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

PoE NETWORK VIDEO RECORDER

1. **GENERAL**

    1.1. **SUMMARY**

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

        Unless, otherwise noted, < > bracketed options apply to 4-port PoE and 8-port PoE product versions, respectively.

        1.1.2.   Related Requirements

            1.1.2.1   28 23 19 – Digital Video Recorders and Analog Recording Devices

            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. HDD – Hard Disk Drive

            1.2.1.2. IP - Internet Protocol

            1.2.1.3. LDAP – Lightweight Directory Access Protocol

            1.2.1.4. Mbps – Megabits per second

            1.2.1.5. NVR – Network Video Recorder

            1.2.1.6. POS – Point of Sale

            1.2.1.7. PSIM – Physical Security Information Management

            1.2.1.8. VMS - Video Management System

            1.2.1.9. PoE – Power Over Ethernet

        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. UL (Power Supply only)

            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 **<4> <8>** IP camera licenses included.

1.6. WARRANTY AND SUPPORT

1.6.1.   Manufacturer shall provide a limited three-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.
11955 Exit Five Parkway
Fishers, IN 46037 USA
Phone: +1 317 845-5710
Web: https://www.exacq.com
E-mail: exacqinfo@tycoint.com

2.1.2. Model: G-Series PoE

2.1.3. Alternates: None

2.2. DESCRIPTION

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

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

2.2.2.1. Chassis: **1 RU rack-mount (shelf)**

2.2.2.2. Camera inputs

    2.2.2.2.1. IP: **<4> <8>**

    2.2.2.2.2. Connectors: **<4> <8>** PoE

2.2.2.3. Audio Inputs: **N/A**

2.2.2.4. Storage capacity: **<4 TB> <6 TB> on a single HDD**

Exacq part numbers differentiated by number of PoE inputs and on-board storage capacity (models have either 4 or 8 IP video inputs, licenses included):

Model Number	Storage Capacity (TB)	Included IP Licenses
PE04-01T-G	1	4
PE04-02T-G	2	4
PE04-04T-G	4	4
PE08-02T-G	2	8
PE08-04T-G	4	8
PE08-06T-G	6	8

2.2.2.5. Video compression – IP: MJPEG, MPEG-4, H.264, H.265

2.2.2.6. Video outputs: N/A

2.2.2.7. Microphone input: 1 RCA connector

2.2.2.8. Audio outputs: 1 stereo (RCA connectors)

2.2.2.9. Alarms:

    2.2.2.9.1. Inputs: provision for 8 external TTL

    2.2.2.9.2. Outputs: provision for 4 external TTL, 1 external relay

2.2.2.10.   Server characteristics:

    2.2.2.10.1. Operating system: Ubuntu Linux 18.04

        2.2.2.10.1.1.   Linux: 60 GB Partition

    2.2.2.10.2. Monitor outputs: 1 HDMI +1 Display Port (max 1 simultaneous)

    2.2.2.10.3. Processor: Gen 7 Intel® Atom

    2.2.2.10.4. Memory: 4 GB

    2.2.2.10.5. Network: 2 x 1000 BASE-T (Gigabit)

    2.2.2.10.6. USB 2.0 ports: 2 (front)

    2.2.2.10.7. USB 3.0 ports: 2 (rear)

    2.2.2.10.8. Optical Drive: **<optional> <optional>** (option is external)

2.2.2.11.   Enclosure

    2.2.2.11.1. Material: painted steel

    2.2.2.11.2. Dimensions (l x w x h):

        2.2.2.11.2.1.   4- and 8-port: 8.67 in x 10.82 in x 1.73 in (22 cm x 27.5 cm x 4.4 cm)

    2.2.2.11.3. Weight:

        2.2.2.11.3.1.   Pounds (lbs):   6 maximum

        2.2.2.11.3.2.   Kilograms (kg): 2.72 maximum

2.2.2.12.   Electrical (System)

    2.2.2.12.1. Input voltage: 56V-DC, 1.8A

2.2.2.13.   Electrical (PoE)

    2.2.2.13.1. Output voltage: **<60> <120>** watts maximum

The NVR will provide 15 watts simultaneous on all ports, and up to 30 watts on any port.

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 exacqVision Start software pre-loaded. Additional functionality is available through upgrade to exacqVision Professional or exacqVision Enterprise VMS software.

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 following video manufacturers:

2.3.1.2. 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.

2.3.1.3. 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.

2.3.1.4. 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.

2.3.2. Recording

2.3.2.1.1. Video storage rate:

2.3.2.1.2. Linux: 60 Mbps

2.3.3. Display

2.3.3.1. Local client display rate:

2.3.3.1.1. Linux HD resolution: **<60> <120>** frames per second

2.4. ENVIRONMENTAL

2.4.1. Operating temperature: 32 – 104 degrees Fahrenheit (0 – 40 degrees C)

2.4.2. Power/heat load: **<100/150> <180/150>** Watts/BTU per hour maximum

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