NOVEMBER 2021

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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 00 00: Electronic Safety and Security**

**Section 28 05 00: Common Work Results For Electronic Safety and Security**

**Section 28 05 19.11: Digital Video Recorders**

**PENTA-BRID 4K 16-CHANNEL 1U HDCVI DIGITAL VIDEO RECORDER**

1. **– GENERAL**
	1. SUMMARY
		1. Section Includes
			1. Section 28 05 23: Storage Area Network Electronic Safety and Security
			2. Section 28 05 25: Cloud Based Storage for Electronic Safety and Security
			3. Section 28 05 29: Storage Management Software for Electronic Safety and Security
			4. Section 28 05 31: Communications Equipment for Electronic Safety and Security
		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. CFR 47 FCC Part 15 Subpart B
		2. European Standards
			1. EN 61000-3-2
			2. EN 61000-3-3
			3. EN 55032
			4. EN 50130
			5. EN 55024
			6. EN 60950-1
			7. IEC 60950-1
	2. SYSTEM DESCRIPTION
		1. Section Includes
			1. Digital Video Recorders
		2. Performance Requirements
			1. The Penta-brid 4K HDCVI DVR shall use an embedded processer with embedded Linux operating system to record video from HDCVI, AHD, TVI, CVBS, and IP data sources.
			2. The Penta-brid 4K HDCVI DVR shall record 8 MP at 15 fps video on all HDCVI channels.
			3. The Penta-brid 4K HDCVI DVR shall offer Analytics+ Perimeter Protection and Smart Motion Detection.
			4. The Penta-brid 4K HDCVI DVR shall be capable of storing up to 20 TB of data from 16 analog camera inputs or 32 IP camera video inputs with up to 8 MP resolution for each IP input.
			5. The Penta-brid 4K HDCVI DVR shall offer AI Coding that places recording emphasis on human or vehicular objects in the video scene.
			6. The Penta-brid 4K HDCVI DVR shall offer the Smart H.265+, H.265, Smart H.264+, and H.264 Video compression protocols.
			7. The Penta-brid 4K HDCVI DVR shall have a maximum incoming bandwidth of 128 Mbps.
			8. The Penta-brid 4K HDCVI DVR shall automatically detect and recognize the transmission protocol (HDCVI, AHD, TVI or CVBS) of each attached analog camera.
			9. The Penta-brid 4K HDCVI DVR shall offer a selection of built-in recording options and schedules.
			10. The Penta-brid 4K HDCVI DVR shall offer a smart search function to search a specific region of the playback video.
			11. The Penta-brid 4K HDCVI DVR shall come in a 1U-high casing.
			12. The Penta-brid 4K HDCVI DVR shall be offered with one of the following pre-installed hard disk drive storage: [4 TB] [6 TB] [8 TB] [10 TB] [no pre-installed hard disk drive.]
	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@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. PENTA-BRID 4K 16-CHANNEL 1U HDCVI DIGITAL VIDEO RECORDER
	[X82R3N] [X82R3N 4] [X82R3N 6] [X82R3N8] [X82R3N10]

		1. General Characteristics:
			1. The Penta-brid 4K HDCVI DVR shall use an embedded processer with embedded Linux operating system to record video from HDCVI, AHD, TVI, CVBS, and IP data sources.
			2. The Penta-brid 4K HDCVI DVR shall record 8 MP at 15 fps video on all HDCVI channels.
			3. The Penta-brid 4K HDCVI DVR shall offer Analytics+ Perimeter Protection and Smart Motion Detection.
			4. The Penta-brid 4K HDCVI DVR shall be capable of storing up to 20 TB of data from 16 analog camera inputs or 32 IP camera video inputs with up to 8 MP resolution for each IP input.
			5. The Penta-brid 4K HDCVI DVR shall offer AI Coding that places recording emphasis on human or vehicular objects in the video scene.
			6. The Penta-brid 4K HDCVI DVR shall offer the Smart H.265+, H.265, Smart H.264+, and H.264 Video compression protocols.
			7. The Penta-brid 4K HDCVI DVR shall have a maximum incoming bandwidth of 128 Mbps.
			8. The Penta-brid 4K HDCVI DVR shall automatically detect and recognize the transmission protocol (HDCVI, AHD, TVI or CVBS) of each attached analog camera.
			9. The Penta-brid 4K HDCVI DVR shall offer a selection of built-in recording options and schedules.
			10. The Penta-brid 4K HDCVI DVR shall offer a smart search function to search a specific region of the playback video.
			11. The Penta-brid 4K HDCVI DVR shall come in a 1U-high casing.
			12. The Penta-brid 4K HDCVI DVR shall be offered with one of the following pre-installed hard disk drive storage: [4 TB] [6 TB] [8 TB] [10 TB] [no pre-installed hard disk drive.]
		2. Display
			1. The Penta-brid 4K HDCVI DVR shall offer one (1) HDMI and one (1) VGA video output interfaces.
			2. The Penta-brid 4K HDCVI DVR shall offer one (1) spot output, either the HDMI or the VGA video output.
			3. The Penta-brid 4K HDCVI DVR shall offer display resolutions of:
				1. HDMI: 3480 x 2160, 2560 x 1440, 1920 × 1080.
				2. VGA: 1920 x 1080, 1280 x 1024, and 1280 x 720
			4. The Penta-brid 4K HDCVI DVR shall offer the following multi-screen display:
				1. IP extension mode disabled: 1/4/8/9/16
				2. IP extension mode enabled: 1/4/8/9/16/25/36
			5. The Penta-brid 4K HDCVI DVR shall offer an on-screen display that lists the camera title, time, video loss indication, camera lock indication, motion detection, and recording indicator.
		3. Video Detection and Alarm
			1. The Penta-brid 4K HDCVI DVR shall offer the following trigger events: recording, PTZ, tour, alarm our, video push, Email, FTP, snapshot, buzzer, and screen tips.
			2. The Penta-brid 4K HDCVI DVR shall be capable of detecting motion
			(396 zones), video loss, tampering, and diagnosis.
		4. Interface
			1. The Penta-brid 4K HDCVI DVR shall have 16 analog (HDCVI, AHD, TVI or CVBS) camera inputs and an additional 16 IP camera video inputs.
			2. The Penta-brid 4K HDCVI DVR shall record incoming audio signals from each HDCVI Video IN port if the connected HDCVI has a built-in microphone.
			3. The Penta-brid 4K HDCVI DVR shall allow all 32 (16 analog plus 16 IP) video channels to record IP cameras.
			4. The Penta-brid 4K HDCVI DVR shall support the following analog camera resolutions:
				1. HDCVI: 8 MP, 6 MP, 4 MP, 1080p at 30 fps; 720p
				2. AHD: 8 MP, 5 MP, 4 MP, 3 MP, 1080p, 720p
				3. TVI: 8 MP, 5 MP, 4 MP, 3 MP, 1080p, 720p
				4. CVBS: NTSC
			5. The Penta-brid 4K HDCVI DVR shall offer one (1) USB 2.0 auxiliary port and one (1) USB 3.0 auxiliary port.
			6. The Penta-brid 4K HDCVI DVR shall offer an RS485 port for PTZ control.
			7. The Penta-brid 4K HDCVI DVR shall offer one (1) audio input channel and one (1) audio output channel.
		5. Storage
			1. The Penta-brid 4K HDCVI DVR shall come with two (2) SATA ports that can each support a 10 TB HDD.
		6. Playback and Backup
			1. The Penta-brid 4K HDCVI DVR shall support output to 1/4/8/9/16 playback devices.
			2. The Penta-brid 4K HDCVI DVR shall allow recorded video searches by time/date, motion detection event, Exact Search, and Smart Search.
			3. The Penta-brid 4K HDCVI DVR 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 Penta-brid 4K HDCVI DVR shall allow data backup via a USB device or another network.
		7. Recording
			1. The Penta-brid 4K HDCVI DVR shall employ the Smart AI Coding, H.265+, H.265, Smart H.264+, and the H.264 video compression protocols.
			2. The Penta-brid 4K HDCVI DVR shall offer video recording resolutions of 8 MP, 6 MP, 5 MP, 4 MP, 3 MP, 4 M-N (1280 x 1440), 1080p, 720p, 960H, D1, and CIF.
			3. The Penta-brid 4K HDCVI DVR shall allow a bit rate of 32 Kbps to 6144 Kbps per channel.
			4. The Penta-brid 4K HDCVI DVR shall offer dual recording at the following rates:
				1. Main Stream:

8 MP at 15 fps;

6 MP or 5 MP at 25 fps,

4K-N, 4 MP, 3 MP, 1080p, 720p, 960H, D1, CIF at 30 fps

* + - * 1. Sub Stream:

960H, D1 or CIF at 30 fps

* + - 1. The Penta-brid 4K HDCVI DVR shall offer the following built-in recording modes:
				1. Manual
				2. Schedule, regular or continuous
				3. Video Detection: Motion Detection, Video Loss, Tampering
				4. Alarm
				5. Stop
			2. The Penta-brid 4K HDCVI DVR shall offer a recording interval between 1 minute and 60 minutes. In addition, The Penta-brid 4K HDCVI DVR 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.
			3. The Penta-brid 4K HDCVI DVR shall be capable of recording from third-party devices, including: Dahua, Arecont Vision, AXIS, Bosch, Brickcom, Canon, CP Plus, Dynacolor, Honeywell, Panasonic, Pelco, Samsung, Sanyo, Sony, Videotec, and Vivotek.
		1. Audio
			1. The Penta-brid 4K HDCVI DVR shall offer G711A, G711U, and PCM audio compression standards.
			2. The Penta-brid 4K HDCVI DVR shall have a sample rate of 8 KHz, 16 bits per channel.
			3. The Penta-brid 4K HDCVI DVR shall offer 64 Kbps audio bit rate per channel.
		2. IP Connectivity
			1. The Penta-brid 4K HDCVI DVR shall allow full control and configuration capabilities via a TCP/IP network.
			2. The Penta-brid 4K HDCVI DVR shall offer one (1) RJ-45 port (1000 Mbps).
			3. The Penta-brid 4K HDCVI DVR shall support a maximum of 128 user access points.
			4. The Penta-brid 4K HDCVI DVR shall conform to the ONVIF 16.12 and to the CGI standard.
			5. The Penta-brid 4K HDCVI DVR shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
			6. The Penta-brid 4K HDCVI DVR 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.
			7. The Penta-brid 4K HDCVI DVR shall support the IOS and the Android mobile operating systems.
		3. Analytics
			1. The Penta-brid 4K HDCVI DVR shall offer a built-in Analytics+ Perimeter Protection and Smart Motion Detection functions.
			2. The Perimeter Protection and Smart Motion Detection analytics shall offer increased alarm accuracy.
			3. The Perimeter Protection analytic shall distinguish between human and vehicle objects.
			4. The Perimeter Protection analytic shall allow ten (10) tripwire/intrusion rules per each channel (up to two (2) channels).
			5. The Smart Motion Detection analytic shall distinguish between human and vehicle objects.
			6. The Smart Motion Detection analytic shall allow configuration on up to 16 channels.
			7. The Perimeter Protection and Smart Motion Detection analytics shall offer searching by channel, time, event type, and target type.
			8. The Intelligent Video System shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
		4. Installation Requirements
			1. The Penta-brid 4K HDCVI DVR shall be capable of operating in temperatures between -10°C to +55°C (+14°F to +131°F).
			2. The Penta-brid 4K HDCVI DVR shall receive power from a 12 VDC, 5 A power adapter and consume less than 32 W of power.
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