September 2022

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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**

**4MP TiOC Network PTZ Camera (25x)**

1. **– GENERAL**
   1. SUMMARY
      1. Section Includes
         1. Section 28 21 17: Video Surveillance – Surveillance Cameras – Camera Housings
         2. Section 28 21 19: Video Surveillance – Surveillance Cameras – Camera Mounts
         3. Section 28 21 21: Video Surveillance – Surveillance Cameras – Illuminators
         4. 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. Electromagnetic Compatibility
        1. FCC Part 15 Subpart B
        2. ANSI C63.4-2014
     2. European Standards
        1. EN 55032
        2. EN 55024
        3. EN 50130-4
     3. 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 – IP Cameras
     2. Performance Requirements
        1. The 4MP TiOC Network PTZ camera shall be a full-featured 4 MP camera designed for discrete video surveillance applications in indoor and outdoor environments.
        2. The 4MP TiOC Network PTZ camera shall provide direct network connection using Smart H.265+, H.265, Smart H.264+, H.264B, H.264H, H.264M, and MJPEG (sub stream only) compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
        3. The 4MP TiOC Network PTZ camera shall offer a 1/2.8-in STARVIS™ Progressive-scan CMOS imager with an effective pixel density of 2560 x 1440 at 30 fps.
        4. The 4MP TiOC Network PTZ camera shall have a motorized lens with a focal length between 4.8 mm to 120.0 mm and an autofocus lens with 25x optical zoom.
        5. The 4MP TiOC Network PTZ camera shall support the following dual, redundant power options:
           1. 24 VDC, 2.5 A (± 25%)
           2. PoE+ (802.3at)
           3. The 4MP TiOC Network PTZ camera shall default to use power from the PoE power supply, if connected.
           4. The 4MP TiOC Network PTZ camera shall reboot and switch to the 24 VDC, 2.5 A (± 25%) power supply if power from the PoE power supply is lost.
        6. The 4MP TiOC Network PTZ camera shall offer True Wide Dynamic Range (120 dB) for clear images in extreme high-contrast environments.
        7. The 4MP TiOC Network PTZ camera shall offer Analytics+ Functions — Perimeter Protection, Face Detection, and Smart Motion Detection+.
        8. The 4MP TiOC Network PTZ camera shall offer Auto-tracking that controls the pan/tilt/zoom actions of the camera to automatically track an object in motion and to keep it in the scene.
        9. The 4MP TiOC Network PTZ camera shall incorporate a built-in defog mode that dynamically adjusts the camera’s contrast to provide improved image quality in scenes affected by fog, smog, mist, smoke or other low-contrast interference.
        10. The 4MP TiOC Network PTZ camera shall offer the Intelligent Video System to detect and analyze moving objects for improved video surveillance.
        11. The 4MP TiOC Network PTZ camera shall conform to the ONVIF standard to provide interoperability with other conformant systems.
        12. The 4MP TiOC Network PTZ camera shall offer three separate and configurable streams with individually configurable HD streams.
        13. The 4MP TiOC Network PTZ camera shall offer bi-directional audio.
        14. The 4MP TiOC Network PTZ camera shall accept two (2) incoming alarm connections and offer one (1) outgoing alarm connection.
        15. The 4MP TiOC Network PTZ camera housing shall conform to the IP66 Ingress Protection.
  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.

15245 Alton Pkwy, #100, 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 MP 45X IR PTZ NETWORK CAMERA 6CE445XANR  
     1. General Characteristics:
        1. The 4MP TiOC Network PTZ camera shall be a full-featured 4 MP camera designed for discrete video surveillance applications in indoor and outdoor environments.
        2. The 4MP TiOC Network PTZ camera shall provide direct network connection using Smart H.265+, H.265, Smart H.264+, H.264B, H.264H, H.264M, and MJPEG (sub stream only) compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
        3. The 4MP TiOC Network PTZ camera shall offer a 1/2.8-in STARVIS™ Progressive-scan CMOS imager with an effective pixel density of 2560 x 1440 at 30 fps.
        4. The 4MP TiOC Network PTZ camera shall have a motorized lens with a focal length between 4.8 mm to 120.0 mm and an autofocus lens with 25x optical zoom.
        5. The 4MP TiOC Network PTZ camera shall support the following dual, redundant power options:
           1. 24 VDC, 2.5 A (± 25%)
           2. PoE+ (802.3at)
           3. The 4MP TiOC Network PTZ camera shall default to use power from the PoE power supply, if connected.
           4. The 4MP TiOC Network PTZ camera shall reboot and switch to the 24 VDC, 2.5 A (± 25%) power supply if power from the PoE power supply is lost.
        6. The 4MP TiOC Network PTZ camera shall offer True Wide Dynamic Range (120 dB) for clear images in extreme high-contrast environments.
        7. The 4MP TiOC Network PTZ camera shall offer Analytics+ Functions — Perimeter Protection, Face Detection, and Smart Motion Detection+.
        8. The 4MP TiOC Network PTZ camera shall offer Auto-tracking that controls the pan/tilt/zoom actions of the camera to automatically track an object in motion and to keep it in the scene.
        9. The 4MP TiOC Network PTZ camera shall incorporate a built-in defog mode that dynamically adjusts the camera’s contrast to provide improved image quality in scenes affected by fog, smog, mist, smoke or other low-contrast interference.
        10. The 4MP TiOC Network PTZ camera shall offer the Intelligent Video System to detect and analyze moving objects for improved video surveillance.
        11. The 4MP TiOC Network PTZ camera shall conform to the ONVIF standard to provide interoperability with other conformant systems.
        12. The 4MP TiOC Network PTZ camera shall offer three separate and configurable streams with individually configurable HD streams.
        13. The 4MP TiOC Network PTZ camera shall offer bi-directional audio.
        14. The 4MP TiOC Network PTZ camera shall accept two (2) incoming alarm connections and offer one (1) outgoing alarm connection.
        15. The 4MP TiOC Network PTZ camera housing shall conform to the IP66 Ingress Protection.
     2. Imaging
        1. The 4MP TiOC Network PTZ camera shall offer a 1/2.8-in STARVIS™ Progressive-scan CMOS imager.
        2. The 4MP TiOC Network PTZ camera shall offer an effective number of pixels of 2560 x 1440 (4MP) effective picture elements.
        3. The 4MP TiOC Network PTZ camera shall offer a 25x optical zoom lens (4.8 mm to 120 mm).
        4. The 4MP TiOC Network PTZ camera shall have a horizontal angle of view of between 55.8° to 2.9°.
        5. The 4MP TiOC Network PTZ camera shall offer an aperture of F1.6–F3.5.
        6. The 4MP TiOC Network PTZ camera shall produce a color image with a minimum scene illumination of 0.005 Lux at F1.6, a monochrome image with a minimum illumination 0.0005 Lux at F1.6, and a color image at 0 lux when in IR mode.
        7. The 4MP TiOC Network PTZ camera shall offer automatic focus and iris control with manual override.
        8. The 4MP TiOC Network PTZ camera shall offer True Wide Dynamic Range of 120 dB.
     3. PTZ Features
        1. The 4MP TiOC Network PTZ camera shall provide a pan range of 360° endless.
        2. The 4MP TiOC Network PTZ camera shall provide a tilt angle of –20° to 90° relative to the horizon.
        3. The 4MP TiOC Network PTZ camera shall provide an automatic flip feature to automatically rotate and flip the camera as it tilts through the vertical position to maintain the correct orientation of the image.
        4. The 4MP TiOC Network PTZ camera shall provide the following modes for variable pan/tilt speeds:
           1. Manual Control:

Pan: 0.1°/s–160°/s

Tilt: 0.1°/s–60°/s

* + - * 1. Preset Mode:

Pan: 240°/s

Tilt: 150°/s

* + - 1. The 4MP TiOC Network PTZ camera shall provide a feature that automatically rotates, or pivots, the camera to simplify tracking of a person walking directly under the camera.
      2. The 4MP TiOC Network PTZ camera shall support 300 presets.
      3. The 4MP TiOC Network PTZ camera shall support the following PTZ modes:
         1. Five (5) PTZ pattern modes.
         2. Five (5) PTZ scan modes.
         3. Eight (8) PTZ tour modes.
         4. One (1) Auto Pan mode.
         5. One (1) Auto Scan mode.
      4. The 4MP TiOC Network PTZ camera shall automatically activate a preset, scan, tour, or pattern mode if the camera does not receive a command during a specified period.
      5. The 4MP TiOC Network PTZ camera shall automatically restore the previous PTZ and lens status after the camera powers up after a power failure.
      6. The 4MP TiOC Network PTZ camera shall support the DH-SD and the Pelco-P/D protocols.
    1. Illumination
       1. The 4MP TiOC Network PTZ camera shall have two (2) IR lights, two (2) dual light fusions, and (2) white-light LEDs.
       2. The 4MP TiOC Network PTZ camera shall offer an IR distance of up to 150 m (492.13 ft) and a white light/smart illumination distance of 50 m (164.04 ft).
    2. Video Characteristics
       1. The 4MP TiOC Network PTZ camera shall offer CBR/VBR bit rate control.
       2. The 4MP TiOC Network PTZ camera shall offer the following video compression protocols
          1. H.265 (1024 kbps–7936 kbps)
          2. H.264 (2816 kbps–8192 kbps)
       3. The 4MP TiOC Network PTZ camera shall offer BLC, HLC, and True WDR (120 dB) modes of backlight compensation.
       4. The 4MP TiOC Network PTZ camera shall offer Auto, Indoor, Outdoor, ATW, Manual, Sodium Lamp, Natural, and Street Lamp modes.
       5. The 4MP TiOC Network PTZ camera shall offer Ultra DNR (2D/3D) noise reduction.
       6. The 4MP TiOC Network PTZ camera shall offer 24 privacy masking areas.
    3. Streaming Capability
       1. The 4MP TiOC Network PTZ camera shall generate full 4 MP (2592 x 1520 pixels) at 30 fps resolution using H.265 compression.
       2. The 4MP TiOC Network PTZ camera shall offer the following resolutions:
          1. 4MP (2560 x 1440)
          2. 3MP (2048 x 1536)
          3. 1080p (1920 x 1080)
          4. 1.3MP (1280 x 960)
          5. 720p (1280 x 720)
          6. D1 (704 x 480)
          7. VGA (640 x 480)
          8. CIF (352 x 240)
       3. The 4MP TiOC Network PTZ camera shall generate three streams at the following maximum resolutions:
          1. Main Stream: 4MP/3MP/1080p/1.3MP/720p at 1–30 fps
          2. Sub Stream 1: D1/VGA/CIF at 1–30 fps
          3. Sub Stream 2: 1080p/1.3M/720p at 1–8 fps
    4. IP Connectivity
       1. The 4MP TiOC Network PTZ camera shall allow full camera control and configuration capabilities via a TCP/IP network.
       2. The 4MP TiOC Network PTZ camera shall deliver 4 MP video, at rates up to 30 frames per second via TCP/IP over an RJ-45 (10/100 Base-T) connection.
       3. The 4MP TiOC Network PTZ camera shall conform to the ONVIF standard.
       4. The 4MP TiOC Network PTZ camera shall offer Quality of Service (QoS) configuration options.
       5. The 4MP TiOC Network PTZ camera shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
       6. The 4MP TiOC Network PTZ camera shall offer local and network storage options that include: FTP, MicroSD, Network Attached Storage (NAS), and recording to a local PC for instant recording.
       7. The 4MP TiOC Network PTZ camera shall support the following protocols: HTTP, HTTPS, TCP/IP, IPv4, RTSP, UDP, SMTP, NTP, DHCP, DNS, DDNS, IPv6, 802.1x, SSL, QoS, FTP, UPnP, ICMP, SNMP, SNMP v1/v2c/v3 (MIB-2), IGMP, ARP, RTCP, RTP, PPPoE, IP Filter, RTMP, Bonjour, TCP, SMB, and NFS.
       8. The 4MP TiOC Network PTZ camera shall support the DMSS and DSS management software.
       9. The 4MP TiOC Network PTZ camera shall support the Android and the iOS mobile operating systems.
    5. Interfaces
       1. The 4MP TiOC Network PTZ camera shall support the following audio compression technologies: G.711a, G.711Mu, G.726, G722.1, G.729, MPEG2-
       2. Layer2, G723, and PCM.
       3. The 4MP TiOC Network PTZ camera shall offer an audio interface with one (1) channel IN and one (1) channel OUT.
       4. The 4MP TiOC Network PTZ camera shall offer an alarm interface with two (2) channels IN and two (2) channels OUT.
    6. Analytics+
       1. The 4MP TiOC Network PTZ camera offers the following built-in Perimeter Protection functions to provide advanced analytics for any scene:
          1. Detect human or vehicle violations using the following methods:

Tripwire: a target crosses a defined line.

Intrusion: a target enters or exits a defined perimeter.

* + - * 1. Monitor a combination of ten (10) detection methods.
        2. Search and retrieve video based on target type.
      1. The 4MP TiOC Network PTZ camera offers the following built-in Perimeter Protection functions to provide advanced analytics for any scene:
         1. Detects and captures a snapshot of a human face within a scene.
      2. The 4MP TiOC Network PTZ camera offers the following built-in Smart Motion Detection+ functions to provide advanced motion analytics for any scene:
         1. Differentiate between and classify human and vehicle objects.
         2. Filter false alarms due to leaves, lights, animals, and other inconsequential objects.
         3. Extract human or vehicle objects from recorded video for quick target search and retrieval.
    1. Intelligent Video System
       1. The Intelligent Video System shall offer intelligent video analytics built-in to the 4MP TiOC Network PTZ camera.
       2. The Intelligent Video System shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
       3. The Intelligent Video System shall support motion detection when an object moves through any part of the scene.
       4. The Intelligent Video System shall detect when a person or object moves the camera to change the scene or covers the camera to obscure the scene.
       5. The Intelligent Video System shall detect multiple object behaviors such as abandoned or missing objects.
       6. The Intelligent Video System shall offer Auto-tracking, a feature that automatically controls the pan, tilt, and zoom functions of the camera to track a moving object and keep it in the scene.
    2. Installation Requirements
       1. The 4MP TiOC Network PTZ camera shall be capable of operating in an outdoor environment within a temperature range of –40° C to +70° C (–40° F to 158° F).
       2. The 4MP TiOC Network PTZ camera shall accept power, transmit video, and accept control via a TCP/IP connection.
       3. The 4MP TiOC Network PTZ camera shall support the following dual, redundant power options:
          1. 24 VDC, 2.5 A (± 25%)
          2. PoE+ (802.3at)
          3. The 4MP TiOC Network PTZ camera shall default to use power from the PoE power supply, if connected.
          4. The 4MP TiOC Network PTZ camera shall reboot and switch to the 24 VDC, 2.5 A (± 25%) if power from the PoE power supply is lost.
    3. Housing Options
       1. The 4MP TiOC Network PTZ camera shall be offered in a metal housing.
       2. The 4MP TiOC Network PTZ camera housing shall conform to the IP66 Ingress Protection standard.

2.3 ACCESSORIES

* + 1. The 4MP TiOC Network PTZ camera shall offer the following accessories:
       1. Included mounting accessories:
          1. Power adapter
          2. Wall mount
       2. Optional mounting hardware:
          1. [Mount adapter]
          2. [Ceiling mount.]
          3. [Parapet mount.]
          4. [Plane mount.]
          5. [Corner mount.]
          6. [Pole 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