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 and Analog Recording Devices**

**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 and Analog Recording Devices

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

**HYBRID NETWORK VIDEO RECORDER**

* + - 1. **GENERAL**
  1. **SUMMARY**

## Section includes a device to acquire, record, store, and display video signals from both directly connected analog cameras and IP network video cameras and encoders.

## Related Requirements

* + - 1. 28 23 19 – Digital Video Recorders and Analog Recording Devices
      2. 28 23 23 – Video Surveillance Systems Infrastructure
      3. 28 23 29 – Video Surveillance Remote Devices and Sensors
  1. **REFERENCES**
     1. Abbreviations
        1. HDD – Hard Disk Drive
        2. IP - Internet Protocol
        3. LDAP – Lightweight Directory Access Protocol
        4. Mbps – Megabits per second
        5. NVR – Network Video Recorder
        6. POS – Point of Sale
        7. PSIM – Physical Security Information Management
        8. VMS - Video Management System
     2. Reference Standards
        1. Institute of Electrical and Electronics Engineers (IEEE) 802.3 standards
        2. FCC – Code of Federal Regulations, Title 47, Part 15
        3. ISO / IEC 14496 – 10 – MPEG-4, Part 10 (H.264)
        4. UL
        5. CE
  2. **SUBMITTALS**
     1. Product Data
        1. Manufacturer’s printed or electronic data sheets
        2. Manufacturer’s installation and operation manuals
  3. **QUALIFICATIONS**
     1. Manufacturer shall be ISO 9001 certified with a minimum of three years’ experience in manufacturing digital storage equipment and associated interfaces.
  4. **LICENSES**
     1. The NVR shall have 8 IP camera licenses included, with a provision to acquire additional licenses to a total of 128.
  5. **WARRANTY AND SUPPORT**
     1. Manufacturer shall provide a limited three-year warranty and updates for device firmware and client and web software during the warranty period.
        1. An extended support option shall be available.

**END OF SECTION**

1. **PRODUCTS**
   1. **EQUIPMENT**
      1. Manufacturer: Exacq Technologies, Inc.

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* + 1. Model: Z-Series Hybrid 4U

Note: Exacq offers an IP-only version of this product.

* + 1. Alternates: None
  1. **DESCRIPTION**
     1. The Hybrid Network Video Recorder (“NVR”) shall be an appliance to acquire, record, store, and display video signals from both directly connected analog cameras and IP network video cameras and encoders.
     2. The NVR appliance hardware shall have the following characteristics:
        1. Camera inputs
           1. **<16> <32> <48> <64>** analog
           2. Up to 128 IP video cameras or encoders
        2. Audio Inputs: **<16>** analog
        3. Storage capacity: **<2 TB> <4 TB> <6 TB> <8 TB> <10 TB> <12 TB> on a single HDD**
        4. RAID configuration: **<RAID 5> <RAID 6>** All Z-Series are configured for RAID storage

Exacq part numbers differentiated by number of analog inputs and on-board storage capacity (all models have up from 8 - 128 IP video inputs, depending on licenses acquired):

Model Number Analog Video Inputs Storage Capacity (TB) Audio Inputs

1608-24T-R4Z 16 24, 16 Available 16  
1608-28T-R4Z 16 28, 20 Available 16  
1608-32T-R4Z 16 32, 24 Available 16  
1608-36T-R4Z 16 36, 28 Available 16  
1608-42T-R4Z 16 42, 30 Available 16  
1608-54T-R4Z 16 54, 42 Available 16  
1608-66T-R4Z 16 66, 54 Available 16  
1608-78T-R4Z 16 78, 66 Available 16  
1608-90T-R4Z 16 90, 78 Available 16  
1608-102T-R4Z 16 102, 90 Available 16  
1608-114T-R4Z 16 114, 102 Available 16  
1608-128T-R4Z 16 128, 112 Available 16  
1608-144T-R4Z 16 144, 128 Available 16  
1608-160T-R4Z 16 160, 144 Available 16  
1608-180T-R4Z 16 180, 160 Available 16  
1608-204T-R4Z 16 204, 180 Available 16  
1608-240T-R4Z 16 240, 216 Available 16  
3208-24T-R4Z 32 24, 16 Available 16  
3208-28T-R4Z 32 28, 20 Available 16  
3208-32T-R4Z 32 32, 24 Available 16  
3208-36T-R4Z 32 36, 28 Available 16  
3208-42T-R4Z 32 42, 30 Available 16  
3208-54T-R4Z 32 54, 42 Available 16  
3208-66T-R4Z 32 66, 54 Available 16  
3208-78T-R4Z 32 78, 66 Available 16  
3208-90T-R4Z 32 90, 78 Available 16  
3208-102T-R4Z 32 102, 90 Available 16  
3208-114T-R4Z 32 114, 102 Available 16  
3208-128T-R4Z 32 128, 112 Available 16  
3208-144T-R4Z 32 144, 128 Available 16  
3208-160T-R4Z 32 160, 144 Available 16  
3208-180T-R4Z 32 180, 160 Available 16  
3208-204T-R4Z 32 204, 180 Available 16  
3208-240T-R4Z 32 240, 216 Available 16  
4808-24T-R4Z 48 24, 16 Available 16  
4808-28T-R4Z 48 28, 20 Available 16  
4808-32T-R4Z 48 32, 24 Available 16  
4808-36T-R4Z 48 36, 28 Available 16  
4808-42T-R4Z 48 42, 30 Available 16  
4808-54T-R4Z 48 54, 42 Available 16  
4808-66T-R4Z 48 66, 54 Available 16  
4808-78T-R4Z 48 78, 66 Available 16  
4808-90T-R4Z 48 90, 78 Available 16  
4808-102T-R4Z 48 102, 90 Available 16  
4808-114T-R4Z 48 114, 102 Available 16  
4808-128T-R4Z 48 128, 112 Available 16  
4808-144T-R4Z 48 144, 128 Available 16  
4808-160T-R4Z 48 160, 144 Available 16  
4808-180T-R4Z 48 180, 160 Available 16  
4808-204T-R4Z 48 204, 180 Available 16  
4808-240T-R4Z 48 240, 216 Available 16  
6408-24T-R4Z 64 24, 16 Available 16  
6408-28T-R4Z 64 28, 20 Available 16  
6408-32T-R4Z 64 32, 24 Available 16  
6408-36T-R4Z 64 36, 28 Available 16  
6408-42T-R4Z 64 42, 30 Available 16  
6408-54T-R4Z 64 54, 42 Available 16  
6408-66T-R4Z 64 66, 54 Available 16  
6408-78T-R4Z 64 78, 66 Available 16  
6408-90T-R4Z 64 90, 78 Available 16  
6408-102T-R4Z 64 102, 90 Available 16  
6408-114T-R4Z 64 114, 102 Available 16  
6408-128T-R4Z 64 128, 112 Available 16  
6408-144T-R4Z 64 144, 128 Available 16  
6408-160T-R4Z 64 160, 144 Available 16  
6408-180T-R4Z 64 180, 160 Available 16  
6408-204T-R4Z 64 204, 180 Available 16  
6408-240T-R4Z 64 240, 216 Available 16

* + - 1. Video compression – Analog: MJPEG, H.264
      2. Video compression – IP: MJPEG, MPEG-4, H.264, H.265
      3. Video output: 1 multiplexed via BNC connector per 16 channels
      4. Microphone input: 1 RCA connector
      5. Audio:
         1. Inputs: 16 via screw terminal
         2. Outputs: 1
      6. Alarms:
         1. Inputs: provision for 16 external TTL
         2. Outputs: provision for 15 external TTL, 1 external relay
      7. Server characteristics:
         1. Operating system: Windows 10 / Windows 2016 / Ubuntu Linux 18.04
         2. Operating system drive: 120 GB SSD
         3. Monitor outputs: 1 HDMI + 1 DVI-I + 1 VGA (max 2 simultaneously)
         4. Processor: Gen 7 Intel® Core i7 (Gen 7 Intel® Xeon E3 optional)
         5. Memory: 8 GB (16GB Optional)
         6. Network: 2 x 1000 BASE-T (2 x 10 Gbps SPF+ optional)
         7. USB 3.0 ports: 6 (2 Front, 4 Rear)
         8. Serial: 1 RS485
      8. Enclosure
         1. Material: painted steel
         2. Dimensions (l x w x h): 27 in. x 17 in. x 7 in. (68.6 cm x 43.18 cm x 17.8 cm)
         3. Weight: 49 – 90 lbs. (22.3 – 40.9 kg) maximum
      9. Electrical
         1. Input voltage: 120/240 VAC auto-sensing
         2. Power Supply: Dual Hot Swap
    1. Video Management System (“VMS”)
       1. The NVR shall come pre-loaded with VMS server software.
       2. The VMS server software shall provide the following features as a minimum:
          1. System

One server connection per client

Browser-based viewing of live and stored video

Auto detection of supported cameras

Support for fish-eye and panoramic lens cameras

Client bandwidth throttling

Soft triggers

Pre and post alarm recording

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

* + - * 1. Live video view

Multiple monitor view support

PTZ control and presets

Digital PTZ control and presets

Motion and alarm indication

Event linking on discrete inputs

* + - * 1. Search, playback, export, archive

Instant replay

Event search

Thumbnail views

Timeline views

Multi-camera playback

Export options

USB storage device

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

* + - * 1. The NVR shall have the ability to support pre-loaded VMS software providing additional advanced functionality, including the following:

System

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

Ability to specify minimum and maximum retention times on a per camera basis

Time-lapse recording

Extended storage

Archiving

Audit trail

Custom user groups

Intelligent search

E-mail notifications on system health

Enterprise level camera, server, and user management

LDAP and active directory support

Live view

Event linking on video, serial, and health events

Video wall support

Event-driven and time-based video switching

Camera groups

Multi-streaming

Event notifications

Map support, including hierarchical maps

Two-way audio

Search, playback, export, archive

Multiple camera export

The NVR comes with the exacqVision Start software pre-loaded. Additional functionality is available through upgrade to exacqVision Professional or exacqVision Enterprise VMS software.

* + 1. User Interfaces – The NVR shall support both thick client browser-based and a mobile web client interface.
       1. Thick client
          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. The client software shall be available for Windows, Apple iOS, and Linux operating systems.
       2. Mobile web client
          1. A free mobile application shall be available permitting remote view of live and recorded video through the NVR.
          2. The mobile application shall support PTZ control and the monitoring and activation of alarms and triggers for the mobile device.
          3. The mobile application shall be available for devices running Apple iOS, Google Android, Microsoft Windows, and Amazon Kindle Fire software.
          4. The mobile application shall allow simultaneous interaction with multiple NVR devices from the same Manufacturer.
          5. The web service supporting the mobile application shall size the video stream to accommodate both low bandwidth and high bandwidth networks.
  1. **PERFORMANCE**
     1. Compatibility
        1. Video – The NVR shall be compatible with the following video manufacturers:
        2. Access control - The NVR shall be compatible with the following access control manufacturers:
        3. POS and retail analytics - The NVR shall be compatible with the following POS and retail analytics manufacturers: Agilence, Sensormatic, Prism Skylabs, Tokheim and Voloforce.
        4. PSIM - The NVR shall be compatible with the following PSIM manufacturers: SureView and VidSys.

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.

* + 1. Recording
       1. Video storage rate: 800 Mbps – Windows

1200 Mpbs – Linux

* + 1. Display
       1. Local client display rate: 700 frames per second (Windows) – HD resolution

900 frames per second (Linux) – HD resolution

* 1. **ENVIRONMENTAL**
     1. Operating temperature: 40 – 95 degrees Fahrenheit (4.5 – 35 degrees C)
     2. Power/heat load (Max | Typical): 440 Watts/1470 BTU/hr | 220 Watts/730 BTU/hr
  2. **OPTIONAL EQUIPMENT** 
     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**

1. **EXECUTION**
   1. **INSTALLATION**
      1. Contractor shall comply with all Manufacturer installation guidelines.
      2. Contractor personnel shall comply with all applicable state and local licensing requirements.
   2. **STORAGE**
      1. Hardware shall be stored in an environment where temperature and humidity are in the range specified by the hardware manufacturer.

**END OF SECTION**