Hybrid Thermal Network Eyeball Camera

256 x 192 Thermal Sensor and a 4 MP CMOS Sensor

Thermal Camera
- 256 x 192 VOx Uncooled Thermal Sensor Technology
- Athermalized Lens, Focus-free
- 2 mm or 7 mm Fixed Thermal Lens Options
- ≤ 50 mK Thermal Sensitivity

Visible-light Camera
- 1/2.7-in. 4 MP Progressive-scan CMOS Sensor
- 2 mm or 8 mm Fixed Lens Options
- Maximum IR Distance 30 m (98.43 ft)

System Features
- Intelligent Video System with Excessive Temperature Detection
- Smart Alarm with Voice Prompt and White Light for Active Alarm
- IP67 Ingress Protection
- Five-year Warranty*

WizSense Series devices combine Dahua's powerful Analytics+ with an intuitive and easy to use interface. WizSense devices offer analytic functions that focus on human and vehicular images and offer specialized thermal analytics to detect rapid temperature changes and smoking. WizSense Series devices provide powerful general surveillance for small to medium size businesses at a sensible price.

System Overview

The Entry-level Visible-Thermal Crossover (EVX) camera combines an uncooled VOx 256 x 192 thermal imager with a 4 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. The built-in Excessive Temperature Detection and Smoking Detection issues an audible and visual alert. Hybrid thermal cameras let you see the visible and the invisible.

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.

Excessive Temperature Detection and Alarm
With built-in temperature functionality, the camera can detect a rapid rise in temperature over a short time and issue an alarm even at long distances. Because thermal cameras are sensitive to temperature, they provide higher detection accuracy than standard cameras, making them particularly fit for applications such as forests, warehouse complexes, and industrial areas.

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 abandoned or missing objects. A camera with IVS quickly and accurately responds to monitoring events in a specific area.

Smart 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.

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 −30 °C to +60 °C (−22 °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.

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

Thermal Camera

Image Sensor	Uncooled VOx Focal Plane Detector
Effective Pixels	256 (H) x 192 (V)
Pixel Size	12 μm
Thermal Sensitivity (NETD)	< 50 mK (f/1.0, 25 Hz, 300 K)
Spectral Range	8 μm to 14 μm
Image Setting	Brightness, Sharpness, ROI, AGC, FFC, 3D DNR
Color Palettes	18, including: White Hot, Black Hot, Ice Heat, Fusion, Rainbow, Globow, Ironbow1, and Sepia

Thermal Lens

Lens Type	Fixed, DDE	
Aperture	F1.0	
Focus Control	Athermalized, Focus-free	
Focal Length	**2 mm**	**7 mm**
Angle of View	H: 87.8° V: 63.8°	H: 24.0° V: 18.0°
Close Focus Distance	0.30 m (0.98 ft)	1.0 m (3.28 ft)

DORI Distance[1]

		2 mm	**7 mm**
Effective Distance, human (1.80 m x 0.50 m)[1]	Detection	83 m (272 ft)	292 m (958 ft)
	Recognition	21 m (69 ft)	75 m (246 ft)
	Identification	11 m (36 ft)	38 m (125 ft)
Effective Distance, vehicle (4.0 m x 1.40 m)[1]	Detection	222 m (728 ft)	778 m (2552 ft)
	Recognition	55 m (180 ft)	194 m (636 ft)
	Identification	27 m (89 ft)	97 m (318 ft)

Visible-light Camera

Image Sensor	1/2.7-in. CMOS
Effective Pixels	2336 (H) x 1752 (V), 4 MP
Electronic Shutter Speed	1/1 s to 1/30,000 s
Minimum Illumination	Color: 0.05 lux at F2.0 B/W: 0.005 lux at F2.0 0 lux with IR On
S/N Ratio	> 55 dB
IR Distance	30.0 m (98.43 ft)
IR On/Off Control	Auto, Manual
IR LEDs	One (1)

Visible-light Lens

Focal Length	**2 mm**	**8 mm**
Maximum Aperture	F2.2	F2.0
Angle of View	Horizontal: 94.0° Vertical: 72.0° Diagonal: 116.0°	Horizontal: 33.4° Vertical: 25.0° Diagonal: 41.9°
Close Focus Distance	0.30 m (0.98 ft)	2.50 m (8.20 ft)
Focus Control	Fixed	

Video

Compression	H.265, H.264, H.264H, MJPEG	
Frame Rate	Main Stream	
	Thermal	1280 x 960, 1024 x 768, 640 x 480, or 256 x 192 at 30 fps
	Visible	2336 x 1752, 1080p, 720p, or D1 at 30 fps
	Sub Stream	
	Thermal	640 x 480, 256 x 192 at 30 fps
	Visible	720p, D1, or CIF at 30 fps
Bit Rate Control		
Bit Rate	H.265	Thermal: 14 Kbps to 3840 Kbps Visible: 14 Kbps to 8192 Kbps
	H.264	Thermal: 24 Kbps to 6144 Kbps Visible: 24 Kbps to 8192 Kbps
Day/Night	Auto (ICR), Color, B/W	
BLC Mode	BLC, HLC, Digital WDR	
White Balance	Auto, Indoor, Outdoor, Manual, ATW, Natural, Street Lamp	
Gain Control	Auto, Gain Priority, Shutter Priority, Manual	
Noise Reduction	2D, 3D	
Motion Detection	4	
Region of Interest	Off, On (4 Zones)	
Flip	0°, 90°, 180°, 270°	
Digital Zoom	16x	
Privacy Masking	4 Region	

Network

Ethernet	RJ-45 (10/100 Base-T)
Protocol	HTTPS, HTTP, TCP, ARP, RTSP, RTP, UDP, RTCP, SMTP, FTP, DHCP, DNS, DDNS, PPPOE, IPv4/v6, SNMP, QoS, UPnP, NTP
Interoperability	ONVIF, CGI
Streaming Method	Unicast / Multicast
Maximum User Access	10 Users
Edge Storage	Micro SD Card Slot, maximum 32 GB
Web Viewer	IE8 or later
Management Software	DSS Pro, DSS Express, DMSS
Mobile Operating System	IOS, Android
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

Audio

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

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.
2. 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 (73.4 °F) 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, among others.

Certifications

Safety	UL 62368-1 CAN/CSA C22.2 No. 62368-1-14
Electromagnetic Compatibility (EMC)	CFR 47 FCC Part 15 subpart B ANSI C63.4-2014

Interface

Audio	Input: One (1) Channel, RCA Jack Output: One (1) Channel, RCA Jack
RS485	One (1) Port
Alarm	Input: One (1) Channel Output: One (1) Channel

Electrical

Power Supply	12 VDC ± 20%, 1.2 A or PoE (IEEE802.3af, Class 0)
Power Consumption	Basic: < 6.5 W (IR off) Maximum: < 13 W (IR on)

Environmental

Operating Condition	−30° C to +50° C (−22° F to +122° F) Less than 95% RH
Storage Conditions	−30° C to +70° C (−22° F to +158° F)
Ingress Protection	IP67

Construction

Casing	Metal
Dimensions	Ø122.18 mm x 112.0 mm (Ø4.80 in. x 4.41 in.)
Net Weight	0.85 kg (1.98 lb)
Gross Weight	1.0 kg (2.20 lb)

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.

Thermal Analytics+

Excessive Temperature Detection	Detects a rise in temperature over a short time and issues an alarm.
Cold/Hot Spot Trace	Indicates the coldest and the hottest spot of the scene.
Smoking Detection	Detects a person smoking in the thermal image and triggers a pre-determined action (voice prompt, white light) to alert the person of the smoking policy.
Human/Vehicle Classification	Detects human or vehicle violations using Tripwire or Intrusion detection methods.

Effective IVS Distances – Thermal Lens

	2 mm	7 mm
Human (1.80 m x 0.50 m)	15.0 m (49.21 ft)	52.50 m (172.24 ft)
Vehicle (4.0 m x 1.40 m)	42.0 m (137.80 ft)	146.50 m (480.64 ft)

Rapid Temperature Rise Detection Distance[2]

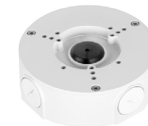|	2 mm	7 mm
Target Size: 0.2 m x 0.2 m, Recommended Distance	8.30 m (27.23 ft)	29.2 m (95.80 ft)
Target Size: 0.2 m x 0.2 m, Maximum Distance	12.0 m (39.73 ft)	40.0 m (131.23 ft)

Ordering Information

Type	Part Number	Description
Hybrid Network Camera	DHI-TPC-DF1241-B2F2-S2	Hybrid Network Eyeball Camera, Thermal: 256 x 192, 2 mm lens, Visible-light: 4MP, 2 mm lens
	DHI-TPC-DF1241-B7F8-S2	Hybrid Network Eyeball Camera, Thermal: 256 x 192, 7 mm lens, Visible-light: 4MP, 8 mm lens
Mounting Accessories, optional	PFA106	Mount Adapter
	PFA130-E	Junction Box
	PFA152-E	Pole Mount (use with PFB203W wall mount)
	PFB203W	Wall Mount
	PFB220C	Ceiling Mount (use with PFA106 mount adapter)
	DH-PFM320D-US	12 VDC, 2 A Power Adapter

Accessories

Optional :

PFA106 Mount Adapter
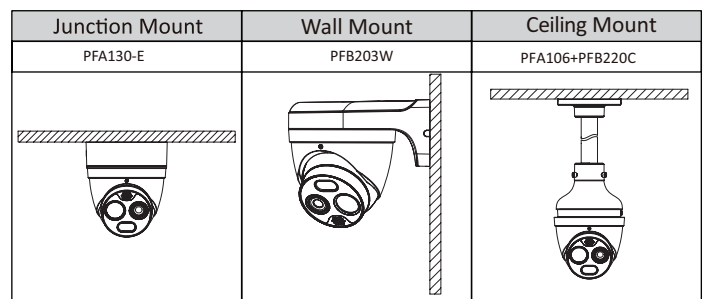
PFA130-E Junction Box

PFA152-E Pole Mount

PFB203W Wall Mount

PFB220C Ceiling Mount

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

Junction Mount	Wall Mount	Ceiling Mount
PFA130-E	PFB203W	PFA106+PFB220C

Dimensions (mm/in.)

112.0 mm (4.41 in.)
Ø122.18 mm (Ø4.80 in.)
Ø4.50 mm (Ø0.18 in.)
Ø84.0 mm (Ø3.31 in.)