

# DHI-TPC-PT8641MA-T

## Thermal Network Mini Hybrid Pan & Tilt Camera



- Vanadium oxide uncooled focal plane detector.
- 4Megapixel progressive scan CMOS.
- Powerful 45x optical zoom.
- Supports tripwire, intrusion, and human/vehicle classification.
- Temperature measurement range of  $-20^{\circ}\text{C}$  to  $+550^{\circ}\text{C}$ .
- Pan:  $0^{\circ}$  to  $360^{\circ}$ , tilt:  $-90^{\circ}$  to  $90^{\circ}$ .
- 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 ( $-40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ )

Developed to operate in extreme conditions, the camera can function in temperatures ranging from  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $+158^{\circ}\text{F}$ ). 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 ( $-20^{\circ}\text{C}$ to $+550^{\circ}\text{C}$ )

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  $-20^{\circ}\text{C}$  to  $550^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$  to  $1022^{\circ}\text{F}$ ).

### 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 heat 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                     | 640 (H) × 512 (V)  |
| Pixel Pitch                          | 17 μm  |
| Spectral Range                       | 8 μm–14 μm   |
| Sensitivity (NETD)                   | ≤35 mK (@f/1.0)  |
| Focal Length                         | 7.5 mm; 13 mm; 25 mm; 50 mm  |
| Field of View                        | 7.5mm: H: 91.2°; V: 70.3°<br>13 mm: H: 48.9°; V: 38.8°<br>25 mm: H:24.6°; V: 19.8°<br>50 mm: H: 12.4°; V: 9.9°   |
| Thermal Focus Control                | Athermalized   |
| Close Focus Distance                 | 7.5mm: 1 m (3.28 ft)<br>13 mm: 2.5 m (8.2 ft)<br>25 mm: 10 m (32.81 ft)<br>50 mm: 40 m (131.23 ft)   |
| Detection Distance <sup>①</sup>      | 7.5 mm: Vehicle:588 m (1929.1 ft);<br>Human: 221m (725.1 ft)<br>13 mm: Vehicle: 1020 m (3,346.46 ft);<br>Human: 382 m (1,253.28 ft)<br>25 mm: Vehicle: 1,961 m (6,433.73 ft);<br>Human: 735 m (2,411.42 ft)<br>50 mm: Vehicle: 3,922 m (12,867.45 ft);<br>Human: 1,470 m (4,822.83 ft)   |
| Recognition Distance <sup>②</sup>    | 7.5 mm: Vehicle:147 m (482.3 ft);<br>Human: 57m (187 ft)<br>13 mm: Vehicle: 255 m (836.61 ft);<br>Human: 98 m (321.52 ft)<br>25 mm: Vehicle: 490 m (1,607.61 ft);<br>Human: 189 m (620.08 ft)<br>50 mm: Vehicle: 980 m (3,215.22 ft);<br>Human: 378 m (1,240.16 ft)  |
| Identification Distance <sup>③</sup> | 7.5 mm: Vehicle:74 m (242.8 ft);<br>Human: 28m (91.9 ft)<br>13 mm: Vehicle: 128 m (419.95 ft);<br>Human: 49 m (160.76 ft)<br>25 mm: Vehicle: 245 m (803.81 ft);<br>Human: 95 m (311.68 ft)<br>50 mm: Vehicle: 490 m (1,607.61 ft);<br>Human: 189 m (620.08 ft)   |
| Note:                                |  |
|                                      | ① Detection Distance: Detects objects, but cannot recognize their characteristics (objects must cover more than 3.6 pixels of the image).<br>② Recognition Distance: Classifies objects into general categories, such as human, vehicle (the object must cover more than 14 pixels of the image).<br>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  |
| Thermal Image Stabilization          | Electronic Image Stabilization (EIS)   |
| Digital Zoom                         | 24 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)                           |
| Temperature Measurement Range    | Low temperature mode:<br>–20 °C to +150 °C (–4 °F to +302 °F)<br>High temperature mode:<br>0 °C to +550 °C (+32 °F to +1022 °F)<br>Auto mode: –20 °C to +550 °C (–4 °F to +1022 °F) |
| Temperature Measurement Accuracy | Max. (±2 °C, ±2%);<br>Operating temperature: –20 °C (–4°F) to +60 °C (+302 °F)  |
| Temperature Measurement Mode     | Spot: 12<br>Line: 12<br>Area: 12<br>Supports 12 rules simultaneously  |

**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<br>Black & white: 0.0001 lux@F1.4<br>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°<br>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)  |
| <b>Audio and Video</b>     |  |
| Video Compression          | H.265; H.264M; H.264H; H.264B  |

|                              |  |
|------------------------------|--|
| <b>Resolution</b>            | Thermal:<br>Main stream: 1280 × 1024; 1280 × 720; 640 × 512; 1280 × 1024 (default)<br>Sub stream: 640 × 512; 320 × 256; 640 × 512 (default)<br>Visible:<br>Main stream: 2688 × 1520; 2560 × 1440; 1920 × 1080; 1280 × 720; 704 × 576; 352 × 288; 2688 × 1520 (default)<br>Sub stream: 1280 × 720; 704 × 576; 352 × 288; 352 × 288 (default)  |
| <b>Video Frame Rate</b>      | Thermal:<br>50 Hz: (main stream) 1 fps–25 fps adjustable, 25 fps by default; (sub stream) 1 fps–25 fps adjustable, 15 fps by default<br>60 Hz: (main stream) 1 fps–30 fps adjustable, 30 fps by default; (sub stream) 1 fps–30 fps adjustable, 15 fps by default<br>Visible:<br>50 Hz: (main stream) 1 fps–25 fps adjustable, 25 fps by default; (sub stream) 1 fps–25 fps adjustable, 15 fps by default<br>60 Hz: (main stream) 1 fps–30 fps adjustable, 30 fps by default; (sub stream) 1 fps–30 fps adjustable, 15 fps by default |
| <b>Audio Compression</b>     | G.711a; G.711mu; PCM   |
| <b>Image Encoding Format</b> | JPEG   |

#### PTZ

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

#### Function

|                                 |  |
|---------------------------------|--|
| <b>Two-way Audio</b>            | Yes  |
| <b>Network Protocol</b>         | HTTP; HTTPS; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPOE; IPv4/v6; SNMP; QoS; UPnP; NTP; Multicast; SFTP; 802.1x |
| <b>Region of Interest (RoI)</b> | Yes  |
| <b>Storage</b>                  | Micro SD card  |
| <b>Micro SD Card (Max.)</b>     | 512 GB   |
| <b>Interoperability</b>         | ONVIF; CGI; Dahua SDK  |
| <b>Browser</b>                  | IE: IE8 and later<br>Chrome: 42 and earlier<br>Firefox: 42 and earlier   |
| <b>User/Host</b>                | Up to 12 (total bandwidth: 64 MB)  |
| <b>Security</b>                 | Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access                        |

|                              |   |
|------------------------------|---|
| <b>User Management</b>       | Up to 20 users; supports multi-level user permissions (2 levels); management group and user group           |
| <b>Malfunction Detection</b> | Network disconnection detection; IP conflict detection; memory card state detection; memory space detection |
| <b>PIP</b>                   | Yes (Intelligence automatically turns off when PIP is on)   |

#### Intelligence

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

#### Port

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

#### Power

|                          |  |
|--------------------------|--|
| <b>Power Supply</b>      | Wide input voltage 10–36 VDC   |
| <b>Power Consumption</b> | Basic: 30 W (illuminator off, heating off)<br>Max: 43 W (illuminator on, heating off); 50 W (illuminator on, heating on) |

#### Environment

|                              |                                      |
|------------------------------|--------------------------------------|
| <b>Operating Temperature</b> | -40 °C to +70 °C (-40 °F to +158 °F) |
| <b>Operating Humidity</b>    | ≤95%                                 |
| <b>Storage Temperature</b>   | -40 °C to +70 °C (-40 °F to +158 °F) |

#### Physical Characteristics

|                    |   |
|--------------------|---|
| <b>Protection</b>  | IP66  |
| <b>Reliability</b> | Surge protection: 6 kV<br>Air discharge of 15 kV<br>Contact discharge of 8 kV |

#### Structure

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

#### Heat Detection Distance

| Focal Length                                 | 7.5mm               | 13 mm               | 25 mm                 | 50 mm                 |
|--|---------------------|---------------------|-----------------------|-----------------------|
| <b>Heat Detection Distance (Recommended)</b> | 220 m (721.78 ft)   | 390 m (1,279.53 ft) | 750 m (2,460.63 ft)   | 1,500 m (4,921.26 ft) |
| <b>Heat Detection Distance (Max.)</b>        | 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                            | 7.5mm            | 13 mm           | 25 mm           | 50 mm            |
| Temperature Measurement Distance (Min.) | 1 m (3.28 ft)    | 2 m (6.56 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) | 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**

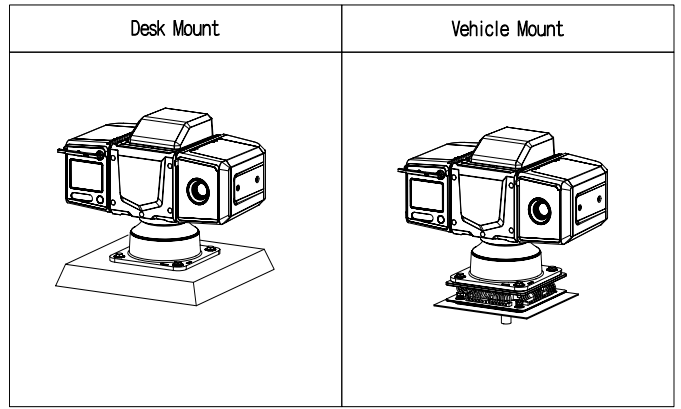
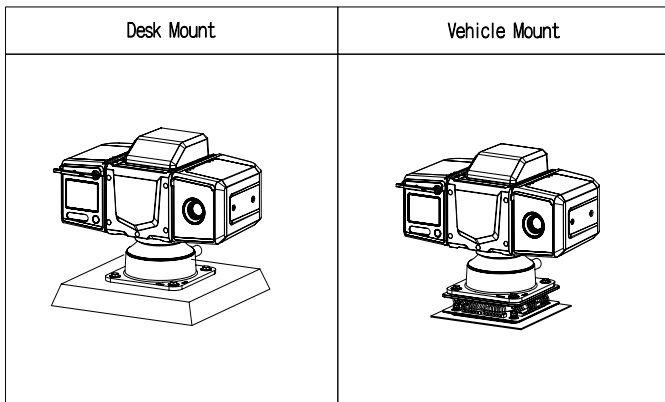
| Type                   | Model                                | Description                                |
|------------------------|--------------------------------------|--|
| Thermal Camera         | DHI-TPC-PT8641MA-TB7Z45V1-BM-IR-S22  | Thermal: 7.5 mm;<br>Visible: 5.5 mm–248 mm |
|                        | DHI-TPC-PT8641MA-TB13Z45V1-BM-IR-S22 | Thermal: 13mm;<br>Visible: 5.5 mm–248 mm   |
|                        | DHI-TPC-PT8641MA-TB25Z45V1-BM-IR-S22 | Thermal: 25 mm;<br>Visible: 5.5 mm–248 mm  |
|                        | DHI-TPC-PT8641MA-TB50Z45V1-BM-IR-S22 | Thermal: 50 mm;<br>Visible: 5.5 mm–248 mm  |
| Accessories (Optional) | RAW021-01                            | Anti-vibration Isolator                    |

**Accessories**

Optional:



RAW021-01  
Anti-vibration Isolator



**Dimensions (mm[inch])**

