

DHI-TPC-SD2241

Thermal Network Hybrid Speed Dome Camera



- Vanadium oxide uncooled focal plane detector.
- 4Megapixel progressive scan CMOS.
- Offers various AI functions such as intrusion, target filtering, fire detection, smoking detection, and calling detection.
- Built-in white light and speaker that produce light and sound alarms to deter intruders.
- Built-in IR LED, and the max. illumination distance 35 m.
- Wide Monitoring Range: Pan: 0° to 360° endless tilt: -15° to +90°.
- Dual image fusion (visible and thermal images).
- 12 VDC±20%/PoE+ power supply.
- IP66 rated.

System Overview

With its dual lens design, Thermal Network Value Hybrid Speed Dome 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.

High Sensitivity

High thermal sensitivity (≤ 50 mK) makes these cameras capture images in fine detail, and detect subtle and large temperature changes.

Intelligent Video System (IVS)

With its built-in intelligent video analytics, the camera detects and analyzes moving objects for improved video surveillance. The camera has a wide range of intelligent detection capabilities, allowing the detection of multiple types of objects and object behaviors, such as vehicle detection. IVS also supports tripwire analytics, allowing the camera to detect when a pre-determined line has been crossed.

Fire Detection & Alarm

With its extended detection range, the camera can detect fires that are in locations distant to it. It is also highly sensitive to temperature changes, allowing the accuracy of its fire detection to be higher than cameras that work in the visible light range.

Smoking Detection

Empowered by deep learning AI technology, the camera can automatically detect and trigger alarms for people smoking, providing intelligent sound and light warnings to dissuade smokers, and avoid potential risks and loss. It multi-tasks in extracting elements from the visible light and thermal image at the same time to detect smoke and the person that is actively smoking.

Environment (-30 °C to +60 °C)

Developed to operate in extreme conditions, the camera can function in temperatures ranging from -30 °C to +60 °C (-22 °F to +140 °F). It was subjected to rigorous dust and water immersion tests, gaining its IP67 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.

Scene

It is highly suitable for parks, transit stations, factories, roads, and more.

Technical Specification

Thermal

| | | | | |
|--|--|--|--|--|
| Detector Type | Vanadium oxide uncooled focal plane detector | | | |
| Effective Pixels | 256 (H) × 192 (V) | | | |
| Pixel Pitch | 12 μm | | | |
| Spectral Range | 8 μm–14 μm | | | |
| Sensitivity (NETD) | ≤50 mK@f/1.0 | | | |
| Focal Length | 3.5 mm; 7 mm | | | |
| Field of View | 3.5 mm: H: 50.6°; V: 37.8° 7 mm: H: 24°; V: 18° | | | |
| Thermal Focus Control | Fixed-focal | | | |
| Close Focus Distance | 3.5 mm: 0.5 m (1.64 ft) 7 mm: 1 m (3.28 ft) | | | |
| Effective Distance Human (1.8 m × 0.5 m) Vehicle (4.0 m × 1.4 m) | Focal Length | Detection Distance | Recognition Distance | Identification Distance |
| | | 3.5 mm | Vehicle: 389 m (1,276.25 ft) Human: 146 m (479.00 ft) | Vehicle: 97 m (318.24 ft) Human: 38 m (124.67 ft) |
| | 7 mm | Vehicle: 778 m (2,552.49 ft) Human: 292 m (958.01 ft) | Vehicle: 194 m (636.48 ft) Human: 75 m (246.06 ft) | Vehicle: 97 m (318.24 ft) Human: 38 m (124.67 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 | 16 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 | 1/2.7" CMOS |
| Max. Resolution | 2336 (H) × 1752 (V) |
| Pixel | 4 MP |
| Horizontal Definition | ≥1600 TVL |
| Min. Illumination | Color: 0.05 lux B/W: 0.005 lux 0 lux (IR on) |
| Visible AGC | Auto/Manual |
| Visible Noise Reduction | 2D NR/3D NR |

| | |
|----------------------------|---|
| S/N Ratio | ≥55 dB |
| White Balance | Auto; indoor; outdoor; tracking; manual; natural; street lamp |
| Defog | Electronic defog |
| Electronic Shutter Speed | 1 s–1/30,000 s (auto/manual) |
| BLC | Yes |
| WDR | DWDR |
| HLC | Yes |
| Day/Night | Auto (ICR); Color; B/W |
| Iris Control | Fixed |
| Image Flip | 180° |
| Exposure Compensation | Yes |
| Visible Focus Control | Fixed-focal |
| Focal Length | 4 mm; 8 mm |
| Field of View | 4 mm: H: 71.2°; V: 52° 8 mm: H: 33.4°; V: 25° |
| Close Focus Distance | 4 mm: 1 m (3.28 ft) 8 mm: 2.5 m (8.20 ft) |
| Aperture | 4 mm: F1.6 8 mm: F2.0 |
| Illuminator On/Off Control | Auto/Manual |
| Illumination Distance | 4 mm: ≥35 m (114.83 ft) 8 mm: ≥50 m (164.04 ft) |

Audio and Video

| | |
|-----------------------|---|
| Video Compression | H.265; H.264; H.264H; H.264B; MJPEG |
| Resolution | Thermal: Main stream: 1.3M (1280 × 960); XVGA (1024 × 768); VGA (640 × 480/256 × 192); 1280 × 960 (default) Sub stream: VGA (640 × 480/256 × 192); 256 × 192 (default) Visible: Main stream: 2336 × 1752; 1080p (1920 × 1080); 720p (1280 × 720); D1 (704 × 576); 2336 × 1752 (default) Sub stream: 720p (1280 × 720); D1 (704 × 576); CIF (352 × 288); 352 × 288 (default) |
| Video Frame Rate | Thermal: Main stream: 1 fps–25 fps, 25 fps by default Sub stream: 1 fps–25 fps, 15 fps by default Visible: Main stream: 1 fps–25 fps, 25 fps by default Sub stream: 1 fps–25 fps, 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: –15° to +90° |
| Manual Control Speed | Pan: 0.1°/s –200°/s Tilt: 0.1°/s –120°/s |
| Preset Speed | Pan: 240°/s Tilt: 200°/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 | Activate Preset/Scan/Tour/Pattern/Pan |

Function

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|--------------------------|---|
| Two-way Audio | Yes |
| Sound and Light Alarm | Yes |
| Network Protocol | HTTPS; HTTP; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPOE; IPv4/v6; SNMP; QoS; UPnP; NTP |
| Region of Interest (RoI) | Yes |
| Storage | Micro SD card |
| Micro SD Card (Max.) | 256 GB |
| Interoperability | ONVIF; CGI; Dahua SDK |
| Browser | IE: IE 9 and later (Edge is not supported) Chrome: 42 and earlier Firefox: 42 and earlier |
| User/Host | Up to 10 (total bandwidth: 100 MB) |
| Security | Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access |
| User Management | Up to 10 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 |
| Fusion Mode | Warm color; cold color; fuse with iron oxide red |
| PIP | Yes (Intelligence automatically turns off when PIP is on) |

Intelligence

| | |
|----------------------------|---------------------------------------|
| Fire Detection | Yes |
| Cold/Hot Spot Trace | Yes |
| IVS (Perimeter Protection) | Yes. Supports tripwire and intrusion. |
| Target Distinction | Human/Vehicle Classification |
| Smoking Detection | Yes |
| Call Detection | Yes |

Port

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

Power

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|-------------------|--|
| Power Supply | 12 VDC, 2 A ± 20%, PoE+ (802.3at) |
| Power Consumption | Basic: <12 W (12 VDC) Max: <24 W (12 VDC, adapter excluded) |
| ePoE | Yes |

Environment

| | |
|-----------------------|--------------------------------------|
| Operating Temperature | -30 °C to +60 °C (-22 °F to +140 °F) |
| Operating Humidity | ≤95% |
| Storage Temperature | -40 °C to +70 °C (-40 °F to +158 °F) |

Physical Characteristics

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|-------------|---|
| Protection | IP66 |
| Reliability | Surge protection: 6 kV Air discharge of 15 kV Contact discharge of 8 kV |

Structure

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|----------------------|---|
| Product Dimensions | 295 mm × Φ160 mm (11.61" × Φ6.30") |
| Packaging Dimensions | 267 mm × 267 mm × 437 mm (10.51" × 10.51" × 17.20") (W × L × H) |
| Net Weight | ≤3.2 kg (7.05 lb) |
| Gross Weight | ≤4.7 kg (10.36 lb) |

Perimeter Protection

| | | |
|---|--------------------|-------------------|
| Focal Length | 3.5 mm | 7 mm |
| Perimeter Protection Distance (Human) | 24.5 m (80.38 ft) | 49 m (160.76 ft) |
| Perimeter Protection Distance (Vehicle) | 73.5 m (241.14 ft) | 147 m (482.28 ft) |

Note:
The table displays the optimal distance obtained from 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.

Fire Detection Distance

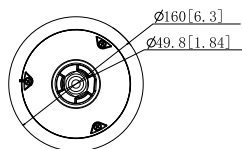
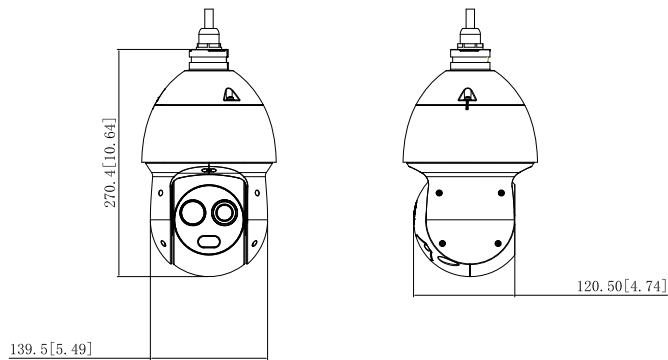
| | | |
|---------------------------------------|---|---|
| Focal Length | 3.5 mm | 7 mm |
| Fire Detection Distance (Recommended) | 14.6 m (47.90 ft), target size: 0.2 m × 0.2 m (0.67 ft × 0.67 ft) | 29.2 m (95.80 ft), target size: 0.2 m × 0.2 m (0.67 ft × 0.67 ft) |
| Fire Detection Distance (Max.) | 22 m (72.18 ft), target size: 0.2 m × 0.2 m (0.67 ft × 0.67 ft) | 40 m (131.23 ft), target size: 0.2 m × 0.2 m (0.67 ft × 0.67 ft) |

Note:
The table displays the measured distances obtained from using the target size 0.2 m × 0.2 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.

Ordering Information

| Type | Model | Description |
|------------------------|---------------------------|--|
| Thermal Camera | DHI-TPC-SD2241-B3F4-DW-S2 | Thermal: 3.5 mm; Visible: 4 mm |
| | DHI-TPC-SD2241-B7F8-DW-S2 | Thermal: 7 mm; Visible: 8 mm |
| Accessories (Optional) | PFB305W | Wall mount bracket |
| | PFB305W + PFA150 | Wall mount bracket + pole mount bracket (pole mount) |
| | PFB305W + PFA151 | Wall mount bracket + corner mount bracket (corner mount) |
| | PFA111 + PFB300C | Joint connector + hang mount bracket (hang mount) |

Dimensions (mm[inch])



Accessories

Optional:



PFB305W
Wall mount bracket



PFB305W + PFA150
Wall mount bracket + pole mount bracket (pole mount)



PFB305W + PFA151
Wall mount bracket + corner mount bracket (corner mount)



PFA111 + PFB300C
Joint connector + hang mount bracket (hang mount)

| Wall Mount | Vertical Pole Mount | Corner Mount |
|---------------|---------------------|--------------|
| | | |
| Ceiling Mount | | |
| | | |