

NDE-8512-RX Fixed dome 2MP HDR X 4.4-10mm PTRZ IP66

FLEXIDOME IP starlight 8000i



- ▶ Motorized Pan, Tilt, Roll, and Zoom (PTRZ) to set the required field of view, without having to touch the camera or lens allows for remote configuration and commissioning
- ▶ Starlight X technology with 1/1.8" HD 1080p sensor for next level low-light performance with maximum detail
- ▶ HDR X - High Dynamic Range to see every detail in both bright and dark areas of the scene without HDR motion blur and artefacts
- ▶ 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 - 2MP X series camera offers a 1/1.8" sensor, starlight X and HDR X technology at HD 1080p resolution. It provides the perfect balance between high resolution and extreme low-light sensitivity with starlight X technology, ensuring highly detailed images even in the most challenging situations.

HDR X enables the camera to capture video with a wide dynamic range across different light levels and without HDR motion blur and artefacts on moving objects. Fast moving objects are easily captured with frame rates of up to 60 frames per second.

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. Remote configuration and commissioning can also be done at a later stage once all cameras have been installed. Simply connect to the camera remotely via the network using the Bosch Project Assistant app, the camera's web interface, or the Bosch Configuration Manager.

Fast performance

The 60 frames per second mode provides for optimum performance in fast action scenes that makes sure no critical data is lost and video is captured with excellent detail.

Starlight X - Next level starlight performance

Starlight X technology combines the latest high performance, large pixel sensors, optics, improved image processing and noise suppression, resulting in a 70% improved sensitivity compared to the standard starlight camera.

HDR X - High Dynamic Range

HDR X is a new technology that combines unique sensor functionality and advanced algorithms. It is a huge leap forward in capturing high quality video of moving objects in scenes with a large dynamic range. It also allows HDR imaging at lower light levels in which traditional HDR technologies are non-functional. This is possible because the HDR X - Motion optimized mode takes two different readouts from one exposure to capture details in both the highlights and shadows of the scene, instead of blending multiple exposures like standard HDR technologies. Blending multiple exposures reduces sharpness and creates unwanted imaging artefacts on moving objects. HDR X resolves these issues, providing a crisp image with improved dynamic range.

In case an even larger dynamic range is required, HDR X - Optimized DR or HDR X - Extreme DR will further increase performance to an absolute maximum by adding another fast exposure. This combines the benefits from HDR X - Motion optimized and traditional HDR.

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 2.1MP	Low activity	Medium activity	High activity
60	836	1261	2753
30	504	753	1647
25	441	661	1440
15	306	461	992
10	229	347	740
5	140	214	450
3	97	150	313
1	45	70	144

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 protection 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.

A free of charge license is required to activate the Camera Trainer program.

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:

2MP camera with 4.4 mm - 10 mm lens or 12 mm - 40 mm lens

DORI	DORI definition	Distance 4.4 mm / 10 mm	Distance 12 mm / 40 mm	Horizontal width
Detect	25 px/m	27 m / 86 m	115 m / 342 m	77 m
	8 px/ft	84 ft / 270 ft		240 ft

DORI	DORI definition	Distance 4.4 mm / 10 mm	Distance 12 mm / 40 mm	Horizontal width
Observe	63 px/m	11 m / 34 m	46 m / 136 m	31 m
	19 px/ft	35 ft / 114 ft	152 ft / 451 ft	101 ft
Recognize	125 px/m	5 m / 17 m	23 m / 69 m	15 m
	38 px/ft	18 ft / 57 ft	76 ft / 225 ft	50 ft
Identify	250 px/m	3 m / 9 m	12 m / 34 m	8 m
	76 px/ft	9 ft / 28 ft	38 ft / 113 ft	25 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

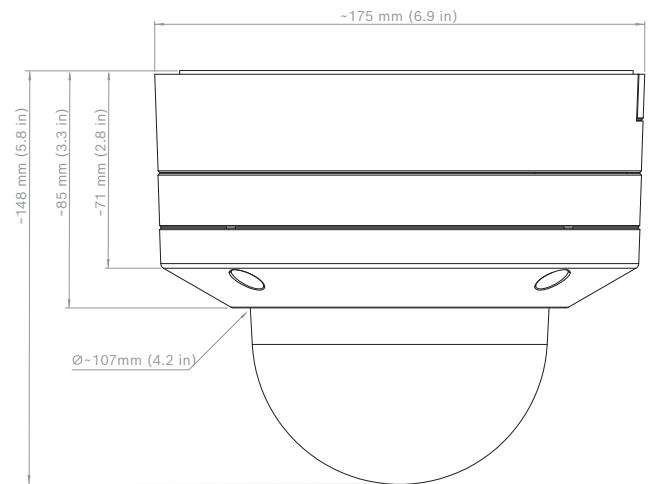
A full line of universal accessories are available that allow a consistent design across different platforms and a wide range of installation possibilities. Several dedicated accessories are available that seamlessly fit to the camera and expand the different installation options over previous generations. 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 301 489-1, 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), CFR 47 FCC, part 15, Class B, AS/NZS CISPR 32	
Immunity	EN 301 489-1, 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)	
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-PLEN, 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, China RoHS, Cmm, UKCA	
Region	Regulatory compliance/quality marks	
Great Britain	UKCA	FLEXIDOME IP startlight 8000i
Europe	CE	FLEXIDOME IP starlight 8000i

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

Electrical

Alarm end-of-line resistor (kΩ)	10 kΩ
Input voltage (VAC)	24 VAC
Input voltage (VDC)	12 VDC – 26 VDC

Output current (A)	50 A
Output voltage (VDC)	12 VDC
PoE input	PoE IEEE 802.3af / 802.3at Type 1, Class 3
Power consumption PoE (W) (typical – maximum)	7 W – 12.95 W
Power consumption VAC (VA) (typical – maximum)	7.10 VA – 13 VA
Power consumption VDC (W) (typical – maximum)	7.50 W – 16 W

Sensor

Total sensor pixels (MP)	2.10 MP
Sensor type	1/1.8 inch CMOS
Effective pixels (H x V px)	1920 px x 1080 px

Optical

Zoom/focus control	Motorized
Iris control	P-iris
Field of View wide (°)	48° – 110°
Field of View tele (°)	27° – 56°
Lens focal length (mm)	4.40 mm – 10 mm
Lens aperture (/F)	1.30 /F – 1.97 /F

Video functions

Camera functionality	Mirror image; Backlight compensation (BLC); Intelligent auto exposure; Intelligent dynamic noise reduction; Contrast enhancement; Sharpness enhancement; Intelligent defog; Pixel counter; Saturation; Brightness
Minimum illumination in color (lx) (starlight sensitivity measured according to IEC 62676 Part 5)	0.0061 lx
Minimum illumination in monochrome (lx) (starlight sensitivity measured according to IEC 62676 Part 5)	0.0007 lx

White balance modes	Basic; Standard; Dominant color; Manual mode; Hold mode; 4 automatic modes; Sodium lamp
White balance (K)	2500 K – 10000 K
Scene modes with scheduler	Standard; Sodium lighting; Vibrant; Sports & gaming; Retail; License plate recognition
Shutter modes	Automatic Electronic Shutter (AES); 1/25 min; 1/15.000 max; Default shutter
Wide dynamic range (WDR) (dB)	144 dB
Display stamping	Name; Logo; Alarm message; Time
Measured according to IEC 62676 Part 5 (dB)	108 dB

Video streaming

Camera processing latency	<67ms
Frame rate (fps)	1 fps – 60 fps
GOP structure	IBBP
Number of encoder output streams	Multiple configurable streams in H.265; H.264 and M-JPEG; Configurable framerate and bandwidth; Region of Interest (ROI); Bosch Intelligent Streaming
Resolution	1920 x 1080; 1280 x 1024; 1280 x 720; 768 x 432; 640 x 480; 1536 x 864; 720 x 480
Video compression	H.264 (ISO/IEC 14496-10); M-JPEG; H.265/HEVC
Video stream signal-to-noise ratio (dB)	>55 dB

Video content analysis

Additional functionalities	Face detection; Tamper detection
Alarm triggers	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
Calibration	Automatic based on gyro sensor, focal length, and camera height

Configurations	Silent VCA; Profile 1; Profile 2; Scheduled; Event triggered
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
Analysis type	Intelligent Video Analytics; Camera trainer

Night vision**Inputs and outputs**

Connector type	Shielded RJ45
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Capacity

Alarm inputs	2
Alarm outputs	1

Connectivity**Audio**

Audio streaming	Full duplex; Half duplex
Compression and sampling rate	G.711 8 kHz; L16 16 kHz; AAC-LC 80kbps 16 kHz; AAC-LC 48kbps 16 kHz
Minimum signal-to-noise ratio (dB)	50 dB

Storage

Memory card slot	SDHC; SD; Dual SDXC
Pre-record interval (s)	5 s

Data security

Local storage encryption	XTS-AES
End-to-end encryption	Full end-to-end with supported VMS
PKI	X.509 certificates
Crypto coprocessor (TPM)	RSA 2048 bit; AES/CBC 256 bit
Encryption	TLS 1.2; TLS 1.0; AES 256; AES 128
Video authentication	MD5; SHA-1; SHA-256; Checksum

Firmware

Common Product Platform	CPP7.3
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Network

Cloud services	Dropbox
Ethernet type	10/100BASE-T

System integration

Conformity	ONVIF Profile S; ONVIF Profile G; ONVIF Profile T
Protocols / standards	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, MIBII); SNMP (V3, MIBII); 802.1x, EAP/TLS; DNS; DNSv6; DDNS (DynDNS.org, selfHOST.de, no-ip.com); SMTP; iSCSI; UPnP (SSDP); DiffServ (QoS); LLDP; SOAP; CHAP; Digest authentication

Mechanical

Bubble material	Polycarbonate
Color	White
Color in RAL	RAL 9003 Signal white
Dimension (Ø x H) (mm)	148 mm x 175 mm
Material	Aluminum
Tilt range (°)	-3° – 81°
Mounting type	Surface-mounted
Pan range (°)	0° – 361°
Pan, tilt, roll adjustment	Motorized
Roll range (°)	-95° – 95°
Weight (kg)	2.20 kg

Environmental

Operating relative humidity, condensing (%)	5% – 100%
Operating temperature (°C)	-50 °C – 60 °C
Operating temperature (°F)	-58 °F – 140 °F

Storage temperature (°C)	-30 °C – 70 °C
Storage temperature (°F)	-22 °F – 158 °F
Operating relative humidity, non-condensing (%)	5% – 93%
Storage relative humidity (%)	0% – 98%
IP rating	IP66; IP6K9K
Impact protection (EN 50102)	IK10+

Camera installation

Field of view adjustment	Motorized pan, tilt, roll
Image rotation	0°; 90° upright; 180°; 270° upright
Positioning	Mounting height; Coordinates

Functionality

Number of independent privacy mask areas	8
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Acoustic

High pass frequency (Hz)	1 Hz
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Ordering information

NDE-8512-RX Fixed dome 2MP HDR X 4.4-10mm PTRZ IP66

Fixed dome.

NDAA compliant

Order number **NDE-8512-RX | F.01U.404.127**

Accessories

NDA-8000-PC Paintable cover, 4 pcs

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

Order number **NDA-8000-PC | F.01U.324.966**

NDA-8000-CBL Clear replacement bubble

Clear replacement bubble.

Order number **NDA-8000-CBL | F.01U.324.934**

NDA-8000-TBL Tinted Bubble

Tinted bubble for FLEXIDOME IP 8000i.

Order number **NDA-8000-TBL | F.01U.324.973**

NDA-8001-IC In-ceiling mount kit

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

Order number **NDA-8001-IC | F.01U.398.407**

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 | F.01U.398.393**

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 | F.01U.324.937**

NDA-8000-WP On-camera weather protector

On-camera weather protector for FLEXIDOME IP 8000i.

Order number **NDA-8000-WP | F.01U.324.929**

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 | F.01U.324.938**

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 | F.01U.324.967**

NDA-U-WMT Pendant wall mount

Universal wall mount for dome cameras, white

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

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

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

Order number **NDA-U-PMTS | F.01U.385.046**

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-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**

NDA-U-PMAL Pole mount adapter large

Universal pole mount adapter, white; large

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

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-RMT Pendant parapet mount

Universal roof mount for dome cameras, white

Order number **NDA-U-RMT | F.01U.324.945**

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**

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**

VG4-SFP SCKT 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-SFP SCKT | 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**

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