SECTION 28 23 19

EMBEDDED NETWORK VIDEO RECORDER

1. GENERAL
	1. SECTION INCLUDES
		1. Provide a complete network video recorder, including engineering, components, installation and commissioning.
	2. RELATED SECTIONS

NOTE TO SPECIFIER: Include related sections as appropriate if network video recorder 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 13 – Video Management System, for interface to a digital video management system.
		6. Section 28 23 23 – Video Surveillance System Infrastructure
	1. REFERENCES
		1. Reference Standards: Provide systems which meet or exceed the requirements of the following publications and organizations as applicable to the Work of this Section:
			1. Canadian ICES-003
			2. Consultative Committee for International Radio (CCIR)
			3. Conformity for Europe (CE)
			4. Electronic Industry Association (EIA)
			5. Federal Communications Commission (FCC)
			6. Joint Photographic Experts Group (JPEG)
			7. Moving Pictures Experts Group (MPEG)
			8. Motion Joint Photographic Experts Group (MJPEG)
			9. National Television Systems Committee (NTSC)
			10. Phase Alternating by Line (PAL)
			11. Underwriters Laboratories Inc. (UL)
			12. Institute for Electrical and Electronics Engineers (IEEE)
			13. ITU-T Video Coding Experts Group (VCEG)
			14. Open Network Video Interface Forum (ONVIF)
			15. Real Time Streaming Protocol (RTSP)
	2. SYSTEM DESCRIPTION
		1. The Network Video Recorder (NVR) supports simultaneous recording, viewing, search, and system management for up to 4 channels – any combination of up to 4 IP cameras including high definition formats.
		2. Basis-of-design is the Honeywell Performance Series Full PoE 4-channel Network Video Recorder.
	3. SUBMITTALS
		1. Manufacturer’s Product Data: Submit manufacturer’s data sheets indicating systems and components proposed for use, including instruction manuals.
		2. Shop Drawings: Submit complete shop drawings including connection diagrams for interfacing equipment, list of connected equipment, and locations for major equipment components.
		3. Record Drawings: During construction maintain record drawings indicating location of equipment and wiring. Submit an electronic version of record drawings not later than Substantial Completion of the project.
		4. Operation and Maintenance Data: Submit manufacturer’s operation and maintenance data, customized to the system installed. Include system and operator manuals.
		5. 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.
		6. 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, provide test and adjustments, and regular inspections.
	4. QUALITY ASSURANCE
		1. Manufacturer: Minimum ten years experience in manufacturing and maintaining IP video recording systems. Manufacturer shall provide toll-free technical assistance and support available 24/7.

* + 1. Installer: Minimum two years experience installing similar systems, and acceptable to the manufacturer of the IP video recording system.
		2. Environmental Conditions: The NVR shall be designed to function in the following environmental conditions:
			1. Operating Temperature: 14°F to 131°F (-10°C to 55°C).
			2. Storage Temperature: -4°F to 158°F (-20°C to 70°C)
			3. Emissions: FCC part 15B Class B
			4. Safety: ANSI / UL 60950-1; CAN / CSA C22.2 No. 60950-1.
		3. Power Requirements: The NVR shall have the following electrical specifications:
			1. Power Supply:
				1. NVR: 12 V DC; 4A external adaptor
				2. PoE: 48 V DC; 1.04 A external adaptor
			2. Power Consumption:
				1. NVR: 35 ~ 115 W depending on the number of HDD installed and PoE loading (maximum 393 Btu/hr)
				2. PoE: 4 ports (IEEE802.3af) total load not to exceed 50 W, maximum load on any single port 15.4 W.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Deliver materials in manufacturer’s labeled packages. Store and handle in accordance with manufacturer’s requirements, in a facility with environmental conditions within recommended limits.
	2. WARRANTY
		1. Manufacturer’s Warranty: The warranty period shall be thirty six (36) months from the delivery date of the system under normal use and service.
1. PRODUCTS
	1. MANUFACTURER
		1. Network Video Recorder (NVR) Manufacturer: Honeywell Performance Series IP Network Video Recorder, [www.honeywellvideo.com](http://www.honeywellvideo.com)
		2. Accepted Part Numbers:
			1. HEN04102
			2. HEN04112
			3. HEN04122
	2. SYSTEM COMPONENTS
		1. NVR: The NVR shall contain the recording engine, database of all network-connected cameras.

* + 1. NVR Web Client: The NVR Web Client shall render video and act as a main human/machine interface.
	1. OPERATIONAL REQUIREMENTS
		1. NVR 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. NVR shall be configured to store and to view images captured by up to 4 cameras.
		3. NVR shall have following major capabilities:
			1. Record and monitor up to 4 IP channels with 100 fps @ 1080p PAL or 120 fps @ 1080p NTSC. Network bandwidth/throughput supported per NVR with Incoming: 36 Mbps, Outgoing: 36 Mbps. Support up to 4 IP cameras for live view and playback synchronization at 1080p resolution at full frame rate.
			2. Live viewing of up to 4 cameras on a single remote workstation with a monitor set up at 1080p resolution.
			3. Powerful investigation and video archive search tools from local or remote client.
			4. Capable of managing motion detection-based recording with pre-event and post-event recording based on IP camera based motion detection and “advanced” search on recordings from local or remote client.
			5. Preview and Calendar Search permitting search for videos and events based on user-selected date and time from local or remote client.
			6. Simultaneous use of multiple video compressions including MJPEG and H.264.
			7. Internationalization - supports the following languages: French, German, Russian, Italian, Spanish, Dutch, Arabic, Czech, Polish, Portuguese, Turkish, and English.
			8. Email on alarm.
			9. Dynamic IP Camera Discovery – Automatically discover all compatible cameras connected to the NVR.
			10. Multi-level user access rights for viewing and manages access to the recorder functions.
			11. Capable of managing continuous, scheduled, manual, event-based, and alarm-based recording features.
			12. 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/edit/delete IP cameras.
				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 and Roles): Provide option to add/edit/delete users.
		5. Configurations for cameras connected to NVR
			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 NVR Viewer shall have the following minimum capabilities:
			+ 1. Main video viewing screen capable of showing 1 and 4 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. Capable of playing 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. Capable of completing alarm management for the alarms coming from the NVR.
				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.
	2. NVR INTEGRATIONS
		1. NVR shall be compatible with the following interoperability standards:
			1. Open Network Video Interface Forum (ONVIF)
			2. Real Time Streaming Protocol (RTSP)
		2. NVR shall be compatible with the following Honeywell Performance Series IP and other Honeywell cameras and encoders:
			+ H2D2PR1(X)
			+ H2S1P6(X)
			+ H2S2P6(X)
			+ H3D1F1(X)
			+ H3D2F1(X)
			+ H3D2S2(X)
			+ H3D2SR2(X)
			+ H3S1P1(X)
			+ H3W1F1(X)
			+ H4D1F1(X)
			+ H4D2F1(X)
			+ H4D2S2(X)
			+ H4D3PRV2(X)
			+ H4D3PRV3(X)
			+ H4S1P1(X)
			+ H4W1F1(X)
			+ HBD1PR1(X)
			+ HBD2FR1(X)
			+ HBD2FR2(X)
			+ HBD2PR1(X)
			+ HBD3PR1
			+ HBD3PR2
			+ HCD1F(X)
			+ HCD2F(X)
			+ HCW1F(X)
			+ HCW2S2(X)
			+ HDZ30\*
			+ HDZ30HD\*
			+ HDZ30HDE\*
			+ HDZ36E\*
			+ HED1PR3
			+ HED3PR3
			+ HVE1\*\*
			+ HVE4\*\*
			+ HVE8\*\*

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

\*\*NOTE: HVE Series cameras do not support the configuration of motion detection through the NVR.

* 1. SYSTEM HARDWARE
		1. Performance Series NVR:
			1. Processor: Dual core embedded processor
			2. Internal Storage: 2 SATA ports expandable up to 6 TB each (12 TB total)
			3. Power supply:
				1. NVR: 12 V DC; 4 A external adaptor
				2. PoE: 48 V DC; 1.04 A external adaptor
			4. Operating system: Embedded Linux
			5. Storage capacities: Up to 12 TB total (6 TB each)
			6. Video Storage Hard Disk Options: Internal fixed 1 TB or 2 TB SATA Hard Disk Drive options
			7. Inputs and outputs: 4 channels alarm inputs, 2 alarm outputs, 1 RS-232, 1RS-485,2 USB port
			8. Network interface:
				1. 1 x RJ-45 port (10 / 100 / 1000 Mbps)
				2. 4 x PoE ports
			9. Monitor Output: 1 HDMI; 1 VGA
	2. MANUFACTURER SUPPORT
		1. Manufacturer shall provide customer service, pre-sales applications assistance, after-sales technical assistance, access to technical online support, and online training using Web conferencing.
		2. Manufacturer shall provide 24/7 technical assistance and support via 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. Test all components before shipping to the project location.
		2. The NVR system shall be installed, programmed, and tested in accordance with manufacturer’s installation instructions.
			1. Coordinate interfaces with Owner’s representative where appropriate.
			2. Provide backboxes, racks, connectors, supports, conduit, cable, and wire for a complete and reliable installation. Obtain Owner’s approval for exact location of all boxes, conduit, and wiring runs prior to installation.
			3. Install conduit, cable, and wire parallel and square with building lines, including raised floors areas. Do not exceed forty percent fill in conduits. Gather wires and tie to create an orderly installation.
			4. Coordinate with other trades to provide proper sequencing of installation.
	3. FIELD COMMISSIONING AND CERTIFICATION
		1. Field Commissioning: Testing the IP Video Recording 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, with the number of sessions and length of sessions as recommended by the NVR Hybrid system manufacturer. Training shall include administration, provisioning, configuration, operation, and diagnostics.

 END OF SECTION