

NDI-3512-AL Fixed dome 2MP HDR 3-9mm IR

FLEXIDOME IP 3000i IR



The FLEXIDOME IP 3000i IR is built for high quality, 24/7 performance, with a range of reliable surveillance features, including Essential Video Analytics, and is designed for easy installation. The built-in active infrared illuminator provides high performance in extreme low-light environments. The camera is for indoor use and has a resolution of 1080p.

System overview

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 is activated from the PC or from the on-board camera push button making it easy to choose the workflow that suits best.

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.

Easy to install stylish indoor dome

Ideal for indoor use, the stylish design is suitable for installations where appearance and flexible coverage are important. The varifocal lens allows you to choose the coverage area to best suit your application. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, and suspended-ceiling mounting.



- ▶ 1080p resolution indoor camera
- ▶ Built-in Essential Video Analytics to trigger relevant alerts and quickly retrieve data
- ▶ Easy to install with auto zoom/focus lens and wizard
- ▶ Fully configurable H.265 multi-streaming
- ▶ Built-in IR illuminator with 30 m (98 ft) viewing distance

Functions

Essential Video Analytics

The built-in video analysis reinforces the Intelligence-at-the-Edge concept and now delivers even more powerful features. Essential Video Analytics is ideal for use in controlled environments with limited detection ranges.

The system reliably detects, tracks, and analyzes objects, and alerts you when predefined alarms are triggered. A smart set of alarm rules makes complex tasks easy and reduces false alarms to a minimum. Metadata is attached to your video to add sense and structure. This enables you to quickly retrieve the relevant images from hours of stored video. Metadata can also be used to deliver irrefutable forensic evidence or to optimize business processes based on people counting or crowd density information. Calibration is quick and easy – just enter the height of the camera. The internal gyro/accelerometer sensor provides the rest of the information to precisely calibrate the video analytics.

High Dynamic Range

The camera has High Dynamic Range. This is based on a multiple-exposure process that captures more details in the highlights and in the shadows even in the same scene. The result is that you can easily distinguish objects and features, for example, faces with bright backlight.

The actual dynamic range of the camera is measured using Opto-Electronic Conversion Function (OECF) analysis according to IEC 62676 Part 5. This method is used to provide a standard result which can be used to compare different cameras.

Intelligent streaming reduces bandwidth and storage requirements

The low-noise image and the efficient H.265 compression technology provide clear images while reducing bandwidth and storage by up to 80% compared to standard H.264 cameras. With this new generation of cameras an extra level of intelligence is added with Intelligent Streaming. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio. The smart encoder continuously scans the complete scene as well as regions of the scene and dynamically adjust compression based on relevant information like movement. Together with Intelligent Dynamic Noise Reduction, which actively analyzes the contents of a scene and reduces noise artifacts accordingly, bitrates are reduced by up to 80%. Because noise is reduced at the source during image capture, the lower bitrate does not compromise image quality. This results in substantially lower storage costs and network strain and still retain a high image quality and smooth motion.

Bitrate optimized profile

The average typical optimized bitrate in kbits/s for various frame rates when in H.265 mode is shown in the table:

fps	1080p
30	600
12	438
5	284
2	122

Multiple streams

The multi-streaming feature delivers various H.264 or H.265 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.

The camera can run multiple independent streams that allows to set a different resolution and frame rate on the first and second stream. The user can also choose to use a copy of the first stream.

The third stream uses the I-frames of the first stream for recording; the fourth stream shows a JPEG image at a maximum of 10 Mbit/s.

Two-way audio and audio alarm

Two-way audio allows the operator to communicate with visitors or intruders via an external audio line input and output. Audio detection can be used to generate an alarm if needed.

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.

Recording and storage management

Recording management can be controlled by the Bosch Video Recording Manager application 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. 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.

Easy installation

Power for the camera can be supplied via a Power-over-Ethernet compliant network cable connection. With this configuration, only a single cable connection is required to view, power, and control the camera. Using PoE makes installation easier and more cost-effective, as cameras do not require a local power source.

The camera can also be supplied with power from +12 VDC/24 VAC power supplies. To increase system reliability, the camera can be simultaneously connected to both PoE and +12 VDC/24 VAC supplies. Additionally, uninterruptible power supplies (UPS) can be used, which will allow continuous operation, even during a power failure.

For trouble-free network cabling, the camera supports Auto-MDIX which allows the use of straight or cross-over cables.

Automatic image rotation

The integrated gyro/accelerometer sensor automatically corrects the image orientation in steps of 90° if the camera is mounted at right angles or upside down. The sensor image can also be rotated manually through steps of 90°.

To efficiently capture details in long hallways without loss of resolution, mount the camera at right angles. The image is displayed upright at full resolution on your monitor.

True day/night switching

The camera incorporates mechanical filter technology for vivid daytime color and exceptional night-time imaging while maintaining sharp focus under all lighting conditions.

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 an SMB connector. The hybrid functionality offers an easy migration path from legacy CCTV to a modern IP-based system.

DORI coverage

DORI (Detect, Observe, Recognize, Identify) is a standard system (EN-62676-4) for defining the ability of a camera to distinguish persons or objects within a covered area. The maximum distance at which a camera/lens combination can meet these criteria is shown below:

1080p camera with 3-9 mm lens

DORI	DORI definition	Distance	Horizontal width
		9 mm / 3 mm	
Detect	25 px/m	32 m / 126 m	77 m 252 ft
	8 px/ft	104 ft / 412 ft	
Observe	63 px/m	13 m / 50 m	30 m 100 ft
	19 px/ft	41 ft / 164 ft	
Recognize	125 px/m	6 m / 25 m	15 m 50 ft
	38 px/ft	21 ft / 82 ft	
Identify	250 px/m	3 m / 13 m	8 m 25 ft
	76 px/ft	10 ft / 41 ft	

Data security

Special measures have been put in place to ensure the highest level of security for device access and data transport. The three-level password protection with security recommendations allows users to customize device access. Web browser access can be protected using HTTPS and firmware updates can also be protected with authenticated secure uploads. The on-board Trusted Platform Module (TPM) and Public Key Infrastructure (PKI) support, guarantee superior protection from malicious attacks. The 802.1x network authentication with EAP/TLS, supports TLS 1.2 with updated cipher suites including AES 256 encryption.

The advanced certificate handling offers:

- Self-signed unique certificates automatically created when required
- Client and server certificates for authentication
- Client certificates for proof of authenticity
- Certificates with encrypted private keys

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 or Video Security Client, with the video security mobile app, or via third-party software.

System integration

The camera conforms to the ONVIF Profile G, ONVIF Profile M, ONVIF Profile S, and ONVIF Profile T specifications. This guarantees interoperability between network video products regardless of manufacturer.

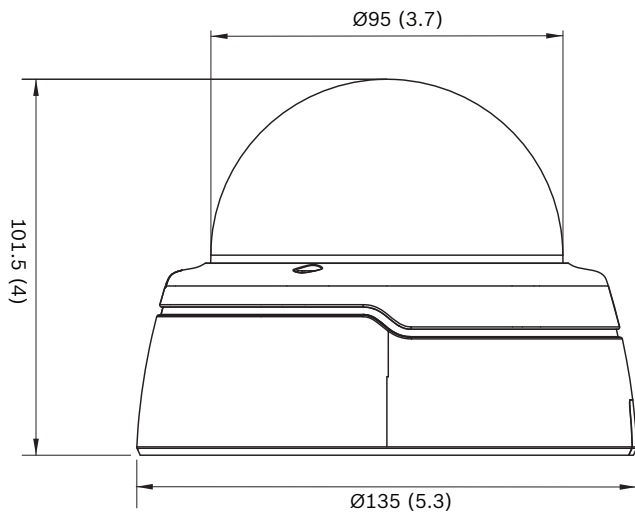
Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Integration Partner Program (IPP) website (ipp.boschsecurity.com) for more information.

Regulatory information

Type	Standards
	IEC 62471
	EN 62368-1
	UL 62368-1
	CSA C22.2 NO. 62368-1:14
	EN 50130-4
	EN 50130-5, Class II (indoor in general, fixed equipment)
	FCC Part15 Subpart B, Class B
	EMC directive 2014/30/EU
	EN 55032 class B
	AS NZS CISPER 32:2015+AMD 1:2020
	ICES-003 Class B
	VCCI CISPER 32:2016
	EN 50121-4:2016
ONVIF compliance	EN 50132-5-2; IEC 62676-2-3
Product certifications	CE, FCC, UL, cUL, RCM, VCCI, CMIM, KCC, BIS, UKCA

Region	Regulatory compliance/quality marks
Great Britain	UKCA
Europe	CE

Installation/configuration notes



Dimensions in mm (inch)

Parts included

Quantity	Component
1	Camera
1	Quick installation guide
1	Safety and security information
1	Camera screw kit
1	Installation template

Technical specifications

Electrical

Input voltage (VDC)	12 VDC \pm 5%
Input voltage (VAC)	24 VAC \pm 10%
PoE nominal voltage (VDC)	48 VDC
Power consumption VDC (W)	10.8 W max.
Power consumption VAC (W)	8.75 W max.
Power consumption PoE (W)	9.2 W max.
PoE input	PoE IEEE 802.3af / 802.3at Type 1, Class 3

Platform

Common Product Platform	CPP7.3
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Sensor

Sensor type	1/2.8 inch CMOS
Effective pixels (H x V)	1920 x 1080

Sensitivity

Measured according to IEC 62676 Part5(1/25, F1.3)	
Color (lx)	0.05 lx
Monochrome (lx)	0.01 lx
With IR (lx)	0.0 lx

Dynamic range

High Dynamic Range (HDR) (dB)	120 dB
Measured according to IEC 62676 Part 5 (dB)	103 dB

Video streaming

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG; H.265/HEVC
Streaming	Multiple configurable streams in H.265; H.264 and M-JPEG; Configurable framerate and bandwidth; Region of Interest (ROI)
Camera processing latency	<120ms (max. average at 1080p30)
GOP structure	IP; IBP; IBBP
Encoding interval (ips)	1 ips – 25 ips (30)
Encoding regions	Up to 8 areas with encoder quality settings per area
Video signal-to-noise ratio (dB)	>55 dB

Video resolution

1080p HD	1920 x 1080
Upright mode 1080p	1080 x 1920
1.3 MP (16:9)	1536 x 864
Upright mode 1.3 MP (16:9)	864 x 1536
720p	1280 x 720
Upright mode 720p	720 x 1280
480p SD	640 x 480

SD	768 × 432
D1	720 × 480

Video functions

Day/night modes	Auto (adjustable switch points); Color; Monochrome
Camera functionality	Mirror image; Flip image; Backlight compensation (BLC); Intelligent dynamic noise reduction; Contrast enhancement; Pixel counter; Saturation; Brightness; Video watermarking; Display stamping; Location
White balance (K)	2500 K – 10000 K
White balance modes	Basic; Standard; Sodium vapor; Dominant color; Manual mode; Hold mode; 4 automatic modes
Shutter modes	Automatic Electronic Shutter (AES); 1/25 min; 1/15,000 max; Default shutter; 1/30 min
Backlight compensation	On/Off
Contrast enhancement	On/Off
Noise reduction	Intelligent Dynamic Noise Reduction with separate temporal and spatial adjustments
Number of privacy masks	8 independent areas, fully programmable
Camera rotation	Automatic detection with manual override (0° / 90° / 180° / 270°)

Video content analysis

Analysis type	Essential Video Analytics
Alarm triggers	Line crossing; Enter / leave field; Loitering; Follow route; Idle / removed object; Crowd density estimation; 3D tracking; Rule based alarms and tracking, People counting
Tamper detection	Maskable
Audio detection	Detection of audio to generate an alarm

Night vision

Built-in IR (m)	30 m
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Built-in IR (ft)	98 ft
Number of IR LEDs	10, high efficiency array
Wavelength (nm)	850 nm
IR intensity	Manually adjustable

Optical

Lens focal length (mm)	3 mm – 9 mm Automatic Varifocal (AVF) lens
Lens aperture (/F)	1.3 /F
Lens mounting	Board
Zoom/focus control	Motorized
Iris control	Automatic; DC-iris
Day/Night	Switched mechanical IR filter
Horizontal field of view	106° - 37°
Vertical field of view	55° - 21°

Inputs and outputs

Analog video out	SMB connector, CVBS (PAL/NTSC), 1 Vpp, 75 Ohm, approx. 500 TVL
Audio line in	0.707 Vrms max., 10 kOhm typical
Audio line out	0.707 Vrms at 16 Ohm typical
Alarm inputs	1
Alarm input activation	Short or DC 5V activation
Alarm outputs	1
Alarm output voltage	30 VDC, max. load 0.5 A
Ethernet	Shielded RJ45

Audio

Compression and sampling rate	G.711 8 kHz; L16 16 kHz; AAC-LC 80kbps 16 kHz; AAC-LC 48kbps 16 kHz
Signal-to-Noise Ratio	>50 dB
Audio streaming	Full duplex; Half duplex

Storage

Internal storage	5-s-pre-alarm-recording
Memory card slot	Micro SDHC; Micro SDXC
Memory card capacity	Micro SDHC: up to 32 GB; Micro SDXC: up to 2 TB
HD recordings	A memory card of Class 6 or higher is recommended
Recording mode	Continuous (ring); Scheduled; Alarm; Event

System integration

Protocols / standards	IPv4; IPv6; UDP; TCP; HTTP; HTTPS; RTP/RTCP; IGMP V2/V3; ICMP; ICMPv6; RTSP; FTP; ARP; DHCP; APIPA (Auto-IP, link local address); NTP (SNTP); SNMP (V1, MIBII); SNMP (V3, MIBII); DNS; DNSv6; DDNS (DynDNS.org, selfHOST.de, no-ip.com); SMTP; iSCSI; UPnP (SSDP); DiffServ (QoS); LLDP; SOAP; CHAP; Digest authentication; 802.1x
Conformity	ONVIF Profile S; ONVIF Profile G; ONVIF Profile T; Auto-MDIX; ONVIF Profile M

Data security

Encryption	TLS 1.2; TLS 1.0; AES 256; AES 128
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Network

Ethernet type	10/100BASE-T; Auto-sensing; Full / half duplex
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Mechanical

3-axis adjustment (pan/tilt/rotation)	350° / 130° / 350°
Dimensions (Ø x H) (mm)	135 mm x 105 mm
Dimensions (Ø x H) (in)	5.32 in x 4 in
Weight (g)	450 g
Weight (lb)	0.99 lb
Color	White; Black
Color in RAL	RAL 9003 Signal white; RAL 9017 Traffic black

Bubble material	Clear polycarbonate
Coating type	Clear with anti-scratch coating

Environmental

Operating temperature (°C)	0 °C – 50 °C
Operating temperature (°F)	32 °F – 122 °F
Storage temperature (°C)	-30 °C – 70 °C
Storage temperature (°F)	-22 °F – 158 °F
Operating relative humidity, non-condensing (%)	5% – 93%
Country of origin	Portugal

Ordering information**NDI-3512-AL Fixed dome 2MP HDR 3-9mm IR**

Fixed dome indoor camera with 2 MP resolution; Essential Video Analytics; integrated IR illuminator NDAA and TAA compliant.

Order number **NDI-3512-AL | F.01U.412.977**

Accessories**BUB-CLR-FDI Bubble, clear, indoor**

Clear polycarbonate bubble for dome camera Indoor

Order number **BUB-CLR-FDI | F.01U.319.963**

BUB-TIN-FDI Bubble, tinted, indoor

Tinted polycarbonate bubble for dome camera. Indoor

Order number **BUB-TIN-FDI | F.01U.319.961**

NBN-MCSMB-03M Cable, SMB to BNC, camera-cable, 0.3m

0.3 m (1 ft) analog cable, SMB (female) to BNC (female) to connect camera to coaxial cable

Order number **NBN-MCSMB-03M | F.01U.291.564**

NBN-MCSMB-30M Cable, SMB to BNC, camera-monitor/DVR

3 m (9 ft) analog cable, SMB (female) to BNC (male) to connect camera to monitor or DVR

Order number **NBN-MCSMB-30M | F.01U.291.565**

NDA-5031-PIP Pendant interface plate NDI-4/5000

Pendant interface plate for indoor FLEXIDOME IP 4000i / 5000i.

Order number **NDA-5031-PIP | F.01U.329.708**

NDA-ADT4S-MINDOME Surface mount box for dome camera

Surface mount box (Ø145 mm / Ø5.71 in) for dome cameras (for indoor camera variant, use together with NDA-ADTVEZ-DOME).

Order number **NDA-ADT4S-MINDOME | F.01U.285.200**

NDA-ADTVEZ-DOME Adapter bracket for dome

Adapter bracket for indoor use (for indoor camera variant, use together with NDA-ADT4S-MINDOME).

Order number **NDA-ADTVEZ-DOME | F.01U.303.769**

NDA-FMT-DOME Inceiling flush mount for dome camera

In-ceiling flush mounting kit for dome cameras (Ø157 mm)

Order number **NDA-FMT-DOME | F.01U.303.768**

NDA-SMB-MINISMB Surface mount box for dome camera 5.87"

Surface mount box (Ø149 mm / Ø5.87 in)

Order number **NDA-SMB-MINISMB | F.01U.299.795**

NDA-U-CMT Corner mount adapter

Universal corner mount, white

Order number **NDA-U-CMT | F.01U.324.946**

NDA-U-PMAL Pole mount adapter large

Universal pole mount adapter, white; large

Order number **NDA-U-PMAL | F.01U.324.944**

NDA-U-PMAS Pole mount adapter small

Pole mount adapter small

Universal pole mount adapter, white; small.

Order number **NDA-U-PMAS | F.01U.324.943**

NDA-U-PMT Pendant pipe mount, 12" (31cm)

Universal pipe mount for dome cameras, 31 cm, white

Order number **NDA-U-PMT | F.01U.324.940**

NDA-U-PMTE Pendant pipe extension, 20" (50cm)

Extension for universal pipe mount, 50 cm, white

Order number **NDA-U-PMTE | F.01U.324.941**

NDA-U-PSMB Pendant wall/ceiling mount SMB

Surface mount box (SMB) for wall mount or pipe mount.

Order number **NDA-U-PSMB | F.01U.324.942**

NDA-U-WMT Pendant wall mount

Universal wall mount for dome cameras, white

Order number **NDA-U-WMT | F.01U.324.939**

NPD-5001-POE Midspan, 15W, single port, AC in

Power-over-Ethernet midspan injector for use with PoE enabled cameras; 15.4 W, 1-port

Weight: 200 g (0.44 lb)

Order number **NPD-5001-POE | F.01U.305.288**

NPD-5004-POE Midspan, 4 port x 15W, AC in

Power-over-Ethernet midspan injector for use with PoE enabled cameras; 15.4 W, 4-ports

Weight: 620 g (1.4 lb)

Order number **NPD-5004-POE | F.01U.305.289**

UPA-1220-60 Power supply, 120VAC 60Hz,12VDC 1A out

Power supply for camera. 100-240 VAC, 50/60 Hz In; 12 VDC, 1 A Out; regulated.

Input connector: 2-prong, North American standard (non-polarized).

Order number **UPA-1220-60 | F.01U.076.155**

VEZ-A2-WW Wall mount for PTZ dome, white

Wall mount (Ø145/149 mm) for dome cameras (use together with appropriate dome adapter bracket); white

Order number **VEZ-A2-WW | F.01U.100.210**

NDA-LWMT-DOME Wall mount, L-shaped, for dome camera

Sturdy wall L-shaped bracket for dome cameras

Order number **NDA-LWMT-DOME | F.01U.303.767**

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