

FLEXIDOME multi 7000i IR



- ▶ 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
- ▶ Integrated surround IR illumination up to 30 m distance for pitch dark scenes

The FLEXIDOME multi 7000i IR 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. By offering coverage of four scenes simultaneously in one single camera, it is perfect for wide area coverage, traffic intersections and building corners. With its integrated 360° IR lighting, the camera can capture crisp images in extremely low light conditions, such as at night-time or dusk.

Functions

Up to 20-megapixel multi-directional overviews

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

| | |
|-------------|-------------------------------|
| NDM-7702-AL | Four independent 3 MP imagers |
| NDM-7703-AL | Four independent 5 MP imagers |

With its four independent imagers, the camera 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.

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.

Automatic image rotation

During installation, each of the four imagers can be positioned and rotated independently. With its dedicated gyro/accelerometer sensors, the camera

can automatically detect the image orientation of each imager. The displayed videos can be corrected in 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.

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 mm to 7.7 mm lens*

| DORI | DORI definition | Distance 3.7 mm/7.7 mm | Horizontal width |
|-----------|------------------------|-------------------------------|---------------------|
| Detect | 25 px/m (8 px/ft) | 45 m/112 m (148 ft/369 ft) | 82 m (256 ft) |
| Observe | 63 px/m (19 px/ft) | 18 m/45 m (59 ft/147 ft) | 33 m (108 ft) |
| Recognize | 125 px/m (38 px/ft) | 9 m/23 m (30 ft/74 ft) | 16 m (54 ft) |
| Identify | 250 px/m (76 px/ft) | 5 m/11 m (15 ft/37 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 mm to 7.7 mm lens*

| DORI | DORI definition | Distance 3.7 mm/7.7 mm | Horizontal width |
|-----------|------------------------|-------------------------------|---------------------|
| Detect | 25 px/m (8 px/ft) | 60 m/148 m (198 ft/485 ft) | 104 m (324 ft) |
| Observe | 63 px/m (19 px/ft) | 24 m/59 m (89 ft/193 ft) | 41 m (136 ft) |
| Recognize | 125 px/m (38 px/ft) | 12 m/30 m (40 ft/97 ft) | 21 m (68 ft) |
| Identify | 250 px/m (76 px/ft) | 6 m/15 m (20 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 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 -40 °C up to +55 °C / -40 °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), 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.

The AVF (Automatic Varifocal) feature means that for each of the lenses the zoom and focus 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.

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

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.

The camera supports industrial microSD cards to allow for extreme lifetime and also provides health monitoring of these cards to 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.

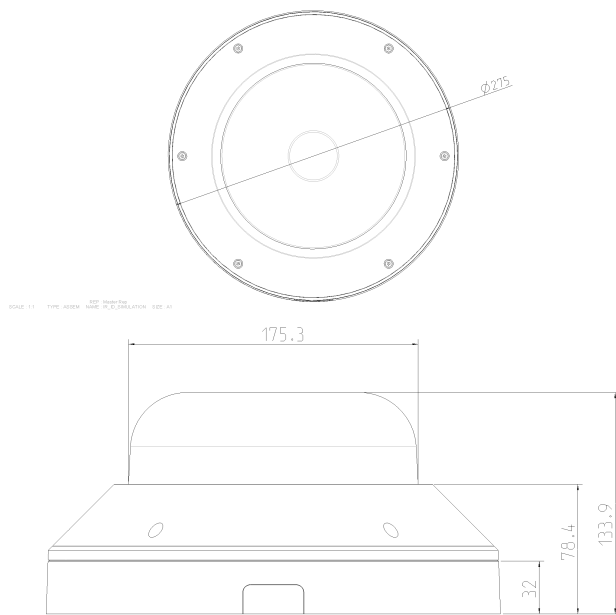
Project Assistant app

As the camera is equipped with a USB-C port for a WiFi dongle (sold separately), 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 WiFi dongle and go to the Bosch Project Assistant app, available for iOS, Windows, or Android.

Certifications and approvals

| Standard | Type |
|--------------------|--|
| Emission | EN 50121-4 EN 55032 (Class A) CFR 47 FCC part 15 (Class A) |
| Immunity | EN 50121-4 EN 50130-4 |
| Environmental | EN50130-5, Class IV, Fixed equipment, Outdoor in general EN 50581 RoHS EU, 2011/65/EU and 2015/863/EU WEEE EU, 2012/19/EU |
| Safety | EN 62368-1 EN 60950-22 UL 60950-1 and UL 60950-22 IEC 62368-1 EN 62471 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, EAC, BIS, KCC, CMIM |

Installation/configuration notes



All dimensions in the drawings are in mm (inch).

Technical specifications

| Power | |
|---|---|
| Input voltage | 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: TBD W / TBD W 24 VAC: 7.1 W - 12 VA / 13 W - 24 VA |
| 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 (12 MP) | TBD lx |
| Mono (12 MP) | TBD lx |
| With IR (12 MP) | TBD lx |
| Color (20 MP) | TBD lx |
| Mono (20 MP) | TBD lx |
| With IR (20 MP) | TBD lx |

| Dynamic range | |
|--|---|
| High Dynamic Range | 120 dB WDR |
| HDR Measured according to IEC 62676 Part 5 | TBD dB WDR (12 MP) TBD dB WDR (20 MP) |
| Night vision | |
| Distance | 30 m (98 ft) |
| LED | 360° LED high efficiency array, 850 nm |
| IR intensity | Adjustable |
| Optical | |
| Lens | 3.7 mm to 7.7 mm F1.9 |
| Adjustment | Motorized zoom/focus |
| Iris control | DC-iris control |
| Day/Night | Switchable IR-cut filter |
| Viewing angle (12 MP variant) | Wide: 84.4° x 60.6° (H x V) Tele: 40.0° x 28.9° (H x V) |
| Viewing angle (20 MP variant) | Wide: 81.3° x 60.6° (H x V) Tele: 38.6° x 28.9° (H x V) |
| Platform | |
| Common product platform | CPP14 |
| Video streaming | |
| Video compression | H.265/HEVC; 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, B-frames TBD |
| 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 |

| Video resolution (H x V) | |
|---|--|
| 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° / 90° upright / 180° / 270° upright |
| 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 points), Color, Monochrome |
| Noise reduction | Dynamic noise reduction with 3 levels: Low, Medium and High |
| Defog | On/off (selectable) for best picture in foggy or misty scenes |
| Scene modes | Standard, Sodium lighting, Sensitivity boost, Backlight, Vibrant, Color only |
| Privacy Masking | Eight independent areas per imager, fully programmable |
| Display stamping | Name; Logo; Time; Alarm message; fully programmable per imager |
| Additional functions | Contrast, Saturation level and Saturation control, Brightness, Sharpness, ALC level |
| 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 |
| Object filters | Duration, Size, Aspect ratio, Speed, Direction, Color, Object classes (4) |

| Video content analysis | |
|--------------------------------|--|
| 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 | 0.707 Vrms max, 10 kOhm typical |
| Audio line out | 0.707 Vrms, 16 Ohm typical |
| Microphone | 1 integrated microphone (can be permanently 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 | RJ45 |
| USB | USB Type C, for use with Wi-Fi dongle for setup and commissioning |
| Fiber optics (sold separately) | The Fiber Optic Ethernet Media Converter kit (VG4-SFPSCKT) 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, 96 kbps at 32/48 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) | 275 x 137 mm (10.8 x 5.4 in.) |
| Weight | TBD kg (TBD lbs) |
| Color | White (RAL9003) |
| Gyrosensor | Yes, 1 per imager |
| 4-axis lens adjustment | Rotate: 0° to 360° Pan: -45° to 45° 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 | -40 °C to +55 °C (-40 °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 | -40 °C (-40 °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-AL Fixed dome 12MP 3.7-7.7mm IR IP66

12 MP multi-imager camera, four motorized zoom/focus lenses, 30 fps, IVA, H.265, IK10, IP66, integrated IR up to 30 m

Order number **NDM-7702-AL | F.01U.389.264**

NDM-7703-AL Fixed dome 20MP 3.7-7.7mm IR IP66

20 MP multi-imager camera, four motorized zoom/focus lenses, 30 fps, IVA, H.265, IK10, IP66, integrated IR up to 30 m

Order number **NDM-7703-AL | F.01U.389.265**

Accessories

NDA-U-WMT Pendant wall mount

Universal wall mount for dome cameras, white

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

NDA-U-WMP Wall mount plate

Back plate for universal wall mount, corner mount and pole mount, white, IP66

Order number **NDA-U-WMP | F.01U.324.950**

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-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-PMAL Pole mount adapter large

Universal pole mount adapter, white; large

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

NDA-U-RMT Pendant parapet mount

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

NDA-U-PA0 Surveillance cabinet 24VAC

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

NDA-U-PA1 Surveillance cabinet 120VAC

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

NDA-U-PA2 Surveillance cabinet 230VAC

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

VG4-SFPSCKT 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
(NDA-U-PA0, NDA-U-PA1 and NDA-U-PA2).
Order number **VG4-SFPSCKT | 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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