



P-Series
Multi-Sensor & Directional Cameras
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Agenda

- Introduction
- How to monitor large spaces
- Multi-directional Key Performance Specifications (many shared features with Multi-Imager)
- Multi-Imager Key Performance Specifications
- Q&A

Notes:

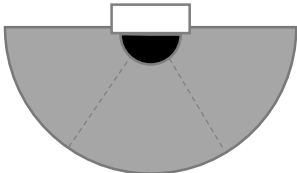

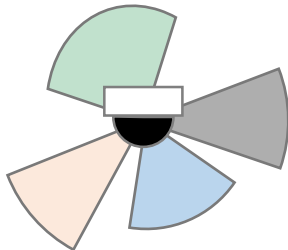
- This webinar is being recorded and will be available for replaying. The presentation materials will also be available in PDF format.
- Please visit <https://www.hanwhasecurity.com/trainings/webinars/> to view webinars & sign up for future webinars.
- We will take Q&A time permitting. In case there is not time to get to all of the questions, we will reply to you individually afterwards. Please use the Chat or Q&A section.
- All participants have been put in to listen only mode.

New - 5 Year Warranty Program on all Hanwha Techwin America products



- For GOLD and SILVER STEP DEALERS
- 3 Years on HDD, Fan/Belt, Pan/Tilt, Slip-Ring for PTZ cameras
- Advance Replacement, No Questions Asked DoA policy.

How to monitor large spaces?

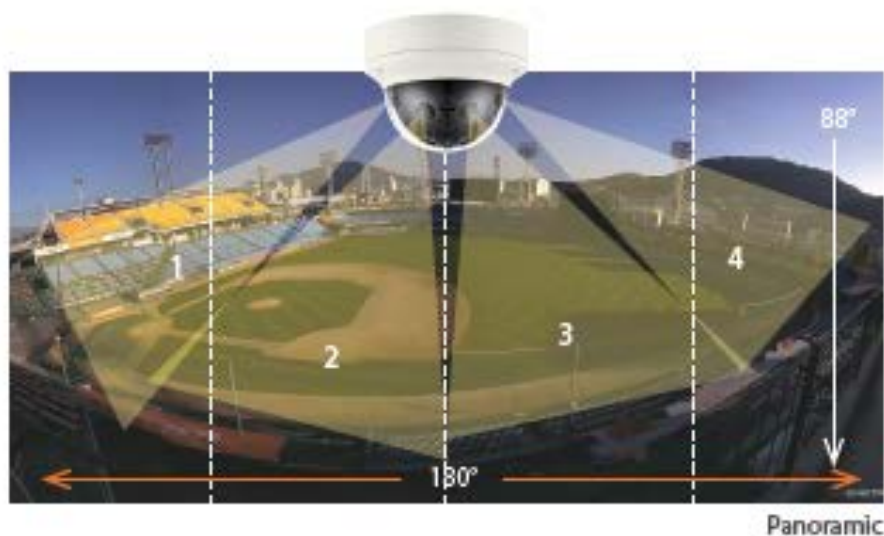
Type	Multi-Imager Camera (180/270 Panoramic camera)	Fisheye Camera (360 Panoramic camera)	Multi-Directional Camera
Target	City, Commercial, Sports - Hall, Plaza, Runway, Stadium	Retail, Commercial - Lobby, Warehouse, Stair, Hallway	Commercial, Logistic, City - Shopping mall, Warehouse, Crossroads
Purpose	Surveil overall the situation on a specific area in massive site.	Surveil the whole area using single camera without blind spot.	Surveil the wide area using single camera instead of 4 cameras.
FoV			

- Designed to outperform the competitors.
- Designed to be full featured/performance enabled.
- Designed to be reliable
- Designed to be available

Four Cameras in One

Hanwha's Wisenet P series PNM-9020V multi-sensor cameras have four sensors, providing an 180° panoramic wide view with up to 7.3 megapixel high resolution within a single camera instead of installing 4 cameras. They offer a seamless single image by merging 4 images from each sensor.

Using PNM-9080VQ and PNM-9081VQ multi-sensor/multi-directional cameras, you can monitor multiple directions simultaneously without blind spots making them ideal for wide areas such as shopping mall entrances, lobbies and airports.

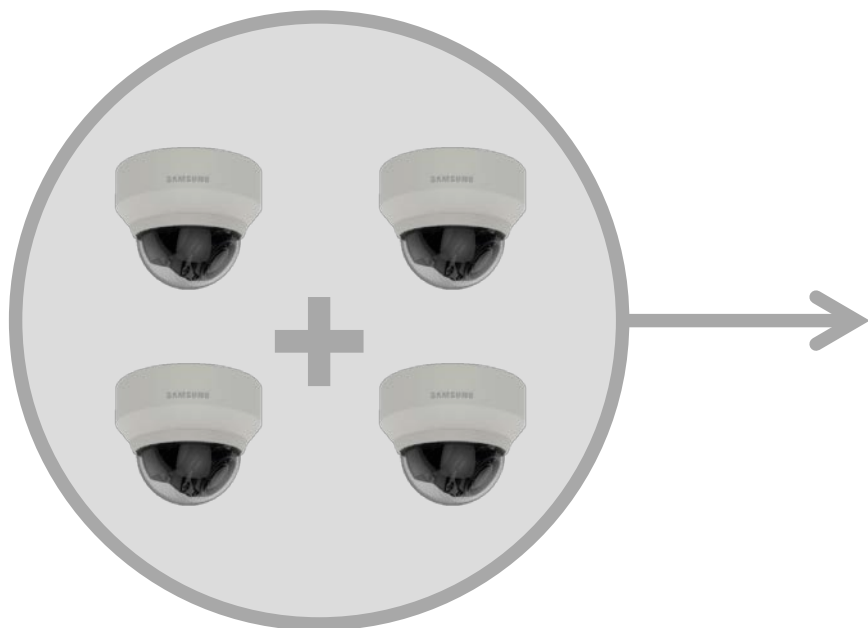


Multi-sensor Camera Lineup

	8MP	20MP
Panoramic	 PNM-9020V	
Multi-directional	 PNM-9080VQ	 PNM-9081VQ

Multi-Directional Camera

- 4 in One
 - Use one camera to replace 4 cameras, monitor large spaces easily.
 - Easy Installation ; use one IP address
 - Quicker installation
 - Fewer network drops, ports on switch, devices to maintain



PNM-9080VQ : 2MP x 4 = 8MP

PNM-9081VQ : 5MP x 4 = 20MP

Outdoor Vandal Rated Multi-Directional Camera



- Triple Codec **H.265/H.264/MJPEG** (The First Multi-Directional camera with H.265)
- **The highest frame rate multi-directional camera in the market**
 - Up to 60fps per imager @ 2MP X 4 (PNM-9080VQ)
 - Up to 30fps per imager @ 5MP X 4 (PNM-9081VQ)
- **True WDR** (Can provide up to 30fps per imager WITH WDR enabled)
 - 120dB (PNM-9081VQ)
 - 150dB (PNM-9080VQ)
- **Motorized vari-focal lens control**
 - 3.6~9.4mm (102.5° ~ 38.7°) on the PNM-9081VQ
 - 2.8~12mm (119.5° ~ 27.9°) on the PNM-9080VQ
- **Overhead view support (1 camera pointing straight down)**
- **Hallway view for any channel**
- **DIS with Gyro**
- **WiseStream II**
- **SD Card recording – 4x microSDXC slots, up to 256Gb for each imager, total of 1Tb of storage**
- **License-Free Intelligent Video Analytics**
 - Tampering, Loitering, Directional Detection, Defocus Detection, Fog Detection, Virtual Line, Enter/Exit, (Dis) Appear, Motion Detection
- **Power:**
 - 60W HPoE (PNM-9081VQ, injector is included)
 - 30W 802.3at PoE+(PNM-9080VQ), injector NOT included
- **IP66 / IK10**

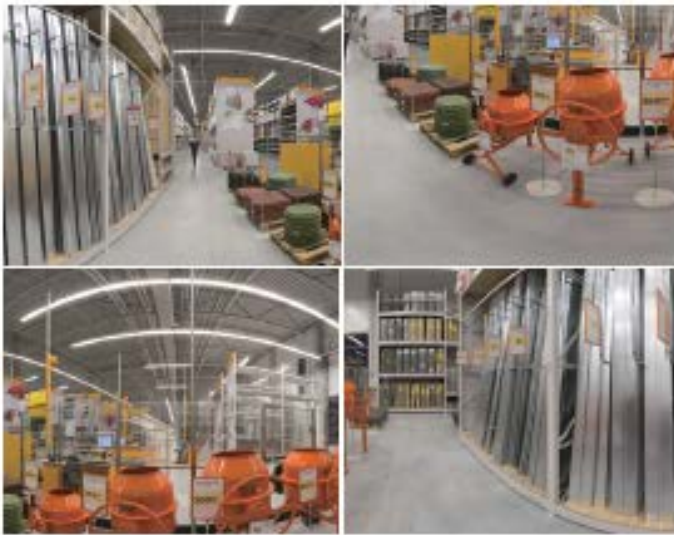


Demo Videos

- PNM-9080QV high frame rate & Sample Videos

Optimized for Indoor and Outdoor Environments

Wisenet P series multi-sensor/multi-directional cameras provide a wide area of coverage in extreme detail.



Warehouses

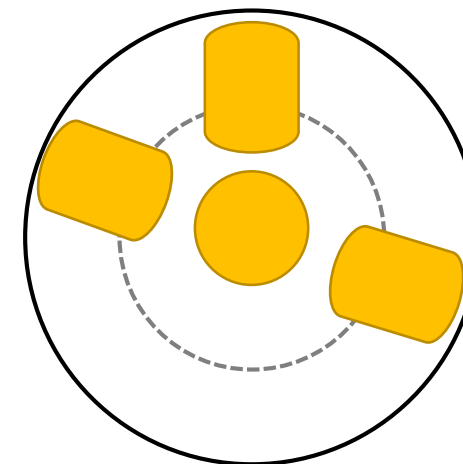
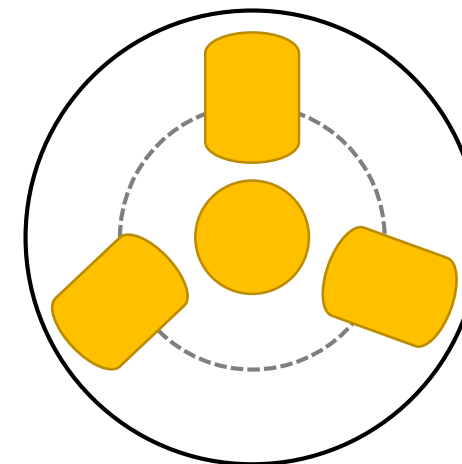
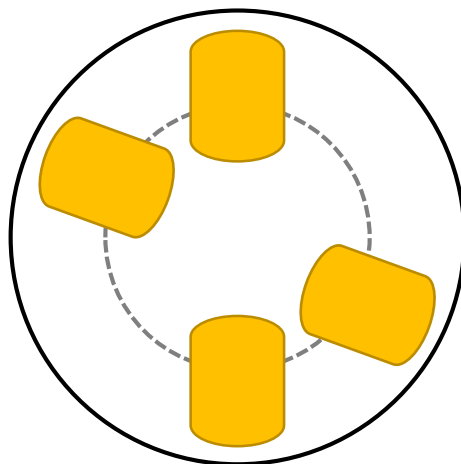
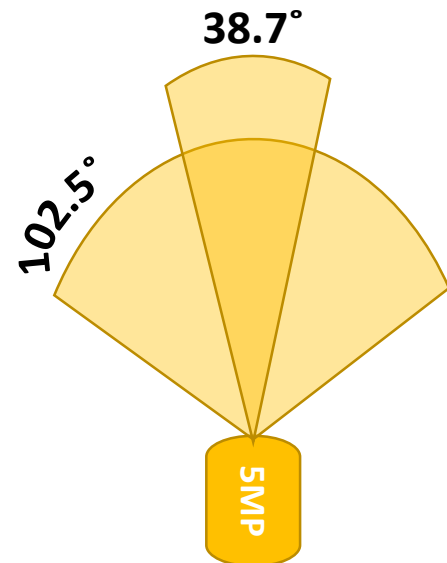
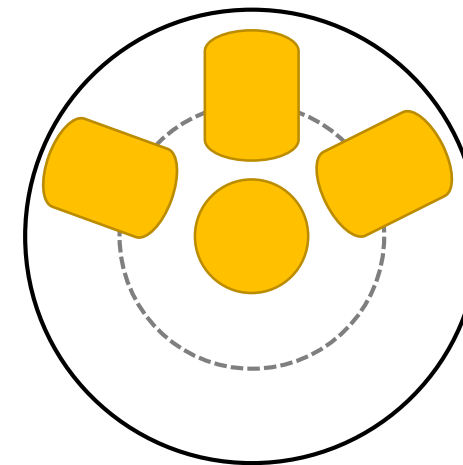
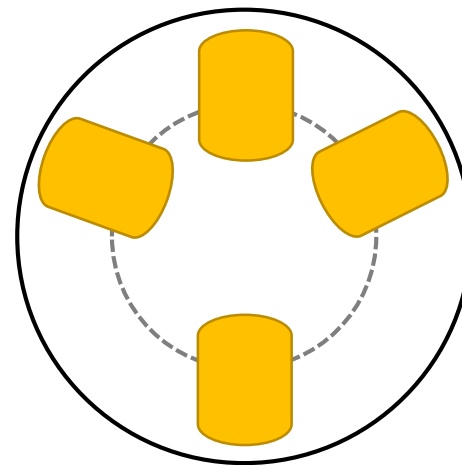
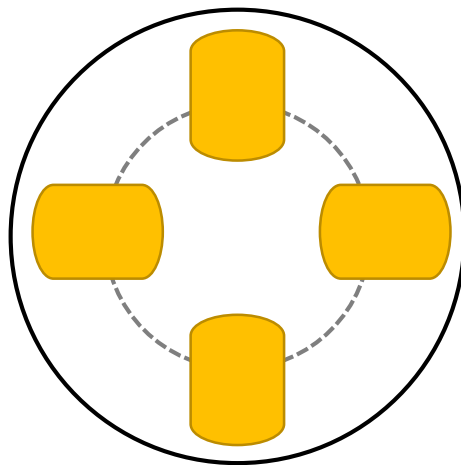
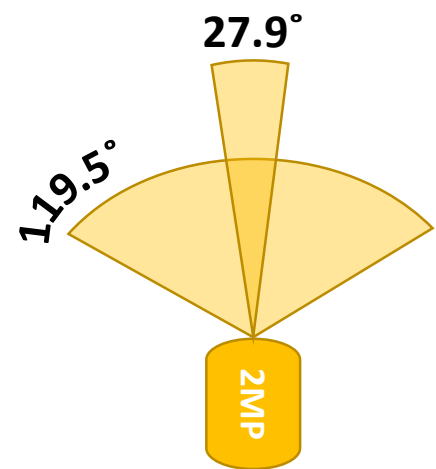


Mall entrances



Large outdoor areas

Multi-Sensor Multi-Directional Many of the Possible Positions



Multiple View Modes

The four sensors in the multi-sensor/multi-directional camera move independently of one another. In addition, one of the sensors can easily be removed and attached in the center of the camera, allowing for flexible set-up.

PNM-9080VQ/9081VQ



Natural and Clear Images

A fisheye camera is optimal for focusing on the center of an image. However, the multi-directional camera, with 4 sensors, shows clearer at the edge of each image.



Fisheye camera



Low pixel density



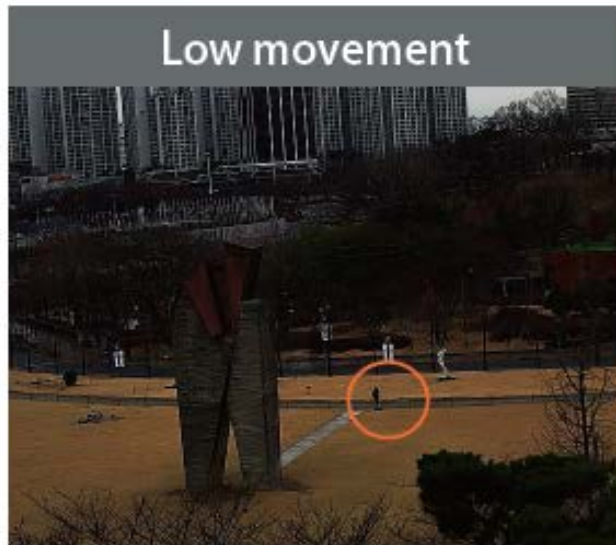
PNM-9080VQ/9081VQ

Uniform pixel density
across all images

Superior & customizable bandwidth reduction

Improve Bandwidth by up to 99% Using WiseStream II

The combination of H.265 compression and WiseStream II, a complementary compression technology that dynamically controls encoding, balancing quality and compression according to movement in the image, result in data reduction of up to 99%. This translates into significant savings on bandwidth, storage and cost.



WiseStream II OFF : 7160kbps
WiseStream II ON : 71.60kbps

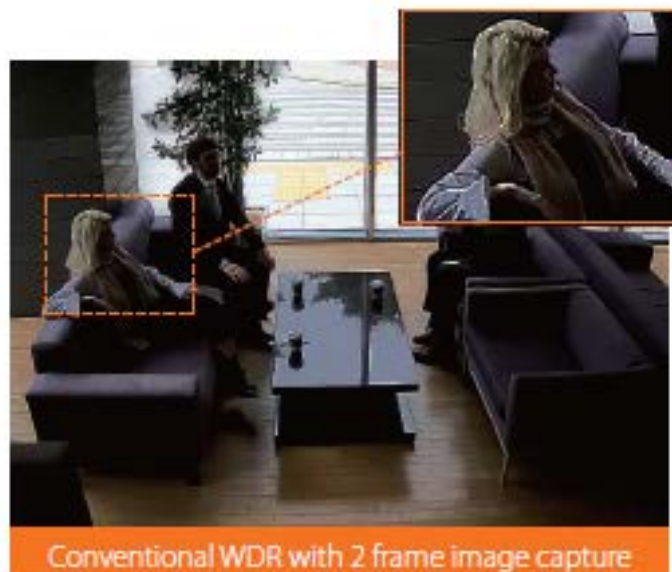
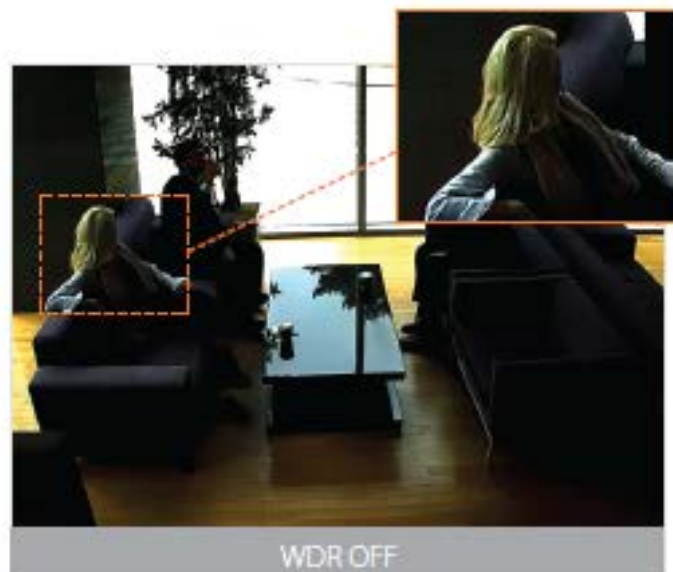


WiseStream II OFF : 7260kbps
WiseStream II ON : 3630kbps



Best-in-Class 150dB Wide Dynamic Range (WDR)

Conventional WDR captures images by taking 2 frames taken at different exposures, whereas the multi-sensor/ multi-directional cameras utilize 4 frame capture at different exposure levels to create a combined image. With the development of cutting-edge WDR technology, these cameras address a limitation found in conventional WDR cameras while producing clear and vivid images. (PNM-9080VQ)



Highlight Compensation (HLC)

Cameras detect areas of an image that are overexposed and reduces the brightness of these areas, improving the overall quality and usability of the image. (PNM-9080VQ and PNM-9081VQ)



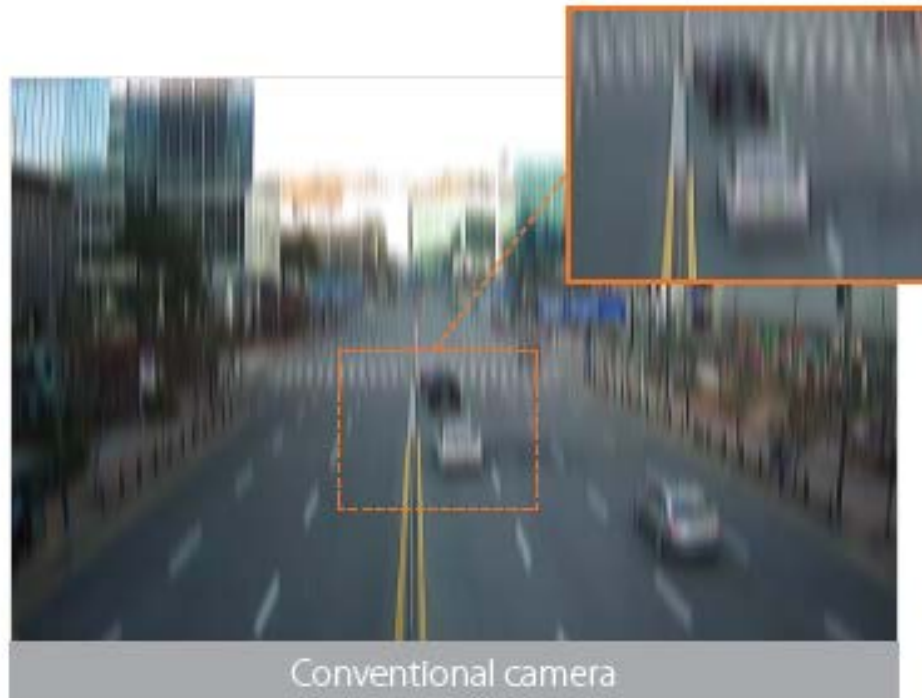
Monitor Color Images Even in Low-Light Environments

With the new, powerful Wisenet 5 chipset and processing technology, combined with Hanwha Techwin's outstanding lens technology, the multi-sensor/multi-directional cameras achieve optimal performance in low-light conditions by capturing and producing crystal-clear images including true-color images without IR LEDs, regardless of the environment or time of day. (PNM-9080VQ and PNM-9081VQ)



Improved Digital Image Stabilization (DIS) with Gyro Sensor

Advances in Hanwha's image stabilization technology allow for the reduction of motion blur caused by wind or vibration. A gyroscopic sensor plus DIS technology is specifically designed and engineered into multi-sensor/multi-directional cameras resulting in sharp, stable images. (PNM-9080VQ and PNM-9081VQ)



Conventional camera

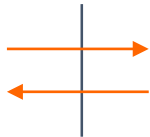
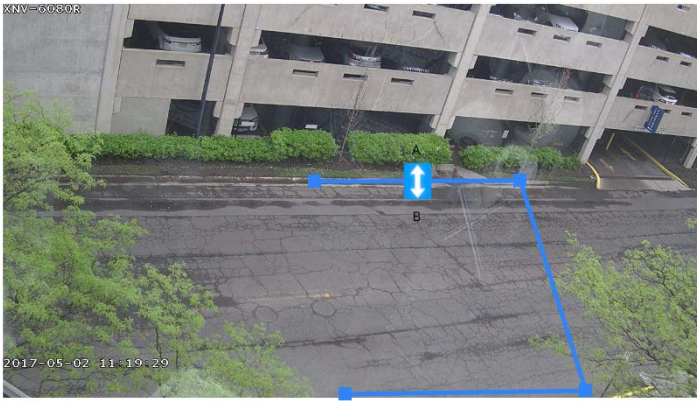


Digital Image Stabilization (DIS) with Gyro Sensor

Video Analytics

Built in on board the PNM-908xVQ cameras.

Line Crossing



- Up to 8 lines that can be preprogrammed with one way or 2 way
- One line can be broken into 8 angles for flexibility.

Intrusion detection



- Up to 8 intrusion detection boxes
- One box can be broken into 8 corners for flexibility
- Any motion within the assigned box or entering the box will trigger the intrusion detection alarm.
- You can assign Motion detection boxes and intrusion detection boxes separately.

Enter/Exit Area



- Up to 8 Enter/Exit Area
- One box can be broken into 8 corners for flexibility
- Only motion entering or exiting the box will trigger an alarm not motion inside the box.

Video Analytics

Built in on board the PNM-908xVQ cameras.

Loitering (Time)



- Up to 8 Loitering detection boxes
- One box can have up to 8 vertices for flexibility
- Any motion within the assigned box the timer starts and if the timer ended before the motion exit the box then it will trigger an alarm.



Appear/Disappear (Time)



- Up to 8 Enter/Exit detection boxes
- One box can have up to 8 vertices for flexibility
- Any static object that appeared/disappeared from the original will start the timer and if the timer ended and the object didn't show up or moved then the camera will trigger an alarm.



Video Analytics

Built in on board the PNM-908xVQ cameras.

Face detection



- Face detection event
 - Up to 35 faces at a time

Defocus detection



- Defocus detection event
- Can trigger simple focus automatically if selected

Fog detection



- Fog detection event
- Can trigger Defog automatically if selected

Video Analytics

Built in on board the PNM-908xVQ cameras.

Tampering Detection



- Tampering detection could be:
 - Spray of paint
 - Cover the lens
 - Change the position of the camera
 - Extreme out of focus

Motion Detection



- Motion detection:
 - Up to 8 Motion detection boxes
- One box can have up to 8 vertices for flexibility

The entire Wisenet P series supports Defocus Detection, which helps to identify when focus goes out and greatly improves the efficiency of the operators.

User can also adjust the optimal focus remotely via the network, greatly reducing the installation / optimization time of the camera.

① Detect defocus



② Alarm out



③ Focus control (Manual)



Digital Auto Tracking

- Detect any moving object on area including people using digital zoom feature
 - Normal : Monitor the full area
 - After detecting the object : Zoom in and trace the object



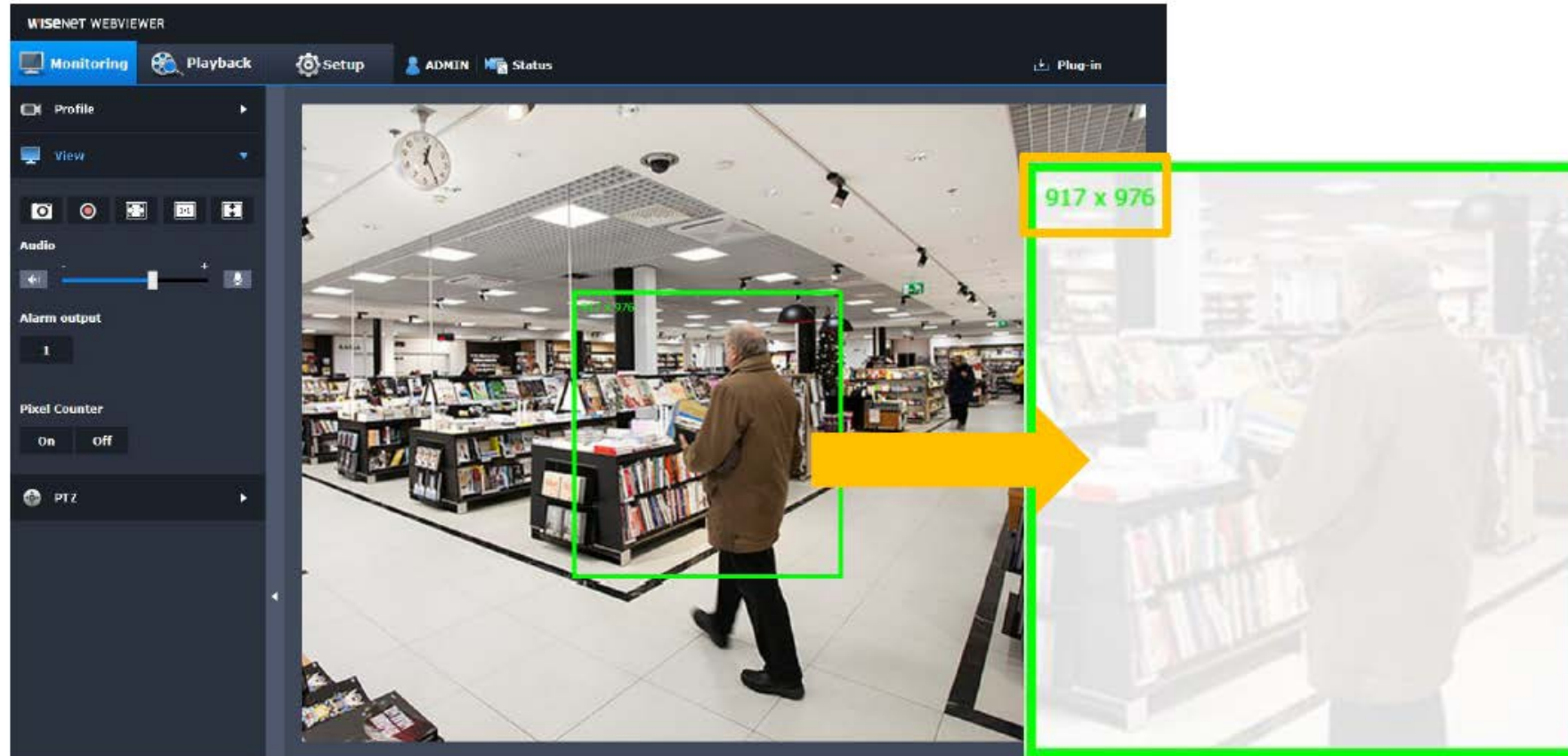
Normal



After detecting the motion
Zoom in and trace the object

Pixel Counter

- Count number of pixel for selected area
 - Only able to use on Plug-in Webviewer



Hanwha's unique PTZ hand-over feature allows an IP PTZ camera to zoom into a pre-set locations once an alarm trigger is received from another camera on the same surveillance system. This feature improves the efficiency of the system by decreasing the reliance on a security guard, or system operator to track events, and by increasing the likelihood that critical events in a surveillance area will be captured and recorded.

1. Fixed camera alarm event



2. Alarm notification sent to PTZ camera



3. PTZ camera immediately zooms into pre-set location

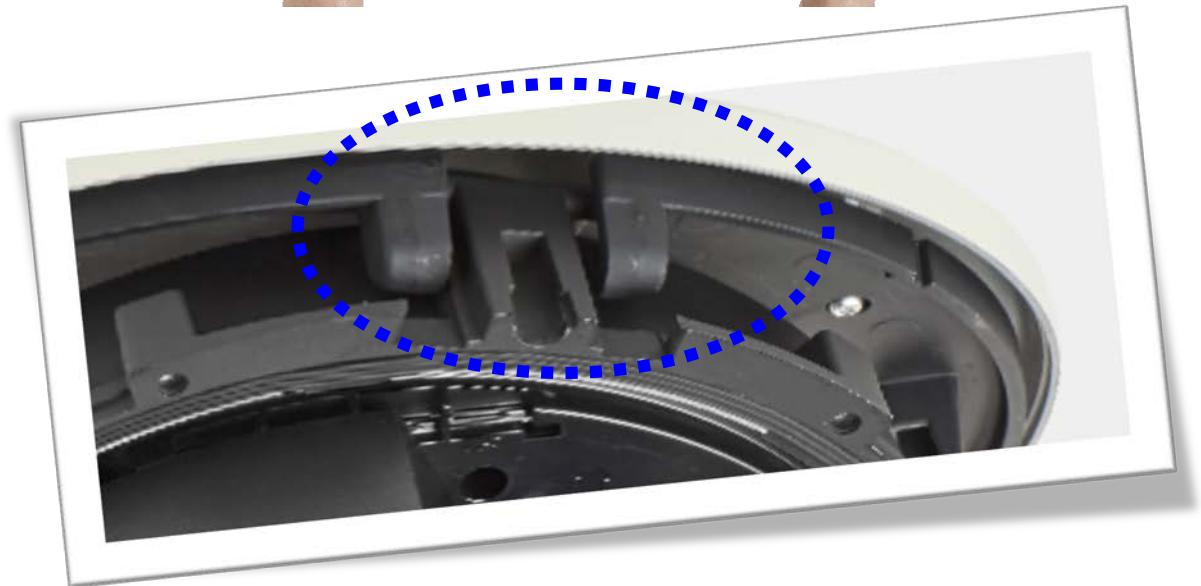


*Trigger Auto-Tracking

Multi-Directional - Easy Installation



1. Mount Plate
2. Hook camera into hinge & attach safety cable..
3. Press camera into clips to retain, tighten 2 screws
4. Adjust each camera
5. Attach dome cover.



Multi-Directional Accessories



PNM-9080VQ Streaming Performance

CH1 Stream #1 1920x1080 @ 30fps
Stream #2 1920x1080 @ 30fps
Stream #3 1920x1080 @ 30fps

CH2 Stream #4 1920x1080 @ 30fps
Stream #5 1920x1080 @ 30fps
Stream #6 1920x1080 @ 30fps

CH3 Stream #7 1920x1080 @ 30fps
Stream #8 1920x1080 @ 30fps
Stream #9 1920x1080 @ 30fps

CH4 Stream #10 1920x1080 @ 30fps
Stream #11 1920x1080 @ 30fps
Stream #12 1920x1080 @ 30fps

PNM-9081VQ Streaming Performance

CH1 Stream #1 2560x1920 @ 30fps

CH2 Stream #4 2560x1920 @ 30fps

CH3 Stream #7 2560x1920 @ 30fps

CH4 Stream #10 2560x1920 @ 30fps

OR

CH1 Stream #1 2560x1920 @ 20fps
Stream #2 2560x1920 @ 20fps
Stream #3 2560x1920 @ 20fps

CH2 Stream #4 2560x1920 @ 20fps
Stream #5 2560x1920 @ 20fps
Stream #6 2560x1920 @ 20fps

CH3 Stream #7 2560x1920 @ 20fps
Stream #8 2560x1920 @ 20fps
Stream #9 2560x1920 @ 20fps

CH4 Stream #10 2560x1920 @ 20fps
Stream #11 2560x1920 @ 20fps
Stream #12 2560x1920 @ 20fps

This Streams refer to unique profiles created in the camera. You can have 1 profile with multiple connections viewing (NVR record, live, mobile, etc.)

Settings for each Lens

- PNM-9080Q/9081Q Features

- Most competitors have GLOBAL settings that do not allow customization per lens.
- Most Competitors have a GLOBAL frame rate, with each imager taking frames from it, resulting in VERY LOW frame rates per imager.
- Video Profile (Frame rate, bit rate, bit rate mode, etc)
- Video Setup
 - Privacy area, Video rotation(Flip, Mirror, Hallway view), Analog V
- Camera Setup
 - Sensor mode, SSDR, White balance, Backlight, Exposure, etc.
- Focus Setup
 - Focus, Simple Focus
- Smart Codec, WiseStream
- Storage
 - Record profile, Normal/Event recording, Pre/Post event duration, Record file type, Overwrite, etc.
- Video Analytics
 - Motion detection, Tampering, Defocus detection, Fog detection, Face detection, IVA

Video profile

Select channel CH **1** 2 3 4 Info

Video profile connection policy ☐ Keep connection when Profile properties are changed

Video profile

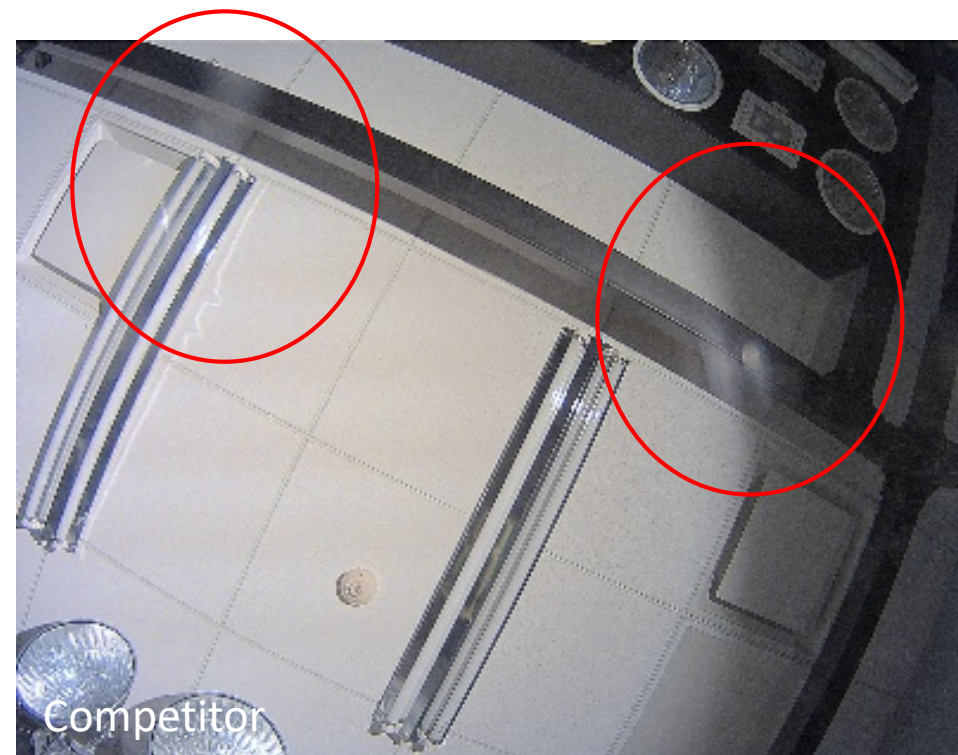
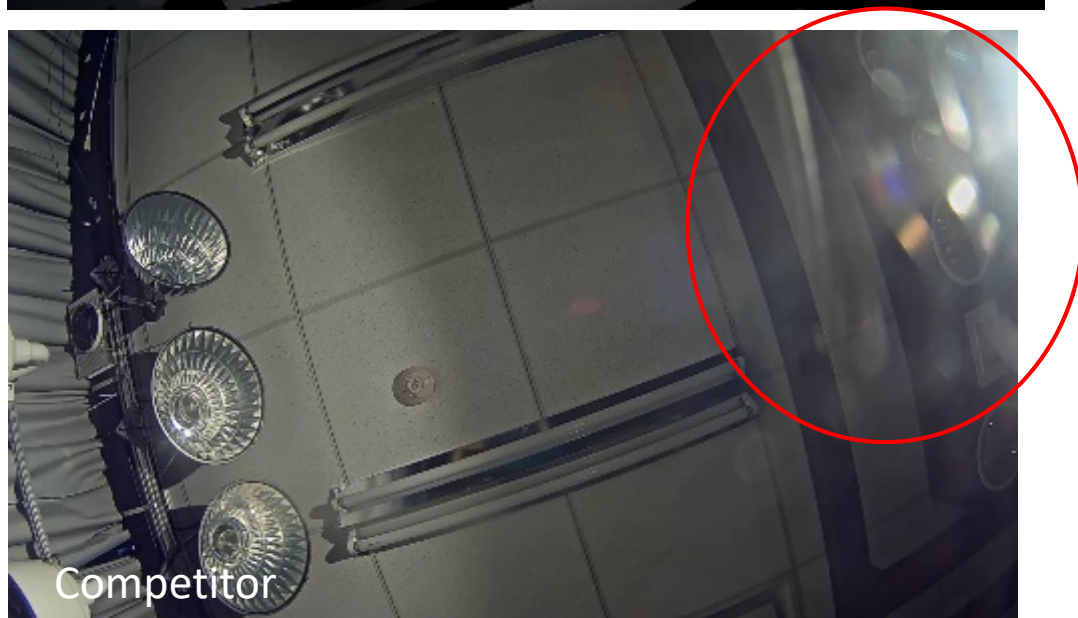
Add Delete

	Name	Codec	Type
<input type="radio"/>	MJPEG	MJPEG	Record / Event
<input checked="" type="radio"/>	H.264	H.264	Default
<input type="radio"/>	H.265	H.265	
<input type="radio"/>	MOBILE	MJPEG	

VMS Integration

- VMS sees multi-directional camera as 1x camera using 1x license, with 4x video units, similar to how most encoders work.
- Integration in place with Milestone, Genetec, Verint.
- In development or testing with ONSSI, Exacq, Mirasys, Salient, ISS, & Digifort.
- Currently, ONVIF protocol must be used with Hanwha NVRs, to register the camera 4 times. Then select the appropriate profile for each imager. PRN-4011 will be updated in August to support SUNAPI protocol. Other Hanwha NVRs will be updated Q1 2018.

Video reflections



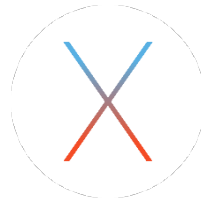
Plug-in Free Operation

The Wisenet X, P, Q series supports a Plugin/Plugin-Free architecture for cross browser support.



H.264/MJPEG @ 1280X720 / 15FPS

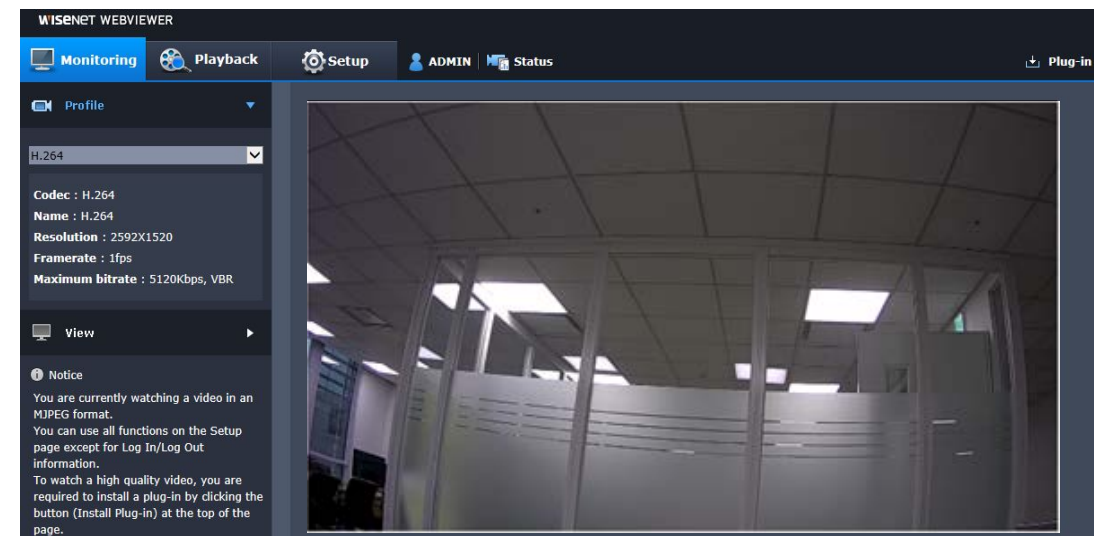
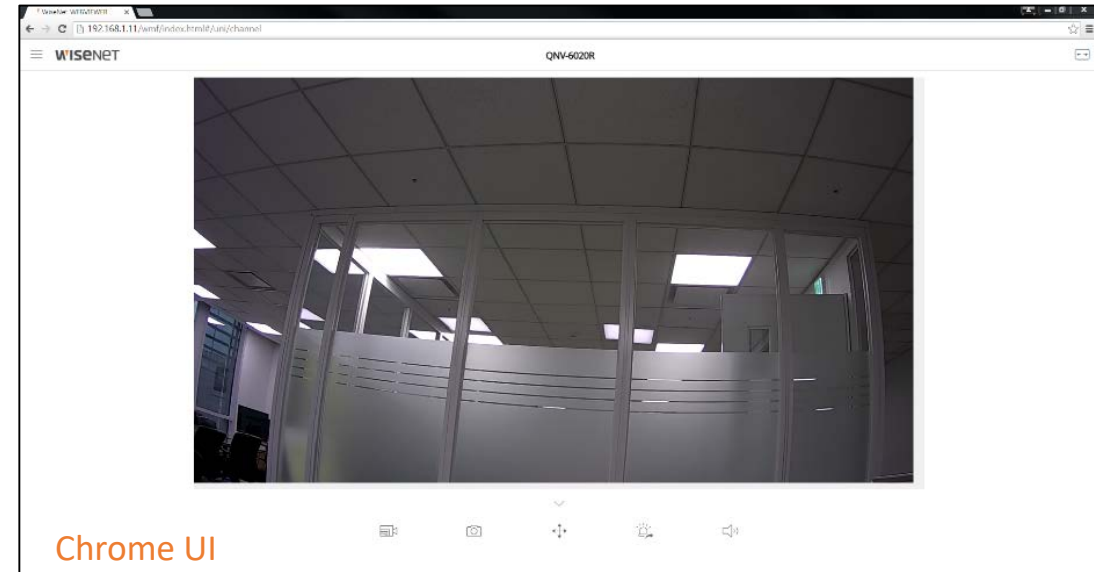
Access to Live Video, SD playback, Setup



Without Plugin installed:

MJPEG @ Max resolution / 1FPS

Access to Live Video, SD playback, Setup



Legacy plugin/plugin-free UI



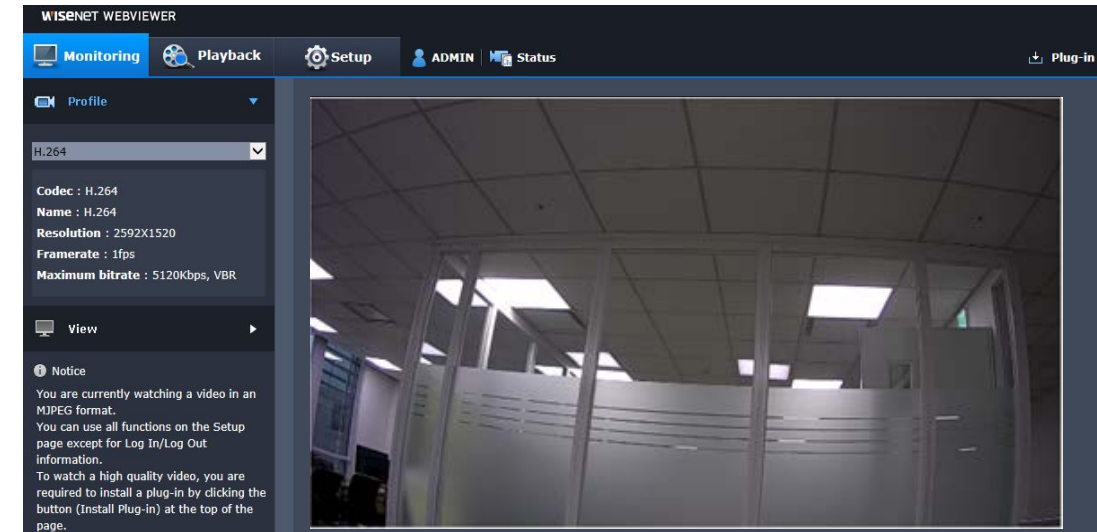
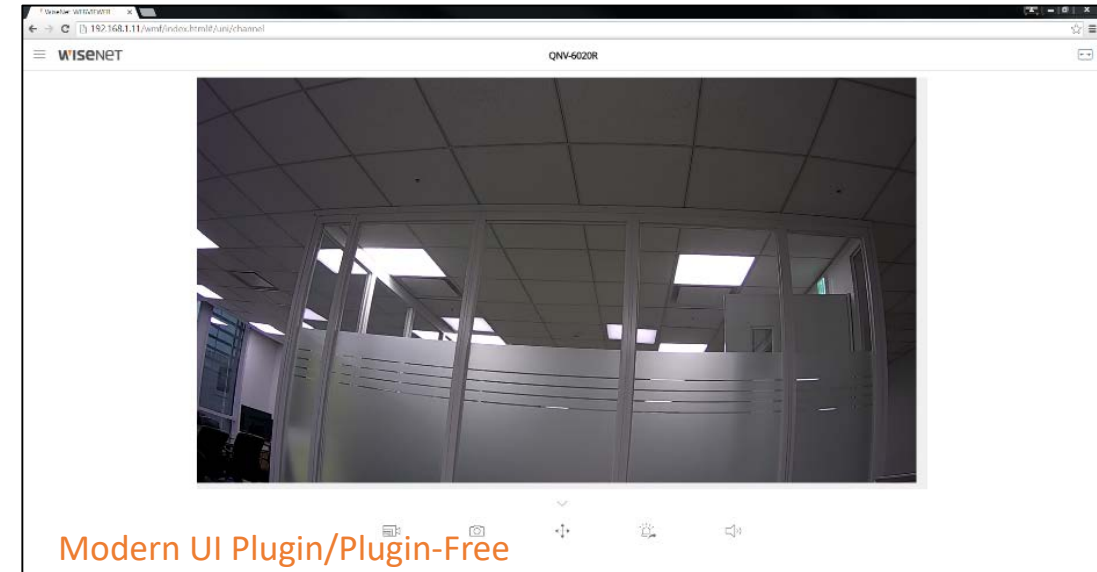
With plugin using IE, Firefox ESR, full framerate & resolution is available.

Plug-in Free Operation

The Wisenet X, P, Q series supports a Plugin/Plugin-Free architecture for cross browser support.

Depending on the OS/Browser used & if a plugin is used, the camera can display Live Video, SD Playback, & Setup:

- H.264/MJPEG @ 1280x720 / 15 FPS
- MJPEG @ Maximum resolution / 1 FPS



Legacy UI w/ plugin-free

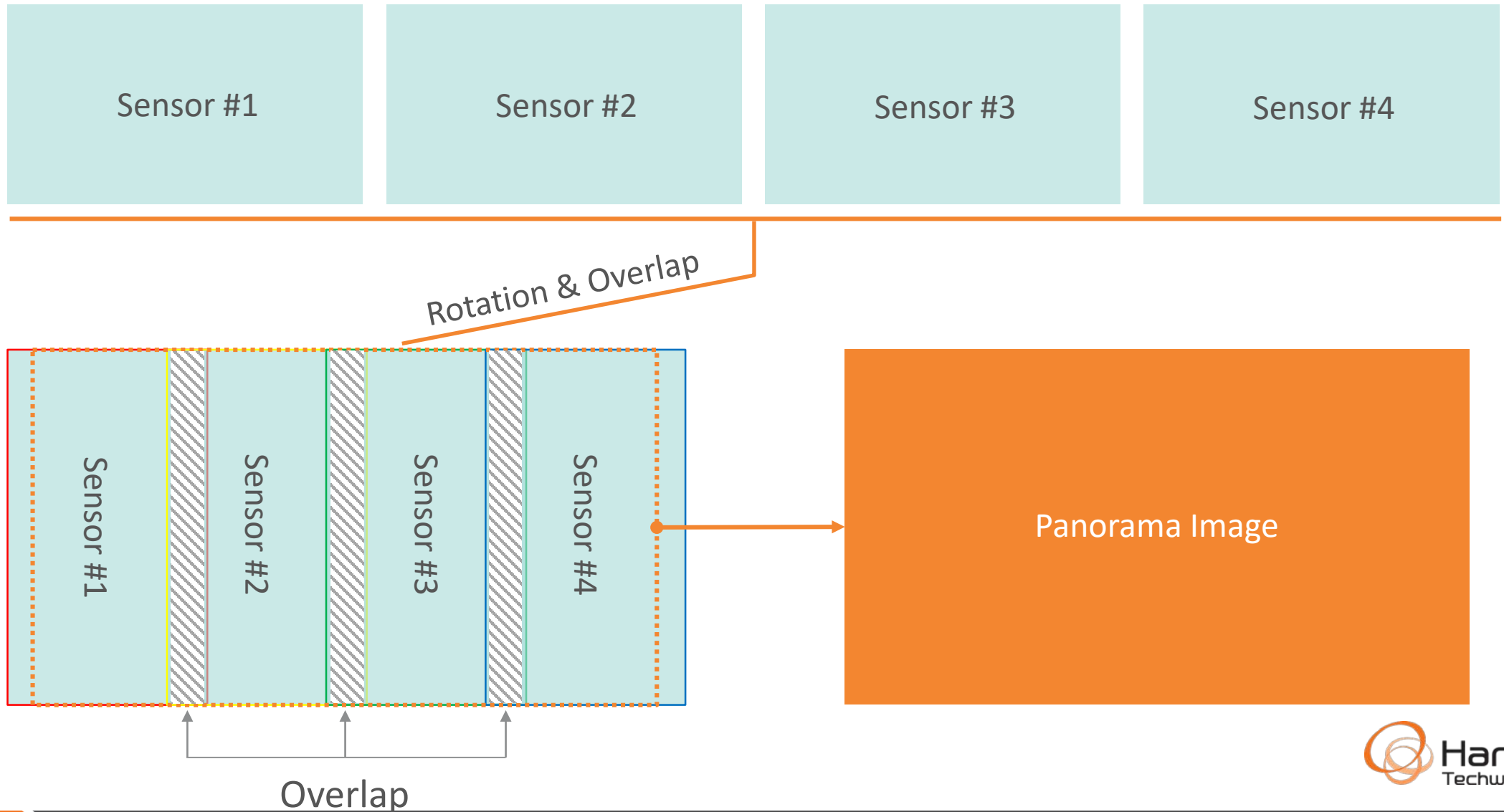
PNM-9020V – Outdoor Vandal Rated Multi-Sensor Camera

- Features of PNM-9020V
 - 4 x 1/2.8'' 2 Megapixel sensors
 - Total Resolution : 4096x1800
 - Triple Codec: **H.265**, H.264, MJPEG
 - WiseStream Smart Codec
 - **30fps@7.3MP stitched**
 - Fixed 3.6mm lenses, ganged together
 - Minimum illumination 0.3Lux
 - Onboard Stitching
 - **Digital Auto Tracking with DPTZ mode**
 - **Motion Detection, Tampering, Virtual Line, Enter/Exit, Appear/Disappear, Heatmap, PTZ Handover, Defocus Detection, Audio Detection**
 - IP66/IK10
 - PoE+ 802.3at 25.5w / 12v DC



PNM-9020V – image stitching

- Onboard Stitching



PNM-9020V



PNM-9020V



PNM-9020V



Demo Videos

- PNM-9020V Highway

Multiple View Modes

The PNM-9020V multi-sensor camera offers panoramic (16:9), half panoramic (4:3) and 3PTZ modes with a panoramic view

PNM-9020V

Panorama



Half Panorama (4:3)



Panorama + 3PTZ



PNM-9020V

Video Analytics & Privacy Masking can cross between image sensors



PNM-9020V - Heatmap

Heatmap – visualize movements and hot/cold zones for retail spaces

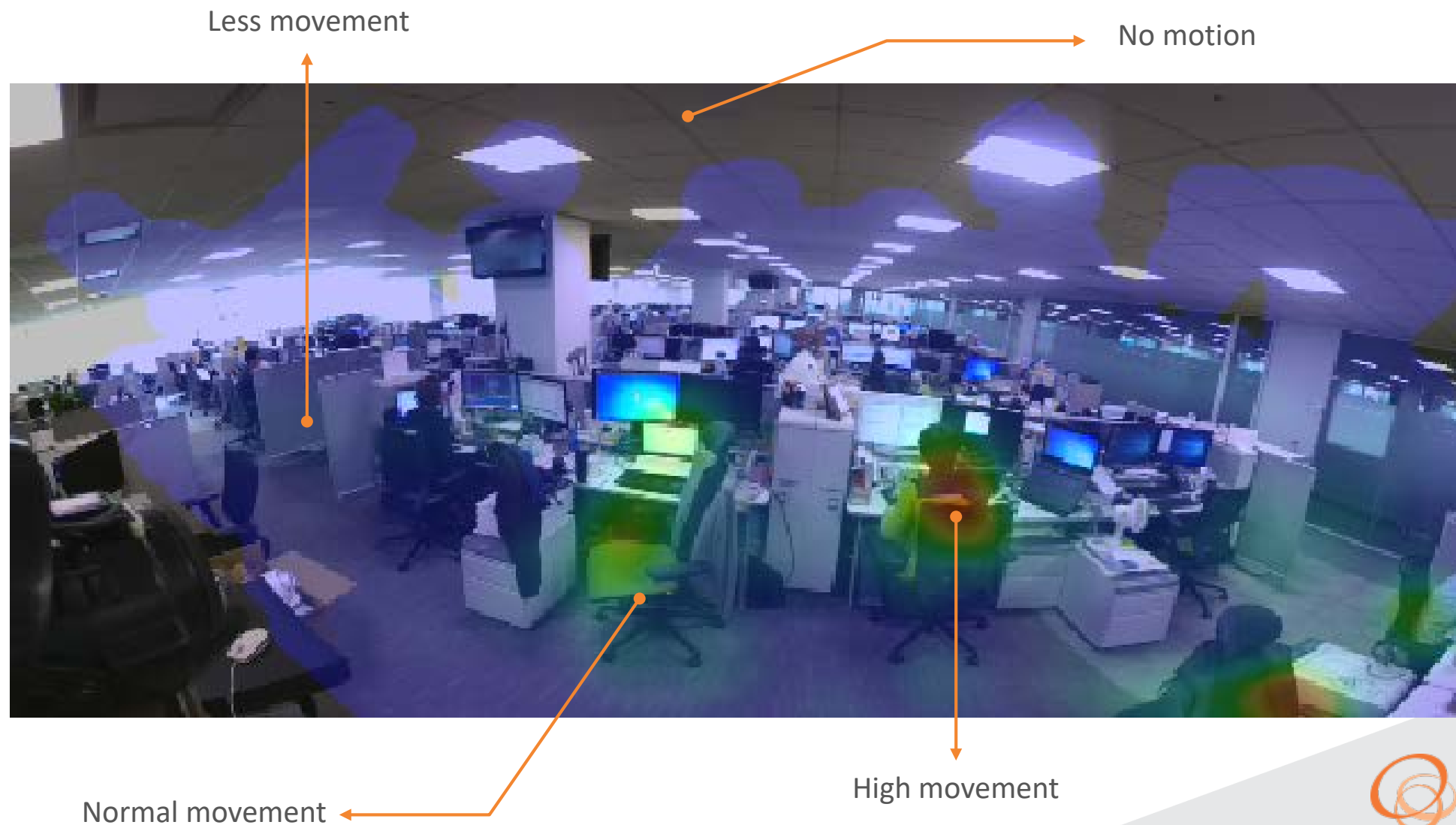
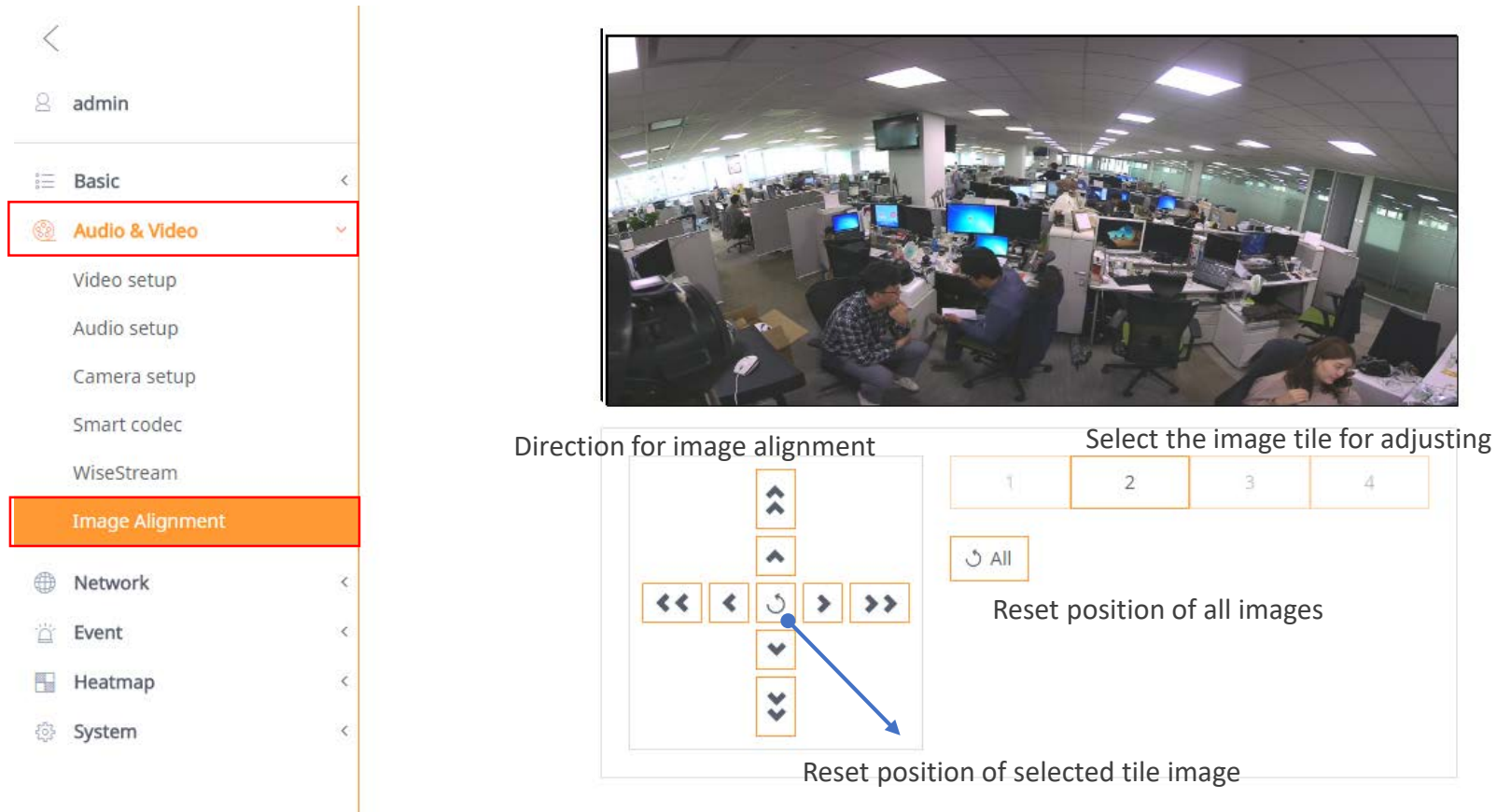


Image Alignment

- Adjust position of each image for making natural stitching image
- Designed for medium distance. Perform stitching in situ.



The interface shows a live video feed of an office environment. Below the feed, there are controls for image alignment. On the left, a sidebar menu lists various settings: Basic, Audio & Video, Video setup, Audio setup, Camera setup, Smart codec, WiseStream, Image Alignment, Network, Event, Heatmap, and System. The 'Image Alignment' option is highlighted in orange. The main area displays the video feed and a control panel. The control panel includes a section for 'Direction for image alignment' with arrows for moving the image in eight directions (up, down, left, right, and diagonals). To the right of this is a section for 'Select the image tile for adjusting' with four numbered buttons (1, 2, 3, 4) and an 'All' button. Below these buttons is a 'Reset position of all images' button. At the bottom of the control panel is a 'Reset position of selected tile image' button.

Multi-Sensor Accessories



PNM-9020V

Hanging

For indoor



SBP-201HM

Parapet



SBP-300LM

Ceiling



SBP-300CM

Wall



SBP-300WM

Wall



SBP-300WM1



PoE+ Injector
PWR-P-POE30

Installation Box



SBP-300NB

Wall Mount Base



SBP-300B

Pole Mount



SBP-300PM

Corner Mount



SBP-300KM



Thank You!

Questions?