exacqVision START ® Video Management System Software

TECHNICAL SPECIFICATIONS SECURITY SYSTEM

DIVISION – 28 ELECTRONIC SAFETY AND SECURITY

LEVEL 1\_\_28 20 00 ELECTRONIC SURVEILLANCE

LEVEL 2\_\_28 23 00 VIDEO SURVEILLANCE

LEVEL 3\_\_28 23 19 DIGITAL VIDEO RECORDERS AND ANALOG RECORDING DEVICES

PART 2 – PRODUCTS

2.01 VIDEO MANAGEMENT SYSTEM SOFTWARE OVERVIEW

A. Basic Architecture.

The exacqVision Start Video Management System (VMS) software shall be used to view live and recorded video from IP cameras and video encoders connected to local and wide area networks. The VMS software shall have a Client/Server-based architecture that can be configured as a standalone VMS system with the Client software running on the server hardware and/or the Client running on any network-connected TCP/IP PC workstation. Multiple client workstations shall be capable of simultaneously viewing live and/or recorded video from a single server. Each server shall also be able to simultaneously provide live and/or recorded video to one or more workstations.

B. IP Camera and Encoder Support.

The VMS software shall have an open architecture supporting IP cameras and encoders from multiple manufacturers providing best-of-breed solutions ranging from low-cost, entry-level features to high-resolution, megapixel features. A minimum of eight (8) IP camera manufacturers shall be supported from leading companies such as ACTi, Arecont Vision, AXIS, Basler, IQinVision, ioimage, Panasonic, Sanyo, Sony, StarDot, and Vivotek.

C. VMS Client Server Architecture.

The VMS software shall be based on a Client/Server architecture that provides a scalable platform, whereby each computer on a network is a client, a server, or both a client and a server simultaneously.

D. VMS Client Software.

A client is a computer system that accesses a remote service on another computer through a TCP/IP network. The VMS Client software displays and searches live and recorded video, audio, and alarms; and administers the VMS Server configurations.

1. One VMS Client application shall be installed in two different configurations depending on requirements. The VMS Client shall have the same features, functions, and user interface in either configuration. The first client installation configuration shall be referred to as a Local Client, meaning the client resides on the same system that is local to the server. The second installation shall be referred to as a Remote Client, meaning it is installed on a different computer that is “remote” from the server and is connected to the server through a local or wide area network. All interaction (viewing live or recorded video and administration) with the server shall be performed through either the Local or Remote client.

2. When configuring a server with full administrative privileges with either a Local or Remote Client, all administration and configurations functions shall be identical. By having full administration and configuration features from a Remote Client, customers and installers shall not be required to administer features where the server hardware is physically located.

3. Video recording shall be allowed to continue at all times during the administration and configuration of any feature of a server from either a Local or Remote. The VMS Client software shall have the same functionality when connected remotely as it does when it is run locally on the same computer as the server software.

4. The VMS Client software shall operate on any of the following operating systems:

a. Microsoft Windows Server 2003/2008

b. Microsoft Windows XP (all versions)

c. Microsoft Windows Vista (all versions)

d. Microsoft Windows 7 (all versions)

e. Linux Ubuntu 6.06/8.04/10.04 Debian Package

f. Mac OSX (operating on Intel CPU)

5. Any combination of VMS Client applications running on any of the supported operating systems shall be able to connect to view and retrieve live or recorded video from any of the VMS applications running on any of the operating systems.

6. At any one time, the VMS Client shall only be able to connect to a single VMS server. When trying to connect to a second VMS server, it shall prompt you to disconnect from the current connected VMS server.

E. Thin Client Browser.

A Client Browser shall allow connections to multiple VMS Servers simultaneously to display live video, recorded video, and PTZ commands. The Client Browser shall operate without installing any software. The VMS Server shall transcode the video into a JPEG file of the size as the browser screen before sending it to the browser. The Client Browser shall display live or recorded video on a PC, Mac, Linux PC, PDA, iPhone, or CEL phone using the following browsers:

1. Internet Explorer 7, 8 or later

2. Firefox 2, 3 or later

3. Opera 9 and later

4. Safari 2 or 3

5. The Client Browser shall also connect with non-JavaScript browsers and shall be compliant with HTML 4.0 (www.w3.org).

F. Mobile Client

The VMS software shall provide at no additional charge a purpose built mobile application capable of viewing multiple simultaneous live video streams and playing a recorded video stream. Application shall be provided for both ios android operating systems. Software that utilizes generic mobile browsers is not acceptable.

G. VMS Client on Multiple Monitors.

The VMS software shall have the capability to run multiple client applications simultaneously on one workstation with multiple monitors. Up to twelve (12) monitors shall be configured on a single workstation with one (1) client application running on each monitor. Because decompressing video is CPU-intensive, the PC workstation shall have multiple core processors, with a recommendation of one core for each VMS client application.

H. VMS Server Software.

A server is a computer system that provides services to other computing systems (clients) over a TCP/IP network. The VMS Server software shall record and retrieve video, audio, and alarm data and provide it to the VMS Clients upon request. The VMS Server software shall operate on any of the following operating systems:

1. Microsoft Windows Server 2003/2008

2. Microsoft Windows XP (all versions)

3. Microsoft Windows Vista (all versions)

4. Microsoft Windows 7 (all versions)

5. Linux Ubuntu 6.06/8.04/10.04 Debian Package

I. Standalone Client/Server.

A client and server can simultaneously reside and operate on one computer and communicate to each other through a TCP/IP loopback interface, a special IP address (127.0.0.1) that is designed for the client and server software to communicate with each other on the same computer. By combining the functionality of the VMS Client and Server software on one system, administrators shall be able to deploy both standalone and network configurations that can scale as required. The administrator shall have the added benefit of configuring and administering the VMS server with identical features either locally or remotely.

J. Edge-based Motion Detection.

When using motion-based video recording, the VMS server software shall be based on metadata generated by the edge network device. The edge network devices shall generate the metadata and transmit it with the video stream to the VMS server software. The motion detection feature of the edge device shall generate an alarm whenever movement occurs in the image. The VMS server software shall read the metadata from the edge device to determine if motion occurred, and then it shall records video if it did occur.

K. Licensing VMS Software.

The VMS server software shall have a feature to license the MAC address of the server hardware, either the integrated Ethernet controller or add-in Ethernet adapter. Licensing individual IP cameras or encoders shall not be required. Licensing the server shall simplify the installation and management of IP cameras or encoders by eliminating the need to provide additional MAC addresses for all the individual devices (IP cameras or encoders). If an IP camera or encoder fails to operate for any reason, an administrator shall be able to add a new IP camera or encoder to the VMS server software without obtaining a new license key.

L. Running as a Service.

The VMS server software shall run as a service. If the VMS Client software is shut down, the VMS server software service shall continue to record video and perform all other configured functions.

M. Unified Codeset

Client and server applications shall utilize unified source code for all software versions so additional features can be enabled by licensing without requiring the installation of additional software.

N. Installing and Updating VMS Client Software.

Installing a new release of the VMS Client software shall be accomplished by clicking on an icon in the Client software that connects to the Internet and provides an option to automatically download and install the updated software. If the user has already installed the most recent version of the VMS software, a message box shall be displayed with that information.

O. Installing and Updating VMS Software.

New releases of the VMS software shall be easily accessed from a website. The server software and client software shall be bundled in a single executable file. When running this executable, the VMS software shall give the user the option to install each individual component of the VMS software. The VMS Software shall also have an option for a silent install that allows the pushing of software upgrades for large deployments.

**2.02 VIDEO MANAGEMENT SYSTEM SOFTWARE FEATURES**

A. Operating Modes.

The VMS software shall have three main modes of operation depicted by three icons. Clicking on any of these icons below shall change the mode of operation:

1. Live Display Mode Icon allows users the ability view live video.

2. Search Mode Icon allows users the ability to search for recorded video.

3. Setup Mode Icon allows Administrators and Power Users the ability configure systems.

B. Live Display Mode Features.

A live display mode shall be used to view live video, Point of Sale data, and alarm information. The live display mode shall have the following features to navigate and view live video:

1. Layout Icons – The VMS shall be used to organize the camera video view panel in the following patterns:

a. 1-camera (full-screen) layout

b. 4-camera (2x2) layout

c. 6-camera (3x2) layout

d. 9-camera (3x3) layout

e. 12-camera (4x3) layout

f. 16-camera (4x4) layout

g. 20-camera (5x4) layout

h. 30-camera (6x5) layout

2. The VMS shall display cameras, alarms, monitor, Point of Sale, and audio icons that are connected to the VMS server.

3. The VMS shall display a hierarchy of cameras, audio input, and serial port input icons organized by Cameras (cameras connected to servers), and Views (saved live display layouts). Clicking on navigation pane bars shall switch the navigation tree into the desired navigation tree display.

4. The VMS shall display video from cameras. Cameras shall be dragged from the navigation tree into the view panel to displayed their live video. If multiple video view panels are in a layout, video shall be moveable by dragging video from one view panel to another panel.

5. The VMS shall provide context-sensitive documentation from the online user manual.

7. The VMS shall have the ability to hide the Navigation Tree.

8. The VMS shall enlarge the video display area by hiding the title and task bars.

9. The VMS shall provide PTZ control that allows the maneuvering of a PTZ camera. The VMS shall also allow the calling of PTZ presets by either right-clicking on the camera cell and then selecting the PTZ Preset, or by clicking the PTZ Control Icon and then pressing the PTZ Preset number.

10. The VMS shall display the current date and time.

C. Pan, Tilt, and Zoom (PTZ) Controls.

The VMS software shall control PTZ cameras and be used to maneuver a mechanical PTZ camera and digitally pan, tilt, and zoom on any video. The following methods of controlling a PTZ camera shall be available:

1. PTZ graphics control windows

2. Live graphic overlay PTZ control icons

3. Keyboard control (Up, Down, Left, Right Arrows; Page Up, Page Down for Zoom)

4. PTZ presets

5. Digital PTZ

6. Proportional PTZ control by clicking the mouse in the center and moving it

D. Auto Replay of Recorded Video from Live Display Mode.

The VMS software shall replay recorded video from the Live Display Mode if the user right-clicks in the appropriate video view panel and selecting Replay. The user shall have the option of reviewing video in increments of 5 or 30 seconds; or 1, 5, or 15 minutes. The Replay window shall open and begin downloading the recorded video. A Scrub Bar shall track the progress of the download. The total number of frames in the video segment and the number of frames that have been downloaded shall be displayed in the status bar. The download shall end if the user clicks a Stop Download button.

E. Creating, Saving and Accessing Views.

The VMS software shall have a feature to organize cameras into preset Views by selecting a Layout button in the Live mode and dragging the cameras to the appropriate spot on the Video View Panel. After saving a view, it shall be accessed by clicking the View button from the Navigation Pane. Selecting a view from the Live Views Site Tree shall display the camera layout in the Video View Panel. The VMS software shall have the capability to create and organize views into folders.

F. Video Tours.

The VMS software shall have the capability to automatically cycle through two or more saved views to create a Video Tour by selecting the desired views typing a description of the tour. A dwell time shall determine the amount of time, in seconds, that each view remains in the Video View Panel before the next view is displayed. The tour shall be activated by clicking on the saved tour description icon visible in the View Navigation pane.

G. Search Mode Overview.

The VMS software shall be used to search for and play back recorded video, audio, and events from VMS servers. The system shall also be capable of performing searches on multiple cameras based on specific criteria. The VMS search software shall have the following features:

1. Input Selection Tree – a list of camera(s), audio input(s), or text data to search.
2. Navigation Pane – a list of cameras, video, audio, and events organized by cameras, groups, maps, and views.
3. Video Time Line – a time line of video displayed in increments of 5 minutes, or 1, 8, or 24 hours.
4. Zoom In (+) and Zoom Out (-) Buttons – zooms in and out on the video time line.
5. Camera Selection List – a list of cameras that have been selected from the camera selection tree.
6. Video Cursor – selects the segment of video to play back. Single-clicking shall move the video cursor to a new location; double-clicking shall start video playback.
7. Recorded Bar – bars that represent recorded video or audio.
8. Video Playback Controls – includes the following controls:
   1. Play video in reverse in fast (double) speed
   2. Play video in reverse in normal speed
   3. Stop video play
   4. Play video forward in normal speed
   5. Play video forward in fast speed
   6. Play video forward one frame at a time
   7. Play video backward one frame at a time
9. Calendar – used to select the day of the video search
10. Start Search Time – used to change the time of the video search
11. Search Button –initiates a new video search based on changes that have been made in the camera selection tree, calendar, and start time.
12. Video Playback Window – video window that video is played back in.
13. Export Buttons – includes Save Picture, Save Video, Print Picture, and Burn to CD or DVD.
14. Scrub Bar and Scrub Handle – used to quickly scrub back and forth through video.
15. Stop Download Button – used to stop the download.

H. Multi Camera Search and Playback.

The VMS software shall have the capability to search for and play back video from multiple cameras simultaneously. All recorded video shall be played back and displayed in a synchronized multi camera layout in one of the following screen layouts:

1. 4-camera (2x2) layout

2. 9-camera (3x3) layout

3. 6-camera (3x2) layout

4. 12-camera (4x3) layout

5. 16-camera (4x4) layout

6. 20-camera (5x4) layout

6. 30-camera (6x5) layout

I. Audio Search and Playback.

The VMS software shall allow search and play back of audio in synchronization with video.

J. Exporting Files.

The VMS software shall have the capability to export video, Point of Sale data, and audio files. The VMS software shall only be able to simultaneously export a single video channel, single audio channel and single POS stream. To export a file, the user shall mark the starting and ending point of the video to export. After the VMS software has exported a video and/or audio file, it shall provide an option to burn the data to a CD or DVD. The VMS software shall provide the option of exporting the file in the following formats:

1. Standalone Exe (\*.exe) – includes an executable player with the video and audio data

2. AVI File (\*.avi) – a multimedia container format

3. PS File (\*.ps) – a format for multiplexing video and audio

4. QuickTime File (\*.mov) – native for Macintosh computers

K. Copy, Save and Print Images.

The VMS software shall also be used to save and print an image. The VMS software shall have the capability to copy a picture to a clipboard and paste it into a document.

L. Standalone Player.

The VMS software shall have the capability to export video and audio files with an executable Standalone Player. Double-clicking on the executable Standalone Player shall start the application and open the video and/or audio files. The Standalone Player shall have the following features:

1. Screen Layouts:

a. 1-camera layout

b. 4-camera (2x2) layout

c. 9-camera (3x3) layout

d. 16-camera (4x4) layout

2. Video Playback Controls – includes the following playback controls:

a. Play video in reverse fast (double) speed

b. Play video in reverse in normal speed

c. Stop video play

d. Play video forward in normal speed

e. Play video forward in fast speed

f. Play video forward one frame at a time

g. Play video backward one frame at a time

3. Scrub Bar and Scrub Handle – used to quickly scrub back and forth through video.

4 Camera and Audio Tree – used to select video and audio for playback

5. File:

a. Open

b. Save Image

c. Copy to Clipboard

d. Save as AVI, PS, or QuickTime

e. Print

f. Exit

6. Options:

a. Show Camera Name

b. Show Timestamp

c. Show Status Boarder

d. Time-lapse Playback Interval

e. Show Camera Tree

f. Show Full Screen

g. Font

7. Tools:

a. Authenticate- used to verify the video hasn’t been tampered with or corrupted.

A keyed-Hash Message Authentication Code, or HMAC, is a type of message authentication code (MAC) calculated using a specific algorithm involving a cryptographic hash function in combination with a secret key. As with any MAC, it can be used to simultaneously verify both the data integrity and the authenticity of the data.

8. Right Click on Video:

a. Clear this video panel

b. Digital PTZ

M. Setup Mode Overview and Features.

The VMS software shall be used by Administrators and Power Users to configure systems. A Setup Mode shall consist of a hierarchy of icons for configuring the systems, also called a configuration tree. Clicking on any of the icons in the configuration tree shall display a new screen for configuring the selected item. The configuration tree shall consist of the following icons and features:

1. My Systems

2. Adding System

3. Client Setup

4. System Information

5. System Setup

6. Add IP Cameras

7. IP Camera Recording Setup

8. IP Camera Setup

9. Audio Input Setup

10. Trigger Input Setup

11. Alarm Output Setup

12. Storage Setup

13. Serial Profile Setup

14. Serial Port Setup

15. Event Linking Setup

16. Schedule Setup

17. User Setup

N. My Systems.

The VMS software shall have a feature for displaying systems that have been added to the Client software, including the system name, system status (connected or not connected), the IP address of the systems, licensing status, and software subscription status. Right-clicking the license information shall also display both the MAC address and license of each server.

O. Adding Systems.

The VMS software shall be used to configure the Client application to connect to VMS servers. Entering a VMS username, password, and IP address shall connect the Client application to the VMS for viewing live and recorded video. The Client shall only allow connection to one VMS at a time. Multiple VMS shall be allowed to be added to the system list, but not connected to simultaneously. All authorized video viewing, searching, and system configuration functions shall be available to the Client application.

P. Client Setup.

The VMS software shall be used to configure the Client software based on personal preferences, including the following:

1. Live video border display status (on or off) and PTZ focus

2. VGA acceleration options

Q. System Information.

The VMS software shall be used to display system information about users that are currently logged into the system, plug-in file version information number and status, and a system log that contains a detailed history of the process that occur on the system. The system log shall be viewed by selecting the start and end date and time and clicking on the search button. The system log shall also be exportable to a file name and opened with a text editor. A log settings feature shall give the user the ability to set the maximum days that logged alarms and the system logs are kept on the system.

R. System Setup.

The VMS software shall have the following features to set up VMS servers:

1. System name

2. Time and date

3. Time zone

4. Time server

5. Network settings (hostname, IP address, network, gateway and DHCP status)

6. Bandwidth settings

7. License key – required to add the number of IP cameras needed for the system. A user shall obtain a license key by providing your network adapter hardware MAC address to the VMS software manufacturer. The VMS software manufacturer shall provide a license key that must be entered manually in the license key edit fields or imported from a file.

8. Importing and Exporting System Settings – every feature in the system that is configured through the Setup Mode site tree shall have the ability to be imported or exported to or from other systems.

S. Add IP Cameras.

The VMS software shall be used to add IP cameras to the VMS server. After IP cameras have been added to a list of IP cameras on the VMS server, the VMS Client software shall be used to configure the IP camera settings and view live and recorded video.

T. IP Camera Recording Setup.

After IP cameras have been added to the VMS server, the VMS software shall be used to enable IP cameras to record video, select the recording resolution, and select the image-per-second (IPS) recording rate. Each IP camera shall be individually configurable. If a camera has been connected to a VMS server and the camera is producing a video signal, the VMS Client software shall automatically detect the video signal and record video. To disable recording, the user shall select a checkbox. The VMS software shall be used to change individual camera resolutions by clicking on a record resolution drop-down menu and selecting QCIF, CIF, 2CIF, D1, VGA, 1M, 1.2M, 1.3M, 1.9M, 2M, 3.1M, 5M, or 10M resolution. Camera resolutions shall vary depending on the IP cameras selected and added to the VMS server.

U. IP Camera Setup.

The VMS software shall be used to configure individual IP camera settings such as camera name, onscreen display, PTZ preset settings and tours, digital PTZ presets, video settings (brightness, contrast, saturation and sharpness), recording quality, compression format (MPEG-4, H.264 or JPEG), pre-motion recording, crop window, motion masks (sensitivity, percentage, include, and exclude), and video masks. Some of the settings shall vary depending on the type, model, and features of IP camera selected and added to the VMS server.

V. Audio Input Setup.

The VMS software shall be used to configure audio input names and enable audio inputs for recording. The VMS software shall be installed with the audio inputs disabled due to legal restraints on audio recording in some jurisdictions. To assign a new, logical name for the audio input channel, the user shall highlight the default name and type the new name. The user shall enable the audio input channel by selecting a checkbox. A listen feature shall allow verification of the audio input connected to a channel. The user shall select a checkbox to hear the audio from the corresponding input channel. To stop the live audio feed, the user shall deselect the checkbox.

W. Trigger Input Setup.

The VMS software shall be used to configure input trigger names and the Normal State (NO = Normally Open and NC = Normally Closed) of the triggers. The user shall assign new logical names and optionally change the Normal State from the default of NO to NC. The user shall verify the proper operation of the input state on the Trigger Input setup screen by observing the Status state, which shall switch between Normal and Alarm. By default, the Normal State shall be set to NC (Normally Closed). The Status state shall switch from a green NORMAL to a red ALARM indicating that an alarm has been detected. The alarm shall be linked to an action such as recording video or triggering a relay by use of the Event Linking feature.

X. Alarm Output Setup.

The VMS software shall be used to configure alarm output names and set the Normal State of the IP camera’s output triggers. The user shall assign new logical names and change the Normal State of the Alarm Outputs from the default of Hi (5 VDC) to Lo (0 VDC). The Status shall be NORMAL in either the Hi or Lo Normal State setting until an event from the Event Linking feature activates an ALARM status. The user shall verify the proper operation of the output state by observing the Status state, which switches between Normal and Alarm. By default, the Normal State shall be set to Hi (5 VDC).

Y. Storage Setup.

The VMS software shall be used to configure hard drives for video storage. The VMS software shall be installed on the C: drive, and separate disk drives shall be used for video storage. The video storage disk drives shall use enterprise class drives designed for constant use. Disk drives shall be visible during configuration for review and adjustment. The VMS software shall enable or disable a drive for video storage by selecting or deselecting the enabled feature during storage setup. The entire disk drive shall be used or an upper limit shall be selected by adjusting a video space slider. The VMS software shall have a feature to display the used space that displays the amount of the disk drive capacity used for storage. The VMS software shall display the status of a healthy or missing disk drive. Another feature shall indicate the age of the oldest video recorded on this system. The VMS shall also have the ability to enforce storage rules on a per-server basis and allow the user either to limit the number of days of recording or to retain the video for a specific number of days. When the setting is configured to limit the number of days of recorded video, the VMS software shall delete any video older than the selected number of days. When the VMS software is configured to keep the video for a specific number of days, it shall maintain the recorded video to the exclusion of recording new video.

Z. Serial Profile Setup.

The VMS software shall be used to create and view transaction profiles so that character strings such as cash register receipts, ATM transactions, or access control transactions can be viewed with live or recorded video. Event keywords shall trigger a system alarm or action. Recorded video shall be searched and retrieved using a search serial feature. The user shall also be able to indicate the beginning and end of transaction key words.

AA. Serial Port Setup.

The VMS software shall provide two ways to receive serial data and control PTZ cameras. The VMS software shall allow the user to create a physical connection to the serial port or communications port on the back panel of the server. The VMS software shall also allow the user to transmit serial data over a network connection in ASCII format. The VMS software shall be used to configure serial ports on the VMS server so that they can be used to communicate with serial devices such as Point of Sale terminals or PTZ cameras. The VMS software shall provide a choice for configuring the serial port, including Unused, POS (Point Of Sale), or PTZ (Pan Tilt Zoom). The PTZ option is used to control the motion of a PTZ camera. The VMS software shall default to Unused until it is otherwise configured. A unique name shall be assigned to the port. The VMS software shall also allow the user to receive data over the network using three different methods: HTTP, TCP, and sending data to a specific port on the server.

AB. Event Linking.

The VMS software shall use input triggers to trigger a desired action such as recording video or triggering an alarm. The Input Trigger shall activate one of the following actions:

1. None

2. Record Video

3. Output Trigger

4. Output Video 1

5. Instant Recall

6. PTZ Preset

AC. Pre and Post Triggers shall be used to trigger certain action types before and after an event occurs. For example, if a door opening is set to trigger video recording, a Pre and/or Post Trigger shall be configured to capture the video for up to 100 seconds before and/or after the door opened.

AD. Schedule.

To maximize the amount of storage on the VMS server, the user shall be able to schedule camera, audio, and event recording based on individual needs. For example, the user shall be able to configure recording video during business hours, but record only motion or event video after business hours. The VMS software shall be used to configure camera and event recording schedules. By default, the VMS software record motion as the default schedule. The default Event schedule shall be event recording, as configured in the Event Linking feature. The system shall have the following modes of video recording:

1. Motion (Blue) means video is recorded when motion is detected.

2. Free Run (Green) means video is continually recorded nonstop.

3. Alarm (Red) means video is recorded when there is a triggering event.

4. Off (White) means video is no video recorded.

AE. The system shall have the following scheduling features:

1. Day – customize the recording schedule by day

2. Camera – customize the recording by camera

3. Event – enables or disables events for a particular time and day

4. Audio – customize the audio recording schedule

AF. Users Setup.

The VMS software shall be used to add or delete users of the VMS server. The User Setup screen shall allow the user to configure a user group access level and the cameras they have access to viewing. A user shall have the ability to login to view live and recorded video. Adding a new user to the VMS server shall consist of creating a username, password, and group access level (also know as privileges or access rights). Users shall be assigned to one of four pre-defined groups. The system shall have the following pre-defined group access levels:

1. Administrator: Has access to all features of the system.

2. Power User: Has access to all features except adding or deleting users.

3. User Admin: Has access to view live video, search recorded video, and add and delete users.

4. Restricted: Has access to view live video and search recorded video. Administrators shall have the ability to limit access to individual cameras, audio sources or serial devices for Restricted users.

**2.03 VIDEO MANAGEMENT SYSTEM HARDWARE**

A. Server Requirements.

The VMS server software shall be capable of operating on the following minimum hardware:

1. Processor: Intel® Atom Processor 330, 1.6 GHz or greater

2. Graphics: 1280x1024x32 bits

3. RAM: 1 GB

4. NIC: 10/100BASE-T Ethernet

5. Hard Disk:

a. Western Digital Enterprise Drives, WD RE4 SATA or WD RE SATA (or)

b. Seagate Barracuda ES.2 SATA

c. 30GB shall be reserved for the Operating System and VMS server software

6. Operating Systems:

a. Microsoft® Windows 2003 Server (or)

b. Microsoft® Windows XP (all versions) (or)

c. Microsoft® Windows Vista (all versions) (or)

d. Microsoft® Windows 7 (all versions)

e. Linux Ubuntu 6.07/8.04/10.04 Debian Package

B. Client Workstation Requirements.

The VMS client software shall be capable of operating on the following minimum hardware:

1. Processor: Intel® Celeron® Processor 420 at 1.6 GHz or greater

2. Graphics: 1280x1024x32 bits

3. RAM: 1GB

4. NIC: 10/100/1000BASE-T Ethernet

5. Hard Disk: 80GB Serial ATA drive

6. Operating Systems:

a. Microsoft® Windows 2003 Server (or)

b. Microsoft® Windows XP (all versions) (or)

c. Microsoft® Windows Vista (all versions) (or)

d. Microsoft® Windows 7 (all versions)

e. Linux Ubuntu 8.04 Debian Package (or)

7. MAC Mini:

8. Processor: Intel® 1.83 GHz Core Duo or greater

9. Graphics: 1024x768x32 bits

10. RAM: 1GB

11. NIC: 10/100/1000BASE-T Ethernet

12. Hard Disk: 80GB Serial ATA drive

13. OS: Mac OS X

C. Multi Monitor Client Workstation Requirements. (4 VGA monitors at up to 1920x1200 resolution)

The VMS client software shall operate on the following minimum required hardware:

1. Processor: Intel® Core i7 Processor 720 (1.6GHz, 6MB L2, 1066) or greater

2. Graphics: Multi-Output Display Adapter

3. RAM: 2GB

4. NIC: 10/100/1000BASE-T Ethernet

5. Hard Disk: 80GB Serial ATA drive

6. Operating Systems:

a. Microsoft® Windows 2003 Server (or)

b. Microsoft® Windows XP (all versions) (or)

c. Microsoft® Windows Vista (all versions) (or)

d. Microsoft® Windows 7 (all versions)