FLEXIDOME IP panoramic 7000 IC

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BOSCH
Invented for life

▶ 12MP / 30 fps sensor for fine details with smooth motion

▶ Edge or client-side dewarping for easy integration

▶ Intelligent Video Analysis on full panoramic overview

▶ Discreet and aesthetic, in-ceiling design

▶ Easily painted for unobtrusive installation

The FLEXIDOME IP panoramic 7000 IC is a discreet, aesthetic camera that 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.

Lens 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.
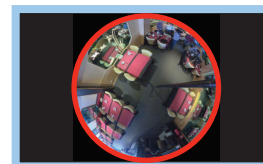
System overview

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°

These panoramic cameras will considerably augment the functionality of any high-end surveillance system especially when coupled with IVA (Intelligent Video Analysis), for example, for people counting or complex rule-based alarm triggering.
IVA continuously monitors the full image circle so you still receive alarms even if you are zoomed-in on a particular region.

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.

Intelligent Video Analytics

The built-in video analytics is both robust and intelligent. The Intelligence-at-the-Edge concept now delivers even more powerful features:

- Simple calibration
- False alarm reduction
- Extended range identification
- Crowd and queue management
- Density and flow counting

The mission critical video analytics reliably detects, tracks, and analyzes objects, and alerts you when predefined alarms are triggered. A smart set of alarm rules, together with object filters and tracking modes, makes complex tasks easy.

The system is also extremely robust and is able to reduce false alarms, for example from foliage or shaking objects, even in harsh weather conditions. IVA also adds sense and structure to your video by adding metadata. Metadata is generated from the full image circle and also separately on the E-PTZ channel. 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.

Essential Analytics

The built-in video analysis reinforces the Intelligence-at-the-Edge concept and now delivers even more powerful features. Essential 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

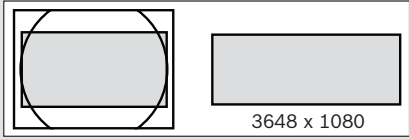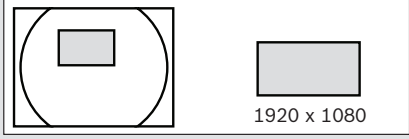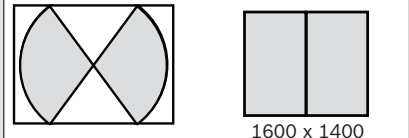The edge dewarping in the camera provides three separate video channels simultaneously at 12.5 fps:

- 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.
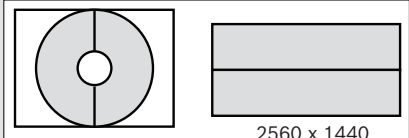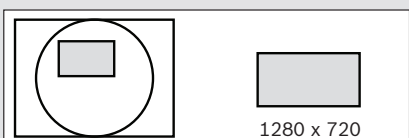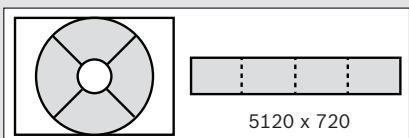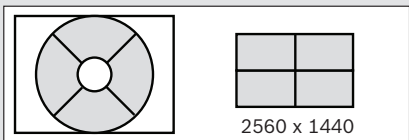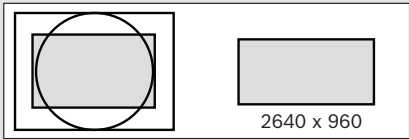
View modes

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	3648 x 1080
E-PTZ view	1920 x 1080
Corridor view	1600 x 1400

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
Double panoramic view	2560 x 1440
E-PTZ view	1280 x 720
North, South, East, West view (client-side only)	5120 x 720
Quad view	2560 x 1440
Panorama view	2640 x 960

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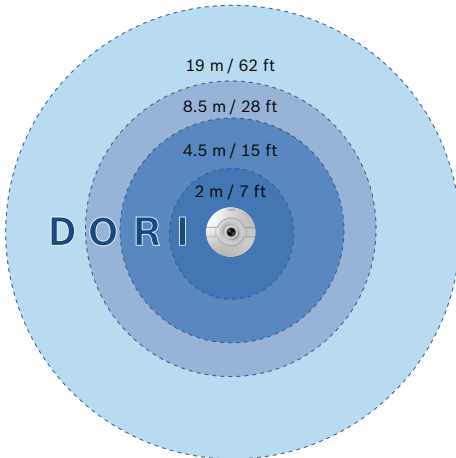
When mounted at a height of 3 m (10 ft) the 180° version of the camera has the following coverage radius for the four levels:

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)
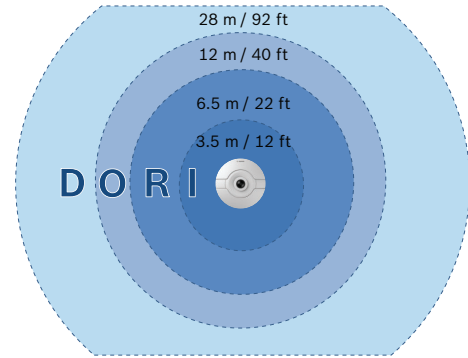
E-PTZ and regions of interest

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
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.
Intelligent Auto Exposure is only available in camera versions with Intelligent Video Analytics

Flush-mount design for easy unobtrusive installation
The low-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, Profile Q and 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	
Conformity	2014/108/EC (EMC) ; 2014/35/EC (LVD) ; 2011/65/EU
Emission	EN 55022: 2010, +AC (2011); CFR 47 FCC part 15:2012-10-1, Class B; AS/NZS CISPR 22:2009 + A1 (2010)
Immunity	EN 50121-4:2006, +AC:2008; EN 50130-5:2011*
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 (2013)
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

mm (in)

68.2 (2.7)

Ø 194.6 (7.7)
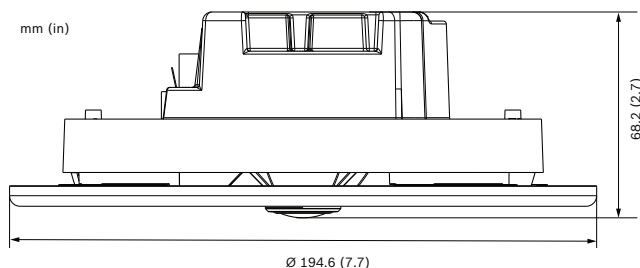
Parts included

Qty	Component
1	FLEXIDOME IP panoramic 7000 IC camera
1	Cover plate
1	Hex wrench
4	Screws (4 x 35)

Qty	Component
4	Plugs
1	Installation Guide
1	Identification label sheet

Technical specifications

Power	
Power Supply	Power-over-Ethernet 48 VDC nominal
Power Consumption	140 mA 200 mA (IVA version)
PoE	IEEE 802.3af (802.3at Type 1)

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 (92+16 dB with intelligent AE)

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	3648 x 1080
	E-PTZ	1920 x 1080
	Corridor	1600 x 1400
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	Double panoramic	2560 x 1440
	E-PTZ	1280 x 720
	Quad	2560 x 1440
	Panoramic	2640 x 960
Video 3 channel	E-PTZ	1280 x 720

Video functions

Day/Night	Color, Monochrome, Auto (adjustable switchover points)
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
Shutter	Automatic Electronic Shutter (AES) Fixed (1/30 [1/25] to 1/15000) selectable Default shutter
Shutter	Automatic Electronic Shutter (AES) Fixed selectable Default shutter
Sharpness	Sharpness enhancement level selectable
Backlight compensation	Off / On / Intelligent Auto Exposure (BLC)
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)
Exposure region	Multiple selectable regions
Privacy Masking	Eight independent areas, fully programmable
Video Motion Analytics	Essential Analytics and Intelligent Video Analytics
Pre-positions	Six independent sectors

Video functions

Display stamping	Individual names and stamps for all video channels
Other functions	Pixel counter, Video watermarking, Location

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 SDHC / 2 TB SDXC 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; Profile G ; Profile Q 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 7000 IC
Flush-mount, high-performance 12MP sensor camera with paintable cover for unobtrusive intelligent panoramic surveillance.
180° lens
Order number **NFN-70122-F1**

FLEXIDOME IP panoramic 7000 IC
Flush-mount, high-performance 12MP sensor camera with paintable cover for unobtrusive intelligent panoramic surveillance.
360° lens
Order number **NFN-70122-F0**

FLEXIDOME IP panoramic 7000 IC
Flush-mount, high-performance 12MP sensor camera with paintable cover for unobtrusive intelligent panoramic surveillance.
180° lens; IVA
Order number **NFN-70122-F1A**

FLEXIDOME IP panoramic 7000 IC
Flush-mount, high-performance 12MP sensor camera with paintable cover for unobtrusive intelligent panoramic surveillance.
360°; IVA
Order number **NFN-70122-F0A**

Accessories

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**