**SECTION 28 23 19**

**DIGITAL VIDEO RECORDERS AND ANALOG RECORDING DEVICES**

**Advanced Technology Video NVR16P2 Network Recorder**

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*This guide specification is intended for use by the design/construction professional and any user of Advanced Technology Video (ATV) products to assist in developing project specifications for security and video surveillance systems.*

*Notes in Italics, such as this one, are explanatory and intended to guide the design professional/specifier and user in the proper selection and use of materials. This specification should be modified where necessary to accommodate individual project conditions.*

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1. **GENERAL**
	1. SUMMARY
		1. Section includes Digital Video Recorders and Analog Recording Devices.
		2. Related Sections:
			1. Section 28 23 13 – Video Surveillance Control and Management Systems
			2. Section 28 23 16 – Video Surveillance Monitoring and Supervisory Interfaces
			3. Section 28 23 26 – Video Surveillance Remote Positioning Equipment
			4. Section 28 23 23 – Video Surveillance Systems Infrastructure
	2. SYSTEM DESCRIPTION
		1. Description: Video surveillance and monitoring at points as indicated on Drawings.
			1. NVR16P2: 16 Channel, 16 PoE Ports, 8MP (4K) Resolution, Network Recorder
		2. Performance Requirements
			1. Fully integrated, stand-alone video recording solution for network surveillance systems of up to 16 channels (cameras).
			2. Capable of recording 8MP (4K), 3840 x 2160 resolution video with H.265 compression
			3. ONVIF compliant for network video interoperability
			4. Connect and record up to sixteen (16) network IP cameras
			5. 4k, 3840 x 2160 display capability on HDMI monitor output
			6. Concurrent displays on HDMI and VGA monitor outputs
			7. Stable embedded operating system.
			8. Easy plug and play functionality with automatic device discovery and display
			9. Desk top and rack mountable.
			10. Pan-Tilt-Zoom (PTZ) camera control
			11. 2-way audio communication
			12. Text input for ATM or Point of Sale (POS)
			13. Multiple Recording Modes: Continuous, Motion, Alarm
			14. Maximum Incoming Throughput of 288Mbps
			15. Powerful Search Modes: Time, Event, Thumbnail, Text, Smart (Motion)
			16. Maximum 2 SATA HDD’s up to 12TB each
			17. Supports Mobile Phone Applications with Apple and Android Operating Systems
	3. DEFINITIONS
		1. H.265 (also known as MPEG-H Part 2): a powerful encoding format that has become the successor to H.264 (MPEG-4 Part 10) standard. Recording video in H.265 format requires approximately 50% less storage than video recorded with H.264.
		2. PTZ: refers to a movable camera that has the ability to pan left and right, tilt up and down, and zoom or magnify a scene.
	4. SUBMITTALS
		1. Submit under provisions of Section 01 33 00 - Submittal procedures.
		2. Shop Drawings: Indicate electrical characteristics and connection requirements, including system wiring diagram.
		3. Product Data: Submit catalog data showing electrical characteristics and connection requirements for each component.
	5. CLOSEOUT SUBMITTALS
		1. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
		2. Project Record Documents: Record actual locations of cameras and routing of cabling.
		3. Operation and Maintenance Data: Submit instructions for operating system and performing routine trouble shooting procedures.
	6. QUALIFICATIONS
		1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.
		2. Supplier: Authorized distributor of specified manufacturer with minimum 5 years documented experience.
		3. Installer: Authorized installer of specified manufacturer with 5 years documented experience and with service
	7. ENVIRONMENTAL REQUIREMENTS
		1. Section 01 60 00 - Product Requirements.
		2. Deliver materials in manufacturer’s original, unopened, undamaged packaging; 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 for installation, environmental, mechanical or electrical requirements and within thermal stress limits.
		5. Ensure conformance with operating limitations according to applicable data sheet.
	8. FIELD MEASUREMENTS
		1. Verify field measurements prior to fabrication.
	9. WARRANTY
		1. Provide manufacturer’s warranty covering [3] years for CCTV products to repair or replace defective equipment.
		2. Exchanges available for product failures.
	10. MAINTENANCE SERVICE
		1. Section 01 70 00 - Execution and Closeout Requirements: Maintenance service.
		2. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
		3. Provide factory direct technical support via phone or e-mail, or any time via Web.
			1. Provide toll-free numbers to contact customer support.
		4. Provide on-site training and on-line training via web.
2. PRODUCTS
	1. DIGITAL VIDEO RECORDERS
		1. Manufacturers:
			1. Advanced Technology Video
			2. Substitutions: Section 01 60 00 - Product Requirements: Not Permitted.
		2. Model: NVR16P2

Product Description: 16 Channel, 16 PoE Ports, 8MP (4K) Resolution, Network Recorder

* + 1. General Requirements:
			1. The Network Video Recorder (NVR) shall provide these features:
				1. Flexible and scalable network video management system in an easy to use versatile design.
				2. View, record, control IP cameras, handle alarms and check device status through one interface.
				3. Simultaneously view and record video from up to 16 different IP video sources
				4. Gigabit Ethernet (GigE) network interface
				5. Remote configuration and management of devices on surveillance system.
				6. Easy Plug and Play functionality with automatic device discovery and display
				7. Internal storage of two (2) SATA HDD’s, up to 12TB each.
				8. Capable of delivering live video to mobile devices
		2. The NVR shall feature H.265 video compression to reduce bandwidth and storage requirements.
		3. The NVR shall be capable of recording up to 8MP (4K), 3840 x 2160 resolution video images.
		4. The NVR shall provide 3rd party network IP camera connectivity for ONVIF compatible cameras.
		5. The NVR shall be capable of displaying Full HD, 1920 x 1080 output on a VGA monitor and 4K, 3840 x 2160, output on HDMI monitor.
		6. The NVR shall provide Network Time Synchronization and Daylight Savings Time change functionality.
		7. The NVR shall offer email notifications generated by programmed alarm activity
		8. The NVR shall provide multiple recording modes:
			1. Continuous
			2. Motion
			3. Alarm
			4. Panic
			5. Continuous + Motion
			6. Continuous + Alarm
			7. Motion + Alarm
			8. Continuous + Motion + Alarm
		9. The NVR shall provide Pre / Post Alarm recording:
			1. 1 ~ 5sec / 5sec ~ 1 hour
		10. The NVR shall provide multiple search modes:
			1. Time
			2. Event
			3. Thumbnail
			4. Test
			5. Smart Motion
		11. The NVR shall support mobile phone applications for iPhone and Android.
		12. The NVR shall provide an embedded PoE switch for all camera channels:
			1. IEEE 802.3af/at
		13. The NVR shall have multiple simultaneous functions with single software interface:
			1. Live viewing
			2. Recording
			3. Playback
			4. Network transmission
			5. Backup (Export)
		14. Electrical:
			1. Input Power: 100 - 240VAC
			2. Power Consumption: 25 Watts with 2 HDD’s
		15. Video
			1. IP camera inputs: 1 – RJ45 Ethernet connector for each camera
			2. Supported video format: H.265, H.264, MPEG-4, MJPEG
			3. Supported video resolution: 3840x2160 ~ 1024x768
			4. Frame Rate: max 30-ips @ 3840 x 2160 resolution
		16. Storage:
			1. Internal HDD: 2 HDD, up to 12TB each
			2. Backup: USB: AVI, H4V, MP4 File Formats
		17. Alarm Handling
			1. Alarm Inputs: 16 TTL (physical connections at the back of the NVR)
			2. Alarm Outputs: 1 TTL (physical connections at the back of the NVR)
		18. Network
			1. Remote Access: ATVision IP Remote Management Software, Smart Manager, Web Browser
			2. Web Browsers: IE, Chrome, Firefox
			3. Simultaneous Users: 10
			4. Bandwidth Throughput: Unlimited (Minimum 288Mbps); Support Bandwidth Control
		19. General
			1. RS485: Terminal Block
			2. Network Ethernet: 1 x RJ45 Port; 10/100/1000 Base-T
			3. Camera Ethernet: 16 x RJ45 PoE Ports
			4. Ethernet PoE Switch: IEEE 802.3at
				1. Maximum 130W total for all ports
			5. USB: 2 USB2.0, 1 USB3.0
			6. Audio
				1. Input: 1 RCA; 16 IP Cameras
				2. Output: 1 RCA; 1 HDMI
			7. Operating Temperature: 0°C ~ +45°C (+32°F ~ +114°F)
			8. Humidity: 0%RH ~ 90%RH
			9. Dimensions: 14.7 x 1.7 x 12.5in (375 x 44.9 x 318.2mm)
			10. Weight: 6.4lbs (2.9kg) (without HDD)
			11. Rack mount ears included
		20. Conformity Certifications:
			1. Federal Communications Commission (FCC)
			2. Underwriters Laboratories (UL)
			3. European Conformity (CE)
		21. Accessories
			1. Recorder Lockbox: XDLBB2
1. EXECUTION
	1. EXISTING WORK
		1. Disconnect and remove abandoned video surveillance equipment.
		2. Extend existing video surveillance installations using materials and methods compatible with existing installations as specified.
		3. Clean and repair existing video surveillance equipment remaining or to be reinstalled.
	2. 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.
		3. Non-compliance with security instructions may result in loss of data.
		4. Ensure environmental, mechanical and electrical requirements are met.
	3. PREPARATION
		1. Protect devices from damage during construction.
	4. INSTALLATION
		1. Install devices in accordance with manufacturer’s instruction at locations indicated on the floor plan drawings.
		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.
			1. Ground and bond video surveillance equipment in accordance with Section 26 05 26.
		5. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.
	5. FIELD QUALITY CONTROL
		1. Test proper operation of all video system devices.
			1. Communication between recorder and cameras.
			2. Independent operation of alarms, and cameras.
		2. Test proper operation of software programs.
		3. Determine and report all problems to the manufacturer’s customer service department.
	6. MANUFACTURER'S FIELD SERVICES
		1. Section 01 40 00 - Quality Requirements: Manufacturer's field services.
		2. Furnish manufacturer’s field representative to supervise final wiring connections and system adjustments.
	7. ADJUSTING
		1. Section 01 70 00 - Execution and Closeout Requirements: Requirements for starting and adjusting.
		2. Make proper adjustment to video system devices for correct operation in accordance with manufacturer’s instructions.
		3. Make any adjustment of camera settings to comply with specific customer’s need.
	8. DEMONSTRATION AND TRAINING
		1. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION