DINION IP imager 9000 HD

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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 (CBIT) 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 Analysis (IVA) 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 Auto Exposure 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.

Hybrid mode
An analog video output enables the camera to operate in hybrid mode. This mode provides simultaneous high resolution HD video streaming and an analog video output via a BNC connector. The hybrid functionality offers an easy migration path from legacy CCTV to a modern IP-based system.

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.

Intelligent Dynamic Noise Reduction reduces bandwidth and storage requirements
The camera uses Intelligent Dynamic Noise Reduction 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 50% 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
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, Intelligent Tracking can follow objects within the defined regions of interest. Intelligent Tracking can autonomously detect and track moving objects or the user can click on an object which the 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 free-of-charge Bosch Video Client, with the video security mobile app, or via third-party software.

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 Profile S specification. Compliance with this standard guarantees interoperability between network video products regardless of manufacturer.
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.

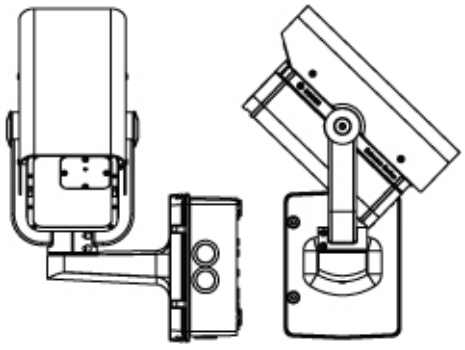
Certifications and approvals

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

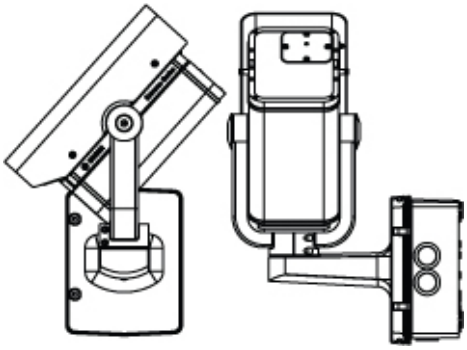
Region	Certification
Europe	CE
USA	UL

Installation/configuration notes

Canting Directions

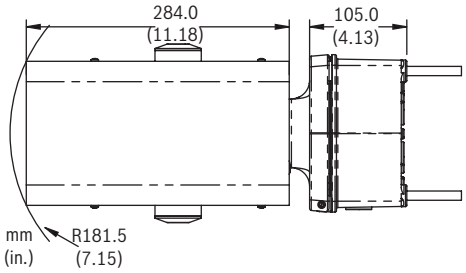


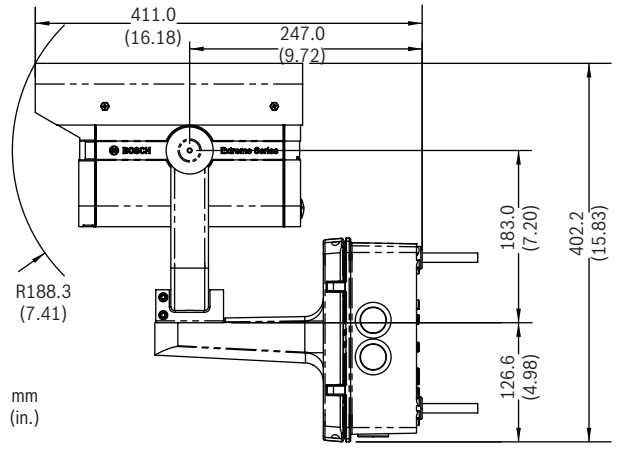
Camera Rotated 90° Left, Tilted 44° Up

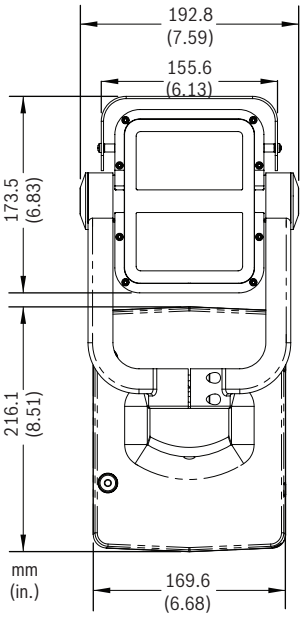


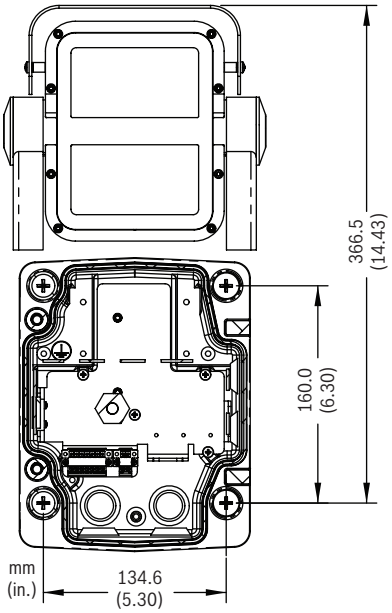
Camera Rotated 90° Right, Tilted 48° Down

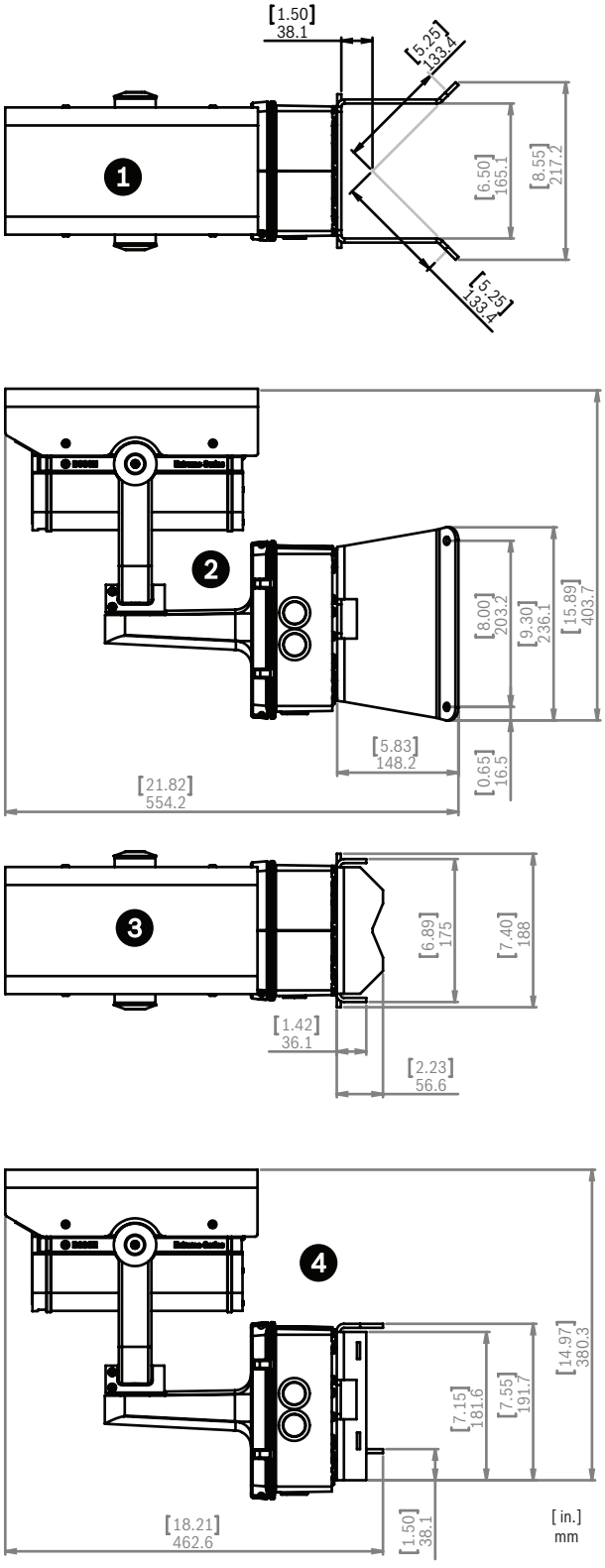
Dimensions





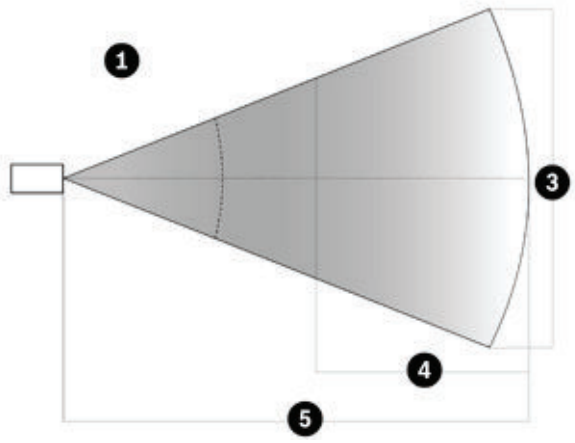


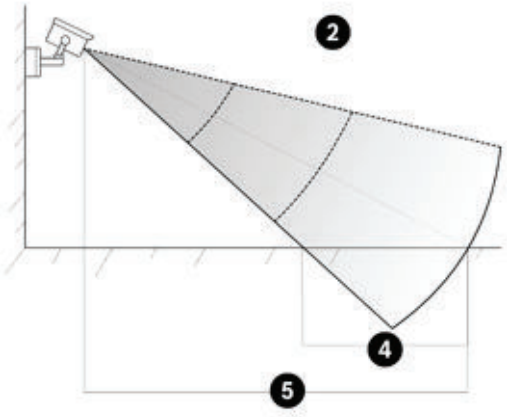




1	Corner Mount - Top	3	Pole Mount - Top
2	Corner Mount - Side	4	Pole Mount - Side

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)
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.

Parts included

Technical specifications

Power	
Power Supply	+12 ~ 24 VDC; 24 VAC; PoE+ (52 VDC nominal)
Power Consumption	2.25 A | 27 W (+12 VDC); 1.65 A | 28 VA (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
Backlight compensation	On, Off, Intelligent Auto Exposure
Noise reduction	Intelligent Dynamic Noise Reduction 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
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 kbps at 16 kHz sampling rate AAC-LC, 80 kbps at 16 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, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication
Encryption	TLS 1.0, SSL, DES, 3DES
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Connectivity	ONVIF Profile S , Auto-MDIX

Software	
Unit Configuration	Via web browser or Configuration Manager
Firmware update	Remotely programmable
Software viewer	Web browser, Bosch Video Client, or third party software

Input/output	
Analog Video out	CVBS (PAL/NTSC), 1 Vpp, BNC, 75 Ohm
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)

Input/output	
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

Mechanical	
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 +12~24 VDC/24 VAC*	–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)
Ambient temperature range in conformance with NEMA TS 2-2003 (R2008), section 2.1.5.1	-34 ºC to +74 ºC (-30 ºF to +165 ºF)
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**

High PoE Midspan, 60 W, 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**

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