

# Hybrid Thermal Network Eyeball Camera

256 x 192 Thermal Sensor and a 4MP CMOS Sensor



## Wiz Sense

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 security 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 4MP visible-light sensor for cost-effective, long-range security 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.

#### High Thermal Sensitivity

The VOx detector offers high thermal sensitivity ( $\leq 50$  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.

#### Remote Temperature Measurement

The thermal camera provides remote temperature measurement and monitoring to send an alert when a temperature exceeds a set threshold. The camera can monitor temperatures at spot, along a line, or within a defined area. Temperature measurement is ideal for use in power or chemical plants where overheating could lead to a dangerous environment.

#### Thermal Camera

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

#### Visible-light Camera

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

#### System Features

- Remote Temperature Measurement<sup>1</sup>
- Intelligent Video System with Excessive Temperature Detection
- Smart Alarm with Voice Prompt and White Light for Active Alarm
- IP67 Ingress Protection
- Five-year Warranty\*

#### 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  $\pm 20\%$  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<sup>2</sup>

		2 mm	7 mm
Effective Distance, human (1.80 m x 0.50 m) <sup>1</sup>	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) <sup>1</sup>	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)

#### Temperature Measurement

Temp. Range	Low Gain	-20° C to 150° C (-4° F to 302° F)
	High Gain	0° C to 550° C (32° F to 1022° F)
Accuracy <sup>3</sup>	Low Gain	±2° C
	High Gain	±2%
Mode	Spot, Line, Area	
Rules	Camera supports 12 rules for each mode, with any 12 modes active at one time	
Measurement Range	2 mm	Minimum: 0.50 m (1.64 ft) Maximum: 2.50 m (8.20 ft)
	7 mm	Minimum: 3.0 m (9.84 ft) Maximum: 8.0 m (26.25 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 B/W: 0.005 lux 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	1.3 MP (1280 x 960, default), XVGA ( 1024 x 768 ), VGA ( 640 x 480 ), 256 x 192 at 30 fps
	Visible	2336 x 1752 (default), 1080P (1920 x 1080 ), 720P (1280 x 720 ), D1 ( 704 x 576 ) at 30 fps
	Sub Stream	
Frame Rate	Thermal	VGA ( 640 x 480 ), 256 x 192 (default) at 30 fps
	Visible	720P ( 1280 x 720 ), D1 ( 704 x 576 ), CIF ( 352 x 288, default)
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, Tracking, 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	One (1) RJ-45 (10/100 Mbps) Port
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
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
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2. 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.

3. To ensure optimal accuracy for temperature measurement, ensure the camera operates in an ambient temperature between -30° C to +50° C (-22° F to +122° F).

**Certifications**

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

**Interface**

<b>Audio</b>	Input: One (1) Channel, RCA Jack Output: One (1) Channel, RCA Jack
<b>RS485</b>	One (1) Port
<b>Alarm</b>	Input: One (1) Channel Output: One (1) Channel

**Electrical**

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

**Environmental**

<b>Operating Condition</b>	-30° C to +60° C (-22° F to +140° F) Less than 95% RH
<b>Storage Conditions</b>	-30° C to +70° C (-22° F to +158° F)
<b>Ingress Protection</b>	IP67

**Construction**

<b>Casing</b>	Metal
<b>Dimensions</b>	Ø122.18 mm x 112.0 mm (Ø4.80 in. x 4.41 in.)
<b>Net Weight</b>	0.85 kg (1.87 lb)
<b>Gross Weight</b>	1.0 kg (2.20 lb)

**Intelligence**

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

<b>Standard Features</b>	<ul style="list-style-type: none"> <li>• Tampering with the camera.</li> <li>• Camera loses or changes focus drastically.</li> <li>• Error writing to an onboard Micro SD card.</li> <li>• Error sending or receiving data over the network.</li> <li>• Unauthorized access to the camera.</li> </ul>
<b>Premium Features</b>	
<b>Tripwire</b>	A target crosses a user-defined line.
<b>Intrusion</b>	A target enters or exits a defined perimeter.

**Thermal Analytics+**

<b>Excessive Temperature Detection</b>	Detects a rise in temperature over a short time and issues an alarm.
<b>Cold/Hot Spot Trace</b>	Indicates the coldest and the hottest spot of the scene.
<b>Smoking Detection</b>	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.
<b>Human/Vehicle Classification</b>	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<sup>4</sup>**

	2 mm	7 mm
Target Size: 0.2 m x 0.2 m, Recommended Distance	8.30 m (27.23 ft)	29.20 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**

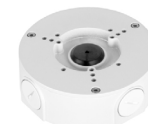
Type	Part Number	Description
Hybrid Network Camera	DHI-TPC-DF1241-TB2F2-S2	Hybrid Network Eyeball Camera, Thermal: 256 x 192, 2 mm lens, Visible-light: 4MP, 2 mm lens
	DHI-TPC-DF1241-TB7F8-S2	Hybrid Network Eyeball Camera, Thermal: 256 x 192, 7 mm lens, Visible-light: 4MP, 8 mm lens
Mounting Accessories, 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



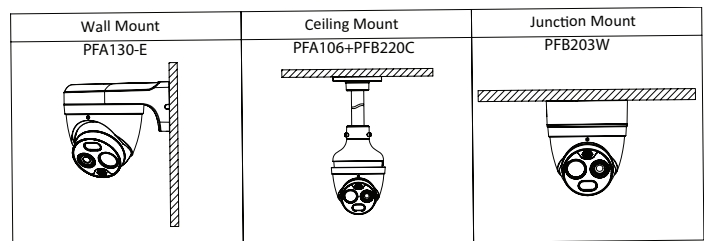
PFB203W  
Wall Mount



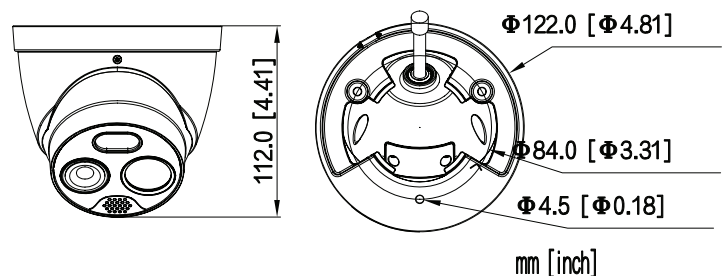
PFB220C  
Ceiling Mount



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



**Dimensions (mm/in.)**



4. 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.