**dahua**
TECHNOLOGY

# DHI-TPC-PT8441D

## Thermal Network Multi-spectral Pan & Tilt Camera

- Vanadium oxide uncooled focal plane detector.
- 4 Megapixel progressive scan CMOS.
- Visible lens offers 56× optical zoom.
- AI functions: heat detection, smoke detection, tripwire, intrusion, boat detection, and human/vehicle classification.
- Pan: 0° to 360° endless, tilt: −45° to +90°.
- Optical defog and Optical Image Stabilization (OIS).
- Auto rain-sensing wiper.
- Wide input voltage 24–57 VDC.
- IP66 rated.

Featuring thermal and visible channels, Thermal Network Multi-spectral Pan & Tilt Camera offers various AI functions such as heat detection, smoke detection, tripwire, intrusion, human/vehicle classification and boat detection. The camera has flexible configuration with the laser illuminator and laser ranging optional. It is widely applied in outdoor scenes of the long-distance perimeter protection and heat detection.

## 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°<br>75 mm: H: 5.2°; V: 3.9°<br>100 mm: H: 3.9°; V: 2.9° |
| Focus Control | Auto; Manual |
| Aperture | 50 mm: F1.0<br>75 mm: F1.0<br>100 mm: F1.1 |
| Detection Distance[1] | 50 mm: Vehicle: 4,525 m (14,845.43 ft);<br>Human: 1,471 m (4,826.12 ft)<br>75 mm: Vehicle: 6,787 m (22,268.14 ft);<br>Human: 2,206 m (7,237.53 ft)<br>100 mm: Vehicle: 9,050 m (29,690.86 ft);<br>Human: 2,941 m (9,648.95 ft) |

| | |
|---|---|
| Recognition Distance[2] | 50 mm: Vehicle: 1,110 m (3,641.33 ft);<br>Human: 378 m (1,240.16 ft)<br>75 mm: Vehicle: 1,665 m (5,462.00 ft);<br>Human: 567 m (1,860.24 ft)<br>100 mm: Vehicle: 2,220 m (7,282.66 ft);<br>Human: 756 m (2,480.31 ft) |
| Identification Distance[3] | 50 mm: Vehicle: 560 m (1,838.01 ft);<br>Human: 189 m (620.08 ft)<br>75 mm: Vehicle: 840 m (2,757.01 ft);<br>Human: 284 m (931.76 ft)<br>100 mm: Vehicle: 1,120 m (3,676.01 ft);<br>Human: 378 m (1,240.16 ft) |

Note:
[1] Detection Distance: Detects objects, but cannot recognize their characteristics (objects must cover more than 3.6 pixels of the image).
[2] Recognition Distance: Classifies objects into general categories, such as human, vehicle (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 engineering truck, car (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<br>Black & white: 0.0005 lux<br>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°<br>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:<br>Main stream: 1280 × 1024; 1280 × 960; 1280 × 720; 400 × 300; 1280 × 960 (default)<br>Sub stream: 640 × 512; 640 × 480; 400 × 300; 400 × 300 (default)<br>Visible:<br>Main stream: 2688 × 1520; 1920 × 1080; 1280 × 720; 704 × 576; 2688 × 1520 (default)<br>Sub stream: 704 × 576; 352 × 288; 352 × 288 (default) |
| Video Frame Rate | Thermal (50 Hz):<br>Main stream: 1 fps–25 fps, 25 fps by default<br>Sub stream: 1 fps–25 fps, 15 fps by default<br>Visible (50 Hz):<br>Main stream: 1 fps–25 fps, 25 fps by default<br>Sub stream: 1 fps–25 fps, 15 fps by default<br>Thermal (60 Hz):<br>Main stream: 1 fps–30 fps, 30 fps by default<br>Sub stream: 1 fps–30 fps, 15 fps by default<br>Visible (60 Hz):<br>Main stream: 1 fps–30 fps, 30 fps by default<br>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<br>Tilt: −45° to +90° |
| Manual Control Speed | Pan: 0.1°/s–140°/s<br>Tilt: 0.1°/s–50°/s |
| Preset Speed | Pan: 0.1°/s–140°/s<br>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 | 4.2 ± 0.4 W |
| Laser Illumination Wavelength | 850 ± 10 nm |
| Laser Illumination Distance | ≥800 m (2,624.67 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 (optional) |
| Interoperability | ONVIF; CGI; DaHuaSDK |
| Browser | IE: IE8 and later (includs the browsers with IE kernel, such as 360 Explorer, Sougou Explorer)<br>Chrome: 42 and earlier<br>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)<br>Max: 69 W (IR on, heater off);<br>92 W (IR on, heater on) |
| | Laser 800 m | Basic: 39 W (illuminator off, heater off)<br>Max: 66 W (illuminator on, heater off);<br>89 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 |
| Reliability | Surge protection: 6 kV<br>Air discharge: 15 kV<br>Contact discharge: 8 kV |
| 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 |

## Heat Detection Distance

| Focal Length | Max. Distance |
|---|---|
| 50 mm | 3,000 m (9,842.52 ft) |
| 75 mm | 4,500 m (14,763.78 ft) |
| 100 mm | 6,000 m (19,685.04 ft) |

Note:
The table displays the measured distances obtained from using the target size 2 m × 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.
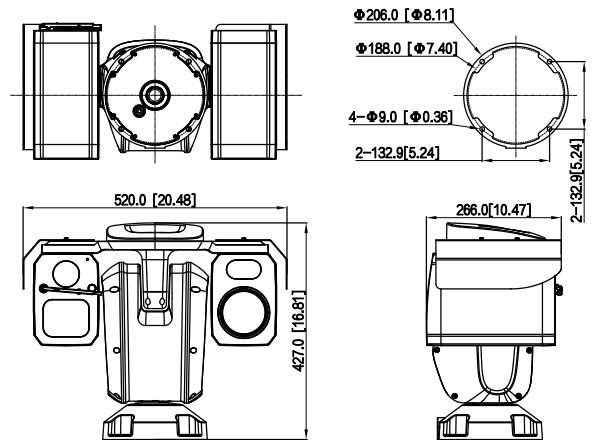
## Perimeter Protection Distance

| Focal Length | Distance (Human) | Distance (Vehicle) |
|---|---|---|
| 50 mm | 350 m (1,148.29 ft) | 1,050 m (3,444.88 ft) |
| 75 mm | 525 m (1,722.44 ft) | 1,575 m (5,167.32 ft) |
| 100 mm | 700 m (2,296.59 ft) | 2,100 m (6,889.76 ft) |

Note:
The table displays the measured distances obtained from using the target sizes 1.8 m × 0.5 m (human) and 1.4 m × 4 m (vehicle) 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 |
|------|-------|-------------|
| 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) |

## Dimensions (mm[inch])



## Installation