be tested by replacing HW

Controls which I/O can be used according to user purpose.

Set the number of images to be acquired per external trigger signal. On models that support it, you can set Trigger Signal Debounce (chattering control).

You can set Flash Signal Debounce.

<Image> 31. Trigger/Flash control tab

Trigger mode, which can acquire images in various forms according to the trigger signal sent from the outside, and Flash Mode to control the strobe lighting according to the exposure are provided. You can use a Software Trigger to replace the external trigger signal.

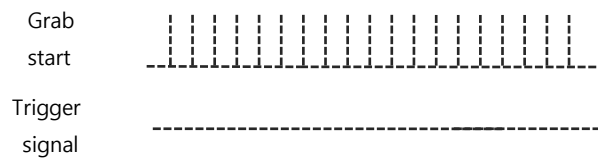
#### ■ Trigger mode

##### <Image> 30. See Trigger/Flash control tab ①

Trigger Mode is a mode that acquires an image according to an external trigger signal. i-Nova supports 3 modes: Free Run, One Shot Trigger, and Pseudo Trigger.

#### ■ Free run mode

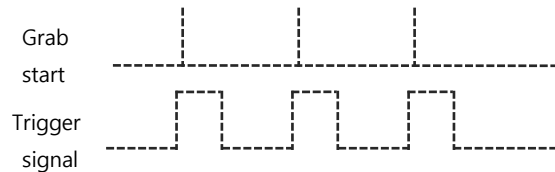
Free running mode is a mode that continuously acquires images according to the frame rate set by the user. In this state, there is no need to separately control the startup.



<image> 32. Frame grab on free-run

■ One shot Trigger mode

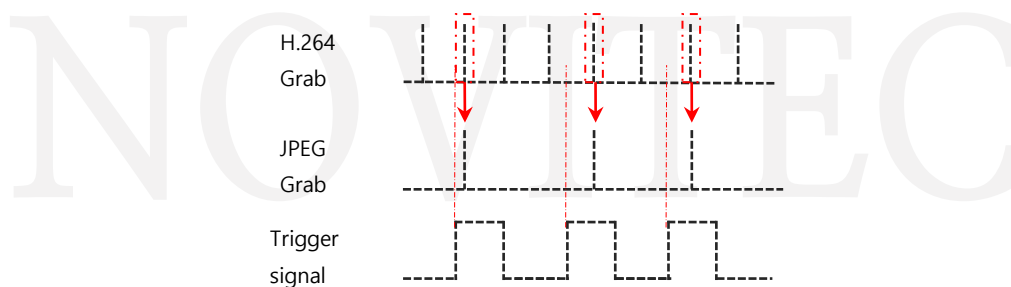
Acquires one image when the trigger signal is input. The maximum input rate is 29 times per second.



<image> 33. Frame grab on normal trigger mode

■ Pseudo Trigger mode

While streaming H.264 continuously, you can grab a JPEG image with delay after an external trigger signal.



<image> 34. Frame grab on pseudo trigger mode with H.264

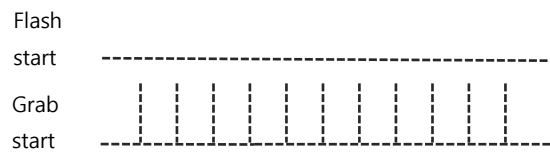
■ Flash mode

<Image> 30. See Trigger/Flash control tab ②

i-Nova supports three flash modes - Flash Off, On, and Auto. Also, you can adjust the timing by adjusting the On/Off delay.

■ Flash Off mode

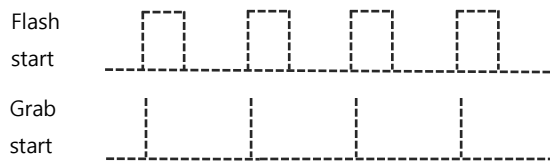
- ◆ This mode turns off the lighting operation. Even when an image is acquired, the lighting does not work.



<Image> 35. Strobe signal - Flash Off

■ Flash On mode

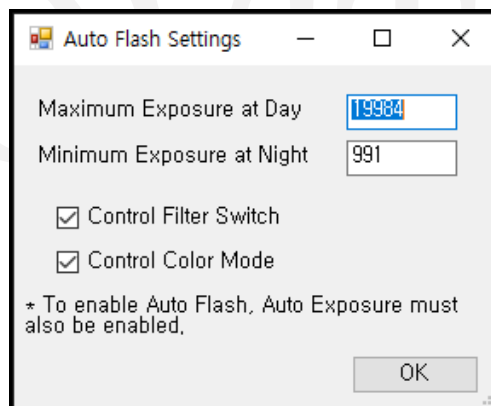
- ◆ When the camera acquires an image and exposure starts, the flash signal turns on.



<Image> 36. Strobe signal - Flash On

■ Auto Flash mode

- ◆ Auto flash mode allows you to automatically control Flash, (if installed) Filter Switcher and Color mode (Mono vs Color) based on the value of the current exposure. By pressing "Setting" button, you can set the auto flash mode settings as below.



<Image> 37. Auto flash settings

- ◆ Maximum Exposure at Day: If the exposure value becomes larger than this, the camera enters into Night mode and flash is enabled.

Minimum Exposure at Night: If the exposure value becomes shorter than this value, the camera enters into Day mode and flash is disabled.

Control Filter Switch: If checked, the camera turns off the filter in Night mode

Control Color Mode: If checked, the camera turns into Monochrome mode in Night mode.

Additional **information about Auto Flash**, see [Novitec You can check it at the technical support cafe.](#)

■ Flash On Delay

- ◆ You can adjust the delay time from acquiring the image grab signal to Flash On.

- Software trigger

<Image> 30. See Trigger/Flash control tab ③

You can send a Software Trigger Signal to the i -Nova. It can be used for testing by replacing the external trigger signal.

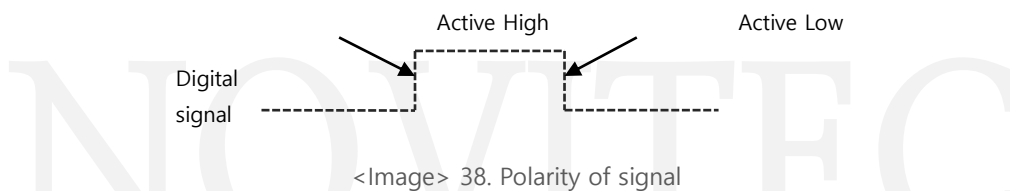
- GPIO Output

<Image> 30. See Trigger/Flash control tab ④

In Standard models, approx. 3.3 V at high setting Signal is output. For Compact, Motor (Sony, On-Semi), and Zoom models, when set to High, Approx. 5.0 V Signal is output.

- Trigger / Flash Polarity

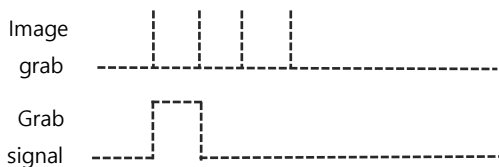
<Image> 30. See Trigger/Flash control tab ⑤, ⑥



Active High setting is a condition that operates when the current signal rises, and Active Low setting is a condition that operates when the current signal decreases. Active High means Rising Edge as shown in the figure, and Active Low means Falling Edge.

- Image count per trigger

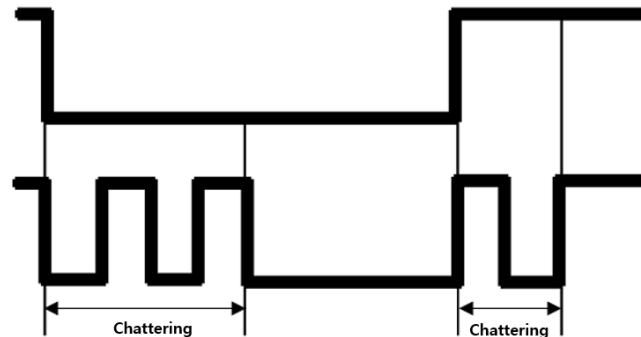
If the Image count per trigger value is set, multiple images are acquired as many as the set value when a trigger signal is input in One Shot Trigger Mode. For example, if the Image count per trigger value is 4 When a signal is received in One Shot Trigger Mode, the image is acquired 4 times.



This setting cannot be used simultaneously with Bracket Mode.

- Minimum trigger pulse

Chattering: A phenomenon in which the contact point is repeatedly attached and dropped within a very short time due to mechanical vibration when the contact point of a switch in the electronic circuit is attached or detached.



<image> 40. Trigger Chattering

To prevent this with software, set Minimum Active, Inactive time to ignore very short pulses which can be noises.

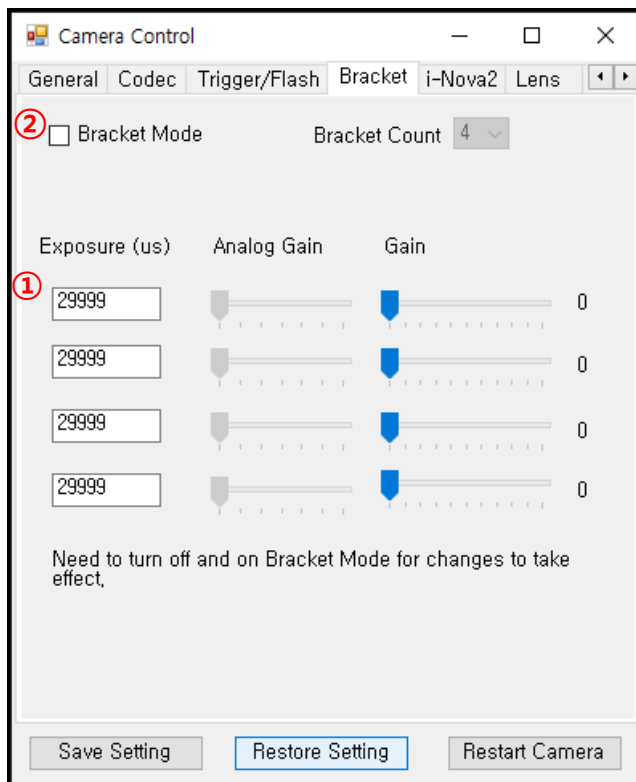
- Active: Signals shorter than the specified length are ignored.
  - ex) When Active is set to 50 ms, the length of the trigger signal must be 50 ms or longer to be recognized as a trigger signal.

- Inactive: Signals within the specified time interval are ignored.
  - ex) When Inactive is set to 50 ms, the minimum signal interval is set to 50 ms, the next signal of the previously received signal must be input after at least 50ms to be recognized as a trigger signal.

Active and Inactive time vary depending on the environment, you can set it up according to your environment through testing. If it does not work as desired, check if the Trigger Polarity setting is correct.

**iN2-32SC and iN2Z-32SC-6Z210 Models does not support Minimum Trigger pulse settings.**

### 7.1.2.4. Bracket Tab



<Image> 41. Bracket mode control tab

When enabled, Bracket mode allows you to acquire multiple images (up to 4), each having different exposure and gain settings.

This is an operation method provided as an additional function in One-Shot trigger mode, and can be used only when Image per trigger is set to 1 in One-Shot trigger mode.

This is a function that supports to acquire images of exposure and gain of 1 to 4 different settings set when inputting an external signal.

(i-Nova2 for Sony sensor models, all Gain must be set the same.)

■ Bracket mode

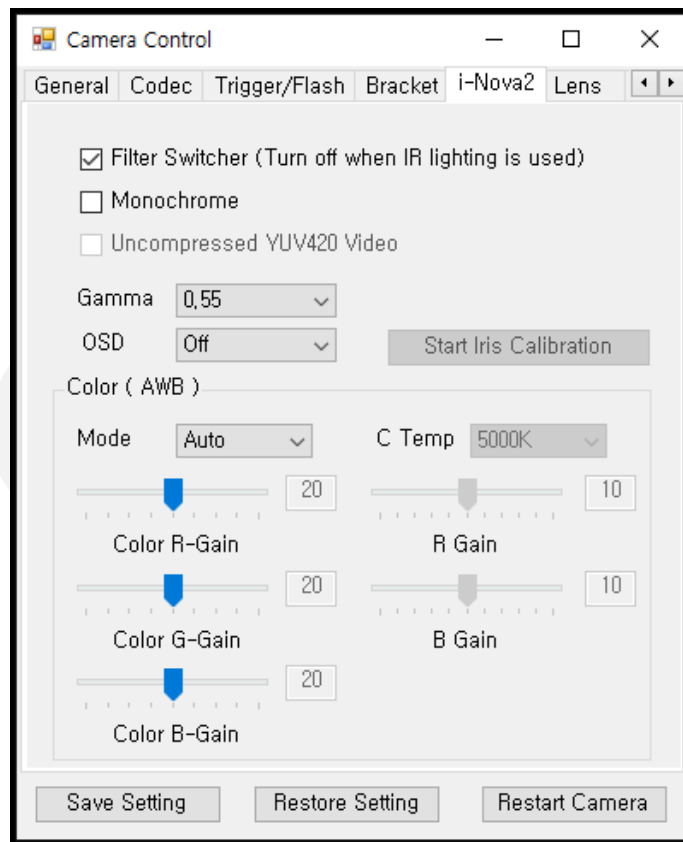
Bracket Mode, you can acquire up to 4 images with preset Exposure, Analog Gain, and Digital Gain values applied in order. Image acquisition works as follows.



<Image> 42. One shot trigger using bracket mode

- The number of bracket count is fixed to 4. For Motor On-Semi model, 3 or 4 can be selected.
- There is a setting in the middle where you can adjust the brightness, and depending on that setting, it is applied to the image individually.
- Check Bracket Mode at the top left to apply. You can check the video using Software Trigger.
- Changing the bracket count takes effect immediately, but if you change the detailed setting values (Exposure, Gain), you need to uncheck and check Bracket Mode again to apply the changes.

#### 7.1.2.5. i-Nova2 tab



<Image> 43. i-Nova2 control tab

- Filter switcher
  - The front end of the i-Nova2 lens change the Filter On/Off setting.
  - Available for all models except i-Nova2 Compact Model.**
- Monochrome
  - Color / Mono image settings.
- Uncompressed YUV420 Video
  - Change to transmit uncompressed video data in YUV420 format instead of JPEG. When using the video

format, UDP Stream must be used due to bandwidth limitations. Frames may be dropped depending on the network environment and client PC specifications.

**Only i-Nova2 Standard, Zoom Model using Sony IMX265 Sensor is available.**

■ Gamma

Gamma correction.

■ OSD & Iris Calibration

- OSD (On-Screen Display): You can set to overlay information such as frame count, Date/Time, JPEG, H.264 on the screen. When using custom mode, the user can output the desired character.
- Iris Calibration: If you are using a motorized lens, you can perform a calibration for Iris adjustment. After starting the setup, you need to leave the camera and subject still for about 2 minutes to proceed normally.

**Available when DC Iris is attached to the i-Nova2 Standard Model.**

■ Color control

The page where you can adjust the camera's White Balance, and you can set it to Auto, AutoExt Preset, or Manual using the AWB option located at the top.

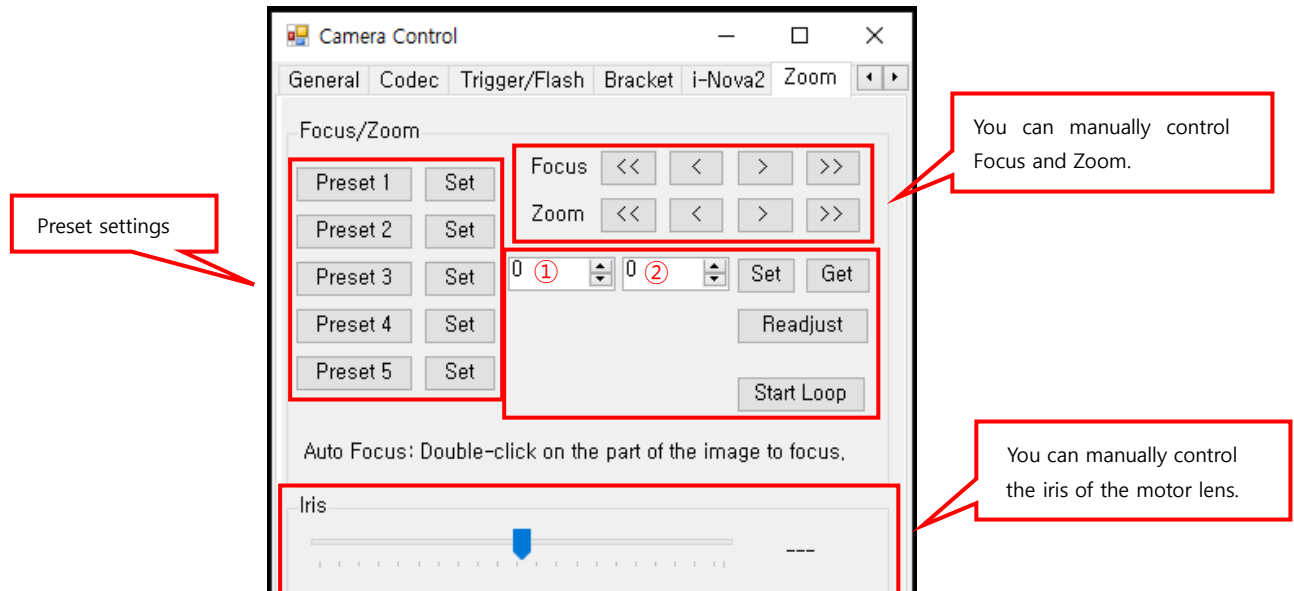
Color R, G, B-Gain at the top is the setting to increase the color intensity regardless of AUTO or MANUAL.

- Auto: You can set the White Balance value automatically and keep the setting value.
- AutoExt: Increases the range for numerical correction with Auto.
- Preset: This is a setting that automatically sets the White Balance value once and keeps the setting value, a mixture of Auto and Manual in half. As the current viewer only supports mode change, 9.2.1. Color explains it in detail.
- Manual: Regardless of the current situation, you can adjust the white balance manually by setting the preset color temperature (C Temp) and additional R and B gains. (The same settings can be made on the web page as well.)



### 7.1.2.6. i-Nova2-Zoom

This menu is active only on the i-Nova2-Zoom model, and menus related to Zoom operation are gathered.



<Image> 44. Zoom control tab

#### ■ Focus & Zoom Preset

You can save the Focus&Zoom value set by the user. If you save the set value by pressing the Set button, it persists even after restarting the camera. The setting value is saved as zoom (serial number) conf file in the same location as the viewer.

One of the preset 1~5 buttons and press the Start Loop button to automatically cycle through settings 1 to 5 repeatedly.

#### ■ Focus setting

Adjusts the focus of the lens attached to the i-Nova2-Motor. Press left to close towards, press right to focus farther away.

#### ■ Zoom setting

Adjusts the zoom of the lens mounted on the i-Nova2-Motor. Press left to zoom wider (closer), right to zoom farther.

#### ■ Set & Get

① - Focus / ② - Zoom

Set : You can set the values of Zoom and Focus to the desired values.

Get: You can check the current Zoom and Focus position.

#### ■ Zoom setting

Readjust: It moves to the last saved Focus and Zoom positions.

The function may take up to 1 minute, Until the movement is completed, focus and zoom control should not be used.

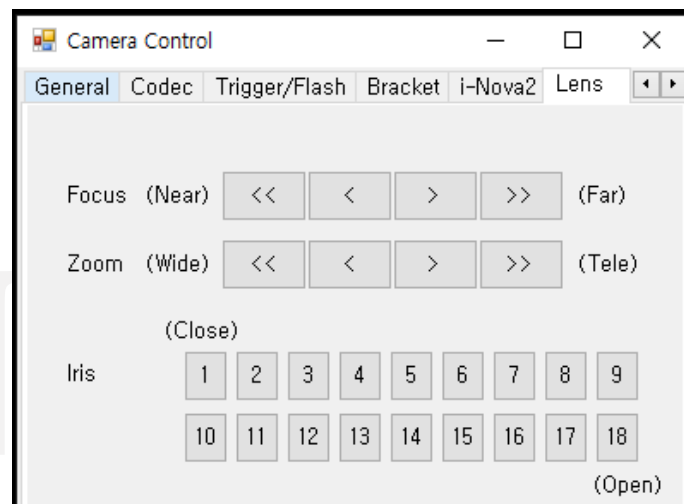
Start Loop: The entire operation is repeated from Preset 1 to 5 at a cycle of 35 seconds.

#### ■ Iris control

A slider that allows you to adjust the aperture of the lens, from 0 to 800.

#### 7.1.2.7. i-Nova2-Motor

This menu is activated only on the i-Nova2-Motor model. Menus related to lens operation are grouped together.



<Image> 45. Lens control tab

#### ■ Focus setting

Adjusts the focus of the lens attached to the Nova2 Motor. Press left to close towards, press right to focus farther away.

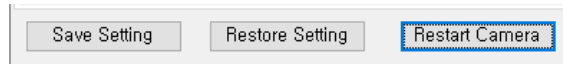
#### ■ Zoom setting

Adjusts the zoom of the lens mounted on the Nova2 Motor. Press left to zoom wider (closer), right to zoom farther.

#### ■ Iris setting

Adjusts the zoom of the lens mounted on the Nova2 Motor. The degree of opening and closing of the iris is controlled through the number buttons in 18 steps, "1" means fully closed and "18" means fully open.

### 7.1.2.8. General Button



<Image> 46. General Button

- Save setting

Saves the set camera settings as default settings, after that, it is maintained even after a camera reboot.

- Restore setting

Initializes the camera settings to the factory defaults, and all settings including the IP address are initialized.

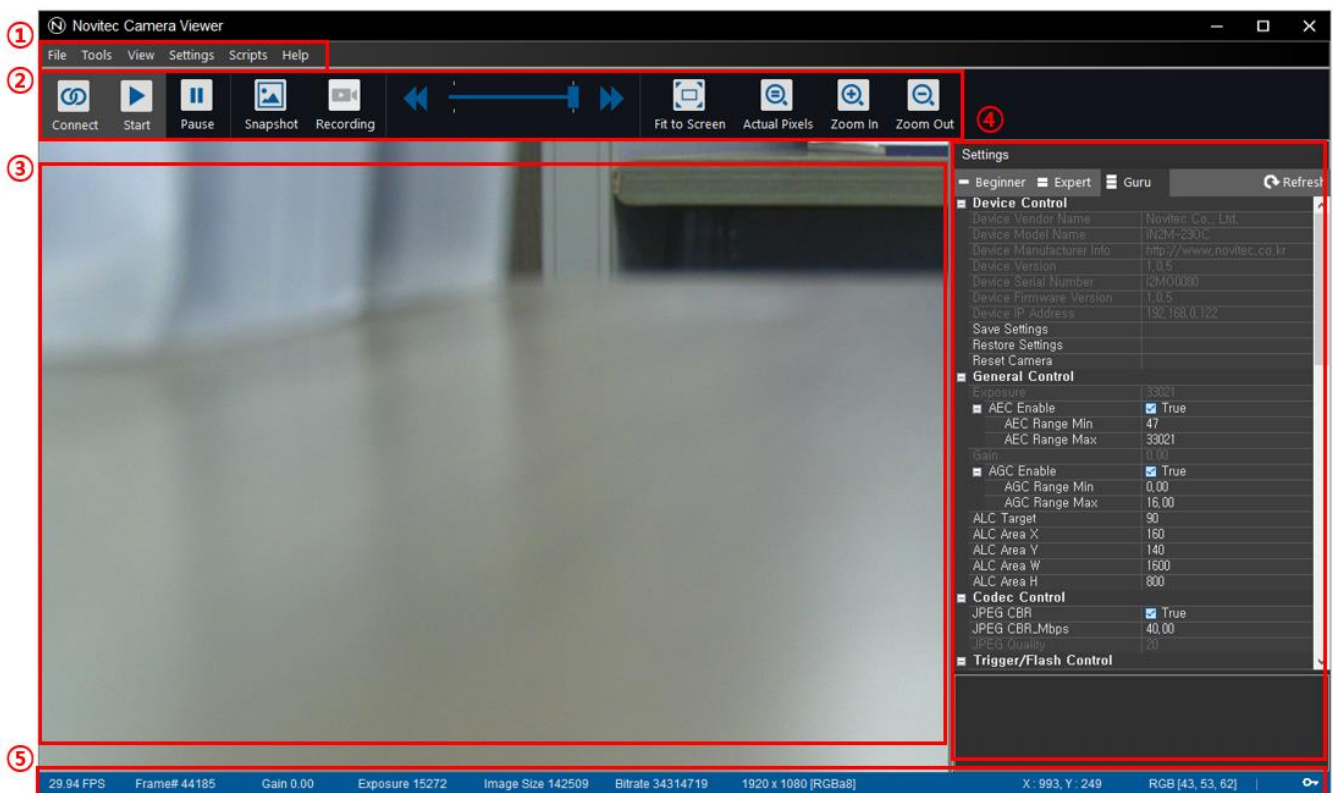
- Restart camera

Reboot the camera.

## 7.2. Novitec Camera Viewer

For i-Nova2, it is recommended to use Novitec SDK 1.7.3 Version or later.

### 7.2.1. Main UI



<Image> 47. Novitec Camera Viewer main UI

## 7.2.2. Detailed Configuration

### 7.2.2.1. Menu

<Image> 47. Novitec Camera Viewer main UI in ①

Name	Description
File	Connect camera, screenshot, exit program
Tools	Overlay text, histogram, firmware update, viewer settings
View	Image display size, such as Zoom-In/Out, console window
Settings	Camera Setting, ALC Area setting
Scripts	Loading and activating scripts
Help	Displaying Program Information

<Table> 3. Novitec Camera Viewer Menu list

### 7.2.2.2. Tool bar

<Image> 47. Novitec Camera Viewer main UI in ②

Name	Description
Connect	Current network discovered camera list output and camera
Start	Play the image of the connected camera.
Pause	Pause the image being played.
Snapshot	Save the current frame in jpeg format.
Fit to Screen	Change the image size to the ③ size.
Actual Pixels	It is shown as the actual image size.
Zoom in/out	Digital Zoom

<Table> 4. Novitec Camera Viewer tool bar

### 7.2.2.3. Image Display

<Image> 47. Novitec Camera Viewer main UI in ③

When you press Start in the tool bar, the image is displayed.

### 7.2.2.4. Settings

<Image> 47. Novitec Camera Viewer main UI in ④

You can change the settings for the camera.

### 7.2.2.5. Status bar

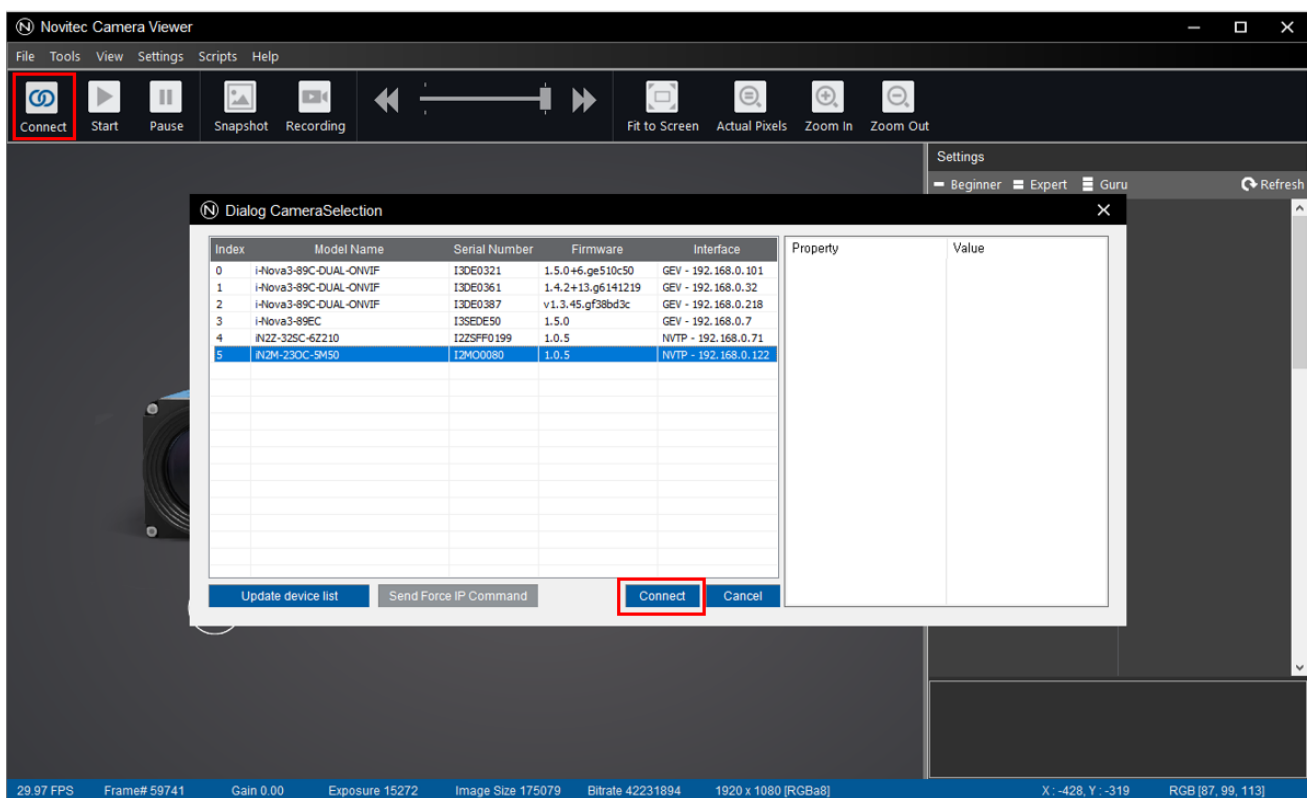
#### <Image> 47. Novitec Camera Viewer main UI in ⑤

Displays current camera status information such as FPS, Image information, Bitrate, Exposure, Gain, etc.

### 7.2.3. Camera connection

#### <Image> 47. Novitec Camera Viewer main UI in ②

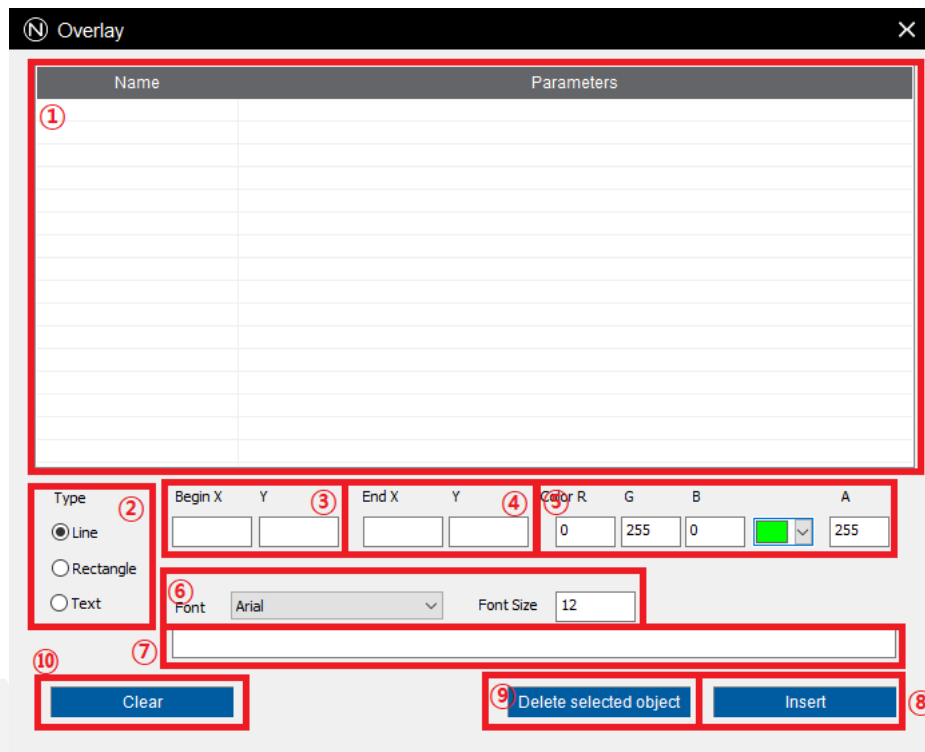
Click the Connect button to display the camera selection window. In that window, select the camera you want to connect to and click Connect.



<Image> 48. Novitec Camera Viewer Connect

### 7.2.4. Overlay

Available when selecting Tools -> Overlay in the Toolbar.



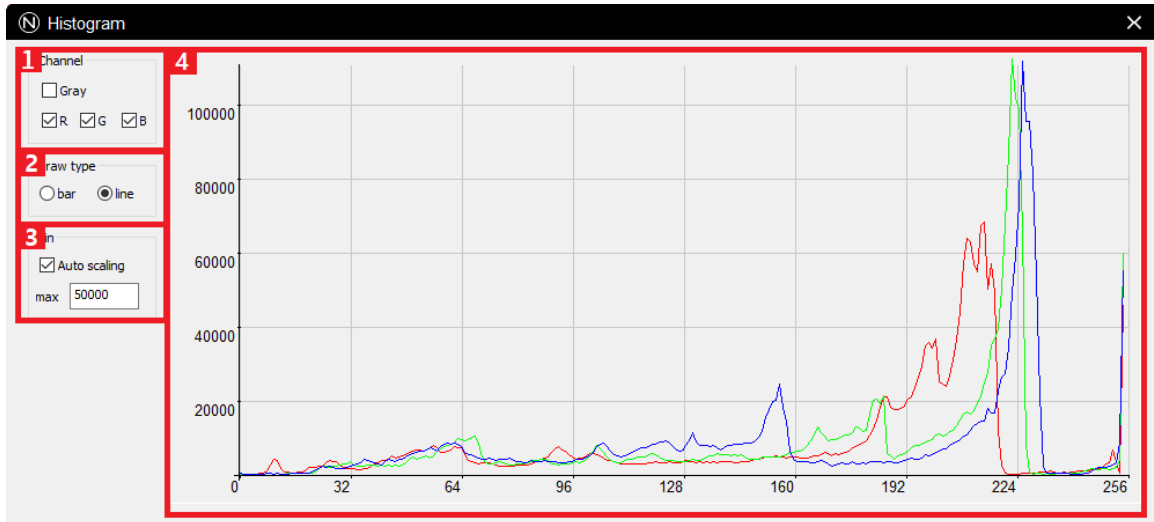
<Image> 49. Novitec Camera Viewer Overlay

Overlay Capability A feature that allows you to draw lines, squares, and text above the screen.

(The function is only visible in the viewer itself, not in the image output using other programs such as the RTSP viewer (such as the VLC Player)

- ① Displays a list of currently registered Overlay objects.
- ② Lets you specify the type of object to register.
- ③ You can set the starting coordinates of the object to be registered (X, Y)
- ④ You can set the end coordinates of the object to be registered (X, Y)
- ⑤ Lets you set the color of the object you want to register.(A value is transparency.)
- ⑥ When you publish text, you can specify the font name and font size for it.
- ⑦ Lets you enter the content of the text you want to publish.
- ⑧ Register the object you set up.
- ⑨ Deletes the selected object from the list.
- ⑩ Deletes all registered objects.

### 7.2.5. Histogram



<Image> 50. Novitec Camera Viewer Histogram

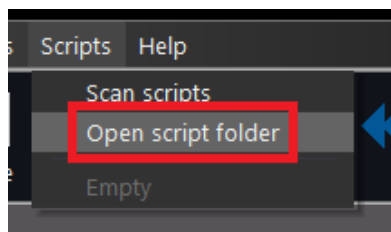
The function that displays the histogram of the current image.

- ① Select the channel to display.
- ② Select the histogram type (bar, linear)
- ③ Sets whether to automatically adjust the height of the histogram.  
(When unchecked, you can manually set it by using the max value below.)
- ④ The screen on which the histogram is displayed.

### 7.2.6. Scripts

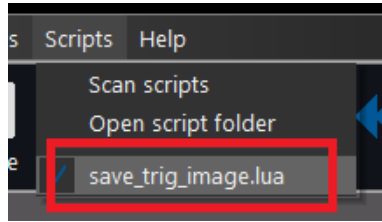
The script function is a function that allows you to control the camera using Lua Script.

The example code for the script exists in the Novitec Camera SDK\scripts folder within the Documents folder.



<Image> 51. Novitec Camera Viewer Script Open folder

Click Scripts – Open script folder in the top menu to put it in the folder that appears, and then click Scanscripts to load the script.



<Image> 52. Novitec Camera Viewer Script enable

Click on the loaded script to activate the script.

## 8. RTSP/ONVIF Streaming

If you use a program that can check RTSP Streaming such as VLC media player, you can check H.264 or MJPEG video.

### 8.1. RTSP Streaming

#### 8.1.1. URL

##### 8.1.1.1. H.264

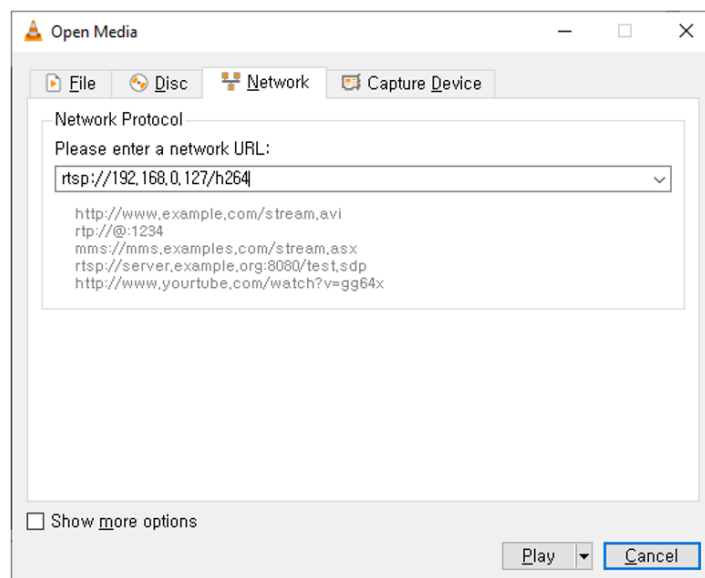
H.264 stream URL: "rtsp://(camera IP address):554/h264"

##### 8.1.1.2. Sub H.264

H.264 sub stream URL: "rtsp://(camera IP address):554/hsub"

##### 8.1.1.3. MJPEG

MJPEG stream URL: "rtsp://(camera IP address):554/jpeg"



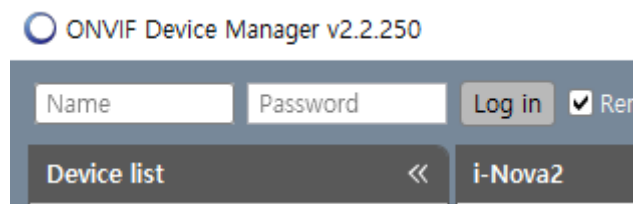
<Image> 53. RTSP stream via VLC player



If RTSP port has not been changed, you can omit “:554” as in the picture above. If you have changed port number, that is, “:( changed port number)” You must insert it in the middle to view the video.

### 8.1.2. ONVIF

When using ONVIF protocol, you can access the camera by logging in with user information.  
(Default – Name: user / Password: inova, if changed, enter the change value)



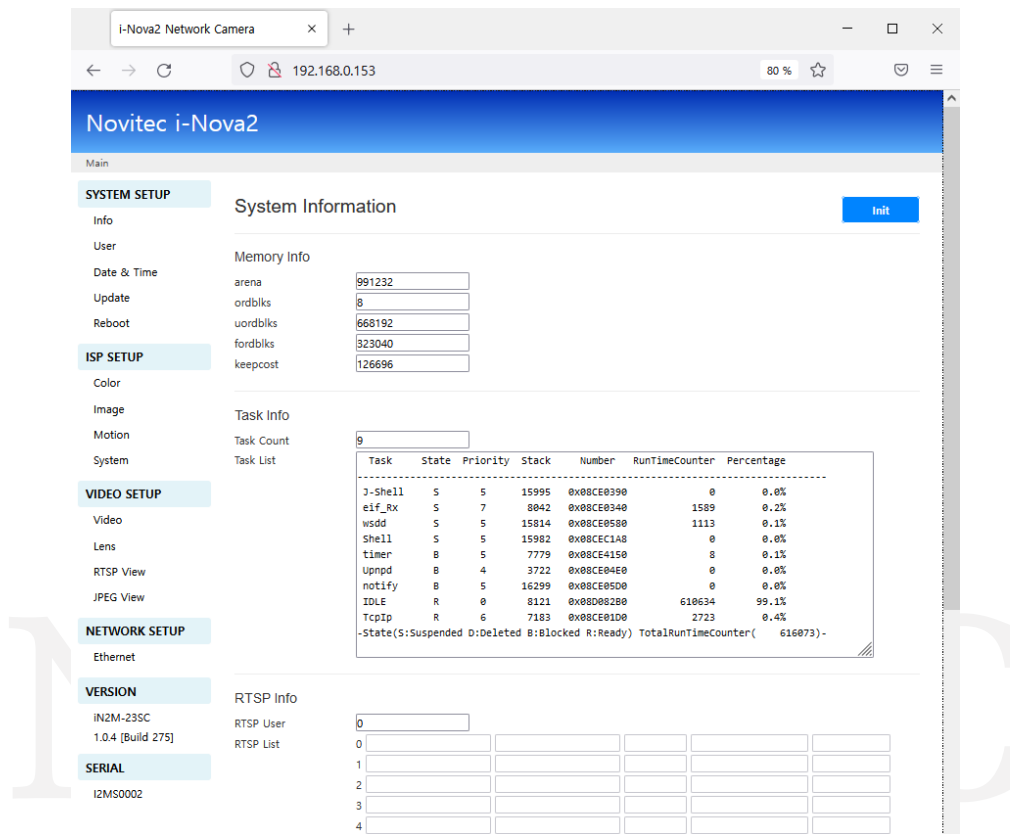
<Image> 54. ONVIF Login via ONVIF Device Manager

As shown in the picture above, you must log in at the top to access the camera, and ONVIF only allows partial control of the camera. Functions provided by Novitec protocol can be controlled using Viewer and SDK.

NOVITEC

## 9. Web page

You can update the camera's firmware or other settings on the web, you can check the video on the web with VLC media player, etc.



<Image> 55. i-Nova2 browser page

### 9.1. System setup

#### 9.1.1. I Info

This page allows you to check information such as the camera's internal memory status.

#### 9.1.2. User

You can edit the login information required for web access.

ID set by default: user, password: inova. You must change the password, as you cannot use the camera's functions until you change it.

#### 9.1.3. Time

Camera's SNTP server information and time zone information.

Date & Time
submit

---

SNTP Enable  OFF  ON

SNTP Server

Repetition Period  [>1](sec)

Retry Time  [>1](sec) - If SNTP fails, retry(ex: 2 times, every 10 seconds).

Retry Count  [>0]

---

Time  -  -   :  :  Get PC time

---

Summer Time  OFF  ON

Timezone

Camera Time 2019-09-01 10:47:19

PC Time 2022-01-26 11:49:24

UpTime 0Days 01:47:20

<Image> 56. i-Nova2 browser page (Date & Time)

#### 9.1.4. Update

This page allows you to update the camera's firmware.

##### Note during update

- Browser refresh Don't do it.
- Do not close the browser that is being updated.
- The file with the same name as the firmware file name at the bottom of the file selection button must be updated.

#### 9.1.5. Reboot

This is the camera restart menu. The camera reboots when you click the Reboot button on the page.

## 9.2. ISP setup

### 9.2.1. Color

This is the page where you can adjust the camera's White Balance, and you can set it to AUTO, AUTOext, PRESET, MANUAL using the AWB option located at the top. Color R, G, B-Gain at the top is the setting to increase the color intensity regardless of AUTO or MANUAL.

PRESET automatically sets the White Balance value once and sets the Auto and Manual, half of which can keep the value This is a mixed setup. If you select this option, the Preset option is activated, and while Idle is set, the White Balance value set through SET continues to be written, and if you select SET and press submit, Saves the Auto White Balance value at that point, and maintains this value when returning to Idle. (When SET is selected, White Balance continues to change like in AUTO mode, but White Balance used at idle is the value at the time SET is set as described above.)

MANUAL, regardless of the current screen, you can manually adjust the White Balance by setting the preset color temperature (C Temp) and additionally R and B Gain.

COLOR
submit

---

AWB AUTO ▼

Color R-Gain 20 [0~40]

Color G-Gain 20 [0~40]

Color B-Gain 20 [0~40]

---

Preset

Preset  Idle  SET

---

Manual

C Temp 5000K ▼

R Gain 10 [0~20]

B Gain 10 [0~20]

<Image> 57. i-Nova2 browser page (Color)

### 9.2.2. Image

You can set image processing options that can be processed inside the camera.

The main function is as shown below, other functions such as area designation can also be set.

A. Sharpness: Sharpness correction

B. Gamma: Gamma correction C. Mirror: Left/Right reversed D. Flip: Flip up/down E. ACE: Backlight Compensation

### 9.2.3. Motion

Settings related to motion detection are available.

### 9.2.4. System

You can set the Color bar for testing or the camera title OSD.

## 9.3. Video setup

### 9.3.1. Video

A page where you can set detailed settings for H.264 and MJPEG video transmitted by the camera.

Video Information
submit

---

Sensor Name	Sony IMX392
Max Resolution	1920 X 1080
Max FPS	30FPS
Output Mode	Normal

---

RTSP Port  [1~65535]

---

#### H264

Profile	<input type="text" value="Baseline"/>
Resolution	<input type="text" value="1920x1080"/>
Quality	<input style="width: 100px;" type="text" value="40"/> [10~51]
GOP(IDR)	<input style="width: 100px;" type="text" value="30"/> [1~240]
FPS	<input type="text" value="30fps"/>
Bitrate Control	<input type="radio"/> OFF <input type="radio"/> VBR <input type="radio"/> CBR <input checked="" type="radio"/> CVBR
Bitrate	<input type="text" value="10Mbit"/>

---

#### HSUB

Profile	<input type="text" value="Baseline"/>
Resolution	<input type="text" value="640x360"/>
Quality	<input style="width: 100px;" type="text" value="50"/> [10~51]
GOP(IDR)	<input style="width: 100px;" type="text" value="30"/> [1~240]
FPS	<input type="text" value="30fps"/>
Bitrate Control	<input type="radio"/> OFF <input type="radio"/> VBR <input checked="" type="radio"/> CBR <input type="radio"/> CVBR
Bitrate	<input type="text" value="1Mbit"/>

---

#### JPEG

Resolution	<input type="text" value="1920x1080"/>
Quality	<input style="width: 100px;" type="text" value="20"/> [5~99]
FPS	<input type="text" value="30fps"/>
Bitrate Control	<input type="radio"/> OFF <input type="radio"/> VBR <input checked="" type="radio"/> CBR
Bitrate	<input type="text" value="40Mbit"/>

<Image> 58. i-Nova2 browser page (Video)

- When encoding Profile,
  - Information that informs you that it can be decoded for a specific use
    - Baseline: low power, low resolution, low This is the delay profile.
    - Main: Bi-directional prediction of I-Frame and P-Frame by using B-Frame It is a profile with higher efficiency than the Baseline profile.
- Resolution: You can set the resolution.
- Quality: It indicates the degree of compression of the video. The smaller the number, the lower the video compression rate and the better the picture quality. Conversely, the higher the number, the higher the video compression rate, but the lower the quality. Available when Bitrate Control OFF or VBR is set.
- GOP: You can set the interval from H.264 to the next i-Frame after i-Frame is acquired.
- FPS: You can set the FPS.

- Bitrate Control

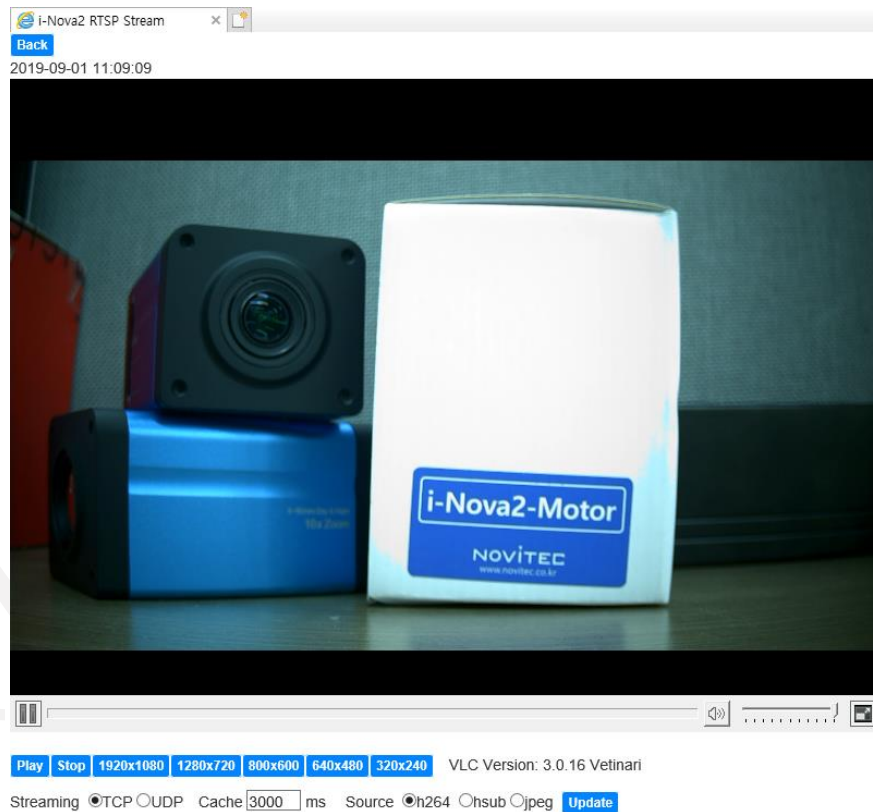
- OFF: Bitrate Control is not used.
- VBR: of the quality value at the specified quality It works. High when there are many changes in the image Bit rate is used, and when the change is small, a low bit rate is used.
- CBR: video change, this is a method of compressing the video using the same bit rate regardless of the content. It has the advantage that the transmission rate is constant, but There is a disadvantage in that data is wasted when there is little change in the image, and when there is a lot of change, the image quality deteriorates.
- CVBR: It works similarly to CBR. Compared to CBR, i-Frame is encoded with a higher quality, and when the video changes temporarily, the bitrate increases by 10% to 30%. When using CVBR, it is recommended to use a bitrate of 1 to 4 Mbps.

- Bitrate: You can set the baud rate of Bitrate Control. There is.

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### 9.3.2. RTSP View

You can view the RTSP stream from the camera. According to the user's request, TCP/UDP Cache (length of video to be secured. The larger this setting value, the more stable video can be played without interruption, but there is a delay in video by that length), h264/ hsub /jpeg profile can be selected. After selecting the desired setting, click the Update button.



<Image> 59. i-Nova2 browser page (RTSP View)

RTSP View can only be executed in Internet Explorer.

### 9.3.3. JPEG View

You can see the still cut of the camera. In Internet Explorer, it refreshes once every 3 seconds and acquires frames, and in other browsers, about 6 frames per second is continuously acquired without page refresh.



<Image> 60. i-Nova2 browser page (JPEG View)

## 9.4. Network setup

### 9.4.1. Ethernet

Camera IP settings.

<Image> 61. i-Nova2 browser page (Ethernet)

To use static IP, you can set the IP after changing DHCP to UNUSE.

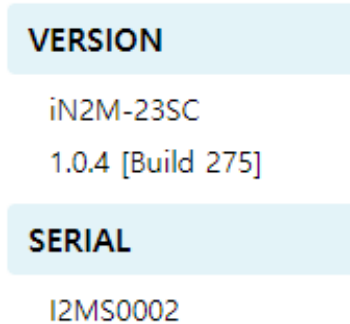
**Additions regarding static IP settings, For details, see [Novitec technical support You can check it out at the cafe](#) .**



## 9.5. Version information

### 9.5.1. Firmware Version, Serial Number

The model name of the camera, You can check the firmware version and serial number.

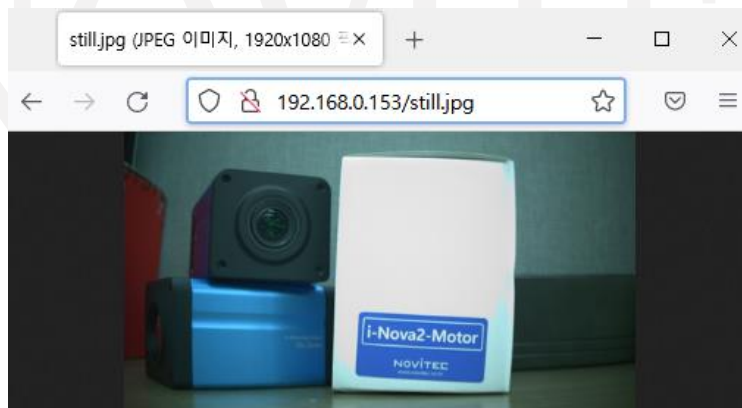


<Image> 62. i-Nova2 browser page (Model, FW Ver. & Serial No.)

## 9.6. Still cut

### 9.6.1. JPEG image still cut

URL [http:// Camera I P /still.jpg](http://CameraIP/still.jpg) You can get Still Cut images from that camera by typing.



<Image> 63. i-Nova2 still cut

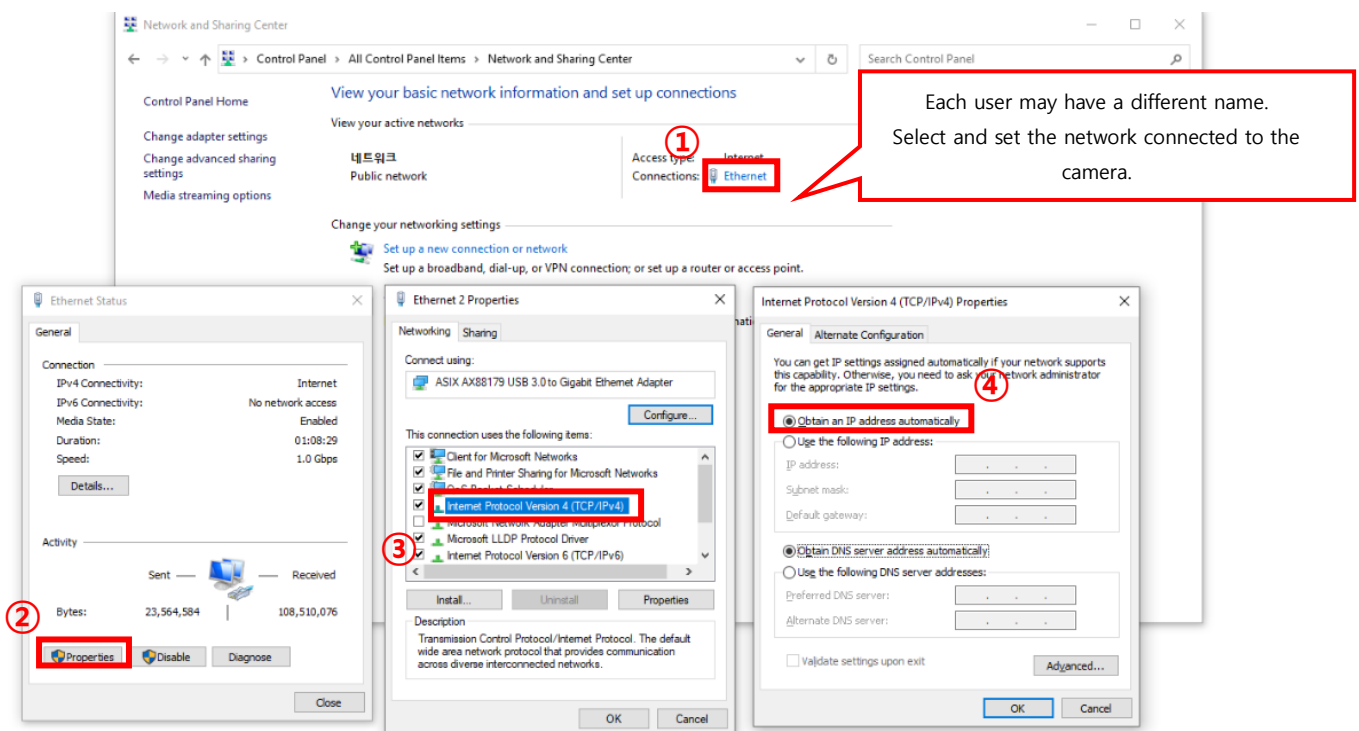
## 10. Trouble shooting

This section introduces problems that may occur during connection and use of the camera and countermeasures.

### 10.1. IP connection problem

#### 10.1.1. When the camera Ethernet setting is Auto IP (DHCP)

In the case of the camera, it is shipped with the DHCP function enabled and set to receive an IP automatically. Therefore, without changing the IP of the i-Nova to a static setting, it can be connected to a hub (with DHCP function), a router, or a PC. If you connect 1:1, you need to set it to automatically receive IPv4 IP assignment.



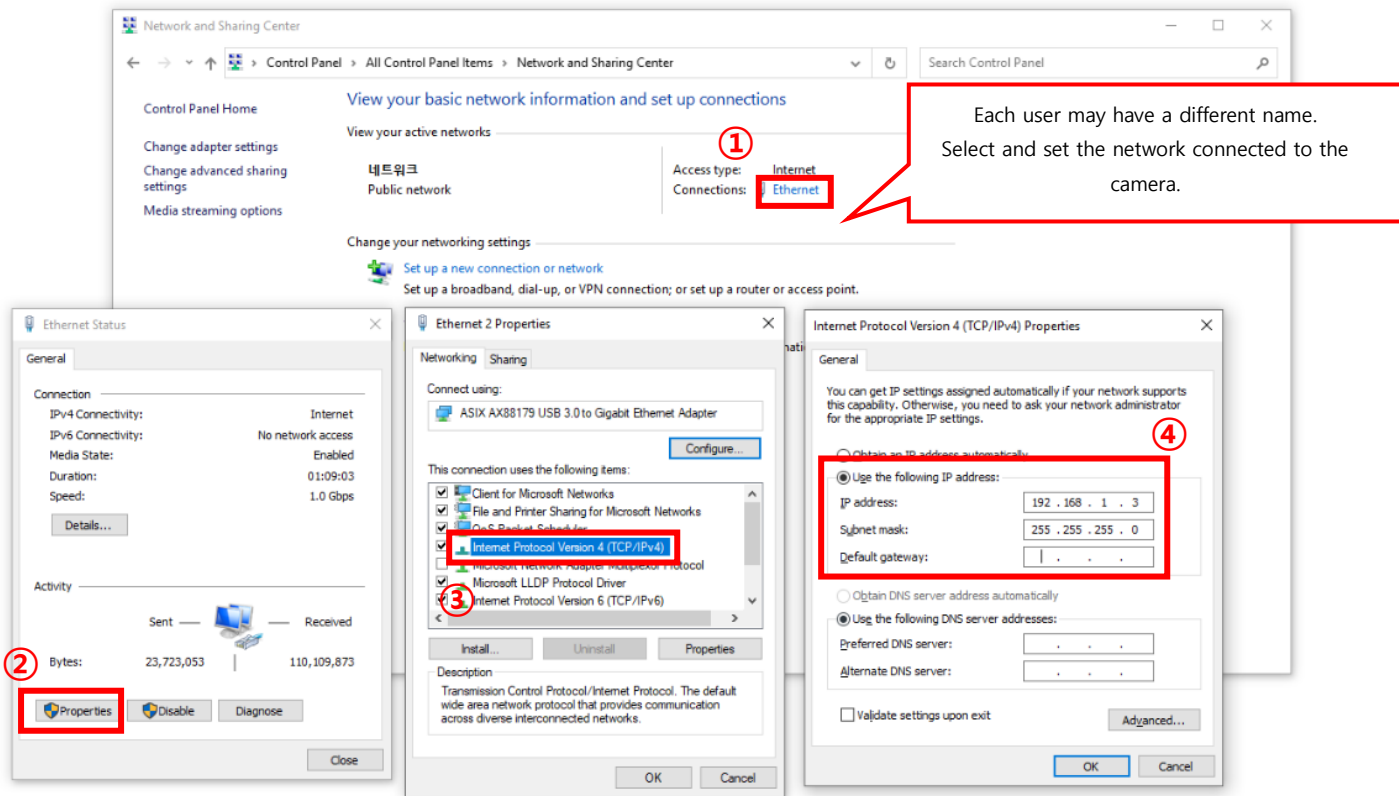
<Image> 64. Check the current computer's IP settings

- TCP/IPv4 properties of the local connection in the network settings of the connected PC. Go to [Control Panel] > [Network and Sharing Center] and click the name of the port connected to the camera.
- Referring to the image above, change it to Obtain an IP address automatically.
- After the change, run the viewer, select the IP address of i-Nova found in the IP list box at the top left, and check the JPEG streaming (TCP/UDP) to check the video.

#### 10.1.2. If the camera Ethernet setting is static IP

The camera is set to receive IP from the DHCP server, but if the user sets to use static IP, IP will not be assigned automatically. In this case, the IP area fixed by the user instead. The IPv4 address of the

connected PC must also match the IP area of i -Nova.



<Image> 65. Change the IP address settings of the connected PC (screen when clicking "Change adapter settings")

- TCP/IPv4 properties of the local connection in the network settings of the connected PC.
- Please change to using the following IP address.
- Match the IP class C of the set i-Nova ("192.168.1" in this example), The last digit should be set so that it does not overlap with other equipment.  
(If i-Nova is number 234, excluding 234)
- Unless there are special circumstances, you can set the default gateway to 1 of class C.
- It will be connected to i-Nova of the static IP shown in the upper left corner.

**10.1.3. Multiple LAN ports as fixed**

If you use the IP address of each connected port as a fixed value when there are multiple ports due to the addition of a LAN card, etc., configure the 3rd digit differently to prevent network problems in advance.

ex) A: 192.168.1.10, B: 192.168.2.10, C: 192.168.3.10

**10.1.4. If the IP address keeps changing**

Fixed IP address to i-Nova, you must access the i-Nova web page. Because it is in DHCP (dynamic allocation) mode at the time of shipment, The IP address may change depending on the situation.

## Network Information

IP Address	<input type="text" value="192.168.0.153"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Default Gateway	<input type="text" value="192.168.0.1"/>
Primary DNS Server	<input type="text" value="192.168.0.1"/>
Secondary DNS Server	<input type="text" value="0.0.0.0"/>
Use DHCP Server	<input type="radio"/> USE <input checked="" type="radio"/> UNUSE

<Image> 66. i-Nova IP address control page

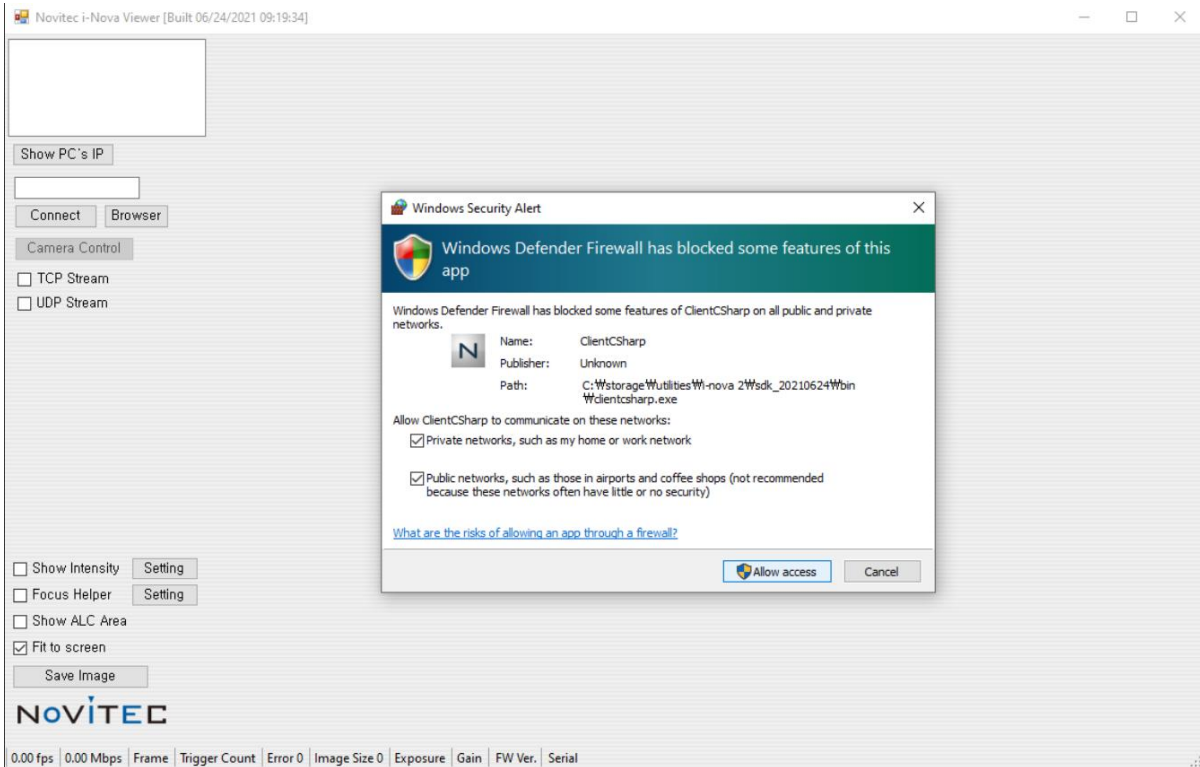
- Browser button in the viewer program or enter the address of i -Nova in a web browser to access the camera web page.
- Change from USE to UNUSE in Use DHCP Server on the Network Settings tab of the web page
- After entering information related to the IP you want to use, press submit to apply the settings.

## 10.2. Firewall problems such as IP search not working (Windows)

If you run the viewer program to connect and use i-Nova, the IP may not appear in the list or the video may be interrupted during video playback because it cannot receive SSDP transmitted from the camera due to a firewall problem. (It can be solved by simply turning the viewer off and on.)

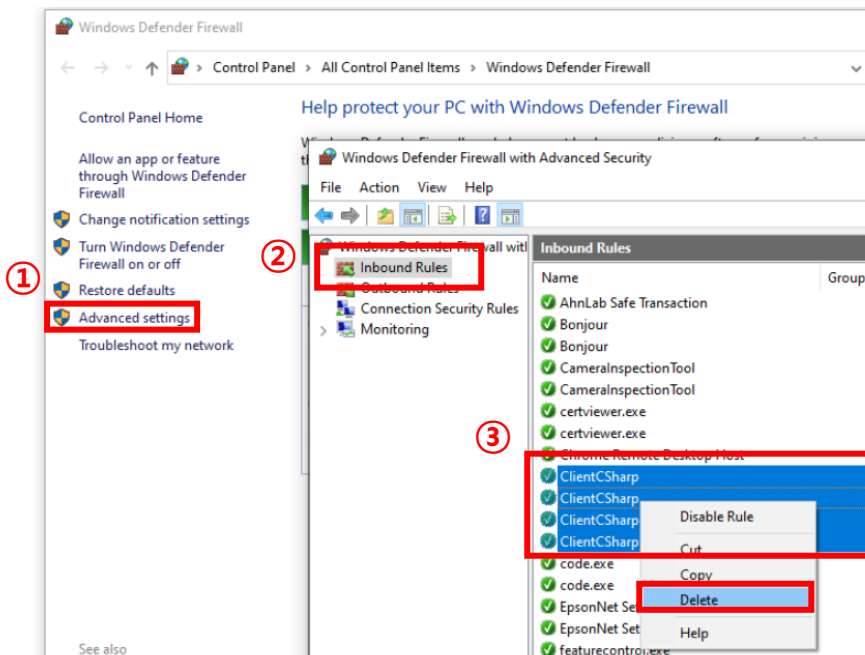
### 10.2.1. Windows Security Alert (Network Connection Setup)

ClientCSharp Viewer for the first time, check the firewall settings. (Windows 7 standard) this You must check all items displayed in the window regarding private networks such as home network and corporate network and public networks such as airports and coffee shops case of checking only home and work networks, if PC and i -Nova are 1:1 connected, IP of i-Nova may not be searched due to firewall problem. The IP of the receiving i -Nova may not be retrieved.



<Image> 67. Firewall settings confirmation window

If you check the settings incorrectly in the window or select Cancel, delete the rule in “Advanced Settings” in Control Panel -> All Control Panel Items -> Windows Defender (Firewall) and run it again. The rule name defaults to ClientCSharp for C# viewers and IpSDKSample for C++ (MFC) viewers.



<Image> 68. Reset the viewer-related settings of the firewall

both "Home, Work" and "Public" networks in the "Windows Security Alert" (Firewall) window that pops up again, you can confirm that i-Nova is normally found in the viewer. (If it is not found, please re-run the viewer program)

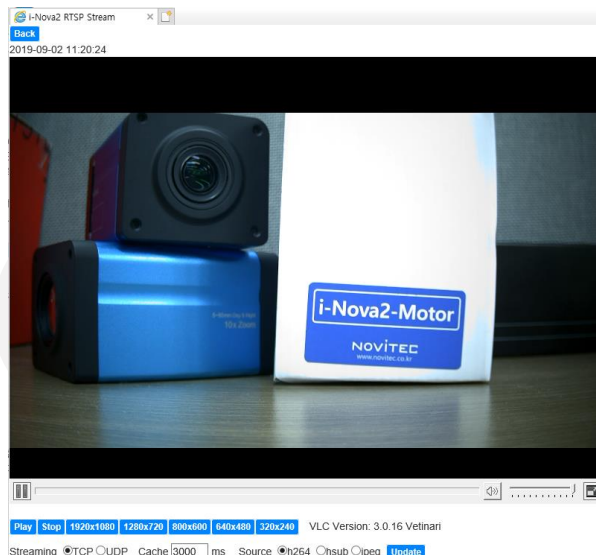
### 10.3. Web player does not run

RTSP video player does not work when accessing the i-Nova web page with a browser.

#### 10.3.1. Internet Explorer (Windows)

VLC Player **32 bit** \_ After downloading and installing the installation file, refresh or close the browser and access the i-Nova web page again to check the H.264 video.

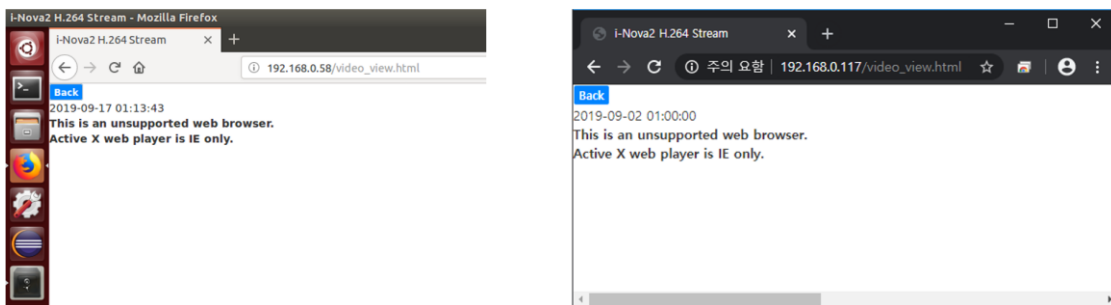
[\(V LC player Download site link , default 32bit \)](#)



<Image> 69. Screen with Browser Player running

#### 10.3.2. Other Browsers

VLC plug-ins cannot be used in browsers other than Internet Explorer, which is the default browser in Windows, RTSP videos cannot be viewed in Chrome, Whale, Edge, Firefox, etc.



<image> 70. Browser player unavailable screen

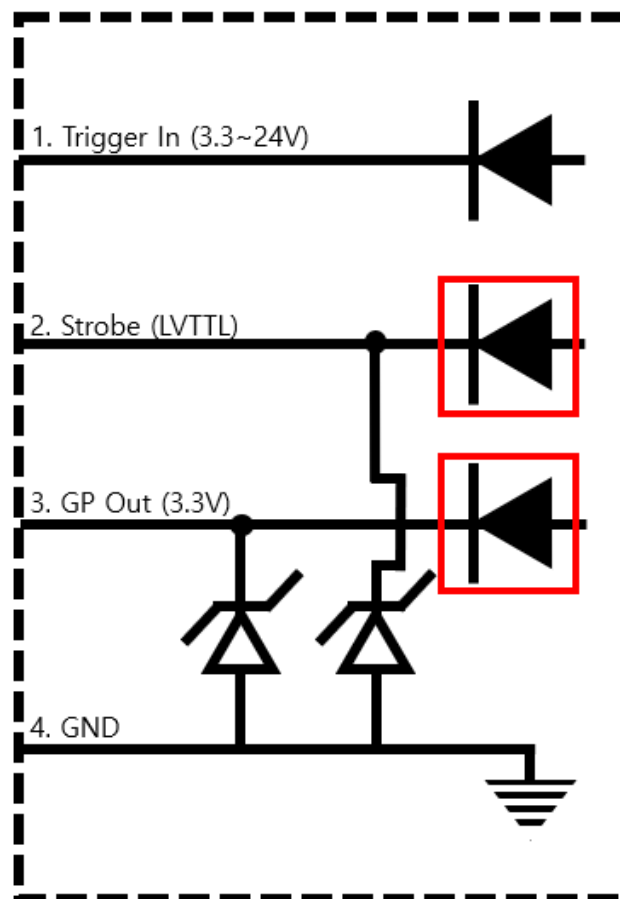
## 10.4. Flash light does not work

Abnormal operation may occur due to external noise according to the installation environment.

### 10.4.1. Does not turn on (Camera I/O wiring problem)

I/O circuit for each camera is slightly different, for older models, the circuits included in the manual may differ. Please check the I/O wiring information by referring to the circuit configuration suitable for the model as shown below.

- Contacting line 1 (Trigger In) and line 4 (GND) It is recognized as a trigger input.
- Line 2 (EXT-Out1) Strobe type LVTTTL signal for lighting control is output.
  - ◆ By default, it is synchronized with the Sensor exposure timing.
- Line 3 (GPIO) can output a control LVTTTL signal that can be directly controlled by the user.



<Image> 71. Circuit example

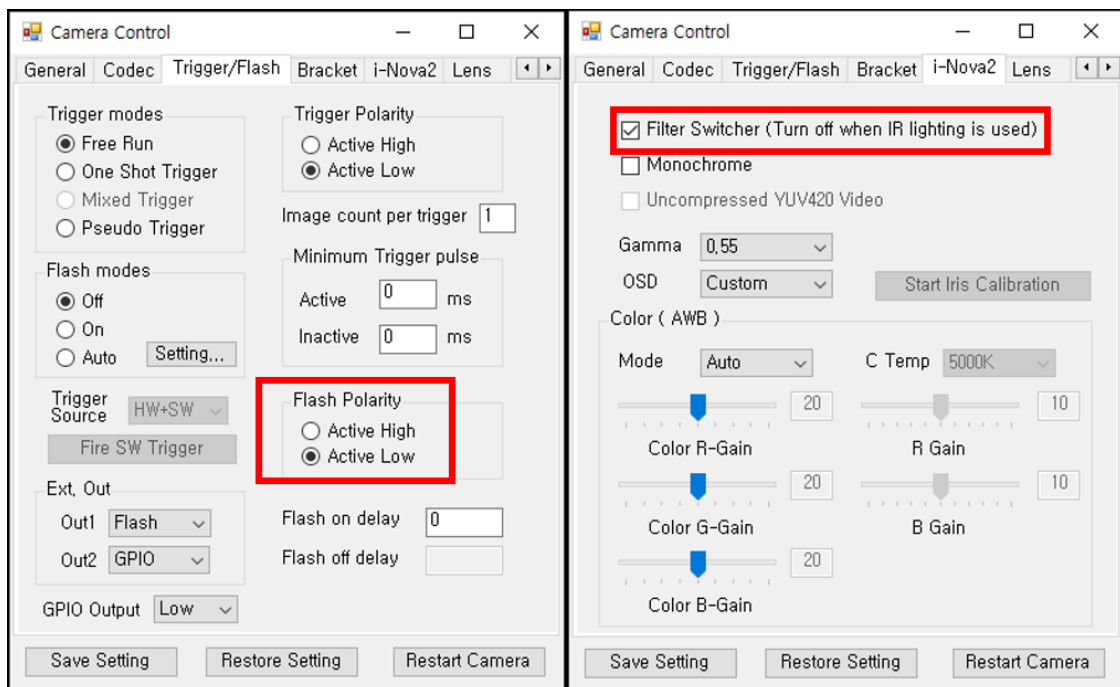
## 10.4.2. Lights out of sync

### 10.4.2.1. The Flash Polarity settings

Camera Flash settings tab does not match the light behavior setting, the light will turn on, but this may happen because the exposure timing does not match. Set to High/Low according to the lighting operation method.

### 10.4.2.2. Check whether filter is used

When flash is used, make sure that the filter is installed in front of the camera sensor or on the lens. In particular when using IR illumination, if the IR-Cut Filter is installed, the light itself does not come on, so the light is on, but a very dark image can be obtained. In the case of i-Nova2, change the IR-Cut Filter and the Filter Switcher that can change the general cover glass and check while changing.



<Image> 72. How to set up lights and filters

## 10.5. RTSP connection not working

Up to 4 channels can be connected, the connection may be blocked if you do not go through the normal connection termination step. In this case, when you open the camera control web page, the RTSP status is displayed on the first Info page. Kick individual streams you don't want there and hang up, after rebooting the camera, you can connect normally.

## 10.6. LED does not light up

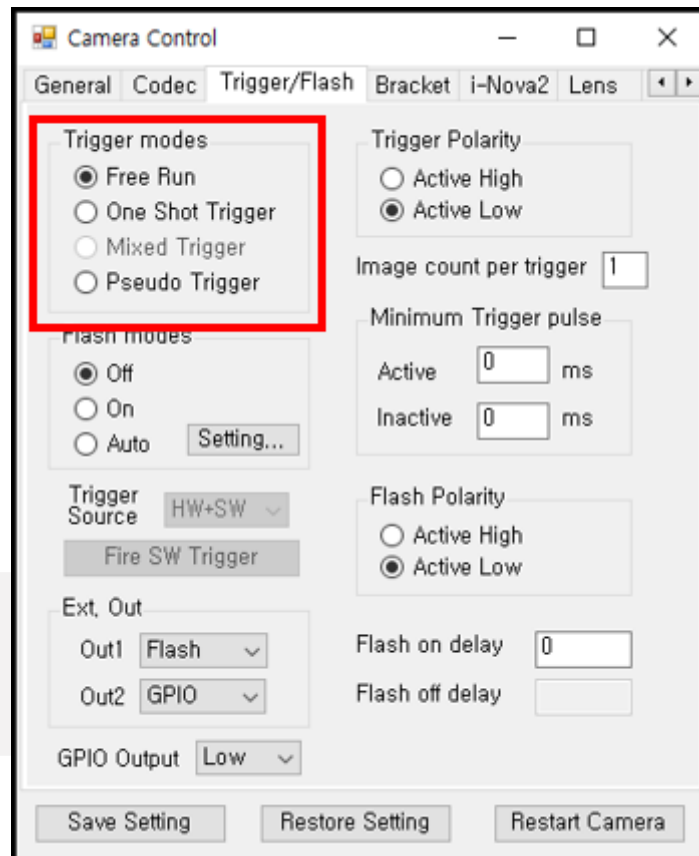
LED on the back of the camera does not light up, an RMA is received through the person in charge. See contact information on the last page.



## 10.7. Problem with video suddenly not appearing

### 10.7.1. Trigger Mode

Make sure you are in Free Run mode in the camera's Trigger modes. If it is not in Free Run mode, you must input a trigger signal to acquire an image.



<Image> 73. Change trigger modes settings

### 10.7.2. In case of Broken Buffer / Time Out, etc.

Check the network status between the camera and the connected PC. In general, this is a situation that occurs when a sent packet is not normally received due to a network environment problem. Alternatively, it is necessary to check whether the firewall of the OS is normally allowed for the program being tested.

### 10.7.3. In case of firmware update

If you update the firmware while streaming, Streaming is paused to avoid interfering with firmware uploads.

## 10.8. Entered value is not set

There can be several reasons for the entered value not being set.

### 10.8.1. If the value set in the viewer is not set properly

**10.8.1.1. If the value is not set properly without rebooting**

When setting by entering a number, after you finish typing, you must press Enter to send the command normally. Also, In the case of Exposure and Gain values, as described above, the sensor Because it can be set by changing to a value that is actually used, it may differ from the value entered by the user.

**10.8.1.2. If the previous setting value is not set properly after rebooting**

Save Setting button before rebooting, the setting value after the previous saving will return to the setting value at the time of the last saving. As described above, after sending the command normally by pressing the Enter key, the save setting is completed only by pressing the Save Setting button.

**10.8.2. If the value set in the web page is not set properly**

Submit button after selecting an option, the setting value is not applied.

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## 11. Appendix

### 11.1. Camera specific

#### 11.1.1. i-Nova2 Standard Camera

<b>Model name</b>	iN2-32SC (IMX265), iN2-23SC (IMX392)
<b>Sensor model</b>	Sony IMX392: 1/2.3" / Sony IMX265: 1/1.8", CMOS, Color
<b>Interface</b>	100/1000Mbps Ethernet, PoE (RJ 45 Connector)
<b>Resolution / Frame rate</b>	1920 x 1080 pixels, 30 fps (JPEG, H.264), 15 fps (YUV420)
<b>Shutter mode</b>	Global Shutter
<b>Color depth</b>	8 bit
<b>Gain</b>	Manual & Auto (0 ~ 48dB)
<b>Trigger modes</b>	Pseudo Trigger, External Trigger, Software Trigger ※ Support burst mode (One trigger & grab multi-images)
<b>Flash out modes</b>	On / Off / Auto
<b>Operation temperature / Humidity</b>	0°C to 50°C / 20 to 80%
<b>Storage temperature / Humidity</b>	-20°C ~ 60°C / 20 ~ 90% (Before Condensation)
<b>Power supply</b>	+12 V DC ~ 24 V DC
<b>Power consumption</b>	Max. 4W
<b>Connector I/O, Power</b>	Mini Clamp Socket, DC Jack (Inner 2.1mm, outer 5mm)
<b>lens mount</b>	C/CS-Mount (M12-Mount Option)
<b>I/O ports</b>	1x Input for Triggering (Low level: 0 ~ 0.8V / high level: 2V ~ 24V) 1x Output for Strobe (3.3V LVTTTL) 1x General Purpose Output (3.3V LVTTTL)
<b>Dimension / Weight</b>	57 x 52 x 45.9 mm (W x H x D), 201 g
<b>Filter switcher / DC iris</b>	IR-cut filter (Controllable) / DC iris supported
<b>Image processing</b>	Motion detection, Gamma, White balance, Sharpness, Flip
<b>Protocol</b>	RTSP (MJPEG, H.264), Novitec Protocol (JPEG, YUV420), ONVIF
<b>SDK</b>	Viewer and example code for Novitec Protocol (C#, C++, Python)
<b>Certificate</b>	KC

<Table> 5. i-Nova2 detailed specifications

## 11.1.2. i-Nova2-Zoom Camera

<b>Model name</b>	iN2Z-32SC-6Z210
<b>Sensor model</b>	Sony IMX265: 1/1.8" CMOS, Color
<b>Interface</b>	100/1000Mbps Ethernet (RJ 45 Connector)
<b>Resolution / Frame rate</b>	1920 x 1080 pixels, 30 fps (JPEG, H.264), 15 fps (YUV420)
<b>Shutter mode</b>	Global Shutter
<b>Color depth</b>	8 bit
<b>Gain</b>	Manual & Auto (0 ~ 48dB)
<b>Trigger modes</b>	Free-running, External Trigger, Software Trigger ※ Support burst mode (One trigger & grab multi-images)
<b>Flash out modes</b>	On / Off / Auto
<b>Operation temperature / Humidity</b>	0°C to 50°C / 20 to 80%
<b>Storage temperature / Humidity</b>	-10°C ~ 60°C / 20 ~ 90% (Before Condensation)
<b>Power supply</b>	+12 V DC to 24 V DC
<b>Power consumption</b>	Max. 6W
<b>Connector I/O, Power</b>	2-pin screw terminal block
<b>Lens</b>	6 ~ 210 mm (35x), IR corrected
<b>Lens control</b>	Motorized Zoom / Focus / Iris
<b>Focal range</b>	0.1m ~ INF(Wide), 1.0m ~ INF(Tele)
<b>F-number</b>	F 1.5 (Wide) ~ F 4.8 (Tele)
<b>I/O ports</b>	1x Input for Triggering (Low level: 0 ~ 0.8V / high level: 2V ~ 24V) 2 x Strobe / GPIO (TTL, Open Collector)
<b>Dimension / Weight</b>	70 x 72 x 150 mm (W x H x D), 79 5g
<b>Filter switcher</b>	IR-cut filter (Controllable)
<b>Image processing</b>	Motion detection, Gamma, Sharpness, White balance
<b>Protocol</b>	RTSP (MJPEG, H.264), Novitec Protocol (JPEG, YUV420), ONVIF
<b>SDK</b>	Viewer and example code for Novitec Protocol (C#, C++, Python)
<b>Certificate</b>	KC, CE

&lt;Table&gt; 6. i-Nova2-Zoom detailed specifications

### 11.1.3. i-Nova2 Compact Camera (Sony Sensor)

<b>Model name</b>	iN2-23SC-C
<b>Sensor model</b>	Sony IMX392: 1/2.3", CMOS, Color
<b>Interface</b>	100/1000Mbps Ethernet, PoE (RJ 45 Connector)
<b>Resolution / Frame rate</b>	1920 x 1080 pixels, 30 fps (JPEG, H.264)
<b>Shutter mode</b>	Global Shutter
<b>Color depth</b>	8 bit
<b>Gain</b>	Manual & Auto (0 ~ 16dB)
<b>Trigger modes</b>	Pseudo Trigger, External Trigger, Software Trigger ※ Support burst mode (One trigger & grab multi-images)
<b>Flash out modes</b>	On / Off / Auto
<b>Operation temperature / Humidity</b>	0°C to 50°C / 20 to 80%
<b>Storage temperature / Humidity</b>	-20°C ~ 60°C / 20 ~ 90% (Before Condensation)
<b>Power supply</b>	+12 V DC to 24 V DC
<b>Power consumption</b>	Max. 4W
<b>Connector I/O, Power</b>	2-pin screw terminal block
<b>lens mount</b>	C/CS-Mount (M12-Mount Option)
<b>I/O ports</b>	1x Input for Triggering (Low level: 0 ~ 0.8V / high level: 2V ~ 24V) 2 x Strobe / GPIO (TTL, Open Collector)
<b>Dimension / Weight</b>	46 x 46 x 40.5 mm (W x H x D), 137 g
<b>Image processing</b>	Motion detection, Gamma, White balance, Sharpness, Flip
<b>Protocol</b>	RTSP (MJPEG, H.264), Novitec Protocol (JPEG), ONVIF
<b>SDK</b>	Viewer and example code for Novitec Protocol (C#, C++, Python)
<b>Certificate</b>	KC

<Table> 7. i-Nova2 Compact (Sony Sensor) detailed specifications

#### 11.1.4. i-Nova2 Compact Camera (Sony Sensor)

<b>Model name</b>	iN2-23SC-C
<b>Sensor model</b>	ON-Semi AR0234CS, CMOS, Color
<b>Interface</b>	100/1000Mbps Ethernet, PoE (RJ45 Connector)
<b>Resolution / Frame rate</b>	1920 x 1080 pixels, 30 fps (JPEG, H.264)
<b>Shutter mode</b>	Global Shutter
<b>Color depth</b>	8 bit
<b>Gain</b>	Manual & Auto (0 ~ 48dB)
<b>Trigger modes</b>	Pseudo Trigger, External Trigger, Software Trigger ※ Support burst mode (One trigger & grab multi-images)
<b>Flash out modes</b>	On / Off / Auto
<b>Operation temperature / Humidity</b>	0°C ~ 50°C / 20 ~ 80%
<b>Storage temperature / Humidity</b>	-20°C ~ 60°C / 20 ~ 90% (Before Condensation)
<b>Power supply</b>	+12 V DC ~ 24 V DC
<b>Power consumption</b>	Max. 4W
<b>Connector I/O, Power</b>	2-pin Screw terminal block
<b>Lens mount</b>	C/CS-Mount (M12-Mount Option)
<b>I/O port</b>	1 x Input for Triggering (Low level: 0 ~ 0.8V / high level: 2V ~ 24V) 2 x Strobe / GPIO (TTL, Open Collector)
<b>Dimension / Weight</b>	46 x 46 x 40.5 mm (W x H x D), 137 g
<b>Image processing</b>	Motion detection, Gamma, White balance, Sharpness, Flip
<b>Protocol</b>	RTSP (MJPEG, H.264), Novitec Protocol (JPEG), ONVIF
<b>SDK</b>	Viewer and example code for Novitec Protocol (C#, C++, Python)
<b>Certificate</b>	KC

<Table> 8. i-Nova2 Compact (On-Semi Sensor) detailed specifications

### 11.1.5. i-Nova2-Motor Camera (Sony Sensor)

<b>Model name</b>	iN2M-23SC-6M22, iN2M-23SC-5M50
<b>Sensor model</b>	Sony IMX392: 1/2.3", CMOS, Color
<b>Interface</b>	100/1000Mbps Ethernet, PoE (RJ 45 Connector)
<b>Resolution / Frame rate</b>	1920 x 1080 pixels, 30 fps (JPEG, H.264)
<b>Shutter mode</b>	Global Shutter
<b>Color depth</b>	8 bit
<b>Gain</b>	Manual & Auto (0 ~ 48dB)
<b>Trigger modes</b>	Pseudo Trigger, External Trigger, Software Trigger ※ Support burst mode (One trigger & grab multi-images)
<b>Flash out modes</b>	On / Off / Auto
<b>Operation temperature / Humidity</b>	0°C to 50°C / 20 to 80%
<b>Storage temperature / Humidity</b>	-20°C ~ 60°C / 20 ~ 90% (Before Condensation)
<b>Power supply</b>	+12 V DC to 24 V DC
<b>Power consumption</b>	Max. 4W
<b>Connector I/O, Power</b>	2-pin screw terminal block
<b>Focal length</b>	6 ~ 22 mm / 5 ~ 50 mm
<b>Lens control</b>	Motorized Zoom / Focus / P-Iris (4 steps)
<b>I/O ports</b>	1x Input for Triggering (Low level: 0 ~ 0.8V / high level: 2V ~ 24V) 2 x Strobe / GPIO (TTL, Open Collector)
<b>Dimension / Weight</b>	6 ~ 22 mm: 62 x 54 x 83.3 mm (W x H x D), 319 g 5 ~ 50 mm: 62 x 54 x 96.5 mm (W x H x D), 375 g
<b>Image processing</b>	Motion detection, Gamma, White balance, Sharpness, Flip
<b>Protocol</b>	RTSP (MJPEG, H.264), Novitec Protocol (JPEG), ONVIF
<b>SDK</b>	Viewer and example code for Novitec Protocol (C#, C++, Python)
<b>Certificate</b>	KC, CE

<Table> 9. i-Nova2-Motor (Sony Sensor) detailed specifications

### 11.1.6. i-Nova2-Motor Camera (ON-Semi Sensor)

<b>Model name</b>	iN2M-23OC-6M22, iN2M-23OC-5M50
<b>Sensor model</b>	ON-Semi AR0234CS, CMOS, Color
<b>Interface</b>	100/1000Mbps Ethernet, PoE (RJ 45 Connector)
<b>Resolution / Frame rate</b>	1920 x 1080 pixels, 30 fps (JPEG, H.264)
<b>Shutter mode</b>	Global Shutter
<b>Color depth</b>	8 bit
<b>Gain</b>	Manual & Auto (0 ~ 16dB)
<b>Trigger modes</b>	Pseudo Trigger, External Trigger, Software Trigger ※ Support burst mode (One trigger & grab multi-images)
<b>Flash out modes</b>	On / Off / Auto
<b>Operation temperature / Humidity</b>	0°C to 50°C / 20 to 80%
<b>Storage temperature / Humidity</b>	-20°C ~ 60°C / 20 ~ 90% (Before Condensation)
<b>Power supply</b>	+12 V DC to 24 V DC
<b>Power consumption</b>	Max. 4W
<b>Connector I/O, Power</b>	2-pin screw terminal block
<b>focal length</b>	6 ~ 22 mm / 5 ~ 50 mm
<b>Lens control</b>	Motorized Zoom / Focus / P-Iris (4 steps)
<b>I/O ports</b>	1x Input for Triggering (Low level: 0 ~ 0.8V / high level: 2V ~ 24V) 2 x Strobe / GPIO (TTL, Open Collector)
<b>Dimension / Weight</b>	6 ~ 22 mm: 62 x 54 x 83.3mm (W x H x D), 319 g 5 ~ 50 mm: 62 x 54 x 96.5mm (W x H x D), 375 g
<b>Image processing</b>	Motion detection, Gamma, White balance, Sharpness, Flip
<b>Protocol</b>	RTSP (MJPEG, H.264), Novitec Protocol (JPEG), ONVIF
<b>SDK</b>	Viewer and example code for Novitec Protocol (C#, C++, Python)
<b>Certificate</b>	KC, CE

<Table> 10. i-Nova2-Motor (ON-Semi Sensor) detailed specifications



## 11.2. Sensor detailed properties

### 11.2.1. i-Nova2 Standard (IMX265) / i-Nova2-Zoom

<b>Sensor Model</b>	Sony IMX265 Color
<b>Technology</b>	CMOS
<b>Optical format</b>	1/1.8"
<b>Optical diagonal</b>	8.9 mm
<b>Resolution</b>	1920 x 1080
<b>Pixel size</b>	3.45 $\mu\text{m}$ x 3.45 $\mu\text{m}$
<b>Shutter mode</b>	Global Shutter

<Table> 11. Image sensor specifications (IMX265)

### 11.2.2. i-Nova2 Standard (IMX392) / i-Nova2 Compact / i-Nova2-Motor

<b>Sensor Model</b>	Sony IMX392 Color
<b>Technology</b>	CMOS
<b>Optical format</b>	1/2.3"
<b>Optical diagonal</b>	7.9 mm
<b>Resolution</b>	1920 x 1080
<b>Pixel size</b>	3.45 $\mu\text{m}$ x 3.45 $\mu\text{m}$
<b>Shutter mode</b>	Global Shutter

<Table> 12. Image sensor specifications (IMX392)

### 11.2.3. i-Nova2-Motor (AR0234CS)

<b>Sensor Model</b>	ON-Semi AR0234CS Color
<b>Technology</b>	CMOS
<b>Optical format</b>	1/2.6"
<b>Optical diagonal</b>	6.8 mm
<b>Resolution</b>	1920 x 1080
<b>Pixel size</b>	3.0 $\mu\text{m}$ x 3.0 $\mu\text{m}$
<b>Shutter mode</b>	Global Shutter

<Table> 13. Image sensor specifications (AR0234CS)

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### 14. Revision history

Date	Version	Description	
18. Feb. 2022	V1.10	New templates to improve appearance and update content	
10. Nov. 2020	v1.07	Updates such as appearance improvements	
19. Aug. 2020	v 1.06	Introduced new models and added explanations for OC, etc.	
10. Aug. 2020	v 1.05	Camera Control Webpage Image Update	
14. Jul. 2020	v 1.04	Update related to Trigger Debouncing	
29. Jan. 2020	v 1.03	i-Nova2 AWB color part update	
13. Mar. 2019	v 1.02	Added i-Nova2 Still cut URL content	
31. Dec. 2018	v 1.01	MJPEG Streaming content technical data Add connector details	
27. Dec. 2018	v1.00	Initial version	

<Table> 14. Revision History Table

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