



Lenel NVR System User Guide



Lenel® NVR 7.1 Lenel NVR System User Guide

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Table of Contents

Introduction	7
 <i>CHAPTER 1</i>	
<i>Lenel NVR Overview</i>	<i>9</i>
Lenel NVR System User Guide Overview	9
Lenel NVR Overview	9
Storage Space Reservation	10
Digital Video Prerequisites	11
<i>Time Synchronization</i>	<i>11</i>
<i>Antivirus Software</i>	<i>11</i>
<i>Windows Updates</i>	<i>11</i>
Storage File Purging	11
 <i>CHAPTER 2</i>	
<i>Lenel NVR Network Configurations</i>	<i>13</i>
Network Configuration	13
<i>Windows Firewall</i>	<i>13</i>
<i>Windows Authentication Model</i>	<i>14</i>
<i>Local vs. Remote Permissions</i>	<i>14</i>
DCOM Configuration	15
Analog Connections	15
 <i>CHAPTER 3</i>	
<i>Lenel NVR Installation</i>	<i>17</i>
Lenel Network Video Recorder	17
<i>Lenel NVR Firmware</i>	<i>17</i>
<i>Uninstall Lenel NVR Firmware for 32-Bit Systems</i>	<i>19</i>

Lenel NVR Unattended Installation Instructions	20
<i>Deploying Prerequisites</i>	20
<i>Deploying the LNV Suite</i>	20
<i>Command-line Syntax</i>	20
<i>Lenel NVR Security</i>	21
<i>Lenel NVR Network Setup</i>	21
Lenel NVR Unattended Upgrade Instructions	22
PTZ Control	23
<i>PTZ Connections</i>	23
<i>PTZ Device Configuration</i>	23

Lenel Network Video Recorder	25
------------------------------------	----

<i>CHAPTER 4</i>	<i>Lenel NVR Capabilities</i>	27
------------------	-------------------------------------	----

Analytics	27
<i>Motion Detection (AI)</i>	27
<i>Blind Camera</i>	27
<i>Brightness Change</i>	27
Backwards Compatibility	28
Recording	28
<i>Normal Mode</i>	28
<i>Event Mode</i>	28
PTZ priority control and locking	28
Recorder failover and redundancy	29
Video locking	29
Video streaming	29

<i>CHAPTER 5</i>	<i>Lenel NVR Alarms and Events</i>	31
------------------	--	----

<i>CHAPTER 6</i>	<i>Cameras</i>	33
------------------	----------------------	----

Supported Camera Functionality	33
<i>Audio</i>	33
<i>Audio Source Types</i>	33
<i>Audio Volume</i>	33
<i>Backlight Compensation</i>	33
<i>Brightness</i>	33
<i>Camera Motion Detection</i>	34
<i>Camera Time Stamps</i>	34
<i>Change Password Capability</i>	34
<i>Contrast</i>	34
<i>Exposure</i>	34
<i>Firmware</i>	34
<i>Frame Rates</i>	34
<i>Gamma</i>	34
<i>GOV Length</i>	34

	<i>H.264</i>	34
	<i>Hue</i>	34
	<i>IO Inputs</i>	34
	<i>IO Outputs</i>	35
	<i>MPEG4</i>	35
	<i>Multiple Video Inputs</i>	35
	<i>Name</i>	35
	<i>PTZ</i>	35
	<i>Quality</i>	35
	<i>Recording on Camera</i>	35
	<i>Resolutions</i>	35
	<i>Saturation</i>	35
	<i>Sharpness</i>	35
	<i>Substreams</i>	35
	<i>Supports Digest Authentication</i>	35
	<i>Two-Way Audio</i>	36
	<i>Video Standards</i>	36
	<i>White Balance</i>	36
<i>CHAPTER 7</i>	<i>Secure Lenel NVR Installation Checklist</i>	37
	Limit Access to the Users Group	37
	Review Machine-Wide DCOM Security Settings	37
<i>CHAPTER 8</i>	<i>Recovery Tool</i>	39
	Recover Video Files	39
<i>CHAPTER 9</i>	<i>Lenel NVR Web Services Installation</i>	41
	Overview	41
	Installing the Lenel NVR Web Services	41
	Maintaining the Lenel NVR Web Services	42

Introduction

Lenel NVR System User Guide Overview

The Lenel NVR System User Guide discusses the general capabilities and technical specifications of the Lenel NVR system. Specific configurations are covered in the documentation for your security management system software.

Lenel NVR Overview

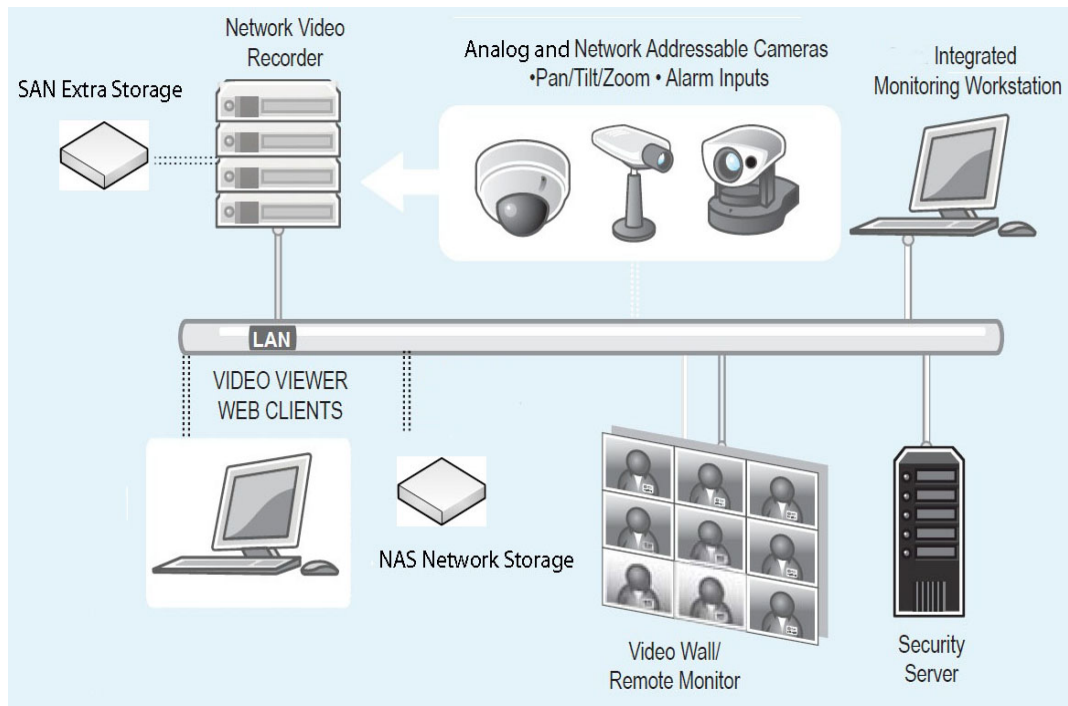
In order to facilitate equipment installation and be adaptable to existing corporate security policies, Lenel NVR video servers are shipped and/or configured by default with no security policies. Once a system is going into production, it is recommended that security on these servers should be locked down by your system administrator so that only users with valid Windows domain accounts have access to video. With the introduction of the browser-based applications, the ability to access video servers is made much easier and therefore, using Windows domain authentication to deny access to these servers is highly recommended and necessary for a secure deployment.

Lenel NVR, utilizing the technology of IP addressable cameras, allows system operators to access and program their cameras from anywhere in the world. These network digital video cameras are designed specifically for remote monitoring and management applications such as security and e-surveillance.

Data can be accessed and viewed over a LAN or the Internet. Through remote viewing and management, these cameras expand the flexibility of corporate security systems while facilitating system integration.

All IP cameras must have their IP address configured according to their respective user guide(s). The IP address also must be entered when configuring the camera in the security management system software.

IP cameras are configurable through the client application. IP addressable cameras are supported by network recorders:



Lenel NVR Configuration

Storage Space Reservation

Lenel NVR content is stored in separate tracks that contain information on the index, video status, and events.

Lenel NVR needs a certain amount of disk space reserved in accordance with Microsoft's drive guidelines. For any storage drive identified for use by Lenel NVR, at least ten percent (10%) of the total storage capacity must remain as free space for Lenel NVR to function correctly. In the **Leave Free Space** text field, enter the percentage of overall disk capacity to be retained as free space. The percentage is then uniformly applied to all installed drives.

Note: In versions prior to Lenel NVR 7.1 SP1, free space was designated in terms of MB. If Lenel NVR 7.1 SP1 is installed as an upgrade, then Lenel NVR will retain the MB value unless the box to switch to percent usage is checked. Once this box is checked, then a value between 10% and 80% can be entered.

If your video becomes inaccessible contact the Lenel Technical Support Group to assist you in data recovery.

Digital Video Prerequisites

Time Synchronization

In order for the digital video system to work properly, time must be synchronized on all computers. Third-party tools are available to synchronize times across multiple time zones.

Antivirus Software

If this type of software is required (due to corporate policy, for instance), then you must adhere to the following guidelines. For real-time protection, exclude the following:

- All files with the extensions.LVI,.LEI, and.LNR
- Data drives
- Lenel NVR suite (use %allusersprofile%/lenel/lnvsuite)

Windows Updates

When running Windows updates be aware that they require a full shut down of your computer. Make sure that these updates are scheduled to run when either recording will not be necessary or when backup or fail over systems are properly configured and running.

Storage File Purging

If the system runs out of hard drive space while the system's cameras are configured for storage capacity, the oldest video files are deleted regardless of what camera they are on. In addition to video files, Lenel NVR content is stored in separate tracks that contain information on the index, video status, and events.

This can lead to potentially problems if not accounted for. For example, consider a case where the retention policy is set to 5 days for all channels, except for 1 channel which is configured for a 30-day retention policy. The reclamation logic will reclaim files for the channel with 30 day retention that are 6-30 days old before reclaiming files from any other channel. This would significantly affect the amount of video that would be stored for the 30 day retention channel.

Lenel NVR Network Configurations

It is very important that all computers on the Lenel NVR Network are on the same domain or trusted domain. If they are not, then Lenel NVR will not function properly.

Network Configuration

The following firewall and permission information needs to be configured correctly for the Lenel NVR to work correctly.

Windows Firewall

By default, the Windows Firewall is enabled. The system administrator must determine whether firewall services are used on their system. If the firewall is enabled, it will prevent the security management system software from functioning properly until certain things are added to the exception list, which defines which components and ports should not be blocked by the firewall. If the firewall is enabled during installation of the security management system software, the exception list will be automatically populated.

Since certain elements are added to the exception list, it is mandatory that the check box “Don’t Allow Exceptions” on the General tab of the Windows Firewall dialog is not selected.

Windows Firewall Settings

Exception List:

- Lenel NVR services:
 - LnrCapSvcu
 - LnrRetrSvcu
 - LnrRTPServer
 - LpsSearchSvc
- RPC Port (TCP/IP 135)
- RTP Port (TCP/IP 554)

- UDP Port (5000)

ICMP Settings

- Allow incoming echo requests

Windows Authentication Model

The process used by Windows to verify a client's identity is called authentication. In order to properly set up a system or troubleshoot an existing installation, the first step is to determine the identity of the client attempting to connect to the server.

Here are some general guidelines:

- Interactive processes always run with the identity of the user that launched them, or they can be launched with credentials of a different user through the "runas" command.
- Services typically run under the SYSTEM account (or another account specified through Windows Services MMC).

When a client connects to a remote server, the client's identity is sent to that machine, and that system authenticates the client. This process can have several outcomes depending on which user account is used by the client:

- If both machines are in a domain and the domain user is used, then the server will use the domain controller to authenticate the incoming client connection.
- If the client used the local machine account and the same local account with the same password exists on the server, then that account will be used.

Note: If the same local account exists on the server, but the password is different, the client's connection attempt will immediately return failure. It will not default to the method described next.

- If the client used the local machine account and an account with that name is unknown to the server, an incoming connection will be assigned the ANONYMOUS user on the remote machine.

Note: There is a security policy which allows ANONYMOUS users to be part of the EVERYONE group, but by default the EVERYONE group only includes users whose identity was established in some way (i.e., not anonymous).

Local vs. Remote Permissions

Extended Windows security model, introduced in Windows XP SP2 and Windows 2003 Server SP1, split up permissions listed in the previous section into two separate parts: local and remote. This allows system administrators more granular control over object security.

As the client-server connection is analyzed, the location of the components will determine which permissions (launch, activation, and access) will be used. If both components are physically running on the same machine, local permissions will be used, otherwise, Windows will use remote permissions.

DCOM Configuration

The DCOM settings must be the same on all computers connected to the Lenel NVR. Be sure to close all security management system applications that may be connected to the recorder.

1. In Windows, from the Start menu select Run
2. Type dcomcnfg and click [OK].
3. Access the Distributed COM Configuration Properties by navigating to ***Component Services > Computers > My Computer***.
4. Right-click on My Computer and select Properties.
5. On the Default Properties tab, make sure it is configured as follows:
 - Select the Enable Distributed COM on this computer check box.
 - Clear the Enable COM Internet Services on this computer check box.
 - Default Impersonation Level should be set to Impersonate.
 - Clear the Provide additional security for reference tracking check box.
6. On the Default Protocols tab, use the buttons to order the list in the exact order shown below:
 - Connection-oriented TCP/IP
 - Datagram UDP/IP
 - Tunneling TCP/IP
 - Connection-oriented SPX
7. Verify that no port ranges are specified for any of the following protocols:
 - Connection-oriented TCP/IP
 - Datagram UDP/IP
 - Tunneling TCP/IP
8. Click [OK].
9. If changes were made, restart the recorder.
10. Verify that the object exporter error does not appear. If the error still occurs, repeat this procedure, but in step 6, remove the Tunneling TCP/IP protocol from the list of default protocols.

Analog Connections

Lenel NVR supports the Lenel 4016 and 4316 analog video cards (16, 32, and 48 channels).

Lenel Network Video Recorder

The Lenel NVR is a network recorder designed to store video obtained from IP cameras. When configuring the IP cameras, be sure to configure the correct IP address in the client software.

Multiple network cards may be installed on the Lenel NVR. When using a second network card to connect to a network independent from that of the host system, the second network must have a different subnet. If not, then the LNVR Network Setup, which is included when the Lenel NVR is installed, must be used. To access the LNVR Network Setup, open the **Lenel Network Video Suite** on the workstation.

Lenel NVR Firmware

In order for the network recorder to work, the correct version of firmware must be installed on the machine. Before installing the Lenel NVR firmware, DirectX should already be installed. If not, the Lenel NVR setup will stop so that you can install DirectX.

Lenel NVR Configuration

IMPORTANT: UAC should be set to “never notify” or unchecked depending on the operating system being used.

IMPORTANT: You must be logged in as an Administrator to properly configure the Lenel NVR.

1. Insert the Supplemental Materials disc into your disc drive, navigate to the **Digital Video\Lenel Network Video Suite 7.x.xxx** directory, and run the **setup.exe** program.
Click [Next].
2. Read the license agreement. If you agree, select the “I accept the terms in the license agreement” radio button. Click [Next].
3. The Custom Setup dialog is displayed.
 - a. Select Lenel Network Video Recorder for installation on the hard drive. Click [Next].
4. LNV Suite log files are always stored at the following location (not user configurable):

X:\ProgramData\Lenel\LNVSuite\7.1\logs

Note: “X:” equals the drive letter assigned to the drive where the LNV Suite log files are stored.

Click [Next].

5. To begin installation, click [Install].

IMPORTANT: If you are installing Lenel NVR using RDP, Windows Firewall does allow exceptions for RDP by default. You must create this exception in the firewall configuration prior to turning the firewall on. Failure to do so will render the recorder unreachable via RDP.

6. The Storage dialog is displayed. This dialog is used to configure the location of data for the network recorder.

- a. Under **Available Locations**, all local hard drives and mapped network drives are listed. Select a drive and click the arrow key to move the selection to the other column (**Selected Locations**).

- If you are using network drives, it is recommended that a user account be created to access those network drives.
- Mapped drives appear in the **Available Locations** list, but will not function properly and should not be used.
- To specify a UNC path name, click <User Location...>. You will then be presented with the option to type in the path or browse for the location.
- The following are supported:

iSCSI: Internet SCSI (Small Computer System Interface), an IP-based storage networking standard for linking data storage facilities. Because of the ubiquity of IP networks, iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), or the Internet and can enable location-independent data storage and retrieval.

SAN: (Storage Area Network). A high-speed special-purpose network (or subnetwork) that interconnects different kinds of data storage devices with associated data servers on behalf of a larger network of users.

NAS: (Network-Attached Storage). A hard disk storage that is set up with its own network address rather than being attached to the department computer that is serving applications to a network's workstation users.

IMPORTANT: When recording to NAS, keep in mind that failures may occur due to lack of bandwidth, or poor hard drive performance (for example, if several Lenel NVRs are writing to the same drive location or same shared folder). Each recorder requires its own dedicated space for storage.

- b. Specify the name of the folder where the data is to be stored. If the name of the folder specified does not already exist, it will be created.
- c. For any storage drive identified for use by Lenel NVR, at least ten percent (10%) of the total storage capacity must remain as free space for Lenel NVR to function correctly. In the **Leave Free Space** text field, enter the percentage of overall disk capacity to be retained as free space. The percentage is then uniformly applied to all installed drives.

Note: In versions prior to Lenel NVR 7.1 SP1, free space was designated in terms of MB. If Lenel NVR 7.1 SP1 is installed as an upgrade, then Lenel NVR will retain the MB value

unless the box to switch to percent usage is checked. Once this box is checked, then a value between 10% and 80% can be entered.

- d. Lenel NVR also supports storing index files separately, on dedicated drives.
 - e. Click [Next].
7. The Security dialog is used to define accessibility for the network recorder.

Note: It is recommended that only users with knowledge of Windows networking and security configure this step.

- a. Select whether to limit access to members of the LNVUsers group or to use anonymous DCOM connections.
 - b. Click [Next].
8. The Identity dialog is used to specify the account under which the Lenel NVR services are run. By default, the System Account is selected.
- If you wish to use the system account, select the **Run as SYSTEM account** radio button.
 - If you are using network drives for storage, select the **Run as the following account** radio button, and specify the user name and password required to access those machines.
9. Once you are finished configuring the network recorder, click [Finish].
10. After the installation is complete, the Security Utility runs automatically. Click [Apply] to apply the security changes to the system with the firewall on.
11. If you wish to make changes to these settings, you may do so at a later time by selecting **Start > All Programs > Lenel Network Video Suite > Lenel Network Video Admin Tool**.

Uninstall Lenel NVR Firmware for 32-Bit Systems

1. Remove the following programs from the computer:
 - Lenel Network Video Suite
 - MSXML 6 SP2 Parser and SDK
2. Delete the following folders from the computer:
 - *X:\Program Files\LVNSuite*

Note: “X:” equals the drive letter assigned to the drive where the LNV Suite is installed.

IMPORTANT: Modifying the registry could cause irreversible damage to your Windows operating system; be sure to back up the registry before making any changes. Follow the instructions located at: <http://support.microsoft.com/kb/322756>.

3. Open the Registry Editor and delete the following entries:
 - `hkey_local_machine\software\Lenel`
 - `hkey_local_machine\software\microsoft\MSSQLService`
 - `hkey_current_user\software\Lenel`

Note: Some keys may not be installed, depending on the version of Lenel NVR firmware.

4. Reboot the computer.

Lenel NVR Unattended Installation Instructions

LVN Suite is a Windows Installer-based setup package capable of running installations in reduced user interface modes to support various industry standard deployment technologies, such as SMS or Active Directory. This section provides specific requirements for deploying the LVN Suite via unattended or silent methods.

On each Lenel NVR on your system:

1. Copy the Unattended Installation folder to a location that can be accessed by the machine.
2. Modify the Sample LNR Install Config.xml file for the required configuration.
3. Run the command line setup.exe file with appropriate flags.

Deploying Prerequisites

There are several third-party prerequisites that are required prior to the Lenel NVR upgrade. These applications (Intel Performance Primitives 5.2, Microsoft XML Parser 6.0, Microsoft.NET Framework 4.0) are installed during the standard user-driven installation, however when running the installation in reduced user interface modes these prerequisite requirements must be met prior to the LVN Suite installation. These applications can be found on the LVN Suite disc and deployed individually using your preferred unattended technology. As an alternative, these prerequisites may be included in a slipstream image of a Windows installation.

Deploying the LVN Suite

The LVN Suite is a standard Windows Installer package capable of supporting an unattended mode of operation. The installer package requires input from a configuration file.

For unattended installations, configuration settings are saved and sent to the installer as part of the command line command that begins the installation. The file can be formatted as a standard Windows XML file and can be found in the in the Unattended Installation folder on the LVN Suite disc.

The file contains configuration settings that must be customized for your specific system needs prior to launching the LVN Suite via in unattended mode. Once the file has been modified as needed for your particular system, it can be stored on a disc or network location so that it can be passed to the setup during the unattended installation. Examples of how to specify your configuration file's location are provided below.

Command-line Syntax

To launch the LVN Suite installer in unattended mode, use the following command-line syntax:
setup.exe /s /v"/qr REBOOTPROMPT=Supress REBOOT=Force ADDLOCAL=LVNR,SVServer
UNATTEND=1 ADMINCONFIGFILE=\\MyNetworkServer\Configurations\Sample LNR Install
Config.xml ""

Once complete, the LVNR will reboot automatically.

Example:

```
"\\MyNetworkServer\Software\Lenel Video Suite Installation X.Y.ZZZ\Setup.exe" /s /v"/qr  
REBOOTPROMPT=Supress REBOOT=Force ADDLOCAL=LVNR,SVServer UNATTEND=1  
ADMINCONFIGFILE=\\MyNetworkServer\Configurations\Sample LNR Install Config.xml""
```

XML

Location: AdminTool Config\Sample LNR Install Config.xml

Example:

```
<?xml version="1.0" encoding="UTF-16" ?>
<LnvSetup Version="1" xmlns="http://www.lenel.com/LNR/2002/LNRAPI">
  <!-- The LnvStorage node identifies the recorder storage ("LNVR Storage" tab in LnvAdminTool) -->
  <LnvStorage folderName="LNVR Storage" leaveFreeSpacePercent="10">
    <!-- Alternately, could specify "leaveFreeSpace = XXX" attribute above to designate desired free space in MBs -->
    <Location>D:\</Location>
    <!-- Add as many content locations as are required -->
    <IndexLocation>E:\</IndexLocation>
    <!-- Add as many index locations as are required or include none if content/index file separation is not desired -->
  </LnvStorage>
  <!-- The ServerAccess node identifies the access ("Security" tab in LnvAdminTool) -->
  <ServerAccess useAnonymousDCOM="false" restricted="true" deleteExisting="true">
    <LnvUser username="SomeUser01" password="SomePassword01!!" />
    <LnvUser username="SomeUser02" password="SomePassword02!!" />
    <!-- Add as many as are required; be sure to include both username and password -->
  </ServerAccess>
  <!-- The LaunchingAccount node identifies the service account ("Identity" tab in LnvAdminTool);
  Specifying "SYSTEM" means use local system account, but you can identify any valid username/password here -->
  <LaunchingAccount username="SYSTEM" password="" />
  <!-- The presence of the AutoLaunch key will force LNVR service to start automatically once this
  config file has been parsed; completely remove it to leave services in "not running" mode -->
  <AutoLaunch />
</LnvSetup>
```

Lenel NVR Security

To restrict access to the Lenel NVR to specific users the following needs to be updated in the Sample LNR Install Config.xml.

```
<ServerAccess useAnonymousDCOM="false" restricted="true" deleteExisting="true">
<LnvUser username="SomeUser01" password="SomePassword01!!"/>
<LnvUser username="SomeUser02" password="SomePassword02!!"/>
<!-- Add as many as are required; be sure to include both username and password -->
</ServerAccess>
```

A Windows user will be created for each 'LnvUser username' specified and will be added to the LNVUsers user group.

By default, all existing Lenel NVR users that are not specified in the Sample LNR Install Config.xml file will be deleted. So if you want USER_X and USER_Y added, but there is already a USER_Z and that user is not specified in the Sample LNR Install Config.xml, USER_Z will be deleted. This can be controlled by setting deleteExisting="false." When set to "false", however, the Admin Tool will not update the passwords of existing users with new passwords that are specified for those users.

Lenel NVR Network Setup

Note: The following only applies when using non-RTP clients, such as OnGuard.

The Lenel NVR Network Setup is a tool is installed with the Lenel Network Video Suite and client software. It can be used to enable and configure multicast protocol and limit port ranges. Perform the following series of steps.

1. On the recorder, open the Lenel Network Video Suite and run the Lenel NVR Network Setup tool. If there is more than one network interface, select the desired interface for sending multicast.

2. On the client(s), run the Lenel NVR Network Setup tool from *X:\Program Files\Common Files\Lenel Shared\LVN Suite Client Components\7.1\LnrNI.exe*. This should be done on every workstation using monitoring software to see live video.

Note: “X:” equals the drive letter assigned to the drive where the **LnrNI.exe** file is located.

- a. Select the **Use Multicast** checkbox.
 - b. If more than one network interface is detected, select the one to be used for receiving live video.
 - c. If there is a firewall between the recorder and the client, certain ports must be open for Multicast/UDP. Select the **Use ports** checkbox. Type in the ports to be opened on the firewall.
3. On routers, IP Multicast must also be enabled. Refer to the manufacturer user guide to enable IP Multicast. This may require a firmware upgrade.

Note: Some network devices (routers/switches) may broadcast it to all devices instead of delivering data only to subscribed clients. Slow (10 Mbps) devices cannot handle the traffic. It may be possible to resolve these issues by using 100 Mbps or higher devices.

4. The following tabs allow you to limit the port range that are used for the sections specified:
 - Client Network Settings
 - Recorder Network settings
 - IVS Network Settings
 - Remote Monitor Network Settings
 - RTP Client settings

Firewalls between the Lenel NVR and its clients usually block both UDP/IP and IP Multicast traffic. This traffic is one-directional communication, so if there are firewalls, they must have traffic enabled going from the Lenel NVR to the clients. If the firewall cannot be configured to enable UDP/IP traffic on all ports, then specify a range of ports to be opened. The number of live video streams on the client is limited by the number of open ports.

Lenel NVR Unattended Upgrade Instructions

When running an unattended upgrade of the Lenel NVR the configuration XML should be modified to remove all of the configuration points. This will maintain the current Lenel NVR configuration after upgrade.

Example of upgrade configuration XML:

```
<?xml version="1.0" encoding="UTF-16" ?>
<LnvSetup Version="1" xmlns="http://www.lenel.com/LNR/2002/LNRAPI">
  <LnvStorage />
  <ServerAccess />
  <AutoLaunch />
</LnvSetup>
```

PTZ Control

Refer to your specific camera user guide to see its specific PTZ Control capabilities. To see specific camera capabilities, please refer to www.lenel.com.

PTZ Connections

PTZ devices without a built-in IP device require a serial connection to an IP camera or video server (via RS-232, RS-485, or RS-422 standard). For more information, refer to the manufacturer's documentation.

PTZ Device Configuration

PTZ devices with built-in IP cameras do not require special configuration. For all other cases, use the IP device's web interface to configure the appropriate settings for the driver and COM port (baud rate, data bits, stop bits, parity bits).

Lenel Network Video Recorder

The following chapter discusses features and capabilities of a Lenel NVR system.

Analytics

Lenel NVR is capable of automatically analyzing video to detect when certain events occur. The full analytic suite is covered in your security management system documentation.

Motion Detection (AI)

Lenel NVR is able to detect moving objects or people within the camera's field of view. Motion detection can be customized to:

- Detect motion in only certain regions of the camera's view
- Configure the movement threshold that must be met in order to generate an alarm.

Blind Camera

Lenel NVR is able to detect when the camera cannot view an area. An alarm is generated if the camera cannot focus on the scenery within the camera's field of view but does detect a solid color image. This is used primarily to alert monitoring stations that a camera has been compromised by being covered.

Brightness Change

Lenel NVR is able to detect lighting changes within the camera's field of view. If the lighting changes from bright to dark or vice-versa an alarm is generated.

Backwards Compatibility

Lenel NVR is backwards compatible with versions of supported certified security management systems with compatibility maintained moving forward.

Recording

The primary function of the Lenel NVR is to record video and audio so that it can be played back at a later time. There are several configurable parameters that control how video is recorded. These parameters affect both the quality of the recording and the amount of storage space the recordings consume. In general, the better the quality of the recording desired, the more storage space is required to maintain it, but the Lenel NVR supports multiple recording modes that help with this trade-off. The first, **Normal Mode**, should be applied to the most common recording scenario. The second, **Event Mode**, should be applied to event scenarios, such as when motion is detected or an access event occurs.

Both Normal and Event Mode recording may be scheduled so that they are in effect only during certain times of the day or certain days of the year.

Normal Mode

For Normal Mode recording when using MJPEG encoding, the Lenel NVR allows you to select frame rates less than or equal to the designated live frame rate, in addition to time-lapse frame rates up to 1 hour per frame.

For Normal Mode recording when using MPEG4 or H.264 encoding, the Lenel NVR allows you to select a frame rate equal to the designated live frame rate, a time-lapse frame rate, or a "Key Frame Only" rate that results in the recording of only the I-frames received from the camera.

Event Mode

The Lenel NVR supports Event Mode recording. Event Mode recording allows recordings to be made at a higher frame rate when an event is generated, thus providing a solution to the quality/space trade-off. Through the Pre-Roll and Post-Roll configuration, that higher frame rate can be applied to recordings made up to 15 minutes before and several minutes after the event occurrence. After the Post-Roll period, recording resumes using the Normal Mode frame rate.

For Event Mode recording when using MJPEG encoding, the Lenel NVR allows you to select frame rates less than or equal to the designated live frame rate.

For Event Mode recording when using MPEG4 or H.264 encoding, the Lenel NVR allows you to select a frame rate equal to the designated live frame rate or a "Key Frame Only" rate.

PTZ priority control and locking

PTZ usage can be prioritized by the user levels configured in the security management system software. Customized in the security management system software, users can be given different PTZ priority levels, which allows a user with a higher priority to lock or take control of the PTZ functionality from someone with a lower priority level.

Recorder failover and redundancy

Secondary recorders record and process video when the primary recorder is offline or at the same time if the redundancy feature is configured.

In standard failover, when the primary recorder goes offline, an alarm is generated and the secondary recorder begins recording video. Users can view live and recorded video from the time the alarm was generated on the secondary recorder. The secondary recorder uses the same workstation, algorithms and channel parameters as the primary recorder. When the primary recorder comes back online, a restored alarm is generated, the primary recorder connects to the IP camera and resumes recording. When both the recorders are online, users can view uninterrupted recorded video.

A redundant failover system may be configured via your security management system software. If a redundant failover system is used then only alarms for the primary recorder will be displayed if both are online.

The redundancy feature is a full-time failover solution. In a failover configuration, video channels are recorded to the primary recorder unless it goes offline, at which time recording occurs on the secondary recorder. In a redundant configuration, video channels are recorded to both the primary and secondary recorders regardless of the status of the primary recorder.

Full configuration of a redundant failover is done by the security management system software.

IMPORTANT: UDP port 5000 must be used when configuring failover.

Video locking

The security management system software can be configured to have the Lenel NVR lock video files associated with events so they are not deleted. The Lenel NVR regularly deletes older files to free disk space but if the event is locked they will not be deleted. Events can be locked automatically by the security management system software or locked manually by the user.

Video streaming

During the Lenel Network Video Suite installation you can also install:

- **Streaming Video Server** - Allows the Lenel NVR to stream video from the recorder to a video viewing application via multicast.
- **Streaming Video Client** - A client application that allows you to configure the ports, channels, and settings of the streaming video server.

The following alarms and events are generated by the Lenel NVR.

Alarm	Event	Description
CPU Utilization Threshold Exceeded	CPU Utilization Threshold Exceeded	Generated by a Lenel NVR recorder when current CPU level exceeds the user-defined limit.
CPU Utilization Threshold Restored	CPU Utilization Threshold Restored	Generated by a Lenel NVR recorder when the current CPU level drop below the user-defined limit.
Disk Read Utilization Threshold Exceeded	Disk Read Utilization Threshold Exceeded	Generated by a Lenel NVR recorder when current hard drive read speed exceeds the user-defined limit.
Disk Read Utilization Threshold Restored	Disk Read Utilization Threshold Restored	Generated by a Lenel NVR recorder when the current hard drive read speed drops below the user-defined limit.
Disk Write Utilization Threshold Exceeded	Disk Write Utilization Threshold Exceeded	Generated by a Lenel NVR recorder when current hard drive write speed exceeds the user-defined limit.

Alarm	Event	Description
Disk Write Utilization Threshold Restored	Disk Write Utilization Threshold Restored	Generated by a Lenel NVR recorder when the current hard drive write speed drops below the user-defined limit.
Event Recording Threshold Exceeded	Event Recording Threshold Exceeded	Generated by a Lenel NVR recorder when a specified time limit is exceeded.
Event Recording Threshold Restored	Event Recording Threshold Restored'	Generated after the alarm that raised the Event Recording Threshold Exceeded alarm ends, or the user manually selects to stop event recording.
Network Utilization Threshold Exceeded	Network Utilization Threshold Exceeded	Generated by a Lenel NVR recorder when current Network activity levels exceeds the user-defined limit.
Network Utilization Threshold Restored	Network Utilization Threshold Restored	Generated by a Lenel NVR recorder when the current Network activity level dropped below the user-defined limit.
Update: Now able to Achieve Current Required Storage Setting	Update: Now able to Achieve Current Required Storage Setting	Generated by a Lenel NVR recorder when the recording rate drops to allow the video storage to be full in the same or more number of days than defined by the user.
Warning: Unable to Achieve Current Required Storage Setting	Warning: Unable to Achieve Current Required Storage Setting	Generated by a Lenel NVR recorder when video storage will be full in less number of days than defined by the user.
Warning: Unable to Meet Required Storage Setting! Deleting Oldest Video	Warning: Unable to Meet Required Storage Setting! Deleting Oldest Video	Generated by a Lenel NVR recorder when there is no space available to record to, so the oldest file will be deleted in order to continue recording.

For a list of currently supported cameras, visit: www.lenel.com.

Supported Camera Functionality

The following list of settings can generally be configured on the cameras currently supported by Lenel NVR. However, not all cameras listed support all listed functionality.

Audio

Specifies whether Audio is implemented on this camera (Audio incoming from the camera to the recorder). Selecting “Yes” denotes that Audio is supported and is recorded on the Lenel NVR.

Audio Source Types

Allows the user to select the audio source type. The audio source type is based on the individual camera. Refer to the camera manufacturer’s user guide for information about available audio source types. Source types can typically be “line” or “microphone”.

Audio Volume

Allows for volume control of the camera's incoming audio.

Backlight Compensation

Allows the user to adjust the camera's backlight compensation.

Brightness

Allows the user to adjust the camera's image Brightness.

Camera Motion Detection

Specifies whether the camera supports Camera Motion Detection.

Camera Time Stamps

Specifies whether the camera supports time stamping based on the image and not on the recorder.

Change Password Capability

Specifies whether the user can change the password on the camera via the software.

Contrast

Allows the user to adjust the camera's image contrast.

Exposure

Allows the user to adjust the camera's image exposure or the amount of time light is allowed to pass through the camera lens.

Firmware

Indicates the firmware of the camera that this version of Lenel NVR is tested and supported with.

Frame Rates

Indicates the available frame rates (frames per second) allowed to be specified in the software for that camera.

Gamma

Allows the user to adjust the gamma of the camera output.

GOV Length

Allows the user to control how many P-frames are sent between I-frames from cameras configured for MPEG4 and H.264 encoding. An "auto" setting is also supported that allows the Lenel NVR to determine the best GOV length based on other configuration settings.

H.264

Specifies whether this camera supports the H.264 standard.

Hue

Allows the user to adjust the camera's image Hue.

IO Inputs

Shows the number of inputs, if any, that can be configured for that camera type.

IO Outputs

Shows the number of outputs, if any, that can be configured for that camera type.

MPEG4

Allows the user to put the camera in MPEG4 mode, which records video using MPEG4 standards.

Multiple Video Inputs

Specifies whether the camera is a multiple video input camera (typically a 4 channel encoder).

Name

Specifies the name of the camera as given by the user.

PTZ

Allows the camera to be controlled via pan, tilt zoom functionality of the video viewing software.

Quality

Allows the user to adjust the camera's image quality.

Recording on Camera

Allows the user to configure recording to the internal storage of a camera if supported by the camera.

Resolutions

Specifies the available resolutions supported for this particular camera type. The resolution may change based on the standard used and the codec.

Saturation

Allows the user to adjust the camera's image color saturation or color level.

Sharpness

Allows the user to adjust the camera's image sharpness.

Substreams

Substreams are supported. From the client, multiple streams can be configured per camera based on camera capabilities.

Supports Digest Authentication

Specifies whether the camera supports Digest Authentication along with Basic Authentication.

Two-Way Audio

Specifies whether the camera can be used for bidirectional audio communications.

Video Standards

Specifies the standards (for example, NTSC, PAL) supported by the camera.

White Balance

Allows the user to adjust the camera's image white balance.

This chapter describes the steps for making the Lenel NVR installation more secure. The intention of this chapter is not to cover general Windows security practices and guidelines, but to assist IT professionals in applying these practices and guidelines to Lenel video products.

Limit Access to the Users Group

By default, Lenel NVR is installed with access granted to all clients. Access includes retrieval of video and the ability to modify the recorder configuration. Access can be limited by running LnrSetup and opening the Security tab.

Review Machine-Wide DCOM Security Settings

Default machine-wide limits should be adjusted to provide adequate security for the Windows installation. Each product in the Video Suite has different DCOM configurations based on the included components.

If access to Lenel NVR is limited to the LNRUsers group, then anonymous user and everyone entries do not have to be given access. Removing these entries from access permission limits and launch/activation limits will improve security. The LNRUsers group must be allowed to access and activate DCOM objects, but not launch them.

If access to the Lenel NVR is not limited to the LNRUsers group, anonymous user access can still be disabled. With this setting, only users that the system knows about will be able to authenticate. This could be problematic for installations that do not have a domain server. Therefore the recommendation is that if the Lenel NVR is secured with this method, then the Lenel NVR and all client machines should be part of a domain.

-
- **WARNING!** • Only use the Lenel NVR Recovery Tool with the assistance of the Technical Support Group.

The Lenel NVR Recovery Tool is used to restore system information that may have been lost as a result of upgrading from an earlier version of Lenel NVR, or from removing storage locations containing Lenel NVR files. Without this system information, the video will not be viewable on a Prism client until the Recovery Tool is run. The video will still be viewable on an OnGuard client.

The Recovery Tool can be run while the Lenel NVR is either recording or not recording. If the Lenel NVR is still recording while the Recovery Tool is run, older video will not be accessible to Prism and the Recovery Tool will take longer to finish than if the Lenel NVR is not recording.

Recover Video Files

- IMPORTANT:** Running the Lenel NVR Recovery Tool will cause services to stop and restart, which will cause video monitoring to stop for several minutes.
- IMPORTANT:** The Lenel NVR Recovery Tool must be run on each Lenel NVR where video will be viewed on Prism.
- IMPORTANT:** If any Lenel NVR channels are configured for failover, the Recovery Tool must be installed and run on both the primary and failover recorders.
- IMPORTANT:** If the Lenel NVR is heavily utilized the Recovery Tool may take a long time to execute.

1. Navigate to **Start > All Programs > Lenel Network Video Suite >** and run the Recovery Tool.
2. The tool will automatically detect the recorder on the Lenel NVR. Click [Start].
3. The tool will process the recorded videos in the Lenel NVR. If the Lenel NVR services are running the tool asks if it is okay to automatically stop and start the services as needed. Click [Yes] to continue the recovery process. The more video that needs to be recovered the longer the tool will take to run.

4. Optionally, you can schedule the specific days and time range during which the Recovery Tool will restart the Lenel NVR services.

Lenel NVR Web Services Installation

Overview

Note: Lenel NVR 7.1 Service Pack 1 (SP1) or higher is required in order to install and use the Lenel NVR Web Services.

The Lenel NVR Web Services provide support for mobile client applications such as Prism Mobile.

Installing the Lenel NVR Web Services is a two-step process:

1. Install Lenel NVR 7.1 Service Pack 1 (SP1) or higher.
2. Install the Lenel NVR Web Services.

Installing the Lenel NVR Web Services

1. Install Lenel NVR 7.1 Service Pack 1 (SP1) or higher.
2. Download the Lenel NVR Web Services package.
3. Open the package and double-click on the **setup.exe** file.
The **InstallShield Wizard for Lenel NVR Web Services** starts.
4. Click **Next**.
The **License Agreement** screen appears.
5. Select **I accept the terms in the license agreement** and click **Next**.
The **Web Server Options** screen appears.
6. Configure the web server options as follows:
 - a. For non-secure communication between client and server, check the **Enable HTTP** box and enter an available port number. Default is **80**.
To see if a port is available, click **Check Port**.
 - b. For secure (encrypted) communication between client and server, check the **Enable SSL** box and enter an available port number. Default is **443**.
To see if a port is available, click **Check Port**.

- c. Click **Next**.

The **Ready to Install** screen appears.

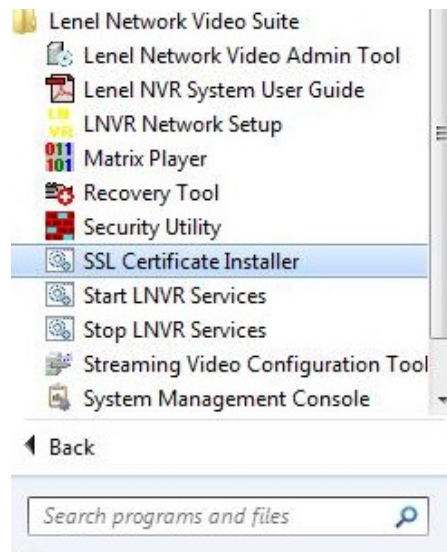
7. Click **Install**.

A progress bar tracks the progress of the installation. When the installation is complete, click **Finish**. The Lenel NVR Web Services are now installed.

Note: The InstallShield Wizard installs two new services specific to Lenel NVR Web Services: **LnrFCGIService** and **LnrWebServerService**. When the Lnv Admin Tool stops and restarts the original set of Lenel NVR services (such as the **Capture** and **Retrieval** services), it also stops and restarts the new services.

KtmKm for Distributed Transaction...	Coordinates transactions between the Distributed Transaction Coordinator (MSDTC) and the ...
Link-Layer Topology Discovery Ma...	Creates a Network Map, consisting of PC and device topology (connectivity) information, an...
LnrCapSvc	LNVR Service responsible for capturing, storing, and live distribution of media via TCP/IP
LnrFCGIService	LNVR service that implements an FCGI-based interface in support of LNVR Web Services
LnrRetrSvc	LNVR Service responsible for distribution of recorded media via TCP/IP
LnrRTPServer	LNVR Service responsible for streaming live and recorded video via RTP/RTSP to clients
LnrWebserverService	LNVR service that controls starting and stopping of the web server
LpsSearchSvc	Service responsible for processing video analytics algorithms
Media Center Extender Service	Allows Media Center Extenders to locate and connect to the computer.
Microsoft .NET Framework NGEN v...	Microsoft .NET Framework NGEN

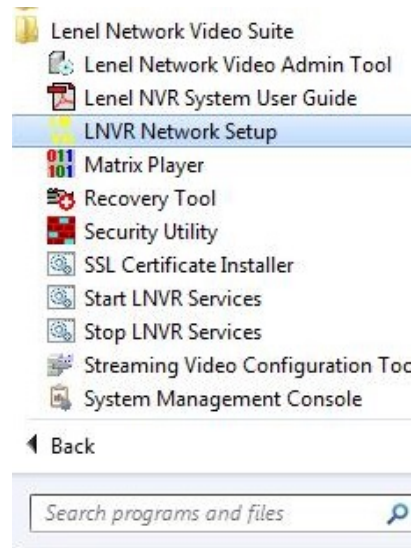
Note: In addition to the new services, an SSL certificate that enables SSL (secure) communication between the client and server is installed. If, after successful installation of the Lenel NVR Web Services, the server's name or domain changes, the SSL certificate must be reinstalled. Use the **SSL Certificate Installer**, located in the **Lenel Network Video Suite**, to reinstall the SSL certificate.



Maintaining the Lenel NVR Web Services

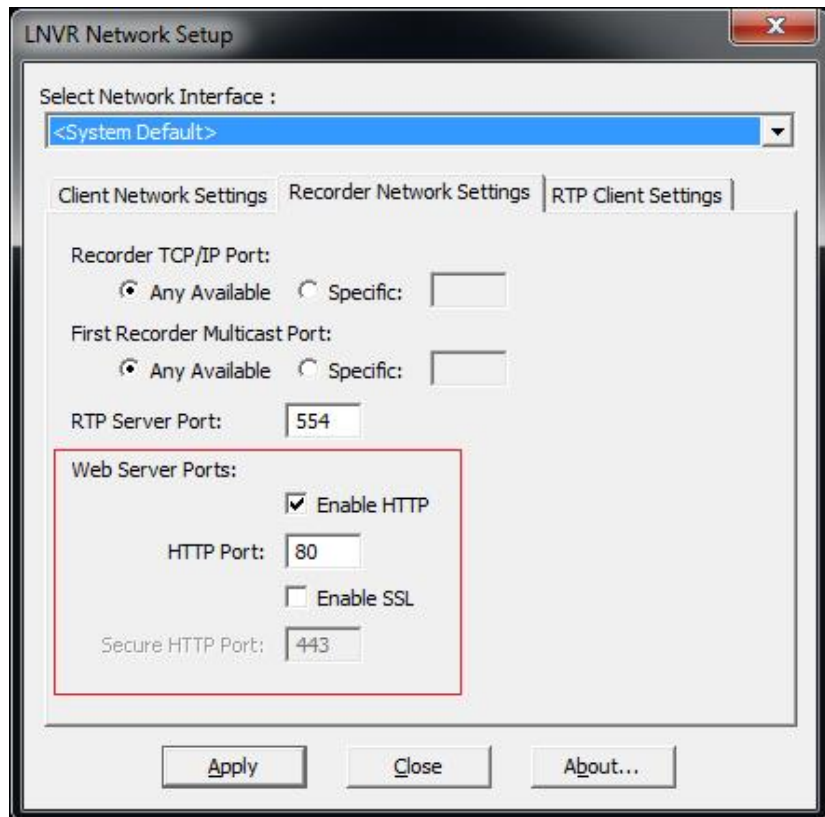
If the web server port numbers must be changed after installing the Lenel NVR Web Services, use the LNVR Network Setup tool to change the port numbers as needed.

1. From the workstation, open the **Lenel Network Video Suite**.



2. Select **LNVR Network Setup**.

The **LNVR Network Setup** screen appears.



3. In the **Web Server Ports** section, configure the communication ports as follows:

- a. For non-secure communication between client and server, check the **Enable HTTP** box and enter an available port number. Default is **80**.
- b. For secure (encrypted) communication between client and server, check the **Enable SSL** box and enter an available port number. Default is **443**.

- c. Click **Apply** and then click **Close**.
4. For changes to take effect, restart the **LnrWebServerService**.

Index

A		
Access	37	
Alarms	31	
Analytics	27	
Antivirus Software	11	
B		
Backwards compatibility	28	
C		
Cameras	33	
D		
DCOM configuration	15	
Digital video	9, 13, 31, 39	
E		
Event Mode		
recording	28	
Events	31	
F		
Firmware	17	
uninstall	19	
L		
Lenel NVR		
capabilities	27	
configuration	17	
installation	17, 41	
network configurations	13	
overview	9	
web services	41	
Live video setup	21	
N		
Network		
configuration	13	
storage	28	
Normal Mode		
recording	28	
P		
PTZ		
priority control and locking	28	
R		
Recorder failover	29	
Recording	28	
event mode	28	
normal mode	28	
Recovery Tool	39	
S		
storage capacity	11	
T		
Time synchronization	11	
V		
Video		
locking	29	
streaming	29	
Video Setup	21	
W		
Web Services		
installation	41	
maintenance	42	

overview	41
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