Exacq Technologies, headquartered in Indianapolis, Indiana, is a leading developer of open architecture, Video Management System (VMS) solutions for security and surveillance applications. Our exacqVision VMS client-server solutions are scalable from a small single camera solution to large scale corporate or campus systems with thousands of cameras. Real-time and recorded video can be viewed, managed and configured from any location on the network.

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STORAGE SEVER SYSTEM MANAGER

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 00 00 Electronic Safety and Security

28 20 00 Electronic Surveillance

28 23 00 Video Surveillance

28 23 19 Digital Video Recorders

Notes to Specifier:

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>.**

2. Explanatory notes and comments are presented in **colored** text.

Important Note to Security Systems Specifiers

CSI MasterFormat 2016 incorporates numerous significant changes affecting electronic safety and security. This document is written to provide flexibility in using either format, although adoption of MasterFormat 2016 is encouraged. The following is a guide to the MasterFormat numbers relevant and related to the product referenced in this specification.

MasterFormat 2014:

27 20 00 Data Communications
28 05 00 Common Work Results for Electronic Safety and Security
28 13 00 Access Control
28 13 16 Access Control Systems and Database Management
28 16 00 Intrusion Detection
28 16 33 Intrusion Detection Control, GUI, and Logic Systems
28 23 00 Video Surveillance
28 23 13 Video Surveillance Control and Management Systems
28 23 16 Video Surveillance Monitoring and Supervisory Interfaces
28 23 19 Digital Video Recorders
28 23 23 Video Surveillance Systems Infrastructure
28 23 29 Video Surveillance Remote Devices and Sensors

MasterFormat 2016:

27 15 01.xx Video Surveillance Communications Conductors and Cables
27 20 00 Data Communications
28 05 00 Common Work Results for Electronic Safety and Security
28 05 xx Power Sources for Electronic Safety and Security
28 05 xx Servers, Workstations and Storage for Electronic Safety and Security
28 05 xx Storage Appliances for Electronic Safety and Security
28 05 xx.xx Network Video Recorders
28 05 xx Cyber Requirements for Electronic Safety and Security
28 05 xx Communications Equipment for Electronic Safety and Security
28 05 xx Systems Integration and Interconnection Requirements
28 05 xx.xx Electrical
28 05 xx.xx Information
28 10 00 Access Control
28 10 xx Access Control Software
28 20 00 Video Surveillance
28 2x 00 Video Management System
28 30 00 Security Detection, Alarm, and Monitoring
28 3x 00 Intrusion Detection
28 3x xx.xx Intrusion Detection Interfaces to Security Monitoring and Control

NETWORK VIDEO RECORDER

1. GENERAL

1.1. SUMMARY

1.1.1. Section includes a device to acquire, record, store, and display video signals from IP network video cameras and encoders.

1.1.2. Related Requirements

1.1.2.1 28 23 19 – Digital Video Recorders

1.1.2.2 28 23 23 – Video Surveillance Systems Infrastructure

1.1.2.3 28 23 29 – Video Surveillance Remote Devices and Sensors

1.2. REFERENCES

1.2.1. Abbreviations

1.2.1.1. FPS – Frames Per Second

1.2.1.2. HDD – Hard Disk Drive

1.2.1.3. IP - Internet Protocol

1.2.1.4. LDAP – Lightweight Directory Access Protocol

1.2.1.5. Mbps – Megabits per second

1.2.1.6. NVR – Network Video Recorder

1.2.1.7. POS – Point of Sale

1.2.1.8. PSIM – Physical Security Information Management

1.2.1.9. VMS - Video Management System

1.2.2. Reference Standards

1.2.2.1. Institute of Electrical and Electronics Engineers (IEEE) 802.3 standards

1.2.2.2. FCC – Code of Federal Regulations, Title 47, Part 15

1.2.2.3. ISO / IEC 14496 – 10 – MPEG-4, Part 10 (H.264)

1.2.2.4. Tested to UL standard IEC 62368-1:2018 and EN 62368-1:2020

1.2.2.5. CE

1.3. SUBMITTALS

1.3.1. Product Data

1.3.1.1. Manufacturer’s printed or electronic data sheets

1.3.1.2. Manufacturer’s installation and operation manuals

1.4. QUALIFICATIONS

1.4.1. Manufacturer shall be ISO 9001 certified with a minimum of three years’ experience in manufacturing digital storage equipment and associated interfaces.

1.5. LICENSES

1.5.1. The NVR shall have 8 (Professional or Enterprise) camera licenses included, with a 5-year SSA.

1.6. WARRANTY AND SUPPORT

1.6.1. Manufacturer shall provide a limited 5-year warranty and updates for device firmware and client and web software during the warranty period.

1.6.1.1. An extended support option shall be available.

END OF SECTION

2. PRODUCTS

2.1. EQUIPMENT

2.1.1. Manufacturer: Exacq Technologies, Inc.
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Fishers, IN 46037 USA
Phone: +1 317 845-5710
Web: https://www.exacq.com
E-mail: exacqinfo@tycoint.com

2.1.2. Models: A-Series 2A
A-Series FA
A-Series FAR

Note:

2.1.3. Alternates: None

2.2. DESCRIPTION

2.2.1. The Network Video Recorder (“NVR”) shall be an appliance to acquire, record, store, and display video signals from both directly connected and IP network video cameras and encoders.

2.2.2. The NVR appliance hardware shall have the following characteristics:

2.2.2.1. Camera inputs

2.2.2.1.1. Up to 64 IP streams (A-Series 2A)
Up to 150 IP streams (A-Series FA, A-Series FAR)

2.2.2.1.2.

2.2.2.2. Maximum HDD 4 front loading (A-Series 2A)
12 hot swappable (A-Series FA, A-Series FAR)

2.2.2.3. Storage capacity: Up to 72 TB (A-Series 2A)
Up to 288 TB (A-Series FA, A-Series FAR)

2.2.2.4. RAID configuration: **<RAID 5> (**A-Series FA), <**RAID 6>** (A-Series FAR)

Exacq part numbers differentiated by number of IP video inputs, storage capacity, and total number of inputs supported. on-board

Model Number	OS	IP Streams	Storage: Total	Storage: Usable	Raid (N/5/6)
IP08-08T-2AL	Linux	64	8TB	8TB	N
IP08-08T-2AW	Windows	64	8TB	8TB	N
IP08-12T-2AL	Linux	64	12TB	12TB	N
IP08-12T-2AW	Windows	64	12TB	12TB	N
IP08-16T-2AL	Linux	64	16TB	16TB	N
IP08-16T-2AW	Windows	64	16TB	16TB	N
IP08-24T-2AL	Linux	64	24TB	24TB	N
IP08-24T-2AW	Windows	64	24TB	24TB	N
IP08-36T-2AL	Linux	64	36TB	36TB	N
IP08-36T-2AW	Windows	64	36TB	36TB	N
IP08-48-2AL	Linux	64	48TB	48TB	N
IP08-48T-2AW	Windows	64	48TB	48TB	N
IP08-72-2AL	Linux	64	72TB	72TB	N
IP08-72T-2AW	Windows	64	72TB	72TB	N
IP08-48T-FAL	Linux	150	48TB	40TB	5
IP08-48T-FAW	Windows	150	48TB	40TB	5
IP08-64T-FAL	Linux	150	64TB	56TB	5
IP08-64T-FAW	Windows	150	64TB	56TB	5
IP08-72T-FAL	Linux	150	72TB	60TB	5
IP08-72T-FAW	Windows	150	72TB	60TB	5
IP08-80T-FAL	Linux	150	80TB	60TB	5
IP08-80T-FAW	Windows	150	80TB	60TB	5
IP08-96T-FAL	Linux	150	96TB	84TB	5
IP08-96T-FAW	Windows	150	96TB	84TB	5
IP08-128T-FAL	Linux	150	128TB	112TB	5
IP08-128T-FAW	Windows	150	128TB	112TB	5
IP08-144T-FAL	Linux	150	144TB	132TB	5
IP08-144T-FAW	Windows	150	144TB	132TB	5
IP08-160T-FAL	Linux	150	160TB	140TB	5
IP08-160T-FAW	Windows	150	160TB	140TB	5
IP08-192T-FAL	Linux	150	192TB	176TB	5
IP08-192T-FAW	Windows	150	192TB	175TB	5
IP08-240T-FAL	Linux	150	240TB	220TB	5
IP08-240T-FAW	Windows	150	240TB	220TB	5
IP08-288T-FAL	Linux	150	288TB	264TB	5
IP08-288T-FAW	Windows	150	288TB	264TB	5
IP08-48T-FARL	Linux	150	48TB	32TB	6
IP08-48T-FARW	Windows	150	48TB	32TB	6
IP08-64T-FARL	Linux	150	64TB	48TB	6
IP08-64T-FARW	Windows	150	64TB	48TB	6
IP08-72T-FARL	Linux	150	72TB	60TB	6
IP08-72T-FARW	Windows	150	72TB	60TB	6
IP08-80T-FARL	Linux	150	80TB	60TB	6
IP08-80T-FARW	Windows	150	80TB	60TB	6
IP08-96T-FARL	Linux	150	96TB	84TB	6
IP08-96T-FARW	Windows	150	96TB	84TB	6
IP08-128T-FARL	Linux	150	128TB	112TB	6

IP08-128T-FARW	Windows	150	128TB	112TB	6
IP08-144T-FARL	Linux	150	144TB	132TB	6
IP08-144T-FARW	Windows	150	144TB	132TB	6
IP08-160T-FARL	Linux	150	160TB	140TB	6
IP08-160T-FARW	Windows	150	160TB	140TB	6
IP08-192T-FARL	Linux	150	192TB	176TB	6
IP08-192T-FARW	Windows	150	192TB	175TB	6
IP08-240T-FARL	Linux	150	240TB	220TB	6
IP08-240T-FARW	Windows	150	240TB	220TB	6
IP08-288T-FARL	Linux	150	288TB	240TB	6
IP08-288T-FARW	Windows	150	288TB	240TB	6

2.2.2.5. Video compression – IP: MJPEG, H.264, H.265 (A-Series, ALL)

2.2.2.6. Microphone input: 1 x 3.5mm connector

2.2.2.7. Audio:

2.2.2.7.1. Inputs: 16 via BNC terminal

2.2.2.7.2. Outputs: 1 x 3.5mm connector

2.2.2.8. Alarms:

2.2.2.8.1. Inputs: USB I/O modules (sold separately)

2.2.2.8.2. Outputs: USB I/O modules (sold separately)

2.2.2.9. Server characteristics:

2.2.2.9.1. Operating system: Windows 11, Ubuntu Linux 22.04

2.2.2.9.2. Operating system drive: 256 GB SSD (A-Series 2A, A-Series FA)
2 x 256 GB SSD configured as RAID 1 (A-Series FAR)

2.2.2.9.3. Monitor outputs: 1 HDMI + 1 VGA + 2 DisplayPort (A-Series 2A)
1 HDMI + 1 VGA + 1 DisplayPort (A-Series FA, A-Series FAR)

2.2.2.9.4. Processor: i3 (A-Series 2A)
i7 (A-Series FA, A-Series FAR)

2.2.2.9.5. Memory: 8GB (16 GB Optional) (A-Series 2A)
16 GB (32 GB Optional) (A-Series FA, A-Series FAR)

2.2.2.9.6. Network: 2 x 2.5 Gbps, 2 x 10Gbps (upgrade sold separately)

2.2.2.9.7. USB ports:

2.2.2.9.7.1. USB 2.0: 4 (2 front + 2 rear) (A-Series 2A)

2.2.2.9.7.2. USB 3.2: 2 (rear) (A-Series 2A)
7 (2 front + 5 rear) (A-Series FA, A-Series FAR)

2.2.2.9.7.3. USB C 1 (rear) (A-Series FA, A-Series FAR)

2.2.2.9.8. Serial: 2

2.2.2.9.9. Optical Drive: N/A

2.2.2.10. Enclosure

2.2.2.10.1. Material: Unpainted steel

2.2.2.10.2. Dimensions (l x w x h): 23 in. x 19 in. x 3.5 in. (58.42 cm x 48.26 cm x 8.89 cm)

2.2.2.10.3. Weight: 31 lbs. (14.06 kg) (A-Series 2A)
47 lbs. (21.32 kg) (A-Series FA, A-Series FAR)

2.2.2.11. Electrical

2.2.2.11.1. Input voltage: 100-240 VAC (SPSU) (A-Series 2A, A-Series FA)
100-240 VAC (RPSU) (A-Series FAR)

2.2.2.11.2. Power Supply: Single (A-Series 2A, A-Series FA)
Dual Hot swappable (A-Series FAR)

2.2.3. Video Management System (“VMS”)

2.2.3.1. The NVR shall come pre-loaded with VMS server software.

2.2.3.2. The VMS server software shall provide the following features as a minimum:

2.2.3.2.1. System

2.2.3.2.1.1. One server connection per client

2.2.3.2.1.2. Browser-based viewing of live and stored video

2.2.3.2.1.3. Auto detection of supported cameras

2.2.3.2.1.4. Support for fish-eye and panoramic lens cameras

2.2.3.2.1.5. Client bandwidth throttling

2.2.3.2.1.6. Soft triggers

2.2.3.2.1.7. Pre and post alarm recording

2.2.3.2.1.8. Continuous motion, time or alarm-based recording, configurable per camera

2.2.3.2.2. Live video view

2.2.3.2.2.1. Multiple monitor view support

2.2.3.2.2.2. PTZ control and presets

2.2.3.2.2.3. Digital PTZ control and presets

2.2.3.2.2.4. Motion and alarm indication

2.2.3.2.2.5. Event linking on discrete inputs

2.2.3.2.3. Search, playback, export, archive

2.2.3.2.3.1. Instant replay

2.2.3.2.3.2. Event search

2.2.3.2.3.2.1. Thumbnail views

2.2.3.2.3.2.2. Timeline views

2.2.3.2.3.3. Multi-camera playback

2.2.3.2.3.4. Export options

2.2.3.2.3.4.1. USB storage device

2.2.3.2.3.4.2. .AVI, .MOV, .MP4 or.EXE file

2.2.3.2.4. The NVR shall have the ability to support pre-loaded VMS software providing additional advanced functionality, including the following:

2.2.3.2.4.1. System

2.2.3.2.4.1.1. Server connections – up to 512 via a thick client interface or 16 via web client

2.2.3.2.4.1.2. Ability to specify minimum and maximum retention times on a per camera basis
2.2.3.2.4.1.3. Time-lapse recording
2.2.3.2.4.1.4. Extended storage
2.2.3.2.4.1.5. Archiving
2.2.3.2.4.1.6. Audit trail
2.2.3.2.4.1.7. Custom user groups
2.2.3.2.4.1.8. Intelligent search
2.2.3.2.4.1.9. E-mail notifications on system health
2.2.3.2.4.1.10. Enterprise level camera, server, and user management
2.2.3.2.4.1.11. LDAP and active directory support
2.2.3.2.4.2. Live view
2.2.3.2.4.2.1. Event linking on video, serial, and health events
2.2.3.2.4.2.2. Video wall support
2.2.3.2.4.2.3. Event-driven and time-based video switching
2.2.3.2.4.2.4. Camera groups
2.2.3.2.4.2.5. Multi-streaming
2.2.3.2.4.2.6. Event notifications
2.2.3.2.4.2.7. Map support, including hierarchical maps
2.2.3.2.4.2.8. Two-way audio
2.2.3.2.4.3. Search, playback, export, archive
2.2.3.2.4.3.1. Multiple camera export

The NVR comes with the either exacqVision Professional or Enterprise software pre-loaded.

2.2.4. User Interfaces – The NVR shall support both thick client browser-based and a mobile web client interface.

2.2.4.1. Thick client

2.2.4.1.1. Client software shall be downloadable at no charge from the NVR Manufacturer's web site and be fully compatible with all available features of the VMS server software.

2.2.4.1.2. The client software shall be available for Windows, Apple iOS, and Linux operating systems.

2.2.4.2. Mobile web client

2.2.4.2.1. A free mobile application shall be available permitting remote view of live and recorded video through the NVR.

2.2.4.2.2. The mobile application shall support PTZ control and the monitoring and activation of alarms and triggers for the mobile device.

2.2.4.2.3. The mobile application shall be available for devices running Apple iOS, Google Android, Microsoft Windows, and Amazon Kindle Fire software.

2.2.4.2.4. The mobile application shall allow simultaneous interaction with multiple NVR devices from the same Manufacturer.

2.2.4.2.5. The web service supporting the mobile application shall size the video stream to accommodate both low bandwidth and high bandwidth networks.

2.3. PERFORMANCE

2.3.1. Compatibility

2.3.1.1. Video:	The NVR shall be compatible with the list of IP camera manufacturing partners located at: https://exacq.com/integration/ipcams/
2.3.1.2. Access control:	The NVR shall be compatible with the list of Access Control Integration partners listed at: https://exacq.com/integration/access_control/
2.3.1.3. POS and retail analytics:	The NVR shall be compatible with the list of POS and retail analytic partners listed at: https://exacq.com/integration/retail_analytics/
2.3.1.4. PSIM:	The NVR shall be compatible with the list of PSIM partners located at: https://exacq.com/integration/psim/
2.3.1.5. Intrusion:	The NVR shall be compatible with the list of intrusion partners located at: https://exacq.com/integration/intrusion/
2.3.1.6. Intercom and audio analytics:	The NVR shall be compatible with the list of Intercom and audio analytics partners located at: https://exacq.com/integration/intercom-audio-analytics/

Specifier should complete the above sections to include manufacturers of those existing or new devices or software that will interface with the NVR.

A list of integrations from Exacq is available at https://exacq.com/integration.

2.3.2. Video throughput

2.3.2.1. Video storage rate – Windows:	350 Mbps (A-Series 2A) 700 Mbps (A-Series FA) 650Mbps (A-Series FAR)
2.3.2.2. Video storage rate – Linux:	400 Mbps (A-Series 2A) 750 Mbps (A-Series FA) 700 Mbps (A-Series FAR)

2.3.3. Display

2.3.3.1. Local client display rate – Windows:	375 FPS @ 1080p
2.3.3.2. Local client display rate – Linux:	700 FPS @ 1080p

2.4. ENVIRONMENTAL

2.4.1.	Operating temperature:	40 – 95 degrees Fahrenheit (4.5 – 35 degrees C)
2.4.2.	Power/heat load (Max):	
2.4.2.1.	A-Series 2A	150 Watt / BTU/H 204.728498
2.4.2.2.	A-Series FA, A-Series FAR:	500 Watt / BTU/H 699.4890348

2.5. OPTIONAL EQUIPMENT

2.5.1. The NVR shall have optional expansion capability for alarm inputs and outputs.

Exacq's USB I/O Module provides 8 TTL inputs, 4 TTL outputs, 1 relay output, and 1 RS-485 serial port through a USB interface.

END OF SECTION

3. EXECUTION

3.1. INSTALLATION

3.1.1. Contractor shall comply with all Manufacturer installation guidelines.

3.1.2. Contractor personnel shall comply with all applicable state and local licensing requirements.

3.2. STORAGE

3.2.1. Hardware shall be stored in an environment where temperature and humidity are in the range specified by the hardware manufacturer.

END OF SECTION