

# DH-TPC-PT8421B

## Thermal Network Hybrid PTZ Camera



- 400x300 VOx uncooled thermal sensor technology
- Athermalized lens(thermal), focus-free
- 1/1.9" 2 Megapixel progressive scan CMOS
- Powerful optical zoom lens(thermal&visible)
- Support fire detection & alarm
- Max 30°/s pan speed, 360° endless pan rotation
- Up to 300 presets, 5 auto scan, 8 tour, 5 pattern
- 2/1 alarm in/out
- Micro SD memory, IP66



### System Overview

Featuring a dual lens Pan/Tilt/Zoom (PTZ) camera, this series provides an all-in-one solution that is especially beneficial for long distance video surveillance in outdoor applications. Together with Dahua Thermal and Starlight technology, the camera's long range capabilities are able to be utilized even at night. The series combines one thermal camera for monitoring in total darkness and one camera with Starlight functionality and a motorized lens for confirming details up close.

### Functions

#### Uncooled Vox Technology

Dahua thermal cameras use uncooled Vox sensor technology. Their small size and better performance make them a cost-effective solution for thermal security.

#### High Sensitivity

High thermal sensitivity (<40mK) allows cameras to capture more image details and temperature difference information.

#### Fire Detection & Alarm

With built-in fire detection functionality, the camera has the ability to detect fires from long range. Because thermal cameras are sensitive to temperature, they provide higher fire detection accuracy than standard cameras, making them particularly fit for applications such as forest fire prevention.

#### Intelligent Video System (IVS)

IVS is a built-in video analytics algorithm that delivers intelligent functions to monitor a scene for tripwire violations, intrusion detection, and abandoned or missing objects. A camera with IVS quickly and accurately responds to monitoring events in a specific area.

### Environmental

With a temperature range of -40 °C to +70 °C, the camera is designed for extreme temperature environments. Subjected and certified to rigorous dust and water immersion tests, the IP66 rating makes 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.

### Protection

The camera Supporting wide range voltage input(100–300V AC), suitable for the most unstable conditions for outdoor applications. Its 6 kV lightning rating provides effective protection for both the camera and its structure against lightning.

| Technical Specification          |                                                                                                                                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                          |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General                          |                                                                                                                                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                          |
| Structure                        | Multi-sensor PTZ camera                                                                                                                                                                                                                              |                                      |                                                                                                                                                                                                                                                                                          |
| Thermal                          |                                                                                                                                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                          |
| Detector Type                    | Vanadium oxide uncooled focal plane detector                                                                                                                                                                                                         |                                      |                                                                                                                                                                                                                                                                                          |
| Effective Pixels                 | 400x300                                                                                                                                                                                                                                              |                                      |                                                                                                                                                                                                                                                                                          |
| Pixel Pitch                      | 17μm                                                                                                                                                                                                                                                 |                                      |                                                                                                                                                                                                                                                                                          |
| Spectral Range                   | 8μm–14μm                                                                                                                                                                                                                                             |                                      |                                                                                                                                                                                                                                                                                          |
| Thermal Sensitivity (NETD)       | ≤40mK                                                                                                                                                                                                                                                |                                      |                                                                                                                                                                                                                                                                                          |
| Focal Length                     | 100mm; 20mm–100mm; 30mm–150mm; 38mm–190mm                                                                                                                                                                                                            |                                      |                                                                                                                                                                                                                                                                                          |
| Field of View                    | 100mm: horizontal: 3.9°; vertical: 2.9°<br>20mm–100mm: horizontal: 19.3°–3.9°; vertical: 14.5°–2.9°<br>30mm–150mm: horizontal: 12.9°–2.6°; vertical: 9.7°–1.9°<br>38mm–190mm: horizontal: 10.2°–2.1°; vertical: 7.7°–1.5°                            |                                      |                                                                                                                                                                                                                                                                                          |
| Focus Mode                       | Auto; manual                                                                                                                                                                                                                                         |                                      |                                                                                                                                                                                                                                                                                          |
| Aperture                         | 100mm: F1.0<br>20mm–100mm: F1.0<br>30mm–150mm: F1.2<br>38mm–190mm: F1.2                                                                                                                                                                              |                                      |                                                                                                                                                                                                                                                                                          |
| Detection Distance               | 100mm: vehicle: 7843m (2574ft); human: 2941m (9649ft)<br>20mm–100mm: vehicle: 7843m (2574ft); human: 2941m (9649ft)<br>30mm–150mm: vehicle: 11765m (38599ft); human: 4412m (14475ft)<br>38mm–190mm: vehicle: 14902m (2552ft); human: 5588m (18333ft) |                                      |                                                                                                                                                                                                                                                                                          |
| Recognition Distance             | 100mm: vehicle: 1961m (6434ft); human: 756m (2480ft)<br>20mm–100mm: vehicle: 1961m (6434ft); human: 756m (2480ft)<br>30mm–150mm: vehicle: 2941m (9649ft); human: 1134m (14475ft)<br>38mm–190mm: vehicle: 3725m (12221ft); human: 1437m (4715ft)      |                                      |                                                                                                                                                                                                                                                                                          |
| Identification Distance          | 100mm: vehicle: 980m (3215ft); human: 378m (1240ft)<br>20mm–100mm: vehicle: 980m (3215ft); human: 378m (1240ft)<br>30mm–150mm: vehicle: 1471m (4826ft); human: 567m (1860ft)<br>38mm–190mm: vehicle: 1863m (6112ft); human: 718m (2356ft)            |                                      |                                                                                                                                                                                                                                                                                          |
| Digital Detail Enhancement (DDE) | Yes                                                                                                                                                                                                                                                  |                                      |                                                                                                                                                                                                                                                                                          |
| AGC                              | Auto; manual                                                                                                                                                                                                                                         |                                      |                                                                                                                                                                                                                                                                                          |
| Noise Reduction                  | 2D NR; 3D NR                                                                                                                                                                                                                                         |                                      |                                                                                                                                                                                                                                                                                          |
| Color Palettes                   | 18 color modes selectable such as Whitehot/Blackhot/Ironrow/Icefire.                                                                                                                                                                                 |                                      |                                                                                                                                                                                                                                                                                          |
| Visible                          |                                                                                                                                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                          |
| Image Sensor                     | 1/1.9 inch CMOS                                                                                                                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                          |
| Effective Pixels                 | 1920x1080                                                                                                                                                                                                                                            |                                      |                                                                                                                                                                                                                                                                                          |
| Max. Resolution                  | 2MP                                                                                                                                                                                                                                                  |                                      |                                                                                                                                                                                                                                                                                          |
|                                  |                                                                                                                                                                                                                                                      | Horizontal Definition                | ≥1100TVL                                                                                                                                                                                                                                                                                 |
|                                  |                                                                                                                                                                                                                                                      | Min. Illumination                    | 6.25mm–300mm: color: 0.001Lux@F1.4; black & white: 0.0001Lux@F1.4<br>21mm–500mm; 12.5mm–775mm; 16.7mm–1000mm: color: 0.002Lux @ (F1.5, AGC ON); black & white: 0.0005Lux @ (F1.5, AGC ON)                                                                                                |
|                                  |                                                                                                                                                                                                                                                      | AGC                                  | Auto; manual                                                                                                                                                                                                                                                                             |
|                                  |                                                                                                                                                                                                                                                      | Noise Reduction                      | 2D NR; 3D NR                                                                                                                                                                                                                                                                             |
|                                  |                                                                                                                                                                                                                                                      | S/N Ratio                            | >55dB                                                                                                                                                                                                                                                                                    |
|                                  |                                                                                                                                                                                                                                                      | White Balance                        | Auto/manual/indoor/outdoor/tracking/outdoor auto/sodium lamp auto/sodium lamp                                                                                                                                                                                                            |
|                                  |                                                                                                                                                                                                                                                      | Electronic Defog                     | Yes                                                                                                                                                                                                                                                                                      |
|                                  |                                                                                                                                                                                                                                                      | Electronic Image Stabilization (EIS) | Yes                                                                                                                                                                                                                                                                                      |
|                                  |                                                                                                                                                                                                                                                      | Optical Defog                        | 6.25mm–300mm: None<br>21mm–500mm: None<br>12.5mm–775mm: None<br>16.7mm–1000mm: Yes                                                                                                                                                                                                       |
|                                  |                                                                                                                                                                                                                                                      | Electronic Shutter Speed             | 1/1s–1/100000s (auto or manual)                                                                                                                                                                                                                                                          |
|                                  |                                                                                                                                                                                                                                                      | BLC                                  | Yes                                                                                                                                                                                                                                                                                      |
|                                  |                                                                                                                                                                                                                                                      | WDR                                  | Yes                                                                                                                                                                                                                                                                                      |
|                                  |                                                                                                                                                                                                                                                      | HLC                                  | Yes                                                                                                                                                                                                                                                                                      |
|                                  |                                                                                                                                                                                                                                                      | Digital Zoom                         | 6.25mm–300mm: 16×<br>21mm–500mm: None<br>12.5mm–775mm: None<br>16.7mm–1000mm: None                                                                                                                                                                                                       |
|                                  |                                                                                                                                                                                                                                                      | Day/Night                            | Auto (ICR); color/B/W                                                                                                                                                                                                                                                                    |
|                                  |                                                                                                                                                                                                                                                      | Focus Mode                           | Auto; semi-auto; manual                                                                                                                                                                                                                                                                  |
|                                  |                                                                                                                                                                                                                                                      | Focal Length                         | 6.25mm–300mm (thermal lens: 100mm);<br>21mm–500mm (thermal lens: 20mm–100mm);<br>12.5mm–775mm (thermal lens: 30mm–150mm);<br>16.7mm–1000mm (thermal lens: 38mm–190mm)                                                                                                                    |
|                                  |                                                                                                                                                                                                                                                      | Field of View                        | 6.25mm–300mm: horizontal: 61.93°–1.61°<br>21mm–500mm: horizontal: 23.5°–1.0°; vertical: 17.6°–0.8°<br>12.5mm–775mm: horizontal: 31.29°–0.32°; vertical: 19.36°–0.20°<br>16.7mm–1000mm: horizontal: 20.51°–0.22°; vertical: 15.54°–0.17°                                                  |
|                                  |                                                                                                                                                                                                                                                      | Close Focus Distance                 | 6.25mm–300mm: 0.01m–1.5m<br>21mm–500mm: 1m–10m<br>12.5mm–775mm: 1m–10m<br>16.7mm–1000mm: 1m–10m                                                                                                                                                                                          |
|                                  |                                                                                                                                                                                                                                                      | Optical Zoom                         | 6.25mm–300mm: 48×<br>21mm–500mm: 24×<br>12.5mm–775mm: 62×<br>16.7mm–1000mm: 60×                                                                                                                                                                                                          |
|                                  |                                                                                                                                                                                                                                                      | Aperture                             | 6.25mm–300mm: F1.4–F4.5<br>21mm–500mm: F3.9<br>12.5mm–775mm: F3.5<br>16.7mm–1000mm: F3.5                                                                                                                                                                                                 |
|                                  |                                                                                                                                                                                                                                                      | Audio and Video                      |                                                                                                                                                                                                                                                                                          |
|                                  |                                                                                                                                                                                                                                                      | Video Compression                    | H.265; H.264M; H.264H; H.264B; MJPEG                                                                                                                                                                                                                                                     |
|                                  |                                                                                                                                                                                                                                                      | Resolution                           | Thermal:<br>Main stream (1280×1024, 1280×960, 1280×720, 400×300) (1280×960 by default); sub stream (640×512, 640×480, 400×300) (400×300 by default)<br>Visible:<br>Main stream (1920×1080, 1280×720, 704×576) (1920×1080 by default); sub stream (704×576, 352×288) (704×576 by default) |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Video Frame Rate      | Thermal:<br>50Hz:<br>Main stream (1280×1024@25fps/1280×960@25fps/1280×720@25fps/400×300@25fps), sub stream (640×512@25fps/640×480@25fps/400×300@25fps)<br>60Hz:<br>Main stream (1280×1024@30fps/1280×960@30fps/1280×720@30fps/400×300@30fps), sub stream (640×512@30fps/640×480@30fps/400×300@30fps)<br>Visible:<br>50Hz:<br>Main stream (1920×1080@25fps/1280×720@25fps/704×576@25fps), sub stream (704×576@25fps/352×288@25fps)<br>60Hz:<br>Main stream (1920×1080@30fps/1280×720@30fps/704×480@30fps), sub stream (704×480@30fps/352×240@30fps) |
| Audio Compression     | G.711a; G.711mu; AAC; PCM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Image Encoding Format | JPEG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## PTZ

|                      |                                                                                     |
|----------------------|-------------------------------------------------------------------------------------|
| Pan/Tilt Range       | Pan: 0°–360° endless;                                                               |
| Manual Control Speed | Pan: 0.01°–30°/s; Tilt: 0.01°–12°/s                                                 |
| Preset Speed         | Pan: 0.01°–30°/s; Tilt: 0.01°–12°/s                                                 |
| Preset               | 300                                                                                 |
| PTZ Mode             | 5 Auto Scan, 8 Tour, 5 Pattern, Auto Pan                                            |
| Speed Setup          | Human-oriented focal length/ speed adaptation                                       |
| Power Up Action      | Auto restore to previous PTZ and lens status after power failure                    |
| Idle Motion          | Activate Preset/ Scan/ Tour/ Pattern if there is no command in the specified period |
| Protocol             | DH-SD, Pelco-P/D (Auto recognition)                                                 |

## General Function

|                          |                                                                                                                                             |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Two-way Talk             | Yes                                                                                                                                         |
| Network Protocol         | HTTP; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPoE; IPv4/v6; SNMP; QoS; UPnP; NTP                                      |
| Region of Interest (ROI) | Yes                                                                                                                                         |
| Edge Storage             | FTP; Micro SD card (256G, hot plug)                                                                                                         |
| Interoperability         | ONVIF; GB/T28181; CGI; PSIA; Dahua SDK                                                                                                      |
| Browser                  | IE: IE8 and the later, and explorer with IE core<br>Google: 42 and the earlier<br>Firefox: 42 and the earlier<br>Safari: 10 and the earlier |
| User/Host                | 20 channels at most (the total bandwidth 64M)                                                                                               |
| Security                 | Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access                             |
| User Management          | Support 20 users at most and users are classified as two groups--administrator group and user group.                                        |
| Malfunction Detection    | Network disconnection; IP addresses conflict; SD card error (status or storage space);                                                      |

## Smart Event

|                       |                    |
|-----------------------|--------------------|
| General IVS Analytics | Tripwire/intrusion |
|-----------------------|--------------------|

## Professional and Intelligent

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| Fire Detection      | Yes                                                                         |
| Cold/Hot Spot Trace | Auto tracking of the hottest spot and the coldest spot in the thermal image |
| Auto Tracking       | Auto tracking of the hottest spot and the coldest spot in the thermal image |

## Port

|              |                                  |
|--------------|----------------------------------|
| Network      | 1 10M/100M Ethernet port (RJ-45) |
| Alarm Input  | 2 channels                       |
| Alarm Output | 1 channels                       |
| Audio Input  | 1 channel                        |
| Audio Output | 1 channel                        |
| RS-485       | 1 channel                        |

## Power

|                   |                                                                                        |
|-------------------|----------------------------------------------------------------------------------------|
| Power Supply      | 100–300V AC and power adapter provided                                                 |
| Power Consumption | <100W (normal power consumption)<br><260W (with heater on) (maximum power consumption) |

## Environment

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| Operating Temperature | -40°C to +70°C (-40°F to 158°F)                             |
| Operating Humidity    | ≤95%                                                        |
| Self-Adaptive         | Auto heating to protect the chip under the cold environment |

## Physical Characteristics

|                      |                                                                                                |
|----------------------|------------------------------------------------------------------------------------------------|
| Protection Grade     | IP66, anti-surge 6KV, anti-elctrostatic 8KV (touched by objects), anti-elctrostatic 15KV (air) |
| Dimensions           | 640mm×400mm×612mm (25.20"x15.75"x24.09")                                                       |
| Packaging Dimensions | 877mm×567mm×892mm (34.53"x22.32"x35.12")                                                       |
| Net Weight           | ≤50kg ( ≤110.23lb )                                                                            |
| Gross Weight         | ≤75kg ( ≤165.35lb )                                                                            |
| Power Adaptor        | Contained                                                                                      |
| Lens                 | Contained                                                                                      |

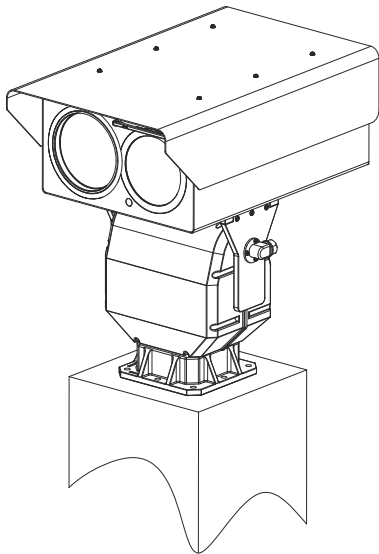
## Certification

|                |                                                 |
|----------------|-------------------------------------------------|
| Certifications | CE (EN 60950:2000); FCC (FCC Part 15 SubpartB ) |
|----------------|-------------------------------------------------|

## Ordering Information

| Type           | Part Number                     | Description                                                     |
|----------------|---------------------------------|-----------------------------------------------------------------|
| DH-TPC-PT8421B | DH-TPC-PT8421BP/N-BM100ZD310B   | Thermal: 400x300 100mm lens<br>Visible: 2MP 6.25-300mm lens     |
|                | DH-TPC-PT8421BP/N-B20100ZC510B  | Thermal: 400x300 20-100mm lens<br>Visible: 2MP 21-500mm lens    |
|                | DH-TPC-PT8421BP/N-B30150ZC710B  | Thermal: 400x300 30-150mm lens<br>Visible: 2MP 12.5-775mm lens  |
|                | DH-TPC-PT8421BP/N-B38190ZF1011B | Thermal: 400x300 38-190mm lens<br>Visible: 2MP 16.7-1000mm lens |

Installation Diagram



Dimensions (mm[inch])

