BOSCH

NDP-5533-Z30L PTZ 4MP HDR 30x IP66 pendant IR
AUTODOME IP starlight 5100i IR

HDR X | IR | IVA | 802.3bt | (night icon)

▶ 30X, 4MP high detail at fast speeds (60 fps)

▶ Starlight technology with 1/1.8 inch HD sensor for excellent low-light performance

▶ HDR X technology with up to 133dB dynamic range and fewer motion-related artifacts

▶ Combination of 320 m (1050 ft) IR (850 nm) + White light LEDs

▶ Rain-sensing wiper for improved images in rain and in dirty urban conditions

Specially designed for covertness, and tuned for applications where surveillance in scenes with changing light levels is necessary, the camera has an integrated 30X optical zoom to identify people at a distance of more than 280 m (919 ft).

The new HDR technology (HDR X) is ideal for PTZ cameras. With the motion-optimized HDR feature, operators can use HDR imaging in scenes with challenging light levels without seeing blur when the camera is moving.

With a 1/1.8-inch HD sensor and integrated IR and white light illumination, the camera provides superior low-light and no-light performance for outstanding image quality with sharp focus details and excellent color reproduction even under challenging lighting conditions.

The integrated, rain-sensing wiper automatically wipes water from the camera window to ensure outstanding image quality in bad weather.

Functions

Outstanding image quality
The 1/1.8-inch CMOS HD sensor combines outstanding sensitivity and sophisticated noise suppression with High dynamic range of 133dB. The camera provides superior low-light performance as well as outstanding image quality, with sharp focus details and excellent color reproduction even under challenging lighting conditions.

Pre-programmed user modes
The camera has several pre-configured scene modes with the best settings for various applications. With one click, users can optimize image settings to match the camera's lighting conditions. Users can also configure individual image settings.

- Standard: For indoor fluorescent lighting.
- Sodium-lighting: For scenarios where the video is captured under sunlight in the day or under sodium vapor lamp at night.
- Vibrant: For enhanced contrast, sharpness, and saturation
- LPR: For applications to capture reflective number plates in combination with IR lighting.

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 the shadows of the scene, instead of blending multiple exposures as do standard HDR technologies. Blending multiple exposures reduces sharpness and creates unwanted imaging artifacts 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.

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.

Intelligent streaming
Smart encoding capabilities, together with Intelligent Dynamic Noise Reduction technology and analytics, make the bandwidth consumption drop to extremely low levels. Only relevant information in the scene, such as motion or objects found with the analytics, are encoded.

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.
A memory card with a maximum of 32 GB (microSDHC) / 2 TB (microSDXC) 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.

Essential Video Analytics on the edge
The camera includes the latest release of Essential Video Analytics application from Bosch for use on Pre-positions.
The Essential Video Analytics application provides reliable video analytics for small and medium business, large retail stores, commercial buildings, and warehouses.
Advanced tasks like multiple line crossing, loitering, idle / removed object detection, crowd density estimation, occupancy and people counting are available for live alarming and forensic search.
Object filters based on size, speed, direction, aspect ratio, and color can be defined.
A simplified calibration mode reduces installation time significantly, because you only need to enter the installation height once for each camera, independent of pre-positions.
After the camera is calibrated, the analytics engine can automatically classify objects as upright person, car, bike, or truck.

Sophisticated alarm responses
The camera supports advanced alarm control that uses sophisticated rules-based logic to determine how to manage alarms. In its most basic form, a rule could define which input(s) should activate which output(s). In a more complex form, inputs and outputs can be combined with pre-defined or user-specified commands to perform advanced camera functions.

Superior privacy masking
The camera allows for a total of 32 individual privacy masks, with up to eight masks displayed in the same scene. Each mask can be programmed with eight corners. Each mask changes size and shape smoothly and quickly, ensuring that the covered object cannot be seen.
With the AUTO Privacy Mask, the color of the Privacy Mask will adapt to the color of the surroundings.

Dual-mode Illumination
The camera has an integrated, long-life, infrared (IR) Illuminator and White light LEDs.
The illuminator enables viewing of objects even in total darkness, ensuring high-quality images regardless of the lighting conditions.
The illuminator allows Detection of objects at a maximum distance of 320 m (1049 ft) with infrared (850 nm) and 60 m (196 ft) with White light.
The following table identifies the application for each type of LED.

Application	Type of illuminator
Close-range illumination	850 nm wide IR LEDs
Long-range illumination	850 nm narrow IR LEDs
Identification and deterrent	White light LEDs

IR illuminator
As ambient light decreases in the scene, the camera switches to monochrome mode and automatically activates the IR LEDs of the illuminator.
The IR mode AUTO can steer IR beam dynamically to match the illumination coverage and intensity with the camera's field of view.
Beam intensity is controlled automatically or manually, depending on user preference. Decreasing intensity reduces overexposure.
For close-range illumination, the wide angle IR LED will strengthen to cover the whole scene. With the increase of camera lens zoom ratio, the narrow angle of IR LED intensity will be increased.
A spotlight mode is provided to allow IR illuminator to brighten the center of the camera's field of view.

White light illuminator
White light mode allows operators to capture full scene details in color.
Operators can turn the White light LEDs on and off as necessary, especially to use as a deterrent effect.

Operators have the option to set automatic timeout of the White light mode. After this mode times out, the illuminator will operate in IR mode. Operators can disable the White light functionality permanently or by sector in order to prevent activation in situations where White light might create a hazardous situation such as distracting a driver on a highway.

Snap to zoom
Drawing a box in the image will trigger the camera to zoom to the correct position.

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:

DORI	Distance to object		
	WIDE 1X	TELE 30X	Scene width
Detection 25 px/m (8 px/ft)	91 m (300 ft)	2794 m (9167 ft)	102 m (336 ft)
Observation 63 px/m (19 px/ft)	36 m (119 ft)	1109 m (3638 ft)	41 m (133 ft)
Recognition 125 px/m (38 px/ft)	18 m (60 ft)	559 m (1834 ft)	20 m (67.2 ft)
Identification 250 px/m (76 px/ft)	9 m (30 ft)	280 m (919 ft)	10 m (33.6 ft)

Data security
Special measures are necessary to ensure the highest level of security for device access and data transport. On initial setup, the camera is only accessible over secure channels. You must set a service-level password in order to access camera functions.
Web browser and viewing client access can be protected using HTTPS or other secure protocols that support state-of-the-art TLS 1.2 protocol 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 protocol. 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.

Software sealing
After camera configuration is set it should not be changed, and system administrators can enable software protection to seal the camera configuration. Any change of the sealing status or of the static configuration, accidental or intentional, will break the seal. The camera then sends an alarm message that the video management system can use to start an appropriate alarm scenario. The camera creates a separate log file of all changes that have an effect on the sealing status.

System integration and ONVIF conformance
The camera conforms to the ONVIF Profile S, ONVIF Profile G and ONVIF Profile T 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.

PTZ drive and mechanism
The camera supports 256 pre-positions and two styles of Guard Tours: Pre-position and Record/Playback. The Pre-position tour has capability for up to 256 pre-positions with a configurable dwell time between pre-positions and can be customized as to the order and the frequency that each Pre-position is visited. The camera also provides support for two (2) recorded tours, which have a total duration of 15 minutes of movements. These are recorded macros of an operator's movements, including pan, tilt, and zoom activities, and can be played back in a continuous manner.
Pan and tilt preset repeatability are accurate to within ±0.1 degrees to ensure that the correct scene is captured every time. The camera delivers maximum pan speed of 240 degrees per second and maximum tilt speed of 100 degrees per second. The camera is capable of manual pan speeds as low as 0.1 degrees per second. The camera provides a pan range of up to 360 degrees continuous rotation.

Ease of installation and servicing
The camera has been designed for quick and easy installation, a key feature of IP video products from Bosch. All housings feature recessed screws and latches for increased tamper resistance.
Bosch designed the camera with the knowledge that field cables and mounts are installed before the camera is mounted. The hinge design allows one

person to hook the camera to the mount. One person can connect the cables directly to the camera without re-routing cables.

The pendant housing is rated to provide IP66 protection and offers an operating temperature range down to -40° C (-40° F). The pendant camera comes fully assembled with a sunshield and ready for pendant arm or pipe applications with the proper mounting hardware (sold separately).

Bosch offers a full complement of hardware and accessories (sold separately) for wall, corner, mast, roof, pipe mount, and in-ceiling applications for indoor and outdoor environments, which allow the camera to be adapted easily to individual site requirements.

Regulatory information

For a full list of all related certifications/standards, refer to the Product Test Reports, available on the online catalog, on the Documents tab of the product page for your device. If the document is unavailable on the product page, contact your sales representative.

Standard	Type
Electromagnetic Compatibility (EMC)	FCC Part 15, ICES-003 EN 55032:2015 + A11: 2020 + A1: 2020 EN 50130-4:2011/A1:2014 EN 50121-4
Product Safety	Complies with UL, CE, CSA, EN, and IEC standards including: UL 62368-1, 3rd Ed EN 62368-1:2020+A11:2020 CAN/CSA-C22.2 No. 62368-1-19, 3rd Ed IEC 62368-1:2018 Ed.3 IEC 62471:2006
Image performance	IEC 62676-5
Color representation	ITU-R BT.709-6
ONVIF conformance	EN 50132-5-2, EN 62676-2
HD	SMPTE 296M-2001 (Resolution: 1280x720) SMPTE 274M-2008 (Resolution: 1920x1080)
Marks	BIS; CE; CMIM; FCC; RCM; China RoHS; UL; VCCI; WEEE
Compliance	NDAA compliant TAA compliant

Region	Regulatory compliance/quality marks	
Europe	CE	Declaration of Conformity (DoC) - AUTODOME 5100i

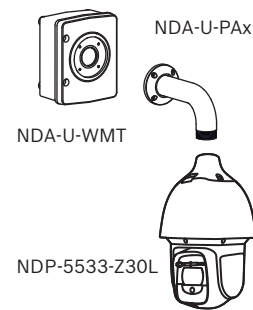| Region	Regulatory compliance/quality marks	
Global	IEC 62443	Industrial Cyber Security Capability
USA	UL CAP	Cybersecurity Assurance Program
Great Britain	UKCA	UK Declaration of Conformity (DoC) - AUTODOME IP starlight 5100i, IR

Installation/configuration notes

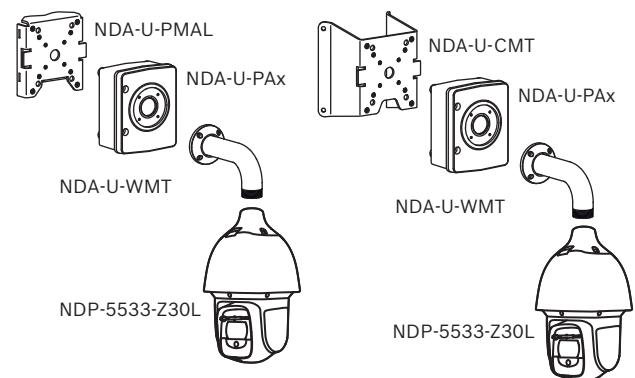*Fig. 1:* Wall mount with surveillance cabinet (IP66)
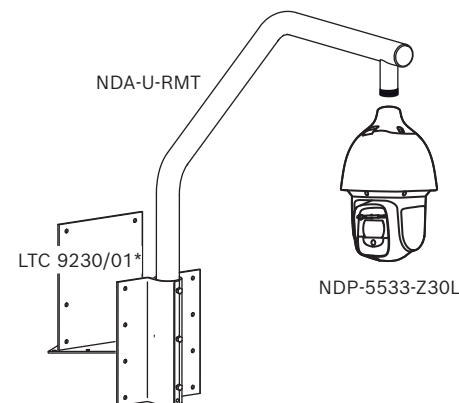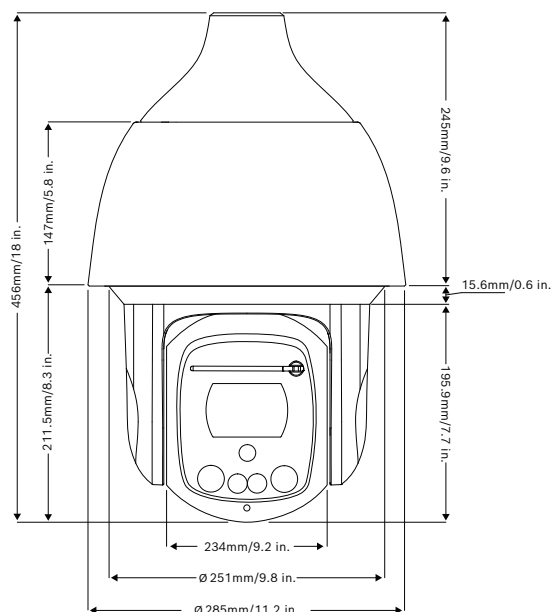

Fig. 2: Pole mount (IP66), corner mount (IP66)

Fig. 3: Roof mount (IP66)
*optional for flat roof mount
For more options, see Quick Selection Guide: Camera accessories.

Dimensions in mm (inch)

Parts included

Quantity	Component
1	AUTODOME IP starlight 5100i IR camera
1	Screwdriver, T15 Torx
3	MAC address labels
1	Pendant interface plate
2	M4 screw
1	IP66 kit
1	PE foam
1	3/16" Allen key (Hex key)
1	Quick Installation Guide
1	Safety instructions

Technical specifications

Sensor

Sensor type	1/1.8 inch CMOS
Total sensor pixels	4 MP approx.
Effective pixels (H x V)	2,688 x 1,520

Sensitivity

Low light technology	starlight

Measuring method	IEC 62676 Part (1/30, F1.6)
Color (lx)	0.0101 lx
Monochrome (lx)	0.0016 lx
With IR	0.0 lx

Optical

Lens zoom (x)	30x motorized zoom
Digital zoom (x)	16x
Lens aperture (/F)	1.5 /F – 4.8 /F
Lens focal length (mm)	6.6 mm – 198 mm
Horizontal field of view (º)	2.1° – 58.5°

Night vision

Number of IR LEDs	4
Wavelength (nm)	850 nm
Beam angle	10° FWHM (narrow) 54° FWHM (wide)
Maximum detection distance IR (ft)	1,050 ft
Maximum detection distance IR (m)	320 m
Number of white LED quads	2
Color temperature	5600-6300K
Beam angle	55° FWHM
Light intensity (3m)	90 lux
Maximum detection distance white light (ft)	197 ft
Maximum detection distance white light (m)	60 m

PTZ functions

Pan range (°)	0° – 360° continuous
Pan speed (°/s)	0.1°/s – 240°/s
Pre-position accuracy (average) (°)	0.10°

Pre-position speed (°/s)	Pan: 240°/s │ Tilt: 100°/s Note: When the operating temperature of the camera is below 0 ℃, the maximum pre-position speed will be 120°/s to keep pre-position accuracy.
Tilt speed (°/s)	0.1°/s – 100°/s
Tilt Angle	-90° to 5° (Auto-flip 190°)

Platform

Common Product Platform	CPP7.3
Memory (MB)	512 MB RAM, 256 MB Flash

Video streaming

Resolution	1920 x 1080; 1280 x 1024; 1280 x 720; 768 x 432; 512 x 288; 256 x 144; 704 x 576; 640 x 480; 2560 x 1440
Frame rate (fps)	30 fps – 60 fps
Overall IP delay	60 fps: 166 ms (typical) │ 30 fps: 233 ms (typical)
Type of stream	High resolution H.26x stream; M-JPEG stream; I-frame only from stream 1
Video compression	H.264 (ISO/IEC 14496-10); M-JPEG; H.265/HEVC
GOP structure	IP; IBP; IBBP

Video functions

WDR technology	HDR X
High Dynamic Range (HDR) (dB)	133 dB
Measured according to IEC 62676 Part 5 (dB)	108 dB
Day/night modes	Auto; Color; Monochrome
Gain control	AGC, Variable 6 dB to 78 dB
Camera functionality	Backlight compensation (BLC); Intelligent auto exposure; Intelligent dynamic noise reduction; Intelligent defog
Video signal-to-noise ratio (dB)	>55 dB
White balance modes	Basic; Standard; Dominant color; Manual mode; Sodium lamp auto

Number of privacy masks	32 individually configurable Privacy Masks; maximum 8 per Pre-position; programmable with 3, 4 or 5 corners; selectable color of Black, White or Gray, as well as an "Auto" option in which the camera selects the most prevalent of the three colors in the background scene as the pattern color
Privacy masks pattern	Black; White; Gray; Auto color
Shutter modes	Automatic Electronic Shutter (AES)
Shutter speed	0.64 sec to 1/66,666 sec
Backlight compensation	On/Off; Intelligent Auto Exposure (IAE)
Number of pre-positions	256
Number of sectors	16
Scene modes	Standard; Sodium lighting; Vibrant; License plate recognition
(Guard) Tours	Custom recorded tours: two (2) Pre-position tours, maximum total duration 30 minutes: one (1), consisting of up to 256 scenes consecutively; one (1), customized up to 256 user-defined scenes
Defog mode feature	Improves visibility when viewing foggy or other low-contrast scenes.

Video content analysis

Analysis type	Essential Video Analytics
Configurations	Silent VCA; Profile 1; Profile 2; Scheduled; Event triggered
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
Object filters	Duration; Size; Aspect ratio; Speed; Direction; Color; Object classes (4)

Storage

Internal storage	Memory card micro SD
Memory card slot	Micro SDHC; Micro SDXC

Inputs and outputs

Ethernet	Shielded RJ45
Alarm inputs	2

Alarm outputs	1
Number of audio inputs	1
Number of audio outputs	1

Audio

Compression and sampling rate	G.711 8 kHz; L16 16 kHz; AAC; 16kHz
Audio input	Line-in
Audio output	Line-out

Network

Ethernet type	10/100BASE-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, self-HOST.de, no-ip.com); SMTP; iSCSI; DiffServ (QoS); LLDP; SOAP; CHAP; Digest authentication
Conformity	ONVIF Profile S; ONVIF Profile G; ONVIF Profile T; ONVIF Profile M

Data security

Crypto coprocessor (TPM)	AES/CBC 256 bit
PKI	X.509 certificates
End-to-end encryption	Full end-to-end with supported VMS
Encryption	TLS 1.2; TLS 1.1; AES 256; AES 128; TLS 1.3
Local storage encryption	XTS-AES
Video authentication	MD5; SHA-1; SHA-256; Checksum
Firmware protection	Signed firmware; Secure reboot

Operation

Software compatibility	Web browser; Bosch Configuration Manager; Bosch Video Management System; Project Assistant; Video Security Client (VSC); Video Recording Manager

Electrical

Type of power supply	VAC; PoE

Input voltage (VAC)	24 VAC
Power consumption VAC (VA) (typical – maximum)	29.5 VA – 55.2 VA
Power consumption VAC (W) (typical – maximum)	21.2 W – 39.4 W
Power consumption PoE (W) (typical – maximum)	21.2 W – 39.4 W
PoE input	PoE++ IEEE 802.3bt, Type 3 standard	PoE+ IEEE 802.3at Type 2 standard (no heater, half illuminator intensity)
Surge protection	Built-in; for power, data, and video and alarm inputs

Note: When using 24 VAC or IEEE 802.3bt, the camera operates at maximum power consumption (heater on, illuminator on to full intensity of IR and White light).

Environmental

IP rating	IP66
Impact protection	IK10
Operating temperature (℃)	-40 ℃ – 60 ℃
Operating temperature (℉)	-40 ℉ – 140 ℉
Operating relative humidity, non-condensing (%)	5% – 93%
Storage temperature (℃)	-40 ℃ – 60 ℃
Storage temperature (℉)	-40 ℉ – 140 ℉
Country of origin	Portugal

Construction

Dimensions (Ø x H) (mm)	285 mm x 456 mm
Dimensions (Ø x H) (in)	11 in x 18 in
Weight (kg)	9.90 kg
Weight (lb)	21.80 lb
Material	Aluminum
Color (RAL)	RAL 9003 Signal white

Ordering information

NDP-5533-Z30L PTZ 4MP HDR 30x IP66 pendant IR
PTZ dome camera, 4MP HDR, 30x optical zoom, clear,
IP66 pendant, IR
NDAA and TAA compliant.
Order number **NDP-5533-Z30L**

Accessories

NPD-6001C Midspan, bt, 60W, indoor
Indoor midspan with Power-over-Ethernet for use with
PoE-enabled cameras; 60 W, single-port, AC input
Order number **NPD-6001C**

NPD-6001C-E Midspan, bt, 60W, IP67
Outdoor midspan with Power-over-Ethernet for use
with PoE-enabled cameras; 60 W, single-port
Order number **NPD-6001C-E**

UPA-2450-50 PSU, 220VAC 50Hz, 24VAC 50VA out
Indoor power supply for camera. 220 VAC, 50 Hz in;
24 VAC, 50 VA out
Order number **UPA-2450-50**

UPA-2450-60 PSU, 120VAC 60Hz, 24VAC 50VA out
Indoor power supply for camera. 120 VAC, 60 Hz In;
24 VAC, 50 VA Out
Order number **UPA-2450-60**

NDA-U-PA0 Surveillance cabinet 24VAC
Surveillance cabinet, 24 VAC input, 24 VAC output
Order number **NDA-U-PA0**

NDA-U-PA1 Surveillance cabinet 120VAC
Surveillance cabinet, 100 - 120 VAC 50/60 Hz input,
24 VAC output
Order number **NDA-U-PA1**

NDA-U-PA2 Surveillance cabinet 230VAC
Surveillance cabinet, 230 VAC input, 24 VAC output
Order number **NDA-U-PA2**

NDA-U-WMT Pendant wall mount
Universal wall mount for dome cameras, white
Order number **NDA-U-WMT**

NDA-U-WMP Wall mount plate
Back plate for universal wall mount, corner mount and
pole mount, white, IP66
Order number **NDA-U-WMP**

NDA-U-CMT Corner mount adapter
Universal corner mount, white
Order number **NDA-U-CMT**

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-PMAS Pole mount adapter small
Pole mount adapter small
Universal pole mount adapter, white; small.
Order number **NDA-U-PMAS**

NDA-U-PMAL Pole mount adapter large
Universal pole mount adapter, white; large
Order number **NDA-U-PMAL**

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-RMT Pendant parapet mount
Universal roof mount for dome cameras, white, for
outdoor usage
Order number **NDA-U-RMT**

VG4-SFPSCKT Ethernet to SFP interface kit
Ethernet media converter video transmitter/data
receiver fiber optic kit
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 mm
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**

Software Options

MVS-FCOM-PRCL License key for serial protocol
Serial Protocol Software License (e-license) for IP
Cameras
Order number **MVS-FCOM-PRCL**

Services

**EWE-AD5HD-IWMP 12 mths wrty ext AD IP 5000 mov
par**
12 months warranty extension
Order number **EWE-AD5HD-IWMP**

https://www.boschsecurity.com