**SECTION 28 23 19**

**DIGITAL VIDEO RECORDERS AND ANALOG RECORDING DEVICES**

**Advanced Technology Video FA-HDX16 Digital Video 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
	2. SYSTEM DESCRIPTION
		1. Description: Digital Video Recorders and Analog Recording Devices.
			1. FA-HDX16: Real Time, H.264, Full HD Display, 16 channel DVR
		2. Performance Requirements
			1. Fully integrated, stand-alone video recording management solution in a compact design.
			2. 16 composite, “loop-through”, video connectors
			3. Full High Definition (Full HD), 1920 x 1080 display capability
			4. Built-in DVD-RW Archiving
			5. Two USB 2.0 I/O Ports (Mouse Capabilities / USB HDD / CDRW / DVDRW / Thumb Drive)
			6. 16-Channel Audio Recording / 1-Channel Audio Playback / 2-Way Audio Capabilities to Remote PC
			7. 480-ips (Images per Second), D1 resolution recording
			8. Pentaplex Functionality (Monitoring, Recording, Playback, Archiving and Transmission at the same time)
			9. Text input for ATM or Point of Sale (POS)
			10. Selectable (CIF, 2CIF, D1) Record Resolution
			11. Concurrent Main, Secondary & Spot Monitor Outputs: HDMI, VGA & BNC
			12. Main & Secondary Video Outputs with Multiple Display Formats (1, 2x2, 1+5, 1+7. 3x3, 4x4, PIP)
			13. 1-Spot Monitor Output for Full-Screen and Camera Sequencing
			14. Intuitive Graphical User Interface (GUI) Menu System
			15. Multiple Recording Modes -Time-Lapse, Alarm, Pre-event, Panic and Continuous
			16. Programmable Record Options -Schedule, Record Rate, Image Quality for each Input
			17. Up to 30 Minute Pre-event / 15 Minute Post Event Recording
			18. Programmable Video Motion Detection (VMD), Video Obscuration Detection (VOD) and Video Blind Detection (VBD) Per Channel
			19. Powerful Search Modes: Calendar, Time-Date, Event, Motion, Museum, Text-In
			20. 2X Digital Zoom
			21. 1-Touch / 2-Touch Clip/Copy Archiving (Compressed Video Image Files)
			22. Archived Video (Clip Copy) Played back using Executable “Player” Software Program uses a proprietary compression method that is impervious to tampering and can be validated true.
			23. Temperature Check, SMART Diagnosis, Auto Recovery, Auto Deletion
			24. Network Time Sync - Master Server or Slave
			25. Key-Lock Security / 256 Individual User Support
			26. Remote Management Software (ATVisionPro™) Supports Static-IP, ADSL, DHCP, Dynamic-IP DVRNS (Enhanced DDNS)
			27. ATVisionPro™ Features: Live Monitoring, Playback Recording, Setup, PTZ control, Upgrades and Full Triplex Operation, (User Defined 64-Channel View), Map Integration, Multi-Site System Health Monitoring with User Defined Customizable Panel Design
			28. PTZ Control – More than 50 Specific Protocols including but not limited to Pelco D, Spectra, Fastrax 2
			29. Infrared Remote Control and mouse
			30. Self-diagnostics automatic notification including hard disk drive S.M.A.R.T. protocol
			31. Blackberry, iPhone, Windows Mobile and Android Compatible
	3. DEFINITIONS
		1. H.264 (also known as MPEG4 Part 10): a powerful encoding format that compresses video much more effectively than older (MPEG4) standards. Recording video in H.264 format requires approximately 30% less storage than traditional MPEG-4.
		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.
		3. CIF: stands for Common Intermediate Format which is a standard size for images produced by digital cameras and video cameras. CIF images are 352 pixels wide and 288/240 (PAL/NTSC) pixels tall (352 x 288/240).
		4. 4CIF or D1: resolution is four (4) times greater than that of CIF images, or 704 pixels wide and 576/480 (PAL/NTSC) pixels tall (704 x 576/480).
	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: FA-HDX16
		3. Product Description: Real Time, H.264, Full HD Display, 16 channel DVR
		4. General Requirements:
			1. The Video Recorder shall provide these features:
				1. Fully integrated, stand-alone video recording management solution in a compact design.
				2. Integrated DVD writer.
				3. Record up to sixteen looped-through, auto-terminating camera inputs using high resolution H.264 video compression.
				4. View recorded video in CIF, 2CIF, or 4CIF/D1 resolution.
				5. Provide system wide recording, monitoring, and management for ATV and third-party PTZ cameras.
				6. Built-in web viewer for remote viewing, playback, control and configuration.
				7. Multiple control options via USB mouse, front panel and remote control.
				8. Remote configuration and management of devices on surveillance system.
				9. Powerful search functions that allow searches based on time/date stamps, motion or input triggers, and smart searches that allow searches on changes in recorded video.
				10. Powerful playback functions.
				11. Capable of delivering live video to mobile devices.
				12. NTSC and PAL selectable video format (auto detected).
				13. 10/100 Base-T Ethernet port for local or wide area network connection.
				14. Stable embedded operating system.
				15. Low maintenance.
		5. The Video Recorder shall feature H.264 video compression to reduce bandwidth and storage requirements.
		6. The Video Recorder shall record automatically in the background.
		7. The Video Recorder shall provide programmable scheduled archiving.
		8. The Video Recorder shall record at up to 25 (PAL) / 30 (NTSC) images per second, per channel at D1 resolution.
		9. The Video Recorder shall be capable of recording at 2CIF and D1 resolution by reducing the recording image rate settings.
		10. The Video Recorder shall be capable of displaying output on three monitors simultaneously.
		11. The Video Recorder shall display Full High Definition (FHD), 1920 x 1080, VGA or composite video output in full-screen, quad, multi-screen pictures, and PIP that can be frozen or zoomed on main and secondary monitors.
		12. The Video Recorder shall display composite video output in full-screen and sequencing full screen pictures on a third spot monitor.
		13. The Video Recorder shall control pan/tilt/zoom (PTZ) equipment via RS485 or ES232 serial communications. The Video Recorder shall support over 50 different PTZ protocols, including but not limited to the following:
			1. Fastrax 2
			2. Pelco P and D
			3. Spectra
		14. The Video Recorder shall support connection to the ATV keyboards that allows loop through connections to control up to 16 digital video recorders from a single keyboard.
		15. The Video Recorder shall contain Alarm handling functions that can be programmed to control relay outputs and telemetry control (PTZ). The alarm functions shall include relay inputs and motion detection in user-definable areas on any camera input.
		16. The Video Recorder shall be operated and programmed via the onscreen display menu system using the front panel control keys, the mouse or the infrared, handheld remote control.
		17. The Video Recorder shall provide three monitor outputs to provide full-screen, quad, multiscreen (main and secondary monitors only), and sequenced viewing.
		18. The Video Recorder shall provide remote management software, ATVisionPro, via a network for Live Monitoring, Playback Recording, Setup, PTZ control, Upgrades and Full Triplex Operation, (User Defined 64-Channel View), Map Integration, Multi-Site System Health Monitoring with User Defined Customizable Panel Design.
		19. The Video Recorder shall include an authenticity check for both local and remote playback.
		20. The Video Recorder shall provide primary storage via SATA Hard Disk Drive (up to 5) (up to 4 with an eSATA HDD).
		21. The Video Recorder shall provide secondary storage via eSATA HDD (RAID); iSCSI HDD (RAID); Built-in DVD RW drive; USB HDD or flash drive.
		22. The Video Recorder shall offer email notifications generated by programmed alarm activity.
		23. The Video Recorder shall support Real Time Streaming Protocol (RTSP) to deliver live video over the Internet to an appropriate mobile device. (The video recorder has been tested and works with the following mobile devices: iPhone, BlackBerry, Window Mobile and Android.)
		24. Specifications:
			1. Electrical:
				1. Input Power: 12V 100 – 240 VAC, 4-2A, 60/50 Hz
				2. Power Consumption: 100 Watts
			2. Video
				1. 16-BNC Looping Inputs, Auto Terminating
				2. Main Monitor Output: BNC Composite,1 Output; VGA: 1 Output; HDMI: 1 Output
				3. Secondary Monitor Output: BNC Composite, 1Output; VGA, 1 Output
				4. Spot Monitor: BNC Composite: 1 Output
				5. Display Mode (Main & Secondary): 1, 2x2, 1+5, 1+7, 3x3, 4x4 Sequence, PIP, and Digital 2X Zoom
				6. Display Mode (Spot): Full-Screen, Sequence
				7. Display Resolution: 1920 x 1080 (FHD), 800 x 600 (VGA)
				8. Record Resolution CIF, 2CIF, D1
				9. Playback/Record Rate:

480 Images/Second (D1)

Guaranteed Full-Duplex – no Record Rate Reduction

* + - * 1. Compression: H.264
				2. Operating System (OS): Embedded Linux
				3. Storage: 5 HDD (Max 4 HDD w/eSATA HDD)
				4. Data Export Medium: eSATA, iSCSI, USB (HDD, CD-RW, Flash-Drive), IDE (CD-RW, DVD-RW)
				5. Alarm Inputs: 16 Terminal Block, Programmable
				6. Alarm Outputs: 4 Relay Output Terminal Block, Programmable
				7. Alarm Reset: 1 TTL, Terminal Block
				8. Serial Interface

RS232C Serial DB9

RS485 Serial Terminal Block

USB v2.0 x 2 I/O control

* + - * 1. Network Interface: 2 x RJ-45 (1 designated for iSCSI)
				2. Network Interface Card 10/100/1000 Base T Ethernet
				3. Network Protocols Static: IP, ADSL, DHCP, DVRNS (Enhanced DDNS)
				4. Remote Connections: Admin: 2 / Watch 10 / Search: 2
				5. Remote Software:

Basic: Monitoring, Playback, Recording, Setup, PTZ, Upgrade, DVR Status

Advanced: Triplex Operation, (User Defined 64-Channel View), Map Integration, Multi-Site System Health Monitoring, Batch upgrades/modifications

* + - * 1. Remote Data Export: Clip-Player, AVI, JPEG, BMP
				2. Remote Transmission Rate: Maximum 60-ips, with Bandwidth Control
				3. PTZ Control:

1-RS485 Serial Connection (Two Wire Half Duplex), Push Terminal

1-RS232C Serial I/O SubD-9 Connector

* + - * 1. Audio Inputs: 4 RCA + 12 D-sub, Line Level
				2. Audio Outputs: 1 RCA + HDMI, Line Level
				3. Dimensions (W x H x D) 16.9” x 3.5” x 19.3” (430mm x 88mm x 490mm), 2U, Rack Mount
				4. Weight 22.9lbs (10.4kg)
				5. Operating Temp 41°F ~ 104°F (5°C ~ 40°C)
				6. Operating Humidity 0% - 90% (Non-Condensing)
		1. Conformity Certifications:
			1. Federal Communications Commission (FCC)
			2. Underwriters Laboratories (UL)
			3. Restriction of Hazardous Substances (RoHS)
		2. Accessories
			1. LB3L: Recorder Lock Box (Black)
			2. Digital Video eSATA External Storage Devices
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 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.
			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 snugness of mounting screws of all installed equipment.
		2. Test proper operation of all video system devices.
			1. Communication between recorder and cameras.
			2. Independent operation of alarms, and cameras.
		3. Test proper operation of software programs.
		4. 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.
		4. Adjust manual lens irises to meet lighting conditions.
	8. DEMONSTRATION AND TRAINING
		1. Demonstrate at final inspection that video management system and devices function properly.
		2. Demonstrate at final inspection camera’s functionality and video recording capabilities.

END OF SECTION