System Overview

The Dahua Panoramic Multi-sensor plus PTZ camera combines eight (8) 2 MP sensors working in tandem to create a comprehensive 360° view, and a high-speed PTZ camera to focus on a specific area of the 360° scene. With its all-in-one design, the camera provides a 360° panorama and provides region of interest details at the same time. In addition, the camera offers the Intelligent Video System (IVS), a built-in video analytic algorithm that delivers intelligent functions to monitor a scene for Tripwire violations, intrusion detection, Auto-tracking and abandoned or missing objects. A camera with the Multi-sensor plus PTZ camera can replace multiple single-sensor cameras providing a higher return on investment.

Functions

Starlight Technology

For challenging low-light applications, Dahua’s Starlight Ultra-low Light Technology offers best-in-class light sensitivity, capturing details in low light down to 0.005 lux. The camera uses a set of optical features to balance light throughout the scene, resulting in clear images in dark environments.

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. The camera also offers tamper detection by recognizing a dramatic scene change and generating a warning message to inspect the camera.

Auto-tracking

This feature controls the pan/tilt/zoom actions of the camera to automatically track an object in motion and to keep it in the scene. The tracking action can be triggered manually or automatically by pre-defined rules. Once a rule is triggered, the camera can zoom in and track the defined target automatically.

True Day/Night

A day/night mechanical IR cut filter makes this camera ideal for applications with fluctuating lighting conditions, delivering color images during the day and automatically switching to monochrome as the scene darkens.

High Efficiency Video Coding (H.265)

The H.265 (ITU-T VCEG) video compression standard offers double the data compression ratio at the same level of video quality, or substantially improved video quality at the same bit rate, as compared to older video compression technologies. H.265 offers such impressive compression by expanding the pattern comparison and difference-coding, improving motion vector prediction and motion region merging, and incorporating an additional filtering step called sample-adaptive offset filtering.

Smart H.265+

Smart H.265+ is the optimized implementation of the H.265 codec that uses a scene-adaptive encoding strategy, dynamic GOP, dynamic ROI, flexible multi-frame reference structure and intelligent noise reduction to deliver high-quality video without straining the network. Smart H.265+ technology reduces bit rate and storage requirements by up to 70% when compared to standard H.265 video compression.

Interoperability

The camera conforms to the ONVIF (Open Network Video Interface Forum) and to the PSIA (Physical Security Interoperability Alliance) specifications, ensuring interoperability between network video products regardless of manufacturer.

Environmental

With a built-in heater and a temperature range of -40 °C to +60 °C (-40 °F to +140 °F), the camera is designed for extreme temperature environments. Its 6KV lightning rating provides effective protection for both the camera and its structure against lightning, and its IP67 ingress protection make it the choice for installation in even the most unforgiving environments. The camera complies with the IK10 Vandal Resistance impact rating and is capable of withstanding the equivalent of 5 kg (11.02 lbs) of force dropped from a height of 40 cm (15.75 in.).
Technical Specification

Panoramic Camera

Image Sensor
Eight (8) 1/1.9-in. 2 MP CMOS Sensors

Effective Pixels
2 x 4096(H) x 1800(V)

Scanning System
Progressive

Electronic Shutter Speed
Auto, Manual: 1/3 s to 1/100,000 s

Minimum Illumination
Color: 0.005 lux at F2.2 (1/3 s, 30 IRE)
Color: 0.03 lux at F2.2 (1/30 s, 30 IRE)
B/W: 0.003 lux at F2.2 (1/3 s, 30 IRE)
B/W: 0.02 lux at F2.2 (1/30 s, 30 IRE)

S/N Ratio
More than 50 dB

Panoramic Lens

Lens Type
Fixed

Mount Type
Board-in

Focal Length
5 mm

Maximum Aperture
F2.2

Angle of View
Horizontal: 360°
Vertical: 80°

PTZ Camera

Image Sensor
One (1) 1/1.9-in. 2 MP CMOS Sensor

Effective Pixels
1920(H) x 1080(V)

RAM/ROM
1024 MB / 128 MB

Scanning System
Progressive

Electronic Shutter Speed
Auto, Manual: 1/3 s to 1/100,000 s

Minimum Illumination
Color: 0.002 lux at F1.5 (1/3 s, 30 IRE)
Color: 0.01 lux at F1.5 (1/30 s, 30 IRE)
B/W: 0.001 lux at F1.5 (1/3 s, 30 IRE)
B/W: 0.008 lux at F1.5 (1/30 s, 30 IRE)

S/N Ratio
More than 50 dB

PTZ Lens

Lens Type
Motorized / Auto Iris (HALL)

Mount Type
Board-in

Focal Length
5.5 mm to 206.0 mm

Maximum Aperture
F1.5

Angle of View
Horizontal: 65.8° to 2.0°

Optical Zoom
37x

Focus Control
Motorized

DORI¹ Distance

Panoramic Camera
Detect (8 ppf): 53 m (178 ft)
Observe (19 ppf): 21 m (69 ft)
Recognize (38 ppf): 10 m (33 ft)
Identify (76 ppf): 5 m (17 ft)

PTZ Camera, Wide-angle
Detect (8 ppf): 70 m (229 ft)
Observe (19 ppf): 28 m (92 ft)
Recognize (38 ppf): 14 m (46 ft)
Identify (76 ppf): 7 m (23 ft)

PTZ Camera, Telephoto
Detect (8 ppf): 2080 m (6824 ft)
Observe (19 ppf): 832 m (2730 ft)
Recognize (38 ppf): 416 m (1365 ft)
Identify (76 ppf): 208 m (682 ft)

1. The DORI distance is a measure of the general proximity for a specific classification to help pinpoint the right camera for your needs. The DORI distance is calculated based on sensor specifications and lab test results according to EN 62676-4, the standard that defines the criteria for the Detect, Observe, Recognize and Identify classifications.

2. Dahua recommends using an NVR that supports 4K decoding and ONVIF compatibility in conjunction with the DH-PSD81602N-A360 Multi-sensor Panoramic + PTZ Network Camera. The camera requires three (3) free channels on the NVR.

PTZ

Pan/Tilt Range
Pan: 0° to 360°, endless
Tilt: -20° to 90°
Auto flip: 180°

Manual Speed Control
Pan: 0.1° /s to 240° /s
Tilt: 0.1° /s to 120° /s

Presets
300

PTZ Mode
5 Pattern, 8 Tour, Auto Pan, Auto Scan

Speed Setup
Human-oriented Focal Length and Speed Adaptation

Power-up Action
Auto restore to previous PTZ and lens status after power failure

Idle Motion
Activate Preset, Scan, Tour, Pattern if there is no command in the specified period

Protocol
DH-SD, Pelco-P/D (Auto recognition)

Video

Compression
Smart H.265+, H.265, Smart H.264+, H.264, MJPEG

Streaming Capability
• Three (3) Streams

Output Channels²
• Two (2) Channels for Stitched Panoramic Video
• One (1) Channel for PTZ Video

Resolution
Panoramic Camera
2 x 4096 x 1800, 2 x 3840 x 1680, 2 x 2880 x 1264,
2 x 1920 x 832, 2 x 1280 x 560, 2 x 1024 x 452

PTZ Camera
1080p (1920 x 1080), 1.3 MP (1280 x 960),
720p (1280 x 720), D1 (704 x 480), CIF (352 x 240)

Frame Rate

Main Stream
Panoramic Camera: 2 x 4096 x 1800 at 25 fps
PTZ Camera: 1080p at 60 fps

Sub Stream 1
Panoramic Camera: 2 x 1024 x 452 at 30 fps
PTZ Camera: D1 at 60 fps

Sub Stream 2
Panoramic Camera: 2 x 1920 x 832 at 30 fps
PTZ Camera: 1080p at 60 fps

Bit Rate Control
CBR, VBR

Bit Rate

Panoramic
H.265: 2 x 14 Kbps to 8192 Kbps
H.264: 2 x 24 Kbps to 8192 Kbps

PTZ
H.265: 4 Kbps to 8192 Kbps
H.264: 8 Kbps to 7168 Kbps

Day/Night
Auto (ICR), Color, B/W

BLC Mode
BLC, HLC, True WDR (120 dB)

White Balance
Auto, Natural, Street Lamp, Outdoor, Manual

Gain Control
Auto, Manual

Noise Reduction
3D DNR

Motion Detection
Off, On (4 Zone, Rectangle)

Region of Interest
Off, On (4 Zone)

Defog
Support, PTZ camera only

Digital Zoom
16x

Privacy Masking
Panoramic
Off, On (4 Area, Rectangle)

PTZ
Off, On (24 Area, Rectangle)
## Ordering Information

<table>
<thead>
<tr>
<th>Type</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panoramic + PTZ Camera</td>
<td>DH-PSD81602N-A360</td>
<td>Eight (8) x 2 MP Multi-sensor Panoramic + PTZ Network Camera, WDR, IVS</td>
</tr>
<tr>
<td>Accessories, Included</td>
<td></td>
<td>Mount Adapter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall Mount Bracket</td>
</tr>
<tr>
<td></td>
<td>DC36V/4.17A</td>
<td>Power Supply</td>
</tr>
</tbody>
</table>

## Audio

| Compression              | G.711a, G.711Mu, AAC, G.726 |

## Network

<table>
<thead>
<tr>
<th>Protocol</th>
<th>HTTP, HTTPS, TCP, ARP, RTSP, RTP, UDP, SMTP, FTP, DHCP, DNS, DDNS, PPPOE, IPv4/6, QoS, UPnP, NTP, Bonjour, 802.1x, Multicast, ICMP, IGMP, SNMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address</td>
<td>Default Address: 192.168.1.108 (Camera uses a single IP address for all sensors)</td>
</tr>
<tr>
<td>Interoperability</td>
<td>ONVIF, PSIA, CGI</td>
</tr>
<tr>
<td>Streaming Method</td>
<td>Unicast, Multicast</td>
</tr>
<tr>
<td>Maximum User Access</td>
<td>10 Users / 20 Users</td>
</tr>
<tr>
<td>Edge Storage</td>
<td>NAS, Local PC for instant recording Micro SD Card, maximum 128 GB</td>
</tr>
<tr>
<td>Web Viewer</td>
<td>IE, Firefox, Safari</td>
</tr>
<tr>
<td>Management Software</td>
<td>Smart PSS, DSS</td>
</tr>
<tr>
<td>Mobile Operating System</td>
<td>iOS, Android</td>
</tr>
<tr>
<td>Certifications</td>
<td>Safety: EN 60950:2000, UL60950-1</td>
</tr>
<tr>
<td></td>
<td>Electromagnetic Compatibility (EMC): FCC Part 15 Subpart B</td>
</tr>
</tbody>
</table>

## Interface

<table>
<thead>
<tr>
<th>Video</th>
<th>One (1) Port, for PTZ camera only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td>Input: Two (2) Channels, Output: One (1) Channel</td>
</tr>
<tr>
<td>RS485</td>
<td>One (1) Port, for PTZ control</td>
</tr>
<tr>
<td>Alarm</td>
<td>Input: Seven (7) Channels (5 VDC, 5 mA), Output: Two (2) Channels (30 VDC, 1 A; 50 VAC, 0.5 A)</td>
</tr>
</tbody>
</table>

## Electrical

| Power Supply              | 36 VDC                                                                                                                           |
|                          | < 120 W                                                                                                                          |

## Environmental

<table>
<thead>
<tr>
<th>Operating Conditions</th>
<th>-40° C to +60° C (-40° F to +140° F) Less than 95% RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Conditions</td>
<td>-40° C to +60° C (-40° F to +140° F) Less than 95% RH</td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>IP67</td>
</tr>
<tr>
<td>Vandal Resistance</td>
<td>IK10</td>
</tr>
</tbody>
</table>

## Construction

| Casing                    | Metal                                                                                                                           |
|                          | Dimensions: ø449.50 mm x 342.50 mm (ø17.70 in. x 13.48 in.)                                                                    |
|                          | Net Weight: 16.0 kg (35.27 lb)                                                                                                 |
|                          | Gross Weight: 25.0 kg (55.0 lb)                                                                                                |

## Intelligence

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

- Tampering with the camera.
- Camera loses or changes focus drastically.
- Error writing to an onboard Micro SD card.
- Error sending or receiving data over the network.
- Unauthorized access to the camera.

### Standard Features

- Tampering with the camera.
- Camera loses or changes focus drastically.
- Error writing to an onboard Micro SD card.
- Error sending or receiving data over the network.
- Unauthorized access to the camera.

### Premium Features

- Motion: An object moves through any part of the scene.
- Tripwire: A target crosses a user-defined line.
- Intrusion: A target enters or exits a defined perimeter.
- Scene Change: A person or object moves the camera to change the scene or covers the camera to obscure the scene.
- Abandoned/Missing Object: A target leaves an object in a designated area, or a target removes an object from the same designated area.
- Auto-tracking: Controls the pan/tilt/zoom actions of the camera to automatically track an object in motion and to keep it in the scene.

## Video Compression

- G.711a, G.711Mu, AAC, G.726

## Video Ethernet

- One (1) RJ-45 Port (10/100/1000 Base-T)

## Video Protocol

- HTTP, HTTPS, TCP, ARP, RTSP, RTP, UDP, SMTP, FTP, DHCP, DNS, DDNS, PPPOE, IPv4/6, QoS, UPnP, NTP, Bonjour, 802.1x, Multicast, ICMP, IGMP, SNMP

## Video IP Address

- Default Address: 192.168.1.108
  (Camera uses a single IP address for all sensors)

## Video Interoperability

- ONVIF, PSIA, CGI

## Video Streaming Method

- Unicast, Multicast

## Video Maximum User Access

- 10 Users / 20 Users

## Video Edge Storage

- NAS, Local PC for instant recording
- Micro SD Card, maximum 128 GB

## Video Web Viewer

- IE, Firefox, Safari

## Video Management Software

- Smart PSS, DSS

## Video Mobile Operating System

- iOS, Android

## Video Certifications

- Safety: EN 60950:2000, UL60950-1
- Electromagnetic Compatibility (EMC): FCC Part 15 Subpart B