



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

## TNM-C4960TD

Bi-spectrum AI Thermal Camera



### 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. Preview and installation ONLY. Requires WIFI dongle.	

### 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)
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## Operational

Day & Night		Auto(ICR)
Backlight Compensation		BLC, WDR, SSSR
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, Notification: e-mail, Recording: SD/SDHC/SDXC or NAS recording at event triggers,Alarm output, Handover: PTZ preset,send message by HTTP/HTTPS/TCP,Audio clip playback
Audio In		Selectable(mic in/line in)
Audio Out		Line out
Color Pallettes		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(Lotering, Intrusion, Enter/Exit, Appear/Disappear)

## Analytics

<b>Business Intelligence</b>	Normal	Vehicle counting	Vehicle counting
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## Network

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

## Security

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

## General

<b>Memory</b>	RAM	4GB
	Flash	512MB
<b>Edge Storage</b>	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)

## DRI (Johnson's Criteria)

Detection	Person(1.67PPM)	1,255m(4,117ft)
	Vehicle(0.65PPM)	3,207m(10,520ft)
Recognition	Person(6.67PPM)	314m(1,029ft)
	Vehicle(2.61PPM)	802m(2,630ft)

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## DRI (Johnson's Criteria)

Identification	Person(13.33PPM)	157m(515ft)	
	Vehicle(5.22PPM)	401m(1,315ft)	

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CAD

Unit: mm [inch]

