SECTION 28 23 29

16-/32-/64-CHANNEL FOCUS 4K EMBEDDED NETWORK VIDEO RECORDER

1. GENERAL
	1. SECTION INCLUDES
		1. Provide a complete 16-/32-/64-channel 4K embedded network video recorder, including design, supply, installation, and commissioning.
	2. RELATED SECTIONS

NOTE TO SPECIFIER: Include related sections as appropriate if video surveillance system is integrated to other systems.

* + 1. Section 26 05 00: Common Work Results for Electrical, for interface and coordination with building electrical systems and distribution.
		2. Section 28 05 13: Conductors and Cables for Electronic Safety and Security, for cabling between system servers, panels, and remote devices.
		3. Section 28 05 28: Pathways for Electronic Safety and Security, for conduit and raceway requirements.
		4. Section 28 13 00: Security Management System, for interface and coordination with electronic access control systems.
		5. Section 28 23 00: Video Surveillance Equipment, for interface with, and administration of video recording equipment.
		6. Section 28 23 13: Video Management System, for interface to a digital video management system.
		7. Section 28 23 23: Video Surveillance Systems Infrastructure.
		8. Section 28 23 29: Video Surveillance Remote Devices and Sensors.
	1. REFERENCES
		1. Reference Standards: Provide systems that meet or exceed the requirements of the following publications and organizations as applicable to the work of this Section.
			1. Canadian ICES-003.
			2. Canadian Standards Association (CSA).
			3. Consultative Committee for International Radio (CCIR).
			4. Conformity for Europe (CE).
			5. Electronic Industry Association (EIA).
			6. Federal Communications Commission (FCC).
			7. Institute of Electronic and Electrical Engineers (IEEE).
			8. Joint Photographic Experts Group (JPEG).
			9. Moving Pictures Experts Group (MPEG).
			10. Motion Joint Photographic Experts Group (MJPEG).
			11. National Television Systems Committee (NTSC).
			12. Phase Alternating Line (PAL).
			13. Underwriters Laboratories Inc. (UL).
			14. ITU-T Video Coding Experts Group (VCEG).
			15. Open Network Video Interface Forum (ONVIF).
			16. Real Time Streaming Protocol (RTSP).
	2. SYSTEM DESCRIPTION
		1. The 16-/32-/64-channel 4K embedded network video recorder, shall provide:
			1. Fully-featured NVRs
				1. High decoding capability for Ultra 4K HD viewing and recording.
				2. View 4/8/16 channels simultaneously with synchronized real-time playback on your monitor (depending on your model).
				3. Up to 12 MP (4K) resolution live view, preview, and playback.
				4. Up to 16 channels at 1080p, or 8 channels at 4 MP, or 4 channels at 8 MP H.265/H.264 decoding.
				5. De-warp fisheye camera video in local and web user interface for 360 degree situational awareness.
			2. Easy to Use
				1. The Quick Wizard and full PoE support (for up to 16 channels) make setup fast and easy.
				2. Quick physical installation with the help of a simple NVR design and easy-to-understand quick installation guides.
				3. Simple remote configuration and firmware updating through the Honeywell Viewer web client and the Honeywell Config tool.
			3. Convenient, Flexible Storage Options
				1. Internal storage supports 4 HDDs expandable up to 32 TB (8 TB each).
				2. Store video clips and snapshots to external storage, such as the client’s PC, through the Internet connection.
				3. Store video clips and snapshots to external network storage servers, such as an FTP site.
				4. Store video clips and snapshots to a USB memory device.
			4. Dynamic, Accessible Monitoring
				1. Monitor from anywhere using the mobile apps for both Apple® and Android™ devices (smartphones, tablet computers, and laptops).
				2. Password-protected access to the NVR’s video and network setup.
			5. Privacy Masking
				1. Conceal up to 4 areas of a scene from viewing and recording.
	3. SUBMITTALS
		1. General: Submittals shall be made in accordance with the Conditions of the Contract and Submittal Procedure Section.
		2. Manufacturer’s Product Data: Submit manufacturer’s data sheets indicating systems and components proposed for use, including instruction manuals.
		3. Shop Drawings: Submit installation drawings, including connection diagrams for interfacing equipment, list of connected equipment, and locations for major equipment components. Shop drawings shall indicate surrounding construction as provided for the Project.
		4. Project Record Drawings: Indicate location of equipment and wiring on project record drawings. Submit an electronic version of the project record drawings not later than Substantial Completion of the Project.
		5. Operation and Maintenance Data: Submit manufacturer’s operation and maintenance data customized to the system installed. Include operator manuals.
		6. Field Tests: Submit results of field testing of every device, including date, testing personnel, retesting date (if applicable), and confirmation that every device passed field testing.
		7. Maintenance Service Agreement: Submit a sample copy of the manufacturer’s maintenance service agreement, including cost and services for a one year period for Owner’s review. Maintenance shall include, but not be limited to, labor and materials to repair the system, tests and adjustments, and regular inspections.
	4. QUALITY ASSURANCE
		1. Manufacturer: Minimum 10 years experience in manufacturing and maintaining video surveillance systems. Manufacturer shall provide toll-free technical assistance and support available 24/7.
		2. Manufacture Location: Provide equipment assembled in China.
		3. Installer: Minimum 2 years experience installing similar systems and shall be acceptable to the manufacturer of the video surveillance system.
		4. Regulatory Requirements:
			1. Emissions: FCC Part 15B, EN55032: 2012 +AC: 2013, EN61000-3-2: 2014, EN61000-3-3: 2013.
			2. Immunity: EU – EN 50130-4: 2011 + A1: 2014, EN 55024: 2010 + A1: 2015.
			3. Safety: North America UL Listed to UL/CSA 60950-1; EU – EN 60950-1.
			4. RoHS: EN 50581: 2012.
		5. Environmental Requirements:
			1. Operating temperatures shall be between 14°F (−10°C) and 131°F (55°C).
			2. Storage temperatures shall be between −4°F (−20°C) and 158°F (70°C), 0% to 90% relative humidity.
			3. Operating Relative Humidity: 10% to 90%, non-condensing.
		6. Power Requirements:
			1. Power Supply: Single, 100~240 V AC, 50/60 Hz.
			2. Power Consumption:
				1. NVRs: 17.5 W max (without HDD).
				2. PoE: 16 ports (PoE 802.3af/at) total load not to exceed 150 W, maximum load for any single port 25.5 W.
	5. DELIVERY, STORAGE, AND HANDLING
		1. Packing and Shipping: Deliver products in manufacturer’s labeled packages.
		2. Storage and Protection: Store and handle products in accordance with manufacturer’s requirements, in a facility where environmental conditions are within recommended limits.
	6. WARRANTY
		1. Manufacturer’s Guarantee: Three (3) years from the manufacture date code under normal use and service for the video surveillance system.
1. PRODUCTS
	1. MANUFACTURERS
		1. Specified Manufacturer: Honeywell Performance Series Focus 4K IP Embedded Network Video Recorder, [www.honeywell.com](http://www.honeywellvideo.com)/security.
		2. Accepted Part Numbers:
			1. HEN16204: NVR, 16-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 480 fps, 0 TB\*.
			2. HEN16284: NVR, 16-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 480 fps, 8 TB.
			3. HEN32204: NVR, 32-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 960 fps, 0 TB\*.
			4. HEN32284: NVR, 32-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 960 fps, 8 TB.
			5. HEN322164: NVR, 32-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 960 fps, 16 TB.
			6. HEN64204: NVR, 64-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 1920 fps, 0 TB\*.
			7. HEN642164: NVR, 64-Channel, H.265, 4K 12 MP, 4 SATA, 16 PoE, 1920 fps, 16 TB.

\* NOTE TO SPECIFIER: Models with 0 TB storage are not available in all regions.

* 1. SYSTEM COMPONENTS
		1. NVR: The NVR shall contain the recording engine, database of all network connected cameras.
		2. Web Client: The NVR Web Client shall render video and act as a main human/machine interface.
	2. OPERATIONAL REQUIREMENTS
		1. 4K ENVR shall provide a user-friendly graphical user interface (GUI) to configure the cameras, create schedules for recording, perform video surveillance and recording operations, and view various reports.
		2. 4K ENVR shall be configured to store and view images captured by up to 64 cameras.
		3. 4K ENVR shall have the following major capabilities:
			1. Record and monitor up to 64 IP channels with 1~15 fps per stream (8 MP).
			2. Network bandwidth/throughput supported per NVR with Incoming: 320 Mbps, Outgoing: 320 Mbps.
			3. Support of up to 16 channels at 1080p H.265/H.264 decoding.
			4. Live viewing of up to 16 channels simultaneously with synchronized real-time playback on your monitor.
			5. Powerful investigation and video archive search tools from local or remote client.
			6. Capable of managing motion detection-based recording, with pre-event and post-event recording based on IP camera-based motion detection events and “advanced” search on recordings from local or remote client.
			7. Preview and Calendar Search permitting search for videos and events based on user-selected date and time from local or remote client.
			8. Simultaneous use of multiple video compressions including H.265, H.264, MJPEG and MPEG4.
			9. Internationalization – supports the following languages: English, French, Italian, Arabic, Turkish, German, Czech, Dutch, Portuguese, Spanish, Polish, Russian.
			10. Email on alarm.
			11. Dynamic IP Camera Discovery – Automatically discover all compatible cameras connected to the NVR.
			12. Multi-level user access rights for viewing and manages access to the recorder functions.
			13. Capable of managing continuous, scheduled, manual, event-based, and alarm-based recording features.
			14. Support for web client and mobile apps.
		4. Workstation (NVR Client) shall provide the following operator options:
			1. Configuration: The operator (with Administrator privileges) shall have the option to configure the NVR. Live update of all configurations is supported. The following configurations shall be possible:
				1. System Configuration: Provide options to configure the system level settings.
				2. Camera Configuration: Provide options to add /delete IP cameras and modify the camera settings.
				3. Schedules: Provide options to configure schedule-based recording for cameras connected to the NVR.
				4. Sequences: Provide options to group a fixed number of cameras to view video.
				5. User Management (Users, Groups and Roles): Provide option to add/edit/delete users and/or groups.
		5. Configurations for cameras connected to the 4K ENVR:
			1. Camera Configuration: The user shall be able to configure the following parameters for each camera connected to the NVR.
				1. Camera Name
				2. IP Address
				3. Camera Type
				4. Continuous Recording: All cameras added shall be defaulted to "24/7" recording with the option to select other recording modes.
				5. Event Based Recording: Shall be “None” by default, with the option to select motion-based recording.
				6. User name: Shall display and enable setting the user name for a camera.
				7. Password: Shall enable setting the password for a camera.
				8. Camera Advanced Settings: Shall enable configuration of Resolution, Video Frame Rate, and Video Bit Rate.
			2. The following video recording options shall be supported:
				1. Schedule-based recording: The system shall support the ability to schedule recordings for each individual camera for times in the future.
				2. User-based recording: The user shall be able to configure user-activated settings for recording moments of interest while viewing live video from a camera. After configuring the user activated settings, the operator can start recording of video when needed. The video is recorded for the time period specified in the System settings for user activated recording.
				3. Event-based recording: Event based recording shall be possible on Video Motion Detection and alarms triggered.
		6. Viewer: The 4K ENVR Viewer shall have the following minimum capabilities:
			1. Main video viewing screen capable of showing 1-, 4-, 8-, 9-, 16-, 25-, 36-, and 64-split salvos of live or recorded video. Standard presets shall be customizable to the user preferences.
			2. Capable of configuring and running scan sequences.
			3. Capable of setting the IP camera resolution and frame rate.
			4. Capable of exporting user-selected image or video clips. A digital signature shall be attached to every exported clip.
			5. Capability to play back the exported video clips. Each video channel that is being recorded by the recording system shall be overlaid with text and a time stamp that is customizable by the user.
			6. Allow the user to initiate recording through the GUI or a controller.
			7. Capability of complete alarm management for the alarms coming from the 4K ENVR.
			8. Playback control including play/pause, stop, rewind, fast play, slow play, frame-by-frame playback, full screen, and back up.
		7. Search: The Search facility shall include search for recorded video and events based on date and time.
	3. SERIES INTEGRATIONS
		1. The 4K ENVR shall be compatible with the following interoperability standards:
			1. Open Network Video Interface Forum (ONVIF)
			2. Real Time Streaming Protocol (RTSP)
		2. The 4K ENVR shall be compatible with the following Honeywell Performance Series IP and other Honeywell cameras and encoders:
			1. 3-inch Indoor Minidome IP Cameras:
				1. H3W2GR1
				2. H3W2GR2
				3. H3W4GR1
			2. 4-inch Rugged Minidome IP Cameras:
				1. H4D8PR1
				2. H4D2PRV2
				3. H4W2PRV2
				4. H4W4PRV2
				5. H4D3PRV3
				6. H4W4PRV3
				7. H4W2GR1
				8. H4W2GR2
				9. H4W4GR1
				10. H4D8GR1
			3. Indoor Box IP Cameras:
				1. HCW2G
				2. HCL2G
				3. HCW4G
				4. HCD8G
			4. Bullet IP Cameras:
				1. HBD8PR1
				2. HBD3PR2
				3. HBW2PR2
				4. HBW4PR2
				5. HBW2PR1
				6. HBW4PR1
				7. HBL2GR1
				8. HBW2GR1
				9. HBW2GR3
				10. HBW4GR1
				11. HBD8GR1
				12. HBD1PR1
				13. HBD3PR1
			5. Indoor Fisheye IP Cameras:
				1. HFD5PR1
			6. Indoor/Outdoor 1080p IR PTZ IP Cameras:
				1. HDZP252DI\*
			7. Ball/Micro Dome IP Cameras:
				1. HED8PR1
				2. HEW2PRW1
				3. HEW4PRW3
				4. HEW2PR1
				5. HEW4PR3
				6. HEW2PR2
				7. HEW4PR2
				8. HED1PR3
				9. HED3PR3
				10. H2W2PRV3
				11. H2W4PRV3
			8. HVE Encoders:
				1. HVE1\*\*
				2. HVE4\*\*
				3. HVE8\*\*

\* NOTE TO SPECIFIER: HDZ Series cameras do not support the configuration of motion detection through the ENVR. There is a minimum 5 second delay after setting presets on HDZ cameras before the PTZ can respond to PTZ commands.

\*\* NOTE TO SPECIFIER: HVE Series encoders do not support the configuration of motion detection through the ENVR.

* 1. SYSTEM HARDWARE
		1. The 4K ENVR shall have the following specifications:
			1. Processor: Quad-core embedded processor
			2. Internal Storage: 4 SATA ports expandable up to 8 TB each (32 TB total)
			3. Operating System: Embedded Linux
			4. Storage Capacities: Up to 32 TB
			5. Video Storage Hard Disk Options: Internal fixed up to 8 TB SATA Hard Disk Drive options
			6. Inputs and Outputs: 16 channels alarm inputs, 6 channels alarm relay outputs, 1 RS232, 3 USB ports
			7. Network Interface:
				1. 1 RJ-45 port (10/100/1000 Mbps)
				2. 16 PoE ports (IEEE802.3af/at)
			8. Monitor Output: 2 HDMI (1 HDMI up to 3840 × 2160); 1 VGA
			9. Unit Dimensions (W × D × H): 17.3 × 16.3 × 3.0 inches (440.0 × 413.0 × 75.0 mm).
			10. Unit Weight: 10.3 lb without HDD (4.65 kg).
		2. The 4K ENVR shall have the following electrical specifications:
			1. Power Supply: Single, 100~240 V AC, 50/60 Hz.
			2. Power Consumption:
				1. NVRs: 17.5 W max (without HDD).
				2. PoE: 16 ports (PoE 802.3af/at) total load not to exceed 150 W, maximum load for any single port 25.5 W.
		3. The 4K ENVR shall be designed to meet the following environmental conditions:
			1. Operating temperatures shall be between 14°F (−10°C) and 131°F (55°C).
			2. Storage temperatures shall be between –4°F (−20°C) and 158°F (70°C), 0% to 90% relative humidity.
			3. Operating Relative Humidity: 10% to 90%, non-condensing.
			4. Emissions: FCC Part 15B; EN 55032: 2012 + AC: 2013, EN 61000-3-2: 2014,
			EN 61000-3-3: 2013.
			5. Immunity: EU – EN 50130-4: 2011 + A1: 2014, EN 55024: 2010 + A1: 2015.
			6. Safety: North America UL Listed to UL/CSA 60950-1; EU – EN 60950-1.
			7. RoHS: EN 50581: 2012.
	2. MANUFACTURER SUPPORT
		1. Manufacturer shall provide customer service, pre-sales applications assistance, after-sales technical assistance, access to online technical support, and online training using Web conferencing.
		2. Manufacturer shall provide 24/7 technical assistance and support by means of a toll-free telephone number at no extra charge.
1. EXECUTION
	1. EXAMINATION
		1. Examine site conditions prior to installation. Notify Architect and Owner in writing if unsuitable conditions are encountered. Do not start installation until site conditions are acceptable.
	2. INSTALLATION
		1. All components of the camera system shall be thoroughly tested before shipping to the project location.
		2. Camera system shall be installed, programmed, and tested in accordance with manufacturer’s instructions and recommendations.
			1. Coordinate interfaces with other products with Owner’s representative where appropriate.
			2. Provide conduit, cable, and wire for complete and reliable installation. Obtain Owner’s approval for exact location of cameras, boxes, conduit, cable, and wiring runs prior to installation.
			3. Install conduit, cable, and wire parallel and square with building lines, including raised floor areas. Do not exceed 40 percent fill in conduits. Gather and tie wires for orderly installation.
			4. Coordinate with other trades to provide proper sequencing of installation.
	3. FIELD COMMISSIONING AND CERTIFICATION
		1. Field Commissioning: Test ENVR system as recommended by manufacturer, including the following:
			1. Conduct complete inspection and testing of equipment, including verification of operation with connected equipment.
			2. Test devices and demonstrate operational features for Owner’s representative and authorities having jurisdiction, as applicable.
			3. Correct deficiencies until satisfactory results are obtained.
			4. Submit written copies of test results.
	4. TRAINING
		1. Conduct on-site system administrator and security/surveillance operator training in accordance with the manufacturer’s instructions and recommendations. Training shall include, but not be limited to: camera administration, provisioning, configuration, operation, and diagnostics.

 END OF SECTION