Thermal Network Bullet Camera

400 x 300 VOx Uncooled Thermal Sensor Technology

- 400 x 300 VOx Uncooled Thermal Sensor Technology
- Athermalized Lens, Focus-free
- H.265 Video Compression
- 7.5 mm, 13 mm, or 25 mm Fixed Thermal Lens Options
- < 40 mK Thermal Sensitivity
- Intelligent Video System with Fire Detection and Alarm Functionality
- Enhanced Power and Data Transmission Distances (ePoE)
- Two (2) Alarm Inputs, Two (2) Alarm Outputs
- Support for PoE and Micro SD Memory Storage
- Designed for Extreme Temperature Environments
- IP67 Ingress Protection
- Five-year Warranty*

System Overview

The Dahua Thermal Network Bullet camera combines an uncooled VOx Microbolometer sensor with an athermalized lens to produce long-range thermal images. The camera produces clear images in total darkness, and delivers usable images in fog, rain, and snow, offering truly covert surveillance without the need for external light. The camera offers a Fire Detection and Alarm feature that identifies an abnormal rise in temperature and sends an alert to warn of a potential fire. Dahua thermal cameras are ideal for forestry, border security, and industrial applications.

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 (< 40 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.

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.

Fire Detection and Alarm

With built-in fire detection functionality, the camera can detect a rapid rise in temperature over a short time and issue an alarm for a potential fire event even at long distances. 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.

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.

Intelligent Video System (IVS)

IVS is a built-in video analytic algorithm that delivers intelligent functions to monitor a scene for Tripwire violations, intrusion detection, and human/vehicle classification. A camera with IVS quickly and accurately responds to monitoring events in a specific area.

Cybersecurity

Dahua network cameras are equipped with a series of key cybersecurity technologies including: security authentication and authorization, access control, trusted protection, encrypted transmission, and encrypted storage. These technologies improve the camera's ability to prevent malicious access and to protect data.

Environmental

With a temperature range of –40 °C to +60 °C (–40 °F to +140 °F), the camera is designed for extreme temperature environments. The camera complies with the IP67 rating makes it suitable for demanding outdoor applications. Its 6KV lightning rating provides protection against the camera and its structure from the effects of lightning.

*Warranty applies to products sold through an authorized Dahua Dealer.

Technical Specification

Thermal Camera

Image Sensor	Uncooled VOx Microbolometer
Effective Pixels	400 (H) x 300 (V)
Pixel Size	17 μm
Thermal Sensitivity (NETD)	40 mK
Spectral Range	8 μm to 14 μm
Image Setting	Brightness, Sharpness, ROI, AGC, FFC, 3D DNR
Color Palettes	18, including: Whitehot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia

Thermal Lens

Lens Type	Fixed, F1.0		
Focus Control	Athermalized, Focus-free		
Focal Length	7.5 mm	13 mm	25 mm
Angle of View	H: 53.7° V: 39.7°	H: 30.2° V: 22.6°	H: 15.5° V: 11.6°

DORI Distance[1]

		7.5 mm	13 mm	25 mm
Effective Distance, human (1.80 m x 0.50 m)[1]	Detection	221 m (725 ft)	382 m (1253 ft)	735 m (2411 ft)
	Recognition	57 m (187 ft)	98 m (322 ft)	189 m (620 ft)
	Identification	28 m (92 ft)	49 m (161 ft)	95 m (312 ft)
Effective Distance, vehicle (4.0 m x 1.40 m)[1]	Detection	490 m (1608 ft)	850 m (2789 ft)	1634 m (5361 ft)
	Recognition	126 m (413 ft)	219 m (719 ft)	420 m (1378 ft)
	Identification	63 m (207 ft)	109 m (358 ft)	210 m (689 ft)

Video

Compression	H.265, H.264, MJPEG
Frame Rate	Main Stream: 1280 x 1024, 1280 x 960, 720p, or 400 x 300 at 30 fps
	Sub Stream: 640 x 512, 640 x 480,or 400 x 300 at 30 fps
Bit Rate Control	CBR, VBR
Bit Rate	H.264: 640 Kbps to 8192 Kbps H.265: 19 Kbps to 7423 Kbps
Motion Detection	Off, On (4 zones, Rectangle)
Region of Interest	Off, On (4 zones)
Digital Zoom	4x
Flip	90°, 180°, 270°
Mirror	Off, On
Privacy Masking	Off, On (4 areas, Rectangle)

Audio

Compression	G.711a, G.711Mu, PCM

Network

Ethernet	RJ-45 (10/100/1000 Base-T)
Protocol	IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP,IGMP, SMTP, SNMP, DNS, DDNS, NTP, RTSP, RTP, FTP, DHCP, PPPoE, IP Filter, QoS, Bonjour, 802.1x
Interoperability	ONVIF Profile S & G, API
Streaming Method	Unicast, Multicast
Maximum User Access	10 Users, 20 Users
Edge Storage	Network Attached Storage (NAS) Local PC for Instant Recording Micro SD Card Slot, maximum 256 GB Memory Status Display: Normal, Error, Active, Formatting, Lock
Web Viewer	IE 11, Chrome, Firefox, Safari
Management Software	SmartPSS, DSS
Mobile Operating System	Android, IOS
Cybersecurity	Video Encryption, Firmware Encryption, Configuration Encryption, Digest, WSSE, Account Lockout, Security Logs, IP/MAC Filtering, Generating and Importing X.509 Certification, Syslog, HTTPS, 802.1x, Trusted Boot, Trusted Execution, Trusted Upgrade

Certifications

Safety	UL 60950-1 CAN/CSA C22.2 No. 60950-1-07 EN 60950:2000
Electromagnetic Compatibility (EMC)	FCC CFR 47 Part 15 Subpart B

Interface

Video	One (1) Port BNC (CVBS) use for camera installation
Audio	Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack
RS485	One (1) Port
Alarm	Input: Two (2) Channels Output: Two (2) Channels

Electrical

Power Supply	12 VDC, 1 A or PoE
Power Consumption	Maximum 13 W

Environmental

Operating Conditions	–40° C to +70° C (–40° F to +158° F) Less than 95% RH Initiate start up above –40° C (–40° F)
Storage Conditions	–40° C to +70° C (–40° F to +158° F) Less than 95% RH
Ingress Protection	IP67

Construction

Casing	Metal
Dimensions	291.0 mm x 103.80 mm x 97.20 mm (11.46 in. x 4.09 in. x 3.83 in.)
Net Weight	1.50 kg (3.31 lb)
Gross Weight	1.90 kg (4.19 lb)

1. The DORI distance is a measure of the general proximity for a specific classification to help pinpoint the right camera for your needs. The DORI distance is calculated based on sensor specifications and lab test results according to EN 62676-4 , the standard that defines the criteria for the Detect, Observe, Recognize and Identify classifications. The Detection, Recognition, and Identification values shown are nominal values and should be used as estimates only. Exact value calculations depend on a wide variety of conditions.

Intelligence

IVS triggers an alarm and takes a defined action for the following events:

Standard Features	• Tampering with the camera. • Camera loses or changes focus drastically. • Error writing to an onboard Micro SD card. • Error sending or receiving data over the network. • Unauthorized access to the camera.
Premium Features	
Tripwire	A target crosses a user-defined line.
Intrusion	A target enters or exits a defined perimeter.
Advanced Features	
Fire Detection	Detects a rapid rise in temperature over a short time and issues an alarm for a potential fire.
Cold/Hot Spot Trace	Indicates the coldest and the hottest spot of the scene.
Human/Vehicle Classification	Detects human or vehicle violations using Tripwire or Intrusion detection methods.

Effective IVS Distances – Themal Lens

	7.5 mm	13 mm	25 mm
Human (1.80 m x 0.50 m)	83.0 m (273.31 ft)	143.0 m (469.16 ft)	275.0 m (902.23 ft)
Vehicle (4.0 m x 1.40 m)	231.0 m (757.87 ft)	400.0 m (1312.34 ft)	771.0 m (2529.53 ft)

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

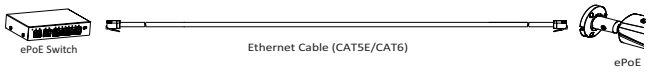
Via RG-59 Coaxial Cable

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

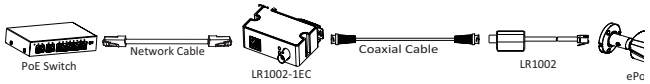
ePoE Applications

Pure Ethernet



Passive EoC

EoC with Single-port EoC Receiver



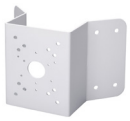
Ordering Information

Type	Part Number	Description
Thermal Network Camera	DH-TPC-BF5401N-B7	Thermal Network Bullet Camera, 400 x 300, 7.5 mm lens, IVS
	DH-TPC-BF5401N-B13	Thermal Network Bullet Camera, 400 x 300, 13 mm lens, IVS
	DH-TPC-BF5401N-B25	Thermal Network Bullet Camera, 400 x 300, 25 mm lens, IVS
Mounting Accessories, optional	PFA121	Junction Box
	PFA151	Corner Mount
	PFA152-E	Pole Mount
	DH-PFM321D-US	12 VDC, 1 A Power Adapter
ePoE Accessories, optional	LR1002	EoC Passive Converter
	LR1002-1EC	Single-port EoC Receiver

Accessories

Optional:

PFA121
Junction Box



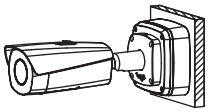
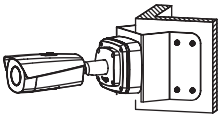
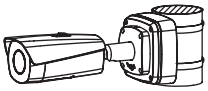
PFA151
Corner Mount

PFA152-E
Pole Mount

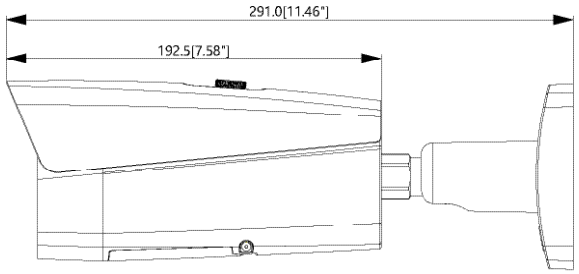
DH-PFM321D-US
12 VDC, 1 A
Power Adapter

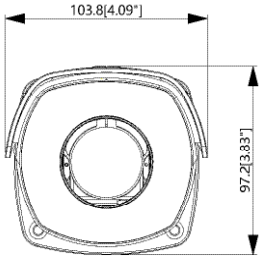
LR1002
EoC Passive Converter

LR1002-1EC
Single-port EoC Receiver

Wall Mount	Corner Mount	Pole Mount
PFA121	PFA121+PFA151	PFA121+PFA152-E
		

Dimensions(mm/in.)





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