i-PRO

i-PRO AI applications

**AI Video Motion Detection / AI Privacy Guard
AI Sound Classification / AI Face Detection
AI People Detection / AI Vehicle Detection
AI Occupancy Detection / AI Scene Change Detection
AI-VMD/AI People Counting for 360-degree fisheye camera
AI Privacy Guard for 360-degree fisheye camera
i-PRO Active Guard**

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.
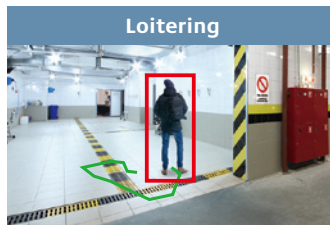
i-PRO AI applications

AI Video Motion Detection (AI-VMD)

• AI differentiates between vehicles, motorcycles, bicycles, and people. It further detects and sends warning notifications when they enter a specified area.
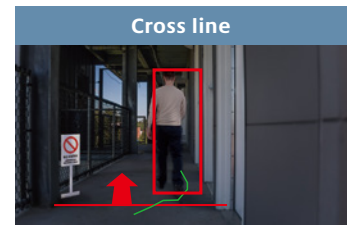 It can also count the number of times the target object crosses line.
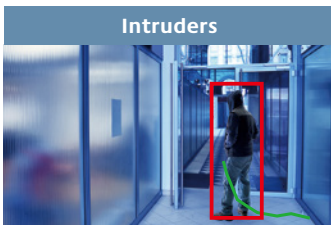
Intruders	Loitering	Direction	Cross line
• It is possible to issue an alarm when a moving object enters a specified area.	• It is possible to issue an alarm when a moving object enters a specified area and stays there for a specified amount of time.	• It is possible to issue an alarm when a moving object enters a specified area and moves in the specified direction.	• It is possible to issue an alarm when an object moving in the specified direction crosses a specified threshold.

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.

Factory		Retail stores	
Original image	Processed image	Original image	Processed image

Privacy Guard target	Face, Human
Stream	Stream(1), Stream(2), Stream(3), Stream(4), Stream(2)&(4)
Masking method	Blurring, Block

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.

Gunshot

Yell

Vehicle horn

Glass break

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

External microphone is required.*
*Frequency characteristics: support 200 Hz to 8 kHz, Omnidirectional microphone.

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.
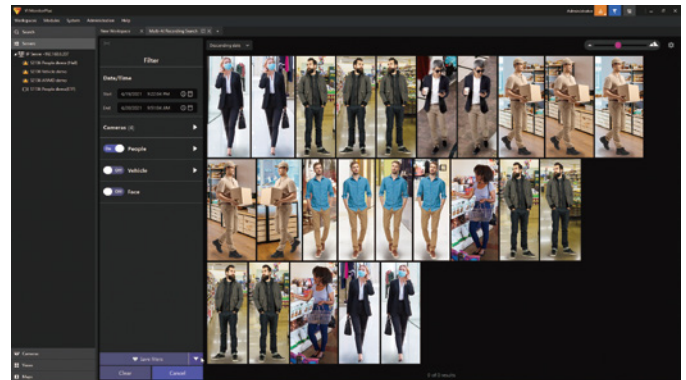
Super Dynamic: OFF **Super Dynamic: 144dB** **Surgical mask**
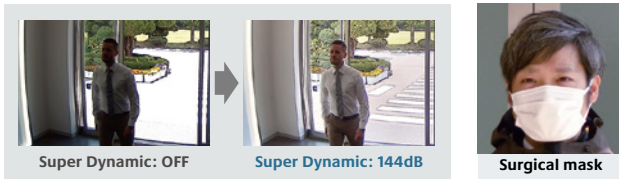
Range of angle	Horizontal : 0° - 45°, Vertical : 0° - 30°
Detection number at the same time	Max. 8 faces
Size of face image	Min. size : width 30 pix
	Recommend : 60 pix
Min. illumination level	100 lux
Max. number of cameras	20 when installed with VMS server PC
	60 when installed in dedicated server PC
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 / Hat
Hair color	Black / Brown / White / Gray / Gold
Sunglasses	Sunglass / 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 pix
		Recommended size : width 100 pix
	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

Mask
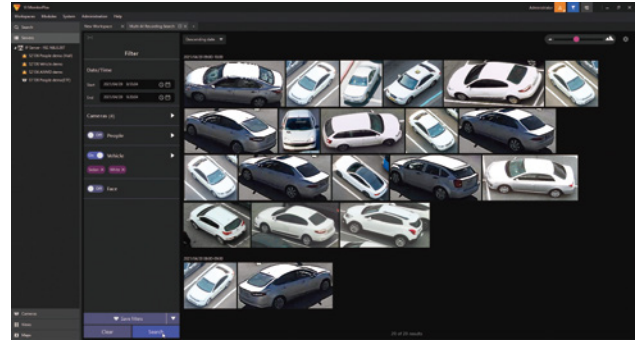
Beard

Hat

Sunglass

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.

Vehicle Type

Truck   Bus   SUV   Van   Sedan   Pickup Truck   Two-Wheel

Vehicle Color

Black   Brown   White   Gray   Red   Blue   Yellow   Green   Purple   Pink

Conditions	Range of angle	Vertical: 0 to 90°
	Detection number at the same time	Max. 20 vehicle
	Size of vehicle image	Min. size: 70 pix for the shorter axis (about 15-20 m ahead)
		Recommended size: 112 pix 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 people in a specified area and issues an alarm when the number exceeds a specified threshold.
Information of the number of people in the area can be output externally via HTTP or MQTT.
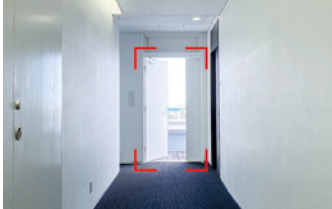
Size of people image	Min. size: width 64 pixel (in case of S series 2MP model)
Detectable angle of view	Vertical : 0° to 45°
Max. number to detect at the same time	Max. 40 people
Detection Area	Max. 4 areas (polygonal)
Number of people to detect	1 to 40 people/area
Detection time	1 to 600 sec/area
Recommended location to install	Indoor
Min. illuminance	50 lux
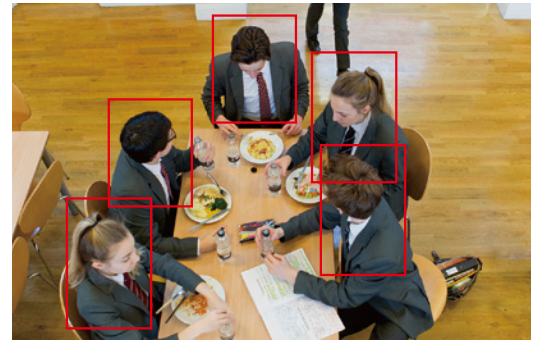
*Example image of detection processing.

AI Scene Change Detection

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

| Left behind object	Door movement	Parking vacancy	Out-of-stock product
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-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.
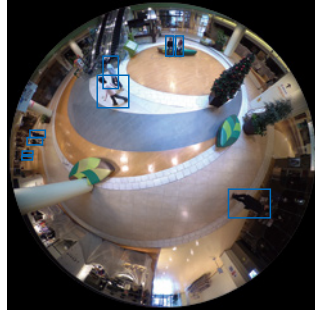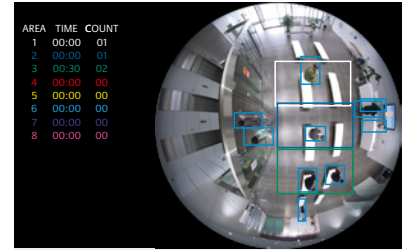
People Counting

• **Cross Line Counting:**
Counts the number of people moving in a specified direction and cross a specified threshold.

• **Area Counting(Queue Management):**
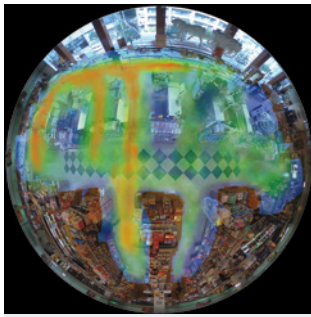Counts the number of people in the set area.
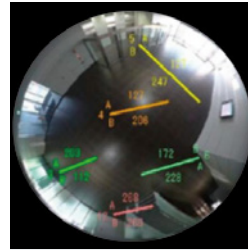
Cross Line Counting

Area Counting

Heat map

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

Passing

Loitering

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.
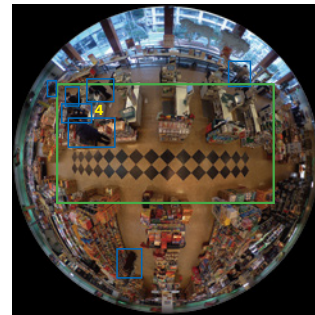
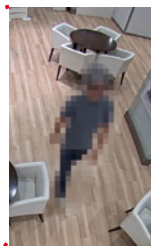# AI Privacy Guard for 360-degree fisheye camera

AI Privacy Guard

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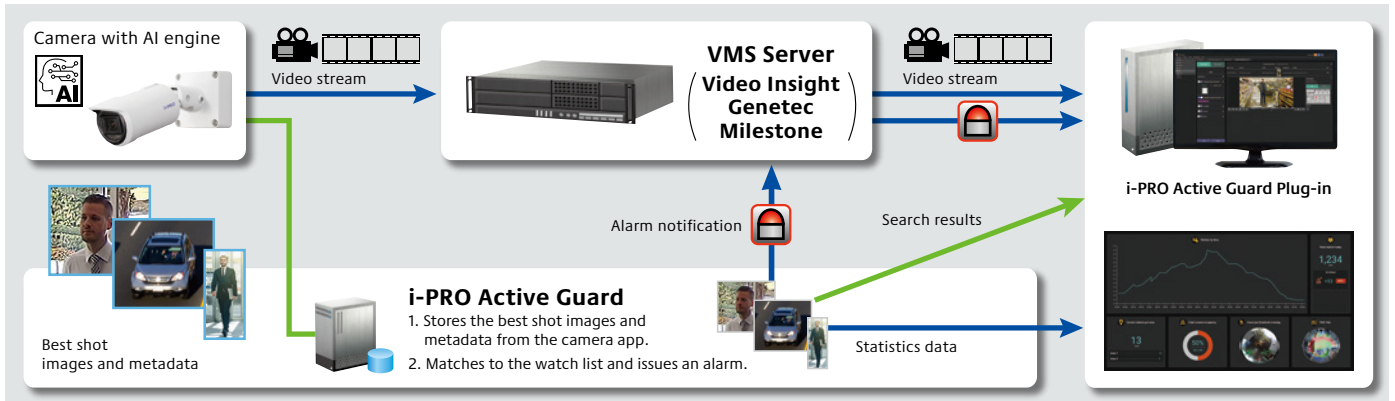

Original image

Processed image
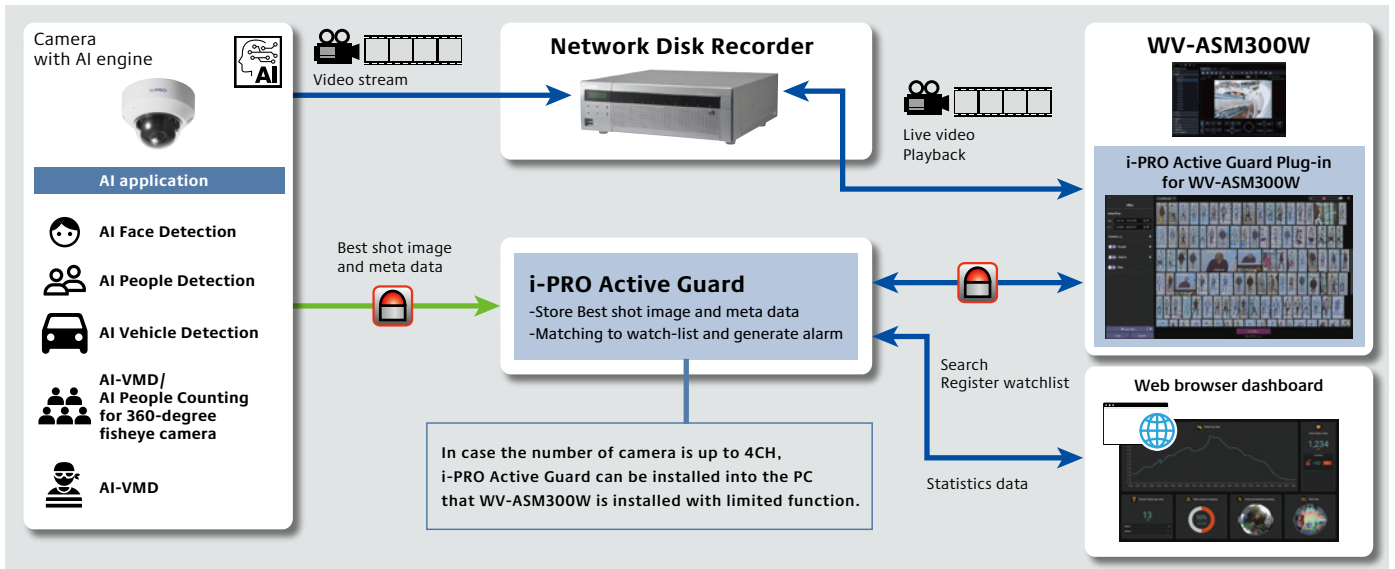
i-PRO Active Guard

- 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 for Video Insight / Genetec / Milestone

Camera with AI engine

Video stream

VMS Server
Video Insight
Genetec
Milestone

Video stream

i-PRO Active Guard Plug-in

Best shot images and metadata

Alarm notification

Search results

i-PRO Active Guard
1. Stores the best shot images and metadata from the camera app.
2. Matches to the watch list and issues an alarm.

Statistics data

To use the system for Milestone, i-PRO Active Guard Plug-in for XProtect developed by ORBNET SYSTEM LTD is required. https://www.milestonesys.com/marketplace/i-pro--co.-ltd/

Example of a basic system connection for WV-ASM300W/Network disk recorder

Camera with AI engine

Video stream

Network Disk Recorder

Live video Playback

WV-ASM300W

i-PRO Active Guard Plug-in for WV-ASM300W

AI application

- AI Face Detection
- AI People Detection
- AI Vehicle Detection
- AI-VMD/ AI People Counting for 360-degree fisheye camera
- AI-VMD

Best shot image and meta data

i-PRO Active Guard
- Store Best shot image and meta data
- Matching to watch-list and generate alarm

Search
Register watchlist

Web browser dashboard

Statistics data

In case the number of camera is up to 4CH, i-PRO Active Guard can be installed into the PC that WV-ASM300W is installed with limited function.

			Video Insight system	Genetec system	Milestone system	WV-ASM300W/ Network disk recorder system
System (i-PRO Active Guard)	Scale	Supported camera	i-PRO network camera with AI engine			
		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 60)		1 to 300CH when installed in dedicated server (AI Face Detection is up to 60)	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	- (only main server should be registered)	- (Management server should be registered)	12 Network disk recorders
		Number of i-PRO Active Guard server per a client	No limitation (depending on capability of whole system)			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 Face Detection / AI People Detection / AI Vehicle Detection	AI Face Detection / AI People Detection / AI Vehicle Detection	AI-VMD / AI Sound Classification / AI Face Detection / AI People Detection / AI Vehicle Detection / AI-VMD/ AI People Counting for 360-degree fisheye camera / AI Scene change detection
		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			
	Store	Retention period	Max. 31 days limitation for face, people or vehicle data / Max. 92 days limitation for people counting data * Max. 366 days by upgrading SQL Server Standard edition or higher			
	Post Search	Filter	People, Vehicle (attribute, date & time, camera, moving direction) Face (similar face, date & time and camera) LPR	People, Vehicle (attribute, date & time, camera, moving direction) Face (similar face, date & time and camera)		
		Similar search	Yes (by same attribute information) *People and Vehicle(by same attribute information) and Face			
		Sort	Descending, Ascending, Relevance (Face , People and Vehicle)			
	Alarm	Watch list alarm	Up to 1,000 faces, Up to 12 people attributes, Up to 12 vehicle attributes			
		Detection alarm	AI Sound Classification (Gunshot / Yell / Vehicle horn / Glass break) AI-VMD (Intruder / Loitering / Direction / Line cross) LPR, VCA, Access Control / AI Scene change detection	AI-VMD, AI Sound Classification are supported in Genetec Security Center and Security Desk (not plugin)	AI Scene change detection *AI-VMD are supported in XProtect (not plug-in)	AI Sound Classification (Gunshot / Yell / Vehicle horn / Glass break) AI-VMD (Intruder / Loitering / Direction / Line cross) / AI Occupancy detection / AI Scene change detection
		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 and CSV
	Dashboard	Supported browser	Microsoft Edge, Google Chrome and Firefox			
		Chart	People counting, occupancy statistics and heatmap when using AI-VMD/AI People Counting for 360-degree fisheye camera. People counting and vehicle counting when using AI-VMD. People counting and occupancy statistics when using AI Occupancy Detection. Data update interval is minimum 15 seconds for people/vehicle 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.			
		Customize	Contents, display size, location for each chart. 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) Basic display color theme (dark or light) Line chart type (Straight line / Smoothed line) , line/area name for counting			