NBE-7704-ALT Bullet 8MP HDR 12-38mm IP66/67 IK10

DINION 7100i IR

- Starlight technology for low-light performance with maximum detail
- High Dynamic Range (HDR) to see every detail in both bright and dark areas of the scene
- IVA Pro brings highly reliable deep-learning based detection of persons and vehicles to scenes ranging from sterile zones to crowded and congested
- Powerful long range (850nm) intelligent IR illumination up to 120 m (394 ft), optional invisible IR (940nm) or white light.
- Extremely robust and stable design with exceptional corrosion resistance for any outdoor application including traffic monitoring, critical infrastructure and perimeter security

The NBE-7704-ALT is an extremely robust bullet camera for mission-critical applications. The ruggedized and stable design has exceptional corrosion resistance for use in any outdoor application.
Using 1/1.8" sensors with 8MP resolution, the NBE-7704-ALT provides the perfect balance between high resolution and extreme low light sensitivity. Starlight and HDR technology combined with powerful smart IR illumination ensure highly detailed images even in the most challenging situations.
The cameras have a powerful, embedded processor with dedicated hardware to support advanced machine learning and deep neural network-based Video Analytics.
Built-in Intelligent Video Analytics Pro (IVA Pro) enriches full situational awareness and triggers relevant alerts.
With the combination of the robust housing, exceptional image quality and the powerful video analytics, the NBE-7704-ALT is the ideal choice for the most demanding outdoor applications, including traffic monitoring, critical infrastructure, and perimeter security.

Functions

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 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 standardized measurements, which can be used to compare different cameras.

Intelligent Video Analytics Pro (IVA Pro)
The camera comes with the IVA Pro Building and the IVA Pro Perimeter pre-installed and brings highly reliable deep-learning based detection and tracking of persons and vehicles to scenes ranging from sterile zones to crowded and congested. Being extremely resistant to false triggers caused by challenging environments with rain, wind (moving trees), snow, hail, and water reflections as well as shadows and bugs, it reliable detects, tracks, and classifies objects. A smart set of alarm and counter rules allows to alert you when predefined alarms are triggered, and to forensically search with high efficiently though recordings. Configuration effort is minimized and made easy by removing the need for calibration.
Additionally, other options can be licensed to optimize the camera analytics for specific enterprise use-cases with the IVA Pro Traffic.

Intelligent Video Analytics Pro (IVA Pro) - optional licenses
With the introduction of IVA Pro Appearance, users can conduct forensic searches based on distinct characteristics, such as color of clothing, bags, hats, or other features, enabling a more precise search of individuals. Furthermore, the integration of IVA Pro Gun Detection enhances security measures by automatically detecting and classifying people brandishing firearms, ensuring comprehensive threat detection.
Additionally, the camera now features IVA Pro Personal Protective Equipment (PPE), designed to detect the proper use of personal protective equipment, which can reduce accident risk and promote health and safety in various environments.
IVA Pro Traffic can be licensed to optimize the camera analytics for ITS applications such as counting and classification, as well as Automatic Incident Detection, which are necessary for highway and urban infrastructure planning. IVA Pro License Plate excels in real-time identification of license plates in parking applications or city environments.for automated ticketing systems, traffic enforcement, and smart parking solutions.

IR illumination
The NBE-7704-ALT offers integrated advanced smart infrared (IR) illumination. The IR range covers a distance of up to 120 m (394 ft).
The combination of multiple IR beam angles, linked to the zoom position of the lens, ensure uniform illumination of the full scene, without hot spots or dark corners in any field of view. Smart IR ensures a balanced image without over exposure on objects closer to the camera.
Optional invisible IR (940nm) or white light modules are available.

Polarizing filter
A polarizing filter kit is available for the DINION 7100i IR tele lens variants. By adding a polarizing filter, the reflections of glass, water, leaves, or wet roads can be reduced, ensuring the relevant details can be captured.

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.

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:

8MP camera with 12 - 38 mm lens*

DORI	DORI definition	Distance 12 mm/38 mm	Horizontal width
Detect	25 px/m (8 px/ft)	237 m/724 m (731 ft/2664 ft)	153 m (480 ft)
Observe	63 px/m (19 px/ft)	94 m/287 m (312 ft/953 ft)	61 m (202 ft)
Recognize	125 px/m (38 px/ft)	47 m/144 m (156 ft/476 ft)	30 m (101 ft)
Identify	250 px/m (76 px/ft)	23 m/72 m (78 ft/238 ft)	15 m (50 ft)

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

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

Resists rain, dust, and tampering with reliable operation across a wide temperature range
Suitable for indoor and outdoor usage.
The robust design of the camera is rated to IP66 / IP67 and IK10 standards, safeguarding the camera against rain and dust while also offering protection against vandalism and tampering.

The camera can operate in a wide ambient temperature range between -50 °C up to +60 °C (-58 °F to +140 °F).

Auto-calibration
The camera offers auto-calibration by transforming 2D pixels into 3D real world measures, such as size, speed and geolocation of objects for tracking use cases. AI technology allows the camera to detect and analyze persons and vehicles in the scene to determine calibration parameters. Calibration efforts are now reduced to a single click, followed by the usual human verification. This reduces the calibration effort or time investment, ensuring optimal accuracy while keeping costs to a minimum.

Electronic image stabilization
The camera incorporates a built-in, electronic Image stabilization and algorithm that allows to sense continuous vibration. If it detects vibration, the device dynamically corrects the shaky video in both vertical and horizontal axis. The Image stabilization function delivers exceptional image clarity and a stable field of view on the monitor.
The EIS crop factor is adjustable. This helps the camera deliver exceptional image clarity, by allowing you to optimize the balance between field of view and the maximum vibration amplitude.

Easy installation
The NBE-7704-ALT uses the proven 3-step installation concept. The mounting plate has multiple hole patterns for installation on electrical boxes (4 inch square and double gang) and on the Bosch Universal Accessories. The back box can be attached with a simple rotate and click. All wires can be connected in the back box.
Power can be supplied through 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.
The design of the camera focuses on robustness and stability. A patented optimized swivel design further helps with the ease of installation.
The swivel has a big-ball joint for optimal stability. When combined with electronic image stabilization, this helps to ensure stable images in challenging environments, such as traffic monitoring.
The camera features a short housing and a big swivel, to ensure maximum stability.
While positioning the camera with the one hand, a locking ring can be tightened with the other hand without using a tool. The camera will stay in position while the swivel can be locked with a locking screw. Once the locking screw is tightened, the locking ring can no longer be untightened by hand.
The camera features a punch down connector for network connection. This helps directly connect bigger cables directly to the camera.
For standard cables, an RJ45 connection is available. For CAT-7 or bigger cables, it is possible to directly punch down the cable on a special connector.
The punch down connector eliminates the need for an external cabinet, where the large diameter cable can be connected to a small patch cable that, in turn, connects to the camera. The large diameter cables can now be directly connected to the camera.
The camera is compatible with the Bosch electrical boxes accessories, including a double gang box and a 4 inch square junction box.

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
- 4096 key length

Advanced edge recording
Advanced edge recording provides the reliable storage solution possible due to the combination of the following functionalities:
- Dual microSD cards that can be set up as either:
  - Mirrored, for redundant storage
  - Failover, for extended service intervals
  - Extended, for maximum retention time
- Industrial microSD card support allows for extreme lifetime
- Health monitoring of industrial microSD cards provide early service indications

Cloud-based services
Using the Bosch Security Cloud, you can configure, troubleshoot, and update supported devices using the browser-based interface or standard tools. With one click on Remote Portal, you can activate additional value-added services, such as Alarm Management in Cloud VMS, or VideoView+.

VideoView+ provides an easy-to-use and cost-effective solution to remotely connect to your device from anywhere, at any time. Leverage the power of the Bosch cloud to monitor your premises and get notified about any incident. VideoView+ also enables live streaming, locally and from remote, of up to 8 concurrent devices via Video Security Client, or of up to 4 concurrent devices on the Android and iOS app clients. This includes replay and export functionality, as well as forensic search to define and perform search criteria for recorded events.

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

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

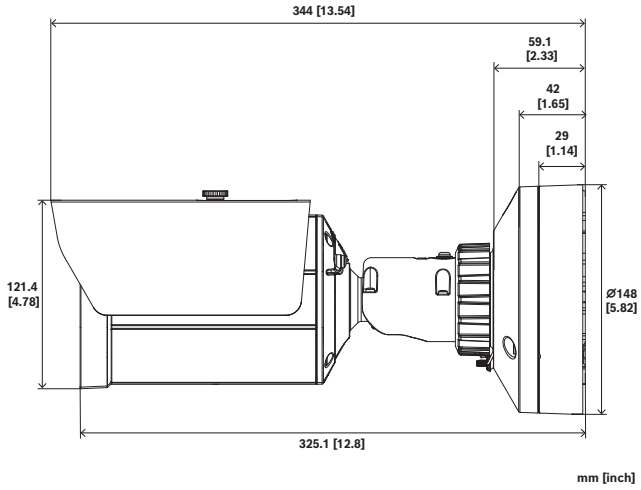
Project Assistant app
As the camera is equipped with a USB-C port for a Wireless installation dongle (sold separately: NCA-WLAN-EU, NCA-WLAN-NA), the installer can easily perform the initial configuration wirelessly. Using a mobile device with the Bosch Project Assistant app, you can do initial set-up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

Regulatory information

Type	Standard
Emission	EN 55032 (Class B) EN 50121-4 EN IEC 61000-6-3 EN IEC 61000-6-4 CFR 47 FCC part 15 (Class B) ICES-003 Issue 7
Immunity	EN 55035 EN 50130-4 EN 50121-4 EN IEC 61000-6-1 EN IEC 61000-6-2 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8
Environmental	EN 50130-5 (Class IV) 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 TS 2-2003, Section 2 (Environmental requirements) EN IEC 63000 (RoHS) California Proposition 65
Corrosion resistance	ISO 14993
Safety	IEC 62368-1 EN 62368-1 UL 62368-1 CSA C22.2 No. 62368-1 IEC 60950-22 EN 60950-22 UL 60950-22 CSA C22.2 No. 60950-22 IEC 62368-3 EN IEC 62368-3 IEC 62471 EN 62471
Impact protection	EN 62262 (IK10)
Ingress protection	EN 60529 (IP66/IP67) NEMA 250 (4X)
ISO 20653	IP6K9K
Marks	CE, cULus, RCM, WEEE, VCCI, CMIM, UKCA
Compliance	NDAA compliant

Region	Regulatory compliance/quality marks	
Global	IEC 62443	Industrial Cyber Security Capability
USA	UL CAP	Cybersecurity Assurance Program

Installation/configuration notes



Dimensions in mm (inch)

Parts included

Quantity	Component
1	NBE-7704-ALT camera
1	TR20 key
1	Mini screwdriver
1	Grommet (IP66)
1	Grommet (IP67)
1	Quick installation guide
1	Safety information
3	Installer UX labels

Technical specifications

Electrical

PoE input	PoE IEEE 802.3af / 802.3at Type 1, Class 3; PoE and auxiliary power can be connected simultaneously for redundant operation
Input voltage (VAC)	24 VAC ±10%
Input voltage (VDC)	12 VDC – 26 VDC ±10%
Power consumption PoE (W) (typical – maximum)	7 W – 12.95 W
Power consumption VAC (VA) (typical – maximum)	12 VA – 25 VA
Power consumption VAC (W) (typical – maximum)	7.10 W – 13 W
Power consumption VDC (W) (typical – maximum)	7.50 W – 16 W

Sensor

Sensor type	1/1.8 inch CMOS
Effective pixels (H x V)	3,840 x 2,160 2.0 µm
Total sensor pixels	8.30 MP approx.

Sensitivity

Low light technology	starlight
Sensitivity	30 IRE
Color (lx) (sensitivity measured according to IEC 62676 Part 5)	0.0899 lx
Monochrome (lx) (sensitivity measured according to IEC 62676 Part 5)	0.0095 lx (0 with IR)
High Dynamic Range (HDR) (dB)	120 dB

Optical

Lens focal length (mm)	12 mm – 38 mm
Iris control	P-iris
IR corrected	Yes
Lens aperture (/F)	2.05 /F – 2.25 /F
Zoom/focus control	Motorized
Field of View wide (H x V)	42° x 24°
Field of View tele (H x V)	9° x 5°

Night vision

IR function	On; Off; Auto; Intelligent IR
LED	Exchangeable illumination modules: 850 nm (default); 940 nm (optional); white light (optional - available at a later date)
Distance 850 nm IR (default)	120 m | 394 ft
Distance 940 nm invisible IR (optional)	80 m | 262 ft

IR intensity	Manually adjustable; Automatic; Exchangeable illumination modules

Firmware

Common Product Platform	CPP14

Video streaming

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG; H.265/HEVC
Sensor modes	25 fps, HDR, 3840 x 2160 (8.3 MP); 30 fps, HDR, 3840 x 2160 (8.3 MP)
Streaming	4 configurable streams in H.265; H.264 and M-JPEG; Configurable framerate and bandwidth; Bosch Intelligent Streaming (available with future firmware update)
Camera processing latency	<120ms (8MP, 30 fps)
GOP structure	IBBP
Frame rate (fps)	1 fps – 30 fps
Video signal-to-noise ratio (dB)	>55 dB
Video resolution (H x V)	4K UHD, 3840 x 2160 6MP 3264 x 1840 4.1MP (16:9) 2688 x 1512 HD 1080p, 1920 x 1080; 1.3MP,1536 x 864; HD 720p, 1280 x 720; SD 432p, 768 x 432; 0.1MP (16:9), 512 x 288

Camera installation

Mirror image	On; Off
Image rotation	0°; 90° upright; 180°; 270° upright
Camera LED	Auto disable; Enable; Disable

Video functions

ALC mode	Standard; Fluorescent; Level; Average vs. Peak; Speed; Priority dark vs. bright
Shutter modes	Automatic Electronic Shutter (AES); 1/25 min; 1/15,000 max; Default shutter
Image stabilization	Electronic
Day/night modes	Auto (adjustable switch points); Color; Monochrome
WDR technology	HDR; HDR - Optimized DR; HDR - Extreme DR
Camera functionality	Geolocation; Backlight compensation (BLC); Contrast enhancement; Sharpness enhancement; Brightness
White balance (K)	2,000 K – 10,000 K
White balance modes	Basic; Standard; Sodium lamp; Manual mode; Hold mode; 3 automatic modes
Number of privacy masks	8
Display stamping	Name; Logo; Alarm message; Time
Scene modes	Standard; Sodium lighting; Vibrant; Sports & gaming; Retail; Fast movement; Sensitivity boost; Color only; LPR; Backlight

Video content analysis

Analysis type	Intelligent Video Analytics Pro: IVA Pro Buildings; Intelligent Video Analytics Pro: IVA Pro Perimeter
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; Objects stopping or starting to move
Object filters	Duration; Size; Aspect ratio; Speed; Direction; Color; Object classes (6)
Perimeter tracking 3D	Ship tracking; Museum mode; Perimeter tracking (2D); People tracking (3D); Base tracking (2D); Traffic tracking (3D)
Calibration	Automatic based on gyro sensor, focal length, and camera height
Number of possible alarm rules (simultaneously)	16
Additional functionalities	Tamper detection

Supported analytics (license)	IVA Pro Appearance; IVA Pro Visual Gun Detection; IVA Pro Personal Protective Equipment; IVA Pro Traffic

Storage

Internal storage	5-s-pre-alarm-recording
Memory card slot	Dual micro SDHC; Dual micro SDXC; Dual micro SD card up to 2 TB
Industrial SD cards	Extreme lifetime and health monitoring support that provides early service indication
Dual SD-card slot configurations	Mirror (redundant storage); Failover (extended service interval); Extend (maximum retention time); Automatic Network Replenishment

Inputs and outputs

Ethernet	Shielded RJ45; Punch down connector
Audio line in	10 kOhm typical; max. 1 Vrms
Audio line out	1.5 kOhm typical; 1 Vrms
Audio input	Line-in
Audio output	Line-out
Alarm inputs	2; Dry contact; 5 - 40 VDC; 2.2 K end-of-line resistor
Alarm outputs	1; max 30 VAC; +40 VDC; 0.5 A; continuous 10 VA
Surge protection	1 kV; 1 kA to ground (8/20 µs)
USB	USB 2.0 Type C, for use with Wireless installation dongle for setup and commissioning (sold separately)
Fiber optics (sold separately)	The Fiber Optic Ethernet Media Converter kit (VG4-SFPSCKT) installed inside a Surveillance Cabinet (NBA-7070-PA0, NBA-7070-PA1 or NBA-7070-PA2) provides the fiber optic interface to the mounted camera

Audio

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
Audio streaming	Full duplex; Half duplex

Network

Protocols / standards	IPv4; IPv6; UDP; TCP; HTTP; HTTPS; RTP/SRTP/RTCP; RTSP/RTSPS; IGMP V2/V3; ICMPv6; FTP/Secure FTP; ARP; DHCP; APIPA (Auto-IP, link local address); NTP (SNTP); SNMP (V1, MIBII); SNMP (V3, MIBII); 802.1x, EAP/TLS; DNS; DNSv6; SMTP; iSCSI; UPnP (SSDP); DiffServ (QoS); LLDP; SOAP; CHAP; Digest authentication, SCEP
Ethernet type	10/100/1000BASE-T
Conformity	ONVIF Profile S; ONVIF Profile G; ONVIF Profile T; ONVIF Profile M

Data security

Crypto coprocessor (TPM)	RSA 4096 bit; AES/CBC 256 bit
PKI	X.509 certificates
End-to-end encryption	Full end-to-end with supported VMS
Encryption	TLS 1.2; 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 boot; Software sealing

Mechanical

Material	Housing: Aluminum with dehumidifying membrane and waterproof connection area
Dimensions (Ø x H) (mm)	148 mm x 115 mm
Dimensions (Ø x H) (in)	5.82 in x 4.52 in
Weight (kg)	2.95 kg
Weight (lb)	6.50 lb

Color (RAL)	RAL 9003 Signal white
Mounting type	Surface-mounted

Environmental

Operating temperature (°C)	-40 °C — 60 °C PoE; -50 °C — 60 °C 12VDC/24VAC; Up to 74 °C according to NEMA TS 2-2021, para 2.1.5.1 using fig. 2.1 test profile
Operating temperature (°F)	-40 °F — 140 °F PoE; -58 °F — 140 °F 12VDC/24VAC; Up to 165 °F according to NEMA TS 2-2021, para 2.1.5.1 using fig. 2.1 test profile
Storage temperature (°C)	-40 °C – 70 °C
Storage temperature (°F)	-40 °F – 158 °F
Cold start temperature (°C)	-40 °C
Cold start temperature (°F)	-40 °F
Operating relative humidity, non-condensing (%)	5% – 93%
Operating relative humidity, condensing (%)	5% – 100%
Storage relative humidity (%)	0% – 98%
Impact protection	IK10
IP rating	IP66; IP67; IP6K9K
Degree of protection	NEMA type 4X

Ordering information

NBE-7704-ALT Bullet 8MP HDR 12-38mm IP66/67 IK10
Fixed bullet camera 8MP with HDR, IVA Pro Buildings Pack, IVA Pro Perimeter Pack, IP67, IK10, H.265, IR, 12-38 mm lens
NDAA compliant
Order number **NBE-7704-ALT**

Accessories

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

NBA-7000-LI Illuminator module invisible 940nm wide
Invisible light illuminator module, 940 nm, wide
Order number **NBA-7000-LI**

NDA-U-CBB Conduit back box, 148mm
Outdoor conduit back box, 148mm, IP66 rated
Order number **NDA-U-CBB**

NCA-WLAN-EU Wireless installation dongle EU
Wireless installation dongle for wireless commissioning
Order number **NCA-WLAN-EU**

NCA-WLAN-NA Wireless installation dongle NA
Wireless installation dongle for wireless commissioning for North America
Order number **NCA-WLAN-NA**

MSD-064G IP SECURITY MICROSD CARD 64GB
64 GB industrial microSD card with health status monitoring
Order number **MSD-064G**

MSD-128G IP SECURITY MICROSD CARD 128GB
128 GB industrial microSD card with health status monitoring
Order number **MSD-128G**

MSD-256G IP SECURITY MICROSD CARD 256GB
256 GB industrial microSD card with health status monitoring
Order number **MSD-256G**

NPD-3001-WAP Portable installation tool
Bosch camera portable and wireless installation tool
Order number **NPD-3001-WAP**

NBA-7070-PA0 Surveillance cabinet 24VAC
Surveillance cabinet, 24 VAC, IK10
Order number **NBA-7070-PA0**

NBA-7070-PA1 Surveillance cabinet 120VAC
Surveillance cabinet, 120 VAC, IK10
Order number **NBA-7070-PA1**

NBA-7070-PA2 Surveillance cabinet 230VAC
Surveillance cabinet, 230 VAC, IK10
Order number **NBA-7070-PA2**

NCA-U-PIG Push-in grommet IP66 patch comp. 25pcs
Push-in grommet IP66 patch comp. 25pcs
Order number **NCA-U-PIG**

NCA-U-PIGS Push-in grommet IP67 4.5-7.5mm 25pcs
Push-in grommet IP67, 4.5-7.5mm, 25pcs
Order number **NCA-U-PIGS**

NCA-U-PIGL Push-in grommet IP67 7.5-10mm 25pcs
Push-in grommet IP67, 7.5-10m, 25pcs
Order number **NCA-U-PIGL**

Software Options

MVC-IVA-TRA IVA Pro Traffic
Video analytics software based on deep neural network technology for traffic monitoring and Automatic Incident Detection.
Order number **MVC-IVA-TRA**

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