



September 2023 New Product Introduction

Hardware PM Team

09.01.2023

New Product SKU: WAVE-PRO-05

A new license type for Wave VMS is now available.

- New Professional Recording license type
- Simplifies system ordering process for SolidEDGE
 - One license included + Wave-PRO-05
- Enables recording of captured video
- Perpetual license – 5 count
- Never expires

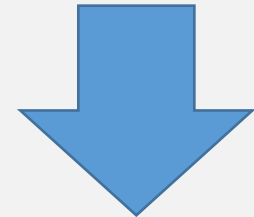
Since the SolidEDGE camera can have up to 6 recording channels



SolidEDGE camera
Includes 1 WAVE PRO License

+

~~WAVE-PRO-01~~
~~WAVE-PRO-04~~



WAVE-PRO-05

5 x WAVE PRO License

4CH and 5CH Multi-Directional Cameras with AI and IR



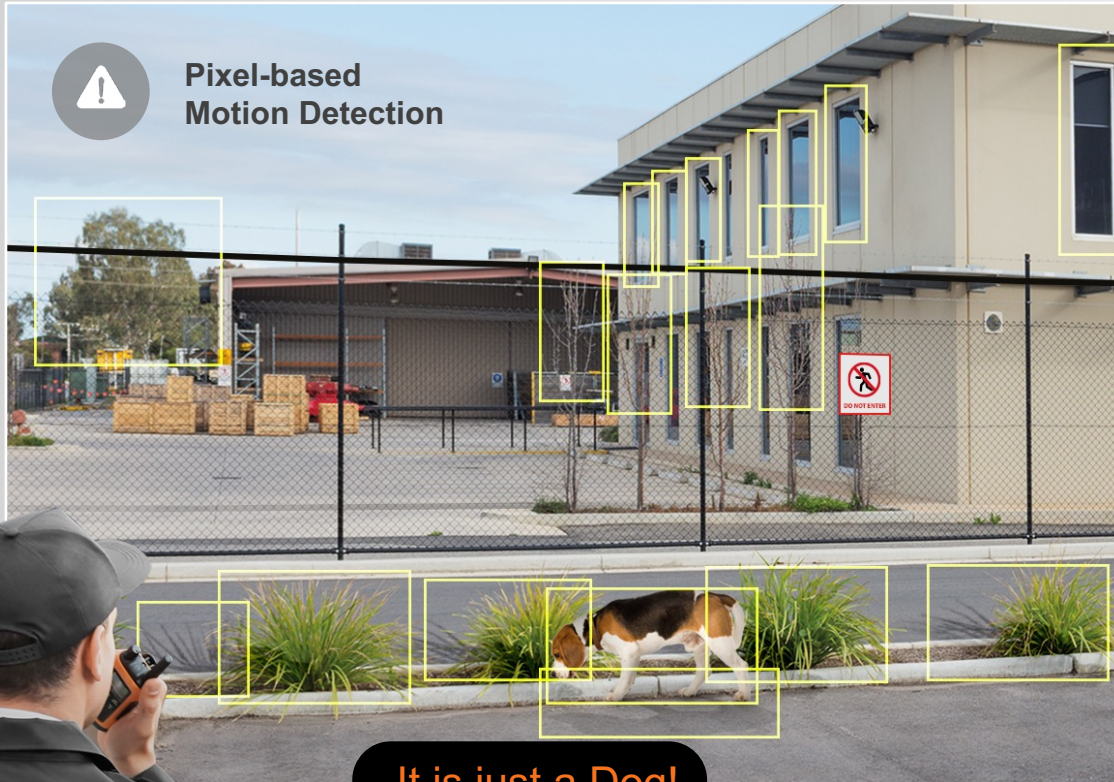
PNM-C32083RVQ / PNM-C16083RVQ



PNM-C34404RQPZ



False alarm reduction



It is just a Dog!

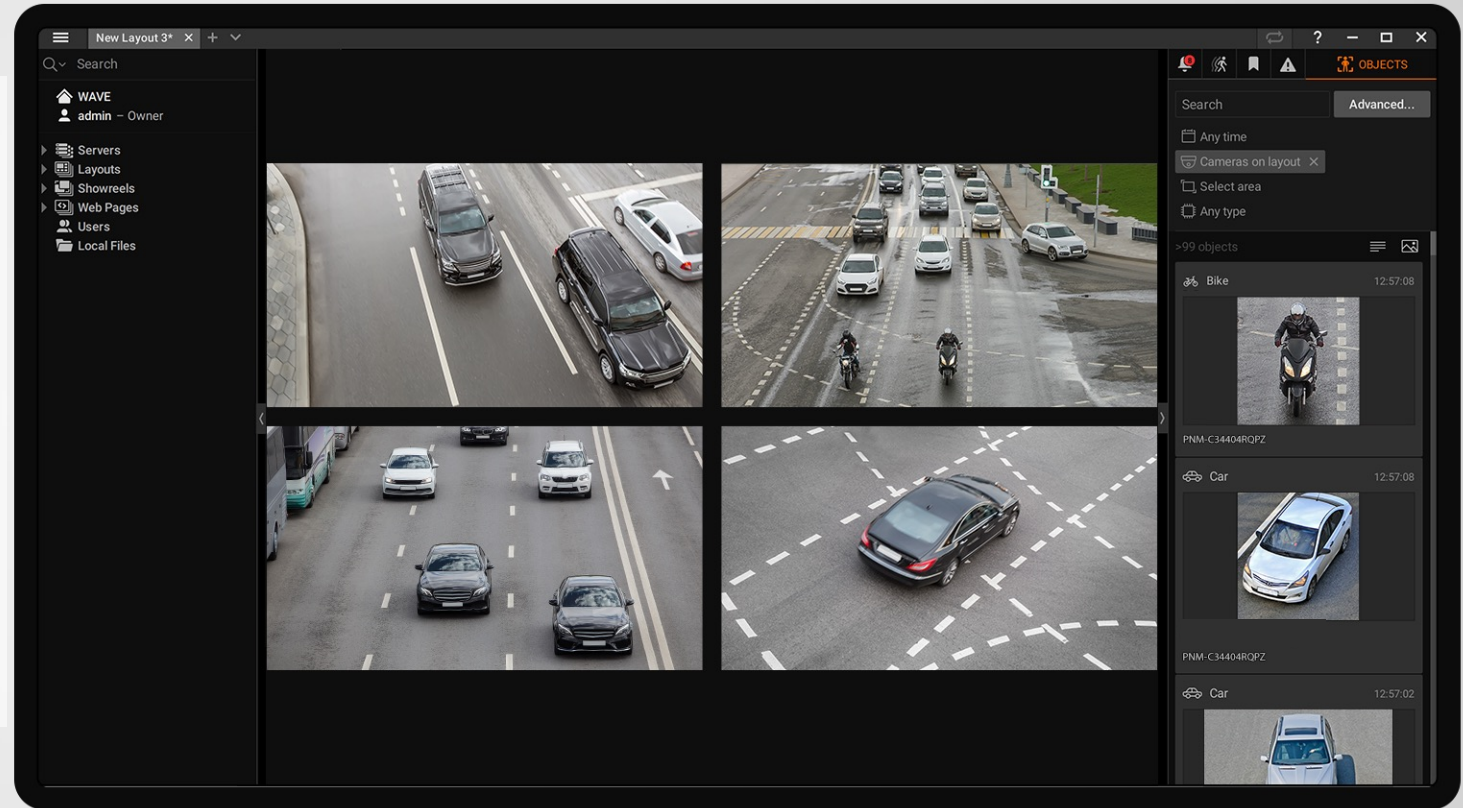


The new 4CH/5CH AI Multi-directional cameras detect and classify people and vehicles in real-time, greatly enhancing the accuracy of video analytics. AI algorithms can recognize people as distinct objects separate from their surroundings, such as waving trees, shadows, or animals. The 4CH/5CH AI Multi-directional cameras can help improve operator efficiency by minimizing false alarms.

Object classification based on AI engine

The camera generates metadata that includes object type (Person, Face, Vehicle, License plate), which is sent to the VMS/NVR for forensic search. Forensic search dramatically enhances search efficiency and reduces the time spent looking for events.

※ Support vehicle type classification (Car/Bus/Truck/Motorcycle/Bicycle)



Object classification items



Person



Face



License plate



Car



Bus



Truck



Motorcycle



Bicycle

AI based Virtual area

Loitering detection

The intelligent video analytics on the camera utilizes AI object detection to trigger events. The virtual areas like enter/exit, intrusion, and loitering can be triggered by AI detected objects within specified duration time.

※ Support object type and vehicle classification selection for event trigger.

 **Loitering Detection**
Person + Time

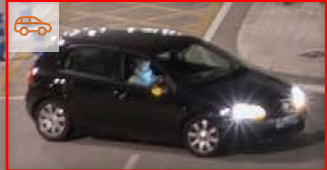


AI based Virtual line

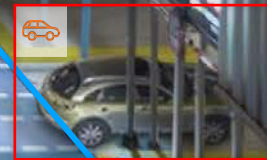
Line crossing

The intelligent video analytics on the camera utilizes AI object detection to trigger events. The virtual line can trigger an event by detecting a person and/or a vehicle crossing the virtual line in the specified direction.

※ Support object type and vehicle classification selection for event trigger.



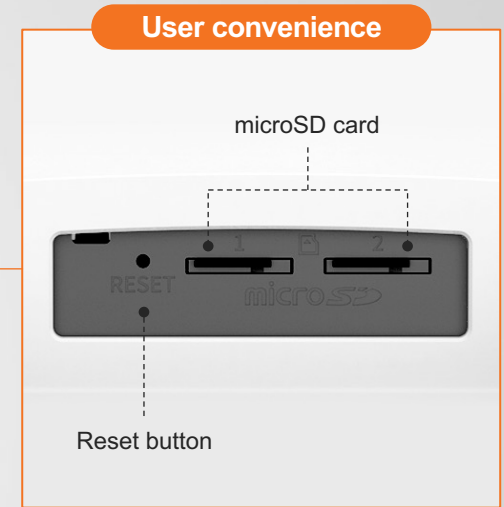
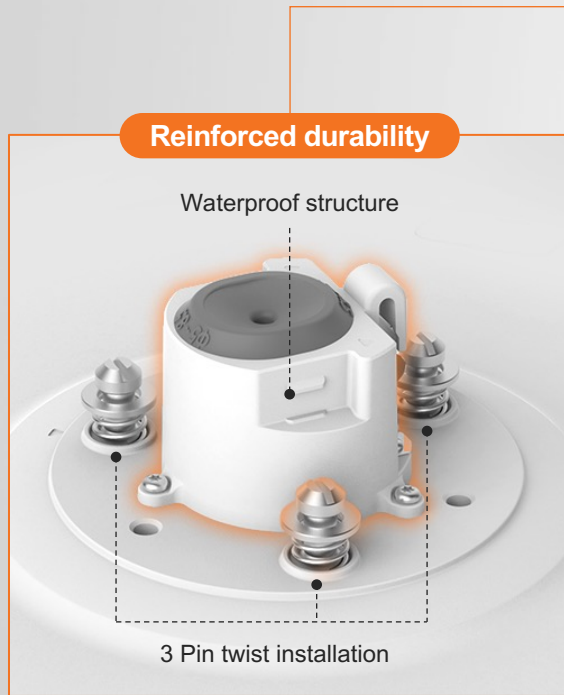
 **Virtual Line Alarm**
Vehicle



New design

The new 5CH AI Multi-directional camera provides an intuitive installation:

- Waterproof structure using Grommet
- Easy installation using the 3-pin twist
- Easily accessible microSD cards
- Dedicated IR for every channel



PTRZ remote adjustment

PTRZ function was added to simplify the installation process. After mounting the camera, all adjustments and configurations can be done remotely.

For easy camera deployment, a 360° preset was also added.



Easy connection with camera via Wi-Fi direct

Wisenet installation app by Hanwha Vision and Wi-Fi dongle can be used to connect to the camera directly, allowing installers to check the scene position and modify the zoom in/out, simple focus, screen capture, flip/mirror/hallway, and view settings.

※ The Wisenet installation app can be downloaded from the app store (Wi-Fi dongle and USB-b type cable not included).

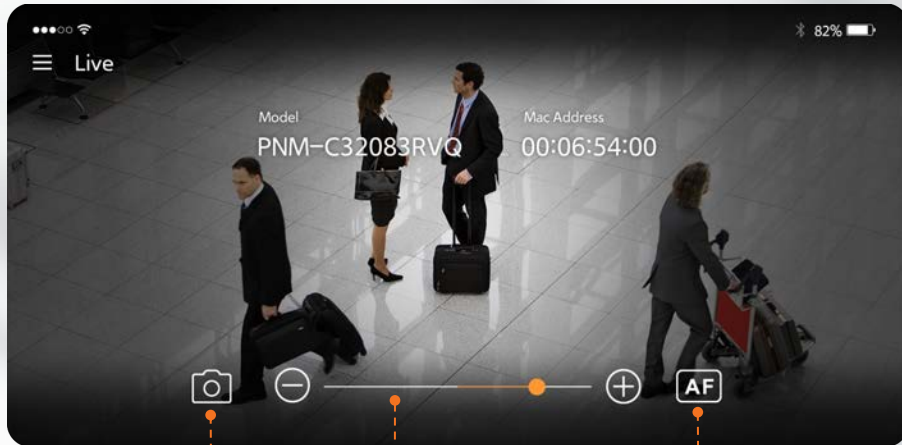


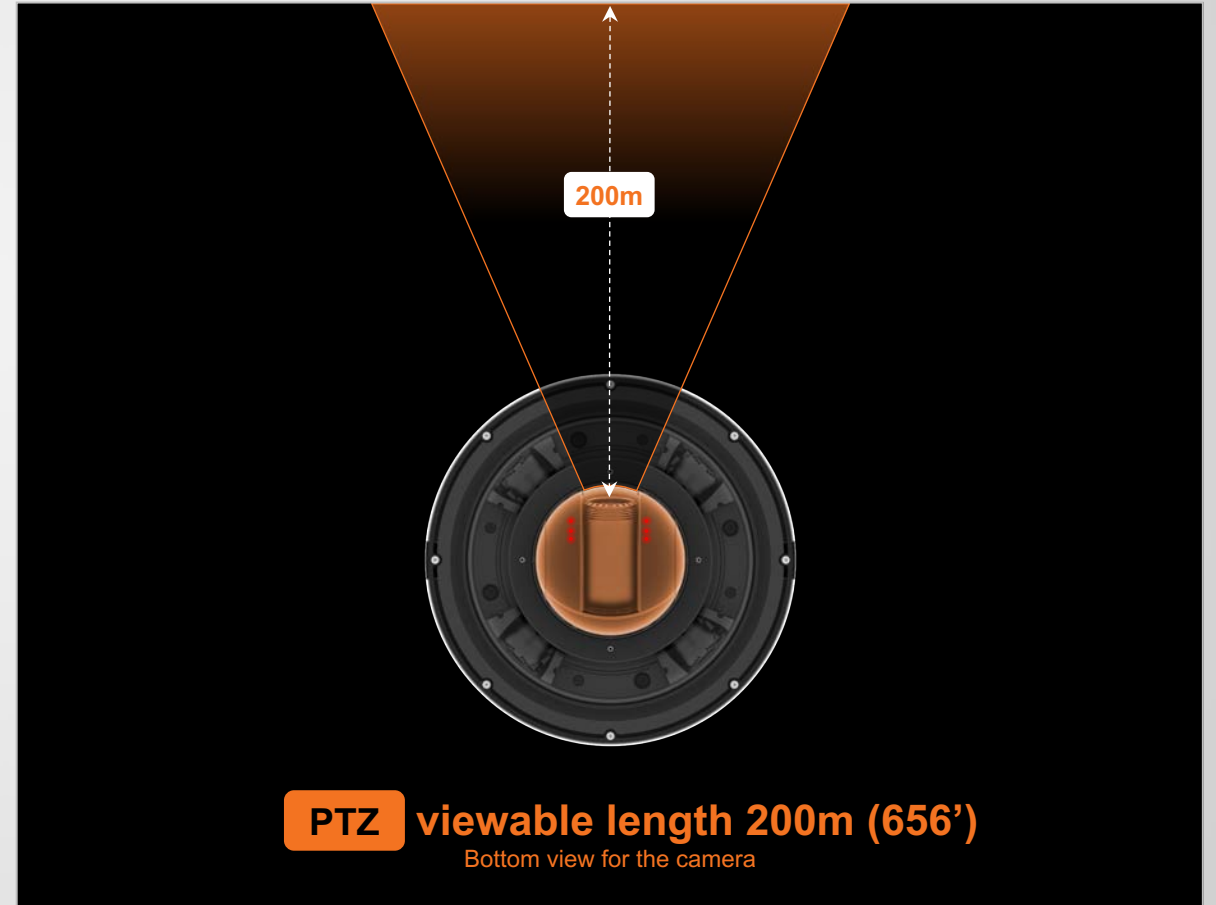
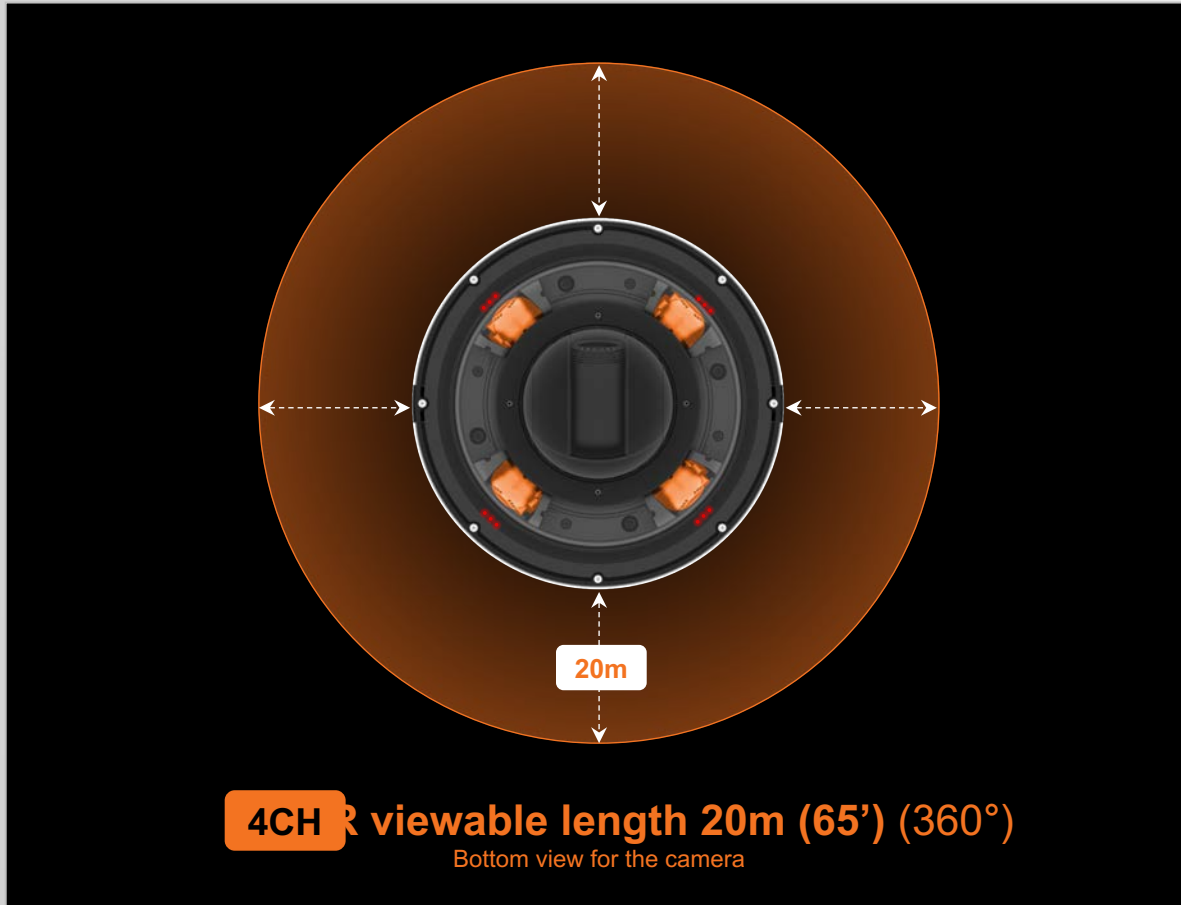
Image capture

Zoom in/out

Simple focus

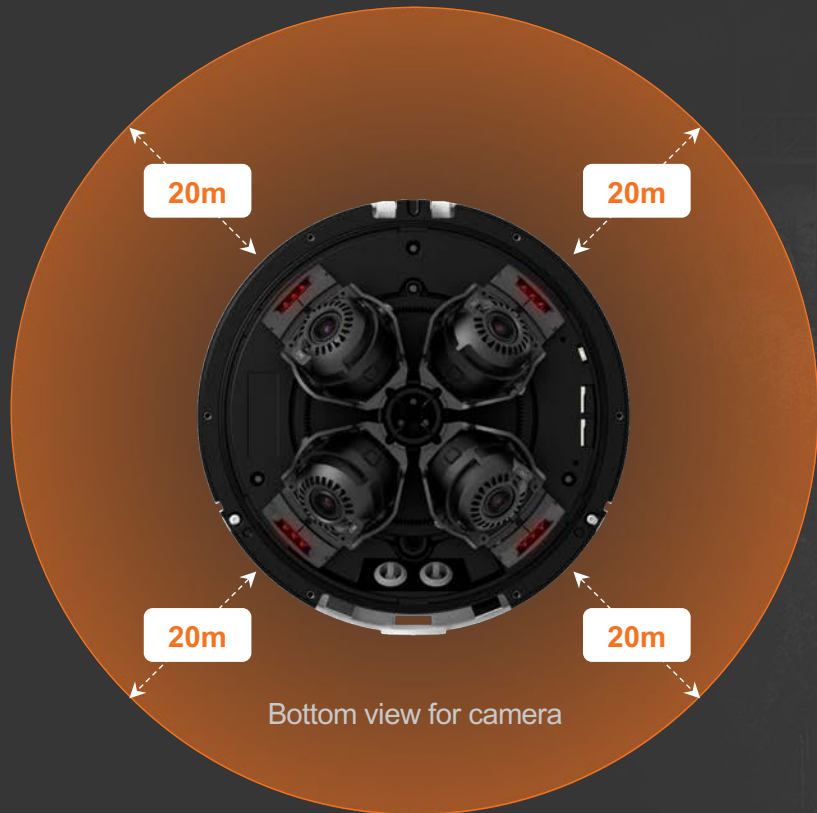
5CH AI Multi-directional camera feature set

The new 5CH AI Multi-directional camera has four independent IR zones dedicated to the Multi-directional channels as well as a dedicated long-range IR on the PTZ camera. Each zone's IR intensity can be manually adjusted to reduce potential reflection from nearby objects.



4CH AI Multi-directional camera feature set

The new 4CH AI Multi-directional camera has four independent IR zones. Each zone's IR intensity can be manually adjusted to reduce potential reflection from nearby objects.



IR viewable length 20m (360°)

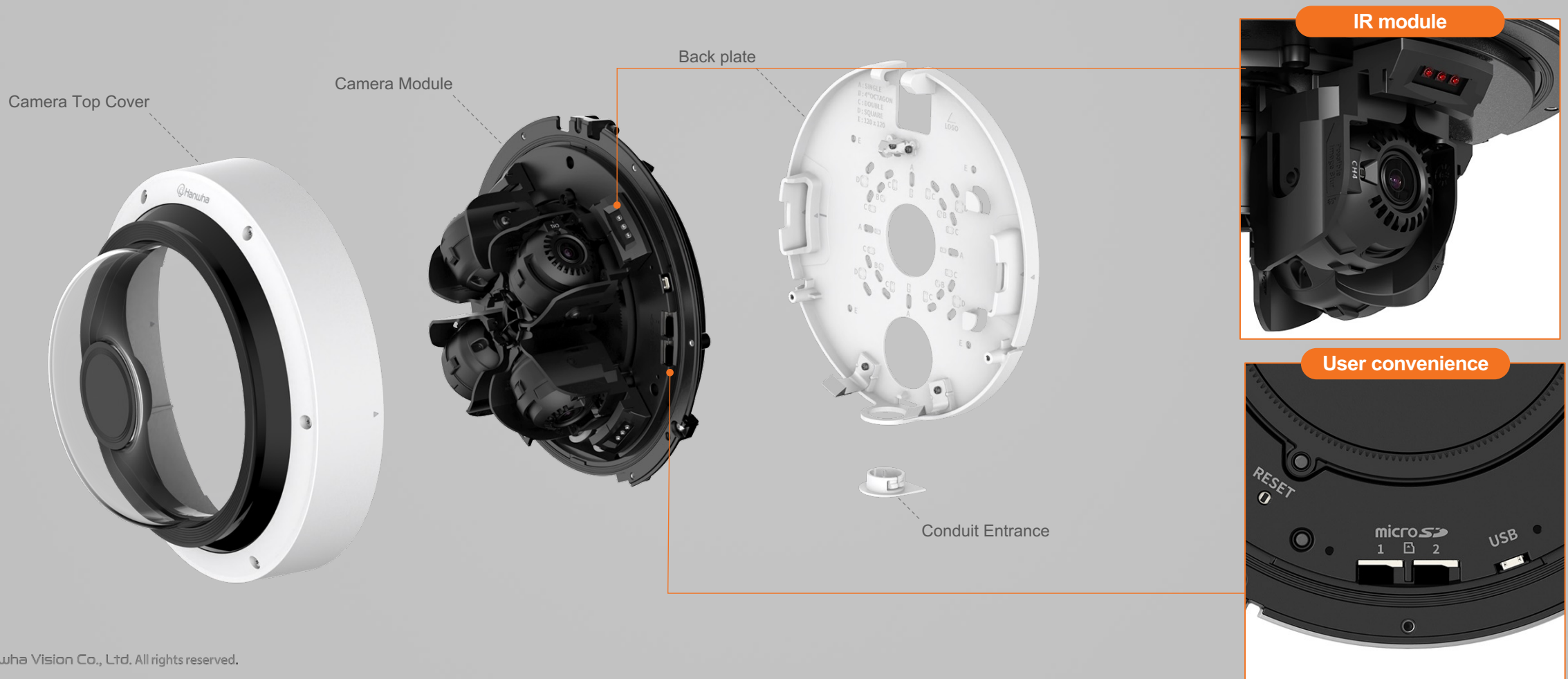
20m

The background image shows a road at night with a car in the distance. A large, semi-transparent orange arrow points from the car towards the camera, with the text '20m' written inside the arrow's shaft, illustrating the IR range in a real-world scenario.

Compact size and semi-modular design

The new 4CH AI Multi-directional camera provides an intuitive installation solution by including a back plate with a hinge, various electrical gang boxes, and a 3/4" conduit entrance for quick and easy installation.

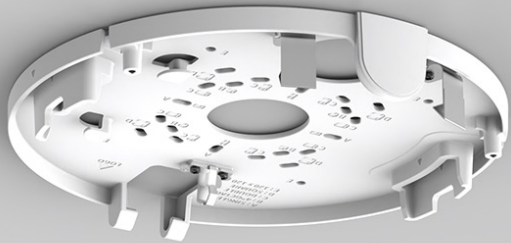
The 4CH AI Multi-directional design provides easy access to the SD cards, USB, and reset button when removing the camera top cover.



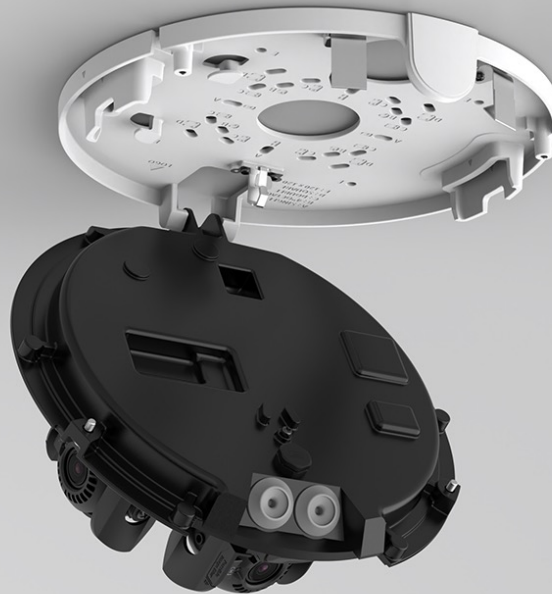
Save your installation time and cost

The new 4CH AI Multi-directional camera has a hinge for ease of installation. It will save time with a simple installation process.

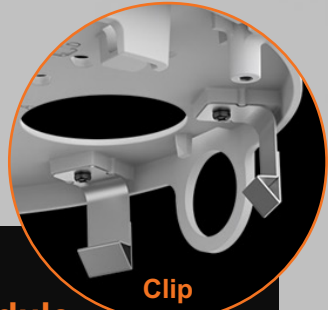
STEP 1.
Install the mount bracket



STEP 2.
Hanging the camera module on a hinge

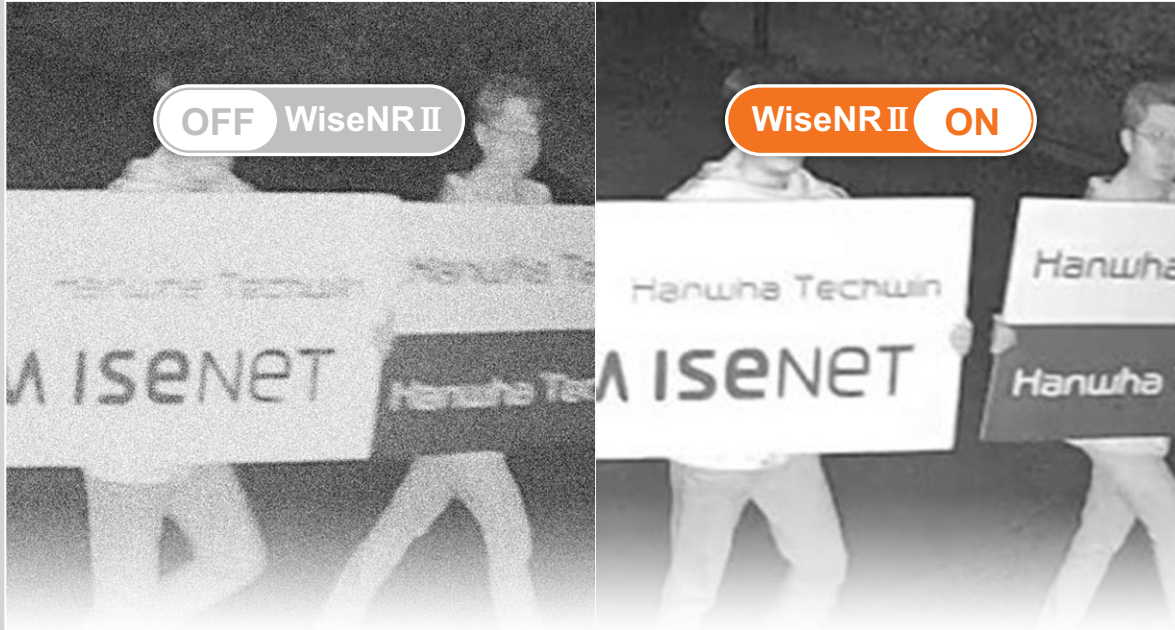


STEP 3.
Cabling and clip the module



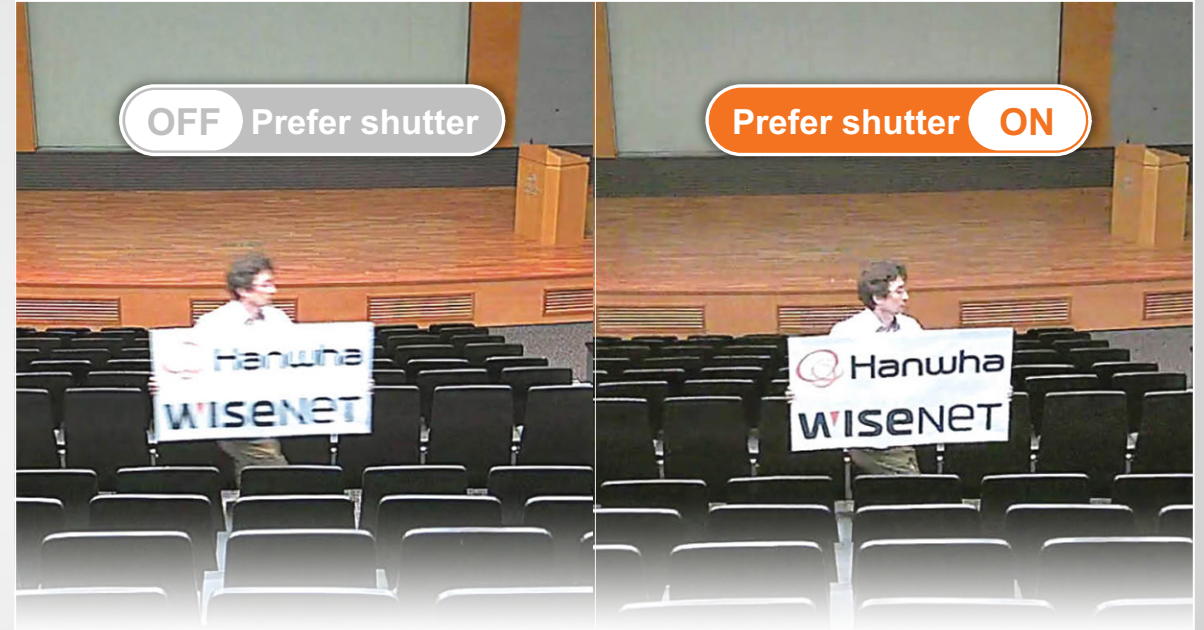
Clip

Improved noise reduction, motion blur reduction



WiseNR II

The newly applied noise reduction technology, WiseNR II, functions based on AI object detection and optimizes image noise and motion blur depending on object movement (person/vehicle).



Prefer shutter control

The Prefer Shutter Speed feature uses the latest AI technology to identify the appearance and movement of objects and re-adjusts the Prefer Shutter value to an optimal level to reduce motion blur effects during a fast-moving object.

AI based bandwidth reduction, advanced LDC



WiseStream III performance based on scene activity

Scene Activity	Bandwidth Reduction
Idle Scene	95%
Activity in the scene	50%

WiseStreamIII

A new cutting-edge video compression technology WiseStreamIII operates based on the object detection accomplished by AI algorithms. When combined with the H.265 compression technology, bandwidth can be reduced by up to 80% without compromising the video quality, enabling efficient video management.

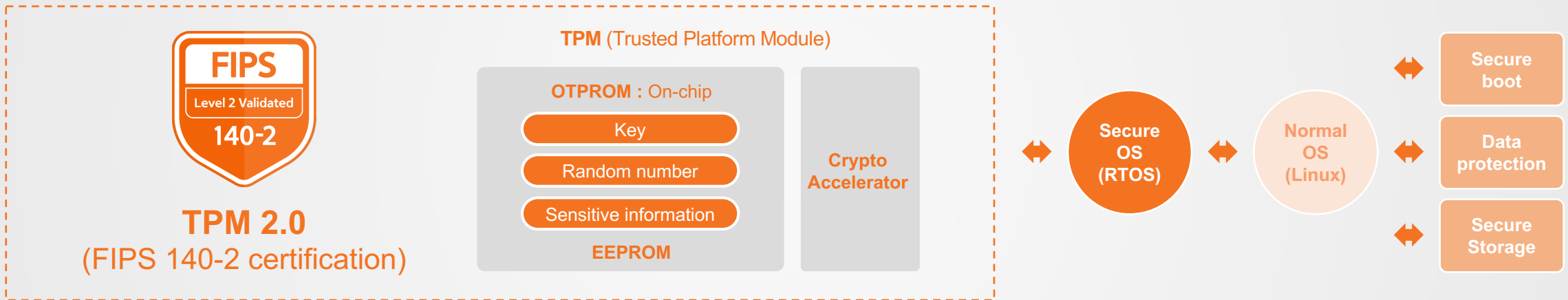


Advanced LDC

The LDC function supports correcting distorted images. The operator can select a level depending on the monitoring environment.

Next level cybersecurity

The cybersecurity of the new 4CH/5CH AI Multi-directional camera validates the boot process, securely stores key information, and preempts hacking risk with unauthorized access blocking. Our cameras also include device certificate Root CA. As a result, we can provide industry-leading end-to-end cybersecurity to the customer.



- ✓ **Data protection** Secure storage/OS

- ✓ **Improved security** TPM 2.0(FIPS 140-2 level2), Device certificate(Hanwha private Root CA)

- ✓ **Integrity** Secure boot, Secure open platform App, Signed firmware

- ✓ **Secured hardware** Secure JTAG

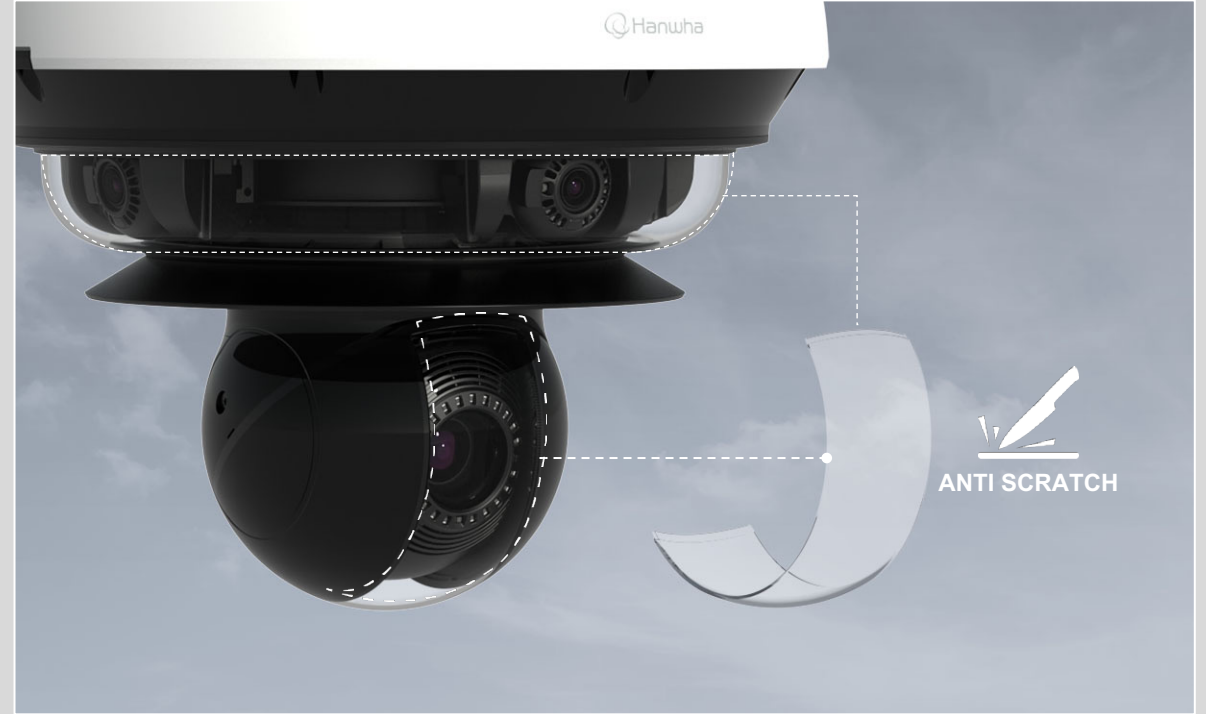
Metal shielded RJ-45



Metal-shielded RJ-45 terminal and enhanced grounding frame structures can protect the camera from transient voltage (lightning, static electricity).

※ Using STP (shielded twisted pair) cabling is recommended.

Hard-coated dome bubble



Hard-coated dome bubble provides better resistance to scratches from external elements (sand, worker's hand, etc.). Also, the degradation of resolution due to scratches is minimized.

Humidity control with AIR vent

The built-in Gore valve prevents condensation and maintains long-term use and storage performance through water vapor control. Also, it can prevent sealing damage through pressure equilibrium in the product.



Expansion of alarm/audio features

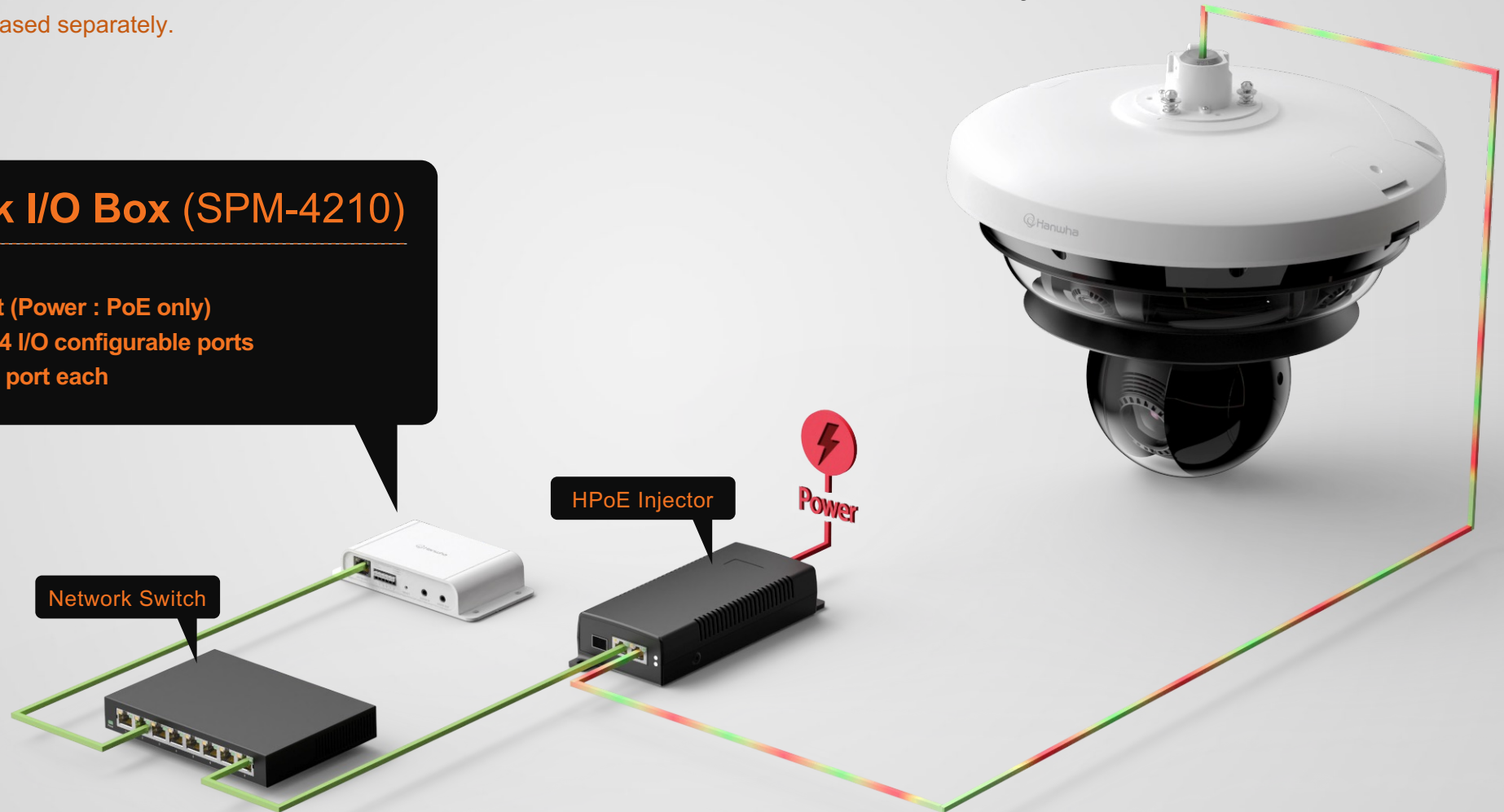
Camera is compatible with Network I/O Box : SPM-4210 adds I/O and Audio functionality

※ Network I/O Box to be purchased separately.

Network I/O Box (SPM-4210)

Alarm/Audio

- ① RJ45 1 port (Power : PoE only)
- ② Selectable 4 I/O configurable ports
- ③ Audio I/O 1 port each

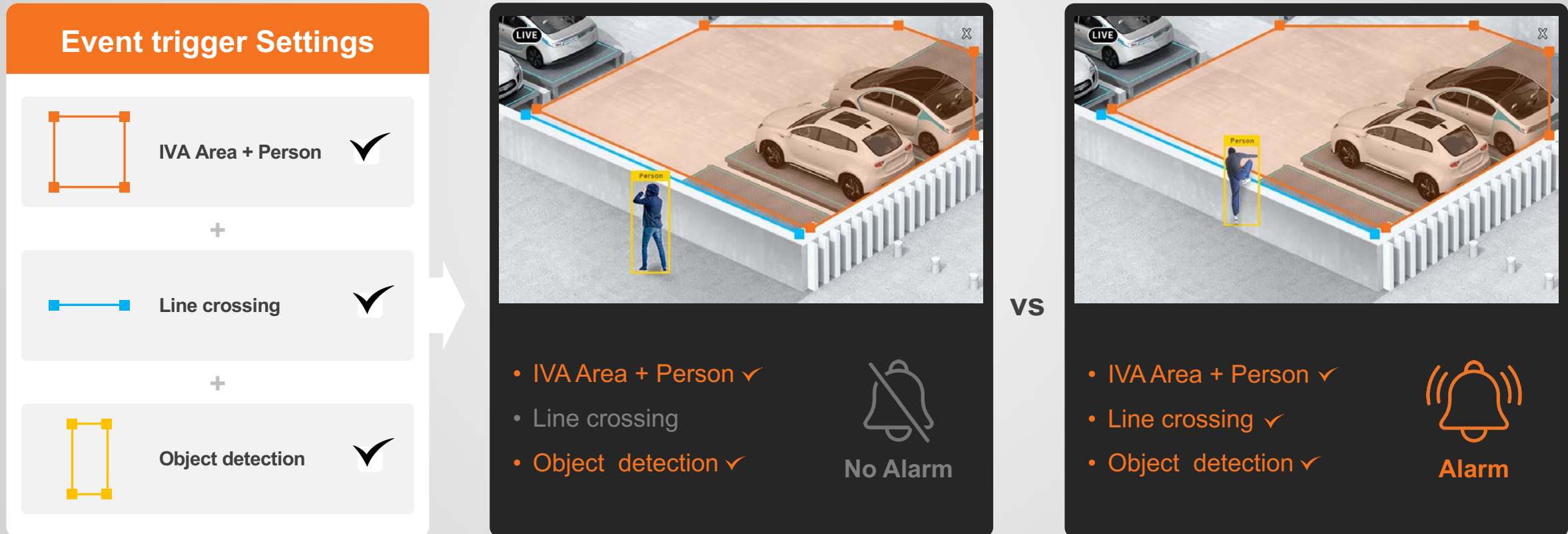


Event rule

Boolean logic

A newly added Boolean Logic rule to our 4CH and 5CH AI Multi-directional camera opens up new possibilities when setting up event action. Up to 3 Event triggers can be grouped to generate a single event.

And you can use analytics from different channels within the same rule.



Key features

Smart zoom

When the multi-directional camera detects an event, it automatically links to PTZ camera which carries out zoom-in and track functions.

Vehicle Loitering: Move to the center of the IVA rule



Event notification







Variety event action

An event action has been added that uses HTTP/HTTPS/TCP to notify other devices when an event occurs.

※ You can find the notification function in the Handover



WHEN EVENT OCCURRED

 Record	 Alarm out	 FTP Image
 E-mail Notification/Image	 HTTP, HTTPS, TCP Notification	 MQTT Notification

Specification



PNM-C34404RQPZ

5CH AI, IR and PTRZ multi-directional camera

- **Motorized varifocal lens**
[4CH] 3.3-5.7mm Lens / Remote PTRZ function, [PTZ] 4.25-170mm (40x) zoom
- **Frame rate**
[4CH] 8MP @ 20 fps (AI Off) / 8MP @ 15 fps* (AI ON), [PTZ] 2MP @ 30 fps
*All Sensors have to be set to 15fps model
- **wisER**
[4CH] 20m (65.6 ft), [PTZ] 200m (656 ft)
- **Next level cybersecurity**
TPM 2.0(FIPS 140-2 certified)
- **Support hallway mode**
- **Reinforced durability**
IP66, IK10, NEMA4X, Metal shielded RJ-45, Hard-coated dome bubble, Humidity control with Air vent
- **microSD/SDHC/SDXC 2 slot** : Maximum 1TB (2 x 512G)
- **Easy installation**
3 Pin-twist mount
- **AI technology**
Object detection(Person/Vehicle*/Face/License plate),
IVA based on classified object(Person/Vehicle)
* Vehicle(Car/Truck/Bus/Motorcycle/Bicycle)
- **AI based features**
WiseNR II, Auto Prefer shutter control, WiseStream III

Specification



PNM-C32083RVQ – 4K x 4
PNM-C16083RVQ – 4MP x 4

4CH AI Multi-directional camera

- **Motorized varifocal lens**
3.3-5.7mm Lens
- **Frame rate**
[PNM-C32083RVQ] 8MP @ 20 fps (AI Off) / 8MP @ 15 fps* (AI ON)
*All Sensors have to be set to 15fps model
[PNM-C16083RVQ] 4MP @ 30 fps (AI ON/Off)
- **wiseliR**
20m (65.6 ft)
- **Next level cybersecurity**
TPM 2.0(FIPS 140-2 certified)
- **Support hallway mode**
- **Reinforced durability**
IP66, IK10, NEMA4X, Metal shielded RJ-45, Humidity control with Air vent
- **microSD/SDHC/SDXC 2 slot** : Maximum 1TB (2 x 512G)
- **Easy installation**
Installation plate, Easy connection with camera via Wi-Fi direct
- **AI technology**
Object detection(Person/Vehicle*/Face/License plate),
IVA based on classified object(Person/Vehicle)
* Vehicle(Car/Truck/Bus/Motorcycle/Bicycle)
- **AI based features**
WiseNR II, Auto Prefer shutter control, WiseStream III

A series Cameras and DVRs

White Light Flat Eye Camera
Analog cameras
DVR Recorders

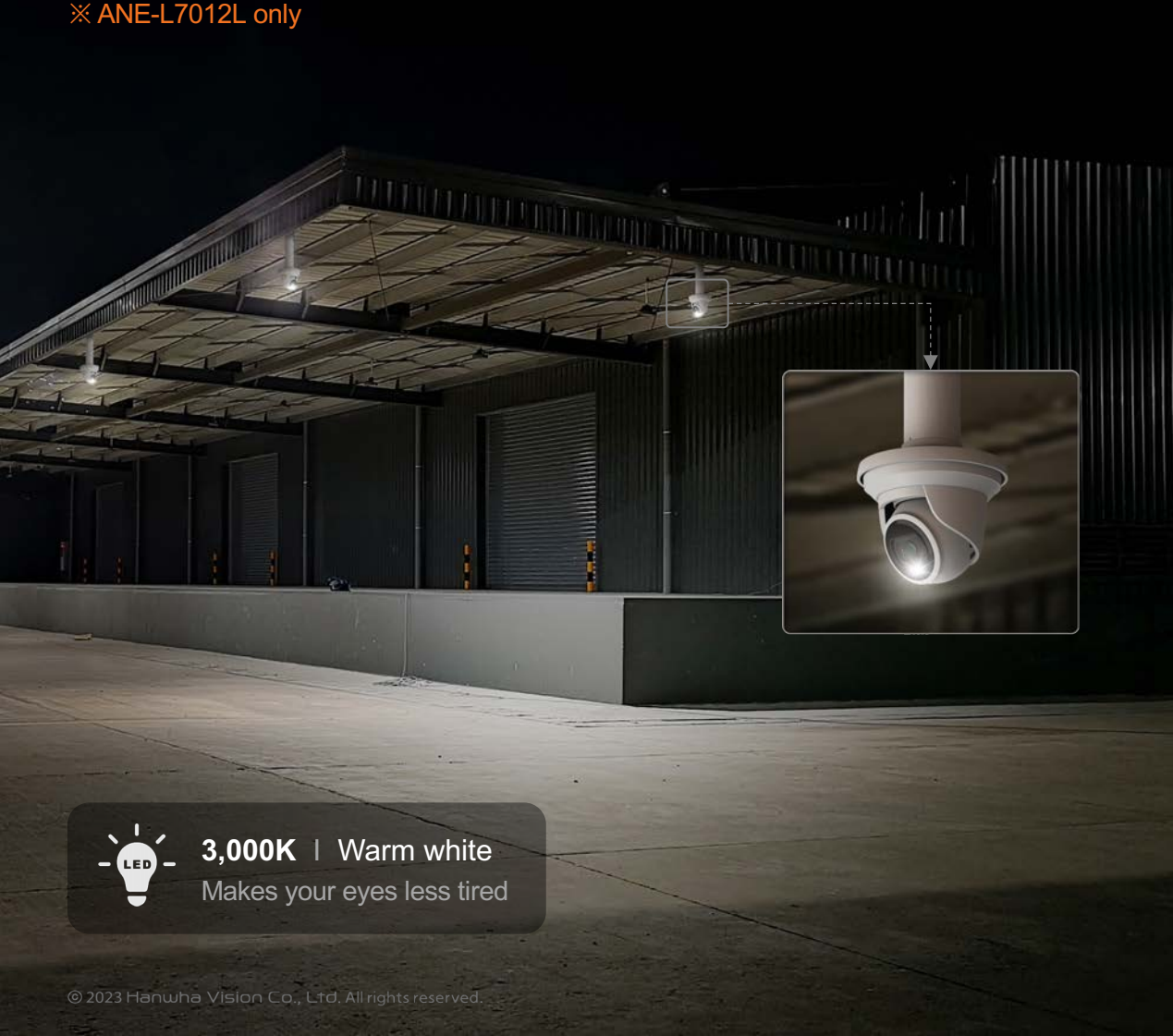


White light camera mode

IP Supplement light

In an environment where it is difficult to install separate lighting, the camera can act as lighting. You can monitor with Color 24/7.

※ ANE-L7012L only



3,000K | Warm white
Makes your eyes less tired

White light camera mode

IP IR vs White light

In an environment where it is difficult to install separate lighting, the camera can act as lighting. You can monitor with Color for 24/7.

※ ANE-L7012L only



Light alarm mode

IP Visual Warning

When tampering detection, motion detection, or IVA are triggered the White light can be activated as a deterrence or welcome light.

You can check moving objects in color by turning on the light.

White light can be activated in constant and flashing mode with a Dwell time of up to 30 seconds.

※ ANE-L7012L only

 Use as Alert

 Use as welcome light



Analog cameras

AHD Camera

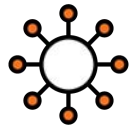


Image rotation

Flip, Mirror & Rotate support



Real-time transmission



Multiple outputs supported

AHD, TVI, CVI, CVBS



12V DC only

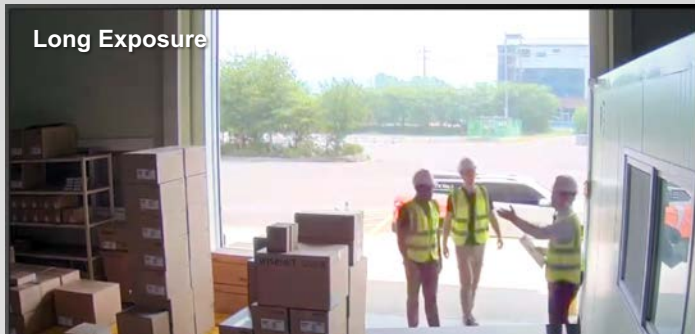
Do not connect AC power



True WDR

IP AHD

Supports backlight compensation by exposure control up to 120dB, not by digital method.



Multiple AHD outputs

AHD

Supports multiple AHD outputs, AHD, TVI, CVI and CVBS



System Overview



※ ARD-410/810/1610 has four/eight/sixteen analog channels plus two IP cameras, and you can use additional IP cameras by turning off analog channels.
The ARD-410/810/1610 has a total number of channels, including Analog and IP of six/ten/eighteen channels.
(ex) The ARD-1610 can have 16 x analog channels + 2 x IP cameras OR 14 x analog channels + 4 x IP cameras.

Installation Wizard

Quick setup for fast and easy installation

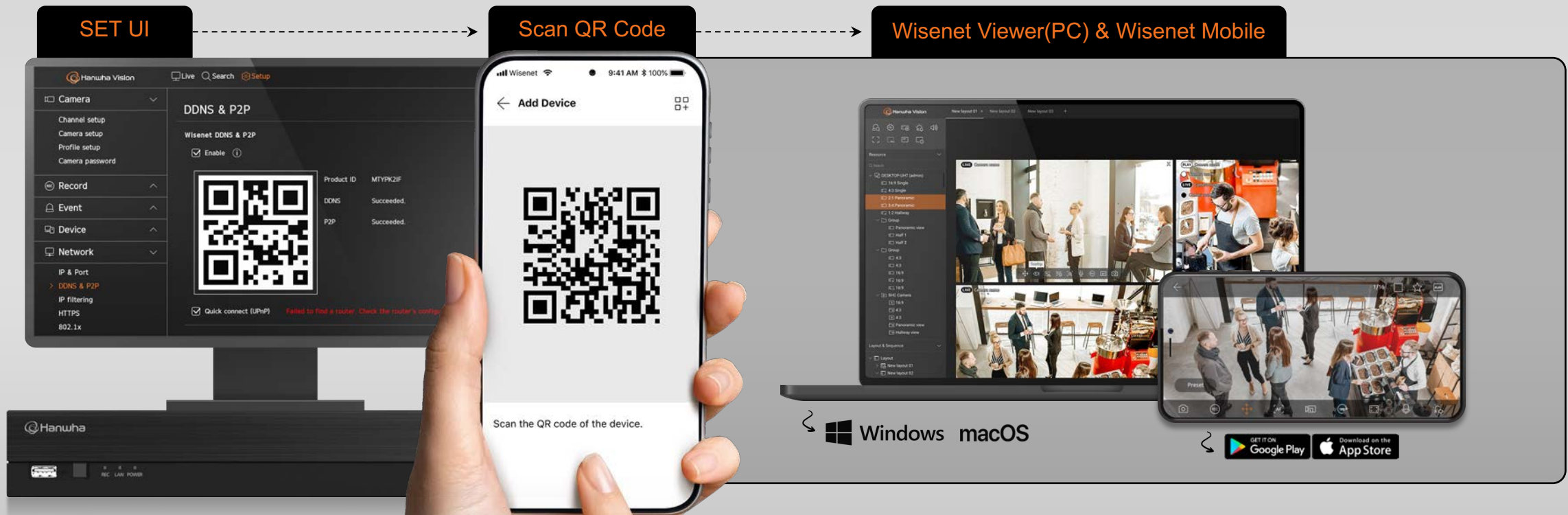
Complete the setup in 9 stages, including Network, Camera, Channel, Date&Time, Mobile/PC Connect

The screenshot shows the 'Installation wizard' interface. At the top, a progress bar highlights the 'Camera register' step. Below it, a large orange-bordered box contains a sequence of 9 steps: STEP 01 (Language), STEP 02 (Network), STEP 03 (Recorder ID/PW), STEP 04 (Camera ID/PW), STEP 05 (Date&Time), STEP 06 (Resolution), STEP 07 (Camera register), STEP 08 (Channel setup), and STEP 09 (Easy connect). Below this box, a table lists camera channels with columns for selection, ID, IP, MAC, status, and channel number.

	Language	Network	Recorder ID/PW	Camera ID/PW	Date&Time	Resolution	Camera register	Channel setup	Easy connect
<input type="checkbox"/>	QNO-8020RA	192.168.7.152	00:09:18:A1:A2:04	Success	<input type="checkbox"/>	6			
<input type="checkbox"/>	QNO-8020RA	192.168.7.153	00:09:18:A1:A2:0D	Success	<input type="checkbox"/>	7			
<input type="checkbox"/>	QNO-8020RA	192.168.7.154	00:09:18:A1:A2:07	Success	<input type="checkbox"/>	8			
<input type="checkbox"/>	QNO-8020RA	192.168.7.155	00:09:18:A1:A2:01	Success	<input type="checkbox"/>	9			
<input type="checkbox"/>	QNO-8020RA	192.168.7.156	00:09:18:A1:A2:08	Success	<input type="checkbox"/>	10	Register >		
<input type="checkbox"/>	QNO-8020RA	192.168.7.157	00:09:18:A1:A2:12	Success	<input type="checkbox"/>	11	< Delete		
<input type="checkbox"/>	QNO-8020RA	192.168.7.158	00:09:18:A1:A2:0A	Success	<input type="checkbox"/>	12			
<input type="checkbox"/>	QNO-8020RA	192.168.7.159	00:09:18:A1:A2:05	Success	<input type="checkbox"/>	13			
<input type="checkbox"/>	QNO-8020RA	192.168.7.160	00:09:18:A1:A2:0C	Success	<input type="checkbox"/>	14			
<input type="checkbox"/>	QNO-8020RA	192.168.7.161	00:09:18:A1:A2:0F	Success	<input type="checkbox"/>	15			
<input type="checkbox"/>	QNO-8020RA	192.168.7.162	00:09:18:A1:A2:03	Success	<input type="checkbox"/>	16			
<input type="checkbox"/>	QNO-8020RA	192.168.7.163	00:09:18:A1:A2:02	Success					
<input type="checkbox"/>	QNO-8020RA	192.168.7.164	00:09:18:A1:A2:14	Success					

Easy connect to Wisenet Viewer(PC) and Wisenet Mobile

Easy connect to your Wisenet Viewer(PC) and Wisenet Mobile Just Scan QR Code or Input Product ID, make you access wherever you like.



Wisenet Viewer(PC)



PC viewer for NVR/DVR



Windows, macOS support



Flexible channel division and custom layout



Event-Action rule management



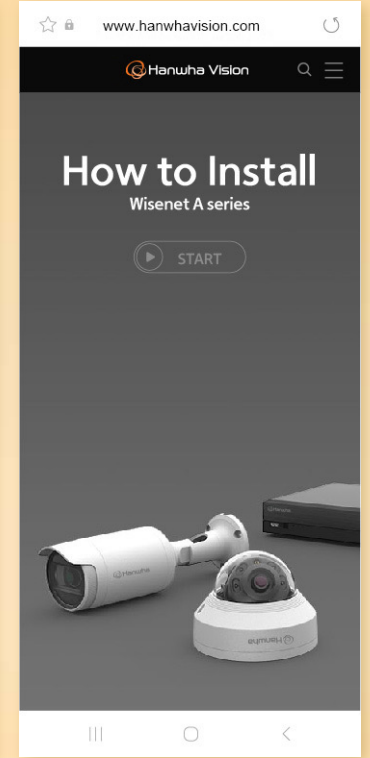
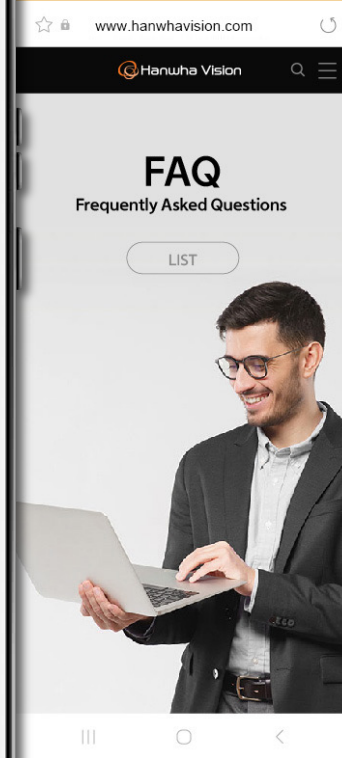
Display web pages & Media files play in the layout



Remote connection (DDNS/P2P)



Customer Support



Scan QR Code, and you can access Technical Support like How to install and FAQ

White Light IP Camera specs



Flateye Camera

ANE-L7012L

Category	Specification
Resolution	4MP
Lens	3.0mm Fixed lens
Framerate	Support 30fps@Max. resolution
Wide Dynamic Range	120dB
Analytics	Motion detection, Tampering Defocus detection, IVA (Enter/Exit, Directional detection, Virtual line): L7012L
Power Consumption	Max 7.6W, Typical 4.2W (PoE) : L7012L
Certification	IP66/IP67, IK10
Application Programming Interface	ONVIF Profile S/G/T SUNAPI (HTTP API)

AHD Camera specs (Motorized Varifocal / Flateye)

Category		2MP		5MP			
		Flateye	Bullet	Flateye	Bullet	Vandal	
		ACE-6020R	ACO-6020R	ACE-8020R	ACO-8020R	ACV-8080R	ACV-8081R
Video	Imaging Device	1/3" 2MP CMOS	1/3" 2MP CMOS	1/2.5" 5MP CMOS	1/2.5" 5MP CMOS	1/2.5" 5MP CMOS	1/2.8" 5MP CMOS
	Resolution	1920x1080	1920x1080	2592x1944	2592x1944	2592x1944	2592x1944
	Max. Framerate	30fps / 25fps (60Hz/50Hz)	30fps / 25fps (60Hz/50Hz)	Max. 30fps (@5MP Max. 20fps, CVI supports up to 4M)	Max. 30fps (@5MP Max. 20fps, CVI supports up to 4M)	Max. 30fps (@5MP Max. 20fps, CVI supports up to 4M)	Max. 30fps (@5MP Max. 20fps)
	Min. Illumination	0.1Lux (F1.0, 1/30sec)	0.1Lux (F1.0, 1/30sec)	0.1Lux (F1.0, 1/30sec)	0.1Lux (F1.0, 1/30sec)	0.1Lux (F1.0, 1/30sec)	0.1Lux (F1.0, 1/30sec)
	Video Out	AHD / TVI / CVI / CVBS	AHD / TVI / CVI / CVBS	AHD / TVI / CVI / CVBS	AHD / TVI / CVI / CVBS	AHD / TVI / CVI / CVBS	AHD / TVI / CVI / CVBS
	Video Transmission Distance	300m (5C2V Coaxial Cable)	300m (5C2V Coaxial Cable)	300m (5C2V Coaxial Cable)	300m (5C2V Coaxial Cable)	300m (5C2V Coaxial Cable)	300m (5C2V Coaxial Cable)
Lens	Focal Length (Zoom Ratio)	3.6mm fixed focal	3.6mm fixed focal	3.6mm fixed focal	3.6mm fixed focal	3.5mm~10.5mm (x3) motorized varifocal	3.5mm~10.5mm (x3) motorized varifocal
	Max. Aperture Ratio	F1.6	F1.6	F1.6	F1.6	F1.6	F1.6
	Angular Field of View	H : 81° V : 42°	H : 81° V : 42°	H : 94° V : 54°	H : 94° V : 54°	H : 114°(Wide) ~ 33.9°(Tele) V : 58.1°(Wide) ~ 18.8°(Tele)	H : 99.1°(Wide) ~ 30.3°(Tele) V : 52.4°(Wide) ~ 17°(Tele)
Operational	Day & Night	AUTO / COLOR / BW	AUTO / COLOR / BW	AUTO / COLOR / BW	AUTO / COLOR / BW	AUTO / COLOR / BW	AUTO / COLOR / BW
	Backlight Compensation	OFF / BLC	OFF / BLC	OFF / BLC	OFF / BLC	OFF / BLC	OFF / WDR/ BLC / HLC
	Wide Dynamic Range	DWDR	DWDR	DWDR	DWDR	DWDR	WDR
	Digital Noise Reduction	2D + 3DNR	2D + 3DNR	2D + 3DNR	2D + 3DNR	2D + 3DNR	2D + 3DNR
	Gain Control	OFF / LOW/MIDDLE / HIGH	OFF / LOW/MIDDLE / HIGH	OFF/LOW/MIDDLE/HIGH	OFF/LOW/MIDDLE/HIGH	OFF/LOW/MIDDLE/HIGH	OFF/LOW/MIDDLE/HIGH
	White Balance	ATW / AWC	ATW / AWC	ATW / AWC	ATW / AWC	ATW / AWC	AUTO / AUTOext / PRESET / MANUAL
	Electronic Shutter Speed	AUTO (1/30~1/50,000)	AUTO (1/30~1/50,000)	AUTO (1/30~1/50,000)	AUTO (1/30~1/50,000)	AUTO (1/30~1/50,000)	AUTO (1/30~1/30,000)
	Video Rotation	OFF / MIRROR / V-FLIP / ROTATE	OFF / MIRROR / V-FLIP / ROTATE	OFF / MIRROR / V-FLIP / ROTATE	OFF / MIRROR / V-FLIP / ROTATE	OFF / MIRROR / V-FLIP / ROTATE	OFF / MIRROR / V-FLIP / ROTATE
	IR Viewable Length	25m	25m	20m	20m	20m	25m
	Coaxial Protocol	ACP (AHD Coax Protocol), TCP (TVI Coax Protocol), CCP (CVI Coax Protocol), CVBS: Pelco-C (Coaxitron)	ACP (AHD Coax Protocol), TCP (TVI Coax Protocol), CCP (CVI Coax Protocol), CVBS: Pelco-C (Coaxitron)	ACP (AHD Coax Protocol), TCP (TVI Coax Protocol), CCP (CVI Coax Protocol), CVBS: Pelco-C (Coaxitron)	ACP (AHD Coax Protocol), TCP (TVI Coax Protocol), CCP (CVI Coax Protocol), CVBS: Pelco-C (Coaxitron)	ACP (AHD Coax Protocol), TCP (TVI Coax Protocol), CCP (CVI Coax Protocol), CVBS: Pelco-C (Coaxitron)	ACP (AHD Coax Protocol), TCP (TVI Coax Protocol), CCP (CVI Coax Protocol), CVBS: Pelco-C (Coaxitron)
Environmental & Electrical	Operating Temperature / Humidity	-30°C ~ + 55°C / Less than 90% RH	-30°C ~ + 55°C / Less than 90% RH	-30°C ~ + 55°C / Less than 90% RH	-30°C ~ + 55°C / Less than 90% RH	-30°C ~ + 55°C / Less than 90% RH	-30°C ~ + 55°C / Less than 90% RH
	Certification	IP67, IK10, FCC, UL	IP67, IK10, FCC, UL	IP67, IK10, FCC, UL	IP67, IK10, FCC, UL	IP66, IK10, FCC, UL	IP66, IK10, FCC, UL
	Input Voltage	12VDC	12VDC	12VDC	12VDC	12VDC	12VDC
	Power Consumption	Max 3.6W	Max. 3.6W	Max 5.4W	Max 5.4W	Max 7.2W	Max 7.2W

AHD Camera specs



Vandal Dome Camera

ACV-8081R/8080R

Category	Specification
Resolution	5MP
Lens	3.3 ~ 10.5mm Motorized Varifocal lens
Framerate	Support 20fps@5MP, 30fps@4MP *CVI supports up to 4MP
Video Out	AHD / TVI / CVI / CVBS
Power Consumption	Max 7.2W
Certification	IP67, IK10

AHD Camera specs



Flateye Camera

ACE-8020R/6020R

Category	Specification
Resolution	5MP / 2MP
Lens	3.6mm fixed focal
Framerate	Support 20fps@5MP - 30fps@4MP : ACE-8020R - 30fps@2MP : ACE-6020R *CVI supports up to 4MP
Video Out	AHD / TVI / CVI / CVBS
Power Consumption	Max 5.4W(8020R) / Max 3.6W(6020R)
Certification	IP67, IK10

AHD Camera specs

ACO-8020R/6020R



Bullet Camera

Category	Specification
Resolution	5MP / 2MP
Lens	3.6mm fixed focal
Framerate	Support 20fps@5MP - 30fps@4MP : ACO-8020R - 30fps@2MP : ACO-6020R *CVI supports up to 4MP
Video Out	AHD / TVI / CVI / CVBS
Power Consumption	Max 5.4W(8020R) / Max 3.6W(6020R)
Certification	IP67, IK10

New A-Series Recorders

ARD-410/810/1610

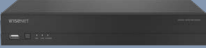




Category	Specification
Inputs	Up to 16 channels
Signal Type	AHD HD TVI, HD CVI (5MP, 4MP, 1080p), CVBS (NTSC/PAL)
Analog Camera Record Rate	5MP (5M Half 12fps/12fps), 4MP (4M Half 15fps/12fps), 2MP (2M 15fps/12fps)
Video Out	AHD / TVI / CVI / CVBS
Recording Bandwidth	30/40/100Mbps
HDD	Up to 2 x 6TB SATA HDD



DVR Recorder specs

Category		 ARD-410	 ARD-810	 ARD-1610
Analog camera	Inputs	4CH (1Vp-p 75ohm, BNC)	8CH (1Vp-p 75ohm, BNC)	16CH (1Vp-p 75ohm, BNC)
	Signal Type	AHD HD TVI, HD CVI (5MP, 4MP, 1080p), CVBS (NTSC/PAL)		
IP Camera	Inputs	Additional 2CH (Max. 6CH)	Additional 2CH (Max. 10CH)	Additional 2CH (Max. 18CH)
	Resolution	5MP ~ CIF		
	Protocols	SUNAPI (Wisenet), ONVIF	SUNAPI (Wisenet), ONVIF	SUNAPI (Wisenet), ONVIF
Local Display	1x HDMI (up to UHD, 3840 x 2160), 1x VGA (up to FHD, 1920x1080)			
Record	Compression	H.265, H.264, MJPEG	H.265, H.264, MJPEG	H.265, H.264, MJPEG
	Analog Camera Record Rate	5MP (5M Half 12fps/12fps), 4MP (4M Half 15fps/12fps), 2MP (2M 15fps/12fps) * Half : Horizontal resolution 1/2		
	IP Camera Recording Bandwidth	Max. 30Mbps	Max. 40Mbps	Max. 100Mbps
Remote Connection	Web Viewer	Google Chrome, Microsoft Edge, Mac Safari		
	Smart Phone	iOS, Android		
	PC Viewer	MS Windows, Apple macOS, Linux Ubuntu		
	Easy Connection	P2P(QR code)		
Environmental	Operating Temperature	0°C to +40°C (+32°F to +104°F)	0°C to +40°C (+32°F to +104°F)	0°C to +40°C (+32°F to +104°F)
	Operating Humidity	20% ~ 85% RH	20% ~ 85% RH	20% ~ 85% RH
Electrical	Power Input	DC 12V		
	Power Consumption	Max. 19.2W (6T HDD 1ea)	Max. 20.4W (6T HDD 1ea)	Max. 40.8W (6T HDD 2ea)




4CH DVR Recorder (ARD vs HRX series)

Category		 ARD-410	 HRX-434	 HRX-435
Analog camera	Inputs	4CH (1Vp-p 75ohm, BNC)	4CH (1Vp-p 75ohm, BNC)	4CH (1Vp-p 75ohm, BNC)
	Signal Type	AHD HD TVI, HD CVI (5MP, 4MP, 1080p), CVBS (NTSC/PAL)	AHD / TVI (8MP , 5MP, 4MP, 1080p, 720p), CVI (5MP, 4MP, 1080p, 720p), CVBS (NTSC/PAL)	
IP Camera	Inputs	Additional 2CH (Max. 6CH)		
	Resolution	5MP ~ CIF	8MP ~ CIF	
	Protocols	SUNAPI (Wisenet), ONVIF	SUNAPI (Wisenet), ONVIF	SUNAPI (Wisenet), ONVIF
Local Display	1x HDMI (up to UHD, 3840 x 2160), 1x VGA (up to FHD, 1920x1080)			
Record	Compression	H.265, H.264, MJPEG	H.265, H.264, MJPEG	H.265, H.264, MJPEG
	Analog Camera Record Rate	5MP (5M Half 12fps/12fps), 4MP (4M Half 15fps/12fps), 2MP (2M 15fps/12fps) * Half : Horizontal resolution 1/2	8MP (8M 8/8fps) , 5MP (5M 12/12fps), 4MP (4M 15/12fps), 2MP (2M 30/25fps)	
	IP Camera Recording Bandwidth	Max. 30Mbps		
Remote Connection	Web Viewer	Google Chrome, Microsoft Edge, Mac Safari		
	Smart Phone	iOS, Android		
	PC Viewer	MS Windows, Apple MacOS, Linux Ubuntu		
	Easy Connection	P2P(QR code)		
Other	Alarm	In 4, Out 1	In 4, Out 1	In 4, Out 2
Environmental	Operating Temperature	0°C to +40°C (+32°F to +104°F)		
	Operating Humidity	20% ~ 85% RH		
Electrical	Power Input	DC 12V		
	Power Consumption	Max. 19.2W (6T HDD 1ea)	Max. 19.2W (6T HDD 1ea)	Max. 40W (6T HDD 4ea)
Dimensions	Height	1U	1U	1U
	WxHxD	11.85" x 1.89" x 8.22"	11.85" x 1.89" x 8.22"	14.57" x 1.73" x 12.6"

8CH DVR Recorder (ARD vs HRX series)

Category		 ARD-810	 HRX-835
Analog camera	Inputs	8CH (1Vp-p 75ohm, BNC)	
	Signal Type	AHD HD TVI, HD CVI (5MP, 4MP, 1080p), CVBS (NTSC/PAL)	AHD / TVI (8MP , 5MP, 4MP, 1080p, 720p), CVI (5MP, 4MP, 1080p, 720p), CVBS (NTSC/PAL)
IP Camera	Inputs	Additional 2CH (Max. 10CH)	
	Resolution	5MP ~ CIF	8MP ~ CIF
	Protocols	SUNAPI (Wisenet), ONVIF	
Local Display		1x HDMI (up to UHD, 3840 x 2160), 1x VGA (up to FHD, 1920x1080)	
Record	Compression	H.265, H.264, MJPEG	
	Analog Camera Record Rate	5MP (5M Half 12fps/12fps), 4MP (4M Half 15fps/12fps), 2MP (2M 15fps/12fps)	8MP (8M 8/8fps), 5MP (5M 12/12fps), 4MP (4M 15/12fps), 2MP (2M 30/25fps)
	IP Camera Recording Bandwidth	Max. 40Mbps <small>* Half : Horizontal resolution 1/2</small>	Max. 50Mbps
Remote Connection	Web Viewer	Google Chrome, Microsoft Edge, Mac Safari	
	Smart Phone	iOS, Android	
	PC Viewer	MS Windows, Apple macOS, Linux Ubuntu	
	Easy Connection	P2P(QR code)	
Other	Alarm	In 4, Out 1	In 8, Out 4
Environmental	Operating Temperature	0°C to +40°C (+32°F to +104°F)	
	Operating Humidity	20% ~ 85% RH	
Electrical	Power Input	DC 12V	
	Power Consumption	Max. 20.4W (6T HDD 1ea)	Max. 120W (6T HDD 4ea)
Dimensions	Height	1U	2U
	WxHxD	11.85" x 1.89" x 8.22"	17.32" x 3.46" x 15.15"

16CH DVR Recorder (ARD vs HRX series)

Category		 ARD-1610	 HRX-1634	 HRX-1635
Analog camera	Inputs	16CH (1Vp-p 75ohm, BNC)		
	Signal Type	AHD HD TVI, HD CVI (5MP, 4MP, 1080p), CVBS (NTSC/PAL)	AHD / TVI / CVI (8MP , 5MP, 4MP, 1080p, 720p), CVBS (NTSC/PAL)	
IP Camera	Inputs	Additional 2CH (Max. 18CH)		
	Resolution	5MP ~ CIF	8MP ~ CIF	
	Protocols	SUNAPI (Wisenet), ONVIF		
Local Display	1x HDMI (up to UHD, 3840 x 2160), 1x VGA (up to FHD, 1920x1080)			
Record	Compression	H.265, H.264, MJPEG		
	Analog Camera Record Rate	5MP (5M Half 12fps/12fps), 4MP (4M Half 15fps/12fps), 2MP (2M 15fps/12fps) * Half : Horizontal resolution 1/2	8MP (8M 8/8fps), 5MP (5M 12/12fps), 4MP (4M 15/12fps), 2MP (2M 30/25fps)	
	IP Camera Recording Bandwidth	Max. 100Mbps	Max. 128Mbps	
Remote Connection	Web Viewer	Google Chrome, Microsoft Edge, Mac Safari		
	Smart Phone	iOS, Android		
	PC Viewer	MS Windows, Apple macOS, Linux Ubuntu		
	Easy Connection	P2P(QR code)		
Other	Alarm	In 4, Out 1	In 16, Out 4	
Environmental	Operating Temperature	0°C to +40°C (+32°F to +104°F)		
	Operating Humidity	20% ~ 85% RH		
Electrical	Power Input	DC 12V		
	Power Consumption	Max. 40.8W (6T HDD 2ea)	Max. 40W (6T HDD 2ea)	Max. 200W (6T HDD 8ea)
Dimensions	Height	1U	1U	2U
	WxHxD	14.57" x 1.73" x 12.6"	14.57" x 1.73" x12.6"	17.32" x 3.46" x 15.15"

Installation solutions



Installation solution

SBP-250HMW

Hanging Cap

Hanging Adapter for PNM-9084QZ & C16083RVQ & C32083RVQ

Will replace
SBP-276HMW



SBD-137WMA

Wall Adapter Plate

Adaptor plate to make a Q-AI camera compatible with
SBP-137WMW and SBP-137WMW1



Installation solution

SBO-090GP

Wall Adapter Plate

Gang Plate (for bullet) Adaptor plate for Single, Double, 4" Octagon Compatible with QNO-C8083R/C9083R / ANO-L6012R/22R/82R / ANO-L7012R/22R/82R

compatible with SBP-137WMW and SBP-137WMW1





High speed LPR Camera: TNO-7180RLP

Wisenet T series LPR Solution

WISENET Road AI

TNO-7180RLP: High Speed Global shutter Wisenet Road AI LPR Camera
Dedicated LPR Camera



TNO-7180RLP
(Camera only)



TNO-7180RLP
(Camera with Pole/wall mount)



TNO-7180RLP
(Camera mounted on a pole)

TNO-7180RLP High Speed LPR/MMCR Camera

WISENET Road AI

Major Specifications

- 3MP Global Shutter Image Sensor
- 6.8~120mm(18x) Motorized Varifocal Lens
- Licensed Road AI, Edge application on the camera
- Detect and Recognize number plate up to 100MPH (160 kmh) speed
- Detect vehicle information such as Make, Model, color over 70 brands, 600 models, 10 colors
- Up to 2 lanes
- IR LED 164ft (50m) coverage
- Audio In/Out, Alarm In/Out
- Power rating: HPoE/12VDC
- USB & CVBS for installation
- IP66/67/IP6K9K, IK10+, NEMA4X



Table Top mount



Wall mount



Pole mount

Wisenet Road AI LPR/MMCR Camera Overview

WISENET Road AI

Low to Mid-Speed P- Series with Road AI Application

- **PNV-A9081RLP**
- **PNO-A9081RLP**
- **PNB-A9091RLPH**
- Road AI application on the Edge
 - License plate reads & Make, Model, Color identification







New

High Speed T- Series with Road AI Application

- **TNO-7180RLP**
 - First Global shutter camera from Hanwha
 - High speed, Longer distance, wider angles & better accuracy
 - Similar interface across all Road AI LPR cameras



Wisenet Road AI LPR/ ANPR Specification

LPR Specification	TNO-7180RLP		PNV-A9081RLP/ PNO-A9081RLP		PNB-A9091RLPH
					
Solution	Community Traffic Observation	Highways	Community Traffic Observation	Parking Application	City Traffic Observation
Image Sensor	Global Shutter		Rolling Shutter	Rolling Shutter	Rolling Shutter
Range of built-in IR LED	Up to ~ 150ft		30m(98.42ft)	30m(98.42ft)	N/A
Speed Description	Regular Speed	High Speed	Moderate Speed	Low speed	Regular Speed
Lane Coverage	Up to 2 lanes (18ft Wide)	Up to 1 lanes (12ft Wide)	Up to 1 lane (3.6m/12ft Wide) (with built in IR)		Up to 2 lanes (5m/18ft Wide)
Speed limit	Up to 75mph	Up to 100 mph	Up to 70kmh (45mph) (with built in IR)	Up to 40kmh (25mph) (with built in IR)	Up to 100kmh (65mph)
Min. Forward Distance	52ft	90ft	12m (38ft)	10m (33ft)	16m (52ft)
Max. Forward Distance	150ft	150ft	12m (38ft) (with built in IR)	13m (45ft) (with built in IR)	36m (120ft)
Max. Horizontal Angle	25°	15°	25°	30°	25°
Max. Vertical Angle	25°	15°	25°	30°	25°
Horizontal Offset	Up to 7m (24ft)	Up to 4m (12ft)	Up to 5m (18ft)	Up to 7m (24ft)	Up to 7m (24ft)
Camera Height	Up to 7m (24ft)	Up to 7m (24ft)	Up to 5m (18ft)	Up to 7m (24ft)	Up to 7m (24ft)
Vehicle Recognition	Vehicle Make/type : 70+, Example: Ford pick up Vehicle Model : 600+, Example: Ford F-150 Vehicle color : 10, Example Red, Green etc		Make : 70+ brands Model : 600+ models Color : 11 colors	Make : 70+ brands Model : 600+ models Color : 11 colors	Make : 70+ brands Model : 600+ models Color : 11 colors

Contents TNO-7180RLP: Key Features

Image Sensor with Global Shutter for High Speed Movement Capture

The TNO-7180RLP's image sensor with global shutter takes snapshots of the entire scene at once, providing clear images even in vehicles moving at high speeds.

Rolling shutters used in conventional cameras, give distorted images at high speed because not all parts of a scene are recorded at exactly the same instant.



Global shutter

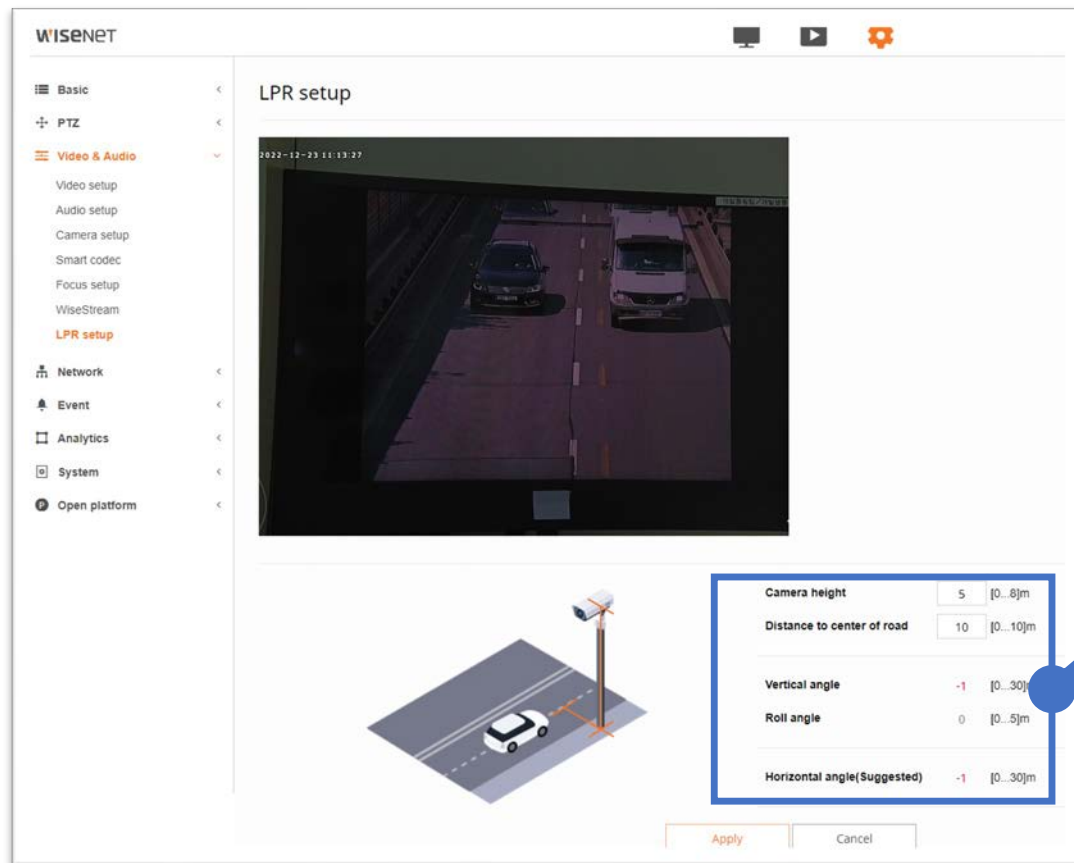


Rolling shutter

TNO-7180RLP: Key Features

Built-in Setup Tool as part of the Firmware

The built-in LPR setup tool which is part of the camera web interface help installer aim the right spot to capture license plate so the achieve the best performance. It suggest vertical, horizontal and roll angle by typing in camera height and distance from center of the road



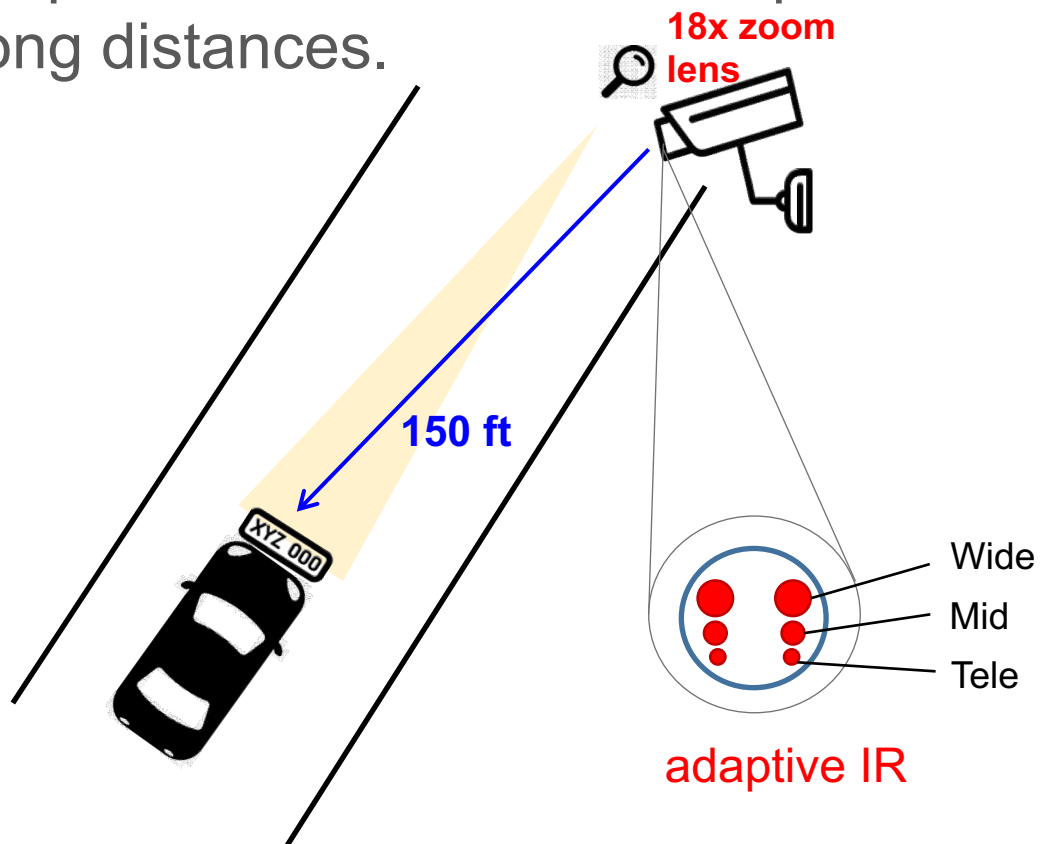
Camera height	5	[0...8]m
Distance to center of road	10	[0...10]m
Vertical angle	-1	[0...30]m
Roll angle	0	[0...5]m
Horizontal angle(Suggested)	-1	[0...30]m

Contents TNO-7180RLP: Key Features

Adaptive IR LED illuminator

If a single-intensity IR illuminator, it can saturates the vehicle's license plate over distance.

The TNO-7180RLP uses two IR modes to avoid washing out too much or insufficient light for the plate. This allows license plate detection without saturation at short, medium or long distances.




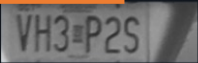


TNO-7180RLP: Key Features


LPR + MMCR (Make/ Model/ Color Recognition)









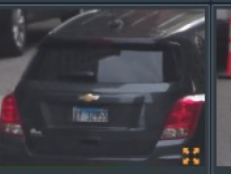



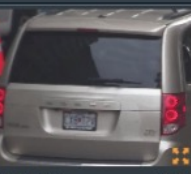















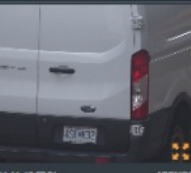



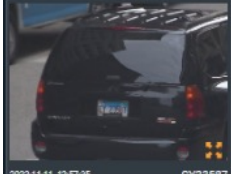















Wisenet Road AI allows recognition of car information such as Make, Model, color in addition to the LPR. It has the similar application features as that of the P-Series LPR cameras.



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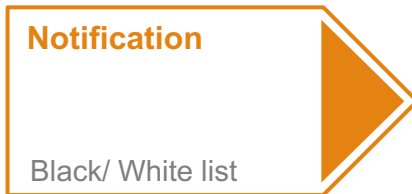
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Plate	VH3P2S	Model	Odyssey
Photo		Type	
Country	US-MO	Color	
List	<input type="button" value="Add plate to list"/>		



 2022-11-11, 12:58:51 68470LB Country: US-IL, Brand:  Type:  Model: Silverado Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:58:47 GF9H2P Country: US-MO, Brand:  Type:  Model: EcoSport Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:58:39 BY32955 Country: US-IL, Brand:  Type:  Model: Trail Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:58:28 CX8T2V Country: US-MO, Brand:  Type:  Model: Grand_C... Color:  List: <input type="button" value="Add plate to list"/>
 2022-11-11, 12:58:22 NFIF88 Country: US-FL, Brand:  Type:  Model: Focus Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:58:19 P460810 Country: US-IL, Brand:  Type:  Model: Accord Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:58:18 BP52546 Country: US-IL, Brand:  Type:  Model: Terrain Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:57:51 45FK32 Country: US-MO, Brand:  Type:  Model: Transit Color:  List: <input type="button" value="Add plate to list"/>
 2022-11-11, 12:57:36 CY23587 Country: US-IL, Brand:  Type:  Model: Equinox Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:57:30 LF0T1W Country: US-IL, Brand:  Type:  Model: Explorer Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:57:21 RJQV2U Country: US-IL, Brand:  Type:  Model: Civic Color:  List: <input type="button" value="Add plate to list"/>	 2022-11-11, 12:57:30 RJ0V2D Country: US-IL, Brand:  Type:  Model: Civic Color:  List: <input type="button" value="Add plate to list"/>

Black/ White list Notification

Wisenet Road AI shows Black/White list event notification



WISENET Road AI

EVENTS NOTIFICATIONS SEARCH STATISTICS SETTINGS ABOUT

Version 7.2.0.670.347

View mode

Black list White list

	Date/Time	Plate	Photo	Country	Type	Brand	Model	Color
▼	25.02.2021, 14:39:45	FC16HKV		GBR			Mokka	White
▼	25.02.2021, 14:39:05	SF55CXU		GBR			Fiesta	Red

Smart Search

Search by various options as country, make(Brand), model, color etc.
Search results are shown max 500 list and can be exported as excel format

Search

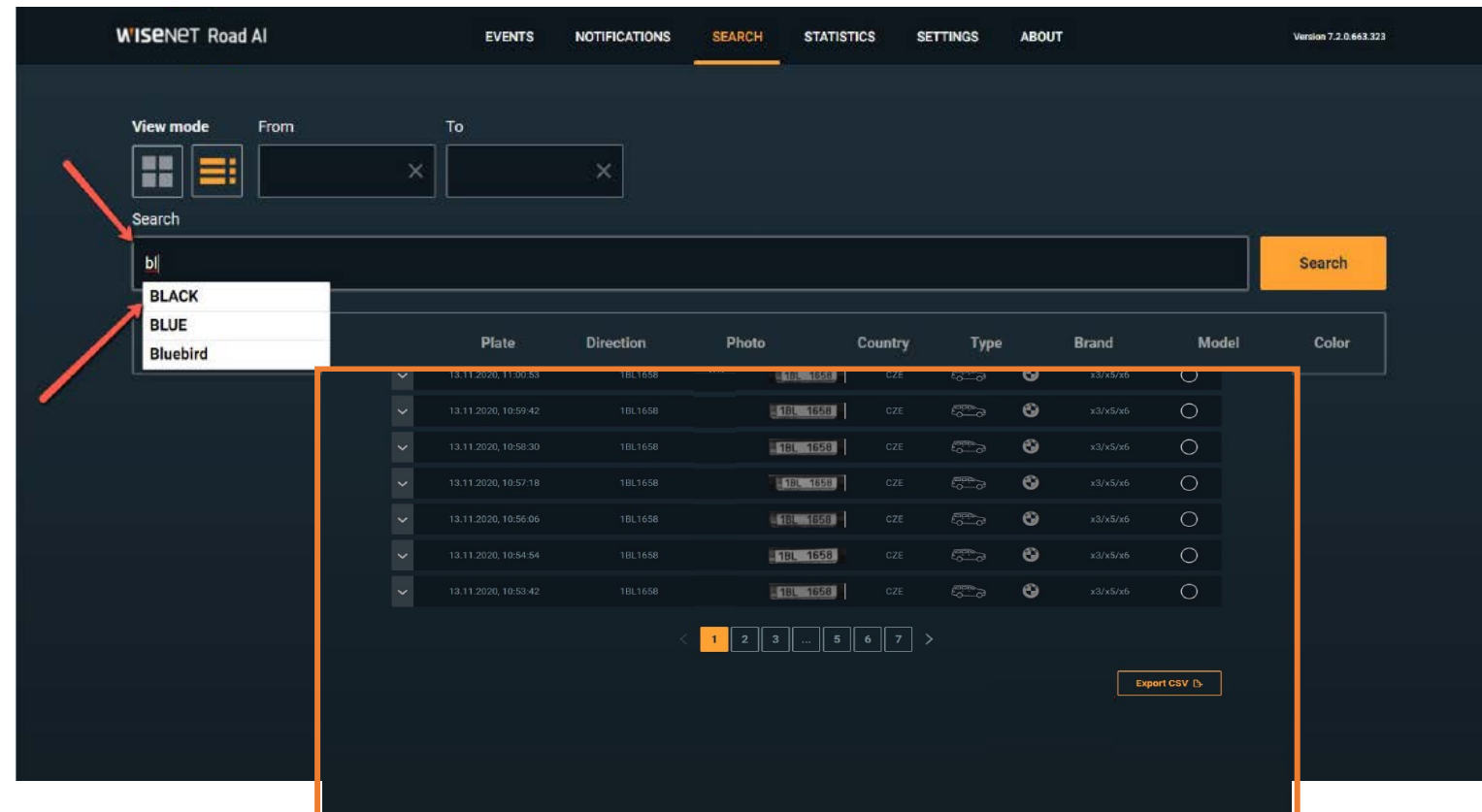
By country, make, Model, color, date etc

1

Export

List of result is exported as excel

2



Statistics – Quick overview as a dashboard

Wisenet Road AI supports various widgets with different parameters in daily, weekly and monthly
The statistics are coming from 10,000 latest cars in DB

Vehicle for

A day
A week

1

Top 5

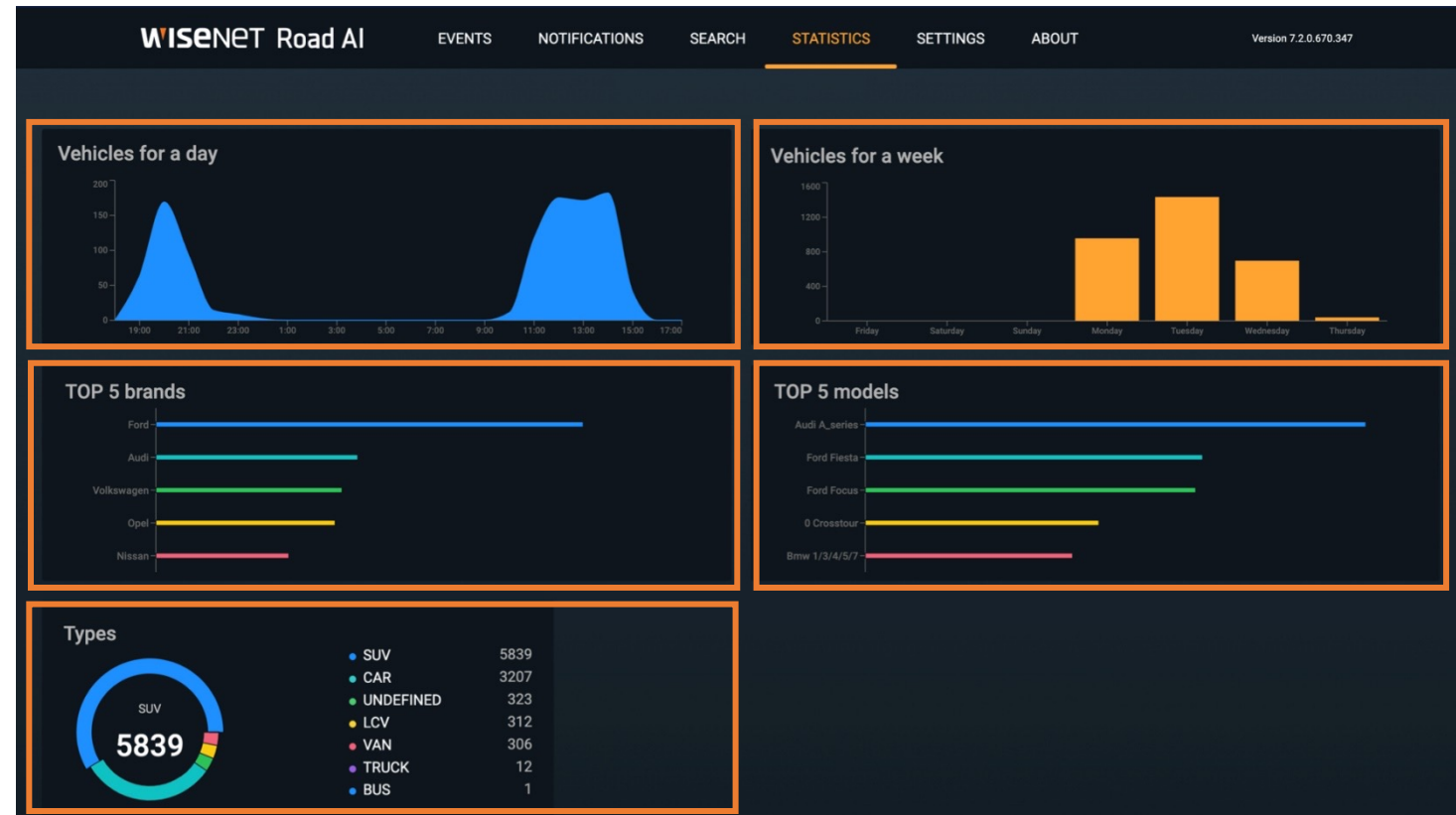
Brands
Models

2

Types

Sedan, Van
SUV, LCV

3



Integration to VMS

Wise Road AI is the LPR solution on the edge designed for Hanwha AI cameras and requires no external computing device including storage



WISENET Road AI



Genetec

milestone

WISENET WAVE

Various 3rd party VMS

- APIs available for additional 3rd party VMS integrations

- Road AI Application on the Edge
- Fully licensed and activated

TNO-7180RLP: Mounting accessories

ONFIDENTIAL

Mount Accessory (White)

Wisenet Road AI Cameras have various accessory such as Wall, Table Top, Horizontal and Hanging mounts.

Caution: Camera cannot be installed upside down (overhang) and rotate the image. Use Hanging mount if such installs are required.



Wall & Vertical Pole

SBP-187WMW



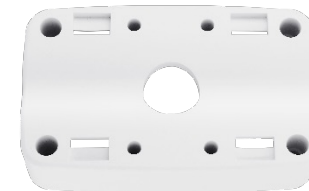
Table Top

SBP-300BW1

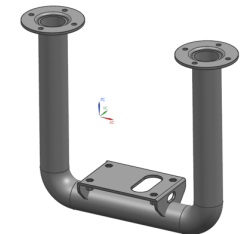


Horizontal Pole

SBP-300PMW2



Hanging Mount**



SBP-187WMW - Steel strap sold separately
SBP-300PMW2 – Steel straps are included



WISENET WAVE
New Generation WAVE Appliances

EOL & Replacement SKUs

Discontinued SKUs	Replacement SKUs
WRT-P-3101MW-1TB	WRT-P-3103MW-1TB
WRT-P-3101MW-2TB	WRT-P-3103MW-2TB
WWT-P-7201MW	WWT-P-7203MW
WWT-P-7201ML	WWT-P-7203ML
WWT-P-3202W	WWT-P-3203W
WWT-P-3202L	WWT-P-3203L
WWT-P-7402W	WWT-P-5403W
WWT-P-7402L	WWT-P-5403L

WRT-P-3103MW

Hanwha Model	WRT-P-3101MW
Form factor	Micro
CPU	Intel Core i3-13100T
RAM	8GB
NIC	(1) 1 Gigabit
OS	Windows 10 IoT Ent LTSC
OS Drive	256GB SSD
HDD Bays (2.5")	1
Max Storage Range	Up to 2TB
PSU	65W



- WRT-P-3103MW Recording Throughput: 45 Mbps

WWT-P (3203 & 5403)

Hanwha Model	WWT-P-3203W	WWT-P-3203L
Form factor	SFF Tower	<<<<< SAME
CPU	Intel Core i3-13100	<<<<< SAME
RAM	8GB	<<<<< SAME
NIC	(1) 1 Gigabit Port	<<<<< SAME
OS	Windows 10 IoT Ent LTSC	Ubuntu 20.04 LTS
OS Drive	256GB M.2 SSD	<<<<< SAME
GPU	Quadro T400	<<<<< SAME
PSU	180W	<<<<< SAME
Warranty	5YR NBD On-Site + KYHD	<<<<< SAME

Hanwha Model	WWT-P-5403W	WWT-P-5403L
Form factor	SFF Tower	<<<<< SAME
CPU	Intel Core i5-13500	<<<<< SAME
RAM	16GB	<<<<< SAME
NIC	(1) 1 Gigabit Port	<<<<< SAME
OS	Windows 10 IoT Ent LTSC	Ubuntu 20.04 LTS
OS Drive	256GB M.2 SSD	<<<<< SAME
GPU	Quadro T400	<<<<< SAME
PSU	180W	<<<<< SAME
Warranty	5YR NBD On-Site + KYHD	<<<<< SAME



- WWT-P-3203: Dual Display Monitors
- WWT-P-5403: Quad Display Monitors

WWT-P-7203Mx

Hanwha Model	WWT-P-7203MW	WWT-P-7203ML
Form factor	Micro	<<<<< SAME
CPU	Intel Core i7-13700T	<<<<< SAME
RAM	16GB	<<<<< SAME
NIC	(1) 1 Gigabit	<<<<< SAME
OS	Windows 10 IoT Ent LTSC	Ubuntu 20.04 LTS
OS Drive	256GB SSD	<<<<< SAME
HDD Bays (2.5")	1	<<<<< SAME
PSU	90W	<<<<< SAME
Warranty	5YR NBD On-Site + KYHD	<<<<< SAME



- WWT-P-7403: Quad Display Monitors

Thank you