dahua TECHNOLOGY

DHI-TPC-PT8441D

Thermal Network Multi-spectral Pan & Tilt Camera

· Vanadium oxide uncooled focal plane detector.

· 1/1.8"4 Megapixel progressive scan CMOS.

· Visible lens offers 56× optical zoom.

· Offers various AI functions such as heat detection, smoke detection, tripwire, intrusion, boat detection, human/vehicle classification.

· Optical Image Stabilization.

· Optical defog.

· Up to 300 presets, 5 auto scan, 8 tour, 5 pattern.

· 7/2 alarm in/out.

· Micro SD memory, IP66.

· Laser illumination distance ≥ 800 m/500 m (optional).

System Overview

Thermal Network Multi-spectral Pan & Tilt Camera provides an all-in-one solution that is especially beneficial for middle and long distance video surveillance in outdoor applications whether day or night. The series combines one thermal camera for monitoring in total darkness and one camera with starlight functionality for confirming details up close. It also offers various AI functions, such as tripwire, intrusion, heat detection, boat detection, and multiple types of intelligence.

Scene

It can be widely applied to the scenes such as fire prevention, railway, coast guard, remote perimeter pretection.

Functions

Uncooled VOx Technology

Dahua thermal cameras use uncooled VOx sensor technology. The detector is small-sized, and highly sensitive allowing the camera to reveal images in greater detail, giving you more visual information on a monitored site. It also improves the accuracy of temperature measurements, ensuring that even minute temperature changes are detected.

AI Functions

Supports multiple intelligent functions such as heat detection, tripwire, intrusion, and person and vehicle classification detection. It supports alarm linkages, such as sending emails and triggering external alarms.

Environment (–40 °C to +70 °C)

Developed to operate in extreme conditions, the camera can function in temperatures ranging from –40 °C to +70 °C (–40 °F to +158 °F). It was subjected to rigorous dust and water immersion tests, gaining its IP66 certification, making it suitable for demanding outdoor applications. For environments with rain, sleet, snow and fog, an integrated wiper (optional) provides users with clear visibility at all times.

Security

Supports allowlists and blocklists of IP and MAC, multiple levels of user management, privacy protection and permission management.

Technical Specification

General

Appearance	Thermal Network Multi-spectral Pan & Tilt Camera
Type	Security

Thermal

Detector Type	Vanadium oxide uncooled focal plane detector
Effective Pixels	400 (H) × 300 (V)
Pixel Pitch	17 µm
Spectral Range	8 µm–14 µm
Sensitivity (NETD)	≤35 mK
Focal Length	50 mm; 75 mm; 100 mm

Field of View		
	50 mm	H: 7.8°; V: 5.8°
	75 mm	H: 5.2°; V: 3.9°
	100 mm	H: 3.9°; V: 2.9°

Focus Control	Auto; Manual

Aperture		
	50 mm	F1.0
	75 mm	F1.0
	100 mm	F1.1

	Focal Length	Detection Distance	Recognition Distance	Identification Distance
DRI Distance Human (1.8 m × 0.5 m) Vehicle (4 m × 1.4 m)	50 mm	Vehicle: 3,922 m (12,867.45 ft) Human: 1,471 m (4,826.12 ft)	Vehicle: 980 m (3,215.22 ft) Human: 378 m (1,240.16 ft)	Vehicle: 490 m (1,607.61 ft) Human: 189 m (620.08 ft)
	75 mm	Vehicle: 5,882 m (19,297.9 ft) Human: 2,206 m (7,237.53 ft)	Vehicle: 1,471 m (4,826.12 ft) Human: 567 m (1,860.24 ft)	Vehicle: 735 m (2,411.42 ft) Human: 284 m (931.76 ft)
	100 mm	Vehicle: 9,049 m (29,661.6 ft) Human: 3,020 m (9,908.13 ft)	Vehicle: 1,961 m (6,433.7 ft) Human: 756 m (2,480.31 ft)	Vehicle: 980 m (3,215.2 ft) Human: 378 m (1,240.16 ft)

Type	Model	Description
Thermal Camera	DH-TPC-HT2201-TD3	3.5 mm

Note:
① DRI Distance: The optimal values calculated according to Johnson's Criteria. They are for reference only. The actual performance depends on environmental conditions.
② D (Detection Distance): Detects objects, but cannot recognize their characteristics. Detected objects only cover a small amount of pixels (objects must cover more than 3.6 pixels of the image).
③ R (Recognition Distance): Classifies objects into general categories, such as human, vehicle, and building (the object must cover more than 14 pixels of the image).
④ I (Identification Distance): Classifies objects into specific categories based on their characteristics, such as soldier, pickup truck, and gas station (the object must cover more than 28 pixels of the image).

Digital Detail Enhancement (DDE)	Yes
Image Stabilization	Electronic Image Stabilization (EIS)
Digital Zoom	19 levels
AGC	Auto; Manual
Noise Reduction	2D NR; 3D NR
Image Flip	180°

Color Palettes	18 (white hot; black hot; fusion; rainbow; globow; ironbow1; ironbow2; sepia; color1; color2; icefire; rain; red hot; green hot; spring; summer; autumn; winter)

Visible

Image Sensor	1/1.8" CMOS
Max. Resolution	2688 (H) × 1520 (V)
Pixel	4 MP
Min. Illumination	Color: 0.005 lux Black & white: 0.0005 lux 0 lux (IR on)
AGC	Auto; Manual
Noise Reduction	2D NR; 3D NR
S/N Ratio	>55 dB
White Balance	Auto; manual; indoor; outdoor; tracking; sodium lamp; street lamp; natural
Defog	Optical defog
Image Stabilization	Optical Image Stabilization
Electronic Shutter Speed	1 s–1/30,000 s (auto/manual)
BLC	Yes
WDR	Yes
HLC	Yes
Digital Zoom	Yes
Day/Night	Auto (ICR); Color; B/W
Image Flip	180°
Exposure Compensation	Yes
Focus Control	Auto; semi-auto; manual
Focal Length	6 mm–336 mm
Zoom Speed	<3.5 s
Field of View	H: 64.4°–1.28° V: 38.37°–0.72°
Close Focus Distance	0.1 m–5 m (0.33 ft–16.4 ft)
Optical Zoom	56×
Aperture	F1.5–F5.3
IR Illumination Distance	150 m (492.13 ft)
IR Illuminator On/Off Control	Auto; Manual

Audio and Video

Video Compression	H.265; H.264H; H.264
Resolution	Thermal: Main stream: 1280 × 1024; 1280 × 960; 1280 × 720; 400 × 300; 1280 × 960 (default) Sub stream: 640 × 512; 640 × 480; 400 × 300; 400 × 300 (default) Visible: Main stream: 2688 × 1520; 1920 × 1080; 1280 × 720; 704 × 576; 2688 × 1520 (default) Sub stream: 704 × 576; 352 × 288; 352 × 288 (default)

Video Frame Rate	Thermal (50 Hz): Main stream: 1 fps–25 fps, 25 fps by default Sub stream: 1 fps–25 fps, 15 fps by default Visible (50 Hz): Main stream: 1 fps–25 fps, 25 fps by default Sub stream: 1 fps–25 fps, 15 fps by default Thermal (60 Hz): Main stream: 1 fps–30 fps, 30 fps by default Sub stream: 1 fps–30 fps, 15 fps by default Visible (60 Hz): Main stream: 1 fps–30 fps, 30 fps by default Sub stream: 1 fps–30 fps, 15 fps by default
Audio Encoding	G.711a; G.711mu; PCM
Image Encoding Format	JPEG

PTZ

Pan/Tilt Range	Pan: 0° to 360° endless Tilt: −45° to +90°
Manual Control Speed	Pan: 0.1°/s–140°/s Tilt: 0.1°/s–50°/s
Preset Speed	Pan: 0.1°/s–140°/s Tilt: 0.1°/s–50°/s
Preset	300
Tour	8 (up to 32 presets per tour)
Pattern	5
Scan	5
Power-off Memory	Yes
Privacy Masking	4 blocks
Idle Motion	Preset; auto pattern; auto tour; pan; progressive scan
Timing Task	Preset; auto pattern; auto tour; pan; progressive scan
Position Display	ON/OFF
Preset Video Freeze	Yes
Telephoto Speed Limit	Yes
Positioning Accuracy	± 0.1°
Wiper	Manual/Auto. Supports setting wiper running times, frequency, and period
3D Positioning	Yes

Laser Illumination (Optional)

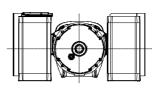|		
Laser Illumination Consumption	Laser 800 m	4.2 ± 0.4 W
	Laser 500 m	3.2 ± 0.3W
Laser Illumination Wavelength	Laser 800 m	850 ± 10 nm
	Laser 800 m	940 ± 10 nm
Laser Illumination Distance	≥800 m (2,624.67 ft); ≥500 m (1,640.42 ft)	
Angle of Laser Illuminator	2° to 70° adjustable	
Laser Zoom Speed	<5 s	
Brightness Setting for Laser Illumination	Auto; Manual	

Function

Two-way Audio	Yes
Network Protocol	HTTP; HTTPS; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPOE; IPv4/v6; SNMP; QoS; UPnP; NTP; Multicast; SFTP; 802.1x
Region of Interest (RoI)	Yes (customizable)
Storage	FTP; Micro SD card (256 G, hot swapping)
Interoperability	ONVIF; CGI; DaHuaSDK
Browser	IE: IE8 and later (includs the browsers with IE kernel, such as 360 Explorer, Sougou Explorer) Chrome: 42 and earlier Firefox: 42 and earlier
User/Host	Up to 12 (total bandwidth: 64 MB)
Security	Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access
User Management	Up to 20 users; supports multi-level user permissions (2 levels): management group and user group
Malfunction Detection	Network disconnection detection; IP conflict detection; memory card state detection; memory space detection
PIP	Yes

Intelligence

Heat Detection	Yes. Marks the detected anomaly.
Cold/Hot Spot Trace	Yes
Perimeter Protection	Yes. Supports tripwire and intrusion.
Target Distinction	Human/Vehicle Classification
Target Filtering	Yes
Target Tracking	Yes
Smoke Detection	Yes
Boat Detection	Yes

Port

Analog Output	1 × CVBS output; BNC port
Network Port	1 × RJ-45 (10/100 Base-T)
Alarm Input	7
Alarm Output	2
Alarm Event	No SD card; low SD card space; SD card error; network disconnection; IP conflict; motion detection; video tampering; intrusion; tripwire; audio detection; defocus on thermal channel
Audio Input	1
Audio Output	1
RS-485	1

Power

Power Supply	Wide input voltage 24–57 VDC

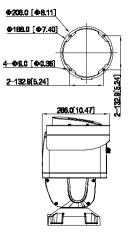| Power Consumption	IR 150 m	Basic: 39 W (IR off, heater off) Max: 69 W (IR on, heater off); 92 W (IR on, heater on)
	Laser 800 m	Basic: 39 W (illuminator off, heater off) Max: 66 W (illuminator on, heater off); 89 W (illuminator on, heater on)
	Laser 500 m	Basic: 39 W (illuminator off, heater off) Max: 50 W (illuminator on, heater off); 73 W (illuminator on, heater on)

Environment

Operating Temperature	−40 °C to +70 °C (−40 °F to +158 °F)
Operating Humidity	≤95%
Storage Temperature	−40 °C to +70 °C (−40 °F to +158 °F)

Physical Characteristics

Protection	IP66
Product Dimensions	520 mm × 266 mm × 427 mm (20.47" × 10.47" × 16.81") (L×W×H)
Packaging Dimensions	722 mm × 675 mm × 443 mm (28.43" × 26.57" × 17.44") (L×W×H)
Net Weight	≤22 kg (48.50 lb)
Gross Weight	≤25 kg (55.12 lb)
Installation	Desk mount
Power Adapter	Included
Lens	Included
PTZ Outlet	Side

Certification

Certifications	CE; FCC

Ordering Information

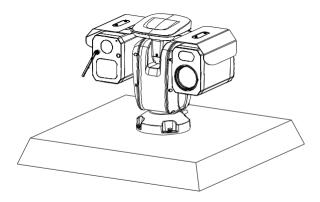| Type	Model	Description
Security	DHI-TPC-PT8441D-B50Z56-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 50 mm; IR Illumination Distance ≥150 m (492.13 ft)
	DHI-TPC-PT8441D-B75Z56-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 75 mm; IR Illumination Distance ≥150 m (492.13 ft)
	DHI-TPC-PT8441D-BM100Z56-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 100 mm; IR Illumination Distance ≥150 m (492.13 ft)
	DHI-TPC-PT8441D-B50Z56L-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 50 mm; Laser Illumination Distance ≥800 m (2,624.67 ft)
	DHI-TPC-PT8441D-B75Z56L-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 75 mm; Laser Illumination Distance ≥800 m (2,624.67 ft)
	DHI-TPC-PT8441D-BM100Z56L-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 100 mm; Laser Illumination Distance ≥800 m (2,624.67 ft)
	DHI-TPC-PT8441D-BM100Z56NRE-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 100 mm; Laser Illumination Distance ≥500 m (1,640.42 ft)
	DHI-TPC-PT8441D-B50Z56NRE-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 50 mm; Laser Illumination Distance ≥500 m (1,640.42 ft)
	DHI-TPC-PT8441D-B75Z56NRE-BM-DC48-S23	Visible Focal Length: 6 mm–336 mm; Thermal Focal Length: 75 mm; Laser Illumination Distance ≥500 m (1,640.42 ft)

Installation

Dimensions (mm[inch])