



A&E Spec

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Architecture and Engineering Specification  
***NLSS Gateway 500 and NLSS Gateway 3000***

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## 1. General

### 1.1 Summary

- A. The NLSS Gateway is a unified, networked security platform that combines video management, video analytics (VA), and access control (AC) with Remote Managed Services (RMS). It is accessible and controllable from anywhere through a web-browser and includes advanced deployment tools such as auto-discovery and provisioning.

### 1.2 References

- A. FCC Part 15 Class B
- B. EN 55022:2006+A1:2007
- C. EN 61000-3-2:2006+A1:2009+A2:2009
- D. EN 61000-3-3:2008
- E. E. EN 55024:1998+A1:2001+A2:2003
- F. ICES-003 Issue 4 February, 2004
- G. RoHS Compliant

### 1.3 System Description

- A. The Gateway shall be a standards-based, networked platform that integrates Video Surveillance, Video Analytics, and Access Control in a single device.
- B. The Gateway shall operate in a standalone mode, with other Gateways, and/or in conjunction with an RMS system.
- C. The Gateway shall support live video, recorded video, simultaneous live and playback of recorded video.
- D. The Gateway shall support live audio and recorded audio.
- E. The Gateway shall support video wall configurations in conjunction with DC-400 decoders.
- F. The Gateway shall support third party Access Control devices integrated into the system.
- G. The Gateway shall support integrated Event Management and Alarm Handling.
- H. The Gateway shall support a web server for multiple web browsers as the interface to the system.
- I. The Gateway shall not require any specific application software to be loaded on client devices.
- J. The Gateway shall not require any licensing for individual cameras, video analytic behaviors, or individual AC doors.
- K. The Gateway shall not impose artificial limits on the number of cameras or doors supported.
- L. The Gateway shall support multiple Gateways in the same network without imposing a fixed limit on the number of Gateways.

**1.4 Submittals**

- A. General: Submittals shall be made pursuant to applicable contracts
- B. Product Data: The following Product Data shall be provided –
  - 1. Data Sheets
  - 2. Quick Start Guide
  - 3. User Manual

**1.5 Delivery, Storage and Handling**

- A. Comply with manufacturer's requirements
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with original identification labels
- C. Protect stored materials from environmental and temperature conditions following the manufacturer's instructions
- D. Handle and operate products and systems according to the manufacturer's instructions

**1.6 Project Site Conditions**

- A. Operations Environment: 0-50 degrees C

**2. Products****2.1 Acceptable Manufacturer**

- A. The NLSS Gateway shall be supplied by: Next Level Security Systems 6353 Corte Del Abeto, Ste. 102, Carlsbad, CA 92011, (760) 444 – 1410  
[www.nlss.com](http://www.nlss.com)
- B. Substitutions: no substitutions are accepted unless specified and approved by the manufacturer (Next Level Security Systems)

**2.2 NLSS Gateway**

- A. The NLSS Gateway shall be a standards-based, networked platform based on Linux Ubuntu, MySQL, Apache, Flash and a Browser interface.
- B. The Gateway shall support an easy to use, intuitive, web based interface to the system.
- C. The Gateway shall support multiple simultaneous users on the system.
- D. The Gateway shall support multiple security levels of Operator and Superuser.
- E. The Gateways shall support the following web browsers and flash player:
  - 1. Internet Explorer version 8.0 and above
  - 2. Mozilla Firefox version 3.6 and above
  - 3. Google Chrome version 8.0 and above
  - 4. Apple Safari 5.0 and above
  - 5. Adobe Flash Player 10.1 and above
  - 6. The Gateway shall support English, French, Spanish, German, Rumanian, and Portuguese languages.

### 2.3 NLSS Gateway Hardware

- A. The Gateway shall have one (1) or more 1 GB Ethernet ports.
- B. The Gateway shall have six (6) or more USB 2.0 ports.
- C. The Gateway shall have one (1) or more eSATA ports.
- D. The Gateway (GW-500) shall have an internal Hard Disk Drive (HDD) of not less than 500GB. The Gateway (GW-3000) shall have an internal Hard Disk Drive (HDD) of not less than 2TB.
- E. The Gateway (GW-500) shall consume fifty (50) watts of power or less.
- F. The Gateway (GW-3000) shall consume ninety (90) watts of power or less.
- G. The mechanical dimensions of the Gateway (GW-500) shall be aprox. 8"x 8"x2". The mechanical dimensions of the Gateway (GW-3000) shall be aprox. 12"x 13.25"x1.75".

### 2.4 System Features

- A. The Gateway shall support local firmware (FW) upgrades.
- B. The Gateway shall support remote FW upgrades.
- C. The Gateway shall support export of system logs.
- D. The Gateway shall support backup of configuration.
- E. The Gateway shall support restoration of configuration.
- F. The Gateway shall support setting the timezone, NTP Server, and manual time of the system.
- G. The Gateway shall support DHCP/DNS and Static Internet Protocol (IP) Address provisioning.
- H. The Gateway shall support System Health (CPU %, System Memory %, GPU %, # of VA, # of Live Streaming, # of Recording, Network Bandwidth, Doors Online of Total Doors).
- I. The Gateway shall support local and remote IP networks through use of routers, switches, and VLANs.
- J. The Gateway shall support the following IP protocols:
  - 1. TCP/IP, UDP, HTTP, HTTPS, RTP, RTSP, DHCP, DNS, ARP, ICMP, IGMP, SIP, NTP, FTP, Bonjour, UPnP, RTMP, RTMFP

### 2.5 Video Features

- A. The Gateway shall automatically discover ONVIF and PSIA standard IP Cameras (and Video Encoders) in the network.
- B. The Gateway shall be able to read the video configuration parameters of IP cameras in the network.
- C. The Gateway shall support multiple video streams with different video parameters on one IP camera.
- D. The Gateway shall support H.264 Main Profile, MPEG4, and MJPEG video compression formats.
- E. The Gateway shall support video resolutions of HD 1080p (1920x1080), HD 720p (1280x720), D1, 4CIF, VGA, CIF and non-standard resolutions up to 1920x1280 for stream that will have video analytics. If video analytics are not applied then resolutions can exceed 1080p.
- F. The Gateway shall support aspect ratios of 16:9, 4:3 and non-standard aspect ratios.

- G. The Gateway shall support frame rates up to 30 frames per second (fps) for HD 1080p streams.
- H. The Gateway shall support Constant Bit Rate Model and Variable Bit Rate Model.
- I. The Gateway shall support multiple bit rates for video.
- J. The Gateway shall support multiple video compression formats, resolutions, aspect ratios, frame rates, bit rate models, and bit rates simultaneously.
- K. The Gateway shall support configuration of RTSP video streams from IP cameras that are not automatically discovered.
- L. The Gateway shall support multiple third party IP cameras and video encoders from the following vendors:
  - 1. Arecont Vision
  - 2. Axis Communications
  - 3. Bosch
  - 4. IQInvision
  - 5. Panasonic
  - 6. Pelco
  - 7. Sony

## 2.6 Video Analytic Features

- A. The Gateway shall support multiple video analytics behaviors:
  - 1. The Gateway shall support video analytics for People Counting.
  - 2. The Gateway shall support video analytics for People Counting by Direction.
  - 3. The Gateway shall support video analytics for Line Crossing.
  - 4. The Gateway shall support video analytics for Activity.
  - 5. The Gateway shall support video analytics for Direction.
  - 6. The Gateway shall support video analytics for Face Capture.
  - 7. The Gateway shall support video analytics for Perimeter.
  - 8. The Gateway shall support video analytics for Loitering.
  - 9. The Gateway shall support video analytics for Object Left Behind & Object Taken Away.
- B. The Gateway shall support video analytics for streams from any camera in the network.

The GW500 shall support 8 Cameras 720p HD 30fps 2Mbps / 4 video analytic rules total; 1 rule per camera **or** 16 Cameras 720p HD 30fps 2Mbps / 2 video analytic rules total; 1 rule per camera.

The GW3000 shall support 16 Cameras 720p HD 30fps 2Mbps / 6 video analytic rules total; 1 rule per camera **or** 32 Cameras 720p HD 30fps 2Mbps / 4 video analytic rules total; 1 rule per camera.
- C. The Gateway shall support multiple video analytics behaviors simultaneously for different video streams.
- D. The video analytics behaviors shall generate integrated events that can be automatically tracked by the system.
- E. The Gateway shall support post processing of video with Video Analytic Forensics

**2.7 Video PTZ Features**

- A. The Gateway shall support Pan, Tilt, Zoom (PTZ) IP Cameras via the browser interface.
- B. The Gateway shall support PTZ presets.
- C. The Gateway shall support PTZ patrols.

**2.8 Video Display Features**

- A. The Gateway shall support 1x1, 1x2, 2x2 layouts and views in the Web-browser.
- B. The Gateway shall automatically discover NLSS DC-400 High Definition (HD) video decoders in the network.
- C. The Gateway shall support 1x1 and 2x2 layouts and views pushed to an HD video display via a DC-400 HD Decoder.
- D. The Gateway shall support video walls by pushing multiple views to multiple HD displays via multiple DC-400 HD Decoders.

**2.9 Video Control Features**

- A. The Gateway shall support graphical video controls in the Web-browser. The graphical controls shall be permanently displayed in the browser or hidden and retrieved when desired.
- B. The graphical video controls shall display recorded video for specific camera.
- C. The graphical video interface shall include PTZ control.
- D. The graphical video interface shall include video analytic setup control.
- E. The graphical video interface shall include manual bookmarking event control.
- F. The graphical video interface shall include Fast Forward (FF), Rewind (RW), Pause, Play, and Live video controls.
- G. The graphical video interface shall include search by date and time of day controls and operations.
- H. The graphical video interface shall include video export control.
- I. The graphical video interface shall include the time, date, and stream information of the video currently playing or paused.
- J. The graphical video interface shall include a Full Screen option.
- K. The graphical video interface shall include a Filmstrip feature.
- L. The graphical video interface shall include a JPEG snapshot export control both on live and archived video.
- M. The graphical video interface shall include a Digital Zoom feature.
- N. The graphical video interface shall include a Camera Output feature.
- O. The graphical video interface shall include a per Camera Report feature.
- P. The graphical video interface shall include a per Camera Events feature.

**2.10 Audio Features**

- A. The Gateway shall support G.711, G.726, and Advanced Audio Codec (AAC) audio coding.
- B. The Gateway shall support live audio from IP cameras.
- C. The Gateway shall support recorded audio from IP cameras.
- D. The Gateway shall support audio in sync with recorded video.
- E. The Gateway shall support audio volume and mute controls via the browser.
- F. The Gateway shall support 2 way audio

**2.11 Storage Features**

- A. The Gateway shall support internal storage of video, audio, events, and configuration data.
- B. The Gateway shall support external USB storage.
- C. The Gateway shall support automatic detection of USB storage added to or removed from the system.
- D. The Gateway shall support manual selection of storage target on a per camera basis.
- E. The Gateway shall support automatic selection of storage target on a per camera basis
- F. The Gateway shall support failover and load balance from one storage type to another if the USB HDD is added or removed.
- G. The Gateway shall support external eSATA HDD storage.
- H. The Gateway shall support external NAS storage.
- I. The Gateway shall support external iSCSI storage.
- J. The Gateway shall support various RAID settings and JBOD arrays to the extent that they are supported by the external HDD.
- K. The Gateway shall support the following file systems: EXT2, EXT3, EXT4, FAT16, FAT32, NTFS
- L. The Gateway shall support the following partition tables: Master Boot Record (MBR)
- M. The Gateway shall support export of stored video and audio clips.
- N. The Gateway shall support minimum and maximum retention targets in units of days.
- O. The Gateway shall support grooming of data when system and/or retention targets are met.
- P. The Gateway shall support storage of individual camera recording schedules.
- Q. The Gateway shall support storage of individual camera codecs, resolutions, frame rates, and bit rates.
- R. The Gateway shall support various RAID settings and JBOD arrays to the extent that they are supported by the external HDD.

## 2.12 Schedules

- A. The Gateway shall support pre-configured and customizable schedules that can be used for multiple items such as event qualification, access control door unlock schedules, access levels, intrusion disarm schedules, and video recording.
- B. The Gateway shall support custom holidays per schedule.

## 2.13 Events

- A. The Gateway shall support eight (8) levels of event severities.
- B. The Gateway shall support acknowledgement of events.
- C. The Gateway shall support application of different severity levels to events.
- D. The Gateway shall support automatic actions for specific events.
- E. The Gateway shall support multiple actions for specific events.
- F. The Gateway shall support the following events:
  - 1. AccessControl.AccessDenied
  - 2. AccessControl.AccessDeniedTrace
  - 3. AccessControl.AccessGrant
  - 4. AccessControl.AccessGrantTrace
  - 5. AccessControl.ControllerOffline
  - 6. AccessControl.ControllerOnline
  - 7. AccessControl.DoorForcedOpen
  - 8. AccessControl.DoorHeldOpen
  - 9. AccessControl.DoorNotUsed
  - 10. AccessControl.DoorSecured
  - 11. AccessControl.DoorUsed
  - 12. Camera.ChannelLoss
  - 13. Camera.ClipExported
  - 14. Camera.Discovered
  - 15. Camera.ExportFailed
  - 16. Camera.MotionEvent
  - 17. Camera.Offline
  - 18. Camera.Online
  - 19. Camera.SnapshotExported
  - 20. Camera.VideoBookmark
  - 21. Camera.VideoLoss
  - 22. System.ExtStorageOffline
  - 23. System.ExtStorageOnline
  - 24. System.StatusUpdate
  - 25. User.CardActivated
  - 26. User.CardDeactivated
  - 27. User.DoorOpened
  - 28. User.Login
  - 29. User.Logoff
  - 30. VideoAnalytics.Activity
  - 31. VideoAnalytics.Direction
  - 32. VideoAnalytics.FaceCapture
  - 33. VideoAnalytics.Loitering

34. VideoAnalytics.PeopleCount
  35. VideoAnalytics.Perimeter
  36. VideoAnalytics.Tripwire
- G. The Gateway shall support the following actions:
1. ACDoorMomentaryUnlock
  2. ACDoorRelock
  3. ACDoorUnlock
  4. ACOutputOff
  5. ACOutputOn
  6. ChannelSetActive
  7. EmailSend
  8. PTZGotoHome
  9. PTZGotoPreset
  10. PTZStartPatrol
  11. StreamRecordStart
  12. StreamRecordStop
  13. VideoAnalyticsStart
  14. VideoAnalyticsStop
  15. ViewSetActive
- H. The Gateway shall support a flexible event and action system such that arbitrary events can trigger arbitrary actions.
- I. The Gateway shall support a real time view of events from the web browser that can be filtered by Event Category and Severity.
- J. The Gateway shall support real time acknowledgement of events and the ability to enter notes for specific events.
- K. The Gateway shall support the ability to select an event and automatically pull up recorded video associated with that event.
- L. The Gateway shall support a logged database of events that can be filtered, sorted, and searched by Event Category, Type, Severity, Device, Date, and Time.
- M. The Gateway shall support a Grid View for viewing face capture JPEGs and videos.
- N. The Gateway shall support Shunt Queue for shunting errant events.
- O. The Gateway shall support an Emergency Queue for emergency events.
- P. The Gateway shall support the ability to lock an event and associated assets.
- Q. The Gateway shall support events that have event status of “needs acknowledge”, “open”, “closed”.
- R. The Gateway shall support filter events per Event Category and Event Subtype.
- S. The Gateway shall support a 3D Real Time and Event Log view.
- T. The Gateway shall support an Event Pane with video, JPEG, User, history, export to CSV and print.

## 2.14 Access Control System Description

- A. The NLSS Gateway incorporates a complete Access Control system along with Video Management, Video Analytics, and Event Management. The AC system scales from small standalone deployments to large-scale deployments with hundreds of doors and multiple sites. It supports field-tested third party AC hardware communicating with the GW over the network. It has the capability to grant or deny access to controlled entry/exit portals, detect events/alarms, seamlessly send them to a real time display for live operator processing and simultaneously store them for future investigations.

## 2.15 Cardholders

- A. The Gateway shall support a flexible system that can create, edit, and delete cardholders with a substantial amount of information per person.
- B. At a minimum, the Gateway shall support the following information per person:
  - 1. First Name
  - 2. Middle Name
  - 3. Last Name
  - 4. Preferred (badge) Name
  - 5. Cardholder ID (Emp#)
  - 6. Cardholder Status
  - 7. Cardholder Type
  - 8. Vehicle Information
  - 9. Credential(s) Information
  - 10. Card Status
  - 11. Access Levels
  - 12. Contact information
  - 13. Organizational information
  - 14. User Defined Options
- C. The system shall allow enabling and disabling credentials.
- D. The Gateway shall allow entry with extended unlock times for specific individuals. This is for compliance with the Americans with Disabilities Act (ADA).
- E. The Gateway shall be able to trace the use of credentials through the system, even if the Access Control category is masked in the Event screen.
- F. The Gateway shall allow manual and/or scheduled enable/disable of credentials.

## 2.16 Access Levels

- A. The Gateway shall support a flexible access level system that can apply to doors/readers and cardholders/credentials.
- B. An Access Level is an association between doors and schedules.  
Considerations:
  - 1. You must first configure schedules in the Configure Schedules screen before associating schedules with access levels (or anything else in the system that uses schedules).
  - 2. Holidays override schedules associated with access levels, except for schedules configured to disregard holidays.
- C. There is no fixed limit to the number of access levels the Gateway can support, however, access levels per cardholder record are defined by the specific hardware specifications.
  - 1. SARGENT supports 16 schedules per lock.
  - 2. HID Edge supports 8 access groups per cardholder record.  
An access groups may contain any number of door group/schedule pairs up to a maximum of 600 characters (including spaces) per line. Each card may contain up to 8 access groups. Please see the appropriate sections in Chapter 14 of the OEM API documentation for the various files (Holidays, Schedules, Door Groups, Access Groups, etc) for details on the contents of each file.
  - 3. Mercury Security supports 32 access levels per cardholder record.
- D. Access levels shall be applied to cardholders/credentials.
  - 1. Try to limit the number of access levels that you configure. Management of access levels is critical. Plan ahead in consideration that each system you connect to have a finite number of access levels per Cardholder record.

## 2.17 Access Parameters

- A. The Gateway shall support 26-bit H10301 format.
- B. The Gateway shall support 37-bit H10302 format (no Facility Code).
- C. The Gateway shall support 37-bit H10304 format.
- D. The Gateway shall support 125kHz Proximity credentials and readers.
- E. The Gateway shall support HID iCLASS 13.56 MHz credentials and readers.
- F. The Gateway shall support the following reader modes:
  - 1. Prox
  - 2. iCLASS
  - 3. Prox+Pin
- G. The Gateway shall support at least five (5) facility codes and/or credential formats per controller.

**2.18 Badges**

- A. The Gateway shall support multiple badge formats.
- B. The Gateway shall support the importation of jpeg photos for badges.
  - 1. Limit to 320\*240
- C. The Gateway shall support the importation of jpeg logos for badges.
- D. The Gateway shall support printing of badges directly from the web browser interface.

**2.19 Doors, Readers, Strikes, Timeouts**

- A. The Gateway shall support multiple readers, door types, lock types, and Request to Exit (REX) types.
- B. The Gateway shall support Wiegand reader interface.
- C. The Gateway shall support default timeouts and individual overrides for:
  - 1. Strike Time
  - 2. Extended Strike Time
  - 3. Door Held Open
  - 4. Extended Door Held Open
- D. The Gateway shall support REX Timeout.
- E. The Gateway shall support Fail Safe and Fail Secure modes.

**2.20 Input/Output (I/O)**

- A. The Gateway shall support dry contact input sensors and output relays for general purpose I/O.
- B. The Gateway shall support inputs with the following parameters:
  - 1. Normally Open
  - 2. Normally Closed
  - 3. Supervised
  - 4. Unsupervised
  - 5. Debounce
  - 6. Input interval
  - 7. Enabled/Disabled
- C. The Gateway shall support outputs with the following parameters:
  - 1. Normally Active
  - 2. Normally Inactive
  - 3. Enabled/Disabled
  - 4. Active Time

**2.21 Access Control Hardware**

- A. The Gateway shall support the following third party AC controllers.
  1. Mercury Security EP1501
  2. Mercury Security EP1502
  3. HID Edge ERP40 Reader/Controllers
  4. HID Edge + E400 Controllers
  5. Sargent vS1 PoE locks
  6. Sargent vS2 Wireless locks
- B. The Gateway shall support the following parameters on the indicated hardware:

Mfg	Cardholders	Access Levels	Readers	Supervised Inputs	Outputs
Assa Abloy	2,000	16 schedules	1	0	0
HID Edge ERP40	44,000	8 ACS Groups per cardholder	1	2 (DC=#1 & REX=#2)	2 (1=strike, 1=spare)
HID Edge+ E400	44,000	8 ACS Groups per cardholder	1	2 (DC=#1 & REX=#2)	2 (1=strike, 1=spare)
EP1501 (PoE)	240,000	32 ACL Levels per cardholder	1	2	2
EP1502	240,000	32 ACL Levels per cardholder	2	8 (DC=1+5, REX=2+6, 3/4/7/8=spare)	4 (2 strikes, 2 spare)
MR50	n/a	n/a	1	2 (DC=#1 & REX=#2)	2 (1=strike, 1=spare)
MR51e	n/a	n/a	1 door (2 reader)	4 (DC=#1, REX=#2, 3/4 = spare)	2 (1=strike, 1=spare)
MR52	n/a	n/a	2	8 (DC=1+5, REX=2+6, 3/4/7/8=spare)	6 (2 strikes, 4 spare)
MR16-In	n/a	n/a	0	16	2
MR16-Out	n/a	n/a	0	0	16

- C. The Gateway shall support the following third party AC Reader Interfaes:
  1. Mercury Security MR52
  2. Mercury Security MR50
  3. Mercury Security MR51e
- D. The Gateway shall support the following third party AC I/O modules:
  1. Mercury Security MR16in
  2. Mercury Security MR16out
- E. The Gateway shall support the following third party Power over Ethernet (PoE) devices mentioned below:
  1. Mercury Security EP1501
  2. Mercury Security MR51e
  3. HID Edge ERP40 Readers and Edge + E400 controllers
- F. The Gateway shall support the following third party multiplexor:
  1. MUX8

## 2.22 Access Control Operations

- A. The AC operations are seamlessly integrated into the NLSS Gateway. Doors and cameras can be correlated one to one. AC events can trigger video actions. The following AC operations shall be available via the browser (both locally and remotely) without going to a separate application:
  - B. Lock Door
  - C. Momentarily Unlock Door
  - D. Disable Credential
  - E. Enable Credential
  - F. Acknowledge AC Events
  - G. Select Event then display associated video

## 2.23 Floor Plans

- A. Floor plans are seamlessly integrated into the NLSS Gateway. JPEG images can be uploaded to the system. Doors and cameras can be placed on the floor plans. Video from cameras can be displayed directly from the floor plans. Events can be displayed directly from the floor plans.
- B. The following operations shall be available via the browser (both locally and remotely) without going to a separate application:
  - 1. Upload JPEG floor plans.
  - 2. Place, arrange and delete cameras in the floor plan.
  - 3. Place, arrange and delete doors in the floor plan.

## 2.24 Reports

- A. Reports are in integral part of any security system. Reports shall include, but not be limited to these reports available via the browser (both locally and remotely) without going to a separate application:
  - 1. Access Control – Controller Online, Controller Offline, Inputs
  - 2. Camera – Motion Event, Online, Video Bookmark, Video Loss
  - 3. Cardholder – Access Grant, Access Denied
  - 4. Door – Forced Open, Held Open, Not Used, Used, Secured,
  - 5. User – Login, Logout
  - 6. Video Analytics Event – Activity, Direction, Face Capture, People Count, Tripwire
- B. Reports shall be presented as Column, Line, or Pie Charts
- C. Reports shall be printable from the browser

### **3. Execution**

#### **3.1 Examination**

- A. Examine area for proper installation and operation
- B. Remedy any unacceptable conditions before proceeding.

#### **3.2 Installation**

- A. Install equipment in accordance with manufacturer's instructions.
- B. Install equipment in accordance with the National Electrical Code or applicable local codes
- C. Ensure installation is secure and protected from accidental or weather damage.

#### **3.3 Demonstration**

- A. Demonstrate proper functioning at final inspection

#### **3.4 Technical Support and Training**

- A. Verify that technical support is available from the manufacturer and web-based training is available