DHI-TPC-BF2241

Thermal Network Hybrid Bullet Camera

- Vanadium oxide uncooled focal plane detector.
- 4Megapixel progressive scan CMOS.
- Offers various AI functions such as intrusion, target filtering, heat 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 with a maximum illumination distance of 35 m.
- Dual image fusion (visible and thermal images).
- 12 VDC ± 20%/PoE power supply.
- IP67 rated.

System Overview

With its dual lens design, Thermal Network Hybrid Bullet 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 (≤ 40 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.

Heat Detection & Alarm

With its extended detection range, the camera can detect heat sources that are in locations distant to it. It is also highly sensitive to temperature changes, allowing the accuracy of its heat source 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)	≤40 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)

	Focal Length	Detection Distance	Recognition Distance	Identification Distance
Effective Distance Human (1.8 m × 0.5 m) Vehicle (4.0 m × 1.4 m)	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)	Vehicle: 49 m (160.76 ft) Human: 19 m (62.34 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 (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
Thermal Image Stabilization	Electronic Image Stabilization (EIS)
Digital Zoom	16 levels
Thermal AGC	Auto/Manual
Thermal Noise Reduction	2D NR/3D NR
Image Flip	90°; 180°; 270°
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	90°; 180°; 270°
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

Function

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

Heat 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

Network Port	1 × RJ-45 (10/100 Base-T)
Alarm Input	1
Alarm Output	1
Audio Input	1
Audio Output	1
RS-485	1

Power

Power Supply	12 VDC, 1 A ± 20%, PoE (802.3af)
Power Consumption	Basic: <5.0 W (12 VDC) Max: <12 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

Protection	IP67
Reliability	Surge protection: 6 kV Air discharge of 15 kV Contact discharge of 8 kV

Structure

Product Dimensions	279.9 mm × 103.8 mm × 95.8 mm (10.31" × 0.46" × 4.35") (L × W × H)

Packaging Dimensions	365 mm × 175 mm × 176 mm (14.37" × 6.89" × 6.92") (L × W × H)
Net Weight	≤1.4 kg (3.09 lb)
Gross Weight	≤1.9 kg (4.19 lb)

IVS Range

Focal Length	3.5 mm	7 mm
Human (1.8 m × 0.5 m)	24.5 m	49 m
Vehicle (1.4 m × 4.0 m)	72.5 m	146.5 m

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.

Heat Detection Distance

Focal Length	3.5 mm	7 mm
Recommended Distance	14.6 m	29.2 m
Max. Distance	22 m	40 m

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

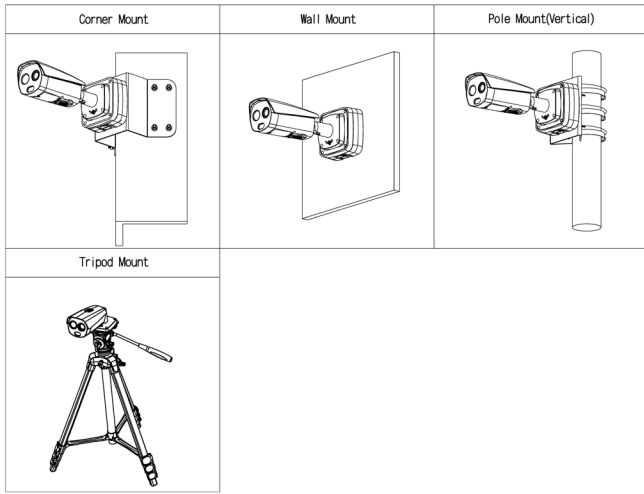| Type	Model	Description
Thermal Camera	DHI-TPC-BF2241-B3F4-DW-S2	Thermal: 3.5 mm; Visible: 4 mm
	DHI-TPC-BF2241-B7F8-DW-S2	Thermal: 7 mm; Visible: 8 mm
Accessories (Optional)	PFA121	Water-proof Junction Box (wall mount)
	PFA121+PFA150	Water-proof Junction Box + Pole Mount Bracket (pole mount)
	PFA121+PFA151	Water-proof Junction Box + Corner Mount Bracket (corner mount)

Accessories

Optional:

PFA121
Water-proof Junction Box (wall mount)

PFA121+PFA150
Water-proof Junction Box + Pole Mount Bracket (pole mount)

PFA121+PFA151
Water-proof Junction Box + Corner Mount Bracket (corner mount)

Corner Mount	Wall Mount	Pole Mount(Vertical)

Tripod Mount

Dimensions (mm[inch])

103.8 [4.09]

98.7 [3.8]

98.8 [3.89]

266.5 [10.49]

281.3 [11.4]

70.0 [2.76]

70.0 [2.76]

4-Φ4.5 [Φ0.18]