



Network

Thermal

## TNM-C4960TD

Bi-spectrum AI Thermal Camera



### Key Features

- Bi-spectrum: VGA thermal & 8MP visible sensor
- Dual (thermal & visible) channel by one device, one IP
- Maximum 30fps @ all resolutions (H.265/H.264)
- Lens : 25mm fixed thermal & 10.9~29mm motorized varifocal visible
- Day & Night(ICR), WDR(120dB)
- Noise reduction : WiseNR II (Based on AI engine, visible only)
- Smart codec : WiseStream III (Based on AI engine, visible), WiseStream II (thermal)
- Video Analytics based on AI
- IP66/IP67, IK10, NEMA4X, NEMA TS 2(2.2.8, 2.2.9)
- PoE+(IEEE802.3at), 12VDC
- Wall & Pole mount all-in-one design

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### Specifications

| Video                   |                       | Thermal                                                                            | Visible                                                                                                                                                                               |
|-------------------------|-----------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Imaging Device          | Size                  |                                                                                    | 1/1.8"                                                                                                                                                                                |
|                         | Type                  | Uncooled micro bolometer (640x480)                                                 | CMOS                                                                                                                                                                                  |
| Resolution              |                       | 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360 | 3840x2160, 3072x1728, 2688x1520, 2592x1944, 2560x1440, 2048x1536, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360 |
| Max. Framerate          | H.265/H.264           | 30fps/25fps(60Hz/50Hz)                                                             | 30fps/25fps(60Hz/50Hz)                                                                                                                                                                |
|                         | MJPEG                 | 3fps                                                                               | 1fps                                                                                                                                                                                  |
|                         | Others                | Max. 15fps when both channel AI on                                                 | Max. 15fps when both channel AI on                                                                                                                                                    |
| Spectral Range          |                       | 8~14 $\mu$ m                                                                       |                                                                                                                                                                                       |
| NETD                    |                       | $\leq$ 60mK                                                                        |                                                                                                                                                                                       |
| Pixel Size              |                       | 12 $\mu$ m                                                                         |                                                                                                                                                                                       |
| Min. Illumination (Lux) | Color(1/30sec, 30IRE) |                                                                                    | 0.06                                                                                                                                                                                  |
|                         | BW(1/30sec, 30IRE)    |                                                                                    | 0.005                                                                                                                                                                                 |
| Video Out               |                       | USB: Micro USB Type B                                                              |                                                                                                                                                                                       |

### Lens

|                               |            |              |                     |
|-------------------------------|------------|--------------|---------------------|
| Focal Length (mm)             |            | 25           | 10.9~29             |
| Max Aperture Ratio (F number) | Wide       | 1.0          | 1.7                 |
|                               | Tele       |              | 1.73                |
| Angular Field of View         | Horizontal | 17°          | 42°(Wide)~15°(Tele) |
|                               | Vertical   | 13°          | 23°(Wide)~8°(Tele)  |
|                               | Diagonal   | 22°          | 49°(Wide)~17°(Tele) |
| iFoV                          |            | 0.48mRad     |                     |
| Min. Object Distance          |            | 26m(85.30ft) | 2.5m(8.20ft)        |
| Focus Control                 |            | Fixed        | Simple focus        |

### Pan / Tilt / Rotate

|                           |      |             |
|---------------------------|------|-------------|
| Pan / Tilt / Rotate Range | Pan  | -170°~+170° |
|                           | Tilt | -40°~50°    |

## Pan / Tilt / Rotate

|          |               |
|----------|---------------|
| Sequence | Preset(255ea) |
|----------|---------------|

## Operational

|                                          |                |                                                                                                                                                                                                                 |
|------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Day & Night                              |                | Auto(ICR)                                                                                                                                                                                                       |
| Backlight Compensation                   |                | BLC, WDR, SSDR                                                                                                                                                                                                  |
| Wide Dynamic Range (dB)                  |                | 120                                                                                                                                                                                                             |
| Digital Noise Reduction                  |                | WiseNR II (Based on AI engine), SSNR V                                                                                                                                                                          |
| Digital Image Stabilization              |                | Support(built-in gyro sensor)                                                                                                                                                                                   |
| Motion Detection                         | Quantity       | 8ea                                                                                                                                                                                                             |
|                                          | Shape          | 8point Polygonal zones                                                                                                                                                                                          |
| Privacy Masking                          | Quantity       | 6ea                                                                                                                                                                                                             |
|                                          | Shape          | Rectangular zones                                                                                                                                                                                               |
|                                          | Color / Option | Gray, Black, White                                                                                                                                                                                              |
| Gain Control                             |                | Low, Middle, High                                                                                                                                                                                               |
| White Balance                            |                | ATW, AWC, Manual, Indoor, Outdoor                                                                                                                                                                               |
| LDC                                      |                | Support                                                                                                                                                                                                         |
| Electronic Shutter                       | Mode           | Minimum, Maximum, Anti flicker, Prefer shutter control(Based on AI engine)                                                                                                                                      |
|                                          | Speed Range    | 1/5~1/12,000sec                                                                                                                                                                                                 |
| Alarm Interface                          | In/Out         | 4 configurable I/O ports                                                                                                                                                                                        |
| Alarm Triggers                           |                | Analytics, Network disconnect, Alarm input                                                                                                                                                                      |
| Alarm Events When Alarm Trigger Occurred |                | File upload(image): e-mail/FTP,<br>Notification: e-mail,<br>Recording: SD/SDHC/SDXC or NAS recording at event triggers,Alarm output,<br>Handover: PTZ preset,send message by HTTP/HTTPS/TCP,Audio clip playback |
| Audio In                                 |                | Selectable(mic in/line in)                                                                                                                                                                                      |
| Audio Out                                |                | Line out                                                                                                                                                                                                        |
| Color Palettes                           |                | Whitehot, Blackhot, Rainbow, Rainbow2, Sepia, Red, Iron, Custom                                                                                                                                                 |

## Analytics

|                        |                    |                                                                                                                                |                                                                                                                                                                          |
|------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classified Object Type |                    | Person, Vehicle                                                                                                                | Person, Face, Vehicle, License plate                                                                                                                                     |
| Attributes             | Vehicle            |                                                                                                                                | Type(car, bus, truck, motorcycle, bicycle)                                                                                                                               |
| Thumbnail              |                    | BestShot                                                                                                                       | BestShot                                                                                                                                                                 |
| Analytics Events       | Based on AI Engine | Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit), Stopped vehicle, Traffic jam | Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit), Stopped vehicle, Traffic jam                                           |
|                        | Normal             | Motion detection, Temperature change detection                                                                                 | Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Virtual area(Loitering, Intrusion, Enter/Exit, Appear/Disappear) |

## Analytics

|                       |        |                  |                  |
|-----------------------|--------|------------------|------------------|
| Business Intelligence | Normal | Vehicle counting | Vehicle counting |
|-----------------------|--------|------------------|------------------|

## Network

|                                   |                    |                                                                                                                                                                                                                       |
|-----------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethernet                          |                    | Metal shielded RJ-45(10/100/1000BASE-T)                                                                                                                                                                               |
| Video Compression                 |                    | H.265/H.264: Main/High, MJPEG                                                                                                                                                                                         |
| Audio Compression                 |                    | G.711 u-law /G.726 selectable,G.726(ADPCM) 8kHz,G.711 8kHz,<br>G.726: 16kbps,24kbps,32kbps,40kbps,<br>AAC-LC: 48kbps at 16kHz                                                                                         |
| Smart Codec                       |                    | Manual, WiseStream II                                                                                                                                                                                                 |
| Bitrate Control                   |                    | H.265/H.264: CBR or VBR,<br>MJPEG: VBR                                                                                                                                                                                |
| Streaming                         | Unicast            | Up to 6 users                                                                                                                                                                                                         |
|                                   | Multicast          | Support                                                                                                                                                                                                               |
|                                   | Multiple Streaming | Up to 3 profiles                                                                                                                                                                                                      |
| Protocol                          |                    | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS,<br>SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS,<br>UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast) |
| Application Programming Interface | ONVIF              | S, T                                                                                                                                                                                                                  |
|                                   | Others             | SUNAPI(HTTP API), Hanwha Vision Open Platform                                                                                                                                                                         |
| Direct Cloud Connection           |                    | Support                                                                                                                                                                                                               |

## Security

|                        |                                                                         |
|------------------------|-------------------------------------------------------------------------|
| OS / Firmware Protect  | Encrypted firmware, Secure boot, Signed firmware                        |
| User authentication    | Digest authentication                                                   |
| Network authentication | IEEE 802.1X(EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2)                      |
| Secure Communication   | HTTPS, WSS(WebSocket Secure)                                            |
| Access Control         | IP-based access control                                                 |
| Data Protect           | Encryption credentials, Encrypt compress for live recording file export |
| Audit                  | Access / System / Event Log management                                  |
| Device ID              | Device certificate(Hanwha Vision Root CA)                               |
| Secure Storage         | HTPM(Hanwha Trusted Platform Module), SDcard partition encrypt(AES-256) |
| Security Certificate   | TPM 2.0 with FIPS 140-2 level2                                          |

## General

|              |                    |                                 |
|--------------|--------------------|---------------------------------|
| Memory       | RAM                | 4GB                             |
|              | Flash              | 512MB                           |
| Edge Storage | Micro SD/SDHC/SDXC | Max. 256GB x 2slot(Total 512GB) |

## Environmental & Electrical

|                     |             |                                        |
|---------------------|-------------|----------------------------------------|
| Operating Condition | Temperature | -40°C~+60°C(-40°F~+140°F)              |
|                     | Humidity    | 0~95% RH(non-condensing)               |
|                     | Others      | Start up should be done at above -30°C |
| Storage Condition   | Temperature | -50°C~+60°C(-58°F~+140°F)              |
|                     | Humidity    | 0~90% RH(non-condensing)               |
| Input Voltage       |             | PoE+(IEEE802.3at, Class4), 12VDC       |
| Power Consumption   | PoE         | Max. 23.5W, Typ 16.0W                  |
|                     | 12VDC       | Max. 19.5W, Typ 14.0W                  |

## Mechanical

|                    |                                                 |
|--------------------|-------------------------------------------------|
| Color              | White                                           |
| Material           | Aluminum                                        |
| RAL Code           | RAL9003                                         |
| Product Dimensions | 353.4(W)x287.5(H)x191.2(D)mm(13.92x11.32x7.53") |
| Product Weight     | 4.53kg(9.99lb)                                  |

## Certifications & Standards

|             |                                                                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC         | FCC 47 CFR 15 Subpart B Class A, ICES-3(A)/NMB-3(A), CE/UKCA - EN55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3, VCCI CISPR 32 Class A, RCM AS-NZS CISPR 32 Class A, KS C 9832 Class A, KS C 9835 |
| Safety      | UL 62368-1, CAN/CSA C22.2 NO. 62368-1                                                                                                                                                                    |
| Environment | IEC 60529 IP66, IEC 60529 IP67, IEC 62262 IK10, NEMA TS 2-2013 (2.2.7, 2.2.8, 2.2.9), NEMA 250 type 4X                                                                                                   |

## DORI (EN62676-4 standard)

|                           |      |                   |
|---------------------------|------|-------------------|
| Detect (25PPM/ 8PPF)      | Wide | 200.1m(656.40ft)  |
|                           | Tele | 583.4m(1913.89ft) |
| Observe (63PPM/ 19PPF)    | Wide | 80.0m(262.56ft)   |
|                           | Tele | 233.3m(765.56ft)  |
| Recognize (125PPM/ 38PPF) | Wide | 40.0m(131.28ft)   |
|                           | Tele | 116.7m(382.78ft)  |
| Identify (250PPM/ 76PPF)  | Wide | 20.0m(65.64ft)    |
|                           | Tele | 58.3m(191.39ft)   |

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CAD

Unit: mm [inch]

