June 2017

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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 2016* 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 21 00: Video Surveillance**

**Section 28 21 13: IP Cameras**

**Section 28 21 13.11: Panoramic Cameras**

**MULTI-SENSOR PANORAMIC CAMERA – 4 X 2 MP MULTI-SENSOR PANORAMIC NETWORK IR BULLET CAMERA**

1. **– GENERAL**
   1. SUMMARY
      1. Section Includes
         1. Section 28 21 13: Video Surveillance – Surveillance Cameras – IP Cameras
         2. Section 28 21 17: Video Surveillance – Surveillance Cameras – Camera Housings
         3. Section 28 21 19: Video Surveillance – Surveillance Cameras – Camera Mounts
         4. Section 28 21 21: Video Surveillance – Surveillance Cameras – Illuminators
         5. Section 28 27 00: Video Surveillance – Video Surveillance Sensors
      2. Related Sections
         1. [Section 28 33 15: Security Detection, Alarm and Monitoring – Security Monitoring and Control – Security Monitoring and Control Software].

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

* 1. REFERENCES
     1. Federal Communications Commission (FCC) ([www.fcc.gov](http://www.fcc.gov))
        1. FCC Part 15 Subpart B
     2. Underwriters Laboratories, Inc. (UL) (www.ul.com)
        1. UL 60950-1
     3. European Standards
        1. CE conformity
        2. EN 60950:2000
     4. HD standards
        1. Complies with the SMPTE 274M-2008 Standard in:
           1. Resolution: 1920x1080
           2. Scan: Progressive
           3. Color representation: complies with ITU-R BT.709
           4. Aspect ratio: 16:9
           5. Frame rate: 25 and 30 frames/s
        2. Complies with the 296M-2001 Standard in:
           1. Resolution: 1280x720
           2. Scan: Progressive
           3. Color representation: complies with ITU-R BT.709
           4. Aspect ratio: 16:9
           5. Frame rate: 25, 30, 50 and 60 frames/s
           6. Interference-Causing Equipment Standards
  2. SYSTEM DESCRIPTION
     1. Section Includes
        1. Video Surveillance – Surveillance Cameras – Panoramic Cameras
     2. Performance Requirements
        1. The Multi-Sensor Panoramic camera shall be a full-featured HD bullet camera designed for discrete video surveillance applications in indoor and outdoor environments.
        2. The Multi-Sensor Panoramic camera shall produce a 180° panoramic image using four (4) 2-MP cameras.
        3. The Multi-Sensor Panoramic camera shall use four (4) high-performance 1/2.8-in. progressive-scan STARVIS™ CMOS sensors each with 2 MP resolution.
        4. The Multi-Sensor Panoramic camera shall deliver a maximum resolution of 4096 x 1800.
        5. The Multi-Sensor Panoramic camera shall employ Starlight Ultra-low Light Technology to capture color images in low light down to 0.007 lux.
        6. The Multi-Sensor Panoramic camera shall utilize eight (8) IR LEDs with a maximum IR distance of 30 m (98.43 ft) and shall produce usable images at 0 lux.
        7. The Multi-Sensor Panoramic camera shall utilize an algorithm that dynamically restores the true color of scene illuminated by a sodium-vapor lamp.
        8. The Multi-Sensor Panoramic camera shall offer a mechanical day/night filter that delivers color images during daylight and automatically switches to a monochrome image as the scene darkens.
        9. The Multi-Sensor Panoramic camera shall offer Digital Wide Dynamic Range for clear images in extreme high-contrast environments.
        10. The Multi-Sensor Panoramic camera shall have a built-in Intelligent Video System that provides analytic algorithms to monitor a scene for tripwire violations, intrusion detection, and abandoned or missing objects.
        11. The Multi-Sensor Panoramic camera shall offer built-in intelligent business analytics that can detect can capture a snapshot of a human face, and measure the number of people in a surveillance scene and create visual representations of the data.
        12. The Multi-Sensor camera shall include a built-in heater to allow operation down to –40° C (–40° F).
        13. The Multi-Sensor Panoramic camera shall offer:
            1. IP67 Ingress Protection.
            2. IK10 Vandal Resistance.
  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. Dimensional Drawings; include
       1. Overall device dimensions.
       2. Dimensions specific for installation.
    4. Closeout Submittals
       1. User manual.
       2. Parts list.
       3. Maintenance requirements.
  1. QUALITY ASSURANCE
     1. Manufacturer:
        1. Minimum of [10] years of experience in manufacture and design Video Surveillance Devices.
     2. Video Surveillance System:
        1. List certifying bodies (UL, CSA, etc.)
        2. Provide evidence of compliance upon request.
     3. Installer:
        1. Minimum of [5] years of experience installing Video Surveillance System.
  2. 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.
  3. WARRANTY
     1. Provide manufacturer’s warranty covering [2] years for replacement and repair of defective equipment. Warranty varies country to country.
  4. 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 via phone and e-mail.

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

Dahua Technology USA Inc.

23 Hubble, Irvine, CA 92618

Tel: (949) 679-7777

Fax: (949) 679-5760

Email: [sales.usa@global.dahuatech.com](mailto:sales.usa@global.dahuatech.com)

* + 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.]
  1. 4 x 2MP MULTI-SENSOR PANORAMIC NETWORK IR BULLET CAMERA  
     DH-IPC-PFW8800N-A180
     1. General Characteristics:
        1. The Multi-Sensor Panoramic camera shall provide four (4) 1/2.8-in. progressive-scan STARVIS™ CMOS sensors with the following:
           1. 4096 x 1800 effective picture elements.
           2. Sensitivity to below 1.0 lux.
        2. The Multi-Sensor Panoramic camera shall offer a Smart IR distance of up to 30.0 m (98.43 ft).
        3. The Multi-Sensor Panoramic camera shall provide direct network connection using Smart H.265+ and H.264 compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
        4. The Multi-Sensor Panoramic camera shall support the following dual, redundant power options:
           1. 24 VAC.
           2. PoE+ (IEEE 802.3at, class 4).
        5. The Multi-Sensor Panoramic camera shall offer Starlight Technology to produce usable video with minimal ambient light.
        6. The Multi-Sensor Panoramic camera shall offer Digital Wide Dynamic Range for clear images in extreme high-contrast environments.
        7. The Multi-Sensor Panoramic camera shall offer bi-directional audio.
        8. The Multi-Sensor Panoramic camera shall offer an alarm interface with two (2) alarm inputs and two (2) alarm outputs.
        9. The Multi-Sensor Panoramic camera shall be able to be mounted to a wall, mounted to a corner position, or mounted to a pole.
        10. The Multi-Sensor Panoramic camera shall offer IP67 Ingress Protection.
        11. The Multi-Sensor Panoramic camera shall offer IK10 Vandal Resistance.
     2. Imaging
        1. The Multi-Sensor Panoramic camera shall offer four (4) 1/2.8-inch progressive-scan STARVIS™ imagers that produce a 180° panoramic image.
        2. The Multi-Sensor Panoramic camera shall offer 4096 x 1800 effective picture elements.
        3. The Multi-Sensor Panoramic camera shall offer a 3.0 mm focal length with a maximum aperture of F2.0.
        4. The Multi-Sensor Panoramic camera offers 180° horizontal angle of view and an 80° vertical angle of view.
        5. The Multi-Sensor Panoramic camera shall produce a color image with a minimum scene illumination of 0.007 lux at F2.0.
        6. The Multi-Sensor Panoramic camera shall produce a usable image with a scene illumination of 0 lux when IR is enabled.
        7. The Multi-Sensor Panoramic camera shall produce an effective image with IR illumination at a distance of 30.0 m (98.43 ft).
        8. The Multi-Sensor Panoramic camera shall contain a minimum of eight (8) IR LEDs.
        9. The Multi-Sensor Panoramic camera shall have a signal to noise ratio of more than 50 dB.
     3. Video Characteristics
        1. The Multi-Sensor Panoramic camera shall offer BLC, HLC, and Digital WDR modes of backlight compensation.
        2. The Multi-Sensor Panoramic camera shall offer Auto, Natural, Street Lamp, Outdoor, and Manual white balance modes.
        3. The Multi-Sensor Panoramic camera shall offer 3D DNR noise reduction.
        4. The Multi-Sensor Panoramic camera shall offer motion detection (four zones) and region of interest (four zones) controls.
        5. The Multi-Sensor Panoramic camera shall offer four (4) privacy masking zones.
        6. The Multi-Sensor Panoramic camera shall offer 16x digital zoom.
     4. Streaming Capability
        1. The Multi-Sensor Panoramic camera shall generate a maximum resolution of 4096 x 1800 using Smart H.265+ compression.
        2. The Multi-Sensor Panoramic camera shall offer CBR/VBR bit rate control.
        3. The Multi-Sensor Panoramic camera shall offer the following video compression protocols:
           1. Smart H.65+
           2. H.265
           3. Smart H.264+
           4. H.264
           5. MJPEG
        4. The Multi-Sensor Panoramic camera shall offer the following bit rates:
           1. H.265: 9 Kbps to 9472 Kbps.
           2. H.264: 24 Kbps to 15616 Kbps.
        5. The Multi-Sensor Panoramic camera shall support video resolutions of 4096 x 1800, 3840 x 1680, 2880 x 1264, 1920 x 832, 1280 x 560, and 1024 x 452.
        6. The Multi-Sensor Panoramic camera shall generate three streams at the following maximum resolutions:
           1. Main Stream: 4096 x 1800 at 25 fps
           2. Sub Stream 1: 1024 x 452 at /30 fps
           3. Sub Stream 2: 1920 x 832 at 30 fps
     5. IP Connectivity
        1. The Multi-Sensor Panoramic camera shall allow full camera control and configuration capabilities via a TCP/IP network.
        2. The Multi-Sensor Panoramic camera shall deliver 4096 x 1800 resolution video at rates up to 25 frames per second via TCP/IP over an RJ-45 (100/1000 Base-T) connection.
        3. The Multi-Sensor Panoramic camera shall conform to the ONVIF, PSIA, and the CGI standard.
        4. The Multi-Sensor Panoramic camera shall offer Quality of Service (QoS) configuration options.
        5. The Multi-Sensor Panoramic camera shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
        6. The Multi-Sensor Panoramic camera shall offer local and network storage options that include: MicroSD, Network Attached Storage (NAS), and recording to a local PC for instant recording.
        7. The Multi-Sensor Panoramic camera shall support the following protocols: HTTP, HTTPs, TCP, ARP, RTSP, RTP, UDP, SMTP, FTP, DHCP, DNS, DDNS, PPPOE, IPv4/v6, QoS, UPnP, NTP, Bonjour, 802.1x, Multicast, ICMP, IGMP, and SNMP.
        8. The Multi-Sensor Panoramic camera shall support the Smart PSS and the DSS management software.
        9. The Multi-Sensor Panoramic camera shall support the Android and the IOS mobile operating systems.
     6. Interface
        1. The Multi-Sensor Panoramic camera shall support the following audio compression technologies: G.711a, G.711Mu, AAC, and G.726.
        2. The Multi-Sensor Panoramic camera shall offer an audio interface with one (1) channel IN and one (1) channel OUT.
        3. The Multi-Sensor Panoramic camera shall feature one (1) video output port for adjustment during installation.
        4. The Multi-Sensor Panoramic camera shall offer two (2) alarm input channels and two (2) alarm output channels.
     7. Intelligence
        1. The Multi-Sensor Panoramic camera offer a built-in Intelligent Video System to provide advanced analytics for any scene.
        2. The Intelligent Video System shall offer intelligent video analytics built-in to the Multi-Sensor Panoramic camera.
        3. The Intelligent Video System shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
        4. The Intelligent Video System shall detect multiple object behaviors such as abandoned or missing objects.
        5. The Intelligent Video System shall support Tripwire analytics to detect when an object has crossed a pre-determined line on the video image.
        6. The Intelligent Video System shall offer Facial Detection to search and identify individuals.
        7. The Intelligent Video System shall offer business analytics to perform the following:
           1. People Counting: Measure the number of customers, visitors or passengers in a surveillance scene.
           2. Heat Map: Generates a visual representation of data.
        8. The Intelligent Video System shall employ an E-PTZ feature that scans a portion of the panoramic scene and zooms that scene for improved observation.
     8. Installation Requirements
        1. The Multi-Sensor Panoramic camera shall be capable of operating in an outdoor environment within a temperature range of –40° C to +60° C (–40° F to 140° F).
        2. The Multi-Sensor Panoramic camera shall accept power, transmit video, and accept control via a TCP/IP connection.
        3. The Multi-Sensor Panoramic camera shall support the following dual, redundant power options:
           1. 24 VAC ± 25%.
           2. PoE+ (IEEE 802.3at, class 4).
     9. Housing Options
        1. The Multi-Sensor Panoramic camera shall be offered in a metal housing.
        2. The Multi-Sensor Panoramic camera housing shall conform to the IP67 standard for ingress protection.
        3. The Multi-Sensor Panoramic camera housing shall conform to the IK10 standard for vandal resistance.
  2. ACCESSORIES
     1. The Multi-Sensor Panoramic camera shall include the following accessories:
        1. Mount adapter.
     2. The Multi-Sensor Panoramic camera shall offer the following optional accessories:
        1. [Junction box.]
        2. [Pole mount.]
        3. [Corner mount.]

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. Perform installation with qualified service personnel.
      3. Install devices in accordance with the National Electrical Code or applicable local codes.
      4. Ensure selected location is secure and offers protection from accidental damage.
      5. 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. DEMOSTRATION
      1. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION