JUNE 2020

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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**

**THERMAL TEMPERATURE MONITORING SOLUTION**

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 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. Safety Certification
			1. Underwriters Laboratories, Inc. (UL) (www.ul.com)
				1. UL60950-1
			2. CSA Group
				1. CAN/CSA C22.2 No. 60950-1-07
		3. CE
			1. EN 60950:2000
	2. SYSTEM DESCRIPTION
		1. Section Includes
			1. Video Surveillance – Surveillance Cameras – IP Cameras
		2. System Components
			1. The thermal temperature monitoring solution shall consist of the following components:
				1. Thermal hybrid network camera.
				2. Blackbody radiation device.
				3. 16-channel NVR
			2. The thermal temperature monitoring solution shall offer the following optional components:
				1. Tripod for mounting thermal camera and blackbody.
				2. Brackets for attaching thermal camera and blackbody to tripod.
				3. Ceiling or wall mount for thermal camera or blackbody device.
				4. HD monitor.
		3. Performance Requirements
			1. The thermal temperature monitoring solution shall offer safe, efficient, accurate temperature monitoring.
			2. The thermal temperature monitoring solution shall be accurate to ±0.3° C (±0.54° F) for recorded temperatures.
			3. The thermal temperature monitoring solution shall offer long-distance Rapid Screening at up to 4.50 m (15.0 ft), Monitoring 30 People per Second.
			4. The thermal temperature monitoring solution shall offer enhanced power and data transmission distances using ePoE technology.
	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 one year 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]

* + 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. THERMAL TEMPERATURE MONITORING SOLUTION

		1. Required Components
			1. Hybrid Thermal Network Camera
				1. The Hybrid Thermal Bullet camera shall be a full-featured 300 x 400 Thermal network camera designed for discrete video surveillance applications in indoor and outdoor environments.
				2. The Hybrid Thermal Bullet camera shall simultaneously transmit and receive video, audio, and control signals over a TCP/IP connection.
				3. The Hybrid Thermal Bullet camera shall contain a 300 x 400 VOx uncooled thermal sensor with a 13 mm athermalized, focus-free lens.
				4. The Hybrid Thermal Bullet camera shall offer a 1/2.8-in. 2 MP progressive-scan CMOS Sensor and a 8 mm fixed lens.
				5. The Hybrid Thermal Bullet camera shall come with one (1) LED illuminator with an IR distance of 35.0 m (114.83 ft) for the visible-light sensor.
				6. The Hybrid Thermal Bullet camera shall offer ≤ 40 mK thermal sensitivity.
				7. The Hybrid Thermal Bullet camera shall support Enhanced Power over Ethernet (ePoE) technology to transmit power and data via Ethernet cabling up to 800 m (2624 ft).
				8. The Hybrid Thermal Bullet camera shall accept two (2) incoming alarm channels and offer two (2) outgoing alarm channels.
				9. The Hybrid Thermal Bullet camera housing shall conform to the IP67 Ingress Protection standard.
			2. Thermal Imaging
				1. The Hybrid Thermal Bullet camera shall offer a 300 x 400 uncooled VOx Microbolometer thermal imaging sensor.
				2. The Hybrid Thermal Bullet camera shall have a pixel size of 17 $µ$m.
				3. The Hybrid Thermal Bullet camera shall offer a thermal sensitivity (NETD) of
				≤ 40 mK.
				4. The Hybrid Thermal Bullet camera shall offer a spectral range of 8 $µ$m to 14 $µ$m.
				5. The Hybrid Thermal Bullet camera shall offer 18 color palettes.
				6. The Hybrid Thermal Bullet camera shall offer a fixed 13 mm athermalized, focus-free lens.
			3. Temperature Measurement
				1. The Hybrid Thermal Bullet camera shall have a temperature measurement range of 30° C to 45° C (86° F to 113° F).
				2. The Hybrid Thermal Bullet camera shall be accurate to within:

 ±0.3° C (±0.54° F), with blackbody

±1° C (±1.8° F, without blackbody)

* + - * 1. The Hybrid Thermal Bullet camera shall support 12 rules simultaneously.
			1. Visible-light Imaging
				1. The Hybrid Thermal Bullet camera shall offer a 1/2.8-inch progressive-scan CMOS sensor.
				2. The Hybrid Thermal Bullet camera shall offer an effective number of pixels of 1920(H) x 1080(V), 2 MP effective picture elements.
				3. The Hybrid Thermal Bullet camera shall offer 8 mm fixed lens with a maximum aperture of F1.9.
				4. The Hybrid Thermal Bullet camera shall have a horizontal angle of view of 40° and a vertical angle of view of 22°.
				5. The Hybrid Thermal Bullet camera shall produce a color image with a minimum scene illumination of 0.002 lux at F1.9 and a monochrome image, when in IR mode, with a minimum illumination of 0 lux at F1.9.
			2. Video Characteristics
				1. The Hybrid Thermal Bullet camera shall offer CBR/VBR bit rate control.
				2. The Hybrid Thermal Bullet camera shall offer the H.265, H.264M, H.264H, H.264B, and the MJPEG video compression protocols.
				3. The Hybrid Thermal Bullet camera shall offer four (4) privacy masking areas.
			3. Streaming Capability
				1. The Hybrid Thermal Bullet camera shall generate a maximum resolution of:

Thermal Imager: 1280 x 960 at 30 fps

Visible Imager: 1920 x 1080 at 30 fps

* + - 1. IP Connectivity
				1. The Hybrid Thermal Bullet camera shall allow full camera control and configuration capabilities via a TCP/IP network.
				2. The Hybrid Thermal Bullet camera shall deliver video, at rates up to 30 frames per second via TCP/IP over an RJ-45 (10/100 Base-T) connection.
				3. The Hybrid Thermal Bullet camera shall conform to the ONVIF standard.
				4. The Hybrid Thermal Bullet camera shall offer Quality of Service (QoS) configuration options.
				5. The Hybrid Thermal Bullet camera shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
				6. The Hybrid Thermal Bullet camera shall offer local and network storage options that include: MicroSD (maximum 256 GB), Network Attached Storage (NAS), and recording to a local PC for instant recording.
				7. The Hybrid Thermal Bullet 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, 802.1x
				8. The Hybrid Thermal Bullet camera shall support the SmartPSS and DSS management software.
				9. The Hybrid Thermal Bullet camera shall support the Android and the IOS mobile operating systems.
			2. Interfaces
				1. The Hybrid Thermal Bullet camera shall support the following audio compression technologies: G.711a, G.711Mu, PCM, and AAC.
				2. The Hybrid Thermal Bullet camera shall offer an audio interface with one (1) channel in (3.5 mm jack) and one (1) channel out (3.5 mm jack).
				3. The Hybrid Thermal Bullet camera shall offer one RS485 connection.
				4. The Hybrid Thermal Bullet camera shall offer an alarm interface with two (2) channels in and two (2) channels out.
			3. Installation Requirements
				1. The Hybrid Thermal Bullet camera shall be capable of operating in an indoor environment within a temperature range of 10° C to +30° C (50° F to 95° F).
				2. The Hybrid Thermal Bullet camera shall support a 12 VAC or an ePoE power supply.
			4. Housing Options
				1. The Hybrid Thermal Bullet camera shall be in a metal housing.
				2. The Hybrid Thermal Bullet camera housing shall conform to the IP67 Ingress Protection standard.
		1. Network Video Recorder
			1. General Requirements
				1. The 16-channel ePoE NVR shall use an embedded multi-core processer with embedded Linux operating system to record video from 16 IP camera inputs.
				2. The 16-channel ePoE NVR shall offer 16 PoE (IEEE 802.3af/at) channels.
				3. The 16-channel ePoE NVR shall support Enhanced Power over Ethernet (ePoE) technology to transmit power and data via Ethernet cabling up to 800 m (2625 ft) via ports 1 through 8.
				4. The 16-channel ePoE NVR shall support Ethernet over Coax (EoC) technology for IP/Analog hybrid system with transmission distances up to 1000 m (3281 ft) via ports 1 through 8.
				5. The 16-channel ePoE NVR shall be capable of storing up to 8 TB of data from 16 IP camera inputs with up to 12 MP resolution for each IP input.
				6. The 16-channel ePoE NVR shall use the Smart H.265+, H.265, Smart H.264+, H.264, and MJPEG Video compression protocols.
				7. The 16-channel ePoE NVR shall offer 4K resolution for display and up to 12 MP resolution for recording.
				8. The 16-channel ePoE NVR shall have a maximum incoming bandwidth of
				320 Mbps.
				9. The 16-channel ePoE NVR shall be capable of recording data and images from an IP camera enabled with the Intelligent Video System.
				10. The 16-channel ePoE NVR shall come in a 1U-high casing.
				11. The 16-channel ePoE NVR shall be powered by a 100 to 240 VAC,
				50/60 Hz power supply and consume less than 16.5 W of power.
			2. Display
				1. The 16-channel ePoE NVR shall offer one (1) HDMI output port
				(up to 3840 x 2160) and one (1) VGA output port (up to 3840 x 2160).
				2. The 16-channel ePoE NVR shall offer native display output resolutions of:
				3480 x 2160, 2560 x 1440 1920 x 1080, 1280 x 1024, 1280 × 720, and
				1024 x 768.
				3. The 16-channel ePoE NVR shall offer the following maximum decoding capabilities:

Four (4) channels of 8 MP at 30 fps

16 channels of 1080p at 30 fps

* + - * 1. The 16-channel ePoE NVR shall offer 1/4/8/9/16 multi-screen display.
				2. The 16-channel ePoE NVR shall offer an on-screen display that lists the camera title, time, video loss indication, camera lock indication, motion detection, and recording indicator.
			1. Video Detection and Alarm
				1. The 16-channel ePoE NVR shall offer the following trigger events: recording, PTZ, tour, alarm out, video push, Email, FTP, snapshot, buzzer, and screen tips.
				2. The 16-channel ePoE NVR shall be capable of detecting motion
				(396 zones), video loss, tampering.
				3. The 16-channel ePoE NVR shall offer four (4) alarm inputs and two (2) relay outputs.
			2. Interface
				1. The 16-channel ePoE NVR shall have 16 PoE outputs. Ports 1 through 8 shall support ePoE and EoC transmission.
				2. The 16-channel ePoE NVR shall offer one (1) USB 2.0 auxiliary port and one (1) USB 3.0 auxiliary ports.
				3. The 16-channel ePoE NVR shall offer one (1) RCA audio input channel and one (1) RCA audio output channels.
				4. The 16-channel ePoE NVR shall allow two-way talk.
				5. The 16-channel ePoE NVR shall offer one (1) RS232 port for PC communication or keyboard connection.
				6. The 16-channel ePoE NVR shall offer one (1) RS485 port for PTZ control.
			3. Storage
				1. The 16-channel ePoE NVR shall come with two (2) SATA III ports that can each support an 8 TB HDD.
				2. The 16-channel ePoE NVR shall be shipped with a 4 TB HDD pre-installed.
			4. Playback and Backup
				1. The 16-channel ePoE NVR shall support synchronous output to 1/4/9/16 playback devices.
				2. The 16-channel ePoE NVR shall allow recorded video searches by time/date, alarm, motion detection event, and Exact Search.
				3. The 16-channel ePoE NVR shall offer the following playback functions: Play, Pause, Stop, Rewind, Fast Play, Slow Play, Next File, Previous File, Next Camera, Previous Camera, Full Screen, Repeat, Shuffle, Backup Selection, and Digital Zoom.
				4. The 16-channel ePoE NVR shall allow data backup via a USB device, an eSATA drive, or another network.
			5. Recording
				1. The 16-channel ePoE NVR shall employ the Smart H.265+, H.265, Smart H.264+, H.264, and the MJPEG video compression protocols.
				2. The 16-channel ePoE NVR shall offer video recording resolutions of
				16 MP, 12 MP, 8 MP, 6 MP, 5 MP, 4 MP, 3 MP, 1080p, 1.3 MP, 720p, D1, and CIF.
				3. The 16-channel ePoE NVR shall offer a maximum incoming bandwidth of
				320 Mbps.
				4. The 16-channel ePoE NVR shall offer the following built-in recording modes:

Manual

Schedule, regular or motion detection

Alarm

IVS

Stop

* + - * 1. The 16-channel ePoE NVR shall offer a recording interval between 1 minute and 60 minutes. In addition, the 16-channel ePoE NVR shall offer a pre-record interval of between 1 second to 30 seconds, and a post-record interval of between 10 seconds to 300 seconds.
			1. IP Connectivity
				1. The 16-channel ePoE NVR shall allow full control and configuration capabilities via a TCP/IP network.
				2. The 16-channel ePoE NVR shall offer one RJ-45 port (10/100/1000 Mbps).
				3. The 16-channel ePoE NVR shall offer 16 PoE ports (IEEE802.3af/at).
				4. The 16-channel ePoE NVR shall support ePoE and EoC transmission distances via porta 1 through 8.
				5. Each PoE port shall provide a maximum of 25.5 W of power, with a total PoE power budget of 130 W.
				6. The 16-channel ePoE NVR shall support a maximum of 128 user access points.
				7. The 16-channel ePoE NVR shall conform to the ONVIF 2.4 and to the CGI standard.
				8. The 16-channel ePoE NVR shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
				9. The 16-channel ePoE NVR shall support the 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.
				10. The 16-channel ePoE NVR shall support the IOS and the Android mobile operating systems.
			2. Installation Requirements
				1. The 16-channel ePoE NVR shall be capable of operating in temperatures between -10°C to +55°C (+14°F to +131°F).
				2. The 16-channel ePoE NVR shall receive power from a 100 to 240 VAC,
				50/60 Hz power source and consume less than 15.2 W of power.
		1. Blackbody Radiation Device
			1. General Requirements
				1. The blackbody radiation device shall offer the following default temperature settings:

35.0° C (95.0° F)

37° C (98.6° F )

40.0° C (104.0° F)

* + - * 1. The blackbody radiation device shall have a working temperature range of +5° C to 50° C (41° F to 122° F).
				2. The blackbody radiation device shall have an effective radiant surface of
				70 mm x 70 mm (2.76 in. x 2.76 in.).
				3. The blackbody radiation device shall have a temperature resolution of
				0.1° C.
				4. The blackbody radiation device shall offer a temperature accuracy of
				±0.2° C.
				5. The blackbody radiation device shall have an effective emissivity of 0.97.
				6. The blackbody radiation device shall require a 110 VAC to 220 VAC power supply and shall consume 35 W of power.

2.3 ACCESSORIES

* + 1. The thermal temperature monitoring solution shall offer the following optional positioning accessories:
			1. Tripod, for mounting the thermal camera or the blackbody device.
			2. Bracket, for attaching the thermal camera or blackbody device to the tripod.
		2. The thermal temperature monitoring solution shall offer the following optional accessories for the hybrid thermal camera:
			- 1. [Junction box.]
				2. [Pole mount.]
				3. [Corner mount.]
				4. [Wall/Ceiling mount.]
				5. [Ceiling mount.]
				6. [12 VDC, 1 A Power Supply.]
				7. [EoC Passive Converter]
				8. [Single-port EoC Receiver]

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