



NDN-498 FlexiDome2X Day/Night IP Cameras



- ▶ **1/3-inch Day/Night CCD with progressive scan**
- ▶ **20-bit image processing technology**
- ▶ **Wide Dynamic Range, 2X-dynamic engine and SmartBLC**
- ▶ **Tri-streaming: Dual H.264 and M-JPEG simultaneously**
- ▶ **Intelligence at the edge**
- ▶ **ONVIF conformant**
- ▶ **High-impact, vandal-resistant enclosure**

FlexiDome2X Day/Night IP cameras are progressive scan CCD cameras in a compact, high-impact rated, vandal-resistant housing.

Equipped with 20-bit DSP with 2X-dynamic, they have a wide dynamic range for sharper, more detailed images with outstanding color reproduction.

They can tri-stream video simultaneously – on two H.264 streams and one M-JPEG stream. Features such as multicasting, internet streaming and iSCSI recording are fully supported. FlexiDome2X IP cameras have built-in video motion detection and additional processing power for video content analysis systems.

Supported by the award-winning Dinion2X digital imaging technology, they provide a proven, dependable solution for many security and surveillance requirements, day or night.

Functions

Progressive scan

To capture sharp images, even in busy scenes with high motion content, the Dinion camera uses progressive scan technology.

Superior image quality

With a 1/3-inch CCD and Bosch's advanced digital signal processing, the FlexiDome2X Day/Night IP camera provides outstanding image quality in virtually all situations. The highly accurate 20-bit digital signal is automatically processed to reveal every detail of the image in both the high and low-light areas of the scene simultaneously.

20-bit Image Processing

The highly accurate digital signal processing optimally captures the detail in both bright highlights and deep shadows simultaneously. By combining 20-bit image processing and wide dynamic range, the FlexiDome2X maximizes the information visible in the picture even with strong backlight.

Wide Dynamic Range

The superior wide dynamic range performance for all lighting conditions reveals details previously unseen.

2X-Dynamic and SmartBLC

Using 2X-Dynamic technology, pixel-by-pixel analysis provides the user with the most detailed information. Turn on SmartBLC to automatically compensate the image without the need for complicated set-up or without compromising dynamic range. Features such as Autoblack and Sharpness further improve the details in a scene, pixel by pixel.

EXHIBIT B

Efficient bandwidth and storage management

The cameras use H.264 compression, bandwidth throttling, and multicasting capabilities to manage bandwidth and storage requirements efficiently, while delivering high image quality and resolution. The bandwidth of an H.264 stream using Main profile at 4CIF resolution is about the same as one MPEG-4 stream at 2CIF resolution. Bosch's innovative tri-streaming feature enables FlexiDome2X IP cameras to generate two independent H.264 streams and one M-JPEG stream simultaneously. This allows streaming of high-quality H.264 images for live viewing and recording while streaming M-JPEG images to another device at the same time. The M-JPEG video stream also provides easy integration with third-party JPEG or M-JPEG-compatible video management systems.

FlexiDome2X IP cameras offer unparalleled recording options. Attached to the network, they can use iSCSI targets directly, as well as Network Video Recorders (NVRs). The iSCSI storage target support enables the cameras to function as a conventional DVR, while streaming high-performance live video across the network.

Standard intelligence

With built-in video content analysis, the camera reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The MOTION+ video motion analysis system, that is built into all camera versions, is the perfect solution for applications where basic video content analysis features are required. This motion analysis algorithm is based on pixel change and includes object size filtering capabilities and sophisticated tamper-detection capabilities.

Hardware enhanced

The hardware-enhanced version of the camera gives you the opportunity to upgrade the video content analysis features of the camera with the more advanced Intelligent Video Analysis (IVA) option. This option bases the IVA algorithm on digital imaging technology that uses multi-level image analysis of pixels, texture, and object direction, and is activated by installing a license.

ONVIF conformance

The camera conforms to the ONVIF (Open Network Video Interface Forum) specification which guarantees interoperability between network video products regardless of manufacturer. ONVIF conformant devices are able to exchange live video, audio, metadata and control information. They are automatically discovered and connected to network applications such as video management systems.

Tough design

The cast-aluminum housing, polycarbonate dome, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force. The enclosure contains the full-featured camera and integral varifocal lens. Ideal for outdoor use, the cameras are protected against water and dust to IP 66 (NEMA-4X) standards. The camera enclosure provides the extra protection necessary for applications such as schools, banks, prisons, parking garages, retail and industrial buildings.

Installation is quick and easy, as the camera comes completely assembled and ready to use. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner and suspended ceiling. The compact, sleek design and virtually flush-mount appearance complements any decor.

Unsurpassed flexibility

There are many ways to access the camera's video: on a PC using a web browser, with the Bosch Video Management System, or with VIDOS. The camera is also ideal for use with a Divar 700 Series digital video recorder. By routing a video stream to a Bosch video decoder, you can also present the video with ultimate clarity on an analog monitor.

Cost effective, simple installation

Three power options, PoE (Power-over-Ethernet), 24 VAC and 12 VDC are available. Using PoE makes installation easier and more cost-effective, as cameras do not require a local power source. To increase system reliability, the camera can be simultaneously connected to both PoE and 12 VDC/24 VAC supplies. Additionally, uninterruptible power supplies (UPS) can be used, which will allow continuous operation, even during a power failure.

For trouble free network cabling, the cameras support Auto-MDIX.

FlexiDome2X IP cameras can be configured using the control buttons on the camera as an alternative to configuration over IP. The On-Screen Display (OSD) simplifies back focus adjustment and network configuration, minimizing installation and support costs. The Lens Wizard automatically detects the lens type and helps focus the lens at the maximum opening to maintain proper focus.

Easy Upgrade

Remotely upgrade the camera whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

EXHIBIT B

Access Security

Various security levels are available for accessing the network, the camera, and the data channels. As well as password protection with three levels, 802.1x authentication using a RADIUS is supported. To secure Web browser access use HTTPS with a SSL certificate stored in the camera. For total data protection, the video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional Encryption Site License.

Programmable Modes

Six independent, pre-programmed operating modes support typical applications, but are fully programmable for individual situations.

Day/Night switching

In night mode, the camera enhances low light viewing by switching the IR (infrared) filter out of the optical path and providing a monochrome image. The camera can switch from color to monochrome mode automatically by sensing the illumination level, manually via the alarm input, or remotely via a web browser. An internal, through-the-lens IR detector enhances monochrome mode stability by preventing the camera from returning to color mode when IR-illumination is dominant.

Privacy masking

Four different privacy zones allow specific parts of a scene to be blocked. A mask for any part of the scene can be pre-programmed.

Default Shutter

The default shutter speed captures fast moving objects when sufficient light is available. When light levels fall and other adjustments have been exhausted, the shutter speed reverts to a standard setting to maintain sensitivity.

SensUp Dynamic

By increasing the integration time up to 10 times on the CCD, the effective sensitivity is dramatically enhanced. This is especially useful when relying only on moonlight for illumination.

Typical applications

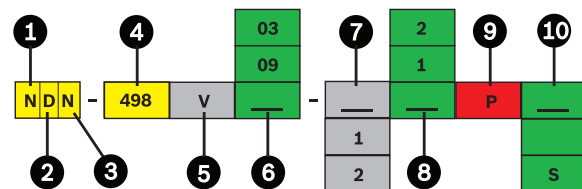
- Prisons and correctional facilities
- Traffic monitoring (air, land and sea)
- Hotels, bars and nightclubs
- Commercial and government buildings
- City surveillance and safety
- Border control

Certifications and Approvals

Region	Certification
Europe	CE Declaration of Conformity Model Identity Declaration
USA	FCC Declaration of Conformity
Electro Magnetic Compatibility	
Emission	EN55022 Class B EN61000-3-2 EN61000-3-3 CFR. 47 FCC Part 15: class B
Immunity	EN50130-4 (PoE, +12 VDC) EN55024 (24 VAC) EN50121-4
Safety	EN60950-1 UL60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	As per IEC60068-2-6 (5 m/s ² , operational)

Installation/Configuration Notes

Ordering chart

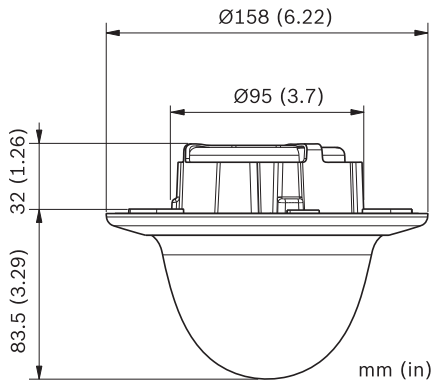


1	N	Network camera
2	D	Dome (FlexiDome fixed dome)
3	N	Day/Night
4	498	Dinion2X performance
5	V	Varifocal lens, auto iris
6	03	2.8 to 10 mm F1.2
	09	9 to 22 mm F1.4
7	1	PAL 50 Hz
	2	NTSC 60 Hz
8	1	Motion+
	2	Designed for IVA *
9	P	PoE
10		Flush mount (blank)
	S	Surface mount

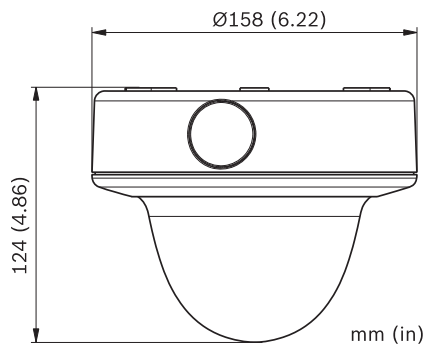
* No license included

EXHIBIT B

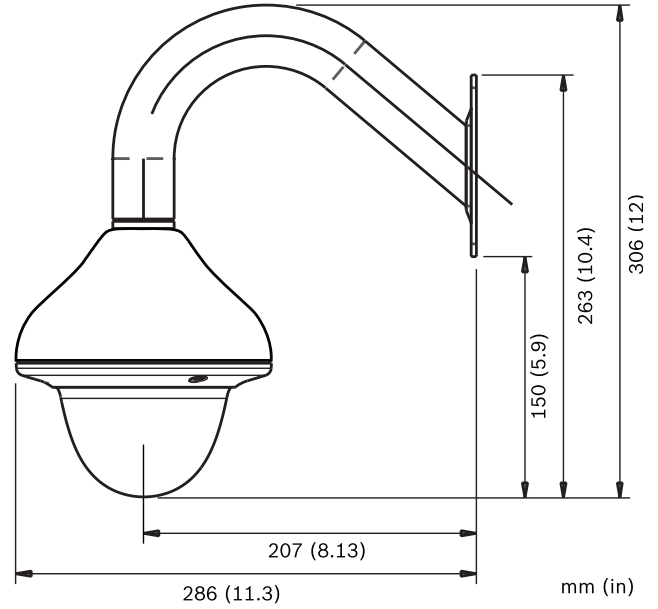
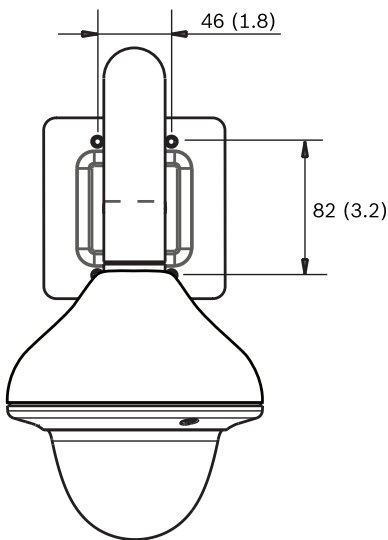
Flush Mounting



Surface Mounting



VDA-WMT-DOME -Pendant Wall Mount



VDA-PMT-DOME -Pendant Pipe Mount

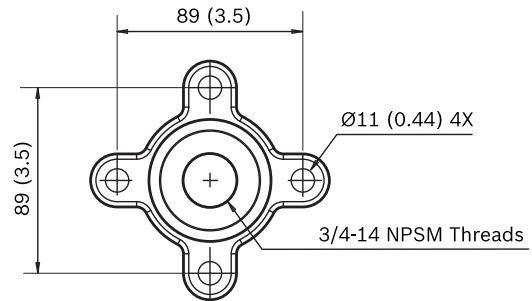
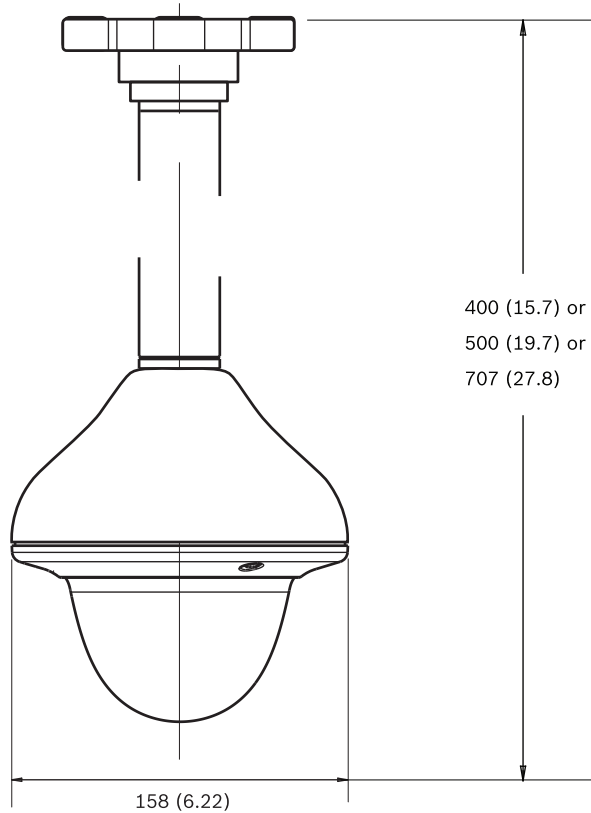
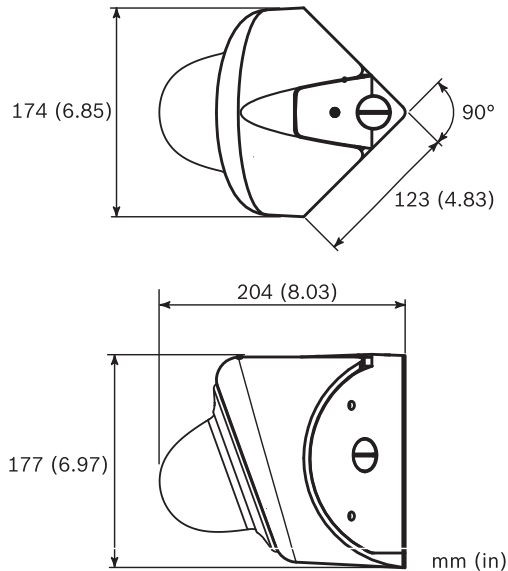


EXHIBIT B



VDA-CMT-DOME –Corner Mount



Parts Included

Quantity	Component
1	NDN-498 Series FlexiDome2X Day/Night IP Camera
1	Lens adjustment cap (focus aid)
1	Safety instructions
1	Quick Install Guide
1	Mini DVD-ROM with manuals, software, and tools
1	Mounting hardware kit + screwdriver bit
1	RJ45 network connector
1	Template for flush mount

Technical Specifications

Electrical

Model No.	Rated Voltage	Rated Frequency
NDN-498Vxx-1xP	24 VAC ±10%	50 Hz
	12 VDC ±10%	
	Power-over-Ethernet	
NDN-498Vxx-2xP	24 VAC ±10%	60 Hz
	12 VDC ±10%	
	Power-over-Ethernet	
Current Consumption	550 mA 700 mA IVA (12 VDC) 550 mA 700 mA IVA (24 VAC) 200 mA (PoE 48 VDC)	

Sensor

Type	1/3-inch CCD, WDR, dual shutter
Active Pixels (PAL)	752 x 582
Active Pixels (NTSC)	768 x 494

Video

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Data rate	9.6 Kbps to 6 Mbps
Resolution	Horizontal x vertical (PAL/NTSC ips)
<ul style="list-style-type: none"> 4CIF CIF 	704 x 576/480 (25/30 ips) 352 x 288/240 (25/30 ips)
Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	I, IP
Frame rate	1 to 50/60 (PAL/NTSC) H.264 1 to 25/30 (PAL/NTSC) M-JPEG

Video Out

Signal	Analog composite (NTSC or PAL) for service
Connector	2.5 mm jack, 75 Ohm
Horizontal resolution	540 TVL
Video S/N	50 dB

EXHIBIT B**Sensitivity (3200 K, scene reflectivity 89%)**

	Full video (100 IRE)	Usable picture (50 IRE)	Minimum illumi- nation (30 IRE)
NDN-498V03 (F1.2)			
Color	2.48 lx (0.23 fc)	0.621 lx (0.058 fc)	0.28 lx (0.027 fc)
Color + SensUp 10x	0.248 lx (0.023 fc)	0.062 lx (0.0058 fc)	0.028 lx (0.0027 fc)
Monochrome	1.01 lx (0.093 fc)	0.23 lx (0.021 fc)	0.099 lx (0.0092 fc)
Monochrome + SensUp 10x	0.1 lx (0.0093 fc)	0.023 lx (0.0021 fc)	0.0099 lx (0.00092 fc)

NDN-498V09 (F1.4)

Color	2.7 lx (0.26 fc)	0.69 lx (0.064 fc)	0.321 lx (0.03 fc)
Color + SensUp 10x	0.27 lx (0.026 fc)	0.069 lx (0.0064 fc)	0.032 lx (0.003 fc)
Monochrome	1.1 lx (0.090 fc)	0.27 lx (0.026 fc)	0.11 lx (0.01 fc)
Monochrome + SensUp 10x	0.11 lx (0.01 fc)	0.027 lx (0.0026 fc)	0.011 lx (0.001fc)

Day/Night	Color, Mono, Auto
Modes	6 preset programmable modes
Dynamic range	120 dB (20-bit image processing)
Signal-to-Noise Ratio	>50 dB
Dynamic engine	2X-Dynamic, XF-Dynamic, SmartBLC+2X-Dy- namic
SmartBLC	On (includes 2X-Dynamic) / Off
AGC	AGC On or Off (0 - 30 dB) selectable
White Balance	ATW, ATWHold and manual (2500 to 10000K)
Shutter	Auto (1/50 [1/60] to 1/10000) selectable Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable
Sensitivity up	Adjustable from Off up to 10x
Auto Black	Automatic continuous, Off
Dynamic Noise Reduction	Auto, On/off selectable
Sharpness	Sharpness enhancement level selectable
Peak White Invert	On/Off
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Motion+ or IVA
Test Pattern Generator	Color bars 100%, Grayscale 11-step, Saw- tooth 2H, Checker board, Cross hatch, UV plane
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable
Controls	OSD with soft-key operation (multi-lingual)

Audio

Standard G.711	300 Hz to 3.4 kHz at 8 kHz sampling rate
Signal-to-noise ratio	> 50 dB

Input/output

Audio	1 x mono line in, 1 x mono line out
• signal line in	9 kohm typical, 5.5 Vpp max
• signal line out	3.0 Vpp at 10 kOhm typical, 2.3 Vpp at 32 Ohm typical, 1.7 Vpp at 16 Ohm typical
Alarm	1 non-isolated closing contact
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Maximum 0.5 A continuous, 10VA

Software Control

Unit Configuration	Via web browser or Configuration Manager
Flicker Control	50/60 Hz, selectable
Software update	Flash ROM, remote programmable

Network

Protocols	RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x, UPnP
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE SUPPLY	IEEE 802.3af compliant

Optical

Varifocal lens	IR corrected, manual zoom and focus adjust- ment
Iris control	Automatic iris control
Viewing angle	
2.8 to 10 mm	Wide 100.8 x 73.7° (H x V) Tele 28.5° x 21.4° (H x V)
9 to 22 mm	Wide: 31.2° x 22.8° (H x V) Tele: 12.8° x 9.6° (H x V)

Mechanical

Weight	0.67 kg (1.48 lb) +SMB: 1.29 kg (2.84 lb)
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° azimuth
Dome bubble	Polycarbonate, clear with UV blocking anti- scratch coating
Trim ring	Aluminum

EXHIBIT B**Environmental**

Operating temperature default (with heater off)	-20 °C to +50 °C (-4 °F to +122 °F) cold start
Operating temperature (with heater on)	-50 °C to +50 °C (-58 °F to +122 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	IEC 60068-2-75 test Eh, 50 J EN 50102, exceeding IK 10
Water/dust protection	IP 66 and NEMA-4X

Ordering Information

NDN-498V03-11P FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Motion+, PoE, Flush mount	NDN-498V03-11P
NDN-498V03-21P FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Motion+, PoE, Flush mount	NDN-498V03-21P
NDN-498V03-12P FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Designed for IVA, PoE, Flush mount	NDN-498V03-12P
NDN-498V03-22P FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Designed for IVA, PoE, Flush mount	NDN-498V03-22P
NDN-498V09-11P FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, PAL, 50 Hz, Motion+, PoE, Flush mount	NDN-498V09-11P
NDN-498V09-21P FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, Motion+, PoE, Flush mount	NDN-498V09-21P
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NDN-498V03-11PS FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Motion+, PoE, Surface mount	NDN-498V03-11PS
NDN-498V03-21PS FlexiDome2X Day/Night IP Camera Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Motion+, PoE, Surface mount	NDN-498V03-21PS
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EXHIBIT B**Ordering Information****Accessories**

VDA-455SMB Surface mount box, high impact for VDC-455, VDM-455, VDC-485, VDN-498, NDC-455 and NDN-498	VDA-455SMB
VDA-WMT-DOME Wall Pendant Mount Bracket Wall pendant mount bracket for FlexiDome cameras	VDA-WMT-DOME
VDA-CMT-DOME Corner Mount Bracket Corner mount bracket for FlexiDome cameras	VDA-CMT-DOME
VDA-PMT-DOME Pendant Pipe Mount Bracket Pendant pipe mount bracket for FlexiDome cameras	VDA-PMT-DOME
S1460 Service/Monitor Cable for FlexiDome analog and IP (2.5 mm connec- tor to BNC), 1 m	S1460
UPA-2410-60 Power Supply 120 VAC, 60 Hz, 24 VAC, 10 VA Out	UPA-2410-60
UPA-2430-60 Power Supply 120 VAC, 60 Hz, 24 VAC, 30 VA Out	UPA-2430-60
UPA-2450-60 Power Supply 120 VAC, 60 Hz, 24 VAC, 50 VA Out	UPA-2450-60
UPA-2420-50 Power Supply 220 VAC, 50 Hz, 24 VAC, 20 VA Out	UPA-2420-50
UPA-2450-50 Power Supply 220 VAC, 50 Hz, 24 VAC, 50 VA Out	UPA-2450-50
VDA-455TBL Tinted bubble Tinted bubble for FlexiDome series	VDA-455TBL
VDA-455CBL Clear bubble Clear Bubble for FlexiDome series	VDA-455CBL

Software Options

MVC-FIVA4-CAM IVA 4.0 VCA software license for IP camera/ dome (e-license)	MVC-FIVA4-CAM
MVC-FENC-AES BVIP AES 128 Bit Encryption BVIP AES 128-bit encryption site license. This license is required only once per installa- tion. It enables encrypted communication be- tween BVIP encoders, decoders and manage- ment stations.	MVC-FENC-AES

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EXHIBIT B

NDC-455 FlexiDome IP Cameras

www.boschsecurity.com



BOSCH

Invented for life



- ▶ 1/3-inch color CCD with progressive scan
- ▶ Quad streaming
- ▶ Flexible recording options
- ▶ Intelligence at the edge
- ▶ ONVIF conformant

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They can Quad-stream video simultaneously – two H.264 streams, an I-frame recording stream and an M-JPEG stream. Features such as multicasting, internet streaming and iSCSI recording are fully supported. FlexiDome IP cameras have built-in video motion detection and additional processing power for video content analysis systems.

FlexiDome IP cameras include picture performance enhancements such as NightSense for low-light scenes and Autoblack for low contrast scenes.

Supported by the award-winning Dinion digital imaging technology, they provide a proven, dependable solution for many security and surveillance requirements.

Functions

Progressive scan

To capture sharp images, even in busy scenes with high motion content, the Dinion camera uses progressive scan technology.

A quality image

With a 1/3-inch color CCD and Bosch's advanced digital signal processing, the FlexiDome IP provides professional image quality. Automatically activate the NightSense feature to extend sensitivity under low-light conditions by a factor of three in monochrome operation. Autoblack improves the overall contrast of an image in low contrast scenes, such as foggy weather conditions.

Efficient bandwidth and storage management

The cameras use H.264 (Main Profile) compression, bandwidth throttling, and multicasting capabilities to manage bandwidth and storage requirements efficiently, while delivering high image quality and resolution.

Bosch's innovative Quad-streaming feature enables the FlexiDome IP to deliver three H.264 streams (two 4CIF streams and an I-frame only stream) together with an M-JPEG stream. These four streams facilitate bandwidth-efficient viewing and recording options as well as integration with third-party video management systems.

FlexiDome IP cameras offer unparalleled recording options. Attached to the network, they can use iSCSI targets directly without any additional recording

EXHIBIT B

software. The recording capabilities of the system can be further enhanced by using the Bosch Video Recording Manager.

The camera also supports local recording on a microSD card. This can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall reliability of video recording.

Standard intelligence

With built-in video content analysis, the camera reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The MOTION+ video motion analysis system, which is built into all camera versions, is the perfect solution for applications where basic video content analysis features are required. This motion analysis algorithm is based on pixel change and includes object size filtering capabilities and sophisticated tamper-detection capabilities.

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Tough design

The cast-aluminum housing, polycarbonate dome, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force. The enclosure contains the full-featured camera and integral varifocal lens. Ideal for outdoor use, the cameras are protected against water and dust to IP 66 (NEMA-4X) standards. The camera enclosure provides the extra protection necessary for applications such as schools, banks, prisons, parking garages, retail and industrial buildings.

Installation is quick and easy, as the camera comes completely assembled and ready to use. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner and suspended ceiling. The compact, sleek design and virtually flush-mount appearance complements any decor.

Unsurpassed flexibility

There are many ways to access the camera's video: on a PC using a web browser, with the Bosch Video Management System, or with the Bosch Video Client. The camera is also ideal for use with a Divar 700 Series digital video recorder. By routing a video stream to a Bosch video decoder, you can also present the video with ultimate clarity on an analog monitor.

Cost effective, simple installation

Three power options, PoE (Power-over-Ethernet), 24 VAC and 12 VDC are available. Using PoE makes installation easier and more cost-effective, as cameras do not require a local power source. To increase system reliability, the camera can be simultaneously connected to both PoE and 12 VDC/24 VAC supplies. Additionally, uninterruptible power supplies (UPS) can be used which allow continuous operation even during a power failure.

For trouble free network cabling, the cameras support Auto-MDIX.

FlexiDome IP cameras can be configured using the control buttons on the camera as an alternative to configuration over IP. Network parameters and basic camera set-up, such as lens set-up and back focus, are quickly and easily performed using the on-screen displays (OSD) and analog video service output.

Easy Upgrade

Remotely upgrade the camera whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

Access Security

Various security levels are available for accessing the network, the camera, and the data channels. As well as password protection with three levels, 802.1x authentication using a RADIUS is supported. To secure Web browser access use HTTPS with a SSL certificate stored in the camera. For total data protection, the video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional Encryption Site License.

Typical applications

- Museums and art galleries
- Shopping centers
- Offices
- Schools, colleges and universities
- Petrol / gas station

Certifications and approvals

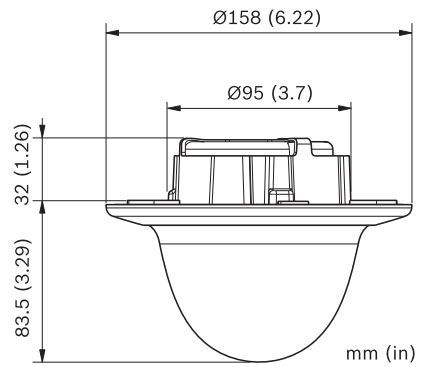
Electro Magnetic Compatibility

Emission	EN55022 Class B EN61000-3-2 EN61000-3-3 CFR. 47 FCC Part 15: class B
Immunity	EN50130-4 (PoE, +12 VDC) EN55024 (24 VAC) EN50121-4

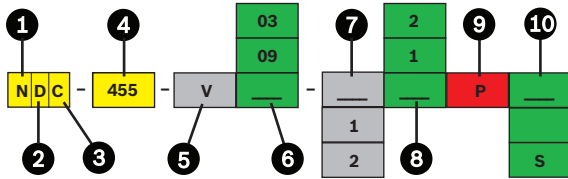
EXHIBIT B

Flush Mounting

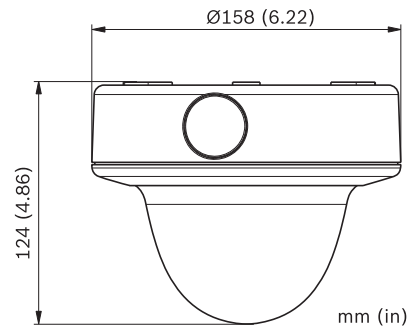
Safety	EN60950-1 UL60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1	
Vibration	As per IEC60068-2-6 (5 m/s ² , operational)	
Region	Certification	
Europe	CE	Declaration of Conformity
USA	FCC	+ UL



Installation/configuration notes



Surface Mounting

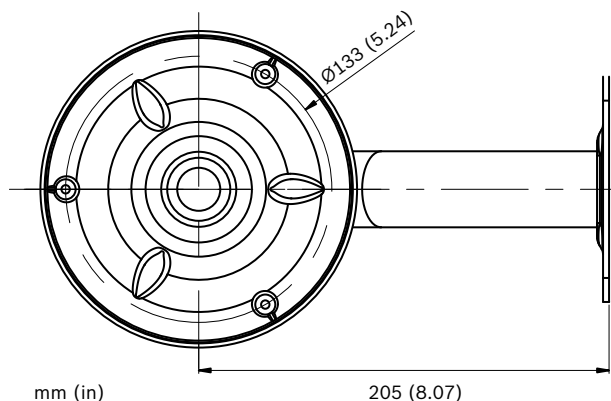
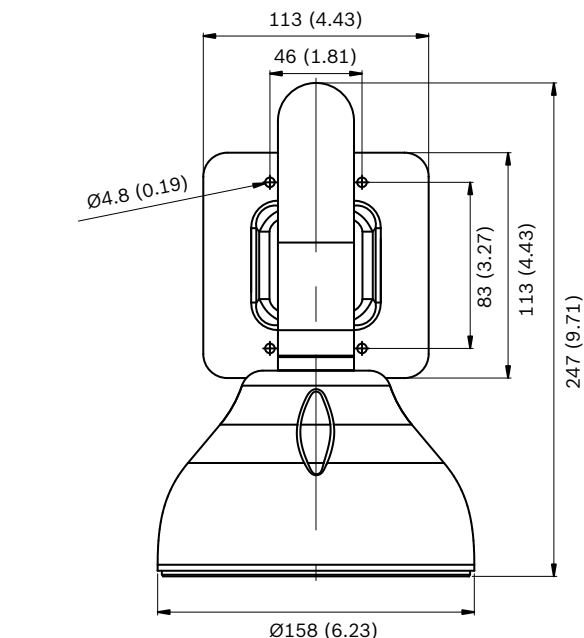


1	N	Network camera
2	D	Dome (FlexiDome fixed dome)
3	C	Color
4	455	Dinion performance
5	V	Varifocal lens, auto iris
6	03	2.8 to 10 mm F1.2
	09	9 to 22 mm F1.4
7	1	PAL 50 Hz
	2	NTSC 60 Hz
8	1	Motion+
	2	IVA ready*
	2I	IVA enabled
9	P	PoE
10	1	Flush mount (blank)
	S	Surface mount

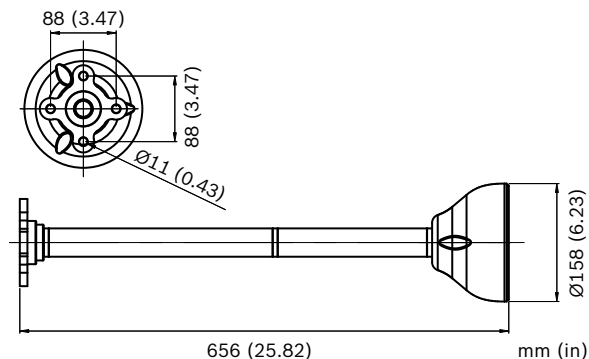
* No license included

EXHIBIT B

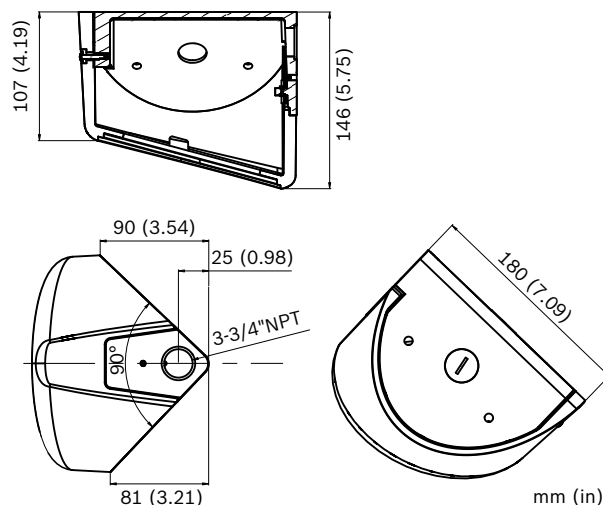
VDA-WMT-DOME –Pendant Wall Mount



VDA-PMT-DOME –Pendant Pipe Mount



VDA-CMT-DOME –Corner Mount



Parts included

Quantity	Component
1	NDC-455 Series FlexiDome IP Camera
1	Lens adjustment cap (focus aid)
1	Safety instructions
1	Quick Install Guide
1	Mini DVD-ROM with manuals, software, and tools
1	Mounting hardware kit + screwdriver bit
1	RJ45 network connector
1	Template for flush mount

i Notice
MicroSD card is not included in a standard delivery.

Technical specifications

Electrical

Model No.	Rated Voltage	Rated Frequency
NDC-455Vxx-1xP	24 VAC ±10%	50 Hz
	12 VDC ±10%	
NDC-455Vxx-2xP	24 VAC ±10%	60 Hz
	12 VDC ±10%	
	Power-over-Ethernet	

EXHIBIT B

Current Consumption	500 mA 650 mA IVA (12 VDC) 500 mA 650 mA IVA (24 VAC) 200 mA (PoE 48 VDC)
Power Consumption	6 W 7.8 W IVA (12 VDC) 7.4 W 9.7 W IVA (24 VAC) 9.6 W (PoE 48 VDC)
Sensor	
Type	1/3-inch, CCD
Active Pixels (PAL)	752 x 582
Active Pixels (NTSC)	768 x 494
Video	
Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Data rate	9.6 Kbps to 6 Mbps
Resolution	Horizontal x vertical (PAL/NTSC ips)
• 4CIF	704 x 576/480 (25/30 ips)
• CIF	352 x 288/240 (25/30 ips)
Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	I, IP, IBBP
Frame rate	1 to 50/60 (PAL/NTSC) H.264 1 to 25/30 (PAL/NTSC) M-JPEG
Video Out	
Signal	Analog composite (NTSC or PAL) for service
Connector	2.5 mm jack, 75 Ohm
Horizontal resolution	540 TVL
Video S/N	50 dB

Sensitivity (3200 K, scene reflectivity 89%)

	Full video (100 IRE)	Usable picture (50 IRE)	Minimum illumination (30 IRE)
NDC-455V03 (F1.2)			
Color	2.6 lx (0.26 fc)	0.65 lx (0.065 fc)	0.30 lx (0.03 fc)
NightSense	1.04 lx (0.104 fc)	0.26 lx (0.026 fc)	0.012 lx (0.0012 fc)
NDC-455V09 (F1.4)			
Color	2.9 lx (0.29 fc)	0.75 lx (0.075 fc)	0.37 lx (0.037 fc)
NightSense	1.25 lx (0.13 fc)	0.30 lx (0.03 fc)	0.14 lx (0.014 fc)

Color/NightSense	Auto, Forced
Signal-to-noise Ratio	> 50 dB
Dynamic Range	60 dB (10-bit processing)
BLC	Center window weighting
Gain	20 dB (max)
White Balance	ATW, ATWHold (2500 to 10000 K)
Shutter	Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable
Auto Black	Automatic continuous, Off
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Motion+ or IVA
Test Pattern Generator	Color bars 100%, Grayscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane
Synchronization	Internal, Line Lock, selectable
Controls	OSD with soft-key operation (multi-lingual)

Audio

Standard G.711	300 Hz to 3.4 kHz at 8 kHz sampling rate
Signal-to-noise ratio	> 50 dB

Input/output

Audio	1 x mono line in, 1 x mono line out
• signal line in	9 kOhm typical, 5.5 Vpp max
• signal line out	3.0 Vpp at 10 kOhm typical, 2.3 Vpp at 32 Ohm typical, 1.7 Vpp at 16 Ohm typical
Alarm	1 non-isolated closing contact
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Maximum 0.5 A continuous, 10VA

Software Control

Unit Configuration	Via web browser or Configuration Manager
Flicker Control	50/60 Hz, selectable
Software update	Flash ROM, remote programmable

EXHIBIT B**Network and Storage**

Protocols	RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNMP, 802.1x, UPnP
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3af compliant
Local Storage	Supports microSD cards (SDHC)

Optical

Varifocal lens	IR corrected, manual zoom and focus adjustment
Iris control	Automatic iris control
Viewing angle	
2.8 to 10 mm	Wide 100.8° x 73.7° (H x V) Tele 28.5° x 21.4° (H x V)
9 to 22 mm	Wide: 31.2° x 22.8° (H x V) Tele: 12.8° x 9.6° (H x V)

Mechanical

Weight	0.67 kg (1.48 lb) +SMB: 1.29 kg (2.84 lb)
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° azimuth
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Trim ring	Aluminum

Environmental

Operating temperature default (with heater off)	-20 °C to +50 °C (-4 °F to +122 °F) cold start
Operating temperature (with heater on)	-50 °C to +50 °C (-58 °F to +122 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	IEC 60068-2-75 test Eh, 50 J EN 50102, exceeding IK 10
Water/dust protection	IP 66 and NEMA-4X

Ordering information**NDC-455V03-11P FlexiDome Color IP Camera**

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, PoE, Flush mount, microSD slot

Order number **NDC-455V03-11P**

NDC-455V03-21P FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, PoE, Flush mount, microSD slot

Order number **NDC-455V03-21P**

NDC-455V03-12IP FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, PoE, Flush mount, microSD slot, IVA enabled

Order number **NDC-455V03-12IP**

NDC-455V03-22IP FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, PoE, Flush mount, microSD slot, IVA enabled

Order number **NDC-455V03-22IP**

NDC-455V09-11P FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, PAL, 50 Hz, PoE, Flush mount, microSD slot

Order number **NDC-455V09-11P**

NDC-455V09-21P FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, PoE, Flush mount, microSD slot

Order number **NDC-455V09-21P**

NDC-455V09-12IP FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, PAL, 50 Hz, PoE, Flush mount, microSD slot, IVA enabled

Order number **NDC-455V09-12IP**

NDC-455V09-22IP FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, PoE, Flush mount, microSD slot, IVA enabled

Order number **NDC-455V09-22IP**

NDC-455V03-11PS FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, PoE, Surface mount, microSD slot

Order number **NDC-455V03-11PS**

NDC-455V03-21PS FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, PoE, Surface mount, microSD slot

Order number **NDC-455V03-21PS**

EXHIBIT B**NDC-455V03-12IPS FlexiDome Color IP Camera**

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, PoE, Surface mount, microSD slot, IVA enabled
Order number **NDC-455V03-12IPS**

NDC-455V03-22IPS FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, PoE, Surface mount, microSD slot, IVA enabled
Order number **NDC-455V03-22IPS**

NDC-455V09-11PS FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, PAL, 50 Hz, PoE, Surface mount, microSD slot
Order number **NDC-455V09-11PS**

NDC-455V09-21PS FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, PoE, Surface mount, microSD slot
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NDC-455V09-12IPS FlexiDome Color IP Camera

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NDC-455V09-22IPS FlexiDome Color IP Camera

Vandal resistant, 1/3-inch Progressive Scan, H.264, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, PoE, Surface mount, microSD slot, IVA enabled
Order number **NDC-455V09-22IPS**

VDA-455SMB

Surface mount box, high impact for VDC-455, VDM-455, VDC-485, VDN-498, NDC-455 and NDN-498
Order number **VDA-455SMB**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras, 1 m
Order number **S1460**

UPA-2410-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 10 VA Out
Order number **UPA-2410-60**

UPA-2430-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 30 VA Out
Order number **UPA-2430-60**

UPA-2450-60 Power Supply, 120 V, 60 Hz

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-60**

UPA-2420-50 Power Supply

220 VAC, 50 Hz, 24 VAC, 20 VA Out
Order number **UPA-2420-50**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-50**

MVC-FIVA4-CAM

IVA 4.xx/5.xx VCA software license for IP camera/dome (e-license)
Order number **MVC-FIVA4-CAM**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

Accessories**VDA-WMT-DOME Wall Pendant Mount Bracket**

Wall pendant mount bracket for FlexiDome cameras
Order number **VDA-WMT-DOME**

VDA-CMT-DOME Corner Mount Bracket

Corner mount bracket for FlexiDome cameras
Order number **VDA-CMT-DOME**

VDA-PMT-DOME Pendant Pipe Mount Bracket

Pendant pipe mount bracket for FlexiDome cameras
Order number **VDA-PMT-DOME**

VDA-455TBL Tinted bubble

Tinted bubble for FlexiDome series
Order number **VDA-455TBL**

VDA-455CBL Clear bubble

Clear Bubble for FlexiDome series
Order number **VDA-455CBL**

EXHIBIT B

Represented by:

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www.boschsecurity.us

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Fax: +86 21 22182398
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Fax: +55 19 2103 2862
al.securitysystems@bosch.com
www.boschsecurity.com

EXHIBIT B

VDN-498 Series FlexiDome 2X Dome Camera

www.boschsecurity.com



BOSCH

Invented for life



- ▶ 20-bit Image Processing Technology
- ▶ CCD sensor with Wide Dynamic Range
- ▶ Dynamic engine with Smart BLC
- ▶ Detail enhancement
- ▶ True Day/Night performance with switchable filter

The FlexiDome 2X Day/Night camera is the ultimate solution for virtually any indoor or outdoor surveillance application. This vandal-resistant dome camera uses a 1/3-inch, wide dynamic range CCD sensor and incorporates advanced (20-bit) digital signal processing for outstanding picture performance.

The 20-bit image processing enhances sensitivity; the 2X-Dynamic extends the dynamic range. This unique combination provides a sharper, more detailed image with outstanding accuracy in color reproduction even under harsh lighting conditions.

The cast-aluminum housing, polycarbonate dome, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force. The enclosure contains the full-featured camera and integral varifocal lens. Ideal for outdoor use, the cameras are protected against water and dust to IP 66 (NEMA-4X) standards. The camera enclosure provides the extra protection necessary for applications such as schools, banks, prisons, parking garages, retail and industrial buildings.

Installation is quick and easy, as the camera comes completely assembled and ready to use. Using the proprietary pan/tilt/rotation mechanism, installers can

select the exact field of view. Mounting options are numerous, including surface, 4S (USA), wall, corner and suspended ceiling. The compact, sleek design and virtually flush-mount appearance complements any decor.

The FlexiDome 2X camera is an ideal solution for many surveillance applications, even under the most challenging lighting conditions. The day/night feature ensures the highest image quality possible at any time. Depending on the available light the camera will automatically switch from color to monochrome.

All FlexiDome cameras are supplied ready to operate. Six distinct pre-programmed operational modes are stored in the camera. Recall the mode that suits your application for optimized performance.

Functions

Detail in Extreme Lighting

In harsh lighting, the difference between the brightest and the darkest parts of a scene can be extreme. To produce a clear picture in these conditions, the CCD sensor in the FlexiDome 2X generates two images; one long exposure to resolve details in the scene's darkest

EXHIBIT B

areas, and one short exposure to resolve details in the scene's brightest areas. The Digital Signal Processor (DSP) of the FlexiDome 2X combines these dual shutter images, mixing pixels from each exposure to produce the most detailed image possible.

20-bit Image Processing

The highly accurate digital signal processing optimally captures the detail in both bright highlights and deep shadows simultaneously. By combining 20-bit image processing and wide dynamic range, the FlexiDome 2X maximizes the information visible in the picture even with strong backlighting.

Wide Dynamic Range

The superior wide dynamic range handling for all lighting conditions reveals details previously unseen.

2X-Dynamic and SmartBLC

Using 2X-Dynamic technology, pixel-by-pixel analysis provides the user with the most detailed information. Turn on SmartBLC to automatically compensate the image without the need for complicated set-up or without compromising dynamic range.

Detail Enhancement

Features such as Autoblack and Sharpness further improve the details in a scene, pixel by pixel.

Day/Night Mode

The day/night mode provides enhanced night viewing by increasing the IR sensitivity. The IR filter can switch from color to monochrome automatically by either sensing the illumination level or via the alarm input. The filter can be switched manually via the alarm input, through the camera menu or via the Bilinx coaxial control interface. An internal through-the-lens IR detector enhances the monochrome mode stability, as it prevents reverting to the color mode when IR illumination is dominant. IR contrast is also measured and used to handle reflected IR light in outdoor scenes.

Privacy masking

Four different privacy zones allow specific parts of a scene to be blocked. Pre-program any part of the scene to be masked.

Default Shutter

The default shutter speed captures fast moving objects when sufficient light is available. When light levels fall and other adjustments have been exhausted, the shutter speed reverts to a standard setting to maintain sensitivity.

Bilinx Technology

Bilinx is a bidirectional communication capability embedded in the video signal of all Bosch FlexiDome cameras. Technicians can check status, change camera settings and even update firmware from virtually anywhere along the video cable. Bilinx reduces service and installation time, provides for more accurate set-up and adjustment, and improves overall performance. In addition, Bilinx uses the standard video cable to

transmit alarm and status messages, providing superior performance without additional installation steps.

Ease of installation

Several features are available that make installation easy:

- Video connection BNC on flying lead
- Power connection on flying leads
- A built-in test pattern generator produces signals to test and fault-find cables.
- A multi-language On-Screen Display (OSD) increases user compatibility.

Programmable Modes

Six independent, pre-programmed operating modes support typical applications, but are fully programmable for individual situations. Switching between modes is easy via Bilinx or the external alarm input.

High efficiency

A high efficiency power supply improves maximum operating temperature.

Video Motion Detection

The built-in video motion detector allows you to select a programmable area with individual thresholds. The global scene change detector minimizes false alarms caused by sudden lighting condition changes, such as switching on or off the indoor or security lighting. When motion is detected, alarms can be displayed in the video signal, the output relay can be closed or an alarm message can be transmitted via Bilinx.

SensUp Dynamic

By increasing the integration time up to 10 times on the CCD, the effective sensitivity is dramatically enhanced. This is especially useful when relying only on moonlight for illumination.

Lens Options

With the FlexiDome 2X dome camera, there is no compromise between scene coverage and aesthetics of the camera. The camera brings the widest choice of lens selection. Choose lenses between 2.8 to 10 mm for wide coverage, 9 to 22 mm VF lens for standard coverage, or 6 to 50 mm for long-rang coverage.

Typical applications

- Entrance foyer/lobby with glass
- Warehouses and loading bays
- Prisons and correctional facilities
- Airport locations including:
 - baggage handling
 - fuel and equipment storage
- Stadium

Certifications and approvals

Electro Magnetic Compatibility

Emission	EN55022 class B, FCC part 15 class B, EN6100-3, EN50121-4
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EXHIBIT B Flush Mounting

Immunity	EN50130-4 (CE), EN50121-4 (CE)
Vibration	IEC60068-2-6

Safety

UL1950-1, CSA 22.2 No. 950-1, EN60950-1 (CE), UL60950, CAN/CSA No. 60950

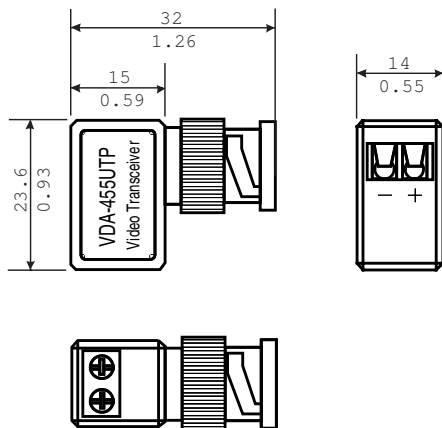
Region	Certification	
Europe	CE	Declaration of Conformity
	CE	
USA	UL	
	FCC	Declaration of Conformity

Installation/configuration notes

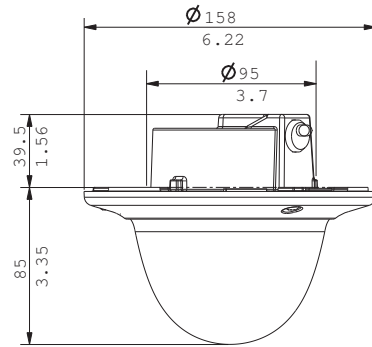
FlexiDome 2X model overview

Model	Standard	Lens
VDN-498V03-11	PAL	2.8 to 10 mm F1.2
VDN-498V03-21	NTSC	2.8 to 10 mm F1.2
VDN-498V06-11	PAL	6 to 50 mm F1.6
VDN-498V06-21	NTSC	6 to 50 mm F1.6
VDN-498V09-11	PAL	9 to 22 mm F1.4
VDN-498V09-21	NTSC	9 to 22 mm F1.4

BNC to UTP Transceiver

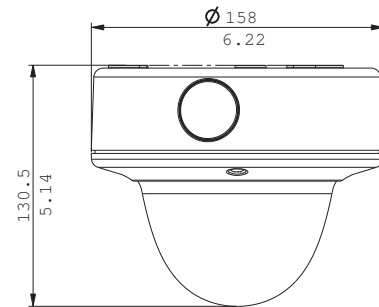


Dimensions in mm (in.)



Dimensions in mm (in.)

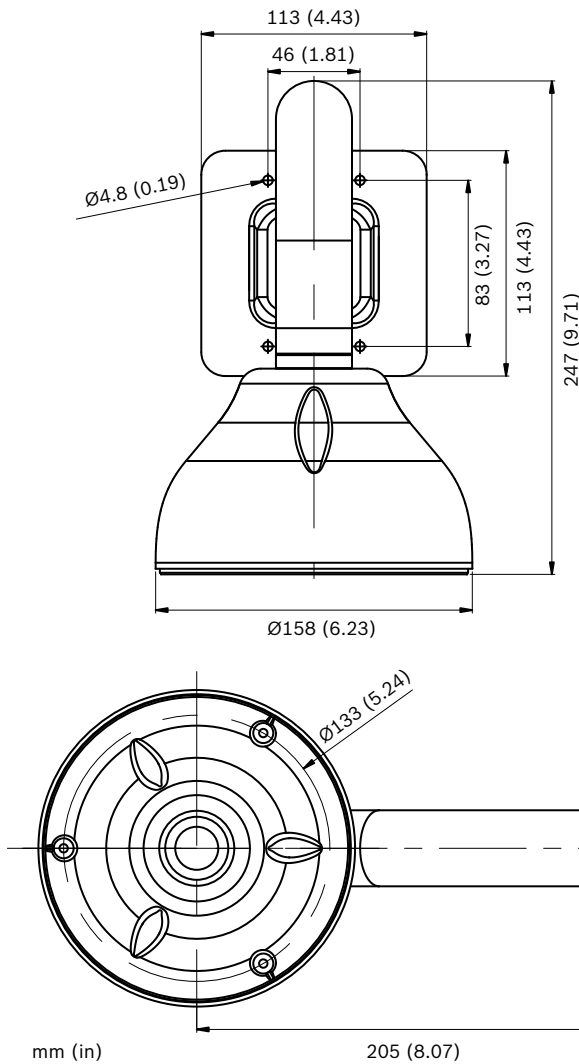
VDA-455SMB-Surface Mount Box



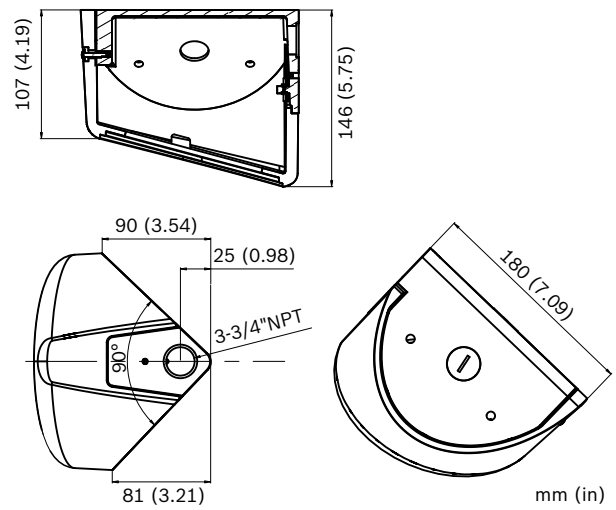
Dimensions in mm (in.) for surface mounting

EXHIBIT B

VDA-WMT-DOME –Pendant Wall Mount



VDA-CMT-DOME –Corner Mount



Technical specifications

Electrical

Model No.	Rated Voltage	Rated Frequency
VDN-498V03/11	24 VAC ±10% 12 VDC ±10%	50 Hz
VDN-498V06/11	24 VAC ±10% 12 VDC ±10%	50 Hz
VDN-498V09/11	24 VAC ±10% 12 VDC ±10%	50 Hz
VDN-498V03/21	24 VAC ±10% 12 VDC ±10%	60 Hz
VDN-498V06/21	24 VAC ±10% 12 VDC ±10%	60 Hz
VDN-498V09/21	24 VAC ±10% 12 VDC ±10%	60 Hz

Power Consumption	400 mA (12 VDC) 350 mA (24 VAC)
CCD Type	1/3-inch interline, WDR dual shutter

Active Pixels	
PAL Model:	752 x 582
NTSC Model	768 x 494

Sensitivity (3200 K, scene reflectivity 89%, transmission 68%)			
	Full video (100 IRE)	Usable picture (50 IRE)	Usable picture (30 IRE)

VDN-498V03 (F1.2)			
Color	2.48 lx (0.23 fc)	0.621 lx (0.058 fc)	0.28 lx (0.027 fc)

VDA-PMT-DOME –Pendant Pipe Mount

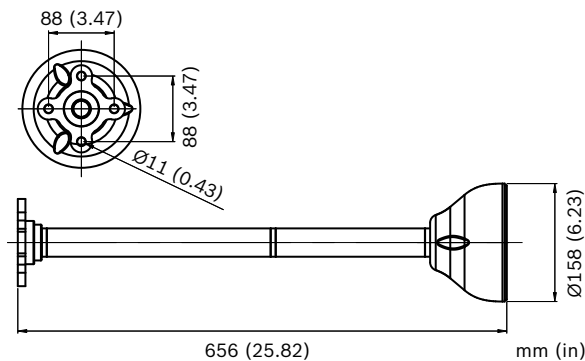


EXHIBIT B

Color + SensUp 10x	0.248 lx (0.023 fc)	0.062 lx (0.0058 fc)	0.028 lx (0.0027 fc)
Monochrome	1.01 lx (0.093 fc)	0.23 lx (0.021 fc)	0.099 lx (0.0092 fc)
Monochrome + SensUp 10x	0.1 lx (0.0093 fc)	0.023 lx (0.0021 fc)	0.0099 lx (0.00092 fc)

VDN-498V06 (F1.6)

Color	3.53 lx (0.356 fc)	0.90 lx (0.09 fc)	0.42 lx (0.042 fc)
Color + SensUp 10x	0.353 lx (0.035 fc)	0.09 lx (0.009 fc)	0.042 lx (0.0042 fc)
Monochrome	1.43 lx (0.144 fc)	0.35 lx (0.035 fc)	0.14 lx (0.014 fc)
Monochrome + SensUp 10x	0.14 lx (0.014 fc)	0.03 lx (0.003 fc)	0.014 lx (0.001fc)

VDN-498V09 (F1.4)

Color	2.7 lx (0.26 fc)	0.69 lx (0.064 fc)	0.321 lx (0.03 fc)
Color + SensUp 10x	0.27 lx (0.026 fc)	0.069 lx (0.0064 fc)	0.032 lx (0.003 fc)
Monochrome	1.1 lx (0.090 fc)	0.27 lx (0.026 fc)	0.11 lx (0.01 fc)
Monochrome + SensUp 10x	0.11 lx (0.01 fc)	0.027 lx (0.0026 fc)	0.011 lx (0.001fc)

Horizontal Resolution	540 TVL
Signal-to-Noise Ratio	>50 dB
Video Output	Composite video 1 Vpp, 75 ohm
Synchronization	Internal, Line Lock
Shutter	Auto (1/50 [1/60] to 1/10000) selectable Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable
Sensitivity up	Adjustable from Off up to 10x
Day/Night	Color, Mono, Auto
Auto Black	Automatic continuous, Off
Dynamic engine	XF-Dynamic, 2X-Dynamic, SmartBLC
Dynamic range	120 dB (20-bit image processing)
Dynamic Noise Reduction	Auto, On/off selectable
Sharpness	Sharpness enhancement level selectable
SmartBLC	On (includes 2X-Dynamic) / Off
AGC	AGC On or Off (0 - 30 dB) selectable
Peak White Invert	On/Off

White Balance	ATW, ATWHold and manual (2500 to 10000K)
Alarm Output	VMD or Bilinx
Synchronization	Internal or line lock
Camera ID	17 character editable string, position selectable
Test Pattern Generator	Color bars 100%, Greyscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane
Modes	6 preset programmable modes
Remote Control	Bilinx coaxial bi-directional communication
Video Motion Detection	One area, fully programmable
Privacy Masking	Four independent areas, fully programmable
Controls	OSD with soft-key operation (multi-lingual)

Optical

Varifocal	Manual zoom and focus adjustment
Iris control	Automatic iris control
Viewing angle	
2.8 to 10 mm	Wide 100.8° x 73.7° (H x V) Tele 28.5° x 21.4° (H x V)
9 to 22 mm	Wide: 31.2° x 22.8° (H x V) Tele: 12.8° x 9.6° (H x V)
6 to 50 mm	Wide: 43.4° x 32.4° (H x V) Tele: 5.8° x 4.4° (H x V)

Mechanical

Dimensions	See drawings
Weight	740 g (1.63 lb)
Mounting	Flush on hollow surface with three (3) screws in a 4S electrical box
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° azimuth
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Trim ring	Aluminum

Environmental

Operating temperature default (with heater off)	-30 °C to +55 °C (-22 °F to +131 °F)
Operating temperature (with heater on)	-50 °C to +55 °C (-58 °F to +131 °F)

EXHIBIT B

Storage temperature	-55 °C to +70 °C (-67 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	IEC 60068-2-75 test Eh, 50 J
	EN 50102, exceeding IK 10
Water/dust protection	IP 66 and NEMA-4X

Ordering information**VDN-498V03-11 Vandal Resistant Day/Night 2X Model**

1/3-inch WDR, PAL D/N, 540 TVL, 12 VDC/24 VAC, 50 Hz, w/2.8-10 mm F1.2 Varifocal lens, white
Order number **VDN-498V03-11**

VDN-498V03-21 Vandal Resistant Day/Night 2X Model

1/3-inch WDR, NTSC D/N, 540 TVL, 12 VDC/24 VAC, 60 Hz, w/2.8-10 mm F1.2 Varifocal lens, white
Order number **VDN-498V03-21**

VDN-498V06-11 Vandal Resistant Day/Night 2X Model

1/3-inch WDR, PAL D/N, 540 TVL, 12 VDC/24 VAC, 50 Hz, w/6-50 mm F1.6 Varifocal lens, white
Order number **VDN-498V06-11**

VDN-498V06-21 Vandal Resistant Day/Night 2X Model

1/3-inch WDR, NTSC D/N, 540 TVL, 12 VDC/24 VAC, 60 Hz, w/6-50 mm F1.6 Varifocal lens, white
Order number **VDN-498V06-21**

VDN-498V09-11 Vandal Resistant Day/Night 2X Model

1/3-inch WDR, PAL D/N, 540 TVL, 12 VDC/24 VAC, 50 Hz, w/9-22 mm F1.4 Varifocal lens, white
Order number **VDN-498V09-11**

VDN-498V09-21 Vandal Resistant Day/Night 2X Model

1/3-inch WDR, NTSC D/N, 540 TVL, 12 VDC/24 VAC, 60 Hz, w/9-22 mm F1.4 Varifocal lens, white
Order number **VDN-498V09-21**

VDN-498V03-11S Vandal Resistant Day/Night 2X Model, Surface Mount

1/3-inch WDR, PAL D/N, 540 TVL, 12 VDC/24 VAC, 50 Hz, w/2.8-10 mm F1.2 Varifocal lens, white, surface mount
Order number **VDN-498V03-11S**

VDN-498V03-21S Vandal Resistant Day/Night 2X Model, Surface Mount

1/3-inch WDR, NTSC D/N, 540 TVL, 12 VDC/24 VAC, 60 Hz, w/2.8-10 mm F1.2 Varifocal lens, white, surface mount
Order number **VDN-498V03-21S**

VDN-498V06-11S Vandal Resistant Day/Night 2X Model, Surface Mount

1/3-inch WDR, PAL D/N, 540 TVL, 12 VDC/24 VAC, 50 Hz, w/6-50 mm F1.6 Varifocal lens, white, surface mount
Order number **VDN-498V06-11S**

VDN-498V06-21S Vandal Resistant Day/Night 2X Model, Surface Mount

1/3-inch WDR, NTSC D/N, 540 TVL, 12 VDC/24 VAC, 60 Hz, w/6-50 mm F1.6 Varifocal lens, white, surface mount
Order number **VDN-498V06-21S**

VDN-498V09-11S Vandal Resistant Day/Night 2X Model, Surface Mount

1/3-inch WDR, PAL D/N, 540 TVL, 12 VDC/24 VAC, 50 Hz, w/9-22 mm F1.4 Varifocal lens, white, surface mount
Order number **VDN-498V09-11S**

VDN-498V09-21S Vandal Resistant Day/Night 2X Model, Surface Mount

1/3-inch WDR, NTSC D/N, 540 TVL, 12 VDC/24 VAC, 60 Hz, w/9-22 mm F1.4 Varifocal lens, white, surface mount
Order number **VDN-498V09-21S**

VDA-455SMB

Surface mount box, high impact for VDC-455, VDM-455, VDC-485, VDN-498, NDC-455 and NDN-498
Order number **VDA-455SMB**

VDA-455UTP

Adaptor for UTP twisted pair output
Order number **VDA-455UTP**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras, 1 m
Order number **S1460**

UPA-2410-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 10 VA Out
Order number **UPA-2410-60**

UPA-2430-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 30 VA Out
Order number **UPA-2430-60**

UPA-2450-60 Power Supply, 120 V, 60 Hz

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-60**

UPA-2420-50 Power Supply

220 VAC, 50 Hz, 24 VAC, 20 VA Out
Order number **UPA-2420-50**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-50**

EX12LED-3BD-8M Infrared Illuminator

EX12LED IR Illuminator, 850 nm, 30 deg beam
Order number **EX12LED-3BD-8M**

EX12LED-3BD-8W Infrared Illuminator

EX12LED, IR Illuminator, 850 nm, 60 deg beam
Order number **EX12LED-3BD-8W**

EXHIBIT B**EX12LED-3BD-9M Infrared Illuminator**

EX12LED IR Illuminator, 940 nm, 30 deg beam
Order number **EX12LED-3BD-9M**

EX12LED-3BD-9W Infrared Illuminator

EX12LED, IR Illuminator, 940 nm, 60 deg beam
Order number **EX12LED-3BD-9W**

Accessories**VDA-455TBL Tinted bubble**

Tinted bubble for FlexiDome series
Order number **VDA-455TBL**

VDA-455CBL Clear bubble

Clear Bubble for FlexiDome series
Order number **VDA-455CBL**

VDA-WMT-DOME Wall Pendant Mount Bracket

Wall pendant mount bracket for FlexiDome cameras
Order number **VDA-WMT-DOME**

VDA-CMT-DOME Corner Mount Bracket

Corner mount bracket for FlexiDome cameras
Order number **VDA-CMT-DOME**

VDA-PMT-DOME Pendant Pipe Mount Bracket

Pendant pipe mount bracket for FlexiDome cameras
Order number **VDA-PMT-DOME**

Software Options**VP-CFGSFT Configuration Software**

for cameras using Bilinx, includes VP-USB Adaptor
Order number **VP-CFGSFT**

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EXHIBIT B

NDN-921 FlexiDomeHD 720p Day/Night IP Camera

www.boschsecurity.com



BOSCH
Invented for life



- ▶ 1/3-inch Day/Night HD CCD with progressive scan
- ▶ 15-bit image processing technology
- ▶ XF dynamic engine and SmartBLC
- ▶ Local Storage for flexible recording options
- ▶ Intelligence at the edge

FlexiDomeHD Day/Night IP cameras are progressive scan HD cameras in a compact, high-impact rated, vandal-resistant housing. They are equipped with a 15-bit DSP and an XF dynamic engine for sharper images with outstanding color reproduction. Features such as multicasting, internet streaming and iSCSI recording are fully supported. FlexiDomeHD cameras have built-in video motion analysis and additional processing power for video content analysis systems. Supported by the Bosch-designed Dinion digital imaging technology, they provide a proven, dependable solution for any security and surveillance requirements, day and night.

Functions

720p HD Cameras

The FlexidomeHD is designed using the latest HD CCD sensor which can deliver high resolution 720p streaming video in HD format (16:9). The camera now brings the unmatched Dinion Image performance to HD-standard video.

Superior image quality

With a 1/3-inch HD CCD sensor and Bosch's advanced digital signal processing, the FlexiDomeHD provides outstanding image quality for a wide range of security applications.

Digital Image Processing

The highly accurate digital signal processing optimally processes the image to bring out the details in the scene making it suitable for applications requiring identification of facial characteristics or alphanumeric characters.

XF-Dynamic and SmartBLC

The XF-Dynamic technology uses pixel-by-pixel analysis to provide the user with the most detailed information. Turn on SmartBLC to automatically compensate the image without the need for complicated set-up or without compromising dynamic range. Features such as Autoblack and Sharpness further improve the details in a scene.

Programmable Modes

Six independent, pre-programmed configuration modes, which have been optimized for typical applications, makes camera programming on-site easy

EXHIBIT B

and user-friendly. The installer just needs to select a mode from the menu that best defines the environment in which the camera is being installed. However, the operator still has the ability to customize these modes, if necessary, for the specific requirements of the site.

Day/Night switching

In night mode, the camera enhances low-light viewing by switching the IR (infrared) filter out of the optical path and providing a monochrome image. The camera can switch from color to monochrome mode automatically by sensing the illumination level, via the alarm input, or remotely via a web browser. In scenes with predominantly IR light, use the alarm input for reliable Day/Night filter switching.

Privacy masking

Four different privacy zones allow specific parts of a scene to be blocked. A mask for any part of the scene can be pre-programmed.

Default Shutter

The default shutter allows the camera to use a higher shutter speed when sufficient light is available (for applications such as traffic management). When light levels fall and other adjustments have been exhausted, the shutter speed reverts to a standard setting to maintain sensitivity.

SensUp Dynamic

By increasing the integration time up to 10 times on the CCD, the effective sensitivity is dramatically enhanced. This is especially useful when relying only on moonlight for illumination.

Efficient bandwidth and storage management

The cameras use H.264 (Main Profile) compression, bandwidth throttling, and multicasting capabilities to manage bandwidth and storage requirements efficiently, while delivering high image quality and resolution.

Bosch's innovative Quad-streaming feature enables the FlexiDomeHD to deliver three H.264 streams (a 720p HD stream, a downscaled resolution stream, and a HD I-frame only stream) together with an M-JPEG stream. These four streams facilitate bandwidth-efficient viewing and recording options as well as integration with third-party video management systems.

FlexiDomeHD cameras offer unparalleled recording options. Attached to the network, they can use iSCSI targets directly without needing any recording software. The recording management capabilities of the system can be further enhanced by using the Bosch Video Recording Manager (VRM).

FlexidomeHD supports local storage on micro SD card. This can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall reliability of video recording.

Standard intelligence

With built-in video content analysis, the camera reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The MOTION+ video motion analysis system, which is built into all camera versions, is the perfect solution for applications where basic video content analysis features are required. This motion analysis algorithm is based on pixel change and includes object size filtering capabilities and sophisticated tamper-detection capabilities.

Hardware enhanced version

The hardware-enhanced version of the camera gives you the opportunity to upgrade the video content analysis features of the camera with the more advanced Intelligent Video Analysis (IVA) option. This option contains such features as idle object, line crossing, flow detection, crowd detection etc. The camera can be ordered with IVA pre-installed from the factory or IVA can be activated on hardware enhanced versions by installing a license on-site.

ONVIF conformance

The camera conforms to the ONVIF (Open Network Video Interface Forum) specification which guarantees interoperability between network video products regardless of manufacturer. ONVIF conformant devices are able to exchange live video, audio, metadata and control information. They are automatically discovered and connected to network applications such as video management systems.

Tough design

The cast-aluminum housing, polycarbonate dome, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force. The enclosure contains the full-featured camera and integral varifocal lens. Ideal for outdoor use, the cameras are protected against water and dust to IP 66 (NEMA 4X) standards. The camera enclosure provides the extra protection necessary for applications such as schools, banks, prisons, retail outlets and industrial buildings.

Installation is quick and easy, as the camera comes completely assembled and ready to use. The camera uses Bosch designed lens and optics to deliver true HD resolution with different light levels.

Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner, and suspended ceiling mounting. The compact, sleek design and virtually flush-mount appearance complements any decor.

Unsurpassed flexibility

There are many ways to access the camera's video: on a PC using a web browser, with the Bosch Video Management System (VMS), or with the Bosch Video Client. The Bosch Video Client is provided free of charge with each camera. This easy-to-use software can easily configure and operate up to 16 cameras. A license upgrade adds support for up to 64 cameras.

EXHIBIT B

Cost effective, simple installation

Three power options, PoE (Power-over-Ethernet), 24 VAC and 12 VDC are available. Using PoE makes installation easier and more cost-effective, as cameras do not require a local power source. To increase system reliability, the camera can be simultaneously connected to both PoE and 12 VDC/24 VAC supplies. Additionally, uninterruptible power supplies (UPS) can be used, which will allow continuous operation, even during a power failure. For trouble-free network cabling, the cameras support Auto-MDIX which allows the installer to use straight or cross-over cables.

Easy Upgrade

Remotely upgrade the camera whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

Access Security

Various security levels are available for accessing the network, the camera, and the data channels. As well as password protection with three levels, 802.1x authentication using a RADIUS (Remote Authentication Dial In User Service) server is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. For total data protection, the video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

Typical applications

- Prisons and correctional facilities
- Retail outlets
- Commercial and government buildings
- Schools
- Hospitals
- Banks
- City surveillance
- Places with high crowd density or mass gatherings

Certifications and approvals

HD standards

- Complies with the 296M-2001 Standard in:
- Resolution: 1280x720
 - Scan: Progressive
 - Color representation: complies with ITU-R BT.709
 - Aspect ratio: 16:9
 - Frame rate: 25 and 30 frames/s

Electro Magnetic Compatibility

Emission	EN55022 Class B EN61000-3-2 EN61000-3-3 FCC Part 15: Class B
Immunity	EN50130-4 (PoE, +12 VDC) EN55024 (24 VAC) EN50121-4
Safety	EN60950-1 UL60950-1 (2nd edition)

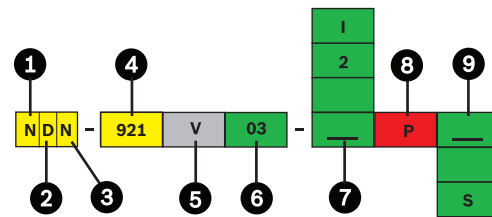
CAN/CSA-C 22.2 No. 60950-1

Vibration As per IEC60068-2-6 (5 m/s², operational)

Region	Certification
Canada	CSA
Europe	CE
USA	UL
	FCC

Installation/configuration notes

Ordering chart



1	N	Network camera
2	D	Dome (FlexiDome fixed dome)
3	N	Day/Night
4	921	DinionHD performance
5	V	Varifocal lens, auto iris
6	03	3 to 9 mm F1.4
7		Motion+
	2	IVA Ready *
	I	IVA enabled
8	P	PoE
9		Flush mount (blank)
	S	Surface mount

* No license included

Flush Mounting

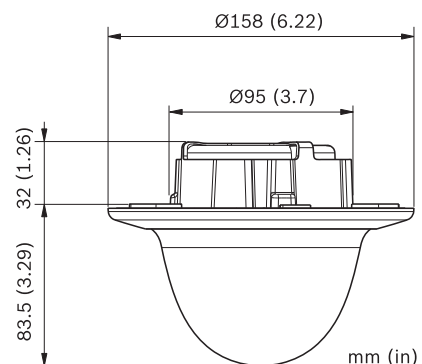
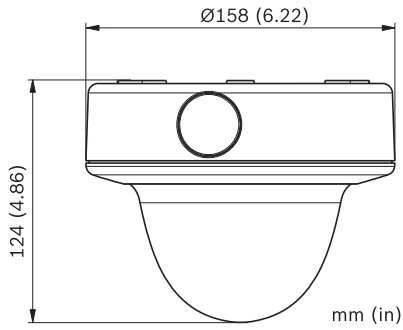
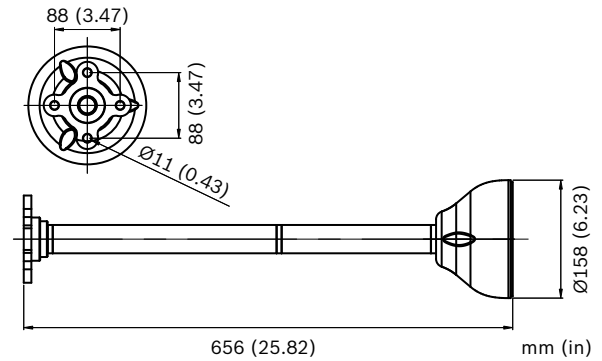


EXHIBIT B

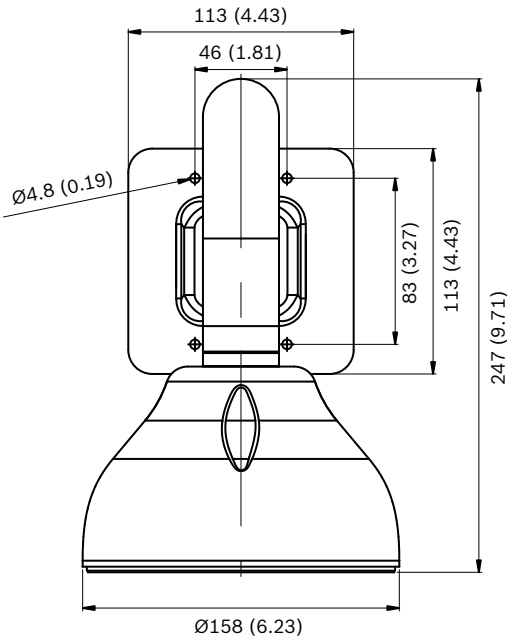
Surface Mounting



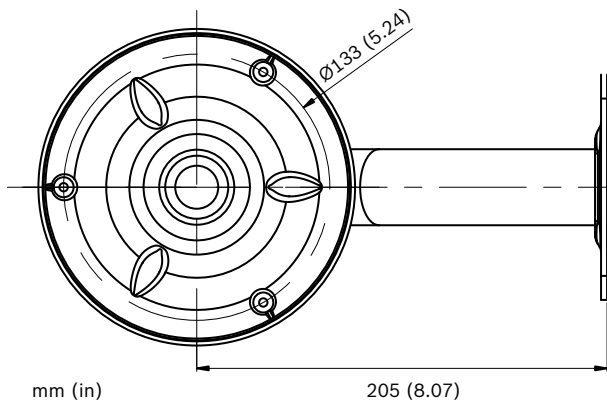
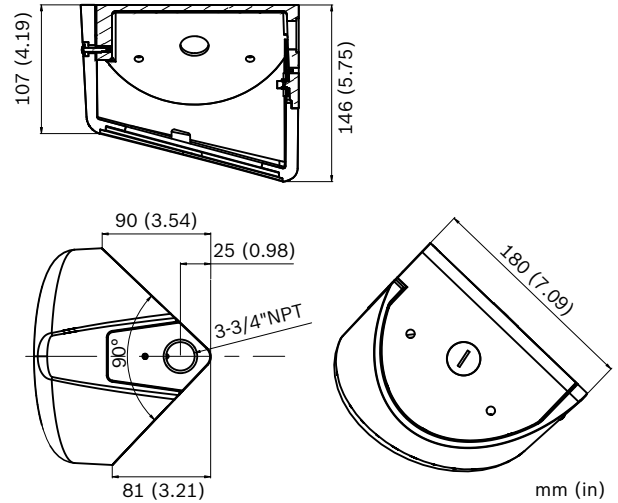
VDA-PMT-DOME -Pendant Pipe Mount



VDA-WMT-DOME -Pendant Wall Mount



VDA-CMT-DOME -Corner Mount



Parts included

Quantity	Component
1	NDN-921 Series FlexiDomeHD Day/Night IP Camera
1	Lens adjustment cap (focus aid)
1	Safety instructions
1	Quick Install Guide
1	Mini DVD-ROM with manuals, software, and tools
1	Mounting hardware kit + screwdriver bit
1	RJ45 network connector
1	Template for flush mount

Technical specifications

Electrical

Power Supply	24 VAC ±10% 50/60 Hz 12 VDC ±10% Power-over-Ethernet 48 VDC nominal
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EXHIBIT B

Current Consumption	550 mA 700 mA IVA (12 VDC) 550 mA 700 mA IVA (24 VAC) 200 mA (PoE 48 VDC)
Power Consumption	6.6 W 8.4 W IVA (12 VDC) 8.2 W 10.4 W IVA (24 VAC) 9.6 W (PoE 48 VDC)

Sensor	
Type	1/3-inch CCD
Active Pixels	1280 x 960

Network Video Output	
Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Four individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.
Two independently configurable H.264 streams	Stream 1: H.264 Main Profile (MP) 720p 25/30 Stream 2: H.264 Baseline Profile plus (BP+) or H.264 MP Standard Definition (SD), or Copy of stream 1
Two additional streams	M-JPEG stream and High Definition (HD) I-frame only stream.
Data rate	9.6 Kbps to 10 Mbps
HD Resolution (H x V)	720p: 1280 x 720
480p Resolution (H x V)	Encoding: 704 x 480 Displayed: 854 x 480
240p Resolution (H x V)	Encoding: 352 x 240 Displayed: 432 x 240

Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	IP, IBP, IBBP

Sensitivity (3200 K, scene reflectivity 89%)

	Minimum illumination (30 IRE)
Color	1 lx
Color + SensUp 10x	0.1 lx
Monochrome	0.4 lx
Monochrome + SensUp 10x	0.04 lx

Day/Night	Color, Mono, Auto
Pre-configured modes	6 preset programmable modes
Dynamic range	70 dB
Dynamic engine	XF-Dynamic, SmartBLC
SmartBLC	On / Off
AGC	AGC On or Off (0 - 35 dB) selectable
White Balance	ATW (2500 to 10000K), ATWhold and manual
Shutter	Auto (1/50 [1/60] to 1/10000) selectable Auto (1/50 [1/60] to 1/50000) automatic Fixed selectable
Sensitivity up	Adjustable from Off up to 10x
Auto Black	Automatic continuous, Off
Dynamic Noise Reduction	Auto, On/off selectable
Sharpness	Sharpness enhancement level selectable
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Motion+ or IVA
Test Pattern Generator	Color bars 100%, Grayscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable

Audio

Standard	G.711, 8kHz sampling rate L16, 16kHz sampling rate
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex

Input/output

Audio	1 x mono line in, 1 x mono line out
• signal line in	9 kohm typical, 5.5 Vpp max
• signal line out	3.0 Vpp at 10 kOhm typical, 2.3 Vpp at 32 Ohm typical, 1.7 Vpp at 16 Ohm typical
Alarm	1 non-isolated closing contact
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Maximum 0.5 A continuous, 10VA

EXHIBIT B**Software Control**

Unit Configuration	Via web browser or Configuration Manager
Flicker Control	50/60 Hz, selectable
Software update	Flash ROM, remote programmable

Network

Protocols	RTP, RTSP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNMP, 802.1x, UPnP
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE SUPPLY	IEEE 802.3af compliant

Optical

Varifocal lens	IR corrected, manual zoom and focus adjustment
Iris control	Automatic iris control
Viewing angle	92.9° to 31.7° horizontal 67.9° to 23.7° vertical

Mechanical

Weight	0.67 kg (1.48 lb) +SMB: 1.29 kg (2.84 lb)
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° azimuth
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Trim ring	Aluminum

Environmental

	Motion+ versions	IVA versions
Operating temperature default (with heater off)	-20 °C to +50 °C (-4 °F to +122 °F) cold start	-20 °C to +45 °C (-4 °F to +113 °F) cold start
Operating temperature (with heater on)	-50 °C to +50 °C (-58 °F to +122 °F)	-50 °C to +45 °C (-58 °F to +113 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)	
Operating humidity	5% to 93% relative humidity	
Storage humidity	Up to 98% relative humidity	
Impact protection	IEC 60068-2-75 test Eh, 50 J EN 50102, exceeding IK 10	

Water/dust protection	IP 66 and NEMA-4X
Environmental Test Method	EN50130-5:1999 Alarm systems Part 5 (Class 4 Outdoor in general)

Ordering information**NDN-921-V03-P FlexiDomeHD 720p**

1/3-inch Dome, HD 720p, H.264, Motion+, PoE
Order number **NDN-921-V03-P**

NDN-921-V03-IP FlexiDomeHD 720p

1/3-inch Dome, HD 720p, H.264, IVA enabled, PoE
Order number **NDN-921-V03-IP**

NDN-921-V03-PS FlexiDomeHD 720p

1/3-inch Dome, HD 720p, H.264, Motion+, PoE,
Surface mount
Order number **NDN-921-V03-PS**

NDN-921-V03-IPS FlexiDomeHD 720p

1/3-inch Dome, HD 720p, H.264, IVA enabled, PoE,
Surface mount
Order number **NDN-921-V03-IPS**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light gray finish
Order number **LTC 9213/01**

UPA-2410-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 10 VA Out
Order number **UPA-2410-60**

UPA-2430-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 30 VA Out
Order number **UPA-2430-60**

UPA-2450-60 Power Supply, 120 V, 60 Hz

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-60**

UPA-2420-50 Power Supply

220 VAC, 50 Hz, 24 VAC, 20 VA Out
Order number **UPA-2420-50**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-50**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

MVC-FIVA4-CAM

IVA 4.xx/5.xx VCA software license for IP camera/dome (e-license)
Order number **MVC-FIVA4-CAM**

EXHIBIT B

Accessories

VDA-WMT-DOME Wall Pendant Mount Bracket

Wall pendant mount bracket for FlexiDome cameras
Order number **VDA-WMT-DOME**

VDA-CMT-DOME Corner Mount Bracket

Corner mount bracket for FlexiDome cameras
Order number **VDA-CMT-DOME**

VDA-PMT-DOME Pendant Pipe Mount Bracket

Pendant pipe mount bracket for FlexiDome cameras
Order number **VDA-PMT-DOME**

VDA-455TBL Tinted bubble

Tinted bubble for FlexiDome series
Order number **VDA-455TBL**

VDA-455CBL Clear bubble

Clear Bubble for FlexiDome series
Order number **VDA-455CBL**

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EXHIBIT B FLEXIDOME starlight HD 720p60 RD

www.boschsecurity.com



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Invented for life



HD ONVIF



- ▶ Excellent low-light performance (0.017 lx in color)
- ▶ Intelligent noise reduction reduces bandwidth and storage requirements by up to 30%
- ▶ High-impact, ruggedized enclosure with choice of lens
- ▶ Auto back focus for fast installation

The FLEXIDOME starlight HD 720p60 camera provides clear images 24/7 – even at night or under low-light conditions.

High sensitivity in color (0.017 lx) and monochrome mode (0.0057 lx) enables this camera to work with a minimum of ambient light. This exceptional light sensitivity combined with Content-Based Imaging Technology (C-BIT) ensures crisp, clear, and detailed images in all lighting conditions. The 720p HD can also provide up to 60 images per second.

System overview

Advantages over SD cameras

Compared to SD cameras, the FLEXIDOME HD 720p60 offers, at no higher cost, motorized autofocus, higher resolution, better sensitivity, higher frame rates, and improved picture quality, and is still more bandwidth-efficient. Video storage costs are significantly reduced.

Functions

Exceptional low-light performance

The latest sensor technology combined with the sophisticated noise suppression results in a sensitivity of 0.017 lx 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.

The camera is a true day/night camera with a mechanical filter for truly outstanding nighttime performance (0.0057 lx in monochrome). The filter can be switched remotely, or automatically via a light level sensor or contact input.

Low bandwidth consumption

The intelligent Dynamic Noise Reduction (iDNR) actively analyzes the contents of the scene to reduce bandwidth and storage requirements. This removes noise artifacts so effectively that compression efficiency is very high (up to 30% improvement). This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio via temporal and spatial noise filtering.

Compression parameters for up to eight user-definable regions can be set. This allows uninteresting regions to be highly compressed, thus lowering bandwidth consumption and storage requirements. Important

EXHIBIT B

regions can be tuned for best image quality, thus allowing the user to allocate bandwidth to important parts of the scene.

Fast performance

The 60 images-per-second mode provides for optimum performance in fast action scenes and is particularly suitable for casino and banking applications.

Flexible lens choice

The camera comes with a choice of tele, mid-range, and ultra wide angle lenses. These varifocal SR (Super Resolution) lenses have an advanced iris design to ensure that the high resolution HD sensor produces the sharpest image possible, even in the corners. The optically corrected ultra wide angle lens provides outstanding performance without the need for de-warping software.

Simple installation

The camera has a very intuitive user interface that allows fast and easy configuration. Six configurable user modes are provided with the best settings for a variety of applications:

- **Outdoor** – general day-to-night changes with sun highlights and street lighting
- **Indoor** – general day-to-night changes without sun highlights and street lighting
- **Motion** – monitoring traffic or fast moving objects; motion artifacts are minimized
- **Lowlight** – optimized for sufficient details at low light.
- **Intelligent AE** (BLC on non-IVA models) – for people moving in front of a bright background
- **Vibrant** – enhanced contrast, sharpness and saturation

The auto-focus lens wizard makes it easy for an installer to accurately focus the camera for both day and night operation. The wizard is activated from the web browser or from the on-board camera push button making it easy to choose the workflow that suits best. The automatic motorized back focus adjustment with 1:1 pixel mapping ensures the camera is always focused accurately.

Streams

The innovative multi-streaming feature delivers various H.264 streams together with an M-JPEG stream. These streams facilitate bandwidth-efficient viewing and recording as well as integration with third-party video management systems.

A corridor mode can be selected for the second stream. In this mode an image of 400 x 720 (9:16 aspect ratio) is cropped from the full sensor image. When the scene to be monitored is suitable to this mode, the bandwidth and storage requirements are reduced.

Storage management

A microSD card can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall recording reliability. Recording

management can be controlled by the Bosch Video Recording Manager (VRM) or the camera can use iSCSI targets directly without any recording software.

Intelligent Video Analytics

IVA versions of the cameras use the latest generation of the Bosch Intelligent Video Analysis (IVA) software. This IVA system is the guard-assistant system of choice when reliable indoor or outdoor video analytics is needed. The state-of-the-art system reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. The face detection feature detects faces in the scene and forwards a high quality JPEG image of the best shot of each face when the face disappears from the scene.

Retrospective forensic search capabilities are available remotely from the web browser or the included Bosch Video Client.

Regions of interest

Two Regions of Interest (ROI) can be user defined. The remote electronic pan, tilt and zoom controls allow you to select specific areas of the parent image. These regions produce separate streams for remote viewing and recording. These streams, together with the main stream, allow the operator to separately monitor the most interesting part of a scene while still retaining situational awareness.

The IVA Intelligent tracker can also follow objects within the defined regions of interest. The Intelligent tracker can autonomously detect and track moving objects or the user can click on an object which the Intelligent tracker will then follow.

Rugged design

The cast-aluminum housing, polycarbonate window, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force (>IK10). Ideal for outdoor use, the camera is protected against water and dust to IP 66 (NEMA Type-4X) standards. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner, and suspended-ceiling mounting.

Access Security

Password protection with three levels and 802.1x authentication is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. The video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

Surveillance software

There are many ways to access the camera's video and IVA-based features: using a web browser, with the Bosch Video Management System, with the Bosch Recording System, with the free-of-charge Bosch Video Client, or with the iPad App.

EXHIBIT B

The Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. It also provides easy live viewing of multiple cameras, playback, forensic search and export.

Access to IVA metadata is available to integrators via RTSP.

Video security App

The Bosch Video Security iPad App has been developed to fully utilize our Dynamic Transcoding features and enable **Anywhere** access to HD surveillance images, even over low-bandwidth connections. The App, together with the Bosch transcoder, is configured to give you complete control of all your cameras, from panning and tilting to zoom and focus functions. It's like taking your control room with you.

Connections

The camera conforms to the ONVIF (Open Network Video Interface Forum) Profile S specification. This guarantees interoperability between network video products regardless of manufacturer. For trouble-free network cabling, the camera supports Auto-MDIX which allows the use of straight or cross-over cables. Camera power is supplied via PoE (Power-over-Ethernet) or via the 24 VAC/12 VDC connector. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Technology Partner Program (TPP) website (tpp.boschsecurity.com) for more information.

Certifications and approvals

HD Standards

Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25/30 and 50/60 frames/s

Electro Magnetic Compatibility

Emission	EN 55022 Class B FCC Part 15 Class B
Immunity	EN 50130-4 (PoE, +12 VDC, 24 VAC)* EN 50121-4
Safety	EN 60950-1 UL 60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	Camera with lens as per IEC 60068-2-6 (5 m/s ² , operational)

* Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera.

However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

Region	Certification
Europe	CE
USA	UL
	FCC
Canada	CSA

Installation/configuration notes

Dimensions

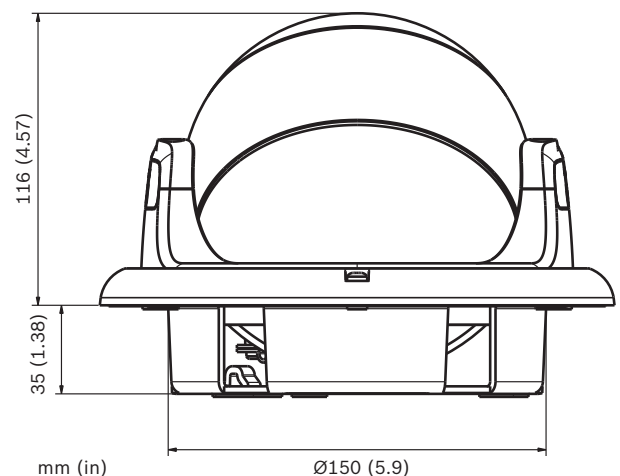
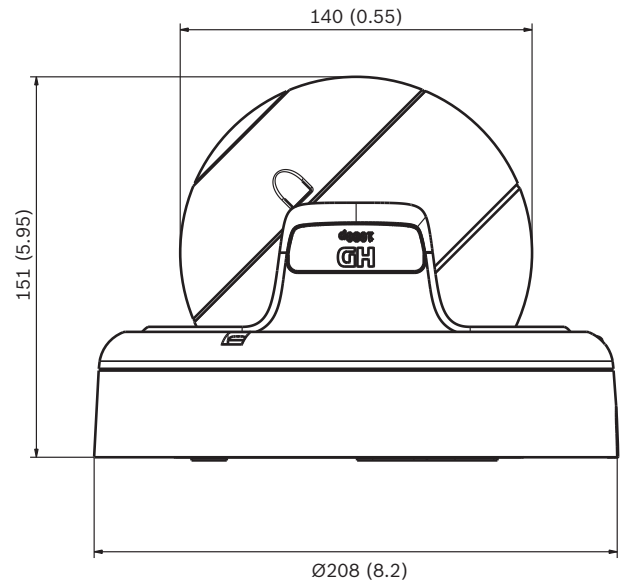
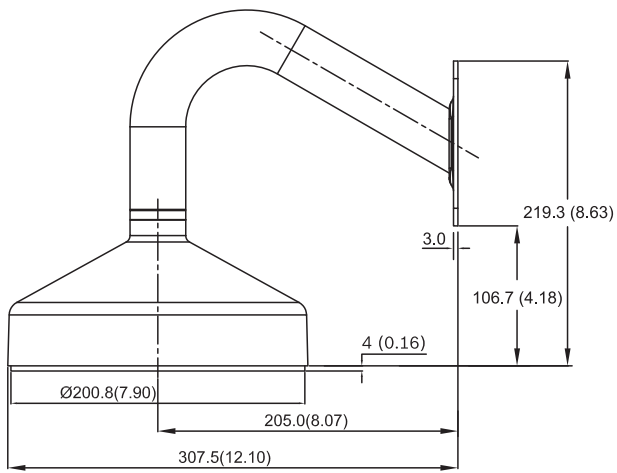
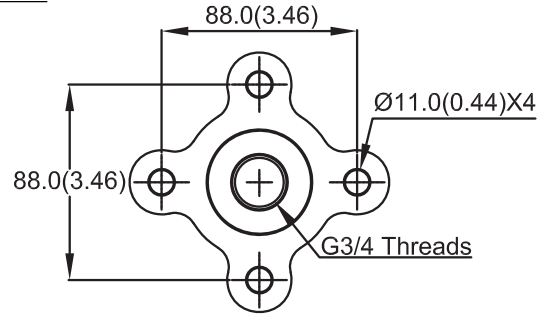
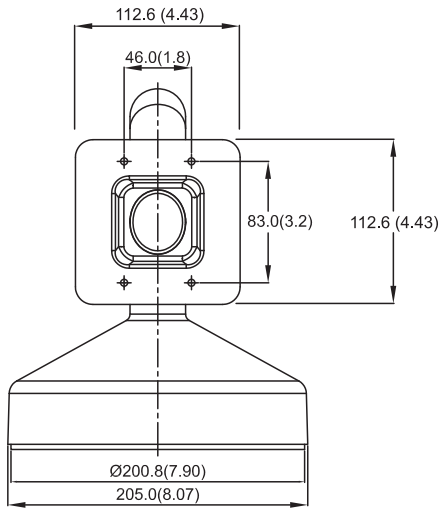
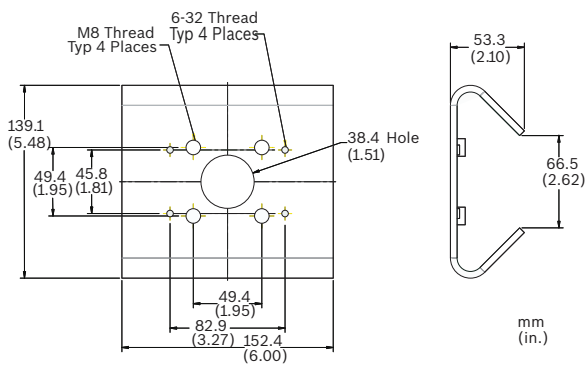


EXHIBIT B

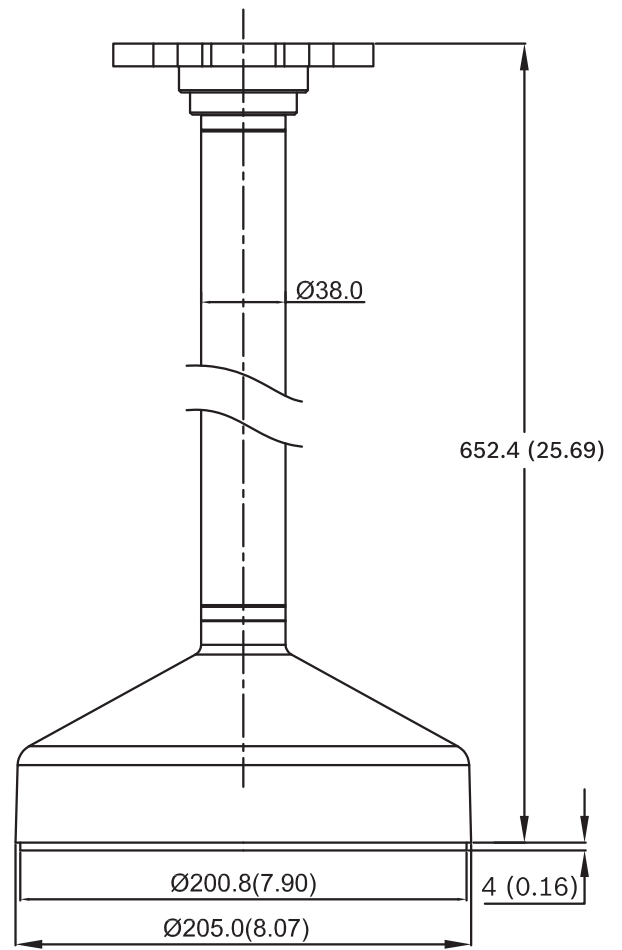
Mounting Brackets (not included)



VDA-832FHD-WMT Wall mount dimensions



LTC 9213/01 Pole Mount Adapter dimensions



VDA-832FHD-PMT Pipe mount dimensions

EXHIBIT B

Technical specifications

Electrical

Power Supply	24 VAC 50/60 Hz 12 VDC Power-over-Ethernet 48 VDC nominal
Current Consumption	1 A (12 VDC) 0.8 A (24 VAC) 0.3 A (PoE 48 VDC)
Power Consumption	12 W

Sensor

Type	1/3-inch CMOS HD
Active Pixels	1280 x 720

Video

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth. Regions of Interest (ROI)

Resolutions (H x V)

- 720p HD	1280 x 720
- 480p SD	Encoding: 704 x 480; Displayed: 854 x 480
- 432p SD	768 x 432
- 288p SD	512 x 288
- 240p SD	Encoding: 352 x 240; Displayed: 432 x 240
- 144p SD	256 x 144
- upright mode	400 x 720
- D1 4:3 cropped	704 x 480

Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	IP, IBP, IBBP

Sensitivity (3200 K, scene reflectivity 89%, F1.2)

	Minimum illumination (30 IRE)
Color	0.017 lx (0.0017 fc)
Monochrome	0.0057 lx (0.00057 fc)

Day/Night	Color, Monochrome, Auto
White Balance	ATW (2500 to 10000K), ATWhold and manual Indoor and Outdoor ATW

Shutter	Automatic Electronic Shutter (AES) Fixed (1/30 [1/25] to 1/150000) selectable Default shutter
Backlight compensation (IVA)	Off, Auto, IntelligentAE (iAE)
Backlight compensation (non IVA)	Off, Auto, BLC
Noise reduction	Intelligent Dynamic Noise Reduction (iDNR) with separate temporal and spatial adjustments
Contrast enhancement	On/off
Sharpness	Sharpness enhancement level selectable
Dynamic range	84 dB
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Intelligent Video Analysis

Audio

Standard	AAC G.711, 8kHz sampling rate L16, 16kHz sampling rate
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex / half duplex

Input/output

Analog Video out (service only)	CVBS (PAL/NTSC), 1 Vpp, 2.5 mm jack, 75 Ohm (non-protected)
Audio	1 x mono line in, 1 x mono line out
• connector	3.5 mm stereo jack
• signal line in	12 kOhm typical, 1 Vrms max
• signal line out	1 Vrms at 1.5 kOhm typical,
Alarm	2 inputs
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC max. Maximum 0.5 A continuous, 10VA

Local Storage

Memory card slot	Supports SDHC and SDXC microSD cards
Recording	Continuous recording, ring recording, alarm/events/schedule recording

EXHIBIT B**Software Control**

Unit Configuration	Via web browser or Configuration Manager
Software update	Flash ROM, remotely programmable

Network

Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNMP, SNMP (V1, MIB-II), 802.1x, SMTP, iSCSI, UPnP (SSDP)
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3at compliant
Connectivity	ONVIF Profile S Auto-MDIX

Optical

Lens	Varifocal SR (Super Resolution)
Focus control	Motorized back-focus adjustment
Iris control	Automatic iris control
Viewing angle	
1.8 to 3 mm (IR corrected)	Wide 105° x 74° (H x V) Tele 77° x 49° (H x V)
3.8 to 13 mm	Wide: 72° x 40° (H x V) Tele: 21° x 11.9° (H x V)
9 to 40 mm (IR corrected)	Wide: 30° x 17° (H x V) Tele: 7.1° x 3.9° (H x V)

Mechanical

Dimensions (D x H)	208 x 151 mm (8.2 x 5.95 in)
Weight	2200 g (4.85 lb)
Color	RAL 9006 Metallic Titanium

Environmental

Operating Temperature	-50°C to +50°C (-58°F to 122°F) Non-IVA: -50°C to +55°C (-58°F to 131°F)
Cold Start Temperature	-20°C (-4°F)
Storage Temperature	-30°C to +70°C (-22°F to +158°F)
Operating Humidity	20% to 93% RH
Storage Humidity	up to 98% RH
Vandal Resistance	IK10
Ingress Resistance	IP 66, NEMA Type-4X

Ordering information**FLEXIDOME HD 720p RD 1.8-3mm**

1/3-inch CMOS, IP Ruggedized Dome Camera, 720p60, 1.8 -- 3 mm SR lens
Order number **NDN-733V02-P**

FLEXIDOME HD 720p RD 3.8-13mm

1/3-inch CMOS, IP Ruggedized Dome Camera, 720p60, 3.8 -- 13 mm SR lens
Order number **NDN-733V03-P**

FLEXIDOME HD 720p RD 9-40mm

1/3-inch CMOS, IP Ruggedized Dome Camera, 720p60, 9 -- 40 mm SR lens
Order number **NDN-733V09-P**

FLEXIDOME HD 720p RD 1.8-3mm IVA

1/3-inch CMOS, IP Ruggedized Dome Camera, 720p60, 1.8 -- 3 mm SR lens, IVA
Order number **NDN-733V02-IP**

FLEXIDOME HD 720p RD 3.8-13mm IVA

1/3-inch CMOS, IP Ruggedized Dome Camera, 720p60, 3.8 -- 13 mm SR lens, IVA
Order number **NDN-733V03-IP**

FLEXIDOME HD 720p RD 9-40mm IVA

1/3-inch CMOS, IP Ruggedized Dome Camera, 720p60, 9 -- 40 mm SR lens, IVA
Order number **NDN-733V09-IP**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light gray finish
Order number **LTC 9213/01**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras, 1 m
Order number **S1460**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

VJT-XTCFX

VideoJet XTC XF, H.264 video transcoder
Order number **VJT-XTCFX**

Accessories**VDA-832FHD-WMT**

Wall mount bracket for HD FlexiDomes
Order number **VDA-832FHD-WMT**

VDA-832FHD-PMT

Pendant pipe mount bracket for HD FlexiDomes
Order number **VDA-832FHD-PMT**

EXHIBIT B

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EXHIBIT B FLEXIDOME HD 1080p RD

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Invented for life



HD ONVIF



- ▶ 1/2.7-inch Day/Night CMOS with progressive scan
- ▶ Choice of high performance lenses
- ▶ Local Storage for flexible recording options
- ▶ Motorized automatic back focus
- ▶ High-impact, ruggedized enclosure

FlexiDomeHD 1080p Day/Night IP cameras are progressive scan CMOS cameras that use the Bosch-designed Dinion digital imaging technology. The camera uses the latest CMOS-based HD sensor for a sharper, more detailed picture with a 16:9 image format.

Features such as multicasting, internet streaming and iSCSI recording are fully supported.

The FlexiDomeHD 1080p camera delivers the highest standards of performance and reliability in any security and surveillance scenario, day or night.

System overview

1080p HD Camera

The FlexiDomeHD camera is designed to stream a high resolution 1080p video image in true HD format (16:9). The camera now brings the unmatched Dinion Image performance to HD-standard video.

Functions

Outstanding image quality

With a 1/2.7-inch CMOS HD sensor, the FlexiDomeHD Day/Night IP camera delivers outstanding image quality. The Bosch designed digital video processing system optimally handles the HD image format without

compromise. Image performance and color reproduction are superb even under challenging lighting conditions.

Flexible lens choice

The camera comes with a choice of tele, mid-range, and ultra wide angle lenses. Each lens is specifically matched to the sensor to ensure full resolution even in the corners. The 1.8 to 3 mm optically corrected ultra wide angle lens provides outstanding performance without the need for de-warping software.

Day/Night switching

In night mode, the camera enhances low light viewing by switching the IR (infrared) filter out of the optical path and providing a monochrome image. The camera can switch from color to monochrome mode automatically by sensing the illumination level, manually via the alarm input, or remotely via a web browser.

Privacy masking

Four different privacy zones allow specific parts of a scene to be blocked. A mask for any part of the scene can be pre-programmed.

EXHIBIT B

Tough design

The cast-aluminum housing, polycarbonate window, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force. The enclosure contains the full-featured camera and integral varifocal lens. Ideal for outdoor use, the cameras are protected against water and dust to IP 66 (NEMA -4X) standards. The camera enclosure provides the extra protection necessary for applications such as schools, banks, prisons, retail outlets and industrial buildings. Installation is quick and easy, as the camera comes completely assembled and ready to use. The camera uses Bosch designed lens and optics to deliver true HD resolution with different light levels. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner, and suspended ceiling mounting. The compact, sleek design and virtually flush-mount appearance complements any decor.

Efficient bandwidth and storage management

The cameras use H.264 (Main Profile) compression, bandwidth throttling, and multicasting capabilities to manage bandwidth and storage requirements efficiently, while delivering high image quality and resolution.

Bosch's innovative Quad-streaming feature enables the FlexiDomeHD to deliver three H.264 streams (a 1080p30 HD stream, a downscaled resolution stream, and a HD I-frame only stream) together with an M-JPEG stream. These four streams facilitate bandwidth-efficient viewing and recording options as well as integration with third-party video management systems.

FlexiDomeHD cameras offer unparalleled recording options. Attached to the network, they can use iSCSI targets directly without needing any recording software. The recording management capabilities of the system can be further enhanced by using the Bosch Video Recording Manager (VRM).

FlexiDomeHD supports local storage on a microSD card. This can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall reliability of video recording.

Standard intelligence

With built-in video content analysis, the camera reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The MOTION+ video motion analysis system that is built into all camera versions, is the perfect solution for applications where standard video content analysis features are required. This motion analysis algorithm is based on pixel change and includes object size filtering capabilities and sophisticated tamper-detection capabilities.

Advanced IVA version

The hardware-enhanced version of the camera upgrades the video content analysis features of the camera with the more advanced Intelligent Video Analysis (IVA). This version contains such features as idle object, line crossing, flow detection, crowd detection etc.

ONVIF conformance

The camera conforms to the ONVIF (Open Network Video Interface Forum) specification which guarantees interoperability between network video products regardless of manufacturer. ONVIF conformant devices are able to exchange live video, audio, metadata and control information. They are automatically discovered and connected to network applications such as video management systems.

Unsurpassed flexibility

There are many ways to access the camera's video: on a PC using a web browser, with the Bosch Video Management System (VMS), or with the Bosch Video Client. The bundled Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. It also provides easy live viewing of multiple cameras, playback, forensic search and export.

Cost effective, simple installation

Three power options, PoE (Power-over-Ethernet), 24 VAC and 12 VDC are available. Using PoE makes installation easier and more cost-effective, as cameras do not require a local power source. To increase system reliability, the camera can be simultaneously connected to both PoE and 12 VDC/24 VAC supplies. Additionally, uninterruptible power supplies (UPS) can be used, which will allow continuous operation, even during a power failure.

For trouble-free network cabling, the cameras support Auto-MDIX which allows the installer to use straight or cross-over cables.

Automatic back focus

An automatic motorized back focus adjustment ensures the camera is focused accurately for both day and night operation.

Intuitive user interface

The FlexiDomeHD camera has a very intuitive user interface that allows fast and easy configuration over IP. An auto-focus lens wizard can be activated either from the PC or through the camera buttons. This makes it easy for the installer to choose the workflow that suits best for setting field-of-view and focus with 1:1 pixel mapping.

Easy Upgrade

Remotely upgrade the camera whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

EXHIBIT B

Access Security

Various security levels are available for accessing the network, the camera and the data channels. As well as password protection with three levels, 802.1x authentication using a RADIUS (Remote Authentication Dial In User Service) server is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. For total data protection, the video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

Bosch Video Client surveillance software

The bundled Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. A wizard allows the configuration of multiple cameras simultaneously using an auto detection device. Multiple cameras can be monitored in one screen and video clips on the SD card can be archived and searched in a single application.

Typical applications

- Prisons and correctional facilities
- Traffic monitoring (air, land and sea)
- Hotels, bars and nightclubs
- Commercial and government buildings
- City surveillance and safety
- Border control

Certifications and approvals

HD Standards

Complies with the SMPTE 274M-2008 Standard in:

- Resolution: 1920x1080
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Electro Magnetic Compatibility

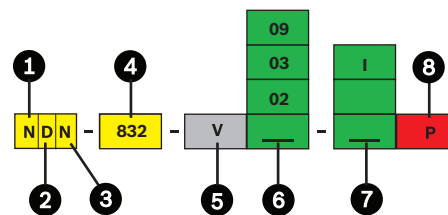
Emission	EN55022 Class B FCC Part 15 Class B
Immunity	EN50130-4 (PoE, +12 VDC, 24 VAC)* EN50121-4
Safety	EN60950-1 UL60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	Camera with lens as per IEC60068-2-6 (5 m/s ² , operational)

* Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera. However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

Region	Certification
Europe	CE
USA	UL
	FCC
Canada	CSA

Installation/configuration notes

Ordering chart

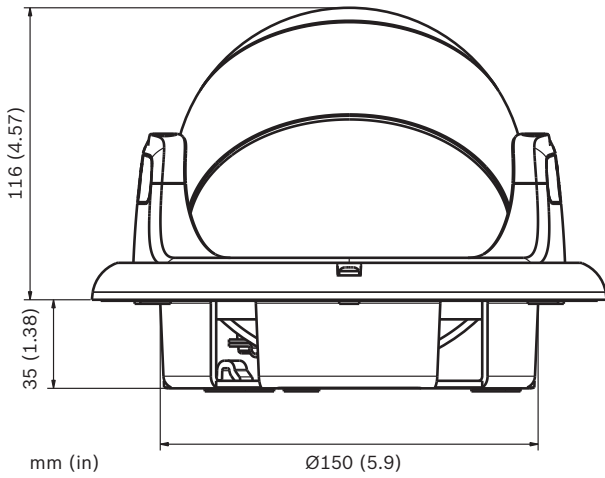
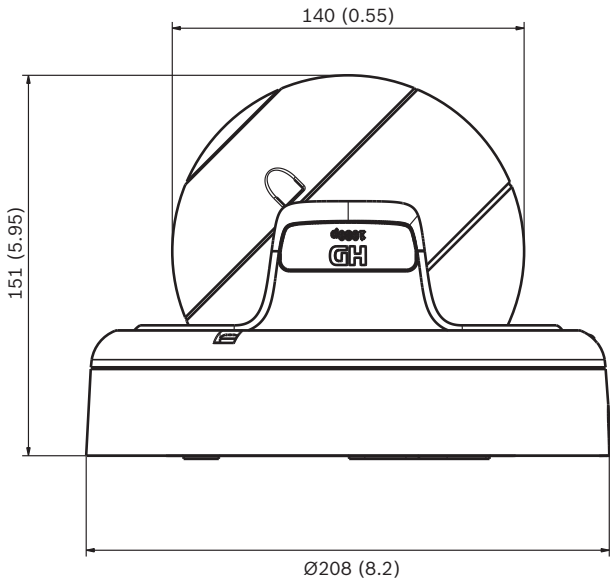


1	N: Network camera	5	Varifocal lens, auto iris
2	D: Dome	6	02: 1.8 to 3 mm lens * 03: 3.8 to 13 mm lens 09: 9 to 40 mm lens
3	N: Day/Night	7	-: Motion+ I: IVA enabled
4	832: FlexiDomeHD performance	8	P: PoE

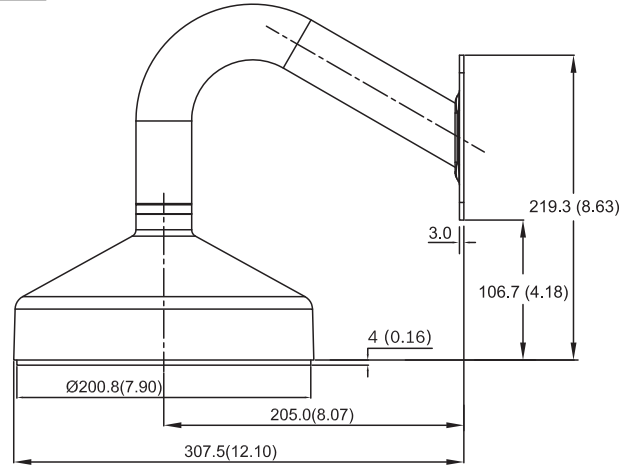
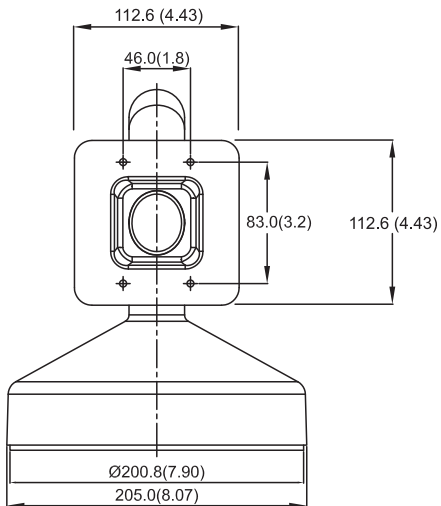
*optically corrected ultra wide angle lens

EXHIBIT B

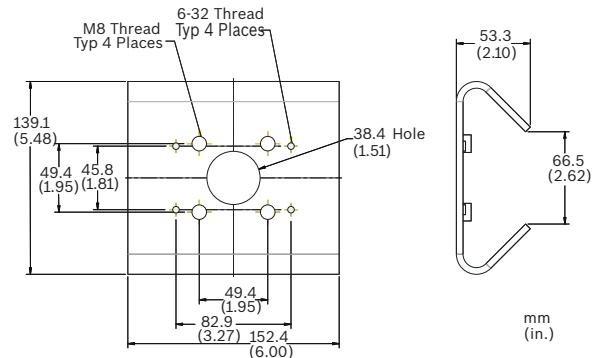
Dimensions



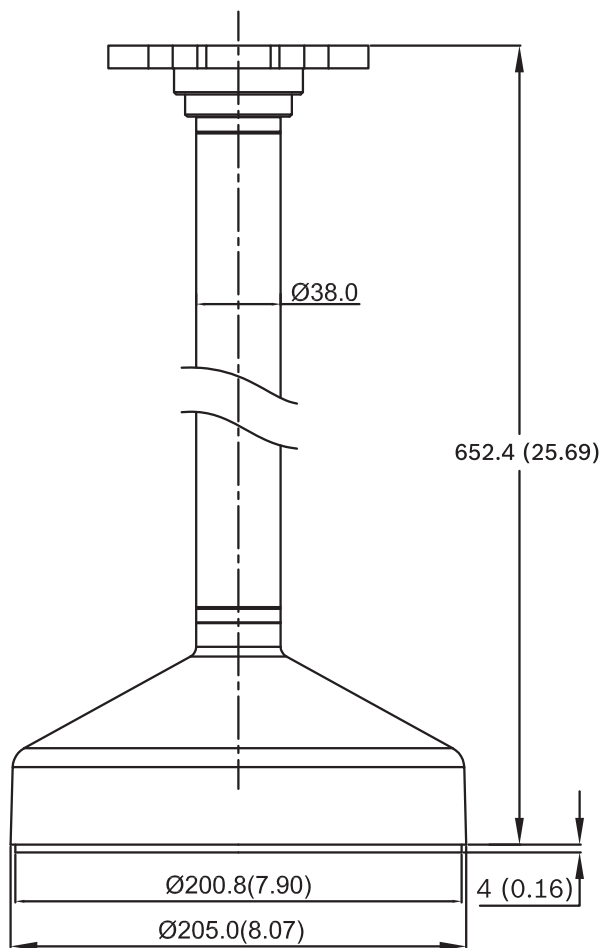
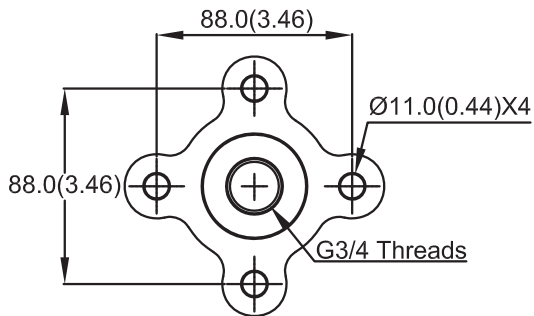
Mounting brackets (not included)



VDA-832FHD-WMT Wall mount dimensions



LTC 9213/01 Pole Mount Adapter dimensions

EXHIBIT B

VDA-832FHD-PMT Pipe mount dimensions

Parts included

Quantity	Components
1	NDN-832 Series FlexiDomeHD Day/Night IP Camera
1	Quick Install Guide and Safety Instructions
1	Optical disk with Bosch Video Client, manuals, and system requirements

Technical specifications**Electrical**

Power Supply	24 VAC \pm 10% 50/60 Hz 12 VDC \pm 10% Power-over-Ethernet 48 VDC nominal
Current Consumption	0.8 A 1 A IVA (12 VDC) 0.7 A 0.8 A IVA (24 VAC) 0.25 A 0.3 A IVA (PoE 48 VDC)
Power Consumption Heater on	9.6 W 11 W IVA (12 VDC) 13.4 W 15.8 W IVA (24 VAC) 12.2 W 13.4 W IVA (PoE 48 VDC)
Power Consumption Heater off	4.8 W 6 W IVA (12 VDC) 8.4 W 10.8 W IVA (24 VAC) 7.2 W 8.4 W IVA (PoE 48 VDC)

Sensor

Type	1/2.7-inch CMOS
Active Pixels	1920 x 1080

Video

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Four individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.
Two independently configurable H.264 streams	Stream 1: H.264 Main Profile (MP) 1080p 25/30, H.264 Main Profile (MP) 720p 25/30 or H.264 MP Standard Definition (SD) Stream 2: Copy of stream 1 (when 1080p), H.264 Main Profile (MP) 720p 25/30 (when stream 1 is 720p) or H.264 MP Standard Definition (SD)
Two additional streams	M-JPEG stream and High Definition (HD) I-frame only stream.
HD Resolution (H x V)	1080p: 1920 x 1080 720p: 1280 x 720
480p Resolution (H x V)	Encoding: 704 x 480 Displayed: 854 x 480
240p Resolution (H x V)	Encoding: 352 x 240 Displayed: 432 x 240
Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	IP, IBP, IBBP

Sensitivity (3200 K, scene reflectivity 89%, F1.2)

Minimum illumination (30IRE)	Color: 0.22 lx (0.022 fc) Monochrome: 0.05 lx (0.005 fc)
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EXHIBIT B

Day/Night	Color, Mono, Auto
White Balance	ATW (2500 to 10000K), ATWhold and manual
Shutter	Auto (1/50 [1/60] to 1/150000) automatic Fixed selectable
Backlight compensation	On/off
Contrast enhancement	On/off
Sharpness	Sharpness enhancement level selectable
Dynamic Range	Digital WDR: 76 dB
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Motion+ or IVA option

Audio

Standard	G.711, 8kHz sampling rate AAC
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex / half duplex

Input/output

Audio	1 x mono line in, 1 x mono line out
• connector	3.5 mm stereo jack
• signal line in	12 kOhm typical, 1 Vrms max
• signal line out	1 Vrms at 1.5 kOhm typical,
Alarm	2 inputs
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Maximum 0.5 A continuous, 10VA
Data port	RS-232/422/485

Local Storage

Memory card slot	Supports SDHC and SDXC microSD cards up to 2 TB
Recording	Continuous recording, ring recording, alarm/events/schedule recording

Software Control

Unit Configuration	Via web browser or Configuration Manager
Software update	Flash ROM, remote programmable

Network

Protocols	RTP, RTSP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x, UPnP
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3at compliant

Optical

Varifocal lens	Manual zoom and focus adjustment
Iris control	Automatic iris control
Viewing angle	
1.8 to 3 mm	Wide 115 x 84° (H x V) Tele 87° x 57° (H x V)
3.8 to 13 mm	Wide: 87° x 48° (H x V) Tele: 26° x 14.1° (H x V)
9 to 40 mm	Wide: 37° x 20° (H x V) Tele: 8.1° x 5.1° (H x V)

Mechanical

Dimensions (D x H)	208 x 151 mm (8.2 x 5.95 in)
Weight	2200 g (4.85 lb)

Environmental

Operating Temperature	-50°C to +55°C (-58°F to 131°F)
Operating Temperature (IVA)	-50°C to +50°C (-58°F to 122°F)
Storage Temperature	-30°C to +70°C (-22°F to +158°F)
Operating Humidity	20% to 93% RH
Storage Humidity	up to 98% RH
Vandal Resistance	Ik10
Ingress Resistance	IP66, NEMA 4x

Ordering information**HD Dome 1080p**

1/2.7-inch CMOS, IP Dome Camera, 1080p HD, Motion +, 1.8 -- 3 mm lens
Order number **NDN-832V02-P**

HD Dome 1080p

1/2.7-inch CMOS, IP Dome Camera, 1080p HD, IVA enabled, 1.8 -- 3 mm lens
Order number **NDN-832V02-IP**

EXHIBIT B**HD Dome 1080p**

1/2.7-inch CMOS, IP Dome Camera, 1080p HD, Motion
+, 3.8 -- 13 mm lens

Order number **NDN-832V03-P**

HD Dome 1080p

1/2.7-inch CMOS, IP Dome Camera, 1080p HD, IVA
enabled, 3.8 -- 13 mm lens

Order number **NDN-832V03-IP**

HD Dome 1080p

1/2.7-inch CMOS, IP Dome Camera, 1080p HD, Motion
+, 9 -- 40 mm lens

Order number **NDN-832V09-P**

HD Dome 1080p

1/2.7-inch CMOS, IP Dome Camera, 1080p HD, IVA
enabled, 9 -- 40 mm lens

Order number **NDN-832V09-IP**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light
gray finish

Order number **LTC 9213/01**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras,
1 m

Order number **S1460**

VJT-XTCXF

VideoJet XTC XF, H.264 video transcoder

Order number **VJT-XTCXF**

Accessories**VDA-832FHD-WMT**

Wall mount bracket for HD FlexiDomes

Order number **VDA-832FHD-WMT**

VDA-832FHD-PMT

Pendant pipe mount bracket for HD FlexiDomes

Order number **VDA-832FHD-PMT**

Represented by:**Americas:**

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apr.securitysystems@bosch.com
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www.boschsecurity.com

EXHIBIT B

FLEXIDOME HD 1080p HDR RD

www.boschsecurity.com



BOSCH

Invented for life



- ▶ High Dynamic Range (90 dB) to see details in bright and dark areas simultaneously
- ▶ Intelligent noise reduction reduces bandwidth and storage requirements by up to 30%
- ▶ High-impact, ruggedized enclosure with choice of lens
- ▶ Auto back focus for fast installation
- ▶ Content-based scene analysis optimizes the image processing

The high dynamic range FLEXIDOME HD 1080p dome camera combines intelligence with adaptive video processing to bring you high performance content-based imaging in any security or surveillance scenario, day or night.

The camera uses an internal feedback system based on the intelligent analysis of the scene, to re-tune the video processing. This provides better detail in the areas that matter and better all-round performance.

Functions

High Dynamic Range

The High Dynamic Range (HDR) of the camera means that you can view details in the bright and the dark areas of a scene at the same time. HDR is based on a dual exposure process that captures more details in highlights and shadows even under challenging lighting conditions. The result is that you can distinguish objects and features easily.

Content-Based Imaging Technology

The Content-Based Imaging Technology (C-BIT) uses IVA information to examine the scene and provide feedback to re-tune the image processing. C-BIT identifies areas for enhanced processing and ensures crisp, clear, and detailed images in difficult lighting

conditions. For example, the intelligent Automatic Exposure (iAE) allows you to view moving objects in bright and dark areas of a scene.

Low bandwidth consumption

The intelligent Dynamic Noise Reduction (iDNR) actively analyzes the contents of the scene to reduce bandwidth and storage requirements. This removes noise artifacts so effectively that compression efficiency is very high (up to 30% improvement). This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio via temporal and spatial noise filtering.

Compression parameters for up to eight user-definable regions can be set. This allows uninteresting regions to be highly compressed, thus lowering bandwidth consumption and storage requirements. Important regions can be tuned for best image quality, thus allowing the user to allocate bandwidth to important parts of the scene.

Flexible lens choice

The camera comes with a choice of tele, mid-range, and ultra wide angle lenses. These varifocal SR (Super Resolution) lenses have an advanced iris design to

EXHIBIT B

ensure that the high resolution HD sensor produces the sharpest image possible, even in the corners. The optically corrected ultra wide angle lens provides outstanding performance without the need for de-warping software.

Simple installation

The camera has a very intuitive user interface that allows fast and easy configuration. Six configurable user modes are provided with the best settings for a variety of applications:

- **Outdoor** – general day-to-night changes with sun highlights and street lighting
- **Indoor** – general day-to-night changes without sun highlights and street lighting
- **Motion** – monitoring traffic or fast moving objects; motion artifacts are minimized
- **Lowlight** – optimized for sufficient details at low light.
- **Intelligent AE** (BLC on non-IVA models) –for people moving in front of a bright background.
- **Vibrant** – enhanced contrast, sharpness and saturation

The auto-focus lens wizard makes it easy for an installer to accurately focus the camera for both day and night operation. The wizard is activated from the web browser or from the on-board camera push button making it easy to choose the workflow that suits best. The automatic motorized back focus adjustment with 1:1 pixel mapping ensures the camera is always focused accurately.

Streams

The innovative multi-streaming feature delivers various H.264 streams together with an M-JPEG stream. These streams facilitate bandwidth-efficient viewing and recording as well as integration with third-party video management systems.

A corridor mode can be selected for the second stream. In this mode an image of 400 x 720 (9:16 aspect ratio) is cropped from the full sensor image. When the scene to be monitored is suitable to this mode, the bandwidth and storage requirements are reduced.

Storage management

A microSD card can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall recording reliability. Recording management can be controlled by the Bosch Video Recording Manager (VRM) or the camera can use iSCSI targets directly without any recording software.

Intelligent Video Analytics

IVA versions of the cameras use the latest generation of the Bosch Intelligent Video Analysis (IVA) software. This IVA system is the guard-assistant system of choice when reliable indoor or outdoor video analytics is needed. The state-of-the-art system reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image.

The best face detection feature detects faces in the scene and forwards a high quality JPEG image of the best shot of each face when the face disappears from the scene.

Retrospective forensic search capabilities are available remotely from the web browser or the Bosch Video Client.

Regions of interest

Two Regions of Interest (ROI) can be user defined. The remote electronic pan, tilt and zoom controls allow you to select specific areas of the parent image. These regions produce separate streams for remote viewing and recording. These streams, together with the main stream, allow the operator to separately monitor the most interesting part of a scene while still retaining situational awareness.

The IVA Intelligent tracker can also follow objects within the defined regions of interest. The Intelligent tracker can autonomously detect and track moving objects or the user can click on an object which the Intelligent tracker will then follow.

Rugged design

The cast-aluminum housing, polycarbonate window, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force (>IK10). Ideal for outdoor use, the camera is protected against water and dust to IP 66 (NEMA -4X) standards. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner, and suspended-ceiling mounting.

Access Security

Password protection with three levels and 802.1x authentication is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. The video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

Surveillance software

There are many ways to access the camera's video and IVA-based features: using a web browser, with the Bosch Video Management System, with the Bosch Recording System, with the free-of-charge Bosch Video Client, or with the iPad App.

The Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. It also provides easy live viewing of multiple cameras, playback, forensic search and export.

Access to IVA metadata is available to integrators via RTSP.

Video security App

The Bosch Video Security iPad App has been developed to fully utilize our Dynamic Transcoding features and enable **Anywhere** access to HD surveillance images, even over low-bandwidth connections. The App, together with the Bosch

EXHIBIT B

transcoder, is configured to give you complete control of all your cameras, from panning and tilting to zoom and focus functions. It's like taking your control room with you.

Connections

The camera conforms to the ONVIF (Open Network Video Interface Forum) Profile S specification which guarantees interoperability between network video products regardless of manufacturer. For trouble-free network cabling, the camera supports Auto-MDIX which allows the use of straight or cross-over cables. Camera power is supplied via PoE (Power-over-Ethernet) or via the 24 VAC/12 VDC connector. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Technology Partner Program (TPP) website (tpp.boschsecurity.com) for more information.

Some typical applications

- Tunnels – viewing details in bright and dark areas
- Entrances and exits – identification with strong backlight
- Traffic – capturing moving vehicles at night

Certifications and approvals

HD Standards

Complies with the SMPTE 274M-2008 Standard in:

- Resolution: 1920x1080
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Electro Magnetic Compatibility

Emission	EN 55022 Class B FCC Part 15 Class B
Immunity	EN 50130-4 (PoE, +12 VDC, 24 VAC)* EN 50121-4
Safety	EN 60950-1 UL 60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	Camera with lens as per IEC 60068-2-6 (5 m/s ² , operational)

Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera. However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

Region	Certification
Europe	CE
USA	UL
	FCC

Installation/configuration notes

Dimensions

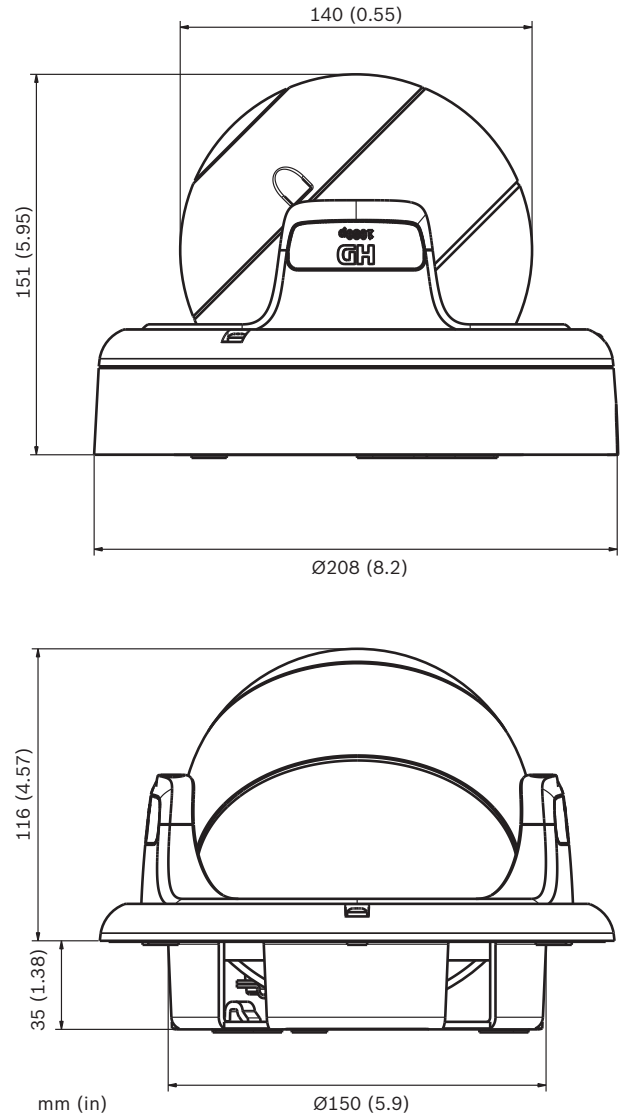
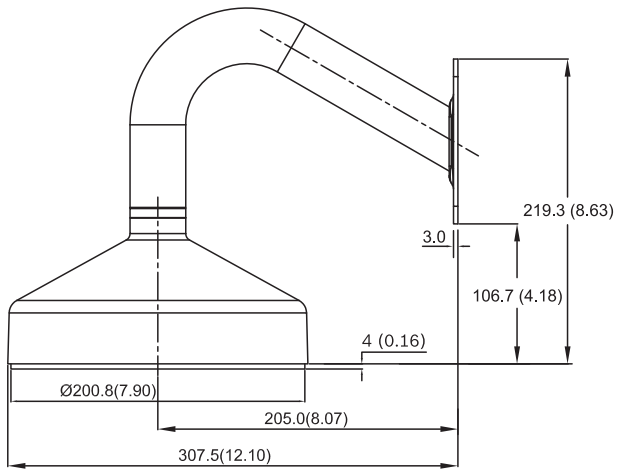
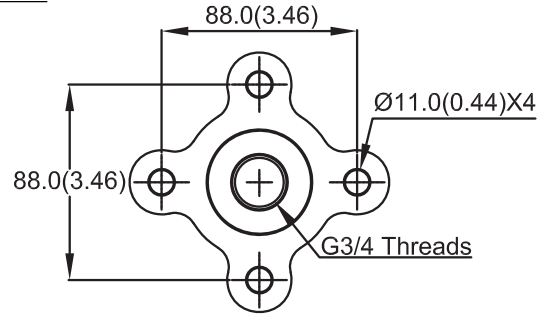
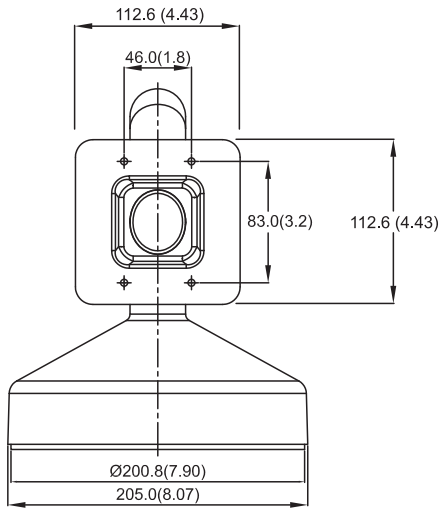
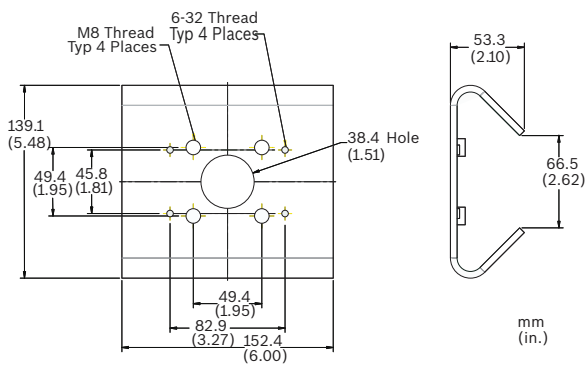


EXHIBIT B

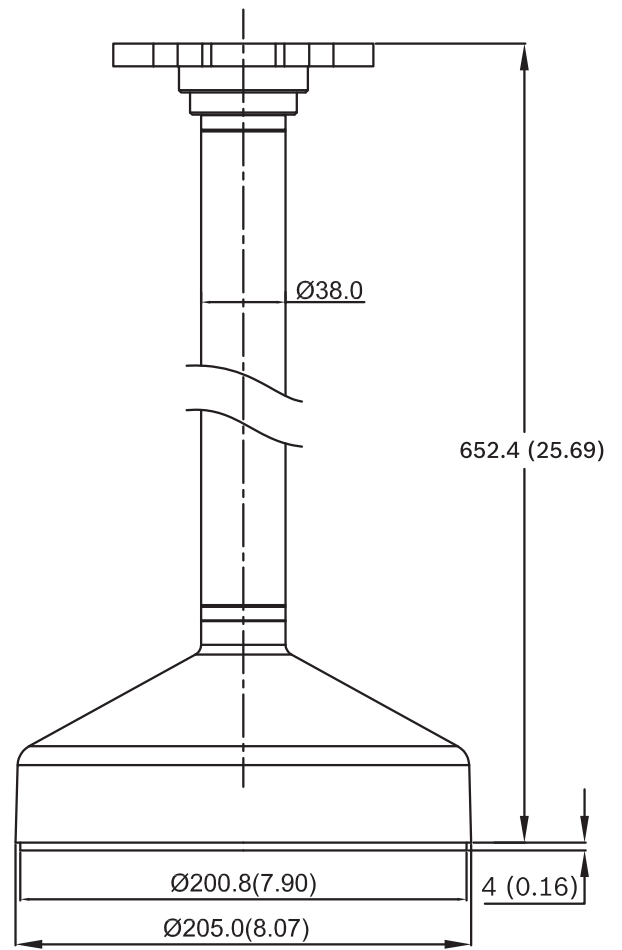
Mounting Brackets (not included)



VDA-832FHD-WMT Wall mount dimensions



LTC 9213/01 Pole Mount Adapter dimensions



VDA-832FHD-PMT Pipe mount dimensions

EXHIBIT B

Technical specifications

Electrical

Power Supply	24 VAC \pm 10% 50/60 Hz 12 VDC \pm 10% Power-over-Ethernet 48 VDC nominal
Current Consumption	1 A (12 VDC) 0.8 A (24 VAC) 0.3 A (PoE 48 VDC)
Power Consumption	12 W

Sensor

Type	1/3-inch CMOS HD
Active Pixels	1920 x 1080

Video

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.

Resolutions (H x V)

- 1080p HD	1920 x 1080
- 720p HD	1280 x 720
- 480p SD	Encoding: 704 x 480; Displayed: 854 x 480
- 432p SD	768 x 432
- 288p SD	512 x 288
- 240p SD	Encoding: 352 x 240; Displayed: 432 x 240
- 144p SD	256 x 144
- corridor mode	400 x 720
- D1 4:3 cropped	704 x 480

Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	IP, IBP, IBBP

Sensitivity (3200 K, scene reflectivity 89%, F1.2)

	Minimum illumination (30 IRE)
Color	0.25 lx (0.025 fc)
Monochrome	0.08 lx (0.008 fc)

Day/Night	Color, Monochrome, Auto
White Balance	ATW (2500 to 10000K), ATWhold and manual Indoor and Outdoor ATW

Shutter	Automatic Electronic Shutter (AES) Fixed (1/30 [1/25] to 1/150000) selectable Default shutter
Backlight compensation	Off/Auto/IntelligentAE
Wide dynamic range	On/off
Noise reduction	Intelligent Dynamic Noise Reduction (iDNR) with separate temporal and spatial adjustments
Contrast enhancement	On/off
Sharpness	Sharpness enhancement level selectable
Dynamic Range	90 dB typical
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Intelligent Video Analysis

Audio

Standard	AAC G.711, 8kHz sampling rate L16, 16kHz sampling rate
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex / half duplex

Input/output

Audio	1 x mono line in, 1 x mono line out
• signal line in	12 kOhm typical, 1 Vrms max
• signal line out	1 Vrms at 1.5 kOhm typical,
Alarm	2 inputs
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC max. Maximum 0.5 A continuous, 10VA

Local Storage

Memory card slot	Supports SDHC and SDXC microSD cards
Recording	Continuous recording, ring recording, alarm/events/schedule recording

Software Control

Unit Configuration	Via web browser or Configuration Manager
Software update	Flash ROM, remote programmable

EXHIBIT B**Network**

Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNMP, SNMP (V1, MIB-II), 802.1x, SMTP, iSCSI, UPnP (SSDP)
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3at compliant
Connectivity	ONVIF Profile S Auto-MDIX

Optical

Lens	Varifocal SR (Super Resolution)
Focus control	Automatic focus adjustment
Iris control	Automatic iris control
Viewing angle	
1.8 to 3 mm	Wide 98° x 67° (H x V) Tele 70° x 43° (H x V)
3.8 to 13 mm	Wide: 63° x 36° (H x V) Tele: 19° x 11.1° (H x V)
9 to 40 mm	Wide: 26° x 15° (H x V) Tele: 6.1° x 3.1° (H x V)

Mechanical

Dimensions (D x H)	208 x 151 mm (8.2 x 5.95 in)
Weight	2200 g (4.85 lb)
Color	RAL 9007 Metallic Titanium

Environmental

Operating Temperature	-50°C to +50°C (-58°F to 122°F)
Cold Start Temperature	-20°C (-4°F)
Storage Temperature	-30°C to +70°C (-22°F to +158°F)
Operating Humidity	20% to 100% RH
Storage Humidity	up to 100% RH
Vandal Resistance	IK10
Ingress Resistance	IP 66, NEMA-4X

Ordering information**HD Dome 1080p**

1/3-inch CMOS, IP Dome Camera, 1080p, HDR, IVA,
1.8 -- 3 mm lens
Order number **NDN-932V02-IP**

HD Dome 1080p

1/3-inch CMOS, IP Dome Camera, 1080p, HDR, IVA,
3.8 -- 13 mm lens
Order number **NDN-932V03-IP**

HD Dome 1080p

1/3-inch CMOS, IP Dome Camera, 1080p, HDR, IVA,
9 -- 40 mm lens
Order number **NDN-932V09-IP**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light gray finish
Order number **LTC 9213/01**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras,
1 m
Order number **S1460**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

VJT-XTCXF

VideoJet XTC XF, H.264 video transcoder
Order number **VJT-XTCXF**

Accessories**VDA-832FHD-WMT**

Wall mount bracket for HD FlexiDomes
Order number **VDA-832FHD-WMT**

VDA-832FHD-PMT

Pendant pipe mount bracket for HD FlexiDomes
Order number **VDA-832FHD-PMT**

EXHIBIT B

Represented by:

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EXHIBIT B

FLEXIDOME starlight HD 720p60 VR

www.boschsecurity.com



BOSCH

Invented for life



HD Onvif



- ▶ Excellent low-light performance (0.017 lx in color)
- ▶ Content-based scene analysis optimizes the image processing
- ▶ Intelligent noise reduction reduces bandwidth and storage requirements by up to 30%
- ▶ Aesthetic vandal-resistant enclosure, suitable for indoor or outdoor applications
- ▶ Easy to install with auto zoom/focus SR lens, wizard and pre-configured modes

The FLEXIDOME starlight HD 720p60 VR camera provides clear images 24/7 – even at night or under low-light conditions.

High sensitivity in color (0.017 lx) and monochrome mode (0.0057 lx) enables this camera to work with a minimum of ambient light. This exceptional light sensitivity combined with Content-Based Imaging Technology (C-BIT) ensures crisp, clear, and detailed images in all lighting conditions. The 720p HD can also provide up to 60 images per second.

The aesthetic vandal resistant housing makes the camera suitable for indoor or outdoor installation.

System overview

Compared to SD cameras, the FLEXIDOME HD 720p60 offers, at no higher cost, motorized autofocus, higher resolution, better sensitivity, higher frame rates, and improved picture quality, and is still more bandwidth-efficient. Video storage costs are significantly reduced.

Functions

Exceptional low-light performance

The latest sensor technology combined with the sophisticated noise suppression results in a sensitivity of 0.017 lx 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.

The camera is a true day/night camera with a mechanical filter for truly outstanding nighttime performance (0.0057 lx in monochrome). The filter can be switched remotely, or automatically via a light level sensor or contact input.

Content-based Imaging Technology

Content-Based Image Technology (C-BIT) is used to radically improve image quality in all lighting conditions and to identify areas for enhanced processing. The camera examines the scene using intelligent video analytics and provides feedback to re-tune the image processing. This provides better detail in the areas that matter and better all-round performance. In IVA versions, the intelligent Automatic Exposure (iAE) technology, for example, allows you to view moving objects in bright and dark areas of a scene.

Low bandwidth consumption

The intelligent Dynamic Noise Reduction (iDNR) actively analyzes the contents of the scene to reduce bandwidth and storage requirements. This removes noise artifacts so effectively that compression

EXHIBIT B

efficiency is very high (up to 30% improvement). This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio via temporal and spatial noise filtering.

Area-based encoding reduces unnecessary bandwidth. Compression parameters for up to eight user-definable regions can be set. This allows uninteresting regions to be highly compressed, thus lowering bandwidth consumption and storage requirements. Important regions can be tuned for best image quality, thus allowing the user to allocate bandwidth to important parts of the scene.

Fast performance

The 60 images-per-second mode provides for optimum performance in fast action scenes and is particularly suitable for casino and banking applications.

Flexible lens choice

The camera comes with a choice of AVF (Automatic Varifocal) lenses for easy installation. These SR (Super Resolution) lenses have an advanced iris design to ensure that the high resolution HD sensor produces the sharpest image possible, even in the corners.

Simple installation

The camera has a very intuitive user interface that allows fast and easy configuration. Six configurable user modes are provided with the best settings for a variety of applications:

- **Indoor** – general day-to-night changes without sun highlights and street lighting
- **Outdoor** – general day-to-night changes with sun highlights and street lighting
- **Motion** – monitoring traffic or fast moving objects; motion artifacts are minimized
- **Lowlight** – optimized for sufficient details at low light.
- **Intelligent AE** (BLC on non-IVA models) – for people moving in front of a bright background
- **Vibrant** – enhanced contrast, sharpness and saturation

The automatic zoom/focus lens wizard makes it easy for an installer to accurately zoom and focus the camera for both day and night operation. The wizard is activated from the PC or from the on-board camera push button making it easy to choose the workflow that suits best.

The AVF (Automatic Varifocal) feature means that the zoom can be changed without opening the camera. The automatic motorized zoom/focus adjustment with 1:1 pixel mapping ensures the camera is always accurately focused.

Streams

The innovative multi-streaming feature delivers various H.264 streams together with an M-JPEG stream. These streams facilitate bandwidth-efficient viewing and recording as well as integration with third-party video management systems.

An upright mode can be selected for the second stream. In this mode an image of 400 x 720 (9:16 aspect ratio) is cropped from the full sensor image. When the scene to be monitored is suitable to this mode, the bandwidth and storage requirements are reduced.

Storage management

A microSD card can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall recording reliability. Recording management can be controlled by the Bosch Video Recording Manager (VRM) or the camera can use iSCSI targets directly without any recording software.

Intelligent Video Analytics

IVA versions of the camera use the latest generation of the Bosch Intelligent Video Analysis (IVA) software. This IVA system is the guard-assistant system of choice when reliable indoor or outdoor video analytics is needed. The state-of-the-art system reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. The face detection feature detects faces in the scene and forwards a high quality JPEG image of the best shot of each face when the face disappears from the scene.

Retrospective forensic search capabilities are available remotely from the web browser or the Bosch Video Client.

Regions of interest

Two Regions of Interest (ROI) can be user defined. The remote electronic pan, tilt and zoom controls allow you to select specific areas of the parent image. These regions produce separate streams for remote viewing and recording. These streams, together with the main stream, allow the operator to separately monitor the most interesting part of a scene while still retaining situational awareness.

The IVA Intelligent tracker can also follow objects within the defined regions of interest. The Intelligent tracker can autonomously detect and track moving objects or the user can click on an object which the Intelligent tracker will then follow.

Aesthetic vandal resistant design

Ideal for indoor or outdoor use, the compact aesthetic design is suitable for installations where housing size and appearance are very important. The cast-aluminum housing, polycarbonate window, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force (IK10). The camera is protected against water and dust to IP 66 (NEMA Type 4X) standards. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner, and suspended-ceiling mounting.

EXHIBIT B**Access Security**

Password protection with three levels and 802.1x authentication is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. The video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

Surveillance software

There are many ways to access the camera's video and IVA-based features: using a web browser, with the Bosch Video Management System, with the Bosch Recording System, with the free-of-charge Bosch Video Client, or with the iPad App.

The Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. It also provides easy live viewing of multiple cameras, playback, forensic search and export.

Access to IVA metadata is available to integrators via RTSP.

Video security App

The Bosch Video Security iPad App has been developed to fully utilize our Dynamic Transcoding features and enable **Anywhere** access to HD surveillance images, even over low-bandwidth connections. The App, together with the Bosch transcoder, is configured to give you complete control of all your cameras, from panning and tilting to zoom and focus functions. It's like taking your control room with you.

Hybrid mode

An analog video output enables the camera to operate in hybrid mode. This mode provides simultaneous high resolution HD video streaming and an analog video output via a BNC connector. The hybrid functionality offers an easy migration path from legacy CCTV to a modern IP-based system.

Connections

The camera conforms to the ONVIF (Open Network Video Interface Forum) Profile S specification. This guarantees interoperability between network video products regardless of manufacturer. For trouble-free network cabling, the camera supports Auto-MDIX which allows the use of straight or cross-over cables. Camera power is supplied via PoE (Power-over-Ethernet) or via the 24 VAC/12 VDC connector. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Technology Partner Program (TPP) website (tpp.boschsecurity.com) for more information.

Certifications and approvals**HD Standards**

Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709

- Aspect ratio: 16:9
- Frame rate: 25/30 and 50/60 frames/s

Electro Magnetic Compatibility

Emission	EN 55022 Class B FCC Part 15 Class B
Immunity	EN 50130-4 (PoE, +12 VDC, 24 VAC)* EN 50121-4
Safety	EN 60950-1 UL 60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	Camera with lens as per IEC 60068-2-6 (5 m/s ² , operational)

* Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera. However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

Region	Certification
Europe	CE
USA	UL
	FCC

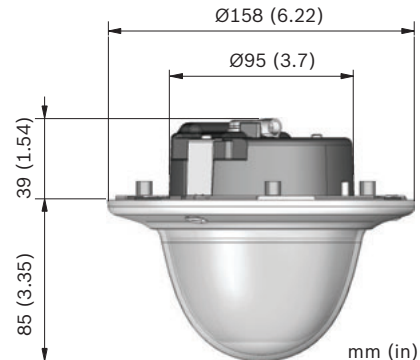
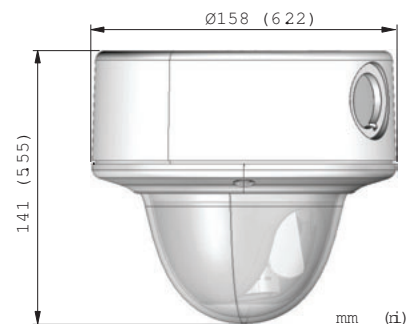
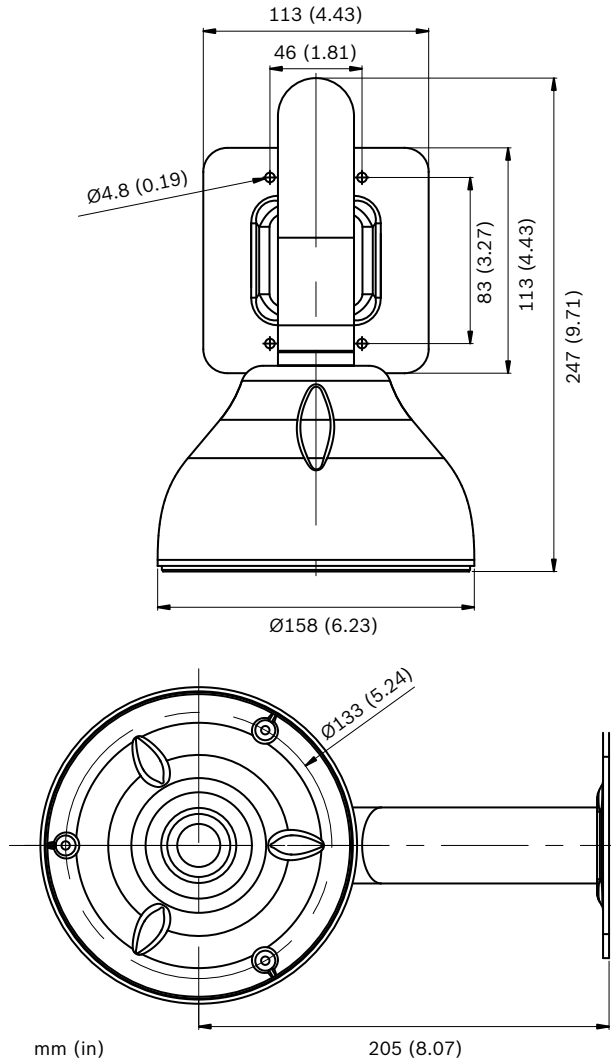
Installation/configuration notes**Dimensions flush mounting****Dimensions surface mounting**

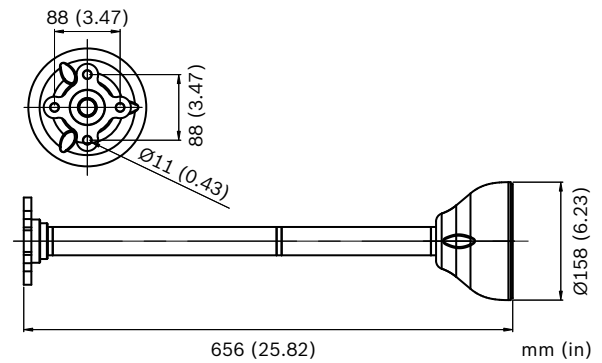
EXHIBIT B

Brackets (not included)

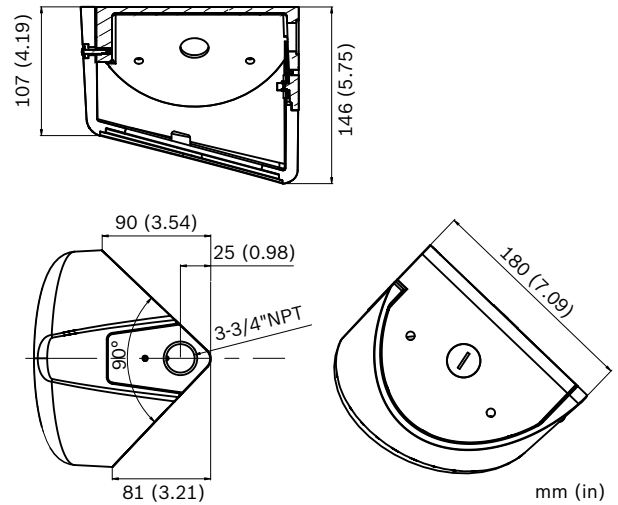
VDA-WMT-DOME –Pendant Wall Mount



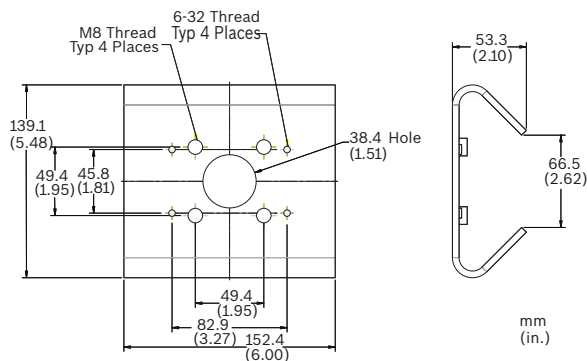
VDA-PMT-DOME –Pendant Pipe Mount



VDA-CMT-DOME –Corner Mount



LTC 9213/01 Pole Mount Adapter



Technical specifications

Electrical

Power Supply	24 VAC 50/60 Hz 12 VDC Power-over-Ethernet 48 VDC nominal
Current Consumption	500 mA 600 mA IVA (12 VDC) 450 mA 500 mA IVA (24 VAC) 150 mA 175 mA IVA (PoE 48 VDC)
Power Consumption	6 W 7.2 W IVA

Sensor

Type	1/3-inch CMOS HD
Active Pixels	1280 x 720

Video streams

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Multiple individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.
Overall IP Delay	Min. 120 ms, Max. 240 ms

EXHIBIT B

GOP structure	IP, IBP, IBBP
Encoding interval	1 to 60 (50) ips
Resolutions (H x V)	
• 720p HD	1280 x 720
• D1 4:3 (cropped)	704 x 480
• SD upright (cropped)	400 x 720
• 480p SD	Encoding: 704 x 480; Displayed: 854 x 480
• 432p SD	768 x 432
• 288p SD	512 x 288
• 240p SD	Encoding: 352 x 240; Displayed: 432 x 240
• 144p SD	256 x 144
Sensitivity (3200 K, scene reflectivity 89%, 30 IRE)	
Lens 3 - 9 mm (F1.2)	
• Color	0.017 lx (0.0017 fc)
• Monochrome	0.0057 lx (0.00057 fc)
Lens 10 - 23 mm (F1.6)	
• Color	0.03 lx (0.003 fc)
• Monochrome	0.01 lx (0.001 fc)
Day/Night	Color, Monochrome, Auto
White Balance	ATW (2500 to 10000K), ATW hold and manual Indoor and Outdoor ATW
Shutter	Automatic Electronic Shutter (AES) Fixed (1/30 [1/25] to 1/150000) selectable Default shutter
Backlight compensation (IVA)	Off/Auto/IntelligentAE (iAE)
Backlight compensation (non-IVA)	Off/Auto/BLC
Noise reduction	Intelligent Dynamic Noise Reduction (iDNR) with separate temporal and spatial adjustments
Contrast enhancement	On/off
Sharpness	Sharpness enhancement level selectable
Dynamic Range	84 dB typical
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Intelligent Video Analysis

Audio

Standard	AAC G.711, 8kHz sampling rate L16, 16kHz sampling rate
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex / half duplex

Input/output

Analog Video out	CVBS (PAL/NTSC), 1 Vpp, BNC, 75 Ohm
Analog Video out (service only)	CVBS (PAL/NTSC), 1 Vpp, 2.5 mm jack, 75 Ohm (non-protected)
Audio	1 x mono line in, 1 x mono line out
• signal line in	12 kOhm typical, 1 Vrms max
• signal line out	1 Vrms at 1.5 kOhm typical,
Alarm	2 inputs
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Maximum 0.5 A continuous, 10VA

Local Storage

Memory card slot	Supports SDHC and SDXC microSD cards
Recording	Continuous recording, ring recording, alarm/events/schedule recording

Software Control

Unit Configuration	Via web browser or Configuration Manager
Software update	Flash ROM, remote programmable

Network

Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNMP, SNMP (V1, MIB-II), 802.1x, SMTP, iSCSI, UPnP (SSDP)
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3at Type-2 compliant
Connectivity	ONVIF Profile S Auto-MDIX

EXHIBIT B**Optical**

Lens	3 to 9 mm Automatic Varifocal (AVF) SR lens - or - 10 to 23 mm Automatic Varifocal (AVF) SR lens
Adjustment	Motorized zoom/focus
Iris control	Automatic iris control
Viewing angle (3 to 9 mm)	Wide: 96° x 52° (H x V) Tele: 32° x 18° (H x V)
Viewing angle (10 to 23 mm)	Wide: 28° x 15° (H x V) Tele: 12.4° x 6.9° (H x V)

Mechanical

Dimensions (D x H)	158 x 124 mm (6.22 x 4.89 in)
Weight	0.85 kg (1.87 lb) 1.28 kg (2.82 lb) with SMB
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° twist
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Trim ring	Aluminum

Environmental

Operating temperature	-30 °C to +50 °C (-22 °F to +122 °F)
Cold start temperature	-20 °C (-4 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	EN 50102, IK10
Water/dust protection	IP 66 and NEMA Type 4X
Environmental Test Method	EN 50130-5:2011 Alarm systems Part 5 (Class IV Outdoor in general)

Ordering information**FLEXIDOME HD 720p60 VR 3-9 mm**

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 3-9 mm SR lens
Order number **NIN-733-V03P**

FLEXIDOME HD 720p60 VR 3-9 mm IVA

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 3-9 mm SR lens, IVA
Order number **NIN-733-V03IP**

FLEXIDOME HD 720p60 VR 3-9 mm SMB

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 3-9 mm SR lens, SMB
Order number **NIN-733-V03PS**

FLEXIDOME HD 720p60 VR 3-9 mm IVA SMB

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 3-9 mm SR lens, IVA, SMB
Order number **NIN-733-V03IPS**

FLEXIDOME HD 720p60 VR 10-23 mm

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 10-23 mm SR lens
Order number **NIN-733-V10P**

FLEXIDOME HD 720p60 VR 10-23 mm IVA

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 10-23 mm SR lens, IVA
Order number **NIN-733-V10IP**

FLEXIDOME HD 720p60 VR 10-23 mm SMB

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 10-23 mm SR lens, SMB
Order number **NIN-733-V10PS**

FLEXIDOME HD 720p60 VR 10-23 mm IVA SMB

1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 720p60, 10-23 mm SR lens, IVA, SMB
Order number **NIN-733-V10IPS**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light gray finish
Order number **LTC 9213/01**

VGA-IC-SP In-ceiling Support Kit for various Bosch dome cameras

Suspended ceiling support kit for various families of Bosch dome cameras
Order number **VGA-IC-SP**

UPA-2420-50 Power Supply

220 VAC, 50 Hz, 24 VAC, 20 VA Out
Order number **UPA-2420-50**

UPA-2430-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 30 VA Out
Order number **UPA-2430-60**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-50**

UPA-2450-60 Power Supply, 120 V, 60 Hz

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-60**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras, 1 m
Order number **S1460**

EXHIBIT B**VJT-XTCF**

VideoJet XTC XF, H.264 video transcoder
Order number **VJT-XTCF**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

Accessories**VDA-WMT-DOME Wall Pendant Mount Bracket**

Wall pendant mount bracket for FlexiDome cameras
Order number **VDA-WMT-DOME**

VDA-CMT-DOME Corner Mount Bracket

Corner mount bracket for FlexiDome cameras
Order number **VDA-CMT-DOME**

VDA-PMT-DOME Pendant Pipe Mount Bracket

Pendant pipe mount bracket for FlexiDome cameras
Order number **VDA-PMT-DOME**

VDA-PLEN-DOME In-ceiling Housing for Plenums Kit

FLEXIDOME in-ceiling housing installation kit (plenum-rated) for various FLEXIDOME cameras
Order number **VDA-PLEN-DOME**

VDA-455TBL Tinted bubble

Tinted bubble for FlexiDome series
Order number **VDA-455TBL**

VDA-455CBL Clear bubble

Clear Bubble for FlexiDome series
Order number **VDA-455CBL**

Surface Mount Box FLEXIDOME VR

Surface Mount Box for FLEXIDOME VR Cameras
Order number **VDA-455SMB-IP**

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EXHIBIT B FLEXIDOME HD 1080p VR

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HD Onvif



- ▶ Aesthetic vandal-resistant enclosure, suitable for indoor or outdoor applications
- ▶ Intelligent noise reduction reduces bandwidth and storage requirements by up to 30%
- ▶ Easy to install with auto zoom/focus SR lens, wizard and pre-configured modes
- ▶ Super Resolution lens choice

The FLEXIDOME HD 1080p VR Dome camera offers superior HD image quality in a aesthetic, vandal resistant housing that is suitable for indoor or outdoor installation. This true day/night camera provides high resolution video, tuned for 24x7 applications.

System overview

Compared to SD cameras, the FLEXIDOME HD 1080p VR offers, at no higher cost, motorized autofocus, higher resolution, better sensitivity, higher frame rates, and improved picture quality, and is still more bandwidth-efficient. Video storage costs are significantly reduced.

Functions

Outstanding image quality

With a 1/2.7-inch CMOS HD sensor, the FLEXIDOME HD 1080p VR camera delivers outstanding image quality. Image performance and color reproduction are superb even under challenging lighting conditions. This true day/night can automatically switch from color to monochrome mode by sensing the illumination level or manually via the alarm input or a web browser.

Content-based Imaging Technology

Content-Based Image Technology (C-BIT) is used to radically improve image quality in all lighting conditions and to identify areas for enhanced processing. The camera examines the scene using intelligent video analytics and provides feedback to re-tune the image processing. This provides better detail in the areas that matter and better all-round performance.

Low bandwidth consumption

The intelligent Dynamic Noise Reduction (iDNR) actively analyzes the contents of the scene to reduce bandwidth and storage requirements. This removes noise artifacts so effectively that compression efficiency is very high (up to 30% improvement). This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio via temporal and spatial noise filtering. Area-based encoding reduces unnecessary bandwidth. Compression parameters for up to eight user-definable regions can be set. This allows uninteresting regions to be highly compressed, thus lowering bandwidth consumption and storage requirements. Important

EXHIBIT B

regions can be tuned for best image quality, thus allowing the user to allocate bandwidth to important parts of the scene.

Flexible lens choice

The camera comes with a choice of AVF (Automatic Varifocal) lenses for easy installation. These SR (Super Resolution) lenses have an advanced iris design to ensure that the high resolution HD sensor produces the sharpest image possible, even in the corners.

Simple installation

The camera has a very intuitive user interface that allows fast and easy configuration. Six configurable user modes are provided with the best settings for a variety of applications:

- **Indoor** – general day-to-night changes without sun highlights and street lighting
- **Outdoor** – general day-to-night changes with sun highlights and street lighting
- **Motion** – monitoring traffic or fast moving objects; motion artifacts are minimized
- **Lowlight** – optimized for sufficient details at low light.
- **Intelligent AE** (BLC on non-IVA models) – for people moving in front of a bright background
- **Vibrant** – enhanced contrast, sharpness and saturation

The automatic zoom/focus lens wizard makes it easy for an installer to accurately zoom and focus the camera for both day and night operation. The wizard is activated from the PC or from the on-board camera push button making it easy to choose the workflow that suits best.

The AVF (Automatic Varifocal) feature means that the zoom can be changed without opening the camera. The automatic motorized zoom/focus adjustment with 1:1 pixel mapping ensures the camera is always accurately focused.

Streams

The innovative multi-streaming feature delivers various H.264 streams together with an M-JPEG stream. These streams facilitate bandwidth-efficient viewing and recording as well as integration with third-party video management systems.

An upright mode can be selected for the second stream. In this mode an image of 400 x 720 (9:16 aspect ratio) is cropped from the full sensor image. When the scene to be monitored is suitable to this mode, the bandwidth and storage requirements are reduced.

Storage management

A microSD card can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall recording reliability. Recording management can be controlled by the Bosch Video Recording Manager (VRM) or the camera can use iSCSI targets directly without any recording software.

Intelligent Video Analytics

IVA versions of the camera use the latest generation of the Bosch Intelligent Video Analysis (IVA) software. This IVA system is the guard-assistant system of choice when reliable indoor or outdoor video analytics is needed. The state-of-the-art system reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. The face detection feature detects faces in the scene and forwards a high quality JPEG image of the best shot of each face when the face disappears from the scene.

Retrospective forensic search capabilities are available remotely from the web browser or the Bosch Video Client.

Regions of interest

Two Regions of Interest (ROI) can be user defined. The remote electronic pan, tilt and zoom controls allow you to select specific areas of the parent image. These regions produce separate streams for remote viewing and recording. These streams, together with the main stream, allow the operator to separately monitor the most interesting part of a scene while still retaining situational awareness.

The IVA Intelligent tracker can also follow objects within the defined regions of interest. The Intelligent tracker can autonomously detect and track moving objects or the user can click on an object which the Intelligent tracker will then follow.

Aesthetic vandal resistant design

Ideal for indoor or outdoor use, the compact aesthetic design is suitable for installations where housing size and appearance are very important. The cast-aluminum housing, polycarbonate window, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force (IK10). The camera is protected against water and dust to IP 66 (NEMA Type 4X) standards. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner, and suspended-ceiling mounting.

Access Security

Password protection with three levels and 802.1x authentication is supported. To secure Web browser access, use HTTPS with a SSL certificate stored in the camera. The video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional encryption site license.

Surveillance software

There are many ways to access the camera's video and IVA-based features: using a web browser, with the Bosch Video Management System, with the Bosch Recording System, with the free-of-charge Bosch Video Client, or with the iPad App.

EXHIBIT B

The Bosch Video Client PC surveillance software offers a user-friendly interface to support easy installation and configuration. It also provides easy live viewing of multiple cameras, playback, forensic search and export.

Access to IVA metadata is available to integrators via RTSP.

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The Bosch Video Security iPad App has been developed to fully utilize our Dynamic Transcoding features and enable **Anywhere** access to HD surveillance images, even over low-bandwidth connections. The App, together with the Bosch transcoder, is configured to give you complete control of all your cameras, from panning and tilting to zoom and focus functions. It's like taking your control room with you.

Hybrid mode

An analog video output enables the camera to operate in hybrid mode. This mode provides simultaneous high resolution HD video streaming and an analog video output via a BNC connector. The hybrid functionality offers an easy migration path from legacy CCTV to a modern IP-based system.

Connections

The camera conforms to the ONVIF (Open Network Video Interface Forum) Profile S specification. This guarantees interoperability between network video products regardless of manufacturer. For trouble-free network cabling, the camera supports Auto-MDIX which allows the use of straight or cross-over cables. Camera power is supplied via PoE (Power-over-Ethernet) or via the 24 VAC/12 VDC connector. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Technology Partner Program (TPP) website (tpp.boschsecurity.com) for more information.

Some typical applications

- General surveillance
- Supermarkets and retail outlets
- Hotels, bars and nightclubs
- Commercial and government buildings

Certifications and approvals

HD Standards

Complies with the SMPTE 274M-2008 Standard in:

- Resolution: 1920x1080
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Electro Magnetic Compatibility

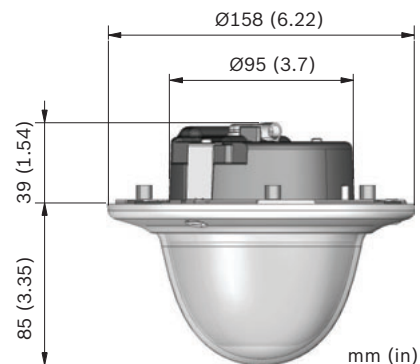
Emission	EN 55022 Class B FCC Part 15 Class B
Immunity	EN 50130-4 (PoE, +12 VDC, 24 VAC)* EN 50121-4
Safety	EN 60950-1 UL 60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	Camera with lens as per IEC 60068-2-6 (5 m/s ² , operational)

* Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera. However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

Region	Certification
Europe	CE
USA	UL
	FCC

Installation/configuration notes

Dimensions flush mounting



Dimensions surface mounting

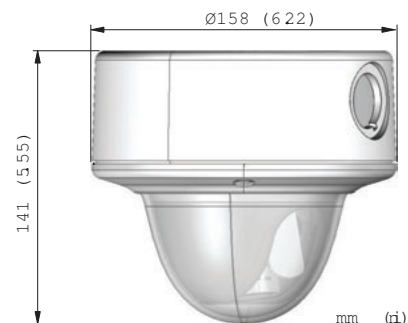
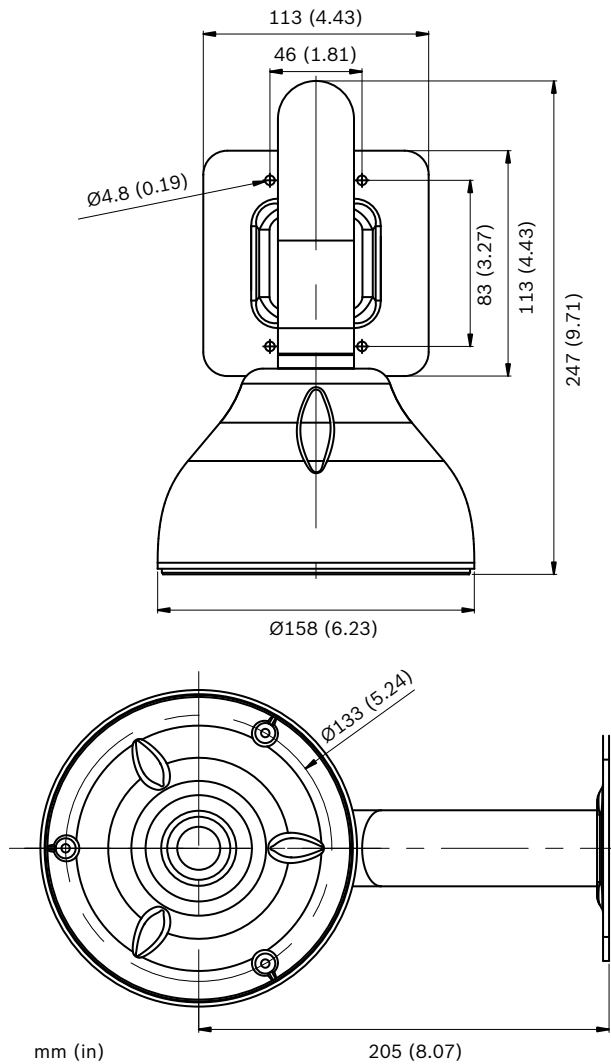
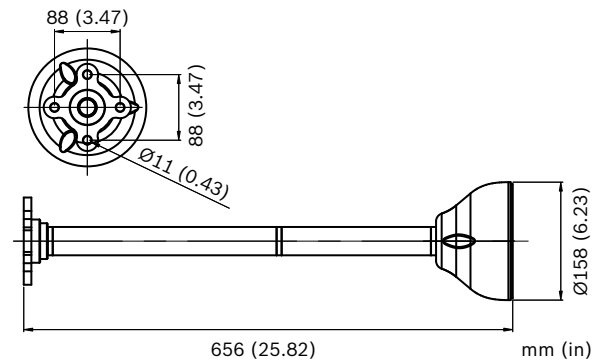


EXHIBIT B

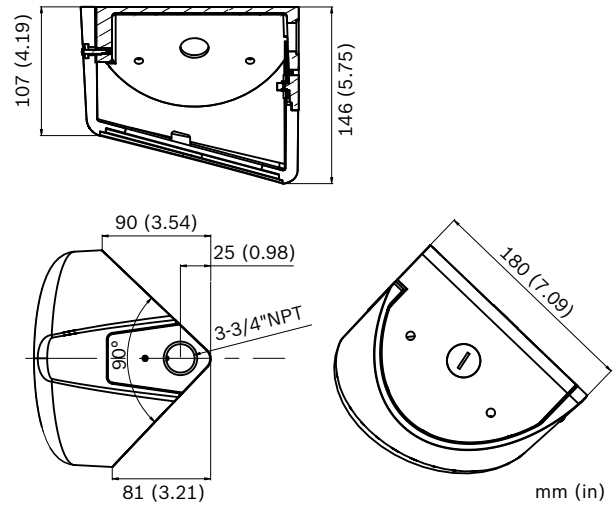
VDA-WMT-DOME -Pendant Wall Mount



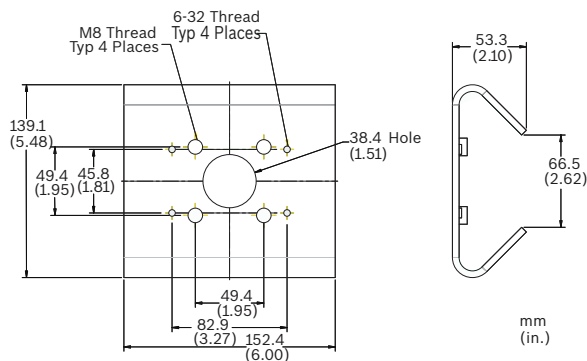
VDA-PMT-DOME -Pendant Pipe Mount



VDA-CMT-DOME -Corner Mount



LTC 9213/01 Pole Mount Adapter



Technical specifications

Electrical

Power Supply	24 VAC 50/60 Hz 12 VDC Power-over-Ethernet 48 VDC nominal
Current Consumption	500 mA 600 mA IVA (12 VDC) 450 mA 500 mA IVA (24 VAC) 150 mA 175 mA IVA (PoE 48 VDC)
Power Consumption	6 W 7.2 W IVA
Sensor	
Type	1/2.7-inch CMOS
Active Pixels	1920 x 1080
Video streams	
Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Multiple individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.
Overall IP Delay	Min. 120 ms, Max. 240 ms

EXHIBIT B

GOP structure	IP, IBP, IBBP
Encoding interval	1 to 30 (25) ips
Resolutions (H x V)	
• 1080p HD	1920 x 1080
• 960p HD 4:3 (cropped)	1280 x 960
• 720p HD	1280 x 720
• D1 4:3 (cropped)	704 x 480
• SD upright (cropped)	400 x 720
• 480p SD	Encoding: 704 x 480; Displayed: 854 x 480
• 432p SD	768 x 432
• 288p SD	512 x 288
• 240p SD	Encoding: 352 x 240; Displayed: 432 x 240
• 144p SD	256 x 144
Sensitivity (3200 K, scene reflectivity 89%, 30 IRE)	
Lens 3 - 9 mm (F1.2)	
• Color	0.22 lx (0.022 fc)
• Monochrome	0.05 lx (0.005 fc)
Lens 10 - 23 mm (F1.6)	
• Color	0.4 lx (0.04 fc)
• Monochrome	0.1 lx (0.01 fc)
Day/Night	Color, Mono, Auto
White Balance	ATW (2500 to 10000K), ATW hold and manual Indoor and Outdoor ATW
Shutter	Automatic Electronic Shutter (AES) Fixed (1/30 [1/25] to 1/150000) selectable Default shutter
Backlight compensation	Off, Auto
Contrast enhancement	On/off
Sharpness	Sharpness enhancement level selectable
Dynamic Range	Digital WDR: 76 dB
Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Motion+ or IVA versions
Audio	
Standard	AAC

	G.711, 8kHz sampling rate L16, 16kHz sampling rate
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex / half duplex

Input/output

Analog Video out	CVBS (PAL/NTSC), 1 Vpp, BNC, 75 Ohm
Analog Video out (service only)	CVBS (PAL/NTSC), 1 Vpp, 2.5 mm jack, 75 Ohm (non-protected)
Audio	1 x mono line in, 1 x mono line out
• signal line in	12 kOhm typical, 1 Vrms max
• signal line out	1 Vrms at 1.5 kOhm typical,
Alarm	2 inputs
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Max. Maximum 0.5 A continuous, 10VA

Local Storage

Memory card slot	Supports SDHC and SDXC microSD cards
Recording	Continuous recording, ring recording, alarm/events/schedule recording

Software Control

Unit Configuration	Via web browser or Configuration Manager
Software update	Flash ROM, remote programmable

Network

Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNTP, SNMP (V1, MIB-II), 802.1x, SMTP, iSCSI, UPnP (SSDP)
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3at Type-2 compliant
Connectivity	ONVIF Profile S Auto-MDIX

Optical

Lens	3 to 9 mm Automatic Varifocal (AVF) SR lens - or - 10 to 23 mm Automatic Varifocal (AVF) SR lens
Adjustment	Motorized zoom/focus
Iris control	Automatic iris control

EXHIBIT B

Viewing angle (3 to 9 mm)	Wide: 121° x 62° (H x V) Tele: 38° x 21° (H x V)
Viewing angle (10 to 23 mm)	Wide: 34° x 18° (H x V) Tele: 14.8° x 8.3° (H x V)

Mechanical

Dimensions (D x H)	158 x 124 mm (6.22 x 4.89 in)
Weight	0.84 kg (1.85 lb) 1.27 kg (2.8 lb) with SMB
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° twist
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Trim ring	Aluminum

Environmental

Operating temperature	-30 °C to +50 °C (-22 °F to +122 °F)
Cold start temperature	-20 °C (-4 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	EN 50102, IK10
Water/dust protection	IP 66 and NEMA Type 4X
Environmental Test Method	EN 50130-5:2011 Alarm systems Part 5 (Class IV Outdoor in general)

Ordering information**FLEXIDOME HD 1080p VR 3-9 mm**

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 3-9 mm lens
Order number **NIN-832-V03P**

FLEXIDOME HD 1080p VR 3-9 mm IVA

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 3-9 mm lens, IVA
Order number **NIN-832-V03IP**

FLEXIDOME HD 1080p VR 3-9 mm SMB

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 3-9 mm lens, SMB
Order number **NIN-832-V03PS**

FLEXIDOME HD 1080p VR 3-9 mm IVA SMB

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 3-9 mm lens, IVA, SMB
Order number **NIN-832-V03IPS**

FLEXIDOME HD 1080p VR 10-23 mm

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 10-23 mm lens
Order number **NIN-832-V10P**

FLEXIDOME HD 1080p VR 10-23 mm IVA

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 10-23 mm lens, IVA
Order number **NIN-832-V10IP**

FLEXIDOME HD 1080p VR 10-23 mm SMB

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FLEXIDOME HD 1080p VR 10-23 mm IVA SMB

1/2.7-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 10-23 mm lens, IVA, SMB
Order number **NIN-832-V10IPS**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light gray finish
Order number **LTC 9213/01**

VGA-IC-SP In-ceiling Support Kit for various Bosch dome cameras

Suspended ceiling support kit for various families of Bosch dome cameras
Order number **VGA-IC-SP**

UPA-2420-50 Power Supply

220 VAC, 50 Hz, 24 VAC, 20 VA Out
Order number **UPA-2420-50**

UPA-2430-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 30 VA Out
Order number **UPA-2430-60**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-50**

UPA-2450-60 Power Supply, 120 V, 60 Hz

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out
Order number **UPA-2450-60**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras, 1 m
Order number **S1460**

VJT-XTCXF

VideoJet XTC XF, H.264 video transcoder
Order number **VJT-XTCXF**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

EXHIBIT B**Accessories****VDA-WMT-DOME Wall Pendant Mount Bracket**

Wall pendant mount bracket for FlexiDome cameras
Order number **VDA-WMT-DOME**

VDA-CMT-DOME Corner Mount Bracket

Corner mount bracket for FlexiDome cameras
Order number **VDA-CMT-DOME**

VDA-PMT-DOME Pendant Pipe Mount Bracket

Pendant pipe mount bracket for FlexiDome cameras
Order number **VDA-PMT-DOME**

VDA-PLEN-DOME In-ceiling Housing for Plenums Kit

FLEXIDOME in-ceiling housing installation kit (plenum-rated) for various FLEXIDOME cameras
Order number **VDA-PLEN-DOME**

VDA-455TBL Tinted bubble

Tinted bubble for FlexiDome series
Order number **VDA-455TBL**

VDA-455CBL Clear bubble

Clear Bubble for FlexiDome series
Order number **VDA-455CBL**

Surface Mount Box FLEXIDOME VR

Surface Mount Box for FLEXIDOME VR Cameras
Order number **VDA-455SMB-IP**

Represented by:**Americas:**

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Fax: +1 585 223 9180
security.sales@us.bosch.com
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Campinas, Sao Paulo, Brazil
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Fax: +55 19 2103 2862
al.securitysystems@bosch.com
www.boschsecurity.com

EXHIBIT B

FLEXIDOME HD 1080p HDR VR

www.boschsecurity.com



BOSCH

Invented for life



HD ONVIF



- ▶ High Dynamic Range to see details in bright and dark areas simultaneously
- ▶ Content-based scene analysis optimizes the image processing
- ▶ Intelligent noise reduction reduces bandwidth and storage requirements by up to 30%
- ▶ Aesthetic vandal-resistant enclosure, suitable for indoor or outdoor applications
- ▶ Easy to install with auto zoom/focus SR lens, wizard and pre-configured modes

The high dynamic range FLEXIDOME HD 1080p VR dome camera combines intelligence with adaptive video processing to bring you high performance content-based imaging in any security or surveillance scenario, day or night.

The aesthetic vandal resistant housing makes the camera suitable for indoor or outdoor installation.

Functions

High Dynamic Range

The High Dynamic Range (HDR) of the camera means that you can view details in the bright and the dark areas of a scene at the same time. HDR is based on a dual exposure process that captures more details in highlights and shadows even under challenging lighting conditions. The result is that you can distinguish objects and features easily.

Content-based Imaging Technology

Content-Based Image Technology (C-BIT) is used to radically improve image quality in all lighting conditions and to identify areas for enhanced processing. The camera examines the scene using intelligent video analytics and provides feedback to re-tune the image processing. This provides better detail in the areas that matter and better all-round

performance. The intelligent Automatic Exposure (iAE) technology, for example, allows you to view moving objects in bright and dark areas of a scene.

Low bandwidth consumption

The intelligent Dynamic Noise Reduction (iDNR) actively analyzes the contents of the scene to reduce bandwidth and storage requirements. This removes noise artifacts so effectively that compression efficiency is very high (up to 30% improvement). This results in reduced-bandwidth streams that still retain a high image quality and smooth motion. The camera provides the most usable image possible by cleverly optimizing the detail-to-bandwidth ratio via temporal and spatial noise filtering.

Area-based encoding reduces unnecessary bandwidth. Compression parameters for up to eight user-definable regions can be set. This allows uninteresting regions to be highly compressed, thus lowering bandwidth consumption and storage requirements. Important regions can be tuned for best image quality, thus allowing the user to allocate bandwidth to important parts of the scene.

EXHIBIT B

Flexible lens choice

The camera comes with a choice of AVF (Automatic Varifocal) lenses for easy installation. These SR (Super Resolution) lenses have an advanced iris design to ensure that the high resolution HD sensor produces the sharpest image possible, even in the corners.

Simple installation

The camera has a very intuitive user interface that allows fast and easy configuration. Six configurable user modes are provided with the best settings for a variety of applications:

- **Indoor** – general day-to-night changes without sun highlights and street lighting
- **Outdoor** – general day-to-night changes with sun highlights and street lighting
- **Motion** – monitoring traffic or fast moving objects; motion artifacts are minimized
- **Lowlight** – optimized for sufficient details at low light.
- **Intelligent AE** – for people moving in front of a bright background
- **Vibrant** – enhanced contrast, sharpness and saturation

The automatic zoom/focus lens wizard makes it easy for an installer to accurately zoom and focus the camera for both day and night operation. The wizard is activated from the PC or from the on-board camera push button making it easy to choose the workflow that suits best.

The AVF (Automatic Varifocal) feature means that the zoom can be changed without opening the camera. The automatic motorized zoom/focus adjustment with 1:1 pixel mapping ensures the camera is always accurately focused.

Streams

The innovative multi-streaming feature delivers various H.264 streams together with an M-JPEG stream. These streams facilitate bandwidth-efficient viewing and recording as well as integration with third-party video management systems.

An upright mode can be selected for the second stream. In this mode an image of 400 x 720 (9:16 aspect ratio) is cropped from the full sensor image. When the scene to be monitored is suitable to this mode, the bandwidth and storage requirements are reduced.

Storage management

A microSD card can be used for local alarm recording or for Automatic Network Replenishment (ANR) to improve the overall recording reliability. Recording management can be controlled by the Bosch Video Recording Manager (VRM) or the camera can use iSCSI targets directly without any recording software.

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Some typical applications

- Tunnels – viewing details in bright and dark areas
- Entrances and exits – identification with strong backlight
- Traffic – capturing moving vehicles at night

Certifications and approvals

HD Standards

Complies with the SMPTE 274M-2008 Standard in:

- Resolution: 1920x1080
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

Complies with the 296M-2001 Standard in:

- Resolution: 1280x720
- Scan: Progressive
- Color representation: complies with ITU-R BT.709
- Aspect ratio: 16:9
- Frame rate: 25 and 30 frames/s

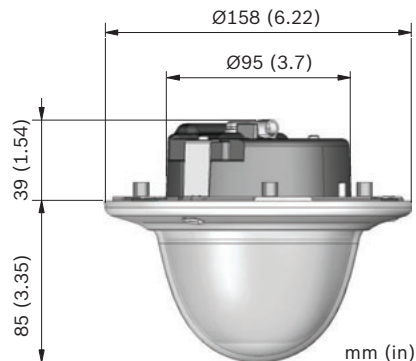
Immunity	EN 50130-4 (PoE, +12 VDC, 24 VAC)* EN 50121-4
Safety	EN 60950-1 UL 60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	Camera with lens as per IEC 60068-2-6 (5 m/s ² , operational)

* Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera. However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

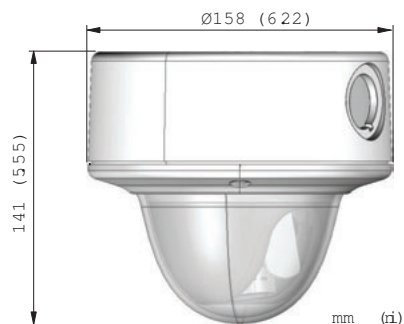
Region	Certification
Europe	CE
USA	UL
	FCC

Installation/configuration notes

Dimensions flush mounting



Dimensions surface mounting

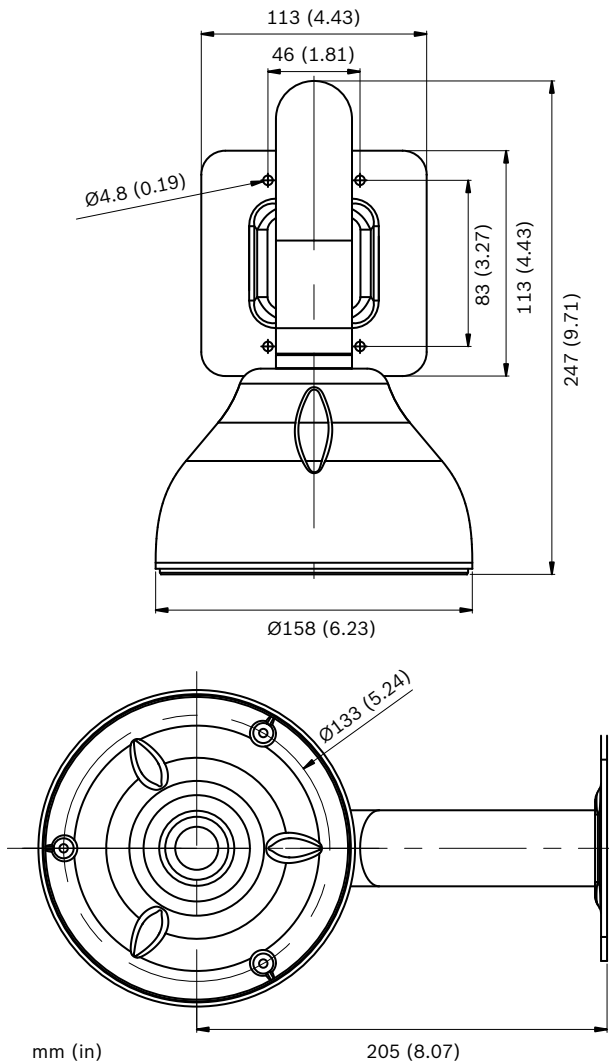


Electro Magnetic Compatibility

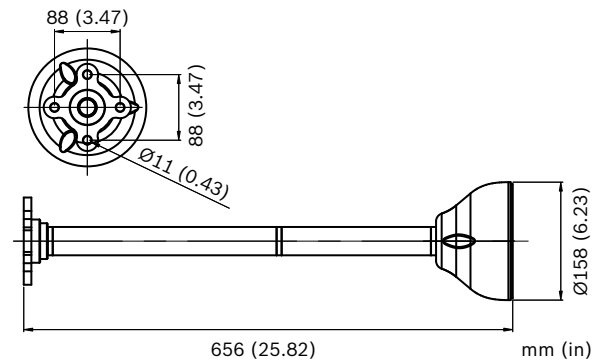
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EXHIBIT B

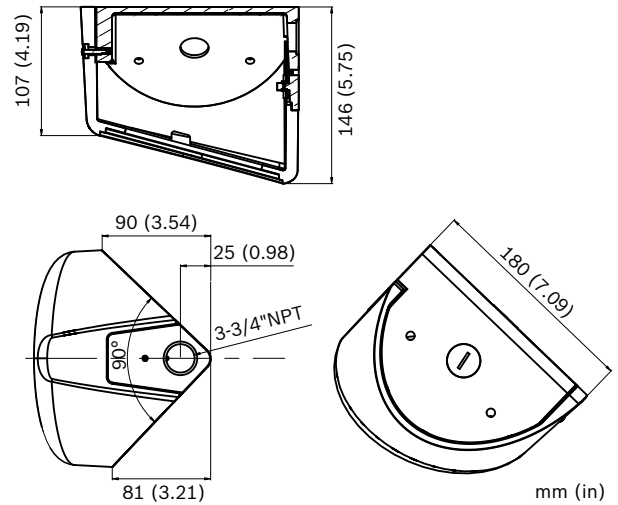
VDA-WMT-DOME -Pendant Wall Mount



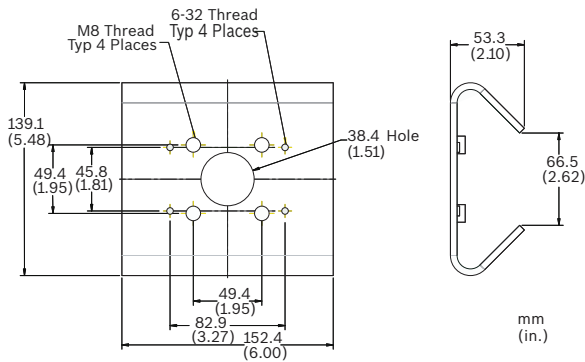
VDA-PMT-DOME -Pendant Pipe Mount



VDA-CMT-DOME -Corner Mount



LTC 9213/01 Pole Mount Adapter



Technical specifications

Electrical

Power Supply	24 VAC 50/60 Hz 12 VDC Power-over-Ethernet 48 VDC nominal
Current Consumption	600 mA (12 VDC) 500 mA (24 VAC) 175 mA (PoE 48 VDC)
Power Consumption	7.2 W
Sensor	
Type	1/3-inch CMOS HD
Active Pixels	1920 x 1080
Video streams	
Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Streaming	Multiple individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.
Overall IP Delay	Min. 120 ms, Max. 240 ms

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• 1080p HD	1920 x 1080
• 960p HD 4:3 (cropped)	1280 x 960
• 720p HD	1280 x 720
• D1 4:3 (cropped)	704 x 480
• SD upright (cropped)	400 x 720
• 480p SD	Encoding: 704 x 480; Displayed: 854 x 480
• 432p SD	768 x 432
• 288p SD	512 x 288
• 240p SD	Encoding: 352 x 240; Displayed: 432 x 240
• 144p SD	256 x 144
Sensitivity (3200 K, scene reflectivity 89%, 30 IRE)	
Lens 3 - 9 mm (F1.2)	
• Color	0.25 lx (0.025 fc)
• Monochrome	0.08 lx (0.008 fc)
Lens 10 - 23 mm (F1.6)	
• Color	0.45 lx (0.045 fc)
• Monochrome	0.15 lx (0.015 fc)
Day/Night	Color, Mono, Auto
White Balance	ATW (2500 to 10000K), ATW hold and manual Indoor and Outdoor ATW
Shutter	Automatic Electronic Shutter (AES) Fixed (1/30 [1/25] to 1/150000) selectable Default shutter
Backlight compensation	Off/Auto/IntelligentAE
Wide dynamic range	On/off
Noise reduction	Intelligent Dynamic Noise Reduction (iDNR) with separate temporal and spatial adjustments
Contrast enhancement	On/off
Sharpness	Sharpness enhancement level selectable
Dynamic Range	90 dB typical

Privacy Masking	Four independent areas, fully programmable
Video Motion Analysis	Intelligent Video Analysis
Audio	
Standard	AAC G.711, 8kHz sampling rate L16, 16kHz sampling rate
Signal-to-noise ratio	> 50 dB
Audio Streaming	Full duplex / half duplex
Input/output	
Analog Video out	CVBS (PAL/NTSC), 1 Vpp, BNC, 75 Ohm
Analog Video out (service only)	CVBS (PAL/NTSC), 1 Vpp, 2.5 mm jack, 75 Ohm (non-protected)
Audio	1 x mono line in, 1 x mono line out
• signal line in	12 kOhm typical, 1 Vrms max
• signal line out	1 Vrms at 1.5 kOhm typical,
Alarm	2 inputs
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Max. Maximum 0.5 A continuous, 10VA
Local Storage	
Memory card slot	Supports SDHC and SDXC microSD cards
Recording	Continuous recording, ring recording, alarm/events/schedule recording
Software Control	
Unit Configuration	Via web browser or Configuration Manager
Software update	Flash ROM, remote programmable
Network	
Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNTP, SNMP (V1, MIB-II), 802.1x, SMTP, iSCSI, UPnP (SSDP)
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE supply	IEEE 802.3at Type-2 compliant
Connectivity	ONVIF Profile S Auto-MDIX

EXHIBIT B**Optical**

Lens	3 to 9 mm Automatic Varifocal (AVF) SR lens - or - 10 to 23 mm Automatic Varifocal (AVF) SR lens
Adjustment	Motorized zoom/focus
Iris control	Automatic iris control
Viewing angle (3 to 9 mm)	Wide: 83° x 45° (H x V) Tele: 28° x 15° (H x V)
Viewing angle (10 to 23 mm)	Wide: 24° x 13° (H x V) Tele: 10.9° x 6° (H x V)

Mechanical

Dimensions (D x H)	158 x 124 mm (6.22 x 4.89 in)
Weight	0.85 kg (1.87 lb) 1.28 kg (2.82 lb) with SMB
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° twist
Dome bubble	Polycarbonate, clear with UV blocking anti-scratch coating
Trim ring	Aluminum

Environmental

Operating temperature	-30 °C to +50 °C (-22 °F to +122 °F)
Cold start temperature	-20 °C (-4 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	EN 50102, IK 10
Water/dust protection	IP 66 and NEMA Type 4X
Environmental Test Method	EN50130-5:2011 Alarm systems Part 5 (Class IV Outdoor in general)

Ordering information**FLEXIDOME HD 1080p HDR VR 3-9 mm IVA**

High Dynamic Range, 1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 3-9 mm SR lens, IVA

Order number **NIN-932-V03IP**

FLEXIDOME HD 1080p HDR VR 3-9 mm IVA SMB

High Dynamic Range, 1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 3-9 mm SR lens, IVA, SMB

Order number **NIN-932-V03IPS**

FLEXIDOME HD 1080p HDR VR 10-23 mm IVA

High Dynamic Range, 1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 10-23 mm SR lens, IVA

Order number **NIN-932-V10IP**

FLEXIDOME HD 1080p HDR VR 10-23 mm IVA SMB

High Dynamic Range, 1/3-inch CMOS, IP Vandal-Resistant Dome Camera, 1080p30, 10-23 mm SR lens, IVA, SMB

Order number **NIN-932-V10IPS**

LTC 9213/01 Pole Mount Adapter

Pole mount adapter with stainless steel straps, light gray finish

Order number **LTC 9213/01**

VGA-IC-SP In-ceiling Support Kit for various Bosch dome cameras

Suspended ceiling support kit for various families of Bosch dome cameras

Order number **VGA-IC-SP**

UPA-2420-50 Power Supply

220 VAC, 50 Hz, 24 VAC, 20 VA Out

Order number **UPA-2420-50**

UPA-2430-60 Power Supply

120 VAC, 60 Hz, 24 VAC, 30 VA Out

Order number **UPA-2430-60**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out

Order number **UPA-2450-50**

UPA-2450-60 Power Supply, 120 V, 60 Hz

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out

Order number **UPA-2450-60**

S1460 Service/Monitor Cable

2.5 mm connector to BNC for analog and IP cameras, 1 m

Order number **S1460**

VJT-XTCXF

VideoJet XTC XF, H.264 video transcoder

Order number **VJT-XTCXF**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.

Order number **MVS-FENC-AES**

Accessories**VDA-WMT-DOME Wall Pendant Mount Bracket**

Wall pendant mount bracket for FlexiDome cameras

Order number **VDA-WMT-DOME**

VDA-CMT-DOME Corner Mount Bracket

Corner mount bracket for FlexiDome cameras

Order number **VDA-CMT-DOME**

EXHIBIT B

VDA-PMT-DOME Pendant Pipe Mount Bracket

Pendant pipe mount bracket for FlexiDome cameras
Order number **VDA-PMT-DOME**

VDA-PLEN-DOME In-ceiling Housing for Plenums Kit

FLEXIDOME in-ceiling housing installation kit (plenum-rated) for various FLEXIDOME cameras
Order number **VDA-PLEN-DOME**

VDA-455TBL Tinted bubble

Tinted bubble for FlexiDome series
Order number **VDA-455TBL**

VDA-455CBL Clear bubble

Clear Bubble for FlexiDome series
Order number **VDA-455CBL**

Surface Mount Box FLEXIDOME VR

Surface Mount Box for FLEXIDOME VR Cameras
Order number **VDA-455SMB-IP**

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EXHIBIT B

AutoDome 800 Series HD PTZ Camera

www.boschsecurity.com



BOSCH

Invented for life



- ▶ HD 1080p resolution at 30 images per second (ips)
- ▶ Intelligent Tracking automatically detects and tracks an object in motion
- ▶ 240x zoom (20x optical, 12x digital)
- ▶ Quad video streaming generates simultaneous H.264, M-JPEG, and JPEG video streams
- ▶ ONVIF conformant; provides interoperability with other conformant systems

The AutoDome 800 Series is an easy to install, indoor/outdoor PTZ camera with superb HDTV 1080p30 quality video. This discrete, high-speed dome camera features day/night functionality for quality images in low light conditions.

The AutoDome 800 Series provides direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality. The AutoDome 800 Series provides complete network-based control of all dome functionality including pan/tilt/zoom operation, presets, tours and alarms as well as web-based configuration of all dome settings.

The AutoDome 800 Series conforms to the ONVIF (Open Network Video Interface Forum) specification guaranteeing interoperability between network video products regardless of manufacturer.

The AutoDome 800 Series maximizes your security investment by integrating with Bosch video products including the Bosch Video Client, Bosch Video Management System, and the Bosch Recording Station, as well as the full range of Bosch video over IP products.

AutoDome 800 Series highlights

The AutoDome 800 Series delivers state-of-the-art technology and features that far exceed other PTZ cameras. The camera streams high-definition video with 20x optical zoom in a field-proven outdoor housing.

High Definition Resolution

720p resolution at 60 images per second provides smooth, detailed video of fast moving objects. 1080p resolution at 30 images per second delivers six times the detail level of standard definition cameras, ensuring crisp video even when zooming in digitally to extend the camera's range. In addition, the 16:9 aspect ratio increases situational awareness by maximizing the field of view without compromising image clarity.

Intelligent Tracking

The AutoDome utilizes the built-in Intelligent Video Analytics (IVA) to continuously follow an individual or an object. The AutoDome uses objects detected by IVA in a stationary position to activate the Intelligent Tracking feature. Intelligent Tracking controls the pan/tilt/zoom actions of the camera to keep the selected object in the scene.

EXHIBIT B

The Intelligent Tracking feature shows its real intelligence when an actively tracked object is lost. Other cameras simply give up when a tracked object stops moving or is momentarily concealed by a stationary object. Intelligent Tracking uses an advanced algorithm that continuously scans the scene for a lost object and resumes tracking when the object reappears or if the camera detects motion along the same trajectory.

Wide Dynamic Range

The AutoDome features Wide Dynamic Range (WDR) technology that allows for the capture of clear images from both bright and dark areas in the same frame. WDR ensures that bright areas are not saturated and that dark areas are not too dark.

System Overview

High-performance 240x PTZ day/night camera

The AutoDome 800 Series camera has a 1/2.8-in.-type CMOS sensor, with 1080p resolution and sensitivity to below 1.0 lux.

The AutoDome supports 99 pre-positions and two styles of Guard Tours: Preset and Record/Playback. The preset standard tour is capable of storing 99 sequential pre-positions with a configurable dwell time between pre-positions. The AutoDome Series also provides support for two recorded tours, which have a combined 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 AutoDome 800 Series delivers variable pan/tilt speeds from a crawl speed of only 0.1 degrees per second up to an ultra-quick 120 degrees per second. The dome is capable of pan speeds of 360 degrees per second and tilt speeds of 100 degrees per second between prepositions. The AutoDome 800 Series provides a tilt angle 18 degrees above the horizon, and a pan range of up to 360 degrees continuous rotation. The AutoDome 800 Series also offers two AutoPan modes: a continuous 360 degree tour mode and a mode where the camera pans between user-defined limits. In addition the AutoScaling (proportional zoom) and AutoPivot (automatically rotates and flips the camera) features ensure optimal control.

Ultra-efficient H.264 encoding

The AutoDome 800 Series uses an advanced H.264 encoder to create high-definition streaming video at ultra-low bit rates. Use of H.264 encoding, bandwidth throttling, and multicasting capabilities, minimizes bandwidth and storage usage to significantly reduce costs. The AutoDome 800 Series supports 1080p30,

720p60, 720p30, 480p30 (WVGA), and 240p30 (WQVGA) resolutions for 50 Hz and 60 Hz models at 16:9 aspect ratio.

Multiple video streams

Bosch's innovative Quad-streaming feature enables the AutoDome 800 Series to deliver three H.264 streams together with an M-JPEG stream in full and reduced bandwidth modes. During full bandwidth operation (full HD 1080p30 or high frame rate 720p60) the second stream is an exact copy of the first stream. In reduced bandwidth mode (720p30), the second stream is an independently configurable, downscaled-resolution stream. In both modes the third H.264 stream consists of HD I-frames only. These streams facilitate bandwidth-efficient viewing and recording options as well as integration with third-party video management systems.

ONVIF conformant

The AutoDome 800 Series conforms to the ONVIF (Open Network Video Interface Forum) specification guaranteeing interoperability between network video products regardless of manufacturer. ONVIF conformant devices are able to exchange live video, audio, metadata and control information and ensure that they are automatically discovered and connected to network applications such as video management systems.

Intelligence

With built-in video content analysis, the AutoDome reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The AutoDome comes with Bosch's Intelligent Video Analysis (IVA) built-in. IVA is state-of-the-art intelligent video analysis that reliably detects, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. The IVA functionality built into the AutoDome is able to detect idle and removed objects as well as loitering, multiple line crossing, and trajectories. IVA also supports BEV (Bird's Eye View) People counting. Assisted Self Calibration and configurable detection filters improve reliability and reduce operator work load.

Advanced networking capabilities

The AutoDome offers advanced capabilities so you can configure the camera to take advantage of the latest networking technology. The AutoDome offers Quality of Service (QoS) configuration options to ensure fast network response to PTZ data and images. Quality of Service (QoS) is the set of techniques to manage network resources. QoS manages the delay, delay variation (jitter), bandwidth, and packet loss parameters to guarantee the ability of a network to deliver predictable results. QoS identifies the type of data in a data packet and divides the packets into traffic classes that can be prioritized for forwarding.

EXHIBIT B

The AutoDome also supports the IPv6 internet-layer protocol for packet-switched internetworking across multiple IP networks. IPv6 uses 128-bit addresses (IPv4 uses 32-bit addressing), which allows for many more devices and users on the internet as well as extra flexibility in allocating addresses and efficiency for routing traffic.

Fiber Optic Kits

Bosch offers the optional VG4-SFPCKT, a unique media converter module for use with 800 Series AutoDomes. This media converter module is designed to accept a wide-range of 10/100 Mbps SFP modules for use with Multimode or Singlemode optical fiber with LC or SC connectors.

The media converter module along with the SFP module is user-installed directly into the AutoDome's power supply box to provide an integrated fiber optic solution.

Ease of installation and servicing

The AutoDome 800 Series has been designed for quick and easy installation; a key feature from Bosch CCTV products. All housings feature recessed screws and latches for increased tamper resistance.

Outdoor Pendant housings are rated to provide IP 66 protection and are offers an operating temperature range down to -45°C (-49°F). The outdoor pendant comes fully assembled with a sunshield and ready for wall or pipe applications with the proper mounting hardware (purchased separately). In addition, the pendant housing comes equipped with a low-impact, high-resolution acrylic bubble for enhanced image clarity. You can easily convert the outdoor pendant for indoor applications by removing the sunshield.

Note: Bosch offers a full complement of hardware and accessories (as a separate purchase) for corner, mast, roof, and pipe mount applications, which allow the AutoDome to be easily adapted to individual site requirements.

Unsurpassed reliability

As with all Bosch products, the AutoDome 800 Series has been subjected to the industry's most comprehensive and demanding battery of endurance tests such as HALT (highly accelerated life testing) to make sure it will hold up through years of use. And of course, it comes with Bosch's industry-leading 3-year warranty.

Functions

The following are some of the features that make the AutoDome 800 Series the perfect fit for a variety of surveillance applications.

Inputs and outputs

The AutoDome 800 Series can handle two (2) alarm inputs and one (1) open-collector alarm output, which can drive an external device.

iSCSI device support

Built-in iSCSI support allows the AutoDome 800 Series to stream video directly to an iSCSI RAID array. This enables efficient video storage and overall system scalability without compromise to recording performance when paired with suitable iSCSI storage arrays.

Network-based control and configuration

The AutoDome 800 Series enables full camera control and configuration capabilities over the network.

Operators or technicians can control camera pan/tilt/zoom operation, presets, tours, and alarm management functions virtually anywhere without need for additional wiring.

The embedded web server lets the installer access all the user settings, make camera adjustments, and update firmware via a standard web browser.

Device management

Simple Network Management Protocol (SNMP) support facilitates the remote monitoring and management. The AutoDome 800 Series provides full support for SNMP v3.

Superior privacy masking

The AutoDome 800 Series provides 24 individual, easy to configure privacy masks, with up to 24 displayed in the same scene. As the camera is zoomed each mask changes size smoothly and quickly ensuring that the covered object cannot be seen. You also have a choice of black or gray masking characteristics.

Viewing

View the video on a PC using a Web browser or via the Bosch Video Client, the Bosch Recording Station, the Bosch Video Management System, or integrate it into another video management system.

Bosch offers a full complement of hardware (as a separate purchase) for wall, corner, mast, roof, and pipe mount applications for indoor and outdoor environments.

Certifications and Approvals

HD standards

- Complies with the SMPTE 274M-2008 Standard in:
 - Resolution: 1920x1080
 - Scan: Progressive
 - Color representation: complies with ITU-R BT.709
 - Aspect ratio: 16:9
 - Frame rate: 25 and 30 frames/s
- Complies with the 296M-2001 Standard in:
 - Resolution: 1280x720
 - Scan: Progressive
 - Color representation: complies with ITU-R BT.709
 - Aspect ratio: 16:9
 - Frame rate: 25, 30, 50 and 60 frames/s

EXHIBIT B

Electromagnetic Compatibility (EMC)	Complies with FCC Part 15, ICES-003, and CE regulations
Product Safety	Complies with CE regulations, UL, CSA, EN, and IEC Standards
Weatherproofing	IP66

Region	Certification
Europe	CE

Parts Included**Outdoor Pendant**

1	Fully-assembled outdoor pendant housing with sunshield
1	Acrylic bubble, clear

Notes:

- The pendant can be converted to an indoor pendant by removing the sunshield.
- Mounting hardware and accessories are available separately.

Technical Specifications**20x HD Day/Night Camera**

Imager	1/2.8-in.-type CMOS	
Number of Pixels	Effective: Approximately 3.27 megapixels Delivered: Approximately 2 megapixels	
Aspect Ratio	HD: 16:9	
Lens	20x optical zoom, (4.7 to 94 mm)	
Focus	One-push (default), Automatic (normal, low), Manual	
Iris	Automatic with manual override (F1.6 to F3.5)	
Field of View		
• 1080p Mode	2.9° (tele) to 55.4° (wide)	
• 720p Mode	2.0 (tele) to 37.6 (wide)	
Minimum Working Distance	10 mm (wide) to 150 mm (tele)	
Automatic Gain Control	Automatic/Manual (-3 to +28 dB, +2 dB steps/16 steps)	
Synchronization	Internal	
Aperture Correction	Adjustable sharpness	
Digital Zoom	12x	
Sensitivity (typical) ¹	30 IRE²	50 IRE²

Day Mode

SensUP Off (1/30 [1/25] shutter); High Sensitivity Off	0.8 lux (0.074 fc)	1.7 lux (0.158 fc)
SensUP On, max.	0.04 lux	0.08 lux

(0.25 sec. shutter); High Sensitivity On ³	(0.004 fc)	(0.007 fc)
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Night Mode

SensUP Off (1/30 [1/25] shutter); High Sensitivity Off	0.12 lux (0.011)	0.3 lux (0.028 fc)
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SensUP On, max. (0.25 sec. shutter); High Sensitivity On ³	0.005 lux (.0005 fc)	0.011 lux (.001 fc)
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Electronic Shutter Speed (AES)	1/1 to 1/10000 s, 22 steps
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Wide Dynamic Range (WDR)	86 dB (50 dB with WDR off)
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Signal to Noise Ratio	> 50 dB (AGC off)
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Backlight Compensation	On/Off
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White Balance	Auto, ATW, Indoor, Outdoor, Outdoor Auto, Sodium Vapor Lamp, One-push, Manual
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Day/Night	Monochrome, Color, Auto
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1. F1.6, maximum AGC. Normal light source (Halogen lamp).

2. Tinted bubble adds 0.8 f-stop loss.

3. Measured using ND1 + ND4 filters and recalculated with the transmission factor at 0.0025.

Software Control

Camera Setup/Control	Via Internet Explorer Web browser version 7.0 or later, Bosch Configuration Manager or BVMS
Software Update	Firmware upload

Network

Standards	H.264 (ISO/IEC 14496-10), M-JPEG, JPEG
Streaming	Individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth;
• 1080p30	One (1) H.264 1080p30 stream plus one (1) M-JPEG and one (1) I-frame stream
• 720p60	One (1) H.264 720p60 stream plus one (1) M-JPEG and one (1) I-frame stream
• 720p30	Two (2) independently configurable H.264 streams: One (1) H.264 720p30 stream, One (1) H.264 BP+ or H.264 MP SD stream, plus one (1) M-JPEG and one (1) I-frame stream
GOP Structure	IP, IBP, IBBP
Data Rate	9.6 kbps to 6 Mbps
Overall IP Delay	240 ms

Resolutions (H x V) and Frame Rates**Stream 1**

• Full HD/1080p	1920 x 1080, 30 ips
• HD/720p	1280 x 720, 60 ips

EXHIBIT B

• HD/720p	1280 x 720, 30 ips
Stream 2⁴	
• SD/480p (WVGA) ⁵	854 x 480, 30 ips
• SD/240p (WQVGA) ⁵	432 x 240, 30 ips
4. Stream 1 must be set to 720p at 30 ips.	
5. Images displayed in 16:9 aspect ratio.	

Network	
Protocols	RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNMP, RTSP, 802.1x, iSCSI, DynDNS, UPnP
Advanced Networking	IPv6, QoS
Ethernet	10-Base T/100 Base-TX, auto-sensing, half/full duplex, RJ45
Audio	
• Standard	G.711, 8 kHz sampling rate L16, 16 kHz sampling rate AAC
• Signal-to-Noise Ratio	>50 dB
• Audio Streaming	Full Duplex / Half Duplex

Fiber Optic Specifications

VG4-SFPSCKT	
Description	Fiber Optic Ethernet Media Converter kit. Requires a small form-factor pluggable (SFP) module (sold separately).
Data Interface	Ethernet
Data Rate	10/100 Mbps IEEE 802.3 Compliant Full Duplex or Half Duplex Electrical Port Full Duplex Optical Port
Compatible Receiver	CNFE2MC
Installation	Installed inside a VG4-A-PA0, VG4-A-PA1, VG4-A-PA2, VG4-A-PSU1, or a VG4-A-PSU2 power supply box with supplied mounting hardware

SFP Modules

Description	Interchangeable modules available for use with MMF or SMF optical fiber.
Data Interface	Ethernet
Data Rate	10/100 Mbps IEEE 802.3 Compliant
Mechanical	

Dimensions (LxWxH)

• SFP-2 and SFP-3	55.5 x 13.5 x 8.5 mm (2.2 x 0.5 x 0.3 in.)
• SFP-25, SFP-26	63.8 x 13.5 x 8.5 mm (2.5 x 0.5 x 0.3 in.)
Weight (all SFP modules)	0.23 kg (.05 lb)

	Type	Connect or	Wavelength (transmit/receive)	Max. Distance
SFP-2	MMF	Duplex LC	1310 nm / 1310 nm	2 km (1.2 miles)
SFP-3	SMF	Duplex LC	1310 nm / 1310 nm	20 km (12.4 miles)
SFP-2 5	MMF	Single SC	1310 nm / 1550 nm	2 km (1.2 miles)
SFP-2 6	MMF	Single SC	1550 nm / 1310 nm	2 km (1.2 miles)

Fiber Compatibility

Optical Fiber Compatibility, MMF	50/125 µm MMF. For 50/125 µm fiber, subtract 4 dB from the specified optical budget value. Must meet or exceed fiber standard ITU-T G.651.
Optical Fiber Compatibility, SMF	8–10/125 µm SMF. Must meet or exceed fiber standard ITU-T G.652.
Optical Distance Specifications	Specified transmission distances are limited to the optical loss of the fiber and any additional loss introduced by connectors, splices, and patch panels. The modules are designed to operate over the entire optical loss budget range, so they do not require a minimum loss in order to operate.

Mechanical

Pan Range	360° cont.
Tilt Angle	18° above horizon
Variable Speed	0.1°/s-120°/s
Pre-position Speed	Pan: 360°/s Tilt: 100°/s
Preset Accuracy	± 0.1° typ.

Electrical

Input Voltage	21-30 VAC 50/60 Hz
Power Consumption, typical	55 W / 60 VA or 19 W / 35 VA ⁶

6. Without heater connected in power supply box for indoor applications.

EXHIBIT B**Surge Suppression**

Protection on Video	Peak current 10 kA (Gas Tube Arrester)
Protection on Audio	Peak current 10 A, peak power 300 W (8/20 μ s)
Protection on RS-232/485	ESD protection \pm 15 kV human body model
Protection on Alarm Inputs	Peak current 17 A, peak power 300 W (8/20 μ s)
Protection on Alarm Outputs	Peak current 2 A, peak power 300 W (8/20 μ s)
Protection on Relay Outputs	Peak current 7.3 A, peak power 600 W (10/1000 μ s)
Protection on Power Input (Dome)	Peak current 7.3 A, peak power 600 W (10/1000 μ s)
Protection on Power Output (Arm Power Supply)	Peak current 21.4 A, peak power 1500 W (10/1000 μ s)
10/100 Ethernet Data Lines	Peak current 14 A, peak power 200 W (8/20 μ s)

Miscellaneous

Sectors/Titling	16 independent sectors with a 20-character title/sector
Masking	24 individually configurable privacy masks
Protocol Support	Bosch (OSRD), ONVIF
Pre-positions	99, each with 20-character titles
Guard Tours	Two (2) types of tours: <ul style="list-style-type: none"> Recorded tours – two (2), total duration 15 minutes Preset tour – one (1), consisting of up to 99 scenes, consecutively
Supported Languages	English, German, Dutch, French, Italian, Spanish, Portuguese, Polish, and Japanese

User Connections

Power, Camera	21-30 VAC, 50/60 Hz
Power, Heater	21-30 VAC, 50/60 Hz
Video and Control	RJ-45 100 Base-TX Ethernet
Alarm Inputs (2)	Programmable for “normally open” or “normally closed”
Open Collector Output (1)	32VDC@150 ma max
Audio Input Line Level (one way audio)	
• Input Voltage	5.5 Vp-p max
• Impedance	9 Kohm typical

Environmental

Design Rating	IP66
Operating Temp.	-45°C to 55°C (-49°F to 131°F) or -10°C to 50°C (14°F to 122°F) ⁸
HALT ⁹ Temp. Tests	-70°C to 70°C (-94°F to 158°F)
Storage Temp.	-45°C to 70°C (-49°F to 158°F)
Humidity	0% to 100% relative, condensing

8. Without heater connected in power supply box for indoor applications.

9. Highly Accelerated Life Tests. Maximum temperature limits.

Construction

Dimensions	See dimensional drawings
Weight	
• Indoor Pendant	2.88 kg (6.3 lb)
• Outdoor Pendant	3.03 kg (6.68 lb)
Bubble Size	153.1 mm (6.03 in.) diameter
Construction Material	
• Housing	Cast aluminum
• Bubble	Acrylic (high-resolution)
Standard Color	White (RAL9003)
Standard Finish	Powder coated, sand finish

Mounts/Accessories**Bubble****Pendant**

Clear high-resolution acrylic	VGA-BUBBLE-PCLA
Tinted high-resolution acrylic	VGA-BUBBLE-PTIA

Pendant Arm Mounts

Wall Arm (No Transformer)	VG4-A-PA0
Wall Arm (120/230 VAC Transformer)	VG4-A-PA1 / VG4-A-PA2
Pendant Arm with Wiring	VGA-PEND-ARM
Mounting plate for VGA-PEND-ARM	VGA-PEND-WPLATE
Trim skirt for AutoDome Series Power Supplies	VG4-A-TSKIRT

Optional Mounting Plates for Arm Mounts

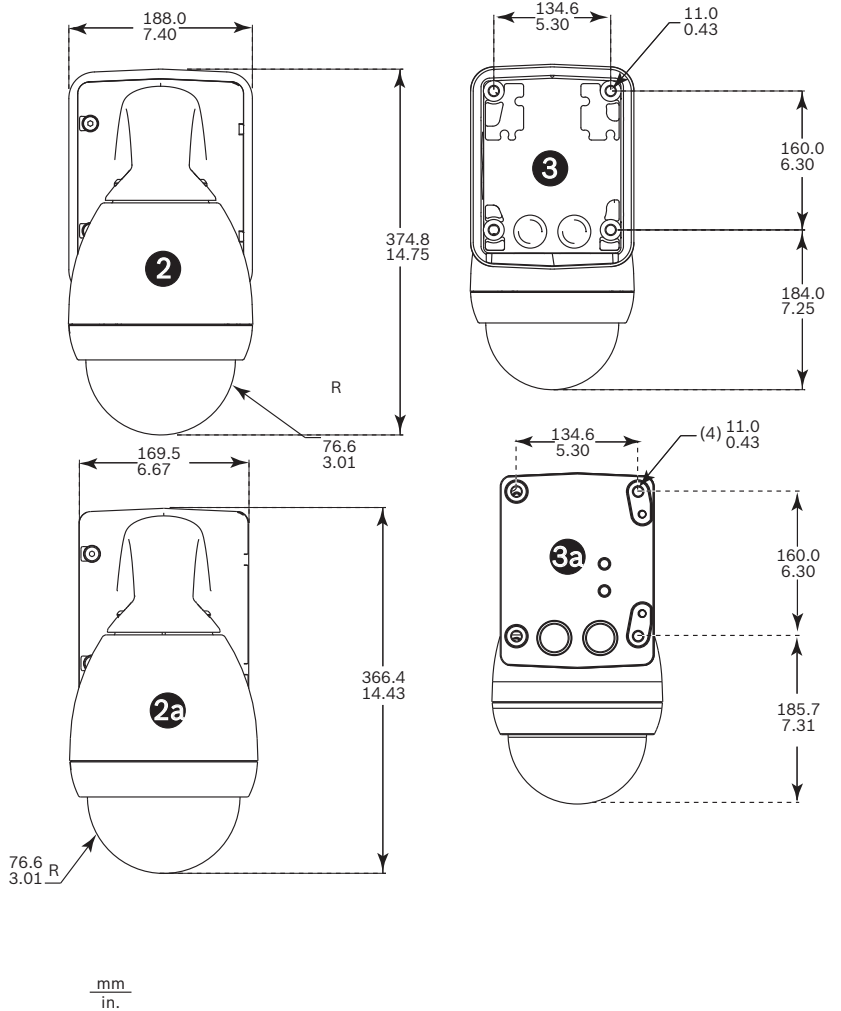
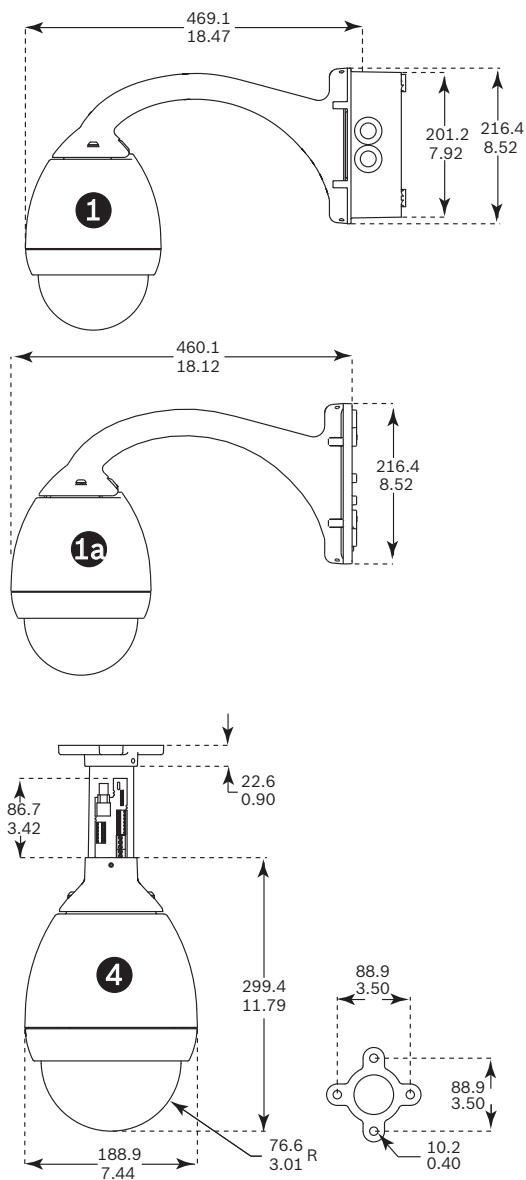
Corner Mounting Plate	VG4-A-9542
Mast (Pole) Mounting Plate	VG4-A-9541

EXHIBIT B

Pendant Pipe Mounts	
Pipe Mount Cap	VG4-A-9543
Pendant Roof Mounts	
Roof (Parapet) Mount <small>(VG4-A-9543 Pipe Mount Cap required. Available separately.)</small>	VGA-ROOF-MOUNT
Optional Mounting Plates for Roof Mounts	
Flat Roof Adapter for Parapet Mount	LTC 9230/01
Power Supplies	
Outdoor Power Supply Box, no transformer	VG4-A-PSU0
Outdoor Power Supply Box (120/230 VAC Transformer)	VG4-A-PSU1 / VG4-A-PSU2
Fiber Optic Kit	VG4-SFPSCKT

EXHIBIT B

Dimensions: Pendant without Sunshield

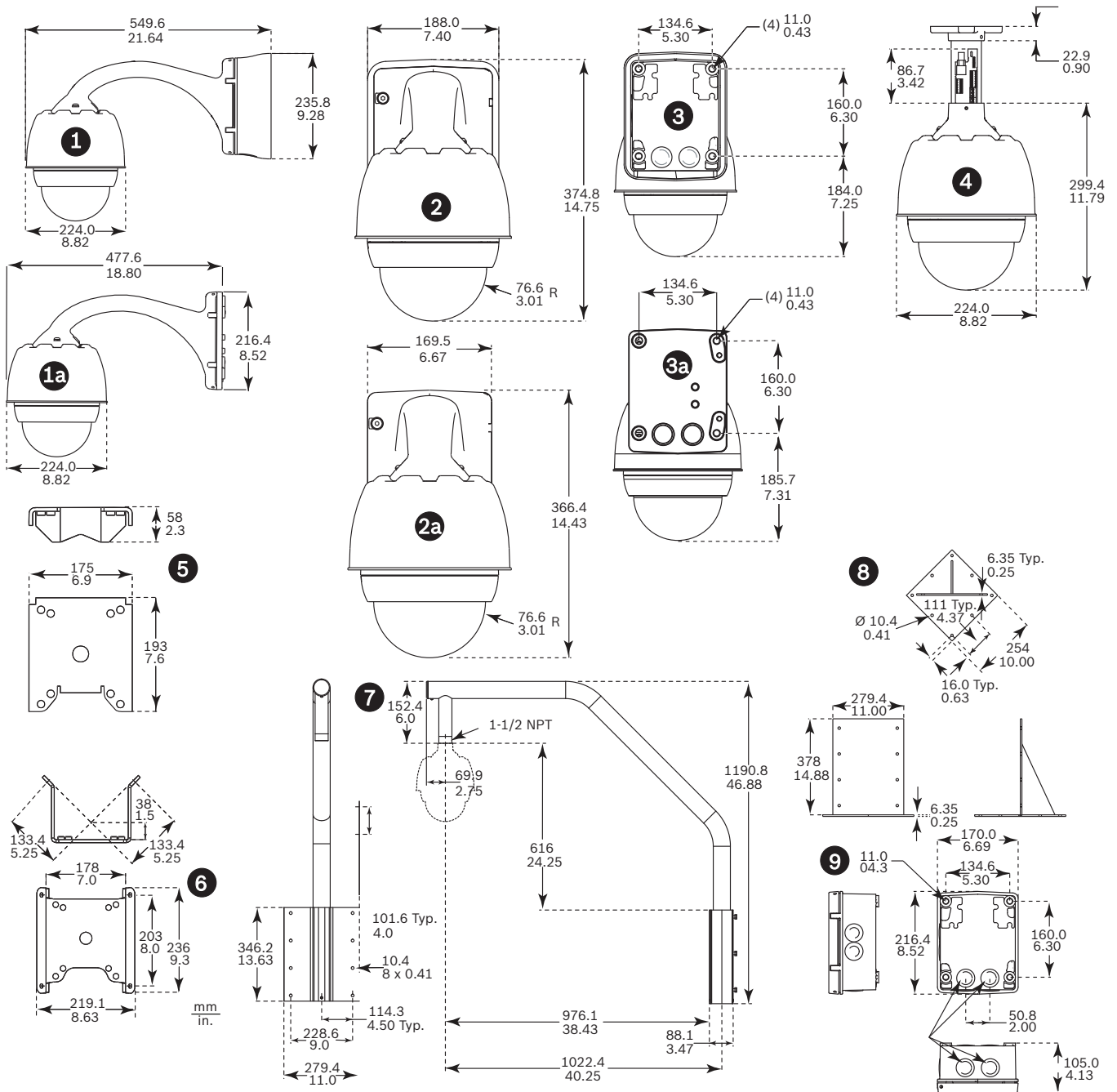


Indoor System Dimensions

Reference	Description
1	Wall Mount – Side with power supply
1a	Wall/Mast Mount – Side with VGA-PEND-WPLATE
2	Wall Mount – Front with power supply and trim skirt
2a	Wall Mount – Front with power supply
3	Wall Mount – Back with power supply and trim skirt
3a	Wall Mount – Back with power supply
4	Pipe Mount

EXHIBIT B

Dimensions: Pendant with Sunshield and Outdoor Mounts



Outdoor System Dimensions

Reference Description

1	Wall Mount – Side with power supply and trim skirt
1a	Wall/Mast Mount – Side with VGA-PEND-WPLATE
2	Wall Mount – Front with power supply and trim skirt
2a	Wall Mount – Front with power supply
3	Wall Mount – Back with power supply and trim skirt
3a	Wall Mount – Back with power supply
4	Pipe Mount

5	Mast Mount
6	Corner Mount
7	Roof Mount
8	Roof Mount Adapter
9	Power Supply for Pipe and Roof Mounts

EXHIBIT B**Ordering Information**

VG5-836-ECEV Outdoor 20x AutoDome 800 Series HD Camera with IVA, Clear Bubble, 50/60 Hz
Outdoor AutoDome 800 Series HD with IVA, 20x day/night, 50/60 Hz camera with clear bubble
Order number **VG5-836-ECEV**

Accessories

VGA-BUBBLE-PCLA Clear High-resolution Bubble for a Pendant Housing
Low-impact acrylic bubble
Order number **VGA-BUBBLE-PCLA**

VGA-BUBBLE-PTIA Tinted High-resolution Bubble for a Pendant Housing
Low-impact acrylic bubble
Order number **VGA-BUBBLE-PTIA**

VGA-PEND-ARM Pendant Arm with Wiring
Compatible with an AutoDome Series pendant housing
Order number **VGA-PEND-ARM**

VGA-PEND-WPLATE Mounting Plate
Mounting plate for VGA-PEND-ARM, compatible with an AutoDome Series camera
Order number **VGA-PEND-WPLATE**

VGA-ROOF-MOUNT Roof Mount
Roof parapet mount, white
(VG4-A-9543 Pipe Mount Cap required. Available separately.)
Order number **VGA-ROOF-MOUNT**

LTC 9230/01 Flat Roof Mount Adapter
For mounting a unit in an upright position on a flat surface for roof parapet mount VGA-ROOF-MOUNT
Order number **LTC 9230/01**

VG4-A-9541 Pole Mount Adapter
Pole mount adapter for a for an AutoDome Series pendant arm or a VEI-30 or NEI-30 Dinion Infrared Imager, designed for poles with a diameter of 100-380 mm (4-15 in.), white
Order number **VG4-A-9541**

VG4-A-9542 Corner Mount Adapter
Corner mount adapter for an AutoDome Series pendant arm or a VEI-30 or NEI-30 Dinion Infrared Imager
Order number **VG4-A-9542**

VG4-A-9543 Pipe Mount
Pipe mount, white, for an AutoDome Series pendant housing
Order number **VG4-A-9543**

VG4-A-PA0 Pendant Arm Mount
Pendant arm mount with power supply box for a AutoDome Series cameras, no transformer, white
Order number **VG4-A-PA0**

VG4-A-PA1 Pendant Arm Mount with 120 VAC Transformer

Pendant arm mount with power supply box for AutoDome Series cameras with a 120 VAC transformer, white
Order number **VG4-A-PA1**

VG4-A-PA2 Pendant Arm Mount with 230 VAC Transformer

Pendant arm mount with power supply box for AutoDome Series cameras with a 230 VAC transformer, white
Order number **VG4-A-PA2**

VG4-A-PSU0 24 VAC Power Supply Unit

24 VAC, 100 W, white, for an AutoDome Series camera
Order number **VG4-A-PSU0**

VG4-A-PSU1 120 VAC Power Supply Unit

120 VAC, 100 W, white, for an AutoDome Series camera
Order number **VG4-A-PSU1**

VG4-A-PSU2 230 VAC Power Supply Unit

230 VAC, 100 W, white, for an AutoDome Series camera
Order number **VG4-A-PSU2**

VG4-SBOX-COVER Cover for Power Supply Box

Spare cover for AutoDome power supply boxes and for the VEI-30 and NEI-30 junction boxes
Order number **VG4-SBOX-COVER**

VG4-SFPSCKT Fiber Optic Ethernet Media Converter Kit

Ethernet media converter video transmitter/data receiver fiber optic kit
Order number **VG4-SFPSCKT**

VG4-A-TSKIRT Trim Skirt for AutoDome Power Supply Boxes

Trim skirt for the following AutoDome Series power supply boxes:
VG4-A-PSU0, VG4-A-PSU1, and VG4-A-PSU2
Order number **VG4-A-TSKIRT**

Software Options**MVS-FENC-AES BVIP AES 128 Bit Encryption**

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.
Order number **MVS-FENC-AES**

EXHIBIT B

Represented by:

Americas:

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Fairport, New York, 14450, USA
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Fax: +1 585 223 9180
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www.boschsecurity.us

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Fax: +31 40 2577 330
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Fax: +55 19 2103 2862
al.securitysystems@bosch.com
www.boschsecurity.com

EXHIBIT B

AUTODOME Junior HD PTZ Camera

www.boschsecurity.com



BOSCH

Invented for life



HD ONVIF



- ▶ HD 1080p30 and 720p60 ips resolutions for crisp, clear images
- ▶ 160x zoom (10x optical, 16x digital)
- ▶ Quad video streaming generates simultaneous H.264, M-JPEG, and JPEG video streams
- ▶ Durable, rugged design with indoor and outdoor models available
- ▶ ONVIF conformant

AutoDome Junior HD is a rugged, extremely compact, and easy to install PTZ camera system with superb HDTV quality video. The camera features day/night functionality for high definition quality images in low light conditions. This discreet, high-speed dome camera has been specifically designed to deliver uncompromised functionality and performance for indoor and outdoor applications.

The AutoDome Junior HD provides direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality. The AutoDome Junior HD provides complete network-based control of all dome functionality including pan/tilt/zoom operation, presets, tours and alarms as well as web-based configuration of all dome settings.

The AutoDome Junior HD conforms to the ONVIF (Open Network Video Interface Forum) specification guaranteeing interoperability between network video products regardless of manufacturer.

AutoDome Junior HD highlights

With a dome diameter of only 6.02 inches (15.3 cm), the AutoDome Junior HD is nearly 50% smaller than the Bosch AutoDome. These compact dimensions

make the AutoDome Junior HD ideal for discreet surveillance applications, including recessed mount options for indoor and outdoor cameras. Despite its compact design, the AutoDome Junior HD delivers state-of-the-art technology and features that are rare to most compact PTZ cameras. Its variable pan and tilt speeds and AutoPivot ensure optimal camera control and viewing at all zoom levels. The high-performance 160x (10x optical/16x digital) zoom autofocus camera incorporates the latest digital imaging technology with excellent sensitivity and resolution. With 99 user-defined presets as well as tour and AutoPan modes, the AutoDome Junior HD is not small on features.

A single AutoDome Junior HD provides as much coverage as four fixed mini domes and is priced lower than a traditional PTZ dome camera. The AutoDome Junior HD maximizes your security investment by integrating with Bosch video management systems – BVMS, BVC, and BRS – as well as the full range of Bosch Video over IP products.

And, the AutoDome Junior HD is simple to install and use; available with surface, wall, recessed, and pipe mount options.

EXHIBIT B

System overview

High-performance 160x PTZ day/night camera

The AutoDome Junior HD PTZ camera has a 1/2.5-inch progressive scan CMOS sensor. With up to 1080p resolution and sensitivity to below 1.0 lux, the AutoDome Junior HD Series offers exceptional performance at a very affordable price.

The AutoDome Junior HD supports up to 99 user-defined presets, as well as 1 preposition tour and 1 AutoPan mode. The preposition tour automatically moves the camera through a series of up to 99 sequential presets with a configurable dwell time between each preset.

Pan and tilt preset repeatability are accurate to within ± 0.1 degrees to ensure that the correct scene is captured every time. AutoDome Junior HD delivers variable pan/tilt speeds from a crawl speed of only 1 degree per second up to an ultra-quick 120 degrees per second. The dome is capable of pan speeds of 360 degrees per second and tilt speeds of 100 degrees per second between presets. AutoDome Junior HD provides a tilt range of 0 to 94 degrees, and a pan range of up to 360 degrees continuous rotation. The AutoScaling (proportional zoom) and AutoPivot (automatically rotates and flips the camera) features ensure optimal control.

Ultra-efficient H.264 encoding

AutoDome Junior HD uses an advanced H.264 encoder to create high-quality streaming video at ultra-low bit rates. Use of H.264 encoding, bandwidth throttling, and multicasting capabilities, minimizes bandwidth and storage usage to significantly reduce costs. AutoDome Junior HD supports 1080p30, 720p60, 720p30, 480p30 (WVGA), and 240p30 (WQVGA) resolutions for 50 Hz and 60 Hz models at 16:9 aspect ratio.

Multiple video streams

Bosch's innovative Quad-streaming feature enables the AutoDome Junior HD to deliver three H.264 streams together with an M-JPEG stream in full and reduced bandwidth modes. During full bandwidth operation (full HD 1080p30 or high frame rate 720p60) the second stream is an exact copy of the first stream. In reduced bandwidth mode (720p30), the second stream is an independently configurable, downscaled-resolution stream. In both modes the third H.264 stream consists of HD I-frames only. These streams facilitate bandwidth-efficient viewing and recording options as well as integration with third-party video management systems.

Open Platform Integration

The AutoDome Junior HD complies with ONVIF Profile S for easy integration into any ONVIF Profile S compliant third-party video management system. In addition, many third-party open platform video management systems support the AutoDome Junior HD.

Intelligence

With built-in video content analysis, the AutoDome Junior HD reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent.

The AutoDome Junior HD also features Bosch's Intelligent Video Analysis (IVA). IVA is state-of-the-art intelligent video analysis that reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image.

Image Stabilization

Image stabilization algorithms included with the AutoDome Junior HD reduces camera shake in both the vertical and horizontal axis, resulting in exceptional image clarity. Bosch's unique image stabilization solution does not reduce camera sensitivity, unlike competitive systems.

Rugged reliability

A heavy-duty, tamper-resistant aluminum housing protects the camera from vandalism and theft, ensuring the AutoDome Junior HD continues to deliver critical images even in the toughest environments. As with all Bosch products, the AutoDome Junior HD has been subjected to the industry's most comprehensive and demanding battery of endurance tests such as HALT (highly accelerated life testing) to make sure it will hold up through years of use. And of course, it comes with Bosch's industry-leading 3-year warranty.

Functions

The following are some of the features that make the AutoDome Junior HD Series the perfect fit for a variety of indoor surveillance applications.

iSCSI device support

Built-in iSCSI support allows AutoDome Junior HD to stream video directly to an iSCSI RAID array. This enables efficient video storage just like a conventional DVR without streaming high bandwidth video across the network, making system recording performance totally independent from network performance.

Network-based control and configuration

The AutoDome Junior HD enables full camera control and configuration capabilities over the network. Operators or technicians can control camera pan/tilt/zoom operation, presets, tours, and alarm management functions virtually anywhere without need for additional wiring.

The embedded web server lets the installer access all the user settings, make camera adjustments, and update firmware via a standard web browser or via the Bosch Video Management System.

Device management

Simple Network Management Protocol (SNMP) support facilitates the remote monitoring and management. AutoDome Junior HD provides full support for SNMP v3.

EXHIBIT B

Superior privacy masking

The AutoDome Junior HD allows for a total of 24 individual, easy to configure privacy masks, with up to 8 displayed in the same scene. As the camera is zoomed each mask changes size smoothly and quickly ensuring that the covered object cannot be seen. You also have a choice of black, gray, or white masking characteristics.

Ease of installation and servicing

The AutoDome Junior HD has been designed for quick and easy installation; a key feature of Bosch CCTV products. The dome comes fully assembled and ready for surface mount applications. Also available are wall, recessed, and pipe mounting kits which allow the AutoDome Junior HD to be easily adapted for individual site requirements. Indoor models are available in white or charcoal; the outdoor model is available in white.

Dual Power Supply

Power for the camera may be supplied via a Power over Ethernet Plus (PoE+, IEEE 802.3at, class 4) compliant network cable connection or via a 24 VAC power supply. The PoE+ option requires only a single cable connection to power and control the camera while also viewing images from the camera. (Outdoor camera models require a 24 VAC power supply to the heater.)

Viewing

View the video on a PC using a Web browser or via the Bosch Video Client, the Bosch Recording Station, the Bosch Video Management System, or in a third-party ONVIF-compliant system.

Video security App

The Bosch Video Security iPad App has been developed to fully utilize our Dynamic Transcoding features and enable **Anywhere** access to HD surveillance images, even over low-bandwidth connections. The App, together with the Bosch transcoder, is configured to give you complete control of all your cameras, from panning and tilting to zoom and focus functions. It's like taking your control room with you.

Certifications and approvals

HD standards

- Complies with the SMPTE 274M-2008 Standard in:
 - Resolution: 1920x1080
 - Scan: Progressive
 - Color representation: complies with ITU-R BT.709
 - Aspect ratio: 16:9
 - Frame rate: 25 and 30 frames/s
- Complies with the 296M-2001 Standard in:
 - Resolution: 1280x720
 - Scan: Progressive
 - Color representation: complies with ITU-R BT.709
 - Aspect ratio: 16:9
 - Frame rate: 25, 30, 50 and 60 frames/s

Electromagnetic Compatibility (EMC)	Complies with FCC Part 15, ICES-003, and CE regulations
Product Safety	Complies with CE regulations, UL, CSA, EN, and IEC Standards Outdoor Models: Passes UL 2043 test
Environmental	Indoor Models: IP54 (excluding VJR-A3-IC mounting option) Outdoor Models: IP65

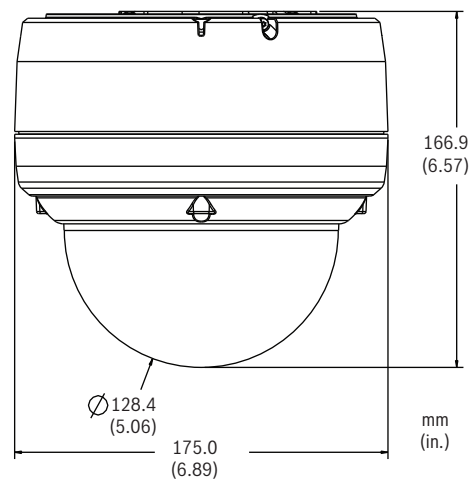


Notice

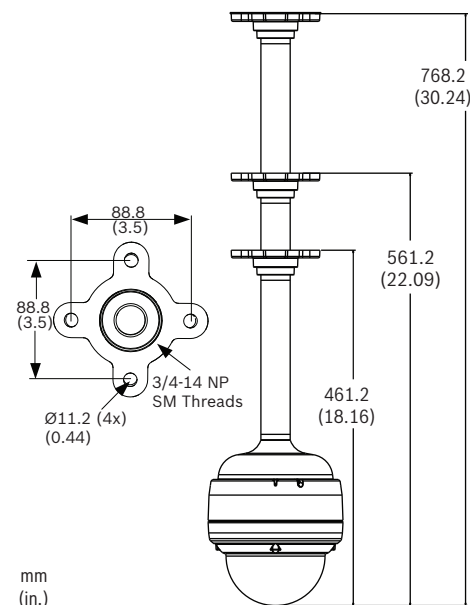
Conformity to EN 50130-4

One of the following power supply units is required to conform to the EN 50130-4 standard: VG4-A-PSU0, VG4-A-PSU1, or VG4-A-PSU2.

Installation/configuration notes

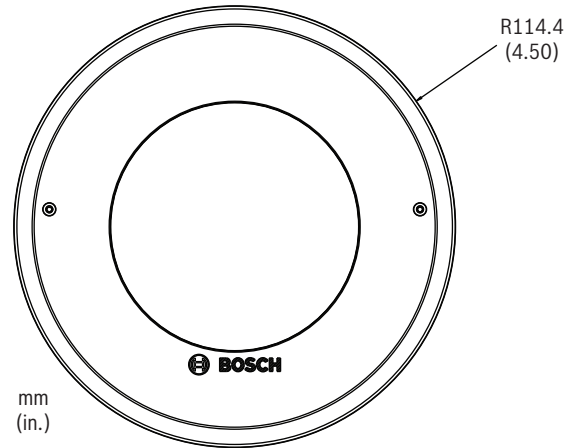
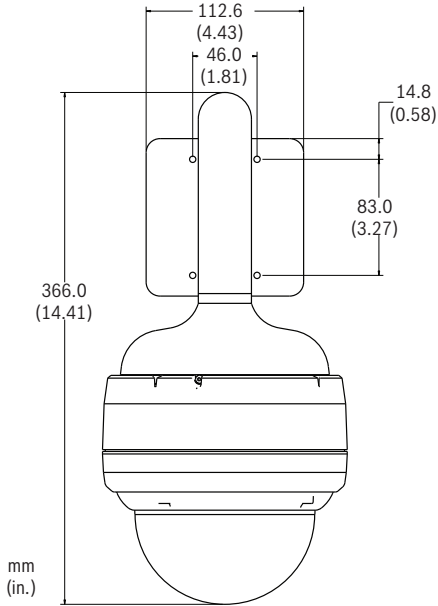


AutoDome Junior HD Dimensions

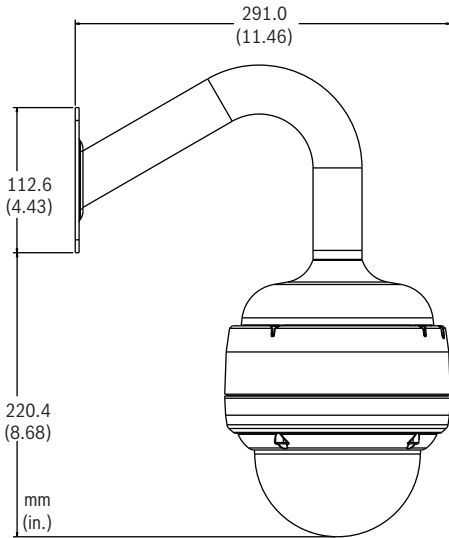


Pipe Mount Dimensions

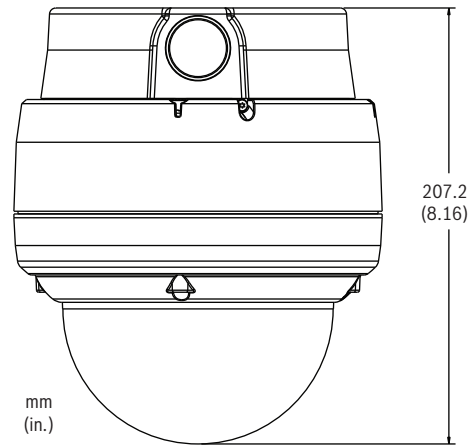
EXHIBIT B



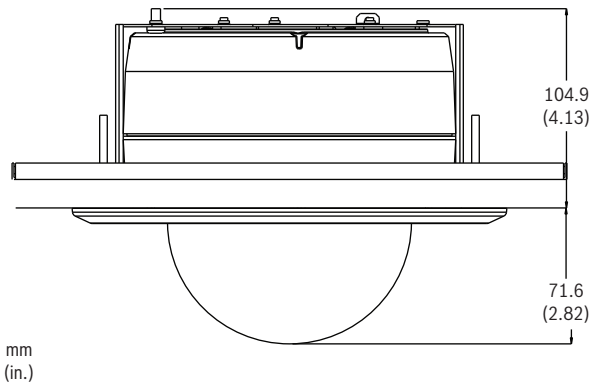
In-Ceiling / Recessed Mount Dimensions



Wall Mount Dimensions



Surface Mount Dimensions



Parts included

Indoor Models

1	PTZ Dome Camera
1	Indoor Bubble, clear or tinted
1	Accessory Kit <ul style="list-style-type: none"> • 1 two-wire camera power cable • 1 four-wire alarm in/out cable
1	Mounting Plate
1	User Manual

Outdoor Models

1	PTZ Dome Camera
1	Outdoor Bubble, clear
1	Accessory Kit <ul style="list-style-type: none"> • 1 two-wire camera power cable • 1 two-wire heater power cable

EXHIBIT B

2: Tinted bubble adds 0.8 f-stop loss.

	• 1 four-wire alarm in/out cable
1	Mounting Plate
1	Outdoor Installation Kit
1	User Manual

Installation Notes:

1. A tinted outdoor bubble is available as an optional purchase.
2. An indoor AutoDome Junior HD camera cannot be converted to an outdoor model by attaching an outdoor bubble.

Technical specifications**10x HD Day/Night Camera**

Imager	1/2.5 inch progressive scan CMOS	
Number of Pixels	2.1 Megapixels	
Aspect Ratio	16:9	
Lens	10x optical zoom (6.3 to 63 mm) (F1.8/F2.5 to close)	
Focus	Automatic with manual override	
Iris	Automatic with manual override	
Field of View	Horizontal: 5.5° to 50.6° Vertical: 3.1° to 29.3°	
Automatic Gain Control	Normal, Medium, High, Fixed	
Synchronization	Internal	
Aperture Correction	On/Off	
Digital Zoom	16x	
Sensitivity(typical) ¹	30 IRE²	50 IRE²
Day Mode		
SensUP Off	1.2 lx	2.0 lx
SensUP On (64x)	0.038 lx	0.063 lx
Night Mode		
SensUP Off	0.06 lx	0.1 lx
SensUP On (64x)	0.0018 lx	0.0031 lx
Electronic Shutter Speed (AES)	1x to 64x; 1/50 (1/60) to 1/10000	
Signal to Noise Ratio	> 50 dB (AGC off)	
Wide Dynamic Range	50 dB	
Backlight Compensation	On/Off	
White Balance	ATW, Indoor, Outdoor, AWB Hold, Extended ATW, Manual (adjustable R and B signals in Manual mode)	
Day/Night	Monochrome, Color, Auto	

1: F1.8, 1/30 (1/25) shutter, maximum AGC.

Software Control

Camera Setup/Control	Via Internet Explorer Web browser version 9.0 or later, Bosch Configuration Manager, or BVMS
Software Update	Firmware upload

Network

Standards	H.264 (ISO/IEC 14496-10), M-JPEG, JPEG
Streaming	Individually configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth; <ul style="list-style-type: none"> • 1080p30 One (1) H.264 1080p30 stream plus one (1) M-JPEG and one (1) I-frame stream • 720p60 One (1) H.264 720p60 stream plus one (1) M-JPEG and one (1) I-frame stream • 720p30 Two (2) independently configurable H.264 streams: One (1) H.264 720p30 stream, One (1) H.264 BP+ or H.264 MP SD stream, plus one (1) M-JPEG and one (1) I-frame stream
GOP Structure	IP, IBP, IBBP
Data Rate	9.6 kbps to 6 Mbps
Overall IP Delay	240 ms
Audio	G.711 (8 bits @ 8KHz) L16 (16 bits @ 16 kHz PCM)

Resolutions (H x V) and Frame Rates**Stream 1**

• Full HD/1080p	1920 x 1080, 30 ips
• HD/720p	1280 x 720, 60 ips
• HD/720p	1280 x 720, 30 ips

Stream 2³

• SD/480p (WVGA) ⁴	854 x 480, 30 ips
• SD/240p (WQVGA) ⁴	432 x 240, 30 ips

3. Stream 1 must be set to 720p at 30 ips.

4. Images displayed in 16:9 aspect ratio.

Network

Protocols	RTP, Telnet, UDP, TCP, IP, http, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNMP, RTSP, 802.1x, iSCSI, DynDNS, UpnP
Ethernet	10-Base T/100 Base-TX, auto-sensing, half/full duplex, RJ45

EXHIBIT B

PoE+	IEEE 802.3at, class 4
Storage	Built-in iSCSI support
Connectivity	ONVIF Profile S
Video Motion Analysis	Intelligent Video Analysis (IVA)

Mechanical/Electrical

Pan Range	0–360° continuous
Tilt Angle	0–93.6°
Variable Speed	Pan: 1°/s to 120°/s Tilt: 1°/s to 100°/s
Pre-position Speed	Pan: 360°/s Tilt: 100°/s
Preset Accuracy	± 0.1° typical
Rated Voltage	
• Camera, All Models	24 VAC ± 10%, 50/60 Hz or Power over Ethernet+ (IEEE 802.3at Class 4)
• Heater, Outdoor Models	24 VAC ± 10%, 50/60 Hz
Power Draw: (typ.)	
• Indoor Models	17 W typical
• Outdoor Models	Camera only: 17 W typical Heater only: 25 W typical Total: 42 W typical

Environmental

Operating Temperature	
• Indoor Models	–10°C to 40°C (14°F to 104°F)
• Outdoor Models	–30°C to 50°C (–22°F to 122°F)
Storage Temperature	–40°C to 60°C (–40°F to 140°F)
Operating Humidity	0% to 90% relative, non-condensing
Environmental Rating	
• Indoor Models	IP54 (excluding VJR-A3-IC mounting option)
• Outdoor Models	IP65

Miscellaneous

Sectors/Titling	Eight (8) independent sectors with 20-character titles/sector
Privacy Masking	24 individually configurable privacy masks, maximum of eight (8) masks displayed in one scene
Presets	99, each with 20-character titles
Guard Tours	Two (2) types of tours:

- Recorded tours: two (2), separately defined user-recorded tour paths
- Preposition tour: one (1), consisting of up to 99 presets, consecutively

Supported Languages	English, German, Dutch, French, Italian, Spanish, Portuguese, Polish, Russian, Chinese, and Japanese
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User Connections

Power	
• Camera, All Models	RJ-45 100 Base-TX Ethernet Power over Ethernet IEEE 802.3at Class 4, or 24 VAC, 50/60 Hz
• Heater, Outdoor Models	24 VAC, 50/60 Hz
Video and Control	RJ-45 100 Base-TX Ethernet
Alarm Input (2)	NC/NO
Alarm Output	Open collector NPN 32 VDC @ 150 mA max
Audio Input Line Level (one way audio)	
• Input Voltage	5.5 Vp-p max
• Impedance	9 Kohm typical

Construction

Size (Diameter x Height)	153.0 x 133.0 mm (6.02 x 4.61 in.)
Bubble Size	128.0 mm (5.04 in.)
Weight	1.92 kg (4.24 lb)
Material	
• Housing	Cast aluminum
• Bubble	Acrylic
Color	
• Indoor Models	White or Charcoal
• Outdoor Models	White

Ordering information**VJR-821-ICCV Indoor 10x AutoDome Junior HD with IVA, Charcoal, Clear Bubble, 60 Hz**

Indoor AutoDome Junior HD with IVA, charcoal, 10x day/night, 60 Hz camera with clear bubble
Order number **VJR-821-ICCV**

EXHIBIT B**VJR-811-ICCV Indoor 10x AutoDome Junior HD with IVA, Charcoal, Clear Bubble, 50 Hz**

Indoor AutoDome Junior HD with IVA, charcoal, 10x day/night, 50 Hz camera with clear bubble

Order number **VJR-811-ICCV**

VJR-821-IWCV Indoor 10x AutoDome Junior HD with IVA, White, Clear Bubble, 60 Hz

Indoor AutoDome Junior HD with IVA, white, 10x day/night, 60 Hz camera with clear bubble

Order number **VJR-821-IWCV**

VJR-811-IWCV Indoor 10x AutoDome Junior HD with IVA, White, Clear Bubble, 50 Hz

Indoor AutoDome Junior HD with IVA, white, 10x day/night, 50 Hz camera with clear bubble

Order number **VJR-811-IWCV**

VJR-821-ICTV Indoor 10x AutoDome Junior HD with IVA, Charcoal, Tinted Bubble, 60 Hz

Indoor AutoDome Junior HD with IVA, charcoal, 10x day/night, 60 Hz camera with tinted bubble

Order number **VJR-821-ICTV**

VJR-811-ICTV Indoor 10x AutoDome Junior HD with IVA, Charcoal, Tinted Bubble, 50 Hz

Indoor AutoDome Junior HD with IVA, charcoal, 10x day/night, 50 Hz camera with tinted bubble

Order number **VJR-811-ICTV**

VJR-821-IWTV Indoor 10x AutoDome Junior HD with IVA, White, Tinted Bubble, 60 Hz

Indoor AutoDome Junior HD with IVA, white, 10x day/night, 60 Hz camera with tinted bubble

Order number **VJR-821-IWTV**

VJR-811-IWTV Indoor 10x AutoDome Junior HD with IVA, White, Tinted Bubble, 50 Hz

Indoor AutoDome Junior HD with IVA, white, 10x day/night, 50 Hz camera with tinted bubble

Order number **VJR-811-IWTV**

VJR-831-EWCV Outdoor 10x AutoDome Junior HD with IVA, White, Clear Bubble, 50/60 Hz

Outdoor AutoDome Junior HD with IVA, white, 10x day/night, 50/60 Hz camera with clear bubble

Order number **VJR-831-EWCV**

Accessories**UPA-2450-60 Power Supply, 120 V, 60 Hz**

Indoor, 120 VAC, 60 Hz In; 24 VAC, 50 VA Out

Order number **UPA-2450-60**

UPA-2450-50 Power Supply, 220 V, 50 Hz

Indoor, 220 VAC, 50 Hz In; 24 VAC, 50 VA Out

Order number **UPA-2450-50**

VJR-A3-IC AutoDome Junior HD Indoor Recessed Mount

Recessed mount for indoor camera applications that do not require IP54 or a plenum rating

Order number **VJR-A3-IC**

VJR-A3-IC54 AutoDome Junior HD Plenum-rated and Outdoor Recessed Mount

Recessed mount required for indoor camera applications that must attain an IP54 or a plenum rating, and required for all recessed outdoor camera applications

Order number **VJR-A3-IC54**

VJR-A3-SP In-ceiling Support Kit for AutoDome 700/800 Series and AutoDome Junior HD

Suspended ceiling support kit for AutoDome 700 and 800 Series and AutoDome Junior HD In-ceiling mounts

Order number **VJR-A3-SP**

VEZ-A2-JC Surface Mount Adapter

Charcoal adapter for AutoDome Junior surface installations

Order number **VEZ-A2-JC**

VEZ-A2-JW Surface Mount Adapter

White adapter for AutoDome Junior surface installations

Order number **VEZ-A2-JW**

VEZ-A2-PC AutoDome Junior Pipe Mount

Charcoal

Order number **VEZ-A2-PC**

VEZ-A2-PW AutoDome Junior Pipe Mount

White

Order number **VEZ-A2-PW**

VEZ-A2-WC AutoDome Junior Wall Mount

Charcoal

Order number **VEZ-A2-WC**

VEZ-A2-WW AutoDome Junior Wall Mount

White

Order number **VEZ-A2-WW**

VJR-SBUB2-CL AutoDome Junior HD Clear Bubble, Indoor

Order number **VJR-SBUB2-CL**

VJR-SBUB2-TI AutoDome Junior HD Tinted Bubble, Indoor

Order number **VJR-SBUB2-TI**

VJR-SBUB3-CL AutoDome Junior HD Clear Bubble, Outdoor

Order number **VJR-SBUB3-CL**

VJR-SBUB3-TI AutoDome Junior HD Tinted Bubble, Outdoor

Order number **VJR-SBUB3-TI**

VG4-A-PSU0 24 VAC Power Supply Unit

24 VAC, 100 W, white, for an AutoDome Series camera

Order number **VG4-A-PSU0**

EXHIBIT B

VG4-A-PSU1 120 VAC Power Supply Unit

120 VAC, 100 W, white, for an AutoDome Series camera

Order number **VG4-A-PSU1**

VG4-A-PSU2 230 VAC Power Supply Unit

230 VAC, 100 W, white, for an AutoDome Series camera

Order number **VG4-A-PSU2**

Software Options

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.

Order number **MVS-FENC-AES**

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EXHIBIT B

DLA-AIOL0 1400 Series IP Video Storage Array

www.boschsecurity.com



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Invented for life



- ▶ RAID-5 protected, all-in-one recording solution for up to 64 channels
- ▶ Pre-installed, pre-configured IP storage solution with 4 TB (4 x 1 TB) storage capacity
- ▶ Dedicated storage operating system delivers robust, secure operation
- ▶ Hot-swappable hard drives
- ▶ Remote monitoring via desktop application or browser

The 1400 Series IP Video Storage Appliance is an affordable, simple and reliable all-in-one recording management solution for network surveillance systems of up to 64 cameras. Powered by Bosch VRM (Video Recording Manager) software, the 1400 Series is an intelligent IP storage device that eliminates the need for separate NVR (Network Video Recorder) server and storage hardware, reducing the total cost of ownership by as much as 45%.

DLA-AIOL0 is a 1U rack mount unit that combines advanced recording management and state-of-the-art iSCSI storage into a single cost-effective, plug and play IP recording appliance for IT-minded customers which are seeking for a state-of-the-art “second generation” NVR recording solution.

System Overview

The 1400 Series IP Video Storage Appliance utilizes an energy efficient, embedded design which reduces possible points of failure and boasts Bosch quality through-and-through. Utilizing “surveillance-rated” hard drives in a fault tolerant RAID-5 configuration, redundant Gigabit Ethernet network interfaces, 4 GB

system memory and an Intel® Pentium Dual Core Processor, the DLA 1400 Series delivers high-end performance at a very affordable price. Easy to install, the DLA 1400 Series features wizard-based set-up and centralized configuration to reduce installation times by as much as 50%. All components are pre-installed and pre-configured. Simply connect to the network and power the unit up—the 1400 Series is ready to begin recording straight out of the box. To create a complete video management solution, just add either Bosch Video Client or Bosch Video Management System (VMS). Bosch VMS Lite—for up to 64 cameras—or Bosch VMS Professional Edition—for up to 128 cameras. Adding Bosch Video Management System or Bosch Video Client software turns the 1400 Series into a scalable IP video management solution.

Bosch Video Management System manages all IP and digital video and audio, plus all the security data being transmitted across your IP network. It seamlessly combines IP cameras and encoders, provides system-wide event and alarm management, system health monitoring, user and priority management.

EXHIBIT B

Bosch Video Client may be used as playback client only or to create an entry-level complete video management solution of up to 64 channels.

Functions

The 1400 Series features a single-socket-system, server-class motherboard, highly energy-efficient hot-swap redundant power supplies, as well as hot-swap SATA-II hard drives providing 4 TB of gross storage capacity. All system software is pre-installed and pre-activated—creating an out-of-the-box ready-to-use recording appliance. The DLA 1400 Series utilizes Microsoft Windows Storage Server 2008. Windows Storage Server is a proven operating system platform that has been specifically optimized for storage applications. The Microsoft implementation of iSCSI is a reference in the industry. It delivers the highest possible quality and reliability, and is a field-proven technology installed on millions of servers worldwide. This next generation of Windows Storage Server is focused on providing a secure platform:

- Hardened platform with reduced high risk layers
- Prevent abnormal activity in the file system and registry
- Re-architected platform to reduce corruption and compromise of the system
- Windows Service Hardening
- Windows Firewall with Advanced Security
- Enhanced and improved TCP/IP Stack

Windows Storage Server is a **dedicated OS** for Storage that has a significantly reduced attack surface than a normal Windows Server. It does not run any exposed applications like email, browser or media player and has a reduced set of services.

Management

Microsoft Windows Storage Server 2008 provides a simple, intuitive user interface for system configuration and unified storage appliance management. Administrators and IT professionals will appreciate the ability to manage the Bosch 1400 Series using the built-in Microsoft System Center Suite. The ability to use one central tool for configuration and operations management reduces installation and training requirements, and helps keep ongoing system management costs low.

Monitoring

The 1400 Series provide SNMP, Remote Desktop and HTTP monitoring support for the Bosch VRM recording management application and the system's hardware. Increased reliability of high-availability hardware, embedded design as well system-wide monitoring and management ensure maximum uptime.

Bosch Quality

Bosch subjects all its products to the most comprehensive and rigorous battery of quality endurance tests in the industry. Our recording products are subjected to extreme temperatures, voltages and vibrations to determine true operating

limits, so you can be assured of years of reliable operation. And Bosch firmly stands behind every product it sells with an end-to-end 3 year warranty backed by technical support.

Certifications and Approvals

Region	Certification	
Europe	CE	DLA-AIOL0 1400 Series
USA	UL	DLA-AIOL0 1400 Series

Installation/Configuration Notes

The 1400 Series comes pre-configured in a RAID-5 standard configuration with 4 LUNs and provides the following specifications:

Gross Capacity	Net Capacity	Bandwidth	iSCSI Sessions
4 x 1 TB	2690 GB	200 Mbit/s	64+

These values refer to the Bosch recording applications; Net capacity for a RAID-5 configuration without hot spare; 64+ concurrent iSCSI sessions indicate the number of concurrent recording sessions plus 8 sessions for replay. The 1400 Series may be upgraded once with an additional 64 channel license. The respective upgrade license has to be purchased. The upgrade allows for a maximum of 128+ sessions: 128 sessions for recording, 8 sessions for replay.



Notice

The 1400 Series only supports Divar 700 if an Uninterruptable Power Supply (UPS) is used. We strongly recommend using an "Online UPS" with an always active battery. The UPS must support Windows Storage Server 2008 and must be sufficient to allow time to bring an auxiliary power source on line, or to properly shut down the 1400 Series disk array(s).



Notice

The 1400 Series is an all-in-one recording solution and does not include any video management or viewing application. Video management or viewing software must be installed on separate hardware.



Notice

Bosch is not liable for system failures of DLA 1400 Series units without internal hard drives (available in the Asia-Pacific-Region only).

Parts Included

Processor

Processor	Intel® Pentium G6950 Dual Core (3M Cache, 2.8 GHz)
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EXHIBIT B

Socket	1
Cache memory	1 x 3 MB Level 2 cache
Memory protection	ECC Unbuffered
Max front side bus	1333 MHz
Memory	
Memory Installed	4 GB, DDR3-1333 ECC UNB (2 x 2 GB)
Storage	
Storage Type	4 Trays: 3.5-inch SATA
Hard Drives Installed	4 TB, WD 1.0 TB 7.200 RPM 32 M 3.5"
SAS RAID Card	AOC-SASLP-H8iR (8-Ports LSI 1078 SAS Controller)

Technical Specifications

Electrical	
120 VAC Input	
Actual output wattage from power supply	202.72 W
Efficiency of power supply	88%
Total system power consumption	230.37 W
Total BTU/h	786.24
Power Factor	.95
System AC input VA requirement	242.49 VA
Input current	2.02 A
240 VAC Input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	90%
Total system power consumption	225.25 W
Total BTU/h	768.77
Power Factor	.92
System AC input VA requirement	244.83 VA
Input current	1.02 A

The 1400 Series comes fully loaded and fully functional with Microsoft Operating System and Bosch recording application pre-installed

Mechanical	
Form Factor	1 U Rack Mount (815TQ-R700)

Power Supply	700 W Gold Level Redundant
USB Ports	4 USB 2.0: 2 in rear, 2 in front, (1 Type-A Onboard)
Network	Dual Intel® 82573 Gigabit LAN
Dimensions (H x W x D)	437 x 44.5 x 648 mm (17.2 x 1.7 x 25.5 in)
Weight	16.3 kg (36 lb)
Environmental	
Operating Temperature	+10 °C to +35 °C (+50 °F to +95 °F)
Non-operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating Relative Humidity	8 to 90% (non-condensing)
Non-Operating Relative Humidity	5 to 95% (non-condensing)

Ordering Information**DLA-AIOL0-04AT**

1400 Series IP Video Storage Array, 4 x 1 TB
Order number **DLA-AIOL0-04AT**

DLA-AIOL0-000N

1400 Series IP Video Storage Array, Empty Chassis
(Asia-Pacific-Region only)
Order number **DLA-AIOL0-000N**

DLA-XVRM-064

AIO-upgrade license for 64 cameras (e-license)
Order number **DLA-XVRM-064**

Accessories**DLA-LDTK-100A**

1000 GB HDD
Order number **DLA-LDTK-100A**

EXHIBIT B

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EXHIBIT B

DLA-AIOL1 1400 Series IP Video Storage Array

www.boschsecurity.com



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- ▶ RAID-5 protected, all-in-one recording solution for up to 64 channels
- ▶ Pre-installed, pre-configured IP storage solution with 8 TB (8 x 1 TB) storage capacity
- ▶ Dedicated storage operating system delivers robust, secure operation
- ▶ Hot-swappable hard drives
- ▶ Remote monitoring via desktop application or browser

The 1400 Series IP Video Storage Appliance is an affordable, simple and reliable all-in-one recording management solution for network surveillance systems of up to 64 cameras. Powered by Bosch VRM (Video Recording Manager) software, the 1400 Series is an intelligent IP storage device that eliminates the need for separate NVR (Network Video Recorder) server and storage hardware, reducing the total cost of ownership by as much as 45%.

DLA-AIOL1 is a 2U rack mount unit that combines advanced recording management and state-of-the-art iSCSI storage into a single cost-effective, plug and play IP recording appliance for IT-minded customers which are seeking for a state-of-the-art “second generation” NVR recording solution.

System Overview

The 1400 Series IP Video Storage Appliance utilizes an energy efficient, embedded design which reduces possible points of failure and boasts Bosch quality through-and-through. Utilizing “surveillance-rated” hard drives in a fault tolerant RAID-5 configuration, redundant Gigabit Ethernet network interfaces, 4 GB

system memory and an Intel® Pentium Dual Core Processor, the DLA 1400 Series delivers high-end performance at a very affordable price. Easy to install, the DLA 1400 Series features wizard-based set-up and centralized configuration to reduce installation times by as much as 50%. All components are pre-installed and pre-configured. Simply connect to the network and power the unit up—the 1400 Series is ready to begin recording straight out of the box. To create a complete video management solution, just add either Bosch Video Client or Bosch Video Management System (VMS). Bosch VMS Lite—for up to 64 cameras—or Bosch VMS Professional Edition—for up to 128 cameras. Adding Bosch Video Management System or Bosch Video Client software turns the 1400 Series into a scalable IP video management solution.

Bosch Video Management System manages all IP and digital video and audio, plus all the security data being transmitted across your IP network. It seamlessly combines IP cameras and encoders, provides system-wide event and alarm management, system health monitoring, user and priority management.

EXHIBIT B

Bosch Video Client may be used as playback client only or to create an entry-level complete video management solution of up to 64 channels.

Functions

The 1400 Series features a single-socket-system, server-class motherboard, highly energy-efficient hot-swap redundant power supplies, as well as hot-swap SATA-II hard drives providing 8 TB of gross storage capacity. All system software is pre-installed and pre-activated—creating an out-of-the-box ready-to-use recording appliance. The DLA 1400 Series utilizes Microsoft Windows Storage Server 2008. Windows Storage Server is a proven operating system platform that has been specifically optimized for storage applications. The Microsoft implementation of iSCSI is a reference in the industry. It delivers the highest possible quality and reliability, and is a field-proven technology installed on millions of servers worldwide. This next generation of Windows Storage Server is focused on providing a secure platform:

- Hardened platform with reduced high risk layers
- Prevent abnormal activity in the file system and registry
- Re-architected platform to reduce corruption and compromise of the system
- Windows Service Hardening
- Windows Firewall with Advanced Security
- Enhanced and improved TCP/IP Stack

Windows Storage Server is a **dedicated OS** for Storage that has a significantly reduced attack surface than a normal Windows Server. It does not run any exposed applications like email, browser or media player and has a reduced set of services.

Management

Microsoft Windows Storage Server 2008 provides a simple, intuitive user interface for system configuration and unified storage appliance management. Administrators and IT professionals will appreciate the ability to manage the Bosch 1400 Series using the built-in Microsoft System Center Suite. The ability to use one central tool for configuration and operations management reduces installation and training requirements, and helps keep ongoing system management costs low.

Monitoring

The 1400 Series provides SNMP, Remote Desktop and HTTP monitoring support for the Bosch VRM recording management application and the system's hardware. Increased reliability of high-availability hardware, embedded design as well system-wide monitoring and management ensure maximum uptime.

Bosch Quality

Bosch subjects all its products to the most comprehensive and rigorous battery of quality endurance tests in the industry. Our recording products are subjected to extreme temperatures, voltages and vibrations to determine true operating

limits, so you can be assured of years of reliable operation. And Bosch firmly stands behind every product it sells with an end-to-end 3 year warranty backed by technical support.

Certifications and Approvals

Region	Certification	
Europe	CE	DLA-AIOL1 1400 Series
USA	UL	DLA-AIOL1 1400 Series

Installation/Configuration Notes

The 1400 Series comes pre-configured in a RAID-5 standard configuration with 4 LUNs and provides the following specifications:

Gross Capacity	Net Capacity	Bandwidth	iSCSI Sessions
8 x 1 TB	6415 GB	200 Mbit/s	64+

These values refer to the Bosch recording applications; Net capacity for a RAID-5 configuration without hot spare; 64+ concurrent iSCSI sessions indicate the number of concurrent recording sessions plus 8 sessions for replay. The 1400 Series may be upgraded once with an additional 64 channel license. The respective upgrade license has to be purchased. The upgrade allows for a maximum of 128+ sessions: 128 sessions for recording, 8 sessions for replay.



Notice

The 1400 Series only supports Divar 700 if an Uninterruptable Power Supply (UPS) is used. We strongly recommend using an "Online UPS" with an always active battery. The UPS must support Windows Storage Server 2008 and must be sufficient to allow time to bring an auxiliary power source on line, or to properly shut down the 1400 Series disk array(s).



Notice

The 1400 Series is an all-in-one recording solution and does not include any video management or viewing application. Video management or viewing software must be installed on separate hardware.



Notice

Bosch is not liable for system failures of DLA 1400 Series units without internal hard drives (available in the Asia-Pacific-Region only).

Parts Included

Processor

Processor	Intel® Pentium G6950 Dual Core (3M Cache, 2.8 GHz)
-----------	--

EXHIBIT B

Socket	1
Cache memory	1 x 3 MB Level 2 cache
Memory protection	ECC Unbuffered
Max front side bus	1333 MHz
Memory	
Memory Installed	4 GB, DDR3-1333 ECC UNB (2 x 2 GB)
Storage	
Storage Type	8 Trays: 3.5-inch SATA
Hard Drives Installed	8 TB, WD 1.0 TB 7.200 RPM 32 M 3.5"
SAS RAID Card	AOC-SASLP-H8iR (8-Ports LSI 1078 SAS Controller)

Technical Specifications

Electrical	
120 VAC Input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	88%
Total system power consumption	291.41 W
Total BTU/h	994.59
Power Factor	.95
System AC input VA requirement	306.75 VA
240 VAC Input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	90%
Total system power consumption	284.94 W
Total BTU/h	972.49
Power Factor	.92
System AC input VA requirement	309.71 VA

The 1400 Series comes fully loaded and fully functional with Microsoft Operating System and Bosch recording application pre-installed

Mechanical	
Form Factor	2 U Rack Mount (825TQ-R720)
Power Supply	720 W Gold Level Redundant

USB Ports	4 USB 2.0: 2 in rear, 2 in front, (1 Type-A Onboard)
Network	Dual Intel® 82573 Gigabit LAN
Dimensions (H x W x D)	648 x 437 x 89 mm (25.5 x 17.2 x 3.5 in)
Weight	23.6 kg (52 lb)
Environmental	
Operating Temperature	+10 °C to +35 °C (+50 °F to +95 °F)
Non-operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating Relative Humidity	8 to 90% (non-condensing)
Non-Operating Relative Humidity	5 to 95% (non-condensing)

Ordering Information**DLA-AIOL1-08AT**

1400 Series IP Video Storage Array, 8 x 1 TB
Order number **DLA-AIOL1-08AT**

DLA-AIOL1-000N

1400 Series IP Video Storage Array, Empty Chassis
(Asia-Pacific-Region only)
Order number **DLA-AIOL1-000N**

DLA-XVRM-064

AIO-upgrade license for 64 cameras (e-license)
Order number **DLA-XVRM-064**

Accessories**DLA-LDTK-100A**

1000 GB HDD
Order number **DLA-LDTK-100A**

EXHIBIT B

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EXHIBIT B

DLA-AIOXL1 1400 Series IP Video Storage Array

www.boschsecurity.com



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- ▶ RAID-5 protected, all-in-one recording solution for up to 64 channels
- ▶ Pre-installed, pre-configured IP storage solution with 16 TB (8 x 2 TB) storage capacity
- ▶ Dedicated storage operating system delivers robust, secure operation
- ▶ Hot-swappable hard drives
- ▶ Remote monitoring via desktop application or browser

The 1400 Series IP Video Storage Appliance is an affordable, simple and reliable all-in-one recording management solution for network surveillance systems of up to 128 channels (with 64 channels pre-licensed). Powered by Bosch VRM (Video Recording Manager) software, the 1400 Series is an intelligent IP storage device that eliminates the need for separate NVR (Network Video Recorder) server and storage hardware, reducing the total cost of ownership by as much as 45%.

DLA-AIOXL1 is a 2U rack mount unit that combines advanced recording management and state-of-the-art iSCSI storage into a single cost-effective, plug and play IP recording appliance for IT-minded customers which are seeking for a state-of-the-art “second generation” NVR recording solution.

System Overview

The 1400 Series IP Video Storage Appliance utilizes an energy efficient, embedded design which reduces possible points of failure and boasts Bosch quality through-and-through. Utilizing “enterprise-rated” hard drives in a fault tolerant RAID-5 configuration, dual port Gigabit Ethernet network interface, 4 GB system

memory and an Intel® Pentium Dual Core Processor, the DLA 1400 Series delivers high-end performance at a very affordable price.

Easy to install, the DLA 1400 Series features wizard-based set-up and centralized configuration to reduce installation times by as much as 45%. All components are pre-installed and pre-configured. Simply connect to the network and power the unit up—the 1400 Series is ready to begin recording straight out of the box.

To create a complete video management solution, just add either Bosch Video Client or Bosch Video Management System (VMS). Bosch VMS Lite—for up to 64 cameras—or Bosch VMS Professional Edition—for up to 128 cameras. Adding Bosch Video Management System or Bosch Video Client software turns the 1400 Series into a scalable IP video management solution.

Bosch Video Management System manages all IP and digital video and audio, plus all the security data being transmitted across your IP network. It seamlessly combines IP cameras and encoders, provides system-wide event and alarm management, system health monitoring, user and priority management.

EXHIBIT B

Bosch Video Client may be used as playback client only or to create an entry-level complete video management solution of up to 64 channels.

Functions

The 1400 Series features a single-socket-system, server-class motherboard, highly energy-efficient hot-swap redundant power supplies, as well as hot-swap SATA-II hard drives providing 16 TB of gross storage capacity. All system software is pre-installed and pre-activated—creating an out-of-the-box ready-to-use recording appliance. The DLA 1400 Series utilizes Microsoft Windows Storage Server 2008. Windows Storage Server is a proven operating system platform that has been specifically optimized for storage applications. The Microsoft implementation of iSCSI is a reference in the industry. It delivers the highest possible quality and reliability, and is a field-proven technology installed on millions of servers worldwide. This next generation of Windows Storage Server is focused on providing a secure platform:

- Hardened platform with reduced high risk layers
- Prevent abnormal activity in the file system and registry
- Re-architected platform to reduce corruption and compromise of the system
- Windows Service Hardening
- Windows Firewall with Advanced Security
- Enhanced and improved TCP/IP Stack

Windows Storage Server is a dedicated OS for Storage that has a significantly reduced attack surface than a normal Windows Server. It does not run any exposed applications like email, browser or media player and has a reduced set of services.

Management

Microsoft Windows Storage Server 2008 provides a simple, intuitive user interface for system configuration and unified storage appliance management. Administrators and IT professionals will appreciate the ability to manage the Bosch 1400 Series using the built-in Microsoft System Center Suite. The ability to use one central tool for configuration and operations management reduces installation and training requirements, and helps keep ongoing system management costs low.

Monitoring

The 1400 Series provides SNMP, Remote Desktop and HTTP monitoring support for the Bosch VRM recording management application and the system's hardware. Increased reliability of high-availability hardware, embedded design as well system-wide monitoring and management ensure maximum uptime.

Bosch Quality

Bosch subjects all its products to the most comprehensive and rigorous battery of quality endurance tests in the industry. Our recording products are subjected to extreme temperatures, voltages and vibrations to determine true operating

limits, so you can be assured of years of reliable operation. And Bosch firmly stands behind every product it sells with an end-to-end 3 year warranty backed by technical support.

Certifications and Approvals

Region	Certification	
Europe	CE	DLA-AIOXL1 1400 Series
USA	UL	DLA-AIOL1 1400 Series

Installation/Configuration Notes

The 1400 Series comes pre-configured in a RAID-5 standard configuration with seven LUNs and provides the following specifications:

Gross Capacity	Net Capacity	Bandwidth	iSCSI Sessions
8 x 2 TB	12930 GB	200 Mbit/s	64+

These values refer to the Bosch iSCSI recording applications; Net capacity for a RAID-5 configuration without hot spare; 64+ concurrent iSCSI sessions indicate the number of concurrent recording sessions plus eight sessions for replay.

The 1400 Series can be upgraded once with an additional 64 channel license. The upgrade license must be purchased. The upgrade allows a maximum of 128+sessions: 128 sessions for recording, 8 sessions for replay.



Notice

The 1400 Series only supports Divar 700 if an Uninterruptable Power Supply (UPS) is used. We strongly recommend using an "Online UPS" with an always active battery. The UPS must support Windows Storage Server 2008 and must be sufficient to allow time to bring an auxiliary power source on line, or to properly shut down the 1400 Series disk array(s).



Notice

The 1400 Series is an all-in-one recording solution and does not include any video management or viewing application. Video management or viewing software must be installed on separate hardware.



Notice

Bosch is not liable for system failures of DLA 1400 Series units without internal hard drives (available in the Asia-Pacific-Region only).

Parts Included

Processor

Processor	Intel® Pentium G6950 Dual Core (3M Cache, 2.8 GHz)
-----------	--

EXHIBIT B

Socket	1
Cache memory	1 x 3 MB Level 2 cache
Memory protection	ECC Unbuffered
Max front side bus	1333 MHz
Memory	
Memory Installed	4 GB, DDR3-1333 ECC UNB (2 x 2 GB)
Storage	
Storage Type	8 Trays: 3.5-inch SATA
Hard Drives Installed	16 TB, Hitachi, 2 TB SATA/300 7.200 RPM 3.5"32 MB Cache
SAS RAID Card	2108 based SAS/SATA RAID card – 8 internal ports/Low profile-PCI-E

USB Ports	4 USB 2.0: 2 in rear, 2 in front, (1 Type-A Onboard)
Network	Dual Intel® 82574L Gigabit LAN
Dimensions (H x W x D)	89 x 437 x 648 mm (3.5 x 17.2 x 25.5 in)
Weight	23.6 kg (52 lb)

Environmental	
Operating Temperature	+10 °C to +35 °C (+50 °F to +95 °F)
Non-operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating Relative Humidity	8 to 90% (non-condensing)
Non-Operating Relative Humidity	5 to 95% (non-condensing)

Technical Specifications

Electrical	
120 VAC Input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	88%
Total system power consumption	291.41 W
Total BTU/h	994.59
Power Factor	.95
System AC input VA requirement	306.75 VA
240 VAC Input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	90%
Total system power consumption	284.94 W
Total BTU/h	972.49
Power Factor	.92
System AC input VA requirement	309.71 VA

The 1400 Series comes fully loaded and fully functional with Microsoft Operating System and Bosch recording application pre-installed

Mechanical	
Form Factor	2 U Rack Mount
Power Supply	720 W Gold Level Redundant

Ordering Information

DLA-AIOXL1-08AT
1400 Series IP Video Storage Array, 8 x 2 TB
Order number **DLA-AIOXL1-08AT**

DLA-AIOL1-000N
1400 Series IP Video Storage Array, Empty Chassis
(Asia-Pacific-Region only)
Order number **DLA-AIOL1-000N**

DLA-XVRM-064
AIO-upgrade license for 64 cameras (e-license)
Order number **DLA-XVRM-064**

Accessories
DLA-LDTK-200A
2000 GB HDD
Order number **DLA-LDTK-200A**

EXHIBIT B

Represented by:

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www.boschsecurity.com

EXHIBIT B

VIP X16 XF E Video Encoder

www.boschsecurity.com



BOSCH
Invented for life



- ▶ 16 video input channels with Dual Streaming
- ▶ Deinterlacing at video input and progressive encoding
- ▶ Network-attached iSCSI recording
- ▶ Motion detection and privacy masking
- ▶ ONVIF conformant

Bosch VIP X16 XF E is a 16-channel CCTV video encoder that offers top-of-the-line Video-over-IP performance for CCTV today.

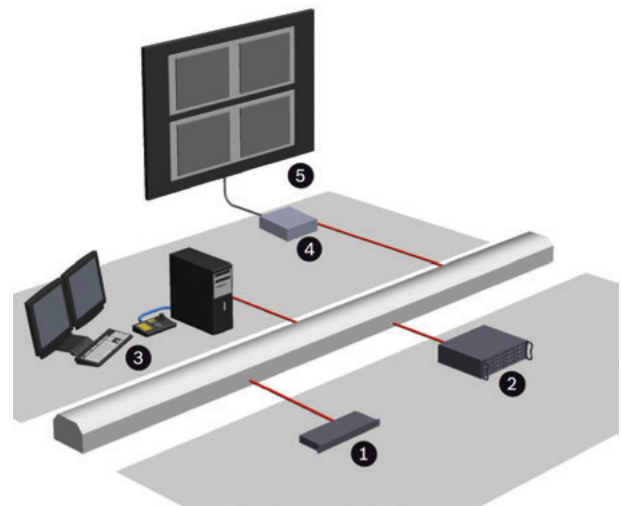
The device provides a 1 Gbps Ethernet port on the rear.

The VIP X16 XF E H.264 High Profile encoder delivers real-time H.264 compressed video over IPv4 and IPv6 networks. It provides a single stream per camera with full frame rate at best quality and Dual Streaming with limits in frame rate.

The unit supports PAL and NTSC sources and offers bidirectional audio communication in parallel to video. View the video on a PC using Bosch's comprehensive video management system, with or without Bosch's IntuiKey keyboard. Alternatively, use a Web browser. Bosch VideoSDK provides the means to integrate the encoder with other video management systems.

With 16 channels in a rack-mountable 1HU form factor VIP X16 XF E offers the highest port density at this quality of video.

System overview



- 1 VIP X16 XF E with 16 analog cameras, network-attached iSCSI storage, or streaming only
- 2 Network-attached iSCSI RAID unit
- 3 Management station with CCTV keyboard
- 4 Decoder
- 5 Monitors

EXHIBIT B

Functions

Flexibility

VIP X16 XF E supports external iSCSI storage across an IP network.

VIP X16 XF E supports the Bosch VRM (Video Recording Manager), Bosch's flexible and scalable recording management software. It allows a flexible assignment of recording space on camera level including load balancing and decent redundancy features. Bosch VRM is available as stand-alone system or embedded into the Bosch Video Management System.

Dual Streaming

The VIP X16 XF E encoder uses the feature Dual Streaming to generate two independent IP video streams per channel, both at full 4CIF resolution, the first stream with full frame rate and the second stream with lower frame rate.

Recording

You can record each video input independently on different media. Thus video can be recorded centrally on iSCSI drives managed by Bosch VRM.

The encoder features a highly flexible recording scheduler, providing up to ten programmable recording profiles and allowing individually assigned camera profiles. With these profiles, you can accelerate the frame rate as well as increase the quality on alarm, saving recording space during non-alarm periods.

Access security

The VIP X16 XF E encoder offers various security levels for accessing the network, the unit, and the data channels. As well as password protection with up to three levels, they support 802.1x authentication using a RADIUS server for identification. You can secure Web browser access by HTTPS using a SSL certificate that is stored in the unit. For total data protection, each communication channel—video, audio, or serial I/O—can be independently AES encrypted with 128-bit keys, once the Encryption Site License has been applied.

Intelligence

VIP X16 XF E comes with built-in MOTION+ video motion detection. This motion detection algorithm is based on pixel change and includes object size filtering capabilities.

On alarm, VIP X16 XF E can send an e-mail with JPEG images attached.

Viewing

View the VIP X16 XF E encoder video on a PC using a Web browser, in the Bosch Video Management System, or integrate it into another video management system. By routing the IP video to a high-performance decoder VIP XD HD or a Monitor Wall, you can present the video with ultimate clarity.

Easy upgrade

Remotely upgrade VIP X16 XF E whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

ONVIF conformance

Conformance to ONVIF 1.02 and ONVIF Profile S provides interoperability between network video products regardless of manufacturer. In addition, the firmware of the device supports all applicable features of the ONVIF 2.2 specification.

ONVIF conformant devices are able to exchange live video, audio, metadata, and control information and ensure that they are automatically discovered and connected to network applications such as video management systems.

Certifications and approvals

Safety

Region	Number
	IEC 60950

System

Region	Number
	IEC 62676-2
	EN50132-5-2

Electromagnetic Compatibility

Region	Number
EU	EN55103-1 Video and audio equipment
	EN55103-2
	EN50130-4 Alarm systems
	EN50121-4
	EN55022 ITE
	EN55024 ITE
	EN61000-3-2
	EN61000-3-3
US	FCC 47 CFR, Part 15 Subpart B Class B
AU	AS/NZS 3548 Class B

Approvals

Region	Certification	
Europe	CE	Declaration of Conformity VIP X16 XF E
USA	UL	Certificate of Compliance VIP X16 XF E
	UL	Bosch Engineering UL online certifications directory (link)

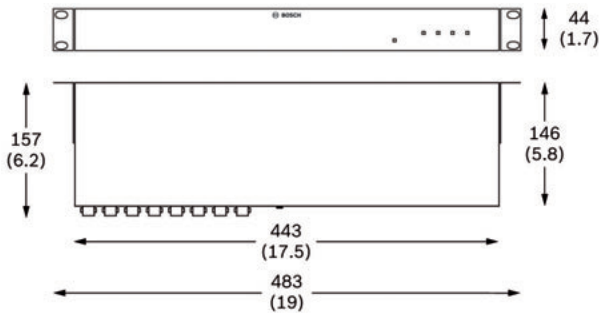
EXHIBIT B

Installation/configuration notes

	Stream 1	Stream 2
4CIF	25/30 ips	6.25/7.5 ips

ips = frame rate in images per second

Dimensions



Dimensions in mm (in)

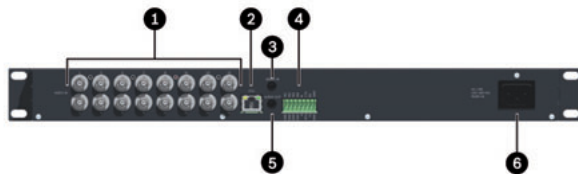
Front view



VIP X16 XF E-front

- 1 Factory reset button
- 2 LED ACTIVITY
- 3 LED LINK
- 4 LED STATUS
- 5 LED CONNECT

Rear view



VIP X16 XF E-rear

- 1 VIDEO IN 1 to 16
- 2 1 x 10/100/1000 Base-T Gigabit Ethernet
- 3 AUDIO IN
- 4 Alarm in, relay out, COM (RS-232/422/485)
- 5 AUDIO OUT
- 6 Power supply input

Parts included

Quantity	Component
1	VIP-X16XF-E
1	Accessory bag
1	Installation Manual
2	Power cords (EU/US one each)

Technical specifications

Input/output	
Video	16 x input
• connector	BNC
• impedance	75 ohm, terminated
• signal	Analog composite, 0.7 to 1.2 Vpp, NTSC or PAL
Audio	2 x mono in, microphone/line 1 x mono line out
• connector	2 x 3.5 mm (1/8 in) stereo jack
• signal line in	9 kohm typical, 5.5 Vpp max, microphone amplifier 60 dB max
• signal line out	3.0 Vpp at 10 kohm
Alarm	4 x input
• connector	Clamp (non-isolated closing contact)
• activation resistance	10 ohm max
Relay	1 x output
• connector	Clamp
• signal	30 Vpp (SELV), 0.2 A
COM port	Clamp, RS-232/422/485
Video	
Standards	H.264 High Profile (ISO/IEC 14496-10) M-JPEG
Data rates	9.6 kbps to 2 Mbps per channel
Resolution (Horizontal x vertical PAL/NTSC)	4CIF 704 x 576/480
GOP structure	I, IP
Total delay	260 ms typical
Dual Streaming	Full performance on first stream, limited frame rate on second stream
Frame rate	1 to 25/30 ips

EXHIBIT B

Audio	
AAC	
• Profile	AAC-LC
• Frequency rate	300 Hz to 6.4 kHz
• Data rate	48 kbps at 16 kHz sampling rate
G.711	
• Frequency rate	300 Hz to 3.4 kHz
• Data rate	80 kbps at 8 kHz sampling rate
L16	
• Frequency rate	300 Hz to 6.4 kHz
• Data rate	640 kbps at 16 kHz sampling rate
Signal-to-noise ratio	> 50 dB
Network	
Ethernet	10/100/1000 Base-T, auto sensing, half/full duplex, RJ45
Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNMP, 802.1x, SMTP, iSCSI, UPnP (SSDP)
Connections	16 simultaneous unicast/multicast
Encryption	TLS 1.0, SSL, AES (licensed option)
Control	
Software update	Flash ROM, remote programmable
Configuration	Configuration Manager or Web browser
Camera control	Via serial interface; supported* protocols and devices:
• Bosch	AutoDome, HSPT, MIC1-300 IP, TC8x00
• Canon	VCC1, VC-C4R
• CBC	SMD 12P/12P/20P
• JVC	TK-C676
• Panasonic	WV-CS850
• Pelco	Spectra D/P
• Sensomatic	SpeedDome Ultra
• Sony	EVI D30/31/D100
• Ultrak	KD6
• VT	VPT4x
* Basic functions only, no claim for full functionality valid. Bosch may not be made responsible if functions are not implemented or not working under all circumstances.	

Mechanical	
Dimensions (H x W x D)	44 x 483 x 157 mm (1.7 x 19 x 6.2 in)
Color	RAL 9017 (Traffic Black)
Weight	Approx. 1.7 kg (3.7 lb)
Electrical	
Input voltage	100 to 240 VAC, 47 to 63 Hz
Input current	0.32 to 0.15 A
Power consumption	16 W
Connectors	IEC 320 C14
Environmental	
Operating temperature	0 °C to +50 °C (+32 °F to +122 °F)
Storage temperature	0 °C to +50 °C (+32 °F to +122 °F)
Relative humidity	0 to 95%, non-condensing
Thermal value	55 BTU/h max

Ordering information**VIP-X16XF-E**

Multi-channel encoder
Order number **VIP-X16XF-E**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.

Order number **MVS-FENC-AES**

Accessories**DSA-N2E6X2-08AT**

DSA E-Series Base Unit, 8 x 2 TB
Order number **DSA-N2E6X2-08AT**

DSA-N2E6X2-12AT

DSA E-Series Base Unit, 12 x 2 TB
Order number **DSA-N2E6X2-12AT**

DSA-N2C6X2-12AT

DSA E-Series Base Unit Dual Controller, 12 x 2 TB
Order number **DSA-N2C6X2-12AT**

DSX-N1D6X2-12AT

DSA E-Series Expansion Unit, 12 x 2 TB
Order number **DSX-N1D6X2-12AT**

DSX-N6D6X3-60AT

DSA E-Series Expansion Unit, 60 x 3 TB
Order number **DSX-N6D6X3-60AT**

EXHIBIT B

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EXHIBIT B

VideoJet X20/X40 XF E H.264 Video Encoder

www.boschsecurity.com



BOSCH
Invented for life



- ▶ High-quality H.264 video over IPv4 and IPv6
- ▶ Bandwidth-friendly adaptive bit rate encoding
- ▶ Transcoding at the edge for advanced remote replay
- ▶ Network-attached RAID storage via iSCSI
- ▶ Local recording on CF card

Bosch VideoJet X20/X40 XF E encoders belong to a family of high-performance, dual- or quad-input CCTV video encoders that deliver real-time H.264 compressed video over IPv4 and IPv6 networks. The units provide two independent streams per camera with full frame rate at best quality for different purposes, like one stream for live viewing with lowest delay while the second stream is optimized for requiring only little recording space. VideoJet X20/X40 XF E encoders support PAL and NTSC sources and provide bidirectional audio communication in parallel to video. They are built into a housing that can be easily rack- or wall-mounted. These powerful and flexible devices represent the cutting edge of high-performance Video-over-IP for CCTV today.

Functions

Flexibility

VideoJet X20/X40 XF E encoders offer unparalleled recording flexibility. Stream video across the network and store it using Network Video Recorders (NVRs). Record locally on CompactFlash, or network-attached RAID iSCSI storage devices. The built-in iSCSI support

enables the VideoJet X20/X40 XF E encoders to act as conventional DVRs while streaming high-performance live video across the network.

Triple streaming

The VideoJet X20/X40 XF E encoders use Dual Streaming to generate two independent IP video streams per channel. This allows viewing and recording at two different quality levels to save disk space and bandwidth. As a third stream for easier third-party integration they provide an independently configured M-JPEG stream. On alarm, they can send an e-mail with JPEG images attached.

Viewing

View the VideoJet X20/X40 XF E encoder video on a PC using a Web browser, in the Bosch Video Management System, or integrate it into another video management system. By routing the IP video to a high-performance VIP XD HD video decoder you can present the video with ultimate clarity. Adaptive bit rate encoding enables viewing from remote sites over bandwidth-limited connections and wireless connections to mobile clients. Latest HTML5 technologies provide easy access from Android, Windows Phone and iOS based mobile devices.

EXHIBIT B

Region of interest (ROI)

Get every detail even on lower bandwidth or smaller video window by panning, tilting and zooming a region-of-interest cut-out from the full image. ROI is possible on both live viewing and playback of recordings.

Advanced remote playback

Bosch's latest enhancements—Adaptive Bit Rate encoding and transcoding—allow replay of recordings over bandwidth-limited connections with smooth browsing through the footage while not missing any detail. Be it a remote guard searching for a specific evidence or alerted by alarm notification, quick access to the relevant recording is easily achieved, and recorded images are presented in original quality even over weak links.

Dual recording

You can record the streams independently on different media. Thus video can be recorded centrally on iSCSI drives managed by VRM Video Recording Manager and redundantly on the local media.

Pre-alarm recording in RAM reduces recording bandwidth on the network, or — if CFcard recording is used — extends the effective life of the storage medium.

Recording profiles

The encoders feature a highly flexible recording scheduler, providing up to ten programmable recording profiles and allowing individually assigned camera profiles. With these profiles, you can accelerate the frame rate as well as increase the resolution on alarm, saving recording space during non-alarm periods.

H.264 Main Profile and Baseline Profile encoding

Bosch VideoJet X20/X40 XF E encoders use H.264 Main Profile and Baseline Profile to encode the video signal. H.264 Main Profile allows encoding with the best encoding and compression efficiency while H.264 Baseline Profile maintains backward compatibility to less-advanced decoders.

Frame rates and resolution

The VideoJet X20/X40 XF E encoders provide dedicated hardware for encoding and thus are not limited in frame rate and resolution settings, nor in Dual Streaming.

Access security

The VideoJet X20/X40 XF E encoders offer various security levels for accessing the network, the unit, and the data channels. As well as password protection with three levels, they support 802.1x authentication using a RADIUS server for identification. You can secure Web browser access by HTTPS using a SSL certificate that is stored in the unit. For total data protection, each communication channel—video, audio, or serial I/O—can be independently AES encrypted with 128-bit keys, once the Encryption Site License has been applied.

Intelligence

VideoJet X20/X40 XF E comes with built-in MOTION+ video motion detection. This motion detection algorithm is based on pixel change and includes object size filtering capabilities and sensitivity settings.

Camera control

Configure and control your camera or dome using one of the various pre-defined control protocols. VideoJet X20/X40 XF E encoders provide a serial interface.

Easy upgrade

Remotely upgrade the VideoJet X20/X40 XF E encoders whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

ONVIF conformance

Conformance to ONVIF 1.02 and ONVIF Profile S provides interoperability between network video products regardless of manufacturer. In addition, the firmware of the device supports all applicable features of the ONVIF 2.2 specification.

ONVIF conformant devices are able to exchange live video, audio, metadata, and control information and ensure that they are automatically discovered and connected to network applications such as video management systems.

Certifications and approvals

Safety

Region	Number
	IEC 60950-1

System

Region	Number
	IEC 62676-2
	EN 50132-5-2

Electromagnetic Compatibility

Region	Number
EU	EN 55103-1 Video and audio equipment
	EN 55103-2
	EN 50130-4 Alarm systems
	EN 50121-4 Railway
	EN 55022 ITE
	EN 55024 ITE
AUS/NZ	EN 61000-3-2
	EN 61000-3-3
	AS/NZS 3548 Class B
US	FCC 47 CFR Part 15 Subpart B Class B

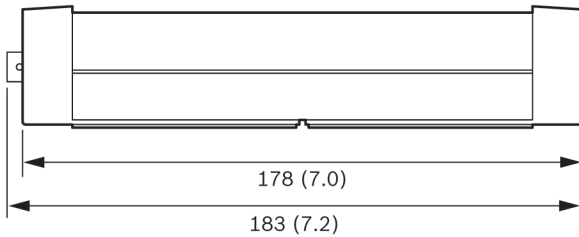
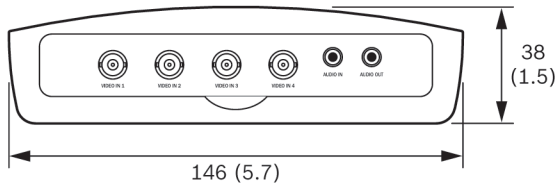
EXHIBIT B

Approvals

Region	Certification	
USA	UL	Bosch Engineering UL online certifications directory (link)
Europe	CE	VideoJet XF

Installation/configuration notes

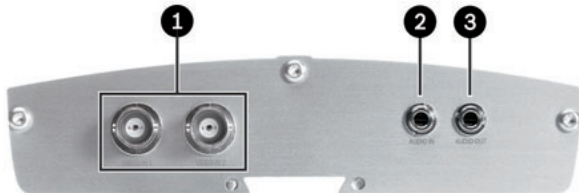
Dimensions



Dimensions in mm (in)

VideoJet X20 XF E:

Front Connectors and Indicators

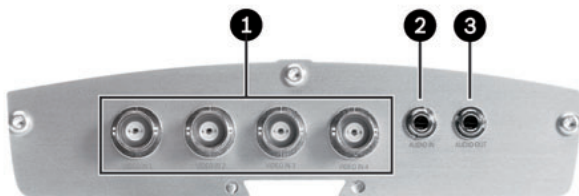


VideoJet front view

- 1 VIDEO IN 1 to VIDEO IN 2
- 2 AUDIO IN
- 3 AUDIO OUT

VideoJet X40 XF:

Front Connectors and Indicators

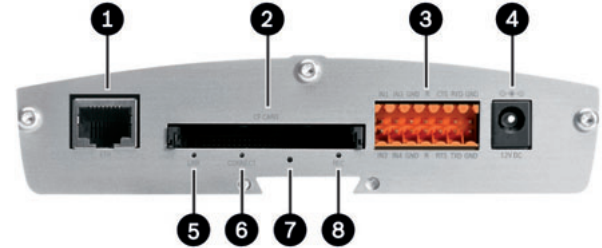


VideoJet front view

- 1 VIDEO IN 1 to VIDEO IN 4
- 2 AUDIO IN
- 3 AUDIO OUT

VideoJet X20/X40 XF E

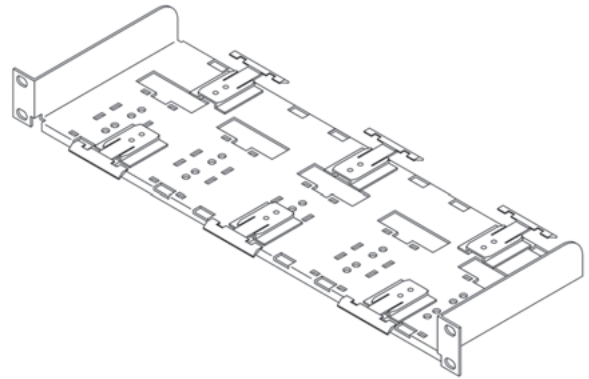
Rear Connectors and Indicators



VideoJet rear view

- 1 10/100 Base-T Fast Ethernet
- 2 CF CARD slot
- 3 Alarm in, relay out, COM (RS-232/422/485)
- 4 Power 12 VDC
- 5 LED LINK
- 6 LED CONNECT
- 7 Factory reset button
- 8 LED REC

Rack Mounting Kit (Optional)



Parts included

Quantity	Component
1	VideoJet X20 XF E encoder with 2 video inputs, or VideoJet X40 XF E encoder with 4 video inputs
1	Quick Installation Guide
1	Safety Hints document
1	Power supply unit with 3 primary adapters (EU, US, UK)
1	Set of spring clamp contact connectors, wall mount and desktop accessories

EXHIBIT B**Technical specifications**

Input/output	
Video	X20: 2 x input
	X40: 4 x input
• connector	BNC
• impedance	75 ohm, switchable
• signal	Analog composite, 0.7 to 1.2 Vpp, NTSC or PAL
Audio	2 x mono line in, 1 x mono line out
• connector	2 x 3.5 mm stereo jack
• signal line in	9 kohm typical, 5.5 Vpp max
• signal line out	3.0 Vpp at 10 kohm / 1.7 Vpp at 16 ohm typical
Alarm	4 x input
• connector	Clamp (non-isolated closing contact)
• activation resistance	10 ohm max
Relay	1 x output
• connector	Clamp
• signal	30 Vpp (SELV), 200 mA
COM port	Clamp, RS-232/422/485
Video	
Standards	H.264 Main Profile, H.264 Baseline Profile (ISO/IEC 14496-10)
Data rates	9.6 kbps to 6 Mbps per channel
GOP structure	I, IP, IPBB, IBRRBP
Overall IP delay	120 ms
Frame rate	1 to 25/30 (PAL/NTSC)
Audio	
AAC	
• Profile	AAC-LC
• Frequency range	300 Hz to 6.4 kHz
• Data rate	48 kbps at 16 kHz sampling rate
G.711	
• Frequency range	300 Hz to 3.4 kHz
• Data rate	80 kbps at 8 kHz sampling rate
L16	
• Frequency range	300 Hz to 6.4 kHz

Audio	
• Data rate	640 kbps at 16 kHz sampling rate
Signal-to-noise ratio	> 50 dB
Network	
Ethernet	10/100 Base-T, auto-sensing, half/full duplex, RJ45
Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP, IGMP V2/V3, ICMP, RTSP, FTP, Telnet, ARP, DHCP, SNTP, SNMP (V1, MIB-II), 802.1x, SMTP, iSCSI, UPnP (SSDP)
Encryption	TLS 1.0, SSL, AES (optional)
Control	
Software update	Flash ROM, remote programmable
Configuration	Configuration Manager or Web browser
Camera control	Via serial interface; supported* protocols and devices:
• Bosch	AutoDome, HSPT, MIC1-300 IP, TC8x00
• Canon	VCC1, VC-C4R
• CBC	SMD 12P/12P/20P
• JVC	TK-C676
• Panasonic	WV-CS850
• Pelco	Spectra D/P
• Sensomatic	SpeedDome Ultra
• Sony	EVI D30/31/D100
• Ultrak	KD6
• VT	VPT4x
	* Basic functions only, no claim for full functionality valid. Bosch may not be made responsible if functions are not implemented or not working under all circumstances.
Storage medium	
CompactFlash	1 x CF slot for optional standard Type I/II CompactFlash memory card, 2 TB
Electrical	
Power supply	Via external unit
Input voltage	12 VDC
Current consumption	0.75 A
Power consumption	Approx. 9 W

EXHIBIT B

Mechanical	
Dimensions (H x W x D)	38 x 146 x 183 mm (1.5 x 5.7 x 7.2 in)
Weight	Approx. 0.6 kg (1.3 lb)
Environmental	
Operating temperature	0 °C to +50 °C (+32 °F to +122 °F) ambient temperature
Relative humidity	0 to 90% atmospheric humidity, non-condensing
Thermal value	31 BTU/h max, fully equipped

Ordering information**VJT-X20XF-E**

VideoJet X20 XF-E, H.264 video encoder with 2 video inputs

Order number **VJT-X20XF-E**

VJT-X40XF-E

VideoJet X40 XF-E, H.264 video encoder with 4 video inputs

Order number **VJT-X40XF-E**

MVS-FENC-AES BVIP AES 128 Bit Encryption

BVIP AES 128-bit encryption site license. This license is required only once per installation. It enables encrypted communication between BVIP devices and management stations.

Order number **MVS-FENC-AES**

Accessories**VIP-VJTXF-RMK Rack Mount Kit XF**

Rack Mount Kit for VideoJet XF and VIP XF encoders

Order number **VIP-VJTXF-RMK**

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EXHIBIT B

DLA-AIOU0 1200 Series IP Video Storage Appliance

www.boschsecurity.com



BOSCH
Invented for life



- ▶ All-in-one recording solution for up to 32 channels
- ▶ Pre-installed, pre-configured IP storage solution with 4 TB (4 x 1 TB) storage capacity
- ▶ Dedicated storage operating system delivers robust, secure operation
- ▶ Field-replaceable hard drives
- ▶ Remote monitoring via desktop application or browser

The 1200 Series IP Video Storage Appliance is an affordable, simple and reliable all-in-one recording management solution for network surveillance systems of up to 32 cameras. Powered by Bosch VRM (Video Recording Manager) software, the 1200 Series is an intelligent IP storage device that eliminates the need for separate NVR (Network Video Recorder) server and storage hardware, reducing the total cost of ownership by as much as 45%.

System Overview

The 1200 Series IP Video Storage Appliance utilizes an energy efficient, embedded design which reduces possible points of failure and boasts Bosch quality through-and-through. Utilizing “surveillance-rated” hard drives, redundant Gigabit Ethernet network interfaces, 4 GB system memory and an Intel® Pentium Dual Core Processor, the DLA 1200 Series delivers high-end performance at a very affordable price. Simple to install, the DLA 1200 Series features wizard-based set-up and centralized configuration to reduce installation times by as much as 50%. All components are pre-installed and pre-configured. Simply connect to the network and power the unit up—the 1200 Series is ready to begin recording straight out of the box.

To create a complete video management solution, just add either Bosch Video Client or Bosch Video Management System (VMS)—Bosch VMS Lite for up to 64 cameras. Adding Bosch Video Management System or Bosch Video Client software turns the 1200 Series into a scalable IP video management solution. Bosch Video Management System manages all IP and digital video and audio, plus all the security data being transmitted across your IP network. It seamlessly combines IP cameras and encoders, provides system-wide event and alarm management, system health monitoring, user and priority management. Bosch Video Client may be used as playback client only or to create an entry-level complete video management solution of up to 64 channels.

Functions

The silent running 1200 Series features a single-socket-system, server-class motherboard, and field-replaceable SATA II hard drives providing 4 TB of gross storage capacity. All system software is pre-installed and pre-activated—creating an out-of-the-box ready-to-use recording appliance.

EXHIBIT B

The DLA 1200 Series utilizes Microsoft Windows Storage Server 2008. Windows Storage Server is a proven operating system platform that has been specifically optimized for storage applications. The Microsoft implementation of iSCSI is a reference in the industry. It delivers the highest possible quality and reliability, and is a field-proven technology installed on millions of servers worldwide.

This next generation of Windows Storage Server is focused on providing a secure platform:

- Hardened platform with reduced high risk layers
- Prevent abnormal activity in the file system and registry
- Re-architected platform to reduce corruption and compromise of the system
- Windows Service Hardening
- Windows Firewall with Advanced Security
- Enhanced and improved TCP/IP Stack

Windows Storage Server is a **dedicated OS** for Storage that has a significantly reduced attack surface than a normal Windows Server. It does not run any exposed applications like email, browser or media player and has a reduced set of services.

Management

Microsoft Windows Storage Server 2008 provides a simple, intuitive user interface for system configuration and unified storage appliance management. Administrators and IT professionals will appreciate the ability to manage the Bosch 1200 Series using the built-in Microsoft System Center Suite. The ability to use one central tool for configuration and operations management reduces installation and training requirements, and helps keep ongoing system management costs low.

Monitoring

The 1200 Series provides SNMP support, Remote Desktop support and HTTP monitoring support for the Bosch VRM recording management application and the system's hardware. Increased reliability of high-availability hardware, embedded design as well system-wide monitoring and management ensure maximum uptime.

Bosch Quality

Bosch subjects all its products to the most comprehensive and rigorous battery of quality endurance tests in the industry. Our recording products are subjected to extreme temperatures, voltages and vibrations to determine true operating limits, so you can be assured of years of reliable operation. And Bosch firmly stands behind every product it sells with an end-to-end 3 year warranty backed by technical support.

Certifications and Approvals

Region	Certification	
Europe	CE	DLA-AIOU0 1200 Series
USA	UL	DLA-AIOU0 1200 Series

Installation/Configuration Notes

The 1200 Series comes pre-configured in a JBOD standard configuration with 1 LUN per hard drive and provides the following specifications:

Gross Capacity	Net Capacity	Bandwidth	iSCSI Sessions
4 x 1 TB	3624 GB	150 Mbit/s	32+

These values refer to the Bosch recording applications; 32+ concurrent iSCSI sessions indicate the number of concurrent recording sessions plus 4 sessions for replay. The 1200 Series may be upgraded once with an additional 32 channel license which has to be purchased. The upgrade allows for 64+ sessions: 64 sessions for recording, 4 sessions for replay.



Notice

The 1200 Series is an all-in-one recording solution and does not include any video management or viewing application. Video management or viewing software must be installed on separate hardware.



Notice

Bosch is not liable for system failures of DLA 1200 Series units without internal hard drives (available in the Asia-Pacific region only).

Parts Included

Processor

Processor Intel® Pentium G6950 Dual Core (3M Cache, 2.8 GHz)

Socket 1

Cache memory 1 x 3 MB Level 2 cache

Memory protection ECC Unbuffered

Max front side bus 1333 MHz

Memory

Memory Installed 4 GB, DDR3-1333 ECC UNB (2 x 2 GB)

Storage

Storage Type 4 Trays: 3.5-inch SATA

Hard Drives Installed 4 TB, WD 1.0 TB 7.200 RPM 32 M 3.5"

Storage Controller Embedded SATA RAID

EXHIBIT B**Technical Specifications**

Electrical	
120 VAC Input	
Actual output wattage from power supply	170.52 W
Efficiency of power supply	85%
Total system power consumption	200.61 W
Total BTU/h	684.70
Power Factor	.98
System AC input VA requirement	204.71 VA
240 VAC Input	
Actual output wattage from power supply	170.52 W
Efficiency of power supply	86%
Total system power consumption	198.28 W
Total BTU/h	676.74
Power Factor	.92
System AC input VA requirement	206.54 VA

The 1200 Series comes fully loaded and fully functional with Microsoft Operating System and Bosch recording application pre-installed

Mechanical	
Form Factor	Mid-Tower (731D-300)
Power Supply	300 W high efficiency
USB Ports	2 USB 2.0: 2 in rear, (1 Type-A Onboard)
Network	Dual Intel® 82573 Gigabit LAN
Dimensions (H x W x D)	425 x 363 x 183 mm (16.75 x 14.25 x 7.25 in)
Weight	10.8 kg (23.8 lb)

Environmental	
Operating Temperature	+10 °C to +35 °C (+50 °F to +95 °F)
Non-operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating Relative Humidity	8 to 90% (non-condensing)
Non-Operating Relative Humidity	5 to 95% (non-condensing)

Ordering Information**DLA-AIOU0-04AT**

1200 Series IP Video Storage System, 4 x 1 TB
Order number **DLA-AIOU0-04AT**

DLA-AIOU0-000N

1200 Series IP Video Storage System, Empty Chassis (Asia-Pacific-Region only)
Order number **DLA-AIOU0-000N**

DLA-XVRM-032

AIO-upgrade license for 32 cameras (e-license)
Order number **DLA-XVRM-032**

Accessories**DLA-UDTK-100A**

1000 GB HDD
Order number **DLA-UDTK-100A**

EXHIBIT B

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EXHIBIT B

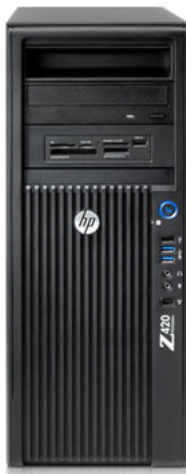
Z420 EE Management Workstation

www.boschsecurity.com



BOSCH

Invented for life



- ▶ Highest-performance workstation with Intel's latest-generation microarchitecture
- ▶ Four-monitor support (AMD FirePro V7900, 2 GB graphics card)
- ▶ Silent running with HP liquid cooling solution
- ▶ Protected by HP Services, including a 3 years Next Business Day on-site support

This HP Z420 management workstation with its latest processing and I/O power from Intel, and the latest graphics technology from leading graphics providers is designed for video-oriented applications that require high performance and most advanced visualization. HP Z420 features a smart chassis that offers tool-less access to the inside and easy configurability for seamless deployment. And with liquid cooling designed to deliver whisper-quiet performance, HP Z420 is built to minimizing power and cooling costs with ENERGY STAR qualified configurations featuring 90% efficient power supplies while taking on bigger computing challenges with the new Intel vPro technology and the latest Intel Xeon six-core processor:

- Intel Xeon E5-1650 (3.2 GHz, 12 MB cache, 1600 MHz memory speed, Six-Core, HT, Turbo)
- 8 GB (4 x 2 GB) DDR3-1600 ECC unbuffered RAM

HP Z420 is a workstation solution based on the Intel C602 Chipset using Intel's vPro technology and on 8 DIMM slots in 4-channel memory architecture. With 2 x PCI Express Gen3 x16 mechanical/electrical, 1 x PCI Express Gen3 x8 mechanical/electrical, 1 x PCI Express Gen2 x8 mechanical/x4 electrical,

1 x PCI Express Gen2 x4 mechanical/x1 electrical and 1 x Legacy PCI, HP Z420 delivers high performance bandwidth interfaces and future expandability:

- The architecture of this management workstation delivers next generation I/O throughput to handle future high throughput and visualization requirements.
- The ultra high-end AMD FirePro V7900 (2 GB, 4 x display ports) 3D graphics card ensures highest performance and resolution for fast presentation of displayed video data.

The convertible minitower chassis allows for Minitower or Desktop orientation.

System overview

Z420 EE Management Workstation is the highest-performance workstation suitable for running the security systems software applications offered by Bosch.

Please refer to the respective application data sheets to get detailed information.

Intel Microarchitecture offers the latest in processor innovation, including:

EXHIBIT B

- Design and performance scalability with Intel Hyper-Threading Technology (Intel HT Technology), scalable cache sizes, system interconnects, and integrated memory controllers.
- Intel Turbo Boost Technology delivers additional performance automatically when needed by taking advantage of the processor's power and thermal headroom.
- Intel Hyper-Threading Technology brings high-performance applications into mainstream computing with 1-16+ threads optimized for a new generation multi-core processor architecture.
- Intel vPro Technology for maximized, hardware-assisted security and manageability

Certifications and approvals

RoHS	Compliant with the Restrictions of Hazardous Substances (RoHS) directive–2002/95/EC
WEEE	Designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive–2002/96/EC
ISO 11469 ISO 1043	Plastic parts used in the product weighing over 25 g are marked per ISO 11469 and ISO 1043
	Contains 0% recycled materials (by weight)
	Product is >90% recyclable when properly disposed of at end-of-life

Approvals

Region	Certification
Global	DOC Z420 Declaration of Conformity (CE + UL)

Installation/configuration notes

Language selection

This management workstation comes in four standard localizations:

MHW-WZ4R2-EEDE German localization/keyboard

MHW-WZ4R2-EEUK British English localization/keyboard

MHW-WZ4R2-EERU Russian localization/keyboard

MHW-WZ4R2-EEUS American English localization/keyboard

Additional optional keyboards listed under **Ordering Information** are available.



Notice

The Bosch management workstation provides a MUI (Multilingual User Interface). With MUI installed the language of the workstation may be changed after initial installation (for details see document “Installation Note MUI on Bosch Platforms”).

Parts included

Quantity	Components
1	HP Z420 8-DIMM Workstation
1	• HP Z420 localization kit (select desired language)
1	• HP Z420 600 W, 90% efficient chassis
1	• 500 GB, 7200 RPM SATA, 1st HDD
1	• HP USB standard keyboard
1	• HP USB optical scroll mouse
1	• HP blue-ray writer SATA 1st ODD
1	• Intel Xeon E5-1650 (3.2/12 MB/1600 6C CPU)
1	• 8 GB (4 x 2 GB) DDR3-1600 ECC RAM
1	• AMD FirePro V7900, 2 GB, 4 x display port graphics card
1	• HP serial port adapter kit
1	Microsoft Windows 7 Ultimate Edition, 64-bit OS
1	HP 3-year Next Business Day on-site hardware support

Technical specifications

Electrical	
Power supply	600 W, 90% efficient, custom PSU (wide ranging, active Power Factor Correction)
Operating voltage range	90 to 269 VAC
Rated voltage range	100 to 240 VAC
	118 VAC
Rated line frequency	50/60 Hz (at 100 to 240 VAC)
	400 HZ (at 118 VAC)
Operating line frequency range	47 to 66 Hz (at 100 to 240 VAC)
	393 to 407 HZ (at 118 VAC)
Rated input current	100 to 240 VAC at 8.0 A
	118 VAC at 8.0 A
Power consumption in sleep mode (defined by ENERGY STAR)—suspend to RAM (S3) (instantly available PC)	<10 W
Heat dissipation (configuration and software dependent)	1365 BTU/h typical (344 kcal/h)
	2354 BTU/h max (593 kcal/h)
Power supply fan	92 x 25 mm variable speed

EXHIBIT B

Electrical	
ENERGY STAR qualified	Yes
80 PLUS compliant	Yes, 90% efficient
Mechanical	
Form factor	Convertible minitower
Chassis dimensions (H x W x D)	
<ul style="list-style-type: none"> Standard minitower orientation 	44.76 x 17.78 x 44.52 cm (17.6 x 7.0 x 17.5 in)
<ul style="list-style-type: none"> Converted desktop orientation 	17.78 x 44.76 x 44.52 cm (7.0 x 17.6 x 17.5 in)
Environmental	
Temperature	
<ul style="list-style-type: none"> operating 	5 °C to 35 °C (40 °F to 95 °F)
<ul style="list-style-type: none"> non-operating 	-40 °C to 60 °C (-40 °F to 140 °F)
Humidity	
<ul style="list-style-type: none"> operating 	8 to 85% relative humidity, non-condensing
<ul style="list-style-type: none"> non-operating 	8 to 90% relative humidity, non-condensing
Maximum altitude (non-pressurized)	
<ul style="list-style-type: none"> operating 	3,048 m (10,000 feet)
<ul style="list-style-type: none"> non-operating 	9,144 m (30,000 feet)

Notes:

- General technical specifications for the workstation are provided in the HP Z420 QuickSpecs (**Worldwide—Version 9—January 8, 2012**).
- Configuration specifications are supplied in the Parts Included section.

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AMD FirePro is a registered trademark of Advanced Micro Devices Inc., all rights reserved.

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80 PLUS is a registered trademark of Ecos, all rights reserved.

Ordering information**MHW-WZ4R2-EEDE Management Workstation**

Highest-performance workstation, German localization included

Order number **MHW-WZ4R2-EEDE**

MHW-WZ4R2-EEUK Management Workstation

Highest-performance workstation, British English localization included

Order number **MHW-WZ4R2-EEUK**

MHW-WZ4R2-EERU Management Workstation

Highest-performance workstation, Russian localization included

Order number **MHW-WZ4R2-EERU**

MHW-WZ4R2-EEUS Management Workstation

Highest-performance workstation, American English localization included

Order number **MHW-WZ4R2-EEUS**

Accessories**MHW-AWLCK-CZ**

Localization (Keyboard): Czech Republic—Czech

Order number **MHW-AWLCK-CZ**

MHW-AWLCK-DK

Localization (Keyboard): Denmark—English

Order number **MHW-AWLCK-DK**

MHW-AWLCK-ESP

Localization (Keyboard): Spain—Spanish

Order number **MHW-AWLCK-ESP**

MHW-AWLCK-FR

Localization (Keyboard): France—French

Order number **MHW-AWLCK-FR**

MHW-AWLCK-IT

Localization (Keyboard): Italy—Italian

Order number **MHW-AWLCK-IT**

MHW-AWLCK-NL

Localization (Keyboard): Netherlands—Dutch

Order number **MHW-AWLCK-NL**

MHW-AWLCK-NO

Localization (Keyboard): Norway—Norwegian

Order number **MHW-AWLCK-NO**

MHW-AWLCK-SE

Localization (Keyboard): Sweden—Swedish

Order number **MHW-AWLCK-SE**

MHW-AWLCK-SUI

Localization (Keyboard): Switzerland—French/German

Order number **MHW-AWLCK-SUI**

EXHIBIT B

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EXHIBIT B

Bosch Recording Station Appliance

www.boschsecurity.com



- ▶ Ready out of the box Recording and Management System for IP video
- ▶ Connect up to 64 video sources per station
- ▶ Supports Bosch H.264/MPEG4, third-party MPEG-4 and JPEG devices, and HD/Megapixel cameras
- ▶ Low bandwidth (WAN) support
- ▶ Interfaces with Bosch intrusion, fire and access solutions

The Bosch Recording Station software is pre-installed on a dedicated Appliance that is ready to go out of the box. The application provides a simple to install and intuitive to use solution for managing multiple locations.

The BRS Appliance is available as stand-alone, all-in-one tower PCs and rack-mounted server units supporting RAID5 redundancy, and comes pre-licensed for 8 IP cameras. Tower units support recording and playback. Rack versions provide recording only, playback is possible via a separate 'viewing station' on a standard PC with BRS Viewer installed.

Building on DiBos technology the Recording Station uses Bosch's proven video management, recording and communications technology and takes IP based video surveillance to a new level. It forms an integral part of overall security solutions for many applications – including banks, large retailers, railway stations, city centers, industrial facilities and office buildings.

With Recording Station you can retrieve live and recorded video from anywhere in the network. Whether they are on site or at a remote network location, authorized personnel have quick, convenient access to all information making Recording Station the perfect solution for surveillance over distributed networks.

Recording Station supports live viewing and recording at any resolution up to 2048 x 1536 pixels (3 Megapixel) including HD widescreen resolutions. It manages

up to 64 IP video sources (Bosch and 3rd party) that are compatible to the following video compression standards:

- Bosch H.264
- Bosch MPEG-4
- Axis MPEG-4
- MJPEG via HTTP and TFTP

The unique, scalable GUI allows live and recorded images from multiple remote stations to be viewed from a single PC (receiver station). With this powerful function, security managers can monitor and supervise multiple locations simultaneously even if remote stations are connected through a WAN.

Each camera offers in-window pan/tilt/zoom functionality from local or remote facilities. Images are displayed with date/time, location, camera name and the status of connected devices such as detectors and sensors.

Recording Station can be programmed to respond to specific situations and events automatically. In response to alarms, the system can be programmed to record at a higher quality and to transmit images or messages to security personnel.

Playback is easy thanks to familiar search and navigation functions using a graphical timeline control. Users can playback recordings from multiple stations simultaneously and synchronously on one interface. Fast, powerful image search functions like the Smart Motion Search eliminate time consuming manual searches.

EXHIBIT B

Export the video to an archive with the push of a single button - all digitally watermarked to ensure the credibility of your recordings. You can even export multiple cameras from different recorders. Use the scheduled export to recurrently backup your recordings on various storage devices, such as external disk arrays and NAS (network attached storage).

To ensure the highest security, all system access is controlled by multiple user authorization levels which determine individual permissions for each user to a very high level of detail. These authorization levels determine what a user can do in the system. Elements such as camera viewing and control, playback and export of recordings, as well the types of system configuration settings that are allowed can be individually configured.

Events, such as login, log-off, status changes, image transmission, video export, and system shutdown are logged in a database and can be easily imported to spreadsheet programs like MS Excel. Video authentication is built-in to detect any attempt to alter the recorded images.

Recording Station provides various interfaces to other systems such as Bosch access solutions and alarm panels, as well as external systems like ATM and POS terminals, fire alarm systems, number plate capture equipment and video content analysis solutions. Integration with other security and building management systems can be accomplished using the VideoSDK providing a complete toolbox of modules for playback, searching, viewing and much, much more. Use Recording Station in a LAN environment with Bosch Video Management System to advance to a true enterprise solution which provides a comprehensive feature set such as centralized user, event and alarm management, multi-monitor workstations with zoomable sitemaps and CCTV keyboard control.

System Overview

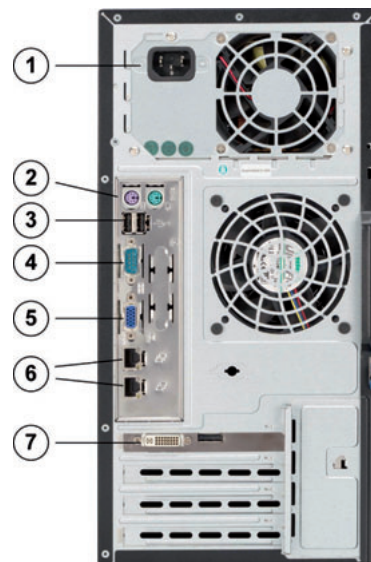
Bosch Recording Station Tower

Front view:



1	DVD writer	4	NIC
2	Overheat/Fan Fail	5	Power on/off
3	HDD		

Rear view:



1	Mains connection 100 - 240 VAC, 50 - 60 Hz	5	Do not use !
2	Keyboard - Mouse Note: We recommend using PS2 mouse and keyboard.	6	2x Ethernet (RJ45)

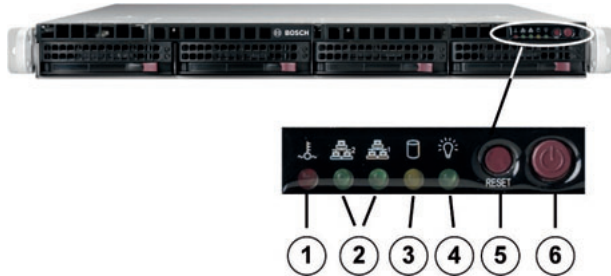
EXHIBIT B

3	2x USB	7	Monitor (DVI)
4	Serial interface COM1		

Bosch Recording Station 19-inch 1U

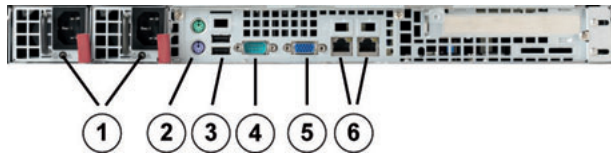
(not available in APR)

Front view:



1	Overheat/Fan Fail	4	Power
2	NIC1/NIC2	5	Reset
3	HDD	6	Power on/off

Rear view:



1	2x mains connection 100 - 240 VAC, 50 - 60 Hz	4	Serial interface COM1
2	Keyboard - Mouse Note: We recommend using PS2 mouse and keyboard.	5	Monitor (VGA) Note: Use only for configuration and maintenance purposes.
3	2x USB	6	2x Ethernet (RJ45)

Bosch Recording Station 19-inch 2U

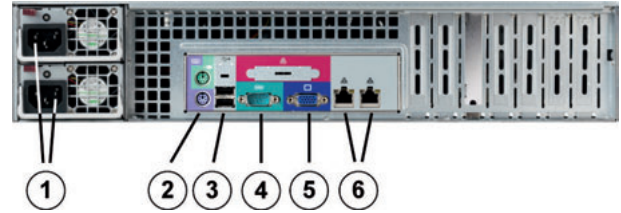
Front view:



1	Power Failure	5	Power
2	Overheat/Fan Fail	6	Reset

3	NIC1/NIC2	7	Power on/off
4	HDD		

Rear view:



1	2x mains connection 100 - 240 VAC, 50 - 60 Hz	4	Serial interface COM1
2	Keyboard - Mouse Note: We recommend using PS2 mouse and keyboard.	5	Monitor (VGA) Note: Use only for configuration and maintenance purposes.
3	2x USB	6	2x Ethernet (RJ45)

Certifications and Approvals

Region	Certification
USA	UL FCC and UL Declaration of Conformity
Europe	CE EC Declaration of Conformity

Technical Specifications

Recording resolutions	QCIF, CIF, 2CIF, 4CIF, HD 720p, HD 1080p Megapixel (arbitrary JPEG resolution up to 2048 x 1536 pixels)
Recording rates per channel	PAL: 0,5 - 25 IPS NTSC: 0,5 - 30 IPS
Supported video codecs / protocols	Bosch MPEG-4 Bosch H.264 Axis MPEG-4, JPEG/MJPEG via HTTP/TFTP

EXHIBIT B

Supported Bosch MPEG-4/H.264 IP cameras	AutoDome Junior HD / HD IVA AutoDome 100/200/300/500 AutoDome Easy IP / IP II / IP II E Axis MPEG4 (no PTZ) Dinion IP (MPEG4) NBN-823V-P Dinion NBN-832V-P HD Dinion NBN-921-P Dinion NBx 4xx P / P IVA Dinion NBx 4xx P SD / P SD IVA Dinion NDx 4xx P SD / P SD IVA Extreme IP FlexiDome IP FlexiDome NDN-921-P FlexiDome NDx 4xx P / P IVA NBC 255-P / 265 P / 225 P NDC 265 P / 225-P / 225 P I NDC-255-P / 255 P I VG4 AutoDome (H.264 IP module) VG5 AutoDome HD / SD VOT 320V
Supported Bosch H.264 and MPEG-4 encoders (video servers)	VideoJet 10/1000 VideoJet X10 / X20 /X40 VideoJet X10 SN / X20 SN / X40 SN VIP X1 XF / X1 XF E VIP10 VIP 1600 / 1600 XFM4 VIPX1 / VIPX1A / VIPX2 / VIPX2A VJ8004 / VJ8004A VJ8008 / VJ8008A
Supported Bosch JPEG IP cameras	NWC-0700/0800 Megapixel IP camera NWC-0900 Day/Night Megapixel IP camera
Supported JPEG IP cameras from other manufacturers	IP cameras from Arecont Vision, Axis, Mototix, Sony and other compatible cameras that support HTTP/TFTP and provide fixed path to JPEG image
Maximum recording rate	100 Mbit per second
Maximum number of connected cameras:	64
Maximum number of configured remote station at one receiver station	200 (can be configured, visible in devices list)
Number of simultaneously connected remote stations at one receiver station	Maximum: 32
Supported Languages	German, English, French, Portuguese, Spanish, Swedish
HTTP Browser Access (WAN)	Installed. A custom HTTP port is possible.
BRS WebServer	ActiveX required on browser
Operating system BRS Appliance	Windows 7 (32-bit)

Device Compatibility / Integration features

Bosch Video Management System	Version 2.3.1 and 3.0
-------------------------------	-----------------------

	Requires 1 Gbit/s connections to central server and workstation; communication via TCP Port 135 plus 4 TCP ports and 4 UDP ports dynamically assigned in the range from 1025 to 65535
ATM integration	DTP3N via RS232 (only EMEA)
ATM/POS integration	Bosch ATM/POS bridge via TCP/IP
IP server integration	Any IP server using socket connections for communication
Alarm panel integration (intrusion, fire, access)	Integration via RS232: AZ1010, BZ500, BZ1012, BZ1060, FPA5000, G-Series Panels, NZ500, NZ1008, NZ1012, NZ1060, UEZ, UGM2020
Digital I/O modules (max. 8 per BRS)	Digital I/O Advantech ADAM-6017, ADAM-6018, ADAM-6022, ADAM-6024, ADAM-6050, ADAM-6050-W, ADAM-6051, ADAM-6051-W, ADAM-6052, ADAM-6055, ADAM-6060, ADAM-6060-W, ADAM-6066
Virtual inputs	External software can trigger events via virtual inputs over TCP/IP
Uninterruptible Power Supply (UPS)	<ul style="list-style-type: none"> Loss of power can cause corruption of the Operating System or the stored video. To avoid loss of data and ensure trouble-free operation, we recommend installing an UPS for critical applications. To connect and configure the UPS, observe the manufacturer's documentation delivered with the UPS. The UPS is not contained in the product.

Electromagnetic Compatibility (EMC)

USA	FCC Part 15, Class A
EU	<ul style="list-style-type: none"> EMC Directive 204/108/EC Interference immunity: Conformance with EN 50130-4 For Tower: To comply with EN50130-4 voltage interruption an external UPS is required. The UPS is not contained in the product. The UPS should be dimensioned for at least 960 VA. Interference emission: EN 55022, Class A Mains power fluctuations: EN 61000-3-2 Voltage fluctuations: EN 61000-3-3

Safety

USA	UL 60950-1, 2nd edition CAN/CSA-C22.2 No.60950-1-07, 2nd edition
EU	EN 60950-1:2006 + A11:2009

EXHIBIT B**Warranty**

Duration	3 years
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Electrical

	BRS Tower	BRS 1 U rackmount	BRS 2U rackmount
120 VAC Input			
Actual output wattage from power supply	170.52 W	202.72 W	256.44 W
Efficiency of power supply	85%	88%	88%
Total system power consumption	200.61 W	230.37 W	291.41 W
Total BTU/h	684.70	786.24	994.59
Power Factor	.98	.95	.95
System AC input VA requirement	204.71 VA	242.49 VA	306.75 VA
Input current		2.02 A	
240 VAC Input			
Actual output wattage from power supply	170.52 W	256.44 W	256.44 W
Efficiency of power supply	86%	90%	90%
Total system power consumption	198.28 W	225.25 W	284.94 W
Total BTU/h	676.74	768.77	972.49
Power Factor	.92	.92	.92
System AC input VA requirement	206.54 VA	244.83 VA	309.71 VA
Input current		1.02 A	

Environmental

For all models	
Operating Temperature	+10 °C to +35 °C (+50 °F to +95 °F)
Non-operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating Relative Humidity	8 to 90% (non-condensing)
Non-Operating Relative Humidity	5 to 95% (non-condensing)

Mechanical

BRS Tower	
Form Factor	Mid-Tower (731D-300)
Power Supply	300 W high efficiency

USB Ports	2 USB 2.0 in rear
Network	Dual Intel® 82573 Gigabit LAN
Dimensions (H x W x D)	363 x 183 x 425 mm (14.25 x 7.25 x 16.75 in)
Weight	10.8 kg (23.8 lb)

BRS 19-inch 1 U
(not available in APR)

Form Factor	1 U Rack Mount (815TQ-R700)
Power Supply	700 W Gold Level Redundant
USB Ports	2 USB 2.0 in rear
Network	Dual Intel® 82573 Gigabit LAN
Dimensions (H x W x D)	44.5 x 437 x 648 mm (1.7 x 17.2 x 25.5 in)
Weight	16.3 kg (36 lb)

BRS 19-inch 2U

Form Factor	2 U Rack Mount (825TQ-R720)
Power Supply	720 W Gold Level Redundant
USB Ports	2 USB 2.0 in rear
Network	Dual Intel® 82573 Gigabit LAN
Dimensions (H x W x D)	89 x 437 x 648 mm (3.5 x 17.2 x 25.5 in)
Weight	23.6 kg (52 lb)

Ordering Information**Bosch Recording Station Tower 1 TB**

Recording Station Tower version with 1 TB storage capacity. Model not available in AMEC and APR.
Order number **BRS-TOW-1100A**

Bosch Recording Station Tower 4 TB

Recording Station Tower version with 4 TB storage capacity.
Order number **BRS-TOW-4100A**

Bosch Recording Station 1U 19-inch Rackmount 4 TB

Recording Station 19-inch rackmount with 4 TB storage capacity in a 1U high chassis. Model not available in APR.
Order number **BRS-RAC1-4100A**

Bosch Recording Station 2U 19-inch Rackmount 8 TB

Recording Station 19-inch rackmount with 8 TB storage capacity in a 2U high chassis.
Order number **BRS-RAC2-8100A**

Bosch Recording Station 2U 19-inch Rackmount 16 TB

Recording Station 19-inch rackmount with 16 TB storage capacity in a 2U high chassis.
Order number **BRS-RAC2-8200A**

EXHIBIT B

Software Options

Expansion License 4 IP cameras (e-license)

Recording Station Expansion License for 4 additional IP Cameras

Order number **BRS-XCAM-04A**

Expansion license for 32 IP cameras (e-license)

Recording Station Expansion License for 32 IP Cameras

Order number **BRS-XCAM-32A**

Feature License ATM POS bridge (e-license)

Recording Station Feature License for ATM/POS Bridge Integration

Order number **BRS-FATM-A**

Feature License IP Server (e-license)

Recording Station Feature License for IP Server Socket Connections

Order number **BRS-FIPS-A**

Feature License Security Panel (e-license)

Recording Station Feature License for Security Panel Integration

Order number **BRS-FPAN-A**

BRS USB Dongle

Recording Station USB dongle. Provides a unique ID if computer signature often changes.

Order number **BRS-DNGL-A**

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EXHIBIT B

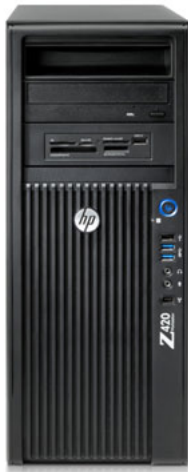
Z420 HE Management Workstation

www.boschsecurity.com



BOSCH

Invented for life



- ▶ High-performance workstation with Intel's latest-generation microarchitecture
- ▶ Dual-monitor support (NVIDIA Quadro 4000, 2 GB graphics card)
- ▶ Silent running with HP liquid cooling solution
- ▶ Protected by HP Services, including a 3 years Next Business Day on-site support

This HP Z420 management workstation with its latest processing and I/O power from Intel, and the latest graphics technology from leading graphics providers is designed for video-oriented applications that require high performance and most advanced visualization. HP Z420 features a smart chassis that offers tool-less access to the inside and easy configurability for seamless deployment. And with liquid cooling designed to deliver whisper-quiet performance, HP Z420 is built to minimizing power and cooling costs with ENERGY STAR qualified configurations featuring 90% efficient power supplies while taking on bigger computing challenges with the new Intel vPro technology and the latest Intel Xeon quad-core processor:

- Intel Xeon E5-1620 (3.6 GHz, 10 MB cache, 1600 MHz memory speed, Quad-Core, HT, Turbo)
- 8 GB (4 x 2 GB) DDR3-1600 ECC unbuffered RAM

HP Z420 is a workstation solution based on the Intel C602 Chipset using Intel's vPro technology and on 8 DIMM slots in 4-channel memory architecture. With 2 x PCI Express Gen3 x16 mechanical/electrical, 1 x PCI Express Gen3 x8 mechanical/electrical, 1 x PCI Express Gen2 x8 mechanical/x4 electrical,

1 x PCI Express Gen2 x4 mechanical/x1 electrical and 1 x Legacy PCI, HP Z420 delivers high performance bandwidth interfaces and future expandability:

- The architecture of this management workstation delivers next generation I/O throughput to handle future high throughput and visualization requirements.
- The high-end NVIDIA Quadro 4000 (2 GB) 3D graphics card ensures highest performance and resolution for fast presentation of displayed video data.

The convertible minitower chassis allows for Minitower or Desktop orientation.

System overview

Z420 HE Management Workstation is the high-performance workstation suitable for running the security systems software applications offered by Bosch.

Please refer to the respective application data sheets to get detailed information.

Intel Microarchitecture offers the latest in processor innovation, including:

- Design and performance scalability with Intel Hyper-Threading Technology (Intel HT Technology), scalable cache sizes, system interconnects, and integrated memory controllers.

EXHIBIT B

- Intel Turbo Boost Technology delivers additional performance automatically when needed by taking advantage of the processor's power and thermal headroom.
- Intel Hyper-Threading Technology brings high-performance applications into mainstream computing with 1-16+ threads optimized for a new generation multi-core processor architecture.
- Intel vPro Technology for maximized, hardware-assisted security and manageability

Certifications and approvals

RoHS	Compliant with the Restrictions of Hazardous Substances (RoHS) directive–2002/95/EC
WEEE	Designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive–2002/96/EC
ISO 11469 ISO 1043	Plastic parts used in the product weighing over 25 g are marked per ISO 11469 and ISO 1043
	Contains 0% recycled materials (by weight)
	Product is >90% recyclable when properly disposed of at end-of-life

Approvals

Region	Certification
Global	DOC Z420 Declaration of Conformity (CE + UL)

Installation/configuration notes

Language selection

This management workstation comes in a standard localization:

MHW-WZ4R2-HEUS American English localization/ keyboard

Additional optional keyboards listed under **Ordering Information** are available.



Notice

The Bosch management workstation provides a MUI (Multilingual User Interface). With MUI installed the language of the workstation may be changed after initial installation (for details see document “Installation Note MUI on Bosch Platforms”).

Parts included

Quantity	Components
1	HP Z420 8-DIMM Workstation
1	• HP Z420 localization kit (select desired language)
1	• HP Z420 600 W, 90% efficient chassis
1	• 500 GB, 7200 RPM SATA, 1st HDD
1	• HP USB standard keyboard

Quantity	Components
1	• HP USB optical scroll mouse
1	• HP 16X DVD± RW SuperMulti SATA
1	• Intel Xeon E5-1620 (3.6/10 MB/1600 QC CPU)
1	• 8 GB (4 x 2 GB) DDR3-1600 ECC RAM
1	• NVIDIA Quadro 4000, 2 GB graphics card
1	• HP serial port adapter kit
1	Microsoft Windows 7 Ultimate Edition, 64-bit OS
1	HP 3-year Next Business Day on-site hardware support

Technical specifications

Electrical	
Power supply	600 W, 90% efficient, custom PSU (wide ranging, active Power Factor Correction)
Operating voltage range	90 to 269 VAC
Rated voltage range	100 to 240 VAC
	118 VAC
Rated line frequency	50/60 Hz (at 100 to 240 VAC)
	400 HZ (at 118 VAC)
Operating line frequency range	47 to 66 Hz (at 100 to 240 VAC)
	393 to 407 HZ (at 118 VAC)
Rated input current	100 to 240 VAC at 8.0 A
	118 VAC at 8.0 A
Power consumption in sleep mode (defined by ENERGY STAR)—suspend to RAM (S3) (instantly available PC)	<10 W
Heat dissipation (configuration and software dependent)	1365 BTU/h typical (344 kcal/h)
	2354 BTU/h max (593 kcal/h)
Power supply fan	92 x 25 mm variable speed
ENERGY STAR qualified	Yes
80 PLUS compliant	Yes, 90% efficient
Mechanical	
Form factor	Convertible minitower
Chassis dimensions (H x W x D)	

EXHIBIT B

Mechanical	
• Standard minitower orientation	44.76 x 17.78 x 44.52 cm (17.6 x 7.0 x 17.5 in)
• Converted desktop orientation	17.78 x 44.76 x 44.52 cm (7.0 x 17.6 x 17.5 in)
Environmental	
Temperature	
• operating	5 °C to 35 °C (40 °F to 95 °F)
• non-operating	-40 °C to 60 °C (-40 °F to 140 °F)
Humidity	
• operating	8 to 85% relative humidity, non-condensing
• non-operating	8 to 90% relative humidity, non-condensing
Maximum altitude (non-pressurized)	
• operating	3,048 m (10,000 feet)
• non-operating	9,144 m (30,000 feet)

MHW-AWLCK-UK

Localization (Keyboard): United Kingdom—British English

Order number **MHW-AWLCK-UK**

Notes:

- General technical specifications for the workstation are provided in the HP Z420 QuickSpecs (**Worldwide—Version 9—January 8, 2012**).
- Configuration specifications are supplied in the Parts Included section.

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80 PLUS is a registered trademark of Ecos, all rights reserved.

Ordering information**MHW-WZ4R2-HEUS Management Workstation**

High-performance workstation, American English localization included

Order number **MHW-WZ4R2-HEUS**

Accessories**MHW-AWLCK-ESP**

Localization (Keyboard): Spain—Spanish

Order number **MHW-AWLCK-ESP**

MHW-AWLCK-FR

Localization (Keyboard): France—French

Order number **MHW-AWLCK-FR**

EXHIBIT B

Represented by:

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EXHIBIT B

UML Series 32-inch High Performance HD LED Monitor

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Full HD 1920 x 1080 resolution
- ▶ Precise color reproduction
- ▶ HDMI, DVI, VGA, S-Video inputs
- ▶ Trigger and Auto Switching features
- ▶ LED backlight panel for higher luminance and lower power consumption

The Bosch UML-323-90 High Performance LED monitor is a 1080p Full HD resolution color monitor ideal for use with analog video, digital video recorders (DVRs), and with PC applications. The monitor features a color LCD flat-screen panel with a 32-inch viewable picture area. The monitor features a wide range of horizontal and vertical viewing angles that provide comfortable, clear viewing – whether you mount it to a wall or to a ceiling.

Functions

Excellent image quality

The Bosch High Performance HD LED monitors automatically adapt to the input resolution of the incoming video signal, and support up to 1920 x 1080 resolution (Full HD). The monitor’s analog VGA input easily accommodates the widespread use of PCs in today’s security surveillance systems. Their high contrast ratio (3000:1) and a high brightness setting offers excellent color accuracy and imaging for easier viewing and interpretation of images. The panel refreshes every 6.5 milliseconds, so you get crisp, clear images with less smearing - and less image “ghosting” in fast-motion video.

True color enhancement

The monitors provide true color performance. The monitors automatically focus on setting the correct color, temperature, and gamma curve settings to deliver the highest possible picture quality.

Certifications and approvals

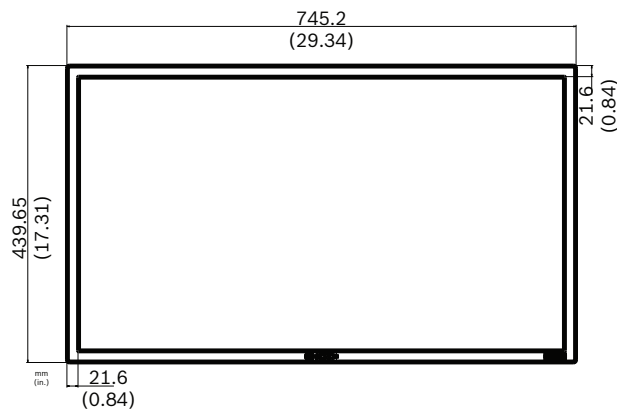
Region	Safety Certification
Canada	cUL
Europe	EN60950, CE Declaration of Conformity, CB scheme
USA	UL60950

Electromagnetic Compatibility (EMC)

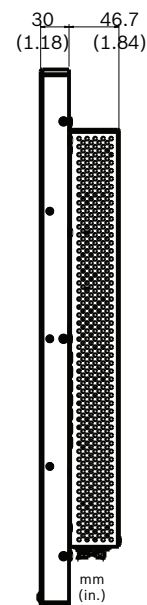
Emission	EN55022:2010 class B, FCC part 15 class B
Immunity	EN55024:2010, EN50130-4:2011

Environmental

Vibration and Shock
Level 5 Energy Star Certificate

EXHIBIT B**Installation/configuration notes**

UML-323-90: Front View



UML-323-90: Side View

Parts included

Quant.	Component
1	Bosch Full HD Color LED Flat Panel Monitor
2	Power Cords, 3-wire with grounded plug 1.8 m (6 ft) long: one with a U.S plug type and one with a European Continental plug type
1	DVI-D to DVI-D cable, 1.8 m (6 ft)
1	VGA to VGA (D-Sub), cable, 1.8 m (6 ft)
1	Trigger cable
1	Remote control
2	AAA batteries for remote control

- 1 Installation Manual (English)
- 1 CD-ROM with multi-language Installation Manual

Technical specifications**Electrical**

Rated Voltage	120/230 VAC, 50/60 Hz
Voltage Range	100–240 VAC, 50/60 Hz
Frequency	Horizontal: 60–73 KHz Vertical: 47–63 Hz
Power at Rated Voltage	
• On	75 W
• Active Off	0.5 W

Video

Sync Format	PAL/NTSC
LCD Panel	LED
Viewable Picture Area	32 in.
Active Display Area (H x V)	698.4 x 392.85 mm (27.5 x 15.5 in.)
Pixel Pitch (H x V):	0.3637 x 0.3637 mm
Resolution ¹	1920 x 1080
Aspect Ratio	16:9
Display Colors	1,073 million
Response Time	6.5 ms (typical)
Backlight	50,000 hours

1. Pixel Policy: Bosch monitors follow the ISO 13406-2 Class II standard.

LCD Panel Optical Characteristics

Luminance	350 cd/m ² (typical)
Contrast Ratio	3000:1 (typical)
Viewing Angle	Horizontal/Vertical: 178°, typical

Video Input

Composite Video (CVBS)	1.0 Vp-p (0.5–1.5 Vp-p), automatic switching from 75 Ohm unbalanced termination to Hi-Z with passive loop-through operation
Y/C (S-video)	0.7 Vp-p (Y-signal), 0.3 Vp-p (C-signal), 75 Ohm termination
VGA (RGB PC)	0.7 Vp-p (0.5–1 Vrms)
Audio Input	2.0 V line level, mono

EXHIBIT B

Timing Modes	
RGB and DVI	HDMI
640 x 480 (60/72/75 Hz)	640 x 480 (60/72/75 Hz)
720 x 400 (70 Hz)	720 x 400 (70 Hz)
800 x 600 (60/75 Hz)	800 x 600 (60/75 Hz)
1024 x 768 (60/75 Hz)	1024 x 768 (60/75 Hz)
1280 x 768 (60 Hz)	1280 x 768 (60 Hz)
1280 x 960 (60 Hz)	1280 x 960 (60 Hz)
1280 x 1024 (60 Hz)	1280 x 1024 (60 Hz)
1360 x 768 (60 Hz)	1360 x 768 (60 Hz)
1366 x 768 (60 Hz)	1366 x 768 (60 Hz)
1600 x 1200 (60 Hz)	1600 x 1200 (60 Hz)
1920 x 1080 (60 Hz)	1920 x 1080 (60 Hz)
	480i (60 Hz)
	480p (60 Hz)
	576i (50 Hz)
	576p (50 Hz)
	720p (50/60 Hz)
	1080i (50/60 Hz)
	1080p (50/60 Hz)

Controls

Input	
Rear Control Panel	Push-buttons
Video Source	Selects: Component Video, S-video, VGA, HDMI, DVI-D
Menu	Selects on-screen display (OSD), up cursor, down cursor/auto adjust, left cursor, right cursor
Power	On/Off
Control Panel Lockout	Multiple push-button combination
On-screen Display	
Video Mode	Input Source, Screen, OSD, Utility
Indicators	
LED	Power On (green) Power Off, Standby (red)
On-screen	VGA: Check input signal Video: Flashes "AV1" or "AV2" when there is a black screen

Connectors	
Video 1 (AV1)	Composite video: two (2) BNC (1 in, 1 out)
Digital	One (1) DVI-D
HDMI	One (1)
VGA	One (1): 1 RGB 15-pin D-sub in, 1 RGB 15-pin D-sub out
Component	One (1): Y, Pb, Pr
Y/C (S-video)	One (1) mini-DIN, 4-pin (1 in)
Audio	Five (5): 2 Audio In: RCA (right/left) 1 Audio In: phono jack 1 Audio Out: RCA (right/left) 1 Speaker Out
Trigger Input	One (1) 1/8 in. mini phono plug
Power Input	100 – 240 VAC

Mechanical

Cabinet Material	SECC
Finish	Black
Mount	Wall mounting compatible with standard bracket
VESA Mounting Compliance	200 x 200 mm (7.87 x 7.8 in.)

Dimensions (W x H x D)

Monitor	745.2 x 439.65 x 76.7 mm (29.34 x 17.31 x 3.02 in.)
With Packaging	910 x 608 x 205 mm (35.83 x 23.94 x 8.1 in.)

Weight

Monitor Weight	12.5 kg (27.6 lb)
Shipping Weight	15.1 kg (33.3 lb)

Environmental

	All Models
Operating Temperature	0°C to +50°C (32°F to 122°F)
Storage Temperature	0°C to +50°C (32°F to 122°F)
Humidity	0% to 90% Relative

Ordering information

UML-323-90 32-inch High Performance HD LED Monitor
32-in. 1080p LED monitor with RGB, DVI, and HDMI inputs
Order number **UML-323-90**

EXHIBIT B

Accessories

UMM-LED32-SD Desktop Monitor Stand

Desktop stand for a 32 in. LED monitor, black
Order number **UMM-LED32-SD**

UMM-WMT-32 Tilt Wall Mount

Tilt wall mount for a 32 in. LED monitor, black
Order number **UMM-WMT-32**

Represented by:

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EXHIBIT B

UML Series 42- and 55-inch High Performance HD LED Monitors

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Full HD 1920 x 1080 resolution
- ▶ Precise color reproduction
- ▶ HDMI, DVI, VGA, S-Video inputs
- ▶ Trigger and Auto Switching features
- ▶ LED backlight panel for higher luminance and lower power consumption

The Bosch High Performance LED monitors are 1080p Full HD resolution color monitors ideal for use with analog video, digital video recorders (DVRs), and with PC applications. The monitors feature a color LCD flat-screen panel and are available with 42-inch or 55-inch viewable picture areas. Each monitor features a wide range of horizontal and vertical viewing angles that provide comfortable, clear viewing – whether you mount it to a wall or to a ceiling.

Functions

Excellent image quality

The Bosch High Performance HD LED monitors automatically adapt to the input resolution of the incoming video signal, and support up to 1920 x 1080 resolution (Full HD). The monitors' analog VGA input easily accommodates the widespread use of PCs in today's security surveillance systems. Their high contrast ratio (4000:1) and a high brightness setting offers excellent color accuracy and imaging for easier viewing and interpretation of images. The panel refreshes every eight milliseconds, so you get crisp, clear images with less smearing - and less image "ghosting" in fast-motion video.

True color enhancement

The monitors provide true color performance. The monitors automatically focus on setting the correct color, temperature, and gamma curve settings to deliver the highest possible picture quality.

Certifications and approvals

Region	Safety Certification
Canada	cUL
Europe	EN60950, CE Declaration of Conformity, CB scheme
USA	UL60950

Electromagnetic Compatibility (EMC)

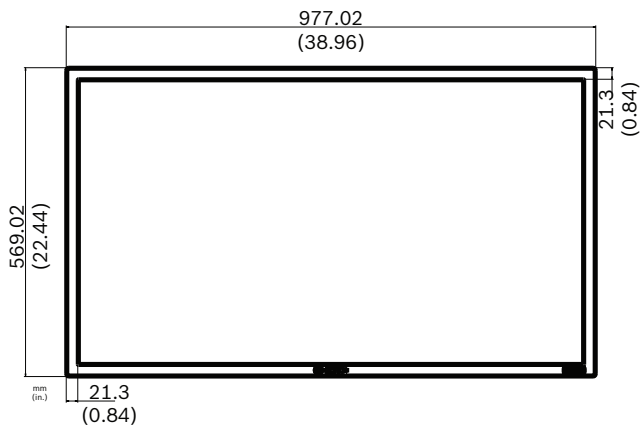
Emission	EN55022:2010 class B, FCC part 15 class B
Immunity	EN55024:2010, EN50130-4:2011

Environmental

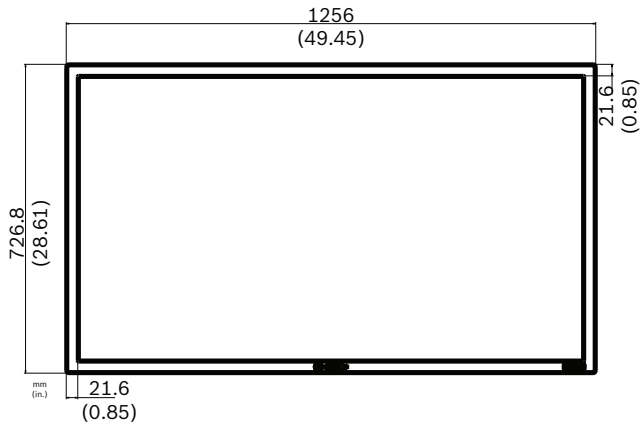
Vibration and Shock
Level 5 Energy Star Certificate

EXHIBIT B

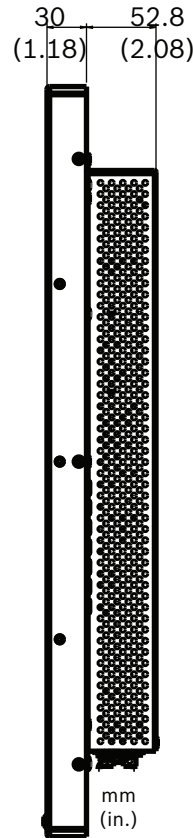
Installation/configuration notes



UML-423-90: Front View



UML-553-90: Front View



UML-423-90/UML-553-90: Side View

Parts included

Quant.	Component
1	Bosch Full HD Color LED Flat Panel Monitor
2	Power Cords, 3-wire with grounded plug 1.8 m (6 ft) long: one with a U.S plug type and one with a European Continental plug type
1	1 DVI-D to DVI-D cable, 1.8 m (6 ft)
1	1 VGA to VGA (D-Sub), cable, 1.8 m (6 ft)
1	Trigger cable
1	Remote control
2	AAA batteries for remote control
1	Installation Manual (English)
1	CD-ROM with multi-language Installation Manual

Technical specifications

Electrical

	UML-423-90	UML-553-90
Rated Voltage	120/230 VAC, 50/60 Hz	
Voltage Range	100-240 VAC, 50/60 Hz	

EXHIBIT B

Frequency	Horizontal: 60–73 KHz Vertical: 47–63 Hz	
Power at Rated Voltage		
• On	150 W	170 W
• Active Off	0.5 W	0.5 W

Video

	UML-423-90	UML-553-90
Sync Format	PAL/NTSC	PAL/NTSC
LCD Panel	LED	LED
Viewable Picture Area	42 in.	55 in.
Active Display Area (H x V)	930.24 x 523.26 mm (36.6 x 20.6 in.)	1209.6 x 648.4 mm (47.6 x 25.5 in.)
Pixel Pitch (H x V):	0.4845 x 0.4845 mm	0.21 x 0.21 mm
Resolution ¹	1920 x 1080	1920 x 1080
Aspect Ratio	16:9	16:9
Display Colors	1,073 million	1,073 million
Response Time	8 ms (typical)	6.5 ms (typical)
Backlight	50,000 hours	50,000 hours

1. Pixel Policy: Bosch monitors follow the ISO 13406-2 Class II standard.

LCD Panel Optical Characteristics

	UML-423-90	UML-553-90
Luminance	500 cd/m ² (typical)	450 cd/m ² (typical)
Contrast Ratio	4000:1 (typical)	4000:1 (typical)
Viewing Angle	Horizontal/Vertical: 178°, typical	Horizontal/Vertical: 178°, typical

Video Input

All Models

Composite Video (CVBS)	1.0 Vp-p (0.5–1.5 Vp-p), automatic switching from 75 Ohm unbalanced termination to Hi-Z with passive loop-through operation
Y/C (S-video)	0.7 Vp-p (Y-signal), 0.3 Vp-p (C-signal), 75 Ohm termination
VGA (RGB PC)	0.7 Vp-p (0.5–1 Vrms)
Audio Input	2.0 V line level, mono

Timing Modes

RGB and DVI

640 x 480	60/72/75 Hz
720 x 400	70 Hz

800 x 600	60/75 Hz
1024 x 768	60/75 Hz
1280 x 768	60 Hz
1280 x 960	60 Hz
1280 x 1024	60 Hz
1360 x 768	60 Hz
1366 x 768	60 Hz
1600 x 1200	60 Hz
1920 x 1080	60 Hz

HDMI

640 x 480	60/72/75 Hz
720 x 400	70 Hz
800 x 600	60/75 Hz
1024 x 768	60/75 Hz
1280 x 768	60 Hz
1280 x 960	60 Hz
1280 x 1024	60 Hz
1360 x 768	60 Hz
1366 x 768	60 Hz
1600 x 1200	60 Hz
1920 x 1080	60 Hz
480i	60 Hz
480p	60 Hz
576i	50 Hz
576p	50 Hz
720p	50/60 Hz
1080i	50/60 Hz
1080p	50/60 Hz

Controls

Input	All Models
Rear Control Panel	Push-buttons
Video Source	Selects: Component Video, S-video, VGA, HDMI, DVI-D
Menu	Selects on-screen display (OSD), up cursor, down cursor/auto adjust, left cursor, right cursor
Power	On/Off
Control Panel Lockout	Multiple push-button combination

EXHIBIT B

On-screen Display	All Models
Video Mode	Input Source, Screen, OSD, Utility
Indicators	All Models
LED	Power On (green) Power Off, Standby (red)
On-screen	VGA: Check input signal Video: Flashes "AV1" or "AV2" when there is a black screen
Connectors	All Models
Video 1 (AV1)	Composite video: two (2) BNC (1 in, 1 out)
Digital	One (1) DVI-D
HDMI	One (1)
VGA	One (1): 1 RGB 15-pin D-sub in, 1 RGB 15-pin D-sub out
Component	One (1): Y, Pb, Pr
Y/C (S-video)	One (1) mini-DIN, 4-pin (1 in)
Audio	Five (5): 2 Audio In: RCA (right/left) 1 Audio In: phono jack 1 Audio Out: RCA (right/left) 1 Speaker Out
Trigger Input	One (1) 1/8 in. mini phono plug
Power Input	100 – 240 VAC

Mechanical

	All Models
Cabinet Material	SECC
Finish	Black
Mount	Wall mounting compatible with standard bracket
VESA Mounting Compliance	400 x 400 mm,

Dimensions (W x H x D)

	UML-423-90	UML-553-90
Monitor	977.02 x 569.92 x 82.8 mm (38.96 x 22.44 x 3.26 in.)	1256 x 726.8 x 82.8 mm (49.45 x 28.61 x 3.26 in.)
With Packaging	1234 x 786 x 275 mm (48.6 x 30.9 x 10.8 in.)	1379 x 850 x 273 mm (54.3 x 33.5 x 10.7 in.)

Weight

Monitor Weight	20 kg (44.1 lb)	32 kg (70.5 lbs)
Shipping Weight	26 kg (57.3lb)	37 kg (81.6 lbs)

Environmental

	All Models
Operating Temperature	0°C to +50°C (32°F to 122°F)
Storage Temperature	0°C to +50°C (32°F to 122°F)
Humidity	0% to 90% Relative

Ordering information

UML-423-90 42-inch High Performance HD LED Monitor
42-in. 1080p LED monitor with RGB, DVI, and HDMI inputs
Order number **UML-423-90**

UML-553-90 55-inch High Performance HD LED Monitor
55-in. 1080p LED monitor with RGB, DVI, and HDMI inputs
Order number **UML-553-90**

Accessories

ST660 Universal Tilt Wall Mount
Tilt wall mount for an LCD 37 in. to 60 in., black
Order number **ST660**

UMM-LED42-SD Desktop Monitor Stand
Desktop stand for a 42 in. or a 55-in. LED monitor, black
Order number **UMM-LED42-SD**

EXHIBIT B

Represented by:

Americas:

Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us

Europe, Middle East, Africa:

Bosch Security Systems B.V.
P.O. Box 80002
5617 BA Eindhoven, The Netherlands
Phone: + 31 40 2577 284
Fax: +31 40 2577 330
emea.securitysystems@bosch.com
www.boschsecurity.com

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Robert Bosch (SEA) Pte Ltd, Security
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11 Bishan Street 21
Singapore 573943
Phone: +65 6571 2808
Fax: +65 6571 2699
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201 Building, No. 333 Fuquan Road
North IBP
Changning District, Shanghai
200335 China
Phone +86 21 22181111
Fax: +86 21 22182398
www.boschsecurity.com.cn

America Latina:

Robert Bosch Ltda Security Systems Division
Via Anhanguera, Km 98
CEP 13065-900
Campinas, Sao Paulo, Brazil
Phone: +55 19 2103 2860
Fax: +55 19 2103 2862
al.securitysystems@bosch.com
www.boschsecurity.com

EXHIBIT B

UML Series 42- and 55-inch High Performance HD LED Monitors

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Full HD 1920 x 1080 resolution
- ▶ Precise color reproduction
- ▶ HDMI, DVI, VGA, S-Video inputs
- ▶ Trigger and Auto Switching features
- ▶ LED backlight panel for higher luminance and lower power consumption

The Bosch High Performance LED monitors are 1080p Full HD resolution color monitors ideal for use with analog video, digital video recorders (DVRs), and with PC applications. The monitors feature a color LCD flat-screen panel and are available with 42-inch or 55-inch viewable picture areas. Each monitor features a wide range of horizontal and vertical viewing angles that provide comfortable, clear viewing – whether you mount it to a wall or to a ceiling.

Functions

Excellent image quality

The Bosch High Performance HD LED monitors automatically adapt to the input resolution of the incoming video signal, and support up to 1920 x 1080 resolution (Full HD). The monitors' analog VGA input easily accommodates the widespread use of PCs in today's security surveillance systems. Their high contrast ratio (4000:1) and a high brightness setting offers excellent color accuracy and imaging for easier viewing and interpretation of images. The panel refreshes every eight milliseconds, so you get crisp, clear images with less smearing - and less image "ghosting" in fast-motion video.

True color enhancement

The monitors provide true color performance. The monitors automatically focus on setting the correct color, temperature, and gamma curve settings to deliver the highest possible picture quality.

Certifications and approvals

Region	Safety Certification
Canada	cUL
Europe	EN60950, CE Declaration of Conformity, CB scheme
USA	UL60950

Electromagnetic Compatibility (EMC)

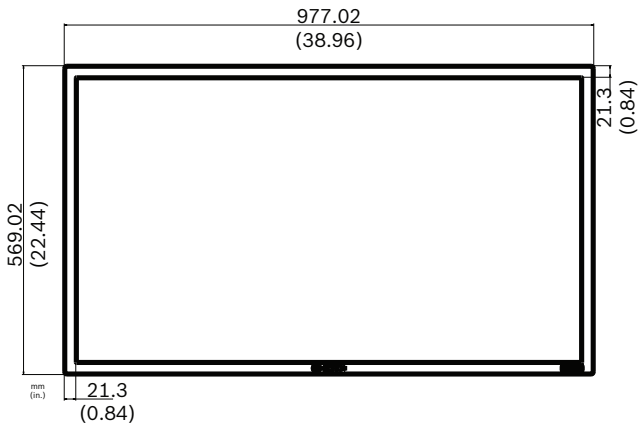
Emission	EN55022:2010 class B, FCC part 15 class B
Immunity	EN55024:2010, EN50130-4:2011

Environmental

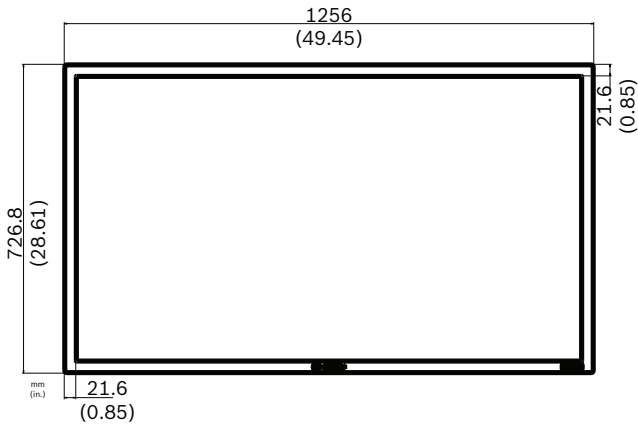
Vibration and Shock
Level 5 Energy Star Certificate

EXHIBIT B

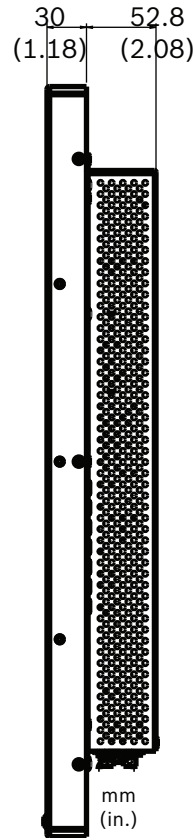
Installation/configuration notes



UML-423-90: Front View



UML-553-90: Front View



UML-423-90/UML-553-90: Side View

Parts included

Quant.	Component
1	Bosch Full HD Color LED Flat Panel Monitor
2	Power Cords, 3-wire with grounded plug 1.8 m (6 ft) long: one with a U.S plug type and one with a European Continental plug type
1	1 DVI-D to DVI-D cable, 1.8 m (6 ft)
1	1 VGA to VGA (D-Sub), cable, 1.8 m (6 ft)
1	Trigger cable
1	Remote control
2	AAA batteries for remote control
1	Installation Manual (English)
1	CD-ROM with multi-language Installation Manual

Technical specifications

Electrical

	UML-423-90	UML-553-90
Rated Voltage	120/230 VAC, 50/60 Hz	
Voltage Range	100-240 VAC, 50/60 Hz	

EXHIBIT B

Frequency	Horizontal: 60–73 KHz Vertical: 47–63 Hz	
Power at Rated Voltage		
• On	150 W	170 W
• Active Off	0.5 W	0.5 W

Video

	UML-423-90	UML-553-90
Sync Format	PAL/NTSC	PAL/NTSC
LCD Panel	LED	LED
Viewable Picture Area	42 in.	55 in.
Active Display Area (H x V)	930.24 x 523.26 mm (36.6 x 20.6 in.)	1209.6 x 648.4 mm (47.6 x 25.5 in.)
Pixel Pitch (H x V):	0.4845 x 0.4845 mm	0.21 x 0.21 mm
Resolution ¹	1920 x 1080	1920 x 1080
Aspect Ratio	16:9	16:9
Display Colors	1,073 million	1,073 million
Response Time	8 ms (typical)	6.5 ms (typical)
Backlight	50,000 hours	50,000 hours

1. Pixel Policy: Bosch monitors follow the ISO 13406-2 Class II standard.

LCD Panel Optical Characteristics

	UML-423-90	UML-553-90
Luminance	500 cd/m ² (typical)	450 cd/m ² (typical)
Contrast Ratio	4000:1 (typical)	4000:1 (typical)
Viewing Angle	Horizontal/Vertical: 178°, typical	Horizontal/Vertical: 178°, typical

Video Input	All Models
Composite Video (CVBS)	1.0 Vp-p (0.5–1.5 Vp-p), automatic switching from 75 Ohm unbalanced termination to Hi-Z with passive loop-through operation
Y/C (S-video)	0.7 Vp-p (Y-signal), 0.3 Vp-p (C-signal), 75 Ohm termination
VGA (RGB PC)	0.7 Vp-p (0.5–1 Vrms)
Audio Input	2.0 V line level, mono

Timing Modes

RGB and DVI	
640 x 480	60/72/75 Hz
720 x 400	70 Hz

800 x 600	60/75 Hz
1024 x 768	60/75 Hz
1280 x 768	60 Hz
1280 x 960	60 Hz
1280 x 1024	60 Hz
1360 x 768	60 Hz
1366 x 768	60 Hz
1600 x 1200	60 Hz
1920 x 1080	60 Hz

HDMI

640 x 480	60/72/75 Hz
720 x 400	70 Hz
800 x 600	60/75 Hz
1024 x 768	60/75 Hz
1280 x 768	60 Hz
1280 x 960	60 Hz
1280 x 1024	60 Hz
1360 x 768	60 Hz
1366 x 768	60 Hz
1600 x 1200	60 Hz
1920 x 1080	60 Hz
480i	60 Hz
480p	60 Hz
576i	50 Hz
576p	50 Hz
720p	50/60 Hz
1080i	50/60 Hz
1080p	50/60 Hz

Controls

Input	All Models
Rear Control Panel	Push-buttons
Video Source	Selects: Component Video, S-video, VGA, HDMI, DVI-D
Menu	Selects on-screen display (OSD), up cursor, down cursor/auto adjust, left cursor, right cursor
Power	On/Off
Control Panel Lockout	Multiple push-button combination

EXHIBIT B

On-screen Display	All Models
Video Mode	Input Source, Screen, OSD, Utility
Indicators	All Models
LED	Power On (green) Power Off, Standby (red)
On-screen	VGA: Check input signal Video: Flashes "AV1" or "AV2" when there is a black screen
Connectors	All Models
Video 1 (AV1)	Composite video: two (2) BNC (1 in, 1 out)
Digital	One (1) DVI-D
HDMI	One (1)
VGA	One (1): 1 RGB 15-pin D-sub in, 1 RGB 15-pin D-sub out
Component	One (1): Y, Pb, Pr
Y/C (S-video)	One (1) mini-DIN, 4-pin (1 in)
Audio	Five (5): 2 Audio In: RCA (right/left) 1 Audio In: phono jack 1 Audio Out: RCA (right/left) 1 Speaker Out
Trigger Input	One (1) 1/8 in. mini phono plug
Power Input	100 – 240 VAC

Mechanical

	All Models
Cabinet Material	SECC
Finish	Black
Mount	Wall mounting compatible with standard bracket
VESA Mounting Compliance	400 x 400 mm,

Dimensions (W x H x D)

	UML-423-90	UML-553-90
Monitor	977.02 x 569.92 x 82.8 mm (38.96 x 22.44 x 3.26 in.)	1256 x 726.8 x 82.8 mm (49.45 x 28.61 x 3.26 in.)
With Packaging	1234 x 786 x 275 mm (48.6 x 30.9 x 10.8 in.)	1379 x 850 x 273 mm (54.3 x 33.5 x 10.7 in.)

Weight

Monitor Weight	20 kg (44.1 lb)	32 kg (70.5 lbs)
Shipping Weight	26 kg (57.3lb)	37 kg (81.6 lbs)

Environmental

	All Models
Operating Temperature	0°C to +50°C (32°F to 122°F)
Storage Temperature	0°C to +50°C (32°F to 122°F)
Humidity	0% to 90% Relative

Ordering information

UML-423-90 42-inch High Performance HD LED Monitor
42-in. 1080p LED monitor with RGB, DVI, and HDMI inputs
Order number **UML-423-90**

UML-553-90 55-inch High Performance HD LED Monitor
55-in. 1080p LED monitor with RGB, DVI, and HDMI inputs
Order number **UML-553-90**

Accessories**ST660 Universal Tilt Wall Mount**

Tilt wall mount for an LCD 37 in. to 60 in., black
Order number **ST660**

UMM-LED42-SD Desktop Monitor Stand

Desktop stand for a 42 in. or a 55-in. LED monitor, black
Order number **UMM-LED42-SD**

EXHIBIT B

Represented by:

Americas:

Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us

Europe, Middle East, Africa:

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P.O. Box 80002
5617 BA Eindhoven, The Netherlands
Phone: + 31 40 2577 284
Fax: +31 40 2577 330
emea.securitysystems@bosch.com
www.boschsecurity.com

Asia-Pacific:

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11 Bishan Street 21
Singapore 573943
Phone: +65 6571 2808
Fax: +65 6571 2699
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Fax: +86 21 22182398
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Campinas, Sao Paulo, Brazil
Phone: +55 19 2103 2860
Fax: +55 19 2103 2862
al.securitysystems@bosch.com
www.boschsecurity.com

EXHIBIT B

UML Series 19- and 22-inch High Performance HD LED Monitors

www.boschsecurity.com



BOSCH

Invented for life



Advantage Line

The Bosch High Performance LED monitors offer HD resolution (up to 1080p) and precise color reproduction. These monitors are ideal for use with analog video, digital video recorders (DVRs), and with PC applications. The monitors feature a color LED flat-screen panel and are available with 18.5-inch or 21.5-inch viewable picture areas. Each monitor features a wide range of horizontal and vertical viewing angles that provide comfortable, clear viewing – whether you place it on a desktop or mount it to a wall or to a ceiling.

These monitors use advanced gamma curve correction and enhanced color temperature calibration to deliver a crisp, clear picture with precise color reproduction.

Features

- ▶ Support up to 1920 x 1080 Full HD resolution (UML-223-90) and 1366 x 768 (UML-193-90)
- ▶ HDMI, DVI, and VGA inputs
- ▶ High contrast ratio 1,000:1
- ▶ Precise color reproduction
- ▶ LED backlight panel for higher luminance and lower power consumption

EXHIBIT B

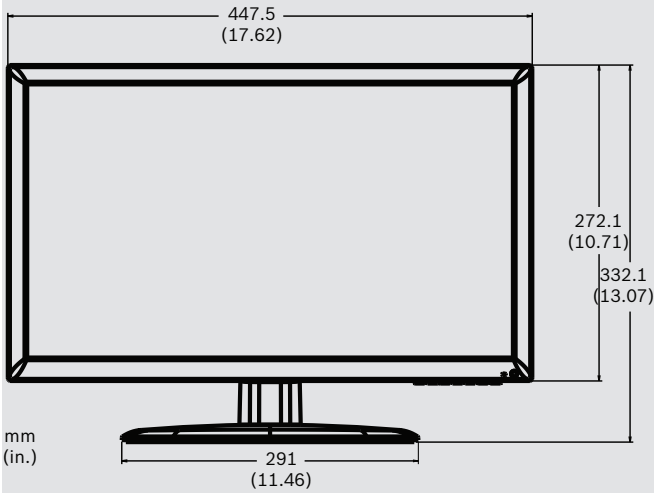
Technical specifications

Electrical		
	UML-193-90	UML-223-90
Rated Voltage	12 VDC, 3.5 A	
Monitor	120/230 VAC, 50/60 Hz	
Power Adapter	100–240 VAC, 50/60 Hz	
Voltage Range	100–240 VAC, 50/60 Hz	
Frequency	Horizontal: 31 - 64 KHz Vertical: 50 - 75 Hz	Horizontal: 31 - 75 KHz Vertical: 50 - 75 Hz
Power at Rated Voltage		
On	42 W	42 W
Active Off	0.5 W	0.5 W
Video		
	UML-193-90	UML-223-90
Sync Format	PAL/NTSC	PAL/NTSC
LCD Panel	LED	LED
Viewable Picture Area	18.51 in.	21.53 in.
Active Display Area (H x V)	409.8 x 230.4 mm (16.1 x 9.1 in.)	476.64 x 268.11 mm (18.8 x 10.6)
Pixel Pitch (H x V):	0.3 x 0.3 mm	0.248 x 0.248 mm
Resolution ¹	1366 x 768	1920 x 1080
Aspect Ratio	16:9	16:9
Display Colors	16.7 million	16.7 million
Response Time	5 ms (typical)	5 ms (typical)
Panel Life	30,000 hours	30,000 hours
<small>1. Pixel Policy: Bosch monitors follow the ISO 13406-2 Class II standard.</small>		
LCD Panel Optical Characteristics		
	All Models	
Luminance	250 cd/m ² (typical)	
Contrast Ratio	1000:1 (typical)	
Viewing Angle	Horizontal: 170° Vertical: 160°	
Input	All Models	
VGA (RGB PC)	0.7 Vp-p (0.5-1 Vrms)	
Timing Modes	UML-193-90	UML-223-90
VGA Input	640 x 480 (60 Hz)	640 x 480 (60 Hz)
	720 x 400 (70 Hz)	720 x 400 (70 Hz)
	800 x 600 (60 Hz)	800 x 600 (60 Hz)
	1024 x 768 (60 Hz)	1024 x 768 (60 Hz)
	1280 x 768 (60 Hz)	1280 x 768 (60 Hz)
	1360 x 768 (60 Hz)	1360 x 768 (60 Hz)
		1440 x 900 (60 Hz)
		1680 x 1050 (60 Hz)
		1920 x 1080 (60 Hz)
DVI/HDMI Input	480i (60 Hz)	480i (60 Hz)
	576i (50 Hz)	576i (50 Hz)
	480p (60 Hz)	480p (60 Hz)
	576p (50 Hz)	576p (50 Hz)
	720p (50/60 Hz)	720p (50/60 Hz)
	1080i (50/60 Hz)	1080i (50/60 Hz)
	1080p (24/25/30/50/60 Hz)	1080p (24/25/30/50/60 Hz)
	640 x 480 (60 Hz)	640 x 480 (60 Hz)
	720 x 400 (70 Hz)	720 x 400 (70 Hz)
	800 x 600 (60 Hz)	800 x 600 (60 Hz)
	1024 x 768 (60 Hz)	1024 x 768 (60 Hz)
	1280 x 768 (60 Hz)	1280 x 768 (60 Hz)
	1360 x 768 (60 Hz)	1360 x 768 (60 Hz)
		1440 x 900 (60 Hz)

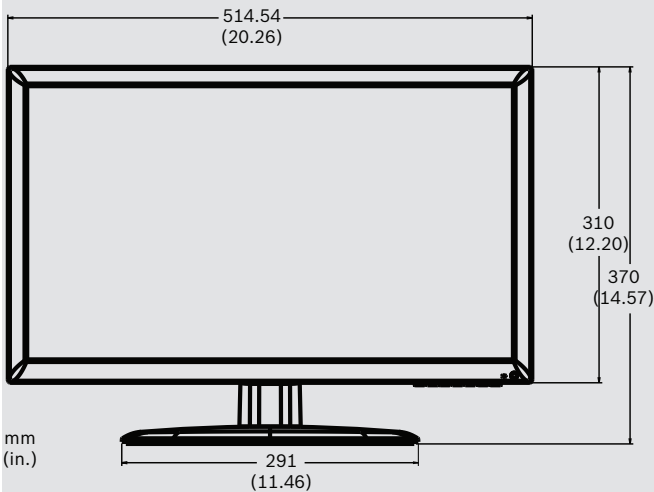
	1680 x 1050 (60 Hz)	1920 x 1080 (60 Hz)
Controls		
Input	All Models	
Control Panel	Push-buttons	
Source	Selects: HDMI, DVI-D, and VGA	
Menu	Selects on-screen display (OSD), up cursor, down cursor/auto adjust, left cursor, right cursor	
Power	On/Off	
Control Panel Lockout	Multiple push-button combination	
On-screen Display	All Models	
Video Mode	Input Source, Screen, OSD, Utility	
Indicators	All Models	
LED	Power On, Standby (blue) Power Off (LED off)	
Connectors	All Models	
Digital	One (1) DVI-D input	
HDMI	One (1) input	
VGA	One (1) RGB 15-pin D-sub input	
Mechanical		
	All Models	
Cabinet Material	SECC	
Finish	Black	
Mount	Wall mounting compatible with standard bracket, or Desktop mounting with included stand	
VESA Mounting Compliance	100 x 100 mm	
Dimensions (W x H x D)		
	UML-193-90	UML-223-90
Monitor	447.5 x 272.1 x 45.107 mm (17.62 x 10.71 x 1.77 in.)	514.54 x 310 x 45.107 mm (20.26 x 12.20 x 1.77 in.)
With Stand	447.5 x 332.1 x 182 mm (17.62 x 13.07 x 7.16 in.)	514.54 x 370 x 182 mm (20.26 x 14.57 x 7.16 in.)
With Packaging	505 x 380 x 130 mm (19.88 x 14.96 x 5.12 in.)	570 x 420 x 130 mm (22.44 x 16.54 x 5.12 in.)
Weight	All Models	
Monitor Weight	3.0 kg (6.6 lb)	3.6 kg (7.9 lb)
Shipping Weight	4.4 kg (9.7 lb)	5.2 kg (11.5 lb)
Environmental		
	All Models	
Operating Temperature	0°C to +50°C (32°F to 122°F)	
Storage Temperature	0°C to +50°C (32°F to 122°F)	
Humidity	0% to 90% Relative	
Certifications and approvals		
Region	Safety Certification	
Canada	cUL	
Europe	EN60950, CE Declaration of Conformity, CB scheme	
USA	UL60950	
Electromagnetic Compatibility (EMC)		
Emission	EN55022 class B, FCC part 15 class B	
Immunity	EN50130-4 (CE)	
Environmental		
Vibration and Shock		

EXHIBIT B

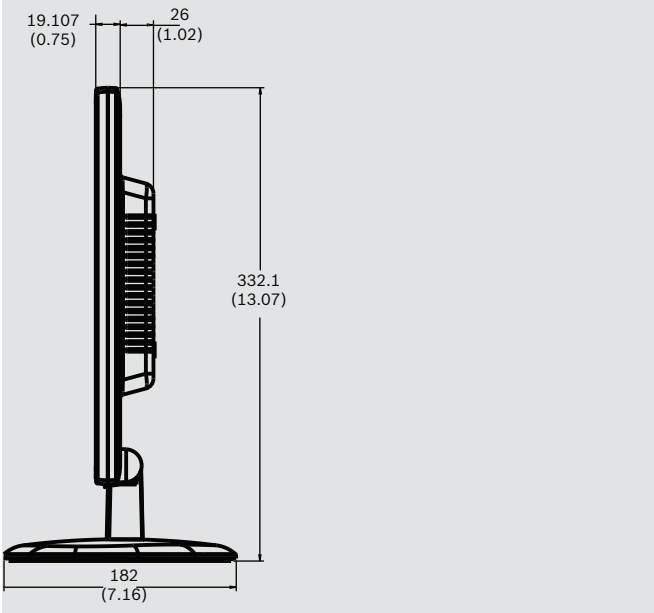
Installation/configuration notes



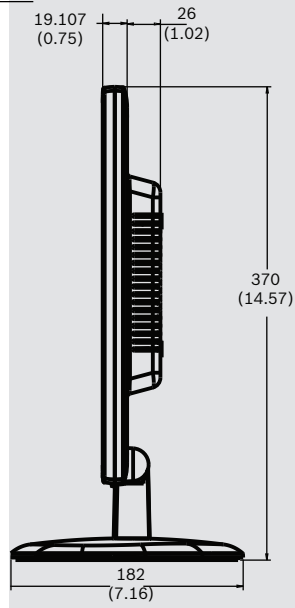
UML-193-90: Front View



UML-223-90: Front View



UML-193-90: Side View



UML-223-90: Side View

Parts included

Quant.	Component
1	Bosch Full HD Color LED Flat Panel Monitor
1	Monitor Stand
2	FS4 x 12 screws, for monitor stand
2	Power Cords, 3-wire with grounded plug 1.8 m (6 ft) long: one with a U.S plug type and one with a European Continental plug type
1	Power Adapter
1	DVI-D to DVI-D cable, 1.8 m (6 ft)
1	VGA to VGA (D-Sub), cable, 1.8 m (6 ft)
1	Stereo Cable, 1.8 m (6 ft)
1	Installation Manual (English)
1	CD-ROM with multi-language Installation Manual

Ordering information

UML-193-90 19-inch High Performance HD LED Monitor	UML-193-90
UML-223-90 22-inch High Performance Full HD LED Monitor	UML-223-90

EXHIBIT B

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www.boschsecurity.com

EXHIBIT B

Bosch Recording Station 8.11 Software

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Recording and Management Software for IP video
- ▶ Connect up to 64 video sources per station
- ▶ Supports Bosch H.264/MPEG-4, third-party MPEG-4 and JPEG devices, ONVIF camera and encoder devices
- ▶ HD / Megapixel camera support
- ▶ Unlimited remote receiver stations

Building on DiBos technology the Recording Station uses Bosch's proven video management, recording and communications technology and takes IP based video surveillance to a new level. It forms an integral part of overall security solutions for many applications – including banks, large retailers, railway stations, city centers, industrial facilities and office buildings. With Recording Station you can retrieve live and recorded video from anywhere in the network. Whether they are on site or at a remote network location, authorized personnel have quick, convenient access to all information making Recording Station the perfect solution for surveillance over distributed networks.

Recording Station supports live viewing and recording at any resolution up to 2048 x 1536 pixels (3 Megapixel) including HD widescreen resolutions. It manages up to 64 IP video sources (Bosch and 3rd party) that are compatible to the following video compression standards:

- Bosch H.264
- Bosch MPEG-4
- Axis MPEG-4
- MJPEG via HTTP and TFTP
- ONVIF camera support

The unique, scalable GUI allows live and recorded images from multiple remote stations to be viewed from a single PC (receiver station). With this powerful function, security managers can monitor and supervise multiple locations simultaneously even if remote stations are connected through a WAN.

Each camera offers in-window pan/tilt/zoom functionality from local or remote facilities. Images are displayed with date/time, location, camera name and the status of connected devices such as detectors and sensors.

Recording Station can be programmed to respond to specific situations and events automatically. In response to alarms, the system can be programmed to record at a higher quality and to transmit images or messages to security personnel.

Playback is easy thanks to familiar search and navigation functions using a graphical timeline control. Users can playback recordings from multiple stations simultaneously and synchronously on one interface. Fast, powerful image search functions like the Smart Motion Search eliminate time consuming manual searches.

Export the video to an archive with the push of a single button - all digitally watermarked to ensure the credibility of your recordings. You can even export

EXHIBIT B

multiple cameras from different recorders. Use the scheduled export to recurrently backup your recordings on various storage devices, such as external disk arrays and NAS (network attached storage).

To ensure the highest security, all system access is controlled by multiple user authorization levels which determine individual permissions for each user to a very high level of detail. These authorization levels determine what a user can do in the system. Elements such as camera viewing and control, playback and export of recordings, as well the types of system configuration settings that are allowed can be individually configured.

Events, such as login, log-off, status changes, image transmission, video export, and system shutdown are logged in a database and can be easily imported to spreadsheet programs like MS Excel. Video authentication is built-in to detect any attempt to alter the recorded images.

Recording Station provides various interfaces to other systems such as Bosch access solutions and alarm panels, as well as external systems like ATM and POS terminals, fire alarm systems, number plate capture equipment and video content analysis solutions. Integration with other security and building management systems is accomplished using OPC (OLE for Process Control). When even tighter integration is required, our VideoSDK provides you with a complete toolbox of modules for playback, searching, viewing and much, much more.

Use Recording Station in a LAN environment with Bosch Video Management System to advance to a true enterprise solution which provides a comprehensive feature set such as centralized user, event and alarm management, multi-monitor workstations with zoom able sitemaps and CCTV keyboard control.

For special cases when the customer wants to be hardware independent we offer a USB dongle that provides a unique Computer Signature (Dongle ID).

Recording Station still needs to be licensed via a software authorization and SLMS.

This USB dongle also can be used in case the Computer Signature changes on every start of Recording Station caused by for example

- RAID which covers / alters the HDD IDs or provides an own - mostly cryptically - hardware ID
- Windows 7 / Server 2008 which shows only these MACs which are actually connected
- Different Windows users which have different permissions to access PC hardware

Technical specifications

Recording resolutions	QCIF, CIF, 2CIF, 4CIF, HD 720p, HD 1080p Megapixel (arbitrary JPEG resolution up to 2048 x 1536 pixels)
Recording rates per channel (depending on camera/ encoder model)	PAL: 0,5 - 50 IPS NTSC: 0,5 - 60 IPS
Supported video codecs / protocols	Bosch MPEG-4 Bosch H.264 Axis MPEG-4, JPEG/MJPEG via HTTP/TFTP
Supported Bosch MPEG-4/H.264 IP cameras	AutoDome Junior HD / HD IVA AutoDome 100/200/300/500 AutoDome Easy IP / IP II / IP II E AutoDome 700 IP AutoDome 800 HD Axis MPEG4 (no PTZ) Dinion IP (MPEG4) Dinion NBN-832V-P HD Dinion NBN-921-P Dinion NBx 4xx P / P IVA Dinion NBx 4xx P SD / P SD IVA Dinion NDx 4xx P SD / P SD IVA Dinion HD 1080p D/N Dinion HD 720p Dinion NER-L2 Extreme IP FlexiDome IP FlexiDome NDN-921-P FlexiDome NDx 4xx P / P IVA FlexiDome HD 1080p D/N FlexiDome HD720p RD NBC 255-P / 265 P / 225 P NBC-255-W / NBC- 265-W NDC 265 P / 225-P / 225 P I NDC-255-P / 255 P I NDC-274 / 284 NTC-265-PI NDN-265-PIO NDN-822 x VG4 AutoDome (H.264 IP module) VG5 AutoDome HD / SD VOT 320V NEI-30 IR Imager IVA
Supported Bosch H.264 and MPEG-4 encoders (video servers)	VideoJet 10/1000 VideoJet X10 / X20 /X40 VideoJet X10 SN / X20 SN / X40 SN VideoJet X1 XF / X1 XF W VideoJet X20 XF E / X40 XF E VIP10 VIP 1600 / 1600 XFM4 VIP X16 XF E VIPX1 / VIPX1A / VIPX2 / VIPX2A VIPX1 XF E VJ8004 / VJ8004A VJ8008 / VJ8008A
Supported Bosch JPEG IP cameras	NWC-0700/0800 Megapixel IP camera NWC-0900 Day/Night Megapixel IP camera

EXHIBIT B

Supported JPEG IP cameras from other manufacturers	IP cameras from Arecont Vision, Axis, Mobotix, Sony and other compatible cameras that support HTTP/TFTP and provide fixed path to JPEG image
Supported ONVIF cameras	AXIS M7014 Video Encoder AXIS P1347 Network Camera AXIS P5534 PTZ Dome Network Camera AXIS Q6035 PTZ Dome Network Camera AXIS Q1604 Sony SNC-CH240 Panasonic WV-SC386 Series PTZ
Maximum number of connected cameras:	64
Maximum number of configured remote station at one receiver station	500 (can be configured, visible in devices list)
Number of simultaneously connected remote stations at one receiver station	Maximum: 32
Supported Languages	Czech, Danish, Dutch, German, Greek, English, Finnish, French, Hungarian, Italian, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish and Turkish
HTTP Browser Access (WAN)	IIS must be installed and configured on the Bosch Recording Station. A custom HTTP port is possible.
BRS WebServer	ActiveX required on browser. For Windows XP and Windows 7: maximum 3 connections to one station
Supported operating systems	Windows 7 (32-bit / 64-bit) Windows Server 2008 (32-bit) Windows Server 2008 R2 (64-bit) Windows XP Professional SP3 (32-bit) Windows Server 2003 (32-bit)

Minimum requirements for Workstation PCs running Bosch Recording Station (Recorder and Receiver)

Maximum recording rate	50 Mbit/s
CPU	Core 2 Duo CPU
RAM	2 GB
Graphic Card	32-Bit color depth (DirectX 9 Hardware Support, no shared memory)
Free disk space	2 GB on system partition
Recording partition	Dedicated partition (e.g. D:) for recording
Network adapter	1000 Base-T, Gbit

Minimum Requirements for server platforms running Bosch Recording Station (Recorder only)

Maximum recording rate	100 Mbit/s (no local viewing)
CPU	quad-core Intel Xeon 5504 processor (2.0 GHz)

RAM	4 GB
Free disk space	2 GB on system partition
Recording partition	Dedicated partition (e.g. D:) for recording
Network adapter	1000 Base-T, Gbit

Device Compatibility / Integration features

Bosch Video Management System	Version 4.0. Requires 1 Gbit/s connections to central server and workstation; communication via TCP Port 135 plus 4 TCP ports and 4 UDP ports dynamically assigned in the range from 1025 to 65535
ATM integration	DTP3N via RS232 (only EMEA)
IP server integration	Any IP server using socket connections for communication
Alarm panel integration (intrusion, fire, access)	Integration via RS232: AZ1010, BZ500, BZ1012, BZ1060, FPA5000, G-Series Panels, NZ500, NZ1008, NZ1012, NZ1060, UEZ, UGM2020
Digital I/O modules	Digital I/O Advantech ADAM-6017, ADAM-6018, ADAM-6022, ADAM-6024, ADAM-6050, ADAM-6050-W, ADAM-6051, ADAM-6051-W, ADAM-6052, ADAM-6055, ADAM-6060, ADAM-6060-W, ADAM-6066,
OPC server	The DiBos 8 OPC server (v8.7) also supports Bosch Recording Station and must be installed separately. The installation file is included on the Setup DVD Note: OPC server is not supported on Windows 7 and Windows Server 2008
Virtual inputs	Up to 132 virtual inputs

Ordering information**DVD Box + Manual without license**

Recording Station DVD Box and Manual, without License

Order number **BRS-DVD-00A****DVD Box + Manual 16 IP cameras**

Recording Station DVD Box and Manual, Base License for 16 IP Cameras included

Order number **BRS-DVD-16A****DVD Box + Manual 32 IP cameras**

Recording Station DVD Box and Manual, Base License for 32 IP Cameras included

Order number **BRS-DVD-32A****Software Options****Base License 4 IP cameras (e-license)**

Recording Station Base License for 4 IP Cameras

Order number **BRS-BASE-04A**

EXHIBIT B

Base License 8 IP cameras (e-license)

Recording Station Base License for 8 IP Cameras
Order number **BRS-BASE-08A**

Base License 16 IP cameras (e-license)

Recording Station Base License for 16 IP Cameras
Order number **BRS-BASE-16A**

Base License 32 IP cameras (e-license)

Recording Station Base License for 32 IP Cameras
Order number **BRS-BASE-32A**

Expansion License 4 IP cameras (e-license)

Recording Station Expansion License for 4 additional
IP Cameras
Order number **BRS-XCAM-04A**

Expansion License 8 IP cameras (e-license)

Recording Station Expansion License for 8 additional
IP Cameras
Order number **BRS-XCAM-08A**

Expansion License 16 IP cameras (e-license)

Recording Station Expansion License for 16 additional
IP Cameras
Order number **BRS_XCAM-16A**

Expansion license for 32 IP cameras (e-license)

Recording Station Expansion License for 32 IP
Cameras
Order number **BRS-XCAM-32A**

Feature License ATM POS bridge (e-license)

Recording Station Feature License for ATM/POS
Bridge Integration
Order number **BRS-FATM-A**

Feature License IP Server (e-license)

Recording Station Feature License for IP Server
Socket Connections
Order number **BRS-FIPS-A**

Feature License Security Panel (e-license)

Recording Station Feature License for Security Panel
Integration
Order number **BRS-FPAN-A**

Feature License CD/DVD writing for Receiver (e-license)

Recording Station (Receiver) Feature License CD/DVD
Writing
Order number **BRS-FWRI-A**

BRS USB Dongle

Recording Station USB dongle. Provides a unique ID if
computer signature often changes.
Order number **BRS-DNGL-A**

30 day Demo License (e-license)

Recording Station Demo License for 32 IP Cameras
(expires after 30 days)
Order number **BRS-DEMO-32A**

EXHIBIT B

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EXHIBIT B

Bosch Video Management System v.4

www.boschsecurity.com



BOSCH

Invented for life



- ▶ Enterprise-class Client/Server based video management system
- ▶ Superior alarm handling with alarm priorities and selectable user group distribution
- ▶ Mobile video client for live and playback
- ▶ Edge based intelligent Video Analytics (IVA) and forensic search
- ▶ Support of 3rd party cameras that are compliant to ONVIF Profile S

The Bosch Video Management System is a unique enterprise IP video security solution that provides seamless management of digital video, audio, and data across any IP network. It is designed to work with Bosch CCTV products as part of a total video security management system. You can integrate your existing components into one easy-to-manage system, or use our full-line capabilities and benefit from a complete security solution based on cutting-edge technology and years of experience.

The Bosch Video Management System allows a very flexible system design:

- Compact: Single Site System
1 to 2000 cameras out of the box.
Only this system supports BIS-BVMS connectivity.
- Enterprise: Multi Site-Single Customer
Up to 10,000 cameras
Supporting multi-site requirements for Metro, Airport and other large industrial facilities
Consisting of individually configured servers
Combined monitoring in Operator Client
- Enterprise: Multi Site-Multi Customer
Up to 10,000 cameras
Up to 10 individually configured subsystems
Enabled for legally different companies

The Bosch Video Management System is installed on a Microsoft Windows Operating System.

We recommend using Bosch Workstations and Servers. They are fully tested and optimized for Bosch Video Management System.

In addition to the Bosch ST standard terms and conditions of sale, the Bosch Video Management System Software is a great option to benefit from the Bosch maintenance service, keeping your VMS always up-to date.

It can be found in your online CCTV product catalog.

System overview

The Bosch Video Management System contains the following software components:

- Management Server software provides management, monitoring, and control of the entire system
- Enterprise Management Server provides access to multiple Management Server computers
- Video Recording Manager (VRM) provides recording and playback management of video, audio, and data
- Configuration Client software provides the user interface for system configuration and management
- Operator Client software provides the user interface for system monitoring and operation
- Mobile Video Service, Mobile Client
- Video Streaming Gateway

EXHIBIT B

These software components can be run together on a single PC for small systems or on separate PCs and servers for large systems.

Bosch Video Recording Manager (VRM) provides a Distributed Network Video Recorder solution, eliminating the need for dedicated NVRs.

The VRM provides load balancing and failover for the iSCSI storage and makes it easy to add additional iSCSI storage later on. VRM introduces the concept of a storage virtualization layer. This abstraction layer enables VRM to manage all of the individual disk arrays in the entire system as a single “virtual” common pool of storage, which is intelligently allocated as needed. The usage of multiple client workstations offers great scalability.

The Bosch VMS manages 2000 IP cameras / encoders per Management Server (up to 10,000 in Enterprise Systems). A Bosch VMS supports 100 workstations.

Functions

Deployment

- Updates of Operator Client and Configuration Client automatically deployed from Management Server
- Supports all Bosch MPEG4 & H.264 encoders, MPEG4 & H.264 IP cameras and IP AutoDome cameras in SD & HD format, decoders, Allegiant, DiBos, Bosch POS/ATM Bridge, and DiBos-compatible ATM Bridge
- Supported HD resolutions: 720p and 1080p

Configuration

- Enterprise System: Operator Client can access up to 10 Management Servers simultaneously
- Support of 3rd party cameras that are compliant to ONVIF Profile S
- Intelligent Video Analysis (IVA) and Forensic Search without servers
- Connectivity to mobile clients (iPad and iPhone, App available in AppStore)
- Automatic scan of IP devices
- Automatic IP address assignment of IP devices
- Batch firmware updates of IP devices
- Configurable Logical Tree
- Pre-configured camera sequences with 25 cameras with each up to 100 steps with individual dwell times.
- “Automatic Sequences” created by multiple selection and drag and drop to Image panes
- 4 configurable user-events (can be triggered via menu command)

User Interface

- Zoomable sitemaps with links, devices, sequences, and Command Scripts
- Automatic map positioning of a camera in a map when this camera is selected
- Sitemaps in DWF format are used. DWF format version 5.0 and 6.0 are supported.
- Up to 4 PC monitors supported per Workstation
- CCTV keyboard support, connected to either Workstation or IP decoder
CCTV keyboard support the Enterprise System (select the desired Management Server)

- Flexible Image panes allow any combination of video window sizes and layouts
- Any live Image pane can be switched to instant playback
- Multiple instant playback Image panes
- Image windows can display live video, instant playback video, text documents, maps, or web pages
- Device states shown by icons, including network-connection loss, video loss, and camera de-adjustment
- Favorites tree can be individually configured per user
- Favorites tree can include complete views with Image pane layouts and camera assignments
- Bookmarks in Live and Playback Mode for easy investigation and export of recordings
Selected clips can be exported to DVD, network drives, or USB sticks with a few mouse clicks
- Camera selection by double-click or drag and drop from site maps, Logical Tree, or Favorites Tree
- Decoders can be organized in Monitor Walls from within Operator Client
- Monitor Walls can be controlled without connection to Management Server
- Control of analog monitors connected to decoders via drag and drop
- Sophisticated multi-camera timeline allows easy, graphical searching of stored video
- Timeline colors indicate recording status – normal recording, alarm recording, motion recording, protected recording, and audio recording (not for cameras managed by a VRM)
- Easy clip selection by dragging hairlines in the timeline
- Flexible search works across all DVRs connected to the system
- Post-recording motion search allows easy locating of changes in selected areas
- Forensic Search allows the usage of Intelligent Video Analysis (IVA) algorithms on the recorded video
- Two audio listening options – selected channel only, or multiple simultaneous channels
- Audio Intercom functionality
- 4:3 and 16:9 Image panes
- Continuous Operation for live, playback and export while Management Server disconnected
- Live and Playback of the following recording engines: Video Recording Manager, Local Storage, Direct-iSCSI-Recording, Bosch Recording Station, Video Streaming Gateway. For legacy purposes the following recording engines are supported: NVR, DiBos, Vidos NVR

Scheduling

- Up to 10 Recording schedules with Holidays and Exception Days
- Task Schedules with Holidays, Exception Days, and recurring schedule support
- Per camera settings for minimum and maximum recording times
- Per camera, per recording schedule frame rate and quality settings for live, normal recording, motion recording, and alarm recording

EXHIBIT B**Event Handling**

- Compound events (combining events with Boolean logic)
- Event duplication allowing separate handling
- Event allocation to user groups
- Schedule dependent event logging
- Schedule dependent event-generated Command Script invocation

Alarm Handling

- Schedule dependent alarm generation
- Alarms can trigger alarm-mode recording for any cameras
- 100 alarm priorities
- Selective auto-popup on alarm
- Alarms displayed in separate alarm window
- Up to 5 Image panes per alarm with live or playback video, sitemaps, documents, or web pages displayed in an “alarm row”, with highest priority alarms on top
- Audio file per alarm
- Workflow with user instructions and user comments, optionally forced before clearing
- Email or SMS notification on alarm
- Alarm display on Monitor Wall
- Alarm auto clear options either time or state dependent

User Management

- LDAP compatible for integration with user management systems such as Microsoft Active Directory
- Access to system resources individually controlled per user group
- Logical Tree customized per user group – users only see devices for which they have access
- User group rights for protecting, deleting, exporting, and printing video
- User group rights for Logbook access
- User group priority assignment for PTZ control and Allegiant camera access
- Individual per-camera privileges assignable per user group for live access, playback, audio, meta data display, dome control
- Dual-authorization logon – special privileges and priorities granted when two users log on together

System Monitoring

- System-wide health monitoring, including Bosch cameras, computers, software, and network equipment
- Network equipment and other third-party devices monitored with SNMP

Customization and Interfacing

- CameoSDK for easy integration into 3rd party Physical Security Information Management (PSIM) and other Management Systems
- RemoteClient Enterprise SDK for system integrators wanting to interface a running Bosch VMS Operator Client.
- Custom Command Scripts can control all system functionality
- Built in Command Script editor supporting C# and Visual Basic .Net

- External software can trigger events and send metadata via “Virtual Inputs”
- Any .Net programming language (C#, JScript, etc.) or COM programming language (C++, Visual Basic, etc.) can be used to interface Bosch VMS functionalities
- Other systems can control a virtual matrix with Allegiant CCL commands that can be sent via RS232
- Compatible with Bosch Building Integration System
- Compatible with Advantech ADAM-6000 series Digital Input / Output modules

Parts included

- The Base Box is delivered with DVD and Quick Start Manual.
- The DVD contains the following items:
 - Installation program that can selectively install all components (Management Server software, Video Recording Manager software, Configuration Client software, Operator Client software, Video Streaming Gateway software, Mobile Video Services software) in all supported languages
 - Configuration Manual (PDF format) in all supported languages (except Arabic)
 - Operator’s Manual (PDF format) in all supported languages (except Arabic)
- Quick Start Manual in English, French, German, Simplified Chinese and Spanish

Licenses are provided as eLicenses via email.

Technical specifications**System Specifications**

Maximum number of workstations simultaneously viewing the same camera	Multicast: 50 Unicast: 5
Supported languages	English, German, Dutch, Italian, Portuguese, French, Spanish, Simplified Chinese, Traditional Chinese, Russian, Hungarian, Japanese, Czech, Danish, Finnish, Greek, Norwegian, Polish, Swedish, Thai, Turkish, Korean, and Arabic

Anti-Virus software must not perform a full-scan. Performance may decrease depending on configuration.

Event reaction time	<1 second, assuming sufficient network bandwidth
Alarm reaction time (incl. 1 live Image pane, 1 instant playback Image pane and 1 map Image pane):	Maximum 2 seconds, assuming sufficient network bandwidth
Bandwidth requirements	Min. 1 Gbps for connections between: Operator Client to Management Server Operator Client to VRM/DiBos Management Server to NVR/VRM/DiBos

Required open ports

EXHIBIT B**Connection to Video Streaming Gateway**

TCP port 8756

Connection to (Enterprise) Management Server:

TCP ports 5390, 5392, 5393, 5395, 5396

Connection to Operator Client Workstations by BVMS SDK:

TCP port (default 5394)

Connection from Management Server to SMTP (for email notifications):

TCP port 25

Connection to Bosch encoders and decoders:

Control channel: TCP ports 80 and 1756

Network scan: UDP ports 1757 and 1758

Multicast detection: one selectable UDP port (default 1800)

Multicast video transmission:

For each encoder audio or video stream, 1 selectable UDP port

Unicast UDP transmission: UDP ports dynamically assigned in the range from 1024 to 65000

Connection between Management Server and DiBos (as of V.8.10., earlier versions need a patch for using Web service):

TCP port 808

Connection between Operator Client and DiBos DVRs (uses DCOM):

TCP Port 135 plus four TCP ports and four UDP ports dynamically assigned in the range from 1025 to 65535

These ports are also used when Management Server and an old DiBOS 8.9 or earlier without patch are connected.

Management Server Specifications

Maximum number of sustained events	For highest performance server: 500 events/s with Logbook 1000 events/s without Logbook 5000 events/s at peaks with Logbook
Logbook	Supported by SQL Server 2008 R2 (64-bit version) 4 GByte Logbook size
Management Server Redundancy	Available with VMware HA. Please contact Bosch Design Engineer for redundancy solutions.
Maximum number of Task Schedules	200

VRM Specifications

Maximum count of VRM servers per Management Server	40
Maximum data rate per iSCSI	Please contact Bosch Design Engineer for iSCSI storage solutions.
Max. number of playback sessions	64

Minimum Client Workstation PC Requirements

Operation System	Windows 7 Professional or Ultimate SP1 64 bit version (required for > 500 cameras)
CPU	Intel Core 2 Duo
RAM	2 GB or greater

	4 GB or greater for Enterprise Operator Clients
Free disk space	3 GB or more for Single Site Systems 5 GB or more for Enterprise Systems We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	Minimum per monitor 1024x768, 1280x1024 or greater recommended
Recommended Graphic Card	MHW-AWGC-Q4000 MHW-AWGC-Q5000

Maximum Graphic Cards Specifications

You find detailed information on the maximum number of Image panes and the CPU load for various workstations or servers and graphic cards in the Application Guide "Display performance indication".

Minimum Management Server PC Requirements

Operation System	Windows 2008 Server R2 SP1 (64-bit) required for > 500 cameras Window 2003 Server R2 SP2 (32-bit only) for NVR only For All-in-one systems and maximum 64 IP cameras/ encoders: Windows 7 Professional or Ultimate SP1 (64-bit only)
CPU	Intel Core 2 Duo Intel Core 2 Quad for systems > 500 cameras
RAM	4 GB or greater 8 GB for systems > 500 cameras
Free disk space	15 GB or greater We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	1024x768 or greater

Minimum VRM Server PC Requirements

Operation System	Windows 7 Ultimate SP1, Professional Edition SP1 64-bit versions Windows Server 2003 R2, Standard Edition, 64-bit versions Windows Server 2008 R2, Standard Edition 64-bit versions Windows Storage Server 2008, Standard Edition 64-bit versions
CPU	Dual-Core Intel Xeon Processor 5110 (1.60 GHz, 1066 FSB) to Quad-Core Intel Xeon Processor E5430 (2.66 GHz, 1,333 FSB)

EXHIBIT B

RAM	Minimum 2 GB
Free disk space	500 MB We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	1024x768 or greater

Mobile Client Requirements

Link to App Store	www.boschsecurity.com/MobileVideoService
Maximum number of Mobile Video Service instances per Management Server	5
Number of simultaneous connections per Mobile Video Service (1 mobile device consumes 1 connection, each stream consumes another connection)	20
Server for Mobile Video Service	Windows Server 2008/R2 or Windows 7 SP1 Professional or Ultimate 64-bit versions
Supported cameras	IP cameras with H.264 support that are directly controlled by Bosch VMS (not controlled by BRS or VIDOS)
iOS Version for iPhone/iPad	5.1.1

Minimum NVR Server PC Requirements

Operation System	Windows XP Professional, SP3 (32-bit only), Windows 2003 Server, R2 SP2 (32-bit only) Windows 7 and Windows Server 2008 not supported
CPU	Intel Core 2 Duo
RAM	2 GB or greater
Free disk space	500 MB + Video Storage We recommend having minimum 15% free disk space.
Hard disk drives	Minimum: separate partition for video storage Separate drive for video storage recommended
Network card	1000Base-T
Display Resolution	1024x768 or greater

Device Compatibility

Barco Monitor Wall	Barco RCPPlusAgent.exe 2.0.6.12 for Barco Monitor Wall
Analog Matrix Switch	Bosch Allegiant series, firmware 8.75 or later and Master Control Software version 2.92

CCTV Keyboard	Bosch Intuikey (KBD-Universal or KBD-Digital), firmware version 1.96
Digital I/O	Digital I/O Advantech ADAM-6050, ADAM-6052, ADAM-6060, ADAM-6066
Digital Video Recorder	Bosch Recording Station 8.10 DiBos, firmware version 8.7 Maximum 100 DiBos/BRS recorders per Management Server
USB to Serial adapter	Belkin serial adapter cable F5U103vea
Ethernet to Serial adapter	Control DeviceMaster RTS 4-Port
IP Devices	VIP-X Series encoders and cameras H.264 Series encoders and cameras MPEG-4, H.264 Main Profile, H.264 Baseline Plus are supported (H.264 Baseline and MPEG-2 not supported)
Connectivity with Building Integration System	Version 2.5 TU1

Ordering information**Demoverision - Non Expandable**Order number **MBV-BDEM-40****Lite-32-Edition - Non Expandable**Order number **MBV-BLIT32-40****Lite-64-Edition - Non Expandable**Order number **MBV-BLIT64-40****Professional Edition**Order number **MBV-BPRO-40****Enterprise System**

2 Workstations, 2 subsystems, 1 CCTV Keyboard
Supports 1 Enterprise Management Server, 2 subsystems (Management Servers)
Order number **MBV-BENT-40**

Enterprise Subsystem Expansion

Supports 1 Management Server as member of an Enterprise System
Order number **MBV-XSUB-40**

Enterprise Upgrade for Pro

Supports 1 Management Server to be upgraded to an Enterprise Management Server
Order number **MBV-FEUP-40**

1 Channel ExpansionOrder number **MBV-XCHAN-40****1 Workstation Expansion**Order number **MBV-XWST-40**

EXHIBIT B**1 DVR Expansion**Order number **MBV-XDVR-40****1 CCTV Keyboard Expansion**Order number **MBV-XKBD-40****1 Forensic Search Expansion**Order number **MBV-XFOREN-40****Allegiant Matrix Connection**Order number **MBV-FALG-40****ATM/POS Connection**Order number **MBV-FATM-40****OPC Server Connection for BIS**Order number **MBV-FOPC-40****Mobile Video Service Expansion**Order number **MBV-XMVS-40****Base Box**

Hard cardboard box including DVD and Quick Start Manual (in English, French, German, Simplified Chinese, and Spanish)

Order number **MBV-BBOX****Services****Maintenance Demoversion**Order number **MBV-MDEM****Maintenance Lite-32-Edition**Order number **MBV-MLIT32****Maintenance Lite-64-Edition**Order number **MBV-MLIT64****Maintenance Professional Edition**Order number **MBV-MPRO****Maintenance Enterprise Edition**Order number **MBV-MENT****Maintenance Enterprise Subsystem Expansion**Order number **MBV-MSUB****Maintenance Mobile Video Service**Order number **MBV-MMVS****Maintenance Enterprise Upgrade for Pro**Order number **MBV-MEUP****Maintenance Channel Expansion**Order number **MBV-MCHAN****Maintenance Workstation Expansion**Order number **MBV-MWST****Maintenance DVR Expansion**Order number **MBV-MDVR****Maintenance CCTV Keyboard Expansion**Order number **MBV-MKBD****Maintenance Forensic Search Expansion**Order number **MBV-MFOREN****Maintenance Allegiant Matrix Connection**Order number **MBV-MALG****Maintenance ATM/POS Connection**Order number **MBV-MATM****Maintenance OPC Server Connection**Order number **MBV-MOPC**

EXHIBIT B

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EXHIBIT B

Bosch Video Management System v.4.5

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Enterprise-class Client/Server based video management system
- ▶ Superior alarm handling with alarm priorities and selectable user group distribution
- ▶ Mobile video client for live and playback
- ▶ Edge based intelligent Video Analytics (IVA) and forensic search
- ▶ Support of 3rd party cameras that are compliant to ONVIF Profile S

The Bosch Video Management System is a unique enterprise IP video security solution that provides seamless management of digital video, audio, and data across any IP network. It is designed to work with Bosch CCTV products as part of a total video security management system. You can integrate your existing components into one easy-to-manage system, or use our full-line capabilities and benefit from a complete security solution based on cutting-edge technology and years of experience.

The Bosch Video Management System allows a very flexible system design:

- Compact: Single Site System
1 to 2000 cameras out of the box.
Only this system supports BIS-BVMS connectivity.
- Enterprise: Multi Site-Single Customer
Up to 10,000 cameras.
Supporting multi-site requirements for Metro, Airport and other large industrial facilities.
Consisting of individually configured servers.
Combined monitoring in Operator Client.
- Enterprise: Multi Site-Multi Customer
Up to 10 subsystems with a total of up to 10,000 cameras.
Up to 30 subsystems for <100 cameras per subsystem.
Enabled for legally different companies.

The Bosch Video Management System is installed on a Microsoft Windows Operating System.

We recommend using Bosch Workstations and Servers. They are fully tested and optimized for Bosch Video Management System.

In addition to the Bosch ST standard terms and conditions of sale, the Bosch Software Maintenance Agreement is a great option to keep your VMS always up-to date.

It can be found in your online CCTV product catalog.

System overview

Bosch VMS contains the following software components:

- Management Server software provides management, monitoring, and control of the entire system
- Enterprise Management Server provides access to multiple Management Servers
- Video Recording Manager (VRM) provides recording and playback management of video, audio, and data
- Configuration Client software provides the user interface for system configuration and management
- Configuration Wizard software provides easy and fast setup of a small recording system
- Operator Client software provides the user interface for system monitoring and operation

EXHIBIT B

- Mobile Video Service provides a transcoding service. It transcodes the live and recorded video stream from a configured camera according to the available network bandwidth. This service enables video clients like an iPhone or a Web client to view high-quality images via low bandwidth.
- Mobile App: You can use the Mobile App on iPhone or iPad to access live and playback video.
- Web Client: You can access live and playback videos via Web browser.
- Bosch Video Streaming Gateway: Provides the integration of ONVIF cameras.
- Remote access via public networks

Bosch Video Recording Manager (VRM) provides a Distributed Network Video Recorder solution, eliminating the need for dedicated NVRs.

The VRM provides load balancing and failover for the iSCSI Storage System and makes it easy to add additional iSCSI Storage System later on. VRM introduces the concept of a storage virtualization layer. This abstraction layer enables VRM to manage all of the individual disk arrays in the entire system as a single “virtual” common pool of storage, which is intelligently allocated as needed.

The usage of multiple client workstations offers great scalability.

Bosch VMS manages 2,000 IP cameras / encoders per Management Server (up to 200,000 in Enterprise Systems). One Bosch VMS supports 100 workstations.

Functions

Cameras

- Supports Bosch MPEG4 & H.264 encoders, MPEG4 & H.264 IP cameras and IP AutoDome cameras in SD & HD format, decoders, DVRs, Allegiant, Bosch Recording Station (BRS)/DiBos, Bosch POS/ATM Bridge, and DiBos-compatible ATM Bridge
- Supported HD resolutions: 720p and 1080p, 5 Megapixel

Deployment

- Updates of Operator Client and Configuration Client automatically deployed from Management Server

Configuration

- Enterprise System: Operator Client can access up to 30 Management Servers (maximum 100 cameras per Management Server) simultaneously
- Remote access: The target of remote access in Bosch VMS is to connect different private networks to public networks.
- Support of 3rd party cameras that are compliant to ONVIF Profile S
- Intelligent Video Analysis (IVA) and Forensic Search without servers
- Connectivity to mobile clients (iPad and iPhone, App available in AppStore)
- Automatic scan of IP devices
- Automatic IP address assignment of IP devices
- Batch firmware updates of IP devices
- Configurable Logical Tree

- Pre-configured camera sequences with 25 cameras with each up to 100 steps with individual dwell times.
- “Automatic Sequences” created by multiple selection and drag and drop to Image panes
- 4 configurable user-events (can be triggered via menu command)

User Interface

- Web Client/iOS App for live and playback video
- Server Lookup: Access method for a user of Configuration Client or Operator Client to sequentially connect to multiple system access points. A system access point can be a Management Server or an Enterprise Management Server.
- Zoomable sitemaps with links, devices, sequences, and Command Scripts
- Automatic map positioning of a camera in a map when this camera is selected
- Sitemaps in DWF format are used. DWF format version 5.0 and 6.0 are supported.
- Up to 4 PC monitors supported per Workstation
- VideoTec DCZ keyboard supported, connected to Workstation via USB interface
VideoTec DCZ keyboard supports Enterprise System (select the desired Management Server)
- Bosch IntuiKey keyboard supported, connected to either Workstation or IP decoder
Bosch IntuiKey keyboard supports Enterprise System (select the desired Management Server)
- Flexible Image panes allow any combination of video window sizes and layouts
- Any live Image pane can be switched to instant playback (not valid for transcoded streams)
- Multiple instant playback Image panes
- Image windows can display live video, instant playback video, text documents, maps, or web pages
- Device states shown by icons, including network-connection loss, video loss, and camera de-adjustment
- Favorites tree can be individually configured per user
- Favorites tree can include complete views with Image pane layouts and camera assignments
- Bookmarks in Live and Playback Mode for easy investigation and export of recordings
Selected clips can be exported to DVD, network drives, or USB sticks with a few mouse clicks
- Camera selection by double-click or drag and drop from site maps, Logical Tree, or Favorites Tree
- Decoders can be organized in Monitor Walls from within Operator Client
- Monitor Walls can be controlled without connection to Management Server
- Control of analog monitors connected to decoders via drag and drop
- Sophisticated multi-camera timeline allows easy, graphical searching of stored video
- Timeline colors indicate recording status – normal recording, alarm recording, motion recording, protected recording, and audio recording (not for cameras managed by a VRM)

EXHIBIT B

- Operator Client can be located in another time zone than Management Server.
Local time zone of Operator Client, UTC or time zone of the Management Server can be displayed.
- Easy clip selection by dragging hairlines in the timeline
- Post-recording motion search allows easy locating of changes in selected areas
- Forensic Search allows the usage of Intelligent Video Analysis (IVA) algorithms on the recorded video
- Two audio listening options – selected channel only, or multiple simultaneous channels
- Audio Intercom functionality
- 4:3 and 16:9 Image panes
- Continuous Operation for live, playback and export while Management Server disconnected
- Live and Playback of the following recording engines: Video Recording Manager, Local Storage, Direct-iSCSI-Recording, Bosch Recording Station (BRS), Video Streaming Gateway (VSG). For legacy purposes the following recording engines are supported: DVR, NVR, DiBos, VIDOS NVR
- Live and Playback via low bandwidth
- Enable TCP for reliable connection (Live Mode)

Scheduling

- Up to 10 Recording schedules with Holidays and Exception Days
- Task Schedules with Holidays, Exception Days, and recurring schedule support
- Per camera settings for minimum and maximum recording times
- Per camera, per recording schedule frame rate and quality settings for live, normal recording, motion recording, and alarm recording

Event Handling

- Compound events (combining events with Boolean logic)
- Event duplication allowing separate handling
- Event allocation to user groups
- Schedule dependent event logging
- Schedule dependent event-generated Command Script invocation

Alarm Handling

- Schedule dependent alarm generation
- Alarms can trigger alarm-mode recording for any cameras
- 100 alarm priorities
- Selective auto-popup on alarm
- Alarms displayed in separate alarm window
- Up to 5 Image panes per alarm with live or playback video, sitemaps, documents, or web pages displayed in an “alarm row”, with highest priority alarms on top
- Audio file per alarm
- Workflow with user instructions and user comments, optionally forced before clearing
- Email or SMS notification on alarm
- Alarm display on Monitor Wall
- Alarm auto clear options either time or state dependent

User Management

- LDAP compatible for integration with user management systems such as Microsoft Active Directory
- Access to system resources individually controlled per user group
- Logical Tree customized per user group – users only see devices for which they have access
- User group rights for protecting, deleting, exporting, and printing video
- User group rights for Logbook access
- User group priority assignment for PTZ control and Allegiant camera access
- Individual per-camera privileges assignable per user group for live access, playback, audio, meta data display, dome control
- Dual-authorization logon – special privileges and priorities granted when two users log on together

System Monitoring

- System-wide health monitoring, including Bosch cameras, computers, software, and network equipment
- Network equipment and other third-party devices monitored with SNMP

Customization and Interfacing

- Server SDK controls and monitors Bosch VMS Management Server by scripts and external applications.
- Client SDK controls and monitors Bosch VMS Operator Client by external applications and scripts (part of the related server configuration).
- Client Enterprise SDK controls and monitors the behavior of Bosch VMS Operator Client of an Enterprise System by external applications.
- Cameo SDK easily embeds the content of the Bosch VMS Image pane into clients of 3rd party Physical Security Information Management (PSIM) and other management systems.
- Custom Command Scripts can control all system functionality
- Powerful built in Command Script editor supporting C# and Visual Basic .Net
- External software can trigger events and send metadata via “Virtual Inputs”
- Any .Net programming language (for example C#) can be used to interface Bosch VMS functionalities
- Other systems can control a virtual matrix with Allegiant CCL commands that can be sent via RS232
- Compatible with Advantech ADAM-6000 series Digital Input / Output modules
- Compatible with Bosch Building Integration System

Parts included

- The Base Box is delivered with DVD and Quick Start Manual.
- The DVD contains the following items:
 - Installation program that can selectively install all components (Management Server software, Video Recording Manager software, Configuration

EXHIBIT B

- Client software, Operator Client software, Video Streaming Gateway software, Mobile Video Services software) in all supported languages
- Configuration Manual (PDF format) in all supported languages (except Arabic)
 - Operator's Manual (PDF format) in all supported languages (except Arabic)
- Quick Start Manual in English, French, German, Simplified Chinese and Spanish
- Licenses are provided as eLicenses via email.

Technical specifications**System Specifications**

Maximum number of workstations simultaneously viewing the same camera	Multicast: 50 Unicast: 5
Supported GUI languages	English, German, Dutch, Italian, Portuguese, French, Spanish, Simplified Chinese, Traditional Chinese, Russian, Hungarian, Japanese, Czech, Danish, Finnish, Greek, Norwegian, Polish, Swedish, Thai, Turkish, Korean, and Arabic
Anti-Virus software must not perform a full-scan. Performance may decrease depending on configuration.	
Event reaction time	< 1 second, assuming sufficient network bandwidth
Alarm reaction time (incl. 1 live Image pane, 1 instant playback Image pane and 1 map Image pane):	Maximum 2 seconds, assuming sufficient network bandwidth
Bandwidth requirements for LAN	Min. 1 Gbps for connections between: Operator Client to Management Server Operator Client to VRM/DiBos Management Server to NVR/VRM/DiBos
Bandwidth requirements for remote access	>= 300kbps
Hardware transcoder	Hardware transcoder VIP-XTXCF-INT or VJT-XTXCF must be configured in VRM, refer to VRM documentation. Hardware transcoding only applicable for VRM connected BVIP cameras. For transcoding live streams it is not required that the respective camera is recording.

Required open ports**Connection to VRM**

LAN: port 1756
WAN: port 80 or port 443 as per default

Connection to Video Streaming Gateway

TCP port 8756 (VSG instance 1)
TCP port 8757 (VSG instance 2)

TCP port 8758 (VSG instance 3)
TCP port 8759 (VSG instance 4)
TCP port 8760 (VSG instance 5)
TCP port 8761 (VSG instance 6)
TCP port 8762 (VSG instance 7)

Connection to (Enterprise) Management Server:
TCP ports 5390, 5392, 5393, 5395, 5396

Connection to Operator Client Workstations by BVMS SDK:
TCP port (default 5394)

Connection from Management Server to SMTP (for email notifications):
TCP port 25

Connection to Bosch encoders and decoders:

Control channel: TCP ports 80 and 1756 (port 443 for encoders using https)
Network scan: UDP ports 1757 and 1758
Multicast detection: one selectable UDP port (default 1800)
Multicast video transmission:
For each encoder audio or video stream, 1 selectable UDP port
Unicast UDP transmission: UDP ports dynamically assigned in the range from 1024 to 65000

Connection between Management Server and DiBos (as of V.8.10, earlier versions need a patch for using Web service):
TCP port 808

Connection between Operator Client and DiBos DVRs (uses DCOM):

TCP Port 135 plus four TCP ports and four UDP ports dynamically assigned in the range from 1025 to 65535
These ports are also used when Management Server and an old DiBos 8.9 or earlier without patch are connected.

Management Server Specifications

Maximum number of sustained events	For highest performance server: 500 events/s with Logbook 1000 events/s without Logbook 5000 events/s at peaks with Logbook
Logbook	Supported by SQL Server 2008 R2 (64-bit version) 4 GByte Logbook size
Management Server Redundancy	Available with VMware HA. Please contact Bosch Design Engineer for redundancy solutions.
Maximum number of Task Schedules	200

VRM Specifications

Version	3.0 Previous versions are not supported.
Maximum count of VRM servers per Management Server	40
Maximum data rate per iSCSI	Please contact Bosch Design Engineer for iSCSI storage solutions.
Max. number of playback sessions	64

EXHIBIT B**Minimum Client Workstation PC Requirements**

Operation System	Windows 7 Professional or Ultimate SP1 64 bit version (required for > 500 cameras) Windows XP Service Pack 3 for < 500 cameras
CPU	Intel Core 2 Duo
RAM	2 GB or greater 4 GB or greater for Enterprise Operator Clients
Free disk space	3 GB or more for Single Site Systems 5 GB or more for Enterprise Systems We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	Minimum per monitor 1024x768, 1280x1024 or greater recommended
Recommended Graphic Cards	MHW-AWGC-Q2000 MHW-AWGC-Q600 MHW-AWGC-Q4000 MHW-AWGC-Q5000 AMD Fire Pro V7900 (not available as separate graphic card)

Maximum Graphic Cards Specifications

Detailed information on the maximum number of Image panes and the CPU load for various workstations or servers and graphic cards in the Application Guide “Display performance indication”.

Minimum Management Server PC Requirements

Operation System	Windows 2008 Server R2 SP1 (64-bit) required for > 500 cameras Windows 7 Professional or Ultimate SP1 (64-bit only) required for Management Server, Configuration Client and Operator Client on the same computer, and maximum 500 IP cameras/encoders Window 2003 Server R2 SP2 (32-bit only) for NVR only
CPU	Intel Core 2 Duo Intel Core 2 Quad for systems > 500 cameras
RAM	4 GB or greater 8 GB for systems > 500 cameras
Free disk space	15 GB or greater We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	1280 x 1024

Minimum VRM Server PC Requirements

Operation System	Windows 7 Ultimate SP1, Professional Edition SP1 64-bit versions Windows Server 2003 R2, Standard Edition, 64-bit versions Windows Server 2008 R2 SP1, Standard Edition 64-bit versions Windows Storage Server 2008 SP1, Standard Edition 64-bit versions
CPU	Dual-Core Intel Xeon Processor 5110 (1.60 GHz, 1066 FSB) to Quad-Core Intel Xeon Processor E5430 (2.66 GHz, 1,333 FSB)
RAM	Minimum 2 GB
Free disk space	500 MB We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	1024x768 or greater

Mobile / Web Client Requirements

Link to App Store	www.boschsecurity.com/MobileVideoService
Maximum number of Mobile Video Service instances per Management Server	5
Number of simultaneous connections per Mobile Video Service (1 mobile device consumes 1 connection, each stream consumes another connection)	20
Server for Mobile Video Service	Windows Server 2008/R2 or Windows 7 SP1 Professional or Ultimate 64-bit versions
Supported cameras	IP cameras with H.264 or H.263 support that are controlled by Bosch VMS (not controlled by VIDOS) ONVIF cameras BRS/DiBos/DVR cameras
iOS Version for iPhone/iPad	6.1.2
Hardware version iPad	iPad, iPad 2, iPad 3 rd generation
Hardware version iPhone	iPhone 4, iPhone 4S, iPhone 5
Browser (Web Client)	Internet Explorer 9.0

EXHIBIT B**Minimum NVR Server PC Requirements**

Operation System	Windows XP Professional, SP3 (32-bit only), Windows 2003 Server, R2 SP2 (32-bit only) Windows 7 and Windows Server 2008 not supported
CPU	Intel Core 2 Duo
RAM	2 GB or greater
Free disk space	500 MB + Video Storage We recommend having minimum 15% free disk space.
Hard disk drives	Minimum: separate partition for video storage Separate drive for video storage recommended
Network card	1000Base-T
Display Resolution	1024x768 or greater

Device Compatibility

Barco Monitor Wall	Barco RCPPlusAgent.exe 2.0.6.12 for Barco Monitor Wall
Analog Matrix Switch	Bosch Allegiant series, firmware 8.75 or later and Master Control Software version 2.92
CCTV Keyboard	VideoTec DCZ keyboard (USB keyboard) Bosch IntuiKey keyboard, firmware version 1.96
Digital I/O	Digital I/O Advantech ADAM-6050, ADAM-6052, ADAM-6060, ADAM-6066
Digital Video Recorder	DVR 431, 440, 451, 480, 630, 650, 670, 700 series (maximum 15 DVRs per Management Server) Bosch Recording Station 8.10, 8.11 DiBos, firmware version 8.7 Maximum 100 BRS/DiBos recorders per Management Server
USB to Serial adapter	Belkin serial adapter cable F5U103vea
Ethernet to Serial adapter	Control DeviceMaster RTS 4-Port
BVIP Devices	VIP-X Series encoders and cameras H.264 Series encoders and cameras MPEG-4, H.264 Main Profile, H.264 Baseline Plus are supported (H.264 Baseline and MPEG-2 not supported)
Connectivity with Building Integration System	Version 2.5 TU1 and 3.0

Remote Access

Remote Access	Direct iSCSI and encoder replay is not supported.		
	Live	Playback	Control
VRM	x	x	x

VSG	x	x	x
ONVIF	x (via VSG)	x (via VSG)	x (via VSG)
Local Storage	x	-	x
Live Only	x	-	x
BRS/DiBos	-	-	-
NVR	x	-	-
DVR	x	x	x

Ordering information**Demoverision - Non Expandable**

1 Forensic Search included.
Order number **MBV-BDEM-45**

Lite-32-Edition - Non Expandable

Supports 32 Cameras, 2 Workstations, 1 CCTV Keyboard, 0 DVRs – Non Expandable

1 Forensic Search included.

Order number **MBV-BLIT32-45**

Lite-64-Edition - Non Expandable

Supports 64 cameras, 4 Workstations, 2 CCTV Keyboards, 0 DVRs – Non Expandable

2 Forensic Search included.

Order number **MBV-BLIT64-45**

Professional Edition

Supports 8 Cameras, 2 Workstations, 1 CCTV Keyboard, 1 DVR

All MBV-X* and MBV-F* can only be combined with the Professional Edition.

1 Forensic Search included.

Order number **MBV-BPRO-45**

Enterprise System

2 Workstations, 2 subsystems, 1 CCTV Keyboard
Supports 1 Enterprise Management Server, 2 subsystems (Management Servers)

Order number **MBV-BENT-45**

1 Channel Expansion

Expansion, order the exact number required.

For example, if you order 128 units you can use 128 cameras/decoders in your Bosch VMS. Only those cameras need to be counted which are shown in the Logical Tree.

Order number **MBV-XCHAN-45**

1 Workstation Expansion

Expansion, order the exact number required.

Order number **MBV-XWST-45**

1 DVR Expansion

Expansion, order the exact number required.

Order number **MBV-XDVR-45**

EXHIBIT B**1 CCTV Keyboard Expansion**

Expansion, order the exact number required.
Order number **MBV-XKBD-45**

1 Forensic Search Expansion

Expansion, order the exact number required. You need one license per Workstation, not per camera or encoder.
Order number **MBV-XFOREN-405**

Enterprise Subsystem Expansion

Supports 1 Management Server as member of an Enterprise System
Order number **MBV-XSUB-45**

Mobile Video Service Expansion

Order number **MBV-XMVS-45**

Enterprise Upgrade for Pro

Supports 1 Management Server to be upgraded to an Enterprise Management Server
Order number **MBV-FEUP-45**

Allegiant Matrix Connection

Order number **MBV-FALG-45**

ATM/POS Connection

Order number **MBV-FATM-45**

OPC Server Connection for BIS

Order number **MBV-FOPC-45**

Base Box

Hard cardboard box including DVD and Quick Start Manual (in English, French, German, Simplified Chinese, and Spanish)
Order number **MBV-BBOX**

Expansion Box

Paper box including Setup DVD
Order number **MBV-XBOX**

Services**Maintenance Demoversion**

Order number **MBV-MDEM**

Maintenance Lite-32-Edition

Order number **MBV-MLIT32**

Maintenance Lite-64-Edition

Order number **MBV-MLIT64**

Maintenance Professional Edition

Order number **MBV-MPRO**

Maintenance Enterprise Edition

Order number **MBV-MENT**

Maintenance Enterprise Subsystem Expansion

Order number **MBV-MSUB**

Maintenance Mobile Video Service

Order number **MBV-MMVS**

Maintenance Enterprise Upgrade for Pro

Order number **MBV-MEUP**

Maintenance Channel Expansion

Order number **MBV-MCHAN**

Maintenance Workstation Expansion

Order number **MBV-MWST**

Maintenance DVR Expansion

Order number **MBV-MDVR**

Maintenance CCTV Keyboard Expansion

Order number **MBV-MKBD**

Maintenance Forensic Search Expansion

Order number **MBV-MFOREN**

Maintenance Allegiant Matrix Connection

Order number **MBV-MALG**

Maintenance ATM/POS Connection

Order number **MBV-MATM**

Maintenance OPC Server Connection

Order number **MBV-MOPC**

EXHIBIT B

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EXHIBIT B

Monitor Wall

www.boschsecurity.com



BOSCH
Invented for life



- ▶ View multiple live cameras on large screens in your surveillance center
- ▶ Multi-channel decoder with single or dual-screen
- ▶ Configurable window layout
- ▶ Compatible with Bosch Video Management System and Bosch Video Client
- ▶ Compatible with all Bosch IP cameras and encoders

Monitor Wall is the easiest way to view many cameras on state-of-the-art monitor walls. They are the modern-day replacement for the familiar rows of analog CRT CCTV monitors and they bring very specific benefits. Because Monitor Wall is a digital software solution, it is not constrained by analog monitor dimensions. Instead it will easily drive the most massive to the tiniest displays, including flat panel plasma displays that are becoming so popular in both Network and Security Operations Centers. All the video is delivered by the high performance Bosch IP cameras and encoders, both MPEG-4 and H.264 and of course SD and HD.

Monitor Wall can be used in combination with Bosch VMS or Video Client to enhance display capabilities especially for large control centers. Used with VRM Server, which allows centralized management and control, an administrator is able to define user groups and associated privileges which is the basis for client access to live viewing, PTZ control, recording and retrieval, and eventual presentation on the Bosch Monitor Wall.

Together with the powerful video management software tools it is ideally suited for CCTV applications of any scale.

Depending on the performance of the PC and its graphic adapter, Monitor Wall can run a single or dual screen with different screen layouts, reaching from full screen to 5x5 or 6x5 view on both screens, depending on screen aspect ratio. The screen layout can be switched manually or automated by the management system or client if e.g. an alarm scenario requires a different view.



Monitor Wall is available as software only to be installed on any high-performance PC of your choice, but for added convenience there is also a choice of recommended hardware solutions.

Technical Specifications

System Requirements

Hardware	Personal Computer
CPU	Intel Pentium Dual Core, 3.0 GHz or better
Hard Disk Interface	IDE or better
RAM	2 GB min
OS	Windows XP SP3 (32-bit)

EXHIBIT B

	Windows 7 (Business, Home; 32-bit, 64-bit in emulation mode)
Graphics Card	NVIDIA GeForce 8600 (PCI Express)
	NVIDIA Quadro FX 3500 PCIe
	NVIDIA Quadro FX 1500 PCIe
	NVIDIA Quadro FX 4500 PCIe
	NVIDIA Quadro FX 4600 PCIe
	NVIDIA Quadro FX 4800 PCIe
	NVIDIA Quadro NVS 285 PCIe
	NVIDIA Quadro NVS 440 PCIe
	ATI FireGL V7200 PCIe
	ATI FireGL V3300 PCIe
Ethernet Card	100 Mbps
Software	DirectX 9.0c
Free Memory (Inst.)	100 MB (.NET environment, Monitor Wall, Configuration Manager, MPEG-ActiveX)

Software Features

Display	Single or Dual Screen (span mode)
	Configurable windows
	Simultaneous viewing of multiple video streams. (Performance will vary according to the video compression settings of each stream and the nature of the scene.)
Configuration	Through Configuration Manager 4.22.0030 or newer
	Automatically through video management system

Ordering Information**MVS-MW Monitor Wall License**

Digital software solution to view many cameras on state-of-the-art monitor screens (e-license)
Order number **MVS-MW**

Represented by:**Americas:**

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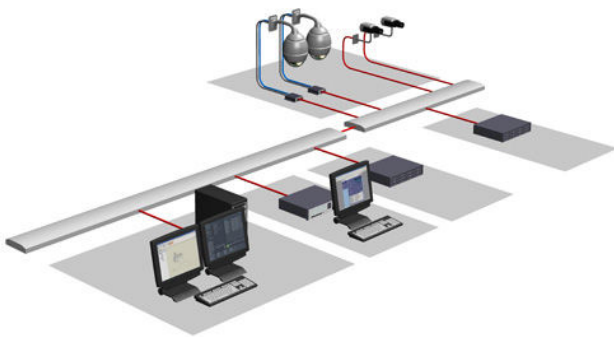
EXHIBIT B

MVM-BVRM Video Recording Manager v2.30

www.boschsecurity.com



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- ▶ Distributed storage and configurable load balancing
- ▶ iSCSI disk array failover for extra reliability
- ▶ Used with all Bosch Video-over-IP cameras and encoders
- ▶ Configuration support for all Bosch disk arrays (DSA and DLA series)
- ▶ Integration of 3rd Party Cameras (ONVIF, RTSP, JPEG)

Bosch Video Recording Manager (VRM) provides a Distributed Network Video Recorder solution, eliminating the need for dedicated NVRs and signaling the second generation of IP network video recording. VRM supports iSCSI-based storage systems and Bosch Video-over-IP devices (IP cameras and IP video encoders).

VRM introduces the concept of a storage virtualization layer. This abstraction layer enables VRM to manage all of the individual disk arrays in the entire system as a single “virtual” common pool of storage, which is intelligently allocated as needed.

VRM eliminates the need for classic Network Video Recorders (NVRs) and their associated server hardware, operating systems, and anti-virus software, as well as the ongoing software patches and updates these systems require.

This new NVR technology makes installation, operation, and maintenance much easier while reducing the total cost of ownership.

System Overview

The Video Recording Manager comprises:

- Recording Management Service (VRM Server)
- Configuration Manager

- Video Streaming Gateway (VSG)

The central Recording Management Service runs as a service on Microsoft Windows platforms. Bosch recommends running VRM Server on a dedicated server/hardware platform.

VRM offers system-wide recording, monitoring, and management of Bosch iSCSI storage, video encoders, and cameras.

VRM software supports Bosch H.264 and MPEG-4 IP video devices including all encoders, Dinion and FlexiDome IP cameras, as well as AutoDome and Extreme IP cameras and the Bosch HD cameras. With the new Video Streaming Gateway component 3rd party cameras supporting either ONVIF, RTSP or JPEG protocol are supported. Supported storage subsystems include the Bosch iSCSI-based DSA, DSA E-Series and DLA Series disk array systems. The iSCSI disk arrays can be attached anywhere on a standard IP network.

VRM offers additional redundancy and data availability by supporting Automated Network Replenishment (ANR) with Bosch Video-over-IP devices (BVIP Firmware 4.0 or later required).

EXHIBIT B

Optimal Performance

The Video Recording Manager offers a high-performance, flexible, scalable, and a highly reliable iSCSI storage management solution.

Optimized performance is obtained by the use of intelligent addressing on a block level, which also allows for load balancing of the video recording to all available storage blocks located on any storage array in the system.

Load balancing is provided with respect to the bandwidth and the number of iSCSI connections and is configurable per IP address (iSCSI target).

Logical Virtualization

The VRM virtualization layer allows the scalability of storage beyond the physical limits of a single storage subsystem. This logical abstraction layer means that each camera can use any storage space it actually needs, rather than an allocated, arbitrary, discrete chunk ahead of time. Adjust retention times of video data as required.

Fast Recording and Retrieval

VRM provides fast and flexible retrieval via a search database of recordings and metadata. Metadata is a form of data that describes other data such as events, ATM/POS information, and video content analysis data. The metadata is recorded with the video data and provides a fast and efficient way for the search engine, in the playback client, to quickly locate specified video clips. The database also keeps track of the location of recording blocks. If this database is lost, VRM can recreate the database by reading the stored metadata, thus providing a self-healing capability.

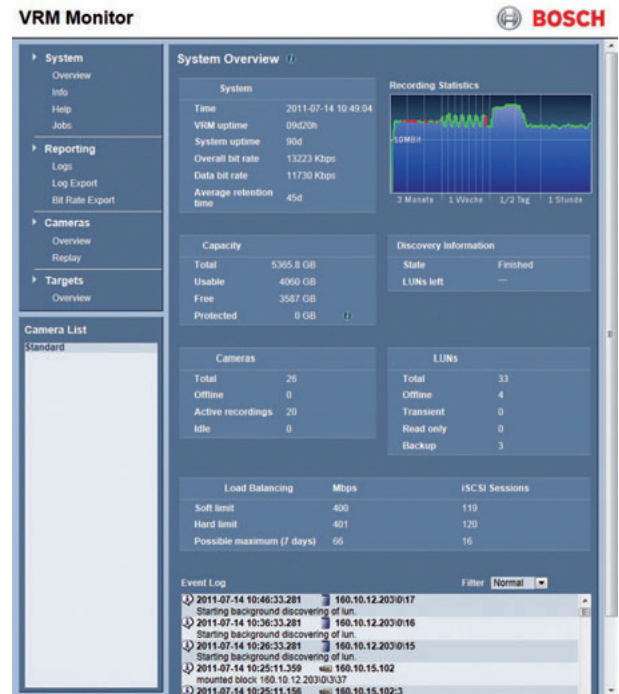
Distributed Storage

VRM not only provides for redundant management of metadata, it also introduces a significant enhancement of overall reliability and availability. By providing redundancy for storage provisioning and a failover design for the central recording management service, there is no single point of failure. In addition, unlike classic NVR systems, VRM scales without requiring additional PCs. This greatly reduces the risk of system failures.

Functions

VRM Server

VRM Server, with the central Recording Management Service, maintains a database containing the recording source information and a list of associated iSCSI drives. The central monitoring includes a Web-based user interface for status monitoring. This provides system status overview, recording status information, as well as for live view and recording preview for single cameras.



VRM Server

Configuration Manager

The Configuration Manager allows for central configuration of the network storage subsystems, recordings (including schedules), data rate, frame rate, stream, and privileges, as well as for managing user accounts.

Playback Client

For replay use Bosch Video Client BVC Version 1.3.1 or later. The BVC is available on the Bosch ST web site www.boschsecurity.com.

For more information about Bosch Video Client BVC, see the product specific documentation.

Integration of 3rd Party Cameras

VRM with its new component Video Streaming Gateway

offers the option to integrate cameras that support ONVIF, standard RTSP or JPEG protocols. The Streaming Gateway is intended for live viewing and VRM iSCSI based recording of cameras in low bandwidth environments or of 3rd party cameras supporting one of the above mentioned protocols.

Automatic Network Replenishment ANR

A VRM server can perform maximum 3 ANR jobs simultaneously. If you configure multiple ANR jobs for 1 device (for example with 4 channels), these jobs are performed one after the other. This avoids overload of the device. The number of ANR jobs cannot be increased by a secondary VRM server. The maximum performance is 24-times of replay, the actual performance may be limited by the capabilities of the encoder/camera.

EXHIBIT B

ANR is only effective for data within the minimum retention time of the system. Recording gaps outside the minimum retention time will not be considered.

Backup of data through VRM

A VRM server can execute maximum 5 backup jobs in parallel. The number of backup jobs cannot be increased by a secondary VRM server. The maximum performance is 24-times of replay. Consider this for bandwidth estimation of the iSCSI targets. The backup functionality is not supported by BVMS or the BVC replay client.

Design Recommendations

Load Balancing (if VRM is configured in "All Mode") VRM provides a new server based "All Mode" (Automatic Mode).

If the previous video device based "All Mode" is used the following design recommendations should be observed:

When calculating the number of storage arrays for VRM environments we strongly recommend adding an additional iSCSI target (n+1 calculation) or using the "Failover Mode".

This recommendation is especially important when using the DLA Series because these storage systems provide a lower reliability and availability than the DSA Series.

ANR

The first implementation of ANR in VRM is suited to protect against single short network outages. One network outage must be longer than 10 seconds to be detected by the ANR mechanism. If the outages are shorter potential gaps are not detected and recording is not refilled.

ANR is not suited to be used for:

- Wireless applications because of frequent network outages.
- Mobile applications because of long outages with large recording gaps which takes very long to be filled.

Licensing

Existing VRM 2.0 licenses can be used.

Installation/Configuration Notes

VRM Components

The Video Recording Manager consists of the following components which may be installed on separate systems.

- VRM Server (central Recording Management Service) with Web interface for VRM Monitor
- Configuration Manager
- Video Streaming Gateway

VRM Monitor

- Displays overall system status information, including uptime, bit rate, and retention times.
- Provides status information on recordings and storage.
- Displays live view and recording previews for a single camera.

Configuration Manager

- Allows configuration of the iSCSI storage subsystems.
 - Bosch DSA Series (NetApp Storage Systems)
 - Bosch DLA Series (Bosch OEM Disk Arrays)
- Allows configuration of recording parameters, including schedules, data rates, frame rates, streams, and privileges.
- Allows management of users and groups with privileges and roles.
- Allows configuration of load balancing parameters (bandwidth and iSCSI connections) per disk array (IP address).

Technical Specifications

Bandwidth	1 Gbit network (recommended)
Supported languages	Arabic, Czech, English, German, Danish, Dutch, Finnish, French, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Portuguese, Polish, Russian, Spanish, Simplified Chinese, Swedish, Thai, Traditional Chinese and Turkish

VRM Server (running as a service)

Supported operating systems	<ul style="list-style-type: none"> • Windows 7 Ultimate, Professional Edition 32-bit, 64-bit versions • Windows Server 2003 R2, Standard Edition, 32/64-bit versions • Windows Server 2008 R2, Standard Edition 64-bit versions • Windows Storage Server 2008, Standard Edition 64-bit versions
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Hardware requirements

CPU	Quad-Core Intel Xeon Processor E5606 (2.13 GHz/4-core/8 MB/80 W)
RAM	1 GB or more
Graphics card	VGA or SVGA-compatible
Network adapter	1 Gbps
Installation	Windows administrator rights
Recommended Bosch Server Hardware	<ul style="list-style-type: none"> • MHW-S380R7-MCDE/MHW-S380R7-HCDE • MHW-S380R7-MCUK/MHW-S380R7-HCUK • MHW-S380R7-MCUS/MHW-S380R7-HCUS

EXHIBIT B**VRM Monitor**

Browser	Replay only with Microsoft Internet Explorer, v8.0 or 9.0
Network adapter	1 Gbps
Software	DirectX 9.0c/MPEG Active X

Configuration Manager

Supported operating systems	<ul style="list-style-type: none"> Windows XP Professional SP3, 32-bit versions Windows 7 Ultimate/Enterprise, 32/64-bit versions Windows Server 2003 R2, Standard Edition with SP2, 32/64-bit versions Windows Server 2008 R2, Standard Edition 64-bit versions Windows Storage Server 2008, Standard Edition 64-bit versions
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Hardware requirements

CPU	Intel Pentium (minimum 2.80 GHz) to Intel Core i3/i5/i7; Intel Xeon Dual Core or Quad Core (X3 or E3 Families)
RAM	256 MB or more
Graphics card	VGA or SVGA-compatible
Network adapter	1 Gbps
Software	DirectX 9.0c
Installation	Windows administrator rights

Note:

One VRM supports:

- 2048 channels
- 1 PB storage (net capacity)
- 40 disk arrays (recommended)
- maximum 120 iSCSI targets supported

When planning for larger environments we strongly recommend using large sized disk arrays instead of a large number of small disk arrays (vertical scaling instead of horizontal scaling). For systems with more than 40 disk arrays, please contact a Bosch Design Engineer. iSCSI based storage systems not qualified by Bosch are not supported.

Ordering Information**MVM-BVRM-016**

Bosch VRM base package with a 16-camera license single-pack. VRM 2.0 licenses can be used.
Order number **MVM-BVRM-016**

MVM-SVRM-BAK

Bosch VRM Failover license. VRM 2.0 licenses can be used.
Order number **MVM-SVRM-BAK**

MVM-XVRM-016

16-camera upgrade license
Order number **MVM-XVRM-016**

MVM-XVRM-032

32-camera upgrade license
Order number **MVM-XVRM-032**

MVM-XVRM-064

64-camera upgrade license
Order number **MVM-XVRM-064**

MVM-XVRM-128

128-camera upgrade license
Order number **MVM-XVRM-128**

MVM-XVRM-256

256-camera upgrade license
Order number **MVM-XVRM-256**

MVM-XVRM-512

512-camera upgrade license
Order number **MVM-XVRM-512**

MVM-XVRM-1024

1024-camera upgrade license
Order number **MVM-XVRM-1024**

MVM-XVRM-2048

2048-camera upgrade license
Order number **MVM-XVRM-2048**

MHW-S380R7-MCUS Bosch VMS Central Server Mid-range (US)

High performance upper-mid-range server, American English localization included
Order number **MHW-S380R7-MCUS**

MHW-S380R7-MCDE Bosch VMS Central Server Mid-range (DE)

High performance upper-mid-range server, German localization included
Order number **MHW-S380R7-MCDE**

MHW-S380R7-MCUK Bosch VMS Central Server Mid-range (UK)

High performance upper-mid-range server, British English localization included
Order number **MHW-S380R7-MCUK**

MHW-S380R7-HCUS Bosch VMS Central Server High-end (US)

High performance high-end server, American English localization included
Order number **MHW-S380R7-HCUS**

MHW-S380R7-HCDE Bosch VMS Central Server High-end (DE)

High performance high-end server, German localization included
Order number **MHW-S380R7-HCDE**

EXHIBIT B

MHW-S380R7-HCUK Bosch VMS Central Server High-end (UK)

High performance high-end server, British English localization included

Order number **MHW-S380R7-HCUK**

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EXHIBIT B

Bosch Video Management System Software v3

www.boschsecurity.com



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- ▶ Enterprise-class Client/Server based video management system
- ▶ System-wide user management, alarm handling, health monitoring, and configuration
- ▶ Full virtual matrix capabilities, including analog monitor support and CCTV keyboard control
- ▶ Superior alarm handling with alarm priorities and selectable user group distribution
- ▶ Advanced user interface concepts for effective and efficient operation

The Bosch Video Management System is a unique enterprise IP video security solution that provides seamless management of digital video, audio, and data across any IP network. It is designed to work with Bosch CCTV products as part of a total video security management system. You can integrate your existing components into one easy-to-manage system, or use our full-line capabilities and benefit from a complete security solution based on cutting-edge technology and years of experience.

The Bosch Video Management System is installed on a Microsoft Windows Operating System.

We recommend using Bosch Workstations and Servers. They are fully tested and optimized for Bosch Video Management System.

In addition to the Bosch ST standard terms and conditions of sale, the Bosch Video Management System software is covered by the Bosch VMS Software Maintenance Agreement, which can be found in your online CCTV product catalog.

System Overview

The Bosch Video Management System contains the following software components:

- Central Server software provides management, monitoring, and control of the entire system
- Video Recording Manager (VRM) and Network Video Recorder (NVR) services provide recording and playback management of video, audio, and data
- Configuration Client software provides the user interface for system configuration and management
- Operator Client software provides the user interface for system monitoring and operation

These software components can be run together on a single PC for small systems or on separate PCs and servers for large systems.

Bosch Video Recording Manager (VRM) provides a Distributed Network Video Recorder solution, eliminating the need for dedicated NVRs, and signaling the second generation of IP Network video recording. The VRM provides load balancing and failover for the iSCSI storage and makes it easy to add additional iSCSI storage later on. VRM introduces the concept of a storage virtualization layer. This abstraction layer enables VRM to manage all of the individual disk arrays in the entire system as a single “virtual” common pool of storage, which is intelligently allocated as needed. The usage of multiple client workstations offers great scalability.

EXHIBIT B

Bosch VMS manages 2000 IP cameras / encoders and 100 workstations out-of-the-box. It can be deployed in larger installations if required. For this contact your Bosch Design Engineer.

Functions**Deployment**

- Updates of Operator Client and Configuration Client automatically deployed from Central Server
- Supports all Bosch MPEG4 & H.264 encoders, MPEG4 & H.264 IP cameras and IP AutoDome cameras in SD & HD format, decoders, Allegiant, DiBos, Bosch POS/ATM Bridge, and DiBos-compatible ATM Bridge
- Supported HD resolutions: 720p and 1080p

Configuration

- Automatic discovery of IP devices
- Automatic IP address assignment of IP devices
- Batch firmware updates of IP devices
- Configurable Logical Tree
- Predefined camera sequences
Pre-configured camera sequences with 25 cameras with each up to 100 steps with individual dwell times.
- “Automatic Sequences” created by multiple selection and drag and drop to Image panes
- Four configurable user-event buttons

User Interface

- Zoomable sitemaps with links, devices, sequences, and Command Scripts
- Sitemaps in DWF format are used. DWF format version 5.0 and 6.0 are supported.
- Up to 4 PC monitors supported per Workstation
- CCTV keyboard support, connected to either Workstation or IP decoder
- Flexible Image panes allow any combination of video window sizes and layouts
- Any live Image pane can be switched to instant playback
- Multiple instant playback Image panes
- Image windows can display live video, instant playback video, text documents, maps, or web pages
- Device states shown by icons, including network-connection loss, video loss, and camera de-adjustment
- Favorites tree can be individually configured per user
- Favorites tree can include complete views with Image pane layouts and camera assignments
- Camera selection by double-click or drag and drop from site maps, Logical Tree, or Favorites Tree
- Decoders can be organized in Analog Monitor Walls
- Control of analog monitors connected to decoders via drag and drop
- Synchronized playback of up to 16 NVR cameras and up to 16 VRM cameras
- Sophisticated multi-camera timeline allows easy, graphical searching of stored video
- Timeline colors indicate recording status – normal recording, alarm recording, motion recording, protected recording, and audio recording (not for cameras managed by a VRM)
- Easy clip selection by dragging hairlines in the timeline

- Selected clips can be exported to DVD, network drives, or USB sticks with a few mouse clicks
- Flexible search works across all NVRs and DVRs connected to the system
- Post-recording motion search allows changes to selected areas of the image to be easily located
- Forensic Search allows the usage of Intelligent Video Analysis (IVA) algorithms on the recorded video
- Two audio listening options – selected channel only, or multiple simultaneous channels
- Audio Intercom functionality
- 4:3 and 16:9 Image panes
- Continuous Operation for live, playback and export while Central Server disconnected
- Live and Playback of the following recording engines: Video Recording Manager, Local Storage, Dircet-iSCSI-Recording, Bosch Recording Station. For migration purposes: NVR, DiBos, Vidos NVR

Scheduling

- Up to 10 Recording schedules with Holidays and Exception Days
- Task Schedules with Holidays, Exception Days, and recurring schedule support
- Per camera settings for minimum and maximum recording times
- Per camera, per recording schedule frame rate and quality settings for live, normal recording, motion recording, and alarm recording

Event Handling

- Event list with device events (e.g. video loss), system events (e.g. disk full), SNMP traps from network devices (e.g., heavy network traffic), subsystem events (e.g. Allegiant alarm), user events (e.g. logon failure), schedule events (e.g. every Tuesday at 10:15), etc.
- Compound events (combining events with Boolean logic)
- Event duplication allowing separate handling
- Event allocation to user groups
- Schedule dependent alarm generation
- Schedule dependent event logging
- Schedule dependent event-generated Command Script invocation

Alarm Handling

- Alarms can trigger alarm-mode recording for any cameras
- 100 alarm priorities
- Selective auto-popup on alarm
- Alarms displayed in separate alarm window
- Up to 5 Image panes per alarm with live or playback video, sitemaps, documents, or web pages displayed in an “alarm row”, with highest priority alarms on top
- Audio file per alarm
- Workflow with user instructions and user comments, optionally forced before clearing
- Email or SMS notification on alarm
- Alarm display on analog monitor walls
- Alarm auto clear options either time or state dependent

EXHIBIT B**User Management**

- LDAP compatible for integration with enterprise user management systems such as Microsoft Active Directory
- Access to system resources individually controlled per user group
- Logical Tree customized per user group – users only see devices for which they have access
- User group rights for protecting, deleting, exporting, and printing video
- User group rights for Logbook access
- User group priority assignment for PTZ control and Allegiant camera access
- Individual per-camera privileges assignable per user group for live access, playback, audio, meta data display, dome control
- Dual-authorization logon – special privileges and priorities granted when two users log on together

System Monitoring

- System-wide health monitoring, including cameras, computers, software, and network equipment
- Network equipment and other third-party devices monitored with SNMP

Customization and Interfacing

- Custom Command Scripts can control all system functionality
- Built in Command Script editor supporting C# and Visual Basic .Net
- External software can trigger events and send metadata via “Virtual Inputs”
- Any .Net programming language (C#, JScript, etc.) or COM programming language (C++, Visual Basic, etc.) can be used to trigger Virtual Inputs
- Other systems can control the virtual matrix with Allegiant CCL commands that can be sent via RS232
- Compatible with Bosch Building Integration System
- Compatible with Advantech ADAM-6000 series Digital Input / Output modules

Parts Included

- The Base Box is delivered with DVD and Quick Start Manual.
 - The DVD contains the following items:
 - Installation program that can selectively install all components (Central Server software, Network Video Recorder software, Video Recording Manager software, Configuration Client software, Operator Client software) in all supported languages
 - Configuration Manual (PDF format) in all supported languages (except Arabic)
 - Operator’s Manual (PDF format) in all supported languages (except Arabic)
 - Quick Start Manual in English, French, German, Simplified Chinese and Spanish
- Licenses are provided as eLicenses via email.

Technical Specifications**System Specifications**

Maximum number of workstations simultaneously viewing the same camera	Multicast: 50 Unicast: 5
Supported languages	English, German, Dutch, Italian, Portuguese, French, Spanish, Simplified Chinese, Traditional Chinese, Russian, Hungarian, Japanese, Czech, Danish, Finnish, Greek, Norwegian, Polish, Swedish, Thai, Turkish, Korean, and Arabic

Anti-Virus software must not perform a full-scan. Performance may decrease depending on configuration.

Event reaction time	<1 second, assuming sufficient network bandwidth
Alarm reaction time (incl. 1 live Image pane, 1 instant playback Image pane and 1 map Image pane):	Maximum 2 seconds, assuming sufficient network bandwidth
Bandwidth requirements	Min. 1 Gbps for connections between: Operator Client to Central Server Operator Client to NVR/VRM/ DiBos Central Server to NVR/VRM/ DiBos

Required open ports**Connection to Central Server:**

TCP ports 5395, 5390, 5392, 5393, 5096

Connection to NVRs:

TCP port 5391

Connection to Operator Client Workstations by BVMS SDK:

TCP port (default 5394)

Connection from Central Server to SMTP (for email notifications):

TCP Port 25

Connection to Bosch encoders and decoders:

Control channel: TCP ports 80 and 1756

Network scan: UDP ports 1757 and 1758

Multicast detection: one selectable UDP port (default 1800)

Multicast video transmission:

For each encoder audio or video stream, 1 selectable UDP port

Unicast UDP transmission: UDP ports dynamically assigned in the range from 1024 to 65000

Connection to DiBos DVRs (uses DCOM):

TCP Port 135 plus four TCP ports and four UDP ports dynamically assigned in the range from 1025 to 65535

EXHIBIT B**Central Server Specifications**

Maximum number of sustained events	For highest performance server, e.g. MHW-S380R6-HC: 5,000 events/s at peaks 2,500,000 events/h received 500,000 events/h thereof written to the system log (Logbook)
Logbook	Supported by SQL Server 2008 R2 (32-bit or 64-bit version) 4 GByte Logbook size
Central Server Redundancy	Available with VMware HA. Please contact Bosch Design Engineer for redundancy solutions.
Maximum number of Task Schedules	200

NVR Specifications

For new system designs refer to VRM specifications.
For NVR-like systems requirements use DLA storage with VRM preloaded.

Maximum number of cameras and data rate per NVR, for advanced performance server, e.g. MHW-S380R6-MC and Bosch DVA-8K, DVA-16K (AV multistream on, rebuild priority low)

Continuous or motion or alarm recording and 4 playback clients with 4 Image panes each:	64 cameras @ 25 IPS / 4 CIF / 2 Mbps
Continuous (1IPS) and motion or alarm recording and 4 playback clients with 4 Image panes each:	Continuous recording: 64 cameras @ 1 IPS / 2 CIF / 1,5 Mbps Motion or alarm: 64 cameras @ 25 IPS / 4 CIF / 2 Mbps
Motion with pre-motion and alarm with pre-alarm recording and 4 playback clients with 4 Image panes each:	Pre-motion / alarm recording: 64 cameras @ 1 IPS / 2 CIF / 1,5 Mbps Motion / alarm: 64 cameras @ 25 IPS / 4 CIF / 2 Mbps
Redundancy	Failover NVR can be assigned to take over for a failed NVR. Multiple Primary NVRs can be assigned to the same Failover NVR. Redundant NVR can be assigned to a Primary NVR.
Maximum number of Primary NVRs serviced by a Failover NVR	2
Maximum number of NVRs per Central Server	2 For higher camera numbers use VRM.
Device compatibility	H.264 encoders and cameras are not supported for NVRs.

VRM Specifications

Maximum count of VRM servers per Central Server	40
Maximum data rate per iSCSI	Please contact Bosch Design Engineer for iSCSI storage solutions.
Max. number of playback sessions	32

Minimum Client Workstation PC Requirements

Operation System	Windows XP Professional, Service Pack 3 (32-bit only) Windows 7 Professional or Ultimate SP1 64 bit version (required for > 500 cameras)
CPU	Intel Core 2 Duo
RAM	2 GB or greater
Free disk space	500 MB or greater We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	Minimum per monitor 1024x768, 1280x1024 or greater recommended
Recommended Graphic Cards	MHW-AWGC-Q2000 MHW-AWGC-Q4000 MHW-AWGC-ATIV38 MHW-AWGC-ATIV58 MHW-AWGC-Q600

Maximum Graphic Cards Specifications

You find detailed information on the maximum number of Image panes and the CPU load for various workstations or servers and graphic cards in the Application Guide "Display performance indication".

Minimum Central Server PC Requirements

Operation System	Windows 2008 Server R2 SP1 (64-bit) required for > 500 cameras Window 2003 Server R2 SP2 (32-bit only) For All-in-one systems and maximum 64 IP cameras/ encoders: Windows XP Professional, SP3 (32-bit only) or Windows 7 SP1 (64-bit only)
CPU	Intel Core 2 Duo
RAM	4 GB or greater 8 GB for systems > 500 cameras
Free disk space	15 GB or greater We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	1024x768 or greater

EXHIBIT B**Minimum NVR Server PC Requirements**

Operation System	Windows XP Professional, SP3 (32-bit only), Windows 2003 Server, R2 SP2 (32-bit only) Windows 7 and Windows Server 2008 not supported
CPU	Intel Core 2 Duo
RAM	2 GB or greater
Free disk space	500 MB + Video Storage We recommend having minimum 15% free disk space.
Hard disk drives	Minimum: separate partition for video storage Separate drive for video storage recommended
Network card	1000Base-T
Display Resolution	1024x768 or greater

Minimum VRM Server PC Requirements

Operation System	Windows 7 Ultimate SP1, Professional Edition SP1 64-bit versions Windows Server 2003 R2, Standard Edition, 64-bit versions Windows Server 2008 R2, Standard Edition 64-bit versions Windows Storage Server 2008, Standard Edition 64-bit versions
CPU	Dual-Core Intel Xeon Processor 5110 (1.60 GHz, 1066 FSB) to Quad-Core Intel Xeon Processor E5430 (2.66 GHz, 1,333 FSB)
RAM	Minimum 2 GB
Free disk space	500 MB We recommend having minimum 15% free disk space.
Network card	1000Base-T
Display Resolution	1024x768 or greater

Device Compatibility

Analog Matrix Switch	Bosch Allegiant series, firmware 8.75 or later and Master Control Software version 2.91
CCTV Keyboard	Bosch Intuikey (KBD-Universal or KBD-Digital), firmware version 1.95
Digital I/O	Digital I/O Advantech ADAM-6050, ADAM-6052, ADAM-6060, ADAM-6066
Digital Video Recorder	Bosch Recording Station 8.9 DiBos, firmware version 8.7 Maximum 50 DiBos recorders per Central Server

USB to Serial adapter	Belkin serial adapter cable F5U103vea
Ethernet to Serial adapter	Control DeviceMaster RTS 4-Port
IP Devices	VIP-X Series encoders and cameras H.264 Series encoders and cameras MPEG-4, H.264 Main Profile, H.264 Baseline Plus are supported (H.264 Baseline and MPEG-2 not supported)

Ordering Information**Demoverision - Non Expandable**

1 Forensic Search included.
Order number **MBV-BDEM-30**

Lite-32-Edition - Non Expandable

Supports 32 Cameras, 2 Workstations, 1 CCTV Keyboard, 0 DVRs – Non Expandable
1 Forensic Search included.
Order number **MBV-BLIT32-30**

Lite-64-Edition - Non Expandable

Supports 64 cameras, 4 Workstations, 2 CCTV Keyboards, 0 DVRs – Non Expandable
2 Forensic Search included.
Order number **MBV-BLIT64-30**

Professional Edition

Supports 8 Cameras, 2 Workstations, 1 CCTV Keyboard, 1 DVR
All MBV-X* and MBV-F* can only be combined with the Professional Edition.
1 Forensic Search included.
Order number **MBV-BPRO-30**

1 Channel Expansion

Expansion, order the exact number required.
For example, if you order 128 units you can use 128 cameras/decoders in your Bosch VMS. Only those cameras need be counted which are shown in the Logical Tree.
Order number **MBV-XCHAN-30**

1 Workstation Expansion

Expansion, order the exact number required.
Order number **MBV-XWST-30**

1 DVR Expansion

Expansion, order the exact number required.
Order number **MBV-XDVR-30**

1 CCTV Keyboard Expansion

Expansion, order the exact number required.
Order number **MBV-XKBD-30**

EXHIBIT B**1 Forensic Search Expansion**

Expansion, order the exact number required. You need one license per Workstation, not per camera or encoder.

Order number **MBV-XFOREN-30**

Allegiant Matrix Connection

Order number **MBV-FALG-30**

ATM/POS Connection

Order number **MBV-FATM-30**

OPC Server Connection for BIS

Order number **MBV-FOPC-30**

Base Box

Hard cardboard box including DVD and Quick Start Manual (in English, French, German, Simplified Chinese, and Spanish)

Order number **MBV-BBOX**

Expansion Box

Paper box including Setup DVD

Order number **MBV-XBOX**

Services**Maintenance Lite-32-Edition**

Order number **MBV-MLIT32**

Maintenance Lite-64-Edition

Order number **MBV-MLIT64**

Maintenance Professional Edition

Order number **MBV-MPRO**

Maintenance Channel Expansion

Order number **MBV-MCHAN**

Maintenance Workstation Expansion

Order number **MBV-MWST**

Maintenance DVR Expansion

Order number **MBV-MDVR**

Maintenance CCTV Keyboard Expansion

Order number **MBV-MKBD**

Maintenance Forensic Search Expansion

Order number **MBV-MFOREN**

Maintenance Allegiant Matrix Connection

Order number **MBV-MALG**

Maintenance ATM/POS Connection

Order number **MBV-MATM**

Maintenance OPC Server Connection

Order number **MBV-MOPC**

EXHIBIT B

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