DHI-TPC-PT8441MA-T

Thermal Network Mini Hybrid Pan & Tilt Camera

· Vanadium oxide uncooled focal plane detector.

· 4Megapixel progressive scan CMOS.

· Powerful 45× optical zoom.

· Support tripwire, intrusion, and human/vehicle classification.

· Temperature measurement range of −20 °C to +550 °C.

· Pan: 0° to 360°, tilt: −90° to 90°.

· Wide input voltage of 10–36 VDC.

· IR illumination distance: 100 m.

· IP66 rated.

System Overview

With its dual lens design, Thermal Network Mini Hybrid Pan & Tilt Camera provides an all-in-one solution for video surveillance in outdoor and indoor scenarios. It adopts Thermal and Visible Technology to capture vivid, detailed images even in dark, small areas. Through its thermal camera, it can capture clear images even in poor or dark lighting, and can detect and reveal details through its visible camera that has Smart IR.

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.

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.

Temperature Measurement (–20 °C to +550 °C)

Dahua thermal cameras (-T models) provide remote temperature monitoring functionality with the ability to set temperature threshold alarms. Object temperatures can be monitored in daytime or at night, making them ideal for usage in power plant or oil extraction applications where overheating can be dangerous. When the temperature exceeds the set threshold, an alarm is triggered. The temperature range is between −20 °C to 550 °C (−4°F to 1022 °F).

High-precision Heat Detection Technology

High-precision heat detection technology is one of Dahua's core technologies. With high precision, low false alarm rate, it is widely used in heat detection of various industries.

AI Functions

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

PTZ with Encoder

Featured with closed-loop control of an encoder and 2D coordinate self-correction, the PTZ can automatically adjust in real time, without any empty trip or missing step, which offers high positioning precision. The angle correction of presets is precise.

3D Directional Pickup

Through shaping the sound wave beams from all directions, the camera acquires and amplifies sound source from the front of the camera, and weakens and filters the sound source from the side and back, which filters out background noise, and realizes "what you see is what you hear".

Scene

It is suitable for the scenarios with complex lighting conditions that require ultra-high-definition image quality, such as vehicle, robots, forests, power monitoring, public security and judicial.

Technical Specification

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)	≤40 mK (@f/1.0)
Focal Length	7.5 mm; 13 mm; 25 mm; M25 mm; 50 mm
Field of View	7.mm: H: 53.7°; V: 39.7° 13 mm: H: 30.0°; V: 22.6° 25 mm/M25 mm: H: 15.5°; V: 11.6° 50 mm: H: 7.8°; V: 5.8°
Thermal Focus Control	7.5 mm: Athermalized 13 mm: Athermalized 25 mm: Athermalized M25 mm: Auto/semi-auto/Manual 50 mm: Athermalized
Close Focus Distance	7.5mm: 1 m (3.28 ft) 13 mm: 2.5 m (8.2 ft) 25 mm: 10 m (32.81 ft) M25 mm: 0.5 m (1.64 ft) 50 mm: 40 m (131.23 ft)
Detection Distance[1]	7.5 mm: Vehicle:588 m (1929.1 ft); Human: 221m (725.1 ft) 13 mm: Vehicle: 1020 m (3,346.46 ft); Human: 382 m (1,253.28 ft) 25 mm/M25mm: Vehicle: 1,961 m (6,433.73 ft); Human: 735 m (2,411.42 ft) 50 mm: Vehicle: 3,922 m (12,867.45 ft); Human: 1,470 m (4,822.83 ft)
Recognition Distance[2]	7.5 mm: Vehicle:147 m (482.3 ft); Human: 57m (187 ft) 13 mm: Vehicle: 255 m (836.61 ft); Human: 98 m (321.52 ft) 25 mm/M25mm: Vehicle: 490 m (1,607.61 ft); Human: 189 m (620.08 ft) 50 mm: Vehicle: 980 m (3,215.22 ft); Human: 378 m (1,240.16 ft)
Identification Distance[3]	7.5 mm: Vehicle:74 m (242.8 ft); Human: 28m (91.9 ft) 13 mm: Vehicle: 128 m (419.95 ft); Human: 49 m (160.76 ft) 25 mm/M25mm: Vehicle: 245 m (803.81 ft); Human: 95 m (311.68 ft) 50 mm: Vehicle: 490 m (1,607.61 ft); Human: 189 m (620.08 ft)

Note:
[1] 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).
[2] Recognition Distance: Classifies objects into general categories, such as human, vehicle, and building (the object must cover more than 14 pixels of the image).
[3] 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
Thermal Image Stabilization	Electronic Image Stabilization (EIS)
Digital Zoom	19 levels
Thermal AGC	Auto/Manual
Thermal Noise Reduction	2D NR/3D NR
Image Flip	180°
Color Palettes	18 (white hot/black hot/fusion/rainbow/golden autumn/ midday/iron red/amber/jade/sunset/icefire/painting/ pomegranate/emerald /spring/summer/autumn/winter)

Visible

Image Sensor	1/1.8" CMOS
Max. Resolution	2688 (H) × 1520 (V)
Pixel	4 MP
Horizontal Definition	≥1200 TVL
Min. Illumination	Color: 0.001 lux@F1.4 Black & white: 0.0001 lux@F1.4 0 lux (IR on)
Visible AGC	Auto/Manual
Visible 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
Electronic Shutter Speed	1 s–1/30,000 s (auto/manual)
BLC	Yes
WDR	Yes
HLC	Yes
Day/Night	Auto (ICR); Color; B/W
Iris Control	Auto
Image Flip	180°
Exposure Compensation	Yes
Visible Focus Control	Auto/semi-auto/manual
Focal Length	5.5 mm–248 mm
Field of View	H: 67.5°–1.9° V: 39.4°–1.1°
Close Focus Distance	0.5 m–2 m (1.64 ft–6.56 ft)
Illuminator On/Off Control	Auto/Manual
Illumination Distance	100 m (328.08 ft, IR) 50 m (164.04 ft, white light)

Audio and Video

Video Compression	H.265; H.264M; H.264H; H.264B
Resolution	Thermal: Main stream: 1280 × 1024; 1280 × 960; 1280 × 720; 400 × 300; 1280 × 1024 (default) Sub stream: 640 × 512; 640 × 480; 400 × 300; 400 × 300 (default) Visible: Main stream: 2688 × 1520; 2560 × 1440; 1920 × 1080; 1280 × 720; 704 × 576; 352 × 288; 2688 × 1520 (default) Sub stream: 1280 × 720; 704 × 576; 352 × 288; 352 × 288 (default)

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

PTZ

Pan/Tilt Range	Pan: 0° to 360° endless Tilt: −90° to +90°
Manual Control Speed	Pan: 0.1°/s –100°/s Tilt: 0.1°/s –80°/s
Preset Speed	Pan: 0.1°/s –100°/s Tilt: 0.1°/s –80°/s
Preset	300
Tour	8 (up to 32 presets per tour)
Pattern	5
Scan	5
Power-off Memory	Yes
Privacy Masking	4 areas in the same view
Idle Motion	Preset; auto pattern; auto tour; pan; progressive scan

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
Storage	Micro SD card
Micro SD Card (Max.)	512 GB
Interoperability	ONVIF; CGI; Dahua SDK
Browser	IE: IE8 and later 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 automatically turns off when PIP is on)

Intelligence

Heat Detection	Yes
Cold/Hot Spot Trace	Yes
IVS (Perimeter Protection)	Yes. Supports tripwire and intrusion.
Target Distinction	Human/Vehicle Classification

Port

Analog Output	1 × CVBS output; BNC port
Network Port	1 × RJ-45 (10/100 Base-T)
Alarm Input	2
Alarm Output	2
Audio Input	1
Audio Output	1
RS-485	1

Power

Power Supply	Wide input voltage 10–36 VDC
Power Consumption	Basic: 30 W (illuminator off, heating off) Max: 43 W (illuminator on, heating off); 50 W (illuminator on, heating 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
Reliability	Surge protection: 6 kV Air discharge of 15 kV Contact discharge of 8 kV

Structure

Product Dimensions	231.3 mm × 389.7 mm × 276.9 mm (9.11" × 15.34" × 10.9") (L × W × H)
Packaging Dimensions	485 mm × 360 mm × 390 mm (19.09" × 14.17" × 15.35") (L × W × H)
Net Weight	≤9 kg (19.84 lb)
Gross Weight	≤12 kg (26.46 lb)

Heat Detection Distance

Focal Length	7.5mm	13 mm	25 mm/ M25mm	50 mm
Heat Detection Distance (Recommended)	220 m (721.78 ft)	390 m (1,279.53 ft)	750 m (2,460.63 ft)	1,500 m (4,921.26 ft)
Heat Detection Distance (Max.)	440 m (1,443.57 ft)	780 m (2,559.06 ft)	1,500 m (4,921.26 ft)	3,000 m (9,842.52 ft)

Note:
The table displays the measured distances obtained from using the target size 2 m x 2 m for testing in an environment where the temperature is 23 °C and the relative humidity is below 60%.
The table is for reference only. The distances within it are subject to actual conditions including atmospheric conditions, target size, the installation site, and more.

Temperature Measurement Distance

Focal Length	7 mm	13 mm	25 mm	M25 mm	50 mm

Temperature Measurement Distance (Min.)	1 m (3.28 ft)	2 m (6.56 ft)	4 m (13.12 ft)	4 m (13.12 ft)	9 m (29.53 ft)
Temperature Measurement Distance (Max.)	6.5 m (21.33 ft)	11 m (36.09 ft)	21 m (68.90 ft)	21 m (68.90 ft)	42 m (137.80 ft)

Note:
The table displays the measured distances obtained from using the target size 0.1 m x 0.1 m for testing in an environment where the temperature is 23 °C and the relative humidity is below 60%.
The table is for reference only. The distances within it are subject to actual conditions including atmospheric conditions, target size, the installation site, and more.
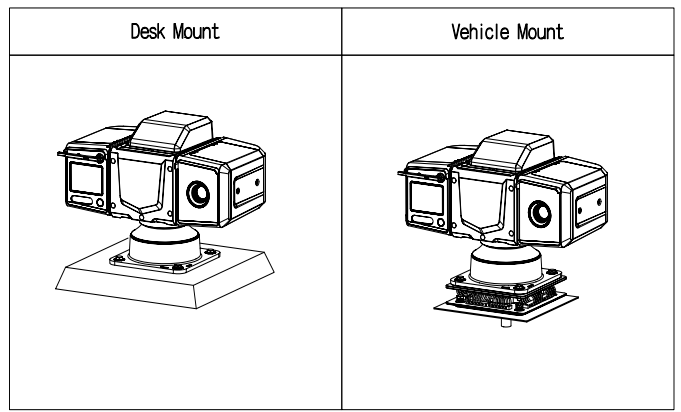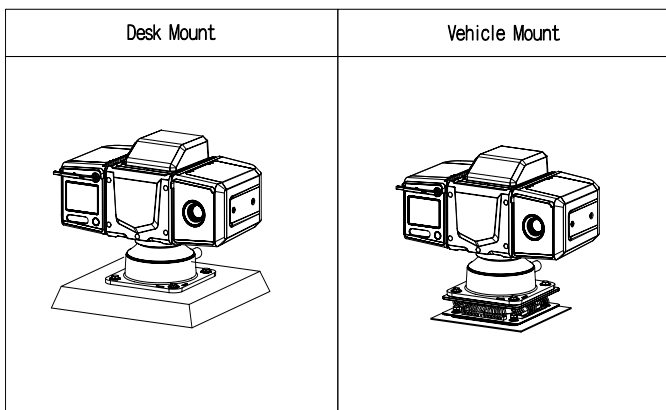
Ordering Information

Type	Model	Description
Thermal Camera	DHI-TPC-PT8441MA-TB7Z45V1-BM-IR-S22	Thermal: 7.5 mm; Visible: 5.5 mm–248 mm
	DHI-TPC-PT8441MA-TB13Z45V1-BM-IR-S22	Thermal: 13mm; Visible: 5.5 mm–248 mm
	DHI-TPC-PT8441MA-TB25Z45V1-BM-IR-S22	Thermal: 25 mm; Visible: 5.5 mm–248 mm
	DHI-TPC-PT8441MA-TBM25Z45V1-BM-WB-S22	Thermal: Motorized 25 mm; Visible: 5.5 mm–248 mm
	DHI-TPC-PT8441MA-TB50Z45V1-BM-IR-S22	Thermal: 50 mm; Visible: 5.5 mm–248 mm
Accessories (Optional)	RAW021-01	Anti-vibration Isolator

Accessories

Optional:

RAW021-01
Anti-vibration Isolator

Desk Mount	Vehicle Mount

Desk Mount	Vehicle Mount

Dimensions (mm[inch])