Hanwha Techwin

Wisenet Thermal Camera Solutions

Webinar

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Agenda & Notes

- Webinar Introductions
- About Hanwha
- Introduction to Thermal Camera Solutions
  - Standard Thermal Cameras
  - Thermal Radiometric Cameras
  - Elevated Body Temperature Bi-Spectral Thermal Radiometric Camera
- Demos / Videos / Q&A

1.This webinar is being recorded and will be available for replay and in pdf format. Please visit https://www.hanwhasecurity.com/trainings/webinars/ to view past webinars & sign up for future ones.

2. All participants have been put into listen only mode.

3. We will take Q&A time permitting and if time runs out to answer all of the questions, we will reply to you individually afterwards. Please use the Chat or Q&A section.

About Hanwha Techwin

- We are a Global Fortune 500 Company
- With a Supply Chain of Trust for cybersecurity including R&D, manufacturing, & QA/QC
- We develop innovative and proprietary SoC design and manufacturing,
- World-class optical design expertise for high-zoom optics for
- Video surveillance solutions across a wide range of industry verticals
- We are a Leading manufacturer in the video surveillance market

Hanwha Techwin America

Manufacturing and Compliance

- Hanwha Techwin is a South Korean company with over 30 years of manufacturing experience in video surveillance. Our Supply Chain of Trust is critical to our cybersecurity.
- All IP cameras, analog cameras, NVRs, DVRs and encoders sold and distributed in North America are manufactured in Hanwha's facilities in **South Korea** and **Vietnam**.
- Hanwha Techwin manufactures a full suite of products compliant with **NDAA** and **TAA** provisions making them eligible for GSA Schedule Contracts and other government opportunities.

TAA COMPLIANT

GSA

NATIONAL DEFENSE AUTHORIZATION ACT

Hanwha Techwin WISENET 7 Made in Korea

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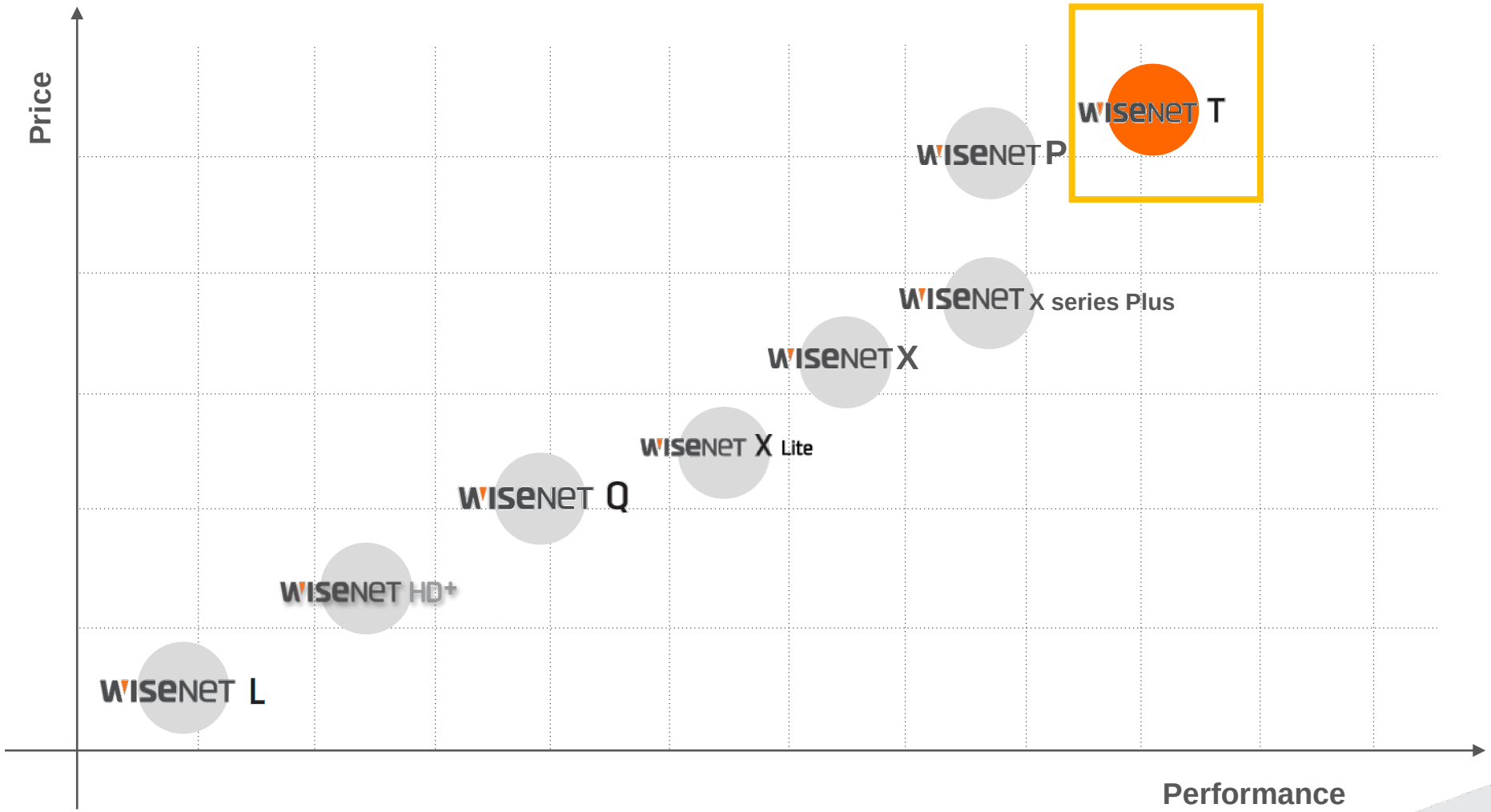
Series Positioning



Sales & Export Restrictions

- ※Please note: Please contact Hanwha Techwin for information on purchasing thermal cameras. Thermal cameras may not be available for purchase by all customers or shipped to all locations. Hanwha Techwin America restricts the purchase and shipment to Ultimate Consignee and Purchaser locations in the United States.

  This product is subject to US export licensing requirements. Exports without an export license or other applicable authorization to most countries is prohibited by law.

Detect People and Objected 24/7 with Thermal Cameras

In challenging weather (fog, smoke, rain) or lighting conditions (complete darkness, backlight), it can be difficult to distinguish people or objects in a complex background by a visible camera or a human eye. For accurate monitoring purposes, a professional surveillance system is required. Wisenet thermal cameras are the excellent choice: they provide high contrast images based on temperature differences between the object and background, so that users can detect incidents more easily. The advanced thermal imaging technology provides high contrast to make the unseen details visible without additional lighting.

https://www.youtube.com/watch?v=JyDh7qzHkuo

Fog

Snow

Darkness

Camouflage

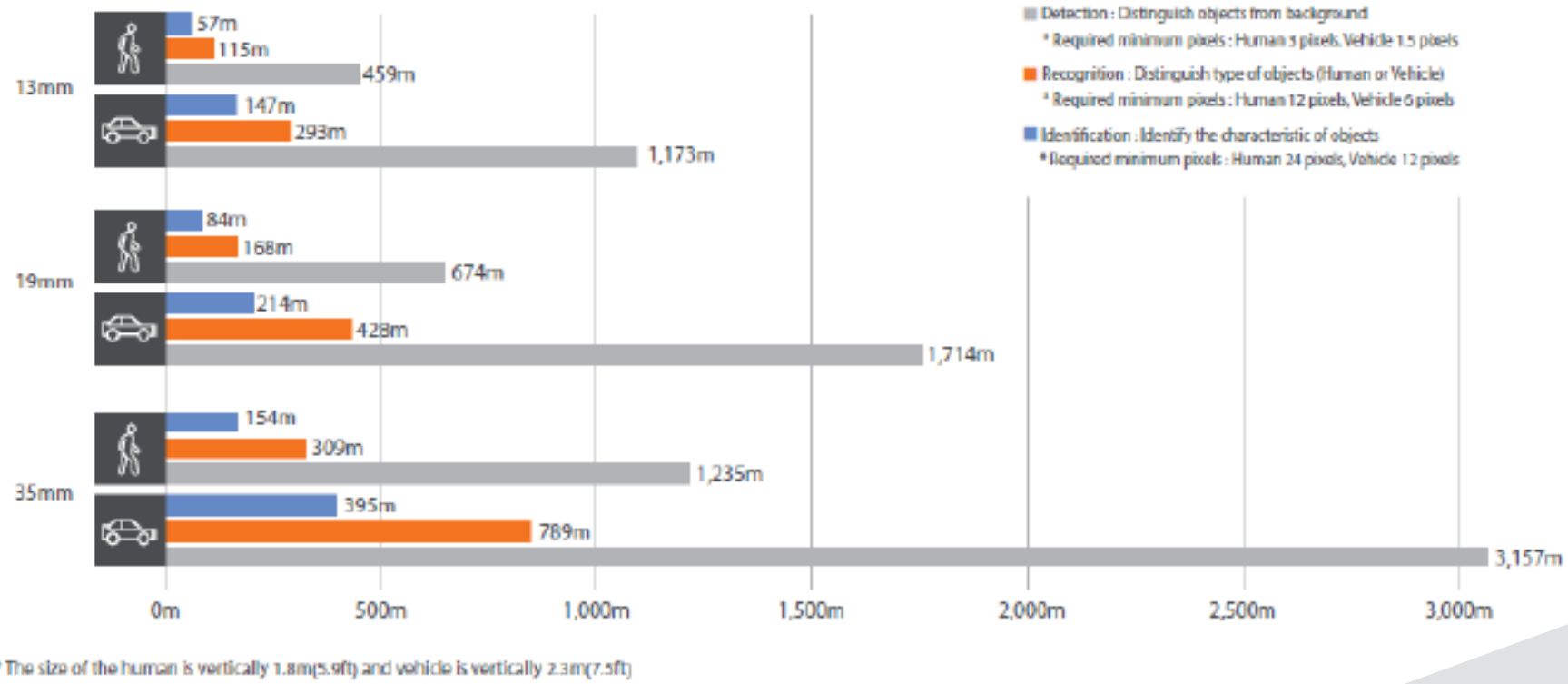
Secure a Wide Variety of Applications

- Wisenet thermal cameras can be powerful tool when monitoring applications where there is very little light, due their ability to create images based on heat. Thermal cameras are especially applicable in manufacturing and industrial facilities, air and seaports and mining areas.

- Industrial facilities
- Sea port
- Mining areas
- City surveillance
- Power plants
- Bridges
- Dams
- Pipelines
- Border security
- Warehouse

Long Range Detection up to 3,157 Meters

- The main task of the thermal camera is to detect events that occur at long distances. Wisenet thermal cameras are equipped with a 35/19/13mm lens (horizontal FoV 17°/32°/49°) to detect vehicles up to 3,157m away. The camera provides an image with high color contrast according to the temperature, so it can easily distinguish objects and background from a long distance. At closer range it can recognize the type of object or identify the characteristic by capturing details.

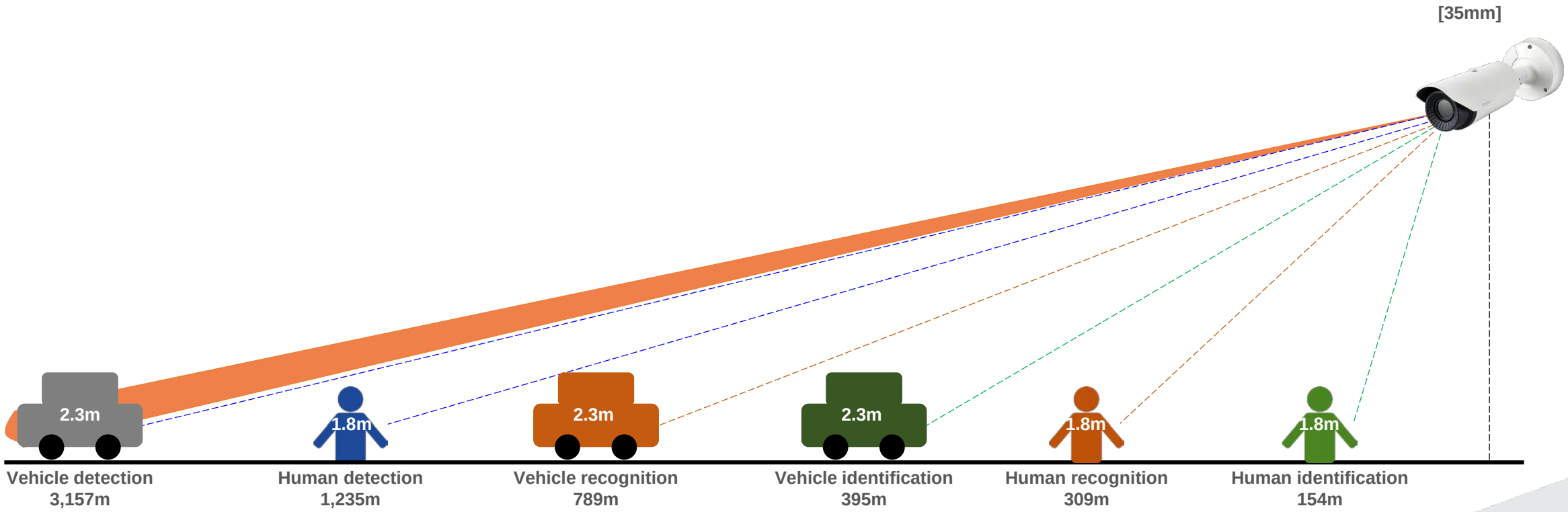


* The size of the human is vertically 1.8m(5.9ft) and vehicle is vertically 2.3m(7.5ft)

Support Long Range Detection

Our thermal camera is suitable for wherever you want to monitor.

- 35mm support max. 3,157m for vehicle detection → horizontal 17˚

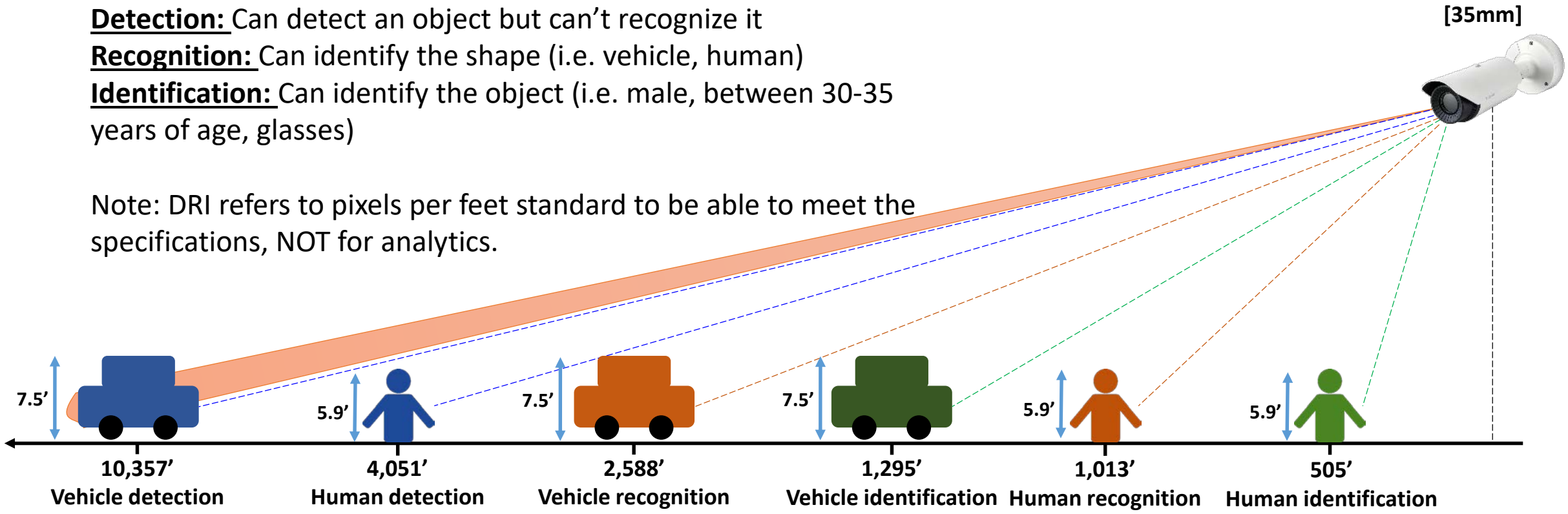


Long Range Detection 35mm Lens

- **35mm supports up to 10,357’ for vehicle detection → horizontal 17˚**

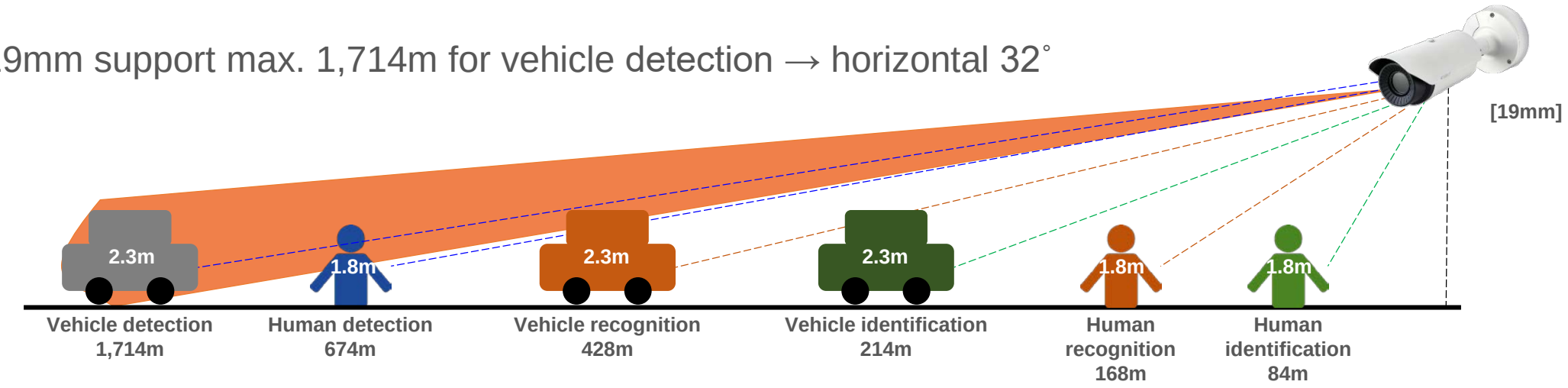
Detection: Can detect an object but can’t recognize it
Recognition: Can identify the shape (i.e. vehicle, human)
Identification: Can identify the object (i.e. male, between 30-35 years of age, glasses)

Note: DRI refers to pixels per feet standard to be able to meet the specifications, NOT for analytics.

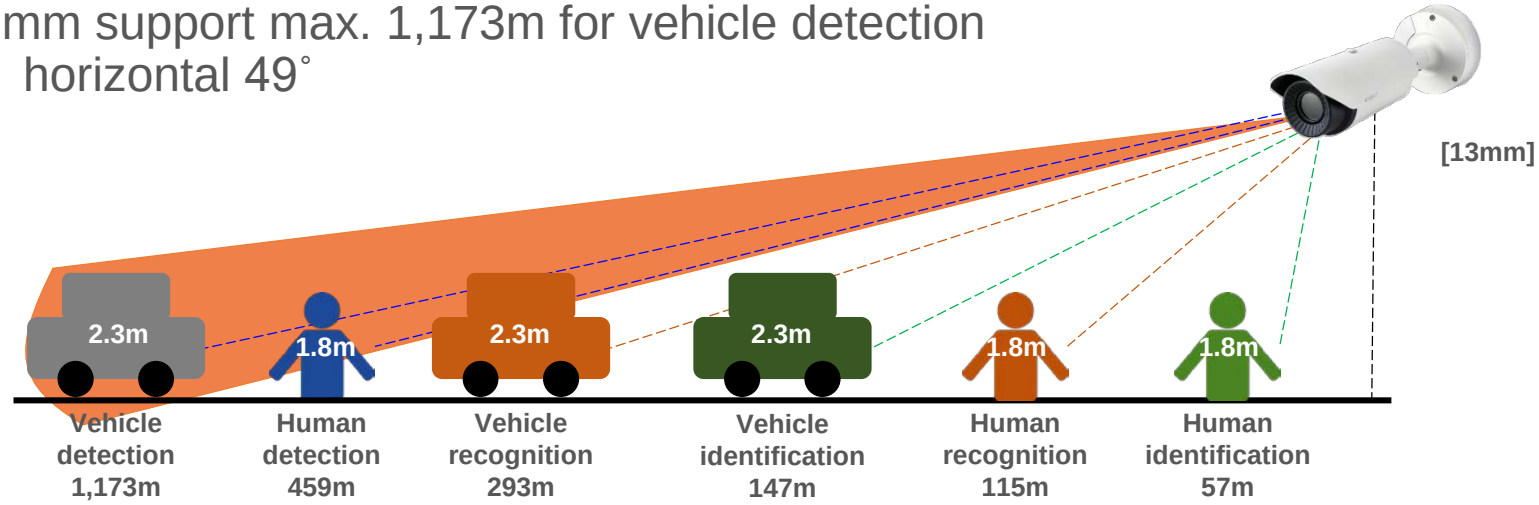


Support Long Range Detection

- 19mm support max. 1,714m for vehicle detection → horizontal 32˚



- 13mm support max. 1,173m for vehicle detection → horizontal 49˚



What is a thermal camera? How does it work?

- How does a thermal camera see temperature?
  - Electromagnetic radiation emitted from an object depends on its temperature
  - This radiation is due to the vibration of its molecules and is called thermal radiation.
  - Thermal radiation from objects can be emitted at any wavelength; objects around room temperature emit infrared radiation, objects with hotter temperatures emit higher frequency visible light, and even hotter objects emit ultraviolet light. This is why hot object, such as heated metal, a match, etc. glow red.

Thermal Camera Types

- Bullet Style Thermal Cameras VGA / QVGA models
- PT Head Style Thermal Camera
- PT Unit Thermal Cameras
- Thermal Radiometric
- Dual Spectral EBT Radiometric Camera

The Invisible Becomes Visible

- Stable and Reliable Clear Thermal Image
  - High resolution 640x480 / QVGA 320x240 thermal image
  - Various lens support (13mm/19mm/35mm)
  - Various type support (bullet / PT head / PT unit)
  - H.265 / H.264 support
  - Full frame streaming (640x480 30fps)
  - WiseStream Ⅱ support
  - Hallway view support
  - DIS with Gyro-sensor
  - PoE/DC/AC
  - IP66/IK10 (depending on model)
  - PTZ Handover
  - Video and audio analytics

※ Detecting temperature range : -50˚C ~ +130˚C

QVGA Thermal Camera Lineup

Model	TNO-3010T	TNO-3020T	TNO-3030T
Image			
Type	Bullet	Bullet	Bullet
Resolution	**320x240**	**320x240**	**320x240**
Lens	*2.7mm, F1.0*	*4.7mm, F1.0*	*13.7mm, F1.0*
FoV	H92.0˚, V65.5˚, D125.7˚	H50.0˚, V36.4˚, D65.3˚	H16.0˚, V12.0˚, D20.0˚
Operating Temp.	-40˚C ~ +60˚C	-40˚C ~ +60˚C	-40˚C ~ +60˚C
Protection	IP66, NEMA4X, IK10	IP66, NEMA4X, IK10	IP66, NEMA4X, IK10

VGA Thermal Camera Lineup

Model	TNO-4030T	TNO-4040T	TNO-4041T	TNO-4050T	TNO-4051T
Image					
Type	Bullet	Bullet	**PT Head**	Bullet	**PT Head**
Resolution	**640x480**	**640x480**	**640x480**	**640x480**	**640x480**
Lens	*13mm, F1.0*	*19mm, F1.0*	*19mm, F1.0*	*35mm, F1.0*	*35mm, F1.0*
FoV	H48.6˚, V36.4˚, D61.6˚	H32.0˚, V24.3˚, D39.2˚	H32.0˚, V24.3˚, D39.2˚	H17.2˚, V13.0˚, D22.0˚	H17.2˚, V13.0˚, D22.0˚
Operating Temp.	-40˚C ~ +60˚C	-40˚C ~ +60˚C	-40˚C ~ +60˚C	-40˚C ~ +60˚C	-40˚C ~ +60˚C
Protection	IP66, NEMA4X, IK10	IP66, NEMA4X, IK10	IP66, NEMA4X, IK10	IP66, NEMA4X	IP66, NEMA4X

QVGA Thermal Cameras (Non-Radiometric)

Main Specifications:

- QVGA 320x240 @ 30fps
- Powered by Wisenet 5 chipset
- Triple Codec (H.265/H.264/MJPEG), WiseStream II
- CVBS output
- Open platform
- Shock detection, Temperature Change Detection
- IP66 / NEMA4X / IK10
- TNO-3xxx (24VAC/12VDC/PoE)

˚F

Model numbers:

- TNO-3010T: 2.7mm lens (92˚)
- TNO-3020T: 4.7mm lens (50˚)
- TNO-3030T: 13.7mm lens (16˚)

VGA Thermal Cameras (Non-Radiometric)

Main Specifications:

- VGA @ 30fps
- Powered by Wisenet 5 chipset
- Triple Codec (H.265/H.264/MJPEG), WiseStream II
- CVBS output
- Open platform
- Shock detection, Temperature Change Detection
- IP66 / NEMA4X / IK10
- TNO-4xxx (24VAC/12VDC/PoE)
- TNU-4xxx (24VAC only)

Model numbers:

- TNU-4041T: 19mm (32˚) Lens Pan/Tilt Head Thermal Camera
- TNU-4051T: 35mm (17˚) Lens Pan/Tilt Head Thermal Camera
- TNO-4030T: 13mm lens (49˚) Bullet Thermal Camera
- TNO-4040T: 19mm lens (32˚) Bullet Thermal Camera
- TNO-4050T: 35mm lens (17˚) Bullet Thermal Camera
- TNU-4041T 19mm lens PT Unit
- TNU-4051T 35mm lens PT Unit

VGA Thermal Positioning Camera
TNU-4051T / TNU-4041T (Non-Radiometric)

Specs

- 19mm / 35mm lens options
- Powered by Wisenet 5 chipset
- High resolution thermal VGA (640 x 480) resolution
- 360˚ endless panning with Look Up capability
- H.265, H.264, MJPEG triple codec support
- WiseStream II support
- Tampering, Loitering, Directional / Virtual Fence Line detection, Enter/ Exit, (Dis) Appear, Audio detection, Motion detection, Sound classification, Shock detection, Temperature change detection

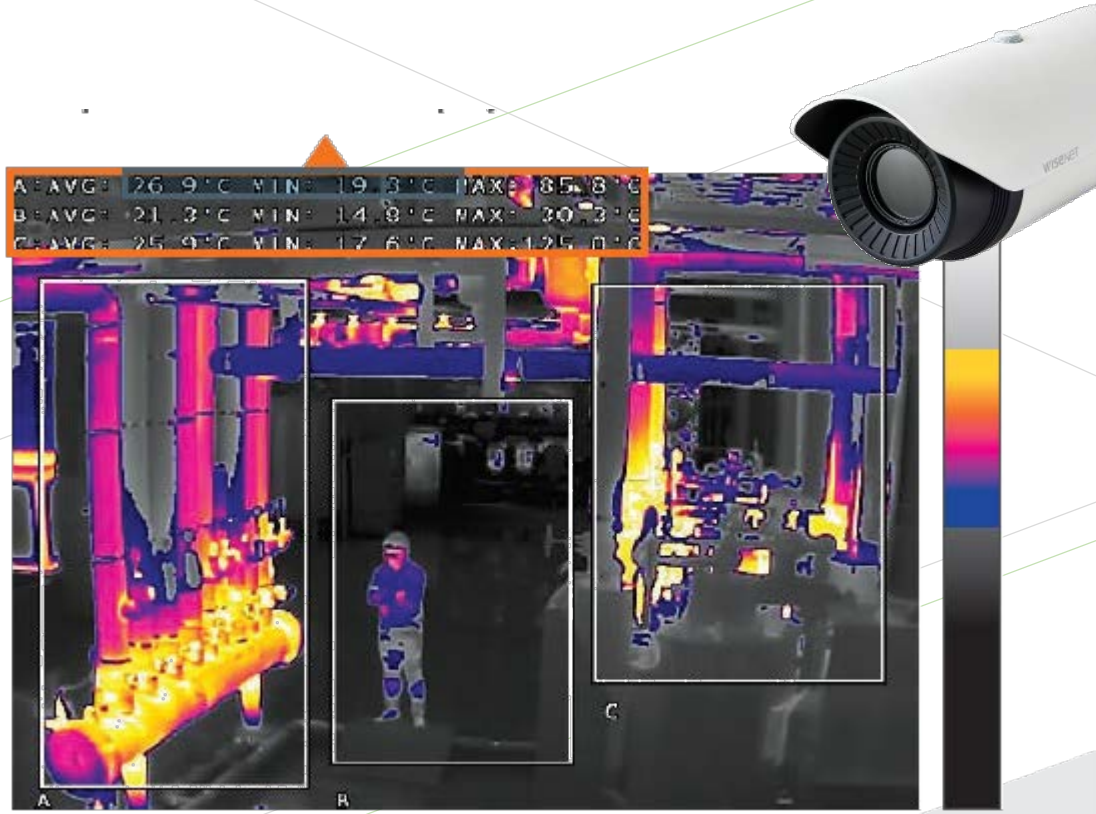
Use Cases

- DOD
- Airport
- Utility
- Ports
- Perimeter watch

T series Radiometry Cameras

Specs

- Powered by Wisenet 5 chipset
- Color palette options
- Multiple lens option 19mm and 35mm
- Triple Codec (H.265, H.264 and MJPEG) with WiseStream II
- IP66 / IK10
- Trigger event based on specific temperature reading on 3 areas (Minimum / Maximum / Average, Above / Below / Increase / Decrease, Duration)
- Spot temperature measurement



Use Cases

- Power plants / utilities
- Temperature sensitive equipment
- Industrial machinery

VGA Thermal Cameras (Radiometric)

Main Specifications:

- Powered by Wisenet 5 chipset
- VGA @ 30fps
- Triple Codec (H.265/H.264/MJPEG), WiseStream II
- CVBS output
- Shock detection, Temperature Change Detection
- Three Temp Detection Range (-4˚F ~ 266˚F)*
- IP66 / NEMA4X / IK10
- 24VAC/12VDC/PoE

Model numbers:

- TNU-4041TR: 19mm (32˚) Lens Pan/Tilt Thermal Camera
- TNU-4051TR: 35mm (17˚) Lens Pan/Tilt Thermal Camera

https://www.youtube.com/watch?v=T-Qm6pBIzkc

*Temperature accuracy ±9˚F (≤211˚F), ±20%(>212˚F)

Key Features

Easy Installation

[Bullet] All ports are on the back

- Provides a USB port for installation with Wi-Fi dongle and Wisenet Installation App

- [PT] : Easy to connect on a PT device (No USB port)

Enhanced Video and Audio Analytics

Wisenet T thermal cameras offer reliable video and audio analytics for efficient monitoring. The featured analytics improve the overall security system's efficiency by automatically notifying users when abnormal behavior is detected.

Temperature Change Detection

Drastic temperature changes can be detected in advance to prevent incidents occurring. (20/40/60/80/100°C difference from current temperature)

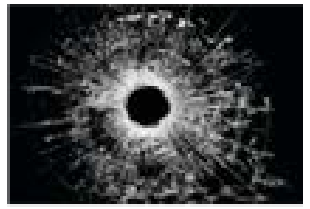
Virtual Line

Alarm events are automatically triggered when the camera detects the moving object crossing the virtual line.

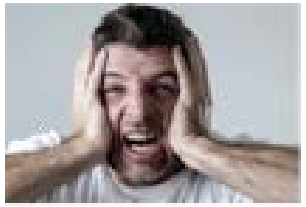
Sound Classification

Sound classification can help users respond immediately in dangerous situations, by classifying sounds such as gunshots, breaking glass, screams and explosions.

Gunshot



Glass breakage



Scream

Explosion

Motion Detection

An alarm is triggered when movement is detected within the defined user area.

Shock Detection

Shock detection protects the camera when events such as vibrations, quivers and shocks occur.

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A Wide Selection of Color Palettes

- Wisenet thermal cameras provide seven different types of color palettes for users to select the best image in various situations. Each color palette has a specific set of colors which change according to the temperature range of the scene. A custom color palette can also be specified.

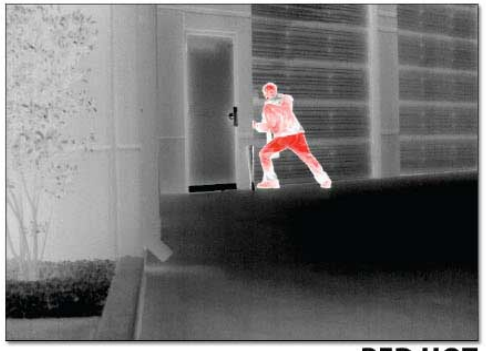

WHITE HOT


BLACK HOT


SEPIA


IRON


RAINBOW


RED HOT

Temperature Change Detection

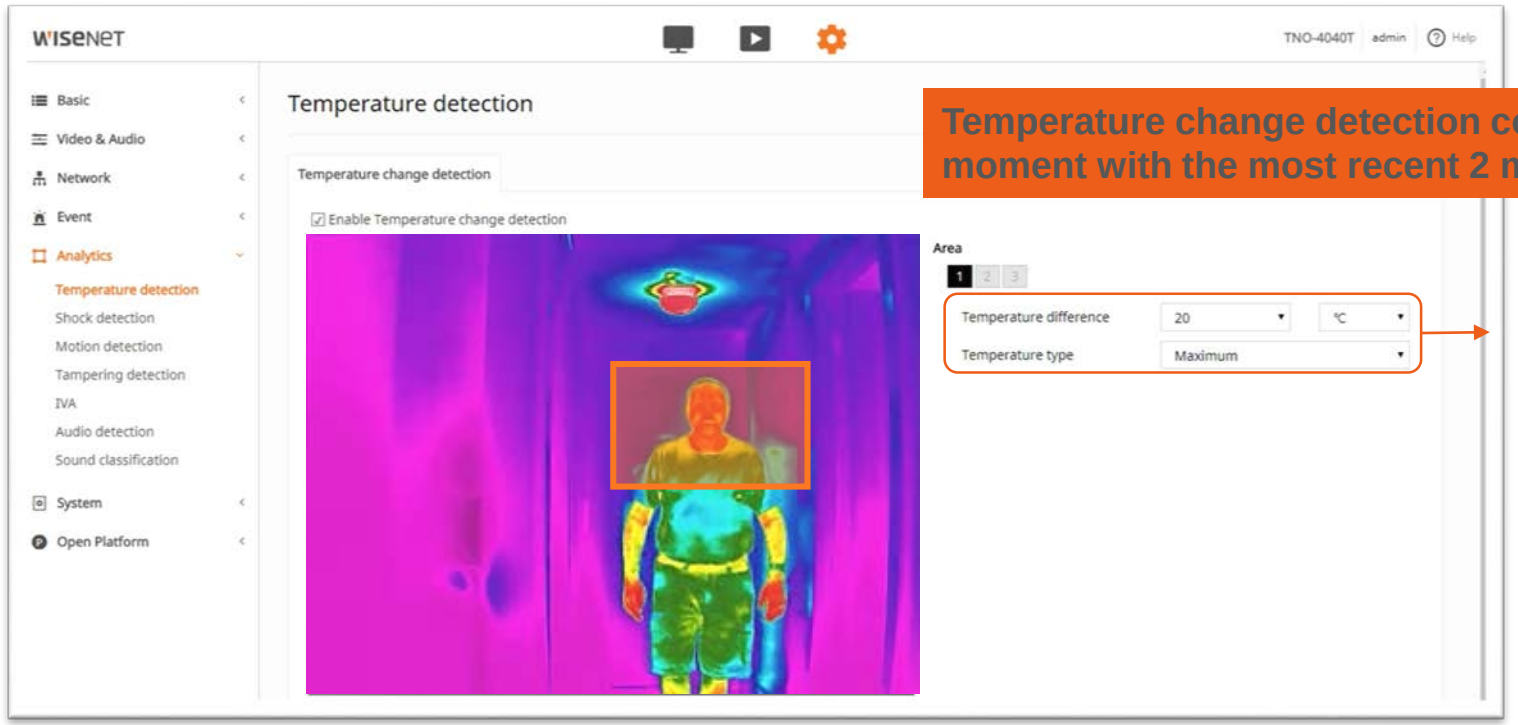
Standard thermal cameras detect rapid temperature change detection. They are not radiometric or thermography cameras.

[SUPPORT]

- 3ea ROI for temperature detection
- Set temperature difference 20/40/60/80/100˚C

[Does not SUPPORT]

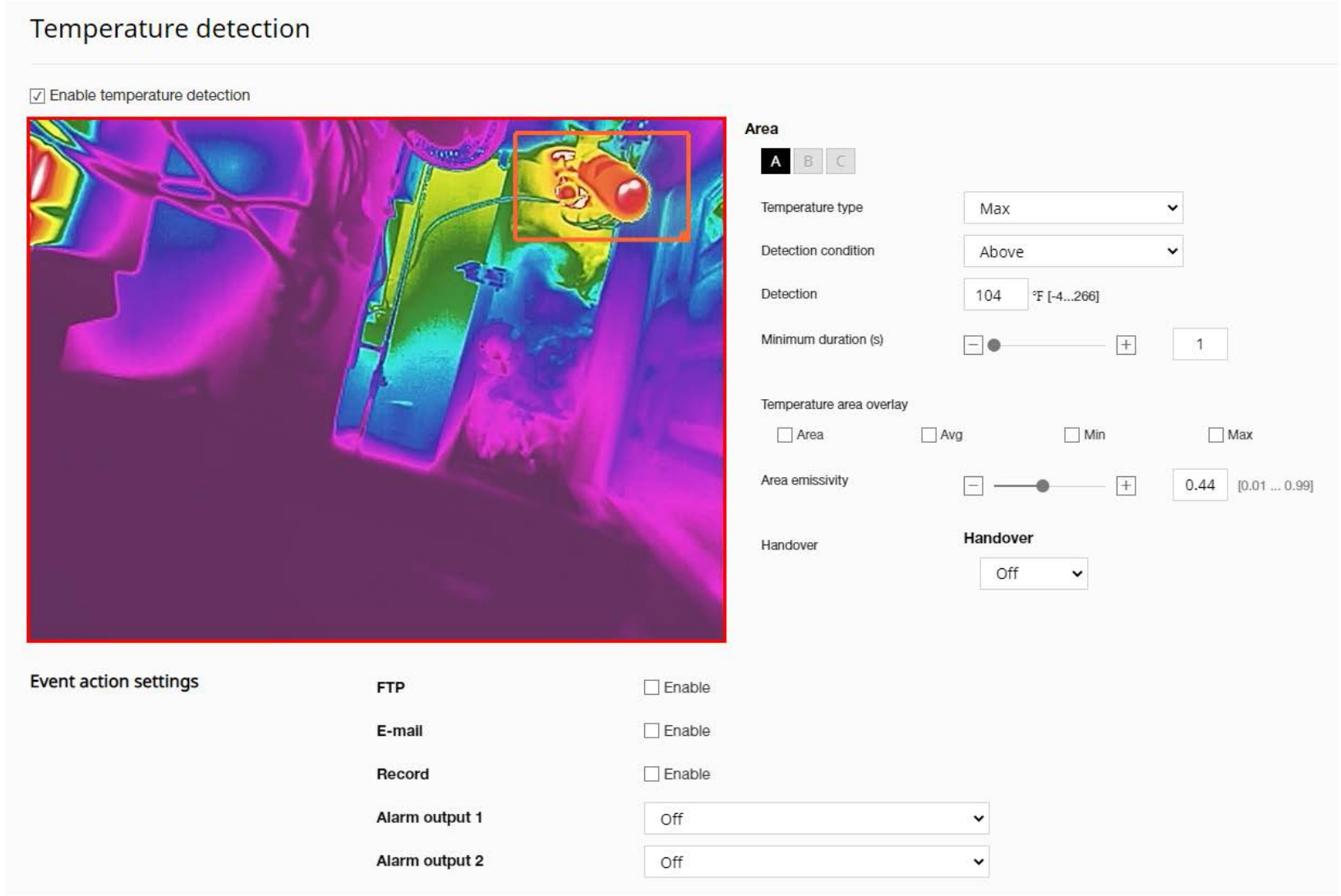
- When temperature changes slowly
- When temperature is out of the range(<-20˚C or <+110˚C)



Temperature change detection compares the temperature value at the moment with the most recent 2 minutes of temperature data.

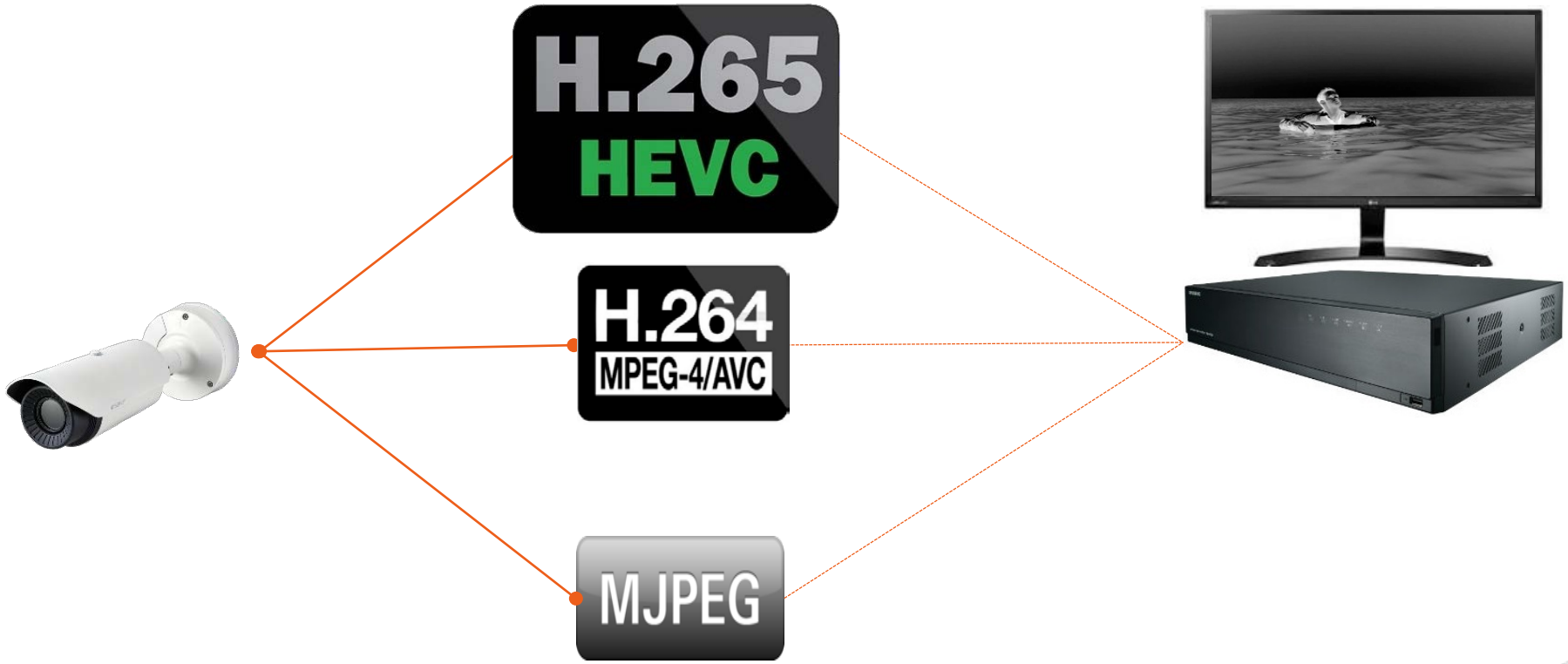
Temperature difference : 20/40/60/80/100˚C
Temperature type : Maximum/Minimum/Average

Radiometric Temperature Detection



Optimize Storage and Bandwidth Efficiency

- H.265 and WiseStream II technology provides superior video streaming performance, allowing multiple video streams to be transferred simultaneously and minimize storage and bandwidth.



Efficient Network Transmission

- Improved Bandwidth Utilization with our WiseStream Ⅱ Technology
  - When Hanwha Techwin's original video compression technology, WiseStream ,Ⅱ is combined with H.265 compression, the bitrate data is reduced by 50% on average compared to current H.264 technology
  - The costs of configuring and maintaining the system are also greatly reduced, while still maintaining the same high quality

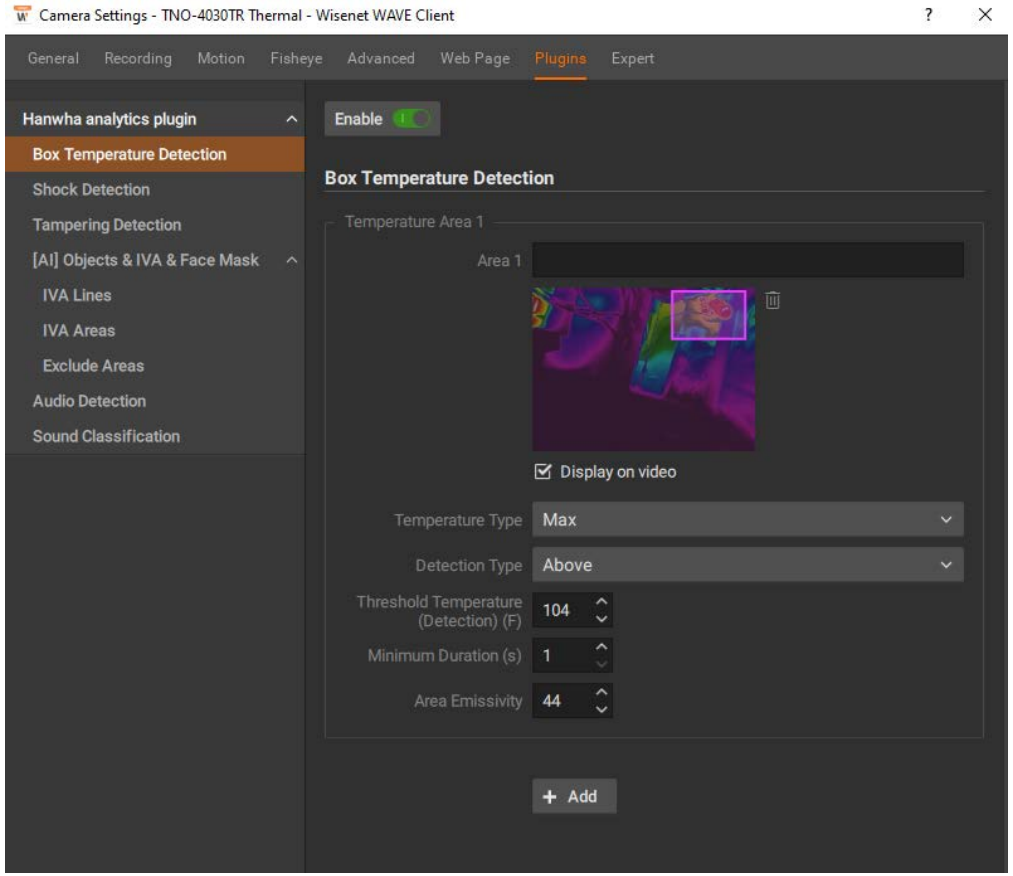
Motion Low	Motion Mid
	
WiseStream Ⅱ OFF : 1024kbps WiseStream Ⅱ ON : 175bps	WiseStream Ⅱ OFF : 1024bkps WiseStream Ⅱ ON : 250kbps

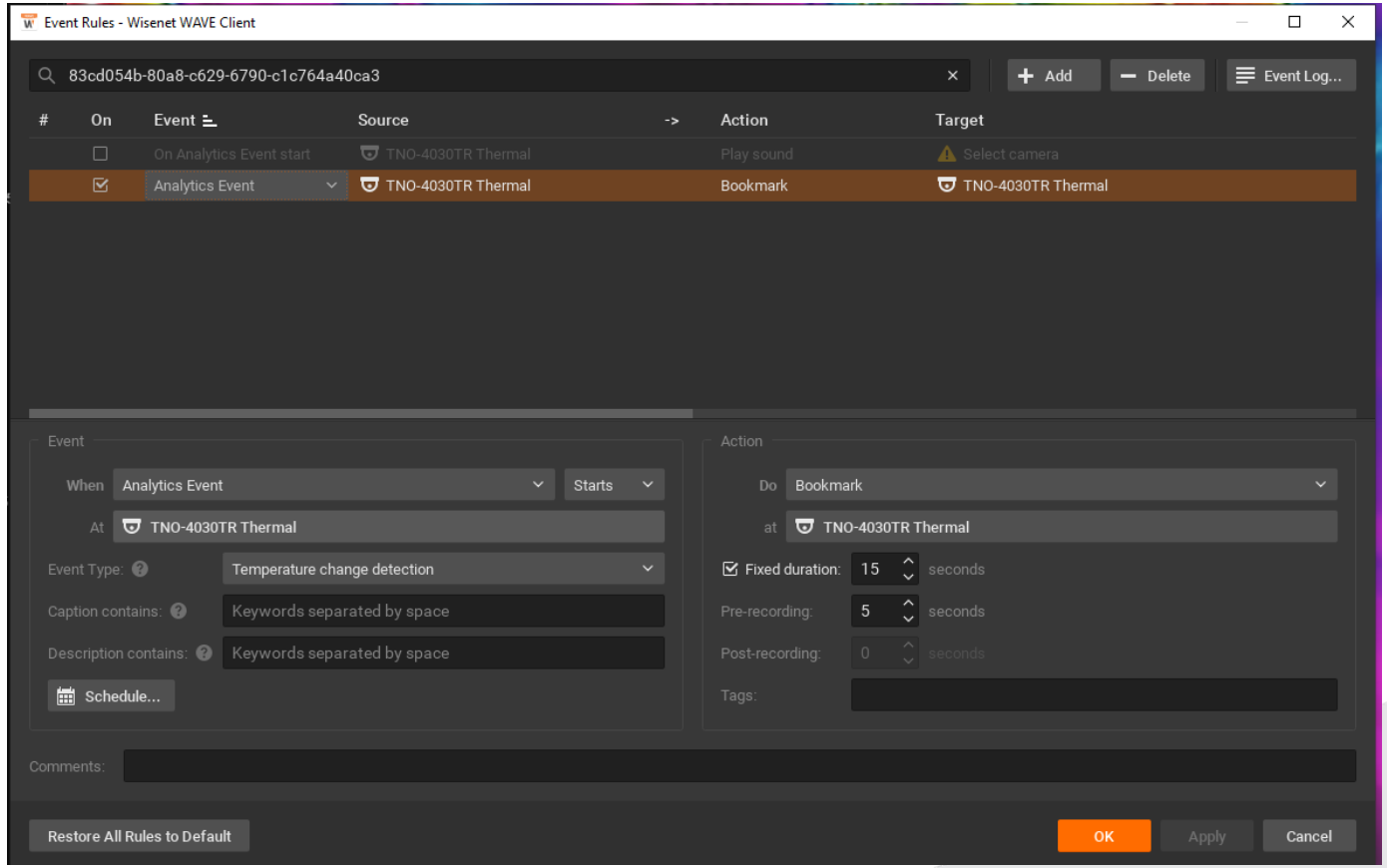
Handover to PTZ

The handover feature allows a PTZ camera to receive an alarm from a thermal camera operating on the same IP video surveillance system. Once the notification is received, the PTZ camera will zoom into the assigned camera pre-set location. With this feature, PTZ cameras support the thermal camera by providing high resolution images whenever a specific detail is required.

WAVE Integration

- Easily configure Thermal analytics & configure alarm event rules





Demos

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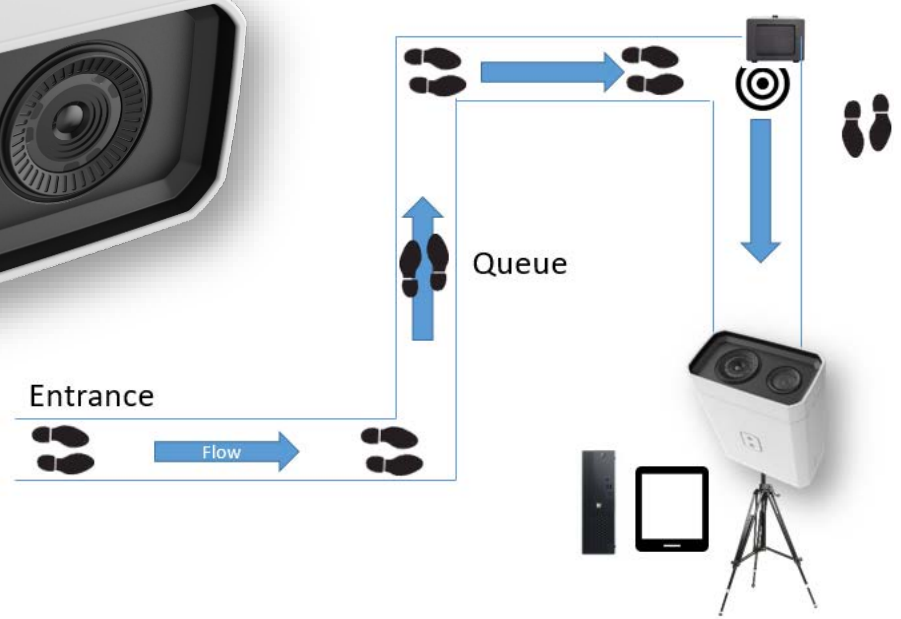
Elevated Body Temperature Detection

TNM-3620TDY



- Purpose built Bi-Spectral AI / Thermal
- Multi-person detection
- Accuracy within +- 0.54°F w/ Blackbody, .9°F w/o Blackbody
- Verification & identification of subject with visible camera
- FDA 510K approved

CH1 : Visible

CH2 : Thermal

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Temperature Detection Thermal Camera

(TNM-3620TDY)

Identification

Visible image 2MP 4mm fixed lens (H : 87.6°, V : 46.4°)

Detection

Thermal image QVGA 4.7mm fixed lens (H : 50.0°, V : 36.4°)

Bi-spectrum camera with dual lens for visible and thermal imaging

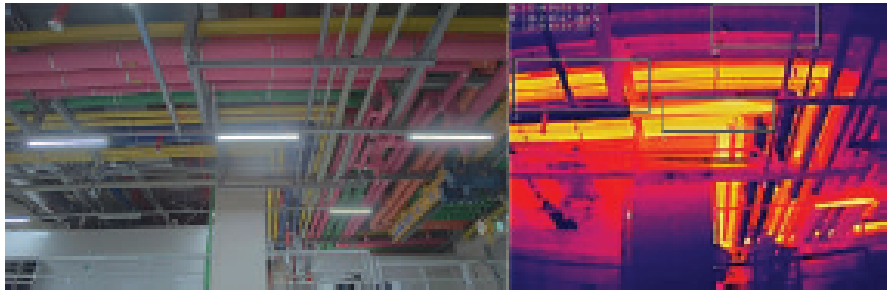
TNM-3620TDY camera features both QVGA (320x240) thermal camera with 4.7mm fixed lens and 2MP (1920x1080) visible camera with 4mm fixed lens together. This camera can quickly screen high temperature and can recognize the object (who the person is) with visible camera.

Two detection modes support

Users can select two modes of detection in the camera according to their needs: estimated body temperature (EBT) mode and normal radiometric mode. Under the EBT mode, the camera can cover temperature range between 30~45℃, use AI to detect faces, and measure the temperature over the eye area as it is closest to the core body temperature. In the normal radiometric mode, the temperature between -20~130℃ can be measured, making it ideal for fire-sensitive areas such as utility tunnels and plants or forest fire monitoring.

EBT(Estimated Body Temperature) mode

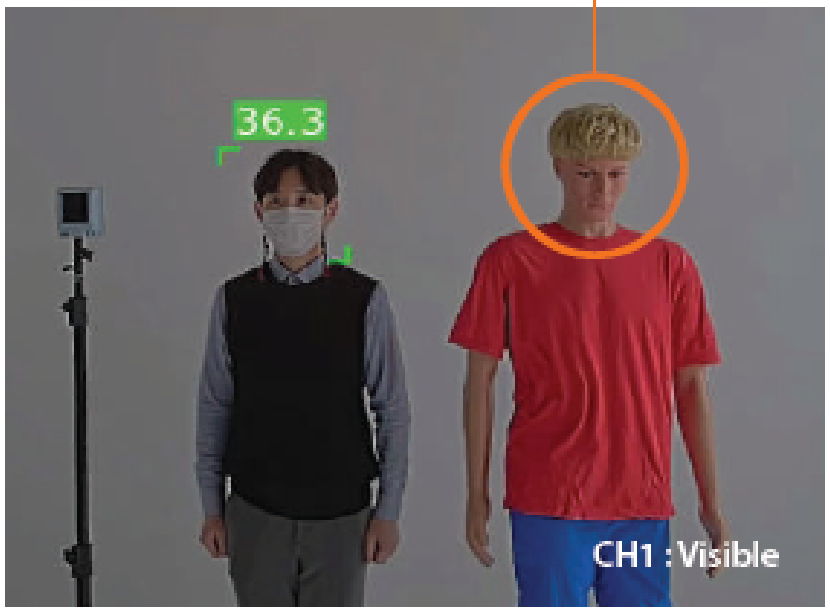
Normal radiometric mode

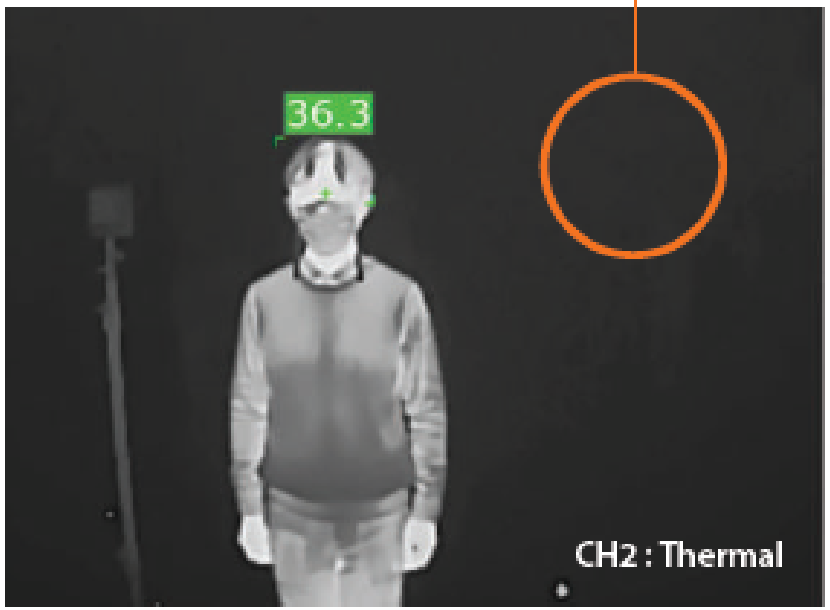


High accuracy with AI deep-learning technology

TNM-3620TDY utilizes built-in AI deep-learning technology to detect the human faces and generates alarms for only humans, making the monitoring more precise and efficient. Users can choose a channel between visible camera and thermal camera to detect human faces. When the thermal camera is selected as a channel to detect human faces, it only detects faces with fever. And therefore, the faces of mannequins or faces in photographs are not detected as shown in the image below. In addition, users can synchronize images of two channels by calibrating the image grid, so that the camera can detect the exact location of objects' faces and measure body temperature.

* It doesn't detect face of mannequins





Demonstration Video

https://www.youtube.com/watch?v=Xw1yBXnAHCg

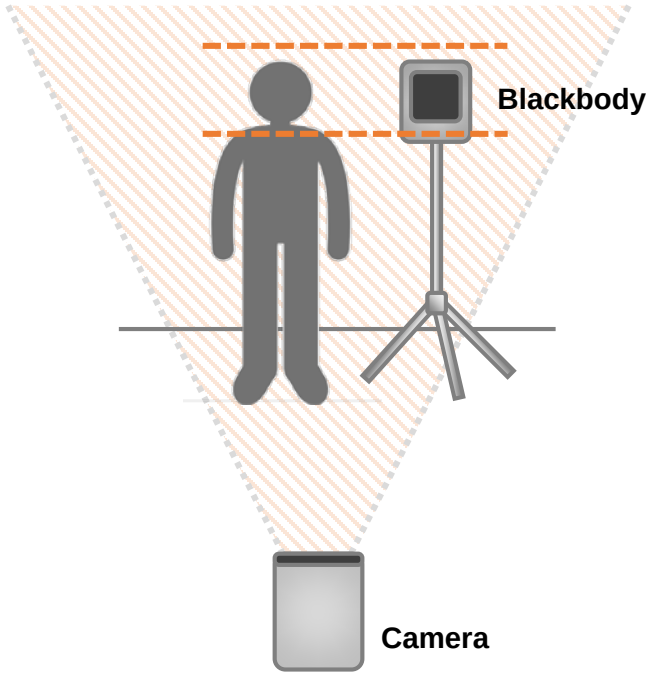
How to setup

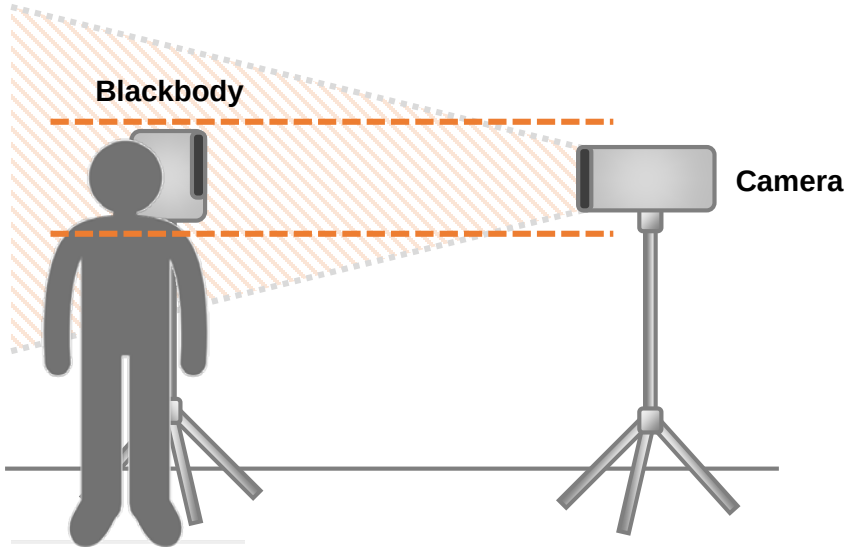
Camera system setup

- **Setup the temperature evaluating environment according the guide of FDA**

  https://www.fda.gov/medical-devices/general-hospital-devices-and-supplies/thermal-imaging-systems-infrared-thermographic-systems-thermal-imaging-cameras

. Install camera and blackbody at a similar height to the face of the person being evaluated.





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How to setup

Camera system setup

- **Setup the temperature evaluating environment according the guide of FDA**

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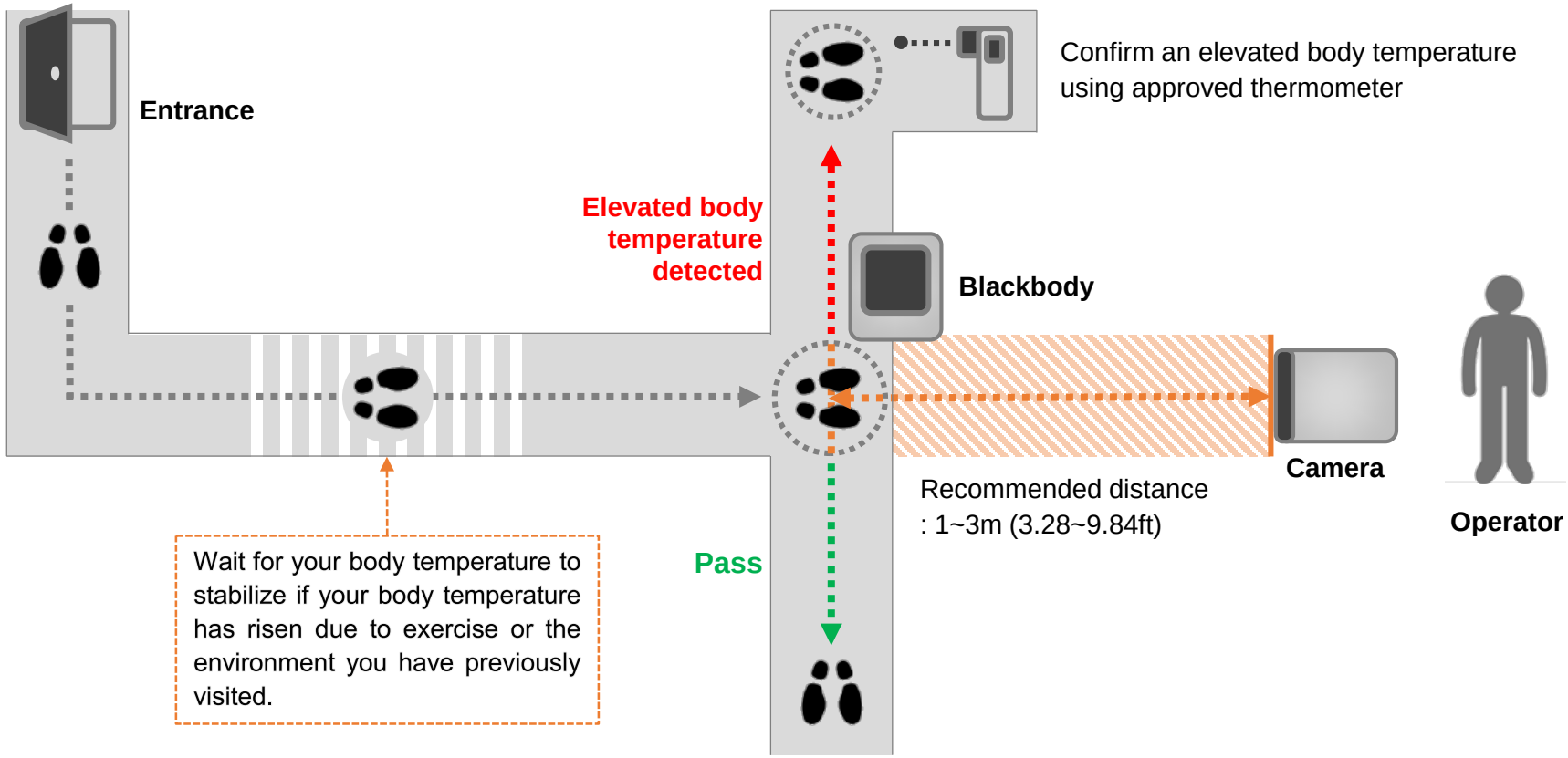

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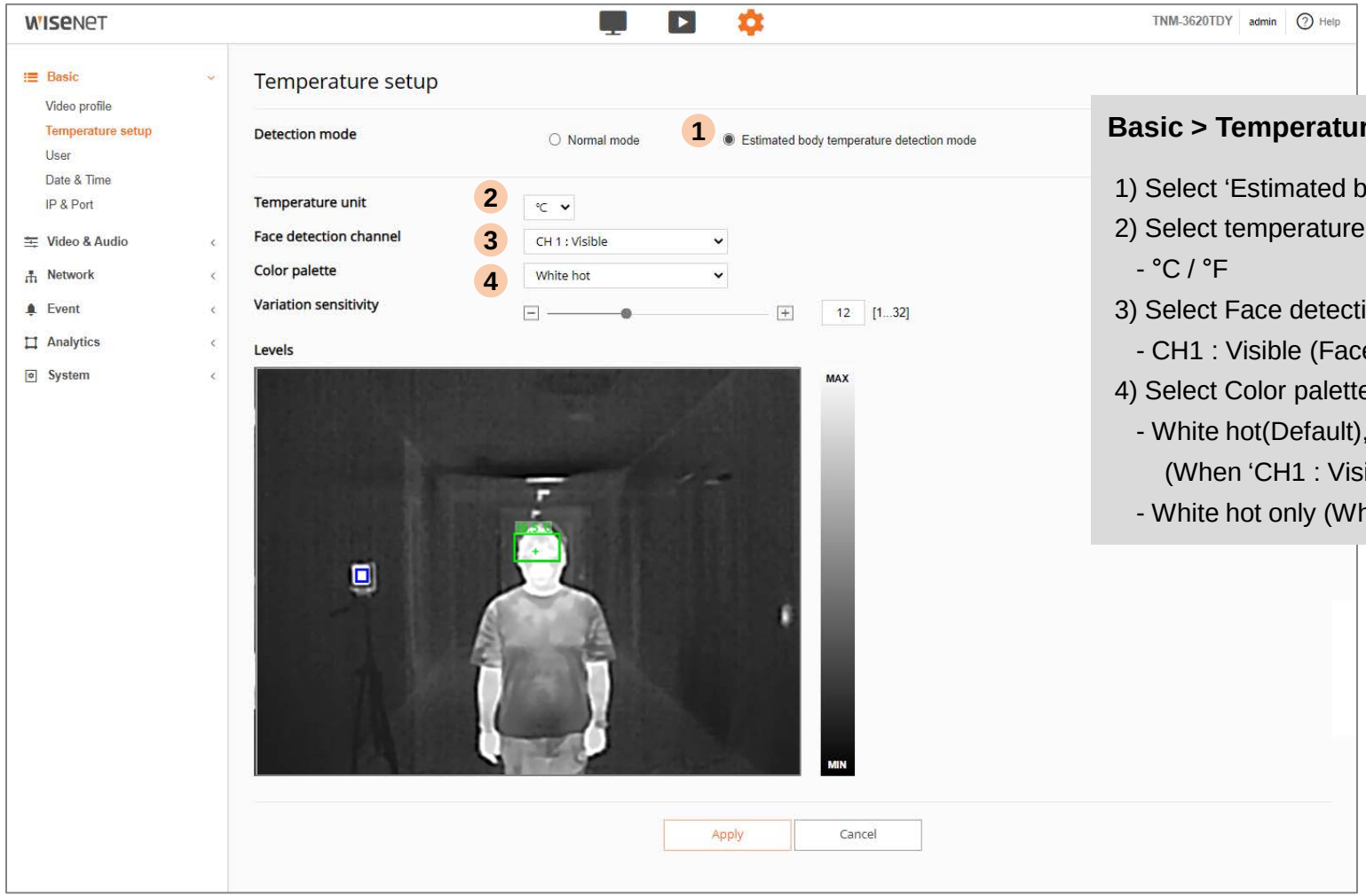
Camera Setup – EBT Mode Configuration



Basic > Temperature setup

1) Select ‘Estimated body temperature detection mode’.
2) Select temperature unit.
   - °C / °F
3) Select Face detection channel.
   - CH1 : Visible (Face) / CH2 : Thermal (Head)
4) Select Color palette.
   - White hot(Default), Black hot, Rainbow 1, Rainbow2, Custom, Sepia, Red, Iron
     (When ‘CH1 : Visible’ is selected for face detection)
   - White hot only (When ‘CH2 : Thermal’ is selected for face detection)

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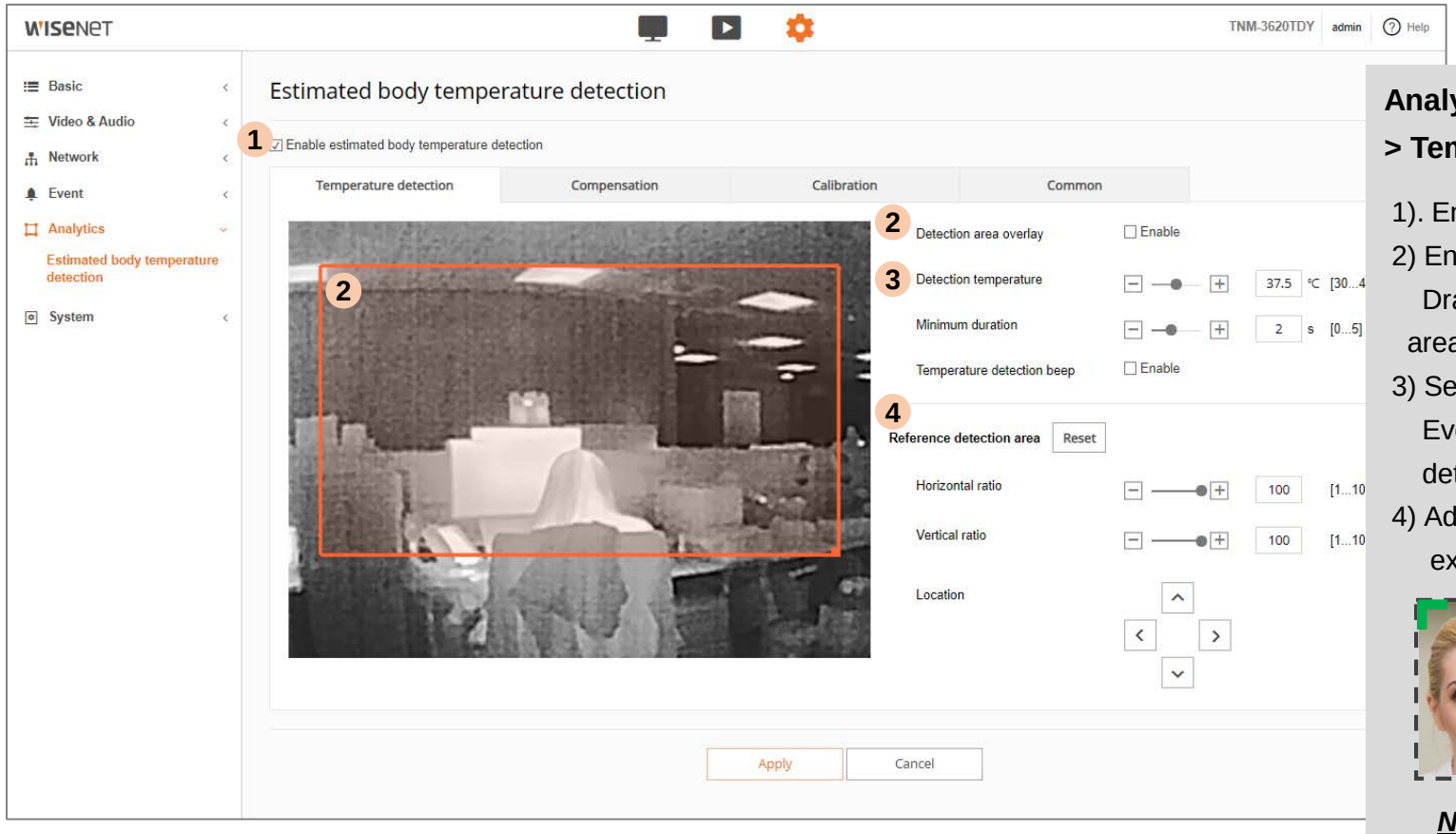
Camera Setup – EBT Mode Configuration



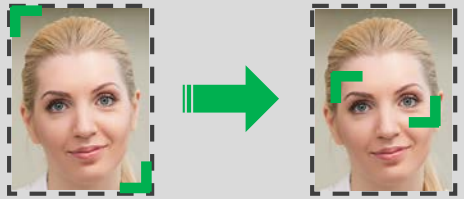
Analytics > Estimated body temperature detection > Temperature detection

1). Enable estimated body temperature detection

2) Enable Detection Area Overlay & Adjust face detection area. Draw an area for face detection to operate. Faces outside this area are not detected and temperature readings will not be taken.

3) Set Detection temperature and minimum duration. Event will only occurred when higher temperature is detected longer than the duration.

4) Adjust Reference detection area. You can set the face area to extract the highest temperature



Note

A person need to be stand in front of the camera at detection distance for correct reference detection area adjustment.

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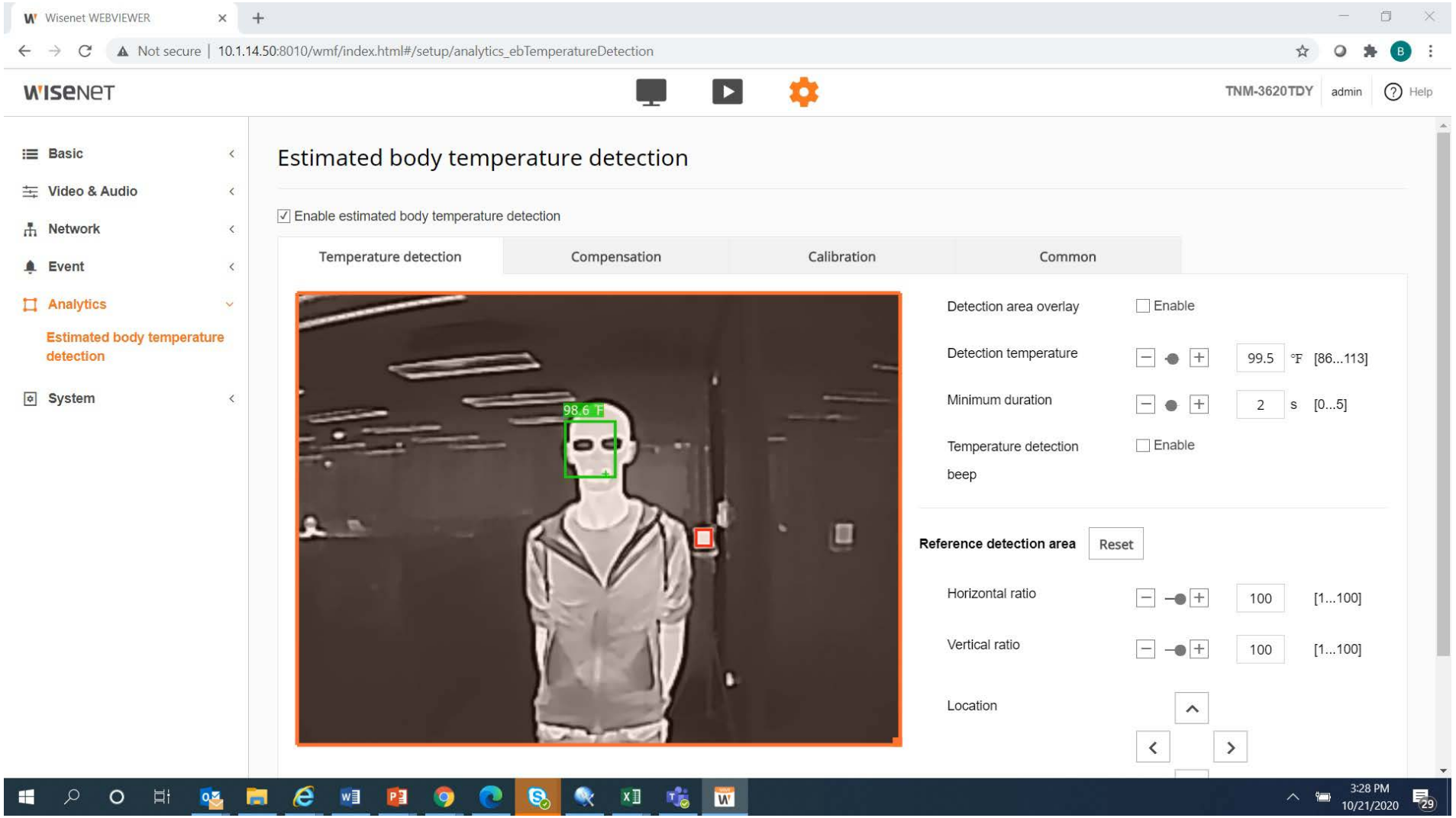
Key Features

Customized detection area setup



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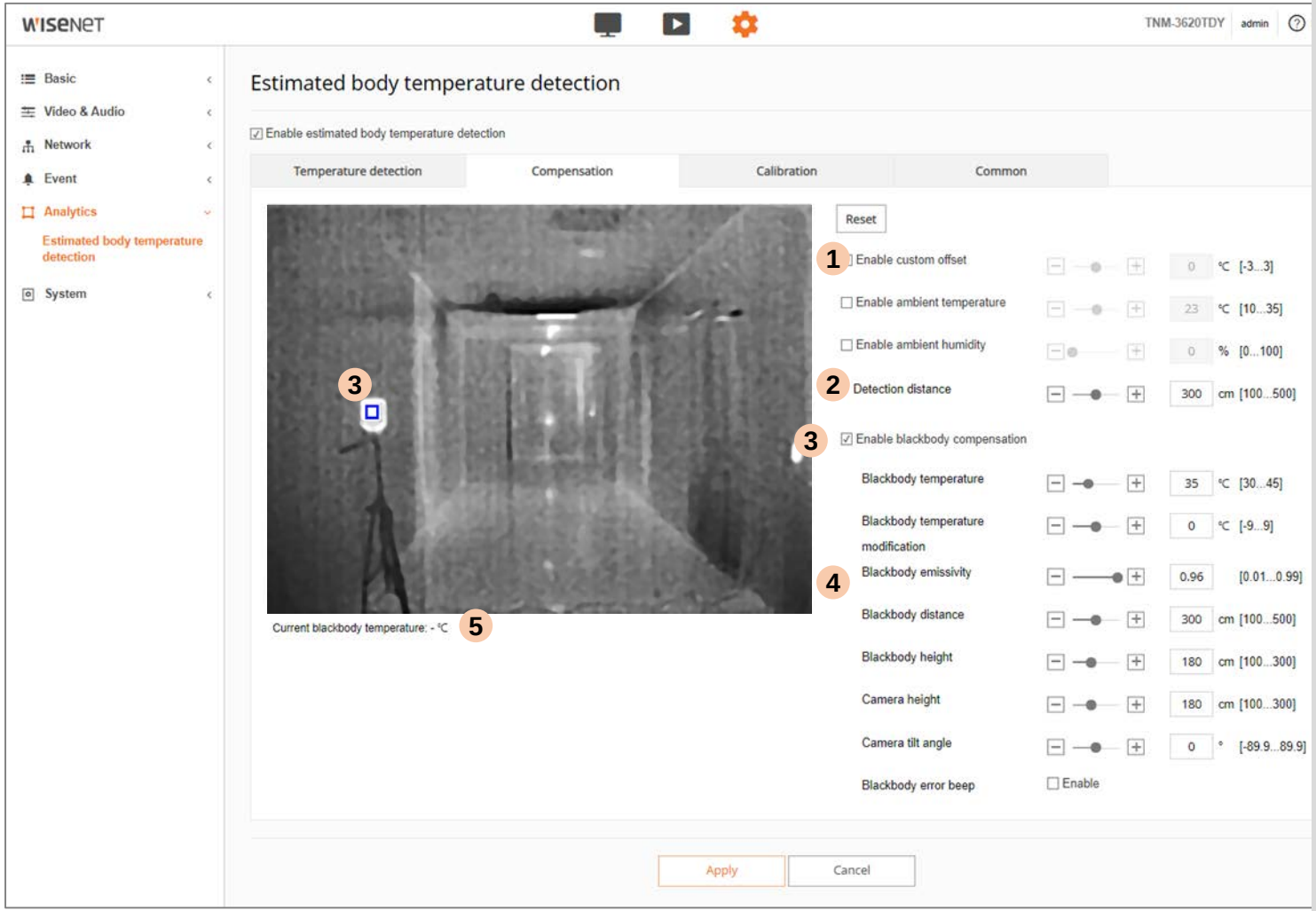
Camera Setup – EBT Mode Configuration



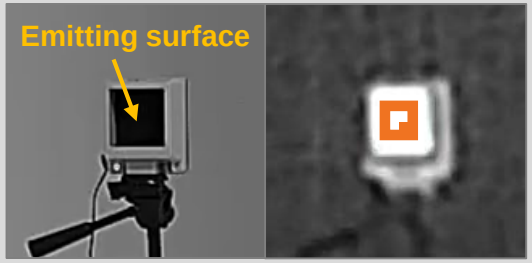
Analytics > Estimated body temperature detection > Compensation

1) Enable and input values according to usage environment for better accuracy
   - custom offset / ambient temperature and humidity
2) Set Detection distance
   - Input the distance between camera and the certain point where a person will be stand
3) Enable blackbody compensation and draw blackbody area
4) Input values according to the blackbody specification and installation.
5) Detected blackbody temperature will be displayed after configuration applied.

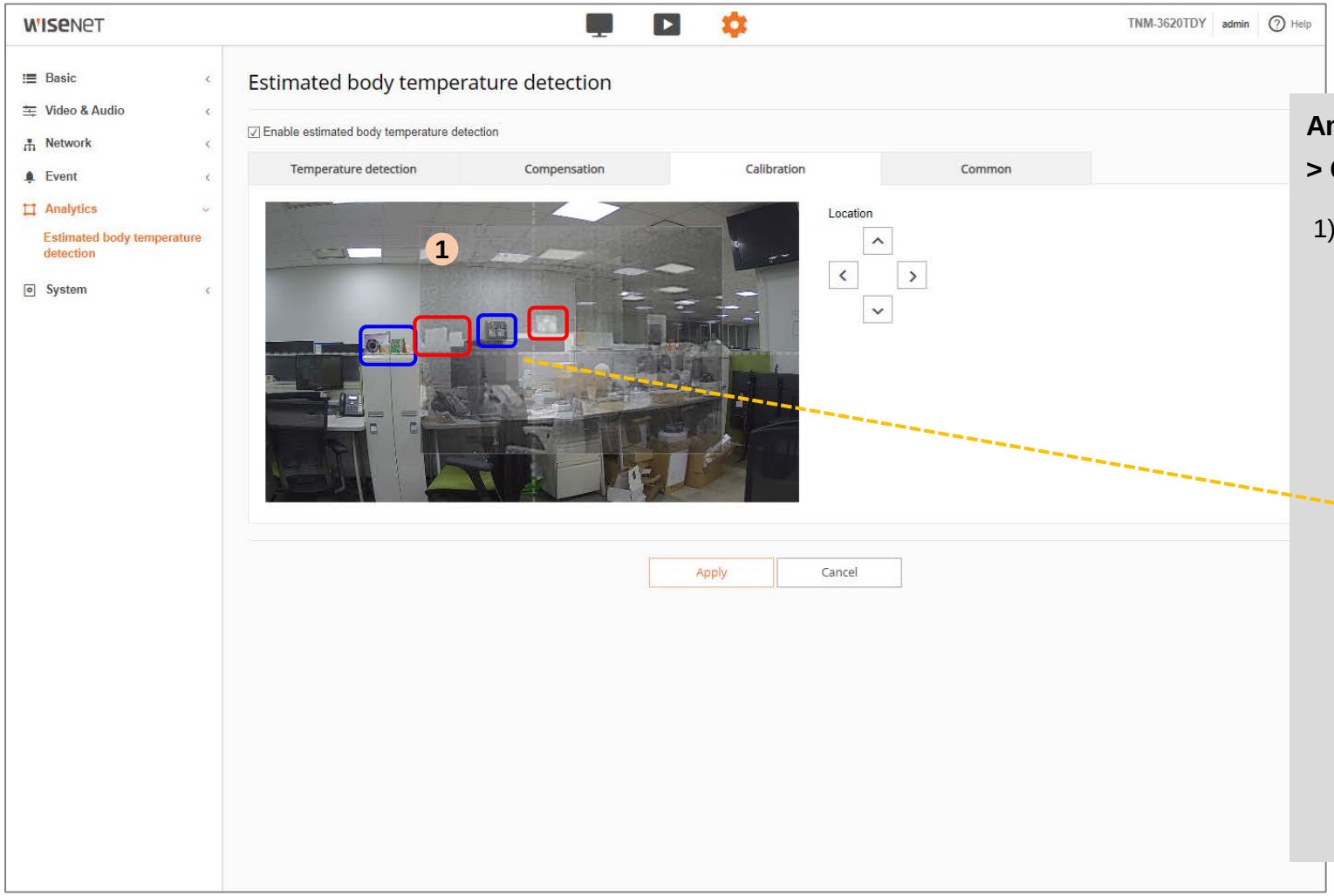
Caution

- SPI-35B blackbody's default temperature and emissivity is applied in camera default setting
- Blackbody area must be drew inside of emitting surface.

Please be careful not to set outside or cross the emitting surface.

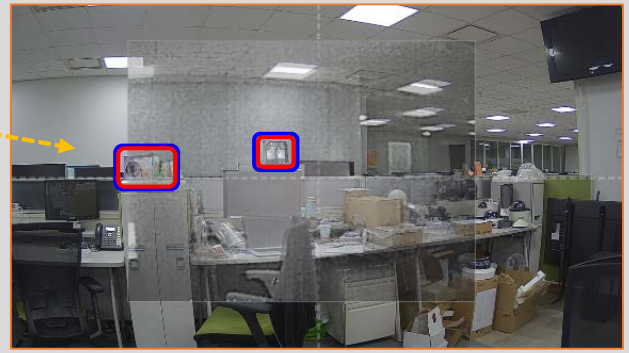


Camera Setup – EBT Mode Configuration



Analytics > Estimated body temperature detection > Calibration

1) This is a coordinate calibration of two channels.
(Related to Overlay box, reference detection area)
Adjust location of overlay thermal image on visible image to fit each other.



Note

A person needs to be standing in front of the camera at the detection distance for correct calibration.

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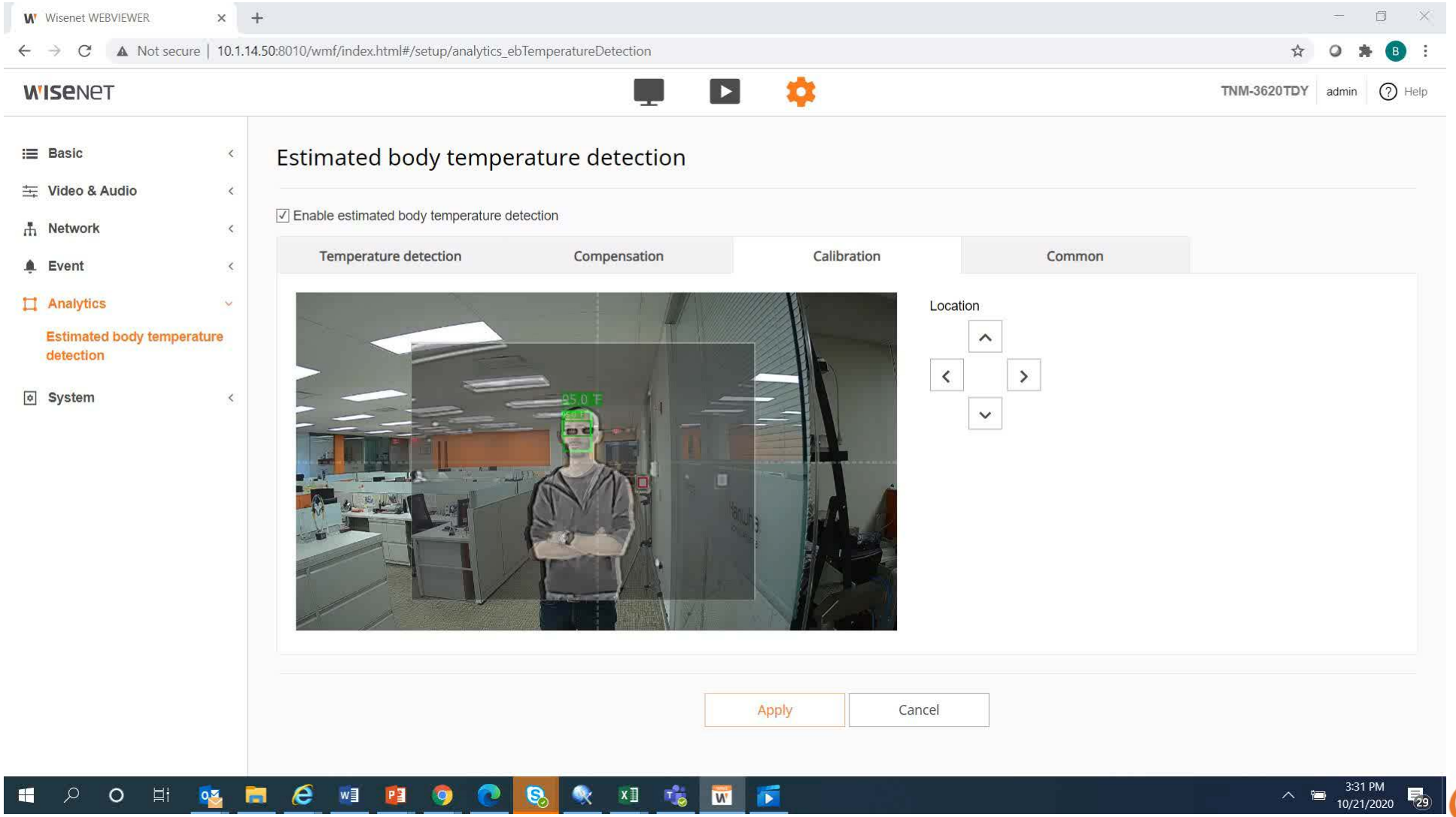
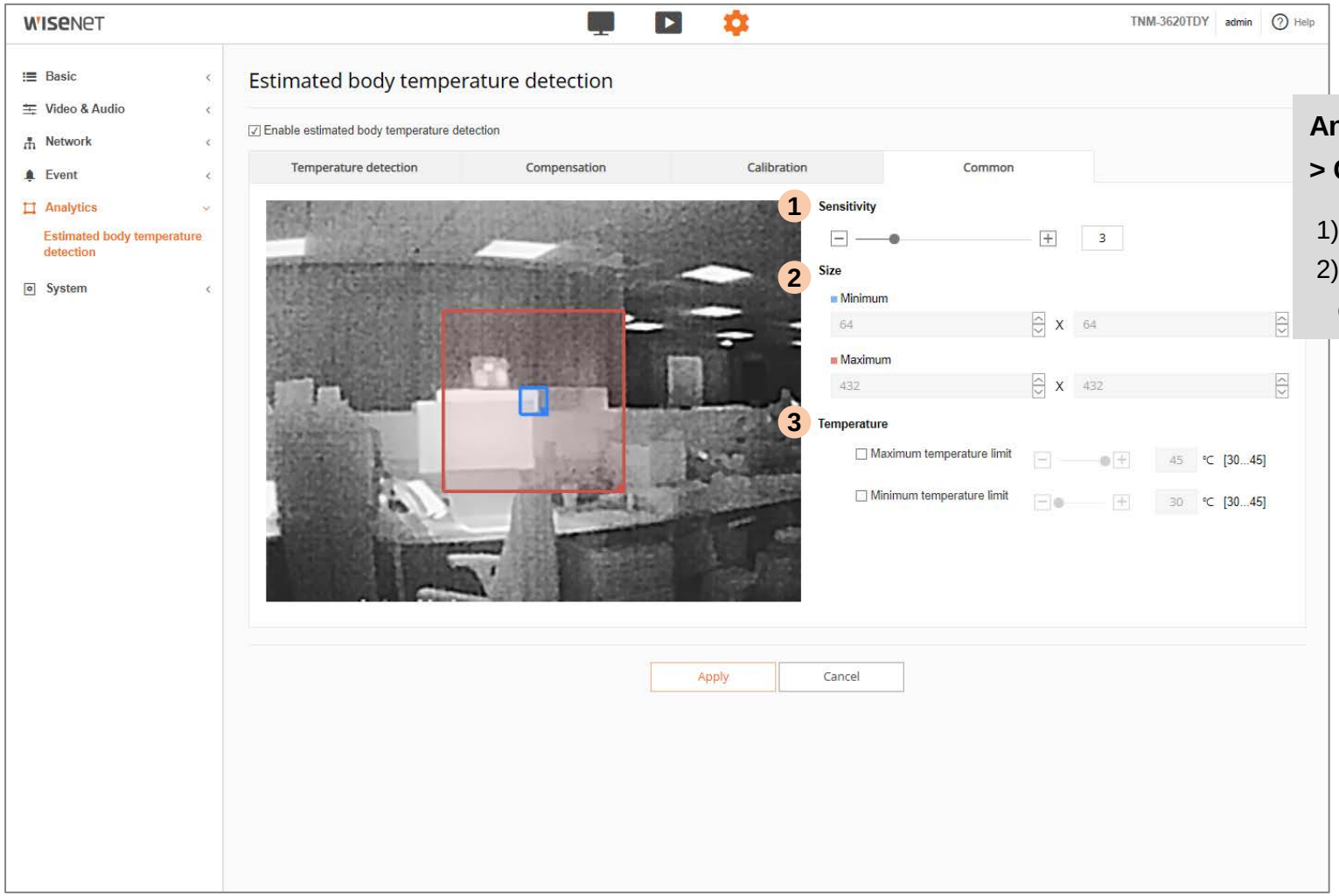
Camera Setup – EBT Mode Configuration



Camera Setup – EBT Mode Configuration



Analytics > Estimated body temperature detection > Common

1) Adjust face detection sensitivity
2) Set size or temperature detection filter according to usage environment.

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Demo

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Thank You!

Questions?

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