

NETWORK CAMERA

User Manual

TNU-6320E/TNO-6320E



Network Camera

User Manual

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Trademark

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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.

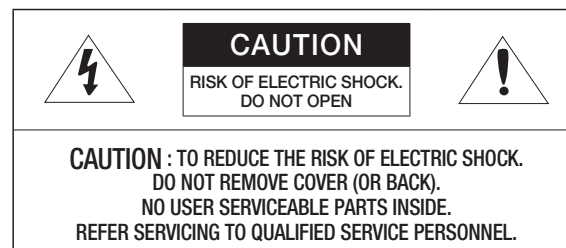
Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

IMPORTANT SAFETY INSTRUCTIONS

1. Before installation, read all manuals thoroughly and proceed with the installation according to the directions.
2. When connecting a power cable or signal line, check the external connection port first. Incorrectly connecting the power supply may cause fire, electric shock or damage to the product.
3. If you notice any unusual smells or smoke coming from the unit, stop using the product. If this occurs, immediately disconnect the power source and contact the service center. Continued use may cause fire or electrical shock.
4. Do not disassemble while the power is on.
5. Before the power is supplied, confirm that all power cords have been properly connected. An insecure connection may result in fire.
6. If needed, you can disassemble the system after the power has been shut off for 30 minutes.
If the system has been in a high or low temperature environment, you may be injured by high heat or low chill of the surface.
7. Before turning the power on, confirm that the power supply supports 24Vac/6A(TNU-6320E) or 24Vac/3A(TNO-6320E) 50/60Hz.
Power in excess of the rated voltage may cause a fire.
8. Lightning or thunder may cause damage to the device.
When installing the product, consider taking measures that will minimize damage to the product in the event of lightning.
9. When the system is installed, it should be tightly anchored on a floor that can sufficiently sustain its weight against any strong wind.
The fixing method and material used must be able to sustain at least 4 times the system's weight.
10. Since the system is remotely controlled and sometimes changes its position, it should be so carefully installed that it does not create any harmful environment, i.e., its moving part does not injure people.
11. Do not attach anything to the system.
12. When installing in a dangerous environment, remove the equipment from the power supply to reduce the possibility of ignition.

13. Install explosion-proof seal fitting at the cable entry.
14. During the assembly, fasten the bolt with a proper amount of torque ($\geq 450\text{N}/\text{mmi}$).
15. Do not install near a heater or motor.
Install the system in a place with good ventilation.
16. You can receive installation support from engineers who are qualified to handle technical services.
17. Do not install the product in a location that is humid, or where the product will be exposed to dust or soot.
18. Do not drop objects on the product, or apply strong impact to it.
Keep away from locations where there is excessive vibration or magnetic interference.
19. Do not install in an operating environment with extreme temperatures.
The camera will operate at temperatures of -30°C or higher.
20. Keep out of direct sunlight, and away from heat radiation sources.
21. If you want to relocate a product that has already been installed, be sure to turn off the power and then move or reinstall it.
Failure to turn off the power may result in fire or electric shock.
22. Install the product in a location with good ventilation.
When connecting a power cable or signal line, check the external connection port first.
23. The rubber part of the camera wiper is expendable. Replace with a new one if performance is degraded.
24. Before cleaning the system, disconnect it from the power supply.

CAUTION



In particular installation environments, there might be interference in radio communications. When interference of electromagnetic waves occurs between the product and radio communication device, it is recommended to keep a certain distance between the two or change the direction of the receiving antenna.

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RECOMMENDED PC SPECIFICATIONS

- CPU : Intel Core 2 Duo 2.4 GHz or higher (for using 1920x1080 30 fps)
Intel Core i7 2.8 GHz or higher (for using 1920x1080 60 fps)
 - Web Plug-in is optimized to SSE 4.1 Instruction Set.
- Resolution : 1280X1024 pixels or higher (32 bit color)
- RAM : 2GB or higher
- Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7
- Supported Browser : Microsoft Internet Explorer (Ver. 8~11), Mozilla Firefox (Ver. 9~19), Google Chrome (Ver. 15~25), Apple Safari (Ver. 6.0.2 (Mac OS X 10.8, 10.7 only), 5.1.7)
 - Windows 8 is supported only in the Desktop mode.
 - Neither a beta test version unlike the version released in the company website nor the developer version will be supported.
 - For IPv6 connection, Window 7 or higher is recommended.
 - For Mac OS X, only the Safari browser is supported.
- Video Memory : 256MB or higher
 -  If the driver of the video graphic adapter is not installed properly or is not the latest version, the video may not be played properly.
 - For a multi-monitoring system involving at least 2 monitors, the playback performance can be deteriorated depending on the system.

NAS RECOMMENDED SPECS

- Recommended capacity : 200GB or higher is recommended.
- Simultaneous access : One unit of NAS can accept a maximum of sixteen camera accesses.
- For this camera, you are recommended to use a NAS with the following manufacturer's specs.

Recommended products	Available sizes
QNAP/SYNOLOGY/HP/DELL	A maximum of 16 cameras can access simultaneously.

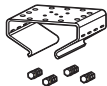


- If you use NAS equipment for purposes other than video saving, the number of accessible cameras may be reduced.

WHAT’S INCLUDED (TNU-6320E)

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

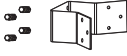
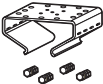
Appearance	Item Name	Quantity	Description
	Rotational explosion-proof PTZ camera	1	-
	Quick Guide (Optional)	1	-
	Warranty card (Optional)	1	-
	Nipple	1	Connects the camera body with seal fitting
	Seal fitting	1	Injects sealing compounds to protect against the outside environment
	Sunshade	1	Blocks direct sunlight
	Wrench Bolt (M8X10)	2	Sun shield is fixed on the camera
	Wrench Bolt (M8X15)	4	Used to assemble the camera body and bracket
	Installation Template	1	Guide for installation work
	Screw for grounding (MS PH M5X8)	1	Used to connect grounding wires

Appearance	Item Name	Quantity	Description
Options (not included)			
	Wall bracket		Used to install a camera on the wall
	Corner bracket		Used to install a wall bracket on a corner of the wall
	Pole bracket		Used to install a wall bracket on a pole
	Support bracket		Used to install a camera on the floor

WHAT'S INCLUDED (TNO-6320E)

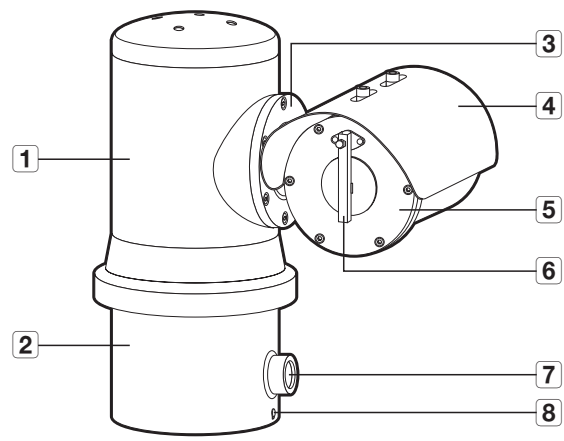
Please check if your camera and accessories are all included in the product package.
(As for each sales country, accessories are not the same.)

Appearance	Item Name	Quantity	Description
	Fixed explosion-proof PTZ camera	1	-
	Quick Guide (Optional)	1	-
	Warranty card (Optional)	1	-
	Nipple	1	Connects the camera body with seal fitting
	Seal fitting	1	Injects sealing compounds to protect against the outside environment
	Sunshade	1	Blocks direct sunlight
	Wrench Bolt (M8X10)	2	Sun shield is fixed on the camera
	Wrench Bolt (M8X15)	4	Used to assemble the camera body and bracket

Appearance	Item Name	Quantity	Description
	Rotation bracket	1	Installed on the camera bottom, and used when the camera is rotating
	Wrench bolt for assembly of rotating bracket (M8X15)	4	
	Hexagonal headed nut to assemble rotation bracket (M8)	4	
	Wrench bolt for fixing wall bracket (M8X15)	4	-
	Hexagonal headed nut to fix wall bracket (M8)	4	-
Options (not included)			
	Wall bracket		Used to install a camera on the wall
	Corner bracket		Used to install a wall bracket on a corner of the wall
	Pole bracket		Used to install a wall bracket on a pole

AT A GLANCE (TNU-6320E)

Appearance



Item	Description
1 Main Housing	Main PCB and tilt motor system are installed in the main housing.
2 Base Housing	Base and pan motor system are included in the main housing.
3 Tilt Shaft	Cables pass through a tilt shaft.
4 Sunshade	Protects the system from sunlight and unwanted reflections.
5 Camera Housing	Camera module and windshield wiper system are installed in the main housing.
6 Windshield Wiper	Wipes away water or dust on the camera screen.
7 Cable Entry	Attached on Seal fitting.
8 Screw for Grounding	Used to connect grounding wires.

Product Indication

2M 32x Network PTZ Camera

MODEL TNU-6320E

SERIAL No.

YEAR.

CE 2460 Ex II 2 GD, Ex d IIC T6 Gb IP67

Ex tb IIIC T80°C Db

EC TYPE EXAMINATION CERTIFICATE: Presafe 16 ATEX 8627X

AMBIENT TEMPERATURE: -40°C ≤ Ta ≤ +60°C

POWER: 24Vac, 6A, 50/60Hz, Max 49W.

CONDUIT SEALING DEVICES ENTRY THREAD SPECIFICATION: NPT 3/4"-14

CAUTION

USE FASTENERS WITH YIELD STRESS ≥ 450N/mm².

WARNING

DO NOT OPEN WHEN ENERGIZED.

AFTER DE-ENERGIZING, DELAY 30Mins BEFORE OPENING.

HANWHA TECHWIN Co., Ltd

86 Cheonggyecheon-ro Jung-gu Seoul Korea

www.hanwhatechwin.com

CE

ATEX Indication Symbol

CE 2460 Ex II 2 GD, Ex d IIC T6 Gb IP67

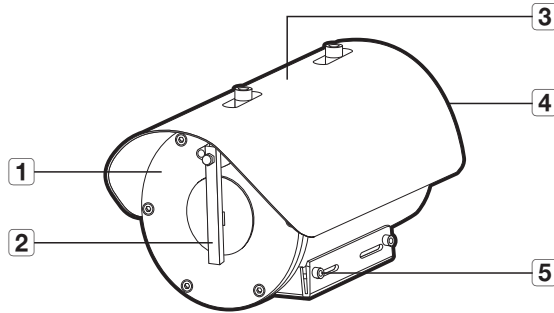
Ex tb IIIC T80°C Db

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Item	
1 CE Symbol	9 Maximum surface temperature of gas
2 Certificate Authority Number	10 Protection level of a system for gas
3 EU mark of existing systems	11 IP protection level
4 System set (not a system for mining but for surface)	12 Protection from dust and ignition for Regions 21 and 22
5 System scope (Protection level is high It is possible to install systems on the first and second regions)	13 Dust group
6 G and/or D - gas or dust	14 Maximum surface temperature of dust
7 Explosion-proof cover to protect against explosive environments	15 Dust protection criteria for a system
8 Gas group	

AT A GLANCE (TNO-6320E)

Appearance



Item	Description
1 Camera Housing	Camera module and windshield wiper system are installed in the main housing.
2 Windshield Wiper	Wipes away water or dust on the camera screen.
3 Sunshade	Protects the system from sunlight and unwanted reflections.
4 Cable Entry	Attached on Seal fitting.
5 Screw for Grounding	Used to connect grounding wires.

Product Indication

2M 32x Network Camera

MODEL. TNO-6320E
 SERIAL No. YEAR.

CE 2460 **Ex** II 2 GD, Ex d IIC T6 Gb IP67 **CE**
 Ex tb IIIC T85°C Db

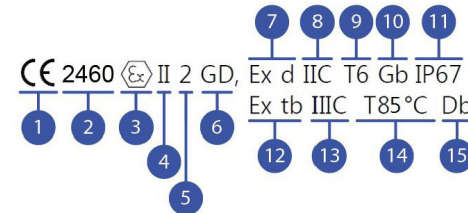
EC TYPE EXAMINATION CERTIFICATE: Presafe 16 ATEX 8628X
 AMBIENT TEMPERATURE: -40°C ≤ Ta ≤ +60°C
 POWER: 24Vac, 3A, 50/60Hz, Max 28W.
 CONDUIT SEALING DEVICES ENTRY THREAD SPECIFICATION: NPT 3/4"-14

CAUTION
 USE FASTENERS WITH YIELD STRESS ≥ 450N/mm².

WARNING
 DO NOT OPEN WHEN ENERGIZED.
 AFTER DE-ENERGIZING, DELAY 30Mins BEFORE OPENING.

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 86 Cheonggyecheon-ro Jung-gu Seoul Korea
 www.hanwhatechwin.com

ATEX Indication Symbol



Item	
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INSTALLATION (TNU-6320E)

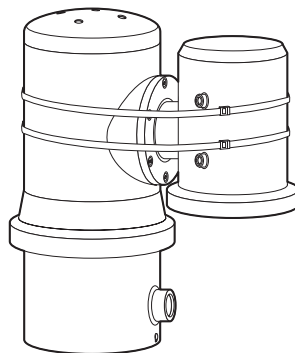
Precautions before installation

Ensure you read out the following instructions before installing the camera:

- Install the system based on the following directions. If you want to install using a different method, you should confirm the safety recommendations by making a request to the manufacturer in advance.
- The gross weight of the system is 35 kg. Be careful when lifting the system, and put on proper anti-slip gloves.
- It must be installed on the area (ceiling or wall) that can withstand 4 times the weight of the camera including the installation bracket.
- Stuck-in or peeled-off cables can cause damage to the product or a fire.
- For safety purposes, keep anyone else away from the installation site. And put aside personal belongings from the site, just in case.

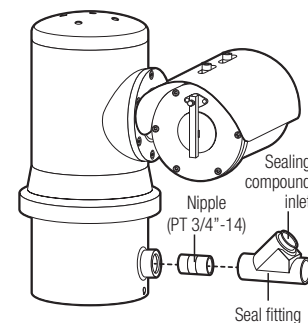
Removing cable ties

The product is released with the camera section fixed with cable ties to prevent damage to the product. First, fix the product securely using a bracket, bolts and nuts, and then remove the cable ties before proceeding to installation.



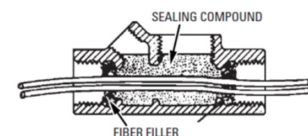
How to install seal fitting in the cable entry

1. Install the conduit seal system according to the EN60079-14 standard.
2. Check items that are installed together with screws, conduit sealing parts, etc.
3. After connecting screws to the cable entry, tightly connect the seal fitting with an explosion-proof nipple.
4. Pass cables that are connected to the outside through the seal fitting. Conduit sealing parts should obtain ATEX certification.



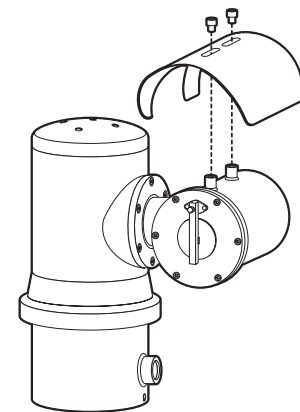
5. Insert sealing parts by referring to the next figure.

! ■ Use sealing compounds that have obtained UL certification.

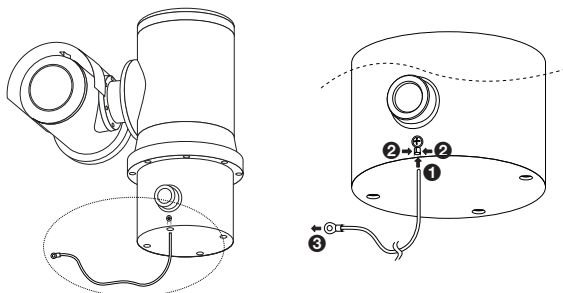


How to install Sunshade

Connect the sunshade to the camera housing with screws using a wrench.



How to install the grounding wires



1. Insert the grounding wires into the cable terminal.
2. Fix the terminal using a cable clamping tool.
3. Connect the grounding cables with the external earthing rod.

! ■ Do not disassemble the system while it is operating. You can disassemble the system for maintenance 30 minutes after the power is shut off.

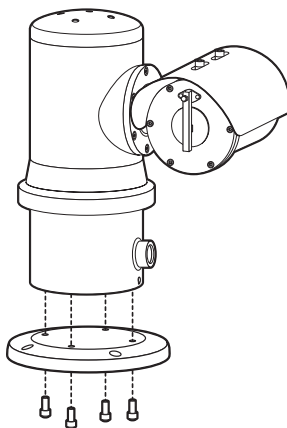
Optional Accessories for Installation

For your easier installation, you can purchase appropriate optional accessories available.

■ How to install a support bracket on the system

1. Assemble the support bracket under the base housing using 4 screw bolts.
2. Install the support bracket on the floor using screw bolts.

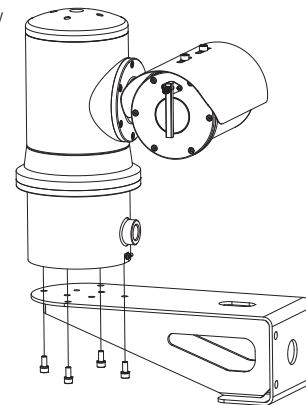
! ■ When the camera is installed on a concrete floor, be sure to use an M8 anchor bolt.
■ Use screws that can support at least 4 times the weight of the system.



■ How to install wall brackets on the system

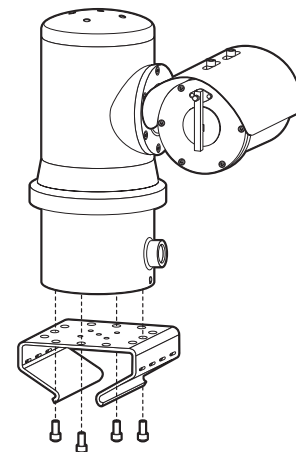
1. Assemble the wall bracket under the base housing using 4 screw bolts.
2. Install the wall bracket on the wall using screw bolts.

! ■ When the camera is installed on a concrete floor, be sure to use an M12 anchor bolt.

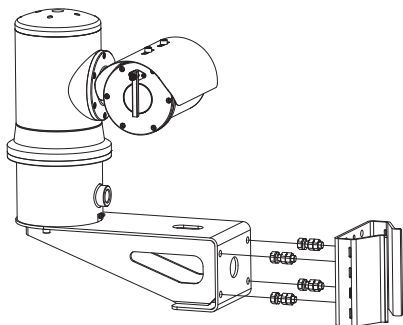


■ How to install a pole bracket on the system

1. Assemble the pole bracket under the base housing using 4 screw bolts.
2. Install the pole on the pole bracket using a steel band.

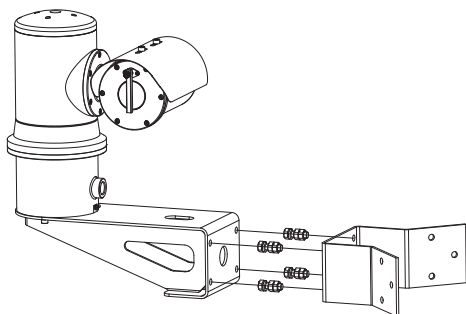


■ How to install wall/pole brackets on the system



1. Assemble pole bracket sides with the wall bracket using a set of 4 bolts.
 - Bolt set M12 bolt X M12 spring washer X M12 nut (2EA)
2. Install the pole on the pole bracket using a steel band.

■ How to install a corner bracket on the system



1. Assemble corner bracket sides with the wall bracket using a set of 4 bolts.
 - Bolt set M12 bolt X M12 spring washer X M12 nut (2EA)
2. Install the corner bracket on the wall using screw bolts.

- ! ■ When the camera is installed on a concrete floor, be sure to use an M12 anchor bolt.

INSTALLATION (TNO-6320E)

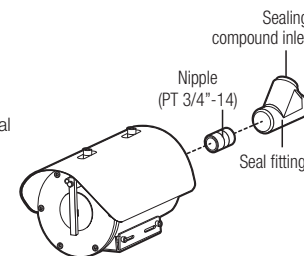
Precautions before installation

Ensure you read out the following instructions before installing the camera:

- Install the system based on the following directions. If you want to install using a different method, you should confirm the safety recommendations by making a request to the manufacturer in advance.
- The gross weight of the system is 7 kg. Be careful when lifting the system, and put on proper anti-slip gloves.
- It must be installed on the area (ceiling or wall) that can withstand 4 times the weight of the camera including the installation bracket.
- Stuck-in or peeled-off cables can cause damage to the product or a fire.
- For safety purposes, keep anyone else away from the installation site. And put aside personal belongings from the site, just in case.

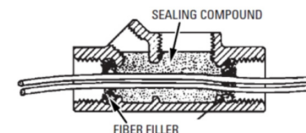
How to install seal fitting in the cable entry

1. Install the conduit seal system according to the EN60079-14 standard.
2. Check items that are installed together with screws, conduit sealing parts, etc.
3. After connecting screws to the cable entry, tightly connect the seal fitting with an explosion-proof nipple.
4. Pass cables that are connected to the outside through the seal fitting. Conduit sealing parts should obtain ATEX certification.



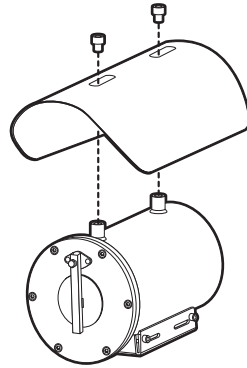
5. Insert sealing parts by referring to the next figure.

- ! ■ Use sealing compounds that have obtained UL certification.



How to install Sunshade

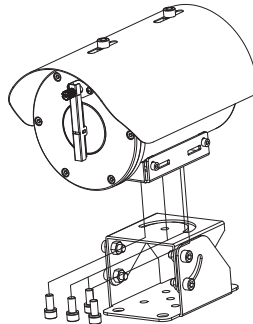
Connect the sunshade to the camera housing with screws using a wrench.



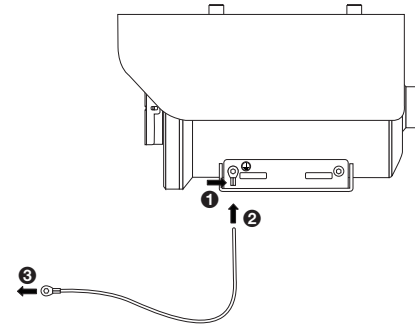
How to install a rotation bracket on the system

1. Assemble the rotation bracket under the housing bracket using 3 or 4 screw bolts according to the angles.
2. Install the rotation bracket on the floor using screw bolts.

- When the camera is installed on a concrete floor, be sure to use an M8 anchor bolt.
- Use screws that can support at least 4 times the weight of the system.



How to install the grounding wires



1. Insert the grounding wires into the cable terminal.
2. Fix the terminal using a cable clamping tool.
3. Connect the grounding cables with the external earthing rod.

- Do not disassemble the system while it is operating. You can disassemble the system for maintenance 30 minutes after the power is shut off.

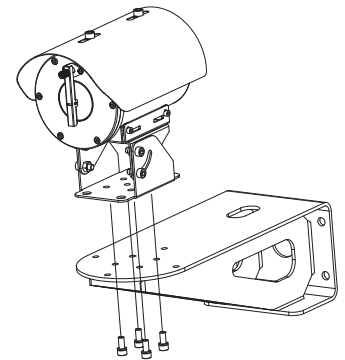
Optional Accessories for Installation

For your easier installation, you can purchase appropriate optional accessories available.

■ How to install wall brackets on the system

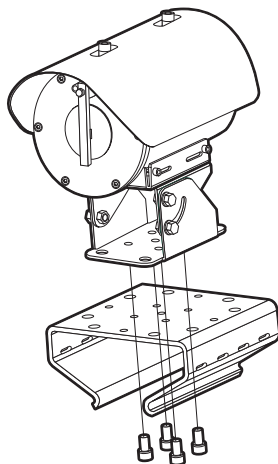
1. Assemble the wall bracket under the rotation bracket using 4 screw bolts.
2. Install the wall bracket on the wall using screw bolts.

- When the camera is installed on a concrete floor, be sure to use an M12 anchor bolt.

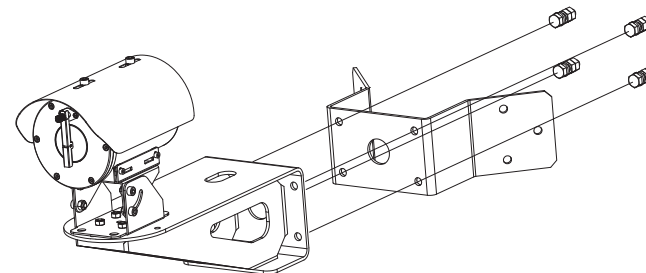


■ How to install a pole bracket on the system

1. Assemble the pole bracket under the rotation bracket using 4 screw bolts.
2. Install the pole on the pole bracket using a steel band.



■ How to install a corner bracket on the system

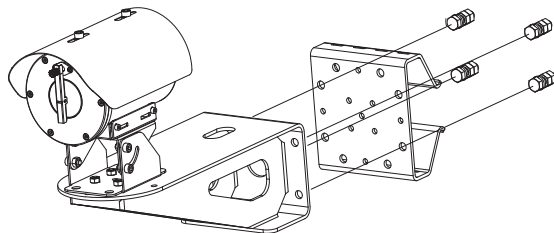


1. Assemble corner bracket sides with the wall bracket using a set of 4 bolts.
 - Bolt set M12 bolt X M12 spring washer X M12 nut (2EA)
2. Install the corner bracket on the wall using screw bolts.



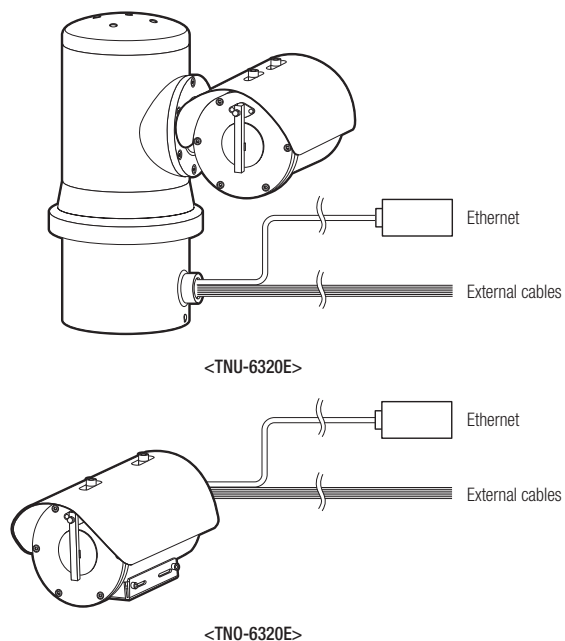
- When the camera is installed on a concrete floor, be sure to use an M12 anchor bolt.

■ How to install wall/pole brackets on the system



1. Assemble pole bracket sides with the wall bracket using a set of 4 bolts.
 - Bolt set M12 bolt X M12 spring washer X M12 nut (2EA)
2. Install the pole on the pole bracket using a steel band.

CONNECTING WITH OTHER DEVICE



Ethernet Connection

Connect the Ethernet cable to the local network or to the Internet.

Power Supply

Connect the power supply line with the camera power supply terminal using a screwdriver.

- Be sure to connect the AC24V power supply (non-polar) while the power is shut off.

Network Cable Specification

Item	Contents	Remark
Connector	RJ45	
Ethernet	10/100Base-T	10/100 Mbps
Cable	UTP Category 5e	
Max Distance	100M	

Power Cable Specification

In case of AC24V Input:

Wire Type (AWG)	#16	#14
Cable Length (Max.)	15 m	24 m

How to connect external cables for each model

Connect external cables by referring the table below.

- Connect alarm input/output cables for each terminals one by one.

TNU-6320E

Label print	COLOR	Description	Remarks
WAS_NO / PUP	Purple	A terminal to connect Washer Pump (NO)	
WAS_NC / ORG	White	A terminal to connect Washer Pump (NC)	
GND / GRN	Green	A common terminal to connect external Alarm signal (GND)	
ALARM_COM / BRN	Brown	A common terminal to connect Relay output signal (COM)	
WAS_COM / BLU	Blue	A common terminal to connect Washer Pump (COM)	
ALARM_IN / ORG	Orange	A terminal to connect external Alarm signal	
ALARM_OUT / YEL	Yellow	A terminal to connect Relay output signal (NC)	
AC24V_A	Red	A terminal for 24Vac power supply input (A)	
AC24V_B	Black	A terminal for 24Vac power supply input (B)	

TNO-6320E

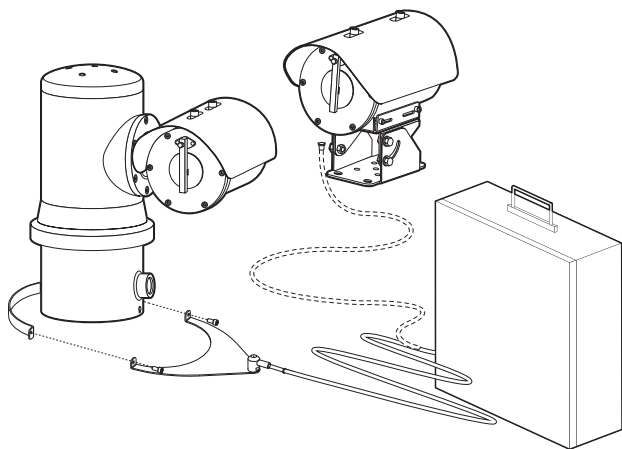
Label print	COLOR	Description	Remarks
GND / GRN	Green	A common terminal to connect external Alarm signal (GND)	
ALARM_COM / BRN	Brown	A common terminal to connect Alarm output signal (COM)	
ALARM_OUT / YEL	Yellow	A terminal to connect Alarm output signal	
ALARM_IN / ORG	Orange	A terminal to connect external Alarm signal	
WAS_COM / BLU	Blue	A common terminal to connect Washer Pump (COM)	
WAS_NO / PUP	Purple	A terminal to connect Washer Pump (NO)	
WAS_NC / WHT	White	A terminal to connect Washer Pump (NC)	
AC24V_A	Red	A terminal for 24Vac power supply input (A)	
AC24V_B	Black	A terminal for 24Vac power supply input (B)	

How to interconnect Washer pump

It is recommended that the camera use the following washer pump.

- Honeywell EXWJ400-10A

Refer to the washer pump manual for details on connection of washer pump and usage.



<Standard method to install camera and washer pump>

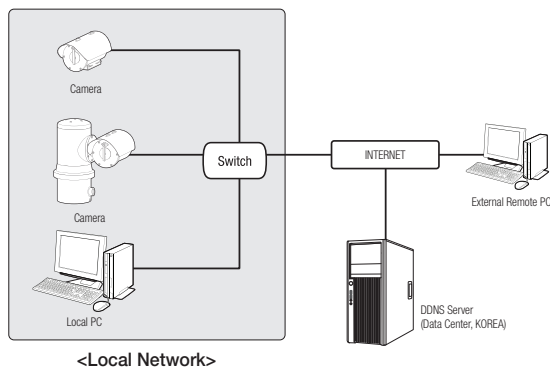
network connection and setup

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

CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

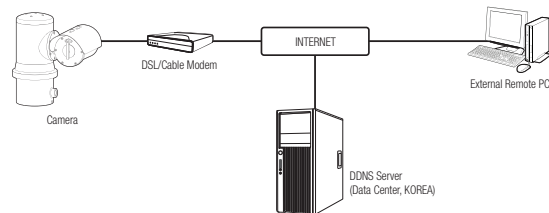
Connecting to the camera from a local PC in the LAN

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



- 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.
- In the IP installer, you can use the initial password, "4321" to set IP Address, Subnet Mask, Gateway, HTTP Port, VNP Port, IP type. After changing the network interface, for better security, access the web viewer and change the password.
- 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 IP Installer. For further details on IP Installer use, refer to "Static IP Setup". (Page 19)

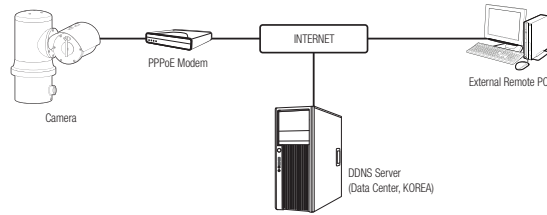
CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



1. Connect the user PC directly with the network camera.
2. Run the IP Installer 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.
4. Move to [Setup] page.
5. Move to [Network] – [DDNS] and configure the DDNS settings.
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.

- For configuring the DDNS settings, refer to "DDNS". (page 46)
- For registering the DDNS settings, refer to "Registering with DDNS". (page 46)
- Refer to "IP & Port" for how to setup IP. (page 33)

CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM

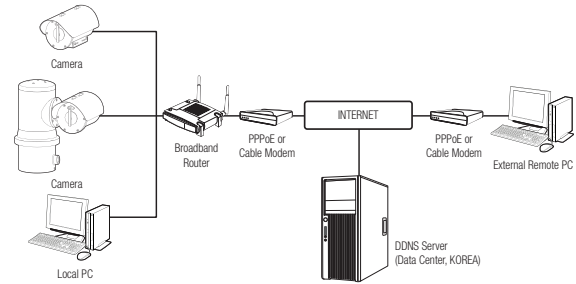


1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to **[Setup]** page.
5. Move to **[Network]** – **[DDNS]** and configure the DDNS settings.
6. Move to **[Basic]** – **[IP & Port]** Setup Page, set the IP type to **[PPPoE]**, and enter the network service's ID and password.
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- For configuring the DDNS settings, refer to "DDNS". (page 46)
- For registering the DDNS settings, refer to "Registering with DDNS". (page 46)
- Refer to "IP & Port" for how to setup IP. (page 33)

CONNECTING THE CAMERA TO A BROADBAND ROUTER WITH THE PPPoE/CABLE MODEM

This is for a small network environment such as homes, SOHO and ordinary shops.

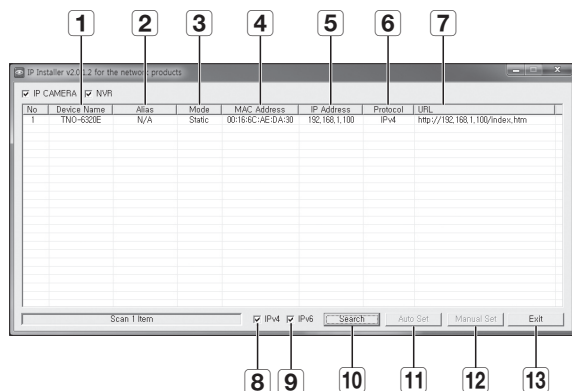


Configuring the network settings of the local PC connected to a Broadband Router

Configuring the network settings of the local PC connected to a Broadband Router, follow the instructions below.

- Select : **<Network>** → **<Properties>** → **<Local Area Connection>** → **<General>** → **<Properties>** → **<Internet Protocol (TCP/IP)>** → **<Properties>** → **<Obtain an IP address automatically>** or **<Use the following IP address>**.
- Follow the instructions below if you select **<Use the following IP address>**:
 - ex1) If the address (LAN IP) of the Broadband Router is 192.168.1.1
IP address : 192.168.1.100
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.1.1
 - ex2) If the address (LAN IP) of the Broadband Router is 192.168.0.1
IP address : 192.168.0.100
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.0.1
 - ex3) If the address (LAN IP) of the Broadband Router is 192.168.xxx.1
IP address : 192.168.xxx.100
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.xxx.1
- For the address of the Broadband Router, refer to the product's documentation.
- For more information about port forwarding of the broadband router, refer to "Port Range Forward (Port Mapping) Setup". (Page 21)

BUTTONS USED IN IP INSTALLER



Item	Description
1 Device Name	Model name of the connected camera. Click the column to sort the list by model name. However, search will be stopped if clicked during the search.
2 Alias	This function is not currently implemented.
3 Mode	Displays either <Static>, <Dynamic> or <PPPoE> for the current network connection status.
4 MAC(Ethernet) Address	Ethernet address for the connected camera. Click the column to sort the list by Ethernet address. However, search will be stopped if clicked during the search.
5 IP Address	IP address. Click the column to sort the list by IP address. However, search will be stopped if clicked during the search.
6 Protocol	Network setting for the camera. The factory default is "IPv4". Cameras with the IPv6 setting will be displayed "IPv6".
7 URL	DDNS URL address enabling access from the external Internet. However, this will be replaced with the <IP Address> of the camera if DDNS registration has failed.
8 IPv4	Scans for cameras with the IPv4 setting.

Item	Description
9 IPv6	Scans for cameras with the IPv6 setting. Activated in an IPv6 compliant environment only.
10 Search	Scans for cameras that are currently connected to the network. However, this button will be grayed out if neither IPv4 nor IPv6 is checked.
11 Auto Set	The IP Installer automatically configures the network settings.
12 Manual Set	You should configure the network settings manually.
13 Exit	Exits the IP Installer program.



- For the IP installer, use only the installer version provided in the installation CD or use the latest one if available. You can download the latest version from the Hanwha Vision web site.

STATIC IP SETUP

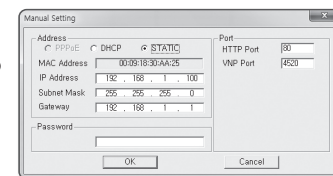
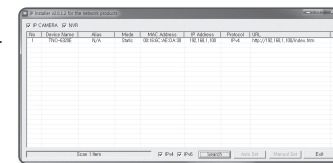
Manual Network Setup

Run <IP Installer_v2.XX.exe> to display the camera search list.
At the initial startup, both [Auto Set] and [Manual Set] will be grayed out.



- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.

- Select a camera in the search list.
Check the MAC address of the camera on the camera's label.
Both the [Auto Set] and [Manual Set] buttons will be activated.
- Click [Manual Set].
The Manual Setting dialog appears.
<IP Address>, <Subnet Mask>, <Gateway>, <HTTP Port>, and <VNP Port> of the camera are displayed in the preset values.
- In the <Address> pane, provide the necessary information.
 - MAC (Ethernet) Address : The MAC address imprinted on the camera label is automatically displayed and requires no user setting.



- IP related parameters can be set only when DHCP is not checked.

network connection and setup

If not using a Broadband Router

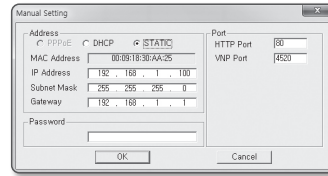
For setting <IP Address>, <Subnet Mask>, and <Gateway>, contact your network administrator.

4. In the <Port> pane, provide necessary information.

- HTTP Port : Used to access the camera using the Internet browser, defaulted to 80.
- VNP Port : Used to control the video signal transfer, defaulted to 4520.

5. Enter the password.

Enter the password of “**admin**” account, which was used to access the camera.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to “**Administrator password change**” of the user setup. (page 32)

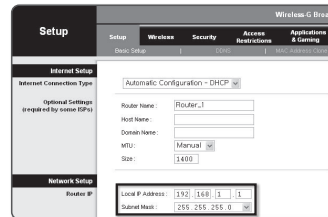
6. Click [OK].

Manual network setup will be completed.

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 21)



If the Broadband Router has more than one camera connected

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

ex)

Category		Camera #1	Camera #2
IP related settings	IP Address	192.168.1.100	192.168.1.101
	Subnet Mask	255.255.255.0	255.255.255.0
	Gateway	192.168.1.1	192.168.1.1
Port related settings	HTTP Port	8080	8081
	VNP Port	4520	4521

- 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

Auto Network Setup

Run <IP Installer_v2.XX.exe> to display the camera search list.

At the initial startup, both [Auto Set] and [Manual Set] will be grayed out.

- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.

1. Select a camera in the search list.

Check the MAC address of the camera on the camera's label. Both the [Auto Set] and [Manual Set] buttons will be activated.

2. Click [Auto Set].

The Auto Setting dialog appears. The <IP Address>, <Subnet Mask>, and <Gateway> will be set automatically.

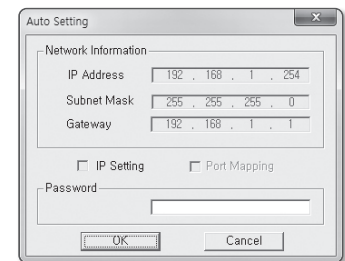
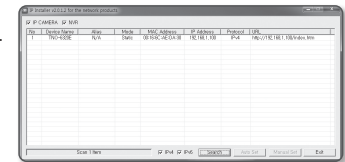
3. Enter the password.

Enter the password of “**admin**” account, which was used to access the camera.

- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to “**Administrator password change**” of the user setup. (page 32)

4. Click [OK].

Auto network setup will be completed.



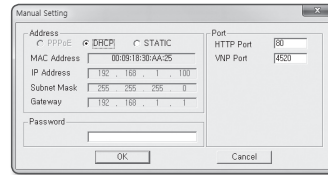
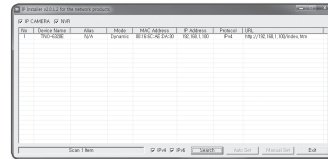
DYNAMIC IP SETUP

Dynamic IP Environment Setup

- 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

Checking the Dynamic IP

1. Run the IP Installer on the user's local computer.
Cameras allocated with <Dynamic IP> address are shown in the list.
2. Select a camera from the search result.
3. Click the [Manual Set] button and check the camera's <Dynamic IP> address.
If you uncheck <DHCP>, you can change IP to <Static>.

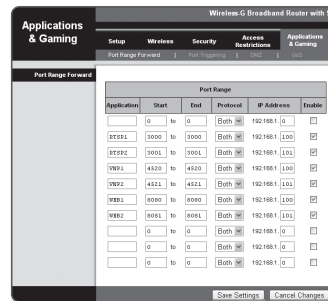


PORT RANGE FORWARD (PORT MAPPING) SETUP

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.
Each port number for the Broadband Router should match that specified in <Setup> - <Basic> - <IP & Port> from the camera's web viewer menu.



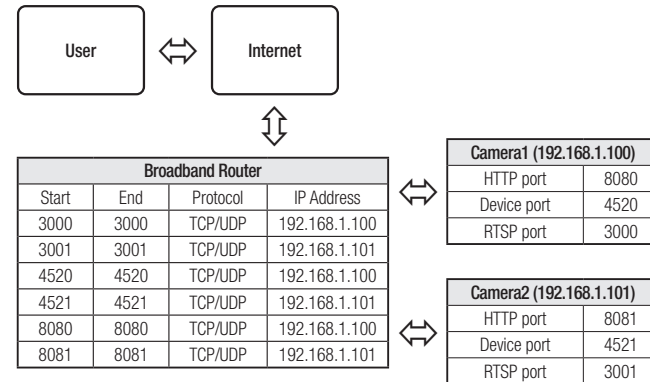
3. When done, click [Save Settings].
Your settings will be saved.

- Above sample instructions are based on the CISCO's Broadband 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 :

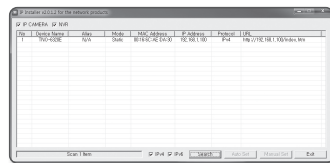


- Port forwarding can be done without additional router setup if the router supports the UPnP (Universal Plug and Play) function.
After connecting the network camera, set <Quick connect> of <DDNS> to <On> in the "Setup → Network → DDNS" menu.

CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

1. Run the IP Installer.
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

Since using the IP Installer 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.

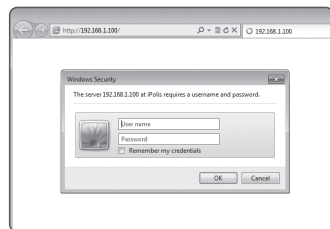
1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.
ex) <http://www.samsungipolis.com/Product ID>

- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 46)

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.
• IP address (IPv6) : 2001:230:abcd:ffff:0000:0000:ffff:1111
→ http://[2001:230:abcd:ffff:0000:0000:ffff:1111] - 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://www.samsungipolis.com/Product ID
- the Login dialog should appear.

! ■ 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.

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, or PPPoE 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.

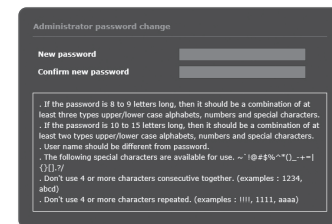
To register your device to the <DDNS> server, visit www.samsungipolis.com and register your device first, and then set the Web Viewer's <Network> - <DDNS> to <DDNS>, as well as providing <Product ID> that had been used for DDNS registration.

PASSWORD SETTING

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

When the "Password change" window appears, enter the new 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.

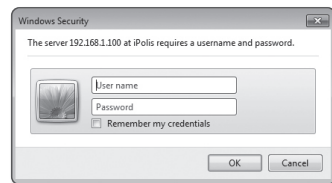


LOGIN

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.

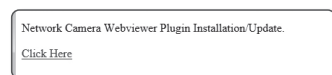
- ! When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.
- ✍ If you check the **"Remember my credentials"** option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.
- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.



INSTALLING WebViewer PLUGIN

If connecting to a camera for the first time, you will see the installation message. Then, install the required WebViewer Plugin to access the camera and control the video from it in real time.

1. When the monitoring page is accessed for the very first time, the installation page is displayed. Click **[Click Here]** to begin installation.



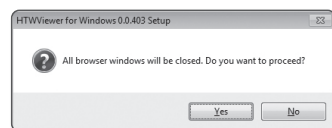
- ! ■ If the plug-in installation file download status is suspended at 99% in the Internet Explorer browser, retry it after selecting "Release SmartScreen filter" in "Tool → SmartScreen filter".

2. Click **[Run]** in the message window.

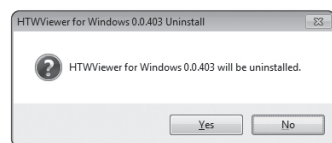


3. Click **[Yes]** when the notice window saying that all browser windows will be closed.

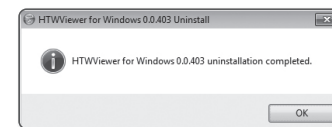
- ✍ ■ Steps 4 and 5 will be skipped if no Web Viewer Plug-in is installed.



4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed.
Click **[Yes]** when the notice window is displayed.



5. Click **[OK]**.
The old version of Web Viewer Plug-in is deleted.

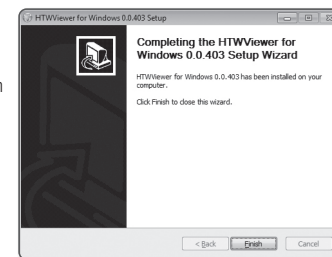


6. Click **[Install]** to begin installation of the Web Viewer Plug-in.



7. Click **[Finish]**.
Web Viewer Plug-in installation is completed.

- ! ■ In your internet explorer, if you need to move to the installation screen after installing the webviewer plugin, check whether webviewer_activeplugin_lib.control in the "Tool → Additional Function Management" menu is "Activated". If not, and if there is a persisting problem, then select "Tools → Internet Options → General" and delete all the search records.



USING THE LIVE SCREEN



Item	Description
1 Monitoring	Move to the monitoring screen.
2 Playback	Moves to a screen that searches the data stored on NAS.
3 Setup	Move to the Setup screen.
4 Profile access information	You can read the profile information.
5 Viewer Screen	Displays the Live video on the screen. You can use the mouse wheel to activate the digital zooming in Viewer screen.
6 Installation of Web viewer plug-in	You can install the Web viewer plug-in, and replay live or recorded videos.
7 Profile type	You can select a profile type in <Video profile> under the <Basic> setup menu. - When the Web Viewer is connected, the profile information currently using is displayed. 1 Afterimages can be displayed on the screen under the following conditions if the video is played in the monitoring page: - The resolution is changed due to a profile change. - Incoming data is being slowed due to a network delay when the profile is changed. - The web browser window size and location is changed.

Item	Description	
8 Screen Optimization	The video size of the camera will switch to as big as the Web browser.	
9 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 640x480. Press it again to switch back to the default resolution.	
10 Full Screen	Switch the current video to the maximum size of the monitor.	
11 Capture	Saves the snapshot as an image file in the .jpg format.	
12 Manual recording	User can store images to NAS personally. ■ To take video manually, change the recording setting first. Refer to “Storage” for how to set recording (page 50).	
13 Alarm output	Activate the Alarm Out port.	
14 Windshield Wiper/Pump	Windshield Wiper	Wipes away water or dust on the camera screen.
	Pump	Helps to spray windshield washer liquid on the camera screen and remove water or dust on the screen.
15 PTZ	Controls Camera Pan/Tilt/Zoom operations. ■ TNO-6320E controls Camera Zoom operation only.	
16 Hide the context menu	The left-corner context menu will disappear but only the menu icon.	

To capture the snapshot

- Click [Capture ()] on the scene to capture.
- When a captured video is saved, a notification message appears. Capturing follows each store path corresponding to browsers.
 - When capturing by IE browser on Windows 7 or above is not possible, run the IE browser as the administrator privilege.

How to record videos manually

- Press [Manual recording ()].
- To end the recording, press [Manual recording ()] again.
 - After the state of NAS is changed to 'On' under NAS connection, it is possible to use the manual recording function.

To fit the full screen

1. Click the **[Full Screen ()]** button.
2. This will fit the Viewer to the full screen.
3. To exit the full screen mode, press **[Esc]** on the keyboard.

 ■ For the Internet Explorer and Google Chrome browser, you can switch to the full screen.

If you want to use windshield wiper/pump

Click the buttons **[Windshield wiper ()]** or **[Pump ()]**.

- ! ■ Preset No. 255 is prepared to move the washer pump to a location during its operation. Default setting is Pan 0 degrees and Tilt -90 degrees. It is possible to change this according to the pump installation location. Even when Preset No. 255 is removed, if the washer is operated, it moves to Pan 0 degrees and Tilt -90 degrees.
- When PAN, TILT, MOVE or PUMP operation is completed, the existing sequence is automatically resumed.

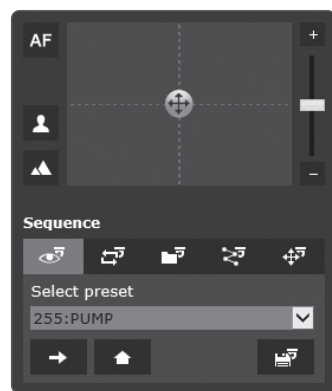
To control the PTZ (TNU-6320E)

1. Press the **[PTZ ()]** tab.
2. Adjust the direction of the camera by controlling the cursor **[]** of the screen moving pad, or control the zoom or focus.

 ■ For further details on PTZ use, refer to "PTZ setup". (page 34)

To run a sequence

-  : Run a saved preset.
Refer to "To configure the detailed settings for the preset" for details of preset setting. (page 34)
-  : Run a saved swing.
Refer to "To configure the swing settings" for details of swing setting. (page 35)
-  : Run a saved group.
Refer to "To set a group" for details of group setting. (page 35)
-  : Run a saved tour.
Refer to "To configure the tour settings" for details of tour setting. (page 35)
-  : Run a saved trace.
Refer to "To set the tracing function" for details of trace setting. (page 36)
-  : Run a saved home position.
Refer to "To add the home position" for details of home position setting. (page 34)
-  : Configure preset.
For details on preset configuration, see "To configure the detailed settings for the preset". (page 34)



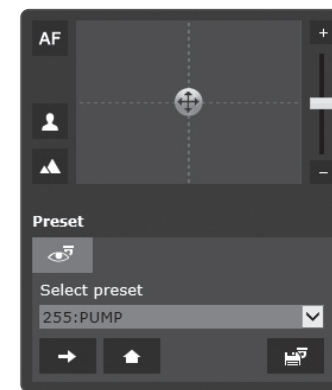
To control the PTZ (TNO-6320E)

1. Press the **[PTZ ()]** tab.
2. Control zoom by moving the bar on the right of the UI up or down, or by pushing the button **[ , ]**.
3. Adjust the focus by pushing buttons **[ /  / AF]**.

 ■ For further details on PTZ use, refer to "PTZ setup". (page 37)

To run a preset

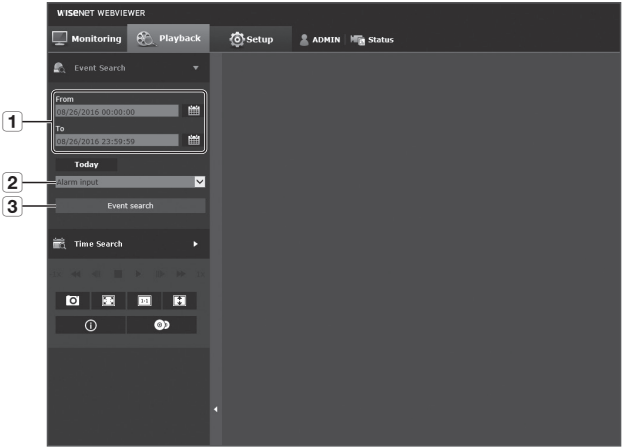
-  : Run a saved preset.
Refer to "To configure the detailed settings for the preset" for details of preset setting. (page 37)



PLAYING THE RECORDED VIDEO

■ Before you can play the video, you must configure the record settings. For details on record settings, refer to "Storage". (page 50)

Name of event search screen and its function



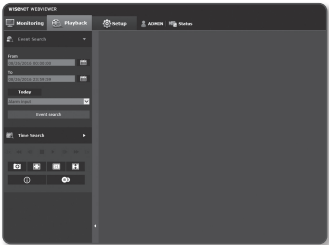
Item	Description
1 Search range setting	Sets date and time range to search from data stored on NAS.
2 Search event setting	Set the event type to search within the search period.
3 Event search	Run the event search.

To play the content after searching by event

1. Click the [Playback (⏮)] button.
2. Specify the start time and end time of your search.
3. Select an event type for your search within the specified period.
4. Click the [Event search] button.
The search results will be displayed in the list.

■ If more than 800 events are recorded within the search period, your search will be limited up to the date when the 800th event is recorded.
For instance, if the search period is between 10th and 15th day of the month, and more than 800 events were recorded 10th through 11th, your search will be limited up to 11th day with a total of 800 events, and events after then (from 12th) will not be found.

5. Select a data item to play in the search list.
6. Click the [Play (▶)] button.
7. To stop playing the video, click [Stop (■)].
8. To return to the search screen, click [Exit (↶)].



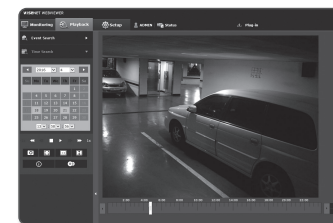
Name of time search screen and its function



Item	Description
1 Time bar	The section in the specific period is played by moving the time bar.
2 Search date setting	Set the search date using the calendar. ■ The date when videos are stored as data is displayed in the form of a box on the calendar.
3 Screen optimization	The camera image is converted to fit the Web browser window.
4 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 800x600. Press it again to switch back to the default resolution.
5 Capture	The current image is saved as a .jpg image file.
6 Full screen	The current image is converted to cover the maximum size of the monitor.
7 Video information	Time data of the replayed video is displayed on the screen.
8 Backup	Sets a desired time zone and backs up videos stored on NAS. ■ Can be set up to 30 minutes.

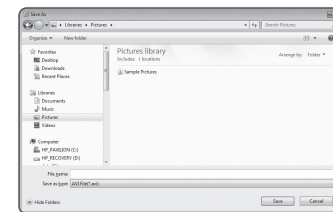
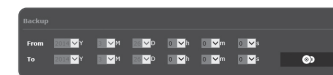
To play after searching by time

- Click [Time Search (📅)].
- Click a desired date in the calendar.
The video on the specified date will be played.
- If the video playback is stopped, select a time and click [Play (▶)].
The video on the selected time will be played.
- While the video is being played, the recording time for the current video will be shown.
- Search for the video forward or backward, and control the play speed.
 - How to Control the Play Interval
 ▶▶: Select this button to move 1 frame forward.
 ◀◀: Select this button to move 1 second back.
 - To control the play speed
 If selecting ▶▶, the button will switch to x1, x2, x4, x8, and the play speed will increase accordingly. When the ◀◀ button is selected, the playing speed is decreased to -1x, -2x, -4x, -8x and the playing speed slows down gradually. Subsequently the quick playing speed is returned to the normal speed and the reverse playing speed increases.
 - To control the playback direction
 If you see the ▶▶ button with the play speed displayed, the video will be played forward; Whereas, if you see the ◀◀ button with the play speed displayed, the video will be played backward.
 - How to set the time bar
 If you press the ⏮ button, the details of the time bar section can be viewed.
 If you press the ⏭ button, you can view a wider range of times and the desired time can be selected more easily.
- Move [Time bar (⏮)] to a desired time point of the video before playing it.
The time containing a normal recoding file will be highlighted in blue; the time with the event recording will be highlighted in red.



To back up the searched video

- During playback, click [Backup (📁)] on the scene to back up.
The scheduling window for backup start and end time appears.
- Click [Backup (📁)] button.
The Save As window appears.
- Confirm the save path and click [Save] button.
The screenshot will be backed up to the specified path.



To play the backup video

The backed up images are saved in an .avi format. Gom Player, VLC Player, and Window Media Player are recommended as the media player compatible with this format.

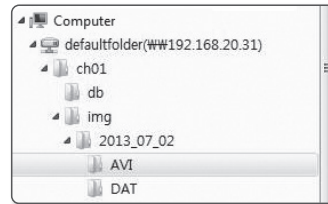


- In case of Windows Media Player, download the latest codec from www.windows7codecs.com and install it prior to use.

To Play an AVI File

NAS (Network-Attached Storage)

1. In Windows browser, use \\<ip address>\ to access.
ex) \\192.168.20.31\defaultfolder\ch01\img\2013_07_02\AVI
2. Go to <Computer> → <Network drive connection> → Enter 1.
3. Connected to the NAS.
4. Play the AVI file in the "ch00\img\YYYY_mm_DD\AVI" directory, using a media player.



- A filename starts with the format "001_YYYYMMDD_HHMMSS.avi" and the file number is incremented by one. YYYYMMDD_HHMMSS indicates the start time of data saving.
- "001_YYYYMMDD_HHMMSS.smi" file is a caption file, and you can view it if it exists in the same directory as its related AVI file.
- The max recording time per AVI file is 30 minutes.
- If you change or damage the saved data on your own, it will not play back or save properly.

Name	Date modified	Type	Size
001_00130702_180726	8/13/2013 10:22 AM	AVI File	455,293 KB
001_00130702_180726.smi	8/13/2013 10:22 AM	SMI File	123 KB
002_00130702_180729	8/13/2013 10:31 AM	AVI File	371,784 KB
002_00130702_180729.smi	8/13/2013 10:31 AM	SMI File	162 KB

SETUP

On the network, you can set up basic information on the camera, PTZ, video, network events and system.

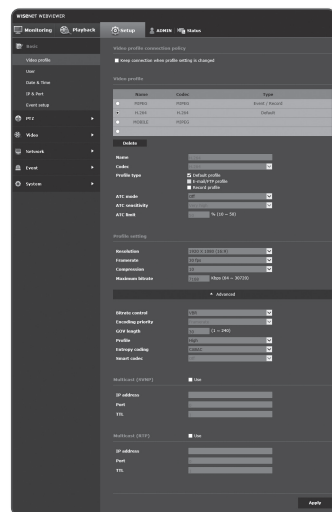
1. In the Live screen, click [Setup ()].
2. The Setup screen appears.

- The setting page for preview video requires the web viewer plug-in to be installed on the PC. If it is not installed properly, the installation page automatically appears.

BASIC SETUP

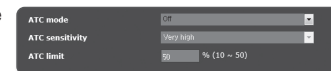
Video profile

1. From the Setup menu, select the <Basic ()> tab.
2. Click <Video profile>.
3. Set the <Video profile connection policy>.
 - Keep connection when profile setting is changed : Output uses the same settings even when the settings of the active profile are changed. If not selected, changing a profile used by an existing connection resets such connection.
4. Select each profile properties.
For more details, refer to "To Add/Change the Video Profile". (Page 31)
5. Click the input box of each item and enter / select a desired value.
 - The context menu may differ depending on the selected codec type.
 - Default profile : If no profile is selected when using the Web Viewer, the default video profile is applied.
 - E-mail/FTP profile : Video profile to be transferred to the specified email or FTP site.
 - Record profile : A profile that is applied when videos are recorded on NAS.



6. According to your situation, set ATC (Auto Transmit Control) mode.

- ATC mode : It adjusts the video properties according to the variance in the network bandwidth, controlling the bit rate. Adjusting the bit rate depends on the ATC mode.
 - Control framerate : Reduce the frame rate if the network bandwidth drops down.
 - Control compression : Control the compression rate if the network bandwidth drops down. Compression adjustment can cause deterioration of the image quality.
- If <Bitrate control> is set to <CBR>, the encoding priority according to the ATC mode will be fixed as below:



Bitrate control / ATC mode	Control framerate	Control compression
CBR	Framerate	Compression

- ATC sensitivity : Affect the transfer rate according to the variance in the network bandwidth. The transfer rate will be adjusted to the fastest if the bandwidth is <Very high>, and adjusted to the latest if the bandwidth is <Very low>.
 - ATC limit : If the quality or frame rate is adjusted, the property will be changed to the applied value (%) against the previous setting value (100%). Note that if you reduce the property value too much, you may encounter flickering on the screen. So it is advisable to adjust the value within the threshold.
- It is recommended to apply ATC control only for cameras supporting ATC.
 - Set the ATC sensitivity to <Very low> in a network environment with high variance in the network bandwidth.
 - If the network connection is unstable, you may encounter flickering on the screen.

7. When done, click [Apply ()].

To Add/Change the Video Profile

The profile setup can be added or modified to accommodate various profiles depending on the recording conditions.

1. Select one from the <Video profile> options.
2. Provide the name and select a codec.
3. Specify the conditions under which the codec will be applied.
4. Specify the details of the selected codec including resolution and frame rate.

Click <Advanced> to display the context menu.

- Resolution : Set the video size of the H.264 and MJPEG files.
- Framerate : Set the max number of video frames per sec.



- The <Sensor> mode setup in Camera Setup changes the maximum configurable framerate.

Sensor	25 fps	30 fps	50 fps	60 fps
Framerate	1~25 fps	1~30 fps	1~50 fps	1~60 fps

- Compression : Specify the compression rate of the video.
- Maximum bitrate : Set the max bit rate of video when the bit rate control is set to VBR.



- As the bit rate can be adjusted limitedly according to the resolution, frame rate and screen complexity, the actual bit rate can be greater than the maximum bit rate. So you must consider the use conditions when setting the value.

- Target bitrate : Set the target bit rate when the bit rate control is set to CBR.
- Bitrate control : You can select one from constant bit rate and variable bit rate for compression. Fixed bitrate means that the network transmission bitrate is fixed while varying the video quality or frame rate, variable bitrate means that a higher priority is placed on the video quality while varying the bitrate.



- After setting the fixed bit rate for bit control, if you select the video quality priority mode, depending on the complexity of the screen, the actual transmitted frame rate may differ from the frame rate setup in order to guarantee the optimal video quality for the given bit rate.

- Encoding priority : You can set the priority of video transmission to frame rate or compression.
- GOV length : It specifies the distance (in terms of number of frames) between two consecutive I-Frames in a video sequence when H.264 codec was selected. (One I-Frame + 0~Several P-Frames)
- Profile : You can select the H.264 profiling method.
- Entropy coding : Reduce the possible compression loss due to encoding.
- Smart codec : Specify the use of Smart codec.



- Can be used when the bitrate control value is CBR. Its specific configuration is set by <Smart Codec> of <Video ()> tab. (Page 45)

- Multicast(SVNP) : Specify the use of the SVNP protocol.
 - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
 - Port : Specify the video communication port.
 - TTL : Set the TTL for the SVNP packet.
- Multicast(RTP) : Specify the use of the RTP protocol.
 - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
 - Port : Specify the video communication port.
 - TTL : You can set the TTL for the RTP packet.



- If you set the Multicast address to 224.0.0.0~224.0.0.255, multicast may not work properly in all environments. In that case, we recommend you change the multicast address.

What is GOV length?

GOV(Group of Video object planes) is a set of video frames for H.264 compression, indicating a collection of frames from the initial I-Frame (key frame) to the next I-Frame. GOV consists of 2 kinds of frames: I-Frame and P-Frame.

I-Frame is the basic frame for the compression, also known as Key Frame, which contains one complete image data. P-Frame contains only the data that has changed from the preceding I-Frame.

For H.264 codec, you can determine the GOV length.

If you set a recording profile with H.264 codec, the GOV length will be framerate/2.

User

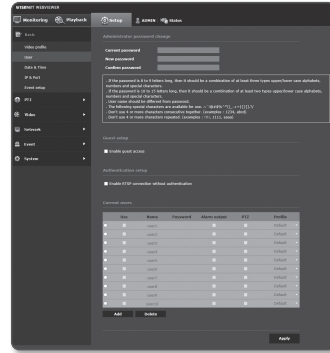
1. From the Setup menu, select the **<Basic (Basic icon)>** tab.
2. Click **<User>**.

3. Provide the necessary user information.

- Administrator password change : Change the password for the administrator.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- It is recommended to change your password once every three months.
- The password length and limits are shown as follows.
 - A combination of at least three types of upper case, lower case, numeric, and special characters: 8 to 9 characters.
 - A combination of at least two types of upper case, lower case, numeric, and special characters: 10 to 15 characters.
 - Should be different from the ID.
 - Cannot repeat the same letter, number of special characters more than 4 times.
 - Don't use 4 or more characters consecutive together. (examples : 1234, abcd)
 - Don't use 4 or more characters repeated. (examples : !!!!, 1111, aaaa)
 - Special characters that are allowed. : ~!@#\$%^&*()_+=|[];?/
 - After the factory setting, the admin and user passwords are initialized. You need to reset the password.
 - When you access the camera web page for the first time or access it after the initialization, you will be moved to the admin password setting menu.
 - In this menu, you need to login again with the new password before using the camera web page menus.
 - If the existing password is not matched, when you change the admin password, you cannot change the password.
 - After changing your password, if there is a camera connected to a CMS or NVR client, then you need to re-register it with the newly changed password. If the camera is still connected with the same password, then the account may be locked because a client uses the previous password.
- If you try to login with the registered account, 5 or more consecutive password authentication has failed, and then the account may be locked for thirty seconds.
- When the password is changed while multiple connections are active from a PC, the browser may malfunction. In that case, reconnect to the server.



- Guest setup : If you select **<Enable guest access>**, the guest account can access the Web viewer screen but can only view the live Viewer screen.
 - The ID/password for the guest account is **<guest/guest>**, which cannot be changed.
- Authentication setup : If you select **<Enable RTSP connection without authentication>**, you can access RTSP without logging in and view the video.

- Current users : If you select **<Use>**, you can set or change the user permissions.
 - The administrator can set alarm output and PTZ execution privilege.
 - Profile : If you select **<Default>**, you can only see the default profile video; if selecting **<All>**, you can see the full profile videos.



- ONVIF functions available to a registered user allowed to use ONVIF functions are limited to those of granted with permission.

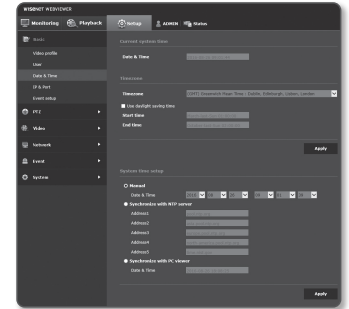
4. When done, click **[Apply (Apply icon)]**.

Date & Time

1. From the Setup menu, select the **<Basic (Basic icon)>** tab.
2. Click **<Date & Time>**.

3. Specify the time and date that will be applied to the camera.

- Current system time : Displays the current time settings of your system.
- Timezone : Specify the local time zone based on the GMT.
- Use daylight saving time : If checked, the time will be set one hour before the local time zone for the specified time period. This option will be displayed only in areas where DST is applied.
- System time setup : Specify the time and date that will be applied to your system.
 - Manual : Specify the time manually.
 - Synchronize with NTP server : Sync with the time of the specified server address.
 - Synchronize with PC viewer : Sets to the time of the computer connected.



4. When done, click **[Apply (Apply icon)]**.



- If you select the **<Synchronize with PC viewer>**, the standard timezone should be set the same as the current timezone in PC.

IP & Port

1. From the Setup menu, select the <Basic ()> tab.

2. Click <IP & Port>.

3. Set the <IPv4 setup>.

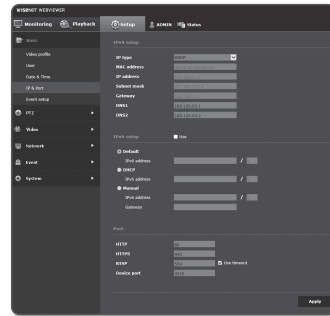
- IP type : Select an IP connection type.
 - Manual : Specify the IP address, Subnet mask, Gateway, DNS1, and DNS2.
 - DHCP : Specify the DNS1 and DNS2.
 - PPPoE : Specify the DNS1, DNS2, ID and Password.
- If you set it to <Manual>, you should specify the IP, Subnet mask, Gateway, DNS 1 & 2 manually.
- MAC address : Shows the MAC address.
- IP address : Displays the current IP address.
- Subnet mask : Displays the <Subnet mask> for the set IP.
- Gateway : Displays the <Gateway> for the set IP.
- DNS1/DNS2 : Displays the DNS(Domain Name Service) server address.

4. Set the <IPv6 setup>.

- Set to <Use> to use IPv6 address.
 - Default : Use the default IPv6 address.
 - DHCP : Display and use the IPv6 address obtained from the DHCP server.
 - Manual : Enter IP address and gateway manually and use it.



- The IP addressing system will be defaulted to DHCP. If no DHCP server is found, the previous settings will be restored automatically.
- Once completed with editing, click [Apply ()] to apply changes and the browser exits. After a while, connect again with the changed IP.



5. Type in each item in the Port menu as necessary.

- Neither the port range between 0 and 1023 nor port 3702 is available.
- HTTP : HTTP port used to access the camera via the web browser. The default is 80(TCP).
 - Setting the HTTP port for Safari and Google Chrome browsers to 65535 is not allowed by security policy.
- HTTPS : In this version, the security of the web communication protocol HTTP is strengthened. It can be used when you set HTTPS mode in SSL. The initial value is set to 443(TCP).
 - The available setting range is 1024~65535. (For security reasons, in your Safari or Google Chrome browser, you may not use 65535 as your HTTPS port.)
- RTSP : Used to transfer videos in the RTSP mode; the default is 554.
- Use timeout : When connecting to RTSP, this function resets the connection if there's no response for a certain time.
- Device port : Set a port used to transfer video signals with the Hanwha Vision protocols.



- If changed the HTTP port, the browser exits. Afterwards, address should contain the newly assigned HTTP port trailing the IP.
ex) IP address: 192.168.1.100, HTTP port : Assigned 8080 → http://192.168.1.100:8080
(If HTTP port is set to 80, no need to specify the port number)
- Using RTSP and HTTPS is recommended in order to prevent the image information from being restored.

6. When done, click [Apply ()].

Event setup

You can easily set the event detection items, and move to the detailed setting.

1. From the Setup menu, select the <Basic ()> tab.

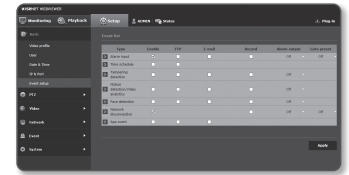
2. Click <Event setup>.

3. Activate desired items on the Event list.

4. When done, click [Apply ()].



- To make detailed event settings, click on your desired settings. Go to detailed <Event> setting.

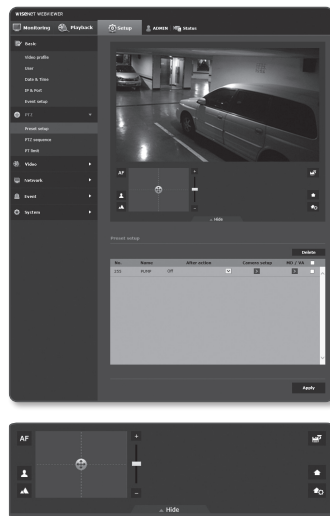


PTZ SETUP (TNU-6320E)

Preset setup

During the PTZ operation of camera, the initial conditions can be set.

1. From the Setup menu, select the <PTZ ()> tab.
2. Click <Preset setup>.
3. Click [▼ Show].
4. Click the cursor () on the screen moving pad to control movement of the screen.
 - Move screen: Scroll the cursor in the direction desired.
 - Control screen movement rate: The further away the cursor is from the center, the faster it moves on the screen.
5. Control zoom movement.
 - Zoom In: Move up the bar in the right of the UI, or press the [] button. The farther the bar is from the center, the faster the screen expands.
 - Zoom Out: Move down the bar in the right of the UI, or press the [] button. The farther the bar is from the center, the faster the screen reduces in size.
6. Adjust the focus.
 - Manual focus ( / ) : The user sets the focus.
 - Auto focus () : The system sets the focus automatically.



- When performing the sequence action at a high or low temperature, the system may respond slower than the set rate for accurate sequence action.
- Preset No. 255 is prepared to move the washer pump to a location during its operation. Default setting is Pan 0 degrees and Tilt -90 degrees. It is possible to change this according to the pump installation location. Even when Preset No. 255 is removed, if the washer is operated, it is moved to Pan 0 degrees and Tilt -90 degrees.

To add the home position

1. Move to a desired start screen point and press []. The point will be set to the home position.
2. Click [] in the home position. You will move to the predetermined home position.
3. When the camera is rebooted after setting, the screen is located at the home position. (If the camera was on another sequence operation, the sequence is performed.)

To add a preset

1. Click on the [] button.
2. Select the preset number to be added.
3. Set the preset name and click on the [OK] button.

To delete a preset

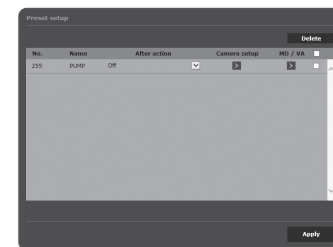
1. Select the preset number to delete.
2. Press the [] button.

To move to a desired preset

1. Double click on the preset number you want to go to at the preset configuration.

To configure the detailed settings for the preset

1. Select the number of preset that you want to configure.
 - After action : In the <After action>, you can select auto execution/video analysis operation after the preset operation. (This setting does not apply in the swing function.)
 - Auto run : The sequence setting for auto execution is performed. If you turn off the function or if there is no auto-executing operation, the preset operation status is maintained. (This setting is not applied if preset is run with a group or tour function.)
 - Video analysis : MD/VA operation is run.
 - Camera setup : You can change the camera setting to the environment of the selected preset. Refer to "Camera setup" for how to set the camera. (page 39)
 - MD / VA : You can set the system to generate an event signal when a movement is detected in the preset, or an intelligent video analysis event is detected. For more details, refer to "MD / VA". (Page 53)
2. When done, click [Apply ()].



- After saving the preset setting, make sure to select <Sequence Setup> or run the preset. If the operation is not performed, the system may run a wrong operation, such as an unintended change of preset setting.
- While setting preset edit, you cannot use the functions, such as preset setting, home position setting and move to the home position.

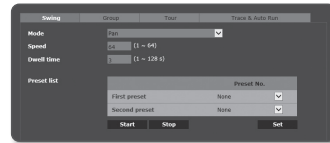
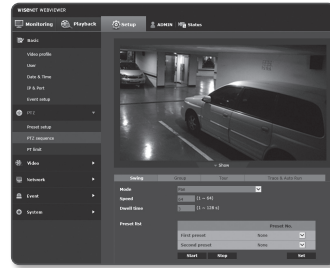
PTZ sequence

1. From the Setup menu, select the <PTZ ()> tab.
2. Click <PTZ sequence>.
3. Set swing, group, tour, tracing & auto operation.

To configure the swing settings

Swing is a monitoring function that moves between two preset points and enables you to trace the motion.

1. Select <Swing>.
The menu screen will switch to the swing setting screen.
2. Select a swing setting mode.
 - Pan : You can set the swing monitoring using the PAN function.
 - Tilt : You can set the swing monitoring using the Tilt function.
 - Pan&Tilt : You can set the swing monitoring only using both PAN and Tilt functions.
3. Set <First preset> and <Second preset> to specify a swing range.



 When moving to the second preset from the first preset, the camera will move to the right direction on the screen.

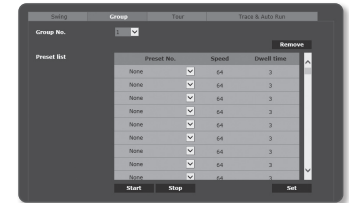
4. Set the moving speed and dwell time.
5. Press the [**Set**] button.
The first preset, second preset, speed and dwell time will be saved in set mode.
6. Press the [**Start**] button.
It performs the swing operation.
7. Press the [**Stop**] button.
The running swing will be stop.

 If you want to set the swing, then you need at least two presets set already.

To set a group

The group function enables you to group various presets before calling them in sequence. Six groups can save a total of 128 presets each.

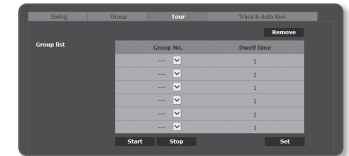
1. Select <Group>.
The menu screen will switch to the group setting screen.
2. Select a group setting mode.
 - Group No. : Select a group number.
 - Preset No. : Select a preset number.
 - Speed : Specify the speed of movement.
 - Dwell time : Specify the duration for which an operation is kept at the preset position.
3. Press the [**Set**] button.
Saved in the bottom list.
4. Press the [**Start**] button.
It performs the group operation.
5. Press the [**Stop**] button.
The running group will be stop.
6. Press the [**Remove**] button.
Selected group data will be deleted.



To configure the tour settings

The tour function enables you to call groups of your presets in sequence.

1. Select <Tour>.
The menu screen will switch to the tour setting screen.
2. Configure the tour settings in detail.
 - Group No. : Select a group number.
 - Dwell time : Specify a waiting time before a new group is called.
3. Press the [**Set**] button.
Saved in the bottom list.
4. Press the [**Start**] button.
It performs the tour operation.
5. Press the [**Stop**] button.
The running tour will be stop.
6. Press the [**Remove**] button.
Selected tour data will be deleted.



To set the tracing function

Tracking remembers the trace of movements instructed using the direction button and reproduces it for your reference.

1. Select <Trace & Auto Run>.

This will bring up the tracing and auto operation setting menu screen.



2. Select a tracking number.

The operation will be saved with display of the memory usage. The saving time differs, depending on the level of the PTZ operation.

If memory is filled to 100% or the recording end configuration is not completed in 2 minutes from the beginning of saving, it will be automatically terminated.

3. Press the [**Set**] button.

Selected tracing number will be saved.

4. Move the navigation path of saving using the pan/tilt/zoom.

5. Press the [**Stop**] button.

Saving is terminated.

6. Press the [**Start**] button.

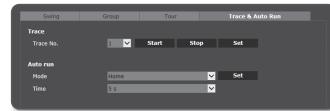
Selected tracing number will be activated as set.

To set the auto run

This feature will activate the predefined sequence function if the user does not manipulate anything on the product for a certain time.

1. Select <Trace & Auto Run>.

This will bring up the tracing and auto operation setting menu screen.



2. Select an auto run mode.

- Home : It is moved to the home position.
- Preset : It is moved to the selected preset number.
- Swing : Automatically executes the operation in Swing mode.
- Group : Automatically executes the operation in Group mode.
- Tour : Automatically executes the operation in Tour mode.
- Trace : Automatically executes the operation in Trace mode.
- Auto pan : Automatically executes the 360° rotation in the pan direction.
You can designate the tilt angle and speed.
- Schedule: You can set autorun function by day / time. You can set the action in minutes, and the default setting is home position.

3. Set the start time of autorun. After selecting the mode, select time (5s/10s/20s/30s/1m/2m/3m/4m/5m).

4. Press the [**Set**] button.

Selected operation will be performed automatically.

PT limit

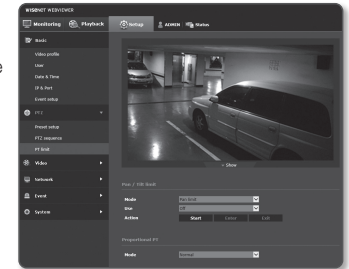
You can specify restrictions on the pan or tilt function.

1. From the Setup menu, select the <PTZ ()> tab.

2. Click <PT limit>.

3. Decide if you want to limit the PT operations. If so, specify the details.

- Mode : Select a mode to set between Pan limit and Tilt limit.
- Use : Select whether to use limit in set mode.
- Action : PT limiting operation is set.
 - [**Start**] : Start limit setting.
 - [**Enter**] : Provide the start and end points.
 - [**Exit**] : If you want to change the point setting, click this to return to the input dialog.



4. Set the Proportional PT mode.

Pan and tilt speed is adjusted according to the zoom magnification. As the zoom magnification grows, the pan and tilt speed decreases.

- Off : Turns off the zoom interworking mode.
- Slow : The manual pan and tilt control speed is changed according to the zoom magnification. It slows down by 20%.
- Normal : The manual pan and tilt control speed is changed according to the zoom magnification.
- Fast : The manual pan and tilt control speed is changed according to the zoom magnification. It speeds up by 20%.

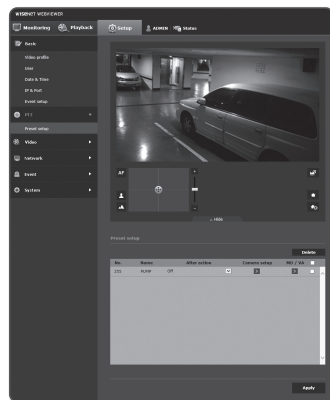
PTZ SETUP (TNO-6320E)

Preset setup

During the camera zoom operation, the initial condition can be set.

1. From the Setup menu, select the <PTZ ()> tab.
2. Click <Preset setup>.
3. Click [ Show].
4. Control zoom movement.
 - Zoom In: Move up the bar in the right of the UI, or press the [] button. The farther the bar is from the center, the faster the screen expands.
 - Zoom Out: Move down the bar in the right of the UI, or press the [] button. The farther the bar is from the center, the faster the screen reduces in size.
5. Adjust the focus.
 - Manual focus ( / ) : The user sets the focus.
 - Auto focus () : The system sets the focus automatically.

- When performing the preset action at a high or low temperature, the system may respond slower than the set rate for accurate preset action.
- Preset No. 255 is prepared to move the washer pump to a location during its operation. Default setting is Pan 0 degrees and Tilt -90 degrees. It is possible to change this according to the pump installation location. Even when Preset No. 255 is removed, if the washer is operated, it is moved to Pan 0 degrees and Tilt -90 degrees.



To add the home position

1. Move to a desired start screen point and press []. The point will be set to the home position.
2. Click [] in the home position. You will move to the predetermined home position.
3. When the camera is rebooted after setting, the screen is located at the home position. (If the camera was on another sequence operation, the sequence is performed.)

To add a preset

1. Click on the [] button.
2. Select the preset number to be added.
3. Set the preset name and click on the [OK] button.

To delete a preset

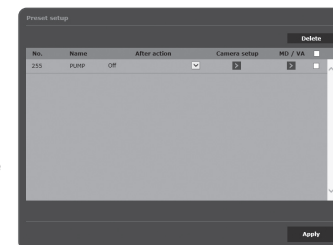
1. Select the preset number to delete.
2. Press the [ Remove] button.

To move to a desired preset

1. Double click on the preset number you want to go to at the preset configuration.

To configure the detailed settings for the preset

1. Select the number of preset that you want to configure.
 - After action : In the <After action>, you can select video analysis operation after the preset operation.
 - Video analysis : MD/VA operation is run.
 - Camera setup : You can change the camera setting to the environment of the selected preset. Refer to “Camera setup” for how to set the camera. (page 42)
 - MD / VA : You can set the system to generate an event signal when a movement is detected in the preset, or an intelligent video analysis event is detected. For more details, refer to “MD / VA”. (Page 53)
2. When done, click [Apply ()].



- After saving the preset setting, make sure to run the preset. If the operation is not performed, the system may run a wrong operation, such as an unintended change of preset setting.
- While setting preset edit, you cannot use the functions, such as preset setting, home position setting and move to the home position.

VIDEO SETUP

Video setup (TNU-6320E)

1. From the Setup menu, select the <Video ()> tab.

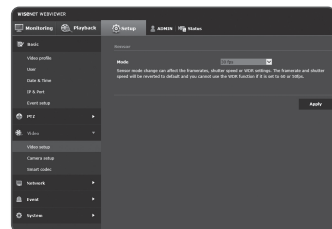
2. Click <Video setup>.

3. Select the sensor mode.

You can set the number of frames captured by the CMOS sensor per second.

- Refer to "Video profile" for the framerate setup range of the <Video profile> according to mode setup. (Page 30)
- You cannot select <WDR> for the <Back light> mode if the sensor mode is 50 fps or 60 fps.

4. When done, click [Apply ()].



Video setup (TNO-6320E)

1. From the Setup menu, select the <Video ()> tab.

2. Click <Video setup>.

3. Select a <Video source> mode.

- Flip mode : Turn upside down the image that is captured by the camera.
- Mirror mode : Flip horizontal the image that is captured by the camera.

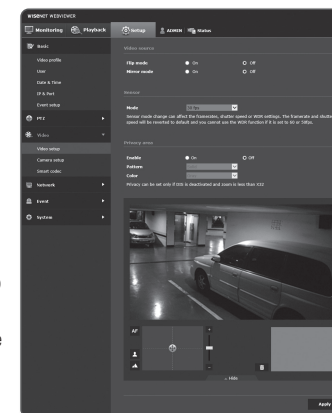
4. Select the sensor mode.

You can set the number of frames captured by the CMOS sensor per second.

- Refer to "Video profile" for the framerate setup range of the <Video profile> according to mode setup. (Page 30)
- If you set the sensor mode to 50 or 60 fps, <WDR> can be available in <Back light> mode.

5. Specify the privacy zone.

6. When done, click [Apply ()].



To set the privacy zone

You can specify a certain area of the camera video to be protected for your privacy.

1. Set it to <On>.

2. Click the button [Apply ()].

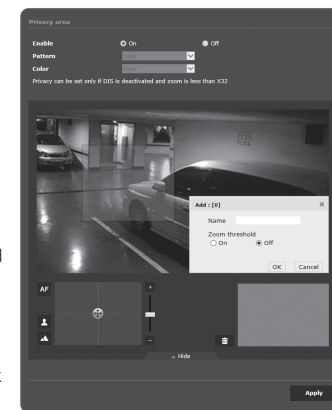
3. Select the pattern and color of the privacy field to be set.

4. Click [▼ Show].

5. Place the cursor at a point in the video and drag it to whatever you need.

6. Check whether the field indicated on the screen is consistent with the field to be set and enter the name. When not using the zoom indication restriction function, select [Off] and then click on the [OK] button. If the displayed field and setting field are different, press on the [Cancel] button and reset.

7. When using the zoom indication restriction function, select [On] and click on the [OK] button. The privacy field will be set and a popup will appear. At this time, move to the zoom position that you wish to set for the zoom operation and click on the [OK] button. To cancel the privacy field setting, click on the [Cancel] button and reset.

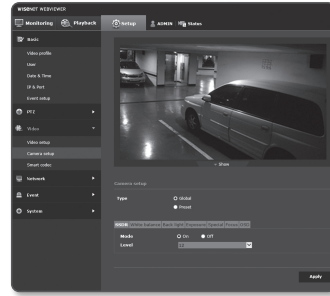


- Privacy area does not use DIS, and if its zoom is below 32X magnification, the privacy can be set.
- Privacy fields that apply zoom indication restriction functions are shown with [ZOOM] following the name.

Camera setup (TNU-6320E)

You can change the camera settings according to the environment where the camera is located.

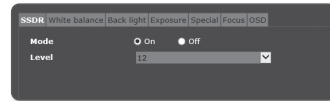
1. From the Setup menu, select the <Video ()> tab.
2. Click <Camera setup>.
3. Configure the settings as necessary of : SDDR, White balance, Back light, Exposure, Special, Focus, OSD
4. When done, click [Apply ()].
 - If a certain time (timeout: 240s) is elapsed with your not pressing the [Apply ()] button after changing the settings, your changes will not be applied.



SSDR Setup

In a scene where the difference between bright and dark is severe, you can increase the brightness of the dark area alone to regulate the overall brightness.

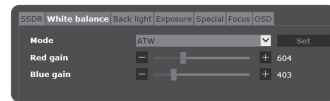
1. Select <SSDR>.
2. Set <Mode> to <On>.
3. Configure the <Level> setting as necessary.
 - Level : Adjust the level of the dynamic range.



White balance Setup

You can correct the image colors based on white under any lighting conditions.

1. Select <White balance>.
2. Select <Mode>.
 - ATW : Corrects the colors of the camera video automatically.
ATW does not work under mercury/sodium lamps.
 - Manual : You can adjust the red and blue gains of the camera video manually.
 - AWC : Corrects the colors of the camera video to be optimized to the current lighting condition and screen mode.
To obtain the optimal condition for the current lighting, put the focus of the camera to a white paper and press the [Set] button. If the lighting environment is changed, you should readjust the settings accordingly.
 - Outdoor : Automatically corrects the video colors of the camera to be optimized to the outdoor environment.
 - Indoor : Automatically corrects the video colors of the camera to be optimized to the indoor environment.
 - MERCURY : The image automatically compensates to the mercury lamp environment.



- In AWC mode, click the [Set] button if you want to keep the white balance level of the current image.

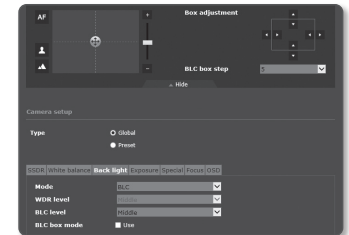


- The white balancing may not work properly in the following conditions:
If this is the case, switch to AWC mode.
 - If the surrounding condition of the object is out of the temperature correction range
ex) Clear sky, sunset
 - If the surrounding of the object is dark
 - If the focus of the camera directly faces the florescent lighting or if the camera is installed in a place of variable illumination, the white balancing operation may be unstable.

BLC Setup

You can specify a desired area on the video manually and set the area to be displayed more clearly.

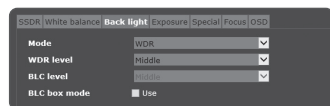
1. Select <Back light>.
2. Set <Mode> to <BLC>.
If you select BLC, the Box adjustment screen and the BLC box step are displayed on the PTZ Control screen.
3. Select each item and set it properly.
 - BLC level : You can change the level to adjust the brightness of the monitoring area.
 - BLC box Mode : Specify the mode of BLC box.
 - Box adjustment : Use the arrow buttons to adjust the size and position of the BLC Box.
 - BLC box Step : Specify the pixel unit for movement. You can use the arrow buttons of <Box adjustment> to add or reduce the pixels.



WDR Setup

You can set to display a sharp image of the objects in a scene where both bright and dark areas exist.

1. Select **<Back light>**.
2. Set **<Mode>** to **<WDR>**.
3. Select each item and set it properly.
 - WDR level : Specify the WDR sensitivity level.



- If WDR mode is active, the shutter mode cannot be changed. Data transfer via the network is available at up to 15 fps.
- If the WDR mode is active, a moving object can cause an afterimage on the screen.

Ex)



<WDR OFF>



<WDR ON>

- If you select WDR, you may encounter the following problems. So set it to Not Used.
 - Unnatural change of colors that cause an unnatural image on the screen
 - Noise on the bright area of the image
- As the performance of the WDR function may differ depending on the bright-area size of the image, it is recommended to optimize the installation angle for the best performance.
- At night operation, this function will be activated only if the incoming highlight exceeds a certain area in a low contrast environment.
- Increasing the maximum value may cause an unnatural portion of the image.
- For the best WDR performance, it is recommended to set the Iris mode to **<Auto>**.
- Since the auto focus operation can be repeated depending on the lighting condition if user backlight compensation is used, it is recommended to use the focusing mode of **<One Shot AF>** or **<Manual>**.

Exposure Setup

You can adjust the exposure level of the camera.

1. Select **<Exposure>**.
2. Select each item and set it properly.
 - Brightness : Adjust the screen brightness.
 - Minimum shutter : Set the min. shutter speed manually.
 - Maximum shutter : Set the max. shutter speed manually.
 - Anti flicker : Select this feature if you encounter a flickering screen due to a frequency mismatch with the ambient lighting.
 - SSNR3 : Specify whether you want to remove the noises in the video.
 - When AGC mode is set to **<Off>**, SSNR3 cannot be used.
 - SSNR3 level : Set the level of SSNR3.
 - Iris : You can set the camera iris to Auto or Manual to your preference.
 - Auto : Automatically sets the iris adaptively to the ambient lighting and shutter speed.
 - Manual : Iris F-No is set manually.
 - Iris F-No : If the iris mode is set to Manual, specify the F number of the iris.
 - As F-No increases, the iris decreases, so the screen is darkened, and as F-No decreases, the screen is brightened.
 - AGC : Select AGC Control mode.
 - Adjust the gain value of the video (that, in particular, was recorded at a low contrast scene and had a lower brightness level than normal) to control the video brightness.
 - If the AGC mode is set to **<Off>** or **<Manual>**, you cannot use SSNR3 and cannot select the **<Auto>** mode for the Date/Night mode setting.

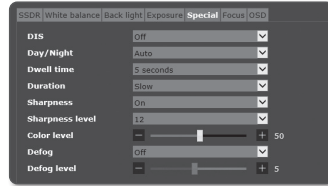


Special Setup

1. Select <Special>.

2. Select each item and set it properly.

- DIS : Automatically compensates for the flicker on the screen.
 - DIS cannot be used if VA/MD and tempering detection are used.
 - Digital zoom cannot be used if DIS is used.
- Day/Night : You can switch the mode to adjust the black and white level as well as the colors.
 - Color : Always displays the video in colors.
 - B/W : Always displays the video in black and white.
 - Auto : Displays in color mode during normal daytime and switches to black and white mode in a low contrast scene at night.
 - When AGC mode of <Exposure> menu is set to <Off>, Day/Night mode cannot be set to <Auto>.
- Dwell time : This is the time while each applicable lighting condition is kept in order to enable the switch between day and night modes.
- Duration : Specify the time interval of lighting at which the sequence operation is triggered.
- Sharpness : Adjust the overall sharpness of the image.
If selecting <On>, you can adjust the sharpness of the image.
- Sharpness level : The higher the level is, the sharper and clearer the outline of the image becomes.
- Color level : Adjust the color level of the image.
- Defog : You can improve images in foggy or cloudy weather.
 - Off : Fog removal function is not active.
 - Auto : Images are compensated automatically according to the amount of fog. To improve the effects of this function, adjust the <Defog level>.
 - Manual : You can set the amount of compensation manually for the image.



- Use this function if the image is unclear due to foggy weather.



- If <Auto> is selected for the defog mode, the level is reduced as the fog is reduced.
If you wish to maintain the fog removal level even when the amount of fog is reduced, select <Manual>.
- Note that the image can be dark if the fog level is high with the amount of fog being small.

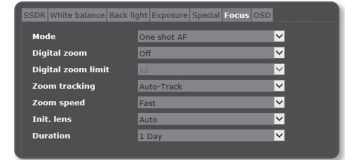
- Defog level : Adjust the fog removal level.

Focus Setup

1. Select <Focus>.

2. Select each item and set it properly.

- Mode
 - Manual : The focus will be adjusted manually according to the zoom factor.
 - Auto : The focus will be adjusted automatically according to the zoom factor.
 - One Shot AF : Auto Focus will be performed once after the zooming operation.
- Digital zoom : Specify the use of digital zoom.
 - Digital zoom cannot be used if DIS is used.
- Digital zoom limit : Specify the limit of the digital zoom.
- Zoom tracking : Specify the focus sync mode with the panning/tilting/zooming operation.
 - Off : Only the zoom lens will work.
 - Auto-Track : It will control (detect and correct) the zooming operation to keep fitting the focus.
 - Tracking : The zooming operation will be guided by the focus track.
- Zoom speed : Adjust the zoom tracking speed.
- Init. lens : Reset the lens to prevent the step-out in zoom mode.
- Duration : Specify the frequency of resetting the lens.
 - You can specify the date of resetting the lens that will perform in auto focus mode. Specify the time between 1 and 7 days, and the resetting will be performed at 24-hour interval starting from the specified date.
- The auto focus function might not work properly under any of the following conditions:
 - Bright or flashing lights (ex.- neon sign)
 - Low illumination of the target area
 - Slow-shutter action
 - Dark object
 - Excessive illumination of the target area
 - If a short-distance object and a long-distance object are in the target area
 - If there is no contract gap (sky, wall, etc.)
 - If the camera is taking a picture of a thin horizontal line
 - In the auto focus mode, because the camera focuses on the object at the center of the area, other objects which are not in the center can be out of focus.

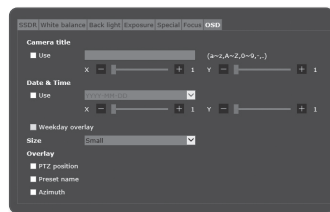


OSD Setup

1. Select <OSD>.

2. Select each item and set it properly.

- Camera title : Specify whether or not to display the camera title on the screen.
 - You can enter up to 15 characters for the title.
- Camera title X, Y : Specify the coordinates where the camera title is displayed on the screen.
- Date & Time : You can set the date and time, and if they should be displayed on the screen.
- Date & Time X, Y : Set the position of time to be displayed on the screen.
- Weekday overlay : You can display the day on the screen.
- Size : Set the size of the OSD indicated in the screen. Select from small/medium/large.
- PTZ position : Set the PTZ location on the screen.
- Preset name : Specify whether or not to display preset name on the screen.
- Azimuth : This function allows you to indicate the azimuth of the field seen in the current screen. Eight compass directions appear on the lower right side of the screen, reflecting the current orientation: E/W/S/N/NE/NW/SE/SW.



- ! A position-adjustable item (Camera title, Date & Time) may not be displayed normally if it overlaps with another fixed OSD item.
- PTZ position appears on the bottom left of the screen and it cannot move to other area. Use this information when placing other items on the screen.

Setting Azimuth

1. Click [▼ Show].

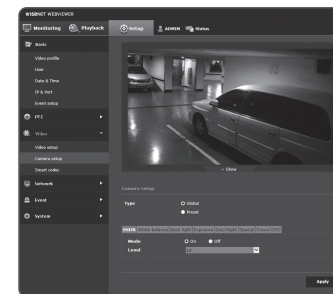
2. After pointing the center of the camera view to the north and pressing the [▲] button, the corresponding orientation will be saved as north.



Camera setup (TNO-6320E)

You can change the camera settings according to the environment where the camera is located.

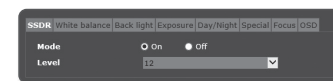
- From the Setup menu, select the <Video ()> tab.
- Click <Camera setup>.
- Configure the settings as necessary of : SDDR, White balance, Back light, Exposure, Day/Night, Special, Focus, OSD
- When done, click [Apply ()].
 - If a certain time (timeout: 240s) is elapsed with your not pressing the [Apply ()] button after changing the settings, your changes will not be applied.



SSDR Setup

In a scene where the difference between bright and dark is severe, you can increase the brightness of the dark area alone to regulate the overall brightness.

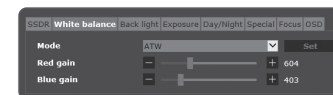
- Select <SSDR>.
- Set <Mode> to <On>.
- Configure the <Level> setting as necessary.
 - Level : Adjust the level of the dynamic range.



White balance Setup

You can correct the image colors based on white under any lighting conditions.

- Select <White balance>.
- Select <Mode>.
 - ATW : Corrects the colors of the camera video automatically. ATW does not work under mercury/sodium lamps.
 - Manual : You can adjust the red and blue gains of the camera video manually.
 - AWC : Corrects the colors of the camera video to be optimized to the current lighting condition and screen mode. To obtain the optimal condition for the current lighting, put the focus of the camera to a white paper and press the [Set] button. If the lighting environment is changed, you should readjust the settings accordingly.
 - Outdoor : Automatically corrects the video colors of the camera to be optimized to the outdoor environment.
 - Indoor : Automatically corrects the video colors of the camera to be optimized to the indoor environment.
 - MERCURY : The image automatically compensates to the mercury lamp environment.

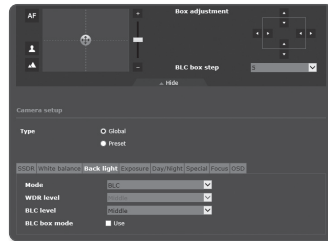


- ✎ In AWC mode, click the **[Set]** button if you want to keep the white balance level of the current image.
- ! The white balancing may not work properly in the following conditions:
If this is the case, switch to AWC mode.
 - If the surrounding condition of the object is out of the temperature correction range
ex) Clear sky, sunset
 - If the surrounding of the object is dark
 - If the focus of the camera directly faces the florescent lighting or if the camera is installed in a place of variable illumination, the white balancing operation may be unstable.

BLC Setup

You can specify a desired area on the video manually and set the area to be displayed more clearly.

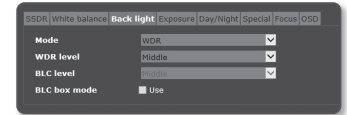
1. Select **<Back light>**.
2. Set **<Mode>** to **<BLC>**.
If you select BLC, the Box adjustment screen and the BLC box step are displayed on the PTZ Control screen.
3. Select each item and set it properly.
 - BLC level : You can change the level to adjust the brightness of the monitoring area.
 - BLC box Mode : Specify the mode of BLC box.
 - Box adjustment : Use the arrow buttons to adjust the size and position of the BLC Box.
 - BLC box Step : Specify the pixel unit for movement. You can use the arrow buttons of **<Box adjustment>** to add or reduce the pixels.



WDR Setup

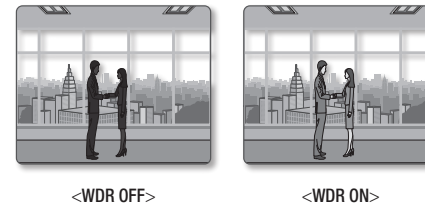
You can set to display a sharp image of the objects in a scene where both bright and dark areas exist.

1. Select **<Back light>**.
2. Set **<Mode>** to **<WDR>**.
3. Select each item and set it properly.
 - WDR level : Specify the WDR sensitivity level.



- ✎ If WDR mode is active, the shutter mode cannot be changed. Data transfer via the network is available at up to 15 fps.
- If the WDR mode is active, a moving object can cause an afterimage on the screen.

Ex)



- ! If you select WDR, you may encounter the following problems. So set it to Not Used.
 - Unnatural change of colors that cause an unnatural image on the screen
 - Noise on the bright area of the image
- As the performance of the WDR function may differ depending on the bright-area size of the image, it is recommended to optimize the installation angle for the best performance.
- At night operation, this function will be activated only if the incoming highlight exceeds a certain area in a low contrast environment.
- Increasing the maximum value may cause an unnatural portion of the image.
- For the best WDR performance, it is recommended to set the Iris mode to **<Auto>**.
- Since the auto focus operation can be repeated depending on the lighting condition if user backlight compensation is used, it is recommended to use the focusing mode of **<One Shot AF>** or **<Manual>**.

Exposure Setup

You can adjust the exposure level of the camera.

1. Select <Exposure>.

2. Select each item and set it properly.

- Brightness : Adjust the screen brightness.
- Minimum shutter : Set the min. shutter speed manually.
- Maximum shutter : Set the max. shutter speed manually.
- Anti flicker : Select this feature if you encounter a flickering screen due to a frequency mismatch with the ambient lighting.
- SSNR3 : Specify whether you want to remove the noises in the video.
 - When AGC mode is set to <Off>, SSNR3 cannot be used.
- SSNR3 level : Set the level of SSNR3.
- Iris : You can set the camera iris to Auto or Manual to your preference.
 - Auto : Automatically sets the iris adaptively to the ambient lighting and shutter speed.
 - Manual : Iris F-No is set manually.
- Iris F-No : If the iris mode is set to Manual, specify the F number of the iris.
 - As F-No increases, the iris decreases, so the screen is darkened, and as F-No decreases, the screen is brightened.
- AGC : Select AGC Control mode.
 - Adjust the gain value of the video (that, in particular, was recorded at a low contrast scene and had a lower brightness level than normal) to control the video brightness.
 - If AGC mode is set to <Off>, the <Auto> mode for SSNR3 and day/night setting cannot be used.

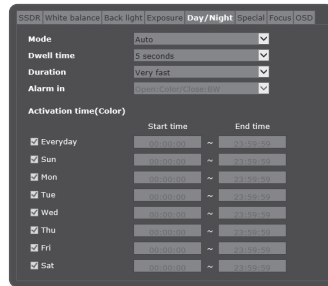


To Set Day/Night

1. Select <Day/Night>.

2. Select each item and set it properly.

- Mode : Mode is used to adjust the color of Color or Black and White.
 - Color : The video is always output in color.
 - B/W : The video is always output in black and white.
 - Auto : Normally, it is set to Color but to B/W under low luminance at night.
 - If AGC of the <Exposure> menu is set to <Off>, the day/night mode cannot be set to <Auto>.
- External : It controls the color of the video when the alarm input terminal is synchronized with an external device.
 - When you select <External>, <Alarm in> on the <Event> tab can't be used.
- Schedule : Set the time during which the camera is operated in the color mode.



- Dwell Time : It specifies the period for which the selected brightness condition must be maintained to switch the lighting mode from Day to Night or vice versa.
- Duration : It specifies the interval of lighting mode conversion.
- Alarm in : The video is set to Color or B/W as the alarm sensor is open or closed.
 - If the Day/Night mode is set to External Input, the alarm input function of the Event-Alarm Input page is disabled.
- Activation time(Color) : It specifies the schedule for color mode operation.
 - If it is set, the Color mode is maintained from 00 second of the starting time to 59 second of the ending time.



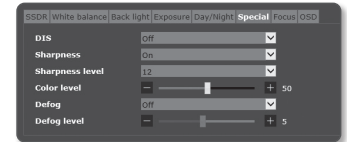
- If you switch the day/night mode, the MD/VA event cannot be detected.

Special Setup

1. Select <Special>.

2. Select each item and set it properly.

- DIS : Automatically compensates for the flicker on the screen.
 - DIS cannot be used if VA/MD and tempering detection are used.
 - Digital zoom cannot be used if DIS is used.
- Sharpness : Adjust the overall sharpness of the image.
 - If selecting <On>, you can adjust the sharpness of the image.
- Sharpness level : The higher the level is, the sharper and clearer the outline of the image becomes.
- Color level : Adjust the color level of the image.
- Defog : You can improve images in foggy or cloudy weather.
 - Off : Fog removal function is not active.
 - Auto : Images are compensated automatically according to the amount of fog. To improve the effects of this function, adjust the <Defog level>.
 - Manual : You can set the amount of compensation manually for the image.



- Use this function if the image is unclear due to foggy weather.



- If <Auto> is selected for the defog mode, the level is reduced as the fog is reduced. If you wish to maintain the fog removal level even when the amount of fog is reduced, select <Manual>.
- Note that the image can be dark if the fog level is high with the amount of fog being small.

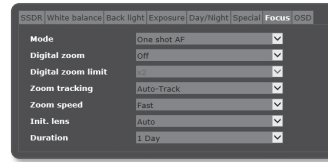
- Defog level : Adjust the fog removal level.

Focus Setup

1. Select <Focus>.

2. Select each item and set it properly.

- Mode
 - Manual : The focus will be adjusted manually according to the zoom factor.
 - Auto : The focus will be adjusted automatically according to the zoom factor.
 - One Shot AF : Auto Focus will be performed once after the zooming operation.
- Digital zoom : Specify the use of digital zoom.
 - Digital zoom cannot be used if DIS is used.
- Digital zoom limit : Specify the limit of the digital zoom.
- Zoom tracking : When using the zoom function, this sets how the focus is interconnected.
 - Off : Only the zoom lens will work.
 - Auto-Track : It will control (detect and correct) the zooming operation to keep fitting the focus.
 - Tracking : The zooming operation will be guided by the focus track.
- Zoom speed : Adjust the zoom tracking speed.
- Init. lens : Reset the lens to prevent the step-out in zoom mode.
- Duration : Specify the frequency of resetting the lens.
 - You can specify the date of resetting the lens that will perform in auto focus mode. Specify the time between 1 and 7 days, and the resetting will be performed at 24-hour interval starting from the specified date.



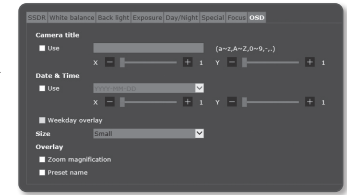
- ! ■ The auto focus function might not work properly under any of the following conditions:
- Bright or flashing lights (ex.- neon sign)
 - Low illumination of the target area
 - Slow-shutter action
 - Dark object
 - Excessive illumination of the target area
 - If a short-distance object and a long-distance object are in the target area
 - If there is no contract gap (sky, wall, etc.)
 - If the camera is taking a picture of a thin horizontal line
- In the auto focus mode, because the camera focuses on the object at the center of the area, other objects which are not in the center can be out of focus.

OSD Setup

1. Select <OSD>.

2. Select each item and set it properly.

- Camera title : Specify whether or not to display the camera title on the screen.
 - You can enter up to 45 characters for the title.
- Camera title X, Y : Specify the coordinates where the camera title is displayed on the screen.
- Date & Time : You can set the date and time, and if they should be displayed on the screen.
- Date & Time X, Y : Set the position of time to be displayed on the screen.
- Weekday overlay : You can display the day on the screen.
- Size : Set the size of the OSD indicated in the screen. Select from small/medium/large.
- Zoom magnification : Display zoom magnification on the screen.
- Preset name : Specify whether or not to display preset name on the screen.



- ! ■ A position-adjustable item (Camera title, Date & Time) may not be displayed normally if it overlaps with another fixed OSD item.

Smart codec

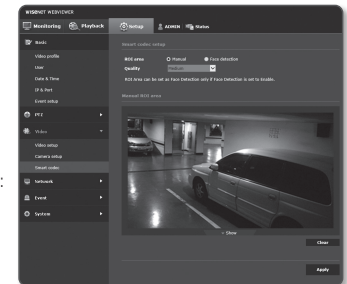
Set a desired area of the video incoming from the camera as ROI area and specify the detection sensitivity for the area.

1. From the Setup menu, select the <Video ()> tab.

2. Click <Smart codec>.

3. Select ROI Area.

- Manual : Specify the ROI area to monitor manually.
- Face detection : Active if a face is recognized on the monitoring screen.
 - Face detection is enabled only if the following conditions are met:
 - The face is positioned at ± 45 degrees to the left or right from the top.
 - The effective range of the face rotation is ± 30 degrees vertically, and ± 60 degrees horizontally.
 - The minimum size of the face is 20x20 based on the resolution of 320x240.



- ! ■ Only when a face-detection event is activated can the field of interest be set as face detection. For details on face detection events, see "Face detection". (page 55)

4. Select a quality for the ROI area.

The ROI area will be displayed in the specified quality.

5. If you set the area of interest by <Manual>, then select the desired area with your mouse and drag it.

- You can specify up to 5 distinct areas.

6. To cancel all the settings for the area, click the [Clear ()] button.

7. When done, click [Apply ()].

- ! ■ The Smart codec will not be active if it is set to <Off> in <Video profile>. (page 30)

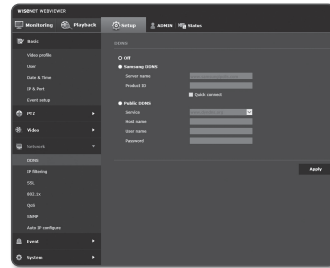
NETWORK SETUP

DDNS

DDNS is an abbreviation of Dynamic Domain Name Service that converts the IP address of a camera into a general Host Name so that the user can easily remember it.

- You can use the DDNS service only if the internet is connected.

1. From the Setup menu, select the **<Network ()>** tab.
2. Click **<DDNS>**.
3. Select the **<DDNS>** connection type.
4. Type in the DDNS items according to the selected type.
 - DDNS : Select this if you use the DDNS server provided by Hanwha Vision.
 - Product ID : Enter the product ID that is registered with the DDNS service.
 - Quick connect : It sets port forwarding automatically when used with a UPnP (Universal Plug and Play) supporting router.



- If you want to use the DDNS service without using a hub that supports the UPnP function, click Quick connect, then go to the hub menu and activate port forwarding for your hub.
For more on how to set port forwarding for your hub, refer to "**Port Range Forward (Port Mapping) Setup**". (page 21)

- Public DDNS : Select one of provided public DDNS servers when you use a public DDNS server.
 - Service : Select desired public DDNS service server.
 - Host name : Enter the name of the host that is registered with the DDNS server.
 - User name : Enter the user name for the DDNS service.
 - Password : Enter the password for the DDNS service.

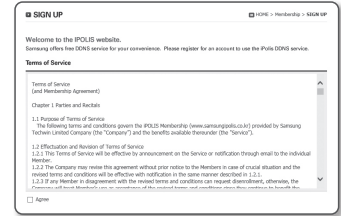
5. When done, click **[Apply ()]**.

- If selected **<Quick connect>**, be sure to select DDNS service.

Registering with DDNS

To register your product with the DDNS

1. Visit the iPOLIS web site (www.samsungipolis.com) and sign in with a registered account.



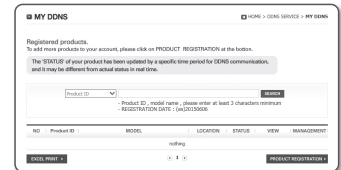
2. From the top menu bar, select **<DDNS SERVICE>** - **<MY DDNS>**.



3. Click **[PRODUCT REGISTRATION]**.

4. Enter the product ID.

- You must perform the duplicate check for the ID that you entered.

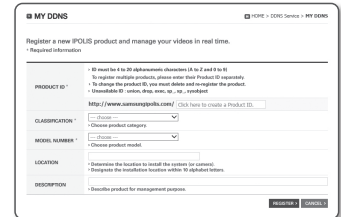


5. Select a **<CLASSIFICATION>** and specify the **<MODEL NUMBER>**.

6. Specify the product location with a description if necessary.

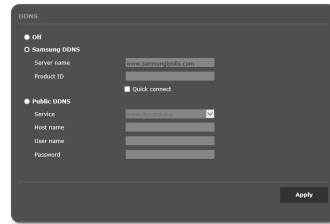
7. Click **[REGISTRATION]**.

The product will be added to the product list that you can check.



To connect to the DDNS in camera setup

1. From the DDNS setup page, set <DDNS> to <DDNS>.
2. Provide the <Product ID> that you registered product ID with the DDNS site.
3. Click [Apply ()].
When the connection is successfully made, you will see the message of <(Success)> on the screen.



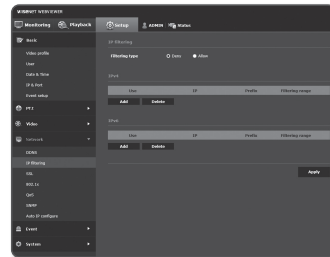
Configuring public DDNS in Camera Settings

1. Open the DDNS settings page and select <Public DDNS> for <DDNS>.
 2. Enter the corresponding site's host name, user name and password.
 3. Click [Apply ()] button.
If the connection properly establishes, <(Success)> appears.
 4. When done, click [Apply ()].
-  ■ To use DDNS service properly, both DDNS setup and the router's port forwarding setup are required.
For port forwarding setup, refer to "Port Range Forward (Port Mapping) Setup". (page 21)

IP filtering

You can create a list of IPs that you want to grant or deny access to them.

1. From the Setup menu, select the <Network ()> tab.
2. Click <IP filtering>.
3. Select <Filtering type>.
 - Deny : If selecting this, access from those IPs that are added to the filtering will be restricted.
 - Allow : If selecting this, access from only those IPs that are added to the filtering will be accepted.
4. Click the [Add ()] button.
The IP list will be created.
5. Provide the IP that you want to grant or deny access from.
When you enter an IP address and a Prefix, the list of IP addresses available will appear in the right-side filter range column.



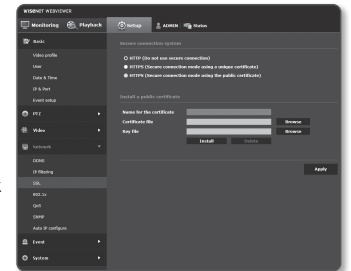
-  ■ If selected <Allow> for IP Filtering and <IPv6 setup> of <IP & Port> is set to <Use>, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
- The IP address of the computer used for the current setup cannot be added to <Deny>, it should be added to <Allow>.
 - Only the IP addresses that are set to <Use> will be displayed in the filter column.

6. Select an IP to delete from the list.
Click the [Delete ()] button.
7. When done, click [Apply ()].

SSL

You can select a secure connection system or install the public certificate for this purpose.

1. From the Setup menu, select the <Network ()> tab.
2. Click <SSL>.
3. Select a secure connection system.
 - To access the camera using HTTPS mode, you have to type the IP address for the camera in the form of "https://<Camera_IP>".
If you failed to configure the Web viewer settings in HTTPS mode with Internet Explorer, edit the Internet options as follows: <Menu → Tools → Internet Options → Advanced → Security → Uncheck TLS 1.0, and check TLS 1.1, TLS 1.2>
4. Search for the public certificate that you want to install on the camera.
To install the certificate on the camera, you need to provide a certificate name (it can be arbitrarily assigned by the user), certificate file issued from the certification authority and a key file.
 - The <HTTPS (Secure connection mode using the public certificate)> item will be active only if there exists a public certificate installed.
5. When done, click [Apply ()].



Installing the certificate

1. Enter the certificate name.
2. Click the [Browse ()] button, select the public certificate file and key file to be installed, and then click the [Install ()] button.

Deleting the certificate

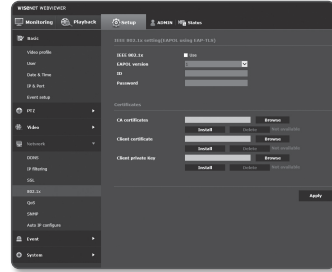
1. Click [Delete ()] button.
2. To delete a public certificate, you should access the network video decoder in the mode of <HTTP (Do not use secure connection)> or <HTTPS (Secure connection mode using a unique certificate)>.

802.1x

When connecting network, you can choose whether using 802.1x protocol, and then install the certification.

1. From the Setup menu, select the <Network ()> tab.
2. Click <802.1x>.
3. Set the <IEEE 802.1x setting(EAPOL using EAP-TLS)>.
 - IEEE 802.1x : Specify the use of the 802.1x protocol.
 - EAPOL version : Select version 1 or 2.
 - ID : Enter the client certificate ID.
 - Password : Enter the client private key password. If the key file used is not encrypted, you don't need to enter it.

 ■ If the connected network device does not support the 802.1x protocol, the protocol will not operate properly even if you set it.



4. Install/remove the certificate.
 - CA certificates : Select a public certificate that contains the public key.
 - Client certificate : Select a public certificate that contains the client certificate key.
 - Client private Key : Select a public certificate that contains the client private key.
5. When done, click [Apply ()].

To install/remove 802.1x related certificates

1. Press the [Browse ()] button for each item and select a certificate to install.
2. If no certificate is installed, you will see "Not Available" appearing next to the selected item.
3. Press the [Install ()] button to start installation with a message of "Installed" next to the item.
4. Press the [Delete ()] button to remove the certificate.

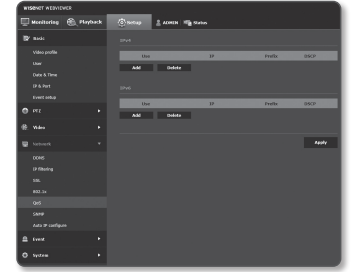
QoS

You can specify the priority to secure a stable transfer rate for a specific IP.

1. From the Setup menu, select the <Network ()> tab.
2. Click <QoS>.
3. Click the [Add ()] button.
The IP list will be created.
4. Enter an IP address to which you will apply QoS.

- The default prefix for IPv4 is 32;
For DSCP, the default is set to 63.
- Only the IP addresses that are set to <Use> can be prioritized.

5. Select an IP to delete from the list.
Click the [Delete ()] button.
6. When done, click [Apply ()].

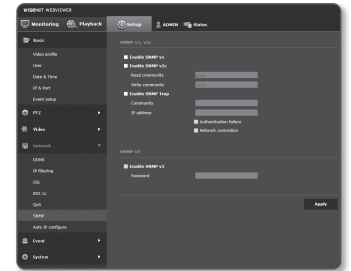


SNMP

With the SNMP protocols, the system or network admin can monitor the network devices on a remote site, and configure the environment settings.

1. From the Setup menu, select the <Network ()> tab.
2. Click <SNMP>.
3. Specify the <SNMP>.

- Enable SNMP v1 : SNMP version 1 will be active.
- Enable SNMP v2c : SNMP version 2 will be active.
 - Read community : Provide the name of the read community where you can access to the SNMP information.
The default name is <public>.
 - Write community : Provide the name of the write community where you can access to the SNMP information. The default name is <write>.
- Enable SNMP Trap : SNMP trap is used to send important events and conditions to the Admin.
 - Community : Enter the trap community name to receive messages.
 - IP address : Enter the IP address to which messages will be sent.
 - Authentication failure : It specifies whether an event shall be generated when the community information is invalid.
 - Network connection : It specifies whether an event shall be generated when the network disconnection is restored.



- Enable SNMP v3 : SNMP version 3 will be active.
- Password : Specify the default password for SNMP version 3.
 - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
 - Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
 - Password should be longer than 8 characters, no more than 16 characters.

4. When done, click **[Apply (Apply)]**.

- ! ■ SNMP v3 is only able to be set when the secure connection mode is HTTPS. Refer to "SSL", (page 47)
- If you don't use SNMP v3, there may be a security issue.

Auto IP configure

You can set the IP available for access and camera searching automatically.

1. From the Setup menu, select the **<Network (Network icon)>** tab.

2. Click **<Auto IP configure>**.

3. Set the **<Link-Local IPv4 address>**.

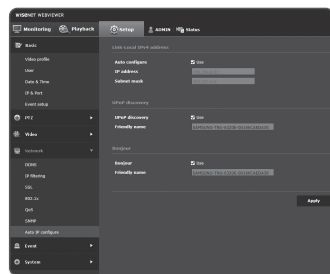
An additional IP address may be assigned to access the camera from the Link-Local network.

- Auto configure : It specifies Able or Disable for the Link-Local IPv4 address.
- IP address : Display the assigned IP address.
- Subnet mask : Display the subnet mask of the assigned IP.

4. Set the **<UPnP discovery>**.

Cameras can be automatically searched in the client and operating system in support of the UPnP protocol.

- UPnP discovery : It specifies Able or Disable for UPnP Discovery.
- Friendly name : Display the camera name.
- Friendly name is displayed in the format of WISENET-<Model Name>-<MAC Address>.



- In the Windows operating system which basically supports UPnP, the cameras connected to the network are displayed.

5. Set the **<Bonjour>**.

Cameras can be automatically searched in the client and operating system in support of the Bonjour protocol.

- Bonjour : It specifies Able or Disable for Bonjour.
- Friendly name : Display the camera name.
- Friendly name is displayed in the format of WISENET-<Model Name>-<MAC Address>.

- In the Mac operating system, which support Bonjour by default, the connected cameras are automatically displayed in the Bonjour bookmark of the Safari web browser. If the Bonjour bookmark is not displayed, check Bookmarks Setup in the "Preference" menu.

6. When done, click **[Apply (Apply)]**.

EVENT SETUP

FTP / E-mail

You can configure the FTP/E-mail server settings so that you can transfer the images taken with camera to your PC if an event occurs.

1. From the Setup menu, select the **<Event (Event icon)>** tab.

2. Click **<FTP / E-mail>**.

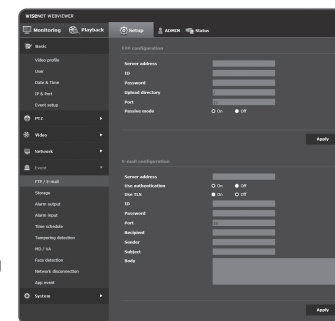
3. Select **<FTP configuration>** or **<E-mail configuration>** and enter / select a desired value.

• FTP configuration

- Server address : Enter the IP address of the FTP server that you transfer the alarm or event images to.
- ID : Enter the user ID with which you will log in to the FTP server.
- Password : Enter the user account password for logging into the FTP server.
- Upload directory : Specify the FTP path where you will transfer the alarm or event images.
- Port : The default port of the FTP server is 21; however, you can use a different port number according to the FTP server settings.
- Passive mode : Select **<On>** if you need to connect in passive mode due to the firewall or the FTP server settings.

• E-mail configuration

- Server address : Enter the SMTP address of the email server that you transfer the alarm or event images to.
- Use authentication : Select whether to use authorization.
- Use TLS : Specify the use of TLS.
- ID : Enter the user ID for logging into the email server.
- Password : Enter the user account password for logging into the email server.
- Port : The default port of the email server is 25; however, you can use a different port number according to the email server settings.
- Recipient : Enter the address of the email recipient.
- Sender : Enter the address of the email sender. If the sender address is incorrect, the email from the sender may be classified as SPAM by the email server and thus may not be sent.
- Subject : Enter a subject for your email.
- Body : Provide the text for the message. Attach the alarm or event images to the email that you are preparing.



4. When done, click **[Apply (Apply)]**.

Storage

You can activate recording on your device, set the recording conditions, check the saved data capacity and format the device itself.

1. From the Setup menu, select the **<Event (📷)>** tab.

2. Click **<Storage>**.

3. Set the saving operation and basic recording.

! ■ Auto deletion is supported only if your NAS meets the recommended specifications.

4. Enter the information registered in your NAS.

- IP address : Unique IP address assigned to the NAS.
- ID : An ID registered in the NAS.
- Password : Password registered in the NAS.
- Default folder : Designate the NAS user folder to save data in.

5. Click the **[Test]** button to see if you can successfully connect to the NAS.

- ! ■ If the success message is displayed, it means that you can successfully save data in the NAS.
- If the fail message is displayed, check the following.
- 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 & 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.

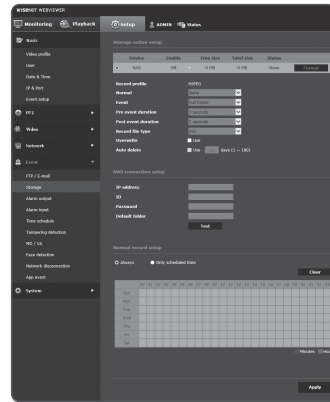
6. After the settings are completed, set the NAS unit to **<On>**.

7. Click the **[Apply (📌)]** button.

8. Log in the NAS and check the **<Free size>** and **<Total size>**.

You can format the default folder specified in the NAS connection setting by clicking the **<Format>** button.

- The data traffic will increase when the camera is set to higher resolution, higher bit rate, and/or higher framerate.
If there is too much data traffic, some frame may be skipped although it is stored in a full frame.
- When a frame skip occurs, images are saved at the rate of min. one image per sec.



- If your device is properly recording data, it will display **"Recording"**.
- If you see an "Error" message, check the following:
 - Check the storage to see if it is connected to the device.
 - Check the files in the storage to see if they are damaged.
 - Check the storage to see if they are physically damaged.

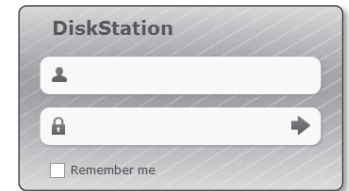
NAS (Network Attached Storage) guide



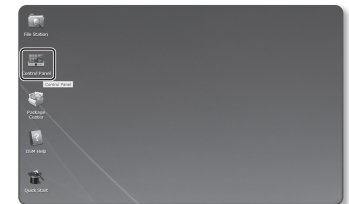
- NAS recommended specs : Refer to **"NAS recommended specs"**. (Page 5)
- If you change the NAS saving while saving data in the NAS, it will not be reflected in the system immediately.
- If you remove NAS equipment on your own while saving data, or if the network is disconnected, NAS saving operation will be terminated abnormally.
- NAS saving allows only one camera to a folder. Logging in with another camera is not allowed, and the images will not be saved.

The following is a description of how to save data using the NAS according to the Synology NAS method, which is one of the recommended products.

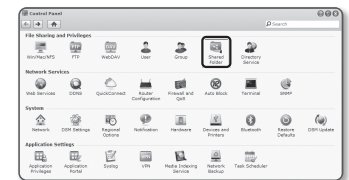
1. Access the Synology NAS as an admin.
In this example, the NAS IP Address is set to **[192.168.20.253]**.



2. If you access it as an admin, the following screen will be displayed. Click the **[Control Panel]**.



3. Click the **<Shared Folder>** in the file sharing and privilege menu.



4. Click the [Create] button.

5. After entering the shared folder name(ID), click the [OK] button to create a shared folder.
In this example, the shared folder name is [testDirectory].

6. In Windows, for NAS access, set the privilege for the shared folder as follows.
Check the admin's [Read/Write].

7. Click on the <User> in the file sharing and privilege menu.

8. After clicking the [Create] button, enter name(ID) and password.
In this example, name(ID) is set to [testID] and password is also set to [testID].

9. In Windows, set the privilege for NAS access.
For the shared folder created in step 4 called "testDirectory" check [Read/Write].

10. Basic setting in the NAS is completed.
Connect your camera to the actual NAS.
As shown below, enter the NAS connection setting items.

11. After entering item 10, check <On>.

12. Click the [Apply (Apply)] button.
Finish saving by using the NAS.

Alarm output

1. From the Setup menu, select the <Event (Event)> tab.

2. Click <Alarm output>.

3. Set the camera's type of alarm output.
■ If you change the alarm output type, the alarm out button on the monitoring page and alarm output type displayed on Event Setup page will be changed accordingly.

• Type

- Normal open : Considers "Open circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Closed circuit" status.
- Normal close : Considers "Closed circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Open circuit" status.

4. Set the alarm output button.

• Mode : Sets the alarm output method.

- There is difference between operations when clicked alarm output button while disabled.

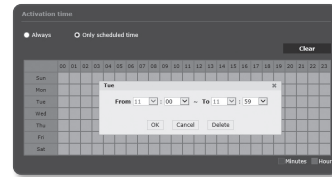
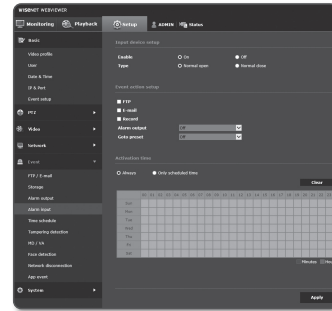
- Pulse : It is activated during the time period specified by the duration (switching interval) and then becomes inactive automatically.
 - Active/Inactive : It maintains as activated until the user clicks the button again to make it inactive.
- Duration : Set the alarm duration that maintains activated if the mode is set to pulse, from 1 to 15 seconds.

5. When done, click [Apply (Apply)].

Alarm input

You can set the alarm input type, activation time, and operation mode.

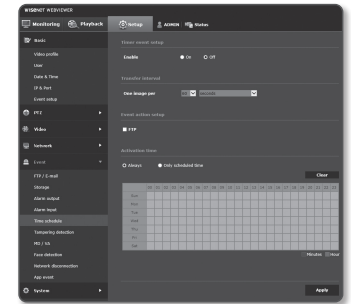
- From the Setup menu, select the **<Event (🔔)>** tab.
- Click **<Alarm input>**.
- Set whether or not to **<Enable>**.
- Select the type.
 - Normal open : It is normally open, but if it is closed, an alarm will be triggered.
 - Normal close : It is normally closed, but if it is open, an alarm will be triggered.
- Specify the **<Activation time>**.
 - Always : Always check if an alarm occurs. It activates in operated mode when the alarm occurs.
 - If set to **<Always>**, the activation time cannot be changed.
 - Only scheduled time : Check if an alarm occurs at a specified day of the week for a specified time period. It activates in operated mode when the alarm occurs.
 - [Clear (🗑️)] : Reset all settings.
 - Minute : Click an area in Activation Time and set the time by minutes.
 - Hour : Drag your mouse at Activation Time and set the time by hours.
- Specify an operation that will perform if an alarm occurs.
 - FTP : Specify the use of FTP transfer in the alarm input setup.
 - Refer to "FTP / E-mail" for more details. (page 49)
 - E-mail : Specify the use of email transfer in the alarm input setup.
 - Refer to "FTP / E-mail" for more details. (page 49)
 - Record : Sets whether or not to record on NAS, when alarm is entered.
 - Set **<Device>** to **<On>** in **<Storage>**. (page 50)
 - Alarm output : Select whether to set the alarm output if an alarm is incoming, and specify the alarm output time.
 - Goto preset : Moves to a preset position when alarm is entered.
- When done, click **[Apply (👉)]**.



Time schedule

System can be configured so that images can be transmitted in a constant time unit at a pre-scheduled operation time, regardless of generated events.

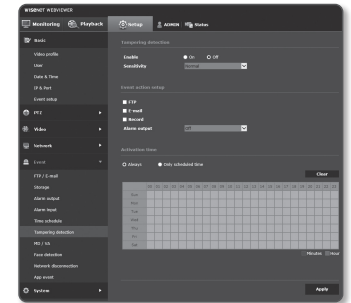
- From the Setup menu, select the **<Event (🔔)>** tab.
- Click **<Time schedule>**.
- Set whether or not to **<Enable>**.
- Specify the **<Transfer interval>**.
 - Always : Always activates in operated mode at the set interval.
 - Only scheduled time : Periodically activates in operated mode at a specified time and date.
- Specify the **<Activation time>**.
 - The transfer interval setting value must be smaller than the preset activation interval to succeed in image transmission.
- Specify the activation conditions.
 - FTP : Specify the use of the FTP transfer if an event occurs.
 - Refer to "FTP / E-mail" for more details. (page 49)
- When done, click **[Apply (👉)]**.



Tampering detection

You can set to detect tampering attempts and trigger events, such as sudden change of camera's framing direction, blocked lens and other overall change of scenes from the video.

- From the Setup menu, select the **<Event (🔔)>** tab.
- Click **<Tampering detection>**.
- Set whether or not to **<Enable>**.
 - When tampering detection is used, the stabilization function cannot be applied.
- Set the tampering detection sensitivity. The higher the sensitivity, detects the minutest tampering attempts.
- Specify the activation time and activation condition.
 - For more information about **<Activation time>** and **<Action>**, refer to "Alarm input". (page 52)
- When done, click **[Apply (👉)]**.



- The default tampering detection function may not work properly in the following cases:
 - Under circumstances of simple background or low illumination and night time may lower the detection sensitivity.
 - A severe shaking of the camera or a drastic change to the illumination can be considered a tampering by mistake.
 - Detection of the tampering may take some time (maximum 5 seconds) right after the tampering was made.
 - Once a tampering is detected, the camera will resume a normal operating after a certain stability time (approx. 5 seconds) during which no detection will be performed.

MD / VA

Events of motion detection and video analysis can be set to trigger event signal output.

1. From the Setup menu, select the <Event (👤)> tab.
2. Click <MD / VA>.
3. Set whether or not to <Enable>.

■ When motion detection or video analytics are used, the stabilization function cannot be used.

4. According to your purpose, select from motion detection and intelligent video analysis.

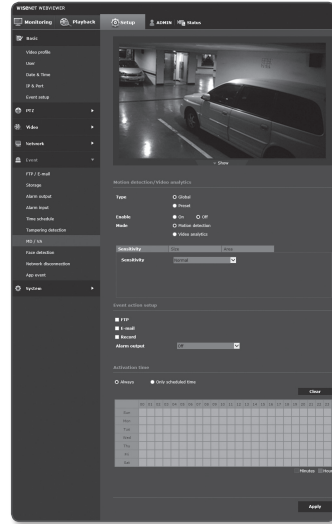
5. Set <Sensitivity>, <Size> and <Area>.
When selected Intelligent Video Analysis, set <Analytics> too.

6. Specify the activation time and activation condition.

■ For more information about <Activation time> and <Action>, refer to "Alarm input". (page 52)

7. When done, click [Apply (👉)].

- Before using, set the minimum and maximum motion sizes to suit desired motion range to be detected.
- Detected size of an object may have difference with the actual size according to its shape.
- Up to 16 objects from the top side of the screen can be displayed.
- If camera is capturing a close object, the video analysis capability may degrade.
- In the following cases, motion detection and intelligent video analysis function may be degraded or cause improper detection.
- The object color or brightness is similar to the background.
 - Small activities around the border area of the camera's field of view.
 - Multiple movements continue occurring at random due to a scene change, rapid lighting changes or other reasons.
 - A fixed object continues moving in the same position.
 - Motions of less position changing such as approaching to the camera or fading away from the camera.
 - Moving object approaches to the camera too close
 - An object hides other objects behind.
 - Two or more objects overlap or one object divides in multiple portions.
 - Too fast object (for a proper detection, one object should be found overlapping between contiguous frames).
 - Reflection / blur / shadow due to a strong light such as direct sunlight, illumination, or headlamp.
 - In severe snow, rain, wind or in dawn / dusk.



To use Motion detection

It detects a motion that meets all conditions specified by sensitivity, size and area.

1. Select a motion detection mode.
2. Select <Sensitivity> tab to set the sensitivity level. You can set the sensor's sensitivity to detect a motion out of the background from the monitoring video.

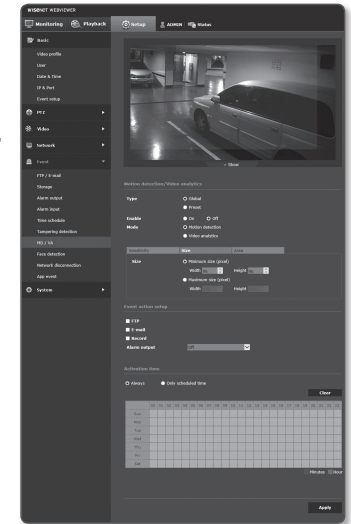
■ In a situation that definitely distinguishes objects out of backgrounds, set this to a low sensitivity level. For opposite case that is hard to distinguish objects like low illuminated situation, set this to a high level.

3. Select <Size> tab.

You can limit the minimum/maximum size of motion to be detected.

- Minimum size (pixel) : To set the minimum size of detected motions, select <Minimum size (pixel)> and then point and drag to the desired size on the screen using the mouse.
- Maximum size (pixel) : To set the maximum size of detected motions, select <Maximum size (pixel)> and then point and drag to the desired size on the screen with your mouse.

■ Motions smaller than the specified minimum size or bigger than the maximum size are not detected. To avoid unintended detections caused by great and small noises, set minimum/maximum motion sizes appropriately in accordance to your environments. Note that same motions on the same location can be differently detected in their detection size; it is recommended to consider and include the tolerable difference when setting the minimum/maximum detection sizes.



4. Select <Area> tab.

You can specify an area on the screen to include or exclude the area to/from detection.

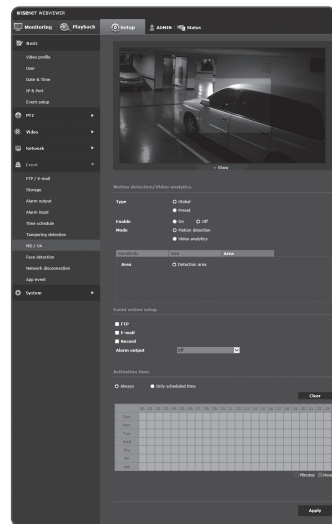
You can specify up to 4 areas.

- Detection area : The whole screen is used as a non-detection region. You can designate a specified region as motion-detection one. You can designate a desired location as a detection region by clicking and dragging it on the image.

5. To delete an area, right click on the screen to open popup context menu and select Delete, and [OK] button.

6. When done, click [Apply ()].

-  Motion detection function other than video analytics does not have an overlay indication on the screen. It is possible to confirm from the system log that a yellow box is displayed on the edge of the monitoring screen.



To use Video analytics

It detects event that meets all conditions specified by sensitivity, size and area and the event condition rules.

1. Select the video analysis mode.

2. Set <Sensitivity> and <Size>.

For further details on settings, refer to "To use Motion detection". (Page 53~54)

3. Select <Analytics> tab.

4. Select the video analysis type.

- Passing : Detects an object passing by the line set by a user.
- Entering/Exiting : Detects an object entering or exiting into/from the area set by a user.
- Appearing (Disappearing) : Detects when an object appears or disappears within a region specified by a user.

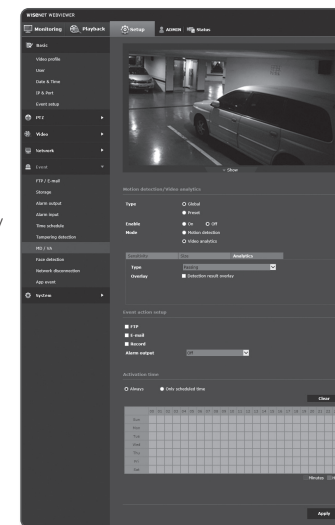
5. Set the video analysis rules.

For further details on settings, refer to "To set the video analysis rules". (page 54~55)

6. Select whether or not to use <Overlay>.

- Detection result overlay : displays the detection result on the image.

7. When done, click [Apply ()].



To set the video analysis rules

■ Passing

1. Set the type to <Passing>.

- Click the start and end points on the screen, and specify the reference line.
If you right-click while drawing a region, you can cancel the drawing.

3. Select the desired rule:

- Right: Detects motions of moving from the left to the right, over the virtual line.
- Left: Detects motions of moving from the right to the left, over the virtual line.

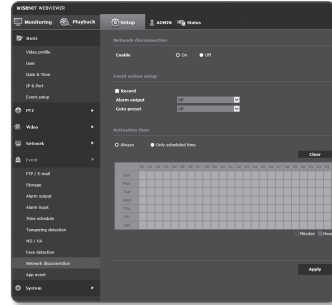
4. Click [OK].

- To remove a defined rule, right click on the displayed virtual line to open popup context menu and select [Delete] button.

Network disconnection

When the network is physically disconnected, it is considered as an event to be saved.

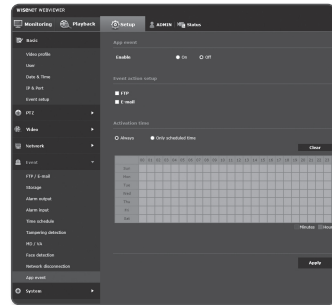
1. From the Setup menu, select the <Event (👤)> tab.
2. Click <Network disconnection>.
3. Set whether or not to <Enable>.
4. Specify the activation time and activation condition.
 - For more information about <Activation time> and <Action>, refer to "Alarm input". (page 52)
5. When done, click [Apply (👉)].



App event

You can set the system to generate signals for the events defined on the application. The event signals provided vary depending on the application function.

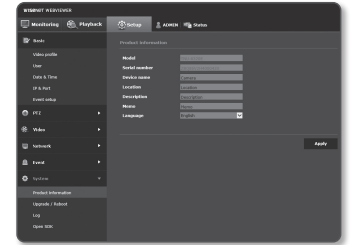
1. From the Setup menu, select the <Event (👤)> tab.
2. Click <App event>.
3. Set whether or not to <Enable>.
4. Specify the activation time and activation condition.
 - For more information about <Activation time> and <Action>, refer to "Alarm input". (page 52)
5. When done, click [Apply (👉)].



SYSTEM SETUP

Product information

1. From the Setup menu, select the <System (⚙️)> tab.
2. Click <Product information>.
3. Check the camera information, or provide details according to your network environment.
 - Model : Model name of the product.
 - Serial number : Product serial number.
 - Device name : Provide a device name that will be displayed on the Live screen.
 - Location : Specify the location where the camera is installed.
 - Description : Provide detailed information about the camera location.
 - Memo : Provide an explanation about the camera for better understanding.
 - Language : Select a preferred language for the Web Viewer OSD.

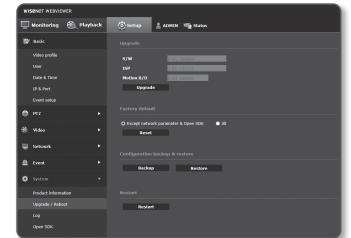


- The default language is set to <English>.

4. When done, click [Apply (👉)].

Upgrade / Reboot

1. From the Setup menu, select the <System (⚙️)> tab.
2. Click <Upgrade / Reboot>.
3. Select a desired item and set it appropriately.
 - Upgrade : Performs upgrading the system.
 - Factory default : Resets the system to the factory default.
 - Except network parameter & Open SDK : Initialize all except for the network setting and lens settings as well as the open SDK installation files and internal settings.
 - All : Resets all settings including the camera settings. (however, the log information will not be reset)
 - The IP addressing system will be defaulted to DHCP if you reset the camera. If no DHCP server is found, the previous settings will be restored automatically.
 - Configuration backup & Restore : Backs up the current system settings before performing the restoration process. The system is automatically restarts after backup or restoration.
 - Restart : Restarts the system.



To perform the upgrade

1. Click [Upgrade].
2. Click [Browse] and specify a file to upgrade.
3. Click [Send].
4. The "Upgrade" dialog appears where the progression will be shown in the bottom.
5. Once completed upgrading, the browser exits and the camera restarts.



- It may take a max of 10 minutes for the upgrade process.
If you forcibly terminate the upgrade process, upgrade will not be completed properly.
- During restarting the system, accessing with web viewer will not be made.
- You can download the latest version from the Hanwha Vision web site.

To back up the current settings

1. Click [Backup].
The Save As dialog should appear.
2. Specify the backup path with a proper file name, and click [Save].
The backup file will be saved to the specified path in the format of ".bin".

To restore the backup settings

1. To restore the backup settings, click [Restore].
2. Select a backup file and click [Open].



- If you perform the backup or restoration, the web browser will be closed and the camera will reboot.
- If you try to recover the config file backed up in other model, some functions may malfunction and you need to change the setting manually.

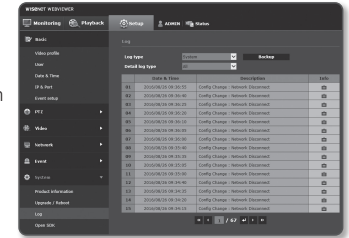
Log

You can check the system log or event log.

1. From the Setup menu, select the <System (⚙️)> tab.
2. Click <Log>.
3. Select a log type.
 - System : You can check the system logs where any system changes are recorded including the time information.
 - Event : You can check the event logs including the time information.
4. From the right log list, select an item to search for.
 - If you select <All> in the top left dropdown list, all logs for the applicable log type will be displayed.
5. If one page can not display all the logs available, use the bottom buttons to move to the previous, next, or the last item.
6. Click on the <Backup> button to save all the log data for the currently selected mode (system, event) in the "time stamp value create by camera in modelname-mode-camera.txt file" in the download folder for the browser.



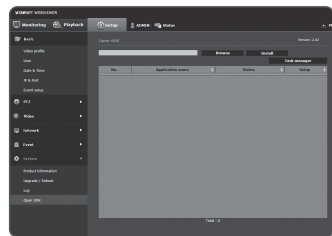
- If you want to view the details of a log, click [Info (📄)] in the right column of the log; the log information will be shown in the bottom pane.
- Each page displays 15 logs with the latest one displayed at the top.
- The event/system log list can contain up to 1000 logs; after that, the existing logs will be deleted from the oldest one each time a new log is created.



Open SDK

A user can install an application on their camera to execute additional functions.

1. From the Setup menu, select the <System ()> tab.
2. Click <Open SDK>.
3. Click the [Browse ()] button to select the *.cap file from the user folder.
4. Click the [Install ()] button to install your application.
5. The information of the installed application is displayed in the list.



- Uninstall : Deletes installed or operating applications.
- Go App : Move to the web page of each application.
- Start : Execute an installed application.
- Stop : Terminates a running application.
- Health : Displays the currently running application's resource occupation rate, thread counts and execution time, etc.
- Priority : Sets the priority of running applications.
If the total resource utilization rate of the camera (including main tasks and applications) exceeds 80%, an ongoing application will be forced to stop. In this case, the priority set by the user is used to determine which application should be stopped first.
- Auto start : When the camera's power supply or main task is running, a certain application for which auto execution has been activated will run automatically.
- Task manager : This displays the resource occupation rate of an application currently running in your camera.
 - Memory Usage (%) : This is the memory utilization rate for each application.
 - CPU Usage (%) : This is the CPU utilization rate for each application.
 - Thread count : This is the number of threads created by each application.
 - Duration : This is the total execution time of each application.
 - Kill Task : Terminates an application.
 - Total Usage : This is the total resource occupation rate of the camera (including main tasks and applications).

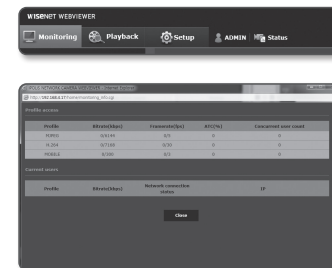
 ■ For questions about application use or installation, check the Hanwha Vision developer website.

VIEWING PROFILE INFORMATION

Profile access

You can check the profile information.

1. Click [Status ()] on the live screen.
 2. The profile information screen is displayed.
 - Profile access : Show the information of the newly added profile.
 - Profile : Show the information of the newly added codec.
 - Bitrate(kbps) : Show both the actual bit rate and the set bit rate.
 - Framerate(fps) : Show both the actual frame rate and the set frame rate.
 - ATC(%) : Show the ATC status.
 - Concurrent users count : Show the number of concurrent users who access the profile.
 - Current users : Shows information on users accessing web viewer and displaying monitoring video.
 - Profile : Show the name of the profile accessed by the user.
 - Bitrate(kbps) : Show the current bit rate.
 - Network connection status : It shows whether the network is working fine.
 - IP : Show the IP address of the current user.
-  ■ To check information on the profile currently used, click [Status ()] again to refresh it. It takes a certain time for any changes to be applied.



TROUBLESHOOTING

PROBLEM	SOLUTION
Cannot control the system.	- Check the power. Confirm that the power is on. - Check whether the communication cable is connected.
I can't access the camera from a web browser.	- 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.
Viewer got disconnected during monitoring.	- Connected Viewers become disconnected upon any change to camera or network configurations. - Check all network connections. - If the camera is connected over an PPPoE network, it's possible for Viewer to disconnect under poor network conditions.
I cannot connect to the system using a tab browser of Internet Explorer 7.0.	An error may be generated when connecting with a new window or tab since the cookie data are shared. Do not use a new window or tab, select "File → New session".
The camera connected to the network is not detected in the IP installer program.	Turn off the firewall settings on your PC and then search the camera again.
Images overlap.	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.
No image appears.	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.
<MD / VA> of <Event> is set to <Enable>, but no notification e-mail reaches me even when an analysis event had occurred.	- Verify the settings in the following sequence: - Check <Data & Time> settings. - The <MD / VA> should be set to <Enable>. - Check if the <E-mail> option of <Event setup> menu is checked to use.

PROBLEM	SOLUTION
Can I define event rules even when I don't use <MD / VA>?	Yes, it can be. You can set rules for events despite of the intelligent video analysis setting.
No signal is found at the Alarm Output port even when an intelligent video analysis event is generated.	Check alarm output port settings.
Cannot record in the NAS.	Confirm that the information registered in the NAS is correct.
It reports that NAS setting has failed.	- 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 & 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.

OPEN SOURCE ANNOUNCEMENT

GPL/LGPL software license

The software included in this product contains copyrighted software that is licensed under the GPL/LGPL. You may obtain the complete Corresponding Source code from us for a period of three years after our last shipment of this product by sending email to help.cctv@hanwha.com

If you want to obtain the complete Corresponding Source code in the physical medium such as CD-ROM, the cost of physically performing source distribution might be charged.

GPL SW

Component Name	License	URL
Base Kernel	GPL 3.0	
Busybox	GPL 2.0	http://www.busybox.net/downloads/snapshots
iproute2-3.1.0	GPL 2.0	
alsa-utils-1.0.24.2	GPL 2.0	
alsa-lib-1.0.24.1	GPL 2.0	
iptables-1.4.12.2	GPL 2.0	http://ftp.netfilter.org/pub/iptables
ethtool-3.2	GPL 2.0	
mt-d-1.4.1	GPL 2.0	ftp://ftp.infradead.org/pub/mt-d-utils
mi-diag-2.11	GPL 2.0	
rp-pppoe-3.10	GPL 2.0	http://www.roaringpenguin.com/pppoe/
wpa_supplicant-0.7.3	GPL 2.0	
bash-4.2	GPL 3.0	
zeroconf	GPL 2.0	

LGPL SW

Component Name	License	URL
glibc	LGPL 2.0	
inetutils	LGPL 3.0	
neon-0.29.6	LGPL 2.0	http://www.webdav.org/neon/
	(The Manual and test suite are GPL)	

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

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To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

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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 Amembership.
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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

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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.
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 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

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Julian Seward, jseward@bzip.org

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files <http://www.ietf.org/rfc/rfc1950.txt> (zlib format), [rfc1951.txt](http://www.ietf.org/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](http://www.ietf.org/rfc/rfc1952.txt) (gzip format).



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