

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

4K IR PTZ NETWORK CAMERA – 4K 30X IR PTZ NETWORK CAMERA

PART 1 – GENERAL

1.1 SUMMARY

A. 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 27 00: Video Surveillance – Video Surveillance Sensors

B. 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.

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. FCC Part 15 Subpart B
 - 2. ANSI C63.4- 2014
- B. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. UL60950-1
- C. CSA Group (www.csagroup.org)
 - 1. CAN/CSA C22.2, No. 60950-1
- D. CONFORMITE EUROPEENNE (CE)
 - 1. EN55032
 - 2. EN55024
 - 3. EN50130-4
- E. HD standards
 - 1. Complies with the UHD-1 Standard in:
 - a. Resolution: 3840 x 2160
 - b. Scan: Progressive
 - c. Color representation: complies with ITU-R BT.2020-2
 - d. Aspect ratio: 16:9
 - e. Frame rate: 25 and 30 frames/s
 - 2. Complies with the SMPTE 274M-2008 Standard in:
 - a. Resolution: 1920x1080
 - b. Scan: Progressive
 - c. Color representation: complies with ITU-R BT.709
 - d. Aspect ratio: 16:9
 - e. Frame rate: 25, 30, 50 and 60 frames/s
 - 3. Complies with the 296M-2001 Standard in:
 - a. Resolution: 1280x720
 - b. Scan: Progressive
 - c. Color representation: complies with ITU-R BT.709
 - d. Aspect ratio: 16:9
 - e. Frame rate: 25 and 30 frames/s
 - f. Interference-Causing Equipment Standards

1.3 SYSTEM DESCRIPTION

A. Section Includes

1. Video Surveillance – Surveillance Cameras – IP Cameras

B. Performance Requirements

1. The 4K PTZ camera shall be a full-featured UHD PTZ unit designed for discrete video surveillance applications in indoor and outdoor environments.
2. The 4K PTZ camera shall offer a Smart IR distance of up to 200 m (656 ft).
3. The 4K PTZ camera shall provide a rules-based auto-tracking feature to automatically track moving object.
4. The 4K PTZ camera shall utilize an algorithm that dynamically adjusts the cameras contrast settings to provide usable image quality in scenes affected by fog, smog, mist, smoke or other low contrast scene.
5. The 4K PTZ 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.
6. The 4K PTZ camera shall be a high performance 1/1.7-in. progressive-scan STARVIS™ CMOS sensor with 4K (3840 x 2160) resolution.
7. The 4K PTZ camera shall support the following dual, redundant power options:
 - a. 24 VAC.
 - b. High PoE.
8. The 4K PTZ camera shall offer Digital Wide Dynamic Range for clear images in extreme high-contrast environments.
9. The 4K PTZ camera shall offer the Intelligent Video System to detect and analyze moving objects for improved video surveillance.
10. The 4K PTZ camera shall offer advanced intelligent features, including facial detection, heat map, and auto-tracking.
11. The 4K PTZ camera shall provide direct network connection using H.265, H.264 and MJPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
12. The 4K PTZ camera shall conform to the ONVIF standard to provide interoperability with other conformant systems.
13. The 4K PTZ camera shall offer three separate and configurable streams with individually configurable streams.
14. The 4K PTZ camera shall have an autofocus lens with 30x optical zoom.
15. The 4K PTZ camera shall have variable pan and tilt speeds, and autopivot capability for optimal camera control and viewing at all zoom levels.
16. The 4K PTZ camera shall offer bi-directional audio.
17. The 4K PTZ camera shall support 300 user-defined presets.
18. The 4K PTZ camera shall offer:
 - a. IP67 environmental protection.
 - b. IK10 vandal resistance.
19. The 4K PTZ camera housing shall be a durable, rugged design with an acrylic bubble.

1.4 SUBMITTALS

- A. Submit under provisions of Section [01 33 00.]
- B. 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.
- C. Dimensional Drawings; include
 - 1. Overall device dimensions.
 - 2. Dimensions specific for installation.
- D. Closeout Submittals
 - 1. User manual.
 - 2. Parts list.
 - 3. Maintenance requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Minimum of [10] years of experience in manufacture and design Video Surveillance Devices.
- B. Video Surveillance System:
 - 1. List certifying bodies (UL, CSA, etc.)
 - 2. Provide evidence of compliance upon request.
- C. Installer:
 - 1. Minimum of [5] years of experience installing Video Surveillance System.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 01 60 00.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers; and unharmed original identification labels.
- C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- D. Handle and operate products and systems according to manufacturer's instructions.

1.7 WARRANTY

- A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment (except quick-wear parts, quick-wear parts cover 1 year warranty). Warranty varies from country to country.

1.8 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

- B. Provide factory direct technical support via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. [Acceptable Manufacturer:
Dahua Technology Co., Ltd.
No.1199 Bin'an Road, Binjiang District, Hangzhou, China. 310053
Tel: +86 571 87688883
Fax: +86 571 87688815
Email: overseas@global.dahuatech.com]
- B. 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.]

2.2 4K IR PTZ NETWORK CAMERA – 4K 30X IR PTZ NETWORK CAMERA SD6AE830V-HNI

- A. General Characteristics:
1. The 4K PTZ camera shall provide a 1/1.7-in. type STARVIS™ CMOS progressive-scan camera with the following:
 - a. 3840 x 2160 (4K) effective picture elements.
 - b. Sensitivity to below 0.05 lux.
 2. The 4K PTZ camera shall offer a Smart IR distance of up to 200 m (656 ft).
 3. The 4K PTZ camera shall provide direct network connection using H.265, H.264, and MJPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
 4. The 4K PTZ camera shall support the following dual, redundant power options:
 - a. 24 VAC.
 - b. High PoE.
 5. The 4K PTZ camera shall provide a rules-based auto-tracking feature to automatically track moving object.
 6. The 4K PTZ camera shall utilize an algorithm that dynamically adjusts the camera's contrast settings to provide usable image quality in scenes affected by fog, smog, mist, smoke or other low contrast scene.
 7. The 4K PTZ camera shall offer Digital Wide Dynamic Range for clear images in extreme high-contrast environments.
 8. The 4K PTZ camera shall offer 300 user-defined pre-positions.
 9. The 4K PTZ camera shall offer five (5) PTZ pattern modes, eight (8) PTZ tour modes, an Auto Pan mode and an Auto Scan mode.
 10. The 4K PTZ camera shall offer bi-directional audio.
 11. The 4K PTZ camera shall offer an alarm interface with seven (7) alarm inputs and two (2) alarm outputs.
 12. The 4K PTZ camera shall support an RS485 connection.
 13. The 4K PTZ camera shall offer a BNC (1.0 Vp-p / 75 Ω) video interface suitable for a PAL or NTSC system.
 14. The 4K PTZ camera shall be able to be mounted to a wall, mounted to a ceiling or mounted to a pole.

15. The 4K PTZ camera shall offer IP67 environmental protection.
16. The 4K PTZ camera shall offer IK10 vandal resistance.

B. Imaging

1. The 4K PTZ camera shall offer a 1/1.7-inch type STARVIS™ CMOS progressive-scan imager.
2. The 4K PTZ camera shall offer 3840 x 2160 (4K) effective picture elements.
3. The 4K PTZ camera shall offer a 16:9 aspect ratio.
4. The 4K PTZ camera shall offer a 30x optical zoom lens (6.0 mm to 180.0 mm) with a further 16x digital zoom.
5. The 4K PTZ camera shall have a 2.10° to 61.20° field of view.
6. The 4K PTZ camera shall offer a maximum aperture of F1.6 to F4.8.
7. The 4K PTZ camera shall produce a color image with a minimum scene illumination of 0.05 lux at F1.6, when in the night mode, with a minimum illumination of 0.005 lux at F1.6
8. The 4K PTZ camera shall produce a usable image with a scene illumination of 0 Lux when IR is enabled.
9. The 4K PTZ camera shall produce an effective image with IR illumination at a distance of 200 m (656 ft).
10. The 4K PTZ camera shall contain a minimum of ten (10) IR LEDs.
11. The 4K PTZ camera shall offer automatic focus and iris control with manual override.
12. The 4K PTZ camera shall have a signal to noise ratio of more than 56 dB.

C. PTZ Features

1. The 4K PTZ camera shall provide a pan range of 360° continuous.
2. The 4K PTZ camera shall provide a tilt angle of -20° to 90° relative to the horizon.
3. The 4K 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 4K PTZ camera shall provide the following modes for variable pan/tilt speeds:
 - a. Manual Control:
 - 1) Pan: 0.1°/s to 200°/s
 - 2) Tilt: 0.1°/s to 120°/s
 - b. Preset Mode:
 - 1) Pan: 240°/s
 - 2) Tilt: 200°/s
5. The 4K PTZ camera shall provide a feature that automatically rotates, or pivots, the camera to simplify tracking of a person walking directly under the camera.
6. The 4K PTZ camera shall divide the cameras 360° rotation into 16 independent sectors with 20-character titles per sector. Any or all of the 16 sectors can be blanked from the operator's view.
7. The 4K PTZ camera shall support 300 presets.

8. The 4K PTZ camera shall support the following PTZ modes:
 - a. Five (5) PTZ pattern modes.
 - b. Eight (8) PTZ tour modes.
 - c. One (1) Auto Pan mode.
 - d. One (1) Auto Scan mode.
9. The 4K PTZ camera shall automatically activate a preset, pan, scan, tour, or pattern mode if the camera does not receive a command during a specified period.
10. The 4K PTZ camera shall automatically restore the previous PTZ and lens status after the camera powers up after a power failure.

D. Video Characteristics

1. The 4K PTZ camera shall offer BLC, HLC, and Digital WDR modes of backlight compensation.
2. The 4K PTZ camera shall offer Auto, ATW, Indoor, Outdoor, and Manual white balance modes.
3. The 4K PTZ camera shall offer Ultra DNR (2D/3D) noise reduction.
4. The 4K PTZ camera shall utilize an algorithm that dynamically adjusts the camera's contrast settings to provide usable image quality in scenes affected by fog, smog, mist, smoke or other low contrast scene.
5. The 4K PTZ camera shall offer motion detection (four zones) and region of interest (four zones) controls.
6. The 4K PTZ camera shall offer 24 privacy masking areas.

E. Streaming Capability

1. The 4K PTZ camera shall generate 4K (3840 x 2160 pixels) resolution using H.265 compression.
2. The 4K PTZ camera shall offer CBR/VBR bit rate control.
3. The 4K PTZ camera shall offer the following video compression protocols
 - a. H.265 (256 K to 8192 Kbps)
 - b. H.264 (256 K to 8192 Kbps)
 - c. MJPEG (256 K to 64256 Kbps)
4. The 4K PTZ camera shall offer Unicast and Multicast streaming methods.
5. The 4K PTZ camera shall offer the following resolution streams:
 - a. 4K (3840 x 2160 pixels) at 25/30 fps
 - b. 1080P(1920x1080) at 50/60 fps
 - c. 1.3MP(1280x960) at 25/30 fps
 - d. 720P(1280 x 720) at 25/30 fps
 - e. D1 (704 x 576 / 704 x 480 pixels) at 25/30 fps
 - f. CIF (352 x 288 / 352 x 240 pixels) at 25/30 fps
6. The 4K PTZ camera shall generate three streams at the following maximum resolutions:
 - a. Main Stream: 4K, 1.3MP or 720P at 25/30 fps; or 1080P at 50/ 60 fps

- b. Sub Stream 1: D1 or CIF at 25/30 fps
 - c. Sub Stream 2: 1080P, 720P or D1 at 25/30 fps
- F. IP Connectivity
 - 1. The 4K PTZ camera shall allow full camera control and configuration capabilities via a TCP/IP network.
 - 2. The 4K PTZ camera shall deliver 4K video, at rates up to 25/30 frames per second via TCP/IP over an RJ-45 (10/100/1000 Base-T) connection.
 - 3. The 4K PTZ camera shall conform to the ONVIF, PSIA, and the CGI standard.
 - 4. The 4K PTZ camera shall offer Quality of Service (QoS) configuration options.
 - 5. The 4K PTZ camera shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
 - 6. The 4K PTZ 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 4K PTZ camera shall support the following protocols: IPv4/ IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPOE, DDNS, FTP, IP Filter, QoS, Bonjour, and 802.1x.
 - 8. The 4K PTZ camera shall support the Android and the IOS mobile operating systems.
- G. Audio Capabilities
 - 1. The 4K PTZ camera shall support the following audio compression technologies: G.711a, G.711Mu, PCM ,G.726, AAC, G722.1, G.729. MPEG2-Layer2.
 - 2. The 4K PTZ Camera shall offer an audio interface with one (1) channel IN and one (1) channel OUT.
- H. Intelligence
 - 1. The 4K PTZ 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 4K PTZ 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 trigger an alarm and take a defined action for the following events:
 - a. Standard Features
 - 1) Tampering with the camera.
 - 2) Error writing to an onboard Micro SD Card.
 - 3) Error sending or receiving data over the network.
 - 4) Unauthorized access to the camera.
 - b. Premium Features
 - 1) Motion: object moves through any part of the scene.
 - 2) Tripwire: a target crosses a user-defined line.
 - 3) Intrusion: a target enters or exits a defined perimeter.
 - 4) Scene Change: a person or object moves the camera to change the scene or covers the camera to obscure the scene.
 - 5) Abandoned/Missing Object: a target leaves an object in a designated area, or a target removes and object from the same designated area.
 - c. Advanced Features

- 1) Facial Detection: detects and captures a snapshot of a human face in a defined area within a scene.
- 2) Heat Map: generates a visual representation of data.
- 3) Auto-tracking: controls the pan/tilt/zoom actions of the camera to automatically track an object in motion and to keep it in the scene.

I. Installation Requirements

1. The 4K PTZ camera shall be capable of operating in an outdoor environment within a temperature range of -40°C to $+70^{\circ}\text{C}$ (-40°F to 158°F).
2. The 4K PTZ camera shall accept power, transmit video, and accept control via a TCP/IP connection.
3. The 4K PTZ camera shall support the following dual, redundant power options:
 - a. 24 VAC $\pm$ 25%.
 - b. High PoE.

J. Housing Options

1. The 4K PTZ camera shall be offered in a metal housing.
2. The 4K PTZ camera housing shall conform to the IP67 standard for a weather-resistant package.
3. The 4K PTZ camera housing shall conform to the IK10 standard for vandal resistance.

2.3 ACCESSORIES

- A. The 4K PTZ camera shall offer the following accessories included with the package:
 1. Wall mount bracket.
 2. Mount adapter.
 3. Power supply.
- B. The 4K PTZ camera shall offer the following optional accessories:
 1. [Ceiling mount bracket]
 2. [Parapet mount bracket]
 3. [Junction box]
 4. [Waterproof junction box]
 5. [Pole mount]

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Perform installation with qualified service personnel.
- C. Install devices in accordance with the National Electrical Code or applicable local codes.
- D. Ensure selected location is secure and offers protection from accidental damage.
- E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION