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.

For additional information, contact:

Exacq Technologies, Inc.  
 11955 Exit Five Parkway  
 Fishers, IN 46037 USA

Phone: +1 317 845-5710

Web: [https://www.exacq.com](https://www.exacq.com/products/a/)

E-mail: [exacqinfo@tycoint.com](mailto:exacqinfo@tycoint.com)

**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.

Unless, otherwise noted, < > bracketed options apply to 2RU, 4RU, and Desktop product versions, respectively.

## 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 4 or 8 IP camera licenses included, with a provision to acquire additional licenses to a total of 64.
  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.

11955 Exit Five Parkway

Fishers, IN 46037 USA

Phone: +1 317 845-5710

Web: [https://www.exacq.com](https://www.exacq.com/products/a/)

E-mail: [exacqinfo@tycoint.com](file:///C:\Users\jdelaney\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\M5S90ZV5\exacqinfo@tycoint.com)

* + 1. Model: A-Series Hybrid

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. Chassis: **<2 RU rack-mount> <4 RU rack-mount> <Desktop>**
        2. Camera inputs
           1. Analog: **<8> <16 looping> <32 looping>** **<48> <64>**

Note: Exacq offers the following analog input options in the A-Series Hybrid:  
  
 2RU: 16 (looping); 32  
 4RU: 16 (looping); 32 (looping); 48; 64  
 Desktop: 8; 16; 32

* + - * 1. IP: Up to 64 IP video cameras or encoders
        2. Connectors: BNC
      1. Audio Inputs: **<8> <16> <32>**

Note: Exacq offers the following audio input options in the A Hybrid Series:  
  
 2RU: 16  
 4RU: 16   
 Desktop: 8; 16; 32

* + - 1. Storage capacity: **<2 TB> <4 TB> <6 TB> <8 TB> <10 TB> on a single HDD**
      2. RAID capability: **<N//A> <RAID 5 option> <N/A>** (Add part 5000-40341 for RAID in 4RU)

Exacq part numbers differentiated by number of analog inputs and on-board storage capacity (all models have up to 4 - 64 IP video inputs, depending on licenses acquired):

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

0804-02T-DT 8 2 8  
0804-04T-DT 8 4 8  
0804-06T-DT 8 6 8  
0804-08T-DT 8 8 8  
0804-12T-DT 8 12 8  
0804-16T-DT 8 16 8  
0804-20T-DT 8 20 8  
1608-02T-DT 16 2 16  
1608-04T-DT 16 4 16  
1608-06T-DT 16 6 16  
1608-08T-DT 16 8 16  
1608-12T-DT 16 12 16  
1608-16T-DT 16 16 16  
1608-20T-DT 16 20 16  
3208-02T-DT 32 2 32  
3208-04T-DT 32 4 32  
3208-06T-DT 32 6 32  
3208-08T-DT 32 8 32  
3208-12T-DT 32 12 32  
3208-16T-DT 32 16 32  
3208-20T-DT 32 20 32  
1608-02T-R2A 16 2 16  
1608-04T-R2A 16 4 16  
1608-06T-R2A 16 6 16  
1608-08T-R2A 16 8 16  
1608-12T-R2A 16 12 16  
1608-18T-R2A 16 18 16  
1608-24T-R2A 16 24 16  
1608-30T-R2A 16 30 16  
3208-02T-R2A 32 2 16  
3208-04T-R2A 32 4 16  
3208-06T-R2A 32 6 16  
3208-08T-R2A 32 8 16  
3208-12T-R2A 32 12 16  
3208-18T-R2A 32 18 16  
3208-24T-R2A 32 24 16  
3208-30T-R2A 32 30 16  
1608-06T-R4A 16 6 16  
1608-08T-R4A 16 8 16  
1608-10T-R4A 16 10 16  
1608-12T-R4A 16 12 16  
1608-16T-R4A 16 16 16  
1608-20T-R4A 16 20 16  
1608-28T-R4A 16 28 16  
1608-36T-R4A 16 36 16  
1608-48T-R4A 16 48 16  
1608-64T-R4A 16 64 16  
1608-80T-R4A 16 80 16  
3208-06T-R4A 32 6 16  
3208-08T-R4A 32 8 16  
3208-10T-R4A 32 10 16  
3208-12T-R4A 32 12 16  
3208-16T-R4A 32 16 16  
3208-20T-R4A 32 20 16  
3208-28T-R4A 32 28 16  
3208-36T-R4A 32 36 16  
3208-48T-R4A 32 48 16  
3208-64T-R4A 32 64 16  
3208-80T-R4A 32 80 16  
4808-06T-R4A 48 6 16  
4808-08T-R4A 48 8 16  
4808-10T-R4A 48 10 16  
4808-12T-R4A 48 12 16  
4808-16T-R4A 48 16 16  
4808-20T-R4A 48 20 16  
4808-28T-R4A 48 28 16  
4808-36T-R4A 48 36 16  
4808-48T-R4A 48 48 16  
4808-64T-R4A 48 64 16  
4808-80T-R4A 48 80 16  
6408-06T-R4A 64 6 16  
6408-08T-R4A 64 8 16  
6408-10T-R4A 64 10 16  
6408-12T-R4A 64 12 16  
6408-16T-R4A 64 16 16  
6408-20T-R4A 64 20 16  
6408-28T-R4A 64 28 16  
6408-36T-R4A 64 36 16  
6408-48T-R4A 64 48 16  
6408-64T-R4A 64 64 16  
6408-80T-R4A 64 80 16

* + - 1. Video compression – Analog: MJPEG, H.264
      2. Video compression – IP: MJPEG, MPEG-4, H.264, H.265
      3. Video outputs: 16/32 2RU 16/32/48/64 4RU 8/16/32 Desktop
         1. By system: **<2/2> <2/2/4/4> <1/2/2>**
      4. Microphone input: 1 RCA connector
      5. Audio outputs: 1 stereo (RCA connectors)
      6. Alarms:
         1. Inputs: **<16> <16> <8>** TTL
         2. Outputs: **<15> <15> <3>** TTL and 1 relay
      7. Server characteristics:
         1. Operating system: Windows 10 / Windows Server 2016 / Ubuntu 18.04
         2. Operating system drive: 120 GB SSD
         3. Monitor outputs: 1 DVI-I + 1 HDMI +1 Display Port (max 2 simultaneous)
         4. Processor: Gen 7 Intel® Core i3; Intel® Core i5 or i7 (Optional)
         5. Memory: 4 GB; 8 GB, 16GB (optional)
         6. Network: 2 x 1000 BASE-T (Gigabit)
         7. USB 3.0 ports: 6 (2 Front, 4 Rear)
         8. Optical Drive: **<optional> <optional> <included>** (option is external)
      8. Enclosure
         1. Material: painted steel
         2. Dimensions (l x w x h):

2RU: 21.25 in x 16.75 in x 3.5 in (54.7 cm x 42.6 cm x 8.9 cm)

4RU: 28 in x 16.75 in x 7.00 in (71.2 cm x 42.6 cm x 17.8 cm)

Desktop: 15.675 in x 13 in x 5.375 in (39.7 cm x 33.1 cm x 14.6 cm)

* + - * 1. Weight:

Pounds (lbs): **<27 – 31> <44 – 60> <18.5 – 22.0>** maximum

Kilograms (kg): **<12.3 – 14.1> <20.0 – 27.3> <8.4 – 10.0>** maximum

* + - 1. Electrical
         1. Input voltage: 120/240 VAC auto-sensing
    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 Professional software pre-loaded. Additional functionality is available through upgrade to 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: AMAG, Brivo, CDVI, CEM Systems, DSX, G4S, Gallagher, ICT, Identicard, Infinias, Inner Range, Kantech, Keyscan, Lenel, Maxxess, Open Options, Paxton, PCSC, RBH Access, R2 Technologies, S2 Security and Software House.
        3. POS and retail analytics - The NVR shall be compatible with the following POS and retail analytics manufacturers: Micros, Agilence, Sensormatic, Prism Skylabs, Tokheim and Voloforce.
        4. PSIM - The NVR shall be compatible with the following PSIM manufacturers: Advancis, ConnectOne, Honeywell, Network Harbor, Qognify, Proximex, 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:
          1. Windows: **<300> <300> <250>** Mbps
          2. Linux: **<450> <550> <300>** Mbps
    2. Display
       1. Local client display rate:
          1. Windows HD resolution: 700 frames per second
          2. Windows Analog resolution: 1800 frames per second
          3. Linux HD resolution: 900 frames per second
          4. Linux Analog resolution: 1800 frames per second
  1. **ENVIRONMENTAL**
     1. Operating temperature: 40 – 95 degrees Fahrenheit (4.5 – 35 degrees C)
     2. Power/heat load (Max | Typical):
        1. 2U Rackmount: 170 Watts/570 BTU/hr | 120 Watts/400 BTU/hr
        2. 4U Rackmount: 280 Watts/940 BTU/hr | 150 Watts/500 BTU/hr
        3. Desktop: 170 Watts/570 BTU/hr | 120 Watts/400 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**