# DINION IP imager 9000 HD

www.boschsecurity.com

## BOSCH
### Invented for life

- ▶ Active infrared 1080p30 HD camera specifically designed for 24-hour perimeter surveillance
- ▶ Remotely adjustable high power infrared illumination for unmatched no-light performance up to 120 m (394 ft) detection
- ▶ All-in-one integrated housing with auto zoom/focus SR lens for quick and easy installation
- ▶ All-weather, vandal-proof design for reliable long-term performance
- ▶ Embedded Intelligent Video Analysis firmware transforms camera into automated detector

The DINION IP imager 9000 HD is a rugged, active infrared surveillance camera designed for fence line or perimeter surveillance and other outdoor low-light applications. The camera provides up to 120 meters (394 feet) of classification level imaging and 33 meters (108 feet) of recognition level imaging in darkness. The IP66 and IK10 ratings ensure water/dust and vandal resistance making it ideal for demanding applications.

Designed for critical infrastructure applications, the rugged infrared imager consistently delivers high-quality 1080p HD images at 30 ips in any lighting conditions.

## System overview

The wide dynamic range sensor gives high quality 1080p HD images during the daytime and provides exceptional night-time performance with the integrated IR. The SR (Super Resolution) lens is designed to provide improved image resolution and sharpness, and better depth-of-field while avoiding the diffraction issues which can occur with megapixel sensors. Its advanced SR-iris design ensures the sharpest image possible, even in the corners.

The highly integrated all-in-one solution, with integrated illuminator and junction box, reduces installation time. This, together with remote lens adjustment and remote IR level control makes installation a lot easier and more convenient. The reliable, rugged construction makes the imager suitable for tough environments and demanding applications such as perimeter surveillance, critical infrastructure surveillance and public area surveillance.

The camera contains the Bosch Intelligent Video Analysis (IVA) application making it a very powerful tool in unmanned perimeter surveillance applications. IVA also contributes to the content-based scene analysis which optimizes image processing and reduces bandwidth and storage requirements.

## Functions

**Content-Based Imaging Technology**
Content-Based Imaging Technology (C-BIT) is used to radically improve image quality in all lighting conditions and to identify areas for enhanced processing. The camera examines the scene using intelligent video analytics and provides feedback to re-tune the image processing. This provides better detail

in the areas that matter and better all-round performance. With IVA, the intelligent Automatic Exposure (iAE) technology, for example, allows you to view moving objects in bright and dark areas of a scene.

### High performance IR illumination
The integrated high-power infrared illuminator operates at a wavelength of 850 nm which provides semi-covert illumination with an excellent range. IR intensity is remotely adjustable. The illuminator can be tilted, and the width of the IR beam is adjusted by placing the 3D diffuser in the IR illumination path. This ability to adjust the IR beam pattern in the field gives a broad coverage and greatly reduces setup time and effort. Variable field illumination also provides even illumination not only across the horizontal field of view but also from foreground to background.
IR on/off and camera day/night switching is controlled by the image brightness level and the ambient visible light sensor. The switch point is also remotely adjustable.
To ensure this performance never fades over time, the IR imager features constant light technology, using closed-loop feedback to control infrared performance throughout the life of the unit.

### Excellent DCRI performance
The Detection, Classification, Recognition, Identification (DCRI) framework is a set of definitions for image quality applicable to optical imaging equipment under different lighting and environmental conditions day and night. The DINION IP imager 9000 HD has excellent range performance when evaluated according to these standards as shown in the following table:

| IR performance ranges (0 lx environment) | |
| --- | --- |
| Detection | 120 m (394 ft) |
| Classification | 120 m (394 ft) |
| Recognition | 33 m (108 ft) |
| Identification | 30 m (98 ft) |

DCRI values are narrow IR beam configuration at maximum focal length.

### Installer friendly
The IP66-rated waterproof and dustproof junction box can be preinstalled and the camera can be hung and connected in seconds, reducing time and energy on the ladder. If PoE+ power is used, a single cable is all that is needed to stream images and to carry power and control signals.
The AVF (Automatic Varifocal) feature means that the zoom can be changed without opening the camera. The automatic motorized zoom/focus adjustment with 1:1 pixel mapping ensures the camera is always accurately focused. The automatic zoom/focus lens wizard makes it easy for an installer to accurately zoom and focus the camera for both day and night

operation. The wizard can be activated remotely from the PC or from the on-board camera push button making it easy to choose the workflow that suits best.

### All-weather, vandal-resistant design
The integrated cast-aluminum housing can withstand the equivalent of 20 joule of impact force (IK10), equivalent to a 5 kg (12 lbs) steel ball dropped from 40cm (IK10 not for lens and IR windows), and is protected against water, dust and corrosion to IP66 and NEMA 4X standards.
This makes it ideal for outdoor use in demanding environments. Using the proprietary pan/tilt mechanism, installers can select the exact field of view. Mounting options are numerous, including pole, wall and corner mounting.

### Video analytics
With built-in video content analysis, the camera reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent.
The latest generation of the Bosch Intelligent Video Analysis (IVA) software is the guard-assistant system of choice when reliable indoor or outdoor video analytics is needed. The state-of-the-art system reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image.
The face detection feature detects faces in the scene and forwards a high quality JPEG image of the best shot of each face when the face disappears from the scene.
Retrospective forensic search capabilities are available remotely from the web browser or the Bosch Video Client.

### iDNR reduces bandwidth and storage requirements
The camera uses intelligent Dynamic Noise Reduction (iDNR) which actively analyzes the contents of a scene and reduces noise artifacts accordingly.
The low-noise image and the efficient H.264 compression technology provide clear images while reducing bandwidth and storage by up to 30% compared to other H.264 cameras. This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio.
Area-based encoding is another feature which reduces bandwidth. Compression parameters for up to eight user-definable regions can be set. This allows uninteresting regions to be highly compressed, leaving more bandwidth for important parts of the scene.
The average typical optimized bandwidth in kbits/s for various image rates is shown in the table:

| IPS | 1080p | 720p | 480p |
| --- | --- | --- | --- |
| 30 | 1600 | 1200 | 600 |
| 15 | 1274 | 955 | 478 |

| 12 | 1169 | 877 | 438 |
| 5 | 757 | 568 | 284 |
| 2 | 326 | 245 | 122 |

### Multiple streams

The innovative multi-streaming feature delivers various H.264 streams together with an M-JPEG stream. These streams facilitate bandwidth-efficient viewing and recording as well as integration with third-party video management systems.

### Regions of interest and E-PTZ

Regions of Interest (ROI) can be user defined. The remote E-PTZ (Electronic Pan, Tilt and Zoom) controls allow you to select specific areas of the parent image. These regions produce separate streams for remote viewing and recording. These streams, together with the main stream, allow the operator to separately monitor the most interesting part of a scene while still retaining situational awareness.

With IVA, the Intelligent tracker can follow objects within the defined regions of interest. The Intelligent tracker can autonomously detect and track moving objects or the user can click on an object which the Intelligent tracker will then follow.

### Tamper and motion detection

A wide range of configuration options is available for alarms signaling camera tampering. A built-in algorithm for detecting movement in the video can also be used for alarm signaling.

A hardware tamper switch detects the opening of the junction box.

### Storage management

Recording management can be controlled by the Bosch Video Recording Manager (VRM) or the camera can use iSCSI targets directly without any recording software.

### Edge recording

The MicroSD card slot supports up to 2 TB of storage capacity. A microSD card can be used for local alarm recording. Pre-alarm recording in RAM reduces recording bandwidth on the network, or — if microSD card recording is used — extends the effective life of the storage medium.

### Cloud-based services

The camera supports time-based or alarm-based JPEG posting to four different accounts. These accounts can address FTP servers or cloud-based storage facilities (for example, Dropbox). Video clips or JPEG images can also be exported to these accounts.

Alarms can be set up to trigger an e-mail or SMS notification so you are always aware of abnormal events.

### Access security

Password protection with three levels and 802.1x authentication is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. The video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

### Complete viewing software

There are many ways to access the camera's features: using a web browser, with the Bosch Video Management System, with the Bosch Recording System, with the free-of-charge Bosch Video Client, or with the video security mobile App.

The Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. It also provides easy live viewing of multiple cameras, playback, forensic search and export.

### Video security App

The Bosch video security mobile App has been developed to enable **Anywhere** access to HD surveillance images allowing you to view live images from any location. The App is designed to give you complete control of all your cameras, from panning and tilting to zoom and focus functions. It's like taking your control room with you.

This App, together with the separately available Bosch transcoder, will allow you to fully utilize our dynamic transcoding features so you can play back images even over low-bandwidth connections.

### System integration

The camera conforms to the ONVIF (Open Network Video Interface Forum) Profile S specification. This guarantees interoperability between network video products regardless of manufacturer. For trouble-free network cabling, the camera supports Auto-MDIX which allows the use of straight or cross-over cables. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Integration Partner Program (IPP) website (ipp.boschsecurity.com) for more information.

### Some typical applications*

- Fence line / perimeter surveillance
- Critical infrastructure surveillance - reservoirs, oil storage facilities, rail-yards, port facilities
- Public area surveillance - town squares, high traffic areas, or entry/exit chokepoints
- City surveillance

*The camera is designed to be installed on static structures using the specified mounting adapters. It should not be installed in dynamic environments or on moving objects such as vehicles, ships or elevators.

## Certifications and approvals

| Standards | |
| --- | --- |
| Safety | EN 60950-1 |
| | UL 60950-1 |
| | CAN/CSA-C22.2 NO. 60950-1 |
| EMC | EN 50130-4 |

| Standards | |
|---|---|
| | FCC Part15 Subpart B, Class B |
| | EMC directive 2004/108/EC |
| | EN 55022/24 class B |
| | VCCI J55022 V2 / V3 |
| | C-tick AS/NZS CISPR 22 (equal to CISPR 22) |
| | ICES-003 class B |
| | EN 50121-4 |
| | EN 50132-5-2; IEC 62676-2-3 |
| Outdoor | UL/cUL 60950-22, IEC50130-5 |
| Eye Safety | CIE/IEC 62471 |
| Product certifications | CE, FCC, UL, cUL, C-tick, CB, VCCI |
| Vibration | IEC 60068-2-6:2007 |
| Solar radiation | IEC 60068-2-5 Edition 2.0:2010, Procedure C |
| Ingress protection | IP66, NEMA 4X |
| Impact protection | IK10 (except window) |

| Region | Certification |
|---|---|
| Europe | CE |
| USA | UL |

## Installation/configuration notes
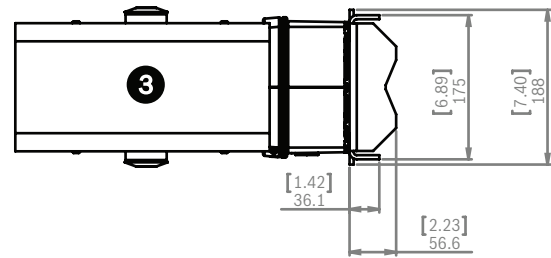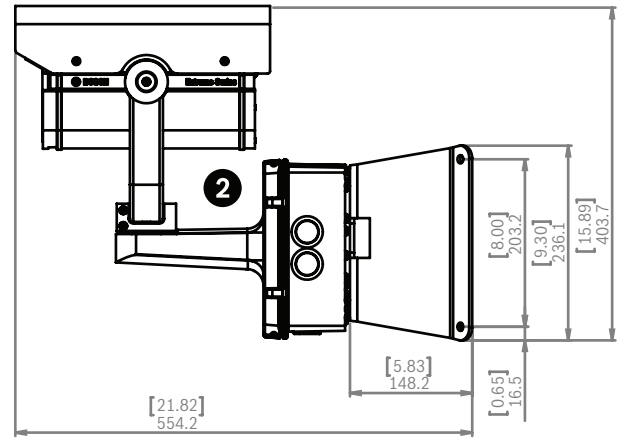
### Canting Directions
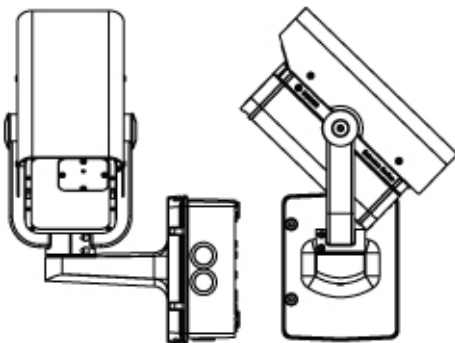


*Camera Rotated 90° Left, Tilted 44° Up*
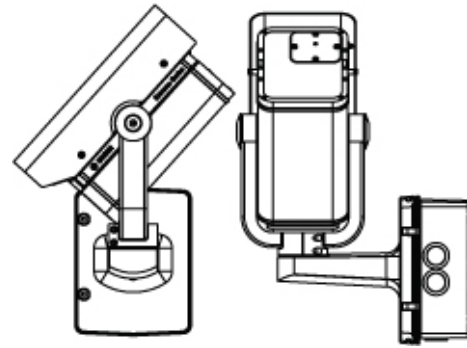


*Camera Rotated 90° Right, Tilted 48° Down*

### Dimensions

192.8
(7.59)

155.6
(6.13)

173.5
(6.83)

216.1
(8.51)

mm
(in.)

169.6
(6.68)

366.5
(14.43)

160.0
(6.30)

mm
(in.)

134.6
(5.30)

[1.50]
38.1

[5.25]
133.4

[6.50]
165.1

[8.55]
217.2

[5.25]
133.4

❶

[8.00]
203.2

[9.30]
236.1

[15.89]
403.7

[5.83]
148.2

[0.65]
16.5

[21.82]
554.2

❷

[6.89]
175

[7.40]
188

[1.42]
36.1

[2.23]
56.6

❸

[14.97]
380.3

[7.15]
181.6

[7.55]
191.7

[18.21]
462.6

[1.50]
38.1

❹

[ in.]
mm
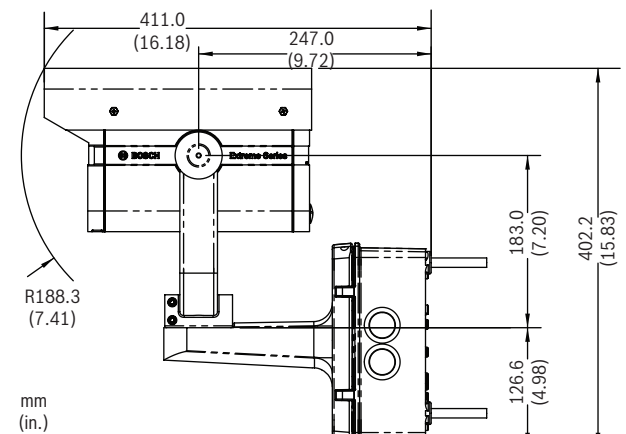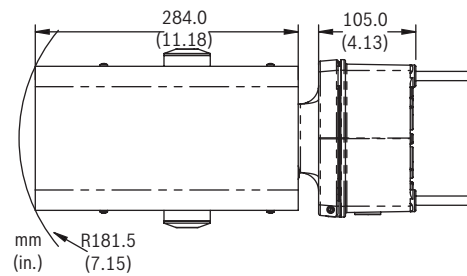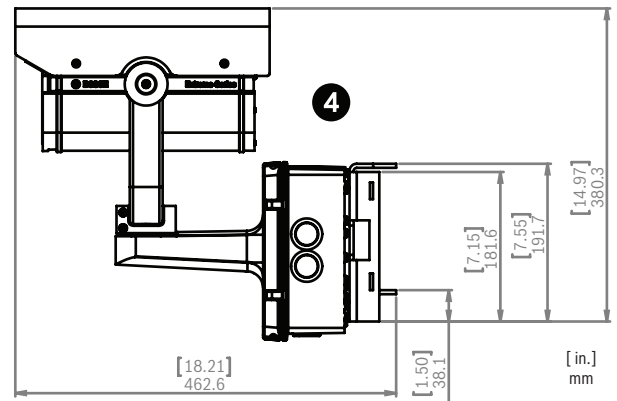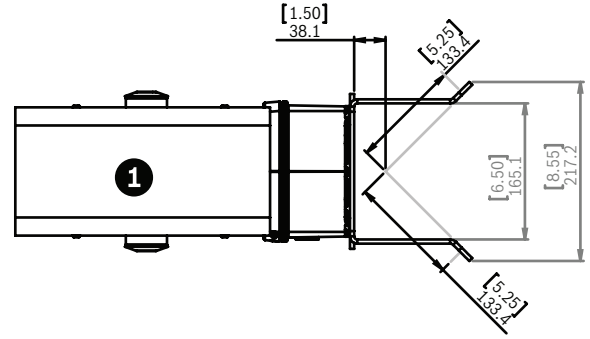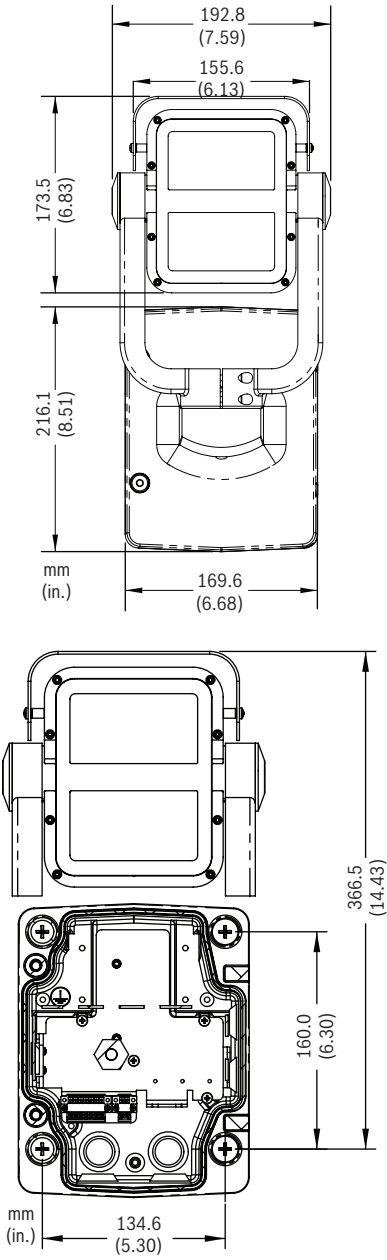
| 1 | Corner Mount - Top | 3 | Pole Mount - Top |
|---|---|---|---|
| 2 | Corner Mount - Side | 4 | Pole Mount - Side |

## Field of View (FoV)
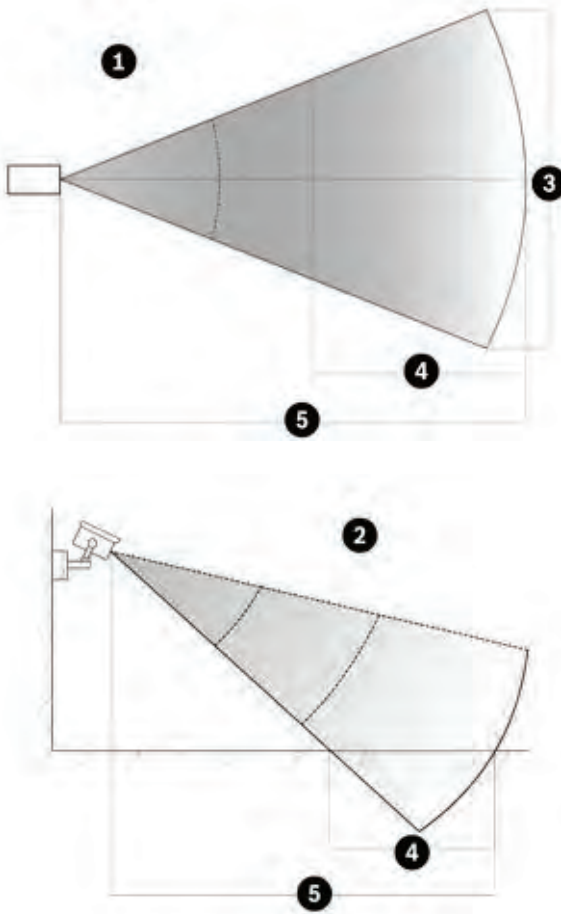


| 1 | Horizontal angle (H) | 4 | Depth-of-Field (DoF) Range |
|---|---|---|---|
| 2 | Vertical angle (V) | 5 | Distance |
| 3 | Horizontal Field-of-illumination (HFoI) Horizontal Field-of-View (HFoV) | | |

| Public area surveillance - 1: RECOGNITION | |
|---|---|
| IR Beam Pattern (H x V) | 42° x 20° |
| Camera Focal Length; FOV (H x V) | 13 mm focal length; 25° x 14° |
| DoF Range | 9 m to 18 m (29.7 ft to 59.4 ft) |
| HFOI | 8.4 m (27.72 ft) max. |
| HFOV | 8.4 m (27.72 ft) max. |

| Public area surveillance - 2: RECOGNITION | |
|---|---|
| IR Beam Pattern (H x V) | 42° x 20° |
| Camera Focal Length; FOV (H x V) | 23 mm focal length; 15° x 8° |
| DoF Range | 18 m to 33 m (59.4 ft to 108.9 ft) |

| Public area surveillance - 2: RECOGNITION | |
|---|---|
| HFOI | 8.4 m (27.72 ft) max. |
| HFOV | 8.4 m (27.72 ft) max. |

| Perimeter surveillance (100 m fence line): CLASSIFICATION | |
|---|---|
| IR Beam Pattern (H x V) | 10° x 10° |
| Camera Focal Length; FOV (H x V) | 23 mm focal length; 15° x 8° |
| DoF Range | 23 m to 120 m (75.9 ft to 396 ft) |
| HFOI | 22.5 m (74.25 ft) max. |
| HFOV | 32 m (105.6 ft) max. |

| Critical infrastructure (entry/exit) surveillance: CLASSIFICATION | |
|---|---|
| IR Beam Pattern (H x V) | 42° x 20° |
| Camera Focal Length; FOV (H x V) | 10 mm focal length; 33° x 18° |
| DoF Range | 10 m to 55 m (33 ft to 181.5 ft) |
| HFOI | 32 m (105.6 ft) max. |
| HFOV | 32 m (105.6 ft) max. |

## Technical specifications

| Power | |
|---|---|
| Power Supply | +12 VDC 24 VAC PoE+ (52 VDC nominal) |
| Power Consumption | 2.25 A \| 27 W (+12 VDC) 1.65 A \| 28 VAC (24 VAC) 490 mA \| 25.5 W (POE+) |
| PoE (Power-over-Ethernet) | 802.3at (Type 2) Power level: Class 4 |

| Sensor | |
|---|---|
| Type | 1/2.7-inch CMOS |
| Pixels | 1952 x 1092 (2.03MP) |

| Video performance | |
|---|---|
| Minimum illumination (30 IRE, 3200 K, scene reflectivity 89%, F1.6) | |
| • Color | 0.4lx |
| • Monochrome | 0 lx (IR) |
| Dynamic range | 76 dB WDR 92 dB WDR (with iAE) |

| Video functions | |
|---|---|
| Day/Night | Color, Monochrome (IR), Auto |
| Shutter | Automatic Electronic Shutter (AES) Fixed (1/25[30] to 1/150000) selectable Default shutter |
| White Balance | Indoor, Outdoor and Manual |

## Video functions

| | |
|---|---|
| Backlight compensation | On, Off, intelligentAE |
| Noise reduction | Intelligent Dynamic Noise Reduction (iDNR) with separate temporal and spatial adjustments |
| Contrast enhancement | On/off |
| Sharpness | Sharpness enhancement level selectable |
| Privacy Masking | Four independent areas, fully programmable |
| Video Motion Analysis | Intelligent Video Analysis (IVA) |
| Other functions | Video watermarking, Alarm mode stamping, Image mirror, Image flip, Contrast, Saturation, Brightness, Pixel counter |

## Video streaming

| | |
|---|---|
| Video compression | H.264 (MP); M- JPEG |
| Streaming | Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth. Regions of Interest (ROI) |
| Overall IP Delay | Min. 120 ms, Max. 340 ms |
| GOP structure | IP, IBP, IBBP |
| Encoding interval | 1 to 25 [30] ips |

## Video resolution (H x V)

| | |
|---|---|
| • 1080p HD | 1920 X 1080 |
| • 720p HD | 1280 x 720 |
| • D1 4:3 (cropped) | 704 x 480 |
| • SD upright (cropped) | 400 x 720 |
| • 480p SD | Encoding: 704 x 480; Displayed: 854 x 480 |
| • 432p SD | 768 x 432 |
| • 288p SD | 512 x 288 |
| • 240p SD | Encoding: 352 x 240; Displayed: 432 x 240 |
| • 144p SD | 256 x 144 |

## Audio streaming

| | |
|---|---|
| Standard | G.711, 8 kHz sampling rate L16, 16 kHz sampling rate AAC-LC, 48 kHz sampling rate AAC-LC, 80 kHz sampling rate |
| Signal-to-Noise Ratio | >50 dB |
| Audio Streaming | Full-duplex / half duplex |

## Local storage

| | |
|---|---|
| Internal RAM | 10 s pre-alarm recording |
| Memory card slot | Supports up to 32 GB microSDHC / 2 TB microSDXC card. (An SD card of Class 6 or higher is recommended for HD recording) |
| Recording | Continuous recording, ring recording. alarm/events/schedule recording |

## Network

| | |
|---|---|
| Protocols | IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, SNTP, SNMP (V1, MIB-II), 802.1x, DNS, DNSv6, DDNS, SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, Digest Authentication. |
| Encryption | TLS 1.0, SSL, DES, 3DES, AES (optional) |
| Ethernet | 10/100 Base-T, auto-sensing, half/full duplex |
| Ethernet connector | RJ45 |
| Connectivity | ONVIF Profile S, Auto-MDIX |

## Software

| | |
|---|---|
| Unit Configuration | Via web browser or Configuration Manager |
| Firmware update | Remotely programmable |
| Software viewer | Bosch Video Client |

## Input/output

| | |
|---|---|
| Analog Video out (service only) | CVBS (PAL/NTSC), 1 Vpp, BNC, 75 Ohm (non-protected) |
| Audio | 1 x mono line in, 1 x mono line out |
| • signal line in | 12 kOhm typical, 1 Vrms max |
| • signal line out | 1 Vrms at 1.5 kOhm typical, |
| Alarm | 1 input |
| • activation voltage | Tolerant from +5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor) |
| Alarm | 1 output |
| • voltage | 30 VAC or +40 VDC max. Maximum 0.5 A continuous, 10VA (resistive load only) |

## Lens

| | |
|---|---|
| Lens type | 10 to 23 mm Automatic Varifocal (AVF) SR lens |
| Infrared performance | IR corrected |
| Adjustment | Motorized zoom/focus |
| Iris control | Automatic iris control |
| Viewing angle (10 to 23 mm) | Wide: 34º x 18º (H x V) Tele: 14.8º x 8.3º (H x V ) |

| Night vision | |
|---|---|
| Distance | 120 m (394 ft) max. |
| LEDs | 7 High efficiency LED array with Variable Field Illumination |
| Beam Patterns (H x V) | Wide beam: 42° x 20° (with 3D diffuser) Narrow beam: 10° x 10° |
| Wavelength | 850 nm |
| Intensity Adjustment | 31 step adjustments from min. to max. |
| On/ Off control | Slave to camera mode Manual on/ off control via IP Interface |
| Illumination Tilt Adjustment | Maximum: 13° tilt above camera axis Minimum: 3° tilt above camera axis |

| Mechanical | |
|---|---|
| Dimensions (H x W x L) - Camera and Bracket | 402 x 193 x 309 mm (15.8 x 7.6 x 12.2 in.) |
| Dimensions (H x W x L) - Total Assembly | 402 x 193 x 406 mm (15.8 x 7.6 x 16.0 in.) |
| Weight- Camera without Junction Box | 6.6 kg (14.5 lb) |
| Weight- Junction Box | 1.4 kg (3.1 lb) |
| Construction | Corrosion-resistant aluminum |
| Color | RAL 9010 pure white with RAL 9005 jet black detail |
| Finish | Wet paint |
| Window | 3.3 mm (1/8-in.) thick glass |
| Bracket | Corrosion-resistant, cable-managed |
| Bracket Pan/Tilt Range | Pan: ±90° Tilt: -48°/+44° |
| Junction Box | Separate from bracket allowing for wiring and cabling prior to camera installation |

| Environmental | |
|---|---|
| Operating Temperature- +12V DC/ 24V AC* | −40°C to +50°C (−40°F to 122°F) |
| Operating Temperature- POE+* | −20°C to +50°C (−4°F to 122°F) |
| Storage Temperature | −40°C to +70°C (−40°F to 158°F) |
| Operating Humidity | 20% to 100% (condensing) |
| Storage Humidity | up to 100% |
| Weatherproofing | IP66 and NEMA 4X |
| Vandal proof | IK10 |
| Vibration | 10 to 150 Hz at 10 m/s$^2$ |

*Warm-up period required for cold start at −40°C (−40°F).

## Ordering information

**DINION IP imager 9000 HD**
High-performance integrated infrared IP camera. IP66; IK10; PoE; iDNR; ROI; IVA; H.264 quad-streaming; free viewing Apps; cloud services; varifocal 10 to 23 mm lens; day/night; 1080p; audio/motion detect; privacy mask
Order number **NAI-90022-AAA**

**Accessories**

**VG4-A-9541 Pole Mount Adapter**
Pole mount adapter for an AUTODOME pendant arm or a DINION imager, designed for poles with a diameter of 100-380 mm (4-15 in.), white
Order number **VG4-A-9541**

**VG4-A-9542 Corner Mount Adapter**
Corner mount adapter for an AUTODOME pendant arm or a DINION imager
Order number **VG4-A-9542**

**UPA-2450-60 Power Supply, 120 V, 60 Hz**
Indoor power supply for camera. 120 VAC, 60 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-60**

**UPA-2450-50 Power Supply, 220 V, 50 Hz**
Indoor power supply for camera. 220 VAC, 50 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-50**

**NPD-6001A High PoE Midspan 60W, single port, AC in**
High Power, 60 W Single Port PoE Midspan with AC in
Order number **NPD-6001A**

**PSU-124-DC050 Universal Power Supply**
Universal Outdoor Power Supply, Input: 120 to 230 VAC, 50/60 Hz; Output: 24 VDC, 50 W
Order number **PSU-124-DC050**

**PSU-224-DC100 Universal Power Supply**
Universal Outdoor Power Supply, Input: 120 to 230 VAC, 50/60 Hz; Output: 2 x 24 VDC, 96 W
Order number **PSU-224-DC100**

**Software Options**

**BVIP AES 128 Bit Encryption**
Single installation licence for BVIP AES 128-bit encryption site. Enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**