Hybrid Thermal Network Bullet Camera

400 x 300 Thermal Sensor and a 2 MP CMOS Sensor

Thermal Camera

- 400 x 300 VOx Uncooled Thermal Sensor Technology
- Athermalized Lens, Focus-free
- 13 mm Fixed Thermal Lens
- ≤ 40 mK Thermal Sensitivity

Visible-light Camera

- 1/2.8-in. 2 MP Progressive-scan CMOS Sensor
- 8 mm Fixed Lens
- Maximum IR Distance 35 m (114 ft)

System Features

- Active Alarm
- Support ROI, Motion Detection, and Color Palettes
- Enhanced Power and Data Transmission Distances (ePoE)
- IP67 Ingress Protection

System Overview

The Hybrid Thermal Network camera combines an uncooled VOx 400 x 300 thermal imager with a 2 MP visible-light sensor for cost-effective, long-range surveillance in a rugged all-in-one package. The thermal imager coupled with an athermalized, focus-free lens produces crisp images in total darkness and sees through rain, fog, and snow. The visible imager with an IR illuminator delivers superior video in any lighting condition.

Functions

Uncooled Vanadium Oxide (VOx) Technology

Dahua thermal cameras use an uncooled Vanadium Oxide (VOx) sensor that delivers higher thermal sensitivity in a more compact and cost-effective package. Vanadium Oxide cameras are also more reliable, as compared to other thermal imaging technologies, due to less moving parts.

Athermalized Lens

The athermalized lens used in Dahua thermal cameras maintains the focus position passively and without power over a wide temperature range.

High Thermal Sensitivity

The VOx detector offers high thermal sensitivity (≤ 50 mK) that allows Dahua thermal cameras to distinguish objects in a scene with minimal temperature differences. The camera captures detailed images where thermal contrast between object and background is minimal.

Active Alarm

The camera is equipped with a white-light illuminator and an external speaker that can be triggered when the camera detects an abnormal event either via the thermal or the visible-light sensor. The camera also takes a snapshot of the scene and can record the snapshot.

Enhanced Power over Ethernet (ePoE) Technology

Dahua's innovative ePoE technology offers a plug-and-play solution to transmit power and data over long distances via Ethernet or coaxial cables, reducing installation time and saving money. ePoE technology is a viable, cost-effective solution for extending transmission distances and for converting existing, coax-based analog systems into IP systems. For video security and surveillance installers, ePoE technology saves time and money by reducing overall cabling requirements, allowing for existing coax cable to be used, and minimizing the number of peripheral devices needed. For new installations, ePoE offers the ability to design long-distance applications without the need for additional repeaters.

Thermal Color Palettes

Dahua thermal cameras provide a choice of color palettes onboard the camera that help to distinguish thermal variations and patterns in an image. The color tones correspond to the apparent surface temperatures of the target.

Interoperability

The camera conforms to the ONVIF (Open Network Video Interface Forum) specification, ensuring interoperability between network video products regardless of manufacturer.

Environmental

With a temperature range of 10° C to +35° C (50° F to +95° F), the camera is suitable for many internal applications. Subjected to rigorous dust and water immersion tests and certified to the IP67 Ingress Protection rating makes it suitable for applications were water and dust are present.

Protection

The camera allows for ±20% input voltage tolerance, 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

DH-TPC-BF5421-T Thermal Hybrid Camera

Thermal Camera

Image Sensor	Uncooled VOx Focal Plane Detector
Effective Pixels	400 (H) x 300 (V)
Pixel Size	17 μm
Thermal Sensitivity (NETD)	≤40 mK
Spectral Range	8 μm to 14 μm
Image Settings	Electronic Thermal Image Stabilization Digital Detail Enhancement
Color Palettes	18, including: Whitehot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia

Thermal Lens

Lens Type	Fixed-focal
Focus Control	Athermalized, Focus-free
Aperture	F1.0
Focal Length	13 mm
Angle of View	Horizontal: 30.0° Vertical: 22.60°

Visible-light Camera

Image Sensor	1/2.8-in. CMOS
Effective Pixels	1920 (H) x 1080 (V)
Electronic Shutter Speed	1/1 s to 1/30,000 s
Minimum Illumination	Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 0 lux with IR On
IR Distance	35.0 m (114.83 ft)
IR On/Off Control	Auto, Manual
IR LEDs	One (1)

Visible-light Lens

Focal Length	8 mm
Maximum Aperture	F1.9
Angle of View	Horizontal: 40° Vertical: 22°

Temperature Measurement

Range	30° C to 45° C (86° F to 113° F)
Accuracy	±0.3° C, with blackbody ±1° C, without blackbody
Mode	Spot, Line, Area
Rule	Supports 12 Rules Simultaneously: • Spot: 12 • Line: 12 • Area: 12

Video

Compression		H.265, H.264, H.264H, H.264B, MJPEG
Frame Rate	Main Stream	
	Thermal	1280 x 1024, 1024 x 768, 640 x 480, 256 x 192 at 30 fps, 1280 x 960 (default)
	Visible	1920 x 1080, 1280 x 720, 704 x 480 at 30 fps
	Sub Stream	
	Thermal	640 x 480, 256 x 192 at 30 fps
	Visible	704 x 480, 352 x 240 at 30 fps
Bit Rate Control		CBR, VBR
Bit Rate		H.264: 640 Kbps to 8192 Kbps
Day/Night		Auto (ICR), Color, B/W
BLC Mode		BLC, HLC, WDR
White Balance		Auto, Manual
Motion Detection		Off, On (4 zones, Rectangle)
Noise Reduction		2D, 3D
Advanced Features		Electronic Thermal Image Stabilization Digital Detail Enhancement
Region of Interest		Off, On
Defog		On, Off
Flip		90°, 180°
Mirror		Off, On
Privacy Masking		Off, On (4 areas, Rectangle)

Network

Ethernet	RJ-45 (10/100 Base-T)
Protocol	IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, ICMP, DHCP, PPPoE, ONVIF
Interoperability	ONVIF, CGI, Dahua SDK
Edge Storage	FTP MicroSD Card slot (up to 256 GB)
Maximum User Access	20 Users (64 Mbps total bandwidth)
User Management	Supports 20 users atone time and users are classified as one of tow groups: administrator or user
Security	Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access
Web Viewer	IE 8 or later, Explorer with IE Core Google: 42 and the earlier Firefox: 42 and the earlier Safari: 10 and the earlier

Certifications

Safety	UL 60950-1 CAN/CSA C22.2 No. 60950-1-07 EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
Electromagnetic Compatibility (EMC)	FCC CFR 47 Part 15 Subpart B EN 55032:2015 EN 61000 3 2:2014

Interface

Audio	Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack
Audio Compression	G.711a, G.711Mu, AAC, PCM
RS485	One (1) Port
Alarm	Input: Two (2) Channels Output: Two (2) Channels
Alarm Linkage	SD Card Recording, On,off Output, Siren and Light, Email, PTZ, snapshot
Malfunction Detection	Motion Detection, Privacy Mask, Audio Detection, SD Card Abnormality, Network Abnormality, anti-burn warning

Electrical

Power Supply	12 VDC ±20% or PoE (IEEE802.3af Class 0)
Power Consumption	Basic: <8 W Maximum: <18 W

Environmental

Operating Temperature	10° C to +30° C (50° F to 86° F), Less than 95% RH
Storage Temperature	10° C to +35° C (50° F to 95° F), Less than 95% RH
Ingress Protection	IP67
Static Discharge Protection	Physical Contact: 8 KV Via Air: 15 KV
Self-Adaptive	Toggles heater on or off, depending on ambient temperature

Construction

Casing	Metal
Dimensions, camera	280.90 mm x 103.80 mm x 96.70 mm (11.06 in. x 4.09 in. x 3.81 in.)
Dimensions, packaging	365.0 mm x 175.0 mm x 176.0 mm (14.37 in. x 6.89 .in x 6.93 in.)
Net Weight	1.40 kg (3.09 lb)
Gross Weight	≤ 1.90 kg (4.19 lb)

ePoE Transmission Distances

Via CAT5E/CAT6 Ethernet Cable

ePoE supply voltage 48 V
Maximum DC resistance < 10 Ω/100 m

Cable Length, m (ft)	Bandwidth, Mbps	PoE Load Capacity, W	Hi-PoE Load Capacity, W	Working Mode
100 (328)	100	25.5	53	IEEE/E100
200 (656)	100	25.5	33	E100
300 (984)	100	19	19	E100
400 (1312)	10	17	17	E10
500 (1640)	10	13	13	E10
800 (2625)	10	7	7	E10

Via CAT5E/CAT6 Ethernet Cable

ePoE supply voltage 53 V
Maximum DC resistance < 10 Ω/100 m

Cable Length, m (ft)	Bandwidth, Mbps	PoE Load Capacity, W	Hi-PoE Load Capacity, W	Working Mode
100 (328)	100	25.5	53	IEEE/E100
200 (656)	100	25.5	47	E100
300 (984)	100	25.5	32	E100
400 (1312)	10	23	26	E10
500 (1640)	10	20	20	E10
800 (2625)	10	13	13	E10

Via RG-59 Coaxial Cable

ePoE supply voltage 48 V
Maximum DC resistance < 5 Ω/100 m

Cable Length, m (ft)	Bandwidth, Mbps	PoE Load Capacity, W	Hi-PoE Load Capacity, W	Working Mode
100 (328)	100	25.5	50	IEEE/E100
200 (656)	100	25.5	30	E100
300 (984)	100	18	18	E100
400 (1312)	100	15	15	E100
500 (1640)	10	12	12	E10
800 (2625)	10	6	6	E10
1000 (3281)	10	5	5	E10

Via RG-59 Coaxial Cable

ePoE supply voltage 53 V
Maximum DC resistance < 5 Ω/100 m

Cable Length, m (ft)	Bandwidth, Mbps	PoE Load Capacity, W	Hi-PoE Load Capacity, W	Working Mode
100 (328)	100	25.5	52	IEEE/E100
200 (656)	100	25.5	48	E100
300 (984)	100	25.5	30	E100
400 (1312)	100	20	23	E100
500 (1640)	10	16	16	E10
800 (2625)	10	10	10	E10
1000 (3281)	10	8	8	E10

Ordering Information

Type	Part Number	Description
Hybrid Network Camera	DH-TPC-BF5421-T	Hybrid Network Bullet Camera, Thermal: 400 x 300, 13 mm lens, Visible-light: 2 MP, 8 mm lens
Mounting Accessories, optional	DH-PFB120C	Ceiling Mount Bracket
	PFA121	Junction Box
	DH-PFB129W	Wall/Ceiling Mount Bracket
	PFA151	Corner Mount
	PFA152-E	Pole Mount
	DH-PFM320D-US	12 VDC, 2 A Power Adapter
	DH-PFM321D-US	12 VDC, 1 A Power Adapter

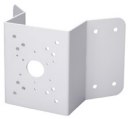
Accessories

Optional:

DH-PFB120C
Ceiling Mount
Bracket

PFA121
Junction Box

DH-PFB129W
Wall/Ceiling Mount
Bracket



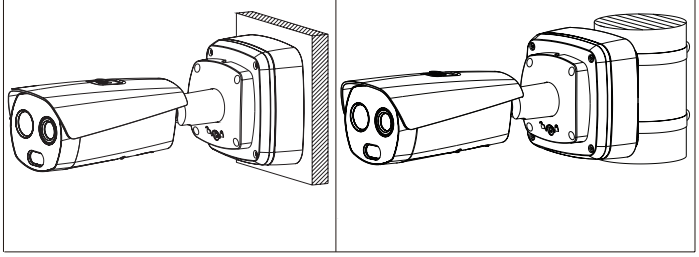
PFA151
Corner Mount

PFA152-E
Pole Mount

DH-PFM320D-US
12 VDC, 2 A
Power Adapter

DH-PFM321D-US
12 VDC, 1 A
Power Adapter

Junction Mount	Pole Mount
PFA121	PFA121 + PFA152-E



Dimensions (mm/in.)