



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PROPRIETARY PRODUCT CERTIFICATION

630-020-07
PROGRAM MANAGEMENT
06/16

To Mario Bizzio, P.E.
Design Engineer

Date: 1/28/2019

Financial Project ID: 439853-1 New Const. RRR
Federal Aid Number: D518-098-B
Project Name: State Road 507 (Babcock St) ITS Expansion
State Road Number: 507 Co. / Sec. / Sub.: Brevard / 70012000
Begin Project MP: 2.528 End Project MP: 5.528
Full Federal Oversight: No Yes Note: If Yes, submit to FHWA Director.

A justification and all supporting documents must be attached to this document.
Mark the appropriate certification:

"I, Scott Arnold, Traffic Engineering Operations Mgr., of the City of Melbourne.
Print Name of Initiator Position Title Name of Agency

do hereby certify that in accordance with the requirements of 23 CFR 635.411(a)(2).
Mark appropriately (choose only one option):

- that this patented or proprietary item is essential for synchronization with existing highway facilities.
- that no equally suitable alternative exists for this patented or proprietary item."

R. Scott Arnold Date 1/28/19
Signature Date

For Department Use Only

"I, JAMES S. STROZ, JR., DTOE
Print Name Position Title

of the Florida Department of Transportation, do hereby approve this certification request made in accordance with the requirements of 23 CFR 635.411(a)(2).
Mark appropriately (choose only one option):

- that this patented or proprietary item is essential for synchronization with existing highway facilities.
- that no equally suitable alternative exists for this patented or proprietary item."

Identify any conditions and limitations:

[Signature] Date 1/30/19
Signature Date



January 28, 2019

VIA EMAIL

Mr. Mario Bizzio, P.E.
District 5 Design Engineer
Florida Department of Transportation
719 S. Woodland Blvd.
DeLand, FL 32720-6800

Subject: Proprietary Product Certification Justification Letter & Backup Documentation
FPID: 439853-1
SR 507 ITS Expansion – City of Melbourne
(Bosch CCTV Cameras)

Dear Mr. Bizzio,

Please see the attached Proprietary Product Certification Form 630-020-07 completed in accordance with Procedure 630-020-005 adopted on August 20, 2014. Please also see the required justification below.

1) Description of the project need for the proprietary product.

- a. Project Description: The 439857-1 project includes the installation of CCTV cameras at various intersections in the City of Melbourne.
- b. Compatibility with Existing Bosch Systems: City of Melbourne has already installed Bosch products included in this Proprietary Product Certification request, as shown in the attached Exhibit A. City of Melbourne currently utilizes Bosch Video Management Systems (BVMS) software to operate their cameras, it is imperative to use the same product on this project.

2) Factual and technical supporting evidence for Synchronization.

- a. Function: the proprietary product is necessary for the satisfactory operation of the existing facility.
 - i. The proposed product sheets are included with this letter as Exhibit A.
 - ii. This product is the same manufacturer as products already in use by City of Melbourne and is guaranteed to be compatible with the existing infrastructure.
 - iii. The proposed product is manufactured to work with BVMS, allowing City of Melbourne to easily operate the camera with existing video management software.
- b. Logistics: the proprietary product is interchangeable with products in City of Melbourne's existing maintenance inventory.
 - i. This product is the same product already in use and is guaranteed to be interchangeable with the existing maintenance inventory.
 - ii. City of Melbourne staff is familiar with the equipment, software and hardware for Bosch CCTV cameras allowing them to quickly replace, program and troubleshoot problems allowing them to maintain camera coverage.
- c. Training cost for staff, such as significant training required to effectively maintain and operate an unfamiliar product.

- i. The current City of Melbourne staff are familiar and trained to use the existing product. By proposing the same product, no additional training cost are anticipated.

In summary, City of Melbourne is respectfully requesting that this proprietary product be furnished for this project. If you have any questions or need any additional information, please don't hesitate to contact me at 321-608-7361 or by email at scott.arnold@mlbfl.org.

Sincerely,



Scott Arnold
Traffic Engineering Operations Mgr.

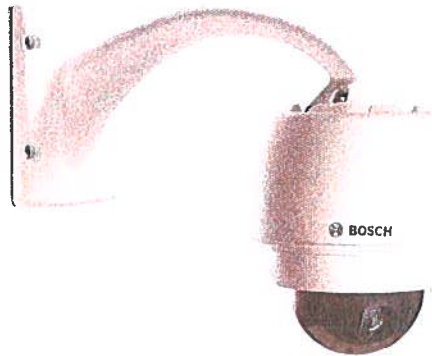
Cc: Jenni Lamb, P.E., City Engineer

AUTODOME VG5-ITS720P-30X4 and VG5-ITS1080P-30X4 for Transportation Applications

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Choice of HD model (720p50/60 or 1080p25/30), NTCIP-conformant, compass direction and absolute AZ/EL position readings
- ▶ Allows upload of a customer logo
- ▶ Intelligent Tracking and alarm rules engine with on-board Intelligent Video Analytics (IVA)
- ▶ Enhanced system flexibility with dual recording options (iSCSI, SD card) and dual power source options (High Power over Ethernet (High PoE) / 24 VAC)
- ▶ Fully configurable quad streaming with individually configurable streams, based on Bosch's Common Product Platform (CPP4)

The AUTODOME ITS Series is an easy-to-install, high-speed PTZ HD dome camera in a field-proven indoor/outdoor housing. The camera delivers unmatched picture quality and network performance day/night and has full built-in support for the NTCIP protocol used in transportation applications.

The camera 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. It also provides direct network video streaming using H.264 compression / bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.

The AUTODOME ITS Series conforms to the National Transportation Communications for ITS Protocol (NTCIP) specification. NTCIP conformance ensures that the AUTODOME camera integrates with transportation management devices.

Functions

High-performance PTZ day/night camera

The HD model has a large sensor area that contributes to high camera sensitivity. The camera can be configured to operate in 720p50/60 mode for capturing fast motion (for example, in traffic or gaming scenarios). The default 1080p25/30 mode delivers high-resolution images with six times more details than a standard definition (SD) camera.

The camera features Wide Dynamic Range (WDR) technology that allows for the capture of clear image reproduction 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. Day/night capabilities and outstanding sensitivity make the IP model an exceptional performer in all lighting conditions. In low light, the camera switches automatically from color to monochrome by removing

the IR filter to boost the infrared illumination sensitivity while maintaining superior image quality. For operation in the darkest conditions, the SensUp control feature automatically reduces the shutter speed to as little as one second. This increases sensitivity by more than 50 times.

Progressive scan

The camera is ideally suited for IP imaging applications. The progressive scan technology in the camera provides smooth and clear images when viewing images from the camera.

Sodium vapor lamp white balance

The camera is an exceptional performer when capturing video under a sodium vapor lamp (a street lamp or tunnel lamp, for example). Images under these conditions may have a yellowish tint, which can make identification difficult. In the Sodium Vapor White Balance mode, the camera automatically compensates for the light from a sodium vapor lamp to restore objects to their original color.

Intelligence

With built-in Intelligent Video Analysis (IVA), the camera reinforces the concept of Intelligence at the Edge. IVA is Bosch's state-of-the-art intelligent video content analysis technology. With IVA, the camera reliably detects and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. IVA also allows the camera to detect multiple object behaviors including idle and removed objects, loitering, multiple line crossing, and trajectories. IVA supports BEV (Bird's-Eye-View) People Counter and Assisted Self-Calibration. Configurable detection filters improve reliability and reduce operator work load.

Intelligent Tracking

The camera utilizes the built-in Intelligent Video Analytics (IVA) to follow an individual or an object continuously. Objects detected by IVA in a stationary position activate the Intelligent Tracking feature, which controls the pan/tilt/zoom actions of the camera to keep the tracked object in the scene. The new tracking feature is based on robust flow detection algorithms which can reliably track moving objects even under challenging scenes.

The tracking and detection reliability can be enhanced further with virtual masking for scenes with a lot of background "noise" such as trees or other objects creating constant motion in the scene.

The camera supports three modes for Intelligent Tracking.

- **Auto mode:** When configured in this mode, the camera actively analyzes the video to detect any moving object. If it detects movement, it begins to track the object. This mode is most useful for scenarios where no motion is expected in the scene.

- **Click mode:** In this mode, users can click an object moving in the live video image to enable the camera to track the movement of the selected object. This mode is most useful for scenarios where normal scene activity is expected.
- **IVA-triggered mode:** In this mode, the camera continuously analyzes the scene for IVA alarms or IVA rule violations. If an IVA rule is violated, it triggers the advanced tracking feature of the camera to start following the object / person that triggered the alarm. This unique combination of robust IVA and Intelligent Tracking allows the camera to track moving objects of interest without getting distracted by other moving objects in the scene.

PTZ drive and mechanism

The camera supports 256 pre-positions and two styles of Guard Tours: Preset and Record/Playback. Users can configure the preset standard tour with as many as 256 sequential pre-positions, with a configurable dwell time between pre-positions. The camera also provides support for two recorded tours, which are recorded macros of an operator's movements, including pan, tilt, and zoom activities, and can be played back with the click of a button.

Pan and tilt preset repeatability are accurate to within ± 0.1 degrees to ensure that the correct scene is captured every time. The camera delivers variable pan/tilt speeds from a crawl speed of only 0.1 degrees per second to a full 400 degrees per second. The camera is capable of pan speeds of 400 degrees per second and tilt speeds of 300 degrees per second between prepositions. The camera provides a tilt angle 18 degrees above the horizon, 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.

Five pre-programmed but configurable user modes, optimized with the best settings for a variety of typical applications, make on-site programming easy and user-friendly. Users select from the menu the mode that best defines the environment in which the camera is installed:

- **Outdoor** – General day-to-night changes with sun highlights and street lighting
- **Indoor** – Ideal mode for indoor applications where lighting is constant and not changing
- **Low light** – Optimized for sufficient details at low light
- **Motion** – Monitoring traffic or fast moving objects; motion artifacts are minimized
- **Vibrant** – Enhanced contrast color reproduction and sharpness

Users have the ability to customize these modes, if necessary, for the specific requirements of the site.

Superior privacy masking

The camera provides 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 in most cases.

Comprehensive streaming capabilities on Bosch's Common Product Platform (CCP4)

The camera has an advanced, efficient H.264 encoder (CPP4) embedded for high-quality streaming video and very efficient streaming and network capabilities. The new platform supports simultaneous streaming of individually configurable streams [SD (H.264 and M-JPEG) or HD] and allows a choice of resolution [SD, or HD in combination of SD resolutions].

Recording and storage management

A memory card (SD (Secure Digital), SDHC (Secure Digital High Capacity), or SDXC (Secure Digital eXtended Capacity)) can be used for local alarm recording or for scheduled local recording 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. The camera 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.

Dual power options

The HD model can be powered by a High Power-over-Ethernet (Bosch High PoE)-compliant network using a Bosch High PoE Midspan (sold separately) over a single network cable and/or a 24VAC power supply. The Midspan is required to operate the heater inside the camera. See the Midspan datasheet for additional details.

When powered using High PoE or PoE+ (IEEE 802.3at class 4) configuration, only a single cable connection is required to power and to control the camera while also viewing images from the camera. For additional system reliability, users also have the option to connect the 24 VAC power supply to the camera while using High PoE.

Ease of installation and servicing

The camera 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. Indoor/outdoor pendant housings are rated to provide IP66 protection and offer an operating temperature range down to -40 °C (-40 °F). The indoor/outdoor pendant comes fully assembled with a sunshield and

ready for wall or pipe applications with the proper mounting hardware (sold separately). You can easily convert the outdoor pendant for indoor applications by removing the sunshield.

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

Video management system support

The camera ships with Bosch Video Client (BVC), an easy-to-use software from Bosch that is suitable for midsize installations. For large enterprise systems, AUTODOME cameras can be used with Bosch Video Management System (BVMS), which allows enhanced video management and viewing capabilities. In addition, the camera is supported/integrated into all of the leading third party video management systems.

ONVIF conformant

The AUTODOME Series conforms to the ONVIF Profile S specification allowing easy integration with the conformant devices and VMS.

For more information about ONVIF, visit www.onvif.org.

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.

Fiber Optic Kit

Bosch offers the optional VG4-SFPSCKT, a unique media converter module for use with various Bosch devices. This media converter module is designed to accept a wide-range of 10/100 Mbps SFP modules for use with Multimode or Single-mode optical fiber with LC or SC connectors.

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

As with all Bosch products, the camera is designed using the industry's best design process and is subjected to the most stringent testing standards such as HALT (highly accelerated life testing), which pushes the limits of products to ensure reliability throughout their lifetime.

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.

Easy upgrade

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

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, including latest versions of EN 50130-4, EN 55022:2006 inc. AL:2007, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, and EN 50121-4 (Railway applications)
Product Safety	Complies with UL, CE, CSA, EN, and IEC Standards 60950-1 & 22
Environmental	IP66, NEMA 4X
ONVIF Conformance	EN 50132-5-2
NEMA TS 2-2003	Complies with: Section 2.2.7: Transients, Temperature, Voltage and Humidity tests Section 2.2.8: Vibration test Section 2.2.9: Shock test

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, VG4-A-PSU2, VG4-A-PA0, VG4-A-PA1, or VG4-A-PA2.

Parts included

- AUTODOME ITS series pendant camera (IP or HD model) with clear acrylic bubble and sunshield
- Product DVD with operation manual and Bosch Video Client (BVC) software
- Packet of printed Safety literature

Notes:

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

Technical specifications

VG5-ITS720P-30X4

Imager	1/3-type Exmor CMOS sensor	
Effective Picture Elements (Pixels)	1305 x 1049 (1.37 MP)	
Lens	30x Zoom 4.3 mm to 129 mm F1.6 to F4.7	
Field of View (FOV)	2.1° to 59°	
Focus	<i>Automatic with manual override</i>	
Iris	<i>Automatic with manual override</i>	
Digital Zoom	12x	
Sensitivity / Minimum Illumination (typical)	30 IRE	50 IRE
Day Mode (Color)		
Fixed shutter 1/30, High Sensitivity mode On	0.052 lux	0.166 lux
Fixed shutter 1/30, High Sensitivity mode Off	0.26 lux	0.66 lux
SensUp On (max. %), High Sensitivity mode On	0.0082 lux	0.033 lux
Night Mode (Black and white)		
Fixed shutter 1/30, High Sensitivity mode On	0.0103 lux	0.041 lux
Fixed shutter 1/4, High Sensitivity mode On	0.00129 lux	---
SensUp On (max. %), High Sensitivity mode On	0.00065 lux	0.00205 lux

SH-VG5-ITS1080P-30X4

Imager	1/2.8-type Exmor CMOS sensor	
Effective Picture Elements (Pixels)	1944 x 1224 (2.38 MP)	
Lens	30x Zoom 4.3 mm to 129 mm F1.6 to F4.7	
Field of View (FOV)	2.3° to 65°	
Focus	<i>Automatic with manual override</i>	
Iris	<i>Automatic with manual override</i>	
Digital Zoom	12x	

Sensitivity / Minimum Illumination (typical)	30 IRE	50 IRE
Day Mode (Color)		
Fixed shutter 1/30, High Sensitivity mode On	0.066 lux	0.209 lux
Fixed shutter 1/30, High Sensitivity mode Off	0.26 lux	0.83 lux
Fixed shutter 1/4, High Sensitivity mode On	---	0.026 lux
Fixed shutter 1/4, High Sensitivity mode Off	---	0.104 lux
SensUp On, High Sensitivity mode On	0.0103 lux	0.033 lux
SensUp On, High Sensitivity mode Off	0.041 lux	0.104 lux
Night Mode (Black and white)		
Fixed shutter 1/30, High Sensitivity mode On	0.033 lux	0.104 lux
Fixed shutter 1/4, High Sensitivity mode On	0.0026 lux	---
SensUp On, High Sensitivity mode On	0.00129 lux	0.0041 lux

Additional Camera Settings

Gain Control	Auto/Manual/Max
Aperture Correction	Horizontal and vertical
Electronic Shutter Speed (AES)	1/1 sec to 1/10000 sec (22 steps)
Dynamic Range	90 dB typical
Signal-to-Noise Ratio (SNR)	>50 dB
Backlight Compensation (BLC)	On/Off
White Balance	2000 K to 10,000 K ATW, AWB Hold, Extended ATW, Manual, Sodium Lamp Auto, Sodium Lamp
Day/Night	Monochrome, Color, Auto
Defog mode feature	Improves visibility when viewing foggy or other low-contrast scenes.

Mechanical

Pan Range	360° cont.
Tilt Angle	18° above horizon
Pre-position Speed	Pan: 400°/s Tilt: 300°/s
Pan/Tilt Modes	
• Turbo Mode (Manual Control)	Pan: 0.1°/s – 400°/s Tilt: 0.1°/s – 300°/s

• Normal Mode	0.1°/s-120°/s
Preset Accuracy	± 0.1° typ.

Electrical

Input Voltage	21-30 VAC, 50/60 Hz; (class II) High PoE (with Bosch NPD-6001A Midspan)
Power Consumption, typical	60 W / 69 VA (heaters on) or 24 W / 44 VA (heaters off) ⁵

Surge Suppression

Protection on Alarm Inputs	Peak current 17 A, peak power 300 W (8/20 µs)
Protection on Alarm Outputs	Peak current 2 A, peak power 300 W (8/20 µs)
Protection on Relay Output	Peak current 7.3 A, peak power 600 W (10/1000 µs)
Protection on Power Input (Dome)	Peak current 7.3 A, peak power 600 W (10/1000 µs)
Protection on Power Output (Arm Power Supply)	Peak current 21.4 A, peak power 1500 W (10/1000 µs)
10/100 Ethernet Data Lines	Peak current 14 A, peak power 200 W (8/20 µs)

Software Control

Camera Setup/Control	Via web browser (such as Internet Explorer version 7.0 or later), Bosch Configuration Manager, Bosch Video Management System (BVMS), Bosch Recording Station (BRS), or Bosch Video Client (BVC)
Software Update	Network firmware upload

Network

HD model:	
Video compression	H.264 (ISO/IEC 14496-10), M-JPEG

Encoding / Streaming

	H.264		MJPEG	
	Scenario			
	Stream 1	Stream 2	Stream 3	Stream 4
1	Full HD 1080p30	Full HD 1080p5	I-frame only from Stream 1	1080p
2	Full HD 1080p30	HD 720p10	I-frame only from Stream 1	1080p
3	Full HD 1080p30	Downscaled stream	I-frame only from Stream 1	1080p

4	Full HD 1080p30	Copy of Stream 1	I-frame only from Stream 1	1080p	Encryption	TLS 1.0, SSL, DES, 3DES, AES
5	HD 720p60	HD 720p8	I-frame only from Stream 1	720p	GOP Structure	IP, IBP, IBBP
6	HD 720p30	HD 720p30	I-frame only from Stream 1	720p	Data Rate	9.6 kbps to 6 Mbps
7	HD 720p30	Downscaled stream	I-frame only from Stream 1	720p	Overall IP Delay	240 ms
8	Downscaled stream	Downscaled stream	I-frame only from Stream 1	1080p	Signal-to-Noise	>50 dB

Resolutions (H x V)

HD Resolutions

- 1080p HD 1920 x 1080
- 720p HD 1280 x 720

Down-scaled SD streams

- 432p SD 768 x 432
- 288p SD 512 x 288
- 144p SD 256 x 144
- Corridor mode 400 x 720
- D1 4:3 cropped 704 x 480

Both models:

Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, SNTP, SNMP (v1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication
-----------	---

NTCIP Protocols

CCTV Camera Control	NTCIP 1205
Application Layer	SNMP per NTCIP 1101:1996 & NTCIP 2301
Transport/Network Layers	TCP/IP per NTCIP 2202:2001
Sub-network Layer	PMPP (Point to Multi-Point Protocol) per NTCIP 2101:2001 & NTCIP 2102:2003

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, 16 kHz sampling rate
	- Signal-to-Noise Ratio	>50 dB
	- Audio Streaming	Bidirectional (full-duplex)

Local Storage

Memory Card Slot	User-supplied SD/SDHC/SDXC memory card (maximum 2TB – SDXC)
Recording	Continuous recording of video and audio, alarm/events/schedule recording

Fiber Optic Kit

VG4-SFP SCKT	
Description	Fiber Optic Ethernet Media Converter kit ⁵ . 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

⁵ Kit available separately and must be installed inside the AUTODOME power supply box

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	Connector	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-25	MMF	Single SC	1310 nm / 1550 nm	2 km (1.2 miles)
SFP-26	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.

Miscellaneous

Sectors/Titling	16 independent sectors with a 20-character title/sector
Masking	24 individually configurable privacy masks
Pre-positions	256, each with a 20-character title
Guard Tours	Two (2) types of tours: <ul style="list-style-type: none"> Recorded tours – two (2) Preset tour – one (1), consisting of up to 256 scenes, consecutively
Supported Languages	English, Chinese, Dutch, French, German, Italian, Japanese, Polish, Portuguese, and Spanish
Protocol Support	Bosch (OSRD), ONVIF, NTCIP
Compass Direction	8 direction points, on/off
Absolute Position	Displays in 0-359° AZ and +17° to -95° EL, on/off
Custom logo	File format: .bmp; 8 bit (256 colors), 128x128 pixels maximum

Camera titles Twenty-character, two-line and three-line camera titles (on the OSD), with configurable text colors, that display either the options for Azimuth/Elevation/Compass/Zoom, or the camera title and compass data

User Connections

Power, Camera	RJ-45 10/100 Base-TX Ethernet (High Power-over-Ethernet (High PoE)) or PoE+ (IEEE 802.3at, class 4 standard) 21-30 VAC, 50/60 Hz
Power, Heater	RJ-45 10/100 Base-TX Ethernet (High Power-over-Ethernet (High PoE)) 21-30 VAC, 50/60 Hz
Video and Control	RJ-45 10/100 Base-TX Ethernet
Alarm Inputs (7)	2 supervised; 5 non-supervised Programmable for "normally open" or "normally closed"
Alarm Outputs (4)	1 dry contact relay; 3 open collector/transistor outputs 32 VDC @ 150 ma max.
Audio	1 x mono line in, 1 x mono line out <ul style="list-style-type: none"> Signal line in 12 kOhm typical, 1 Vrms max Signal line out 1 Vrms at 1.5 kOhm, typical

Environmental

Ingress Protection Rating/Standard	IP66 ⁷
NEMA 4X	<ul style="list-style-type: none"> Access to Hazardous parts Ingress of solid foreign objects (falling dirt, circulating dust, settling dust) Ingress of water (dripping and light splashing, hosedown and splashing) Corrosive agents
Operating Temperature	-40 °C to +55 °C (-40 °F to +131 °F) or -10 °C to +55 °C (+14 °F to +131 °F) ⁶
	Compliant to -34 °C to +74 °C (-30 °F to +165 °F) based on NEMA TS-2 Section 2.2.7.
Storage Temp.	-40°C to 60°C (-40°F to 140°F)
Humidity	0% to 100% relative, condensing

Construction

Dimensions	See dimensional drawings
Weight	3.06 kg (6.75 lb)
Bubble Size	153.1 mm diameter (6.03 in.)
Construction Material	

- Housing Cast aluminum
 - Bubble Pendant: High-resolution acrylic or rugged polycarbonate
- Standard Color White (RAL 9003)
- Standard Finish Powder coated, sand finish

Mounts/Accessories

Bubbles

Clear high-resolution acrylic (Included with pendant camera models.) VGA-BUBBLE-PCLA

Note: Polycarbonate bubbles are not recommended for use with HD products because of optical degradation.

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 VG4 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

Pendant Pipe Mounts

- Pipe Mount Cap VG4-A-9543

Pendant Roof Mounts

- Roof (Parapet) Mount (VG4-A-9543 Pipe Mount Cap required. Available separately.) VGA-ROOF-MOUNT

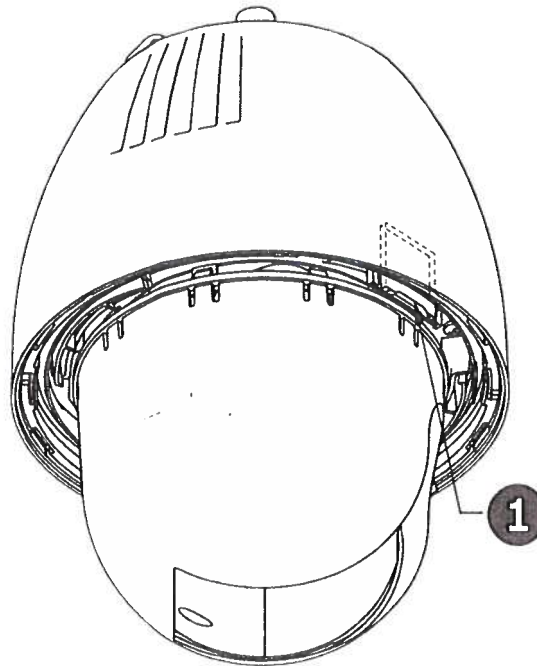
Optional Mounting Plates for Roof Mounts

- Flat Roof Adapter for Parapet Mount LTC 9230/01

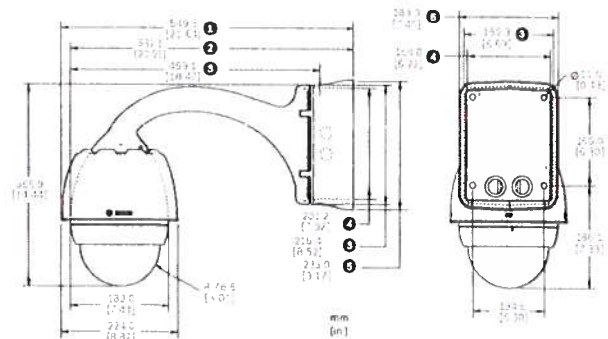
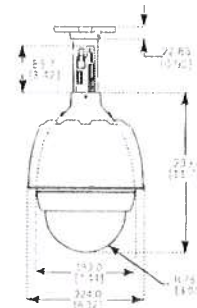
Power Supplies

- High PoE Midspan 60W, single port, AC in NPD-6001A
- 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

Dimensional Drawings



SD card slot (1)



Dimensions - Pendant, Pipe mounts

- 1 Power supply box and sunshield
- 2 Sunshield removed
- 3 Mounting plate
- 4 Power supply box
- 5 Trim skirt
- 6