

FLEXIDOME multi 7000i



The FLEXIDOME multi 7000i camera is built for high-quality performance, featuring four independent imagers with motorized zoom/focus lenses. It helps to simplify installation and lower costs while maintaining flexibility in coverage. With four scenes simultaneously in a single camera, it is perfect for wide area coverage, traffic intersections and building corners. When the lenses are tilted at the right angle, the camera can even cover an area up to full 360°. Additionally, the zoom capability allows the camera to obtain detailed coverage for more distant areas.

Functions

Up to 20-megapixel multi-directional overviews

Four independent imagers with separate remote zoom and focus lenses capture very high-quality images with a total resolution of up to 20 megapixels:

NDM-7702-A	Four independent 3 MP imagers
NDM-7703-A	Four independent 5 MP imagers

Each of the four imagers can be set-up flexibly with 3-axis movement along a circular track. This enables surround coverage, capturing detailed images from every angle for comprehensive video coverage with four separate views from a single IP address.

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.



- ▶ Four 3 MP or 5 MP imagers at 30 fps in one camera on a single IP address
- ▶ Easy and flexible installation with four motorized zoom/focus lenses
- ▶ High Dynamic Range (HDR) to see every detail in both bright and dark areas of the scene
- ▶ Built-in Intelligent Video Analytics to trigger relevant alerts and quickly retrieve data

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.

H.265 high-efficiency video encoding

The camera is designed on the most efficient and powerful H.264 and H.265/HEVC encoding platform. The camera is capable of delivering high-quality and high-resolution video with very low network load. With a doubling of encoding efficiency, H.265 has become the new compression standard of choice for IP video surveillance systems.

Two-way audio and built-in microphone

Two-way audio allows the operator to communicate with visitors or intruders via an external audio line input and output. Alternatively, there is an integrated microphone to capture crisp and clear audio. By using the integrated or external microphone, audio detection can be used to generate alarms to alert the security operator quicker and act more proactively. If required by local laws, the microphone can be blocked via a secure license key.

Intelligent Video Analytics

The camera uses the latest generation of Bosch Intelligent Video Analytics (IVA). Specifically designed for the most demanding environments. It is extremely resistant to false triggers caused by challenging environments with snow, wind (moving trees), rain, hail, and water reflections. By using the zoom function of the lens, the camera can provide automatic person detection over distances up to 130 m / 430 ft.

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. Intelligent Video Analytics also adds sense and structure to your video by adding metadata. Calibration is quick and easy - just enter the height of the camera. The internal gyro/accelerometer sensors provide the rest of the information to precisely calibrate the video analytics for each imager. The next step in video analytics is taken with the incorporation of machine learning capabilities. With Camera Trainer you can tailor the built-in Intelligent Video Analytics to detect new user-defined moving or stationary objects and situations, or any subsequent changes.

DORI coverage

DORI (Detect, Observe, Recognize, Identify) is a standard system (EN-62676-4) for defining the ability of a person viewing the video 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:

12 MP camera with 3.7 - 7.7 mm lens*

DORI	DORI definition	Distance 3.7 mm/7.7 mm	Horizontal width
Detect	25 px/m (8 px/ft)	47 m/114 m (148 ft/357 ft)	82 m (256 ft)
Observe	63 px/m (19 px/ft)	19 m/45 m (62 ft/150 ft)	33 m (108 ft)
Recognize	125 px/m (38 px/ft)	9 m/23 m (31 ft/75 ft)	16 m (54 ft)
Identify	250 px/m (76 px/ft)	5 m/11 m (16 ft/38 ft)	8 m (27 ft)

*The numbers in this table do not reflect IVA distances. For IVA distances, refer to the lens calculator / Bosch IP video design tool.

20 MP camera with 3.7 - 7.7 mm lens*

DORI	DORI definition	Distance 3.7 mm/7.7 mm	Horizontal width
Detect	25 px/m (8 px/ft)	56 m/147 m (176 ft/461 ft)	104 m (324 ft)
Observe	63 px/m (19 px/ft)	22 m/59 m (74 ft/194 ft)	41 m (136 ft)
Recognize	125 px/m (38 px/ft)	12 m/30 m (37 ft/97 ft)	21 m (68 ft)
Identify	250 px/m (76 px/ft)	6 m/15 m (19 ft/49 ft)	10 m (34 ft)

*The numbers in this table do not reflect IVA distances. For IVA distances, refer to the lens calculator / Bosch IP video design tool.

Scene modes

Multiple configurable modes are provided with the best settings for a variety of applications. In one click fully optimized image settings can be selected to suit the conditions. Different scene modes can be selected for different situations such as sodium lighting, fast moving objects, or dark environments.

Resists rain, dust, and tampering with reliable operation across a wide temperature range

Suitable for indoor and outdoor usage.

The robust design of the camera is rated to IP66 and IK10 standards, safeguarding the camera against rain and dust while also offering protection against vandalism and tampering.

The camera can operate in a wide ambient temperature range between -50 °C up to +55 °C / -58 °F up to 131 °F.

Easy installation

With the multi-imager camera, it is only necessary to install one camera, pull one cable, configure one IP address, and acquire one video management software (VMS) license (applicable for most common VMS, including BVMS 11.1 or higher), while having the benefit of using four cameras.

The mechanical design follows the Bosch installation philosophy by using an installation mount plate and easy cable management.

Power can be supplied via Power-over-Ethernet. 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.

Modular accessories

A full line of modular accessories is available that allows a consistent design across different cameras and a wide range of installation possibilities. Available options include wall or pipe mount, a surveillance cabinet with power and fiber optic options, and an in-ceiling mounting kit. There is also a conduit adapter available for installations on concrete walls or ceilings.

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 cameras have built-in Secure Element (SE) hardware providing main Trusted Platform Module (TPM) functionality to ensure the highest levels of data security and privacy protection. Together with Public Key Infrastructure (PKI) support, superior protection from malicious attacks is guaranteed. 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

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. It has advanced edge recording providing a reliable storage solution possible due to the combination of these functions:

- Industrial SD card support allows for extreme lifetime
- Health monitoring of industrial SD cards provide early service indications.

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.

Bosch Remote Portal

With the secure cloud infrastructure, Bosch Remote Portal, you can manage your connected Bosch devices. From the Bosch Remote Portal you can:

- Complete initial configuration of your connected Bosch devices (online or offline).
- Update firmware for single or multiple devices.
- Manage certificates.
- Monitor the health of your connected Bosch devices.

Project Assistant app

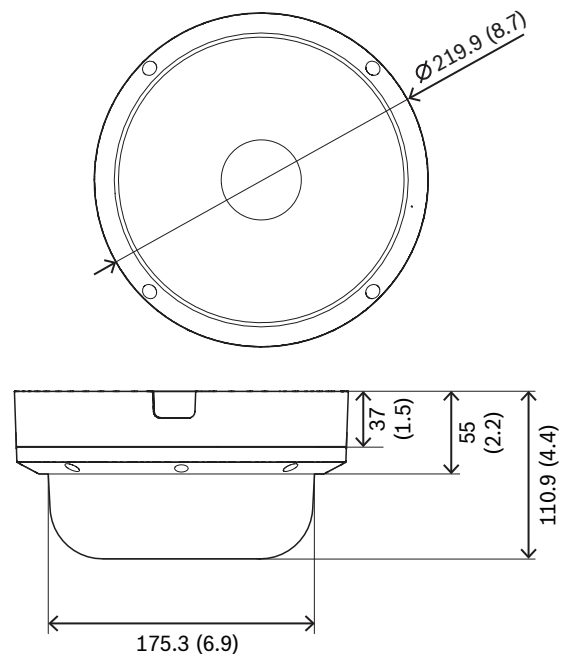
As the camera is equipped with a USB-C port for a wireless USB dongle (sold separately, available mid of 2021), the installer can easily perform the initial configuration wirelessly. Using a mobile device with the Bosch Project Assistant app, you can do initial set-up and lens zoom-focus to find the right scene. Simply connect the wireless USB dongle and go to the Bosch Project Assistant app, available for iOS, Windows, or Android.

Certifications and approvals

Standard	Type
Emission	EN 55032 (Class A) CFR 47 FCC part 15 (Class A)

Standard	Type
Immunity	EN 50121-4 EN 50130-4
Environmental	EN50130-5, Class IV, Fixed equipment, Outdoor in general EN IEC 63000: 2018 RoHS EU, 2011/65/EU and 2015/863/EU WEEE EU, 2012/19/EU NEMA TS-2 chapter 2.1
Safety	EN 62368-1 EN 60950-22 UL 62368-1 and UL 60950-22 IEC 62368-1 CAN/CSA-C22.2 No. 62368-1 CAN/CSA-C22.2 No. 60950-22-07
Image performance	IEC 62676-5
Impact protection	IK10
Weather protection	IP66 NEMA Type 4X
Marks	CE, FCC, UL, WEEE, RCM, VCCI, CMIM, UKCA, China RoHS

Installation/configuration notes



Dimensions in mm (in.)

Technical specifications

Power

Input voltage	30 W (according to PoE+ IEEE 802.3at Type 2, Class 4) 24 VAC ±10% PoE+ and auxiliary power can be connected simultaneously for redundant operation
Power Consumption (typical / maximum)	PoE+: 18.02 W 24 VAC: 1.1 A / 16.0 W

Sensor

Sensor type	4x 1/2.7-inch CMOS
Effective pixels (12 MP)	4x 2048 (H) x 1536 (V)
Effective pixels (20 MP)	4x 2592 (H) x 1944 (V)

Sensitivity

Measured according to IEC 62676 Part 5 (1/25, F1.9)	
Color	0.091 lx
Mono	0.012 lx

Dynamic range

High Dynamic Range	120 dB WDR
HDR Measured according to IEC 62676 Part 5	105 dB WDR

Optical

Lens	3.7 - 7.7 mm F1.9
Adjustment	Motorized zoom/focus
Day/Night	Switchable IR-cut filter
Viewing angle (12 MP variant)	Wide: 81.9° x 59.8° (H x V) Tele: 39.5° x 28.9° (H x V)
Viewing angle (20 MP variant)	Wide: 85.6° x 62.4° (H x V) Tele: 39.0° x 29.2° (H x V)
Viewing angle (maximum combined)	Up to 360° coverage (depending on lens position and tilt)

Platform

Common product platform	CPP14
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Video streaming

Video compression	H.265; H.264; M-JPEG
Streaming	Multiple configurable streams in H.264, H.265 and M-JPEG, configurable frame rate and bandwidth. Regions of Interest (ROI)
Camera latency	120 ms
GOP structure	IP, IBP, IBBP
Frame rate	1-30 fps
Signal-to-Noise Ratio (SNR)	>55 dB

Video resolution (H x V)

Max. Resolution (12 MP variant)	4x 2048 x 1536 (4:3) @30 fps 4x 1920 x 1080 (16:9) @30 fps
Max. Resolution (20 MP variant)	4x 2592 x 1944 (4:3) @30 fps 4x 2560 x 1440 (16:9) @30 fps

Multiple lower resolutions available in 4:3 and 16:9 format individually selectable per stream and imager

Image setup

Mirror image	On / Off
Rotate image	0° / 180°
Positioning	Coordinates / Mounting height

Video functions

White Balance	2300 to 10000K, 3 automatic modes (Basic, Standard, Sodium vapor), Manual mode and Hold mode
Shutter	Automatic Electronic Shutter (AES); Fixed shutter (1/25[30] to 1/15000) selectable; Default shutter
Day/Night	Auto (adjustable switch point), Color, Monochrome
Noise reduction	Dynamic noise reduction with 3 levels: Low, Medium and High
Scene modes	Standard, Sodium lighting, Sensitivity boost, Backlight, Vibrant, Color only
Privacy Masking	Eight independent areas per imager, fully programmable

Video functions	
Display stamping	Name; Logo; Time; Alarm message; fully programmable per imager
Additional functions	Contrast, Saturation level and control, Brightness, Sharpness, ALC level, Defog
Video content analysis	
Analysis type	Intelligent Video Analytics, Camera Trainer
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, Flow / counter flow
Number of rules (simultaneously)	16 per imager
Object filters	Duration, Size, Aspect ratio, Speed, Direction, Color, Object classes (4)
Tracking modes	Standard (2D) tracking, 3D tracking, 3D people tracking, Ship tracking, Museum mode
Calibration / Geolocation	Automatic, based on gyro sensor, focal length and camera height
Additional functions	Tamper detection
Local storage	
Internal RAM	5 s pre-alarm recording
Memory card slot	Micro SDXC / SDHC / SD card
Industrial SD cards	Extreme lifetime and health monitoring support (if supported by the SD card) that provides early service indication.
Input/output	
Audio line in	0.6 Vrms, 40 kOhm
Audio line out	1.0 Vrms, 10 kOhm
Microphone	1 integrated microphone (can be disabled)
Alarm input	1 input
Alarm input activation	Short or DC 5V activation
Alarm output	1 output
Alarm output voltage	30 VDC, max. load 0.5 A
Ethernet	RJ-45

Input/output	
USB	USB Type C, for use with Wi-Fi dongle for setup and commissioning (sold separately)
Fiber optics (sold separately)	The Fiber Optic Ethernet Media Converter kit (VG4-SFP5CKT) installed inside a Surveillance Cabinet (NDA-U-PA0, NDA-U-PA1 or NDA-U-PA2) provides the fiber optic interface to the mounted camera.
Audio streaming	
Standard	G. 711, 8 kHz sampling rate L16, 16 kHz sampling rate AAC-LC, 48 Kbit/s at 16 kHz sampling rate AAC-LC, 80 Kbit/s at 16 kHz sampling rate
Signal-to-Noise Ratio	>50 dB
Audio Streaming	Full-duplex / half duplex
Network	
IP	One IP address for all four imagers
Protocols	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, V3, 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
Ethernet	10/100/1000 Base-T
Interoperability	ONVIF Profile S; ONVIF Profile G; ONVIF Profile T
Data security	
Secure Element ("TPM")	RSA 4096 bit, AES/CBC 256 bit
PKI	X.509 certificates
Encryption	Full end-to-end encryption with supported VMS Network: TLS1.0/1.1/1.2, AES128, AES256 Local storage: XTS-AES
Video authentication	checksum, MD5, SHA-1, SHA-256
Mechanical	
Dimensions (D x H)	220 x 111 mm (8.7 x 4.4 in.)
Weight	2.33 kg (5.14 lbs)
Color	White (RAL9003)

Mechanical	
Gyrosensor	Yes, 1 per imager
4-axis lens adjustment	Pan: 0° to 360° Rotate: -20° to 20° Tilt: 0° to 105° Roll: -90° to 90°
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Housing	Aluminum with dehumidifying membrane and waterproof connection area
Mounting	Mounting plate included for surface mount, 4-inch square junction box, single and double gang box
Conduit	3/4-inch NPT (M25) conduit side entry (sold separately)
Environmental	
Operating temperature	-50 °C to +55 °C (-58 °F to +131 °F) for continuous operation; Up to +74 °C (+165 °F) according to NEMA TS 2-2003 (R2008), para 2.1.5.1 using fig. 2.1 test profile
Storage temperature	-40 °C to 70 °C (-40 °F to 158 °F)
Cold start temperature	-20 °C (-4 °F)
Operating humidity	5% to 93% RH non condensing 100% RH condensing
Storage humidity	Up to 98% RH
Impact protection	IK10
Water/dust protection	IP66 and NEMA Type 4X

Ordering information

NDM-7702-A Fixed dome 12MP 3.7-7.7mm IP66

12 MP multi-imager camera, four motorized zoom/focus lenses, 30 fps, IVA, H.265, IK10, IP66
Order number **NDM-7702-A | F.01U.389.262**

NDM-7703-A Fixed dome 20MP 3.7-7.7mm IP66

20 MP multi-imager camera, four motorized zoom/focus lenses, 30 fps, IVA, H.265, IK10, IP66
Order number **NDM-7703-A | F.01U.389.263**

Accessories

NDM-7051-PIPW Pendant Interface Plate, 220mm

Pendant interface plate for FLEXIDOME multi 7000i
Order number **NDM-7051-PIPW | F.01U.391.133**

NDM-7051-CA Conduit adapter M25 for NDM-770*, 5pcs

Conduit adapter for FLEXIDOME multi 7000i and FLEXIDOME multi 7000i IR, 5 pieces
Order number **NDM-7051-CA | F.01U.394.257**

NDM-U-WMT Pendant wall mount

Universal wall mount for dome cameras, white
Order number **NDM-U-WMT | F.01U.324.939**

NDM-U-WMP Wall mount plate

Back plate for universal wall mount, corner mount and pole mount, white, IP66
Order number **NDM-U-WMP | F.01U.324.950**

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

Universal pipe mount for dome cameras, 31 cm, white
Order number **NDM-U-PMT | F.01U.324.940**

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

Extension for universal pipe mount, 50 cm, white
Order number **NDM-U-PMTE | F.01U.324.941**

NDM-U-PMTS Pendant pipe mount, 4" (11 cm)

Universal pendant pipe mount for dome cameras, 11 cm (4"), white
Order number **NDM-U-PMTS | F.01U.385.046**

NDM-U-PSMB Pendant wall/ceiling mount SMB

Surface mount box (SMB) for wall mount or pipe mount.
Order number **NDM-U-PSMB | F.01U.324.942**

NDM-U-PMAS Pole mount adapter small

Pole mount adapter small
Universal pole mount adapter, white; small.
Order number **NDM-U-PMAS | F.01U.324.943**

NDM-U-PMAL Pole mount adapter large

Universal pole mount adapter, white; large
Order number **NDM-U-PMAL | F.01U.324.944**

NDM-U-RMT Pendant parapet mount

Universal roof mount for dome cameras, white
Order number **NDM-U-RMT | F.01U.324.945**

NDM-U-PA0 Surveillance cabinet 24VAC

Surveillance cabinet, 24 VAC input, 24 VAC output, IP66
Order number **NDM-U-PA0 | F.01U.324.947**

NDM-U-PA1 Surveillance cabinet 120VAC

Surveillance cabinet, 100 - 120 VAC 50/60 Hz input, 24 VAC output, IP66
Order number **NDM-U-PA1 | F.01U.324.948**

NDM-U-PA2 Surveillance cabinet 230VAC

Surveillance cabinet, 230 VAC input, 24 VAC output, IP66
Order number **NDM-U-PA2 | F.01U.324.949**

VG4-SFPCKT Ethernet to SFP interface kit

Ethernet media converter video transmitter/data receiver fiber optic kit for AUTODOME cameras, for MIC-IP-PSU for MIC analog cameras and for the Surveillance cabinets (NDM-U-PA0, NDM-U-PA1 and NDM-U-PA2).
Order number **VG4-SFPCKT | F.01U.142.529**

SFP-2 Fiber module, multimode, 1310nm, 2LC

SFP Fiber Optic Module, 2 km (1.2 miles), 2 LC connectors.
Multi-mode
1310 nm
Order number **SFP-2 | F.01U.136.537**

SFP-3 Fiber module, single-mode, 1310nm, 2LC

SFP Fiber Optic Module, 20 km (12.4 miles), 2 LC connectors.

Single-mode

1310 nm

Order number **SFP-3 | F.01U.136.538**

SFP-25 Fiber module, 1310/1550nm, 1SC

SFP Fiber Optic Module, 2 km (1.2 miles), 1 SC connector

Multi-mode

1310/1550 nm

Order number **SFP-25 | F.01U.136.541**

SFP-26 Fiber module, 1550/1310nm, 1SC

SFP Fiber Optic Module, 2 km (1.2 miles), 1 SC connector

Multi-mode

1550/1310 nm

Order number **SFP-26 | F.01U.136.542**

NDA-U-PMTG Pendant pipe mount, gang box

Universal pipe mount, compatible with gang box installation for fixed dome cameras only, white

Order number **NDA-U-PMTG | F.01U.358.359**

NDA-U-WMTG Pendant wall mount, gang box

Universal wall mount, compatible with gang box installation for fixed dome cameras only, white

Order number **NDA-U-WMTG | F.01U.358.358**

NPD-6001B Midspan, 60W, single port, AC in

60 W indoor midspan for cameras without illuminators

Order number **NPD-6001B | F.01U.347.358**

F.01U.392.458

NPD-3001-WAP Portable installation tool

Bosch camera portable and wireless installation tool

Order number **NPD-3001-WAP | F.01U.353.329**

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