**NVR5000 Series, Standalone Embedded RAID NVR**

**Architectural and Engineering Specification**

**Part 1: General**

* 1. **General Information**

Such as summary, general product requirements, quality assurance, general system description, glossary of terms, references, submittals, delivery storage and handling, drawings, specifications, project background, site conditions, services, applicable codes and standards should be stated in here according to the tender requirements.

**Part 2: Products**

* 1. **General Description**

The NVR5316 Linux RAID NVR is part of Surveon Enterprise NVR5000 Series. Featuring 16-bay hot-swappable hard disks and RAID 1, 5, 6 data production, the NVR5316 supports Full HD (1080P) video recording of up to 64 channels for the video retention period from 7 to 30 days. Based on the client-server architecture, the NVR5316 provides high I/O, large capacities, and overall system stability necessary for scalable projects. The NVR5316 also comes with the enterprise VMS with real-time monitoring and video analytics and supports centralized management and TV wall matrix with the Surveon Control Center (SCC). The compact server NVR size, cableless design, redundant components such as cooling fans and power supplies also ensure excellent system reliability and easy maintenance for middle to large applications.

The Surveon Video Management Software (VMS) is an enterprise-grade security management solution. Scalable and effective, the Surveon VMS is based on the client-server architecture and featured with intuitive monitoring, real-time detection, intelligent searches, video analytics, investigative tools, multi-access, easy scalability, and optimized megapixel recording to deliver highly integrated and reliable solutions.

Surveon Control Center (SCC) is based on the enterprise level client-server architecture and the domain based framework with the advanced features including video-wall, central alarm management, I/O control, and advanced event report system. With the SCC, project managers can easily handle a distributed system with unlimited cameras, multiple servers and clients, and effectively take charge of the entire system using the centralized management.

* 1. **Network Video Recorder (NVR) Hardware Features**
1. The server hardware shall be capable of running the Linux operating systems.
2. Standard resolution and high resolution mega-pixel IP cameras shall be selectable. MPEG-4, H.264 or MJPEG video compression format shall be user selectable on any camera. Video recording shall be available at up to 30 frames per second per input channel depending on IP camera type and server model selected.
3. Each server shall have a 2 Gbit 1000 Base-T RJ-45 Ethernet connection for networking to remote PC clients. Multiple servers shall be accessible by multiple clients located anywhere on the network. Each server shall record video, audio, and text while displaying live video or playback video. In the event that there is no client actively attached to the server, the server shall continue to record video and audio, monitor events and all other server functions.
4. Recorded video shall be triggered by built in motion detection, an external input device, or in continuous record mode. A 24/7 scheduler shall allow individual cameras to be configured. Video shall be recorded to internal hard drives, SAS expansion drives or iSCSI storage.
5. The RAID 1, 5, 6 options shall be internal to the server and shall provide notification of a drive failure to the administrator.
6. Each server shall have a watchdog system that monitors the system and automatically reboots the system should it lock-up or fail to operate.
	1. **External Storage**
7. The Network Video Recorder software shall support iSCSI connected external storage units.
8. The Network Video Recorder shall support SAS connected external storage units.
9. The latest list of supported external storage devices shall be available on the manufacturer's web site.

* 1. **Supported IP Cameras & Peripheral Devices**
1. The Network Video Recorder shall interoperate with cameras of a range of types from a variety of manufacturers.
2. The Network Video Recorder shall support dual-streaming from IP cameras or encoders that support this functionality.
3. The Network Video Recorder shall include driver support for IP fixed cameras.
4. The Network Video Recorder shall include driver support for IP pan-tilt-zoom cameras.
5. The Network Video Recorder shall include driver support for IP Megapixel cameras.
6. Supported cameras shall be easily interchangeable between different models without the need to register each individual MAC address.
7. The latest list of supported devices must be available on the manufacturer’s web site.
	1. **Maintenance / Software Upgrades**
8. Firmware updates (REFLASH) to the Network Video Recorder firmware shall be supported from any fast and reliable connection, whether it is executed over the LAN, WAN or internet.

* 1. **IT Requirements / Networking**
1. The Network Video Recorder shall operate as a read-only platform that prevents the installation of any third party software and restricts any file-level access to provide for a stronger level of virus protection and ensure a higher up-time operation in a commercial/industrial environment.
2. The Network Video Recorder system shall integrate into standard TCP/IP network environments.
3. The Network Video Recorder software shall support a static IP address setting from the local IT administrator for both of the client and camera network interface cards (NICs).
4. The Network Video Recorder software shall support receiving its IP address information from an existing dynamic host configuration protocol (DHCP) server for the user’s network (LAN1). In addition, it shall include the option of being the DHCP server for smaller environments where a DHCP server may not available.
	1. **Security**
5. The Network Video Recorder shall be designed to provide multiple levels of access and management.
6. The Network Video Recorder software shall support 3 different levels of permissions for each individual camera. Each group of users shall have their own unique combination of permission settings:
7. Viewer – (Basic Access)
8. Power User – (Users have same rights as Viewer, plus modify camera settings)
9. Administrator – (Users have full rights to camera and system settings)
	1. **Application Programmer Interface (API)**
10. The system must have the ability to host multiple remote users, archive data, and search for data, all while recording multiple video streams.
	1. **Equipment**
11. **NVR5316 Series Specification**
12. Server Processor: Intel Core i3 Dual-Core 3.5GHz
13. System Memory: DDR3 4GB (up to 32GB)
14. Operating System: Linux Embedded System
15. Storage: 16 x 3.5" SATAII/SATAIII hard disk drives
16. I/O Interface:
RJ-45: 2x Gigabit Ethernet
USB: 2x USB2.0, 2x USB3.0
VGA: x1, HDMI: x2

Expansion port: 2x SAS 6G Expansion Port
DIDO: 16 Pin for 8 in / 2 out

1. RAID: Non RAID, 1, 5, 6
2. Electrical:
Input voltage: 100-240VAC, 50~60Hz, 10~5A (max)
Power Supply: Two redundant 530W
3. Operating Environment: Humidity:
5% to 80% (non-condensing)
Temperature: 5º to 35ºC
4. LED Indicator: Yes (Power, HDD, Fan, System Fault)
5. Dimensions: 130(H) x 448(W) x 500(D) mm
6. Weight: ≤21.54kg / 47.49lbs (without HDD)
7. Certification: UL, CB, FCC / CE Class A
8. Warranty: 3 years

* 1. **The Software Overview**
1. The software shall be used to view live and recorded video from IP devices connected to local and wide area networks. The software shall have a client/server-based architecture that can be configured as a standalone software system with the client software running on the server hardware and/or the client running on any network-connected TCP/IP workstation. Multiple client workstations shall be capable of simultaneously viewing live and/or recorded video from one or more servers. Multiple servers shall also be able to simultaneously provide live and/or recorded video to one or more workstations. The server software shall also have the ability to be installed on an IP edge device—such as an IP camera or encoder that allows for 3rd party applications—allowing the device to serve as both a server and IP video recording device.
2. Recording of all video transmitted to the software shall be continuous, uninterrupted and unattended.
3. The software shall offer the capability of video motion detection recording, such that video is recorded when the software detects motion within a region of interest of the camera’s view. Video prior to the detection of the motion shall also be stored with recording using the pre-recorded feature.
4. The software shall manage the video it has been configured to monitor. Loss of video signal shall be configured to annunciate on software client by an on-screen visual indication alerting operators of video loss.
5. The 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.
6. The software client shall be able to view live video and audio, recorded video and audio and be able to configure the complete system all from a single application.
7. The software shall continue to record video and audio at all times during the administration and configuration of any feature.
8. The software client shall have the same functionality when connected remotely as it does when it is run locally on the same computer as the server software.
9. The software client shall add and remove features based on the permissions of the user and the licensed functionality.
10. The software client shall operate on all of the following operating systems:
Windows7 Professional, Enterprise, Ultimate
11. The software shall also allow an authorized user to view video through a web client interface. The web client interface shall allow authorized users to view live video, view recorded video, and control pan-tilt zoom (PTZ) cameras. The web client interface shall allow connections to multiple software servers simultaneously.\*
12. The web client interface shall operate without requiring installation of any software.
13. The web client interface shall support the following browsers: Internet Explorer 6 and later.
14. The software server software shall record and retrieve video, audio and alarm data and provide it to the software clients upon request.
15. The 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 and Android operating systems
16. The software shall license the total number of cameras on the system. This license shall be based on the MAC address of a single network card that is present on the system. The software shall only require that this network card be enabled and does not require that data is actually sent through it.
17. The software server software shall run as a service. The software shall not require any application to be running in order to operate.
18. The software shall allow the use of maps. The maps will be accessible to users with the appropriate permission levels and display video sources and their status.
19. The software shall allow maps to be embedded inside of maps (i.e. hierarchical or nested maps).
20. The software shall consist of a single client application.
21. The client software shall not be dependent on, nor require any connection to, a central management or configuration server.
22. The software shall be ONVIF compliant and provide support for ONVIF compliant cameras.
	1. **The Software Features**
23. **Live View**
24. The software shall show live video from IP Cameras and Video Transmitters in MJPEG, MPEG4 and H.264 formats.
25. The software shall support cameras with resolutions ranging from Standard Definition, High Definition (HD) and up to 5 Megapixel.
26. The software shall allow configuration of the video and audio stream settings for each user, depending on the support hardware.
27. Users shall be able to move any camera image from one display screen to another via drag-and-drop.
28. Users shall be able to display any camera view.
29. Users shall be able to take a snapshot of one image or all images currently displayed and save as a bitmap or JPEG image to a configurable location.
30. Users shall be able to adjust the camera volume.
31. Users shall be able to talk via a microphone to the chosen camera(s).
32. Users shall be able to broadcast via a microphone to all the cameras.
33. Users shall be able to replay currently viewed live video by a single mouse click for replays from 20 seconds, 1, 5, 15, 30, to 45 minutes before current time or from alarm time.
34. Users shall be able to set manual record time from 10, 20, to 30 minutes.
35. Users shall be able to set presets.
36. Users shall be able to have a quick access to image settings.
37. Users shall be able to send views in smaller divisions to larger divisions for better viewing.
38. Users shall be able to remove or reconnect a camera from live view via a quick access.
39. When in live display mode, the user shall be able to receive live video, live audio and alarm information.
	1. 1-camera (full-screen) layout
	2. 1-camera (1x1) layout
	3. 4-camera (2x2) layout
	4. 4-camera (1+3, 1 large view and 3 small views) layout
	5. 6-camera (1+5, 1 large view and 5 small views ) layout
	6. 8-camera (1+7, 1 large view and 7 small views) layout
	7. 9-camera (3x3) layout
	8. 10-camera (2+8, 2 large views and 8 small views) widescreen layout
	9. 16-camera (4x4) widescreen layout
	10. 25-camera (5x5) widescreen layout
	11. 36-camera (6x6) widescreen layout
40. The software shall have the SPOT functionality to have pages auto flip between pages.
41. The software shall have Event Log Window showing alarm and event information for a quick view.
42. The software shall display alarm notifications and have the instant playback functionality in the VI panel on the live view page.
43. The software shall allow the customization of the user interface to allow software triggers to be shown. This shall allow them to activate events through the push of a button, which could trigger recording, PTZ presets, output triggers or email.
44. Users shall be able to zoom a PTZ camera in or out using the PC mouse.
45. The software shall have a feature for viewing logical groups of cameras. This shall allow efficient viewing of cameras in a logical order.
46. The software shall have a feature to organize your cameras into preset views. Views are preconfigured arrangements of the video panels so that they may be easily recalled later. A view can save the location of the video streams, audio streams, maps and event views. These views shall be accessible in both live and recorded video modes.
47. The software shall have the capability to automatically cycle through two or more saved views to create a video tour. The software shall allow the configuration of the dwell time and the different views it shall use.
48. Users shall be able to listen to audio from multiple cameras through PC speakers.
49. Users shall be able to mute a client speaker.
50. **Playback**
51. The software client shall be used to search for and play back recorded video, and events from the software servers.
52. The 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.
53. The software shall support searching through recorded video based on time, date, video source and image region and have the results displayed as both a clickable timeline and a series of thumbnail images.
54. The software shall allow you to search on a specific area of recorded video and display only the frames where motion happened in that area.
55. The software shall have the capability to export video files.
56. The software shall provide the option of exporting the file in the following formats:
	1. AVI File (\*.avi) – a multimedia container format
57. The software shall playback video recorded in MJPEG, MPEG4 and H.264 formats.
58. The software shall replay footage in same video pane, or navigate to recorded video panes.
59. The software shall playback video from up to 16 cameras at once in a single video window.
60. The software shall playback each camera separately or synchronize to playback from the same time.
61. The software shall playback synchronized recorded audio in each video pane.
62. The software shall playback video using the following standard operations:
	1. Play-pause-fast forward at different speeds (x1/8, x1/4, x1/2, x2, x4, x8)
	2. Rewind at different speeds (x1/8, x1/4, x1/2, x2, x4, x8)
	3. Users shall be able to move playback to a different time either using the timeline or entering a specific date and time.
	4. Users shall be able to take a snapshot of one image or all images currently displayed and save as a JPEG image to a configurable location.
63. **Time Search**
	1. Users shall be able to view the recorded video footage for a camera along a timeline. They shall be able to expand and contract the timeline to show a larger or smaller time range and to scroll the timeline backwards and forwards to show different time periods.
	2. The software shall provide a calendar control to allow navigation to any year / month /day in the recording library.
	3. The software shall provide a go to “hour / minute / second” control.
64. **VI Search**
	1. Users shall be able to configure a region of interest for motion search.
	2. The software shall support the following options for VI search:
* General Motion Detection
* Foreign Object Detection
* Forbidden Area Detection
* Intrusion Detection
* Going Out Detection
* Missing Object Detection
* Tampering Detection
* Camera Motion Detection
* Virtual Fence Detection
* Tailgating Detection
	1. Users shall be able to adjust the sensitivity of the detection search.
1. **Event Search**
	1. Users shall be able to find motion in recorded footage from a selected time and display a motion profile on the timeline.
	2. Users shall be able to view thumbnails and for moving playback to next/previous motion.
	3. The software shall allow the user to perform a visual thumbnail search. The user can select one camera to see one image per set time period. The user shall be able to play video from that image or zoom in to a time range.
	4. The software shall support the following options for VI search:
* General Motion Detection
* Foreign Object Detection
* Forbidden Area Detection
* Intrusion Detection
* Going Out Detection
* Missing Object Detection
* Tampering Detection
* Camera Motion Detection
* Virtual Fence Detection
* Tailgating Detection
	1. It shall be possible to combine motion search modes to further refine the search.
	2. The software shall be able to display thumbnail images taken from the video footage in the current time line period. Thumbnails can be displayed by:
		+ Time: At equal intervals across the timeline period depending on the number of thumbnails set for the user.
		+ Alarms: One image for each alarm in the period.
		+ Label: One image for each label in the period
		+ Motion: One image for each time motion goes above a configurable threshold
	3. Users shall be able to play back a recording from a selected thumbnail.
	4. Users shall be able to review all video watched by a selected user in a selected time period in an event player.
1. **Export**
	1. Users shall be able to export video clips from a selected camera or cameras within a site to a named incident.
	2. Users shall be able to select the start and end times of the export by clicking and dragging on the timeline.
	3. The software shall show progress and estimated time to completion in an export status window.
	4. Users shall be able to add additional clips to existing incidents.
	5. Users shall be able to play back incidents with all the playback operations provided by the full software application.
	6. Export of video recorded in MJPEG, MPEG4 and H.264
	7. Playback of exported video in player
2. **Audio in Playback**
	1. Users shall be able to listen to audio recorded with video from all cameras being played back or selected cameras only.
3. **Setup**
4. The software shall allow the configuration of the video devices to be performed in the client and then pushed out to the devices. The configuration itself shall be stored both on the camera and on the software.

1. The software shall allow RAID configuration.
2. The software shall be able to automatically synchronize with the server.
3. Users with authorities shall be able to acquire playback camera list from Recording.
4. Users with authorities shall be able to see video analytics in the set panel.
5. Users with authorities shall be able to import / export the Server Configuration to the different server.
6. Users with authorities shall be able to set router port mapping.
7. Users with authorities shall be able to adjust the images settings for every connected camera, including brightness, saturation, contrast, hue, and sharpness.
8. Users with authorities shall be able to edit cameras, including their vendors, models, and connection permissions.
9. Users with authorities shall be able to edit camera connections, such as auto-assign IP address, or use specific IP address.
10. Users with authorities shall be able to arrange presets for PTZ cameras.
11. Users with authorities shall be able to arrange patrol settings for PTZ cameras.
12. Users with authorities shall be able to check the compatibility of other connecting device.
13. Users with authorities shall be able to initialize the camera so that the camera will correspond to the settings on the server.
14. Users with authorities shall be able to set the cameras time automatically synchronized with the server.
15. Users with authorities shall be able to set all cameras time automatically synchronized with the server in one time.
16. Users with authorities shall be able to change both the setting of the stream port and the IP address by editing the server.
17. Users with authorities shall be able to use the web client.
18. The software shall be able to support multiple network cards.
19. The software shall be able to use DHCP server when there is no DHCP service available.
20. **Configuring Recording**
21. Users shall be able to configure the recording schedule for cameras on NVRs. Recording can be configured to be:
* 24/7
* Timed (from minute to weekly schedules)
* On alarm or event
1. Users shall be able to find recordings within a specified time period.
2. **Alarm Configuration**
	1. The software shall be able to send a predefined email based on an event trigger.
	2. The software shall have a feature to export a video segment from specific cameras to a storage device upon an input trigger or other event being activated.
	3. The software client can be configured to automatically switch views on any trigger within the event monitoring function.\*
	4. The software shall have the ability to configure each video input’s recording time on an hourly basis. This shall allow the user to schedule when to record on motion, when to record on event and when not to record.
	5. The members of these custom user groups shall all have the same permissions.
	6. The software shall support video loss alarm inputs.
	7. The software shall support network loss alarm inputs.
	8. The software shall support analytics alarm inputs, with separate events for each analytics filter.
	9. The software shall support inputs (detectors) that do not cause an alarm to be generated.
	10. The software shall support Pre/Post Alarm Recording and be able to trace back and preserve video/images from several minutes before and after the occurrence of an alarm.
	11. Users shall be able to sort the alarm information in various ways by clicking on column headings.
	12. The software shall support set and unset of alarm zones such that alarms are only generated when the alarm zone is set.
	13. Users shall be able to manually set and unset zones.
	14. Users shall be able to configure the alarm sound for all alarm zones in a site or for each alarm zone individually.
	15. The software shall be used to connect different types of events, such as input triggers, to a desired action, such as recording video or triggering an alarm. The software shall recognize the following event types:
		* General Motion Detection
		* Foreign Object Detection
		* Forbidden Area Detection
		* Intrusion Detection
		* Going Out Detection
		* Missing Object Detection
		* Tampering Detection
		* Camera Motion Detection
		* Virtual Fence Detection
		* Tailgating Detection
		* Sensor Input
		* Clock Alarm
		* Disk Error
		* Video Loss
		* RAID Failure
3. **Alarm response**
4. The software shall generate an alarm if any of the detectors within an alarm zone are activated.
5. The software shall alert new alarms with popup images and optionally a sound.
6. Users shall be able to configure the actions that should be performed when an alarm occurs:
* Show video from camera, camera view or video wall in specified video panes or monitors
* Move camera to preset position
* Show E-Map
* Send email to multiple recipients
* Send SMS to multiple recipients
* Perform a relay action
* Start recording one or more cameras
* Show event log
* Control recording
* Show video popup
* Control PTZ
* Make alarm sound
1. From a looped replay, users shall be able to quickly jump to continuous replay from the alarm time.
2. The users shall be able to display a map showing the location of the alarm.
3. Users shall be able to view live or recorded video associated with the alarm.
4. **Monitoring and Diagnostics**
5. The software shall automatically check for devices not on the network and notify users when not available.
6. The software shall be able to detect the connection of the cameras. By inputting the following information such as IP address, port, channel, username and password, its connectivity will be displayed.
7. It shall be possible to define the users who get notified if devices become unavailable.
8. The software shall scan for devices using any combination of IP broadcast addresses, individual IP addresses or ranges of IP addresses.
9. Users shall be able to turn off scanning of devices.
10. The software shall notify users of problems with NVRs. The notifications will be those supported by each NVR.
11. Users shall be able to find historical alarms matching specified criteria:
* Alarm type
* From site(s)
* Time range
1. **General**
2. The software shall be available in the multiple languages, including:
* English
* French
* Italian
* German
* Spanish
* Chinese (Traditional)
* Chinese (Simplified)
* Cezch
* Polish
* Portuguese
* Russian
* Slovenian
1. The software shall provide online context help.
2. The software shall provide an electronic user’s guide in PDF format.

1. **Users**
2. User Configuration
* Users shall be able to configure named user groups. A group can be granted administrator rights:
* Admin (can configure everything)
* Power User (can configure almost everything except SCC Server configurations)
* User (can configure everything except users and groups)
* Viewer (limited user functions only)
1. Users shall be able to configure named user accounts and allocate them to user groups.
2. Users shall be able to enable and disable user accounts.
3. Users shall be able to set up a user to use a password when he logs into the software.
4. The software shall use a combination of a username and a password to authenticate the user’s permission level.
5. The software shall allow granularity of permissions by creating custom user groups.
6. Users shall be able to grant permission for user groups and/or users to access any object in the system (sites, cameras, monitors, video walls, alarm zones, detectors and relays.) For each object access can be limited by function:
* Delete Camera
* E-Map Setting
* Digital I/O setting
* Camera Advance Video
* PTZ Control
* Shut Down
* Playback VI search
* Add Camera
* Schedule Setting
* Import/Export
* Camera Privacy Mask
* VI Setting
* View Explorer Setting
* Reboot
* Playback Event Search
* Alarm Rule Setting
* Storage Manager
* Camera Image Setting
* PTZ Setting
* Instant Playback
* Playback Time Search
1. Users shall be able to reset access permissions on individual objects to use the access permissions of their parent site.
2. Users shall be able to configure application settings specific to Replay event in live or Playback view.
3. Users shall be able to prevent simultaneous listen and speak (full duplex audio.)
4. **User Logon**
5. Users shall be able to log into the software manually.
6. The software shall allow users to log out and log in without closing the application.
7. Users shall be able to change their own password (if given write permission to the site database).
8. **Site Setup Requirements**
9. The software shall discover IP Video devices on a network either by broadcast address or unicast addresses for each device.
10. Users with authorities shall be able to add cameras in by simply scanning/searching.
11. Users with authorities shall be able to add cameras manually by inputting cameras’ IP addresses.
12. Users authorities shall be able to delete cameras from the server.
13. The software shall allow configuration of IP Video System devices via their web configuration interface.
14. The software shall enable mass configuration of devices, in particular encoder settings on IP cameras and encoders.
15. Administrators shall be able to set the time-zone on a site - different sites can each have their own time zone.
16. Users shall be able to create sequences and video walls within the sites, set up 24/7 recording for each camera and enable video loss and network loss alarms.
17. Users shall be able to remove devices from sites.
18. Users shall be able to enter a localized display name for cameras, monitors, alarm panels, alarm servers and NVRs which overrides the name stored on the device.
19. The software shall enable a copy of the configuration database from each server. For SCC, it shall be able to generate logs from every connected server.\*
20. **Maps**
21. Users shall be able to create one or more maps for each site by importing an image for the background. The following image formats shall be supported:
* Bitmap (BMP)
* JPEG (JPG)
1. Users shall be able to reposition items by drag and drop or entering specific coordinates.
2. Users shall be able to add cameras to map via drag and drop.
3. Users shall be able to link to any map from any map.
4. The map should be viewable on a separate monitor from the main video(s).
5. Users shall be able to display live and recorded video from any camera on a map.
6. Users should be able to click on any camera to view the video.
7. Activated alarms shall be visually represented on the map.
8. Where detector/zones areas have been configured and in an alarmed state, the user should be able to start video from all cameras associated with that zone by clicking on it.
9. Users shall be able to:
* Manage alarms from a map
* Clear alarms
* View Video associated with an alarm
* Set/unset detectors
1. **DI/DO (Relays)**
2. Users shall be able to configure relay actions using binary outputs on IP Cameras.
3. The relay activation shall be pulsed with a configurable pulse time period.
4. The software shall support latched relay outputs.
5. Users shall be able to associate relay actions with specific cameras so that the actions are readily available when video is displayed from that camera.
6. The software shall perform relay actions on alarm and event.
7. **Matrix\***
8. The software shall support centralized alarm management; all the alarms concerning connected NVRs can be managed via a single login. Users can log in remotely; once logged in, the administrator shall have controls over unlimited connected NVR and cameras.
9. The software shall allow virtual matrix functionality by designating a cell to do so. This video cell shall automatically show video as it is triggered.
10. An IP video wall shall be constructed using secondary workstations, each of which manages unlimited monitors depending on the PC/VGA connected. The video wall shall be controlled over an IP network and have an unlimited number of primary workstations.
11. The video wall shall have the ability to be managed from primary workstations through a standard joystick.
12. Monitors within the video wall shall be able to display:
	1. live video
	2. video walls
	3. site maps
	4. alarm status
13. It shall be possible to constrict the video wall using any PC monitors e.g. CRT, Plasma, LCD, HD TV.
14. The IP Video Wall shall be fully scalable to meet any control room requirement. It shall be possible to add more slaves with monitors as needed up to unlimited.
15. The IP Video Wall shall support unlimited master workstations.
16. The IP Video Wall shall support standard and High Definition widescreen video.
17. The IP Video Wall shall be able to display site maps and alarm status.
18. The IP Video Wall shall be able to dynamically change the video layout of a monitor.
19. The software shall allow users to easily drag icons representing cameras, sequences, video walls and guard tours onto PC viewing panes and onto monitors.
20. **Sequences**
	1. Users shall be able to configure sequences of cameras, camera views and or presets (PTZ cameras); each camera can have a separate dwell time.
	2. Users shall be able to reorder the cameras within a sequence.
	3. Users shall be able to run multiple sequences in video panes.
	4. Users shall be able to run sequences on monitors.
	5. Users shall be able to pause (hold) a sequence.
	6. Users shall be able to display the next or previous camera in the sequence.
21. **Video Wall**
	1. Users shall be able to configure video wall containing cameras, camera views and PTZ cameras. Each video wall can optionally have an associated video pane layout.
	2. Users shall be able to reorder the cameras within a video wall.
	3. Users shall be able to display a video wall across a set of video panes within in any of the video windows (changes layout automatically if configured to do so).
	4. Users shall be able to display a video wall across a set of monitors.
	5. Users shall be able to view all cameras in a site as a video wall.

1. **Matrix Numbering**
	1. The software shall automatically allocate logical numbers to cameras, video walls, sequences, so that they can be started by number using a joystick.
	2. The software shall allow the following options for configuring matrix numbers:
		1. Display matrix numbers on user interface
		2. Number of digits in numbering scheme
		3. Whether to put PC panes in the virtual matrix or otherwise
	3. Users shall be able to manually renumber cameras, video walls, sequences, guard tours.
	4. It shall be possible to allocate a matrix number to cameras, monitors, sequences, video walls, guard tours in the range 1 to unlimited.
	5. Users shall be able to array the multiple monitors as one big video wall.

*Surveon reserves the right to change products or specifications without notice.*

Items with \* indicates functions of Surveon Control Center.