DHI-TPC-DF1241

Thermal Network Mini Hybrid Eyeball Camera

- Uncooled VOx thermal sensor technology
- Athermalized lens (thermal camera), focus-free
- 1/2.7'' 4Megapixel progressive scan CMOS
- Support ROI, motion detection, color palettes
- Smoking and call behaviour detection
- Support heat detection and alarm
- Built-in 1/1 alarm in/out
- Micro SD memory, IP67, PoE
- Smart linkage with strobe light and audio
- Dual image fusion (visible and thermal images)

Launched by Dahua Technology, Eureka Series is a series of AI products and solutions that adopts independent AI chip and deep learning algorithm. It focuses on human and vehicle with high accuracy, enabling users to fast act on defined targets. Based on Dahua's advanced technologies, Eureka Series provides intelligent, simple and inclusive products and solutions.

System Overview

Featuring dual lens, fixed camera, this series provides an all-in-one solution for capturing video surveillance for indoor and outdoor applications. Together with Thermal and Visible Technology, the camera is the perfect solution for dark, small area monitoring applications. The series combines one thermal camera for monitoring in total darkness and one visible camera with Smart IR for confirming details.

Functions

Uncooled VOx Technology

Dahua thermal cameras use uncooled VOx sensor technology. The detector is small-sized, and highly sensitive allowing the camera to reveal images in greater detail, giving you more visual information on a monitored site. It also improves the accuracy of temperature measurements, ensuring that even minute temperature changes are detected.

High Sensitivity

High thermal sensitivity (< 40 mK) makes these cameras capture images in fine detail, and detect subtle and large temperature changes.

Heat Detection & Alarm

With its extended detection range, the camera can detect heat sources that are in locations distant to it. It is also highly sensitive to temperature changes, allowing the accuracy of its heat source detection to be higher than cameras that work in the visible light range.

Intelligent Video System (IVS)

With its built-in intelligent video analytics, the camera detects and analyzes moving objects for improved video surveillance. The camera has a wide range of intelligent detection capabilities, allowing the detection of multiple types of objects and object behaviors, such as vehicle detection. IVS also supports tripwire analytics, allowing the camera to detect when a pre-determined line has been crossed.

Smoking Detection

Empowered by deep learning AI technology, the camera can automatically detect and trigger alarms for people smoking, providing intelligent sound and light warnings to dissuade smokers, and avoid potential risks and loss. It multi-tasks in extracting elements from the visible light and thermal image at the same time to detect smoke and the person that is actively smoking.

Environmental

Developed to operate in extreme conditions, the camera can function in temperatures ranging from −30 °C to +50 °C (−22 °F to +122 °F). It was subjected to rigorous dust and water immersion tests, gaining its IP66 certification, making it suitable for demanding outdoor applications. For environments with rain, sleet, snow and fog, an integrated wiper (optional) provides users with clear visibility at all times.

Protection

The camera supports ± 20% voltage input, making it suitable for even the most unstable conditions. It has 6 kV lightning certification, providing strong protection for both the camera and its structure against lightning, making it ideal for outdoor applications.

Technical Specification

Thermal

Detector Type	Vanadium Oxide Uncooled FPA		
Max. Resolution	256 × 192		
Pixel Pitch	12 μm		
Spectral Range	8 μm–14 μm		
Thermal Sensitivity (NETD)	< 40 mK (@f/1.0, 25 Hz, 300 K)		
Focal Length	2 mm	3.5 mm	7 mm
Field of View	H: 87.8°, V: 63.8°	H: 50.6°, V: 37.8°	H: 24°, V: 18°
Close Focus Distance	0.3 m (0.98 ft)	0.5 m (1.64 ft)	1.0 m (3.28 ft)
Effective Distance① Human (1.8 m × 0.5 m)	D②: 83 m (272 ft) R③: 21 m (69 ft) I④: 11 m (36 ft)	D: 146 m (479 ft) R: 38 m (125 ft) I: 19 m (622 ft)	D: 292 m (958 ft) R: 75 m (246 ft) I: 38 m (125 ft)
Effective Distance Vehicle (4.0 m × 1.4 m)	D: 222 m (728 ft) R: 55 m (80 ft) I: 27 m (89 ft)	D: 389 m (1,276 ft) R: 97 m (318 ft) I: 49 m (161 ft)	D: 778 m (2,552 ft) R: 194 m (636 ft) I: 97 m (318 ft)

Note:
① Effective Distance: The optimal values calculated according to Johnson's Criteria. They are for reference only. The actual performance depends on environmental conditions.
② D (Detection Distance): Detects objects, but cannot recognize their characteristics. Detected objects only cover a small amount of pixels (objects must cover more than 3.6 pixels of the image).
③ R (Recognition Distance): Classifies objects into general categories, such as human, vehicle, and building (the object must cover more than 14 pixels of the image).
④ I (Identification Distance): Classifies objects into specific categories based on their characteristics, such as soldier, pickup truck, and gas station (the object must cover more than 28 pixels of the image).

Aperture	F1.0
Digital Detail Enhancement (DDE)	Yes
Digital Zoom	16 levels
AGC	Auto; Manual
Noise Reduction	2D NR; 3D NR
Image Flip	90°; 180°; 270°
Color Palettes	18 (Whitehot; Blackhot; Ironrow; Icefire; Fusion; Rainbow; Globow; Iconbow1; Iconbow2, etc.)
Fusion Mode	3 (Warm color; Cool color; Ironred)

Visible

Image Sensor	1/2.7'' CMOS		
Max. Resolution	2336 × 1752		
Pixel	4 MP		
Electronic Shutter Speed	1/30,000 s–1 s		
Min. Illumination	Color: 0.05 lux Black & white: 0.005 lux 0 lux (IR on)		
IR Illumination Distance	≥ 30 m (98.43 ft)		
IR Illuminator On/Off Control	Auto; Manual		
Focal Length	2 mm	4 mm	8 mm
Aperture	F2.2	F1.6	F2.0
Field of View	H: 94° V: 72°	H: 71.2° V: 52°	H: 33.4° V: 25°
Focus Control	Fixed		
Close Focus Distance	0.3 m (0.98 ft)	1.0 m (3.28 ft)	2.5 m (8.2 ft)
Day/Night	Auto (ICR); Color; B/W		
BLC	Yes		
WDR	DWDR		
HLC	Yes		
White Balance	Auto; Manual; Indoor; Outdoor; Tracking; Street lamp; Natural		
AGC	Auto; Manual		
Noise Reduction	2D NR; 3D NR		
S/N Ratio	≥ 55 dB		
Region of Interest (RoI)	Yes		
Image Flip	90°; 180°; 270°		
Exposure Compensation	Yes		

Intelligence

General Intelligence	Tripwire; Intrusion
Advanced Intelligence	Heat Detection & Alarm Cold & Hot Spot Trace Human & Vehicle Classification Smoking Detection Call Detection

Video and Audio

Video Compression	H.265; H.264M; H.264H; H.264B; MJEPG
Resolution	Thermal: Main Stream: 1280 × 960 (1.3M); XVGA (1024 × 768); VGA (640 × 480); 256 × 192; 1280 × 960 (by default) Sub Stream: VGA (640 × 480); 256 × 192; 256 × 192 (by default) Visual: Main Stream: 2336 × 1752; 1080p (1920 × 1080); 720p (1280 × 720); D1 (704 × 576); 2336 × 1752 (by default) Sub Stream: 720p (1280 × 720); D1 (704 × 576); CIF (352 × 288); 352 × 288 (by default)
Frame Rate	Thermal 50 Hz: (main stream) 1 fps–25 fps adjustable, 25 fps by default; (sub stream) 1 fps–25 fps adjustable, 15 fps by default 60 Hz: (main stream) 1 fps–30 fps adjustable, 30 fps by default; (sub stream) 1 fps–30 fps adjustable, 15 fps by default Visual 50 Hz: (main stream) 1 fps–25 fps adjustable, 25 fps by default; (sub stream) 1 fps–25 fps adjustable, 15 fps by default 60 Hz: (main stream) 1 fps–30 fps adjustable, 30 fps by default; (sub stream) 1 fps–30 fps adjustable, 15 fps by default
Audio Compression	G.711a; G.711mu; PCM

Network

Protocol	HTTPS; HTTP; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPOE; IPv4/v6; SNMP; QoS; UPnP; NTP

Edge Storage	Micro SD card (256 G)
Interoperability	ONVIF; CGI
Browser	IE: IE 8 and later Google: 42 and earlier Firefox: 42 and earlier
User/Host	10
Security	Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access

Port

Network	One 10/100 M Ethernet port (RJ-45)
Audio Input	1
Audio Output	1
Alarm Input	1
Alarm Output	1
RS-485	1 pair

Power

Power Supply	12 VDC, 1.2 A (± 20%) PoE
Power Consumption	Basic: < 6.5 W (LED off) Max: < 13 W (LED on, heater on)

Environment

Operating Temperature	−30 °C to +50 °C (−22 °F to +122 °F)
Storage Temperature	−30 °C to +70 °C (−22 °F to +158 °F)
Operating Humidity	≤ 95%
Protection	P67; anti-surge 6 kV; anti-elctrostatic 6 kV (touched by objects); anti-elctrostatic 8 kV (air)

Structure

Product Dimensions	122 mm × 122 mm × 112 mm (4.8" × 4.8" × 4.41")
Packaging Dimensions	155 mm × 155 mm × 135 mm (6.10" × 6.10" × 5.31")
Net Weight	≤ 0.85 kg (1.87 lb)
Gross Weight	≤ 1 kg (2.20 lb)

Ordering Information

Type	Part Number	Description
Thermal Camera	DHI-TPC-DF1241-B2F2-DW-S2	Thermal: 256 × 192 2 mm lens Visible: 4 MP 2 mm lens
	DHI-TPC-DF1241-B3F4-DW-S2	Thermal: 256 × 192 3.5 mm lens Visible: 4 MP 4 mm lens
	DHI-TPC-DF1241-B7F8-DW-S2	Thermal: 256 × 192 7 mm lens Visible: 4 MP 8 mm lens
Accessories (Optional)	PFB203W	Wall-mount bracket
	PFA106	Ceiling-mount adapter plate
	PFB220C	Ceiling-mount bracket
	PFA130-E	Junction box
	PFM320D	Power adapter

IVS Range

Focal Length	2 mm	3.5 mm	7 mm
Human (1.8 m × 0.5 m)	14 m	24.5 m	49 m
Vehicle (1.4 m × 4.0 m)	42 m	72.5 m	146.5 m

Note:
The table displays the optimal distance obtained from testing in an environment where the temperature is 23 °C 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, and more.

Heat Detection Distance

Focal Length	2 mm	3.5 mm	7 mm
Recommended Distance	8.3 m	14.6 m	29.2 m
Max. Distance	12 m	22 m	40 m

Note:
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 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, and more.

Accessories

Optional:

PFB203W
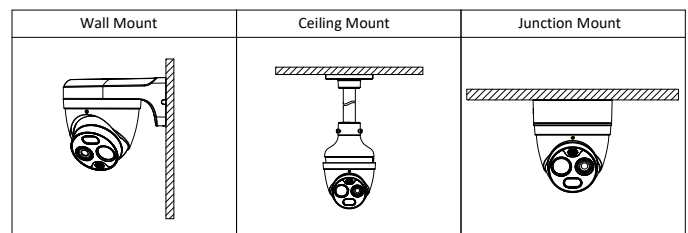Wall-mount bracket

PFA106
Ceiling-mount adapter plate

PFB220C
Ceiling-mount bracket

PFA130-E
Junction box

PFM320D
Power adapter

Wall Mount	Ceiling Mount	Junction Mount

Dimensions (mm [inch])

112 [4.41"]

Ø122.0 [Ø4.8"]
Ø84.0 [Ø3.31"]
3-Ø4.5 [Ø0.18"]