# 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, 3.5 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, 4 mm, or 8 mm Fixed Lens Options
- Maximum IR Distance 30 m (98.43 ft)

System Features

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


WizSense

WizSense Series devices combine Dahua's powerful Analytics+ with an intuitive and easy to use interface. WizSense devices offer Perimeter Protection functions that focus on human and vehicular images and ignore irrelevant images to capture important video while reducing false alarms. WizSense Series devices provide powerful general surveillance for small to medium size businesses at a sensible price.

## System Overview

The Hybrid Thermal Network 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 Fire Detection and Smoking Detection features identifies a potential issue and 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.

### 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.

### 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.

### 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.



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

## 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:<br>Whitehot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia |

### Thermal Lens

| | | | | |
|---|---|---|---|---|
| Lens Type | | Fixed, DDE | | |
| Aperture | | F1.0 | | |
| Focus Control | | Athermalized, Focus-free | | |
| Focal Length | | 2 mm | 3.5 mm | 7 mm |
| Angle of View | | H: 87.8°<br>V: 63.8° | H: 50.6°<br>V: 37.8° | H: 24.0°<br>V: 18.0° |
| Close Focus Distance | | 0.50 m (1.64 ft) | 0.50 m (1.64 ft) | 1.0 m (3.28 ft) |
| Effective Distance, human (1.80 m x 0.50 m)[1] | Detection | 83 m (272 ft) | 146 m (479 ft) | 292 m (958 ft) |
| | Recognition | 21 m (69 ft) | 38 m (125 ft) | 75 m (246 ft) |
| | Identification | 11 m (36 ft) | 19 m (62 ft) | 38 m (125 ft) |
| Effective Distance, vehicle (4.0 m x 1.40 m)[1] | Detection | 222 m (728 ft) | 389 m (1276 ft) | 778 m (2552 ft) |
| | Recognition | 55 m (80 ft) | 97 m (318 ft) | 194 m (636 ft) |
| | Identification | 27 m (89 ft) | 49 m (161 ft) | 97 m (318 ft) |

### Rapid Temperature Rise Detection Distance

| | 2 mm | 3.5 mm | 7 mm |
|---|---|---|---|
| Target Size: 0.2 m x 0.2 m, Recommended Distance | 8.80 m (28.87 ft) | 13.20m (43.31 ft) | 30.70 m (100.72 ft) |
| Target Size: 0.2 m x 0.2 m, Maximum Distance | 17.50 m (57.41 ft) | 26.30 m (86.29 ft) | 61.40 m (201.44 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<br>B/W: 0.005 lux at F2.0<br>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

| | 2 mm | 4 mm | 8 mm |
|---|---|---|---|
| Focal Length | 2 mm | 4 mm | 8 mm |
| Maximum Aperture | F2.2 | F1.6 | F2.0 |
| Angle of View | Horizontal: 94.0°<br>Vertical: 72.0°<br>Diagonal: 116.0° | Horizontal: 71.2°<br>Vertical: 52.0°<br>Diagonal: 92.6° | Horizontal: 33.4°<br>Vertical: 25.0°<br>Diagonal: 41.9° |
| Close Focus Distance | 0.30 m (0.98 ft) | 1.0 m (3.28 ft) | 2.50 m (8.20 ft) |
| Focus Control | Fixed | | |

### Video

| | | |
|---|---|---|
| Compression | | H.265, H.264, H.264H, H.264B, 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 | | CBR/VBR |
| Bit Rate | H.265 | Thermal: 14 Kbps to 3840 Kbps<br>Visible: 14 Kbps to 8192 Kbps |
| | H.264 | Thermal: 24 Kbps to 6144 Kbps<br>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 | | Off, On (4 Zones, rectangular) |
| Region of Interest | | Off, On (4 Zones) |
| Flip | | 90°, 180°, 270° |
| Digital Zoom | | 16x |
| Privacy Masking | | Off, On (4 Areas, rectangular) |

### 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 |
| Streaming Method | Unicast, Multicast |
| Maximum User Access | 10 Users |
| Edge Storage | Micro SD Card Slot, maximum 128 GB |
| Web Viewer | IE 8 and later |
| Management Software | DSS Pro, DSS Express |
| Mobile Operating System | IOS, Android |

### Audio

| | |
|---|---|
| Compression | G.711a, G.711Mu, AAC, PCM |

1. 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.

## Certifications

| | |
|---|---|
| Safety | UL 62368-1<br>CAN/CSA C22.2 No. 62368-1-14 |
| Electromagnetic Compatibility (EMC) | CFR 47 FCC Part 15 Subpart B<br>ANSI C63.4-2014<br>EN 55032:2015, EN 61000-3-2:2014 |

## Interface

| | |
|---|---|
| Audio | Input: One (1) Channel, RCA Jack<br>Output: One (1) Channel, RCA Jack |
| RS485 | One (1) Port |
| Alarm | Input: One (1) Channel<br>Output: One (1) Channel |

## Electrical

| | |
|---|---|
| Power Supply | 12 VDC ± 20% or PoE |
| Power Consumption | Basic: < 6.5 W (IR off)<br>Maximum: < 13 W (IR on) |

## Environmental

| | |
|---|---|
| Operating Condition | –30° C to +60° C (–22° F to +140° F)<br>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<br>(ø4.80 in. x 4.41 in.) |
| Net Weight | 0.90 kg (1.98 lb) |

## Intelligence

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

| | |
|---|---|
| Standard Features | • Tampering with the camera.<br>• Camera loses or changes focus drastically.<br>• Error writing to an onboard Micro SD card.<br>• Error sending or receiving data over the network.<br>• Unauthorized access to the camera. |
| Premium Features | |
| Abandoned/Missing Object | A target leaves an object in designated area, or a target removes an object from the same designated area. |

## Thermal Analytics+

| | |
|---|---|
| Fire Detection | Detects a 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. |
| 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. |

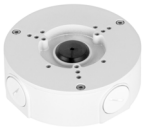
## Ordering Information

| Type | Part Number | Description |
|---|---|---|
| Hybrid Network Camera | DH-TPC-DF1241N-D2F2 | Hybrid Network Dome Camera, Thermal: 256 x 192,2 mm lens, Visible-light: 4 MP, 2 mm lens |
| | DH-TPC-DF1241N-D3F4 | Hybrid Network Dome Camera, Thermal: 256 x 192, 3.5 mm lens, Visible-light: 4 MP, 4 mm lens |
| | DH-TPC-DF1241N-D7F8 | Hybrid Network Dome Camera, Thermal: 256 x 192, 7 mm lens, Visible-light: 4 MP, 8 mm lens |
| Mounting Accessories, optional | PFA106 | Mount Adapter |
| | PFA130-E | Junction Box |
| | PFA152-E | Pole Mount<br>(use with PFB203W wall mount) |
| | PFB203W | Wall Mount |
| | PFB220C | Ceiling Mount<br>(use with PFA106 mount adapter) |
| | DH-PFM320D-US | 12 VDC, 2 A Power Adapter |

## Accessories

Optional:

PFA106
Mount Adapter



PFA130-E
Junction Box

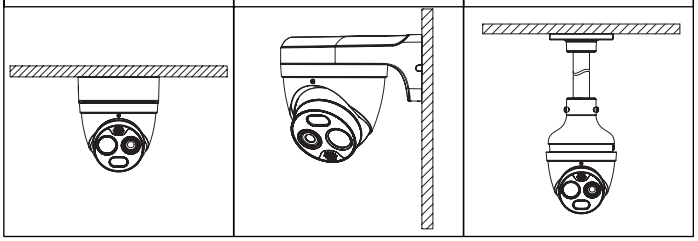
PFA152-E
Pole Mount

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.)