

Human Body Temperature Measurement

Complete Solution to Detect and Monitor Human Body Temperature



Required Components

- DH-TPC-BF3221-T Thermal Hybrid Network Camera
- JQ-D70Z Blackbody
- DHI-NVR5216-16P-I 16-channel NVR with Face Recognition

Recommended Accessories

- VCT-999 Tripod (x2)
- RQW026-00 Connector (x2)

Solution Features

- Safe, Effective, and Accurate Temperature Measurement
- ±0.3° C Temperature Measurement (with blackbody)
- · Contactless and Fast Multi-person Screening
- Recommended for Use in Commercial Buildings, Healthcare
 Facilities, Airports, Metro Stations, and Public Gathering Locations

Solution Overview

The Dahua Human Body Temperature Monitoring solution offers the latest hybrid thermal network camera that combines a Vanadium Oxide (VOx) sensor with a 2 MP visible-light sensor. The solution also provides a blackbody calibration device that maintains a constant temperature as a reference point for the thermal camera. The thermal camera coupled with the blackbody calibration device and a feature-rich 4 TB Network Video Recorder delivers a contactless solution for continuous, contactless, and non-invasive temperature monitoring.

Human Body Temperature Measuring technology assists in preventing the spread of viral diseases by allowing for quick, accurate detection of elevated body temperatures. Thermal imaging equipment can easily be installed and implemented to detect elevated body temperature in environments such as airports, hospitals, clinics, office buildings, cruise ships, and any large public gathering location.

Thermal Camera 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 (≤ 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.

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.

NVR Functions

The Dahua DHI-NVR5216-16P-I combines Analytics+ algorithms with Dahua's ePoE technology into an all-in-one network video recorder. This NVR uses a powerful multi-core processor to provide 4K resolution processing for applications where impeccable image details are required. In addition, the NVR can be employed as edge storage, central storage, or backup storage with an intuitive shortcut operation menu for remote management and control.

The Dahua Analytics+ algorithms significantly improve accuracy and reliability, as compared to standard intelligent features, to achieve precision human facial analysis. The NVR processes 24 facial images per second on up to four (4) channels of video stream face recognition and supports 20 face databases that can store up to 100,000 total face images. The Analytics+ facial recognition extracts facial metadata, including detecting a human wearing a mask. The system can identify certain facial attributes, including when a human wears a surgical-type face mask. Wearing of such a mask still allows for temperature measurement without interference.

Real-time Face Recognition

Analytics+ performs real-time facial recognition on up to four (4) streaming video channels simultaneously. The server captures and analyzes facial features to determine gender, age, expression, glasses, moustache, and mask, and then can record the faces and store the associated structured data. The server also filters incoming video to display faces that match target features.

Face Database Management

In addition to the 100,000 facial images, the NVR database also stores names, genders, birthdays, nationality, address, and ID information associated with each facial image. The NVR also offers powerful and configurable database management features that can be applied to each face recognition channel independently.

| Thermal Camera Image Sensor Uncooled VOx Microbolometer Effective Pixels 256 (H) x 192 (V) Pixel Size 12 µm Thermal Sensitivity (NETD) \$\frac{50 \text{ mt mt}}{1}\$ \text{ mt}} \$\frac{50 \text{ mt}}{1}\$ \text{ mt}} \$\frac{10 \text{ mt}}{1}\$ \text{ mt}} \$10 \text{ mt | | | | Video | | |
|---|---------------------------------------|--|--|-------------------------------|-------------|---|
| Thermal Camera Thermal Hybrid Camera Thermal Camera | Technical Specification | | | Compression | | H.265, H.264, MJPEG |
| Thermal Camera Thermal and 30 fps | DH-TPC-RF3221-T Thermal Hybrid Camera | | | | Main Stream | |
| Image Sensor | | Trybria Camera | | | Thermal | 1280 x 1024, 1024 x 768, 640 x 480, 256 x 192 at 30 fps |
| Effective Pixels 256 (H) x 192 (V) | | Lincooled VOv Microbolometer | | Frame Rate | Visible | 1920 x 1080, 1280 x 720, 704 x 480 at 30 fps |
| Pixel Size 12 µm Visible 704 x 480, 352 x 240 at 30 fps Thermal Sensitivity (NETD) \$ 50 mK at f/1.1 Spectral Range 8 µm to 14 µm Bit Rate 1.264; 540 Kbps to 8192 Kbps Image Setting 8 Brightness, Sharpness, ROI, AGC, FFC, 3D DNR Lost York Balance Auto, Manual Bit Rate 1.264; 540 Kbps to 8192 Kbps Whitehot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbowl, and Sepia 6.20 Palettes 6.20 Mirror Off, On (4 zones, Rectangle) 7.1 mm Focus Control Athermalized, Focus-free 7.1 mm Network Angle of View 4.24 Not Vertical: 18* Visible-light Camera 1.72.8 in. CMOS 1.72. | image Sensor | Oncooled VOX Microbolometer | | | Sub Stream | |
| Pikel Size | Effective Pixels | 256 (H) x 192 (V) | | | | |
| Thermal Sensitivity (NETD) Spectral Range 8 µm to 14 µm Image Setting Brightness, Sharpness, ROI, AGC, FFC, 3D DNR 18, including: White-hot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia Thermal Lens Lens Type Fixed Focus Control Athermalized, Focus-free Focal Length Angle of View Visible-light Camera Image Sensor 1/2.8-in. CMOS Effective Pixels Liectronic Shutter Speed 1/1 s to 1/30,000 s Minimum Illumination Replications Some at 1/1.1 Bit Rate H. 76.4: 640 Kbps to 8192 Kbps Auto (Monto) BLC, HLC, WDR White Balance Auto, Manual Motion Detection Off, On (4 zones, Rectangle) Off, On (4 zones) Pefog On, Off Filip 180° Mirror Off, On (4 zones) Privacy Masking NetWork Ethernet Ru-45 (10/100 Base-T) Protocol Upp i, SMP, DNS, DNS, NTP, RTSP, RTP, I Upp, i, SMP, PRNS, DNNS, NTP, RTSP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, SMP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, RTP, RTP, RTP, RTP, I Upp, i, SMP, CMP, DNPS, PRNF, RTP, RTP, RTP, RTP, RTP, RTP, RTP, RTP | Pixel Size | 12 μm | | | Visible | |
| Spectral Range | Thermal Sensitivity (NETD) | < 50 mK at f/1.1 | | | | |
| Image Setting Brightness, Sharpness, ROI, AGC, FFC, 3D DNR 18, Including: Whitehot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia Thermal Lens Lens Type Fixed Focus Control Athermalized, Focus-free Focal Length 7.1 mm Angle of View Motion Detection Off, On (4 zones, Rectangle) Focal Sepia On, off Filip 180° Mirror Off, On Privacy Masking Off, On (4 areas, Rectangle) Protocol Off, On (4 areas, Rectangle) NetWork Ethernet RJ-45 (10/100 Base-T) Protocol UPP, SMMP, ONS, DDMS, NTP, RTSP, RTP, 1 UPP, ISMMP, ONS, DDMS, NTP, RTSP, RTP, 1 UPP, | | | | | | |
| Image Setting 18, including: Whitebot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia Thermal Lens Lens Type Fixed Focus Control Athermalized, Focus-free Focal Length Angle of View Minimum Illumination IR Distance IR On/Off Control Region Off, Dayson Auto, Manual White Balance Auto, Manual Motion Detection Off, On (4 zones, Rectangle) Motion Detection Off, On (4 zones) Motion Detection Off, On (4 zones) Motion Detection Off, On (4 zones) Mirror Off, On (6 zones) Mirror Privacy Masking Off, On (4 areas, Rectangle) Motion Detection Off, On (4 zones) Mirror Off, On (4 zones) Mirror Privacy Masking Off, On (4 areas, Rectangle) Motion Detection Off, On (4 zones) Mirror Off, On (4 zones) Mirror Privacy Masking Off, On (4 areas, Rectangle) Network Ethernet R1-45 (10/100 Base-T) Protocol Pro | Spectral Range | 8 μm to 14 μm | | | | |
| 18, including: Whitehot, Blackhot, Icefire, Fusion, Rainbow, Globow, Ironbow1, and Sepia Motion Detection Region of Interest Off, On (4 zones, Rectangle) Region of Interest Off, On (4 zones) | Image Setting | Brightness, Sharpness, ROI, AGC, FFC, 3D DNR | | | | |
| Globow, Ironbow1, and Sepia Region of Interest Defog On, Off On, Off Defog On, Off Filip 180° Filip 180° Mirror Off, On Privacy Masking Off, On (4 areas, Rectangle) Network Angle of View Horizontal: 24° Vertical: 18° Visible-light Camera Image Sensor 1/2.8-in. CMOS Effective Pixels 1920 (H) x 1080 (V) Electronic Shutter Speed 1/1 s to 1/30,000 s Minimum Illumination Color: 0.002 lux at F1.9 Olux with IR On IR Distance 35.0 m (114.83 ft) Region of Interest Defog On, Off Mirror Off, On Privacy Masking Off, On (4 areas, Rectangle) Network Ethernet RJ-45 (10/100 Base-T) Protocol PPA/PPOE, HTTP, HTTPS, 802.1x, Oos, FTP, S UDP, IGMP, DNK.P, DNS, DNS, NTP, RTSP, RTP, T UDP, IGMP, ICMP, DNC, PPPOE, ONVIF Streaming Method Unicast, Multicast Maximum User Access 20 Users Certifications IR Distance 35.0 m (114.83 ft) Safety En 60950:2000 Electromagnetic Compatibility ECC CFR 47 Part 15 Subpart B Interface Focal Length Maximum Aperture F1.9 Audio Audio Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Audio Compression Audio Gorpical Compatibility G7.11a, G.711Mu, AAC, PCM | | 18, including: | | | | |
| Thermal Lens Defog On, Off On (4 zones) Defog On, Off On On, Off On On, Off On Off, | Color Palettes | | | | | |
| Fixed Fixed Fixed Fixed Fixed Fixed Mirror Off, On | T | , | | _ | st | |
| Focus Control Athermalized, Focus-free Focal Length 7.1 mm Network Angle of View Horizontal: 24* Vertical: 18* Visible-light Camera Image Sensor I/2.8-in. CMOS Effective Pixels Electronic Shutter Speed I/1 s to 1/30,000 s Minimum Illumination IR Distance IR On/Off Control IR On/Off Control Auto, Manual IR LEDs One (1) Visible-light Lens Mirror Off, On Privacy Masking Off, On (4 areas, Rectangle) Network Ethernet RJ-45 (10/100 Base-T) Network Ethernet RJ-45 (10/100 Base-T) IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, S UPpP, SMMP, DMS, DMS, DMS, DMS, DDNS, NTP, RTSP, RTP, T UPP, ISMMP, DMS, DMS, DNS, DDNS, NTP, RTSP, RTP, T UPPPOE, ONVIF ONVIF Profile S & G, API Streaming Method Unicast, Multicast Unicast, Multicast Maximum User Access 20 Users Certifications Safety EN 60950:2000 FCC CFR 47 Part 15 Subpart B Interface Focal Length B mm Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Audio Output: One (1) Channel, 3.5 mm Jack Audio Compression G.711a, G.711Mu, AAC, PCM | Thermal Lens | | | _ | | |
| Focul Control Athermalized, Focus-free Focal Length 7.1 mm Network Angle of View Horizontal: 24* Vertical: 18* Visible-light Camera Image Sensor Iffective Pixels Electronic Shutter Speed Iffective Pixels Inimum Illumination IR Distance IR On/Off Control IR On/Off Control IR On/Off Control IR LEDs One (1) Visible-light Lens Privacy Masking Off, On (4 areas, Rectangle) Network Ethernet RJ-45 (10/100 Base-T) IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, S UPP, SNMP, DNS, DNS, DNS, DNS, NTP, RTSP, RTP, T UPP, IGMP, ICMP, DHCP, PPPOE, ONVIF Interoperability ONVIF Profile S. & G, API Streaming Method Unicast, Multicast Maximum User Access 20 Users Certifications Safety EN 60950:2000 Electromagnetic Compatibility IR LEDs One (1) Interface Audio Audio Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Audio Compression Angle of View Angle of View Audio Compression G.711a, G.711Mu, AAC, PCM | Lens Type | Fixed | | Flip | | |
| Focal Length 7.1 mm Network Horizontal: 24° Vertical: 18° Visible-light Camera Image Sensor Image Sensor Iffective Pixels Electronic Shutter Speed Iffective Pixels Interperability Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 B/W: 0 | Focus Control | Athermalized, Focus-free | | | | |
| Angle of View Horizontal: 24* Vertical: 18* Visible-light Camera Image Sensor Iffective Pixels Electronic Shutter Speed Iffective Pixels Color: 0.002 lux at F1.9 Olix with IR On IR Distance IR On/Off Control IR LEDs One (1) Visible-light Lens Focal Length Maximum Aperture Angle of View Horizontal: 24* Vertical: 18* Ethernet R45 (10/100 Base-T) IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, STP, RTP, TUDP, IGMP, IDMP, ID | Focal Length | 7.1 mm | | - | | Off, On (4 areas, Rectangle) |
| Angle of View Vertical: 18° Visible-light Camera Image Sensor Iffective Pixels Electronic Shutter Speed If 1/2.8-in. CMOS Electronic Shutter Speed If 1/3 to 1/30,000 s Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 Olux with IR On IR Distance IR On/Off Control Auto, Manual IR LEDs One (1) Visible-light Lens Focal Length Maximum Aperture Angle of View Vertical: 18° Protocol IPV4/IPV6, HTTP, HTTPS, 802.1x, Qos, FTP, STP, TTP, TUDP, IGMP, ICMP, DNIS, DDNS, NTP, RTSP, RTP, TUDP, IGMP, ICMP, DHICP, PPPOE, ONVIF Interoperability ONVIF Profile S & G, API Streaming Method Unicast, Multicast Unicast, Multicast Visible-light Lens Electromagnetic Compatibility (EMC) FCC CFR 47 Part 15 Subpart B Interface Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack | | | | Network | | |
| Visible-light Camera Image Sensor I/2.8-in. CMOS Effective Pixels Ip20 (H) x 1080 (V) Electronic Shutter Speed I/1 s to 1/30,000 s Minimum Illumination Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 Olux with IR On IR Distance IR On/Off Control IR LEDs One (1) Visible-light Lens Focal Length Maximum Aperture F1.9 Angle of View Protocol UPNP, SMMP, DNS, DDNS, NTP, RTSP, RTP, TUDP, IGMP, ICMP, DHCP, PPPOE, ONVIF Interoperability ONVIF Profile S & G, API Interoperability ONVIF Profile S & G, API Streaming Method Unicast, Multicast Maximum User Access 20 Users Certifications Electromagnetic Compatibility (EMC) FCC CFR 47 Part 15 Subpart B Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack | Angle of View | | | Ethernet | | RJ-45 (10/100 Base-T) |
| Effective Pixels 1920 (H) x 1080 (V) Electronic Shutter Speed 1/1 s to 1/30,000 s Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 O lux with IR On IR Distance 35.0 m (114.83 ft) IR Electronagnetic Compatibility Visible-light Lens Focal Length 8 mm Angle of View Interoperability ONVIF Profile S & G, API Streaming Method Unicast, Multicast Maximum User Access 20 Users Certifications Electromagnetic Compatibility (EMC) Interface Audio Audio Audio Compression Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack | Visible-light Camera | | | Protocol | | IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, ICMP, DHCP, PPPOE, ONVIF |
| Effective Pixels 1920 (H) x 1080 (V) Electronic Shutter Speed 1/1 s to 1/30,000 s Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 O lux with IR On IR Distance 35.0 m (114.83 ft) IR On/Off Control Auto, Manual IR LEDs One (1) Visible-light Lens Focal Length 8 mm Maximum Aperture F1.9 Angle of View Streaming Method Unicast, Multicast Maximum User Access 20 Users Certifications Safety EN 60950:2000 Electromagnetic Compatibility (EMC) FCC CFR 47 Part 15 Subpart B Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Audio Compression G.711a, G.711Mu, AAC, PCM | - | | | Interoperability | / | ONVIF Profile S & G, API |
| Electronic Shutter Speed I/1 s to 1/30,000 s Color: 0.002 lux at F1.9 B/W: 0.0002 lux at F1.9 O lux with IR On IR Distance IR On/Off Control IR LEDs One (1) Visible-light Lens Focal Length Maximum User Access 20 Users Certifications EN 60950:2000 Electromagnetic Compatibility (EMC) Interface Audio Audio Audio Audio Audio Compression Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Audio Compression Audio Compression G.711a, G.711Mu, AAC, PCM | Effective Pixels | · · · · · · · · · · · · · · · · · · · | | · | | Unicast. Multicast |
| Minimum Illumination B/W: 0.0002 lux at F1.9 O lux with IR On Certifications IR Distance 35.0 m (114.83 ft) IR On/Off Control IR LEDs One (1) Visible-light Lens Focal Length Maximum Aperture F1.9 Angle of View Certifications Certifications EN 60950:2000 Electromagnetic Compatibility (EMC) FCC CFR 47 Part 15 Subpart B Interface Audio Audio Audio Output: One (1) Channel, 3.5 mm Jack | | | | _ | | |
| IR On/Off Control IR LEDs One (1) Visible-light Lens Focal Length Maximum Aperture Angle of View Auto, Manual Electromagnetic Compatibility (EMC) FCC CFR 47 Part 15 Subpart B Interface Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack | Minimum Illumination | B/W: 0.0002 lux at F1.9 | | Certifications | | |
| IR LEDs One (1) Visible-light Lens Interface Focal Length Maximum Aperture F1.9 Angle of View FCC CFR 47 Part 15 Subpart B FCC CFR 47 Part 15 Subpart B FCC CFR 47 Part 15 Subpart B Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack | IR Distance | 35.0 m (114.83 ft) | | Safety | | EN 60950:2000 |
| Visible-light Lens Interface Focal Length Maximum Aperture F1.9 Angle of View One (1) Interface Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack | IR On/Off Control | Auto, Manual | | Electromagnetic Compatibility | | FCC CFD 47 Part 15 Culmort D |
| Focal Length 8 mm Audio Input: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Output: One (1) Channel, 3.5 mm Jack Audio Compression G.711a, G.711Mu, AAC, PCM | IR LEDs | One (1) | | (EMC) | | recern 47 Fait 13 Subpart B |
| Audio Output: One (1) Channel, 3.5 mm Jack Maximum Aperture F1.9 Angle of View Angle of View Vertical: 32° Audio Compression G.711a, G.711Mu, AAC, PCM | Visible-light Lens | | | Interface | | |
| Angle of View Angle of View Audio Compression G.711a, G.711Mu, AAC, PCM | - | | | Audio | | |
| Angle of View Horizontal: 40° Vertical: 23° | Maximum Aperture | | | Audio Compression | | G.711a, G.711Mu, AAC, PCM |
| , , | Angle of View | | | · | | |
| Temperature Measurement Alarm Input: Two (2) Channels Output: Two (2) Channels | Temperature Measurement | | | | | |
| Range 30° C to 45° C (86° F to 113° F) | Range | 30° C to 45° C (86° F to 113° F) | | | | output the (2) shames |
| Accuracy $\pm 0.3^{\circ}$ C, with blackbody $\pm 1^{\circ}$ C, without blackbody | Accuracy | · | | | | |
| Mode Spot, Line, Area | Mode Spot, Line, Area | | | | | |
| Rule Supports 12 Rules Simultaneously: Spot: 12 Line: 12 Area: 12 | | | | | | |

Technical Specification - Thermal Hybrid Camera, cont.

Electrical

| Power Supply | 12 VDC or PoE (IEEE802.3af Class 0) |
|-------------------|-------------------------------------|
| Power Consumption | Maximum 12 W |

Environmental

| Operating Temperature | 10° C to +35° C (50° F to +95° F) |
|-----------------------|---|
| Storage Conditions | 10° C to +35° C (50° F to +95° F) Less than 95% RH |
| Ingress Protection | IP67 |

Construction

| Casing | Metal |
|------------|--|
| Dimensions | 279.90 mm x 103.80 mm x 95.80 mm (11.02 in. x 4.09 in. x 3.77 in.) |
| Net Weight | 1.40 kg (3.09 lb) |

Ordering Information

| Туре | Part Number | Description |
|--------------------------------|-----------------|---|
| Hybrid Network Camera | DH-TPC-BF3221-T | Hybrid Network Bullet Camera, Thermal: 256 x 192, 7.1 mm lens, Visible-light: 2 MP, 8 mm lens |
| Mounting Accessories, optional | PFA121 | Junction Box |
| | PFA151 | Corner Mount |
| | PFA152-E | Pole Mount |
| | DH-PFM321D-US | 12 VDC, 1 A Power Adapter |

Accessories

Optional:



PFA121 Junction Box



PFA151 Corner Mount



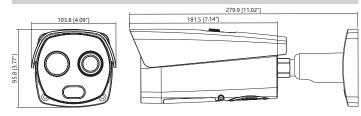
PFA152-E Pole Mount

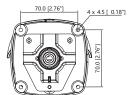


DH-PFM321D-US 12 VDC, 1 A Power Adapter

| Junction Mount | Pole Mount |
|----------------|-------------------|
| PFA121 | PFA121 + PFA152-E |
| 00 | |

Dimensions (mm/in.)





| Technical Specification | | Recording | | |
|----------------------------------|--|---|---|--|
| DHI-NVR5216-16P-I 16-channel NVR | | Compression | Smart H.265+, H.265, Smart H.264+, H.264, MJPEG | |
| System | | Supported IP Camera Resolution | 16 MP, 12 MP, 8 MP, 6 MP, 5 MP, 4 MP, 3 MP, 1080p, 1.3 MP, 720p, D1, CIF | |
| Main Processor | Multi-core Embedded Processor | Maximum Incoming Bandwidth | 320 Mbps (160 Mbps when Analytics+ functions enabled) | |
| Operating System Embedded LINUX | | Record Mode | Manual, Schedule (Continuous, Motion Detection, Alarm, IVS) | |
| Analytics+ Perimeter Pro | tection | | 1 to 120 minutes (default: 60 minutes) | |
| Performance | 16 channels10 Tripwire/Intrusion rules per channel | Record Interval | Pre-record: 1 to 30 s Post-record: 10 to 300 s | |
| Object Classification | Human or Vehicle Secondary Recognition for Tripwire and Intrusion | Video Detection and Alar | m | |
| Search | • Search by object classification (human or vehicle) | Trigger Events | Alarm Out, Video Push, Email, Recording, PTZ, Tour, Snapshot, Voice Prompt, Buzzer and Screen Tips | |
| Analytics+ Face Recognit | ion | Video Detection | Motion Detection, MD Zones: 396 (22 × 18); Video Loss, Tampering, and Scene Change | |
| | Process 24 facial images per secondUp to four (4) channels of video stream face | Alarm Inputs | Four (4) Channels | |
| Performance | recognition • 16 channel picture stream face recognition (with face detection camera) | Relay Outputs | Two (2) Channels | |
| Character Manda | Detects a face not stored in the database. | Playback and Backup | | |
| Stranger Mode | Similarity Threshold set manually. | Sync Playback | 1, 4, 9, 16 | |
| Search by Image | Up to eight (8) target face image searches simultaneously. Supports Similarity Threshold for each target face | Search Mode | Time and Date, Alarm, Motion Detection, and Exact Search (accurate to one second) | |
| Database Management | image. 20 Face Databases 100,000 total face images Stores name, gender, birthday, nationality, | Playback Function | | |
| | address, ID information for each face picture. Each database can be applied to video channels | Backup Mode | USB Device, Network | |
| Database Application | independently. | Third-party Support | | |
| Trigger Events | Buzzer, Voice Prompts, Email, Snapshot, Recording, Alarm Out, PTZ Activation | Third-party Support | Arecont Vision, Airlive, AXIS, Canon, Dynacolor, JVC, LG, Panasonic, Pelco, Xunmei, Samsung, Sanyo, | |
| Analytics+ Metadata Ext | raction | | Sony, Watchnet, plus more | |
| Face | Gender, age, wearing glasses, beard, wearing mask | Network | | |
| Vehicle | Color, model, logo, plate color, decorations, driver on phone, driver wearing seatbelt | Interface | One (1) RJ-45 Port (10/100/1000 Mbps) | |
| Human Body | Clothing style and color, wearing hat, carrying bag | PoE | 16 POE Ports (IEEE802.3af/at) | |
| Non-motor Vehicle | Type, color, number of people | ePoE and EoC | Ports 1 through 8 | |
| Search | Search video for target using metadata tags | Network Function | HTTP, HTTPS, TCP/IP, IPv4/IPv6, UPnP, SNMP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, Alarm Center, IP Search (Support Dahua IP | |
| Audio and Video | | Maximum Usar Assass | camera, DVR, NVS, etc.), P2P | |
| IP Camera Input | 16 Channels | Maximum User Access Mobile Operating Systems | 128 Users IOS, Android | |
| Audio | Input: One (1) Channel, RCA Output: (1) Channel, RCA | Interoperability | ONVIF 2.4, SDK, CGI | |
| Display | | Storage | 31111 2.1, 331, CCI | |
| Interface | One (1) HDMI Output | | Two (2) SATA III Ports, | |
| Native Output Resolution | 3840 x 2160, 1920 x 1080, 1280 x 1024, 1280 x 720 | Internal HDD | up to 8 TB capacity for each HDD | |
| (HDMI and VGA) Maximum Decoding | 1024 x 768 Four (4) Channels of 8 MP at 30 fps | Auxiliary Interface | | |
| | 16 Channels of 1080p at 30 fps | USB | One (1) USB 3.0 Port, rear One (1) USB 2.0 Port, front | |
| Multi-screen Display | 1, 4, 8, 9, 16 | RS232 | One (1) Port for PC Communication and Keyboard | |
| | | RS485 | One (1) Port for PTZ Control | |

Technical Specification - 16-channel NVR, cont. Electrical **Power Supply** Single, 100 VAC to 240 VAC, 50/60 Hz Power Consumption, NVR < 16.5 W, without HDD • 130 W Total Rated Power PoE Budget (80% control for protection) • Maximum 25.5 W for a single port Environmental –10° C to +55° C (14° F to 131° F), 86 kpa to 106 kpa **Operating Conditions** −20° C to +70° C (−4° F to 158° F), 0% to 90% RH **Storage Conditions** Construction Dimensions 1U, 375.0 mm x 327.18 mm x 53.80 mm NVR (14.76 in. x 12.88 in. x 2.12 in.) NVR with PFH101 482.60 mm x 327.18 mm x 53.80 mm (19.0 in. x 12.88 in. x 2.12 in.) Rack Mount Tray 2.70 kg (5.95 lb), without HDD Net Weight 4.00 kg (8.82 lb), without HDD Gross Weight Installation Standard 19-in. Rack-mount Certifications UL 60950-1 Safety EN60950-1 FCC CFR 47 Part 15 Subpart B **Electromagnetic Compatibility** ANSI C63.4-2014 (EMC) EN55032, EN55024, EN50130-4

ePoE/EOC Transmission Distances

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 < $10 \Omega/100 \text{ m}$

| 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 $< 5 \Omega/100 \text{ m}$

| 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 |

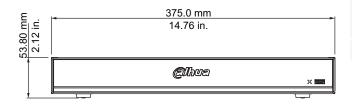
Via RG-59 Coaxial Cable

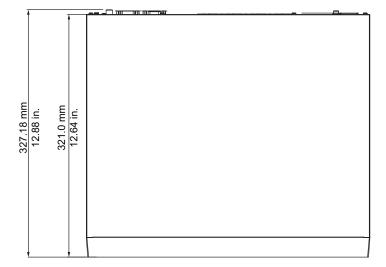
ePoE supply voltage 53 V Maximum DC resistance < 5 $\Omega/100$ m

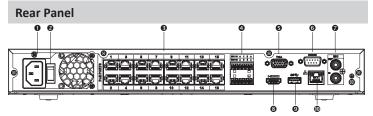
| Cable Length, m (ft) | Bandwidth, Mbps | PoE Load Capacity, W | Hi-PoE Load Capacity, W | Working Mode |
|-------------------------|--------------------|-------------------------|----------------------------|-----------------|
| 100 (328) | 100 | 25.5 | 52 | IEEE/E100 |
| 200 (656) | 100 | 25.5 | 48 | 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 |

Thermal Solution

Technical Specification - 16-channel NVR, cont. **Ordering Information** Туре Part Number Description 16-channel 1U ePoE 4K, H.265 4K NVR with DHI-NVR5216-16P-I 4TB Network Video Recorder with Analytics+ Analytics+, 4 TB Rack Mount Tray 482.60 mm x 281.20 mm x 43.7 mm (19.0 in. x 11.07 in. x 1.72 in.) Accessories, PFH101 optional LR1002 EoC Passive Converter ePoE Accessories







| 1 | Power Input | 6 | RS232 Port |
|---|---|----|---|
| 2 | Power Switch | 7 | Audio Input (x1 RCA) Audio Output (x1 RCA) |
| 3 | PoE/PoE+ Ports (x16 RJ-45) ePoE/EoC Ports: 1 through 8 | 8 | HDMI Output |
| 4 | Alarm Input (x2) Alarm Output (x2) RS485 | 9 | USB 3.0 Port |
| 5 | VGA Output | 10 | RJ-45 Ethernet Port (1000 Mbps) |

Thermal Solution

| Technical Specification | |
|---|---|
| JQ-D70Z Human Temperature Measurement Blackbody | |
| Working Temperature | Factory Settings: 35.0° C (95.0° F), 37° C (98.6° F), 40.0° C (104.0° F) Environmental Temperature: +5° C to 50° C (41° F to 122° F) |
| Effective Radiant Surface | 70 mm x 70 mm (|
| Temperature Resolution | 0.1° C |
| Temperature Accuracy | ±0.2° C (single point) |
| Temperature Stability | ±0.1° C to 0.2° C / 30 minutes |
| Effective Emissivity | 0.97 |
| Temperature Sensor | Pt100 |
| Power Supply | 110 VAC to 220 VAC |
| Power Consumption | 35 W |
| Net Weight | 1.80 kg (3.97 lb) |
| Dimensions (W x H x D) | 110.0 mm x 120.0 mm x 180.0 mm (4.33 in. x 4.72 in. x 7.09 in.) |
| Ambient Operating Conditions | 0° C to 40° C (32° F to 104° F) ≤ 80% RH |
| Accessory | Description |
| VCT-999 | Tripod Two (2) required: • One (1) for thermal camera • One (1) for blackbody |
| RQW026-00 | Connector Two (2) required: • One (1) to connect thermal camera to tripod • One (1) to connect Blackbody to tripod |

Installation Recomendations For Thermal Camera and Blackbody Lens Focal Distance Between Distance Between the Human Channel Length Camera and Blackbody Forehead and the Camera Width 3.0 m 1.30 m 3.0 m 7.0. mm (118.11 in) (118.11 in.) (51.18 in.)

Note: The accuracy of temperature measurement is best when the human forehead and blackbody are at the same distance from the camera.

