

FLEXIDOME IP panoramic 6000 IC

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BOSCH
Invented for life



- ▶ 12MP / 30 fps sensor for fine details with smooth motion
- ▶ Discreet and aesthetic in-ceiling design
- ▶ Easily painted for unobtrusive installation
- ▶ Edge or client-side dewarping for easy integration
- ▶ Built-in Essential Video Analytics to trigger relevant alerts and quickly retrieve data

This discreet, aesthetic camera mounts flush in a ceiling or wall. Its easily-painted cover plate blends in with almost all surroundings. The 12MP sensor operating at 30 fps provides full panoramic surveillance with complete area coverage, fine details and high speeds. The camera offers full situational awareness and simultaneous E-PTZ views in high resolution.

Versions

The 360° version of the camera, when mounted centrally on a ceiling, gives complete wall-to-wall coverage. The 180° version has a higher effective resolution and is ideal for wall mounting or for ceiling mounting in corridors.

Dewarping

The lens captures a circular image. Our dewarping software transforms this circular image into several different distortion-free rectangular views. To facilitate system integration, you can choose edge dewarping inside the camera or client-side dewarping on an external platform.

The freely available Video Security Client from Bosch provides advanced client-side dewarping features.

System overview

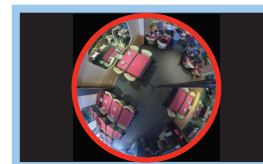
Advantages of panoramic surveillance

Panoramic surveillance offers full 180° or 360° coverage of the designated area. Because our panoramic cameras cover the full area, they provide complete situational awareness and are ideally suited to following movement in one continuous sweep.

180°



360°



Functions

12MP sensor at 30 fps

The ultra high 12MP sensor resolution together with the exceptionally high frame rate of 30 fps makes this camera unique in the field of panoramic image capture. Motion is smoother and the E-PTZ feature provides more detailed images.

The effective resolution for the 180° version is 8MP and for the 360° version 7MP.

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.

Client-side dewarping

With client-side dewarping, the camera streams a single circular non-dewarped image at 30 fps. Dewarping is performed with our dewarping software that is installed on the PC where multiple view modes are available or you can choose to use a third-party client-side dewarping software solution.

Edge dewarping

The edge dewarping in the camera provides three separate video channels simultaneously at 12.5 fps:

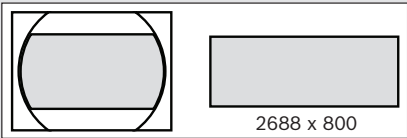
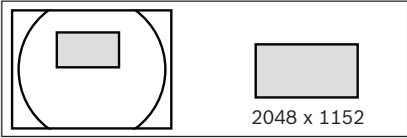
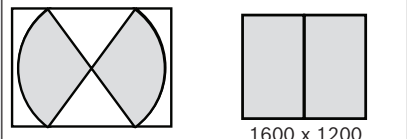
- Full image circle (Video 1 channel)
- Dewarped view mode (Video 2 channel)
- E-PTZ (Video 3 channel)

Different view modes can be selected for the video 2 channel. Your selection depends on the resolution you require and how you wish to view the dewarped image.

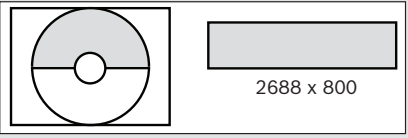
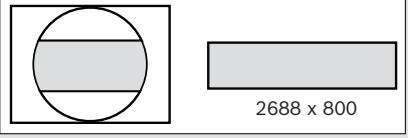
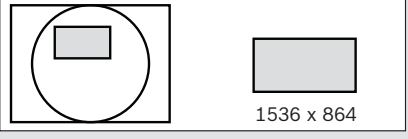
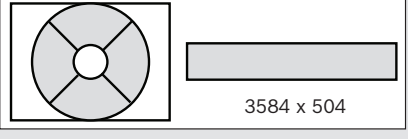
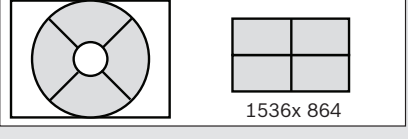
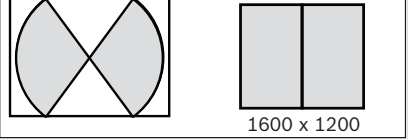
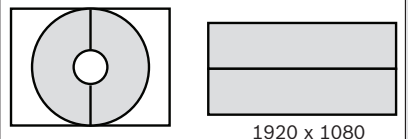
View modes

The following view modes can be selected at 12.5 fps with edge dewarping or 30 fps with our client side dewarping.

With the 180° lens version, you can select one of the following view modes for the second channel:

180° lens version	Full image cut-out and displayed image
Panoramic view	 2688 x 800
E-PTZ view	 2048 x 1152
Corridor view	 1600 x 1200

With the 360° lens version, select one of the following view modes for the second channel:

360° lens version	Full image cut-out and displayed image
Panoramic view (ceiling mount)	 2688 x 800
Panoramic view (wall mount)	 2688 x 800
E-PTZ view	 1536 x 864
Full panoramic view	 3584 x 504
Quad view	 1536x 864
Corridor view	 1600 x 1200
Double panoramic view	 1920 x 1080

DORI coverage

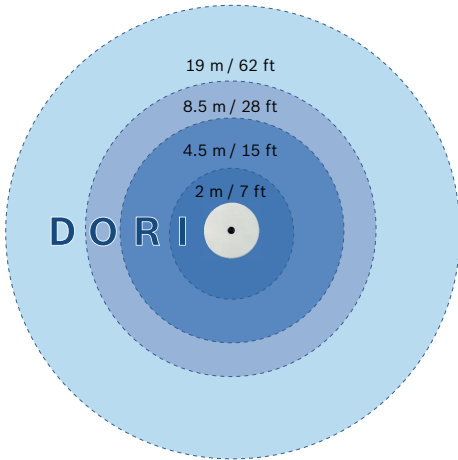
DORI (Detect, Observe, Recognize, Identify) is a standard system (EN-62676-4) for defining the ability of a camera to distinguish persons or objects within a covered area. The maximum distance at which a camera/lens combination can meet these criteria is shown below:

For high mounting applications, the center image DORI values are:

DORI	Object distance - 180°	Object distance - 360°
Detect	55 m (181 ft)	42 m (138 ft)
Observe	22 m (72 ft)	16.5 m (54 ft)
Recognize	10.5 m (35 ft)	8.5 m (28 ft)
Identify	5.5 m (18 ft)	4 m (13 ft)

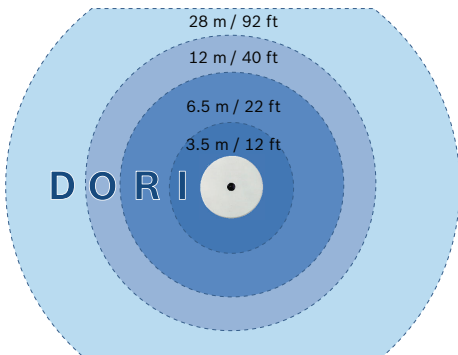
When mounted at a height of 3 m (10 ft) the 360° version of the camera has the following coverage radius for the four levels:

DORI	DORI definition	Coverage radius
Detect	25 px/m (8 px/ft)	19 m (62 ft)
Observe	63 px/m (19 px/ft)	8.5 m (28 ft)
Recognize	125 px/m (38 px/ft)	4.5 m (15 ft)
Identify	250 px/m (76 px/ft)	2 m (7 ft)



When mounted at a height of 3 m (10 ft) the 180° version of the camera has the following coverage radius for the four levels:

DORI	DORI definition	Coverage radius
Detect	25 px/m (8 px/ft)	28 m (92 ft)
Observe	63 px/m (19 px/ft)	12 m (40 ft)
Recognize	125 px/m (38 px/ft)	6.5 m (22 ft)
Identify	250 px/m (76 px/ft)	3.5 m (12 ft)



E-PTZ and regions of interest

The remote E-PTZ (Electronic Pan, Tilt and Zoom) controls allow you to select specific areas of the full image circle. These Regions of Interest (ROI) can be easily defined, allowing the most interesting part of a

scene to be monitored separately. The high resolution ensures that details are not lost even when using the electronic zoom.

The E-PTZ feature of a panoramic camera has some advantages over normal PTZ cameras. There is no camera movement so the camera does not draw attention to itself or appear intrusive. Situational awareness is still retained even when zooming in on a particular object of interest. The smooth E-PTZ function helps navigation, and presets are available as they are with regular PTZ cameras.

Record exactly what you want

The camera provides the full resolution circular image for recording even if you are viewing only a portion of the scene. This means that you can always perform retrospective dewarping and analyses on the complete area covered and then zoom in on the region or object of interest.

With edge-dewarping you can also choose to only record the relevant parts of the scene which helps reduce bitrates significantly.

Intelligent Dynamic Noise Reduction

Quiet scenes with little or no movement require a lower bitrate. By intelligently distinguishing between noise and relevant information, Intelligent Dynamic Noise Reduction reduces bitrate by up to 50%.

Because noise is reduced at the source during image capture, the lower bitrate does not compromise on video quality.

Intelligent Dynamic Noise Reduction adjusts spatial and temporal filtering (3DNR) based on intelligent analysis of the scene content. Motion compensated temporal filtering (MCTF) reduces motion blur normally associated with standard temporal filtering. This maintains image quality of fast moving objects while still optimizing bitrate.

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. Area-based encoding is only available with client-side dewarping.

Bitrate optimized profile

The average typical optimized bandwidth in kbits/s for various image rates is shown in the table:

fps	12MP (full image circle)	Dewarped ROI (720p)
30	6000	-
25	5678	-
20	5285	-
15	4777	-
12.5	4456	855

fps	12MP (full image circle)	Dewarped ROI (720p)
10	4062	750
5	2839	550
2	1223	237

Measured dynamic range

The dynamic range of the camera is outstanding and is obvious in real-world performance comparisons – 92 dB wide dynamic range (plus an extra 16 dB when combined with Intelligent Auto Exposure).

The actual dynamic range of the camera is measured using Opto-Electronic Conversion Function (OECF) analysis with a standardized test chart based on ISO standards. This method provides more realistic and verifiable results in comparison with the theoretical approximations sometimes used.

Priority exposure control

To optimize image quality, eight zones for measuring the exposure can be drawn on the full image circle and assigned a priority level. These zones are given a higher or lower priority when the camera calculates the exposure level. This ensures that the important areas of the scene have the ideal exposure level.

Intelligent Auto Exposure

Fluctuations in backlight and front light can ruin your images. To achieve the perfect picture in every situation, Intelligent Auto Exposure automatically adjusts the exposure of the camera. It offers superb front light compensation and incredible backlight compensation by automatically adapting to changing light conditions.

Flush-mount design for easy unobtrusive installation

The flat-profile design of the camera makes it exceedingly suitable for installations where unobtrusive surveillance is required. The thin cover plate fits flush with any mounting surface, and its e-coating is easily painted to blend with most surroundings.

The discreet high quality IR corrected lens is factory focused and is not restricted by a bubble, so installation is simplified and sharpness is assured. Power for the camera is 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.

Scene modes

The camera has a very intuitive user interface that allows fast and easy configuration. Nine configurable modes are provided with the best settings for a variety of applications. Different scene modes can be selected for day or night situations.

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

Insert a memory card into the card slot to store up to 2 TB of local alarm recording. Pre-alarm recording in RAM reduces recording bandwidth on the network, and extends the effective life of the memory card.

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.

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. The Video Security Client has extensive dewarping capabilities and can be used for client-side dewarping as well as for viewing the available modes.

System integration

The camera conforms to the ONVIF Profile S, ONVIF Profile Q and ONVIF Profile G specifications. Compliance with these standards 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.

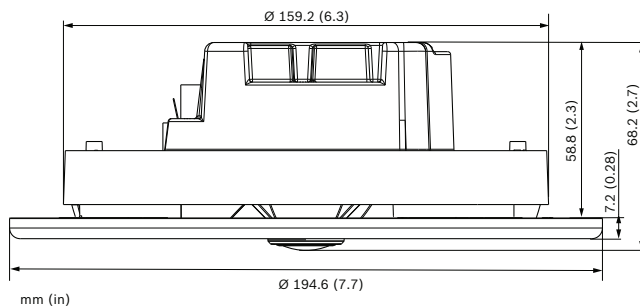
Certifications and approvals

Standards	
Emission	EN 50121-4:2006, +AC:2008; EN 55022: 2010, +AC (2011), Class B; CFR 47 FCC part 15:2012-10-1, Class B;
Immunity	EN 50121-4:2006, +AC:2008; EN 50130-5:2011*

Standards	
Safety	EN 60950-1:2006, +A11:2009, +A1:2010, +A12:2011, AC:2011; UL 60950-1, 2nd edition:2011; CAN/CSA-C 22.2 No. 60950-1-07, 2nd edition
Environmental tests	EN 50130-4:2011, Class II (Indoor in general, fixed equipment), Alarm systems - Part 5: Environmental test methods
Environmental	EN 50581 (2012)
Marks	CE, cULus, WEEE, PADS, RCM and China RoHS

* All systems where this camera is used must comply with this standard as well.

Installation/configuration notes



Technical specifications

Power	
Power Supply	Power-over-Ethernet 48 VDC nominal
PoE	IEEE 802.3af (802.3at Type 1)
Current draw (PoE)	140 mA max.
Sensor	
Type	1/2.3-inch CMOS
Total sensor pixels	12MP
Used pixels (180° version)	3648 x 2160 (8MP)
Used pixels (360° version)	2640 x 2640 (7MP)
Video performance – Sensitivity – 360° lens	
(3100K, reflectivity 89%, F2.8, 30IRE)	
Color	0.55 lx
Mono	0.18 lx

Video performance – Sensitivity – 180° lens		
(3100K, reflectivity 89%, F2.8, 30IRE)		
Color	0.46 lx	
Mono	0.15 lx	
Video performance – Dynamic range		
Dynamic range	92 dB WDR (+16 dB IAE)	
Video streaming		
Video compression	H.264 (MP); M-JPEG	
Streaming	Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth. Multiple channels with edge dewarping. Regions of Interest (ROI)	
Overall IP Delay	Min. 120 ms, Max. 340 ms	
Encoding interval	1 to 25 [30] ips	
Encoder regions	Eight independent areas for setting encoder quality to optimize bitrate.	
Video resolution (H x V) – 180° version		
Video 1 channel	Image circle	3640 x 2160
Video 2 channel	Panoramic	2688 x 800
	E-PTZ	2048 x 1152
	Corridor	1600 x 1200
Video 3 channel	E-PTZ	1280 x 720
Video resolution (H x V) – 360° version		
Video 1 channel	Full image circle	2640 x 2640
Video 2 channel	Full panoramic	3584 x 504
	E-PTZ	1536 x 864
	Quad	1536 x 864
	Panoramic	2688 x 800
	Double panoramic	1920 x 1080
	Corridor	1600 x 1200
Video 3 channel	E-PTZ	1280 x 720
Video functions - color		
Adjustable picture settings	Contrast, Saturation, Brightness	
White Balance	2500 to 10000K, 4 automatic modes (Basic, Standard, Sodium vapor, Dominant color), Manual mode and Hold mode	

Video functions - ALC	
ALC level	Adjustable
Saturation	Adjustable from peak to average
Shutter	Automatic Electronic Shutter (AES); Fixed shutter (1/25[30] to 1/15000) selectable; Default shutter
Day/Night	Auto (adjustable switch points), Color, Monochrome

Video functions - enhance	
Sharpness	Sharpness enhancement level selectable
Backlight compensation	On/off
Contrast enhancement	On/off
Noise reduction	Intelligent Dynamic Noise Reduction with separate temporal and spatial adjustments
Intelligent defog	Intelligent Defog automatically adjusts parameters for best picture in foggy or misty scenes (switchable)

Video content analysis	
Analysis type	Essential Video Analytics
Configurations	Silent VCA / Profile1/2 / Scheduled / Event triggered
Alarm rules (combinable)	Any object Object in field Line crossing Enter / leave field Loitering Follow route Idle / removed object Counting Occupancy Crowd density estimation Condition change Similarity search
Object filters	Duration Size Aspect ratio Speed Direction Color Object classes (4)
Tracking modes	Standard (2D) tracking 3D tracking 3D people tracking Museum mode
Calibration / Geolocation	Automatic based on gyro / accelerometer data and camera height

Video content analysis	
Tamper detection	Maskable
Detection	Audio

Additional functions	
Scene modes	Nine default modes, Scheduler
Privacy Masking	Eight independent areas, fully programmable
Video authentication	Off / Watermark / MD5 / SHA-1 / SHA-256
Display stamping	Name; Logo; Time; Alarm message
Pixel counter	Selectable area

Optical	
Lens (180° version)	2.1 mm fixed-focus lens (IR corrected), F2.8
Lens (360° version)	1.6 mm fixed-focus lens (IR corrected), F2.8
Lens mount	Board mounted
Iris control	Fixed iris
Field of view (180° version)	180° (H) x 93° (V)
Field of view (360° version)	180° (H) x 180° (V)
Minimum object distance	0.1 m
Day/Night	Switched mechanical IR filter

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

Software	
Unit discovery	IP Helper
Unit configuration	Via web browser or Configuration Manager
Firmware update	Remotely programmable
Software viewing	Web browser; Video Security Client; Video Security App; Bosch Video Management System; Bosch Video Client; or third party software
Latest firmware and software	http://downloadstore.boschsecurity.com/

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 1.2, SSL, DES, 3DES
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Connectivity	Auto-MDIX
Interoperability	ONVIF Profile S; GB/T 28181

Mechanical	
Dimensions camera	Ø195 x 68.2 mm (7.68 x 2.68 in)
Dimensions flush profile	Ø195 x 7 mm (7.68 x 0.28 in)
Weight	761 g (1.68 lb)

Environmental	
Operating Temperature	-20°C to +40°C (-4°F to 104°F)
Storage Temperature	-20°C to +60°C (-4°F to 140°F)
Operating humidity	20% to 93% RH
Storage humidity	up to 98% RH
Vandal resistance	IK06 (Lens: IK04)

Ordering information

FLEXIDOME IP panoramic 6000 IC

Flush-mount, high-performance 12MP sensor camera with paintable cover for unobtrusive intelligent panoramic surveillance.

Essential Video Analytics

180° lens

Order number **NFN-60122-F1**

FLEXIDOME IP panoramic 6000 IC

Flush-mount, high-performance 12MP sensor camera with paintable cover for unobtrusive intelligent panoramic surveillance.

Essential Video Analytics

360° lens

Order number **NFN-60122-F0**

Accessories

NPD-5001-POE Midspan PoE Injector

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

Order number **NPD-5001-POE**

NPD-5004-POE Midspan PoE Injector

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

Order number **NPD-5004-POE**

VDA-PLEN-DOME In-ceiling Housing for Plenums

In-ceiling housing for plenums kit for several series of Bosch dome cameras

Order number **VDA-PLEN-DOME**

Represented by:

Europe, Middle East, Africa:
Bosch Security Systems B.V.
P.O. Box 80002
5600 JB Eindhoven, The Netherlands
Phone: + 31 40 2577 284
emea.securitysystems@bosch.com
emea.boschsecurity.com

Germany:
Bosch Sicherheitssysteme GmbH
Robert-Bosch-Ring 5
85630 Grasbrunn
Germany
www.boschsecurity.com

North America:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
onlinehelp@us.bosch.com
www.boschsecurity.us

Asia-Pacific:
Robert Bosch (SEA) Pte Ltd, Security Systems
11 Bishan Street 21
Singapore 573943
Phone: +65 6571 2808
Fax: +65 6571 2699
apr.securitysystems@bosch.com
www.boschsecurity.asia