

NDE-8503-RT Fixed dome 6MP HDR 12-40mm PTRZ IP66

FLEXIDOME IP starlight 8000i



- ▶ Wireless or remote configuration and commissioning with the Project Assistant app. Pan, Tilt, Roll and Zoom (PTRZ) to set the camera to the required field of view, without having to touch the camera or lens
- ▶ 1/1.8" 6MP sensor and starlight technology to provide detailed images even in extreme low-light situations
- ▶ High Dynamic Range to see every detail in both bright and dark areas of the scene
- ▶ Built-in Intelligent Video Analytics with object detection to trigger alerts and quickly retrieve data with the highest levels of reliability
- ▶ Camera Trainer to train the camera to recognize user-specified target objects for both moving and non-moving objects

The FLEXIDOME IP starlight 8000i - 6MP performance line camera offers a 1/1.8" sensor, starlight performance and High Dynamic Range with 6 megapixel resolution to provide crisp and highly detailed images even in extreme low-light situations. The camera's remote commissioning functionality makes sure installation and commissioning can be done in very little time. Using a PC or a mobile device with the Bosch Project Assistant app, you can pan, tilt, roll and zoom (PTRZ) and point the camera to the required field of view with a single click - without ever having to touch the camera or lens.

Functions

Full Remote Commissioning

Installing a professional IP video surveillance camera has never been so easy. In fact, as an installer, you'll never want to go back to the old methods of installing cameras again. We've simplified the installation and commissioning stages to such a degree that they can be done in very little time.

With the FLEXIDOME IP starlight 8000i camera's remote commissioning functionality there's no need to go up and down ladders. Using a PC or a mobile device with the Bosch Project Assistant app, you can pan, tilt, roll and zoom (PTRZ) and point the camera to the required field of view with a single click - without ever having to touch the camera or lens. Wireless or remote configuration and commissioning can also be done at a later stage once all cameras have been installed. Simply connect the Bosch Project Assistant app, available for iOS, Windows or Android, wirelessly to the camera. Or connect to the camera remotely via the network using the camera's web interface or the Bosch Configuration Manager.

Fast performance

The high sensor resolution together with a frame rate of 30 frames per second makes this camera an ideal solution for capturing fast moving objects in high detail and, at the same time, providing situational awareness.

Starlight performance

The latest sensor technology combined with the sophisticated image processing and noise suppression results in an exceptional sensitivity in color. The low-light performance is so good that the camera continues to provide excellent color performance even with a minimum of ambient light.

High Dynamic Range

The high dynamic range mode 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.

Scene modes

Nine 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 traffic or retail environments.

Intelligent streaming

Smart encoding capabilities, together with Intelligent Dynamic Noise Reduction technology and analytics, reduce the bandwidth consumption to extremely low levels. Only relevant information in the scene, like motion, or objects found with the analytics, need to be encoded.

The camera is capable of quad streaming which allows the camera to deliver independent, configurable streams for live viewing, recording, or remote monitoring via constrained bandwidths. Each of these streams can be adapted independently to deliver high quality video, perfectly tailored to purpose, while reducing bit rate by up to 90% compared to a standard camera.

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 is the compression standard of choice for IP video surveillance systems.

Bitrate optimized profile

The average bitrate for the bitrate optimized profile using H.265 encoding in kbps for different frame rates can be found in the table provided below.

FPS at 6MP	Low activity	Medium activity	High activity
30	1632	2438	5335
25	1430	2143	4666

FPS at 6MP	Low activity	Medium activity	High activity
15	990	1494	3214
10	741	1123	2397
5	453	692	1458
3	316	485	1014
1	146	227	468

Notice

Actual bitrate values may vary depending on scene complexity/activity and picture settings.

Recording and storage management

Recording management can be controlled by the Bosch Video Recording Manager application, or the camera can use local storage and iSCSI targets directly without any recording software.

Local storage can be used for recording "at the edge" or for Automatic Network Replenishment (ANR) technology to improve the overall recording reliability.

Pre-alarm recording in RAM reduces bandwidth consumption on the network and extends the effective life of the memory card.

Advanced edge recording

Advanced edge recording provides the most reliable storage solution possible due to the combination of the following functionalities:

- Dual SD cards that can be set up as either:
 - Mirrored, for redundant storage
 - Failover, for extended service intervals
 - Extended, for maximum retention time
- Industrial SD card support allows for extreme lifetime
- Health monitoring of industrial SD cards provide early service indications

Intelligent Video Analytics on the edge

The camera includes the latest release of the Intelligent Video Analytics application from Bosch. Specifically designed for the most demanding environments. It delivers the highest levels of accuracy for mission-critical applications such as perimeter security of airports, critical infrastructures and government buildings, border patrol, ship tracking and traffic monitoring (e.g. wrong-way detection, traffic counts, monitoring roadsides for parked cars).

Intelligent Video Analytics is extremely resistant to false triggers caused by challenging environments with snow, wind (moving trees), rain, hail, and water reflections. It is ideal for providing automatic object detection over large distances.

The set-up of Bosch's video analytics is also second to none, which is great news for installers. Should your customer decide to use Intelligent Video Analytics, configuration and calibration couldn't be easier. Simply enter the height of the camera and the rest of the calibration is carried out by the video analytics itself based on information provided by the camera's built-in gyro sensor.

Camera Trainer

Based on examples of target objects and non-target objects, the Camera Trainer program uses machine learning to allow the user to define objects of interest and generate detectors for them. In contrast to the moving objects that the Intelligent Video Analytics application detects, the Camera Trainer program detects both moving and non-moving objects and classifies them immediately. Using Configuration Manager, you can configure the Camera Trainer program using both live video as well as recordings available through the respective camera. The resulting detectors can be downloaded and uploaded for distribution to other cameras.

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:

6 MP Camera with 12 mm - 40 mm lens

DORI	DORI definition	Distance	Horizontal width
Detect	25 px/m 8 px/ft	201 m / 591 m 628 ft / 1848 ft	131 m 408 ft
Observe	63 px/m 19 px/ft	80 m / 235 m 264 ft / 778 ft	52 m 172 ft
Recognize	125 px/m 38 px/ft	40 m / 118 m 132 ft / 389 ft	26 m 86 ft
Identify	250 px/m 76 px/ft	20 m / 59 m 66 ft / 195 ft	13 m 43 ft

Data security

Special measures ensure the highest level of security for device access and data transport. On initial setup, the camera is only accessible over secure channels and enforces a password. Web browser and viewing client access can be protected using HTTPS or other secure protocols that support state-of-the-art TLS 1.2 with updated cipher suites including AES encryption with 256 bit keys. No software can be installed in the camera, and only authenticated

firmware can be uploaded. A three-level password protection with security recommendations allows users to customize device access.

Network and device access can be protected using 802.1x network authentication with EAP/TLS.

Superior protection from malicious attacks is guaranteed by the Embedded Login Firewall, on-board Trusted Platform Module (TPM) and Public Key Infrastructure (PKI) support.

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

System integration and ONVIF conformance

The camera conforms to the ONVIF Profile S, ONVIF Profile G, ONVIF Profile M, and ONVIF Profile T specifications. For H.265 configuration, the camera supports Media Service 2, which is part of ONVIF Profile T. 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.

Universal accessories

A full line of universal accessories are available that allow a consistent design across different platforms and a wide range of installation possibilities. Several dedicated accessories are available that seamlessly fit to the camera and expand the different installation options over previous generations. Available options include: a paintable cover, an on-camera weather protector, a clear or tinted replacement bubble, in-ceiling mounting kits, a surveillance cabinet with power and fiber optic options and different mounting options.

Regulatory information

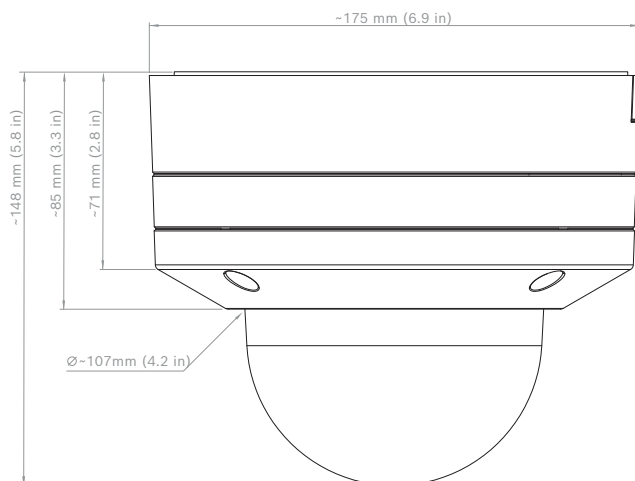
Standards	Type
Emission	EN 300 328, EN 62311, EN 50121-4 (EN 55016-2-1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6), ISED RSS-247, ISED RSS-GEN, CFR 47 FCC, part 15.247, 15.205, 15.207, 15.209, Class B, AS/NZS CISPR 32
Immunity	EN 301 489-1, EN 301 489-3, EN 301 489-17, EN 50130-4 (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6), EN 50121-4 (EN 55016-2-1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6)

Standards	Type
Environmental	EN 50130-5 Class IVA (EN 60068-2-2, EN 60068-2-5, EN 60068-2-6, EN 60068-2-18, EN 60068-2-27, EN 60068-2-30, EN 60068-2-42, EN 60068-2-52, EN 60068-2-75, EN 60068-2-78, EN 60529), UL 2043 when combined with NDA-8001-PLFN, Nema TS 2 Section 2
Safety	EN 62368-1, EN 60950-22, UL 62368-1, UL 60950-22, CSA C22.2 No. 62368-1-14, CAN/CSA-C22.2 No. 60950-22:07
Image performance	IEC 62676-5
HD	SMPTE 296M-2001 (Resolution: 1280x720) SMPTE 274M-2008 (Resolution: 1920x1080)
Color representation	ITU-R BT.709-6
ONVIF conformance	EN 50132-5-2, EN 62676-2
Impact protection	EN 62262 (IK10)
Water/dust protection	EN 60529 (IP66), ISO 20653 (IP6K9K), UL50E (Type 4X), UL 60950-22
Environment	2011/65/EU RoHS (EN 50581 and EN IEC 63000), 1999/45/EC and 1907/2006 REACH, 2012/19/EU WEEE, 94/62/EC Packaging
Marks	CE, cULus, WEEE, RCM, EAC, China RoHS, Cmm, BIS, NOM, ANRT, KCC, Anatel, ICASA, TRA, BSMI, NCC

Region	Regulatory compliance/quality marks	
Europe	CE	
USA	UL CAP	Cybersecurity Assurance Program
	UL	E243325-UL TC 20190122

Installation/configuration notes

Dimensions



Parts included

Quantity	Component
1	FLEXIDOME IP 8000i camera
1	T-20 security Torx bit
1	Quick installation guide
1	Safety information
2	Rubber grommet for the Ethernet cable
1	Network patch cable 50 cm
1	10-pin I/O connector
1	2-pin power connector
1	Cable conduit for side entry
1	Washer for cable conduit
1	Adapter plate for cable conduit (Ø 3/4" / M25)
1	Adapter plate for cable conduit (Ø 1/2" / M20)
3	Identification label

Technical specifications

Power

Input voltage	PoE IEEE 802.3af / 802.3at Type 1, Class 3; 24 VAC ±10%; 12-26 VDC ±10%; PoE and auxiliary power can be connected simultaneously for redundant operation
Power Consumption (typical / maximum)	PoE: 7 W / 12.95 W; 24 VAC: 7.1 W - 12 VA / 13 W - 25 VA; 12-26 VDC: 7.5 W / 16 W

Sensor

Sensor type	1/1.8-inch CMOS
Effective pixels	3264 x 1840 2.3 µm pixels, 6.0MP (approx.)

Starlight sensitivity

Measured according to IEC 62676 Part 5 (1/25, F2.3)

Color	0.1222 lx
Mono	0.0198 lx

Dynamic range

Dynamic range (WDR)	HDR 120 dB
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Dynamic range	
Measured according to IEC 62676 Part 5	106 dB WDR
Optical	
Lens	12 to 40 mm P-iris lens (IR corrected); F-stop 2.3 - 2.3
Adjustment	Motorized zoom/focus
Iris control	P-iris control
Viewing angle	Wide: 36.2° x 19.9° (H x V); Tele: 12.6° x 7.1° (H x V)
Platform	
Common product platform	CPP7.3

Video streaming	
Video compression	H.265; H.264; M-JPEG
Sensor modes	25 fps, HDR, 3072 x 1728 (5.3 MP) 30 fps, HDR, 3072 x 1728 (5.3 MP) 25 fps, 3264 x 1840 (6 MP) 30 fps, 3264 x 1840 (6 MP)
Streaming	Multiple configurable streams in H.264, H.265 and M-JPEG, configurable frame rate and bandwidth. Regions of Interest (ROI) Bosch Intelligent Streaming
Camera latency	<120ms
GOP structure	IP, IBP, IBBP
Frame rate	1-60 fps
Signal-to-Noise Ratio (SNR)	>55 dB

Video resolution (H x V)	
6.0 MP	3264 x 1840
5.3 MP	3072 x 1728
2.8 MP (4:3)	1920 x 1440
1080p HD	1920 x 1080
1.3 MP (5:4)	1280 x 1024

Video resolution (H x V)	
720p HD	1280 x 720
480p SD	854 x 480
SD 4:3 (cropped)	704 x 480

Camera installation	
Mirror image	On / Off
Rotate	0° / 90° upright / 180° / 270° upright
Camera LED	Auto disable/Enable/Disable
Positioning	Coordinates / Mounting height
Camera view wizard	Motorized pan, tilt, roll, zoom, autofocus
Wireless commissioning	IEEE 802.11b/g/n

Video functions - color	
Adjustable picture settings	Contrast, Saturation, Brightness
White Balance	2500 to 10000K, 4 automatic modes (Basic, Standard, Sodium lamp, 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

Video functions - enhance

Intelligent defog	Intelligent Defog automatically adjusts parameters for best picture in foggy or misty scenes (switchable)
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Video content analysis

Analysis type	Intelligent 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, Flow / counter flow
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
Tamper detection	Maskable

Additional functions

Scene modes	10 default modes with scheduler: Indoor, Outdoor, Traffic, Night Optimized, Intelligent AE, Vibrant, Low bitrate, Sports & Gaming, Retail, License Plate Recognition (LPR)
Privacy Masking	Eight independent areas, fully programmable
Face detection	Image posting
Display stamping	Name; Logo; Time; Alarm message
Pixel counter	Selectable area

Local storage

Internal RAM	5 s pre-alarm recording
Memory card slots	Dual SDXC / SDHC / SD card slots, up to 2TB.
Dual SD-card slot configurations	<ul style="list-style-type: none"> • Mirror (redundant storage) • Failover (extended service interval) • Extend (maximum retention time) • Automatic Network Replenishment

Local storage

Industrial SD cards	Extreme lifetime and health monitoring support that provides early service indication.
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Input/output

Power output	+12 VDC, max 50 mA
Audio signal line in	10 kOhm typical; 1 Vrms max
Audio signal line out	1 Vrms; 1.5 kOhm typical
Alarm input	2 supervised inputs, dry contact or voltage operated (5 - 40 VDC); 2.2K end-of-line resistor
Alarm output	1 output, maximum: 30 VAC or +40 VDC, 0.5 A continuous, 10 VA
Ethernet	Shielded RJ45
Surge protection	Ethernet: 1 kV, 2 kA to ground (8/20 µs pulse)
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, 48 kbps at 16 kHz sampling rate AAC-LC, 80 kbps at 16 kHz sampling rate
Signal-to-Noise Ratio	>50 dB
Audio Streaming	Full-duplex / half duplex

Network

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), Diff-Serv (QoS), LLDP, SOAP, CHAP, digest authentication
Ethernet	10/100 Base-T

Network	
Interoperability	ONVIF Profile S, ONVIF Profile G, ONVIF Profile T, ONVIF Profile M
Data security	
Crypto Coprocessor (TPM)	RSA 2048 bit, AES/CBC 256 bit
PKI	X.509 certificates
Encryption	Full end-to-end encryption with supported VMS Network: TLS1.0/1.2, AES128, AES256 Local storage: XTS-AES
Video authentication	checksum, MD5, SHA-1, SHA-256
Mechanical	
Dimensions (D x H)	175 x 148 mm (6.9 x 5.7 in)
Weight	2.2 kg (4.85 lbs)
Mounting	Surface mount
Color	White (RAL9003)
Motorized PTR range	Pan: 0° to +361°; Tilt: -3° to +90°; Roll: -95° to +95°
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Housing	Aluminum with dehumidifying membranes and waterproof connection area
Environmental	
Operating temperature	-50 °C to +60 °C (-58 °F to +140 °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	-30 °C to +70 °C (-22 °F to +158 °F)
Operating humidity	5% to 93% RH non condensing 5% to 100% RH condensing
Storage humidity	Up to 98% RH
Impact resistance casing and dome	IK10+ (50 joules)
Water/dust protection	IP66, IP6K9K and NEMA Type 4X

Ordering information

NDE-8503-RT Fixed dome 6MP HDR 12-40mm PTRZ IP66

Fixed dome with wireless commissioning and with tele lens. Made to order. Contact your Bosch sales dealer for availability.

NDAA compliant

Order number **NDE-8503-RT**

Accessories

NDA-8000-PC Paintable cover, 4 pcs

Paintable cover (4 pieces) for FLEXIDOME IP 8000i.

Order number **NDA-8000-PC**

NDA-8000-CBL Clear replacement bubble

Clear replacement bubble.

Order number **NDA-8000-CBL**

NDA-8000-TBL Tinted Bubble

Tinted bubble for FLEXIDOME IP 8000i.

Order number **NDA-8000-TBL**

NDA-8001-IC In-ceiling mount kit

In-ceiling mount kit for FLEXIDOME IP 8000i with microphone support

Order number **NDA-8001-IC**

NDA-8001-PLEN Plenum-rated mount kit

Plenum-rated in-ceiling mount kit for FLEXIDOME IP 8000i with microphone support

Order number **NDA-8001-PLEN**

NDA-8000-SP In-ceiling mount support kit

Soft ceiling support for in-ceiling mount kit for FLEXIDOME IP 8000i.

Order number **NDA-8000-SP**

NDA-8000-WP On-camera weather protector

On-camera weather protector for FLEXIDOME IP 8000i.

Order number **NDA-8000-WP**

NDA-8000-PIP Pendant interface plate, indoor

Pendant interface plate for FLEXIDOME IP 8000i and FLEXIDOME IP panoramic 6000/7000 outdoor.

Order number **NDA-8000-PIP**

NDA-8000-PIPW Pendant interface plate, outdoor

Pendant interface plate including weather protector for FLEXIDOME IP 8000i and FLEXIDOME IP panoramic 6000/7000 outdoor.

Order number **NDA-8000-PIPW**

NDA-U-WMT Pendant wall mount

Universal wall mount for dome cameras, white

Order number **NDA-U-WMT**

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

Universal pipe mount for dome cameras, 31 cm, white

Order number **NDA-U-PMT**

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

Universal pendant pipe mount for dome cameras, 11 cm (4"), white

Order number **NDA-U-PMTS**

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

Extension for universal pipe mount, 50 cm, white

Order number **NDA-U-PMTE**

NDA-U-PSMB Pendant wall/ceiling mount SMB

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

Order number **NDA-U-PSMB**

NDA-U-PA0 Surveillance cabinet 24VAC

Surveillance cabinet, 24 VAC input, 24 VAC output, IP66

Order number **NDA-U-PA0**

NDA-U-PA1 Surveillance cabinet 120VAC

Surveillance cabinet, 100 - 120 VAC 50/60 Hz input, 24 VAC output, IP66

Order number **NDA-U-PA1**

NDA-U-PA2 Surveillance cabinet 230VAC

Surveillance cabinet, 230 VAC input, 24 VAC output, IP66

Order number **NDA-U-PA2**

NDA-U-PMAL Pole mount adapter large

Universal pole mount adapter, white; large

Order number **NDA-U-PMAL**

NDA-U-PMAS Pole mount adapter small

Pole mount adapter small

Universal pole mount adapter, white; small.

Order number **NDA-U-PMAS**

NDA-U-RMT Pendant parapet mount

Universal roof mount for dome cameras, white

Order number **NDA-U-RMT**

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**

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**

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**

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**

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**

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**

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**

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