dahua
TECHNOLOGY

# DH-IPC-HDBW2449E-S-IL

## 4MP Smart Dual Light Fixed-focal Dome WizSense Network Camera

WizSense

Launched by Dahua Technology, WizSense is a series of AI products and solutions that adopt 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, WizSense provides intelligent, simple and inclusive products and solutions.

## Series Overview

With advanced deep learning algorithm, Dahua WizSense 2 Series network camera supports intelligent functions, such as perimeter protection and smart motion detection. With starlight technology, this series camera provides a better image effect in the condition of low illuminance.

## Functions

### Smart Dual Light

Dahua Smart Dual Light technology adopts smart algorithm to detect targets. Usually, the IR illuminator is on at night; when the target appears in the monitoring area, the white light is on, and the camera records the full-color video and information of key events. That is, the camera links snapshot and video with full-color image. When the target is out of the monitoring area, the white light is off and the IR illuminator is on, which reduces light pollution efficiently.

### SMD Plus

With intelligent algorithm, Dahua Smart Motion Detection technology can categorize the targets that trigger motion detection and filter the motion detection alarm triggered by non-concerned targets to realize effective and accurate alarm.

### Perimeter Protection

With deep learning algorithm, Dahua Perimeter Protection technology can recognize human and vehicle accurately. In restricted area (such as pedestrian area and vehicle area), the false alarms of intelligent detection based on target type (such as tripwire, intrusion, fast moving, parking detection, loitering detection and gathering detection) are largely reduced.

- 4-MP 1/2.9" CMOS image sensor, low luminance, and high definition image.
- Outputs max. 4 MP (2688 × 1520) @20 fps, and supports 2560 × 1440@25/30 fps.
- H.265 codec, high compression rate, ultra-low bit rate.
- Built-in IR LED and warm light , the max. IR illumination distance is 30 m and the max. warm light distance is 30 m.
- ROI, SMART H.264+/H.265+, flexible coding, applicable to various bandwidth and storage environments.
- Rotation mode, WDR, 3D NR, HLC, BLC, digital watermarking, applicable to various monitoring scenes.
- Intelligent monitoring: Intrusion, tripwire (the two functions support the classification and accurate detection of vehicle and human).
- Abnormality detection: Motion detection, video tampering, audio detection, no SD card, SD card full, SD card error, network disconnection, IP conflict, illegal access, and voltage detection.
- Supports max. 256 G Micro SD card; built in Mic.
- 12 VDC/PoE power supply, easy for installation.
- IP67, IK10 protection.
- SMD Plus.

4Mp | Smart Dual Light | SMD Plus | Perimeter Protection | Smart Codec | Full-color

### Smart H.265+ & Smart H.264+

With advanced scene-adaptive rate control algorithm, Dahua smart encoding technology realizes the higher encoding efficiency than H.265 and H.264, provides high-quality video, and reduces the cost of storage and transmission.

### Full-color

With high-performance sensor and large aperture lens, Dahua Full-color technology can display clear colorful image in the environment of ultra-low illuminance. With this photosensitivity technology, the camera can capture more available light, and display more colorful image details.

### Cyber Security

Dahua network cameras employ a series of security technologies, including security authentication and authorization, access control protocols, trusted protection, encrypted transmission and encrypted storage. These technologies improve the camera's defense against external cyber threats and prevent malicious programs from compromising the device.

### Protection (IP67, Wide Voltage)

IP67: The camera passes a series of strict test on dust and soak. It has dust-proof function, and the enclosure can work normally after soaking in 1 m deep water for 30 minutes.
Wide voltage: The camera allows ±30% (for some power supplies) input voltage tolerance (wide voltage range), and it is widely applied to outdoor environment with instable voltage.

## Technical Specification

### Camera

| | |
|---|---|
| Image Sensor | 1/2.9" CMOS |
| Max. Resolution | 2688 (H) × 1520 (V) |
| ROM | 128 MB |
| RAM | 128 MB |
| Scanning System | Progressive |
| Electronic Shutter Speed | Auto/Manual 1/3 s–1/100,000 s |
| Min. Illumination | 0.006 lux@F1.6 (Color, 30 IRE);<br>0.0006 lux@F1.6 (B/W, 30 IRE);<br>0 lux (Illuminator on) |
| S/N Ratio | ＞56 dB |
| Illumination Distance | Up to 30 m (98.43 ft) (IR)<br>Up to 30 m (98.43 ft) (Warm light) |
| Illuminator On/Off Control | Auto;Manual |
| Illuminator Number | 3 (IR LED); 4 (Warm light) |
| Angle Adjustment | Pan: 0°–355°;<br>Tilt: 0°–65°;<br>Rotation: 0°–355° |

### Lens

| | |
|---|---|
| Lens Type | Fixed-focal |
| Lens Mount | M12 |
| Focal Length | 2.8 mm; 3.6 mm |
| Max. Aperture | F1.6 |
| Field of View | 2.8 mm: H: 101°; V: 54°; D: 120°<br>3.6 mm: H: 83°; V: 43°; D: 100° |
| Iris Control | Fixed |
| Close Focus Distance | 2.8 mm: 1.1 m (3.61 ft)<br>3.6 mm: 1.7 m (5.58 ft) |

| | Lens | Detect | Observe | Recognize | Identify |
|---|---|---|---|---|---|
| DORI Distance | 2.8 mm | 63.6 m<br>( 208.66 ft) | 25.4 m<br>( 93.33 ft) | 12.7 m<br>( 41.67 ft) | 6.4m<br>( 21.00 ft) |
| | 3.6 mm | 85.4 m<br>( 280.18 ft) | 34.2 m<br>( 112.20 ft) | 17.1 m<br>( 56.10 ft) | 8.5 m<br>( 27.89 ft) |

*DORI (Detect, Observe, Recognize, Identify) is a standard system (EN-62676-4) for defining the ability of a person viewing the video to distinguish persons or objects within a covered area. The numbers in this table do not reflect intelligent function distances. For intelligent function distances, refer to installation and commissioning manual/project design tool.

### Intelligence

| | |
|---|---|
| IVS (Perimeter Protection) | Intrusion, tripwire (the two functions support the classification and accurate detection of vehicle and human) |
| SMD | SMD Plus |
| Smart Search | Work together with Smart NVR to perform refine intelligent search, event extraction and merging to event videos |

### Video

| | |
|---|---|
| Video Compression | H.265; H.264; H.264H; H.264B; MJPEG (Only supported by the sub stream) |
| Smart Codec | Smart H.265+; Smart H.264+ |
| Video Frame Rate | Main stream: 2688 × 1520 @ (1–20 fps)/2560 × 1440@(1–25/30 fps)<br>Sub stream: 704 × 576@(1–25 fps)/704 × 480@(1–30 fps)<br>*The values above are the max. frame rates of each stream; for multiple streams, the values will be subjected to the total encoding capacity. |
| Stream Capability | 2 streams |
| Resolution | 4M (2688 × 1520/2560 × 1440); 3M (2304 × 1296); 1080p (1920 × 1080); 1.3M (1280 × 960); 720p (1280 × 720);D1 (704 × 576/704 × 480); VGA (640 × 480); CIF (352 × 288/352 × 240) |
| Bit Rate Control | VBR;CBR |
| Video Bit Rate | H.264: 32 kbps–6144 kbps;<br>H.265: 12 kbps–6144 kbps |
| Day/Night | Auto(ICR)/Color/B/W |
| BLC | Yes |
| HLC | Yes |
| WDR | 120 dB |
| White Balance | Auto; natural; street lamp; outdoor; manual; regional custom |
| Gain Control | Auto/Manual |
| Noise Reduction | 3D NR |
| Motion Detection | OFF/ON (4 areas, rectangular) |
| Region of Interest (RoI) | Yes (4 areas) |
| Smart Illumination | Yes |
| Smart Dual Light | Yes |
| Image Rotation | 0°/90°/180°/270° (Support 90°/270° with 2688 ×1520 resolution and lower) |
| Mirror | Yes |
| Privacy Masking | 4 areas |

### Audio

| | |
|---|---|
| Built-in MIC | Yes, built-in Mic |
| Audio Compression | G.711a; G.711Mu; PCM; G.726 |

### Alarm

| | |
|---|---|
| Alarm Event | No SD card; SD card full; SD card error; network disconnection; IP conflict; illegal access; motion detection; video tampering; tripwire; intrusion; audio detection; voltage detection; SMD; security exception |

### Network

| | |
|---|---|
| Network Port | RJ-45 (10/100 Base-T) |
| SDK and API | Yes |
| Network Protocol | IPv4; IPv6; HTTP; TCP; UDP; ARP; RTP ; RTSP; RTCP; RTMP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; NTP; Multicast; ICMP; IGMP |
| Interoperability | ONVIF (Profile S & Profile G & Profile T); CGI |

| | |
|---|---|
| User/Host | 20 (Total bandwidth: 48 M) |
| Storage | FTP; SFTP; Micro SD card (support max. 256 GB) |
| Browser | IE; Chrome; Firefox |
| Management Software | Smart PSS Lite; DSS; DMSS |
| Mobile Client | iOS;Android |
| Cyber Security | Video encryption;Firmware encryption;Configuration encryption;Digest;WSSE;Account lockout;Security logs;IP/MAC filtering;Generation and importing of X.509 certification;syslog;HTTPS;802.1x;Trusted boot;Trusted execution;Trusted upgrade |

### Certification

| | |
|---|---|
| Certifications | CE-LVD: EN62368-1;<br>CE-EMC: Electromagnetic Compatibility Directive 2014/30/EU |

### Power

| | |
|---|---|
| Power Supply | 12 VDC/PoE (802.3af) |
| Power Consumption | Basic: 2.4 W (12 VDC), 3 W (PoE);<br>Max.: 6.6 W (12 VDC), 7.9 W (PoE) (H.265 + intelligence on+ WDR + illuminator intensity) |

### Environment

| | |
|---|---|
| Operating Temperature | −40 °C to +60 °C(−40 °F to +140 °F) |
| Operating Humidity | ≤95%(RH), non-condensing |
| Storage Temperature | −40 °C to +60 °C(−40 °F to +140 °F) |
| Storage Humidity | ≤95%(RH), non-condensing |
| Protection | IP67; IK10 |

### Structure

| | |
|---|---|
| Casing Material | Metal |
| Product Dimensions | 81.0 mm ✘ Φ109.9 mm (3.19" ✘ Φ4.33") |
| Net Weight | 0.35 kg (0.77 lb) |
| Gross Weight | 0.50 kg (1.10 lb) |

## Ordering Information

| Type | Part Number | Description |
|---|---|---|
| IP CAMERA | DH-IPC-HDBW2449E-S-IL | 4MP Smart Dual Light Fixed-focal Dome WizSense Network Camera |
| Accessories (Optional) | DH-PFA109 | Mount adapter |
| | DH-PFB220C | Ceiling Mount Bracket |
| | DH-PFB305W | Wall mount bracket |
| | DH-PFA151 | Corner mount bracket |
| | DH-PFA150 | Pole Mount Bracket |
| | DH-PFA152-E | Pole Mount Bracket |
| | DH-PFB203W | Wall mount bracket |
| | DH-PFA136 | Junction box |
| | DH-PFM321-EN | DC12V1A power adapter |
| | DH-PFM321D-EN | DC12V 1A power adapter |
| | DH-PFM320D-EN | DC12V2A power adapter |
| | PFM900-E | Integrated Mount Tester |
| | DHI-TF-P100/256GB | MicroSD Card |

## Accessories

**Dimensions (mm[inch])**

Optional:



**DH-PFA109**
Mount adapter

**DH-PFB220C**
Ceiling Mount Bracket

**DH-PFB305W**
Wall mount bracket

**DH-PFA151**
Corner mount bracket

**DH-PFA150**
Pole Mount Bracket

**DH-PFA152-E**
Pole Mount Bracket

**DH-PFB203W**
Wall mount bracket

**DH-PFA136**
Junction box

**DH-PFM321-EN**
DC12V1A power adapter

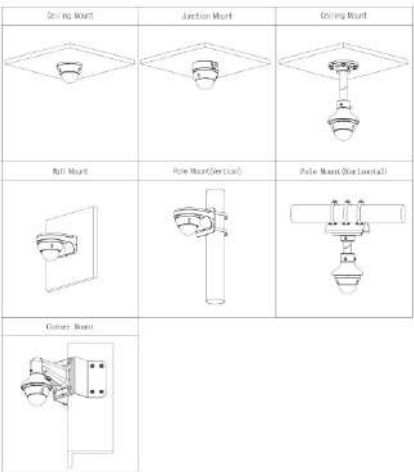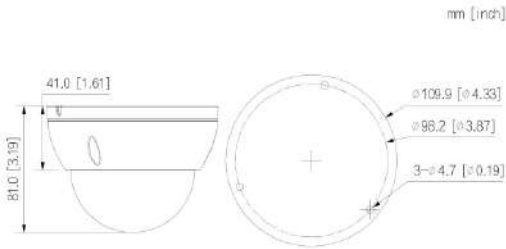**DH-PFM321D-EN**
DC12V 1A power adapter

**DH-PFM320D-EN**
DC12V2A power adapter

**PFM900-E**
Integrated Mount Tester

**DHI-TF-P100/256GB**
MicroSD Card



Dimensions diagram: 41.0 [1.61], 81.0 [3.19], Ø109.9 [Ø4.33], Ø96.2 [Ø3.87], 3-Ø4.7 [Ø0.19]

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# DHI-NVR4104HS-P-EI

## 4CH Compact 1U 4PoE 1HDD WizSense Network Video Recorder

**WizSense**

Launched by Dahua Technology, WizSense is a series of AI products and solutions that adopt 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, WizSense provides intelligent, simple and inclusive products and solutions.

## Series Overview

NVR4000-EI series is a new generation of network recorders that offers powerful decoding capabilities, and strong bandwidth. It features high-precision face recognition, perimeter protection, and SMD (Smart Motion Detection), which can distinguish target vehicles and humans from other types in real time. When connected with select IPC cameras, Quick Pick technology becomes available, allowing human and vehicle targets to be easily searched for and picked out. This network recorder is not only cost-effective, but also compatible with a wide variety of third-party devices, making it a great choice for small and medium-sized businesses.

## Functions

### Face Recognition
Dahua Face Recognition technology extracts the features of captured faces and compares them with that in face database.

### Perimeter Protection
Automatically filters out false alarms caused by animals, rustling leaves, bright lights, etc. Enables system to act secondary recognition for the targets. Improves alarm accuracy.

· Smart H.265+/H.265/Smart H.264+/H.264/MJPEG decoding format
· Access, storage or forwarding at 80 Mbps
· Max. decoding capability: 16 × 1080p@30 fps. Supports adaptive decoding
· AI by NVR: 1-channel face detection and recognition; 2-channel perimeter protection; up to 10 face databases and 20,000 face images; 4-channel SMD Plus
· AI by Camera: Face detection and recognition, perimeter protection; SMD Plus; people counting; stereo analysis; heat map
· Connected to the third-party network cameras
· Security baseline 2.3

| Face Detection | Face Recognition | Perimeter Protection | SMD Plus | IVS | Heat Map |
| ANPR | People Counting | Quick Pick | | | |

### SMD Plus
With intelligent algorithm, Dahua Smart Motion Detection technology can categorize the targets that trigger motion detection and filter the motion detection alarm triggered by non-concerned targets to realize effective and accurate alarm.

### AI Search
With AI search, operators can search for videos by the attributes of targets and event types, which helps them to quickly and efficiently investigate where and when targets appeared and events took place.

### Heat Map by Camera
Dahua heat map technology is used to display the crowd density and people appearance probability. Export and display the crowd status by different colors. Generally, the crowd status is the statistics of people quantity in space and time dimensions.

### ANPR by Camera
With deep learning algorithm, Dahua ANPR technology can recognize the number plate information of vehicles in the image with ANPR cameras. Support blocklist/allowlist mode, searching target vehicles from recorded video.

### Quick Pick
Dahua Quick Pick technology can enable users to quickly pick up the human/vehicle targets that they are interested in, which facilitates retrieval from SMD events.

## Technical Specification

### System

| | |
|---|---|
| Main Processor | Industrial-grade processor |
| Operating System | Embedded Linux |
| Operating Interface | Web, Local GUI |

### AI

| | |
|---|---|
| AI by Recorder | Face detection, face recognition, perimeter protection, and SMD Plus; |
| AI by Camera | Face detection; face recognition; perimeter protection; SMD Plus; ANPR; people counting; stereo analysis; heat map |

### Perimeter Protection

| | |
|---|---|
| Perimeter Performance AI by Recorder (Number of Channels) | 2 channels, 10 IVS rules for each channel |
| Perimeter Performance of AI by Camera (Number of Channels) | All channels (8 targets/s) |

### Face Detection

| | |
|---|---|
| Face Attributes | Gender; age group; glasses; expressions; face mask; beard |
| Face Detection Performance of AI by Recorder (Number of Channels) | 1 channel (up to 12 face images/s each channel) |
| Face Detection Performance of AI by Camera (Number of Channels) | All channels (8 targets/s) |

### Face Recognition

| | |
|---|---|
| Face Database Capacity | Up to 10 face databases with 20,000 images, with a total capacity of 2.5 G. Name, gender, birthday, address, credential type, credential No., countries & regions and state can be added to each face image. |
| Face Recognition Performance of AI by Recorder (Number of Channels) | 4-channel FD (by camera) + FR (by recorder),image stream: 12 face images/s<br>1-channel FD (by recorder) + FR (by recorder), video stream: 12 face images/s |
| Face Recognition Performance of AI by Camera (Number of Channels) | All channels (8 targets/s) |

### SMD Plus

| | |
|---|---|
| SMD Plus by Recorder | 4 channels: Secondary filtering for human and motor vehicle, reducing false alarms caused by leaves, rain and lighting condition change |
| SMD Plus by Camera | All channels (16 targets/s) |

### Audio and Video

| | |
|---|---|
| Access Channel | 4 channels |
| Network Bandwidth | 80 Mbps incoming, 80 Mbps recording and 80 Mbps outgoin |

| | |
|---|---|
| Resolution | 16 MP; 12 MP; 8 MP; 6 MP; 5 MP; 4 MP; 3 MP; 1080p; 960p; 720p; D1; CIF |
| Decoding Capability | AI disabled: 2-channel 16 MP@30 fps; 2-channel 12 MP@30 fps; 4-channel 8 MP@30 fps<br>AI enabled: 1-channel 16 MP@30 fps; 2-channel 12 MP@30 fps; 3-channel 8 MP@30 fps; 3-channel 6 MP@30 fps; 4-channel 5 MP@30 fps |
| Video Output | 1 HDMI, 1 VGA<br>HDMI: 3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720<br>VGA: 1920 × 1080, 1280 × 1024, 1280 × 720<br>*Simultaneous/heterogeneous video sources output for VGA and HDMI is configurable. |
| Multi-screen Display | 1st Screen: 1/4<br>2nd Screen: 1/4 |
| Third-party Camera Access | Panasonic, Sony, Samsung, Axis, Pelco, Arecont, ONVIF, Canon |

### Compression Standard

| | |
|---|---|
| Video Compression | Smart H.265+; H.265; Smart H.264+; H.264; MJPEG |
| Audio Compression | G.711a; G.711u; PCM; G726 |

### Network

| | |
|---|---|
| Network Protocol | HTTP; HTTPS; TCP/IP; IPv4/IPv6; UPnP; SNMP; UDP; SMTP; NTP; DHCP; DNS; IP Filter; PPPoE; DDNS; FTP; Alarm Server; IP Search (Support Dahua IP camera; DVR; NVS; etc.); P2P; auto register |
| Mobile Phone Access | iOS; Android |
| Interoperability | ONVIF 22.06(Profile T; Profile S; Profile G); CGI; SDK |
| Browser | Chrome; IE9 and later; Firefox |

### Recording Playback

| | |
|---|---|
| Multi-channel Playback | Up to 4 channels |
| Record Mode | General, motion detection; intelligent; alarm |
| Backup Method | USB device and network |
| Playback Mode | Instant playback, general playback, event playback, tag playback, smart playback |

### Alarm

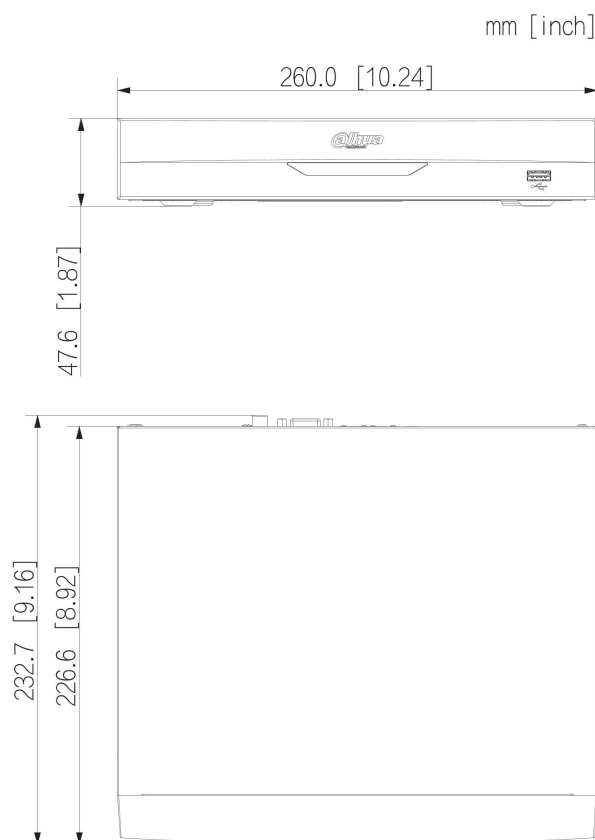| | |
|---|---|
| General Alarm | Motion detection; privacy masking; video loss; scene changing; PIR alarm; IPC external alarm |
| Anomaly Alarm | Camera disconnection; storage error; disk full; IP conflict; MAC conflict; login locked; and cybersecurity exception |
| Intelligent Alarm | Face detection; face recognition; perimeter protection; SMD Plus; people counting; stereo analysis; heat map |
| Alarm Linkage | Record; snapshot; IPC external alarm output; audio; buzzer; log; preset; email |

### Port

| | |
|---|---|
| Audio Input | 1-channel RCA |
| Audio Output | 1-channel RCA |
| Disk Interface | 1 SATA port, up to 16 TB.The maximum HDD capacity varies with environment temperature. |
| USB | 2 (1 front USB 2.0 port, 1 rear USB 2.0 port) |
| HDMI | 1 |

| VGA | 1 |
|---|---|
| Network Port | 1 (10/100 Mbps Ethernet port, RJ-45) |
| PoE Port | 4 ports, 10/100 Mbps, IEEE 802.3 af/at |

## General

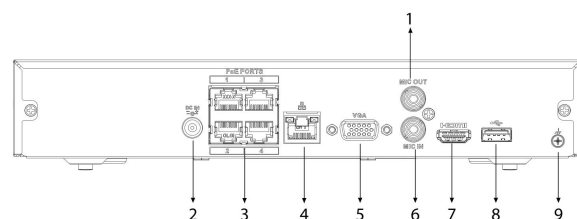| | |
|---|---|
| Power Supply | 53 VDC, 1.226 A |
| Power Consumption | Total output of NVR is <10 W(without HDD) Total output power of PoE is 36W,the maximum output power of asingle port is 25.5W |
| Net Weight | 0.86 kg (1.90 lb) |
| Gross Weight | 1.88 kg (4.14 lb) |
| Product Dimensions | 260 mm × 232.7 mm × 47.6 mm (10.24" × 9.16" × 1.87") (W × L × H) |
| Packaging Dimensions | 333 mm × 89 mm × 315 mm (13.11" × 3.50" × 12.40") (W × L × H) |
| Operating Temperature | −10 °C to +55 °C (14 °F to +131 °F) |
| Storage Temperature | −20 °C to +60 °C (−4 °F to +140 °F) |
| Operating Humidity | 10%–93% (RH), non-condensing |
| Installation | Rack or desktop |
| Certifications | FCC: 47 CFR FCC Part15, SubpartB, Class A CE-EMC: EN 55032:2015+A1:2020; EN IEC 61000-3-2:2019+A1:2021; EN 61000-3-3:2013+A1:2019+A2:2021; EN 55035:2017+A11:2020; EN 50130-4:2011+A1:2014 CE-LVD: EN 62368-1:2014 |

## Ordering Information

| Type | Model | Description |
|---|---|---|
| NETWORK VIDEO RECORDER | DHI-NVR4104HS-P-EI | 4CH Compact 1U 4PoE 1HDD WizSense Network Video Recorder |

## Dimensions (mm[inch])



## Panels



| | | | |
|---|---|---|---|
| 1 | AUDIO OUT, RCA Connector | 2 | Power Input |
| 3 | PoE Ports | 4 | Network Port |
| 5 | VGA Port | 6 | AUDIO IN, RCA Connector |
| 7 | HDMI Port | 8 | USB Port |
| 9 | Ground | | |