May 2015

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**Product Guide Specification**

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, based on *MasterFormat 2004* and *The Project Resource Manual—CSI Manual of Practice. The Manufacturer is responsible for technical accuracy.*

The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Words and sentences within brackets [ ] are choices to include or exclude a particular item or statement. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

**SECTION 28 23 29**

**VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS**

**Bosch FLEXIDOME IP outdoor 5000 cameras**

1. **– GENERAL**
   1. SUMMARY
      1. Section Includes
         1. Video Surveillance Remote Devices.
      2. Related Sections
         1. Section [28 23 13 – Video Surveillance Control and Management Systems].
         2. Section [28 23 16 – Video Surveillance Monitoring and Supervisory Interfaces].
         3. Section [28 23 19 – Digital Video Recorders and Analog Recording Devices].
         4. Section [28 23 23 – Video Surveillance Systems Infrastructure].

\*\*\*\*\*\*\*\*\*\*Specifier’s note: Include those standards referenced elsewhere in this SECTION.

* 1. REFERENCES

|  |  |
| --- | --- |
| **Standards** |  |
|  | [NDI-50022-A3] IEC 62471 (IR version) |
|  | EN 60950-1 |
|  | UL 60950-1 |
|  | UL 60950-22 |
|  | CAN/CSA-C22.2 NO. 60950-1-03 |
|  | CAN/CSA-C22.2 NO. 60950-22 |
|  | EN 50130-4 |
|  | EN 50130-5 |
|  | FCC Part15 Subpart B, Class B |
|  | EMC directive 2004/108/EC |
|  | EN 55022 class B |
|  | EN 55024 |
|  | AS/NZS CISPR 22 (equal to CISPR 22) |
|  | ICES-003 Class B |
|  | VCCI J55022 V2/V3 |
|  | EN 50121-4 |
|  | EN 60950-22 |
| **ONVIF compliance** | EN 50132-5-2; IEC 62676-2-3 |
| **Product certifications** | CE, FCC, UL, cUL, RCM, CB, VCCI |
| **Ingress protection** | IP66 |
| **Impact protection** | IK10 |

* 1. DEFINITIONS
     1. Sensitivity: refers to the minimum level of light the sensor needs to generate an acceptable video picture, and is measured in lux.
     2. Day/Night (infrared sensitive): The camera has normal color operation in situations where there is sufficient illumination (day conditions), but when there is little light available (night conditions) the sensitivity is increased.
     3. IDNR (Intelligent Dynamic Noise Reduction): The intelligent Dynamic Noise Reduction applies temporal noise filtering when no motion is detected. The filtering reduces the noise in the image and this makes the encoder step more effective.
  2. SYSTEM DESCRIPTION
     1. Video Surveillance Remote Devices
        1. NDN-50022-A3 FLEXIDOME IP outdoor 5000 HD camera
        2. NDI-50022-A3 FLEXIDOME IP outdoor 5000 IR camera
     2. Performance Requirements
        1. Complete outdoor network video surveillance system inside a dome camera.
        2. 1080p resolution.
        3. Intelligent Dynamic Noise Reduction (IDNR) technology.
        4. Automatic Varifocal 3 to 10 mm, DC Iris fixed board-mounted lens.
        5. True day/night function.
        6. Quad-streaming IP video.
        7. Micro SDHC/SDXC card slot for edge recording up to 2 TB.
        8. ONVIF conformant.
        9. +12 VDC or Power over Ethernet (IEEE 802.3af compliant, class 2).
        10. IP66 water ingress protection.
        11. IK10 impact protection.
        12. [NDI-50022-A3] Built-in active infrared illumination.
  3. SUBMITTALS
     1. Submit under provisions of Section [01 33 00].
     2. Product Data:
        1. Manufacturer’s data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
     3. Shop Drawings; include
        1. System device locations on architectural floor plans.
        2. Full Schematic of system, including wiring information for all devices.
     4. Closeout Submittals
        1. User manual.
        2. Parts list.
        3. System device locations on architectural floor plans.
        4. Wiring and connection diagram.
        5. Maintenance requirements.
  4. QUALITY ASSURANCE
     1. Manufacturer:
        1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.
        2. Manufacturer’s quality system: Registered to ISO 9001 Quality Standard.
     2. Video Surveillance System
        1. Listed by [UL] [EN] [FCC] specifically for the required loads. Provide evidence of compliance upon request.
     3. Installer:
        1. Minimum of [5] years experience installing Video Surveillance Systems.
  5. DELIVERY, STORAGE AND HANDLING
     1. Comply with requirements of Section [01 60 00].
     2. Deliver materials in manufacture’s original, unopened, undamaged containers; and unharmed original identification labels.
     3. Protect store materials from environmental and temperature conditions following manufacturer’s instructions.
     4. Handle and operate products and systems according to manufacturer’s instructions.
     5. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.
  6. WARRANTY
     1. Provide manufacturer’s warranty covering [3] years for replacement and repair of defective equipment.
  7. MAINTENANCE
     1. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
     2. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

1. **– PRODUCTS**
   1. MANUFACTURERS
      1. Acceptable Manufacturer:

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* + 1. Substitutions: [Not permitted.] [Under provisions of Division 1.]
       1. [All proposed substitutions must be approved by the Architect or Engineer professional.]
       2. [Proposed substitutions must provide a line-by-line compliance documentation.]

\*\*\*\*\*\*\*\*\*\*Specifier’s note: Select Camera System Series based on project requirement.

* 1. FLEXIDOME IP outdoor 5000 camera  
     [NDN-50022-A3], [NDI-50022-A3]
     1. General Characteristics:
        1. The camera shall be capable of operating in an indoor or an outdoor environment.
        2. The camera shall be easy to install.
        3. The camera shall provide an automatic zoom/focus lens wizard to remotely zoom and focus the lens.
        4. The camera shall offer 1080p resolution at 30 fps.
        5. The camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
        6. A user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, Bosch Video Client, Bosch Video Security Client or with the Bosch Video Security App.
        7. The camera shall have a mechanical IR cut-off filter for true day/night switching.
        8. The camera shall use Intelligent Dynamic Noise Reduction technology to remove noise artifacts and reduce the bitrate by up to 50% (giving reduced bandwidth and storage requirements).
        9. The camera shall utilize Intelligent Defog (IDefog) to effectively remove the haze from the picture and provides a better visibility.
        10. The camera shall accept power via Power over Ethernet (IEEE 802.3af compliant).
        11. The camera shall offer tamper and intelligent motion detection.
        12. The camera shall offer two-way full duplex audio communication.
        13. The camera shall provide configurable scene modes that give optimized settings for distinct applications.
        14. The camera shall provide eight independent, fully programmable privacy mask areas.
        15. The camera shall utilize pixel-by-pixel analysis to automatically compensate for bright areas of a high contrast scene without having to define a window or area.
        16. The camera shall have a CVBS analog video output for hybrid operation.
        17. The camera shall be rated to IP66 standard against water and dust ingress.
        18. The camera shall be rated to IK10 impact protection.
        19. [NDI-50022-A3] The camera shall have a built-in active infrared illuminator.
     2. Image processing and compression
        1. The camera shall use a progressive scan CMOS image sensor.
        2. The camera shall produce a resolution of 1920 x 1080 pixels with a 16:9 aspect ratio.
        3. The camera shall be fitted with a board-mounted automatic varifocal lens.
        4. The camera shall have a wide dynamic range.
        5. The camera shall have a high sensitivity.
        6. The camera shall have an automatic electronic shutter.
        7. The camera shall be capable of capturing and storing images using the following compression standards:
           1. H.264 MP (Main Profile)
           2. M-JPEG
        8. The camera shall offer a region of interest to zoom into a specific area of the full image.
        9. The camera shall allow a region of interest to be sent in a separate stream so it is possible to view both an overview and a detail at the same time.
     3. [NDI-50022-A3] Night Vision (Infrared)
        1. The camera shall have a LED high efficiency IR array for effective night vision.
        2. The camera shall allow adjusting intensity of IR output to fit with the environment.
     4. Audio
        1. The camera shall offer G.711, AAC and L16 audio compression (live and recording).
        2. The camera shall offer full duplex audio communication.
     5. Network Video
        1. The camera shall provide direct network connection.
        2. The camera shall allow full camera control and configuration capabilities over the network.
        3. The camera shall deliver video over a 10/100 Base-T, auto-sensing, half/full duplex, RJ45 Ethernet connection.
        4. The camera shall comply with the IEEE 802.3af Power over Ethernet standard.
        5. The camera shall conform to the ONVIF Profile S standard.
        6. The camera shall support AutoMDIX.
     6. Image Posting

1. The camera shall offer periodic JPEG image posting to an FTP server or a Dropbox account.
   * 1. Access Security
        1. The camera shall offer three levels of password protection.
        2. The camera shall support 802.1x authentication using a RADIUS (Remote Authentication Dial In User Service) server.
        3. The camera shall store a SSL certificate for use with HTTPS.
        4. The camera shall be capable of being independently AES encrypted with 128-bit keys.
     2. Recording and Storage Management
        1. The camera shall support iSCSI devices to allow video stream to be recorded directly to an iSCSI RAID array.
        2. The camera shall support iSCSI storage targets to enable the camera to function as a conventional DVR.
        3. The camera shall have a microSD card slot.
        4. The local storage feature shall be capable of storage for Automatic Network Replenishment (ANR).
        5. Local Recording: Continuous recording, ring recording, alarm/events/schedule recording.
     3. Alarm Handling Features:
        1. The camera shall provide the capability on alarm to display up to a 31 character, programmable alarm message.
        2. The camera shall provide email alarm messaging with optional JPEG posting.
     4. Embedded Video Content Analysis
        1. The camera shall be VCA enabled.
        2. The camera shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
        3. The camera shall be capable of detecting and sending alarms for abnormal events.
        4. The camera shall allow users to set up to 10 separate profiles and switch profiles based on a day/night or holiday schedules.
        5. The camera shall offer MOTION+ video motion analysis that uses an algorithm based on pixel change.
        6. The MOTION+ feature shall include extended tamper detection capabilities.
     5. Surveillance Software
        1. The camera shall be accessible from a web browser, from the Bosch Video Management System, from the free-of-charge Bosch Video Client or Video Security Client, or via third-party software.
        2. The camera shall be accessible from the Bosch Security System mobile app.
     6. Technical Specifications

| **Power** | |
| --- | --- |
| Input voltage | +12 VDC or  Power-over-Ethernet (48 VDC nominal) |
| Power consumption | 3.8 W max.  [NDI-50022-A3] 6.3 W max. (IR version) |
| PoE | IEEE 802.3af (802.3at Type 1)  Power level: Class 2 |

| **Sensor** | |
| --- | --- |
| Sensor type | 1/2.7‑inch CMOS |
| Total sensor pixels | 1952 x 1092 (2MP) |

| **Video performance - Sensitivity** | |
| --- | --- |
| Sensitivity – (3200K, reflectivity 89%, F1.5, 30IRE) | |
| Color | 0.24 lx |
| Mono | 0.05 lx |
| [NDI-50022-A3] With IR | 0.0 lx |

| **Video performance ‑ Dynamic range** | |
| --- | --- |
| Dynamic range | 76 dB |

| **Video streaming** | |
| --- | --- |
| Video compression | H.264 (MP); M-JPEG |
| Streaming | Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth.  Regions of Interest (ROI) |
| Overall IP Delay | Min. 120 ms, Max. 340 ms |
| GOP structure | IP, IBP, IBBP |
| Encoding interval | 1 to 30 [25] fps |
| Encoder regions | Up to 8 areas with encoder quality settings per area |

| **Video resolution (H x V)** | |
| --- | --- |
| * 1080p HD | 1920 X 1080 |
| * 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 |

| **Video functions** | |
| --- | --- |
| Day/Night | Color, Monochrome, Auto |
| Adjustable picture settings | Contrast, Saturation, Brightness |
| White Balance | 4 automatic modes, manual mode and measure |
| Shutter | Automatic Electronic Shutter (AES);  Fixed shutter (1/25[30] to 1/15000) selectable;  Default shutter |
| Backlight compensation | On/off |
| Noise reduction | **Intelligent Dynamic Noise Reduction** with separate temporal and spatial adjustments |
| Contrast enhancement | On/off |
| Sharpness | Sharpness enhancement level selectable |
| Intelligent defog | **Intelligent Defog** automatically adjusts parameters for best picture in foggy or misty scenes (switchable) |
| Privacy Masking | Eight independent areas, fully programmable |
| Video Analysis | **MOTION+** |
| Other functions | Image mirror, Image flip, Pixel counter, Video watermarking, Display stamping, Scene modes, Location |

| [NDI-50022-A3] **Night vision (IR version only)** | |
| --- | --- |
| Distance | 15 m (50 ft) |
| LED | 10 LED high efficiency array, 850 nm |
| IR intensity | Adjustable |

| **Optical** | |
| --- | --- |
| Lens type | 3 to 10 mm Automatic Varifocal (AVF), DC Iris F1.3 – 360, IR corrected |
| Lens mount | Board mounted |
| Day/Night | Switched mechanical IR filter |
| Horizontal field of view | 36° - 117° |
| Vertical field of view | 20° - 61° |
| Adjustment | Motorized zoom/focus |
| Iris control | Automatic iris control |

| **Input/output** | |
| --- | --- |
| Analog video out | SMB connector, CVBS (PAL/NTSC), 1 Vpp, 75 Ohm |
| Audio line in | 0.707 Vrms max, 10 kOhm typical, jack connector |
| Audio line out | 0.707 Vrms at 16 Ohm typical, jack connector |
| Alarm input | 1 input |
| Alarm input activation | Short or DC 5V activation |
| Alarm output | 1 output |
| Alarm output voltage | 30 VDC, max. load 0.5 A |
| Ethernet | RJ45 |

| **Audio streaming** | |
| --- | --- |
| Standard | G.711, 8 kHz sampling rate  L16, 16 kHz sampling rate  AAC-LC, 48 kbps at 16 kHz sampling rate  AAC-LC, 80 kbps at 16 kHz sampling rate |
| Signal-to-Noise Ratio | >50 dB |
| Audio Streaming | Full-duplex / half duplex |

| **Local storage** | |
| --- | --- |
| Internal RAM | 10 s pre-alarm recording |
| Memory card slot | Supports up to 32 GB microSDHC / 2 TB microSDXC card. (An SD card of Class 6 or higher is recommended for HD recording) |
| Recording | Continuous recording, ring recording. alarm/events/schedule recording |

| **Software** | |
| --- | --- |
| Unit Configuration | Via web browser or **Configuration Manager** |
| Firmware update | Remotely programmable |
| Software viewer | Web browser, **Video Security Client**, **Bosch Video Client**, or third party software |

| **Network** | |
| --- | --- |
| Protocols | **IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, NTP (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** |
| Encryption | TLS 1.0, SSL, DES, 3DES, AES (optional) |
| Ethernet | 10/100 Base-T, auto-sensing, half/full duplex |
| Connectivity | Auto-MDIX |
| Interoperability | **ONVIF Profile S**;  GB/T 28181 |

| **Mechanical** | |
| --- | --- |
| 3-axis adjustment (pan/tilt/rotation) | 350º / 130º / 330º |
| Dimensions | Diameter: 145 mm (5.71 in)  Height: 131 mm (5.14 in) |
| Weight | 1102 g (2.43 lb) approx. |
| Color | RAL 9004, RAL 9010 |

| **Environmental** | |
| --- | --- |
| Operating temperature | -30 ºC to +50 ºC (-22 ºF to +122 ºF) |
| Storage temperature | -30 ºC to +70 ºC (-22 ºF to +158 ºF) |
| Humidity | 20% to 90% relative humidity (non condensing) |

1. **– EXECUTION**
   1. EXAMINATION
      1. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
      2. Do not begin installation until unacceptable conditions are corrected.
   2. PREPARATION
      1. Protect devices from damage during construction.
   3. INSTALLATION
      1. Install devices in accordance with manufacturer’s instruction at locations indicated on the floor drawings plans.
      2. Ensure selected location is secure and offers protection from accidental damage.
      3. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.
   4. FIELD QUALITY CONTROL
      1. Test snugness of mounting screws of all installed equipment.
      2. Test proper operation of all video system devices.
      3. Determine and report all problems to the manufacturer’s customer service department.
   5. ADJUSTING
      1. Make proper adjustment to video system devices for correct operation in accordance with manufacturer’s instructions.
      2. Make any adjustment of camera settings to comply with specific customer’s need.
   6. DEMONSTRATION
      1. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION