

# DH-IPC-HDW3541EM-S-S2

## 5MP IR Fixed-focal Eyeball 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

Dahua WizSense 3 Series Network Camera greatly saves on bandwidth and storage space through its AI Coding technology. Driven by its advanced deep learning algorithms, the camera supports intelligent functions such as perimeter protection, smart motion detection (SMD), Quick Pick, and AI SSA (AI Scene Self-adaptation), making it easy and convenient to use. Starlight technology and its large aperture lens also allow the camera to produce clear, vivid images even in poor lighting conditions.

### Functions

#### SMD 4.0

Dahua Smart Motion Detection technology works with intelligent algorithms to classify targets that trigger motion detection alarms. It filters out objects that are not targets, such as small and large animals, to avoid triggering false alarms. With an AI NVR, Quick Pick technology becomes available, allowing you to easily search for and pick out human and vehicle targets from SMD event videos, prioritizing the highest matches.

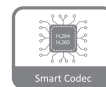
#### AI SSA

Dahua AI Scene Self-adaptation (AI SSA) adopts deep learning algorithms to detect environmental conditions, such as rain, fog, backlight, low light and flicker, to adjust the parameters of the image to suit the conditions, ensuring that clear images are always produced.

#### 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.

- 5-MP 1/2.7" CMOS image sensor, excellent low luminance performance and high definition of images.
- Outputs max. 5 MP (2960 × 1668) @20 fps and supports 4MP (2688 × 1520) @25/30 fps.
- H.265 codec, high compression rate, ultra-low bit rate.
- Built-in IR LED, max. IR distance: 50 m.
- ROI, SMART H.264 +/H.265+, AI 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 detection: Intrusion, tripwire (support the classification and accurate detection of vehicle and human).
- Abnormality detection: Motion detection, privacy masking, scene changing, audio detection, no SD card, SD card full, SD card error, network disconnection, IP conflict, illegal access, and voltage detection.
- Max. 256 G Micro SD card. built-in Mic.
- 12 VDC/PoE power supply, easy for installation.
- IP67 protection.
- SMD 4.0, AI SSA.



### 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) are largely reduced.

### 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 normal 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.

### 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 comprising the device.

## Technical Specification

### Camera

|                            |   |
|----------------------------|---|
| Image Sensor               | 1/2.7" CMOS   |
| Max. Resolution            | 2960 (H) × 1668 (V)   |
| ROM                        | 128 MB  |
| RAM                        | 512 MB  |
| Scanning System            | Progressive   |
| Electronic Shutter Speed   | Auto/Manual 1/3 s–1/100,000 s   |
| Min. Illumination          | 0.005 lux@F1.4 (Color, 30 IRE)<br>0.0005 lux@F1.4 (B/W, 30 IRE)<br>0 lux (Illuminator on) |
| S/N Ratio                  | >56 dB  |
| Illumination Distance      | Up to 50 m (164.04 ft)  |
| Illuminator On/Off Control | Auto/Manual   |
| Illuminator Number         | 2 (IR LED)  |
| Pan/Tilt/Rotation Range    | Pan: 0°–360°; Tilt: 0°–78°; Rotation: 0°–360°   |

### Lens

|                      |   |                        |                       |                      |                      |
|----------------------|---|------------------------|-----------------------|----------------------|----------------------|
| Lens Type            | Fixed-focal   |                        |                       |                      |                      |
| Lens Mount           | M12   |                        |                       |                      |                      |
| Focal Length         | 2.8 mm; 3.6 mm; 6 mm  |                        |                       |                      |                      |
| Max. Aperture        | F1.4  |                        |                       |                      |                      |
| Field of View        | 2.8 mm: Horizontal: 97°; Vertical: 71°; Diagonal: 129°<br>3.6 mm: Horizontal: 80°; Vertical: 57°; Diagonal: 107°<br>6 mm: Horizontal: 50°; Vertical: 37°; Diagonal: 64°   |                        |                       |                      |                      |
| 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)<br>6 mm: 3.3 m (10.83 ft)  |                        |                       |                      |                      |
| DORI Distance        | Lens  | Detect                 | Observe               | Recognize            | Identify             |
|                      | 2.8 mm  | 63.6 m<br>(208.66 ft)  | 25.4 m<br>(83.33 ft)  | 12.7 m<br>(41.67 ft) | 6.4 m<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)  |
|                      | 6 mm  | 124.0 m<br>(406.82 ft) | 49.6 m<br>(162.73 ft) | 24.8 m<br>(81.36 ft) | 12.4 m<br>(40.68 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) | Tripwire, intrusion (support the classification and accurate detection of vehicle and human)                    |
| AI SSA                     | Yes   |
| Quick Pick                 | With AI NVR, quickly pick up the human/vehicle targets that users are interested in from SMD events             |
| 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+<br>Smart H.264+   |
| AI Coding                   | AI H.265<br>AI H.264   |
| Video Frame Rate            | Main stream: 2880 × 1620 @ (1–20) fps /<br>2960 × 1668 @ (1–20) fps /<br>2688 × 1520 @ (1–25/30 fps)<br>Sub stream 1: 704 × 576 @ (1–25 fps)/<br>704 × 480 @ (1–30 fps)<br>Sub stream 2: 1920 × 1080 @ (1–25/30 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           | 3 streams  |
| Resolution                  | 5M (2880 × 1620/2960 × 1668); 4M (2688 × 1520); 3.6M (2560 × 1440); 3M (2048×1536); 3M (2304 × 1296); 1080p (1920 × 1080); 1.3M (1280 × 960); 720p (1280 × 720); D1 (704 × 576/704×480); CIF (352 × 288/352 × 240); VGA (640 × 480)  |
| Bit Rate Control            | CBR/VBR  |
| Video Bit Rate              | H.264: 3 kbps–8192 kbps<br>H.265: 3 kbps–8192 kbps   |
| Day/Night                   | Auto (ICR)/Color/B/W   |
| BLC                         | Yes  |
| HLC                         | Yes  |
| WDR                         | 120 dB   |
| Scene Self-adaptation (SSA) | Yes  |
| White Balance               | Auto; natural; street lamp; outdoor; manual; regional custom   |
| Gain Control                | Auto   |
| Noise Reduction             | 3D NR  |
| Motion Detection            | OFF/ON (4 areas, rectangular)  |
| Region of Interest (RoI)    | Yes (4 areas)  |
| Defog                       | Yes  |
| AFSA                        | 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                                |
| Audio Compression | G.711a; G.711Mu; PCM; G.726; G.723 |

### Alarm

|             |   |
|-------------|---|
| Alarm Event | No SD card; SD card full; SD card error; service life warning (only supported by Dahua card); network disconnection; IP conflict; illegal access; motion detection; video tampering; intrusion; tripwire; scene changing; audio detection; voltage detection; SMD; safety 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; QoS; UPnP; NTP; Multicast; ICMP; IGMP; NFS; PPPoE; SNMP   |
| 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 |
| Interoperability    | ONVIF (Profile S/Profile G/Profile T); CGI; P2P; Milestone; Genetec   |
| User/Host           | 20 (Total bandwidth: 64 M)  |
| Storage             | FTP; SFTP; Micro SD card (support max. 256 G); NAS  |
| Browser             | IE:IE11<br>Chrome<br>Firefox  |
| Management Software | Smart PSS; DSS; DMSS  |
| Mobile Client       | iOS; Android  |

## Certification

|                |  |
|----------------|--|
| Certifications | CE-LVD: EN62368-1;<br>CE-EMC: Electromagnetic Compatibility Directive 2014/30/EU;<br>FCC: 47 CFR FCC Part 15, Subpart B;<br>UL/CUL: UL62368-1 & CAN/CSA C22.2 No. 62368-1-14 |
|----------------|--|

## Power

|                   |   |
|-------------------|---|
| Power Supply      | 12 VDC/PoE (802.3af)  |
| Power Consumption | Basic: 4.3 W (12 VDC); 4.9 W (PoE)<br>Max. (WDR + IR intensity + Intelligence): 7.6 W (12 VDC); 8.9 W (PoE) |

## Environment

|                       |   |
|-----------------------|---|
| Operating Temperature | −40 °C to +60 °C (−40 °F to 140 °F) /Less than 95% (RH) |
| Storage Temperature   | −40 °C to +60 °C (−40 °F to 140 °F)                     |
| Protection            | IP67  |

## Structure

|                    |                                      |
|--------------------|--------------------------------------|
| Casing             | Metal                                |
| Product Dimensions | 93.6 mm × Φ106.0 mm (3.69" × Φ4.17") |
| Net Weight         | 500 g (1.10 lb)                      |
| Gross Weight       | 770 g (1.70 lb)                      |

## Ordering Information

| Type                   | Model                 | Description  |
|------------------------|-----------------------|--|
| 5MP Camera             | DH-IPC-HDW3541EM-S-S2 | 5MP IR Fixed-focal Eyeball WizSense Network Camera |
|                        |                       |  |
| Accessories (Optional) | PFA139                | Junction Box                                       |
|                        | PFB204W               | Wall Mount   |
|                        | PFA106                | Ceiling Mount                                      |
|                        | PFB220C               | Ceiling Mount                                      |
|                        | PFA152-E              | Pole Mount   |
|                        | PFM321D               | 12 VDC 1 A Power Adapter                           |
|                        | PFM900-E              | Integrated Mount Tester                            |
|                        | TF-P100               | TLC SD Card  |

## Accessories

### Optional:



PFA139  
Junction  
Box



PFB204W  
Wall  
Mount



PFA106  
Ceiling  
Mount



PFB220C  
Ceiling  
Mount



PFA152-E  
Pole  
Mount



PFM321D  
12 VDC 1 A  
Power Adapter



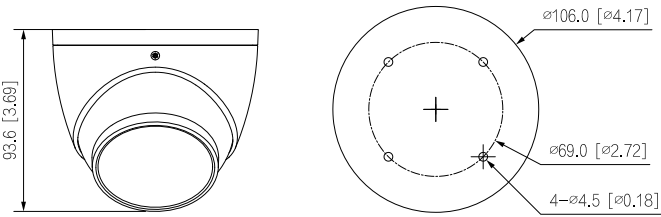
PFM900-E  
Integrated  
Mount Tester



TF-P100  
TLC SD  
Card

| Junction Mount       | Ceiling Mount | Wall Mount |
|----------------------|---------------|------------|
|                      |               |            |
| Pole Mount(Vertical) |               |            |
|                      |               |            |

Dimensions (mm[inch])



# 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



### 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 blacklist/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 outgoing |

|                           |   |
|---------------------------|---|
| 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

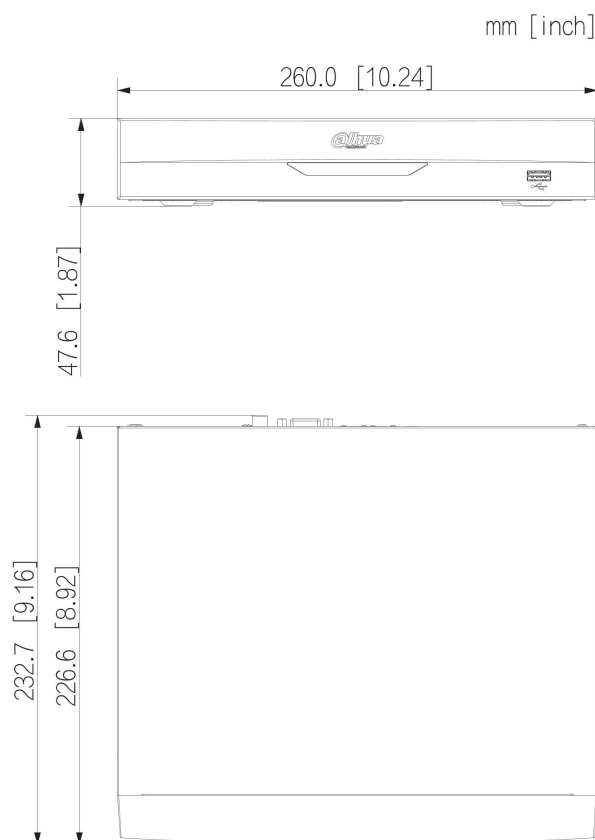
|                |  |
|----------------|--|
| Audio Input    | 1-channel RCA  |
| Audio Output   | 1-channel RCA  |
| Disk Interface | 1 SATA port, up to 16 TB.The maximum HDD capacity varies with environment temperature. |
| USB            | 2 (1 front USB 2.0 port, 1 rear USB 2.0 port)  |
| HDMI           | 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<br>CE-EMC: EN 55032:2015+A1:2020;<br>EN IEC 61000-3-2:2019+A1:2021;<br>EN 61000-3-3:2013+A1:2019+A2:2021; EN 55035:2017+A11:2020; EN 50130-4:2011+A1:2014<br>CE-LVD: EN 62368-1:2014 |

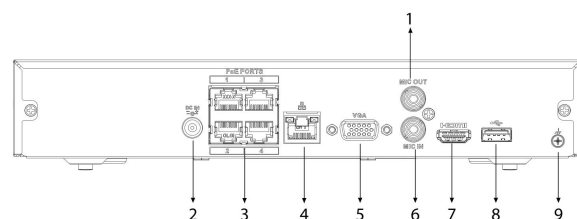
## Dimensions (mm[inch])



## Ordering Information

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

## 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                   |                           |