Network Camera
User Manual

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◊ Design and specifications are subject to change without prior notice.

◊ The initial administrator ID is "admin" and the password should be set when logging in for the first time.
  Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
  Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.
IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean the contaminated area on the product surface with a soft, dry cloth or a damp cloth. (Do not use a detergent or cosmetic products that contain alcohol, solvents or surfactants or oil constituents as they may deform or cause damage to the product.)
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. This product is intended to be supplied by a Listed Power Supply Unit marked “Class 2” or “LPS” and rated from 12 Vdc, 2.2 A / PoE (55 Vdc), 0.55A.
16. This product is intended to be supplied by isolation power.
17. If you use excessive force when installing the product, the camera may be damaged and malfunction. If you forcibly install the product using non-compliant tools, the product may be damaged.
18. Do not install the product in a place where chemical substances or oil mist exists or may be generated. As edible oils such as soybean oil may damage or warp the product, do not install the product in the kitchen or near the kitchen table. This may cause damage to the product.
19. When installing the product, be careful not to allow the surface of the product to be stained with chemical substance. Some chemical solvents such as thinner or adhesives may cause serious damage to the product’s surface.
20. If you install/disassemble the product in a manner that has not been recommended, the production functions/performance may not be guaranteed.
21. Installing or using the product in water can cause serious damage to the product.

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

To prevent injury, this apparatus must be securely attached to the Wall/ceiling in accordance with the installation instructions.

CAUTION

EXPLANATION OF GRAPHICAL SYMBOLS

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.
Class I construction
An apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

Battery
Batteries (battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.
The battery cannot be replaced.

Disconnection Device
Disconnect the main plug from the apparatus, if it’s defected. And please call a repair man in your location.
When used outside of the U.S., it may be used HAR code with fittings of an approved agency is employed.

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

ATTENTION
Il y a risque d’explosion si la batterie est remplacée par une batterie de type incorrect.
Mettre au rebut les batteries usagées conformément aux instructions.

These servicing instructions are for use by qualified service personnel only.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
The CVBS out terminal of the product is provided for easier installation, and is not recommended for monitoring purposes.
Please use the input power with just one camera and other devices must not be connected.
The ITE is to be connected only to PoE networks without routing to the outside plant.
The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802.3.bt shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1.

Unit is intended for installation in a Network Environment 0 as defined in IEC TR 62102.
As such, associated Ethernet wiring shall be limited to inside the building.

Please read the following recommended safety precautions carefully.
- Do not place this apparatus on an uneven surface.
- Do not install on a surface where it is exposed to direct sunlight, near heating equipment or heavy cold area.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not place a glass of water on the product.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Please wear protective gloves when installing/removing the camera.
The high temperature of the product surface may cause a burn.

User’s Manual is a guidance book for how to use the products.
The meaning of the symbols are shown below.
- Reference : In case of providing information for helping of product’s usages
- Notice : If there's any possibility to occur any damages for the goods and human caused by not following the instruction
  ※ Please read this manual for the safety before using of goods and keep it in the safe place.
We do not guarantee the quality of third-party products (e.g. lenses, accessories) that you separately purchase.
RECOMMENDED PC SPECIFICATIONS

- CPU : Intel(R) Core(TM) i9-7920X 2.9GHz or higher
- RAM : 64G or higher
- Supported OS : Windows 8.1, 10, Mac OS X 10.12, 10.13, 10.14
- Recommended browser : Google Chrome
- Supported browsers : MS Explore11, MS Edge, Mozilla Firefox(Window 64bit only), Apple Safari(Mac OS X only)
- VGA : GTX 1080, 11GB graphics card or higher

* Please see the appendix for detailed information on verified OS and browsers.

RECOMMENDED MICRO SD/SDHC/SDXC MEMORY CARD SPECIFICATIONS

- Recommended capacity : 16GB to 256GB (MLC type)
- Recommended Manufacturers : SanDisk, Transcend
- Product Type : High endurance
- The compatibility varies depending on the card manufacturers and types.
- For the recording of MJPEG SD, we recommend the recording resolution of MJPEG to be 4K or less.
- Regarding multi-profile specifications, TNB-9000 supports a total of three profiles. CH1 supports two profiles, DPTZ CH2 supports one profile. Therefore, if you are using all three profiles, you cannot additionally set and use a record profile, such as an SD card. In this case, to keep using the recording function, set up the record profile exactly the same as a profile currently being used.

NAS RECOMMENDED SPECS

- Recommended capacity : 200GB or higher is recommended.
- For this camera, you are recommended to use a NAS with the following manufacturer’s specs.
- Recommended products : QNAP NAS, Synology NAS

[While using the NAS auto recording, if you reboot your camera, the N/W connection may be deferred and the behavior of NAS auto recording might fail depending on the attributes of your external N/W devices.]

WHAT'S INCLUDED

Please check if your camera and accessories are all included in the product package.
(As for each sales country, accessories are not the same.)

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Item Name</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Camera</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quick Guide (Optional)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HPoE injector</td>
<td>1</td>
<td>Connects power supply and network</td>
</tr>
<tr>
<td></td>
<td>Power cord</td>
<td>1</td>
<td>Connects to HPoE</td>
</tr>
<tr>
<td></td>
<td>6-position Terminal Block</td>
<td>1</td>
<td>Used for alarm in/out terminals</td>
</tr>
<tr>
<td></td>
<td>Power Terminal Block</td>
<td>1</td>
<td>Plugged in the power plug</td>
</tr>
</tbody>
</table>

- SFP modules and fiber optic converters are separately sold. Please select and purchase an SFP of 100/1000 Base-FX and a fiber optic converter.
## MOUNT LENS - OPTIONAL

### Appearance

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Item Name</th>
<th>Description</th>
<th>Model Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>mount Lens</td>
<td>Optional lens to be inserted in a camera</td>
<td>Canon 24mm f1.4L, Auto-Iris (EF 24mm f/1.4L II USM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canon 35mm f1.4L, Auto-Iris (EF 35mm f/1.4L II USM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canon 50mm f1.4, Auto-Iris (EF 50mm f/1.4 USM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canon 85mm f1.2L, Auto-Iris (EF 85mm f/1.2L II USM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canon 100mm f2.0, Auto-Iris (EF 100mm f/2 USM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canon 70-200mm f2.8L, Auto-Iris, Vari Focal (EF 70–200mm f/2.8L USM)</td>
<td></td>
</tr>
</tbody>
</table>

⚠️ The product image is different for each lens model.

⚠️ When using Canon 70-200mm f2.8L, Auto-Iris, Vari Focal (EF 70–200mm f/2.8L USM) mount lens, housing accessory components must be used.

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## AT A GLANCE

### Front Side

1. **Mount Lens**
   - This lens is to be installed in a camera. It is separately sold.

2. **Lens release button**
   - Used for releasing a mounted lens.

3. **Screw hole for installation**
   - Used to fix the camera on a housing.
   - The screw size: It is the specification for the screws used to fasten the camera to the support.
     - 1/4" -20 UNC
     - L: 4.5mm±0.2mm (ISO Standard), or 0.197" (ASA Standard)

⚠️ Housing is not included. For more information to use housing, refer to the product’s documentation.

---
### Rear Side

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a</strong> Micro SD Memory Card Compartment</td>
<td>Compartment for the Micro SD memory card.</td>
</tr>
<tr>
<td><strong>b</strong> Micro HDMI port</td>
<td>Connect to a monitor by using an HDMI gender cable to view the camera feed.</td>
</tr>
<tr>
<td><strong>c</strong> MICRO USB port</td>
<td>Port to connect the Wi-Fi dongle. You can check the installation video through the applications installed in the smartphone. Refer to &quot;Connect to WiFi dongle&quot; on page 11. Wifi dongle and OTG adapter are sold separately.</td>
</tr>
<tr>
<td><strong>d</strong> Audio terminal</td>
<td></td>
</tr>
<tr>
<td>AUDIO OUT</td>
<td>Used to connect to speakers.</td>
</tr>
<tr>
<td>AUDIO IN</td>
<td>Used to connect to a microphone.</td>
</tr>
<tr>
<td><strong>e</strong> SFP module slot</td>
<td>The terminal that makes fiber optic connection through SFP module (LC type). (100/1000Base-FX)</td>
</tr>
<tr>
<td><strong>f</strong> Alarm I/O Port</td>
<td></td>
</tr>
<tr>
<td>ALARM IN</td>
<td>Used to connect the alarm input sensor or external day/night sensor.</td>
</tr>
<tr>
<td>ALARM OUT</td>
<td>Used to connect the alarm output signal.</td>
</tr>
<tr>
<td>GND</td>
<td>Used for earth-grounding.</td>
</tr>
<tr>
<td>RS-485+</td>
<td>RS-485 Data line</td>
</tr>
<tr>
<td>RS-485-</td>
<td>RS-485 Data line</td>
</tr>
<tr>
<td><strong>g</strong> Power Port</td>
<td>Used to plug the power cable.</td>
</tr>
<tr>
<td><strong>h</strong> HPoE Connection port</td>
<td>Terminal that connects power and network through an HPoE injector.</td>
</tr>
<tr>
<td><strong>i</strong> Reset Button</td>
<td>The button restores all camera settings to the factory default. Press and hold for about 5 seconds to reboot the system. If you reset the camera, the network settings will be adjusted so that DHCP can be enabled. If there is no DHCP server in the network, you must run the Device Manager program to change the basic network settings such as IP address, Subnet mask, Gateway, etc., before you can connect to the network.</td>
</tr>
<tr>
<td><strong>j</strong> Lightning protective grounding port</td>
<td>Used to discharge the lightning current safely outside in order to protect the camera.</td>
</tr>
</tbody>
</table>

- RS-485 port only supports direct connection with pan/Tilt driver and external connections of the RS-485 controller is not supported.
MOUNTING THE LENS

Disconnect the power before proceeding.

- Mount lenses are sold separately. For the list of compatible lenses, see page 7.
- The camera power must be turned off when installing/removing a compatible lens.

Mounting the lens on a camera
After aligning and inserting the lens mount index, turn it clockwise to mount it.

- The color of the lens mount index varies depending on the mount lens model.
- For more information on the lens to be mounted, see the user manual for the lens.

Release lens
While pressing and holding the lens release button on the camera, turn the lens clockwise to release it from the camera.
INSERTING/REMOVING A MICRO SD MEMORY CARD

- Disconnect the power cable from the camera before inserting the Micro SD memory card.
- Do not insert the Micro SD memory card while it's upside down by force. Otherwise, it may damage the Micro SD memory card.

Remove memory slot cover
Using the driver, remove the screws that fasten the dust-resistant cover to the memory slot, and then remove the cover so you can insert the memory card.

Inserting a Micro SD Memory Card
Push the Micro SD memory card in the direction of the arrow shown in the diagram.

Removing a Micro SD Memory Card
Gently press down on the exposed end of the memory card as shown in the diagram to eject the memory card from the slot.

- Pressing too hard on the Micro SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- Before removing the Micro SD memory card, in Setup - Event - Storage, set the device to Off and press the [Apply] button and turn the camera off.
- If you turn off the camera or remove the Micro SD memory card that contains data from the product, the data may be lost or damaged.
CONNECTING WITH OTHER DEVICE

- Connect and use a HPoE-enabled router.
- The Micro USB out terminal of the product is provided for easier installation, and is not recommended for monitoring purposes.

Connecting Wi-Fi

Camera Setup
1. Connect OTG adapter (5-pin) and WiFi dongle to the micro USB terminal.

Smartphone Setup
1. Install the Wisenet Installation application.
2. Select the camera SSID after turning on the WiFi.
3. Run the Wisenet Installation application.
4. When you log in to the camera, the video will be connected.
   - The video will be played without being logged in during the initial connection.
5. You can adjust angle of view while watching the video through smartphone.

Recommended dongle manufacturer

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETIS</td>
<td>WF2123 n300</td>
</tr>
<tr>
<td>EDIMAX</td>
<td>EW-7811Un</td>
</tr>
<tr>
<td>IP Time</td>
<td>N100mini</td>
</tr>
<tr>
<td>TP-LINK</td>
<td>TL-WN823N V1</td>
</tr>
<tr>
<td>ASUS</td>
<td>USB-N13</td>
</tr>
<tr>
<td>NETGEAR</td>
<td>WNA3100M</td>
</tr>
</tbody>
</table>
Connecting the SFP module

1. Insert the SFP module.

2. Connect the optical cable (AB) of the LC type to the SFP module.
3. Connect the other end of the optical cable (BA) to the fiber optic converter that pairs with the SFP module.

- SFP modules and fiber optic converters are separately sold.
- SFP modules of the following manufacturers are recommended:
  - Comnet, IFS, Skylane, AVAGO, CISCO
- Connect the SFP module and fiber optic converter by cross-connecting the optical cable (AB/BA).

- The connection of the SFP module must be made after the connected camera is turned off.
- Do not install/remove the SFP module while the camera is on.
- A kink in the optical cable may disrupt the connection for communication.
- Do not directly look at the optical cable. It can damage your eyes.

Ethernet Connection

Connect to your local network or internet by connecting your ethernet cable or SFP Optic Link.
The ethernet link on this product supports redundant link between RJ-45 and SFP, and SFP takes priority.

Behavior example:
- If SFP port is linked up during the use of RJ-45, SFP is activated for the ethernet link while RJ-45 is deactivated.
- If the SFP link is suddenly down during the use of SFP, the RJ-45 link is automatically activated.
Powering and networking
Connect the HPoE device with the HPoE terminal of the camera.

- Connect and use a HPoE-enabled router.
- Use a HPoE device that complies with the IEEE802.3at (PSE TYPE 3 or 4) standard.
- If you connect using a HPoE-enabled router, you don’t need a separate power supply cable to power it on.

Network Cable Specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>RJ45 (10/100/1000BASE-T)</td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td>10/100/1000BASE-T</td>
<td>To operate with 1000BASE-T, a cable of SSTP-CATEGORY 7 or higher should be used for the Giga hub.</td>
</tr>
<tr>
<td>Cable</td>
<td>SSTP-CATEGORY 7</td>
<td></td>
</tr>
<tr>
<td>Max Distance</td>
<td>100M</td>
<td>DC Resistance ≤ 0.188 Ω/m</td>
</tr>
<tr>
<td>HPoE</td>
<td>HPoE</td>
<td></td>
</tr>
</tbody>
</table>

Power Cable Specification for Each Model

In case of DC 12V Input:

<table>
<thead>
<tr>
<th>Wire Type (AWG)</th>
<th>#14</th>
<th>#16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable Length (Max.)</td>
<td>24m</td>
<td>15m</td>
</tr>
</tbody>
</table>

Optical communication ethernet standard

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet : Optical communication</td>
<td>SFP (LC Type)</td>
</tr>
<tr>
<td>Optical communication : Ethernet physical tier</td>
<td>10/100/1000BASE-T</td>
</tr>
<tr>
<td>Optical communication : Default speed</td>
<td>100/1000Mbps</td>
</tr>
<tr>
<td>Optical communication : Ethernet standard</td>
<td>IEEE 802.3ab, IEEE 802.3z</td>
</tr>
</tbody>
</table>
**Grounding the Product**

Connect the ground wire to the ground terminal which is located above the power input terminal by using a screwdriver.

- Grounding protects the product from a surge or lightning.
- When grounding, make sure to turn the product’s power off.

**Recommended Grounding Cable**

- Length : Less than 3M
- Gauge : 18 AWG or bigger
  Ex) UL1007 AWG 18/16, UL1015 AWG18/16/14/12, UL2468 AWG18/16/14

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**Connecting to Audio Input/Output**

1. Connect the AUDIO IN port of the camera with the microphone or LINE OUT port of the amplifier that the microphone is connected to.
2. Connect the AUDIO OUT port of the camera with the speaker or LINE IN port of the amplifier that the speaker is connected to.
3. Check the specifications for audio input.
   - **Audio Codec**
     - Audio In : G.711 PCM (Bit Rate: 64kbps / Sampling Frequency: 8kHz), G.726 ADPCM (Bit Rate: 16Kbps, 24Kbps, 32Kbps, 40Kbps / Sampling Frequency: 8kHz), AAC (Bit Rate: 48Kbps / Sampling Frequency: 16kHz)
     - Audio Out : G.711 PCM (Bit Rate: 64Kbps / Sampling Frequency: 8kHz)
   - **Full duplex Audio**
   - **Audio in** : Mono signal line input (Max.2.4 Vpp)
   - **Audio out** : Mono signal line output (Max.2.4 Vpp)
   - **Line out impedance** : 600Ω
Connecting to the I/O port box
Connect the Alarm I/O signal to the corresponding port of the rear port box.

- ALARM IN : Used to connect the alarm input sensor or external day/night sensor.
- ALARM OUT : Used to connect the alarm output signal.
- GND : Used for earth-grounding.
- RS-485+: Communication port for RS-485 receiver (+).
- RS-485- : Communication port for RS-485 receiver (–).

Connecting an external RS-485 device
Connect the camera with an external device using the [RS-485 +, -] ports.
You can control the pan/tilt operations of the camera via RS-485 communications.

- The GND connection is recommended for RS-485 communications. If you encounter a communication failure, connect the GND pin as appropriate to correct the GND level between camera and external device.

To connect the external sensor
Connect one strand of each signal line (2-strand) of the sensors to the [ALARM IN] port, and connect the other strand to the [GND] port.

Alarm In Wiring Diagram

To connect the alarm out
If devices (e.g., flashing light and siren) that exceed the voltage and current specifications are connected by using the open collector method, it may cause malfunction.
Refer to the alarm out connection diagram below when connecting devices that exceed the voltage and current specifications.

Alarm Out Wiring Diagram
network connection and setup

You can set up the network settings according to your network configurations.

CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

Connecting to the camera from a local PC in the LAN

1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.

CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM

1. Connect the user PC directly with the network camera.
2. Run the Device Manager and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
6. Move to [Basic] – [IP & Port], and set the IP type to [DHCP].
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- A remote PC in an external Internet out of the LAN network may not be able to connect to the camera installed in the intranet if the port-forwarding is not properly set or a firewall is set.
- In this case, to resolve the problem, contact your network administrator.
- By factory default, the IP address will be assigned from the DHCP server automatically.
- If there is no DHCP server available, the IP address will be set to 192.168.1.100.
- To change the IP address, use the Device Manager.
- For further details on Device Manager use, refer to “Using Device Manager”. (Page 17)

- For information on how to set DDNS, refer to the online help of Web Viewer.
- For information on how to set the IP format, refer to the online help of Web Viewer.
**USING DEVICE MANAGER**

- Device manager program can be downloaded from [Technical Guides] (<Technical Guides>)-[Online Tool> menu at Hanwha Techwin website (http://www.hanwha-security.com).  
- More instructions of Device Manager can be found at [Help> menu of the main page.

**AUTOMATICALLY SEARCHING CAMERA**

If a camera is connected to the same network of the PC where device manager is installed, you can find network camera by using search function.

1. Click <Search> at the main page of device manager.  
2. Check the camera from the list.  
   - Check MAC address at the sticker attached to the camera.

**CONFIGURING IP ADDRESS**

If you want to change camera network setting, <Login OK> sign must be displayed at <Status>. Click <Authentication> at the main page to log in.

### Configuring Static IP

Manually insert and configure IP address & port information.

1. Click the camera from the list that you want the change the IP setting.
2. Click <IP Assign> at the main page of device manager.
3. Select <Assign the following IP address>.
   - IP information of the camera will be displayed as previously set.
4. Fill in IP & Port related categories.

#### If not using a Broadband Router

For setting <IP Address>, <Subnet Mask>, and <Gateway>, contact your network administrator.

- HTTP Port : Used to access the camera using the Internet browser, defaulted to 80.
- RTSP Port: A port that controls real-time streaming. The initial value is 554.

#### If using a Broadband Router

- IP Address : Enter an address falling in the IP range provided by the Broadband Router.  
ex) 192.168.1.2–254, 192.168.0.2–254, 192.168.XXX.2–254  
- Subnet Mask : The <Subnet Mask> of the Broadband Router will be the <Subnet Mask> of the camera.  
- Gateway : The <Local IP Address> of the Broadband Router will be the <Gateway> of the camera.

- The settings may differ depending on the connected Broadband Router model.  
  For more information, refer to the user manual of the applicable router.

- For more information about port forwarding of the broadband router, refer to “Port Range Forward (Port Mapping) Setup”.  
  (Page 19)

#### If the Broadband Router has more than one camera connected

Configure the IP related settings and the Port related settings distinctly with each other.

<table>
<thead>
<tr>
<th>Category</th>
<th>Camera #1</th>
<th>Camera #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP related settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP Address</td>
<td>192.168.1.100</td>
<td>192.168.1.101</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>255.255.255.0</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Gateway</td>
<td>192.168.1.1</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>Port related settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTTP Port</td>
<td>8080</td>
<td>8081</td>
</tr>
<tr>
<td>RTSP Port</td>
<td>554</td>
<td>555</td>
</tr>
</tbody>
</table>

- If the <HTTP Port> is set other than 80, you must provide the <Port> number in the address bar of the Internet browser before you can access the camera.  
  ex) http://IP address : HTTP Port  
  http://192.168.1.100:8080

5. Click [Apply] Button.  
6. If the success message is displayed, click [OK].
Configuring Dynamic IP

Receive IP address from DHCP

- Example of the Dynamic IP environment
  - If a Broadband Router, with cameras connected, is assigned an IP address by the DHCP server
  - If connecting the camera directly to modem using the DHCP protocols
  - If IPs are assigned by the internal DHCP server via the LAN

1. Click the camera from the list that you want to change the IP setting.
2. Click <IP Assign> at the main page of device manager.
3. Select <Obtain an IP address automatically (DHCP)>.
4. Click [Apply] button.
5. If the success message is displayed, click [OK].

AUTOMATICALLY CONFIGURING IP

1. Click the camera from the list that you want to automatically configure the IP.
2. Click < > at the main page of device manager.
   - Equipment Setting menu appears.
3. At the menu, click <Auto IP Configure>.
4. Click [Close] button.

MANUALLY REGISTERING CAMERA

If the camera cannot be found using search function, the camera can be registered remotely by manually inserting IP information, if the camera is connected to external network.

1. Click <Add Devices> - <Manually Add Device> at the main page of device manager.
2. Insert the range of IP address that you search.
3. Select the <Model Name> of the camera that you register, and insert HTTP port, ID, and password.
4. Click [Register] button.
5. Check if camera is registered.
   - Check MAC address at the sticker attached to the camera.
PORT RANGE FORWARD (PORT MAPPING) SETUP

If you have installed a Broadband Router with a camera connected, you must set the port range forwarding on the Broadband Router so that a remote PC can access the camera in it.

Manual Port Range Forwarding

1. From the Setup menu of the Broadband Router, select <Applications & Gaming> - <Port Range Forward>. For setting the port range forward for a third-party Broadband Router, refer to the user guide of that Broadband Router.

2. Select <TCP> and <UDP Port> for each connected camera to the Broadband Router. The number of each port to be configured to the IP router should be set according to the port number designated in <Setup> - <Basic> - <IP & Port> on the camera web viewer.

3. When done, click [Save Settings]. Your settings will be saved.

- Port forwarding setting is an example of setting CISCO IP router.
- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.

Setting up Port Range Forward for several network cameras

- You can set a rule of Port Forwarding on the Broadband Router device through its configuration web page.
- A user can change each port using the camera setting screen.

When Camera1 and Camera2 are connected to a router:

<table>
<thead>
<tr>
<th>Camera1 (192.168.1.100)</th>
<th>Camera2 (192.168.1.101)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP port 8080</td>
<td>HTTP port 8081</td>
</tr>
<tr>
<td>RTSP port 3000</td>
<td>RTSP port 3001</td>
</tr>
</tbody>
</table>

- Port forwarding can be done without additional router setup if the router supports the UPnP (Universal Plug and Play) function. After connecting the network camera, select the checkbox from the menu <Quick connect> in <Wisenet DDNS> in "Settings -> Network -> DDNS".
CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

1. Run device manager.
   It will scan for connected cameras and display them as a list.

2. Double-click a camera to access.
   The Internet browser starts and connects to the camera.

   Access to the camera can also be gained by typing the camera’s IP address in the address bar of the Internet browser.

CONNECTING TO THE CAMERA FROM A REMOTE PC VIA THE INTERNET

On a remote computer that is not in the Broadband Router’s network cluster is not allowed, users can access cameras within a Broadband Router’s network by using the camera’s DDNS URL.

1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.

2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar:
   ex) http://ddns.hanwha-security.com/ID

   To use Wisenet DDNS, sign up at the Wisenet DDNS homepage (http://ddns.hanwha-security.com) and register the product at [My DDNS] > [Register Product].
CONNECTING TO THE CAMERA

Normally, you would

1. Launch the Internet browser.
2. Type the IP address of the camera in the address bar.
   ex) IP address (IPv4): 192.168.1.100 → http://192.168.1.100
   - the Login dialog should appear.

If the HTTP port is other than 80

1. Launch the Internet browser.
2. Type the IP address and HTTP port number of the camera in the address bar.
   ex) IP address : 192.168.1.100:HTTP Port number(8080) → http://192.168.1.100:8080 - the Login dialog should appear.

Using URL

1. Launch the Internet browser.
2. Type the DDNS URL of the camera in the address bar.
   ex) URL address : http://ddns.hanwha-security.com/ID
   - the Login dialog should appear.

Connecting via Bonjour

1. Run the client or operating system in support of the Bonjour protocol.
2. Click the camera name for search.
   - In the Mac operating system, click the camera name searched from the Bonjour tab of Safari.
   - The login window is displayed.

To check the DDNS address

If the camera is connected directly to the DHCP cable modem, DSL modem, the IP address of your network will be changed each time you try to connect to the ISP (Internet Service Provider) server. If this is the case, you will not be informed of the IP address changed by DDNS. Once you register a dynamic IP-based device with the DDNS server, you can easily check the changed IP when you try to access the device.

To register your device to the <DDNS> server, visit http://ddns.hanwha-security.com and register your device first, and then set the Web Viewer's <Network> - <DDNS> to <Wisenet DDNS>, as well as providing <Product ID> that had been used for DDNS registration.

Network connection is disabled in the LAN only environment.

Connecting via UPnP

1. Run the client or operating system in support of the UPnP protocol.
2. Click the camera name for search.
   - In the Windows operating system, click the camera name searched from the network menu.
   - The login window is displayed.
PASSWORD SETTING

When you access the product for the first time, you must register the login password.

- For a new password with 8 to 9 digits, you must use at least 3 of the following: uppercase/lowercase letters, numbers and special characters. For a password with 10 to 15 digits, you must use at least 2 types of those mentioned.
  - Special characters that are allowed: ~`!@#$%^*()_-+=|{}[]().?
- For higher security, you are not recommended to repeat the same characters or consecutive keyboard inputs for your passwords.
- If you lost your password, you can press the [RESET] button to initialize the product. So, don’t lose your password by using a memo pad or memorizing it.

LOGIN

Whenever you access the camera, the login window appears. Enter the User ID and password to access the camera.

1. Enter “admin” in the <User name> input box.
   The administrator ID, “admin”, is fixed and can not be changed.
2. Enter the password in the <Password> input field.
3. Click [OK].
   If you have logged in successfully, you will the Live Viewer screen.

- When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.

- If you check the “Remember my credentials” option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.

- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.

CAMERA WEB VIEWER SETUP

1. Click the [Setup ( ] icon.
2. The Settings window appears.
3. You can configure settings for the camera’s basic information, video, audio, network, event, analysis, and system over the network.
4. Click <Help ( )> to view detailed descriptions of each function.

Due to PC performance issues, a high resolution video (above 4K) will be switched to Plug-in free profile in the web viewer. For optimal live monitoring, please use a high performance monitoring service, such as SSM.
## TROUBLESHOOTING

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>When an Windows 10 user accesses the web viewer through Chrome or Firefox, the sound volume of microphone changes periodically.</td>
<td>• This is what happens when microphone driver has been set to Realtek driver. Install the High Definition Audio device (Windows Default Driver) or the third party driver as the microphone driver.</td>
</tr>
<tr>
<td>No video is displayed when accessing the plug-in free webviewer on Safari via HTTPS.</td>
<td>• On the authentication popup window prompted when initially accessing https, click &quot;View Authentication Certificate&quot; and select the &quot;Always trust when connecting to the designated webviewer IP&quot; check box. • If the webviewer is failing to display a video after you select &quot;Next&quot; on the message window below, press the command key + Q to exit the Safari browser, access again and follow the procedures stated above.</td>
</tr>
<tr>
<td>I can’t access the camera from a web browser.</td>
<td>• Check to make sure that the camera’s Network settings are appropriate. • Check to make sure that all network cables have been connected properly. • If connected using DHCP, verify that the camera is able to acquire dynamic IP addresses without any problem. • If the camera is connected to a Broadband Router, verify that port forwarding is properly configured.</td>
</tr>
<tr>
<td>Viewer got disconnected during monitoring.</td>
<td>• Connected Viewers become disconnected upon any change to camera or network configurations. • Check all network connections.</td>
</tr>
<tr>
<td>The camera connected to the network is not detected in the Device Manager program.</td>
<td>• Turn off the firewall settings on your PC and then search the camera again.</td>
</tr>
<tr>
<td>Images overlap.</td>
<td>• Check whether two or more cameras are set to a single multicast address instead of different addresses. If a single address is used for multiple cameras, the images may overlap.</td>
</tr>
<tr>
<td>No image appears.</td>
<td>• If the transmission method is set to multicast, check whether there is a router that supports multicast in the LAN the camera is connected to.</td>
</tr>
<tr>
<td>Voice is not recorded even though audio input settings are configured.</td>
<td>• You must enable the &lt;Audio In&gt; check box in &lt;Basic&gt; - &lt;Video Profile&gt;.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Motion detection&gt; of &lt;Analytics&gt; is set to &lt;Enable&gt;, but no notification e-mail reaches me even when an analysis event had occurred.</td>
<td>• Verify the settings in the following sequence: A. Check &lt;Data &amp; Time&gt; settings. B. The &lt;Motion detection&gt; should be set to &lt;Enable&gt;. C. Check if the &lt;E-mail&gt; option of &lt;Event setup&gt; menu is checked to use.</td>
</tr>
<tr>
<td>No signal is found at the Alarm Output port even when an intelligent video analysis event is generated.</td>
<td>• Check alarm output port settings.</td>
</tr>
<tr>
<td>Cannot record into the Micro SD memory card.</td>
<td>• Check if the memory card is defective.</td>
</tr>
<tr>
<td>Micro SD memory card is inserted but the camera does not operate properly.</td>
<td>• Check if the memory card is inserted in the proper direction. Operation of memory card that is formatted by other devices is not guaranteed with this camera unit. • Format the memory card again in &lt;Storage&gt; menu.</td>
</tr>
<tr>
<td>Cannot record in the NAS.</td>
<td>• Confirm that the information registered in the NAS is correct.</td>
</tr>
<tr>
<td>It reports that NAS setting has failed.</td>
<td>• Confirm that the IP address of the NAS is valid. • Confirm that the ID/password of the NAS is valid. • Confirm that you can access the folder designated as the default folder using the ID of the NAS. • Confirm that the NAS SMB/CIFS items are unchecked. • Confirm that the NAS IP address and the camera IP address are in the same format. ex) The NAS &amp; camera subnet mask initial value is 255.255.255.0. If the IP address is 192.168.20.32 then the NAS IP address should be in the range of 192.168.20.1~192.168.20.255. • Check whether you tried to access as another user without formatting the default folder saved or used. • Confirm that you used recommended NAS equipment.</td>
</tr>
</tbody>
</table>
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<th>Component Name</th>
<th>License</th>
<th>URL</th>
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</tr>
<tr>
<td>BusyBox</td>
<td>GPL 2.0</td>
<td>ftp://ftp.netfilter.org/pub/busybox</td>
</tr>
<tr>
<td>iptables-1.4.21</td>
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<tr>
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<td>GPL 2.0</td>
<td>ftp://ftp.netfilter.org/pub/ethtool-utils</td>
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<tr>
<td>mtd-1.5.2</td>
<td>GPL 2.0</td>
<td>ftp://ftp.infradead.org/pub/mtd-utils</td>
</tr>
<tr>
<td>mii-dag-0.11</td>
<td>GPL 2.0</td>
<td>ftp://ftp.infradead.org/pub/mtd-utils</td>
</tr>
<tr>
<td>ip-pppoe-3.11</td>
<td>GPL 2.0</td>
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<tr>
<td>bash-4.3.30</td>
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<td>zerocore</td>
<td>GPL 2.0</td>
<td><a href="http://www.busybox.net/downloads/snapshots">http://www.busybox.net/downloads/snapshots</a></td>
</tr>
</tbody>
</table>

LGPG SW

Component Name | License | URL |
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<tbody>
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</tbody>
</table>

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   3. to distribute a copy of a work to the general public or a large number of specific persons.

Article 3. Copyright

1. The copyrights of the Source Code shall be owned by Ken Sakamura.

Article 4. License of Source Code

1. As provided for in this Article, T-Engine Forum shall provide, and grant a license to use, the Source Code free of charge to any person who has taken the necessary procedure for registration as prescribed by T-Engine Forum and agreed to the T-License.


3. In accordance with the license granted under Article 4.1 above, the Source Code User may perform the following acts:
   1. to copy and/or modify the Source Code provided by T-Engine Forum hereunder for its own research, development and the like.
   2. to run the Source Code provided by T-Engine Forum hereunder for its own research, development and the like.
   3. to run the Source Code modified in accordance with the provision of Article 4.3 (1) above for its own research, development and the like.
   4. to distribute the Binary Code created from the Source Code provided by T-Engine Forum hereunder or from the Source Code modified in accordance with the provision of Article 4.3 (1) above.

4. In accordance with the license granted under Article 4.1 above, the System Developer may perform the following acts:
   1. to perform any and all acts set forth in the Article 4.3 above.
   2. to develop and manufacture the Embedded Product containing the Binary Code, and, whether with or without payment, provide the End User with the same and make the Binary Code available to the End User on the Embedded Product.

5. The Source Code User and the System Developer shall be obligated to give a notice that the Source Code is used, in such a way as separately specified by T-Engine Forum, when they use the Source Code or the Binary Code, or make the Binary Code available for the End User on the Embedded Product.

Article 5. Distribution of Modified Source Code

1. Any of A- members of T-Engine Forum may become the Distributor of Modification by obtaining the approval of T-Engine Forum through the registration procedure as prescribed by the Forum provided that only the department of the A- member which has taken the registration procedure may distribute the Modified Source Code in such a way as provided for in this Article as long as it holds the A-membership.

2. The Distributor of Modification may create the Modified Source Code based on the Source Code provided by T-Engine Forum and the Patch for Modification to be applied to create such Modified Source Code from the Source Code.

3. The Distributor of Modification shall, prior to the distribution, inform T-Engine Forum of and register a name and description of the Modified Source Code in such a way as specified by T-Engine Forum.

4. The Distributor of Modification shall determine the name of the Modified Source Code subject to the rules separately established by T-Engine Forum and publish an appropriate notice as required by the rules on the Patch for Modification and the Modified Source Code.

5. The Distributor of Modification may distribute the Modified Source Code to a third party, whether with or without payment, provided that the Distributor of Modification shall take the necessary measures to prohibit the third party from making the re-Distribution of the Modified Source Code.

6. Developer with the Patch for Modification. Provided, however, that the Distributor of Modification shall be obligated to confirm that the System Developer is the Source Code User duly licensed under Article 4.1.

7. The Distributor of Modification may perform the Vicarious Execution of Patch Processing for the System Developer.

8. The System Developer shall not distribute the Modified Source Code in further modified form to any third party as a stand-alone software product.

9. The System Developer may, under the same obligation as imposed in Article 4.5, make the Embedded Product available for the End User through use of the Patch for Modification distributed by the Distributor of Modification or the Derivative Works obtained through the Vicarious Execution of Patch Processing.

Article 6. Distribution and Registration of the Ported Source Code

1. The Source Code User and the System Developer may, whether with or without charge, distribute to any third party only the following parts of the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware:
   1. The Hardware-dependent Part and/or Compiler-dependent Part; provided that the Source Code User and the System Developer shall inform T-Engine Forum of, and T-Engine Forum may publish, a method for distributing said Part(s) to third parties.
   2. The Header File; provided that the Header File shall be distributed together with the Binary Code of the Ported Source Code.

2. Any member of T-Engine Forum may request T-Engine Forum to register and distribute, as an original source code for T-Kernel, the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.

3. Any member of T-Engine Forum who requests the distribution mentioned in the preceding paragraph shall accord to the following conditions:
   1. The member shall confirm that the object hardware is the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.
   2. The member shall provide T-Engine Forum with a complete set of operational environment for the object hardware and T-Kernel free of charge when requesting the distribution.
   3. The member shall submit test results of the Ported Source Code to T-Engine Forum when requesting the distribution.

4. In the event that T-Engine Forum accepts the request mentioned in Article 6.2, T-Engine Forum shall register and distribute the Ported Source Code as the Source Code for T-Kernel. Provided, however, that the Ported Source Code may be treated in the same way as the Modified Source Code until the time of registration hereunder.

5. The provision set forth in Article 3 shall apply to the Ported Source Code registered in accordance with this Article.

Article 7. Use for Other Purpose

1. Any use of the Source Code, the Modified Source Code or the Ported Source Code other than those stipulated in Articles 4, 5 and 6 shall be subject to the prior approval of T-Engine Forum.

Article 8. Limited Warranty

1. T-Engine Forum and the copyright holder of the Source Code warrant that the Source Code does not infringe third party's copyrights. Provided, however, that T-Engine Forum and the copyright holder of the Source Code make no warranty as to the Hardware-dependent Part and/or Compiler-dependent Part set forth in Article 6.2 in the Ported Source Code by any third party.


3. Neither T-Engine Forum nor the copyright holder of the Source Code warrants that the Source Code does not infringe any third party's industrial property rights.

4. No event shall T-Engine Forum and the copyright holder of the Source Code be liable for any dispute which may arise between the Source Code User and a third party in connection with the third party's industrial property rights.

Article 9. Indemnity

1. Neither T-Engine Forum nor the copyright holder of the Source Code shall be liable for any damages (including, but not limited to, damages resulting from loss of profit, business interruption, loss of business information or any other pecuniary damage) arising out of use or impossibility of use of the Source Code, even if T-Engine Forum and the copyright holder have been informed of the possibility of such damages.

Article 10. Breach of Agreement

1. In case that T-Engine Forum considers that the License Agreement is breached or that the proliferation of T-Kernel is obstructed, T-Engine Forum shall take measures to correct such breach or such obstruction, take measures on the ground of copyright infringement, or take any other necessary measures against the breaching person or the obstructing person, regardless of whether or not the said person is a member of T-Engine Forum.

2. In case of breach of this License Agreement by a member of T-Engine Forum, T-Engine Forum may take appropriate measures against the member; for example, the member is disqualified from membership, depending on what kind of breach has been committed by it.

3. Any legal dispute which may arise in relation to any breach of this License Agreement shall be subject to the exclusive jurisdiction of the Tokyo District Court.

Article 11. Governing Law and Language

1. This License Agreement shall be governed by and interpreted under the laws of Japan.

2. This License Agreement is executed in both Japanese text and English text provided that the Japanese text shall govern the interpretation and performance of this License Agreement.

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This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

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