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i-PRO AI Applications



Install Various types of applications to keep your i-PRO network camera on the cutting edge.

There are many types of AI applications that can be installed on network cameras at no additional cost. Although i-PRO network cameras are edge devices, they are in charge

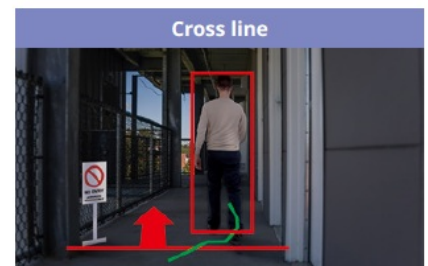
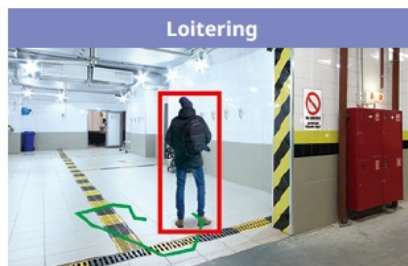
of various detection processes. As a result, the camera is responsible for the advanced processing and the server does not require expensive hardware.

i- PRO AI applications

AI Video Motion Detection (AI-VMD)

AI differentiates between vehicles, motorcycles, bicycles, people, and objects detected by AI on-site learning. It further detects and sends warning notifications when they enter a specified area. It can also count the number of times the target object crosses line.

- It is possible to issue an alarm when a moving object enters a specified area.
- It is possible to issue an alarm when a moving object enters a specified area and stays there for a specified amount of time.



- It is possible to issue an alarm when an object moving in the specified direction crosses a specified threshold. (Counting is also available)
- Tailgating can be configured for alarm notification when multiple cross line are detected within a specified time period.



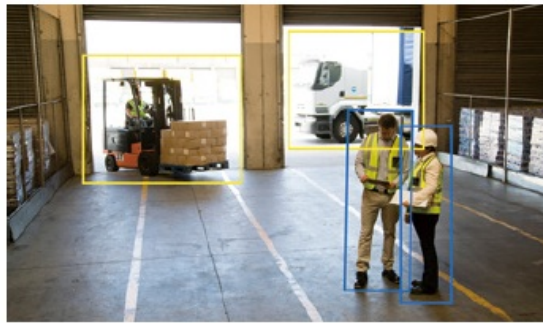
- It is possible to issue an alarm when a moving object enters a specified area and moves in the specified direction.
- It is possible to issue an alarm when a moving object exceeds a specified speed.

AI On-site Learning

AI On-site Learning allows to enhance AI analysis by adding target object and improving accuracy.

You can add customized objects to detect using on-site camera footage through simple

learning process. In addition, it contributes to reduce missed/false alarms by training based on the past footage.



Supported camera	WV-X15xxx, WV-X22xxx, WV-X25xxx (New X series Camera) Note: To be used with AI-VMD
SD card	Not required
No. of learning images required	10 – 200 images
No. of target to be added	Up to 5 targets Note: Additional targets can be detected simultaneously

* For learning process, collecting images and manual operations to teach the correct target are required. Also, detection performance depends on the learning results and the environments you use. Be sure to check the operation at the installation site.

* For configuration (detection area etc.), please use the latest version of i-PRO configuration tool (iCT).

AI Privacy Guard

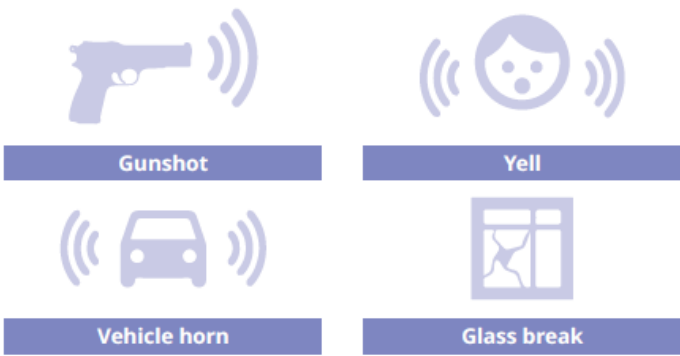
To protect privacy and portrait rights, it is possible to automatically apply a mosaic the entire face and figure of a person captured by the camera.



Privacy Guard target	Face, Human, Except face, Except human, All * “Except face, Except human, All” are available with the firmware released in February 2024 or later
Stream	Stream(1), Stream(2), Stream(3), Stream(4), Stream(2)&(4)
Masking method	Blurring, Filling

AI Sound Classification

AI detects and identifies (gunshot / yell / vehicle horn / glass break) sound. It then sends a warning notification according to the sound identified.

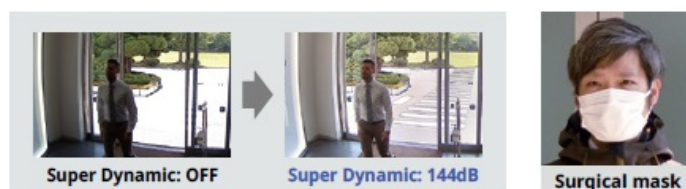


Classification target	1. Gunshot 2. Yell 3. Vehicle horn 4. Glass break
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Classification condition	Target sound is 6 dB louder than crowd. Target sound continues more than a second. (except for gunshot)
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AI Face Detection

The i-PRO network camera utilizing an AI engine and i-PRO Active Guard realize real-time face recognition without an expensive face recognition server. AI detection enables highly accurate face detection, and is also effective for detection in low lighting, backlit environments, or for detecting faces obscured by masks.



Range of angle	Horizontal: 0° – 45°, Vertical: 0° – 30°
Detection number at the same time	Max. 8 faces
Size of face image	Min. size: width 30 pixel Recommend: 60 pixel
Min. illumination level	100 lux
Max. number of cameras	20 when installed with VMS server PC 60 when installed in dedicated server PC
Max. number of watchlist	1,000 faces
Recommended model	WV-S1136, WV-S1536LTN, WV-S2536LTN

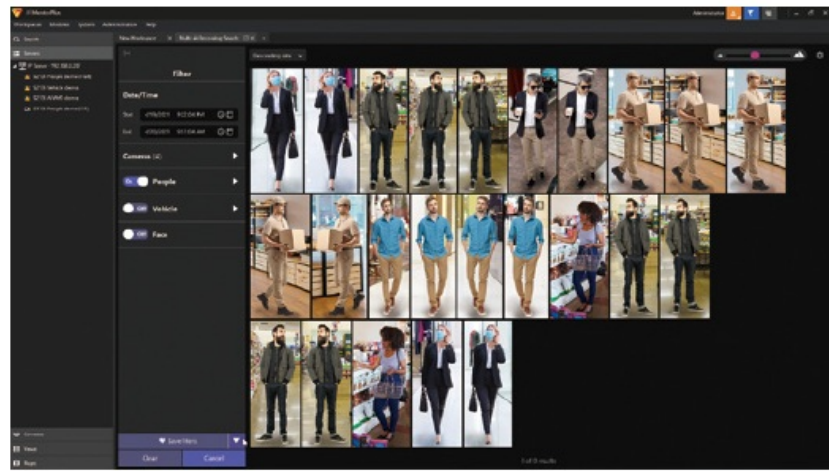
AI People Detection

Characteristics of the human face and clothing are extracted and classified into useful categories such as gender, age, and clothing color. This abundant attribute information can then be searched to easily find the target person.

Attributes	Values
Gender	Male / Female
Age	Child (0-10) / Young Adult (11-20) / Adult (21-60) / Senior (61+)
Mask	Mask / No Mask
Hair type	Long hair / Short hair
Hair color	Black / Brown / White / Gray / Gold
Hat	Hat / No Hat
Sunglasses	Sunglasses / No Sunglasses
Beard	Beard / No Beard
Top type	Long sleeves / Short sleeves
Top color	Black / Brown / White / Gray / Green / Red / Blue / Yellow / Orange / Purple / Pink
Bottom type	Long / Short
Bottom color	Black / Brown / White / Gray / Green / Red / Blue / Yellow / Orange / Purple / Pink
Bag	Bag / No Bag

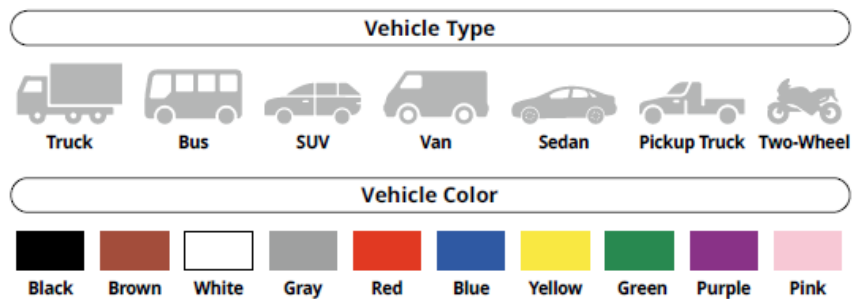
Bag color	Black / Brown / White / Green / Red / Blue / Yellow / Orange / Purple / Pink
Shoes color	Black / Brown / White / Green / Red / Blue / Yellow

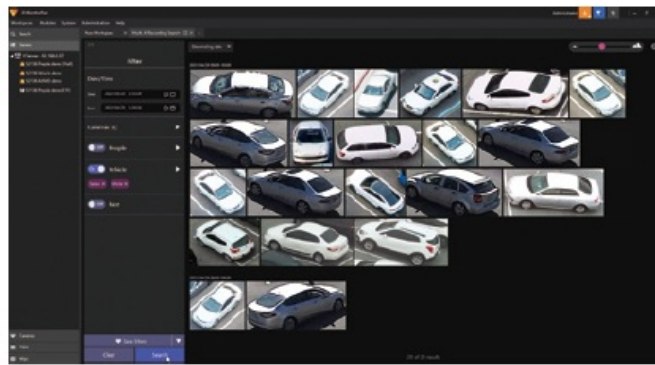
Conditions	Range of angle	Vertical: 0° to 45°
	Detection number at the same time	Max. 20 people
	Size of people image	Min. size: width 60 pixel Recommended size : width 100 pixel
	Min. illumination level	Min. illumination level : 10 lux Recommended illumination level : 50 lux
Mask Area (non-detection area)		Max. 8 areas (polygonal) can be set



AI Vehicle Detection

Vehicle characteristics are extracted and classified into useful categories such as type and color. This abundant attribute information can then be searched to easily find the target vehicle.





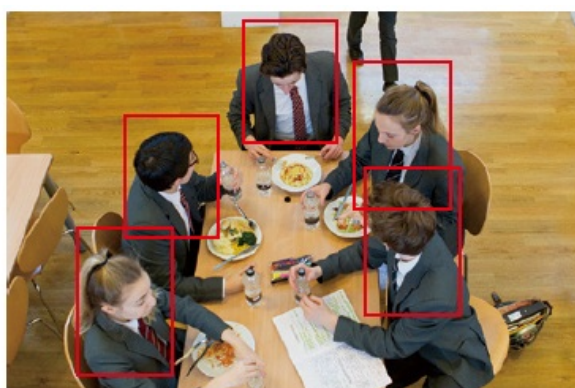
Conditions	Range of angle	Vertical: 0° to 90°
	Detection number at the same time	Max. 20 vehicles
	Size of vehicle image	Min. size: 70 pixel for the shorter axis (about 15-20 m ahead) Recommended size: 112 pixel for the shorter axis
	Min. illumination level	5 lux
Mask Area (non-detection area)		Max. 8 areas (polygonal) can be set

AI Occupancy Detection

It counts the number of objects in a specified area and issues an alarm when the number exceeds a specified threshold. Information of the number of objects in the area can be output externally via HTTP or MQTT.

Size of people image	Min. size: width 64 pixel (in case of S series 2MP model)
Detectable angle of view	Vertical: 0° to 45°
Detection object	People / Vehicles / Bicycles / Objects detected by AI on-site learning

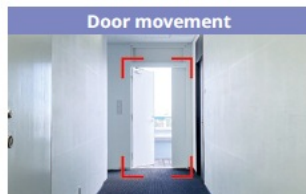
Max. number to detect at the same time	People / Vehicles / Bicycles: Max. 40 objects Objects detected by AI on-site learning: Max. 20 objects
Detection Area	Max. 4 areas (polygonal)
Number of objects to detect	1 to 40 objects/area
Detection time	0.1 to 3,600 sec/area
Recommended location to install	People: Indoor Vehicles / Bicycles / Objects detected by AI on-site learning: Indoor/ Outdoor
Min. illuminance	50 lux



*Example image of detection processing.

It can define/learn the normal scene for each camera and output an alarm when it is determined to be abnormal.

- If the normal status is an empty area, the application will notify you when a stationary object is left behind.
- If the normal status is a closed door, the application will notify you when the door is left open for a defined period of time.
- If the normal status for a spot is set to “occupied”, the application will notify you when the spot is vacant.
- If the normal status is set to “full shelf”, the application will notify you when the shelf is empty or low, as defined.



Scene Change judgment method	The user trains the app with multiple images of normal scenes, and the app monitors the amount of pixel change from the trained images. It issues an alarm when the amount of pixel change exceeds a threshold for a specified time period.
Recommended location to install	Indoor
SD Memory Card	Required
Detection size	5% or more of the width of the angle of view
Detection Area	Max. 16 areas (quadrilateral)
Detection time	2 to 3600 sec/area

AI Processing Relay

It can be used when you want to add an AI function to an already installed camera. This software receives MJPEG data from other cameras, performs AI processing with AI Extension Software, and performs alarm reception and image search with i-PRO Active Guard.

	WV-S71300-F3 (i-PRO Mini) Note : Camera function on install camera is not available.	WV-X15xxx, WV-X22xxx, WV-X25xxx (New X series Camera) Note : Camera function is available.
Input	Up to 1 ch	Up to 3ch

No. of apps to be installed *1		Up to 2 apps	Up to 3 apps
Supported camera		i-PRO camera Other Company Camera *2	
Received video format	Video format	H.265, H.264, JPEG *3	
	Resolution	Recommended resolution : 2MP(1920×1080) or 1MP(1280×720) Max. resolution : 1920×1080 Min. resolution : 640×360	
Available AI app *4		AI-VMD / AI People Detection / AI Vehicle Detection / AI Occupancy Detection / AI Scene Change Detection	
Supported System *5		Video Insight / Genetec / Milestone / ASM300 / Luxriot with i-PRO Active Guard / Network Optix with i-PRO Advanced Object Search Plugin	

- For more details, refer AI apps compatibility in Accessory Selector <https://i-pro.com/selector/accessory/> or the Technical Information [C0103] https://i-pro.com/products_and_solutions/en/surveillance/learning-and-support/knowledge-base/technical-information
- The camera must be able to output “Received video format”. And you need to know JPEG stream CGI or RTSP stream URL.
- [H.265]
 - Only 1 non-AI camera can be connected.
 - The frame rate of the connected non-AI cameras must be 3-10 fps.
(Recommended 5 fps)
 - The frame rate of non-AI cameras must be within 10 fps and the bit rate must be

within 1 Mbps.

[H.264]

- The frame rate of the connected non-AI cameras must be 3-15 fps.

(Recommended 5 fps)

The total frame rate of the connected non-AI cameras should be kept within 15 fps, and the total bitrate should be kept within 3 Mbps.

Example:

- When connecting 3 non-AI cameras with X-series camera: within 5 fps and 1 Mbps per channel
- When connecting 2 non-AI cameras with X-series camera: within 7.5 fps and 1.5 Mbps per channel
- When connecting 1 non-AI camera with X-series camera: within 15 fps and 3 Mbps per channel.

[JPEG]

- The frame rate of the connected non-AI cameras must be 3-15 fps.

(Recommended 5 fps)

4. The AI analysis performance depends on the image quality, so it will be a best effort. Please check it with cameras you use on site.

5. ASM300 with i-PRO Active Guard™ supports only i-PRO cameras.

“Video Insight with i-PRO Active Guard”, AI Occupancy Detection alarms are not supported because they do not go through i-PRO Active Guard.

Supported functions with AI Processing Relay for each VMS Video Insight with i-PRO Active Guard

Video Insight with i-PRO Active Guard

	AI-VMD	AI People Detection	AI Vehicle Detection	AI Occupancy Detection	AI Scene Change Detection
Alarm Management	✓	✓	✓	N / A	✓
Similarity Search	-	✓	✓	-	-
Statistics Dashboard	✓	✓	✓	✓	-

Genetec / Milestone / Luxriot with i-PRO Active Guard

	AI-VMD	AI People Detection	AI Vehicle Detection	AI Occupancy Detection	AI Scene Change Detection
Alarm Management	✓*	✓	✓	✓*	✓*
Similarity Search	-	✓	✓	-	-
Statistics Dashboard	✓	✓	✓	✓	-

*Luxriot supports only Past event search

ASM300 with i-PRO Active Guard supports only cameras which can connect i-PRO NVR

	AI-VMD	AI People Detection	AI Vehicle Detection	AI Occupancy Detection	AI Scene Change Detection
Alarm Management	✓	✓	✓	✓	✓
Similarity Search	-	✓	✓	-	-
Statistics Dashboard	✓	✓	✓	✓	-

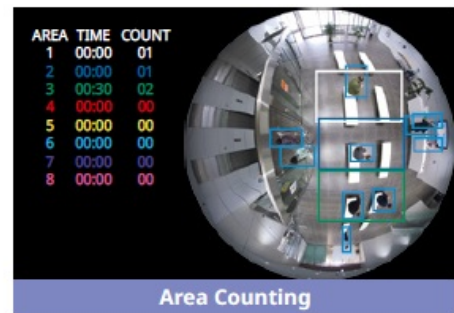
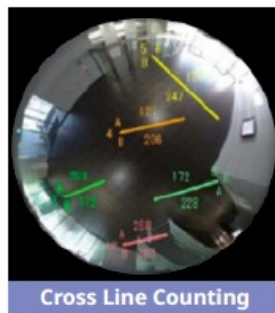
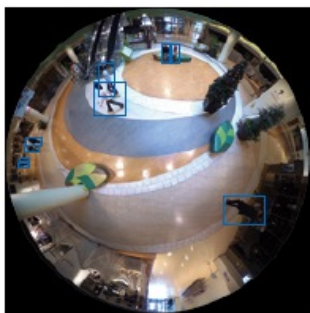
Network Optix with i-PRO Advanced Object Search Plugin

	AI-VMD	AI People Detection	AI Vehicle Detection	AI Occupancy Detection	AI Scene Change Detection
Alarm Management	✓	✓	✓	-	-
Similarity Search	-	✓	✓	-	-
Statistics Dashboard	-	-	-	-	-

AI-VMD/AI People Counting for 360-degree fisheye camera

AI Video Motion Detection

- AI differentiates between vehicles and people, detecting and sending warning notifications when an intruder enters a specified area.
- Intruder detection:
Issues an alarm when a moving object enters a specified area.
- Cross Line detection:
Issues an alarm when an object moving in the specified direction crosses a specified threshold.
- Loitering detection:
Issues an alarm when a moving object enters a specified area and stays there for a specified amount of time.



People Counting

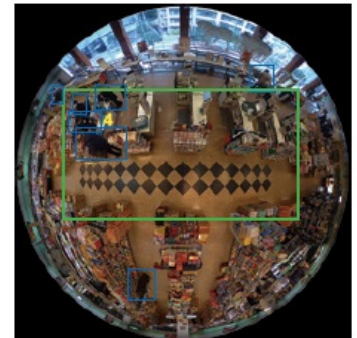
- **Cross Line Counting:**

Counts the number of people moving in a specified direction and cross a specified threshold.

- **Area Counting(Queue Management):**

Counts the number of people in the set area.

Detection number at the same time is Max. 100 people.



Heat map

Heat mapping provides statistical information about traffic flow and keeps counts for people passing through and loitering in the area.

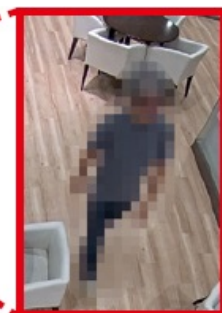
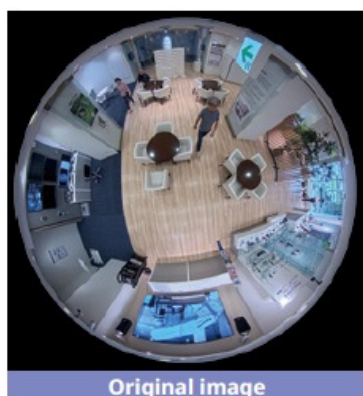
Occupancy detection

The network camera uses its AI engine to detect congestion, providing data that can be used to direct visitor traffic flow in advance or help staff work more efficiently.

AI Privacy Guard for 360-degree fisheye camera

AI Privacy Guard

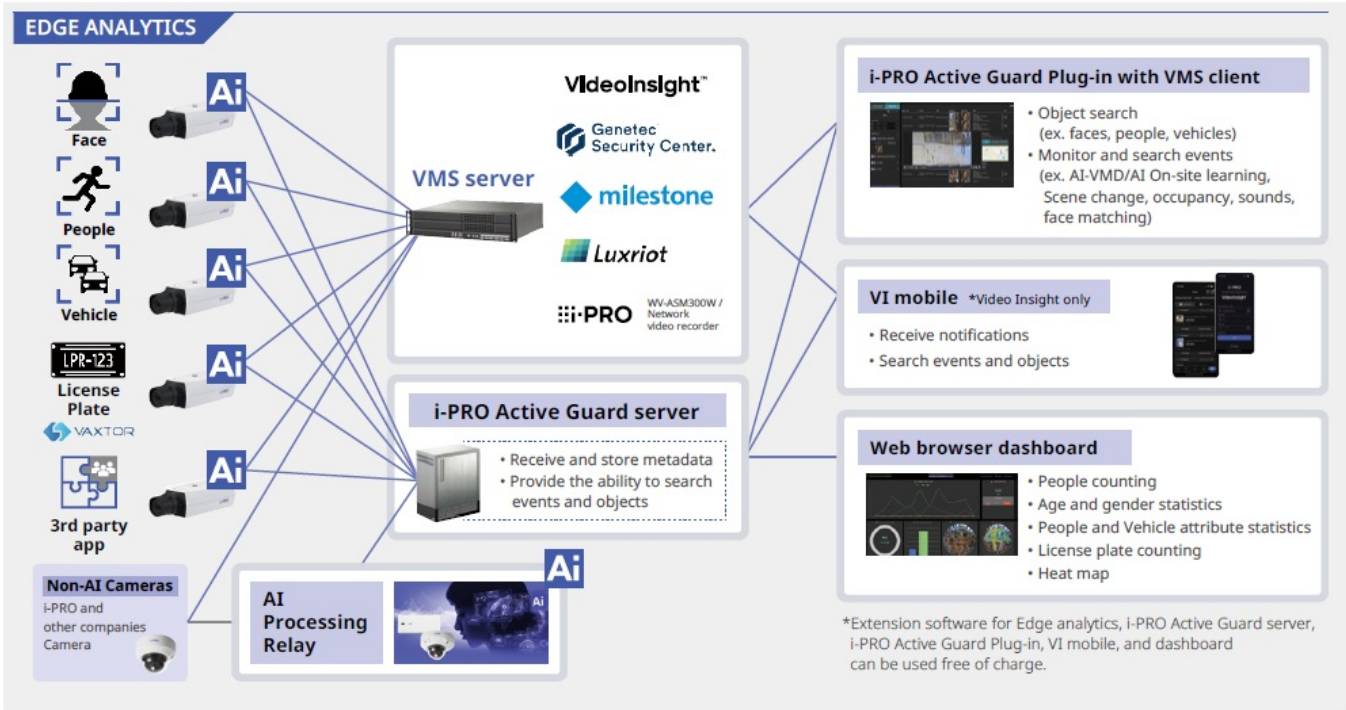
AI can automatically mosaic faces and figures of people who are photographed to safeguard privacy and portrait rights.



i-PRO Active Guard

The i-PRO Active Guard stores the best images and metadata captured by i-PRO network cameras, then collates this data with the watch list registered in the client software and issues an alarm when a match is found. The server does not require expensive hardware because i-PRO network cameras handle the advanced processing. The server can even be installed on the same hardware as the VMS. The system comprises the i-PRO Active Guard, the AI application installed on i-PRO network cameras utilizing AI engines, and i-PRO Active Guard Plug-in software for the VMS client.

Example of a basic system connection



Specification

		Video Insignht system	Genetec system	Milestone system	Luxriot	WV-ASM300W
	Supported camera	i-PRO network camera with AI engine				

Scale	Number of camera	1 to 100 CH when installed with VMS server (AI Face Detection is up to 20) 1 to 300CH when installed in dedicated server (AI Face Detection is up to 100)	1 to 300CH when installed in dedicated server (AI Face Detection is up to 100)	1 to 4CH when installed with WV-ASM300W (AI Face Detection is up to 4) 1 to 300CH when installed in dedicated server (AI Face Detection is up to 60)
	Number of client	No limitation (depending on limitation of VMS)		

Number of Recording server	12 VI IP servers	<p>– (only main server should be registered)</p> <p>–</p> <p>* Only main server should be registered, Federated architecture is not supported</p>	<p>– (Management servers should be registered)</p> <p>–</p> <p>* Management server should be registered, Federated architecture is not supported</p>	Luxriot Evo Server should be registered.	12 Network disk recorders
Number of i-PRO Active Guard server per a client	<p>No limitation</p> <p>(depending on capability of whole system)</p>				100

Supported AI applications	For plugin	AI-VMD / AI Sound Classification / AI Face Detection / AI People Detection / AI Vehicle Detection / AI Scene Change Detection / AI On-site Learning / AI Processing Relay / Vaxtor ALPR, ALPR MMC, OCR Genesis, OCR Container	
	For dashboard	AI Face Detection, AI People Detection, AI Vehicle Detection, AI-VMD/AI People Counting for 360-degree fisheye camera, AI-VMD, AI Occupancy detection, AI On-site Learning, Vaxtor ALPR, Vaxtor ALPR MMC	AI Face Detection, AI People Detection, AI Vehicle Detection, AI-VMD/AI People Counting for 360-degree fisheye camera, AI-VMD, AI Occupancy detection / AI On-site Learning / Vaxtor ALPR, Vaxtor ALPR MMC
Store	Retention period	Max. 31 days limitation for face, people or vehicle data / Max. 92 days limitation for people counting data * Max. 397 days (Image, Alarm) and 732 days (Counting data) by upgrading SQL Server Standard edition or higher	
Post Search	Filter	People, Vehicle (attribute, region of interest, date & time, camera, moving direction) Face (similar face, region of interest, date & time and camera) LPR (License plate number, country, vehicle type, color, brand, model, moving direction, date & time, camera) OCR (OCR code, date & time and camera) Container (container code, size code, owner country / city / company), date & time and camera	

	Similar search	People and vehicle (by same attribute information as detected ones), Face (search for similar faces or region of interest), LPR (license plate number) and OCR (OCR code and container code)
	Sort	Descending, Ascending, Relevance (Face, People, Vehicle, LPR and OCR) Timeline view (VI, Genetec and ASM300 only)
	Watch list alarm	Up to 30,000 faces, Up to 12 people attributes, Up to 12 vehicle attributes Up to 12 License plate groups or attributes, Up to 12 OCR groups

Alarm	Detection alarm	<p>AI Sound Classification (Gunshot / Yell / Vehicle horn / Glass break)</p> <p>AI-VMD</p> <p>(Intruder / Loitering / Direction / Line cross /</p> <p>On-site learning)/ LPR, OCR (OCR code, container code)</p> <p>VCA, Access Control /</p> <p>AI Scene change detection</p>	<p>AI Sound Classification (Gunshot / Yell / Vehicle horn / Glass break)</p> <p>AI-VMD (Intruder / Loitering / Direction /Line cross / On-site learning) AI Scene change detection</p> <p>AI Occupancy detection LPR</p> <p>OCR (OCR code, container code)</p>

	Related function	Show alarm on real-time, Alarm search, VMS's Rules configuration, Map overlay, Notification to mobile app, Manage alarm status				Alarm destination (plugin , camera, IO Unit or Custom HTTP) and alarm trigger can be configured.
Playback/Export	Playback	Playback video around the time of the best shot on full and multi-view	Playback video around the time of the best shot on full screen			
	Export video	Save best shot image, Export video from Recording server				
	Export Search result	HTML and CSV	HTML	HTML	HTML	HTML and CSV

Da sh bo ard	Supp orted brow ser	Microsoft Edge, Google Chrome and Firefox
	Chart	<ul style="list-style-type: none"> • People counting, occupancy statistics and heatmap when using AI-VMD/AI People Counting for 360-degree fisheye camera. • People counting, vehicle counting, object counting (enabled by on-site learning) and heatmap when using AI-VMD on fixed camera. People counting and occupancy statistics when using AI Occupancy Detection. • Chart can be plotted by the combination of each line or area of each camera for People, vehicle and on-site learning object counting. Data update interval is minimum 5 seconds for people/vehicle on-site learning object counting and 1 min for heat map. • Age and gender statistics when using AI Face Detection. Data update interval is minimum 1 min. People attribute statistics when using AI People Detection. Data update interval is minimum 1 min. Vehicle attribute statistics when using AI Vehicle Detection. Data update interval is minimum 1 min. • LPR counting when using LPR application. Data update interval is minimum 1 min.
	Cust omiz e	<p>Contents, display size, location for each chart.</p> <p>3 Layouts per user can be saved and 24 user can be registered. (Up to 4 user can be log-in at the same time)</p> <p>Basic display color theme (dark or light)</p> <p>Line chart type (Straight line / Smoothed line), line/area name for counting</p>

System requirement

		VMS	WV-ASM300
i-PRO Active Guard server installed in dedicated	<p>Up to 100 cameras</p> <p>*Camera with AI Face Detection is up to 60.</p>	<ul style="list-style-type: none"> • Intel® Core™ i7-9700 (4.9 GHz, 8 core 8 thread) or better • 32 GB of RAM or more • 64 bit operating system Microsoft® Windows 10 Pro Microsoft® Windows 10 Enterprise Microsoft® Windows 10 Education • Microsoft® Windows 10 Pro Education Microsoft® Windows 10 IoT Enterprise • *version 2004 or later • Microsoft® Windows 11 Pro Microsoft® Windows 11 Enterprise Microsoft® Windows 11 Education Microsoft® Windows 11 Pro Education Microsoft® Windows 11 IoT Enterprise • Microsoft® Windows Server 2016 Standard Microsoft® Windows Server 2019 Standard Microsoft® Windows Server 2022 Standard • Microsoft® Windows Server 2016 Datacenter Microsoft® Windows Server 2019 Datacenter Microsoft® Windows Server 2022 Datacenter • GbE network interface card 	

<p>ed server</p> <p>*Not support to install with Milestone XProtect</p>	<p>Up to 300 cameras</p> <p>*Camera with AI Face Detection is up to 60.</p>	<ul style="list-style-type: none">• Intel® Xeon® Silver 4208 2.1 GHz (8 core 16 thread) or better• 32 GB of RAM or more• 64 bit operating system <p>Microsoft® Windows Server 2016 Standard Microsoft® Windows Server 2019 Standard Microsoft® Windows Server 2022 Standard</p> <p>Microsoft® Windows Server 2016 Datacenter Microsoft® Windows Server 2019 Datacenter Microsoft® Windows Server 2022 Datacenter</p> <ul style="list-style-type: none">• GbE network interface card

i-PRO Active Guard server installed with VMS server	Up to 100 cameras	<ul style="list-style-type: none"> • Intel® Xeon® Silver 4208 2.1 GHz (8 core 16 thread) or better • 32 GB of RAM or more • 64 bit operating system <p>Microsoft® Windows Server 2016 Standard Microsoft® Windows Server 2019 Standard Microsoft® Windows Server 2022 Standard</p> <p>Microsoft® Windows Server 2016 Datacenter Microsoft® Windows Server 2019 Datacenter Microsoft® Windows Server 2022 Datacenter</p> <ul style="list-style-type: none"> • GbE network interface card 	
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i-PRO Active Guard server installed with ASM 300	Up to 4 cameras		<ul style="list-style-type: none"> • Intel® Core™ i7-10700 (4.8 GHz, 8 core 16 thread) or better • 16 GB of RAM or more • 64 bit operating system • Microsoft® Windows 10 Pro version 20H2 or later, Microsoft® Windows 11 (64 bit) • GbE network interface card • Graphic: NVIDIA Quadro P1000, NVIDIA T1000
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Note : i-PRO Active Guard server can be run on Microsoft® Hyper-V with Windows Server 2022 and VMware® ESXi 7.0 Update 3. When using virtual platform, CPU, memory, network adapters, and storage may become bottlenecks.

Please consider in advance the allocation of sufficient CPU, memory, and network settings to meet the above hardware requirements.

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Important

- Safety Precautions : Carefully read the Basic Information, Installation Guide and Operating Instructions before using this product.
- i-PRO Co., Ltd. cannot be held responsible for the performance of the network and/or other manufacturers' products used on the network.
- When monitoring remotely, please pay attention to the network design.
- For details, please contact your local i-PRO sales representatives.

All images are for illustrative purposes only.
Specifications are subject to change without notice

https://i-pro.com/products_and_solutions/surveillance


Documents / Resources

	<p>i-PRO AI Applications [pdf] User Guide</p> <p>WV-X15xxx, WV-X22xxx, WV-X25xxx, WV-S1136, WV-S1536LTN, WV-S2536LTN, AI Applications, AI, Applications</p>
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References

- [User Manual](#)

 i-PRO

 Ai, AI Applications, Applications, i-PRO, WV-S1136, WV-S1536LTN, WV-S2536LTN, WV-X15xxx, WV-X22xxx, WV-X25xxx

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