# 2026

Technology Beyond Technologies

# THERMAL IMAGING SOLUTION

TBT

# TBT Inc.

TBT Inc. is a global small and medium-sized company that specializes in developing and manufacturing uncooled/cooled thermal imaging cameras and exports them not only in Korea but also abroad.


## ***Technology*** *Beyond Technologies*

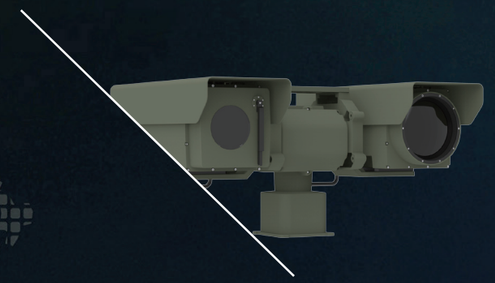
TBT Inc. is a **Manufacturer Specializing in Thermal Imaging Cameras**
that develops and manufactures thermal imaging cameras and image analysis monitoring systems.

Recently, in recognition of the performance of our products,
we are exporting thermal imaging cameras not only in Korea but also abroad such as Asia, the Middle East, and Europe.

We also offer a wide range of solutions
in defense, government agencies, and private industries for different purposes.

# TMS Sereis

Multisensor Lineup



*EO/IR Identification System*

# *TMS-20M Series*

## SPECIFICATIONS

| PT DRIVER | | TMS-20M_O42Y103 | TMS-20M_O69Y103 |
|---|---|---|---|
| Range | | PAN : 360° Endless, TILT : 90° ~ -90° | |
| Speed | | PAN : 0.01° ~ 60°/sec, TILT : 0.01° ~ 30°/sec | |
| Accuracy | | 0.001° | |
| Power Supply | | 24V DC (22 - 32V) | |
| Interface | Control | Ethernet | |
| | Sensor | Ethernet TCP/IP(10/100base) | |

| EO CAMERA | |
|---|---|
| Image Sensor | 1/2" Sony CMOS Sensor |
| Effective Pixels | 1937(H) x 1097(V) = 2.12M Pixels |
| Video Format | 1080p@60/50fps, 1080p@30/25fps,<br>720p@60/50fps, 720p@30/25fps |
| Vedio Output | HD-SDI |
| Lens Focal length | 16 ~ 1030mm (x64 Optical Zoom, x32 Digital Zoom) |
| F/# | F2.8 - F22 |
| HFOV | 26.0°~0.4° |
| ND Filter | ND10% |
| Min. Illumination | Color: 0.15 lux/DSS 0.0375 lux,<br>B/W: 0.01 lux/DSS 0.002 lux |
| Image Correction | BLC, DNR, Defog, DIS |
| Focus | Auto / Manual |

| IR CAMERA | | |
|---|---|---|
| Detector Type | Cooled InSb, 640(H) x 512(V) | |
| F/# | F/#4.0 | |
| Output Resolution | 1280x720, Option 1920x1080 | |
| Lens Focal length | 21mm ~ 420mm | 35mm ~ 690mm |
| HFOV | 25.1° ~ 1.3° | 15.2° ~ 0.8° |
| Pixel Pitch | 15µm | |
| Spectral Range | 3.7µm ~ 5µm (MWIR) | |
| NETD | <20mK typical (without Lens) | |
| Focus | Auto / Manual | |
| Vedio Output | HD-SDI | |
| Image Correction | DNR, DIS, Adaptive HEQ, LAE, Auto Integral Time, DDE | |

| MECHANICAL | | |
|---|---|---|
| Operating Temp. | -32°C to +55°C | |
| Certification | IP66, MIL-STD-461G, MIL-STD-810G | |
| Dimensions | 911.2mm(W) x 455.3mm(H) x 665mm(D) | |
| Weight | 65kg | 68.2kg |

### *FEATURES*

- With the composition of a zoom lens visible camera and a thermal camera, it has excellent detection ability even in bad weather.
- High precision (zero backlash) controllable by installing a harmonic reducer.
- Stability and prevention of displacement due to strong winds/ heavy snowfall.
- Easy replacement and maintenance with the unitization of each sensor that is easy to disassemble.
- IP66 Protection Level.
- MIL-STD-461G, MIL-STD-810G Certification.
- Built-in image tracking for reliable tracking.

| DRI | | | |
|---|---|---|---|
| Lens | 16~1030mm | 21~420mm | 35~690mm |
| Drone<br>0.3 x 0.3 m | D : 6.54km<br>R : 3.19km<br>I : 1.71km | D : 4.2km<br>R : 1.05km<br>I : 0.66km | D : 6.2km<br>R : 1.7km<br>I : 1.2km |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.



*EO/IR Identification System*

# *TMS-20J Series*

## SPECIFICATIONS

| PT DRIVER | | |
|---|---|---|
| Range | | PAN : 360° Endless, TILT : -70° ~ 45° |
| Speed | | PAN : 0.01° ~ 30°/sec, TILT : 0.01° ~ 30°/sec |
| Resolution | | 0.0009° |
| Accuracy | | 0.01° |
| Power Supply | | 24V DC (22 - 32V) |
| Interface | Control | Ethernet, RS422 |
| | Sensor | Ethernet |

| EO CAMERA | |
|---|---|
| Image Sensor | 1/2.8" 5MP CMOS Sensor (2592 x 1944) |
| Output Resolution | 2592 x 1944 |
| Shutter Type | Rolling Shutter |
| Lens Focal length | 12.5 ~ 1000mm (over x4 Digital zoom) |
| FOV | 0.29°~23.4°/0.22°~17.6° |
| DRI | Vehicle (5m x 2m) : over 12km<br>Vessel (15m x 10m) : over 47km |
| Defog | 100 Steps |
| Min. Illumination | 0.001Lux |
| Backlight Correction | BLC, HLC, WDR, SSDR |
| Focus | Auto / Manual |
| DIS | Support |

| IR CAMERA | |
|---|---|
| Detector Type | Cooled InSb, 1280(H) x 1024(V) |
| F/# | F/#4.0 |
| Output Resolution | 1920x1080 |
| Pixel Pitch | 10µm |
| Spectral Range | 3µm ~ 5µm |
| NETD | <25mK typical (without Lens) |
| Lens | 33mm ~ 420mm |
| FOV | 1.7°~20.0°/1.4°~17.6° |
| DRI | Vehicle (5m x 2m) : approx. 11km<br>Vessel (15m x 10m) : approx. 42km |
| Focus | Auto / Manual |
| Image Correction | AGC, Adaptive HEQ, LAE, DDE, DNR, Gamma, Sharpness,<br>Auto Integral Time, Stabilizer |

| MECHANICAL | |
|---|---|
| Operating Temp. | -32°C to +55°C |
| Certification | IP66 |
| Dimensions | 928.7mm(W) x 474.2mm(H) x 800mm(D) |
| Weight | 56.5kg |

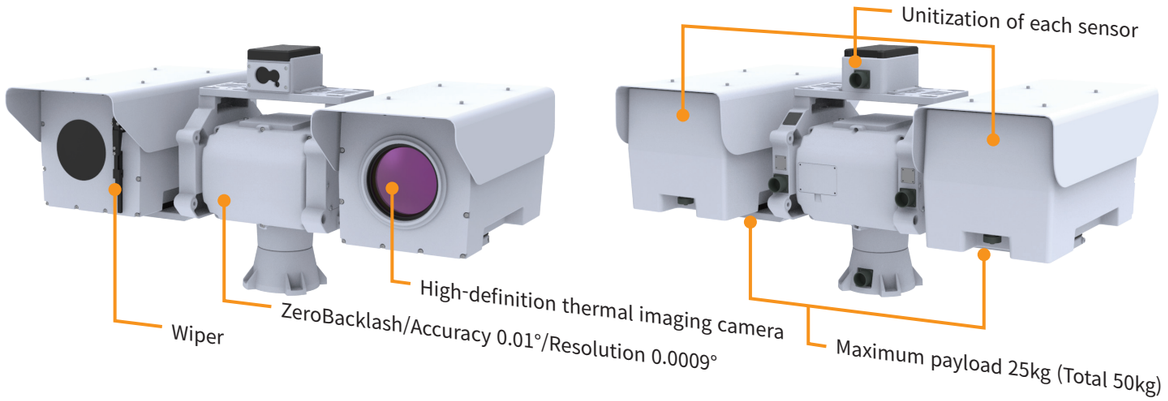
### *FEATURES*

- With the composition of a zoom lens visible camera and a thermal camera, it has excellent detection ability even in bad weather.
- High precision (zero backlash) controllable by installing a harmonic reducer.
- Stability and prevention of displacement due to strong winds/ heavy snowfall.
- Easy replacement and maintenance with the unitization of each sensor that is easy to disassemble.
- IP66 Protection Level.
- Built-in image tracking for reliable tracking.

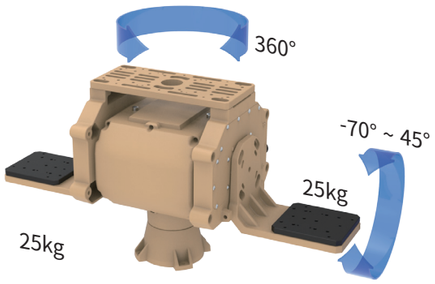
| IR CAMERA DRI | |
|---|---|
| Lens | 21~420mm |
| Drone 0.3 x 0.3 m | D : 5.1km<br>R : 1.36km<br>I : 0.89km |
| Human 1.8 x 0.5 m | D : 13.8km<br>R : 4.3km<br>I : 2.8km |
| Vehicle 2.3 x 2.3 m | D : 20.6km<br>R : 8.9km<br>I : 6.1km |
| Vessel 15 x 15 m | D : 32.9km<br>R : 24.5km<br>I : 21.1km |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

# TMS-20 Series




## Durability-based design




With a structure that can withstand up to 50kg of weight and a design that is resistant to rain, wind, vibration, etc., we have secured durability without problems in long-term operation.
Minimum PT speed of 0.01°/s and Zero Backlash.
Accuracy 0.01°(0.18mrad), Resolution 0.0009°(0.0157mrad).

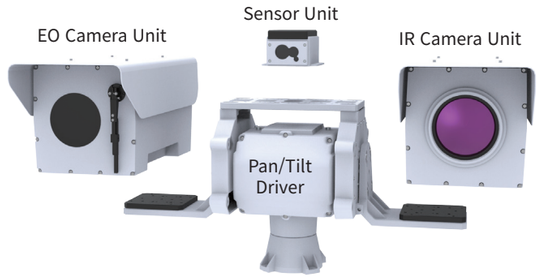
## Automatic Integration Time

It is a function that optimizes image quality by detecting rapid temperature changes in the operating environment and adjusting the integration time in real time.
There is no hassle of adjusting the integration time according to weather conditions such as summer, winter, and high daily temperature differences.


[ Before ] [ After ]

## Rapid Maintenance

Since it is designed as a unit of all components, it is easy to disassemble and assemble and convenient to maintain.



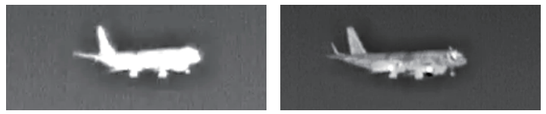

## LAE (Local Area Enhancement)

Increase situational awareness by improving image contrast for very dark or very bright areas with local processing.

[ LAE Off ] [ LAE On ]

## Adaptive HEQ (Adaptive Histogram Equalization)

Special imaging processing that highlights complex (high entropy) areas in a scene improves object details except for backgrounds such as sky, sea, etc

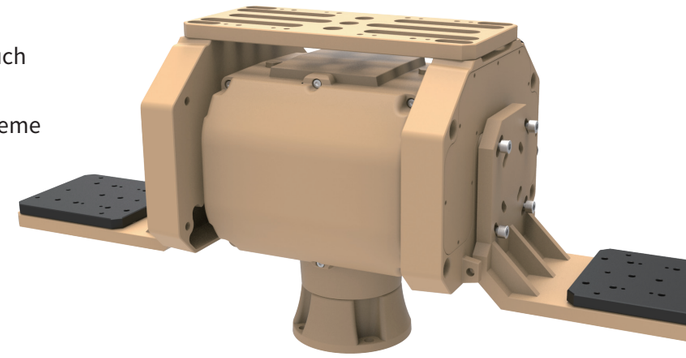


[ HEQ Off ] [ HEQ On ]

*Pan Tilt Driver*

# PT Driver *TMS-20 Series*

It can withstand up to 50kg of weight, and it can be operated with high precision with EO/IR lenses of 1,000mm or higher and a wide range of sensors such as LRF/GPS/DMC.
Designed with strong durability, it is strong in extreme environments such as long periods of rain, wind, and earthquakes.
Excellent resolution and Zero Backlash ensure smooth operation when equipped with long-range zoom lenses.
Wide compatibility with a wide range of interfaces enables a wide range of sensors to be mounted according to user needs.



## SPECIFICATIONS

| | | |
|---|---|---|
| Range | Azimuth | n x 360° |
| | Elevation | -70° ~ 45° |
| Speed | Azimuth | 0.01°/s to 60°/s |
| | Elevation | 0.01°/s to 60°/s |
| Resolution | 0.0009° (0.0157 mrad) | |
| Accuracy | 0.01° (0.18 mrad) | |
| Payload (Side Mount) | 2 x 25kg | |
| Interface | Control | Ethernet, RS422 (P/T Only) |
| | Sensor | Ethernet |
| Temperature | Operating | -32°C to +55°C |
| | Storage | -40°C to +60°C |
| Power Supply | 24V DC (20 - 32V) | |
| Environmental Protection | IP66 | |
| Dimensions (WxHxD) | 807mm x 393.5mm x 323mm | |
| Weight | approx. 24.9kg | |

## OPTION

| | | |
|---|---|---|
| LRF | Safety | Eye Safe Class 1 |
| | Precision | <1.5m |
| | Range(km) | 5 / 10 (Nato Target) |
| GPS | | |
| DMC | | |
| Control Soft ware | Basic GUI | |
| | Auto Targeting | |
| | Auto Tracking | |
| Joystick | 3Axis / USB Interface | |

*Megapixel Cooled Thermal Camera F/#4.0*

# IR CAMERA *TMS-20 Series*

With the 1280x1024 sensor, the UpScale delivers excellent picture quality with FHD-class picture quality and NETD 25mK resolution.
A completely redesigned thermal imaging camera platform that delivers unsurpassed performance with state-of-the-art technology.
Always provide good thermal imaging even in dark and bright areas without user adjustment.
Various image processing ensures clear image quality even in extreme environments, and depending on the lens, it can detect more than 26km (vehicle).
It has excellent IP grade and has the best durability for waterproofing and dustproofing.


## SPECIFICATIONS

| | |
|---|---|
| Detector Type | Cooled InSb |
| Array Format | 1280 x 1024 |
| Output Resolution | 1920 x 1080 , Option (1280 x 1024 / 1280 x 720 / 720 x 576) |
| Pixel Pitch | 10μm |
| Spectral Range | 3 ~ 5μm |
| F/# | F/#4.0 |
| NETD | <25mK typical (without Lens) |
| Video Interface | Ethernet, HDMI / Option : CVBS, HD-SDI |
| Control Interface | Ethernet RS232, RS422 (Option) |

## LENS OPTION

| Lens Focal length | 15 to 300mm | 33 to 420mm | 60 to 600mm | 60 to 690mm | 72 to 900mm | 100 to 1200mm |
|---|---|---|---|---|---|---|
| HFOV (H) | 44.9° to 2.4° | 20° to 1.7° | 11.4° to 1.2° | 11.5° to 1° | 9.3° to 0.8° | 6.8° to 0.6° |
| F/# | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 |
| Drone 0.3 x 0.3 m | D : 3.7km<br>R : 1km<br>I : 0.62km | D : 5.1km<br>R : 1.36km<br>I : 0.89km | - | D : 7.8km<br>R : 2.26km<br>I : 1.39km | D : 9.8km<br>R : 2.9km<br>I : 1.8km | - |
| Human 1.8 x 0.5 m | D : 10.7km<br>R : 3.2km<br>I : 2km | D : 13.8km<br>R : 4.3km<br>I : 2.8km | D : 17.4km<br>R : 6km<br>I : 3.9km | D : 18.8km<br>R : 6.8km<br>I : 4.5km | D : 21.5km<br>R : 8.5km<br>I : 5.7km | D : 24.3km<br>R : 10.7km<br>I : 7.3km |
| Vehicle 2.3 x 2.3 m | D : 17.7km<br>R : 6.8km<br>I : 4.5km | D : 20.6km<br>R : 8.9km<br>I : 6.1km | D : 23.5km<br>R : 11.6km<br>I : 8.2km | D : 24.5km<br>R : 12.8km<br>I : 9.1km | D : 26.3km<br>R : 15.1km<br>I : 11.1km | D : 28.1km<br>R : 17.7km<br>I : 13.6km |
| Vessel 15 x 15 m | D : 31.3km<br>R : 22.1km<br>I : 17.7km | D : 32.9km<br>R : 24.5km<br>I : 21.1km | - | D : 35.4km<br>R : 28km<br>I : 25km | D : 36.7km<br>R : 29.5km<br>I : 25.8km | - |
| Dimensions (WxHxD, Unit : mm) | 255x253x665 | 255x253x665 | 255x253x705 | 255x253x705 | 295x300x800 | 392x396x870 |
| Weight | 12.2kg | 12.9kg | 15.2kg | 16.1kg | 22.1kg | 30.5kg |

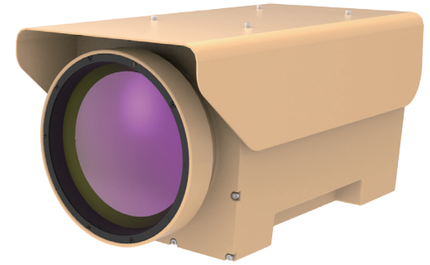
D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.



*Cooled Thermal Camera F/#4.0*

# IR CAMERA *TMS-20 Series*

The 640 x 512 sensor delivers excellent picture quality with FHD class picture quality and NETD 20mK resolution with UpScale.
A completely redesigned thermal imaging camera platform that delivers unsurpassed performance with state-of-the-art technology.
You can always provide good thermal imaging images in dark and bright areas without user adjustment.
Various image processing ensures clear image quality even in extreme environments, and depending on the lens, it can detect more than 24 km (vehicle).
It has excellent IP grade and has the best durability for waterproofing and dustproofing.



## SPECIFICATIONS

| | |
|---|---|
| Detector Type | Cooled InSb |
| Array Format | 640 x 512 |
| Output Resolution | 1280 x 720, Option (1920 x 1080 / 1280 x 1024 / 720 x 576) |
| Pixel Pitch | 15μm |
| Spectral Range | 3.7 ~ 5μm |
| F/# | F/#4.0 |
| NETD | <20mK typical (without Lens) |
| Video Interface | Ethernet, HDMI / Option : CVBS, HD-SDI |
| Control Interface | Ethernet RS232, RS422 (Option) |

## LENS OPTION

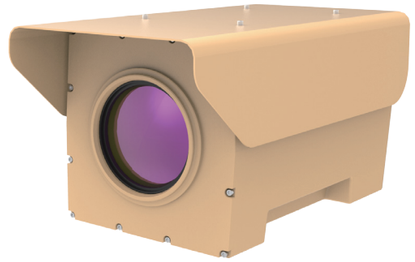
| Lens Focal length | 15 to 300mm | 21 to 420mm | 30 to 600mm | 35 to 690mm | 45 to 900mm | 60 to 1200mm |
|---|---|---|---|---|---|---|
| HFOV (H) | 35.1° to 1.8° | 25.1° to 1.3° | 17.2° to 0.9° | 15.2° to 0.8° | 10.9° to 0.6° | 8.6° to 0.5° |
| F/# | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 |
| Drone 0.3 x 0.3 m | D : 3.5km<br>R : 0.94km<br>I : 0.59km | D : 4.8km<br>R : 1.3km<br>I : 0.83km | - | D : 7.3km<br>R : 2.1km<br>I : 1.3km | D : 9km<br>R : 2.7km<br>I : 1.7km | - |
| Human 1.8 x 0.5 m | D : 10km<br>R : 3km<br>I : 1.9km | D : 12.9km<br>R : 4.1km<br>I : 2.6km | D : 16.2km<br>R : 5.6km<br>I : 3.6km | D : 17.6km<br>R : 6.3km<br>I : 4.2km | D : 20.2km<br>R : 7.9km<br>I : 5.3km | D : 22.8km<br>R : 10km<br>I : 6.8km |
| Vehicle 2.3 x 2.3 m | D : 16.5km<br>R : 6.3km<br>I : 4.2km | D : 19.3km<br>R : 8.3km<br>I : 5.6km | D : 22km<br>R : 10.8km<br>I : 7.5km | D : 23km<br>R : 11.9km<br>I : 8.4km | D : 24.7km<br>R : 14.1km<br>I : 10.7km | D : 26.4km<br>R : 16.4km<br>I : 12.5km |
| Vessel 15 x 15 m | D : 29.2km<br>R : 20.5km<br>I : 16.6km | D : 30.9km<br>R : 22.9km<br>I : 19.4km | - | D : 33.3km<br>R : 26.1km<br>I : 23.1km | D : 34.5km<br>R : 27.6km<br>I : 24.9km | - |
| Dimensions (WxHxD, Unit : mm) | 255x253x665 | 255x253x665 | 255x253x705 | 255x253x705 | 295x300x800 | 392x396x870 |
| Weight | 12.2kg | 12.9kg | 15.2kg | 16.1kg | 22.1kg | 30.5kg |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

*Cooled Thermal Camera F/#5.5*

# IR CAMERA F5.5 *TMS-20 Series*

UpScale with 640x512 sensors delivers excellent picture quality with FHD-class picture quality and NETD 20mK resolution.
A completely redesigned thermal imaging camera platform that delivers unsurpassed performance with state-of-the-art technology.
Always provide good thermal imaging even in dark and bright areas without user adjustment.
Various image processing ensures clear image quality even in extreme environments, and depending on the lens, it can detect more than 14km (vehicle).
It has excellent IP grade and has the best durability for waterproofing and dustproofing.



## SPECIFICATIONS

| | |
|---|---|
| Detector Type | Cooled InSb |
| Array Format | 640 x 512 |
| Output Resolution | 1280 x 720, Option (1920 x 1080 / 1280 x 1024 / 720 x 576) |
| Pixel Pitch | 15μm |
| Spectral Range | 3.7 ~ 5μm |
| F/# | F/#5.5 |
| NETD | <20mK typical (without Lens) |
| Video Interface | Ethernet, HDMI / Option : CVBS, HD-SDI |
| Control Interface | Ethernet RS232, RS422 (Option) |

## LENS OPTION

| Lens Focal length | 20 to 275mm | 50 to 700mm | 80 to 1200mm |
|---|---|---|---|
| HFOV (H) | 28.0° ~ 1.9° | 10.9° to 0.8° | 7.1° to 0.5° |
| F/# | F/#5.5 | F/#5.5 | F/#5.5 |
| Drone 0.3 x 0.3 m | D : 2.9km<br>R : 0.75km<br>I : 0.47km | D : 6.7km<br>R : 1.9km<br>I : 1.2km | D : 8.8km<br>R : 3km<br>I : 1.9km |
| Human 1.8 x 0.5 m | D : 8.4km<br>R : 2.4km<br>I : 1.5km | D : 16.7km<br>R : 5.7km<br>I : 3.7km | D : 22km<br>R : 9km<br>I : 6km |
| Vehicle 2.3 x 2.3 m | D : 14.9km<br>R : 5.2km<br>I : 3.4km | D : 22.5km<br>R : 11.1km<br>I : 7.8km | D : 26.1km<br>R : 15.6km<br>I : 11.6km |
| Vessel 15 x 15 m | D : 28.5km<br>R : 19.1km<br>I : 15.1km | D : 33.2km<br>R : 25.8km<br>I : 22.7km | D : 36.4km<br>R : 30.4km<br>I : 26.9km |
| Dimensions (WxHxD, Unit : mm) | 180x180x400 | 255x253x665 | 268x268x446 |
| Weight | 7kg | 12.5kg | 21kg |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.



*UnCooled Thermal Camera*

# IR CAMERA *TMS-20 Series*

640x480 sensors deliver high-definition quality and NETD 60mK resolution with UpScale.
Various image processing ensures clear image quality even in extreme environments, and depending on the lens, it can detect more than 21 km (vehicle).
It has excellent IP grade and has the best durability for waterproofing and dustproofing.

## SPECIFICATIONS

| | |
|---|---|
| Detector Type | Uncooled LWIR Thermal Imager |
| Array Format | 640 x 480 |
| Output Resolution | 1280 x 720 (Digital or Network) |
| Pixel Pitch | 12μm |
| Spectral Range | 8 ~ 14μm |
| NETD | <50mk@F1.0 @ Room Temperature |
| Video Interface | CVBS : 1.0Vp-p 75Ω (Option : HD-SDI) |
| Control Interface | RS-232, Network |

## LENS OPTION

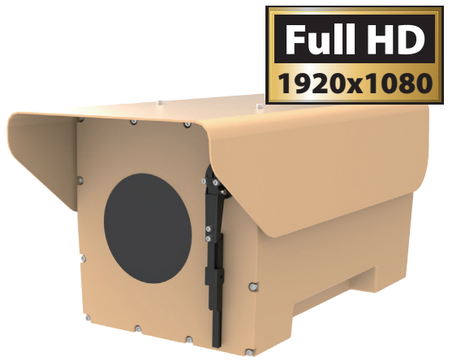
| Lens Focal length | 26-105mm | 15-150mm | 25-225mm |
|---|---|---|---|
| HFOV (H) | 17.1°~4.1° | 29°~2.9° | 17.7°~1.9° |
| F/# | F/1.6 | F/0.85-1.35 | F/0.95~1.5 |
| Human 1.7 x 0.5 m | D : 3.83km<br>R : 0.9km<br>I : 0.48km | D : 5.47km<br>R : 1.29km<br>I : 0.68km | D : 8.2m<br>R : 1.93km<br>I : 1.02km |
| Vehicle 2.3 x 2.3 m | D : 10.85km<br>R : 2.25km<br>I : 1.19km | D : 15.46km<br>R : 3.21km<br>I : 1.7km | D : 23.19km<br>R : 4.81km<br>I : 2.56km |
| Dimensions (WxHxD, Unit : mm) | 255x253x665 | 255x253x665 | 255x253x665 |
| Weight | 12.6kg | 13.6kg | 14kg |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

*Daylight Camera*

# EO CAMERA *TMS-20 Series*

Ultra-sensitive sensors help ensure clear day and night images.
Excellent visibility at night with very low illumination specifications.
It has a built-in image shake correction function using a gyro sensor.
With a wide range of cameras and lens options, you can install lenses of 1000mm or more.
WEffective image correction is possible through functions such as WDR/BLC.
Auto Focus allows you to always have clear subjects.




## SPECIFICATIONS

| | | |
|---|---|---|
| Image Sensor | 1/1.8" CMOS | 1/2.8" CMOS |
| Interface | Network | Network |
| Ethernet | RJ-45(10/100BASE-T) | RJ-45(10/100BASE-T) |
| Resolution | 1920x1080 | 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240 |
| Gyro Image Stabilizer | Support (EIS) | Support (Built-in Gyro Sensor) |
| Backlight Correction | BLC, HLC, WDR | BLC, HLC, WDR, SSDR |
| Defog | Support (NIR) | Support |
| Acceptable Lens | 6-540mm, 15-850mm | 27-1070mm, 41-1560mm |

## LENS OPTION

| | | | | |
|---|---|---|---|---|
| Lens Focal length | 6 to 540mm | 15 to 850mm | 27 to 1070mm | 41 to 1560mm |
| HFOV (H) | 65.24° to 0.82° | 29.12° to 0.53° | 15.4° to 0.45° | 10.3° to 0.30° |
| Human 1.8 x 0.5 m | TBD | TBD | D : 28.5km<br>R : 11.4km<br>I : 5.7km | D : 41.6km<br>R : 16.6km<br>I : 8.3km |
| Vehicle 2.3 x 2.3 m | TBD | TBD | D : 40.7km<br>R : 16.3km<br>I : 8.1km | D : 59.4km<br>R : 23.7km<br>I : 11.8km |
| Dimensions (WxHxD, Unit : mm) | TBD | TBD | 255x249.9x705 | 255x249.9x705 |
| Weight | TBD | TBD | 18.5kg | 18.5kg |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.



*Sensor Unit / Joystick Controller*

# OPTION *TMS-20 Series*

## Sensor Unit

Highly integrated LRF laser distance meters, compact and eye-safe, are used in many applications, from demanding military measurements to portable systems.
Highly integrated technology enables accurate distance measurement under harsh environmental conditions.

## SPECIFICATIONS

| | |
|---|---|
| Laser safety class | Eye Safe Class 1 |
| Wavelength | 1.5μm |
| Measurement range (NATO Target) | 5km / 10km |
| Extinction ratio | 44.7dB |
| Measurement rates | 0.2, 1, 4, 10, 15, 200 Hz |
| Precision | <1.5m |
| Beam divergence | 0.35mrad |
| False detection rate | < 1% |
| Target discrimination | < 30m |
| Range gating resolution | 1m |
| Option | Laser Pionter |

## Joystick Controller

The smooth control stick allows precise control, while the precision nano trim wheel enables fine orientation adjustment.
A high-resolution contactless sensor ensures accurate response to control stick inputs and extends the controller's service life.

## SPECIFICATIONS

| | |
|---|---|
| OS | Windows 10/11 |
| Interface | USB-C to USB-A |
| Weight | 820g |
| Dimensions (WxHxD) | 164.1 x 216.84 x 230.47mm |

# TMS-10 Series

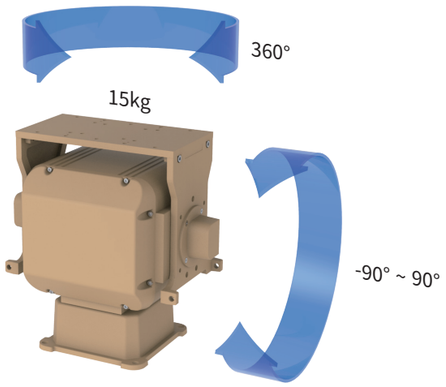
## Pan/Tilt Step Motor drive method

The motor, a key rotational drive part of the pan/tilt, uses a step motor with low error and very responsive.

※ Step motor: The rotor rotates at a specific angle or step with the drive shaft.

**Advantages of a Step Motor**
Ultra-precise control with fine-grained step angles using micro-step methods
Angle errors per step are very low and errors are not accumulated.
High responsiveness of running, stopping, and reverse rotation and low tremor in stop.
Excellent positioning against wind and other external forces with solid stationary conditions.
There is no need for maintenance such as replacing the brush of a regular DC motor.
The high resolution encoder provides excellent position detection accuracy.

## Durability-based design

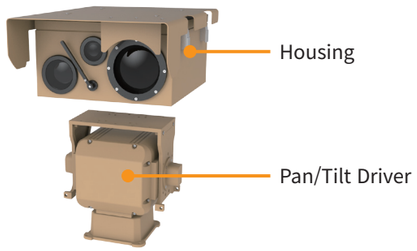



It is developed with domestic technology from the product design stage and manufactured through gravity casting molds to ensure high durability and excellent quality.
It can withstand up to 15kg of weight and has a design that is resistant to rain, wind, vibration, etc. to ensure durability without problems in long-term operation.
Minimum PT speed of 0.01°/s and Zero Backlash.
System accuracy 0.01° (0.18 mrad), system resolution 0.0009° (0.0157 mrad).

## Securing the Vision


The design of sun visors and wipers provides clear visibility even in direct sunlight, snow, or rainy environments.

## Compatibility and Convenience

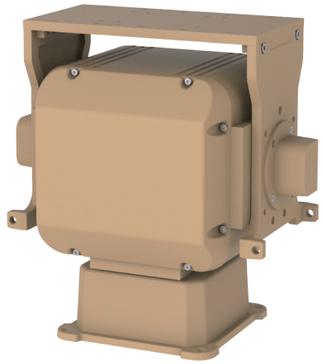



The housing and pan/tilt are easy to attach and detach, so spare parts of the same equipment can be replaced immediately on site to prevent monitoring gaps in case of emergency maintenance.
It also has a wide range of interfaces and compatibility to operate complex equipment such as EO/IR, LRF, GPS, DMC, etc., and can be mounted on various equipment (Vehicle, Mast, Stand, Vessel, etc.) according to the customer's use.

*Pan Tilt Driver*

# PT Driver *TMS-10 Series*

It can withstand up to 15kg of weight and can be operated with high precision with a wide range of sensors such as EO/IR and LRF/GPS/DMC of various lenses.
Designed with strong durability, it is strong in extreme environments such as long periods of rain, wind, and earthquakes.
Excellent resolution and Zero Backlash ensure smooth operation when equipped with long zoom lenses.
Various interfaces and wide compatibility enable a wide range of sensors to be mounted according to user needs.



## SPECIFICATIONS

| | | |
|---|---|---|
| Range | Azimuth | n x 360° |
| | Elevation | -90° ~ 90° |
| Speed | Azimuth | 0.02°/s to 60°/s |
| | Elevation | 0.02°/s to 50°/s |
| Resolution | 0.0009° (0.0157 mrad) | |
| Accuracy | 0.01° (0.18 mrad) | |
| Payload | 15kg | |
| Interface | Control | Ethernet, RS422 (P/T Only) |
| | Sensor | Ethernet |
| Temperature | Operating | -32°C to +55°C |
| | Storage | -40°C to +60°C |
| Power Supply | DC24V±20% / max. 200W (including Fan, Heater) | |
| Environmental Protection | IP66 | |
| Dimensions (WxHxD) | 342mm x 230mm x 341mm | |
| Weight | approx. 12kg | |

## OPTION

| | | |
|---|---|---|
| LRF | Safety | Eye Safe Class 1 |
| | Precision | <1.5m |
| | Range(km) | 5 / 10 (Nato Target) |
| Control Soft ware | Basic GUI | |
| | Auto Targeting | |
| | Auto Tracking | |
| Joystick | 3Axis / USB Interface | |

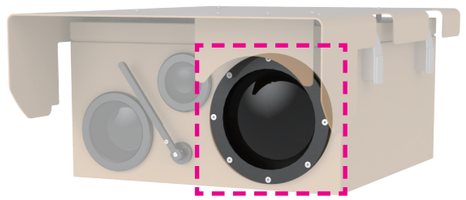
*UnCooled Thermal Camera*

# IR CAMERA *TMS-10 Series*

640x480 sensors deliver high-definition quality and NETD 60mK resolution with UpScale.

Various image processing ensures clear image quality even in extreme environments, and depending on the lens, it can detect more than 14 km (vehicle).

It has excellent IP rating and has the best durability for waterproofing and dustproofing.



## SPECIFICATIONS

| | |
|---|---|
| Detector Type | Uncooled LWIR Thermal Imager |
| Array Format | 640 x 480 |
| Output Resolution | 1280 x 720 (Digital or Network) |
| Pixel Pitch | 12µm |
| Spectral Range | 8 ~ 14µm |
| NETD | <50mk@F1.0 @ Room Temperature |
| Video Interface | Ethernet, CVBS (Option) |
| Control Interface | RS-232, Network |
| Power | DC 12V/3.0A, DC24V/3.5A |

## LENS OPTION

| Lens Focal length | 26-105mm | 12-120mm | 30-150mm |
|---|---|---|---|
| HFOV (H) | 17.46°~4.19° | 35°~3.7° | 14.7°~2.9° |
| F/# | F/1.6 | F/1.2 | F/0.85-1.2 |
| Human 1.7 x 0.5 m | D : 3.9km<br>R : 0.98km<br>I : 0.6km | D : 4.47km<br>R : 1.11km<br>I : 0.69km | D : 5.59km<br>R : 1.39km<br>I : 0.87km |
| Vehicle 2.3 x 2.3 m | D : 10km<br>R : 2.5km<br>I : 1.5km | D : 11.5km<br>R : 2.87km<br>I : 1.79km | D : 14.3km<br>R : 3.59km<br>I : 2.24km |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.



*Daylight Camera*

# EO CAMERA *TMS-10 Series*

Get clear daytime and nighttime images with ultra-sensitive sensors.

It has a built-in image shake correction function using a gyro sensor.

Effective image correction is possible through functions such as WDR/BLC.

Auto Focus enables you to always have clear subjects.


## SPECIFICATIONS

| | |
|---|---|
| Detector Type | 1/2.8" 2MP CMOS |
| Interface | Network |
| Ethernet | 10Base-T/100Base-Tx |
| Resolution | 1920x1080, 1280x720, 720x576, 720x480, 352x288, 352x240, 176x144, 176x120 |
| Backlight Correction | HLC |
| Defog | Support (Built in Optical Filter) |
| Power | DC 12V/3.0A, DC24V/3.5A |

## LENS OPTION

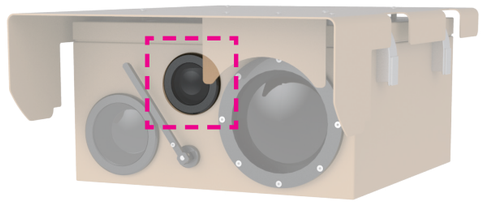
| Lens Focal length | 7.1 to 300mm |
|---|---|
| HFOV (H) | 41.54° to 1.07° |
| Human 1.8 x 0.5 m | D : 10.3km<br>R : 4.1km<br>I : 2km |
| Vehicle 2.3 x 2.3 m | D : 14.7km<br>R : 5.9km<br>I : 2.9km |

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

*Housing / Joystick Controller*

# *OPTION* *TMS-10 Series*

## Housing Option



Highly integrated LRF laser distance meters, compact and eye-safe, are used in many applications, from demanding military measurements to portable systems.
Highly integrated technology enables accurate distance measurement under harsh environmental conditions.

### SPECIFICATIONS

| | |
|---|---|
| Laser safety class | Eye Safe Class 1 |
| Wavelength | 1.5μm |
| Measurement range (NATO Target) | 5km / 10km |
| Extinction ratio | 44.7dB |
| Measurement rates | 0.2, 1, 4, 10, 15, 200 Hz |
| Precision | <1.5m |
| Beam divergence | 0.35mrad |
| False detection rate | < 1% |
| Target discrimination | < 30m |
| Range gating resolution | 1m |
| Option | Laser Pionter |

## Joystick Controller

The smooth control stick allows precise control, while the precision nano trim wheel enables fine orientation adjustment.
A high-resolution contactless sensor ensures accurate response to control stick inputs and extends the controller's service life.

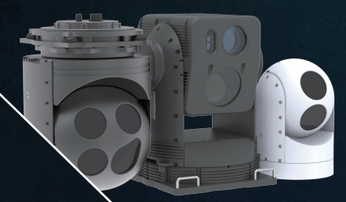
### SPECIFICATIONS

| | |
|---|---|
| OS | Windows 10/11 |
| Interface | USB-C to USB-A |
| Weight | 820g |
| Dimensions (WxHxD) | 164.1 x 216.84 x 230.47mm |



# TBX Sereis

Gimbal Lineup



# TBX Series



| THERMAL | TBX-05 Series | TBX-10, 15 Series | TBX-20 Series | TBX-20F Series | TBX-20T Series | TBX-30, 35 Series | TBX-40 Series |
|---|---|---|---|---|---|---|---|
| Sensor Type | Uncooled TiOx 640x480 | Uncooled TiOx 640x480 | Cooled InSb 640x512 | Cooled InSb 640x512 | Cooled InSb 640x512 | Cooled InSb 640x512 | Cooled InSb 640x512 |
| Pixel Pitch | 17μm | 17μm | 15 μm | 15 μm | 15 μm | 15 μm | 15 μm |
| NETD | ≤50mK @F1.0 | ≤50mK @F1.0 | <20mK typical (without lens) | <20mK typical (without lens) | <20mK typical (without lens) | <20mK typical (without lens) | <20mK typical (without lens) |
| Focal Length | 35mm (H:17.5° x V:13.2°) | 19mm, 35mm(H:17.5°) | 20-275mm(28.0° ~ 1.9°) | 20-275mm(28.0° ~ 1.9°) | 20-275mm(28.0° ~ 1.9°) | 21-420mm(25.1°~1.3°),<br>35-690mm(15.2° ~ 0.8°),<br>45-900mm(10.9° ~ 0.6°) | 20-275mm(28.0° ~ 1.9°) |
| F Number | F/1.2 | F/1.2 | F/5.5 | F/5.5 | F/5.5 | F/4.0 | F/5.5 |
| Cooler | - | - | Stirling Cooler | Stirling Cooler | Stirling Cooler | Stirling Cooler | Stirling Cooler |
| **COLOR CAMERA** | | | | | | | |
| Sensor Type | 1/1.8” Global Shutter | 1/2.8" 2MP CMOS | 1/2.8 inch CMOS | 1/2.8 inch CMOS | 1/2.8 inch CMOS | 1/1.8 inch CMOS | 1/2 inch CMOS |
| Resolution | 1920 x 1080 | 1920 x 1080 | 1920 x 1080 | 1920 x 1080 | 1920 x 1080 | 1920 x 1080 | 1920 x 1080 |
| Focal length | 6~180mm 30x Zoom, 2MP HD | 4.44 ~ 142.6mm, 32x Optical Zoom, 16x Digital Zoom | | 4.44 ~ 142.6mm, 32x Optical Zoom, 16x Digital Zoom | | 15.2 ~ 500mm, Auto Focus, 32x Optical Zoom, 16x Digital Zoom | 5.8 ~ 210mm, 36x Optical Zoom, 12x Digital Zoom |
| Field of View(H) | 60°(Wide) ~ 2°(Tele) | 62.8°(Wide) ~ 2.23°(Tele) | | 62.8°(Wide) ~ 2.23°(Tele) | | 25.6°(Wide) ~ 0.81°(Tele) | 60°(wide) ~ 3.7°(tele) |
| **GIMBAL** | | | | | | | |
| Dimensions (D x H, mm) | 110 x 170 | 190 x 270 | 290 x 420 | 322 x 449 | 320 x 440 | 420 x 650 | 322 x 449 |
| Weight | ≤1.6Kg | ≤1.3Kg, ≤7Kg | ≤18Kg | ≤28Kg | ≤28Kg | ≤65Kg | ≤60Kg |
| Gimbal Travel Characteristic | 제품별 상이 | Pan : 360° continuous,<br>Tilt : -30° ~ +90° | Pan : 360° continuous,<br>Tilt : -60° ~ +90° | Pan : 360° continuous,<br>Tilt : -60° ~ +90° | Pan : 360° continuous,<br>Tilt : -60° ~ +90° | Pan : 360° continuous,<br>Tilt : -30° ~ +75° | Pan : 360° continuous,<br>Tilt : -60° ~ +90° |
| Max Speed | Pan : 60°/s, Tilt : 60°/s | Pan : 60°/s, Tilt : 30°/s | Pan : 60°/s, Tilt : 60°/s | Pan : 60°/s, Tilt : 60°/s | Pan : 60°/s, Tilt : 60°/s | Pan : 60°/s, Tilt : 60°/s | Pan : 60°/s, Tilt : 60°/s |
| Gyroscope | MEMS | MEMS | MEMS | FOG | FOG | FOG | FOG |
| Gyro | 2~3 axis, Pitch, Roll& Yaw | 2~3 axis,<br>Pitch, (Roll) & Yaw | 2~3 axis,<br>Pitch, (Roll) & Yaw | 4 axis<br>Dual Pitch & Yaw | 3 axis,<br>Pitch, Roll & Yaw | 3 axis: pitch, roll & yaw<br>4 axis: dual pitch & yaw | 3 / 4 axis,<br>Pitch, Roll & Yaw |
| **ENVIRONMENT** | | | | | | | |
| Standards | - | - | MIL-STD-810G, MIL-STD-461G | MIL-STD-810G,506.4 Rain | MIL-STD-810G | MIL-STD-810G, MIL-STD-461F | MIL-STD-810G and MIL-STD-461G |
| Operating Temperature | 제품별 상이 | -30°C to +55°C | -20°C to +55°C | -20°C to +55°C | -20°C to +55°C | -32°C to +55°C | -20°C to +55°C |
| Storge Temperature | - | - | -30°C to +75°C | -30°C to +75°C | -30°C to +75°C | -30°C to +75°C | -30°C to +75°C |
| **POWER REQUIREMENT** | | | | | | | |
| Voltage | 12V DC | 12-34 VDC | 22-34 VDC | 22-34 VDC | 22-34 VDC | 22-32 VDC | 22-34 VDC |
| Consumption | ≤10W / ≤30W | ≤100W | 300W(max) | 300W(max) | 300W(max) | 500W(max) | 300W(max) |
| **OPTION** | | | | | | | |
| Laser Ranger Finder | O | O | O | O | O | O | O |
| Laser Pointer | - | - | O | O | O | O | O |
| Laser Desigsntor | O / - | O | O | O | O | O | O |
| SWIR | O | O | O | O | O | O | O |
| Software | O | O | O | O | O | O | O |
| Controller | O | O | O | O | O | O | O |
| Auto Tracker | O | O | O | O | O | O | O |

* Specifications may vary depending on selected options. Please contact our sales team for detailed information.

# TPV Sereis

Uncoold Camera

*Uncooled IR Camera*

# TPV-IHW/IAHW Series

## FEATURES

### *Uncooled Thermal Imaging Camera*

- 1280 x 720 Output Resolution
- NETD : ＜55mk@f/1.0
- Pixel Pitch : 12μm

### *Temperature Detection(TPV-IAHW)*

- Area (10) / Center / Mask (3)
- Temperature Range -20°C ~ 350°C
- Accuracy ±2°C or ±2%

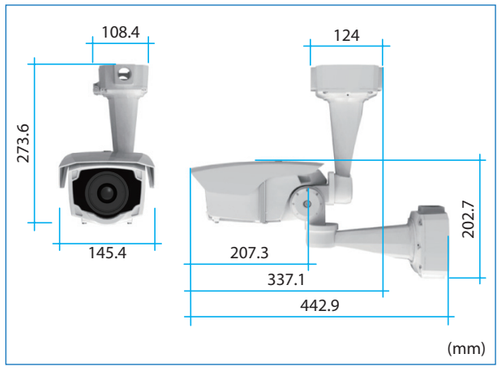
## SPECIFICATIONS

• Specifications are subject to change without notice.

| THERMAL MODULE | |
|---|---|
| SENSOR | |
| Thermal Sensor | Uncooled Microbolometer |
| Pixel Pitch | 12μm |
| Spectral Range | 8 ~ 14μm |
| NETD | <55mK@f/1.0, 30Hz, 300K |
| VIDEO | |
| Output Frequency | NTSC : 59.94Hz (30fps), PAL : 50Hz (25fps) |
| Video Output | CVBS : 1.0Vp-p/75Ω |
| Array Format | 640 x 480 |
| Output Resolution | 1280 x 720 |
| LENS | |
| Lesn | 8mm (FOV 58.3°x42.5°)[Basic]/19mm (FOV 22.8° x17.2°)[Option], 35mm (FOV 12.5°x9.4°)[Option] |
| MEASUREMENT | Only TPV-IAHW |
| Detect Mode | Area (10) / Center / Mask (3) |
| Temperature Range | -20°C ~ 350°C |
| Accuracy | ±2°C or ±2% |
| Emissivity Correction | 0.10 ~ 2.00 |
| FUNCTION | |
| Calibration | Manual / Auto / Interval |
| IDE Set | 0 ~ 30 (31 steps) |
| Mirror Mode | Enable / Disable |
| Image Flip | Enable / Disable |
| Inverse Mode | Enable / Disable |
| Image Mode | 11 Colors(Gray/Rainbow/Iron/Jet/Thermal/ BlueOrangeIcb/Smart/Cool/Gray+Rainbow/Gray+Jet/ Gray+Iron) |
| AGC Mode | MGC Mode / AGC#1(Low) / AGC#2(Middle) / AGC#3(High) |
| MECHANICAL | |
| Dimensions | 337.1mm(W) x 273.6mm(H) x 153.7mm(D) |
| Weight | 2.3kg |
| ELECTRICAL | |
| Power Consumption | DC12V 1.73A 21.0W Max |
| Power Supply | 12V DC (2A) |
| ETC | |
| Interface | IP |
| Storage Temp. | -40°C ~ 60°C |
| Operating Temp. | -20°C ~ 55°C |

| NETWORK | |
|---|---|
| Video compression | H.265 Main profile, H.264(High, Main, Base Line profile), MJPEG |
| Resolution | Color : 1920x1080, 1280x1024, 1280x720, 704x480, 704x576, 640x486, 352x288, 320x240<br>Thermal : 1280x720, 720x480, 640x480, 320x240 |
| Frame Rate | Color : Max 60fps @ 1920X1080<br>Thermal : Max 30fps @ 1280X720 |
| Video Streaming | H.265, H.264, M-JPEG Triple Streaming (Independently controllable frame rate and bandwidth) |
| LAN Interface | 10/100BaseT Ethernet Auto-Aware |
| Control | Joystick Controller (RS-485:Pelco-D) |
| Security Features | Multi user level protection for camera access |
| Support Protocol | TCP/IP, UDP, IPv4/v6, HTTP, HTTPS, FTP, UPnP, RTST, RTCP, DHCP, ARP, Zeroconf |
| Viewer and Control | Easy access through the viewer, controlling/setting temperature measurement functionality with dedicated software. |

## DIMENSIONS



# *TPV-IHDR Series*



## *FEATURES*

### *Uncooled Thermal Camera*
- 1280 x 720 Output Resoluton
- NETD : <55mk (@300K,F1.0)
- Pixel Pitch : 12µm

### *36x Zoom Full HD Color Camera*
- 2 Megapixel 36x Zoom Full HD Camera
- Defog
- Wiper type

### *Laser illuminator*
- Visibility 200m

## SPECIFICATIONS

* Specifications are subject to change without notice.

| THERMAL MODULE | |
|---|---|
| SENSOR | |
| Thermal Sensor | Uncooled Micro Bolometer, 640 x 480, 12µm Pixel Pitch |
| Wave Langth | 8 ~ 14µm |
| NETD | <55mk (@f1.0, 30Hz, 300k) |
| Output Frequency | NTSC : 59.94Hz (30fps), PAL : 50Hz (25fps) |
| Resolution | 1280 x 720 |
| Lens | 26 ~ 105mm (17.1°~4.1°), 15 ~ 150mm (29°~2.9°) |
| FUNCTION | |
| Calibration | Manual / Auto / Interval |
| IDE Set | 0 ~ 30 (31 steps) |
| Mirror Mode | Enable / Disable |
| Image Flip | Enable / Disable |
| Inverse Mode | Enable / Disable |
| Image Mode | 11 Colors(Gray/Rainbow/Iron/Jet/Thermal/BlueOrangeIcb/ Smart/Cool/Gray+Rainbow/Gray+Jet/Gray+Iron) |
| AGC Mode | MGC Mode / AGC#1(Low) / AGC#2(Middle) / AGC#3(High) |
| COLOR MODULE | |
| Image Sensor | Sony IMX385LQR, 1/2" RGB Bayer Array CMOS Sensor |
| Total Image Pixels | 1952(H) x 1113(V) approx. 2.17M pixels |
| Lens | 6.0 ~ 216 mm±5%, F1.5±5%(Wide) ~ F4.8±5%(Tele) 36x Day & Night Zoom Lens, H56.5°(W) ~ V33.6°(W) |
| Scanning Mode | Progressive Scan |
| Luminance S/N ratio | More than 50dB |
| FUNCTION | |
| HDR | DOL(Digital Over Lab) HDR |
| Noise Reduction | 2D-NR, 3D-NR |
| Digital Zoom | X8 |
| BLC | On/Off |
| HLC | On/Off |
| Defog | Off / On(Auto / Manual) |
| Laser illuminator | |
| Visibility | 200m |

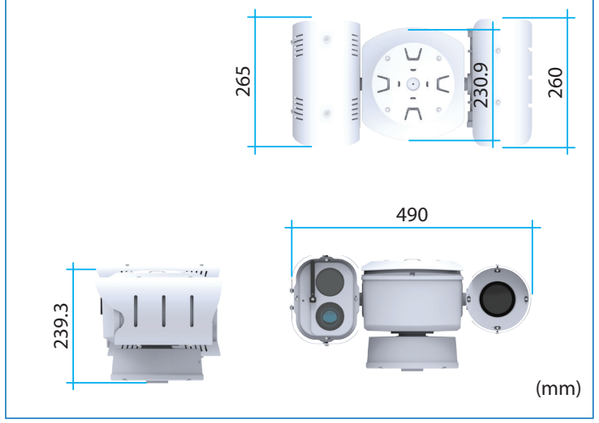
| NETWORK | |
|---|---|
| Video compression | H.265 Main profile, H.264(High, Main, Base Line profile), MJPEG |
| Resolution | Color : 1920x1080, 1280x1024, 1280x720, 704x480, 704x576, 640x486, 352x288, 320x240 Thermal : 1280x720, 720x480, 640x480, 320x240 |
| Frame Rate | Color : Max 60fps @ 1920X1080 Thermal : Max 30fps @ 1280X720 |
| Video Streaming | H.265, H.264, M-JPEG Triple Streaming (Independently controllable frame rate and bandwidth) |
| Application Programming Interface | ONVIF |
| LAN Interface | 10/100BaseT Ethernet Auto-Aware |
| Control | Joystick Controller (RS-485:Pelco-D) |
| Security Features | Multi user level protection for camera access |
| Support Protocol | TCP/IP, UDP, IPv4/v6, HTTP, HTTPS, FTP, UPnP, RTST, RTCP, DHCP, ARP, Zeroconf |
| Viewer and Control | Easy access through the viewer, controlling/ setting temperature measurement functionality with dedicated software. |
| MECHANISM | |
| Interface | |
| Preset | 256 (1 Home-Position) |
| Video Output | rtsp(H.264), CVBS : 1.0Vp-p / 75Ω |
| Alarm Input | 2 |
| Aux Output | 2 Relay |
| Auto Flip | Digital Auto Flip (Automatic angle detection) |
| Auto calibration | Auto calibration when out of 0.5° or more |
| PAN/TILT | |
| Pan / Tilt Rotation Angle | 0° ~ 360° Endless |
| Pan / Tilt Speed | Manual : 0.1° ~ 90°/sec (64steps), Preset : MAX 100°/sec |
| System Accuracy | 0.0225° |
| OTHERS | |
| Dimensions (WxHxD) | 26~105mm : 490mm x 239.3 x 265mm 15~150mm : 530mm x 239.3mm x 355mm |
| Weight | 26~105mm : 15kg, 15~150mm : 17.5kg |
| Construction | Aluminum die casting |
| Storage Temperature | -32°C ~ 60°C |
| Operating Temperature | -32°C ~ 60°C |
| POWER | |
| Power Consumption | Camera : DC24V 3.3A 80W Max Heater : DC24V 3.53A 84.7W Max |
| Power Supply | DC24V 5A |

| Color Camera Lens Option | 6mm~216mm |
|---|---|

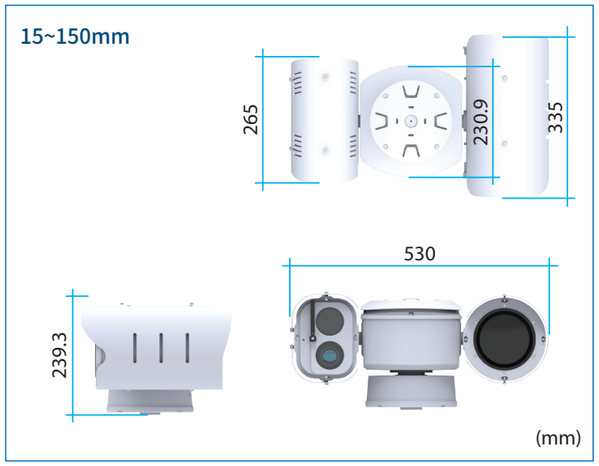
| Thermal Imaging Camera Lens Option | 26~105mm | 15~150mm |
|---|---|---|

## DIMENSIONS

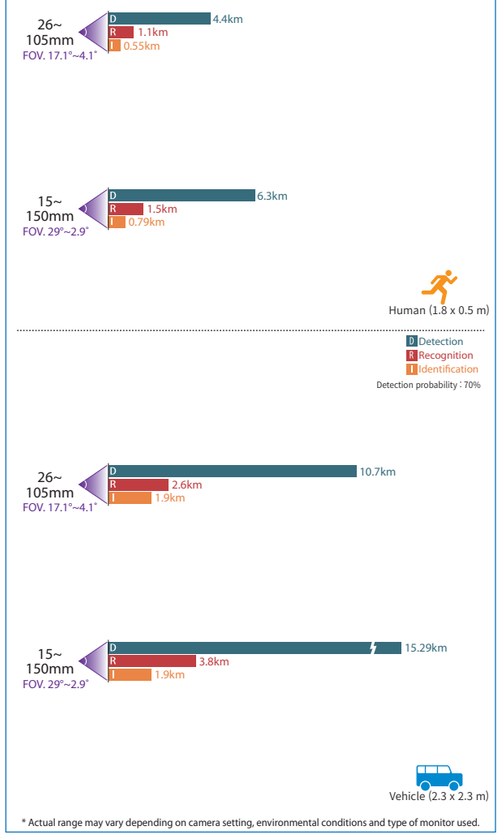
### 26~105mm




### 15~150mm




## RANGE PERFORMANCE




* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

# *TPV-IAHDR Series*



## *FEATURES*

### *Uncooled Thermal Camera*
- 1280 x 720 Output Resoluton
- NETD : <55mk (@300K,F1.0)
- Pixel Pitch : 12μm
- Thermography

### *36x Zoom Full HD Color Camera*
- 2 Megapixel 36x Zoom Full HD Camera
- Defog
- Wiper type

### *Laser illuminator*
- Visibility 200m

## SPECIFICATIONS

* Specifications are subject to change without notice.

| THERMAL MODULE | |
|---|---|
| SENSOR | |
| Thermal Sensor | Uncooled Micro Bolometer, 640 x 480, 12μm Pixel Pitch |
| Wave Langth | 8 ~ 14μm |
| NETD | <55mk (@f1.0, 30Hz, 300k) |
| Output Frequency | NTSC : 59.94Hz (30fps), PAL : 50Hz (25fps) |
| Resolution | 1280 x 720 |
| Lens | 8mm (58.3°x42.5°), 19mm (22.8°x17.2°), 35mm (12.5°x9.4°), 60mm (7.3°x5.5°), 100mm (4.4°x3.3°) |
| FUNCTION | |
| Calibration | Manual / Auto / Interval |
| IDE Set | 0 ~ 30 (31 steps) |
| Mirror Mode | Enable / Disable |
| Image Flip | Enable / Disable |
| Inverse Mode | Enable / Disable |
| Image Mode | 11 Colors(Gray/Rainbow/Iron/Jet/Thermal/BlueOrangeIcb/ Smart/Cool/Gray+Rainbow/Gray+Jet/Gray+Iron) |
| AGC Mode | MGC Mode / AGC#1(Low) / AGC#2(Middle) / AGC#3(High) |
| MEASUREMENT | |
| Detect Mode | Area (10) / Center / Mask (3) |
| Temperature Range | -20°C ~ 350°C |
| Accuracy | ±2°C or ±2% |
| Emissivity Correction | 0.10 ~ 2.00 |
| COLOR MODULE | |
| Image Sensor | Sony IMX385LQR, 1/2" RGB Bayer Array CMOS Sensor |
| Total Image Pixels | 1952(H) x 1113(V) approx. 2.17M pixels |
| Lens | 6.0 ~ 216 mm±5%, F1.5±5%(Wide) ~ F4.8±5%(Tele) 36x Day & Night Zoom Lens, H56.5°(W) ~ V33.6°(W) |
| Scanning Mode | Progressive Scan |
| Luminance S/N ratio | More than 50dB |
| FUNCTION | |
| HDR | DOL(Digital Over Lab) HDR |
| Noise Reduction | 2D-NR, 3D-NR |
| Digital Zoom | X8 |
| BLC | On/Off |
| HLC | On/Off |
| Defog | Off / On(Auto / Manual) |
| Laser illuminator | |
| Visibility | 200m |

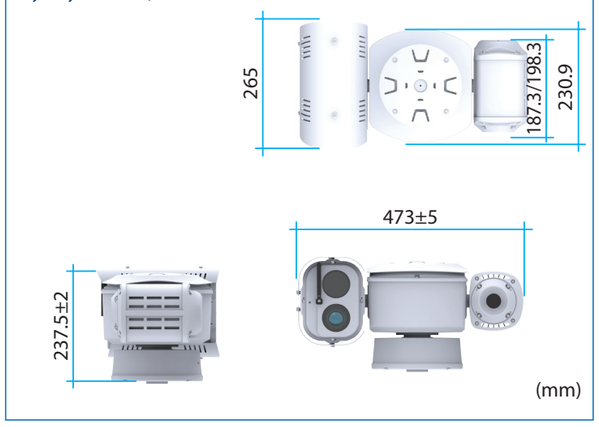
| NETWORK | |
|---|---|
| Video compression | H.265 Main profile, H.264(High, Main, Base Line profile), MJPEG |
| Resolution | Color : 1920x1080, 1280x1024, 1280x720, 704x480, 704x576, 640x486, 352x288, 320x240 Thermal : 1280x720, 720x480, 640x480, 320x240 |
| Frame Rate | Color : Max 60fps @ 1920X1080 Thermal : Max 30fps @ 1280X720 |
| Video Streaming | H.265, H.264, M-JPEG Triple Streaming (Independently controllable frame rate and bandwidth) |
| Application Programming Interface | ONVIF |
| LAN Interface | 10/100BaseT Ethernet Auto-Aware |
| Control | Joystick Controller (RS-485:Pelco-D) |
| Security Features | Multi user level protection for camera access |
| Support Protocol | TCP/IP, UDP, IPv4/v6, HTTP, HTTPS, FTP, UPnP, RTST, RTCP, DHCP, ARP, Zeroconf |
| Viewer and Control | Easy access through the viewer, controlling/ setting temperature measurement functionality with dedicated software. |
| MECHANISM | |
| Interface | |
| Preset | 256 (1 Home-Position) |
| Video Output | rtsp(H.264), CVBS : 1.0Vp-p / 75Ω |
| Alarm Input | 2 |
| Aux Output | 2 Relay |
| Auto Flip | Digital Auto Flip (Automatic angle detection) |
| Auto calibration | Auto calibration when out of 0.5° or more |
| PAN/TILT | |
| Pan / Tilt Rotation Angle | 0° ~ 360° Endless |
| Pan / Tilt Speed | Manual : 0.1° ~ 80°/sec (64steps), Preset : MAX 80°/sec |
| System Accuracy | 0.0225° |
| OTHERS | |
| Dimensions (WxHxD) (Unit:mm) | 8, 19, 35, 60mm : 473±5 x 237.5±2 x 265 100mm : 530±5 x 237.5±2 x 265 |
| Weight | 8mm, 19mm, 35mm : 14.5kg / 60mm : 14.8kg 100mm : TBD |
| Construction | Aluminum die casting |
| Storage Temperature | -32°C ~ 60°C |
| Operating Temperature | -32°C ~ 60°C |
| POWER | |
| Power Consumption | Camera : DC24V 3.3A 80W Max Heater : DC24V 3.53A 84.7W Max |
| Power Supply | DC24V 5A |

| Color Camera Lens Option | 6mm~216mm |
|---|---|

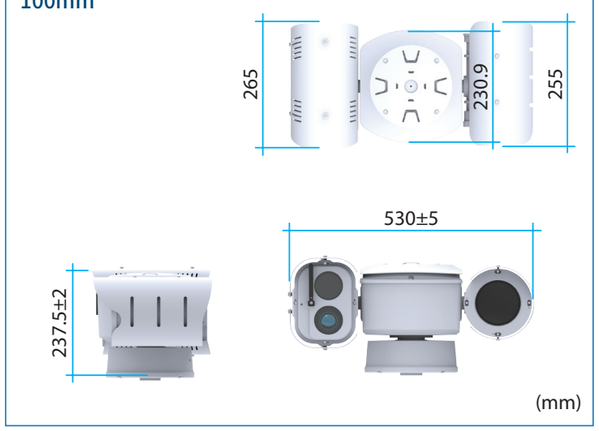
| Thermal Imaging Camera Lens Option | 8 / 19mm | 35mm | 60mm | 100mm |
|---|---|---|---|---|

## DIMENSIONS

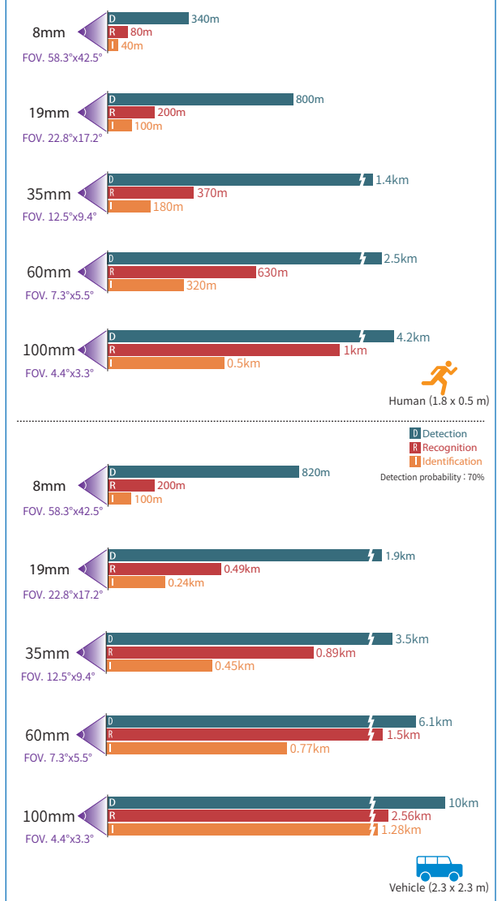
### 8, 35, 19mm / 60mm




### 100mm




## RANGE PERFORMANCE




* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.


*Mini Bi-spectrum Radiometric Detector*

# TPV-IASW-M2+

## FEATURES

### *Thermal Imaging Camera*

- Uncooled VOx Micro bolometer 256×192 resolution
- Sensitivity ≤60mK
- Support 3 temperature measurement rule types (Spot, Line, Area)
- Temperature Range : -20°C ~ 150°C, Option 0°C ~ 550°C
- Temperature accuracy : ±2 °C, ±2%
- Reliable temperature exception alarm function

### *Color Camera*

- 2MP 1600x1200p

### *Certifications*

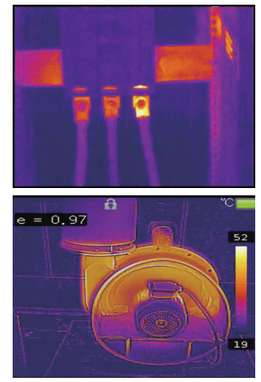
- CE, FCC, IP67

## SPECIFICATIONS

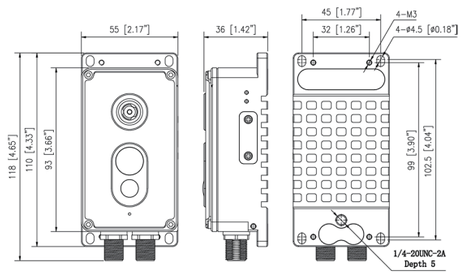
• Specifications are subject to change without notice.

| Thermal Camera | |
|---|---|
| Thermal Sensor | Vanadium Oxide Uncooled Focal Plane Arrays |
| Array Resolution | 256 x 192 (Up-scale 704 x 576) |
| Pixel Pitch | 12μm |
| Wave Length | 8 ~ 14μm |
| NETD | ≤60mk |
| Angle of View | H : 90°, V : 65° |
| Image Setting | Brightness, Contrast, Sharpness |
| Color Palettes | up to 17 modes |
| **Temperature Detection** | |
| Temperature Range | -20°C ~ +150°C, Option 0°C ~ +550°C |
| Accuracy | ±2% or ±2°C |
| Temperature Detection | Support 3 temperature measurement rule types (Spot, Line, Area) total 19ea |
| **Visible Camera** | |
| Sensor Type | 1/2.8" 2MP STARVIS CMOS |
| Output Resolution | 1600 (H)×1200(V) |
| Shutter Speed | 1/5 ~ 1/20,000s |
| Angle of View | H : 100°, V : 75° |
| Minimum Illumination | Color: 0.05Lux @(F2.2, AGC ON), B/W: 0.005Lux @(F2.2, AGC ON), 0Lux with illuminator on |
| **EVENT** | |
| Temperature Alarm | Over temperature alarm, Temperature difference alarm |
| **POWER** | |
| Power Supply | 12 VDC ±20%/PoE (802.3af) |
| Power Consumption | Max 3W |
| **NETWORK** | |
| Protocols | IPv4/IPv6, HTTP/HTTPS, DNS, DDNS, DHCP, PPPOE, RTSP/RTP/RTCP, TCP/UDP, NTP, ARP, UPnP, FTP, SMTP, QoS, 802.1x, SNMP, Multicast |
| Application Programming Interface | ONVIF (Profile S/T/G/M), CGI, SDK |
| Control | Web Viewer |
| **INTERFACE** | |
| Ethernet | 10/100 Base-T RJ−45 Connector |
| Alarm | 1ch Alarm Input, 1ch Alarm Output |
| RS-232 | Support |
| RS-485 | Support |
| **GENERAL** | |
| Operating Temp. | -30°C ~ +60°C (0% ~ 90%RH) |
| Ingress Protection | IP67 |
| Certifications | CE, FCC |
| Dimensions | 55 x 118 x 36mm |
| Weigh | 300g |

## PERFORMANCE




## DIMENSIONS




Unit : mm

# TPV-IASW-M3 Series

**Feature 01** — High-Definition Video with Thermal Camera of 256x196 resolution & 4Mega pixel color camera

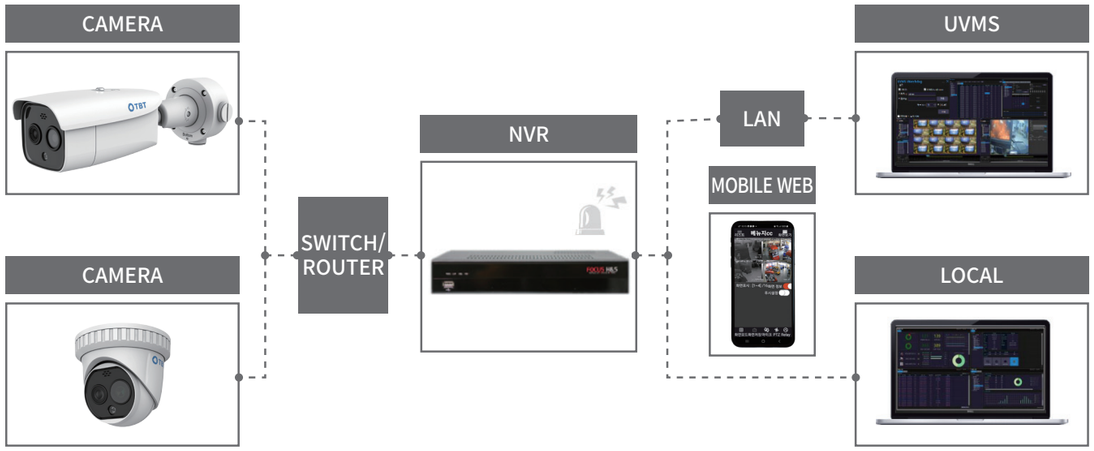
**Feature 02** — Provides time for prevention based on rapid temperature anomaly detection

**Feature 03** — Human/Vehicle Detection Using Deep Learning AI Technology

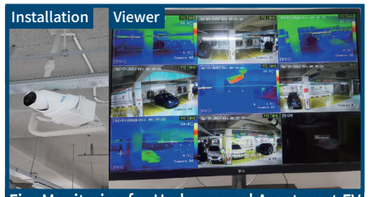
**Feature 04** — Strobe lights and audio alarms, crime prevention warnings (announcement)

**Feature 05** — Prevents false detection with area set

## System Configure (Provision of Outsourced Integrated Monitoring Service)

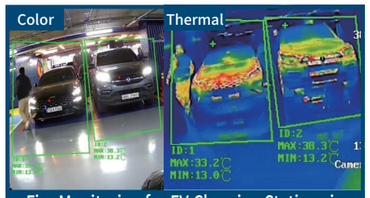



## Installation Cases



Fire Monitoring for Underground Apartment EV Charging Stations

Fire Monitoring for Public EV Charging Stations



Fire Monitoring for EV Charging Stations in Large Buildings

Server Room Overheat Detection

Electric Golf Cart Fire Monitoring

Object Recognition for Automatic Pedestrian Detection Signals

*Thermal Image Detection AI Dual Dome Camera*

# TPV-IASW-M3-D-3.6mm


FIRE Detection

TTA Verified — 공공기관용 IP카메라 보안 성능품질 Ver.1 [보안 Ⅱ 성능품질 □] (TTA-V-24-1009)

## FEATURES

***Uncooled Thermal Imaging Camera***
- 256 x 192 resolution, 12 µm
- NETD : 40mK

***Color Camera***
- 2688 x 1520 CMOS, 0.0017 Lux
- DDE,AGC,3D DNR

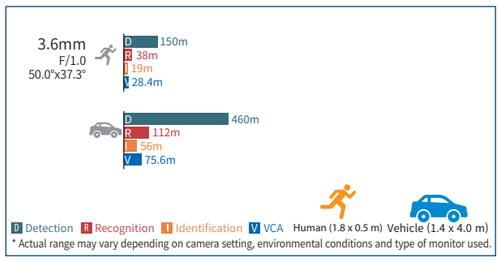
***Temperature Detection***
- Range -20°C to 150°C, Accuracy ± 8°C
- Fire prevention and VCA AI DEEP Learning
- 10 points, 10 areas, and 1 line

## SPECIFICATIONS

* Specifications are subject to change without notice.

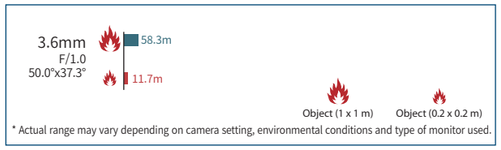
| | |
|---|---|
| **Thermal Module** | |
| Image Sensor | VOx Uncooled Focal Plane Arrays, 256 x 192, 12 µm Pixel Pitch |
| Spectral Range | 8 µm ~ 14 µm |
| NETD | < 40 mK (25°C, F1.0) |
| Lens Focal Length | F1.0, 3.6mm (H50.0° x V37.3°) |
| Digital Zoom | x2, x4 |
| **Color Module** | |
| Image Sensor | 1/2.7" Progressive Scan CMOS, 2688 × 1520 |
| Min. Illumination | Color: 0.0176 Lux @ (F2.25, AGC ON)<br>B/W: 0.0035 Lux @ (F2.25, AGC ON) |
| Shutter Speed | 1 s to 1/100,000 s |
| Lens Focal Length | F1.6, 4.3 mm(84.0° x 43.1°) |
| IR Illuminator Distance | Up to 15 m |
| **Smart Function** | |
| VCA | 4 VCA rule types (line crossing, intrusion, region entrance, and region exiting), up to 8 VCA rules in total. |
| Temperature Measurement | 3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line) |
| Temperature Range | -20°C to 150°C (-4°F to 302°F) |
| Temperature Accuracy | ± 8°C (± 14.4°F) |
| **Network** | |
| Protocols | IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP ,SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTCP, RTP, TCP, UDP, IGMP, ICMP, DHCP, PPPoE, Bonjour, SFTP, SRTP |
| Application Programming Interface | CGI, RTSP, ONVIF Support |
| Video Compression | Main Stream: H.265/H.264<br>Sub-Stream: H.265/H.264/MJPEG |
| Main Stream | Thermal: 30 fps (1280 x 720, 704 x 576, 640 x 512, 320 x 240)<br>Optical: 30 fps (2688 x 1520, 1920 x 1080, 1280 x 720) |
| Sub-stream | Thermal: 30 fps (704 x 576, 640 x 512, 320 x 240)<br>Optical: 30 fps (704 x 480, 352 x 240) |
| Audio Compression | G.722.1/G.711ulaw/G.711alaw/MP2L2/G.726/PCM |
| **Interface** | |
| Alarm Input | 1, alarm input |
| Alarm Output | 1, alarm output |
| Audio Input | 1, 3.5 mm Mic in/Line in interface<br>Line input: 2 to 2.4 V [p-p], output impedance: 1 KΩ ± 10% |
| Audio Output | Linear level, impedance: 600 Ω |
| Communication Interface | 1, RJ45 10 M/100 M Self-adaptive Ethernet interface. |
| **General** | |
| Power Consumption | 12VDC ±25%: 0.5A, Max. 6, PoE (IEEE802.3at) |
| Operating Temperature/Humidity | Temp.: -40°C to 65°C (-40°F to 149°F) Humidity: 95% or less |
| Protection Level | IP68 Standard |
| Dimensions | 138.3mm x 138.3mm x 123.1mm |
| Weight | 940g (2.07 lb) |

## LENS DRI RANGE



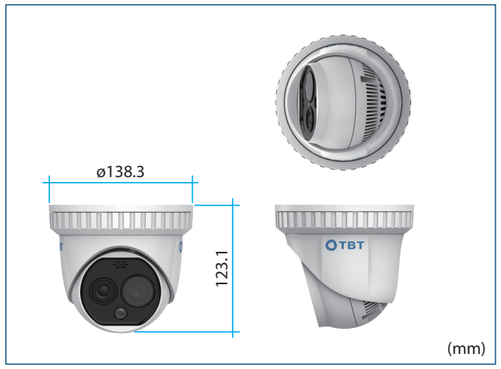
* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

## FIRE DETECTION RANGE



* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

## DIMENSIONS



*Thermal Image Detection AI Dual Bullet Camera*

# TPV-IASW-M3-B-6.9mm


TTA Verified
공공기관용 IP카메라 보안 성능품질 Ver.1 [보안 Ø 성능품질 □] (TTA-V-24-1008)

## FEATURES

***Uncooled Thermal Imaging Camera***
- 256 x 192 resolution, 12 µm
- NETD : 40mK

***Color Camera***
- 2688 x 1520 CMOS, 0.0017 Lux
- DDE,AGC,3D DNR

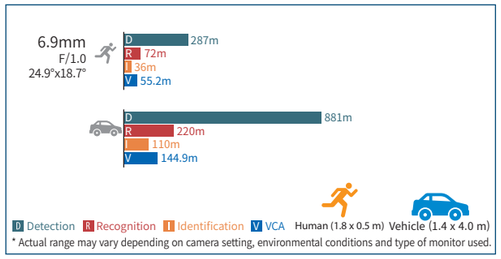
***Temperature Detection***
- Range -20°C to 150°C, Accuracy ± 8°C
- Fire prevention and VCA AI DEEP Learning
- 10 points, 10 areas, and 1 line

## SPECIFICATIONS

* Specifications are subject to change without notice.

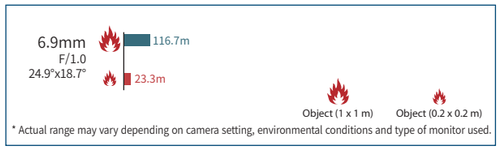
| Thermal Module | |
|---|---|
| Image Sensor | VOx Uncooled Focal Plane Arrays, 256 x 192, 12 µm Pixel Pitch |
| Spectral Range | 8 µm ~ 14 µm |
| NETD | < 40 mK (25°C, F1.0) |
| Lens Focal Length | F1.0, 6.9mm (H24.9° x V18.7°) |
| Digital Zoom | x2, x4 |
| **Color Module** | |
| Image Sensor | 1/2.7" Progressive Scan CMOS, 2688 × 1520 |
| Min. Illumination | Color: 0.0176 Lux @ (F2.25, AGC ON)<br>B/W: 0.0035 Lux @ (F2.25, AGC ON) |
| Shutter Speed | 1 s to 1/100,000 s |
| Lens Focal Length | F1.6, 6.4 mm(53.0° x 28.0°) |
| IR Illuminator Distance | Up to 30 m |
| **Smart Function** | |
| VCA | 4 VCA rule types (line crossing, intrusion, region entrance, and region exiting), up to 8 VCA rules in total. |
| Temperature Measurement | 3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line) |
| Temperature Range | -20°C to 150°C (-4°F to 302°F) |
| Temperature Accuracy | ± 8°C (± 14.4°F) |
| **Network** | |
| Protocols | IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP ,SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTCP, RTP, TCP, UDP, IGMP, ICMP, DHCP, PPPoE, Bonjour, SFTP, SRTP |
| Application Programming Interface | CGI, RTSP, ONVIF Support |
| Video Compression | Main Stream: H.265/H.264<br>Sub-Stream: H.265/H.264/MJPEG |
| Main Stream | Thermal: 30 fps (1280 x 720, 704 x 576, 640 x 512, 320 x 240)<br>Optical: 30 fps (2688 x 1520, 1920 x 1080, 1280 x 720) |
| Sub-stream | Thermal: 30 fps (704 x 576, 640 x 512, 320 x 240)<br>Optical: 30 fps (704 x 480, 352 x 240) |
| Audio Compression | G.722.1/G.711ulaw/G.711alaw/MP2L2/G.726/PCM |
| **Interface** | |
| Alarm Input | 2, alarm input |
| Alarm Output | 2, alarm output |
| Audio Input | 1, 3.5 mm Mic in/Line in interface<br>Line input: 2 to 2.4 V [p-p], output impedance: 1 KΩ ± 10% |
| Audio Output | Linear level, impedance: 600 Ω |
| Communication Interface | 1, RJ45 10 M/100 M Self-adaptive Ethernet interface. |
| **General** | |
| Power Consumption | 12VDC ±25%: 0.5A, Max. 6, PoE (IEEE802.3at) |
| Operating Temperature/Humidity | Temp.: -40°C to 65°C (-40°F to 149°F) Humidity: 95% or less |
| Protection Level | IP68 Standard |
| Dimensions | 358.43mm x 114.19mm x 113mm |
| Weight | 1550g (3.41 lb) |

## LENS DRI RANGE



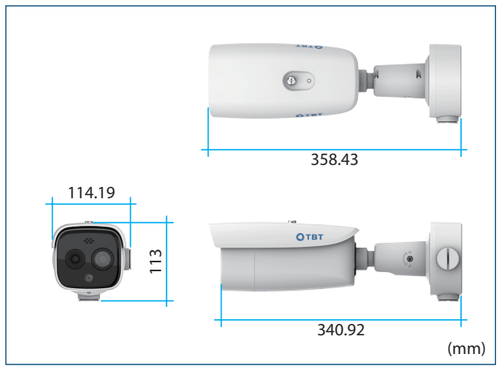

* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

## FIRE DETECTION RANGE




* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

## DIMENSIONS






*Intelligent Multi-Sensor Fire Detection Solution*

# TPV-IASW-M3-F


## FEATURES

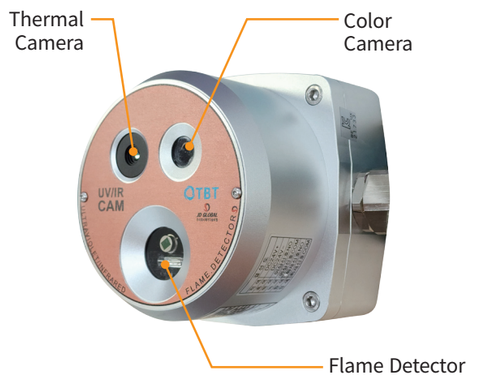
- High-quality video with 256 x 196 thermal imaging and 4MP visible imaging
- Rapid detection of abnormal temperature changes helps secure time for fire prevention
- Human/vehicle detection using deep learning AI technology
- Built-in UV/IR dual-spectrum flame detector
- Configurable detection zones help prevent false alarms

## SPECIFICATIONS

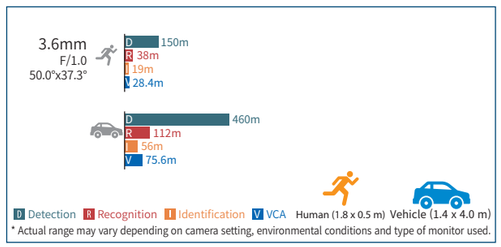
* Specifications are subject to change without notice.

| Thermal Module | |
|---|---|
| Image Sensor | VOx Uncooled Focal Plane Arrays, 256 x 192, 12 µm Pixel Pitch |
| Spectral Range | 8 µm ~ 14 µm |
| NETD | < 40 mK (25°C, F1.0) |
| Lens | F1.0, 3.6mm (50.0°x37.3°) |
| Digital Zoom | x2, x4 |
| **Color Module** | |
| Image Sensor | 1/2.7" Progressive Scan CMOS, 2688 × 1520 |
| Min. Illumination | Color : 0.0176 Lux @ (F2.25, AGC ON)<br>B/W : 0.0035 Lux @ (F2.25, AGC ON) |
| Shutter Speed | 1 s to 1/100,000 s |
| Lens Focal Length | F1.6, 4.3 mm(84.0° x 43.1°) |
| IR Illuminator Distance | Up to 15 m |
| **Smart Function** | |
| VCA | 4 VCA rule types (line crossing, intrusion, region entrance, and region exiting), up to 8 VCA rules in total. |
| Temperature Measurement | 3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line) |
| Temperature Range | -20°C to 150°C |
| Temperature Accuracy | ± 8°C |
| **Flame Detector** | |
| Detection Type | UV / IR dual-spectrum type |
| Detection Time | 1-10sec |
| Detection Range | 50M |
| Field of View | 90° |
| Self-Diagnosis | Power fault, internal temperature fault, UV sensor fault, and IR sensor fault |
| **기타** | |
| Input Voltage | Non-polarized DC 24V, tolerance ±20% |
| Power Consumption | 12V 16mA(동작시), 12V 27mA(화재 알람 상태) |
| Operating Temperature | -40°C to 85°C |
| Operating Humidity | 95% RH or less |
| Certification | Type Approval : GAM24-30<br>(Acid-resistant type / reusable type / waterproof type / indoor & outdoor type etc) |
| Dimensions | 132mm x 132mm x 108mm (without Bracket) |
| Material | Aluminum die-casting / SUS 6061 |

## TPV-IASW-M3-F




## LENS DRI RANGE




* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

## FIRE DETECTION RANGE


* Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

# Module

Cooled / Uncooed

*Uncooled Thermal Imaging Camera Module*

# *TQM-1M Series*

## SPECIFICATIONS

* Specifications are subject to change without notice.

### DETECTOR

| | |
|---|---|
| Detector Type | Uncooled Micro Bolometer, 640x480 |
| Pixel Pitch | 12μm |
| Spectral Response | 8μm ~ 14μm (LWIR) |
| Frame rate | 30Hz |
| Thermal Time Constant | <10ms |
| NETD | Room Temperature Condition<br>- Performance Grade: ≤ 50mK |
| Operability | ≥ 99.5% |

### VIDEO

| | |
|---|---|
| Video Format | All Digital Standard Format applied<br>- CVBS 720x480i60, 720x576i50<br>- BT.1120 SEP16 1280x720p30 |

### FUNCTION

| | |
|---|---|
| Calibration | Manual/Interval/Auto Mode Selectable |
| Image Enhance | Brightness, Contrast, Equalization, Edge, CLAHE |
| Image Utility | Auto Focus, DIS, DNR |
| Colorization | 3EA (Gray, Jet, Plasma) |
| D-Zoom | X1.0 ~ X4.0 (per X0.1) |

### MECHANICAL

| | |
|---|---|
| Dimensions (WxHxD) | 33mm x 33mm x 24.3mm (without lens) |
| Weight | 55g (without lens) |

### ELECTRICAL

| | |
|---|---|
| Power Consumption | 3.5 W |
| Power Supply | 12V |

### ETC

| | |
|---|---|
| Operating Temperature | -32°C ~ +60°C |
| Storage Temperature | -40°C ~ +65°C |
| Command & Control | RS232 |
| NUC | Factory Calibrated, Periodic Shutter Calibration |

TQM-1M is an Intelligent Thermal Engine Module applied with Cutting Edge GPU Processor. This elaborated module, provides User's friendly Development Characteristics such as various interfaces & video format, easy mount and a multiple of optical lens options for customer's camera systems.

## *FEATURES*

- Automotive Certificated SoC Processor Applied (AEC-Q100)
- User's selectable optical FOVs
- Various IR Image Processing and Standard Digital Video Interfaces
- Designed for commercial and Military Environments

## *APPLICATIONS*

This module is the most suitable for EST Camera and SWaP-C applications, which are Hand-held Thermal Imaging Systems, Surveillance, UAV/Drone, Automotive Night Vision and etc.

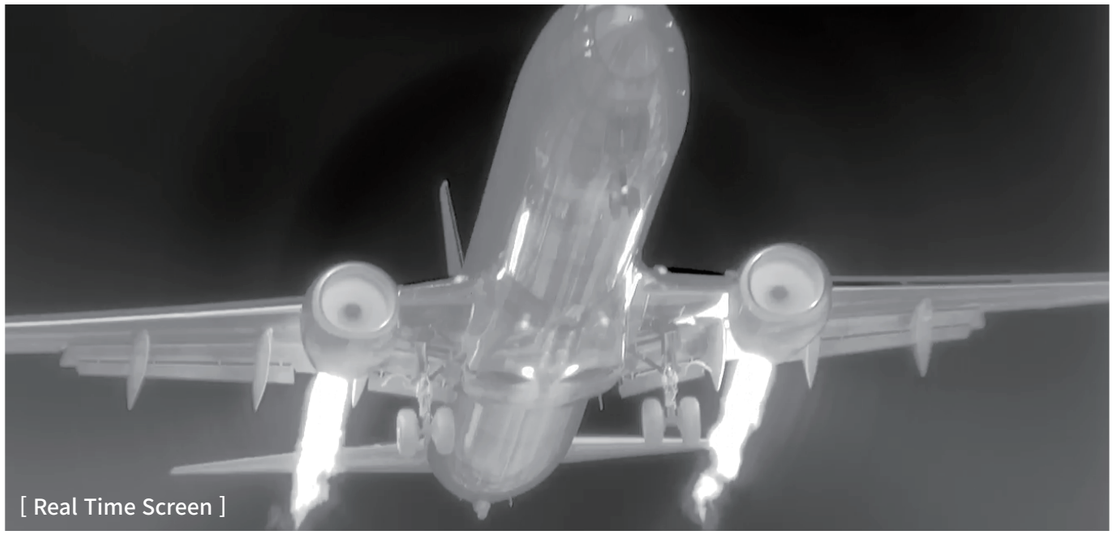
## LENS OPTION

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

| | | | | | |
|---|---|---|---|---|---|
| Lens Focal length | 6.2mm | 19mm | 26-105mm | 15-150mm | 25-225mm |
| HFOV | 75° | 22.8° | 17.1°~4.1° | 29°~2.9° | 17.7°~1.9° |
| F/# | F/1.0 | F/1.03 | F/1.6 | F/0.85-1.35 | F/0.95~1.5 |
| DRI<br>Human 0.5 x 1.7 m | D : 280m<br>R : 70m<br>I : 30m | D : 680m<br>R : 180m<br>I : 90m | D : 3.83km<br>R : 0.9km<br>I : 0.48km | D : 5.47km<br>R : 1.29km<br>I : 0.68km | D : 8.2m<br>R : 1.93km<br>I : 1.02km |
| DRI<br>Vehicle 2.3 x 2.3 m | D : 570m<br>R : 150m<br>I : 80m | D : 1,260m<br>R : 350m<br>I : 180m | D : 10.85km<br>R : 2.25km<br>I : 1.19km | D : 15.46km<br>R : 3.21km<br>I : 1.7km | D : 23.19km<br>R : 4.81km<br>I : 2.56km |
| Dimensions (Unit : mm, DxL) | 33 x 55.7 | 33 x 57.52 | Ø82 x 207.47 | Ø143.5 x 191.54 | Ø189.5 x 362.44 |
| Weight | 85g | 90g | 550g | 3.2kg | 4.13kg |

** The Dimension and Weight can be varied according to the options.

# NYX Series




The NyX series is a completely redesigned thermal imaging camera platform designed to deliver unsurpassed performance with state-of-the-art technology, which can always provide good thermal imaging in dark and bright areas without user adjustment. NyX technology enables you to experience improved situational awareness.

## LAE (Local Area Enhancement)

Increase context awareness by improving image contrast for very dark or very bright areas with local processing.

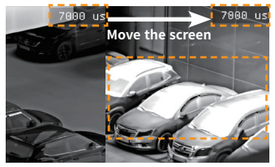
[ LAE Off ]

[ LAE On ]

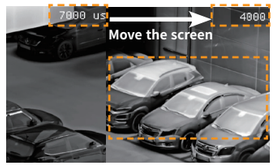
## Automatic Integration Time

It is a function that optimizes image quality by detecting rapid temperature changes in the operating environment and adjusting the integration time in real time.

There is no hassle of adjusting the integration time according to weather conditions such as summer, winter, and high daily temperature differences.




[ Before ]




[ After ]

## DDE (Digital Detail Enhancement)

Improves detailed description of objects by enhancing low contrast targets in high dynamic ranges.

[ DDE Off ]

[ DDE On ]

## ROI User Settings

It is a function that processes images only in certain areas.

Only the set area can be processed separately by setting a specific area by the user himself.

## Adaptive HEQ (Adaptive Histogram Equalization)

Special imaging processing that highlights complex (high entropy) areas in a scene improves object details except for backgrounds such as sky, sea, etc

[ HEQ Off ]

[ HEQ On ]

*Cooled Thermal Imaging Camera Module*

# NYX-1280R Series

## SPECIFICATIONS

* Specifications are subject to change without notice.

### DETECTOR

| | |
|---|---|
| Detector Type | Cooled InSb, 1280(H) x 1024(V) |
| Pixel Pitch | 10μm |
| Spectral Response | 3μm ~ 5μm (MWIR) |
| F/# | F/#4.0 |
| NETD | <25mK typical (without lens) |

### COOLER

| | |
|---|---|
| Cooler Type | Stirling Cooler, MTTF: 12,000Hours (Option: 17,000Hours) |
| Cool-down Time | <7Minute (@23°C) (Max) |

### VIDEO

| | |
|---|---|
| Output Frequency | 30Hz |
| Video Output | HDMI (Option : HD-SDI, Camera Link) |
| Resolution | 1920 x 1080, Option (1280x1024/1280x720/720x576) |

### FUNCTION

| | |
|---|---|
| Calibration | Manual /Interval(min) Mode Selectable |
| Image Translation | FLIP(Vertical, Horizontal), Inverse |
| Image Enhance | AGC, Adaptive HEQ, LAE, DDE, DNR, Gamma, Sharpness, Auto Integral Time |
| Image Utility | Auto Focus, Digital Zoom (x8) |
| Pseudo Color | WhiteHot / Rainbow / Twilight / TwilightShifted / Turbo / Iron / Plasma |

### MECHANICAL

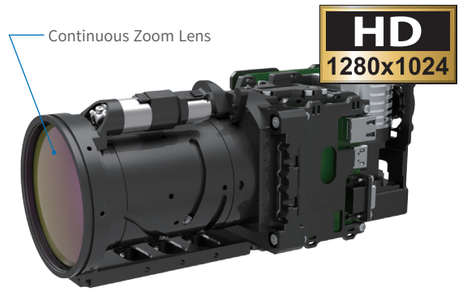
| | |
|---|---|
| Dimensions (WxHxD) | 117mm x 110mm x 158mm |
| Weight | 1.74kg |

### ELECTRICAL

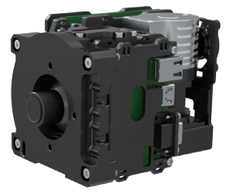
| | |
|---|---|
| Power Supply | DC24V / 1.76A[42.24W] (Max) |

### ETC

| | |
|---|---|
| Ext-Interface | RS-232, RS-422 (9600/19200/38400/57600/115200bps) |
| Operating Temperature | -32°C ~ +55°C |
| Storage Temperature | -40°C ~ +65°C |




[With 15-300mm Zoom Lens]



[Without Lens]

- Detector type : Cooled InSb 10μm (1280 x 1024)
- NETD : <25mk typical (without lens)
- Continuous ZOOM LENS
- Continuous Digital Zoom x8
- Advanced image processing
  - Auto Gain Control (AGC)
  - Adaptive Histogram Equalization (Adaptive HEQ)
  - Local Area Enhancement (LAE)
  - Digital Detail Enhancement (DDE)
  - Denoise Reduction (DNR)
  - Sharpness
- MTTF(Mean Time To Failure)
  - 12,000 hours (Option : 17,000 hours)
- Various color sets
  (WhiteHot / Rainbow / Twilight / TwilightShifted / Turbo / Iron / Plasma)

### LENS OPTION

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

| Lens Focal length | 15 ~ 300mm | 33 ~ 420mm | 60 ~ 600mm | 60 ~ 690mm | 72 ~ 900mm | 100 ~ 1200mm |
|---|---|---|---|---|---|---|
| HFOV | 44.9° ~ 2.4° | 20.0° ~ 1.7° | 11.4° ~ 1.2° | 11.5° ~ 1.0° | 9.3° ~ 0.8° | 6.8° ~ 0.6° |
| F/# | F/4.0 | F/4.0 | F/4.0 | F/4.0 | F/4.0 | F/4.0 |
| DRI<br>Human 1.8 x 0.5 m | D : 10.7km<br>R : 3.2km<br>I : 2km | D : 13.8km<br>R : 4.3km<br>I : 2.8km | D : 17.4km<br>R : 6km<br>I : 3.9km | D : 18.8km<br>R : 6.8km<br>I : 4.5km | D : 21.5km<br>R : 8.5km<br>I : 5.7km | D : 24.3km<br>R : 10.7km<br>I : 7.3km |
| DRI<br>Vehicle 2.3 x 2.3 m | D : 17.7km<br>R : 6.8km<br>I : 4.5km | D : 20.6km<br>R : 8.9km<br>I : 6.1km | D : 23.5km<br>R : 11.6km<br>I : 8.2km | D : 24.5km<br>R : 12.8km<br>I : 9.1km | D : 26.3km<br>R : 15.1km<br>I : 11.1km | D : 28.1km<br>R : 17.7km<br>I : 13.6km |
| Dimensions (Unit : mm, WxHxD) | 117 x 113.6 x 274 | 132 x 132 x 344.5 | 173 x 173 x 396 | 210 x 210 x 408 | 286 x 286 x 481.6 | 388 x 388 x 567.2 |
| Weight | 2.9kg | 3.6kg | 5.4kg | 6.3kg | 10kg | 16.4kg |

*Cooled Thermal Imaging Camera Module*

# *NYX-640R Series*

## SPECIFICATIONS

• Specifications are subject to change without notice.

### DETECTOR

| | |
|---|---|
| Detector Type | Cooled InSb, 640(H) x 512(V) |
| Pixel Pitch | 15μm |
| Spectral Response | 3.7μm ~ 5μm (MWIR) |
| F/# | F/#4.0 |
| NETD | <20mK typical (without lens) |

### COOLER

| | |
|---|---|
| Cooler Type | Stirling Cooler, MTTF : 15,000Hours |
| Cool-down Time | <7Minute (@23°C) (Max) |

### VIDEO

| | |
|---|---|
| Output Frequency | 30Hz |
| Video Output | HDMI (Option : HD-SDI, CVBS, Camera Link) |
| Resolution | 1280x720, Option (1920x1080/1280x1024/720x576) |

### FUNCTION

| | |
|---|---|
| Calibration | Manual /Interval(min) Mode Selectable |
| Image Translation | FLIP(Vertical, Horizontal), Inverse |
| Image Enhance | AGC, Adaptive HEQ, LAE, DDE, DNR, Gamma, Sharpness, Auto Integral Time |
| Image Utility | Auto Focus, Digital Zoom (x8) |
| Pseudo Color | WhiteHot / Rainbow / Twilight / TwilightShifted / Turbo / Iron / Plasma |

### MECHANICAL

| | |
|---|---|
| Dimensions (WxHxD) | 118.2mm x 108.7mm x 150.7mm |
| Weight | 1.74kg |

### ELECTRICAL

| | |
|---|---|
| Power Supply | DC24V / 1.37A [32.88W] (Max) |

### ETC

| | |
|---|---|
| Ext-Interface | RS-232, RS-422 (9600/19200/38400/57600/115200bps) |
| Operating Temperature | -32°C ~ +55°C |
| Storage Temperature | -40°C ~ +65°C |

Continuous Zoom Lens

[With 15-300mm Zoom Lens]

[Without Lens]

- Detector type : Cooled InSb 15μm (640 x 512)
- NETD : <20mk typical (without lens)
- Continuous ZOOM LENS
- Continuous Digital Zoom x8
- Advanced image processing
  - Auto Gain Control (AGC)
  - Adaptive Histogram Equalization (Adaptive HEQ)
  - Local Area Enhancement (LAE)
  - Digital Detail Enhancement (DDE)
  - Denoise Reduction (DNR)
  - Sharpness
- MTTF(Mean Time To Failure) 15,000 hours
- Various color sets
  (WhiteHot / Rainbow / Twilight / TwilightShifted / Turbo / Iron / Plasma)

## LENS OPTION

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

| Lens Focal length | 15 ~ 300mm | 21 ~ 420mm | 30 ~ 600mm | 35 ~ 690mm | 45 ~ 900mm | 60 ~ 1200mm |
|---|---|---|---|---|---|---|
| HFOV | 35.1° ~ 1.8° | 25.1° ~ 1.3° | 17.2° ~ 0.9° | 15.2° ~ 0.8° | 10.9° ~ 0.6° | 8.6° ~ 0.5° |
| F/# | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 | F/#4.0 |
| DRI<br>Human 1.8 x 0.5 m | D : 10km<br>R : 3km<br>I : 1.9km | D : 12.9km<br>R : 4.1km<br>I : 2.6km | D : 16.2km<br>R : 5.6km<br>I : 3.6km | D : 17.6km<br>R : 6.3km<br>I : 4.2km | D : 20.2km<br>R : 7.9km<br>I : 5.3km | D : 22.8km<br>R : 10km<br>I : 6.8km |
| DRI<br>Vehicle 2.3 x 2.3 m | D : 16.5km<br>R : 6.3km<br>I : 4.2km | D : 19.3km<br>R : 8.3km<br>I : 5.6km | D : 22km<br>R : 10.8km<br>I : 7.5km | D : 23km<br>R : 11.9km<br>I : 8.4km | D : 24.7km<br>R : 14.1km<br>I : 10.7km | D : 26.4km<br>R : 16.4km<br>I : 12.5km |
| Dimensions (Unit : mm, WxHxD) | 118.2 x 111.4 x 265.5 | 132 x 132 x 336 | 173 x 173 x 387.4 | 210 x 210 x 399.5 | 286 x 286 x 423.2 | 388 x 388 x 559.9 |
| Weight | 2.9kg | 3.6kg | 5.4kg | 6.3kg | 10kg | 16.4kg |



*Cooled Thermal Imaging Camera Module*

# *NYX-640C Series*

## SPECIFICATIONS

• Specifications are subject to change without notice.

### DETECTOR

| | |
|---|---|
| Detector Type | Cooled InSb, 640(H) x 512(V) |
| Pixel Pitch | 15μm |
| Spectral Response | 3.7μm ~ 5μm (MWIR) |
| F/# | F/#5.5 |
| NETD | <20mK typical (without lens) |

### COOLER

| | |
|---|---|
| Cooler Type | Stirling Cooler, MTTF : 10,000Hours |
| Cool-down Time | <7Minute (@23°C) (Max) |

### VIDEO

| | |
|---|---|
| Output Frequency | 30Hz |
| Video Output | HDMI (Option : HD-SDI, CVBS, Camera Link) |
| Resolution | 1280x720, Option (1920x1080/1280x1024/720x576) |

### FUNCTION

| | |
|---|---|
| Calibration | Manual /Interval(min) Mode Selectable |
| Image Translation | FLIP(Vertical, Horizontal), Inverse |
| Image Enhance | AGC, Adaptive HEQ, LAE, DDE, DNR, Gamma, Sharpness, Auto Integral Time |
| Image Utility | Auto Focus, Digital Zoom (x8) |
| Pseudo Color | WhiteHot / Rainbow / Twilight / TwilightShifted / Turbo / Iron / Plasma |

### MECHANICAL

| | |
|---|---|
| Dimensions (WxHxD) | 99.7mm x 88.4mm x 130.9mm |
| Weight | 1.14kg |

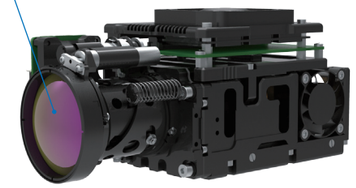
### ELECTRICAL

| | |
|---|---|
| Power Supply | DC24V / 1.40A [33.79W] (Max) |

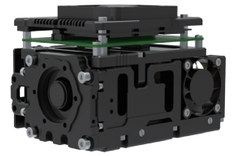
### ETC

| | |
|---|---|
| Ext-Interface | RS-232, RS-422 (9600/19200/38400/57600/115200bps) |
| Operating Temperature | -32°C ~ +55°C |
| Storage Temperature | -40°C ~ +65°C |

Continuous Zoom Lens



[With 20-275mm Zoom Lens]



[Without Lens]

- Detector type : Cooled InSb 15μm (640 x 512)
- NETD : <20mk typical (without lens)
- Continuous ZOOM LENS
- Compact Type
- Continuous Digital Zoom x8
- Advanced image processing
  - Auto Gain Control (AGC)
  - Adaptive Histogram Equalization (Adaptive HEQ)
  - Local Area Enhancement (LAE)
  - Digital Detail Enhancement (DDE)
  - Denoise Reduction (DNR)
  - Sharpness
- MTTF(Mean Time To Failure) 10,000 hours
- Various color sets
  (WhiteHot / Rainbow / Twilight / TwilightShifted / Turbo / Iron / Plasma)

## LENS OPTION

D : Detection R : Recognition I : Identification * Actual range may vary depending on camera setting, environmental conditions and type of monitor used.

| Lens Focal length | 20 ~ 275mm | 50 ~ 700mm | 80 ~ 1200mm |
|---|---|---|---|
| HFOV | 28° ~ 1.9° | 10.9° ~ 0.8° | 7.1° ~ 0.5° |
| F/# | F/#5.5 | F/#5.5 | F/#5.5 |
| DRI<br>Human 1.8 x 0.5 m | D : 8.4km<br>R : 2.4km<br>I : 1.5km | D : 16.7km<br>R : 5.7km<br>I : 3.7km | D : 22km<br>R : 9.1km<br>I : 6.1km |
| DRI<br>Vehicle 2.3 x 2.3 m | D : 14.9km<br>R : 5.2km<br>I : 3.4km | D : 22.5km<br>R : 11.1km<br>I : 7.8km | D : 26.1km<br>R : 15.7km<br>I : 11.7km |
| Dimensions (Unit : mm, WxHxD) | 99.7 x 88.4 x 195.1 | 156.2 x 156.2 x 304.7 | 268 x 268 x 453.5 |
| Weight | 1.4kg | 2.78kg | 8.54kg |

10, Seounsandan-ro 4-gil, Gyeyang-gu, Incheon, 21072 Korea
**TEL** +82. 32. 552. 1941~3 **FAX** +82. 32. 552. 1944
**E-MAIL** sales@tbtsys.com **Website** www.tbtsys.com