SECTION 28 23 19

DIGITAL VIDEO RECORDER

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

NOTE TO SPECIFIER: Include related sections as appropriate if digital 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
		7. Section 28 23 29 – Video Surveillance System Remote Devices and Sensors
	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. Real Time Streaming Protocol (RTSP)
	2. SYSTEM DESCRIPTION
		1. The digital video recorder shall provide an economical digital recording and transmission system offering storage and playback of High Quality Analog (HQA) video from 1 to 16 traditional analog cameras, recording at up to 1080p resolution, simultaneous HDMI/VGA outputs, and video loop out, with two USB ports and an internal 10/100 or 10/100/1000 Mbps network adaptor as standard equipment.
		2. Basis-of-design is the Honeywell Performance Series HQA Digital Video Recorders.
	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 tests 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 DVR 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. Relative Humidity: 10% to 90%
		3. Regulatory Requirements:
			1. Emissions: FCC Part 15 Class B, CE (EN 55022)
			2. Immunity: CE (EN 50130-4)
			3. Safety: CE (EN 60950-1)
			4. RoHS: CE (EN50581)
		4. Power Requirements: The DVR shall have the following electrical specifications:
			1. Input Voltage:
				1. HRHM104: 12 V DC; 2 A
				2. All other DVRs (including HRHH2042): 12 V DC; 5 A
			2. Power Consumption:
				1. HRHM104: 10 W (without HDD)
				2. All other DVRs (including HRHH2042): 15 W (without HDD)
	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. Digital Video Recorder (DVR) Manufacturer: Honeywell Performance Series HQA Digital Video Recorder, [www.honeywellvideo.com](http://www.honeywellvideo.com)
		2. Accepted Part Numbers:
			1. HRHM1041(X)
			2. HRHH2042(X)
			3. HRHH1081(X)
			4. HRHH1083(X)
			5. HRHH2082(X)
			6. HRHH2086(X)
			7. HRHH1161(X)
			8. HRHH1163(X)
			9. HRHH1166(X)
	2. SYSTEM COMPONENTS
		1. DVR: The DVR shall contain the recording engine, database of all Digital-connected cameras and encoders, integrated components and their configurations.

* + 1. Web Client Software (DVR Web Client): The DVR Web Client software shall render video and act as a main human/machine interface.
		2. Cabling
	1. OPERATIONAL REQUIREMENTS
		1. The DVR 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. The DVR shall be configured to store and to view images captured by up to 16 cameras.
		3. The DVR shall have following major specifications:
			1. Recording and monitoring specifications:
				1. **HRHM104**: 50/60fps @ 1080p; 100/120fps @ 720p, 960H, 4CIF, CIF
				2. **HRHH204**: 100/120fps @ 1080p, 720p, 960H, 4CIF, CIF
				3. **HRHH108:** 100/120fps @ 1080p; 200/240fps @ 720p, 960H, 4CIF, CIF
				4. **HRHH208:** 200/240fps @1080p, 720p, 960H, 4CIF, CIF
				5. **HRHH116:** 200/240fps @ 1080p; 400/480fps @ 720p, 960H, 4CIF, CIF
			2. Live viewing of up to 16 cameras on a single remote workstation with a monitor set up at 1080p resolution.
			3. 4, 8, or 16 composite video inputs.
			4. HDMI/VGA output at up to 1920 x 1080 (1080p) resolution.
			5. H.264 and G.711 image compression.
			6. The following recording resolutions:
				1. 1080p: 1920 x 1080
				2. 720p: 1280 x 720
				3. 960: 960 x 480 (NTSC); 960 x 576 (PAL)
				4. D1: 704 x 480 (NTSC); 704 x 576 (PAL)
				5. 4CIF: 704 x 480 (NTSC); 704 x 576 (PAL)
				6. CIF: 352 x 240 (NTSC); 352 x 288 (PAL)
				7. QCIF: 176 x 120 (NTSC); 176 x 144 (PAL)
			7. The following internal hard disk drive (HDD) storage options:
				1. 4-channel pure HQA DVRs: 1 TB SATA drive, up to 4 TB
				2. 4- / 8- / 16-channel hybrid HQA/SD DVRs: 2 TB SATA drives, up to 8 TB
			8. Two USB ports and an internal network adaptor:
				1. 4-channel pure HQA DVRs: 1 RJ-45 (10/100 Mbps) adaptor
				2. 4- / 8- / 16-channel hybrid HQA/SD DVRs: 1 RJ-45 (10/100/1000 Mbps) adaptor
			9. The 4- / 8- / 16-channel hybrid HQA/SD DVRs shall support operation using the front panel, IR remote, or USB mouse. The HQA pure DVR (HRHM104) DVRs shall support operation using only the USB mouse.
			10. The 4- / 8- / 16-channel hybrid HQA/SD DVRs’ front panel shall include the following features:
				1. Operational and programming buttons.
				2. USB port for saving video clips/snapshots to external storage.
				3. LED status indicators, including indicators for power, hard disk drive activity, and network connectivity.
			11. The HQA pure DVR (HRHM104) DVRs front panel shall include the following features:
				1. USB port for saving video clips/snapshots to external storage.
				2. LED status indicators, including indicators for power, hard disk drive activity, and network connectivity.
			12. The DVRs’ back panel shall include the following features:
				1. A power switch.
				2. BNC video inputs.
				3. RCA audio inputs and audio output.
				4. RS-485 PTZ control interface.
				5. Alarm inputs and relay outputs, NO/NC.
				6. HDMI monitor output.
				7. VGA monitor output.
				8. USB port for connecting a mouse.
				9. RJ-45 10/100 Mbps or RJ-45 10/100/1000 Mbps (model dependent) Base-T Ethernet port.
				10. Low voltage DC power supply jack.
			13. The DVRs shall support DDNS via Honeywell DDNS.
			14. The DVRs shall be preconfigured with a fixed IP address and subnet mask for quick integration within existing IT structures. The DVRs shall be configurable to DHCP in the local GUI for quick integration with an existing IT structure.
			15. The DVRs shall display video in full screen or multi-screen format, with the camera number, a user-definable camera name, and the camera’s recording/alarm status displayed for each camera.
			16. The DVRs shall support continuous, event, and combined continuous/event recording that is user configurable by channel, and shall support manual recording overrides of the recording schedule.
			17. The DVRs shall support powerful investigation and video archive search tools from local or remote client. These tools shall include the ability to perform index-based searches of recorded video.
			18. The DVRs shall support preview and calendar search, permitting search for videos and events based on user-selected date and time from local or remote client.
			19. The DVRs shall include playback controls that allow the user to play back recorded video forwards and backwards at multiple speeds.
			20. The DVRs shall support adjustments to the picture resolution, brightness, contrast, color, motion sensitivity, and images per second during recording, and these settings shall be user configurable by channel.
			21. The DVRs shall be capable of managing motion detection-based recording with pre-event and post-event recording triggered by camera-based motion detection and “advanced” search on recordings from local or remote client.
			22. The DVRs shall support simultaneous use of multiple video compressions including H.264 and G.711.
			23. The DVRs shall support remote operation and configuration through a remote viewing software, a web client, and mobile device applications (Apple and Android).
			24. The DVRs remote viewing software shall include, at a minimum, the following functions:
				1. Viewing live video.
				2. Searching recorded video.
				3. Exporting still images (JPEGs) and video clips (AVIs).
				4. Controlling PTZ cameras.
				5. Simultaneous access for up to 128 users.
			25. The DVRs shall support analog PTZ dome control through the RS-485 port, including multiple pan, tilt, zoom, and focus speeds; iris control, programming and viewing presets. Only one user shall be allowed to access the PTZ controls at a time.
			26. The DVRs shall support up to 4 user-configurable privacy masking zones for each channel.
			27. The DVRs shall support alarm sensor in and relay out functions, motion detection, and video loss detection, and shall include alarm monitoring software.
			28. The DVRs shall support a delay period of time, a Latch (in seconds), before an alarm is activated, and shall include the option of displaying a sensor status bar on the main display screen.
			29. The DVRs shall have the ability of automatic responses when an alarm event is detected. These responses shall include:
				1. Automatically displaying video full screen
				2. Initiating recording for a set time
				3. Sending emails (including a snapshot) and popup notifications
				4. Activating an alarm beep notification
			30. The DVRs shall include a system log that records and displays information relating to alarm events, reboots, and other system information. The user shall have the ability to export the log information.
			31. The DVRs shall be equipped with self-diagnostic functions, including S.M.A.R.T. disk health check.
			32. The DVRs shall adjust for Daylight Saving Time changes, with no loss of video when the clock advances forward one hour. When the clock is adjusted back when Daylight Saving Time ends, the DVR shall record both hours, allowing the user to select which hour to play back from the File list. When in Timeline playback, only the first hour will be played. The File list will show two recordings for the same hour.
			33. The DVRs shall include a user management console that allows the administrator to create, edit, and delete user accounts.
			34. The DVRs shall support the following languages: Arabic, French, German, Russian, Italian, Spanish, Dutch, Czech, Polish, Portuguese, Turkish, and English.
	2. DVR INTEGRATIONS
		1. The DVR shall be compatible with the Real Time Streaming Protocol (RTSP) interoperability standard.
		2. DVR shall be compatible with the following Honeywell Performance Series Fixed cameras
			1. HD29HD1(X)
			2. HD30HD1(X)
			3. HB74HD1(X)
			4. HD73HD1(X)
			5. HB75HD1(X)
			6. HD30HD2(X)
			7. HB74HD2(X)
			8. HD73HD2(X)
			9. HB75HD2(X)
	3. SYSTEM HARDWARE
		1. The digital video recorder shall have the following mechanical specifications:
			1. Unit dimensions (W x D x H)
				1. HRHM104 DVRs: 12.6 x 10.0 x 2.2 inches (325 x 254 x 55 mm)
				2. All other DVRs: 14.8 x 11.2 x 2.1 inches 375 x 285 x 53 mm)
			2. Unit weight (without HDD):
				1. HRHM104 DVRs: 3.3 pounds (1.55 kg)
				2. All other DVRs: 5.2 pounds (2.35 kg)
			3. Electrical:
				1. Power Supply:

HRHM104 DVRs: 12 V DC, 2 A

All other DVRs: 12 V DC, 5 A

* + - * 1. Power Consumption (without HDD):

HRHM104 DVRs: 10 W

All other DVRs: 15 W

* + - 1. Environmental:
				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. Relative Humidity: 10% to 90%
	1. 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 DVR 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 DVR system manufacturer. Training shall include administration, provisioning, configuration, operation, and diagnostics.

 END OF SECTION