

The open platform company

Milestone Systems

XProtect® Professional 2016

Administrator Manual

Contents

Copyright, trademarks and disclaimer 10

Before you start 11

About this manual 11

About minimum system requirements 11

About naming of host names 11

About important port numbers 12

About daylight saving time 12

About time servers 13

About virus scanning 13

System overview 15

System components 15

Clients 18

XProtect Smart Client 18

Milestone Mobile client 19

XProtect Web Client 20

Recording Server Manager 21

XProtect Download Manager 22

Licenses 25

About licenses 25

License information overview 26

About automatic license activation 28

About device changes without activation 28

Hardware device summary 30

About replacing hardware devices 30
Get additional licenses 31
About license activation 32
Install and upgrade 34
Install your system software 34
Install XProtect Smart Client 35
Install from the management server 35
Install silently 35
Install video device drivers 36
Upgrade 37
About upgrading 37
About updates 37
Upgrading from one product version to another product version 38
Upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product 39
About removing system components 40
Getting started 41
About the Getting started page 41
Automatic configuration wizard 41
Automatic configuration wizard: First page 41
Automatic configuration wizard: Scanning options 42
Automatic configuration wizard: Select hardware manufacturers to scan for 42
Automatic configuration wizard: Scanning for hardware devices 42
Automatic configuration wizard: Continue after scan 42
Add hardware wizard 43
Express 43
Manual 45

Configure storage wizard 48
Configure storage: Video settings and preview 48
Configure storage: Online schedule 48
Configure storage: Live and recording settings (motion JPEG cameras)49
Configure storage: Live and recording settings - H.264/MPEG4 cameras51
Configure storage: Drive selection 54
Configure storage: Recording and archiving settings 57
Adjust motion detection wizard 59
Adjust motion detection: Exclude regions 59
Adjust motion detection: Motion detection 60
Manage user access wizard 62
Manage user access: Basic and Windows users 62
Manage user access: Access summary 63
Advanced configuration 64
Hardware devices 64
About hardware devices 64
About microphones 64
About speakers 64
About recording audio 65
About dedicated input/output devices 65
Show or hide microphones or speakers 66
Configure hardware devices 66
Delete/disable hardware devices 66
About replacing hardware devices 67
About the Replace Hardware Device wizard 67
Speaker properties 69
Hardware properties 70
Cameras and storage information 72

About video and recording configuration 72
About database resizing 73
About motion detection 73
About motion detection and PTZ cameras 75
Configure camera-specific schedules 75
Configure when cameras should do what 77
Configure motion detection 77
Disable or delete cameras 78
Move PTZ type 1 and 3 to required positions 78
Recording and storage properties 79
Camera properties 99

Microphones 122
About microphones 122
Configure microphones or speakers 123
Show or hide microphones or speakers 123
Microphone (properties) 123

Events and output 124
About input and output 124
About events and output 124
Overview of events and output 125
Add an analytics event 128
Add a hardware input event 128
Add a hardware output 129
Add a manual event 129
Add a generic event 130
Add a timer event 130
Configure hardware output on event 131
Configure general event handling 131
Generate alarms based on analytics events 132

Test a generic event 132
General event properties 134
Events and output properties 134
Scheduling and archiving 145
About scheduling 145
About archiving 146
Configure general scheduling and archiving 151
General scheduling properties 152
Camera-specific scheduling properties 156
Matrix 158
About Matrix video-sharing 158
About Matrix-recipients 159
Configure Matrix 159
Matrix properties 159
Logs 162
About logs 162
Configure system, event and audit logging 165
Log properties 166
Notifications 168
About notifications 168
Email 168
SMS 172
Scheduling 175
Central 176
About Central 176
Enable XProtect Central 176
Central properties 177
Access control 177

About access control integration 177
XProtect Access licenses 178
Wizard for access control system integration 179
Access control properties 180
Server access 188
About server access 188
About registered services 189
Configure server access 189
Server access properties 189
Master/Slave 191
About master and slave 191
Configure master and slave servers 192
Master/slave properties 192
Users 193
About users 193
Add basic users 194
Add Windows users 194
Add user groups 195
Configure user and group rights 195
User properties 196
Services 201
About services 201
Start and stop services 202
Servers 203
LPR servers 203
Mobile server 243
Alarms 254
About alarms 254

About maps 256
Add an alarm 256
Add a time profile (for alarms) 256
Alarms properties 257
MIP plug-ins 262
About MIP plug-ins 262
XProtect Transact 263
XProtect Transact introduction 263
XProtect Transact configuration 266
Settings 279
About automatic device discovery 279
Change default file paths 279
Options 280
General 280
User Interface 281
Default File Paths 282
Audio Recording 282
Analytics Event Settings 283
Event Server Settings 283
System maintenance 285
Backing up and restoring configuration 285
About back up and restore of configuration 285
Back up system configuration 285
Restore system configuration 286
Back up and restore alarm and map configuration 286
Export and import Management Application configuration 289
Restore system configuration from a restore point 291

Importing changes to configuration 292

About importing changes to configuration 292

About required fields for CSV files when you import changes to configurations 292

Import changes to configuration 293

Glossary of Terms 294

Index 303

Copyright, trademarks and disclaimer

Copyright © 2016 Milestone Systems A/S

Trademarks

XProtect is a registered trademark of Milestone Systems A/S.

Microsoft and Windows are registered trademarks of Microsoft Corporation. App Store is a service mark of Apple Inc. Android is a trademark of Google Inc.

All other trademarks mentioned in this document are trademarks of their respective owners.

Disclaimer

This text is intended for general information purposes only, and due care has been taken in its preparation.

Any risk arising from the use of this information rests with the recipient, and nothing herein should be construed as constituting any kind of warranty.

Milestone Systems A/S reserve the right to make adjustments without prior notification.

All names of people and organizations used in the examples in this text are fictitious. Any resemblance to any actual organization or person, living or dead, is purely coincidental and unintended.

This product may make use of third party software for which specific terms and conditions may apply. When that is the case, you can find more information in the file **3rd_party_software_terms_and_conditions.txt** located in your Milestone system installation folder.

Before you start

About this manual

The following product help/manual covers the features and functionality available in your version of the XProtect Professional VMS software. XProtect Professional VMS covers XProtect Enterprise, XProtect Professional, XProtect Express, XProtect Essential and XProtect Go.

In some cases the help may mention some functionality or settings that are only available in a more advanced version of the XProtect Professional VMS products. In such cases, the help/manual explicitly mentions which product versions the functionality or settings are available in.

About minimum system requirements

Important: Your system no longer supports Microsoft® Windows® 2003, but you can still run/access clients from computers with Windows 2003.

Important: Your system no longer supports Microsoft® Windows® 32-bit OS, but you can still run/access XProtect Web Client and XProtect Smart Client from computers with Windows 32-bit OS.

For information about the minimum system requirements to the various components of your system, go to the Milestone website http://www.milestonesys.com/SystemRequirements.

About naming of host names

Names of hosts you use in connection with your VMS system must following the Microsoft standard of naming. This means that all host names must only use the ASCII letters 'a' through 'z' (in a case-insensitive manner), the digits '0' through '9', and the hyphen ('-'). If you use country- or regionally-specific characters as part of a host name for a component you use with the VMS system, you may not be able to establish a connection between the system and the host machine.

When you install the surveillance system, it is important that you have administrator rights on the computer that should run the system. If you only have standard user rights, you cannot configure the surveillance system.

About important port numbers

Your system uses particular ports when communicating with other computers, cameras, and so on. Make sure that the following ports are open for data traffic on your network when you use your system:

Name	Description
Port 20 and 21 (inbound and outbound)	Used for FTP traffic. FTP (File Transfer Protocol) is a standard for exchanging files across networks. FTP uses the TCP/IP standards for data transfer, and is often used for uploading or downloading files to and from servers.
Port 25 (inbound and outbound)	Used for SMTP traffic. Simple Mail Transfer Protocol (SMTP) is a standard for sending e-mail messages between servers. This port should be open since, depending on configuration, some cameras may send images to the surveillance system server via e-mail.
Port 80 (inbound and outbound)	Used for HTTP traffic between the surveillance server, cameras, and XProtect Smart Client, and the default communication port for the surveillance system's Image Server service.
Port 554 (inbound and outbound)	Used for RSTP traffic in connection with H.264 video streaming.
Port 1024 (outbound only)	Used for HTTP traffic between cameras and the surveillance server.
Port 1234 (inbound and outbound)	Used for event handling.
Port 1237 (inbound and outbound)	Used for communication with the XProtect Central add-on product.
Port 8081 and 8082	Used for communication with the Mobile service.
Port 22331	Used for communication with the Event Server service.

Your organization may also have selected to use any other port numbers, for example if you have changed the server access (on page 189) port from its default port number (80) to another port number.

About daylight saving time

Daylight saving time (DST) is the practice of advancing clocks in order for evenings to have more daylight and mornings to have less. The use of DST varies between countries/regions.

When you work with a surveillance system, which is inherently time-sensitive, it is important that you know how the system handles DST.

Spring: Switch from Standard Time to DST

The change from standard time to DST is not much of an issue since you jump one hour forward. Typically, the clock jumps forward from 02:00 standard time to 03:00 DST, and the day has 23 hours. In that case, there is no data between 02:00 and 03:00 in the morning since that hour, for that day, did not exist.

Fall: Switch from DST to Standard Time

When you switch from DST to standard time in the fall, you jump one hour back. Typically, the clock jumps backward from 02:00 DST to 01:00 standard time, repeating that hour, and the day has 25 hours. In that case, you reach 01:59:59, then immediately revert back to 01:00:00. If the system did not react, it would essentially re-record that hour, so the first instance of, for example, 01:30 would be overwritten by the second instance of 01:30.

Because of this, your system forcefully archives the current video in the event that the system time changes by more than five minutes. The first instance of the 01:00 hour is not viewable directly from clients. However, the data is recorded and safe, and it can be browsed using the XProtect Smart Client by opening the archived database directly.

About time servers

Once your system receives images, they are instantly time-stamped. Since cameras are separate units which may have separate timing devices, camera time and your system time may not correspond fully. This may occasionally lead to confusion. If your cameras support timestamps, Milestone recommends that you auto-synchronize camera and system time through a time server for consistent synchronization.

For information about how to configure a time server, search the Microsoft website http://www.microsoft.com/ for 'time server', 'time service', or similar terms.

About virus scanning

As is the case with any other database software, if an antivirus program is installed on a computer running XProtect® software, it is important that you exclude specific file types and locations, as well as certain network traffic. Without implementing these exceptions, virus scanning uses a considerable amount of system resources. On top of that, the scanning process can temporarily lock files which likely results in a disruption in the recording process or even database corruption.

When you need to perform virus scanning, do not scan Recording Server directories containing recording databases (by default c:\mediadatabase\, as well as all folders under that location). Avoid also to perform virus scanning on archive storage directories. In older versions of the software, the databases are by default located in the installation folder, each being a subfolder with the MAC address of the device recorded.

Create the following additional exclusions:

- File types: .blk, .idx, .pic, .pqz, .sts, .ts

- C:\Program Files\Milestone or C:\Program Files (x86)\Milestone and all subdirectories.
- Exclude network scanning on TCP ports:

Product	TCP ports
XProtect® Enterprise, XProtect® Professional, XProtect® Express, XProtect® Essential	80, 25, 21, 1234, 1237, 22331
Milestone Mobile	8081
XProtect® Transact	9001

or

- Exclude network scanning of the following processes:

Product	Processes
XProtect Enterprise, XProtect Professional, XProtect Express, XProtect Essential	RecordingServer.exe, ImageServer.exe, ManagementApplication.exe, ImageImportService.exe, RecordingServerManager.exe, VideoOS.ServiceControl.Service.exe, VideoOS.Event.Server.exe
Milestone Mobile	VideoOS.MobileServer.Service.exe
XProtect Transact	VideoOS.Transact.TransactService.exe

Organizations may have strict guidelines regarding virus scanning, however it is important that the above locations and files are excluded from virus scanning.

System overview

System components

Your system consists of a number of components, each targeted at specific tasks and user types:

Name	Description
Management Application	The main application for configuring the surveillance system server, for example when you add new cameras, set up users or change configuration on the system.
Recording Server service	A vital part of the surveillance system. The Recording Server service runs to ensure that devices transfer video streams to your system. The Recording Server service installs automatically and runs in the background on the surveillance system server. You manage the service through the Management Application.
Event Server service	Handles configuration of alarms and maps from all servers within the surveillance system installations, including Master/slave setups, throughout your organization. This enables monitoring and instant overview of alarms and possible technical problems within your systems. The event server is automatically installed on the surveillance system server where it runs in the background.
Microsoft® SQL Server Express Database	The surveillance system's alarm data is stored in a SQL Server Express database. The SQL database is a lightweight, yet powerful, version of a full SQL server which is automatically installed on, and runs in the background of, your surveillance system server.
Image Server service	Handles access to the surveillance system for users logging in with clients. The Image Server service is automatically installed and runs in the background on the surveillance system server. You can manage the service through the Management Application.
Download Manager	Manages the system-related features your organization's users can access from a targeted welcome page on the surveillance system server.
XProtect® Smart Client	XProtect Smart Client is a client application for the daily operations of security installations. Its streamlined interface makes it easy to monitor installations of all sizes, manage security incidents and access and export live and recorded video. Milestone recommends that you always use the latest version of XProtect Smart Client to best use new features and functions included in your surveillance system.
Milestone Mobile client	A free application designed by Milestone that allows you to view video from your system from almost anywhere on your smartphone or tablet. You can also control outputs, such as opening and closing doors and switching lights on or off, allowing you to gain control and dynamically respond to incidents in the system.

Name	Description
XProtect® Web Client	A simplified web-based client application for XProtect surveillance systems for viewing, playing back and sharing video from most operating systems and web browsers. With no need to install additional software, you can monitor your system from any computer or Internet connection.

Clients

Clients are applications used for viewing live and recorded video from the hardware devices set up in the Management Application.
Your system supports three different clients:

- XProtect Smart Client
- Milestone Mobile client
- XProtect Web Client

XProtect Smart Client

About XProtect Smart Client

Designed for Milestone XProtect® IP video management software, the XProtect Smart Client is an easy-to-use client application that provides intuitive control over security installations. Manage security installations with XProtect Smart Client which gives users access to live and recorded video, instant control of cameras and connected security devices, and an overview of recordings. Available in multiple local languages, XProtect Smart Client has an adaptable user interface that can be optimized for individual operators' tasks and adjusted according to specific skills and authority levels.



The interface allows you to tailor your viewing experience to specific working environments by selecting a light or dark theme, depending on room lighting or brightness of the video. It also features work-optimized tabs and an integrated video timeline for easy surveillance operation. Using the MIP SDK, users can integrate various types of security and business systems and video analytics applications, which you manage through XProtect Smart Client.

XProtect Smart Client must be installed on users' computers. Surveillance system administrators manage clients' access to the surveillance system through the Management Application. Recordings viewed by clients are provided by your XProtect

system's Image Server service. The service runs in the background on the surveillance system server. Separate hardware is not required.

To download XProtect Smart Client, you must connect to the surveillance system server which presents you with a welcome page that lists available clients and language versions. System administrators can use XProtect Download Manager to control what clients and language versions should be available to users on the welcome page of the XProtect Download Manager.

Milestone Mobile client

About Milestone Mobile client

Milestone Mobile client is a mobile surveillance solution closely integrated with the rest of your XProtect system. It runs on your Android tablet or smartphone, your Apple® tablet, smartphone or portable music player or your Windows Phone 8 tablet or smartphone and gives you access to cameras, views and other functionality set up in the management clients.

Use the Milestone Mobile client to view and play back live and recorded video from one or multiple cameras, control pan-tilt-zoom (PTZ) cameras, trigger output and events and use the Video push functionality to send video from your device to your XProtect system.



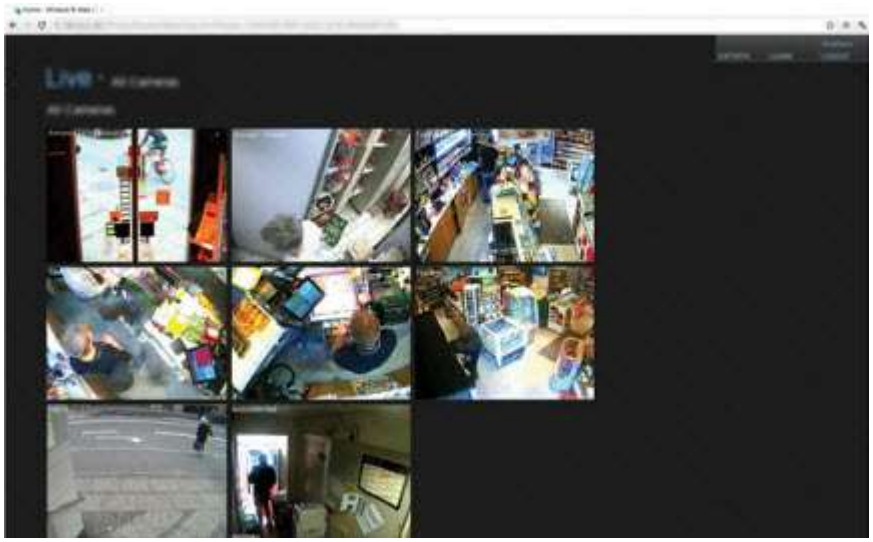
If you want to use Milestone Mobile client with your system, you must add a Mobile server to establish the connection between the Milestone Mobile client and your system. Once the Mobile server is set up, download the Milestone Mobile client for free from Google Play, App Store or Windows Phone Store to start using Milestone Mobile.

You need one hardware device license per device that should be able to push video to your XProtect system.

XProtect Web Client

About XProtect Web Client

XProtect Web Client is a web-based client application for viewing, playing back and sharing video. It provides instant access to the most commonly used surveillance functions, such as viewing live video, play back recorded video, print and export evidence. Access to features depends on individual user rights which are set up in the management client.



To enable access to the XProtect Web Client, you must install a Mobile server to establish the connection between the XProtect Web Client and your system. The XProtect Web Client itself does not require any installation itself and works with most Internet browsers. Once you have set up the Mobile server, you can monitor your XProtect system anywhere from any computer or tablet with Internet access (provided you know the right external/Internet address, user name and password).

Access XProtect Web Client

If you have a Milestone Mobile server installed on your computer, you can use the XProtect Web Client to access your cameras and views. Since you do not need to install XProtect Web Client, you can access it from the local computer on which you installed the Milestone Mobile server or any other computer you want to use for this purpose.

1. Set up the Milestone Mobile server in the Management Application
2. Open an Internet browser (Internet Explorer, Mozilla Firefox, Google Chrome or Safari) or click **Open XProtect Web Client** in the Mobile Server Manager (see "About Mobile Server Manager" on page 251).
3. Type the external IP address, that is the external address and port of the server on which the Milestone Mobile server is running.

Example: The Milestone Mobile server is installed on a server with the IP address 127.2.3.4 and is configured to accept HTTP connections on port 8081 and HTTPS connections on port 8082 (default settings of the installer).

In the address bar of your browser, type: **http://1.2.3.4:8081** or **https://1.2.3.4:8082**, depending on whether you want to use a standard HTTP connection or a secure HTTPS connection. You can now begin using XProtect Web Client.

4. Add the address as a bookmark in your browser for easy future access to XProtect Web Client. If you use XProtect Web Client on the local computer on which you installed the Milestone Mobile server, you can also use the desktop shortcut which the installer creates. Click the shortcut to launch your default browser and open XProtect Web Client.

You must clear the cache of Internet browsers running the XProtect Web Client before you can use a new version of the XProtect Web Client. System administrators must ask their XProtect Web Client users to clear out their browser's cache upon upgrade or force this action remotely (you can do this action only in Internet Explorer in a domain).

Recording Server Manager

The Recording Server service is a vital part of the surveillance system. Video streams are only transferred to your system while the Recording Server service is running. The Recording Server Manager informs you about the state of the Recording Server service. It also lets you manage the service.

In the notification area (the system tray), the Recording Server Manager's icon indicates whether the Recording Server service is running or not.

 - A green icon in the notification area indicates that the Recording Server service is running.

 - A red icon in the notification area indicates that the Recording Server service has stopped.

By right-clicking the icon, you can open the Management Application, start and stop the Recording Server service, view log files, and view version information.

Monitor System Status

Right-click the notification area's Recording Server icon and select **Show System Status** to get access to the **Status** window.

The **Status** window lets you view the status of the image server(s) and connected cameras. The status of each server/camera is indicated by a color:

- **Green** indicates that the server or camera is running correctly.
- **Gray** indicates that the **camera** (not the server) is not running. Typically, a camera is indicated in gray in the following situations:
  - The camera is not online (as defined in the camera's online period schedule).

  - The Recording Server service has been stopped.

- **Red** indicates that the server or camera is not running. This may because it has been unplugged or due to a network or hardware error. Errors are listed in the Recording Server log file.

Place your mouse pointer over a camera in the status window to view details about the relevant camera. The information appears as a pop-up and updates approximately every 10 seconds.

Name	Description
Resolution	The resolution of the camera.
FPS	The number of frames per second (frame rate) currently used by the camera. The number updates each time the camera has received 50 frames.
Frame count	The number of frames received from the camera since the Recording Server service was last started.
Received KB	The number of kilobytes sent the by camera since the Recording Server service was last started.
Offline	Indicates the number of times the camera has been offline due to an error.

XProtect Download Manager

Manage which system-related features your organization's users can access from a targeted welcome page on the surveillance system server through the use of XProtect Download Manager.

- Access XProtect Download Manager from Windows' **Start** menu: Select **All Programs** > **Milestone XProtect Download Manager** > **Download Manager**.

Examples of user-accessible features

- **XProtect Smart Client**. Users connect to the surveillance server through an Internet browser where they are presented with a welcome page. From the welcome page, users can download XProtect Smart Client software and install it on their computers.

- **Various plug-ins**. Downloading such plug-ins can be relevant for users if your organization uses add-on products with the surveillance system.

The welcome page

The welcome page links to downloads of various features. Users can select language from a menu in the top right corner of the welcome page.

To view the welcome page, open an Internet browser (for example, Internet Explorer version 6.0 or later) and connect to the following address:

```
http://[surveillance server IP address or hostname]
```

If you have configured the Image Server service with a port number other than the default port 80 (you configure this as part of the server access properties), users must specify the port number as well, separated from the IP address or hostname by a colon:

```
http://[surveillance server IP address or hostname]:[port number]
```

The content of the welcome page is managed through XProtect Download Manager and can look different in different organizations.

Immediately after you install your system, the welcome page provides access to XProtect Smart Client in all languages. You can also download XProtect Smart Client in 32- or 64-bit if you run a 64-bit operating system and in 32-bit if you run a 32-bit operating system. This initial look of the welcome page is automatically provided through XProtect Download Manager's default configuration.

Default configuration of XProtect Download Manager

XProtect Download Manager has a default configuration. This ensures that your organization's users can access standard features without the surveillance system administrator having to set up anything. The XProtect Download Manager configuration is represented in a tree structure.

Download Manager's tree structure explained:

- The **first level of the tree structure** indicates that you are working with a system.
- The **second level** indicates that this is the default setup.
- The **third level** refers to the languages in which the welcome page is available. In the example, the welcome page is available in a dozen languages (English, Arabic, Danish, Dutch, French, and more).
- The **fourth level** refers to the features that you can make available to users. For example, you could limit these features to XProtect Smart Client.
- The **fifth level** (**5**) refers to particular versions of each feature, for example, version 4.0, 32-bit, and more that you can make available to users.
- The sixth **level** (**6**) refers to the language versions of the features which can be made available to users. For XProtect Smart Client, which is only available with all languages embedded, the only option is **All Languages**.

The fact that only standard features are initially available helps reduce installation time and save space on the server. There is no need to have a feature or language version available on the server if nobody is going to use it. You can make more features and/or languages available if you need to.

Making new features available

When you install new features, these are by default selected in XProtect Download Manager and immediately available to users through the welcome page.

You can always show or hide features on the welcome page by selecting or clearing check boxes in the tree structure. You can change the sequence in which features and

languages are displayed on the welcome page by dragging items and dropping them in the relevant position.

Hiding and removing features

You can remove features in several ways:

You can **hide features** from the welcome page by clearing check boxes in XProtect Download Manager's tree structure. If you do this, the features are still installed on the surveillance system server, and by selecting check boxes in the tree structure, you can quickly make the features available again.

You can **remove features** which have previously been made available through XProtect Download Manager. This removes the installation of the features on the surveillance system server. The features disappear from XProtect Download Manager, but installation files for the features are kept in the surveillance system server's **Installers** or relevant language folder, so you can re-install them later if required. To do so:

1. In XProtect Download Manager, click **Remove features...**
2. In the **Remove Features** window, select the features you want to remove.
3. Click **OK** and then click **Yes**.

Licenses

About licenses

When you have purchased your XProtect software and licenses, you receive two emails. One with your order confirmation and another with your software license file.

The software license file uses the file extension .lic and is named after your Software License Code (SLC). Your SLC is also printed on your order confirmation and consists of several numbers and letters grouped by hyphens similar to this:

- Product version 2014 or earlier: xxx-xxxx-xxxx
- Product version 2016 or later: xxx-xxx-xxx-xx-xxxxxx

The software license file contains all information about your purchased VMS products and licenses.

Milestone recommends that you store the information about your SLC and a copy of your software license file in a safe place from which you can find them again. You can also see your SLC from the **Help** menu > **About**. You may need the software license file or your SLC when you, for example create a My Milestone user account, contact your reseller for support and if you need to make changes to your system.

To get started, you download the software from our website. While you are installing (see "Install your system software" on page 34) the software, you are asked to provide the software license file. If you have not yet received the software license file, you can still install the software and run it for a 30-day trial period with a maximum of eight added cameras and a retention time of maximum five days. To continue using your system, you must import (see "Importing a new software license file" on page 40) your software license file before the end of the trial period.

Once the installation is complete and you have activated your licenses, you can see an overview of your licenses (see "License information overview" on page 26) for the current installation on the Getting started page.

You have purchased at least two types of licenses:

Base licenses: As a minimum, you have a base license for one of the XProtect VMS products. You may also have one or more base licenses for XProtect add-on products.

Hardware device licenses: Every hardware device that you add to your XProtect system requires a hardware device license. You do not need hardware device licenses for speakers, microphones or input and output devices attached to your cameras. You need only one hardware device license per video encoder IP address even if you connect several cameras to the video encoder. A video encoder can have one or more IP addresses.

For more information, see the list of supported hardware on the <Company> website https://www.milestonesys.com/supported-hardware. If you want to use the video push feature in Milestone Mobile, you also need one hardware device license per mobile device or tablet that should be able to push video to your system. If you are short of hardware device licenses, you can disable (see "Disable or delete cameras" on page 78) less important hardware devices to allow new hardware devices to run instead. You may also

need a hardware device license for some devices that are NOT attached to your cameras. Examples of camera independent devices are perimeter detectors and some types of audio devices and input/output boxes. See the supported hardware site https://www.milestonesys.com/supported-hardware on the Milestone website.

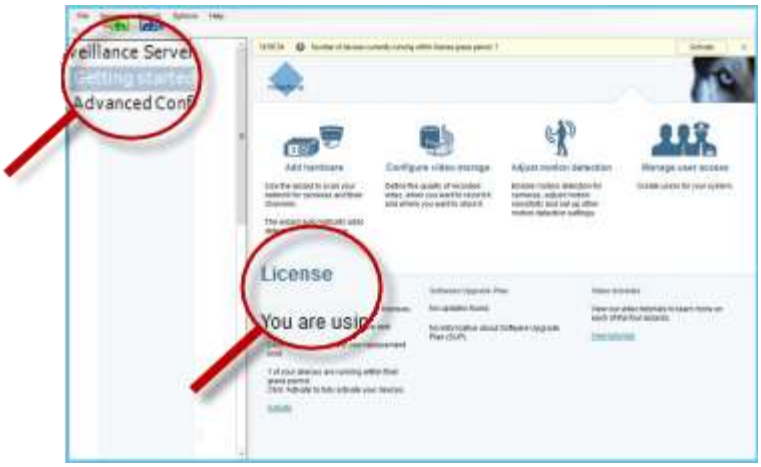
Most XProtect add-on products require additional license types. The software license file also includes information about your licenses for add-on products. Some add-on products have their own separate software license files. You can find more information about add-on product licenses here:

- XProtect Access (see "XProtect Access licenses" on page 178)
- XProtect LPR (see "LPR licenses" on page 205)
- XProtect Transact

For add-on product licenses for XProtect Retail and XProtect Screen Recorder, see the documentation for these products.

License information overview

On the **Getting started** page under **License** in the bottom left corner, see the following information about your hardware device licenses:



- The number of hardware device licenses activated on this server and the total number of hardware device licenses you have purchased as part of the same software license file..
- If the same software license file is shared on multiple surveillance systems in a master/slave setup, the license overview shows the same total number of purchased licenses for all systems.
  To find out how many free licenses you have, add the number of activated licenses on all your systems and subtract this number from the total number of purchased licenses. Alternatively, visit our website for software registration http://online.milestonesys.com.
- The maximum number of hardware devices you can add to each server in your VMS system. To exceed this maximum, you must upgrade to a more advanced

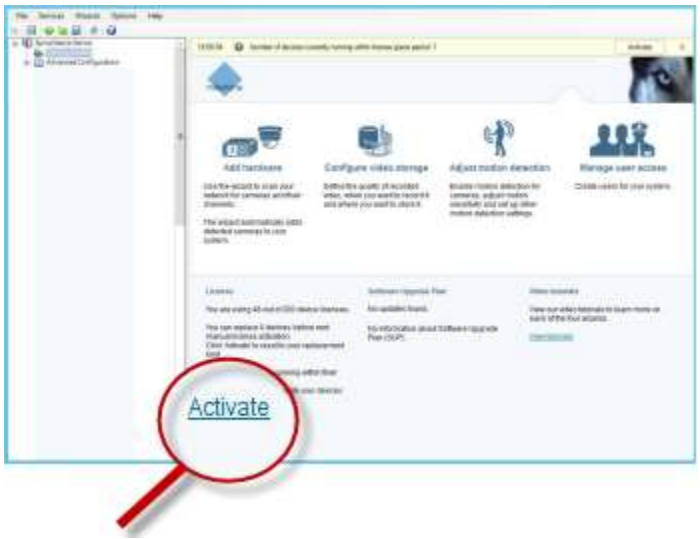
XProtect VMS product. For more information about how to do this, contact your reseller.

- The number of activated hardware devices you have replaced or added without having to activate.
  The column **Changes without activation** shows the number of hardware devices you can replace or add without having to activate your hardware device licenses as well as how many changes you have already made since last activation. Hardware devices added within your number of device changes without activation run as fully activated hardware device licenses and have the status **Licensed** in the Hardware device summary (on page 30) table. Because you can add or replace devices without activating them, you gain flexibility in the day-to-day maintenance of your system. For more information, see About device changes without activation (on page 28).

- The number of hardware devices running in a 30-day grace period. If you have already used your number of device changes without activating this or have added more hardware devices than you have purchased licenses for, the added hardware devices run in a grace period. Once the grace period expires, cameras are disabled and stops sending video to the system. You can also see when the first grace period for a hardware device expires.

For easy maintenance and flexibility, your VMS system is set up to automatically activate your licenses online each time you add or remove hardware devices. Of course, automatic license activation (see "About automatic license activation" on page 28) requires that your system is connected to the Internet.

If your system is not connected to the Internet, and you have added or replaced hardware devices within your number of device changes without activating them or have added hardware devices that now run in a grace period, click the Activate link to activate your hardware device licenses. Your number of device changes without activation now reflects the new number of activated licenses. The hardware devices previously in grace period are moved to activated if you have enough purchased licenses. For more information, see About license activation (on page 32).



About automatic license activation

Milestone recommends that your surveillance system is online so that your licenses are automatically activated.

When your system is online, the system activates your hardware devices or other licenses a few minutes after you have made your changes. The result is that:

- you never have to manually start a license activation
- the number of used device changes without activation is always zero
- no hardware devices are within a grace period, unless you have added more hardware devices than your number of purchased hardware device licenses allows.

In some cases you must activate licenses manually. Such cases are when you have purchased additional licenses, if you have bought or renewed a Milestone Care subscription (see "About the Getting started page" on page 41), or if Milestone has granted you a higher number of device changes without activation (see "About device changes without activation" on page 28).

About device changes without activation

On the Getting started page, the column Changes without activation shows the number of hardware devices you can replace or add without having to activate your hardware device licenses and how many changes you have already made since the last activation.

Hardware devices added within your device changes without activation run as fully activated hardware device licenses and has the status Licensed in the Hardware device summary (on page 30) table. One year after your last license activation, your number of used device changes without activation is automatically reset to zero. Once the reset happens, you can continue to add and replace hardware devices without activating the licenses.

The number of device changes without activation differs from installation to installation and is calculated based on several variables. For a detailed description, see How the number of device changes without activation is calculated (on page 29).

If your surveillance system is offline for longer periods of time, for example in cases with a surveillance system on a ship on a long cruise or a surveillance system in a very remote place without any Internet access, you can contact your Milestone reseller and request a higher number of device changes without activation.

You must explain why you think you qualify for a higher number of device changes without activation. Milestone decides each request on an individual basis. Should you be granted a higher number of device changes without activation, you must activate your licenses to register the higher number on your XProtect system.

How the number of device changes without activation is calculated

The device changes without activation are calculated based on three variables. If you have several installations of the Milestone software, the variables apply to each of them separately. The variables are:

- **C%** that is a fixed percentage of the total amount of activated licenses.
- **Cmin** that is a fixed minimum value of the number of device changes without activation.
- **Cmax** that is a fixed maximum value of the number of devices changes without activation.

The number of device changes without activation can never be lower than the **Cmin** value or higher than the **Cmax** value. The calculated value based on the **C%** variable changes according to how many activated devices you have on each installation in your system. Devices added with device changes without activation are not counted as activated by the **C%** variable.

Milestone defines the values of all three variables and the values are subject to change without notification. The values of the variables differ depending on the product.

For more information about the current default values for your product, go to My Milestone http://www.milestonesys.com/device-change-calculation.

Examples based on C% = 15%, Cmin = 10 and Cmax =100

A customer buys 100 hardware device licenses. He adds 100 cameras to his system. Unless he has enabled automatic license activation, his device changes without activation is still zero. He activates his licenses and he now has 15 device changes without activation.

A customer buys 100 hardware device licenses. He adds 100 cameras to his system and activates his licenses. His device changes without activation is now 15. The customer decides to delete a hardware device from his system. He has now 99 activated devices and his number of device changes without activation drops to 14.

A customer buys 1000 hardware device licenses. He adds 1000 cameras and activates his licenses. His device changes without activation is now 100. According to the **C%** variable, he should now have had 150 devices changes without activation, but the **Cmax** variable only allows him to have 100 devices changes without activation.

A customer buys 10 hardware device licenses. He adds 10 cameras to his system and activates his licenses. His number of device changes without activation is now 10 because of the **Cmin** variable. If the number was only calculated based on the **C%** variable, he would only have had 1 (15% of 10 = 1.5 rounded off to 1).

A customer buys 115 hardware device licenses. He adds 100 cameras to his system and activates his licenses. His device changes without activation is now 15. He adds another 15 cameras without activating them, using 15 out of 15 of his device changes without activation. He removes 50 of the cameras from the system and his device changes without activation goes down to 7. This means that 8 of the cameras previously added within the 15 device changes without activation go into a grace period. The customer now adds 50 new cameras. Because the customer activated 100 cameras on his system

last time he activated his licenses, the device changes without activation goes back to 15 and the 8 cameras, which were moved into a grace period, moves back as device changes without activation. The 50 new cameras go into a grace period.

Hardware device summary

You can get an overview of the status of your hardware device licenses and channels by expanding **Advanced Configuration** > **Hardware Devices**. The **Hardware Device Summary** table contains the following information:

Name	Description
Hardware Device Name	The name of your hardware device.
License	The licensing status of your hardware devices. There are the following statuses: **Licensed**, **[number of] day(s) grace period, Trial,** or **Expired**.
Video Channels	The number of available video channels on your hardware devices.
Speaker Channels	The number of available speaker channels on your hardware devices.
Microphone Channels	The number of available microphone channels on your hardware devices.
Address	The HTTP addresses of your hardware devices.
WWW	Links to the web addresses of your hardware devices.
Port	The ports used by your hardware devices.
Device Driver	The name of the device drivers associated with your hardware devices.

About replacing hardware devices

If you remove a hardware device from a recording server and save the configuration, you also free a hardware device license. Simply disabling a device does not free a license. You can replace a licensed hardware device with a new hardware device and activate and license it instead. The total number of purchased hardware device licenses corresponds to the total number of hardware devices that can run on the surveillance system simultaneously.

When you replace a hardware device, you must use the Replace Hardware Device wizard (see "About the Replace Hardware Device wizard" on page 67) to map all relevant databases of cameras, microphones, inputs, outputs, and more. Remember to activate the license when you are finished.

Get additional licenses

If you want to add more hardware devices or other components that require a license that you currently do not have licenses for, you must buy additional licenses to enable the devices to send data to your system before the grace period ends.

- To get additional licenses for your system, contact your XProtect product reseller.

New licenses to your existing surveillance system version:

- Activate your licenses manually to get access to the new licenses.

  For more information, see Activate licenses offline (on page 32) or Activate licenses online (on page 32).

New licenses and an upgraded surveillance system version:

- You receive an updated software license file (**.lic**) with the new licenses and the new version. You must use the new software license file during the installation of the new version.

About license activation

This topic is only relevant if your surveillance system is offline or if you want to make a manual license activation. If your system is online, your licenses are activated automatically. For more information see About automatic license activation (on page 28).

When you have installed your VMS and added hardware devices, the hardware devices run in a 30-day grace period. Before the end of the 30-day grace period, you must activate your hardware device licenses or your hardware devices stop sending video to your surveillance system.

Milestone recommends that you activate your licenses before you make final adjustments to your system and its hardware devices. For more information, see Activate licenses offline (on page 32) and Activate licenses online (on page 32).

If you add more hardware devices than the number of purchased hardware device licenses, the hardware devices run with in a grace period. If you want to see video from these hardware devices after the expiry of the grace period, you must buy additional licenses (see "Get additional licenses" on page 31). You can also disable (see "Delete/disable hardware devices" on page 66) less important cameras to allow new hardware devices to run instead.

If you have several VMS products installed in a master/slave setup, you activate your licenses from each installation and get an updated and activated .lic file for each installation. This is also the case if all your VMS products share the same software license file.

Activate licenses online

This topic is only relevant if your surveillance system is offline or if you want to make a manual license activation. If your system is online, your licenses are activated automatically. For more information see About automatic license activation (on page 28).

If you have purchased additional licenses or want to upgrade, you must manually activate your licenses. If the computer that runs the Management Application has Internet access, you can do a manual online activation.

1. From the **File** menu, select **Activate License Online**.
2. The **Online License Retrieval** dialog box opens and your licenses are activated.

Activate licenses offline

This topic is only relevant if your surveillance system is offline or if you want to make a manual license activation. If your system is online, your licenses are activated automatically. For more information see About automatic license activation (on page 28).

You must manually activate your licenses if:

- You have purchased additional licenses, want to upgrade
- You have bought or renewed a Milestone Care subscription (see "About the Getting started page" on page 41)

- Milestone has granted you a higher number of device changes without activation (see "About device changes without activation" on page 28)

1. From the **File** menu, select **Activate License Offline**.
2. Click **Export** to export a license request file.
3. The license request file is automatically given the same name as your SLC. If you have several sites, remember to make the name unique so you easily can identify which file belong to which site.
4. Copy the license request file (.lrq) to a computer with internet access and log into our website for software registration http://online.milestonesys.com.
5. Copy the activated software license file (.lic) that has the same name as your license request file to your computer with Management Application.
6. In the same dialog box that you opened in step 1, click **Browse** to use the activated software license file.
7. Click **Activate**.

If the computer that runs the Management Application does not have Internet access, you can activate licenses offline.

Activate licenses after grace period

If you do not activate a license for a hardware device or other device used with an add-on product within the grace period, the device becomes unavailable and cannot send data to the surveillance system.

- The device itself, its configuration and other settings are not removed from the system configuration.
- To receive data from the expired device again, activate the license.

For more information see Activate licenses offline (on page 32) and Activate licenses online (on page 32).

Install and upgrade

Install your system software

Do not install your surveillance software on a mounted drive. A mounted drive is a drive that is attached to an empty folder on an NTFS (NT File System) volume, with a label or name instead of a drive letter. If you use mounted drives, critical system features may not work as intended. You do not, for example, receive any warnings if the system runs out of disk space.

Before you start: shut down any existing surveillance software. If you are upgrading, read Upgrading from one product version to another product version (on page 38) first.

1. Run the installation file
2. If you have a previous installation of your system or any of the other XProtect Professional VMS products installed, the system detects this installation and informs you that your previous installation is removed after installing the new version. If you accept this, click **Yes** to continue the installation. All your recordings and configuration from the previous version are available in the new version
3. Select language for the installer and then click **Continue**
4. Select **Trial** to install a 30-day trial version of the system software if you do not have a software license file named after your SLC. If you have a software license file, first save it on your local drive. Do not try to import it directly from a network drive or a USB stick. Import it by typing the destination of the software license file or clicking **Browse**
5. Read and accept the license agreement. Indicate if you want to participate in the Milestone data collection program and if you want to enable access to the **Customer Dashboard**
6. Select **Typical** or **Custom** installation. If you select **Custom** installation, you can select application language, which features to install and where to install them. Let the installation wizard complete
7. If you have installed a trial version, open the Management Application once the installation is complete and select which of the XProtect Professional VMS products you want to use, for example XProtect Enterprise

You can now begin to configure your system, see Configure your system in Management Application.

Install XProtect Smart Client

You must install XProtect Smart Client on your computer before you can use it. You download XProtect Smart Client from the surveillance system server and install it on your computer or install directly from a DVD.

Install from the management server

Before you begin, verify that your computer meets the XProtect Smart Client's minimum system requirements.

1. Open Internet Explorer and connect to the management server using the URL or IP address of that server.
2. On the **Welcome** page, click **Language** and select the language you want to use.
3. The **XProtect Smart Client setup** wizard starts. In the wizard, follow the installation instructions.

The wizard suggests an installation path. Normally, you can use the suggested installation path. However, if you have previously used add-on products, this path might not be valid anymore.

Install silently

A surveillance system administrator can deploy the system or XProtect Smart Client to users' computers by using tools such as Microsoft Systems Management Server (SMS). With this tool, you can build up databases of hardware and software on local networks. You can then use the databases for distributing and installing software applications over local networks.

To install silently:

1. Locate the XProtect Smart Client .exe file **MilestoneXProtectSmartClient (64-bit).exe**. Find the file in a subfolder under the folder **httpdocs**. The **httpdocs** folder is located under the folder in which your Milestone surveillance software is installed.

   The path is typically (if you are using an English language version of the XProtect Smart Client):
   C:\Program Files (x86)\Milestone\Milestone Surveillance\httpdocs\XProtect Smart Client Installer\[version number] [bit-version]\All Languages\en-US

   For example:
   C:\Program Files (x86)\Milestone\Milestone Surveillance\httpdocs\XProtect Smart Client Installer\2016 (64-bit)\All Languages\en-US

2. Run a silent installation using one of the following two options:

   a) Run with default parameter settings:

To run a silent installation using the default values for all parameters, start a command prompt (cmd.exe) in the directory where the installation program is located and perform the following command:

- XProtect Smart Client:

  MilestoneXProtectSmartClient (64-bit).exe --quiet

  Your system:

  Milestone XProtect Professional VMS Products 2016 System Installer.exe --quiet

This performs a quiet installation of XProtect Smart Client or your system using default values for parameters such as target directory and so on. To change the default settings, see the following:

a) Customize default parameters using an XML argument file as input:

In order to customize the default installation settings, you must provide an XML file with modified values as input. In order to generate the XML file with default values, open a command prompt in the directory where the installation program is located and perform the following command:

- XProtect Smart Client:

  MilestoneXProtectSmartClient (64-bit).exe --generateargsfile=[path]

- Your system:

  Milestone XProtect Professional VMS Products 2016 System Installer.exe --generateargsfile=[path]

Open the generated arguments.xml file in a text editor and perform any changes needed. Then perform the following command in the same directory to run a modified version of the silent installation.

- XProtect Smart Client:

  MilestoneXProtectSmartClient (64-bit).exe --arguments=[full path]args.xml --quiet

- Your system:

  Milestone XProtect Professional VMS Products 2016 System Installer.exe --arguments= [full path]args.xml --quiet

Install video device drivers

Video device drivers are installed automatically during the initial installation of your system. New versions of video device drivers, known as XProtect Device Pack, are released from time to time and made available for free on the Milestone website http://www.milestonesys.com. Milestone recommends that you always use the latest version of video device drivers. When you update video device drivers, you can install the latest version on top of any version you may have installed.

When you install new video device drivers, your system cannot communicate with camera devices from the moment you begin the installation until the moment installation

is complete and you have restarted the Recording Server service. Usually, the process takes no longer than a few minutes, but Milestone highly recommends that you perform the update at a time when you do not expect important incidents to take place.

To install video device drives:

1. On the system server on which you want to install the new video device drivers version, shut down any running surveillance software, including any running Recording Server service.
2. Run the XProtect Device Pack installation file and follow the wizard.
3. When the wizard is complete, remember to start the Recording Server service again.

If you use the Add Hardware Devices Wizard's Import from CSV File option, you must—if cameras and server are offline—specify a **HardwareDriverID** for each hardware device you want to add. To view a current list of IDs, view the release notes for the XProtect Device Pack used in your organization. Alternatively, visit the Milestone website http://www.milestonesys.com for the latest information.

Upgrade

About upgrading

If you want to upgrade your system, you can do this in different ways. You can:

- Perform an upgrade from one product version to a newer version of the same product (see "Upgrading from one product version to another product version" on page 38), for example upgrading from XProtect Enterprise 2013 to XProtect Enterprise 2014.
- Perform an upgrade from one XProtect product to another XProtect product (see "Upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product" on page 39), for example upgrading from XProtect Essential to XProtect Professional. You can also downgrade a product if you need to.

If you upgrade your software, you gain access to more or expanded functionality.

About updates

Milestone regularly release service updates that offers improved functionality and support for new devices.

When a new version of your VMS software is available, a message in the yellow notification bar informs you that you can update the software. Milestone recommends that you always install the latest version of your surveillance software to ensure that your software is running as smoothly as possible.

Upgrading from one product version to another product version

About upgrading from one product version to another product version

You can upgrade your entire system configuration from one product version to another, for example from XProtect Enterprise 2013 to XProtect Enterprise 2014 fairly fast and easily. Install the new product on top of the old version without any need to install the previous version.

When you install the new version of your system, it inherits the configuration from the previously installed version/product. Milestone recommends that you make regular backups of your server configuration as a disaster recovery measure. You should also do this when you upgrade your server. While it is rare that you lose your configuration (cameras, schedules, views and more), it **can** happen under unfortunate circumstances. Fortunately, it takes only a minute to back up your existing configuration.

If you use XProtect Professional 6.5, you must upgrade to XProtect Professional 10.0 or newer before you can upgrade to the current version. You must also perform a manual backup of your system configuration before you can upgrade your system.

Note that you do not need to manually remove the old version of your system before you install the new version. The old version is removed when you install the new version. However, you must remove XProtect Basis+ versions earlier than 6.0 manually before installing the new version.

The following describes backing up XProtect Professional 6.5 or earlier. If you need information about how to back up configuration for XProtect Professional 10.0 or newer, see Back up system configuration (on page 285).

1. Create a folder called **Backup** on a network drive, or on removable media.
2. On the system server, open **My Computer**, and go to the system's installation folder.
3. Copy the following files and folders into your **Backup** folder:
   - All configuration (.ini) files
   - All scheduling (.sch) files
   - The file **users.txt** (only present in a few installations)
   - Folders with a name ending with **...ViewGroup** and all their content

Note that some of the files/folders may not exist if you are upgrading from old software versions.

If you installed your system as a custom version to a non-default file-path, make a backup of your existing configuration and restore it to a new installation folder called **[relevant folder]\Milestone Surveillance**. When you run the installer, select **Custom** installation and when you are prompted for an installation folder, select the **[relevant folder]** created for restoring.

Upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product

About upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product

If you use one of the XProtect Professional VMS products, for example XProtect Express, and decide that you want to use the additional features and functionality found in a different XProtect VMS product, for example, XProtect Professional, you can upgrade your system.

First, you must place a trade-in order for your current XProtect Professional VMS product and purchase a base license for a more advanced XProtect VMS product. When you do this, you receive a new software license file. The software license file defines which XProtect Professional VMS product you can use. Therefore, you do not need to install anything, only import your new software license file (see "Importing a new software license file" on page 40).

Your settings from the previous product are the same in the new product. You must redefine some of the old settings and define the settings to the new functionality included in your more advanced and feature-rich XProtect product to make use of the expanded functionality.

Example: If you upgrade from XProtect Go to XProtect Essential, you should, among other things, be aware of:

- XProtect Smart Client: In XProtect Go, only one instance of the XProtect Smart Client can be connected at a time. When you upgrade, you can connect more instances of the XProtect Smart Client. Since you come from XProtect Go, the Management Application is set to only allow one connected XProtect Smart Client at a time. You can change this setting **manually** in the Management Application. In general, you gain the full use of XProtect Smart Client functionality when you upgrade.
- Number of cameras: XProtect Go allows you to use up to eight cameras at the same time, while you can use many more in XProtect Essential and other XProtect VMS products. The number of cameras you have added are inherited by the upgraded product, but you must, of course, add any additional cameras to the Management Application yourself.

For more information about the various differences between products, check the Milestone website http://www.milestonesys.com.

If you have installed a trial version of any XProtect Professional VMS product, you can also upgrade to a licensed version of the XProtect Professional VMS product. To do this, you purchase a base license as well as the needed hardware device licenses and import the software license file. Keep in mind that the retention time for a trial installation is maximum five days. As a result, you never have more than five days of recordings once you have imported the software license file. Remember to manually change the retention time in the Management Application for your product.

Importing a new software license file

If you have upgraded to a more feature-rich XProtect Professional VMS product, do the following to import your new software license file:

1. Copy your software license file which you have received by email to a local drive on the management server.
2. From the Management Application's **File** menu, select **Import License**.
3. Find your new software license file and click **Open**.

About removing system components

To remove the entire surveillance system, that is the surveillance server software and related installation files, the video device drivers, XProtect Download Manager, XProtect Smart Client, the Event Server service and the Milestone Mobile server, from your server, follow the standard Windows procedure for uninstalling programs. See the Windows Help for more information.

You can also remove individual components, such as XProtect Smart Client and video drivers by using the standard Windows procedure for uninstalling programs.

Important: If you remove your surveillance system, your recordings are not removed. They remain on the server even after the server software has been removed. Configuration files also remain on the server. This allows you to reuse your configuration if you install the system again at a later time.

Getting started

About the Getting started page

The Getting started page is always shown when you open the Management Application. The Getting started page serves as a place of reference for users. It also provides different wizards that help to configure your surveillance system quickly. After you have run the wizards, it is likely that you need to fine-tune your system further. For more information, see the Advanced configuration (on page 64) chapter in the help.

Under the License heading in the bottom-left part of the page, you can get an overview of your system's hardware device licenses (on page 25) and your number of device changes without activation (see "About device changes without activation" on page 28).

Under the Milestone Care heading you can see information about your current Milestone Care™ level and if there are updates for your installation. Your installation is always coverede by Milestone Care Basic which gives you access to different types of self-help material like knowledge base articles, guides and tutorials on the Milestone website http://www.milestonesys.com/support. If you have bought a Milestone Care Plus subscription through your reseller, you also have access to upgrades. You also get access to the Customer Dashboard service, the Smart Connect feature, and the full Push Notification functionality. The expiration date of your Milestone Care Plus subscription is visible on the page. If you have a Milestone Care Premium subscription, you can also contact Milestone support for help. Please remember to include information about your Milestone Care ID when contacting Milestone support. Again, the expiry date for your Milestone Care Premium subscription is visible. To learn more about Milestone Care, follow the links. If you decide to buy or renew a Milestone Care subscription after you have installed your system, you must activate your licenses (see "About license activation" on page 32) before the correct Milestone Care information is shown.

You can also access and view video tutorials that show and explain how to go through each step of your system's wizards. To access the video tutorials, click the **View tutorials** link in the bottom-right part of the page. The link takes you to an external web page with video tutorials for your system.

Automatic configuration wizard

The **Automatic configuration** wizard is for easy configuration for first time use of the system. Use the wizard to automatically add cameras to your system using this step-by-step procedure.

Automatic configuration wizard: First page

When you open the Management Application for the first time, the Automatic configuration wizard opens to guide you through the process of adding hardware devices to your system. If you are new to the system, click **Yes, configure** to scan your network for available cameras and configure your system. To exit and use a more advanced way of adding devices to your system, click **Skip** to leave the wizard and go to the

Management Application to get more options for setting up your system's device configuration.

Automatic configuration wizard: Scanning options

Choose where you want your system to scan for cameras and devices.

By default, the **Scan local network** checkbox is selected, which means that you only scan your local network for devices. However, if you know the IP address or a range of IP addresses to which cameras and devices are attached, specify these by clicking the Plus icon next to **Add the IP addresses or IP ranges to be scanned**. You can add more than one range of IP addresses if you need to.

Automatic configuration wizard: Select hardware manufacturers to scan for

If you know the specific manufacturer of your hardware device(s), select these in the dropdown on this page. You can select as many manufacturers as you want to.

Note: By default, all manufacturers are selected. If you want to reduce the scanning time or know the specific manufacturers of your cameras, only select the checkboxes that represents these manufacturers.

Automatic configuration wizard: Scanning for hardware devices

Scanning for hardware devices that match your selected manufacturers begins. A status bar indicates how far in the scan process you are. Once scanning for cameras and devices is complete, you may need to provide user name and password for your selected devices or cameras. When you have typed in the relevant credentials, click the **Verify** button to add the device to your system.

Note: Not all devices and cameras need a user name and password. You can add such devices to your system without any need to type in credentials.

Automatic configuration wizard: Continue after scan

Once you have added the number of devices and cameras you want to add, your system sets up storage for you. Storage is the location to which your system saves recordings. By default, your system chooses the location with most available disk space.

When the system has finished configuring storage, you are given the option to automatically add new cameras to your system as they are detected on the network. Enabling this allows you to set up your system so that any devices or cameras are automatically set up for you in the future as soon as they are connected to your network. Note that not all devices and cameras support automatic discovery. If your device/camera does not show up automatically after you have connected it to your network, you must add it manually.

To go directly to XProtect Smart Client once you have completed the wizard, select the check box in the bottom-left corner of the wizard page.

Add hardware wizard

You add cameras and other hardware devices, such as video encoders, to your system through the **Add Hardware wizards**. If the hardware device has microphones or speakers attached, the tool automatically adds these as well.

You may have a limit on the number of cameras you can use in your system. Note that you can add more cameras than you are allowed to use. If you use video encoder devices on your system, note that many video encoder devices have more than one camera connected to them. For example, a fully used four-port video encoder counts as four cameras.

The wizard offers you two different ways of adding cameras:

Name	Description
Scan for hardware	Scans your network for relevant hardware devices based on your specifications regarding required IP ranges, discovery methods, drivers, and device user names and passwords. See Add hardware: Scan for hardware (see "Express" on page 43)
Manually specify the hardware to add	Specify details about each hardware device separately. A good choice if you only want to add a few hardware devices, and you know their IP addresses, required user names and passwords and more. See Add hardware: Manually specify the hardware to add (see "Manual" on page 45). Alternatively, import data about cameras as comma-separated values from a file. An effective method if you set up several systems. See Add hardware: Import from CSV File (see "Import from CSV file" on page 46).

Express

Device discovery is a method with which hardware devices make information about themselves available on the network. Based on such information, your system can quickly recognize relevant hardware devices, such as cameras and video encoders, and include them in a scan.

The **Scan for hardware** method gives you the option to scan your network for relevant hardware devices and quickly add them to your system in just a few steps.

Choose between these two options for adding hardware:

- **Scan local network**: Perform an automated scan for available hardware on your local network that support device discovery, on the part of your network (subnet) where the system server itself is located.
- **Add IP address or IP range to be scanned:** Add hardware to your system by indicating IP ranges and ports from which the system begin scanning for hardware.

To use the **Scan local network** method, your system server and your cameras must be on the same layer 2 network. This means that it must be on a network where all servers, cameras, and so on can communicate without the need for a router. The reason for this is that device discovery relies on direct communication between the system server and the cameras.

If you use routers on your network, specify the IP range where you hardware is located using the Add IP address or IP range to be scanned-option or choose one of the Manually specify the hardware to add (see "Manual" on page 45)-methods.

Add hardware: Scanning options

Choose where you want your system to scan for cameras and devices.

By default, the **Scan local network** checkbox is selected, which means that you only scan your local network for devices. However, if you know the IP address or a range of IP addresses to which cameras and devices are attached, specify these by clicking the Plus icon next to **Add the IP addresses or IP ranges to be scanned**. You can add more than one range of IP addresses if you need to.

Add hardware: Select hardware manufacturers to scan for

If you know the specific manufacturer of your hardware device(s), select these in the dropdown on this page. You can select as many manufacturers as you want to.

Note: By default, all manufacturers are selected. If you want to reduce the scanning time or know the specific manufacturers of your cameras, only select the checkboxes that represents these manufacturers.

Hardware detection and verification

Scanning for hardware devices that match your selected manufacturers begins. A status bar indicates how far in the scan process you are. Once scanning for cameras and devices is complete, you may need to provide user name and password for your selected devices or cameras. When you have typed in the relevant credentials, click the **Verify** button to add the device to your system.

Note: Not all devices and cameras need a user name and password. You can add such devices to your system without any need to type in credentials.

Once you have added the number of devices and cameras you want to add, your system sets up storage for you. Storage is the location to which your system saves recordings. By default, your system chooses the location with most available disk space.

Manual

With the **Manually specify the hardware to add** method, you can specify details about each hardware device separately.

This options is a good choice if you only want to add a few hardware devices, and you know their IP addresses, user names and passwords and so on. Similarly, automated searches on the local network using the **Scan for hardware** option might not work for all cameras, for example cameras using the system's **Universal Driver**. For such cameras, you must add these to the system manually.

Alternatively, choose Import CSV file (see "Import from CSV file" on page 46). This option lets you import data about hardware devices and cameras as comma-separated values (CSV) from a file. This is a highly effective method if you set up several similar systems.

Information, driver selection and verification

Specify information about each hardware device you want to add:

Name	Description
IP Address	The IP address or host name of the hardware device.
Port	The Port number on which to scan. The default is port 80. If a hardware device is located behind a NAT-enabled router or a firewall, you may need to specify a different port number. In such cases, remember to configure the router/firewall so it maps the port and IP address used by the hardware device.
User Name	The user name for the hardware device's administrator account. Many organizations use the hardware device manufacturer's default user names for their hardware devices. If that is the case in your organization, select "<default>". Do not type a manufacturer's default user name as this can be a source of error, trust that your system knows the manufacturer's default user name. You can also select other typical user names, such as admin or root, from the list. Type a new user name if you want a user name which is not on the list.
Password	The password required to access the administrator account. Some hardware devices do not require user name/password for access.
Driver	The driver to scan for for your hardware device. By default, the wizard shows the Autodetect option. The Autodetect option finds the relevant driver automatically. Select a manufacturer if you know the specific manufacturer to reduce scanning time.

Once you have added the number of devices and cameras you want to add, your system sets up storage for you. Storage is the location to which your system saves recordings. By default, your system chooses the location with most available disk space.

Import from CSV file

Import data about hardware devices and cameras as comma-separated values (CSV) from a file. This is a highly effective method if you set up several similar systems.

Add Hardware Devices wizard - Import from CSV File - example of CSV file

The following is an example of a CSV file for use when cameras and server are online.

It includes the parameters **HardwareAddress**, **HardwarePort**, **HardwareUsername**, **HardwarePassword** and **HardwareDriverID**. Note that HardwareUserName and HardwareDriverID are optional parameters.

You can leave out the HardwareUsername if you have not changed the default HardwareUsername for the device. HardwareDriverID is an optional field. If empty, it is automatically set to autodetect.

```
HardwareAddress;HardwarePort;HardwareUsername;HardwarePassword;HardwareDriverID;
192.168.200.220;80;root;pass;128;
192.168.200.221;80;user;password;165;
192.168.200.222;80;r00t;pass;172;
192.168.200.223;80;;p4ss;
192.168.200.224;80;usEr;pASs;
```

Add hardware: Import from CSV file - CSV file format and requirements

The CSV file must have a header line (determining what each value on the following lines is about), and the following lines must each contain information about one hardware device only. For each hardware device, the following information is required:

HardwareAddress	The IP address of the hardware device.
HardwareUsername	The user name for hardware device's administrator account.
HardwarePassword	The password for hardware device's administrator account.
HardwareDriverID	If cameras and server are offline: specify a **HardwareDriverID** for each hardware device you want to add. Example: **ACTi ACD-2100 105** indicates that you should use **105** as the ID if adding an ACTi ACD-2100 hardware device.

Existing configuration parameters that are not specified in CSV file remain unchanged. If a parameter value for an individual camera in the CSV file is empty, the existing parameter value remains unchanged on that camera.

You can store hardware device information in spreadsheets as found in, for example, Microsoft Excel to save the information as comma-separated values in a CSV file.

The following applies for the information present in CSV files:

- The first line of the CSV file must contain the headers, and following lines must contain information about one hardware device each
- Separators can be commas, semicolons or tabs, but you cannot mix them
- All lines must contain valid values. All camera names, user names and similar items must be unique, and cannot contain any of the following special characters: **< > & ' " \ / : * ? | [ ]**

- There is no fixed order of values, and you can omit optional parameters entirely
- Boolean fields are considered true unless set to 0, false or no
- Lines containing only separators are ignored
- Empty lines are ignored.

Even though the CSV file format is generally ASCII only, Unicode identifiers are allowed. Even without Unicode identifiers, the entire file or even individual characters can be Unicode strings.

Configure storage wizard

The **Video storage** step helps you quickly configure your cameras' video and recording properties.

Configure storage: Video settings and preview

Control bandwidth, brightness, compression, contrast, resolution, rotation and more in Video settings. Use the list on the left side of the wizard window to select a camera and adjust its video settings. Then select the next camera and adjust its settings. Video settings are to a large extent camera-specific, so you must configure these settings individually for each camera.

Click **Open Settings Dialog** to configure the camera's settings in a separate dialog. When you change video settings, they are applied immediately. This means that—for most cameras—you can immediately see the effect of your settings in a preview image. However, it also means that you cannot undo your changes by exiting the wizard. For cameras set to use the video formats MPEG or H.264, you can typically select which live frame rate to use for the camera.

Video settings may feature an **Include Date and Time** setting. If set to **Yes**, date and time from the camera are included in the video. Note, however, that cameras are separate units which may have separate timing devices, power supplies, etc. Camera time and XProtect system time may therefore not correspond fully, and this may occasionally lead to confusion. As your system time-stamps all frames upon reception, and exact date and time information for each image is already known, Milestone recommends that you set it to **No**.

Note: For consistent time synchronization, you may automatically synchronize camera and system time through a time server if your camera supports this.

Configure storage: Online schedule

Specify when each camera should be online. An online camera is a camera that transfers video to the server for live viewing and further processing. The fact that a camera is online does not in itself mean that your system records video from the camera (configure recording settings on one of the following pages). By default, cameras you add to your system are automatically online (Always on), and you only need to modify their online schedules if you require cameras to be online only at specific times or events. Note,

however, that you can change this default as part of the scheduling options (on page 154).

For each camera, you can initially select between two online schedules:

- **Always on:** The camera is always online.
- **Always off:** The camera is never online.

If these two options are too simple for your needs, use the **Create / Edit...** button to specify online schedules according to your needs, and then select these schedules for your cameras. This way, you can specify whether cameras should be online within specific periods of time, or whether they should start and stop transferring video when specific events occur within specific periods of time.

The **template** can help you configure similar properties quickly. For example, if you have 20 cameras and you want a particular frame rate on all of them, you can enter it once in the template, and then apply the template to the 20 cameras.

Name	Description
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Apply template on selected cameras	Apply the value from the template to selected cameras.

Configure storage: Live and recording settings (motion JPEG cameras)

This wizard page only appears if one or more of your cameras use the MJPEG video format.

Select pre- and post-recording, which allows you to store recordings from the time before and after detected motion and/or specified events. Also specify which frame rates to use for each camera (XProtect Enterprise and XProtect Professional only).

Properties available in all XProtect software versions:

Name	Description
Pre-recording	You can store recordings from periods preceding detected motion and/or start events. Select check box to enable this feature. Specify the required number of seconds in the neighboring column.
Seconds [of pre-recording]	Specify the number of seconds for which you want to record video from before recording start conditions (that is motion or start event) are met. Usually, only some seconds of pre-recording is required, but you can specify up to 65535 seconds of pre-recording, corresponding to 18 hours, 12 minutes and 15 seconds. However, if specifying a very long pre-recording time, you can potentially run into a scenario where your pre-recording time spans scheduled or unscheduled archiving (see "About archiving" on page 146) times. That can be problematic since pre-recording does not work well during archiving.
Post-recording	You can store recordings from periods following detected motion and/or stop events. Select check box to enable this feature. Specify the required number of seconds in the neighboring column.
Seconds [of post-recording]	Specify the number of seconds for which you want to record video from after recording stop conditions (that is motion or stop event) are met. Usually, only some seconds of post-recording is required, but you can specify up to 65535 seconds of post-recording, corresponding to 18 hours, 12 minutes and 15 seconds. However, if specifying a very long post-recording time, you can potentially run into a scenario where your post-recording time spans scheduled or unscheduled archiving times. That can be problematic since post-recording does not work well during archiving.

Properties available in XProtect Enterprise and XProtect Professional only:

Frame Rate	Required average frame rate for video from the camera. Select number of frames, then select the time unit interval (second, minute or hour).
Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Properties available in all XProtect software versions:

The **template** can help you configure similar properties quickly. For example, if you have 20 cameras and you want a particular frame rate on all of them, you can enter it once in the template, and then apply the template to the 20 cameras.

Name	Description
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Apply template on selected cameras	Apply the value from the template to selected cameras.

Configure storage: Live and recording settings - H.264/MPEG4 cameras

This wizard page only appears if one or more of your cameras use the H.264/MPEG4 video format.

Specify which frame rate to use for each camera, and whether to record all frames or keyframes only. You can also select pre- and post-recording, allowing you to store recordings from periods preceding and following detected motion and/or specified events.

Note that all of the properties can also be specified individually for each camera.

Properties available in all XProtect software versions:

Name	Description
Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Record on	Select under which conditions video from the camera should be recorded: • **Always:** Record whenever the camera is enabled (see "General" on page 99) and scheduled to be online (see "Online period" on page 156) (the latter allows for time-based recording). • **Never**: Never record. Live video will be displayed, but—since no video is kept in the database—users will not be able to play back video from the camera. • **Motion Detection**: Select this to record video in which motion (see "Motion detection & exclude regions" on page 111) is detected. Unless post-recording (see the following) is used, recording will stop immediately after the last motion is detected. • **Event**: Select this to record video when an event occurs and until another event occurs. Use of recording on event requires that events have been defined, and that you select start and stop events. Use the **Configure events** list, located below the other fields to define events that suit your needs. • **Motion Detection and Event**: Select this to record video in which motion is detected, or when an event occurs and until another event occurs. Remember to select start and stop events in the neighboring columns.
Pre-recording	You can store recordings from periods preceding detected motion and/or start events. Select check box to enable this feature. Specify the required number of seconds in the neighboring column.

Name	Description
Seconds [of pre-recording]	Specify the number of seconds for which you want to record video from before recording start conditions (that is motion or start event) are met. Usually, only some seconds of pre-recording is required, but you can specify up to 65535 seconds of pre-recording, corresponding to 18 hours, 12 minutes and 15 seconds. However, if specifying a very long pre-recording time, you can potentially run into a scenario where your pre-recording time spans scheduled or unscheduled archiving (see "About archiving" on page 146) times. That can be problematic since pre-recording does not work well during archiving.
Post-recording	You can store recordings from periods following detected motion and/or stop events. Select check box to enable this feature. Specify the required number of seconds in the neighboring column.
Seconds [of post-recording]	Specify the number of seconds for which you want to record video from after recording stop conditions (that is motion or stop event) are met. Usually, only some seconds of post-recording is required, but you can specify up to 65535 seconds of post-recording, corresponding to 18 hours, 12 minutes and 15 seconds. However, if specifying a very long post-recording time, you can potentially run into a scenario where your post-recording time spans scheduled or unscheduled archiving times. That can be problematic since post-recording does not work well during archiving.

Properties available in XProtect Enterprise and XProtect Professional only:

Keyframe Only	Select **Keyframe only** if you want motion detection to take place only on keyframes of the video stream to reduce the system resources used on motion detection.

The **template** can help you configure similar properties quickly. For example, if you have 20 cameras and you want a particular frame rate on all of them, you can enter it once in the template, and then apply the template to the 20 cameras.

Name	Description
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Apply template on selected cameras	Apply the value from the template to selected cameras.

Configure storage: Drive selection

Specify which drives you want to store cameras' recordings on. You can specify separate drives/paths for recording and archiving (see "About archiving" on page 146).

Properties available for all XProtect software versions:

Name	Description
Drive	Letter representing the drive in question, for example C:.
Purpose	Select what you want to use the drive for: **Not in use:** Do not use the drive. **Recording:** Only available if the drive is a local drive on the surveillance system server. Network drives cannot be used for recording. Use the drive for storing recordings in the regular database for the system. **Archiving:** Use the drive for archiving. For archiving, it is generally a good idea to use a drive which has plenty of space. With dynamic path selection for archives, you do not have to worry about drive space. **Rec. & Archiving:** Only available if the drive is a local drive on the surveillance system server. Network drives cannot be used for recording. Use the drive for storing recordings in the regular database for the system as well as for archiving.
Recording Path	Path to the folder in which the camera's database should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the required cell. You can only specify a path to a folder on a **local** drive. You cannot specify a path to a network drive. If you use a network drive, it is not be possible to save recordings if the network drive becomes unavailable. If you change the recording path, and you have existing recordings at the old location, you are asked whether you want to move the recordings to the new location (recommended), leave them at the old location, or delete them. **Tip:** If you have several cameras, and several local drives are available, you can improve performance by distributing individual cameras' databases across several drives.

Name	Description
Archiving Path	Only editable if not using dynamic paths for archiving (see "About archiving" on page 146). Path to the folder in which the camera's archived recordings should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the relevant cell. If you change the archiving path, and there are existing archived recordings at the old location, you are asked whether you want to move the archived recordings to the new location (recommended), leave them at the old location, or delete them. Note that if you move archived recordings, your system also archives what is currently in the camera database. In case you wonder why the camera database is empty just after you have moved archived recordings, this is the reason.
Total Size	Total size of the drive.
Free Space	Amount of unused space left on the drive.
Dynamic path selection for archives	If using this option (highly recommended), you should select a number of different local drives for archiving. If the path containing the surveillance system database is on one of the drives you have selected for archiving, the system always tries to archive to that drive first. If not, the system automatically archives to the archiving drive with the most available space at any time, provided there is not a camera database using that drive. Which drive has the most available space may change during the archiving process, and archiving may therefore happen to several archiving drives during the same process. This fact has no impact on how users find and view archived recordings.
Archiving Times	Specify when you want your system to automatically move recordings to your archiving path(s). You can specify up to 24 archiving times per day, with minimum one hour between each one. Select the hour, minute and second values and click the **up** and **down** buttons to increase or decrease values, or simply overwrite the selected value, and then click **Add**. The more you expect to record, the more often you should archive.

Properties available in XProtect Enterprise and XProtect Professional only:

Network Drive	Lets you add a network drive to the list of drives. First specify the network drive, then click **Add** (the button becomes available when you specify a network drive) . Note that network drives cannot be used for recording, only for archiving.

Configure storage: Recording and archiving settings

Select recording and archiving (see "About archiving" on page 146) paths for each individual camera.

All properties on a white background are editable, properties on a **light blue** background cannot be edited.

Name	Description
Recording Path	Path to the folder in which the camera's database should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the required cell. You can only specify a path to a folder on a **local** drive. You cannot specify a path to a network drive. If you use a network drive, it is not be possible to save recordings if the network drive becomes unavailable. If you change the recording path, and you have existing recordings at the old location, you are asked whether you want to move the recordings to the new location (recommended), leave them at the old location, or delete them. **Tip:** If you have several cameras, and several local drives are available, you can improve performance by distributing individual cameras' databases across several drives.
Archiving Path	Only editable if not using dynamic paths for archiving (see "About archiving" on page 146). Path to the folder in which the camera's archived recordings should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the relevant cell. If you change the archiving path, and there are existing archived recordings at the old location, you are asked whether you want to move the archived recordings to the new location (recommended), leave them at the old location, or delete them. Note that if you move archived recordings, your system also archives what is currently in the camera database. In case you wonder why the camera database is empty just after you have moved archived recordings, this is the reason.
Retention time	Total amount of time for which you want to keep recordings from the camera (that is, recordings in the camera's database as well as any archived recordings). The default retention time is 7 days. Retention time covers the **total** amount of time you want to keep recordings for. In earlier versions of your surveillance system, you specified time limits separately for the database and archives.

The **template** can help you configure similar properties quickly. For example, if you have 20 cameras and you want a particular frame rate on all of them, you can enter it once in the template, and then apply the template to the 20 cameras.

Name	Description
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Apply template on selected cameras	Apply the value from the template to selected cameras.

Adjust motion detection wizard

The Adjust Motion Detection wizard helps you quickly configure your cameras' motion detection properties.

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application.

Adjust motion detection: Exclude regions

Disable motion detection in specific areas of cameras' views in the Exclude regions section of the wizard. Disabling motion detection in certain areas may help you avoid detection of irrelevant motion, for example if a camera covers an area where a tree is swaying in the wind or where cars regularly pass by in the background.

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ. See also View video from cameras in the Management Application.

For each camera for which exclude regions are relevant, use the list in the left side of the wizard window to select the camera and define its exclude regions. Exclude regions are camera-specific, and you must configured motion detection individually for each camera on which they are required.

When you have selected a camera, you see a preview from the camera. You define regions to exclude in the preview, which is divided into small sections by a grid.

- To make the grid visible, select the **Show Grid** check box.
- To define exclude regions, drag the mouse pointer over the required areas in the preview while pressing the mouse button down. Left mouse button selects a grid

section and right mouse button clears a grid section. Selected areas are highlighted in blue.

If you use the **Include All** button, you can quickly select all grid sections in the preview. This can be a good idea if you want to disable motion detection in most areas of the preview, in which case you can clear the few sections in which you do not want to disable motion detection. With the Exclude All button, you can quickly clear all sections.

Adjust motion detection: Motion detection

Motion detection is a key element in most surveillance systems. Depending on your configuration, motion detection settings may determine when video is recorded (saved on the surveillance system server), when notifications are sent, when output (a light or siren) is triggered and more.

It is important that you find the best possible motion detection settings for each camera to avoid unnecessary recordings, notifications and more. Depending on the physical location of your cameras, it is a good idea to test settings under different physical conditions (day/night, windy/calm weather and similar conditions).

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ. See also View video from cameras in Management Application.

You can configure motion detection settings for each camera, or for several cameras at once. Use the list in the left pane of the wizard window to select cameras. To select several cameras at a time, press **CTRL** or **SHIFT** while you select. When you select a camera, you see a preview from that camera. If you select several cameras, you see a preview from the last camera you select. A green area in the preview indicates motion.



Properties available in all XProtect software versions:

Name	Description
Sensitivity	Adjust the **Sensitivity** slider so that irrelevant background noise is filtered out, and only real motion is shown in green. Alternatively, specify a value between 0 and 256 in the field next to the slider to control the sensitivity setting. The slider determines how much each pixel must change before it is regarded as motion. With a high sensitivity, very little change in a pixel is required before it is regarded as motion. The more you drag the slider to the left, the more of the preview becomes green. This is because with high sensitivity, even the slightest pixel change is regarded as motion.
Motion	Adjust the **Motion** slider so that motion detection is only triggered by the required level of motion. The selected motion level is indicated by the black vertical line in the **Level** bar above the sliders. The black vertical line serves as a threshold. When motion is above (to the right of) the selected level, the bar changes color from green to red, indicating a positive motion detection. Alternatively, specify a value between 0 and 10000 in the field on the left to control the motion setting. The more you drag the slider to the left, the more positive motion detections you see because less change will be needed to trigger a positive motion detection. The number of positive motion detections may also affect the amount of video you record, the amount of notifications you receive and more.
Detection interval	Specify how often motion detection analysis is carried out on video from the camera. The default is every 240 milliseconds (close to once a quarter of a second). The interval is applied regardless of your cameras' frame rate settings. Adjusting this setting can help lower the amount of system resources used on motion detection.
Detection resolution	Specify whether the full image or a selected percentage of the image should be analyzed. For example, by specifying 25%, every fourth pixel is analyzed instead of all pixels, reducing the system resources used but also offering less accurate motion detection.

Properties available in XProtect Enterprise only:

Keyframe Only	Select **Keyframe only** if you want motion detection to take place only on keyframes of the video stream to reduce the system resources used on motion detection.

Manage user access wizard

Use the **Manage user access step** to add individual users so they can access the system and its clients. The access summary at the end of the wizard lists the cameras your users have access to.

Important: When you use the wizard, all users you add get access to all cameras, including any new cameras added at a later stage. You can, however, specify access settings, users and user rights (see "Configure user and group rights" on page 195) separately, see Configure server access (on page 189). You cannot add users to groups (see "Add user groups" on page 195).

Manage user access: Basic and Windows users

Active Directory® is supported in XProtect Enterprise 2013+ and XProtect Professional 2013+ only.

You can add client users in two ways. You can combine these if you need to.

Name	Description
Basic user	Create a dedicated surveillance system user account with basic user name and password authentication for each individual user.
Windows user	Import users defined locally on the server or from Active Directory, and authenticate them based on their Windows login.

You must define users as local PC users on the server and disable simple file sharing on the server.

Add Basic users

- Specify a user name and password, and click the **Add Basic User** button. Repeat as required.

Add Windows users

1. Click **Add Windows User...** to open the **Select Users or Groups** dialog. You can only make selections from the local computer, even if you click the **Locations...** button.

2. In **Enter the object names to select**, enter the user name(s), then use the **Check Names** feature to verify the user name. If you enter several user names, separate each name with a semicolon. Example: **Brian; Hannah; Karen; Wayne**.
3. When done, click **OK**.

Important: When a user who has been added from a local database logs in with a client, the user should not specify any server name, PC name, or IP address as part of the user name. Example of a correctly specified user name: USER001, not: PC001/USER001. The user should, of course, still specify a password and any relevant server information.

Manage user access: Access summary

The access summary lists which cameras your users have access to. When you use the wizard, all users you have added have access all to cameras, including any new cameras added at a later stage. You can, however, limit individual users' access to cameras by changing their individual rights (see "Configure user and group rights" on page 195).

Advanced configuration

Hardware devices

About hardware devices

You add cameras and other hardware devices, such as video encoders, to your system through the Add Hardware Devices... wizard (see "Add hardware wizard" on page 43). If microphones or speakers are attached to a hardware device, they are automatically added as well, if your software version supports this.

About microphones

In your system, **Microphones** are typically attached to hardware devices, and therefore physically located next to cameras. Operators, with the necessary rights, can then listen to recordings through the XProtect Smart Client (provided the computer running the XProtect Smart Client has speakers attached). You manage microphones on your system, meaning you can always manage the microphones attached to cameras, **not** microphones attached to XProtect Smart Client operators' computers.

If you have added more microphones to your system than you need, you can hide the ones you do not need by right-clicking the relevant microphone or speaker and select **Hide**. If you need the hidden microphone again, you can right-click the overall microphone icon and select **Show Hidden Items**.

About speakers

Speakers are attached to devices, and typically physically located next to cameras. They can typically transmit information to people near a camera. Operators with the necessary rights can talk through speakers using XProtect Smart Client (provided the computer running XProtect Smart Client has a microphone attached).

Example: An elevator is stuck. Through a camera mounted in the elevator, XProtect Smart Client operators can see that there is an elderly lady in the elevator. A microphone attached to the camera records that the lady says: "I am afraid. Please help me out!" Through a speaker attached to the camera, operators can tell the lady that: "Help is on its way. You should be out in less than fifteen minutes."

If you have added more speakers to your system than you need, you can hide the ones you do not need by right-clicking the relevant peaker and select **Hide**. If you need the hidden speaker again, you can right-click the overall speaker icon and select **Show Hidden Items**.

About recording audio

If you record audio, it is important that you note the following:

- Your system only records incoming audio (from microphones). The system does not record outgoing audio (from speakers).
- Audio recording affects video storage capacity. The system records audio to the associated camera's database. Therefore, it is important to bear in mind that the database is likely to become full earlier if you record audio and video than if you only record video. The fact that the database becomes full is not in itself a problem since your system automatically archives data if the database becomes full. However, you may need additional archiving space if you record audio.
    - Example: If you use MPEG4, each one-second video GOP (Group Of Pictures) are stored in one record in the database. Each second of audio is stored in one record in the database. This reduces the database's video storage capacity to half its capacity, because half of the database's records is used for storing audio. Consequently, the database runs full sooner, and automatic archiving takes place more often than if you were only recording video.
    - Example: If you use MJPEG, audio is stored in one record for every JPEG for as long as the audio block size does not exceed the time between the JPEGs. In extreme cases, this reduces the database's video storage capacity to half its capacity, because half of the database's records is used for storing audio. If you use very high frame rates, which means less time between each JPEG, a smaller portion of the database is used for storing audio records, and consequently a larger portion is available for storing video. The result is that the database runs full sooner, and automatic archiving takes place more often than if you were only recording video.

The above examples are simplified. The exact available video storage capacity also depends on GOP/JPEG and audio kilobyte size.

About dedicated input/output devices

You can add a number of dedicated input/output (I/O) hardware devices to your system. For information about which I/O hardware devices your system supports, see the release notes.

When you add I/O hardware devices, input on them can be used for generating events in your system and events in your system can be used for activating output on the I/O hardware devices. This means that you can use I/O hardware devices in your events-based system setup in the same way as a camera.

With certain I/O hardware devices, the surveillance system must regularly check the state of the hardware devices' input ports to detect whether input has been received. Such state checking at regular intervals is called **polling**. The interval between state checks, called a **polling frequency**, is specified as part of the general ports and polling properties (see "Ports and polling" on page 134). For such I/O hardware devices, the polling frequency should be set to the lowest possible value (one tenth of a second between state checks). For information about which I/O hardware devices require polling, see the release notes.

Show or hide microphones or speakers

If you have added more microphones or speakers to your system than you need, you can hide the ones you do not need by right-clicking the relevant microphone or speaker and select **Hide**. If you need the hidden microphone/speaker again, you can right-click the overall microphone or speaker icon and select **Show Hidden Items**.

Configure hardware devices

Once you have added hardware devices, you can specify/edit device-specific properties including: the IP address, which video channels to use, which COM ports to use for controlling attached PTZ cameras and whether to use Fisheye lens technology.

1. Expand **Advanced Configuration**, expand **Hardware Devices**, right-click the relevant hardware device, and select **Properties**.
2. Specify Name and video channels, Network, device type and license (see "Network, device type, and license" on page 70), PTZ device (see "PTZ device (properties)" on page 72), and Fisheye lens properties as required.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Delete/disable hardware devices

Important: If you delete a hardware device, you not only delete all cameras, speakers and microphones attached to the hardware device. You also delete any recordings from cameras on the hardware device.

1. Expand **Advanced Configuration**, expand **Hardware Devices**, right-click the hardware device you want to delete, and select **Delete Hardware device**.
2. Confirm that you want to delete the hardware device and all its recordings.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.
4. Restart (see "Start and stop services" on page 202) the Recording Server service.

Alternately, you can also consider disabling the individual cameras, speakers or microphones connected to the hardware device:

1. Expand **Advanced Configuration**, expand **Hardware Devices**, and expand the relevant hardware device.
2. Right-click the camera, microphone or speaker that you want to disable, and select **Disable**.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.
4. Restart (see "Start and stop services" on page 202) the Recording Server service.

About replacing hardware devices

If you need to, you can replace a hardware device that you have added and configured on your system with a new one, for example to replace a physical camera on your network.

Open the Replace Hardware Device wizard (see "About the Replace Hardware Device wizard" on page 67), which helps you through the entire replacement process on the surveillance system server, including:

- Detecting the new hardware device
- Specifying license for the new hardware device
- Deciding what to do with existing recordings from the old hardware device

About the Replace Hardware Device wizard

Use the Replace Hardware Device wizard to replace a hardware device that you have previously added to and configured on your surveillance system. To open the Replace Hardware Device wizard, right-click the device that you want to replace and select **Replace Hardware Device**. The wizard is divided into the New hardware device information page and the database action page.

New hardware device information

Specify details about the new hardware device:

Name	Description
IP Address	The IP address or host name of the hardware device.
Port	The Port number on which to scan. The default is port 80. If a hardware device is located behind a NAT-enabled router or a firewall, you may need to specify a different port number. In such cases, remember to configure the router/firewall so it maps the port and IP address used by the hardware device.
User Name	The user name for the hardware device's administrator account. Many organizations use the hardware device manufacturer's default user names for their hardware devices. If that is the case in your organization, select "<default>". Do not type a manufacturer's default user name as this can be a source of error, trust that your system knows the manufacturer's default user name. You can also select other typical user names, such as admin or root, from the list. Type a new user name if you want a user name which is not on the list.
Password	The password required to access the administrator account. Some hardware devices do not require user name/password for access.

To specify which device driver to use for the new hardware device, you can:

- Select the video device driver in the **Hardware device type** list, and then click **Auto-detect/Verify Hardware Device Type** to verify that the driver matches the hardware device.

  - or -

- Click **Auto-detect/Verify Hardware Device Type** to automatically detect and verify the right driver.

When the right driver is found, the **Serial number (MAC address)** field displays the MAC address of the new hardware device. When done, click **Next**.

Camera and database action

On the last page of the Replace Hardware wizard, decide what to do with the camera and the database containing recordings from the camera attached to the old hardware device. For multi-camera devices, such as video encoders, you must decide what to do for each video channel on the new hardware device.

The table in the left side of the wizard page lists available video channels on the new hardware device. For a regular single-camera hardware device, there are only one video channel. For video encoders, there are typically several video channels.

1. For each video channel, use the table's **Inherit** column to select which camera from the old hardware device should be inherited by the new hardware device.

2. Decide what to do with camera databases. You have three options:
   - **Inherit existing database(s):** The cameras you selected to be inherited by the new hardware device inherit camera names, recordings databases as well as any archives from the old hardware device. Databases and archives are renamed to reflect the new hardware device's MAC address and video channels. The rights of users with access to the inherited cameras are automatically updated so they can view both old and new recordings. Users do not notice the hardware device replacement since camera names remain the same.
   - **Delete the existing database(s):** The databases of the cameras you selected to be inherited by the new hardware device are not deleted. New databases are created for future recordings, but it is not possible to view recordings from before the hardware replacement.
   - **Leave the existing database(s):** The databases of the cameras you selected to be inherited by the new hardware device are not deleted. New databases are created for future recordings, but even though the old databases still exist on the System server, it is not possible to view recordings from before the hardware replacement. Should you later want to delete the old databases, you must delete this manually.
3. If the new hardware device has fewer video channels than the old hardware device, it is not possible for the new hardware device to inherit all cameras from the old hardware device. When that is the case, you are asked what to do with the databases of cameras that could not be inherited by the new hardware device. You have two options:
   - **Delete the databases for the cameras that are not inherited:** The databases of the cameras that could not be inherited by the new hardware devices are deleted. It is not possible to view recordings from before the hardware replacement. New databases are, of course, created for future recordings by the new hardware devices.
   - **Leave the databases for the cameras that are not inherited:** The databases of the cameras that could not be inherited by the new hardware devices are not deleted. Even though the old databases still exist on the System server, it is not possible to view recordings from before the hardware replacement. Should you later want to delete the old databases, you must delete this manually. New databases will, of course, be created for future recordings by the new hardware devices.
4. Click **Finish**. When you are ready, restart the Recording Server service. The hardware replacement are not evident in clients until you restart the Recording Server service.

Speaker properties

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, you can determine when to record audio. Your choice applies for all cameras on your system.

Name	Description
Enabled	Speakers are by default enabled, meaning they can transfer audio to your system. If required, you can disable an individual speaker, in which case no audio is transferred from the speaker to the system.
Speaker name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**

Hardware properties

Hardware name and video channels

When you configure hardware devices, specify the following properties:

Name	Description
Hardware name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Video channel # enabled	Enable/disable each of the selected hardware device's video channels. Many hardware devices only have a single video channel, in which case only one channel will be listed. Other hardware devices—typically video encoder devices—have several video channels.

Network, device type, and license

When you configure hardware devices (on page 66), specify the following properties:

Name	Description
IP Address	The IP address or host name of the hardware device.
HTTP Port	Port to use for HTTP communication with the hardware device. Default is port 80. To use the default port, select **Use default HTTP port**.
FTP port	Port to use for FTP communication with the hardware device. Default port is port 21. To use the default port, select **Use default FTP port**.
User name	Only relevant when you have selected **Server requires login**. Specify the user name required for using the SMTP server.
User Name	The user name for the hardware device's administrator account. Many organizations use the hardware device manufacturer's default user names for their hardware devices. If that is the case in your organization, select "<default>". Do not type a manufacturer's default user name as this can be a source of error, trust that your system knows the manufacturer's default user name. You can also select other typical user names, such as admin or root, from the list. Type a new user name if you want a user name which is not on the list.
Password	Password for the hardware device's administrator account, a.k.a. the root password.
Hardware type	Read-only field displaying the type of video device driver used for communication with the hardware device.
Serial number (MAC address)	Read-only field displaying the serial number of device. The serial number is usually identical to the 12-character hexadecimal MAC address of the hardware device (example: 0123456789AF).
License information	The current license status for the hardware.
Replace Hardware Device	Opens a wizard (see "About the Replace Hardware Device wizard" on page 67), with which you can replace the selected hardware device with another one if you need to. This can be relevant if you replace a physical camera on your network. The wizard helps you take all relevant issues into account: for example, deciding what to do with recordings from cameras attached to the old hardware device, etc.

PTZ device (properties)

The PTZ Device tab is only available if you configure (see "Configure hardware devices" on page 66) video encoder hardware devices on which the use of PTZ (pan-tilt-zoom) cameras is possible:

Name	Description
Connected cameras have Pan-tilt-zoom capabilities	Select the checkbox if any of the cameras attached to the video encoder device is a PTZ camera.
PTZ type on COM#	If a PTZ camera is controlled through a COM port, select the relevant option. Options are device-specific, depending on which PTZ protocols the device uses. Select None if you have no PTZ cameras controlled through COM ports.

The table in the lower half of the dialog contains a row for each video channel on the hardware device. First row from the top corresponds to video channel 1, second row from the top corresponds to video channel 2, etc.

Name	Description
Name	Name of the camera attached to the video channel in question.
Type	Select whether the camera on the selected camera channel is fixed or moveable: • **Fixed**: Camera is a regular camera mounted in a fixed position • **Moveable**: Camera is a PTZ camera
Port	Available only if **Moveable** is selected in the **Type** column. Select which COM port on the video encoder to use for controlling the PTZ camera.
Port Address	Available only if **Moveable** is selected in the **Type** column. Lets you specify port address of the camera. The port address will normally be 1. If using daisy chained PTZ cameras, the port address will identify each of them, and you should verify your settings with those recommended in the documentation for the camera.

Cameras and storage information

About video and recording configuration

Once you have added hardware devices and attached cameras, you can configure video and recording settings in three ways:

Name	Description
Wizard-driven	Guided configuration where you can specify video, recording and archiving settings for all your cameras.
General	Specify video, recording and shared settings (such as dynamic archiving paths and whether to record audio or not) for all your cameras.
Camera-specific	Specify video, recording and camera-specific settings (such as event notification, PTZ preset positions and fisheye view areas) for each individual camera.

About database resizing

In case recordings for a camera get bigger than expected, or the available drive space is suddenly reduced in another way, an advanced database resizing procedure automatically takes place:

- If archives (see "About archiving" on page 146) are present on the same drive as the camera's database, the oldest archive for all cameras archived on that drive is moved to another drive (moving archives is only possible if you use dynamic archiving (see "Dynamic path selection (properties)" on page 81), with which you can archive to several different drives) or—if moving is not possible—deleted.
- If no archives are present on the drive containing the camera's database, the size of all camera databases on the drive is reduced by deleting a percentage of their oldest recordings, temporarily limiting the size of all databases.

When the Recording Server service (see "About services" on page 201) is restarted upon such database resizing, the original database sizes are used. Therefore, you should make sure to solve the drive size problem. Should the database resizing procedure take place, you are informed on-screen in XProtect Smart Client, in log files, and, if set up, through notifications.

About motion detection

Motion detection settings are linked to the Recording properties settings for the camera under which you can enable and configure motion detection for the selected camera. Motion detection configuration is a key element in your system: your motion detection configuration determines when the system generates motion events and typically also when video is recorded.

Motion detection is enabled as default. Disabling it improves the CPU and RAM performance of your system, but can also affect your motion detection, event and alarm management.

Time spent on finding the best possible motion detection configuration for each camera helps you avoid unnecessary recordings. Depending on the physical location of the camera, it may be a good idea to test motion detection settings under different physical conditions such as day/night and windy/calm weather.

Before you configure motion detection for a camera, Milestone recommends that you have configured the camera's image quality settings, for example resolution, video codec and stream settings. If you later change image quality settings, you should always test any motion detection configuration afterwards.

In the following two tables, you can see the differences between enabling (table 1) and disabling (table 2) built-in motion detection for a camera.

Enabled motion detection

Recording properties setting	Recordings	Motion-based events	Non-motion based events	Sequences
Always	Yes	Yes	Yes	Yes
Never	No	Yes	Yes	No
Built-in Motion Detection	Yes	Yes	Yes	Yes
Built-in Motion Detection & Event or Event only	Yes	Yes	Yes	Yes

Disabled motion detection

Camera's recording settings	Recordings	Motion-based events	Non-motion based events	Sequences
Always	Yes	No	Yes	No
Never	No	No	Yes	No
Built-in Motion Detection	No	No	Yes	No
Built-in Motion Detection and Event or Event only	Yes (depending on settings)	No	Yes (depending on settings)	No

Motion detection sensitivity

Motion detection is per default set up for dynamic sensitivity. However, you can also adjust the sensitivity level manually under **Motion Detection** properties.

Milestone recommends that you do not enable manual sensitivity because:

- With dynamic sensitivity, the system calculates and optimizes the sensitivity level automatically and suppresses the motion detections that come from noise in the images.
- Dynamic sensitivity improves motion detection at nighttime, where the noise in the images often triggers false motion.
- The system is not overloaded from too much recording.

- The users are not missing results from too little recording.

Motion detection and PTZ cameras

Motion detection generally works the same way for pan-tilt-zoom (PTZ) cameras as it does for regular cameras. However, you cannot configure motion detection separately for each of a PTZ camera's preset positions.

About motion detection and PTZ cameras

Motion detection generally works the same way for pan-tilt-zoom (PTZ) cameras as it does for regular cameras. However, you cannot configure motion detection separately for each of a PTZ camera's preset positions.

In order to activate unwanted recordings, notifications and more, the system automatically disables motion detection while a PTZ camera moves between two preset positions. After a number of seconds has passed, the system automatically enables motion detection again. This period of time is known as the transition time and is specified on the PTZ camera's PTZ patrolling properties (see "PTZ patrolling" on page 118).

Configure camera-specific schedules

If you base your schedule profile—or parts of it—on events within periods of time, remember to select **Start event** and **Stop event** from the lists below the calendar section.

Use the **Configure events** list, located below the other fields to define events that suit your needs.



The fact that a camera transfers video to your system does not necessarily mean that video from the camera is recorded. Recording is configured separately, see Configure video and recording (see "About video and recording configuration" on page 72).

For each camera, you can create schedule profiles based on:

Properties available in all XProtect software versions:

Online periods

- Periods of time (example: Mondays from 08.30 until 17.45), shown in pink:
- Events within periods of time (example: from Event A occurs until Event B occurs Mondays from 08.30 until 17.45), shown in yellow:

  The two options can be combined , but they cannot overlap in time.

Speedup

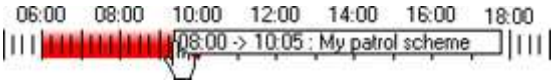
- Periods of time (example: Mondays from 08.30 until 17.45), shown in olive green:

E-mail notification

- Periods of time (example: Mondays from 08.30 until 17.45), shown in blue:

PTZ patrolling

- Periods of time (example: Mondays from 08.30 until 17.45), shown in red:
- If use of one patrolling profile is followed immediately by use of another, run your mouse pointer over the red bar to see which patrolling profile applies when.



Properties available in XProtect Enterprise and XProtect Professional only:

SMS notification

- Periods of time (example: Mondays from 08.30 until 17.45), shown in green:

Set up a profile

1. In the **Schedule Profiles** list, select **Add new...**.
2. In the **Add Profile** dialog, enter a name for the profile. Names must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
3. In the top right corner of the dialog, select **Set camera to start/stop on time** to base subsequent settings on periods of time or **Set camera to start/stop on event** to base subsequent settings on events within periods of time.

4. In the calendar section, place your mouse pointer at a required start point, then hold down the left mouse button, drag the mouse pointer and release at the required end point.
    - You specify each day separately.
    - You specify time in increments of five minutes. The system helps you by showing the time over which your mouse pointer is positioned.



If you base your schedule profile—or parts of it—on events within periods of time, remember to select **Start event** and **Stop event** from the lists below the calendar section.

- Use the **Configure events** list, located below the other fields to define events that suit your needs.
- To delete an unwanted part of a schedule profile, right-click it and select **Delete**.
- To quickly fill or clear an entire day, double-click the name of the day.
- As an alternative to dragging inside the calendar section, use the **Start time**, **End time** and **Day** fields, then the **Change Period** or **Set Period** button as required. When using the **Start time** and **End time** fields, remember that time is specified in increments of five minutes. You cannot specify a period shorter than five minutes, and you can only use times like 12:00, 12.05, 12:10, 12:15, etc. If you specify a time outside of the five-minute intervals, such as 12:13, you will get an error message.

Configure when cameras should do what

Use the scheduling feature to configure when:

- Cameras should be online and transfer video to your system.
- Cameras should use speedup to use a higher than normal frame rate
- You want to receive email and/or SMS notifications regarding cameras
- PTZ cameras should patrol, and according to which patrolling profile
- Archiving should take place

See Configure general scheduling and archiving (on page 151) and Configure camera-specific schedules (on page 75).

Configure motion detection

To configure motion detection, do the following:

1. Expand **Advanced Configuration** > **Cameras and Storage Information**, right-click the relevant camera > **Properties**.
2. In the **Camera Properties** window, select the **Recording Properties** tab > select the relevant settings (see "About motion detection" on page 73).
3. Select the **Motion Detection** tab. If there are any areas to exclude from motion detection (for example, if the camera covers an area where a tree is swaying in the wind), you can exclude that area (see "Adjust motion detection: Exclude regions" on page 59) by selecting it with your mouse.
4. Fill in the relevant properties (see "Motion detection & exclude regions" on page 111). Note that there are some differences in motion-detection behavior for PTZ cameras (see "About motion detection and PTZ cameras" on page 75).

Disable or delete cameras

All cameras are enabled by default. This means that video from the cameras can be transferred to your system if the cameras are scheduled to be online (see "Online period" on page 156).

To **disable** a camera:

1. Expand **Advanced Configuration**, expand **Cameras and Storage Information**, double-click the camera you want to disable, and clear the **Enabled** box.
2. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

To delete a camera, you have to delete the hardware device (see "Delete/disable hardware devices" on page 66). If you delete the hardware device, you also delete any attached microphones or speakers. If you do not want this, consider disabling the camera instead.

Move PTZ type 1 and 3 to required positions

For PTZ types 1 and 3, you can move the PTZ camera to required positions in several different ways:



1. Click the required position in the camera preview (if supported by the camera).
2. Use the sliders located near the camera preview to move the PTZ camera along each of its axes: the X-axis (for panning left/right), the Y-axis (for tilting

up/down), and the Z-axis (for zooming in and out; to zoom in, move the slider towards **Tele**; to zoom out, move the slider towards **Wide**).

3. Use the navigation buttons:


Moves the PTZ camera up and to the left


Moves the PTZ camera up


Moves the PTZ camera up and to the right


Moves the PTZ camera to the left


Moves the PTZ camera to its home position (that is default position)


Moves the PTZ camera to the right


Moves the PTZ camera down and to the left


Moves the PTZ camera down


Moves the PTZ camera down and to the right


Zooms out (one zoom level per click)


Zooms in (one zoom level per click)

Recording and storage properties

Recording and archiving paths (properties)

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the properties in question are shared by all cameras rather than being specific to individual cameras.

You can edit all properties on a white background. You cannot edit properties on a light blue background. Note that all of the properties can also be specified individually for each camera.

Name	Description
Template	The template can help you configure similar properties quickly. Say you have 20 cameras and you want to change the recording path, archiving path, and retention time for all of them. Instead of having to enter the same three pieces of information 20 times, you can simply enter them once in the template, and then apply the template to the 20 cameras with only two clicks.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Camera Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Shortcut	Users of XProtect Smart Client can take advantage of keyboard shortcuts, some of which let the users toggle between viewing different cameras. Such shortcuts include numbers which are used to identify each camera. Shortcut numbers must be unique for each camera. A camera shortcut number must not contain any letters or special characters, and must not be longer than eight digits. Examples of correct camera shortcut numbers: 3, 12345678. Examples of incorrect camera shortcut numbers: Cam#3, 123456789. More information about using the keyboard shortcuts is available in the separate documentation for XProtect Smart Client.
Recording Path	Path to the folder in which the camera's database should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the required cell. You can only specify a path to a folder on a **local** drive. You cannot specify a path to a network drive. If you use a network drive, it is not be possible to save recordings if the network drive becomes unavailable. If you change the recording path, and you have existing recordings at the old location, you are asked whether you want to move the recordings to the new location (recommended), leave them at the old location, or delete them. **Tip:** If you have several cameras, and several local drives are available, you can improve performance by distributing individual cameras' databases across several drives.

Name	Description
Archiving Path	Only editable if not using dynamic paths for archiving (see "About archiving" on page 146). Path to the folder in which the camera's archived recordings should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the relevant cell. If you change the archiving path, and there are existing archived recordings at the old location, you are asked whether you want to move the archived recordings to the new location (recommended), leave them at the old location, or delete them. Note that if you move archived recordings, your system also archives what is currently in the camera database. In case you wonder why the camera database is empty just after you have moved archived recordings, this is the reason.
Retention time	Total amount of time for which you want to keep recordings from the camera (that is, recordings in the camera's database as well as any archived recordings). The default retention time is 7 days. Retention time covers the **total** amount of time you want to keep recordings for. In earlier versions of your surveillance system, you specified time limits separately for the database and archives.
Camera	Click the **Open** button to configure detailed and/or camera-specific settings (such as event notification, PTZ preset positions, and fisheye view areas) for the selected camera.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Set selected template value on selected cameras	Apply only a selected value from the template to selected cameras.
Set all template values on selected cameras	Apply all values from the template to selected cameras.

Dynamic path selection (properties)

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. In the case of dynamic path selection, this is because the properties are shared by all cameras.

With dynamic archiving (see "About archiving" on page 146) paths, you specify a number of different archiving paths, usually across several drives. If the path containing the

system database is on one of the drives you have selected for archiving, the system always tries to archive to that drive first. If not, the system automatically archives to the archiving drive with the most available space at any time, provided there is not a camera database using that drive. Which drive has the most available space may change during the archiving process, and archiving may therefore happen to several archiving drives during the same process. This fact has no impact on how users find and view archived recordings.

Dynamic archiving paths are general for all your cameras. You cannot configure dynamic archiving paths for individual cameras.

Name	Description
Enable dynamic path selection archives	Enables the use of dynamic path selection, allowing you to select which paths you want to use. The list of selectable paths initially represents all drives on the server, both local and mapped drives. You can add further paths with the **New path** feature below the list.
Use	Select particular paths for use as dynamic archiving paths. You can also select a previously manually added path for removal (see description of **Remove** button in the following).
Drive	Letter representing the drive in question, for example C:.
Path	Path to where you save the files, for example C:\ or \\OurServer\OurFolder\OurSubfolder\.
Drive Size	Total size of the drive.
Free Space	Amount of unused space left on the drive.
New path	Specify a new path, and add it to the list using the Add button. Paths must be reachable by the surveillance system server, and you must specify the path using the UNC (Universal Naming Convention) format, example: \\server\volume\directory\. When the new path is added, you can select it for use as a dynamic archiving path.
Add	Add the path specified in the **New path** field to the list.
Remove	Remove a selected path—which has previously been manually added—from the list. You cannot remove any of the initially listed paths, not even when they are selected.

Video recording (properties)

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the properties in question are shared by all cameras rather than being specific to individual cameras.

The term **recording** means saving video and, if applicable, audio from a camera in the camera's database on the surveillance system server. Video/audio is often saved only when there is a reason to do so, for example as long as motion is detected, when an event occurs and until another event occurs, or within a certain period of time.

You can edit all properties on a white background. You cannot edit properties on a light blue background. Note that you can also specify all of the Video Recording properties individually for each camera (see "Recording" on page 105).

Name	Description
Template	The template can help you configure similar properties quickly. Say you have 20 cameras and you want to change the recording path, archiving path, and retention time for all of them. Instead of having to enter the same three pieces of information 20 times, you can simply enter them once in the template, and then apply the template to the 20 cameras with only two clicks.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Camera Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Record on	Select under which conditions video from the camera should be recorded: • **Always:** Record whenever the camera is enabled (see "General" on page 99) and scheduled to be online (see "Online period" on page 156) (the latter allows for time-based recording). • **Never**: Never record. Live video will be displayed, but—since no video is kept in the database—users will not be able to play back video from the camera. • **Motion Detection**: Select this to record video in which motion (see "Motion detection & exclude regions" on page 111) is detected. Unless post-recording (see the following) is used, recording will stop immediately after the last motion is detected. • **Event**: Select this to record video when an event occurs and until another event occurs. Use of recording on event requires that events have been defined, and that you select start and stop events. Use the **Configure events** list, located below the other fields to define events that suit your needs. • **Motion Detection and Event**: Select this to record video in which motion is detected, or when an event occurs and until another event occurs. Remember to select start and stop events in the neighboring columns.
Start Event	Select required start event. Recording will begin when the start event occurs (or earlier if using pre-recording; see the following).

Name	Description
Stop Event	Select required stop event. Recording will end when the stop event occurs (or later if using post-recording; see the following).
Pre-recording	You can store recordings from periods preceding detected motion and/or start events. Select check box to enable this feature. Specify the required number of seconds in the neighboring column.
Seconds [of pre-recording]	Specify the number of seconds for which you want to record video from before recording start conditions (that is motion or start event) are met. Usually, only some seconds of pre-recording is required, but you can specify up to 65535 seconds of pre-recording, corresponding to 18 hours, 12 minutes and 15 seconds. However, if specifying a very long pre-recording time, you can potentially run into a scenario where your pre-recording time spans scheduled or unscheduled archiving (see "About archiving" on page 146) times. That can be problematic since pre-recording does not work well during archiving.
Post-recording	You can store recordings from periods following detected motion and/or stop events. Select check box to enable this feature. Specify the required number of seconds in the neighboring column.
Seconds [of post-recording]	Specify the number of seconds for which you want to record video from after recording stop conditions (that is motion or stop event) are met. Usually, only some seconds of post-recording is required, but you can specify up to 65535 seconds of post-recording, corresponding to 18 hours, 12 minutes and 15 seconds. However, if specifying a very long post-recording time, you can potentially run into a scenario where your post-recording time spans scheduled or unscheduled archiving times. That can be problematic since post-recording does not work well during archiving.
Camera	Click the **Open** button to configure detailed and/or camera-specific settings (such as event notification, PTZ preset positions, and fisheye view areas) for the selected camera.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Set selected template value on selected cameras	Apply only a selected value from the template to selected cameras.

Name	Description
Set all template values on selected cameras	Apply all values from the template to selected cameras.

If the camera uses the MJPEG video format

With MJPEG, you can define frame rates for regular as well as speedup modes. If the camera offers dual stream, you can also enable this.

Note that there are three places where you can set frame rate:

- Live Frame Rate - used for the regular recording stream
- Live Frame Rate - used when speeding up recordings in connection with motion detection or similar functionality.
- FPS (Frames per second) - used for the additional stream used for live viewing.

Regular frame rate mode:

Properties available for all XProtect software versions:

Name	Description
Frame Rate	Required average frame rate for video from the camera. Select number of frames, then select the time unit interval (second, minute or hour).

Properties available in XProtect Enterprise and XProtect Professional only:

Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Speedup frame rate mode:

Properties available in all XProtect software versions:

Name	Description
Enable speedup frame rate	The speedup feature lets you use a higher than normal frame rate if motion is detected and/or an event occurs. When you enable speedup, further columns for specifying speedup details become available.
Frame Rate	Speedup frame rate for viewing video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.
On motion	Select this check box to use the speedup frame rates when motion is detected. The camera will return to the normal frame rates two seconds after the last motion is detected.
On event	Select this check box to use the speedup frame rates when an event occurs and until another event occurs. Use of speedup on event requires that events have been defined, and that you select start and stop events in the neighboring lists. Use the **Configure events** list, located below the other fields to define events that suit your needs.
Start Event	Select required start event. The camera will begin using the speedup frame rates when the start event occurs.
Stop Event	Select required stop event. The camera will return to the normal frame rates when the stop event occurs.

Properties available in XProtect Enterprise and XProtect Professional only:

Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode. If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Tip: Speedup does not necessarily have to be based on motion- or events, you can also use scheduling (see "Speedup" on page 157) to configure speedup based on particular periods of time. If you prefer such time-based speedup, you should still enable the use of speedup by selecting the **Enable speedup** check box.

Dual stream:

This feature is only available on cameras supporting dual stream.

Name	Description
Enable dedicated live stream	This additional stream feature lets you use the alternative stream of the camera. It enables two independent streams to the recording server—a stream for live viewing and another stream for recording purposes, with different resolution, encoding, and frame rate.
Stream	Select the type of the live stream. Stream settings for viewing live video and for recording video may very well be different in order to get the best result.
Resolution	Select the resolution of the camera.
FPS	Select the camera's live frame rate per second (FPS)

If the camera uses the MPEG video format

With MPEG, you can define frame rate and other settings:

Properties available in all XProtect software versions:

Name	Description
Frame rate per second	Frame rate for viewing live and recorded video from the camera. Select number of frames per second.

Properties available in XProtect Enterprise, XProtect Professional and XProtect Express only:

Record keyframes only	Keyframes stored at specified intervals record the entire view of the camera, whereas the following frames record only pixels that change. This helps greatly reducing the size of MPEG files. Select the check box if you only want to record keyframes. Note that you can specify exceptions if motion is detected or events occur.
Record all frames on motion	Allows you to make exceptions if you have selected to record keyframes only. Select this check box to record all frames when motion is detected. Two seconds after the last motion **is detected**, the camera will return to recording keyframes only**.**
Record all frames on event	Allows you to make exceptions if you have selected to record keyframes only. Select this check box to record all frames when an event occurs and until another event occurs. Use of this feature requires that events have been defined, and that you select start and stop events in the neighboring lists. Use the **Configure events** list, located below the other fields to define events that suit your needs.
Start Event	**Use when recording on Event or Motion Detection & Event.** Select required start event. The camera will begin recording all frames when the start event occurs.
Stop Event	Select required stop event. The camera will again only recording keyframes when the stop event occurs.

Dual stream:

This feature is only available on cameras supporting dual stream.

Name	Description
Enable dedicated live stream	This additional stream feature lets you use the alternative stream of the camera. It enables two independent streams to the recording server—a stream for live viewing and another stream for recording purposes, with different resolution, encoding, and frame rate.
Stream	Select the type of the live stream. Stream settings for viewing live video and for recording video may very well be different in order to get the best result.
Resolution	Select the resolution of the camera.
FPS	Select the camera's live frame rate per second (FPS)

Manual recording

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. In the case of manual recording, it is because the properties are shared by all cameras.

When manual recording is enabled, XProtect Smart Client users with the necessary rights can manually start recording if they see something of interest while viewing live video from a camera which is not already recording.

If enabled, manual recording can take place even if recording for individual cameras (see "Recording" on page 105) is set to **Never** or **Conditionally**.

When started from XProtect Smart Client, such user-driven recording always takes place for a fixed time, for example for five minutes.

Name	Description
Enable manual recording	Select check box to enable manual recording and specify further details.
Default duration of manual recording	Period of time (in seconds) during which user-driven recording take place. Default duration is 300 seconds, corresponding to five minutes.
Maximum duration of manual recording	The maximum allowed period of time for user-driven recording. This maximum is not relevant in connection with manual recording started from XProtect Smart Client, since such manual recording always takes place for a fixed time. In some installations, you can also combine manual recording with third-party applications if integrating these with the system through an API or similar, and in such cases specifying a maximum duration may be relevant. If you are using manual recording in connection with XProtect Smart Client only, disregard this property.

Frame rate - MJPEG

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the properties in question are shared by all cameras rather than being specific to individual cameras.

You can edit all properties on a white background. You cannot edit properties on a light blue background. Note that all of the Frame rate - MJPEG properties can also be specified individually for each camera (see "Recording" on page 105) using MJPEG.

Template and common properties

Name	Description
Template	The template can help you configure similar properties quickly. Say you have 20 cameras and you want to change the recording path, archiving path, and retention time for all of them. Instead of having to enter the same three pieces of information 20 times, you can simply enter them once in the template, and then apply the template to the 20 cameras with only two clicks.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Set selected template value on selected cameras	Apply only a selected value from the template to selected cameras.
Set all template values on selected cameras	Apply all values from the template to selected cameras.
Camera Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**

Regular frame rate properties

Properties available in all XProtect software versions:

Name	Description
Frame Rate	Required average frame rate for video from the camera. Select number of frames, then select the time unit interval (second, minute or hour).
Time Unit	Select required unit for live and recording frame rates (per second, minute, or hour). Note that you can only select time bases that let you speed up frame rates. Example: If you have specified 15 frames per **second** in normal mode, you cannot specify 16 frames per **minute** or **hour** in speedup mode.
Camera	Click the **Open** button to configure detailed and/or camera-specific settings (such as event notification, PTZ preset positions, and fisheye view areas) for the selected camera.

Properties available in XProtect Enterprise and XProtect Professional only:

Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Speedup frame rate properties

Properties available in all XProtect software versions:

Name	Description
Enable Speedup	The speedup feature lets you use a higher than normal frame rate if motion is detected and/or an event occurs. When you enable speedup, further columns for specifying speedup details become available.
Frame Rate	Speedup frame rate for viewing video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.
Time Unit	Select required unit for live and recording frame rates (per second, minute, or hour). Note that you can only select time bases that let you speed up frame rates. Example: If you have specified 15 frames per **second** in normal mode, you cannot specify 16 frames per **minute** or **hour** in speedup mode.
Speedup On	• **Motion Detection:** Select this to speed up when motion (see "Motion detection & exclude regions" on page 111) is detected. Normal frame rates will be resumed immediately after the last motion **is detected.** • **Event:** Select this to speed up when an event occurs and until another event occurs. Use of speedup on event requires that events have been defined, and that you select start and stop events in the neighboring columns. Use the **Configure events** list, located below the other fields to define events that suit your needs. • **Motion Detection & Event:** Select this to speed up when motion is detected, or when an event occurs and until another event occurs. Remember to select start and stop events in the neighboring columns.
Schedule Only	Select this to speed up according to the camera's speedup schedule (see "Speedup" on page 157) only.
Start Event	Select required start event. The camera will begin using the speedup frame rates when the start event occurs.
Stop Event	Select required stop event. The camera will return to the normal frame rates when the stop event occurs.
Camera	Click the **Open** button to configure detailed and/or camera-specific settings (such as event notification, PTZ preset positions, and fisheye view areas) for the selected camera.

Properties available in all XProtect software versions:

Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode. If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Frame Rate - MPEG

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the properties in question are shared by all cameras rather than being specific to individual cameras.

You can also specify all of the Frame Rate H.264/MPEG4 properties individually for each camera (see "Recording" on page 105) using H.264/MPEG4.

Properties available in all XProtect software versions:

Name	Description
Template	The template can help you configure similar properties quickly. Say you have 20 cameras and you want to change the recording path, archiving path, and retention time for all of them. Instead of having to enter the same three pieces of information 20 times, you can simply enter them once in the template, and then apply the template to the 20 cameras with only two clicks.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Camera Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Dual Stream	Allows you to check if dual streaming is enabled on the camera(s). Note that the information is read-only. For cameras that support dual streaming, this can be enabled/disabled as part of individual cameras' Video (on page 101) properties.
Live FPS	Select the camera's live frame rate per second (FPS).
Camera	Click the **Open** button to configure detailed and/or camera-specific settings (such as event notification, PTZ preset positions, and fisheye view areas) for the selected camera.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Set selected template value on selected cameras	Apply only a selected value from the template to selected cameras.
Set all template values on selected cameras	Apply all values from the template to selected cameras.

Properties available in XProtect Enterprise and XProtect Professional only:

Record Keyframe Only	Keyframes stored at specified intervals record the entire view of the camera, whereas the following frames record only pixels that change; this helps greatly reduce the size of MPEG files. Select the check box if you only want to record keyframes.
Record All Frames on	Allows you to make exceptions if you have selected to record keyframes only. • **Motion Detection**: Select this to record all frames when motion is detected. Two seconds after the last motion (see "Motion detection & exclude regions" on page 111) is detected, the camera will return to recording keyframes only**.** • **Event**: Select this to record all frames when an event occurs and until another event occurs. Requires that events have been defined, and that you select start and stop events in the neighboring columns. Use the **Configure events** list, located below the other fields to define events that suit your needs. • **Motion Detection & Event**: Select this to record all frames when motion is detected, or when an event occurs and until another event occurs. Remember to select start and stop events in the neighboring columns. • **Schedule only**: Select this to record all frames according to the camera's speedup schedule (see "Speedup" on page 157) only.
Start Event	**Use when recording on Event or Motion Detection & Event.** Select required start event. The camera will begin recording all frames when the start event occurs.
Stop Event	Select required stop event. The camera will again only recording keyframes when the stop event occurs.

Audio recording

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, you can decide whether to record audio or not. Your choice applies for all cameras on your system.

Name	Description
Always	Always record audio on all applicable cameras.
Never	Never record audio on any cameras. Note that even though audio is never recorded, you can still listen to live audio in XProtect Smart Client.

If you record audio, it is important that you note that audio recording affects video storage capacity.

Audio is recorded to the associated camera's database. Therefore, bear in mind that the database is likely to become full earlier if you record audio and video than if you only record video. The fact that the database becomes full is not in itself a problem since your system automatically archives (see "About archiving" on page 146) data if the database becomes full. However, you may need additional archiving space if you record audio.

- Example: If you use MPEG4, each one-second video GOP (Group Of Pictures) are stored in one record in the database. Each second of audio is also stored in one record in the database. This reduces the database's video storage capacity to half its capacity, because half of the database's records is used for storing audio. Consequently, the database runs full sooner, and automatic archiving takes place more often than if you were only recording video.
- Example: If you use MJPEG, audio is stored in one record for every JPEG for as long as the audio block size does not exceed the time between the JPEGs. In extreme cases, this reduces the database's video storage capacity to half its capacity, because half of the database's records is used for storing audio. If you use very high frame rates, which means less time between each JPEG, a smaller portion of the database is used for storing audio records, and consequently a larger portion is available for storing video. The result is that the database runs full sooner, and automatic archiving takes place more often than if you were only recording video.

Above examples are simplified. The exact available video storage capacity also depends on GOP/JPEG and audio kilobyte size.

Audio selection

When you configure video and recording (see "About video and recording configuration" on page 72), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the properties in question are shared by all cameras rather than being specific to individual cameras. With a default microphone and/or speaker selected for a camera, audio from the microphone and/or speaker is automatically used when you view video from the camera. Note that all of the properties can also be specified individually for each camera.

Properties available in all XProtect software versions:

Name	Description
Template	The template can help you configure similar properties quickly. Say you have 20 cameras and you want to change the recording path, archiving path, and retention time for all of them. Instead of having to enter the same three pieces of information 20 times, you can simply enter them once in the template, and then apply the template to the 20 cameras with only two clicks.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Camera Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Default Microphone	Select a default microphone.
Camera	Click the **Open** button to configure detailed and/or camera-specific settings (such as event notification, PTZ preset positions, and fisheye view areas) for the selected camera.
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Set selected template value on selected cameras	Apply only a selected value from the template to selected cameras.
Set all template values on selected cameras	Apply all values from the template to selected cameras.

Properties available in XProtect Enterprise and XProtect Professional only:

Default Speaker	Select a default speaker.

Storage information

The storage information properties show how much storage space you have on your system and how much of it is free. To quickly view disk space usage in a pie chart format, select the line representing the drive you are interested in.

Name	Description
Drive	Letter representing the drive in question, for example C:.
Path	Path to where you save the files, for example C:\ or \\OurServer\OurFolder\OurSubfolder\.
Usage	What the storage area is used for, for example recording or archiving.
Drive Size	Total size of the drive.
Video Data	Amount of video data on the drive.
Other Data	Amount of other data on the drive.
Free Space	Amount of unused space left on the drive.

Camera properties

General

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, properties include:

Name	Description
Enabled	Cameras are by default enabled, meaning that provided they are scheduled to be online (see "Online period" on page 156) and that they can to transfer video to your system. You can disable an individual camera, in which case no video/audio is transferred from the camera source to your system.
Preview	Select this check box to show a preview of your camera's video. If you clear the check box, your system does not show a preview for your camera.
Camera Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Camera shortcut number	Users of XProtect Smart Client can take advantage of keyboard shortcuts, some of which let the users toggle between viewing different cameras. Such shortcuts include numbers which are used to identify each camera. Shortcut numbers must be unique for each camera. A camera shortcut number must not contain any letters or special characters, and must not be longer than eight digits. Examples of correct camera shortcut numbers: 3, 12345678. Examples of incorrect camera shortcut numbers: Cam#3, 123456789. More information about using the keyboard shortcuts is available in the separate documentation for XProtect Smart Client.

These properties are to a large extent camera-specific. Since such properties vary from camera to camera, descriptions in the following are for guidance only. If you can access the selected camera, a live preview is displayed. Click the **Camera Settings...** button to open a separate window with properties for the selected camera.

The video properties typically let you control bandwidth, brightness, compression, contrast, resolution, rotation, and more by overwriting existing values of selecting new ones. When you adjust video settings, you can—for most cameras—preview the effect of your settings in an image below the fields.

Video settings may feature an **Include Date and Time** setting. If set to **Yes**, date and time from the camera are included in video. Note, however, that cameras are separate units which may have separate timing devices, power supplies, etc. Camera time and system time may therefore not correspond fully, and this may occasionally lead to confusion. As all frames are time-stamped by your system upon reception, and exact date and time information for each image is already known, it is recommended that the setting is set to **No**.

For consistent time synchronization, you may—if supported by the camera—automatically synchronize camera and system time through a time server.

Video

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, you can use either the MJPEG video format or the MPEG video format. Depending on which of the two options, you choose, you can set different options for your camera.

MJPEG video format

With MJPEG, you can define frame rates for regular as well as speedup modes. If the camera offers dual stream, you can also enable this. Note that there are three places where you can set frame rate:

- Live Frame Rate - used for the regular recording stream
- Live Frame Rate - used when speeding up recordings in connection with motion detection or similar functionality.
- FPS (Frames per second) - used for the additional stream used for live viewing.

Regular frame rate mode

Properties available for all XProtect software versions:

Frame Rate	Required average frame rate for video from the camera. Select number of frames, then select the time unit interval (second, minute or hour).

Properties available in XProtect Enterprise and XProtect Professional only:

Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Speedup frame rate mode

Properties available in all XProtect software versions:

Enable speedup frame rate	The speedup feature lets you use a higher than normal frame rate if motion is detected and/or an event occurs. When you enable speedup, further columns for specifying speedup details become available.
Frame Rate	Speedup frame rate for viewing video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.
On motion	Select this check box to use the speedup frame rates when motion is detected. The camera will return to the normal frame rates two seconds after the last motion is detected.
On event	Select this check box to use the speedup frame rates when an event occurs and until another event occurs. Use of speedup on event requires that events have been defined, and that you select start and stop events in the neighboring lists.
Start Event	Select required start event. The camera begins using the speedup frame rates when the start event occurs.
Stop Event	Select required stop event. The camera returns to the normal frame rates when the stop event occurs.

Properties available in XProtect Enterprise and XProtect Professional only:

Live Frame Rate	Required average frame rate for live video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode. If the camera supports dual stream and dual stream is enabled, the **Live Frame Rate** column will be read-only with the value **Dual streaming—**which cannot be altered.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select number of frames, then select the time unit interval (second, minute or hour). The frame rate must be higher than the frame rate specified under normal mode.

Note: Speedup does not necessarily have to be based on motion- or events, you can also use scheduling to configure speedup based on particular periods of time. If you prefer such time-based speedup, you should still enable the use of speedup by selecting the **Enable speedup** check box.

Dual stream

Enable dedicated live stream	This additional stream feature lets you use the alternative stream of the camera. It enables two independent streams to the recording server—a stream for live viewing and another stream for recording purposes, with different resolution, encoding, and frame rate.
Stream	Select the type of the live stream. Stream settings for viewing live video and for recording video may very well be different in order to get the best result.
Resolution	Select the resolution of the camera.
FPS	Select the camera's live frame rate per second (FPS)

MPEG video format

With MPEG, you can define frame rate and other settings:

Frame rate

Properties available in all XProtect software versions:

Frame rate per second	Frame rate for viewing live and recorded video from the camera. Select number of frames per second.

Properties available in XProtect Enterprise, XProtect Professional and XProtect Express only:

Record keyframes only	Keyframes stored at specified intervals record the entire view of the camera, whereas the following frames record only pixels that change. This helps greatly reducing the size of MPEG files. Select the check box if you only want to record keyframes. Note that you can specify exceptions if motion is detected or events occur.
Record all frames on motion	Allows you to make exceptions if you have selected to record keyframes only. Select this check box to record all frames when motion is detected. Two seconds after the last motion **is detected**, the camera will return to recording keyframes only**.**
Record all frames on event	Allows you to make exceptions if you have selected to record keyframes only. Select this check box to record all frames when an event occurs and until another event occurs. Use of this feature requires that events have been defined, and that you select start and stop events in the neighboring lists.
Start Event	**Use when recording on Event or Motion Detection & Event.** Select required start event. The camera begins recording all frames when the start event occurs.
Stop Event	Select required stop event. The camera only records keyframes when the stop event occurs.

Dual stream

Enable dedicated live stream	This additional stream feature lets you use the alternative stream of the camera. It enables two independent streams to the recording server—a stream for live viewing and another stream for recording purposes, with different resolution, encoding, and frame rate.
Stream	Select the type of the live stream. Stream settings for viewing live video and for recording video may very well be different in order to get the best result.
Resolution	Select the resolution of the camera.
FPS	Select the camera's live frame rate per second (FPS)

Audio

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, properties include the possibility of selecting a default microphone and/or speaker for the camera. With a default microphone and/or speaker selected for a camera, audio from the microphone and/or speaker is automatically used when you view video from the camera.

If a microphone/speaker is attached to the same hardware device as the camera, that particular microphone/speaker is the camera's default microphone/speaker if you do not select otherwise.

Properties available in all XProtect software versions:

Name	Description
Default Microphone	Select a default microphone.

Properties available in XProtect Enterprise and XProtect Professional only:

Default Speaker	Select a default speaker.

The ability to select a default microphone or speaker for the camera is only available if at least one microphone and/or speaker has been attached to a hardware device on the surveillance system.

Recording

The term **recording** means **saving video** and, if applicable, **audio** from a camera in the camera's database on the surveillance system server. Video/audio is often saved only when there is a reason to do so, for example as long as motion is detected, when an event occurs and until another event occurs, or within a certain period of time.

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, recording properties include:

Name	Description
Always	Record whenever the camera is enabled (see "General" on page 99) and scheduled to be online (see "Online period" on page 156) (the latter allows for time-based recording).
Never	Never record. Live video will be displayed, but—since no video is kept in the database—users will not be able to play back video from the camera.
Conditionally	Record when certain conditions are met. When you select this option, specify required conditions (see the following) which enables you to store recordings from periods preceding and following detected motion and/or specified events. Example: If you have defined that video should be stored when a door is opened, being able to see what happened immediately prior to the door being opened may also be important. Say you have specified that video should be stored conditionally on event, with a start event called **Door Opened** and a stop event called **Door Closed**. With three seconds of pre-recording, video is recorded from three seconds before **Door Opened** occurs and until **Door Closed** occurs.
Built-in motion detection	Select this check box to record video in which motion (see "Motion detection & exclude regions" on page 111) is detected. Unless post-recording (see the following) is used, recording will stop immediately after the last motion is detected.
On event	Select this check box to record video when an event occurs and until another event occurs. Use of recording on event requires that events have been defined, and that you select start and stop events in the neighboring lists. Use the **Configure events** list, located below the other fields to define events that suit your needs.
Start Event	Select required start event. Recording will begin when the start event occurs (or earlier if using pre-recording; see the following).
Stop Event	Select required stop event. Recording will end when the stop event occurs (or later if using post-recording; see the following).
Enable pre-recording	Available only when the option **Conditional** is selected. Specify the number of seconds for which you want to record video from before recording start conditions (that is motion or start event) are met.

Name	Description
Enable post-recording	Available only when the option **Conditional** is selected. Specify the number of seconds for which you want to record video after recording stop conditions (that is motion end or stop event) are met.

Note that manual recording (on page 90) may be enabled. With manual recording, users of XProtect Smart Client with the necessary rights can manually start recording if they see something of interest while viewing live video from a camera which is not already recording. If enabled, manual recording can take place even if recording for individual cameras is set to **Never** or **Conditionally**.

Recording and archiving paths

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, properties include:

Component	Requirement
Recording Path	Path to the folder in which the camera's database should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the required cell. You can only specify a path to a folder on a **local** drive. You cannot specify a path to a network drive. If you use a network drive, it is not be possible to save recordings if the network drive becomes unavailable. If you change the recording path, and you have existing recordings at the old location, you are asked whether you want to move the recordings to the new location (recommended), leave them at the old location, or delete them. **Tip:** If you have several cameras, and several local drives are available, you can improve performance by distributing individual cameras' databases across several drives.
Delete Database	Click button to delete all recordings in the database for the camera. Archived recordings are not affected. **Important:** Use with caution. All recordings in the database for the camera are permanently deleted. As a security measure, you must confirm that you want to delete the database.
Archiving Path	Only editable if not using dynamic paths for archiving (see "About archiving" on page 146). Path to the folder in which the camera's archived recordings should be stored. Default is C:\MediaDatabase. To browse for another folder, click the browse icon next to the relevant cell. If you change the archiving path, and there are existing archived recordings at the old location, you are asked whether you want to move the archived recordings to the new location (recommended), leave them at the old location, or delete them. Note that if you move archived recordings, your system also archives what is currently in the camera database. In case you wonder why the camera database is empty just after you have moved archived recordings, this is the reason.
Delete Archives	Click button to delete all archived recordings for the camera. Recordings in the camera's regular database will not be affected. The ability to delete is available regardless of whether you use a single archiving path or dynamic archiving paths. **Important:** Use with caution. All archived recordings for the camera are permanently deleted. As a security measure, you must confirm that you want to delete the archives.

Component	Requirement
Retention time	Total amount of time for which you want to keep recordings from the camera (that is, recordings in the camera's database as well as any archived recordings). The default retention time is 7 days. Retention time covers the **total** amount of time you want to keep recordings for. In earlier versions of your surveillance system, you specified time limits separately for the database and archives.
Database Repair Action	Select which action to take if the database becomes corrupted: ▸ **Repair, scan, delete if fails**: Default action. If the database becomes corrupted, two different repair methods will be attempted: a fast repair and a thorough repair. If both repair methods fail, the contents of the database will be deleted. ▸ **Repair, delete if fails**: If the database becomes corrupted, a fast repair will be attempted. If the fast repair fails, the contents of the database will be deleted. ▸ **Repair, archive if fails**: If the database becomes corrupted, a fast repair will be attempted. If the fast repair fails, the contents of the database will be archived. ▸ **Delete (no repair)**: If the database becomes corrupted, the contents of the database will be deleted. ▸ **Archive (no repair)**: If the database becomes corrupted, the contents of the database will be archived. If you choose an action to repair a corrupt database, this corrupt database is closed while it is repaired. Instead, a new database is created to allow recordings to continue. XProtect Smart Client can often repair a corrupt database if it has been archived. When you open the corrupt database in XProtect Smart Client, XProtect Smart Client repairs the database automatically if at all possible. **Tip:** There are several things you can do to prevent that your databases become corrupt in the first place.

Component	Requirement
Configure Dynamic Paths	With dynamic archiving paths, you specify a number of different archiving paths, usually across several drives. If the drive containing the camera's database is among the path you have selected for dynamic archiving, your system always tries to archive to that path first. If not, the system automatically archives to the archiving drive with the most available space at any time, provided there is not a camera database using that drive. See also Dynamic path selection (see "Dynamic path selection (properties)" on page 81).

Event notification

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, properties include event notification. Event notifications inform XProtect Smart Client users that an event has occurred on your system. Event notifications can be valuable for client users, as they can quickly detect that an event has occurred. Even though you configure event notifications separately for each camera, you can select between all events on your system, regardless whether events are manual, generic or originate on another hardware device than the camera itself.

In XProtect Smart Client, event notification is given by a yellow indicator which lights up when a relevant event has taken place. You can also add an optional sound on event notification in XProtect Smart Client itself.

Three indicators are available for each camera in XProtect Smart Client:



- The yellow event indicator. Lights up when a relevant event has taken place.
- A red motion indicator. Lights up when motion has been detected.
- An optional green video indicator. Lights up when video is received from the camera.

You can turn off the bar in which the indicators are displayed in XProtect Smart Client. Do not turn off if XProtect Smart Client must rely on event notifications.

Select required events

1. In the **Available events** list, select the relevant event. You can only select one event at a time.
2. Click the **>>** button to copy the selected event to the **Selected Events** list.
3. Repeat for each required event.

If you later want to remove an event from the **Selected Events** list, select the relevant event, and click the **<<** button.

Output

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, you can also associate a camera with particular hardware output (see "Add a hardware output" on page 129), for example the sounding of a siren or the switching on of lights.

Associated output can then be activated automatically when motion is detected in video from the camera, or manually when Smart Client users with the necessary rights (see "Configure user and group rights" on page 195) view live video from the camera.

1. In the **Available output** list, select the required output. It is only possible to select one output at a time. If you have not yet defined any suitable output, you can quickly do it: Use the **Configure Output** button, located below the other fields.
2. Click the **>>** button to copy the selected output to the:
   - **On manual activation** list, in which case the output is available for manual activation in XProtect Smart Client.

     and/or
   - **On motion detected** list, in which case the output is activated when motion is detected in video from the camera. If required, the same output can appear on both lists.
3. Repeat for each required output.

If you later want to remove an output from the one of the lists, select the output in question, and click the **<<** button.

Motion detection & exclude regions

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, adjusting motion detection is important because it may determine when video from the camera is recorded, when email notifications are generated or when hardware output, such as lights or sirens, is activated. Time spent on finding the best possible motion detection settings for each camera may help you later avoid unnecessary recordings and notifications. Depending on the physical location of the camera, it may be a very good idea to test motion detection under different physical conditions such as day/night or windy/calm weather.

Before you configure motion detection for a camera, you should configure the camera's video properties (see "General" on page 99) including compression and resolution.

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application.

Name	Description
Enable	Enable or disable (see "About motion detection" on page 73) the built-in motion detection.
Show grid	Turn the grid on and off. Turning the grid off may provide a less obscured view of the preview image. You select the areas to exclude from motion detection the same way as when the grid is visible. When the grid is turned on, the preview image is divided into small sections by a grid. To define areas which should be excluded from motion detection, drag the mouse over the areas in the preview image while pressing the mouse button down. The left mouse button selects a grid section and the right mouse button clears a grid section. Selected areas are highlighted in blue.
Include All	Quickly select all grid sections in the preview image. This can be useful if you want to exclude motion detection in most areas of the image, in which case you can clear the few sections in which you do not want to exclude motion detection.
Exclude All	Clear all grid sections in the preview image.

Name	Description
Manual sensitivity	Enable this functionality to be able to adjust the Sensitivity slide for motion yourself. Drag the slider to the left for a higher sensitivity level, and to the right for a lower sensitivity level. ▸ The **higher** the sensitivity level, the less change is allowed in each pixel before it is regarded as motion. ▸ The **lower** the sensitivity level, the more change in each pixel is allowed before it is regarded as motion. Pixels in which motion is detected are highlighted in green in the preview image. Milestone recommends that you do not enable manual sensitivity because: ▸ With dynamic sensitivity, the system calculates and optimizes the sensitivity level automatically and suppresses motion detections that come from noise in the images. ▸ Dynamic sensitivity improves motion detection at nighttime, where the noise in the images often triggers false motion. ▸ The system is not overloaded from too much recording. ▸ The users are not missing results from insufficient recording.
Sensitivity	Use this to determine how much each pixel must change before it is regarded as motion. With a high sensitivity, very little change in a pixel is required before it is regarded as motion. Areas in which motion is detected are highlighted in green in the preview image. Select a slider position in which only detections you consider motion are highlighted. The more you drag the slider to the left, the more of the preview image becomes highlighted. This is because with a high sensitivity even the slightest change in a pixel will be regarded as motion. As an alternative to using the slider, you may specify a value between 0 and 256 in the field next to the slider to control the sensitivity setting.

Name	Description
Motion	Adjust the **Motion** slider so that motion detection is only triggered by the required level of motion. The selected motion level is indicated by the black vertical line in the **Level** bar above the sliders. The black vertical line serves as a threshold. When motion is above (to the right of) the selected level, the bar changes color from green to red, indicating a positive motion detection. Alternatively, specify a value between 0 and 10000 in the field on the left to control the motion setting. The more you drag the slider to the left, the more positive motion detections you see because less change will be needed to trigger a positive motion detection. The number of positive motion detections may also affect the amount of video you record, the amount of notifications you receive and more.
Keyframe Only	Select **Keyframe only** if you want motion detection to take place only on keyframes of the video stream to reduce the system resources used on motion detection.
Detection interval	Specify how often motion detection analysis is carried out on video from the camera. The default is every 240 milliseconds (close to once a quarter of a second). The interval is applied regardless of your cameras' frame rate settings. Adjusting this setting can help lower the amount of system resources used on motion detection.
Detection resolution	Specify whether the full image or a selected percentage of the image should be analyzed. For example, by specifying 25%, every fourth pixel is analyzed instead of all pixels, reducing the system resources used but also offering less accurate motion detection.

Privacy masking

If you need to mask any areas of the camera image from viewing, set the following properties:

Name	Description
Enable	Enable the **Privacy Masking** feature.
Show grid	Turn the grid on or off. Turning the grid off may provide a less obscured view of the preview image. Select areas to exclude the same way as you would when the grid is visible. When on, the preview image is divided into small sections by a grid. To define areas which should be excluded from privacy masking, drag the mouse over the areas in the preview image while pressing the mouse button down. The left mouse button selects a grid section and the right mouse button clears a grid section. Selected areas are highlighted in red.
Show privacy mask	Turn the red area indicating privacy masking on or off. Turning off the red area may provide a less obscured view of the preview image.
Clear	Clear the privacy masking.

Fisheye lens (properties)

Fisheye lens technology allows you to view panoramic video through an advanced fisheye lens. To use fisheye lens technology, you must enable the technology and, in some cases, enter a special license key. If you are unsure if you need a special fisheye license key, contact your system vendor for further information.

Name	Description
Enable fisheye lens support	Select the check box to enable use of the fisheye lens technology and to be able to specify further properties.
Immervision Enables® panomorph RPL number	When you enable the panomorph support functionality, you must also select a Registered Panomorph Lens (RPL) number from the **ImmerVision Enables® panomorph RPL number** list. This is to ensure that the lens is correctly identified and configured with the lens used with the camera. You can usually find the RPL number on the lens itself or on the box it came in. If you, at some point, want to add additional types of lenses, go to **File** and select **Import new lens types**. Locate the .xml file that contains information about the lens type and press **OK**. For details of ImmerVison, panomorph lenses, and RPLs, see the ImmerVision Enables website https://www.immervisionenables.com/**.**
Camera position/orientation	Choose whether the camera is mounted in the ceiling, on a wall or on ground level.

PTZ preset positions

PTZ-related properties are only available when you are dealing with a PTZ (pan-tilt-zoom) camera.

You can use PTZ preset positions for making the PTZ camera automatically go to a particular position when particular events occur, and when setting up PTZ patrolling profiles. Preset positions can also be used in clients to allow users that have been given rights (see "Configure user and group rights" on page 195) to move the PTZ camera between preset positions. Names of preset positions must contain only the characters A-Z, a-z and the digits 0-9. If you import preset positions from cameras (see the following), verify that their names do not contain other characters. If they do, change the preset position names before you import them.

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application.

Name	Description
PTZ type	Your configuration options depend on the type of PTZ camera in question: • Type 1 (stored on server): You define preset positions by moving the camera using the controls in the upper half of the window, then storing each required position on the system server. You can define up to 50 preset positions this way. • Type 2 (imported from camera): You import preset positions which have previously been defined and stored on the PTZ camera itself through the camera's own configuration interface. The number of allowed preset positions depends on the PTZ camera and driver used. • Type 3 (stored on camera): You define preset positions by moving the camera with the controls in the upper half of the window, then storing each required position in the camera's own memory. You can define up to 50 preset positions this way. If preset positions have already been defined for the camera, you can simply import them for use with the system.
Import / Refresh	Only available when you have selected PTZ type 2 or 3. Lets you import already defined preset positions from the camera's memory for use with the system. If you have already imported preset positions this way, and preset positions have since then been added or changed on the camera, you can use this button to refresh the imported preset positions.
Add New	Only available when you have selected PTZ type 1. When you have move the camera to a required position using the controls in the upper half of the window, type a name for the position in the blank field, then click the button to add the position to the list of defined preset positions. Remember that names of preset positions must contain only the characters A-Z, a-z and the digits 0-9.
Set New Position	Only available when you have selected PTZ type 1 or 3. Lets you change an already defined preset position. In the list, select the preset position you want to change. Then move the camera to the new required position using the controls in the upper half of the window. Then click the button to overwrite the old position with the new one.

Name	Description
Delete	Only available when you have selected PTZ type 1 or 3. Lets you delete an already defined preset. In the list, select the preset position you want to delete, then click the button. Before you delete a preset position, make sure it is not used in PTZ patrolling or PTZ on event. Since the preset positions are stored on the camera, you can bring a deleted preset position back into your system by clicking the **Import / refresh** button. If you bring back a preset position this way, and you use the preset position with PTZ patrolling or PTZ on event, you must manually configure the PTZ patrolling and/or PTZ on event to use the preset position again.
Test	Try out a preset position. In the list, select the preset position you want to test, then click the button to view the camera move to the selected position.
PTZ control wheel	Move a preset position selected in the list up and down respectively. The selected preset position is moved one step per click. By moving preset positions up or down, you can control the sequence in which preset positions are presented in clients.

PTZ patrolling

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application.

You can only set PTZ-related properties for pan-tilt-zoom (PTZ) cameras. PTZ patrolling is the continuous movement of a PTZ camera between a number of preset positions. To use patrolling, you must specify at least two preset positions for the relevant PTZ camera. To configure PTZ patrolling, select a patrolling profile in the **Patrolling profiles** list and specify relevant properties to define the exact behavior of the patrolling profile. When you have defined your patrolling profiles, remember to schedule the use of patrolling profiles. Note that if users manually operate PTZ cameras, this can override patrolling. You can specify a patrolling profile with only one preset if needed. Such a patrolling profile can be useful in two cases: **f**or moving a PTZ camera to a specific position at a specific time, and for moving a PTZ camera to a specific position upon manual control of the PTZ camera.

Patrolling profiles

A PTZ camera may patrol according to several different patrolling profiles. For example, a PTZ camera in a supermarket may patrol according to one patrolling profile during

opening hours, and according to another patrolling profile when the supermarket is closed. You can reuse the names of patrolling profiles defined for other cameras. This allows you to use a single patrolling profile name across several PTZ cameras, and can make scheduling of PTZ patrolling much easier. Even though several PTZ cameras share a patrolling profile name, the movement between preset positions is individual for each camera.

From the **Patrolling profiles** list, select which patrolling profile to configure:

Name	Description
Add New	Add a new patrolling profile to the list. When you add a new patrolling profile, you can either give it a unique name, or reuse an existing name from another PTZ camera with PTZ patrolling. Using several identically named patrolling profiles can be advantageous when you later configure scheduling. Example: If you have configured patrolling profiles identically named Night Patrolling on 25 different cameras, you can schedule the use of Night Patrolling on all 25 cameras in one go, even though Night Patrolling covers individual preset positions on each of the 25 cameras.
Delete	Delete an existing patrolling profile. Note that the selected patrolling profile is removed from the list without further warning.

Patrolling list

Having selected a patrolling profile in the **Patrolling profiles** list, you can specify which of the PTZ camera's preset positions to use with the selected patrolling scheme. Use the button to copy a selected preset positions to the **Patrolling list**. To change the sequence of preset positions in the **Preset Positions** list, select a preset position, and use the or buttons to move the selected preset position up or down in the list. The selected preset position is moved one step per click. If you later want to remove a preset position from the Patrolling list, select the preset position in question, and click the button.

Name	Description
Wait time (sec.)	Specify the number of seconds for which the PTZ camera should stay at each preset position before it moves on to the next preset position. The default is 10 seconds. The wait time applies to all presets in the patrolling profile. The PTZ camera stays at each preset position for the same number of seconds.
Transition time (sec.)	Specify the number of seconds needed for the PTZ camera to move from one preset position to another. The default is five seconds. During this transition time, motion detection is automatically disabled, as irrelevant motion is otherwise likely to be detected while the camera moves between the preset positions. After the specified number of seconds, motion detection is automatically enabled again. The transition time applies to all presets in the patrolling profile. It is important that the camera can switch between any of the patrolling profile's preset positions within the number of seconds you specify. If not, the system is likely to detect false motion. Note that it takes longer for the PTZ camera to move between positions that are located physically far apart (for example from an extreme left position to an extreme right position) than between positions that are located physically close together.

PTZ scanning

PTZ scanning (continuous panning) is supported on a few PTZ cameras only. You can enable PTZ scanning and select a PTZ scanning speed from the list below the check box. PTZ scanning only works for PTZ type 1 cameras (where preset positions are configured and stored on the server). If the camera is a PTZ type 2 camera, and you import preset positions which have previously been defined and stored on the PTZ camera itself through the camera's own configuration interface, PTZ scanning stops working.

Pause PTZ patrolling

PTZ patrolling pauses automatically when users operate the camera manually as well if your system is using **PTZ on Event**. If the system detects motion, it may also pause PTZ patrolling. Pause settings are tied to the selected patrolling profile. This allows you the flexibility of having different pause settings for different patrolling profiles on the same camera.

Pause patrolling if motion is detected

To pause PTZ patrolling when the system detects motion, so that the PTZ camera remains at the position where the system detected motion for a specified period of time, do the following:

1. Select the **Pause patrolling if motion is detected** check box.
2. Select whether the PTZ camera should resume patrolling:

- After a certain number of seconds has passed since first detection of motion, regardless whether further motion is detected or
- After a certain number of seconds has passed without further detection of motion

3. Specify the number of seconds for the selected option (default is ten and five seconds respectively).
4. Unless the transition time is set to zero, the system automatically disables motion detection while the camera moves between preset positions, as the system is likely to detect irrelevant motion otherwise while the camera moves between the preset positions.

Resume PTZ patrolling

The system automatically pauses PTZ patrolling when users operate the camera manually as well as if PTZ on Event is in use. You can specify how many seconds should pass before the system resumes regular patrolling after a manual or event-based interruption. The default is 30 seconds.

Apart from manual control, users of XProtect Smart Client can also stop a selected PTZ camera's patrolling entirely. For XProtect Smart Client users, the number of seconds specified in the **Patrolling settings** section therefore only applies when users manually control a PTZ camera and not when users stop a PTZ camera's patrolling entirely. When XProtect Smart Client users stop a PTZ camera's patrolling entirely, the camera's patrolling resumes only when the XProtect Smart Client user selects to resume it.

PTZ on event

PTZ-related properties are only available when you are dealing with a pan-tilt-zoom (PTZ) camera. When a PTZ camera supports preset positions (see "PTZ preset positions" on page 116), you can make the PTZ camera automatically go to a particular preset position when a particular event occurs. When associating events with preset positions on a PTZ camera, you can select between all events defined on your system. You are not limited to selecting events defined on a particular hardware device.

Component	Requirement
Event	Select the relevant event.
PTZ Preset Position	Select the relevant preset position. For this purpose, you can only use an event once per PTZ camera. However, use different events for making the PTZ camera go to the same preset position. Example: ○ Event 1 makes the PTZ camera go to preset position A ○ Event 2 makes the PTZ camera go to preset position B ○ Event 3 makes the PTZ camera go to preset position A

If later you want to end the association between a particular event and a particular preset position, clear the field containing the event. After you have made the PTZ setting changes, restart services (see "Start and stop services" on page 202).

Cameras that do not support multiple simultaneous video streams cannot connect to the surveillance server and the Management Application at the same time. Milestone recommends that you stop (see "Start and stop services" on page 202) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application.

Microphones

About microphones

In your system, **Microphones** are typically attached to hardware devices, and therefore physically located next to cameras. Operators, with the necessary rights, can then listen to recordings through the XProtect Smart Client (provided the computer running the XProtect Smart Client has speakers attached). You manage microphones on your system, meaning you can always manage the microphones attached to cameras, **not** microphones attached to XProtect Smart Client operators' computers.

If you have added more microphones to your system than you need, you can hide the ones you do not need by right-clicking the relevant microphone or speaker and select **Hide**. If you need the hidden microphone again, you can right-click the overall microphone icon and select **Show Hidden Items**.

Configure microphones or speakers

1. Expand **Advanced Configuration** > **Hardware Devices**, and expand the hardware device to which the relevant microphone or speaker is attached.
2. Right-click the relevant microphone or speaker, and select **Properties**.
3. Specify properties (see "Speaker properties" on page 69) as required.

Configuration of microphones and speakers in your system is very basic. You control volume settings and similar settings on the microphone or speaker units themselves.

Show or hide microphones or speakers

If you have added more microphones or speakers to your system than you need, you can hide the ones you do not need by right-clicking the relevant microphone or speaker and select **Hide**. If you need the hidden microphone/speaker again, you can right-click the overall microphone or speaker icon and select **Show Hidden Items**.

Microphone (properties)

When you configure video and recording (see "About video and recording configuration" on page 72) for specific cameras, you can determine when to record audio. Your choice applies for all cameras on your system.

Microphone properties

Enabled	Microphones are by default enabled, meaning that they can transfer audio to your system. If needed, you can disable an individual microphone, in which case no audio is transferred from the microphone to your system.
Name	The name as it appears in the Management Application as well as in clients. You can overwrite the existing name with a new one. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**

On some hardware devices, you can also enable/disable audio on the hardware device itself, typically through the hardware device's own configuration web page. If audio on a hardware device does not work after enabling it in the Management Application, you should verify if the problem exists because audio is disabled on the hardware device itself.

Recording settings

Name	Description
Always	Always record audio on all applicable cameras.
Follow video	Record audio only when video is recorded from a camera, which has a microphone attached.
Never	Never record audio on any cameras. Note that even though audio is never recorded, you can still listen to live audio in XProtect Smart Client.

Events and output

About input and output

Hardware input, such as door sensors, can be attached to input ports on hardware devices. Input from such external hardware input units can be used for generating events in your system.

Hardware output units can be attached to output ports on many hardware devices, allowing you to activate lights, sirens, and more from your system. Such hardware output can be activated automatically by events, or manually from clients.

Before you specify use of hardware input and hardware output units on a hardware device, verify the hardware device recognized the sensor operatione. Most hardware devices are capable of showing this in their configuration interfaces, or via CGI script commands. Also check the system's release notes to verify that the hardware device and firmware used supports input and output-controlled operations.

You do not have to configure hardware input units separately. Any hardware input units connected to hardware devices are automatically detected when you add the hardware devices to your system. The same goes for hardware output, but hardware output does require some simple configuration in your system.

If you want to configure hardware output and automatically trigger output when events occur, so that, for example, lights are switched on when a door is opened or when motion is detected in video, see Add a hardware output (on page 129) and Configure hardware output on event (on page 131).

About events and output

You can use events and output of various types to automatically trigger actions in your system. Examples of actions: starting or stopping recording on cameras, switching to a particular video frame rate, triggering notifications, making PTZ cameras move to specific preset positions. You can also use events for activating hardware output. You can also configure events and output to generate alarms.

Events can be divided in to:

- **Internal events (system-related):** for example, motion, server responding/not responding, archiving problems and lack of disk space.
- **External events (integrated):** for example, MIP plug-in events.

Overview of events and output

Types of events:

Name	Description
Analytics events:	You can use analytics events as alarms and integrate seamlessly with the Alarms feature. Analytics events are typically data received from external third-party video content analysis (VCA) providers. An example of a VCA-based system could be an access control system.
Hardware input events:	Hardware input, such as door sensors, can be attached to input ports on hardware devices. Input from such external hardware input units can be used for generating events in the system. Events based on input from hardware input units attached to hardware devices are called hardware input events. Some hardware devices have their own capabilities for detecting motion, for detecting moving and/or static objects and more (configured in the hardware devices' own software, typically by accessing a browser-based configuration interface on the hardware device's IP address.) When this is the case, your system considers such detections as input from the hardware, and you can use such detections as input events as well. Lastly, hardware input events can be based on the system detecting motion in video from a camera, based on motion detection settings in the system. This type of hardware input events is also called system motion detection events or VMD (Video Motion Detection) events. In earlier versions of the surveillance system, VMD events were an event type of their own. They are now considered a type of hardware input event.
Hardware output:	Hardware output units can be attached to output ports on many hardware devices, allowing you to activate lights, sirens, and more from the system. Such hardware output can be activated automatically by events, or manually from clients.

Name	Description
Manual events:	Events may be generated manually by the users selecting them in their clients. These events are called manual events. Manual events can be of the type **Global events** or **Timer events:** Global events apply to all hardware whereas timer events are separate events, triggered by the hardware input event, manual event or generic event under which they are defined. Timer events occur a specified number of seconds or minutes after the event, under which they are defined, has occurred. Timer events may be used for a wide variety of purposes, typically for stopping previously triggered actions. **Example:** A camera starts recording based on a hardware input event, for example when a door is opened. A timer event stops the recording after 15 seconds.
Generic events:	Input may also be received in the form of TCP or UDP data packages, which the system can analyse, and—if they match specified criteria—use to generate events. Such events are called generic events.
Output control on event:	Hardware output can be activated automatically when events occur. For example, when a door is opened (hardware input event), lights are switched on (hardware output). When you configure the output control, you can select between all output and events defined in the system. You are not limited to selecting output or events defined on particular hardware devices. You can use a single event for activating more than one output.

Before you configure events of any type, **configure general event handling**, such as which ports the system should use for event data. Normally, you can just use the default values, but it is a good idea to verify that your organization is not already using the ports for other purposes. See Configure general event handling (on page 131).

Before you specify use of hardware input and hardware output units on a hardware device, verify that sensor operation is recognized by the hardware device. Most hardware devices are capable of showing this in their configuration interfaces, or via CGI script commands. Also check the surveillance system's release notes to verify that input and output controlled operations are supported for the hardware device and firmware used. If you are using several servers in a master/slave setup, input and output on a specific hardware device should be defined on one of the servers only. Do not define the same input or output on the same hardware device on several servers.

Master/slave functionality is available in XProtect Enterprise and XProtect Professional only.

You do not have to configure hardware input units separately. Any hardware input units connected to hardware devices are automatically detected when you add the hardware devices to the system. The same goes for hardware output, but hardware output does require some simple configuration in the system.

If you want to **configure hardware output** and **automatically trigger output when events occur**, so that, for example, lights are switched on when a door is opened or when motion is detected in video, see Add a hardware output (on page 129) and Configure hardware output on event (on page 131).

When you are ready to **configure events**, see Add a hardware input event (on page 128), Add a generic event (on page 130), and Add a manual event (on page 129). If you want to use timer events with your other events, see Add a timer event (on page 130).

Add an analytics event

To add an analytics event, do the following:

1. Expand **Events and Output**, right-click **Analytics Events** and select **Create New**.
2. Specify required properties (see "Analytics event" on page 134). Click **OK**.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Add a hardware input event

With hardware input events, you can turn input received from input units attached to hardware devices into events in your system.

Before you specify input for a hardware device, verify the hardware device recognizes sensor operation. Most hardware devices can show this in their configuration interfaces, or via CGI script commands. Also check the release notes to verify that input-controlled operation is supported for the hardware device and firmware used.

To add and/or configure a hardware input event, do the following:

1. Expand **Advanced Configuration** > **Events and Output**. Right-click **Hardware Input Events** > **Enable New Input Event**.
2. In the **Hardware Input Event Properties** window's list of hardware devices, expand the relevant hardware device to see a list of pre-defined hardware input.
3. Select the required types of input to use them as events. The types of input often vary from camera to camera. If motion detection (see "Motion detection & exclude regions" on page 111) is enabled in the system for the relevant camera, note the input type **System Motion Detection**, which lets you turn detected motion in the camera's video stream into an event.

   Note that some types of input are mutually exclusive. When you select one type of input, you may therefore note that other types of input become unavailable for selection.

4. For each selected type of input, select required properties (see "Hardware input event" on page 137). When ready, click **OK**, or click the **Add button** to add a timer event (on page 130) to the event you have just created.
5. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Add a hardware output

With hardware output, you can add external output units, such as lights, sirens and door openers, to your system. Once added, output can be activated automatically by events or detected motion, or manually by client users.

Before you specify output, verify that sensor operation is recognized by the hardware device with which you are going to use the output. Most hardware devices are capable of showing this in their configuration interfaces, or via CGI script commands. Also check the release notes to verify that output-controlled operation is supported for the hardware device and firmware used.

To add a hardware output event, do the following:

1. Expand **Advanced Configuration** > **Events and Output**. Right-click **Hardware Output** > **Add New Output**.
2. In the **Hardware Output Properties** window's list of hardware devices, select the relevant hardware device, and click the **Add** button below the list.
3. Specify required properties (see "Hardware input event" on page 137).
4. Click **OK**.
5. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

For information about how to configure automatic activation of hardware output when events occur, see Configure hardware output on event (on page 131). You configure output for manual activation in clients as well as for automatic activation on detected motion individually for each camera (see "Output" on page 111).

Add a manual event

With manual events, your users with required rights (see "Configure user and group rights" on page 195) can trigger events manually from their clients. Manual events can be global (shared by all cameras) or tied to a particular camera (only available when the camera is selected). You can use manual events for a wide variety of purposes, for example:

- As start and stop events for use when scheduling cameras' online periods (see "Online period" on page 156). For example, you can make a camera start or stop transferring video to the surveillance system based on a manual event.
- As start and stop events for controlling other camera settings. For example, you can make a camera use a higher frame rate based on a manual event or you can use a manual event for triggering PTZ on event (on page 121).

- For triggering output. Particular output can be associated (see "Configure hardware output on event" on page 131) with manual events.
- For triggering event-based notifications (see "About notifications" on page 168).
- In combinations. For example, a manual event could make a camera start transferring video to the surveillance system while an output is triggered and an e-mail notification is sent to relevant people.

To add a manual event, do the following:

1. Expand **Advanced Configuration** > **Events and Output**. Right-click **Manual Events** > **Add New Manual Event**
2. In the list in the left side of the Manual Event Properties, select global or a camera as required.
3. Click the **add** button and specify required properties (see "Hardware input event" on page 137). When ready, click **OK**, or click the **Add** button again to add a timer event (on page 130) to the event you have just created.
4. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Add a generic event

Your system can analyze received TCP and/or UDP data packages, and automatically trigger events when specified criteria are met. This way, you can easily integrate your surveillance system with a very wide range of external sources, for example access control systems and alarm systems and more. Events based on the analysis of received TCP and/or UDP packets are called generic events.

1. Expand **Advanced Configuration**, then expand **Events and Output**. Right-click **Generic Events** > **Add New Generic Event**.
2. In the **Generic Event Properties** window, click the **Add** button, and specify relevant properties. When ready, click **OK**, or click the **Add** button to add a timer event to the event you have just created.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Add a timer event

Timer events are separate events, triggered by the type of event under which they are defined. Timer events occur a specified number of seconds or minutes after the event under which they are defined has occurred. Timer events may be used for a wide variety of purposes, typically for stopping previously triggered actions. Examples:

- A camera starts recording based on a hardware input event, for example when a door is opened. A timer event stops the recording after 15 seconds

- Lights are switched on and a camera starts recording based on a manual event. A timer event stops the recording after one minute, and another timer event switches the lights off after two minutes

To add a timer event, select any event you have previously configured, click the Add button, and specify required properties (see "Timer event" on page 141). Your system comes with two simple schedule profiles, Always on and Always off, which you cannot edit or delete. If these do not meet your needs, you can create any number of customized schedule profiles for each camera. You can reuse a customized schedule profile for more than one purpose if you want to. Save your configuration changes by clicking Save in the yellow notification bar in the upper-right corner of the Management Application.

Tip: You can add as many timer events as required under an event. This way, you can, for example, make one timer event trigger something 10 seconds after the main event, another timer event trigger something else 30 seconds after the main event, and a third timer event trigger something else 2 minutes after the main event.

Configure hardware output on event

Once you have added hardware output (see "Add a hardware output" on page 129), such as lights, sirens, door openers and more, you can associate the hardware output with events. This way, particular hardware output can be activated automatically when events occur. Example: When a door is opened (hardware input event), lights are switched on (hardware output).

When making the associations, you can select between **all** output and events defined on your surveillance system server. You are not limited to selecting output or events defined on particular hardware devices.

1. Expand **Advanced Configuration**, then expand **Events and Output**. Right-click **Output Control on Event** and select **Properties**.

2. Fill in the relevant properties (see "Output control on event (Events and Output-specific properties)" on page 145). Click **OK**.

3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

You can use a single event for activating more than one output. You cannot delete associations, but you can change your selections or select **None** in both columns as required.

Note: If you have not yet defined any suitable event or output, you can quickly do it: Use the **Configure events** list and/or **Configure Output...** button, located below the list of associations.

Configure general event handling

Before configuring events of any type, configure general event handling, such as which ports your system should use for event data. Normally, you can just use the default values, but it is a good idea to verify that your organization is not already using the ports for other purposes.

1. Expand **Advanced Configuration**, right-click **Events and Output**, and select **Properties**.
2. Specify required properties (see "Ports and polling" on page 134). Your system comes with two simple schedule profiles, **Always on** and **Always off**, which you cannot edit or delete. If these do not meet your needs, you can create any number of customized schedule profiles for each camera. You can reuse a customized schedule profile for more than one purpose if you want to.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Generate alarms based on analytics events

Generating alarms based on analytics events is normally a three-step process:

1. Enable the analytics events feature and set up its security. A list of allowed addresses can be used to control who can send event data to the system and on which port the server listens.
2. Create the analytics event, possibly with a description of the event, and test it.
3. Use the analytics event as the source of an alarm definition (see "Alarms definition" on page 257).

As indicated, to use VCA-based events (see "VCA" on page 301), most often a third-party VCA tool is required for supplying data to your system. Which VCA tool to use is entirely up to you, as long as the data supplied by the tool adheres to the applied formatting rules described in the Milestone Analytics Events Developers Manual. Contact Milestone for more details.

Test a generic event

If you have added a generic event, a quick and easy way to test your generic event is to first set up an event notification and then use **Telnet** to send a small amount of data which triggers the generic event and in turn the event notification.

For this example, we have created a generic event called **Video**. Our generic event specifies that if the term **video** appears in a received TCP data package, this should trigger the generic event. Your generic event may be different, but you can still use the principles outlined in the following:

1. Expand **Advanced Configurations**, then expand **Cameras and Storage Information**, right-click a camera to which you have access in XProtect Smart Client, and select **Properties**.
2. Select **Event Notification** and select the required generic event. Make sure that your generic event is the **only** event appearing in the **Selected Events** list while you are performing the test, otherwise you cannot be sure that it is your generic event which triggers the event notification. Once you are done testing, you can move any temporarily removed events back to the **Selected Events** list.

3. Save your configuration changes by clicking the **Save Configuration** button in the Management Application toolbar.
4. Make sure the Recording Server service is running. Also make sure that the camera for which you just configured the event notification is displayed and that you have camera title bars enabled in XProtect Smart Client, so you can see the yellow event indicator.
5. In Windows' **Start** menu, select **Run...**, and type the following in the **Open** field:
   - If you are performing the test on the system server itself: `telnet localhost 1234`
   - If you are performing the test from a remote computer: Substitute **localhost** with the IP address of your system's server. Example: If the IP address of the surveillance system server is 123.123.123.123, type: `telnet 123.123.123.123 1234`

   This opens a **Telnet** window.

   In the above examples, the number **1234** indicates the port on which the system server listens for generic events. Port 1234 is the default port for this purpose, but you can change this by specifying another port number as part of the general event handling configuration (see "Configure general event handling" on page 131). If you have changed the alert and generic event port number on your system, type your system's alert and generic event port number instead of **1234**.
6. In the **Telnet** window, type the terms (**event substring**) required to trigger your generic event. In our case, a single term, **video**, is required:

   While you type in the Telnet window, you may experience an echo. This is the server repeating some or all of the characters it receives. It does not have any impact as long as you are sure you type the relevant characters.
7. Close the **Telnet** window. You must close the window, since your input is not sent to the surveillance system until you close the window.
8. Go to XProtect Smart Client. If the yellow event indicator lights up for the relevant camera, your generic event works as intended.

Important: You can enter up to 128 characters for your generic event. The system disregards any extra characters you may enter once you have passed 128 characters.

General event properties

Ports and polling

The **General Event Properties** window lets you specify network settings to be used in connection with event handling.

Name	Description
Alert and generic event port	Specify port number to use for handling events. Default port is port 1234.
SMTP event port	Specify the port number to use for sending event information from hardware devices to the system via SMTP. The default port is port 25.
FTP event port	Port to use for FTP communication with the hardware device. Default port is port 21.
Polling interval [1/10] second	For a small number of hardware devices, primarily dedicated input/output devices (see "About dedicated input/output devices" on page 65), the system must regularly check the state of the hardware devices' input ports in order to detect input. Such state checking at regular intervals is called polling. You can specify (in tenths of a second) the interval between state checks. Default value is 10 tenths of a second (that is one second). For dedicated input/output devices, it is highly recommended that the polling frequency is set to the lowest possible value (one tenth of a second between state checks). For information about which hardware devices require polling, see the release note.

Events and output properties

Analytics event

When you configure analytics events (see "Add an analytics event" on page 128), specify the following:

Name	Description
Name	Type a name for the event.
Description	Enter a description (optional).
Test Event	Test the validity of the event by clicking this button (optional). **Tip:** You can carry out this test at any step of the analytics event creation/editing process and as many times as you wish.

When you click **Test Event**, a window opens which goes through a number of conditions that must be met for analytics events to work. The window consists of two tabs: **Tasks** and **Errors**.

The **Tasks** tab lists the conditions that are tested and mark them failed: ✗ or success: ✓. The **Errors** tab shows a list of errors corresponding to any failed conditions.

Remember to save any changes made during the test.

When done, check the presence of your test event in the XProtect Smart Client **Alarm list**. Sort by type **Test Alarm** to make your test event appear at the top of the **Alarm list**. See the XProtect Smart Client documentation for more details.

Conditions	Description	Error messages and solutions
Changes saved	If the event is new, is it saved? Or if there are changes to the event name, are these changes saved?	**Save changes before testing analytics event.** Solution/Explanation: Save changes.
Analytics Events enabled	Is the Analytics Event feature enabled?	**Analytics events have not been enabled.** Solution/Explanation: Enable the Analytics Events feature.
Address allowed	Is the IP address/host name of the machine sending the event(s) allowed (listed on the analytics events address list)?	**The local host name must be added as allowed address for the Analytics Event service.** Solution/Explanation: Add your machine to the analytics events address list (of allowed IP addresses/host names). **Error resolving the local host name.** Solution/Explanation: The IP address/host name of the machine cannot be found or is invalid.
Analytics event used in alarm definition	Is the analytics event used actively in any alarm definitions?	**Analytics event is not used in any alarm definition.** Solution/Explanation: Use the analytics event in an alarm definition.
Send analytics event	Did sending a test event to the Event Server succeed?	See table below.

Error messages and solutions for the condition **Send analytics event**:

Error messages	Solution/Explanation
Event Server not found.	Unable to find the Event Server service on the list of registered services.
Error connecting to Event Server.	Unable to connect to the Event Server service on the defined port (most likely due to network problems, the Event Server service being stopped or similar).
Error sending analytics event.	Connection to the Event Server service established but event cannot be sent (most likely due to network problems, for example time out).
Error receiving response from Event Server.	Event sent to Event Server but no reply received (most likely due to network problems or port being busy (see the Event Server log, typically located at ProgramData\Milestone\XProtect Event Server\logs\—can be opened in Microsoft Notepad or similar tool)).
Analytics event unknown by Event Server.	The Event Server service does not know the event most likely due to the event, or changes to the event, not having been saved.
Invalid analytics event received by Event Server.	Event format is somehow incorrect.
Sender unauthorized by Event Server.	Most likely your machine is not on the list of allowed IP addresses/host names.
Internal error in Event Server.	An Event Server error. Open the Event Server log in Microsoft Notepad or similar tool. The log is typically located at ProgramData\Milestone\XProtect Event Server\logs\
Invalid response received from Event Server.	Response is invalid. Possibly due to port being busy or network problems. Open the Event Server log in Microsoft Notepad or similar tool. The log is typically located at ProgramData\Milestone\XProtect Event Server\logs\
Unknown response from Event Server.	Response is valid but not understood. Possibly due to port being busy or network problems. Open the Event Server log in Microsoft Notepad or similar tool. The log is typically located at ProgramData\Milestone\XProtect Event Server\logs\
Unexpected error.	Please contact your system provider Milestone Support (support@milestonesys.com) for help.

Hardware input event

When you add hardware input events (see "Add a hardware input event" on page 128), some properties depend on the selected type of input:

Properties available in all XProtect software versions:

Name	Description
Enable	Select the check box to use selected type of input as an event in the system, and specify further properties.
Event name	Specify a name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]** Some cameras only support event names of a certain length and/or with a certain structure. Refer to the camera's documentation for exact details.
Images from camera	Only relevant if you use pre- and post-alarm images in your system. This functionality is only available for selected cameras and enables the sending of images from immediately before an event took place from the camera to the surveillance system via email. Note pre- and post-alarm images are not the same as the pre- and post-recording feature (see "Recording" on page 105) particular to your system.
Number of pre-alarm images	Only relevant if using pre-alarm images, a feature available for selected cameras only. Specify required number of pre-alarm images. Allowed number may differ from camera to camera; allowed range is displayed to the right of the field.
Frames per second	Only relevant if using pre-alarm images, a feature available for selected cameras only. Specify required frame rate. Used in combination with the Number of pre-alarm images field, this field indirectly allows you to control how long before the event you want to receive pre-alarm images from.
Send e-mail if this event occurs	Only available if email notifications (see "Configure email notifications" on page 169) are enabled. Select if the system should automatically send an email when the event occurs. Recipients are defined as part of the email notification configuration. When using email notifications, remember the individual cameras' scheduling.
Attach image from camera	Only available if e-mail notification (see "Configure email notifications" on page 169) is enabled. Select to include an image, recorded at the time the event is triggered, in the e-mail notification, then select the relevant camera in the list next to the check box.
Delete	Delete a selected event.
Add	When a specific hardware input event is selected, clicking Add adds a timer event (see "Add a timer event" on page 130) to the selected hardware input event.

Properties available in XProtect Enterprise and XProtect Professional only:

Send SMS if this event occurs	Select if the system should automatically send an SMS when the event occurs. You define the recipients of the SMS notifications as part of the SMS notification configuration. When you use SMS notifications, remember that you may have set individual camera scheduling. The setting is only available if you have enabled SMS notifications.

Hardware output

When you add hardware output (see "Add a hardware output" on page 129), specify the following properties:

Name	Description
Output name	Specify a name. If you are going to make the hardware output available for manual activation in clients, this is the name that client users will see. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]** Some cameras only support event names of a certain length and/or with a certain structure. Refer to the camera's documentation for exact details.
Output connected to	Select which of the hardware device's output ports the output is connected to. Many hardware devices only have a single output port; in that case simply select **Output 1**.
Keep output for	Lets you specify the amount of time for which the output should be applied. Specify the required amount of time in either 1/10 seconds or seconds. Some hardware devices are only able to apply output for a relatively short time, for example for up to five seconds. Refer to the documentation for the hardware device in question for exact information.

To verify that your hardware output works, click the **Test Output** button.

Manual event

When you add manual events (see "Add a manual event" on page 129), specify the following properties:

Properties available in all XProtect software versions:

Name	Description
[List of defined global events and cameras]	Contains a Global node and a list of all defined cameras. You can configure as many manual events as required, no matter whether they are global or camera-specific. A + sign next to the Global node indicates that one or more global manual events have already been configured. A + sign next to a camera indicates that one or more manual events have already been configured for that camera.
Event name	Specify a name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]** Some cameras only support event names of a certain length and/or with a certain structure. Refer to the camera's documentation for exact details.
Send e-mail if this event occurs	Only available if email notifications (see "Configure email notifications" on page 169) are enabled. Select if the system should automatically send an email when the event occurs. Recipients are defined as part of the email notification configuration. When using email notifications, remember the individual cameras' scheduling.
Attach image from camera	Only available if e-mail notification (see "Configure email notifications" on page 169) is enabled. Select to include an image, recorded at the time the event is triggered, in the e-mail notification, then select the relevant camera in the list next to the check box.
Delete	Delete a selected event.
Add	Add a new event. When **Global** or a specific camera is selected, clicking **Add** adds a new manual event. When a specific manual event is selected, clicking **Add** adds a timer event (see "Add a timer event" on page 130) to the selected manual event.

Properties available in XProtect Enterprise and XProtect Professional only:

Send SMS if this event occurs	Select if the system should automatically send an SMS when the event occurs. You define the recipients of the SMS notifications as part of the SMS notification configuration. When you use SMS notifications, remember that you may have set individual camera scheduling. The setting is only available if you have enabled SMS notifications.

Timer event

When you add timer events (see "Add a timer event" on page 130), specify the following properties:

Name	Description
Timer event name	Specify a name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]** Some cameras only support event names of a certain length and/or with a certain structure. Refer to the camera's documentation for exact details.
Timer event occurs after	Specify the amount of time that should pass between the main event occurring and the timer event (in seconds or minutes).

Generic event

When you add generic events (see "Test a generic event" on page 132), specify the following properties:

Name	Description
Event name	Specify a name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]** Some cameras only support event names of a certain length and/or with a certain structure. Refer to the camera's documentation for exact details.
Event port	Read-only field displaying the port number on which your system listens for generic events (default is port 1234). You can change the port number as part of the general event handling configuration (see "Configure general event handling" on page 131).
Event substring	Specify the individual items for which your system should look out for when analyzing data packages. Specify one or more terms, then click the **Add** button to add the specified term(s) to the Event message expression field, the content of which is used for the actual analysis. Examples: • **Single term:** User001 (when added to the Event message expression field, the term appears as "User001") • **Several terms as one item:** User001 Door053 Sunday (when added to the Event message expression field, the terms appears as " User001 Door053 Sunday") When you add several terms as one item (appearing as, for example, " User001 Door053 Sunday" in the Event message expression field), everything between the quotation marks must appear together in the package, in the specified sequence, in order to match your criterion. If the terms must appear in the package, but not necessarily in any exact sequence, add the terms one by one (they appear as "User001" "Door053" "Sunday" in the **Event** message expression field). TCP and UDP packages used for generic events can contain special characters such as @, #, +, 藪~ and more within the text string to be analyzed.

Name	Description
Event message expression	Displays the string which will be used for the actual package analysis. The field is not directly editable. However, you can position the cursor inside the field in order to determine where a new item should be included when you click the Add button or one of the parenthesis or operator buttons described in the following. Likewise, you can position the cursor inside the field in order to determine where an item should be removed when clicking the Remove button: The item immediately to the left of the cursor will be removed when you click the Remove button. • **(:** Lets you add a start parenthesis character to the Event message expression field. Parentheses can be used to ensure that related terms are processed together as a logical unit; in other words, they can be used to force a certain processing order in the analysis. Example: If using ("User001" OR "Door053") AND "Sunday", the two terms inside the parenthesis will be processed first, then the result will be combined with the last part of the string. In other words, the system first looks for any packages containing either of the terms User001 or Door053, then it takes the results and run through them in order to see which packages also contain the term Sunday. • **):** Lets you add an end parenthesis character to the Event message expression field. • **AND:** Lets you add an AND operator to the Event message expression field. With an AND operator, you specify that the terms on both sides of the AND operator must be present. Example: If using User001 AND Door053 AND Sunday, the term User001 as well as the term Door053 as well as the term Sunday must be present in order for the criterion to be met. It is not enough for only one or two of the terms to be present. As a rule of thumb, the more terms you combine with AND, the fewer results you retrieve: • **OR:** Lets you add an OR operator to the Event message expression field. With an OR operator, you specify that either one or another term must be present. Example: If using User001 OR Door053 OR Sunday, the term User001 or the term Door053 or the term Sunday must be present in order for the criterion to be met. The criterion is satisfied even if only one of the terms is present. As a rule of thumb, the more terms you combine with OR, the more results you will retrieve: • **Remove:** Lets you remove the item immediately to the left of a cursor positioned in the Event message expression field. If you have not positioned the cursor in the Event message expression field, the last item in the field will be removed.

Name	Description
Event priority	The same data package may be analyzed for different events. The ability to assign a priority to each event lets you manage which event should be triggered if a received package matches the criteria for several events. The priority must be specified as a number between 0 (lowest priority) and 1000 (highest priority). When the system receives a TCP and/or UDP package, analysis of the packet starts with analysis for the event with the highest priority. This way, when a package matches the criteria for several events, only the event with the highest priority will be triggered. If a package matches the criteria for several events with an identical priority, for example two events with a priority of 999, all events with the priority in question are triggered.
Event protocol	Select which protocol the system should listen for in order to detect the event: • **Any:** Listen for, and analyze, packages using TCP as well as UDP protocol. • **TCP:** Listen for, and analyze, packages using TCP protocol only. • **UDP:** Listen for, and analyze, packages using UDP protocol only.
Event rule type	Select how particular your system should be when analyzing received data packages: • **Search:** In order for the event to occur, the received package must contain the message specified in the Event message expression field, but may also have more content. **Example**: If you have specified that the received package should contain the terms "User001" and "Door053", the event is triggered if the received package contains the terms "User001" and "Door053" and "Sunday" since your two required terms are contained in the received package. • **Match:** In order for the event to occur, the received package must contain exactly the message specified in the **Event** message expression field, and nothing else.
Send e-mail if this event occurs	Only available if email notifications (see "Configure email notifications" on page 169) are enabled. Select if the system should automatically send an email when the event occurs. Recipients are defined as part of the email notification configuration. When using email notifications, remember the individual cameras' scheduling.

Name	Description
Attach image from camera	Only available if e-mail notification (see "Configure email notifications" on page 169) is enabled. Select to include an image, recorded at the time the event is triggered, in the e-mail notification, then select the relevant camera in the list next to the check box.
Send SMS if this event occurs	Select if the system should automatically send an SMS when the event occurs. You define the recipients of the SMS notifications as part of the SMS notification configuration. When you use SMS notifications, remember that you may have set individual camera scheduling. The setting is only available if you have enabled SMS notifications.
Delete	Delete a selected event.
Add	Add a new event. When the **Generic Events** node is selected, clicking **Add** will add a new generic event. When a specific generic event is selected, clicking **Add** will add a timer event (on page 130) to the selected generic event.

Output control on event (Events and Output-specific properties)

When you add output controls on events (see "Configure hardware output on event" on page 131), specify the following properties:

Name	Description
Event	Select the required event.
Output	Select the required output event.

Scheduling and archiving

About scheduling

The scheduling feature lets you specify:

- When you want to archive
- That some cameras transfer video to your system at all times

- That some cameras transfer video only within specific periods of time or when specific events occur
- When you want to receive notifications from the system

You can set up general scheduling properties for all your cameras or individual properties per camera. You can set up when:

- One or more cameras should be online and transfer video to your system.
- One of more cameras should use speedup and use a higher than normal frame rate.
- You want to receive any notifications regarding one or more cameras.
- Archiving takes place.
- PTZ cameras should patrol, and according to which patrolling profile

About archiving

Archiving is an integrated and automated feature with which recordings are moved to free up space for new recordings. By default, recordings are stored in the database for each camera. The database for each camera can contain a maximum of 600,000 records or 40 GB. Your system automatically archives recordings if a camera's database becomes full. Consequently, having sufficient archiving space is important.

You do not have to do anything to enable archiving**.** Archiving runs in the background and is automatically enabled and carried out from the moment your system is installed. The most recent recordings are saved on a local storage in order to prevent network-related problems in the saving process.

The default settings for your system is to perform archiving once a day, or if your database becomes full. You can change the settings for when and how often archiving takes place in the Management Application. You can also schedule archiving up to 24 times a day, with a minimum of one hour between each one. This way, you can pro-actively archive recordings, so databases never become full. The more you expect to record, the more often you should archive.

You can also change the retention time, which is the total amount of time you want to keep recordings from a camera (recordings in the camera's database as well as any archived recordings) under the properties of the individual camera.

Your system automatically archives recordings if a camera's database becomes full. You only specify **one** time limit (the retention time) as part of the general **Recording and Archiving** paths properties. Note that retention time determines when archiving takes place. Retention time is the total amount of time for which you want to keep recordings from a camera (that is recordings in the camera's database as well as any archived recordings).

Backup of archives

Milestone does not recommend that you create backups based on the content of camera databases as it may cause sharing violations or other malfunctions. Instead, create backups based on the content of archives. If you have not specified separate archiving

locations for separate cameras, you could back up the default local archiving directory, **Archives**.

Important: When you schedule a backup, make sure the backup job does not overlap with any scheduled archiving times.

If archiving fails

Under rare circumstances, archiving may fail, for example due to network problems. However, this does not pose at threat in your system. The system creates a new database and continues archiving in this new database. You can work with and view both this new database and the old one like any other databases.

About archiving locations

The default archiving folder (see "Default File Paths" on page 282) (C:\MediaDatabase) is located on the system server. You can change the default archiving folder to any other location locally, or select a location on a network drive to use as the default archiving folder. In the archiving folder, separate subfolders for storing archives for each camera are automatically created. These subfolders are named after the MAC address of the hardware device to which the camera is connected.

Because you can keep archives spanning many days of recordings and archiving may take place several times per day, further subfolders, named with the archiving date and time, are also automatically created.

The subfolders are named according to the following structure:

```
...\Archives\CameraMACAddress_VideoEncoderChannel\DateAndTime
```

If the video encoder does not have several channels, the video encoder channel will always be _1 (example: 00408c51e181_1).

Example: an archiving at 23.15 on 31st December 2012 for a camera with the MAC address 00408c51e181 attached to channel 2 would be stored:

```
C:\MediaDatabase\Archives\00408c51e181_2\2012-12-31-23-15
```

About archiving to other locations

When you archive to other locations than the default archiving directory, your system first temporarily stores the archive in the local default archiving directory, then immediately moves the archive to the archiving location you have specified. Archiving directly to a network drive can mean that archiving time varies depending on the available bandwidth on the network. First storing the archive locally, then moving it speeds up the archiving procedure, and reduces delays in case of network problems.

If you archive to a network drive, the regular camera database can only be stored on a local drive attached directly to your system's server.

About dynamic archive paths

With dynamic archiving paths, you specify a number of different archiving paths, usually across several drives. Milestone recommends using dynamic paths (see "Configure

storage wizard" on page 48), which also is the default setting when you configure cameras through the Configure video & recording wizard.

If the path containing the camera's database is on one of the drives you have selected for dynamic archiving, your system always tries to archive to that drive first. If not, your system automatically archives to the archiving drive with the most available space at any time, provided a camera database is not using that drive.

The drive that has the most available space may change during the archiving process, and archiving may happen to several archiving drives during the same process. This does not have impact on how users find and view archived recordings.

Dynamic archiving paths are general for all your cameras. You cannot configure dynamic archiving paths for individual cameras.

When deciding which drives to use for dynamic archiving, consider the pros and cons in the following examples (in which we assume that the default archiving path is on drive C:—drive letters are examples only, different drive letters may of course be used in your organization):

- **Camera records to drive C: and archives to drive C:**

  If the path containing the camera's database is on one of the drives you have selected for dynamic archiving, your system tries to archive to that drive first. Archiving takes place quickly, but may also fill up the drive with data fairly quickly.

- **Camera records to drive C: and archives to drive D:**

  Recordings and archives are on separate drives. Archiving takes place less quickly. Your system will first temporarily store the archive in the local default archiving directory on C:, then immediately move the archive to the archiving location on D:. Therefore, you need sufficient space to accommodate the temporary archive on C:.

- **Camera 1 records to drive C: and archives to drive D: while Camera 2 records to drive D: and archives to drive C:**

  Avoid this. One camera's archiving may take up space required for another camera's recordings. In the above example, Camera 1's archiving to D: may result in no recording space for camera 2 on D:. The rule is: "Do not cross recording and archiving drives."•

If you use several surveillance servers in a master/slave setup, each surveillance server must archive to its own mapped location in order for archiving to work. If you attempt to archive to the same mapped location for all the servers, archiving fails.

Master/slave is only available in XProtect Enterprise or XProtect Professional

If you use several surveillance servers in a master/slave setup, each surveillance server must archive to its own mapped location in order for archiving to work. If you attempt to archive to the same mapped location for all the servers, archiving will fail.

About archiving audio

If you have enabled an audio source (for example, a microphone) on a hardware device, audio recordings are archived together with video recordings from the camera attached to the hardware device. If the hardware device is a video encoder with several channels,

audio is archived with the camera on channel 1. When you have enabled an audio source, the system records audio to the associated camera's database. This affects the database's capacity for storing video. You may, therefore, want to use scheduled archiving more frequently if you record audio and video than if you only record video.

Storage capacity required for archiving

The storage capacity required for archiving depends entirely on the amount of recordings you plan to keep, and on how long you want to keep them (retention time). Some organizations want to keep archived recordings from a large number of cameras for several months or years. Other organizations may only want to archive recordings from one or two cameras, and they may want to keep their archives for much shorter periods of time.

You should always first consider the storage capacity of the **local** drive containing the default archiving directory to which archived recordings are always moved, even though they may immediately after be moved to an archiving location on another drive. Basically, the capacity of the local drive should be at least twice the size required for storing the databases of all cameras.

When you archive, the system automatically checks that space required for the data to be archived plus 1 GB of free disk space per camera is available at the archiving location. If not, the archive location's oldest data from the relevant camera is deleted until there is sufficient free space for the new data to be archived.

When you estimate storage capacity required for archiving, consider your organization's needs, then plan for worst case rather than best case scenarios.

Tip: The Storage Calculator in the Support section of the Milestone website http://www.milestonesys.com can help you determine the storage capacity required for your surveillance system.

About archiving schedules

There are two ways in which to configure archiving schedules:

- While you configure your cameras through the Configure Video and Recording wizard (see "Configure storage wizard" on page 48), in which case you configure your archiving schedule on the wizard's **Drive selection** page.
- As part of the general Scheduling and Archiving properties: Expand **Advanced Configuration**, right-click **Scheduling and Archiving**, select **Properties**, select **Archiving** in the dialog, and specify relevant properties (see "Archiving" on page 155).

Automatic response if running out of disk space

If your system runs of disk space while archiving, you can set up an automatic response. Two scenarios can occur, depending on whether the camera database drive is different from, or identical to, the archiving drive:

Same drive: Automatic moving or deletion of archives if drive runs out of disk space

If your system server is running out of disk space, and the archiving drive is identical to the camera database drive, your system automatically does a number of attempts to free up space. Most of these attempts will result in the loss of your data from archives or databases.

- First, the system attempts to move archives. You can only move archives if you use dynamic archiving, with which you can archive to several different drives. This happens if:
  - there is less than 15% disk space left, and the available disk space goes below 40 GB plus 2 GB per camera

    - or -
  - the available disk space goes below 225 MB plus 30 MB per camera. Example: with ten cameras, the server would be running out of disk space if the remaining available disk space went below 525 MB (225 MB plus 30 MB for each of the ten cameras).

  The difference ensures that very large disks are not necessarily considered to be running out of disk space just because they have less than 15% disk space left.
- If the system cannot move archives, your system attempts to delete the oldest archives. This happens if:
  - there is less than 10% disk space left, and the available disk space goes below 30 GB plus 1.5 GB per camera

  - or -
  - the available disk space goes below 150 MB plus 20 MB per camera (example: with ten cameras, the server would be running out of disk space if the remaining available disk space went below 350 MB (150 MB plus 20 MB for each of the ten cameras))

  The difference ensures that very large disks not necessarily are considered to be running out of disk space just because they have less than 10% disk space left.
- If there are no archives to delete, your system attempts to resize camera databases by deleting their oldest recordings. This happens if:
  - there is less than 5% disk space left, and the available disk space goes below 20 GB plus 1 GB per camera

  - or -
  - the available disk space goes below 75 MB plus 10 MB per camera (example: with ten cameras, the server would be running out of disk space if the remaining available disk space went below 175 MB (75 MB plus 10 MB for each of the ten cameras))

  The difference ensures that very large disks will not necessarily be considered to be running out of disk space just because they have less than 5% disk space left.

When the system restarts your recording server after resizing the database, the original databases sizes are used, so you should make sure that the drive size problem is solved or, alternatively, adjust camera database sizes to reflect the altered drive size.

If the system performs the database resizing procedure, you are informed on-screen in XProtect Smart Client, in log files, and or in notifications (if set up).

Different drives: Automatic archiving if database drive runs out of disk space

In case the system server is running out of disk space, and the archiving drive is **different from** the camera database drive, and archiving has not taken place within the last hour, archiving automatically begins in an attempt to free up disk space. This will happen regardless of any archiving schedules. The server is considered to be running out of disk space if:

- there is less than 10% disk space left, and the available disk space goes below 30 GB plus 1.5 GB per camera
- the available disk space goes below 150 MB plus 20 MB per camera. Example: with ten cameras, the server would be running out of disk space if the remaining available disk space went below 350 MB (150 MB plus 20 MB for each of the ten cameras).

The difference ensures that very large disks are not necessarily considered to be running out of disk space just because they have less than 10% disk space left.

On the archiving drive, the system automatically checks that the space required for data from a camera to be archived plus 1 GB of free disk space per camera is available. If not, the archive drive's oldest data from the relevant camera is deleted until there is sufficient free space for the new data to be archived.

About viewing archived recordings

You can view archived recordings via XProtect Smart Client. You can, for example, use features such as exporting and browsing with archived recordings.

For archived recordings stored on a local or network drive, you can use XProtect Smart Client's playback features to find and view the relevant recordings, similar to recordings stored in a camera's regular database. You can also use exported archives, archives stored outside local or network drives, in XProtect Smart Client. For more information, see the XProtect Smart Client documentation on the Milestone website http://www.milestonesys.com/Support/Technical-Support/Self-Help/downloads/?type=13 for downloading manuals and guides.

Configure general scheduling and archiving

To configure general scheduling and archiving, do the following:

1. Expand **Advanced Configuration**, right-click **Scheduling and Archiving** > **Properties**.

2. Specify properties as required for Scheduling all cameras (on page 152), Scheduling options (on page 154), and Archiving (on page 155).
3. Your system comes with two simple schedule profiles, **Always on** and **Always off**, which you cannot edit or delete. If these do not meet your needs, you can create any number of customized schedule profiles for each camera. You can reuse a customized schedule profile for more than one purpose if you want to.
4. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

When archiving, disable any virus scanning (see "About virus scanning" on page 13) of camera databases and archiving locations.

General scheduling properties

Scheduling all cameras

When you configure general scheduling and archiving (see "Configure general scheduling and archiving" on page 151), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the properties in question are shared by all cameras rather than being specific to individual cameras.

Note that you can specify the properties for **Online Period**, **Speedup**, **Notifications (Email and SMS)**, and **PTZ Patrolling** individually for each camera.

Properties available for all XProtect software versions:

Name	Description
Template	The template can help you configure similar properties quickly. Say you have 20 cameras and you want to change the recording path, archiving path, and retention time for all of them. Instead of having to enter the same three pieces of information 20 times, you can simply enter them once in the template, and then apply the template to the 20 cameras with only two clicks.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to actually apply the template.
Camera	The name as it appears in the Management Application as well as in clients.
Online	Select the required profile (for example **Always on**) for the online schedule (see "Configure camera-specific schedules" on page 75) for the relevant camera(s). You specify a camera's online periods by creating schedule profiles based on: • Periods of time (example: Mondays from 08.30 until 17.45), shown in pink:  • Events within periods of time (example: from Event A occurs until Event B occurs Mondays from 08.30 until 17.45), shown in yellow:  The two options can be combined , but they cannot overlap in time.
E-mail	Select the required profile for the e-mail notification schedule for the camera(s) in question. You specify a camera's e-mail notification periods by creating schedule profiles based on periods of time (example: Mondays from 08.30 until 17.45), shown in blue: 
Select All	Click button to select all cameras in the **Apply Template** column.
Clear All	Click button to clear all selections in the **Apply Template** column.
Set selected template value on selected cameras	Apply only a selected value from the template to selected cameras.
New schedule profile	Create a new schedule profile of any type by clicking the **Create...** button.

Properties available in XProtect Enterprise and XProtect Professional only:

SMS	Select the required profile for the SMS notification schedule for the camera(s) in question. You specify a camera's SMS notification periods by creating schedule profiles based on periods of time (example: Mondays from 08.30 until 17.45), shown in green: 
PTZ Patrolling	Only available for PTZ (pan-tilt-zoom) cameras with patrolling, the continuous movement of a PTZ camera between a number of preset positions. Lets you select the required profile for the PTZ patrolling schedule (see "PTZ patrolling" on page 157) for the camera(s) in question. You specify a camera's patrolling schedule based on patrolling profiles within particular periods of time (example: Mondays from 08.30 until 17.45), shown in red: 

Scheduling options

When you configure general scheduling and archiving (see "Configure general scheduling and archiving" on page 151), you can specify certain properties for many cameras in one go. In the case of Scheduling Options, it is because the properties are shared by all cameras.

Name	Description
Start cameras on client requests	Cameras may be offline, for example because they have reached the end of an online recording schedule (see "Online period" on page 156), in which case client users will not be able to view live video from the cameras. However, if you select Start cameras on client requests, client users will be able to view live video from the camera outside online schedule—but without recording (technically: force the camera to be online outside its online schedule). You must select **Enable recording when started on client request** (see the following), if you want recording to take place.
Enable recording when started on client request	Enable recording on the camera when **Start cameras on client requests** (see the previous) is also selected. If a user does not have access to manual recording (see "Camera access" on page 198), selecting **Enable recording when started on client request**, will **not** enable the user to do manual recording.
Schedule profile for new cameras	Select which online schedule profile to use as default for cameras you subsequently add to your system. Note that your selection only applies for the online schedule, not for any other schedules. The default selection is **Always on**, meaning that new cameras will always be online, that is transferring video to the system server for live viewing and further processing.
Maximum delay between reconnect attempts	Control the aggressiveness of reconnection attempts. If your system loses the connection to a camera, it will by default attempt to re-establish the connection after ten seconds. In some environments, for example if using vehicle-mounted cameras through wireless connections, camera connections may frequently be lost, and you may want to change the aggressiveness of such reconnection attempts.

You can view live and even record video from a camera outside its online recording schedule. To do this, you select the **Start cameras on client requests** and, if needed, the **Enable recording when started on client request** options in the following when setting up your scheduling properties for the camera in question.

Archiving

Your system automatically archives (see "About archiving" on page 146) recordings if a camera's database becomes full (in earlier versions, this was an option configured individually for each camera).

Properties available in all XProtect software versions:

Name	Description
Archiving Times	Specify when you want your system to automatically move recordings to your archiving path(s). You can specify up to 24 archiving times per day, with minimum one hour between each one. Select the hour, minute and second values and click the **up** and **down** buttons to increase or decrease values, or simply overwrite the selected value, and then click **Add**. The more you expect to record, the more often you should archive.
Send email on archiving failure	Your system automatically sends an email to selected recipients if archiving fails if you enable this. You must also enable the email notification feature. Recipients are defined as part of the email notification properties (see "Email (Properties)" on page 169).
Properties available in XProtect Enterprise and XProtect Professional only:	
Send SMS on archiving failure	Select if the system should automatically send an SMS if archiving fails. You define the recipients of the SMS notifications as part of the SMS notification configuration. The setting is only available if you have enabled SMS notifications.
Properties available in XProtect Enterprise only:	
Archive on event	If selected, your system starts archiving when a certain event occurs. Select the event from the list.

Camera-specific scheduling properties

Online period

When you configure scheduling (see "Configure camera-specific schedules" on page 75) for specific cameras, your Online Period settings are probably the most important, since they determine when each camera should transfer video to the system.

Cameras added to the system are automatically online by default, and you only need to modify the online period settings if you want cameras to be online only at specific times or events. This default setting may be changed as part of the general scheduling options (see "Scheduling options" on page 154), in which case cameras added at a later time are not automatically online.

The fact that a camera transfers video to the system does not necessarily mean that video from the camera is recorded. Recording is configured separately, see Configure video and recording (see "About video and recording configuration" on page 72).

Name	Description
Online	Select the required profile (for example **Always on**) for the online schedule (see "Configure camera-specific schedules" on page 75) for the relevant camera(s). You specify a camera's online periods by creating schedule profiles based on: • Periods of time (example: Mondays from 08.30 until 17.45), shown in pink:  • Events within periods of time (example: from Event A occurs until Event B occurs Mondays from 08.30 until 17.45), shown in yellow:  The two options can be combined , but they cannot overlap in time.

If you want to view live video as well as record video from a camera outside its online recording schedule, select the Start cameras on client requests (see "Scheduling options" on page 154) and the Enable recording when started on client request (see "Scheduling options" on page 154) options to set up your scheduling properties for a relevant camera.

Speedup

Speedup may also take place based on events, but that is configured elsewhere. See Frame rate - MJPEG (General recording and storage properties) (see "Frame rate - MJPEG" on page 90) and Video (Camera-specific properties) (see "Video" on page 101).

Name	Description
Speedup	For specific MJPEG cameras, specify speedup periods. Before you can define this type of schedule, you must enable (see "Frame rate - MJPEG" on page 90) speedup. You specify a camera's speedup periods by creating schedule profiles based on periods of time (example: Mondays from 08.30 until 17.45), shown in olive green: 

PTZ patrolling

When you configure scheduling (see "Configure camera-specific schedules" on page 75) for PTZ (pan-tilt-zoom) cameras capable of patrolling (see "PTZ patrolling" on page 118), you can specify which patrolling profiles to use at specific times. Before you can define this type of schedule, you must configure patrolling for the relevant cameras.

Name	Description
PTZ Patrolling	Only available for PTZ (pan-tilt-zoom) cameras with patrolling, the continuous movement of a PTZ camera between a number of preset positions. Lets you select the required profile for the PTZ patrolling schedule (see "PTZ patrolling" on page 157) for the camera(s) in question. You specify a camera's patrolling schedule based on patrolling profiles within particular periods of time (example: Mondays from 08.30 until 17.45), shown in red: 

Use of one patrolling profile may be followed immediately by use of another (example: use the Daytime patrolling profile Mondays from 08.30 until 17.45, then the Evening patrolling profile Mondays from 17.45 until 23.00). Use of two patrolling profiles cannot overlap.

Unlike other types of scheduling, there are no ready-made Always on and Always off schedule profiles for PTZ patrolling. You can create any number of customized schedule profiles for each camera. When you create a customized schedule profile (see "Configure camera-specific schedules" on page 75) for one camera, you can reuse it with other cameras if required.

Matrix

About Matrix video-sharing

The Matrix feature allows distributed viewing of live video from any camera to any Matrix-recipient on a network operating with the system. A computer on you can view which Matrix-triggered video is called a Matrix-recipient. In order to become a Matrix recipient, you must have the XProtect Smart Client installed on the computer.

For more information about Matrix video sharing, refer to the XProtect Smart Client User's Manual, available from the Milestone website http://www.milestonesys.com, or the XProtect Smart Client's own built-in help system.

There are two ways in which Matrix-triggered video can appear on a Matrix-recipient:

- **Manual triggering**: Another user wants to share important video, and sends it from XProtect Smart Client or from a custom-made website to the relevant Matrix-recipient.
- **Automatic triggering**: Video is sent to the relevant Matrix-recipient automatically when a predefined event occurs, for example when a door sensor detects that a door is opened, or when the surveillance system detects motion in the video from a camera.

About Matrix-recipients

A computer on which Matrix-triggered video can be viewed is known as a Matrix-recipient. In order to become a Matrix-recipient, the computer must have the XProtect Smart Client installed.

There are two ways in which Matrix-triggered video can appear on a Matrix-recipient:

- **Manual triggering**: Another user wants to share important video, and sends it from an XProtect Smart Client—or from a custom-made web page—to the required Matrix-recipient.
- **Automatic triggering**: Video is sent to the relevant Matrix-recipient automatically when a predefined event occurs, for example when a door sensor detects that a door is opened, or when the surveillance system detects motion in the video from a camera.
- For more information about Matrix-recipients, refer to the XProtect Smart Client User's Manual, available from the Milestone website http://www.milestonesys.com, or the XProtect Smart Client's own built-in help system.

Configure Matrix

1. Expand **Advanced Configuration**, right-click **Matrix** and select **Properties**.
2. Enable the use of Matrix by selecting the **Enable Matrix** check box.
3. Specify required properties (see "Matrix recipients" on page 159), or, for automatically triggered video sharing, select **Matrix Event Control** and configure Matrix Event Control properties (see "Matrix event control" on page 161). When ready, click **OK.**
4. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Matrix properties

Matrix recipients

The **Matrix Recipients** tab is used to enable Matrix functionality and to define which computers to display Matrix-triggered live video. A computer on which Matrix-triggered video can be displayed is known as a Matrix-recipient. Being able to view Matrix-triggered video requires that you have installed XProtect Smart Client on the user's computer.

Name	Description
Enable Matrix	Select check box to enable Matrix functionality.
[List of Defined Matrix recipients]	Lists any already defined Matrix recipients, that is computers on which Matrix-triggered video can be displayed. To change the properties of an already defined Matrix recipient, select the required Matrix recipient, make the changes in the fields below the list, then click the Update button. To remove a Matrix recipient from the list, select the unwanted Matrix recipient, then click the **Delete** button.
Name	Name of the Matrix-recipient. Used when you add a new Matrix-recipient or edit the properties of an existing one. The name appears in various day-to-day usage situations. Therefore, is a good idea to use a descriptive and unambiguous name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Address	IP address of the Matrix recipient, used when adding a new Matrix recipient or editing the properties of an existing one.
Port	Specify the port number to be used when sending commands to the Matrix recipient. Used when adding a new Matrix recipient or editing the properties of an existing one. The Matrix recipient will listen for commands on this port. By default, port 12345 is used; you can of course specify another port number.
Password	Specify the password to be used when communicating with the Matrix recipient. Used when adding a new Matrix recipient or editing the properties of an existing one
Matrix-recipient is an XProtect Smart Client	Select if the relevant Matrix-recipient is XProtect Smart Client. If you use XProtect Smart Client, distribution of Matrix-triggered live video takes place slightly differently.
Clear	Removes any content in the **Name**, **Address**, and **Password** fields.
Update	Updates the properties of the selected Matrix recipient with the changes made during editing. Available only if you have edited the properties of an existing Matrix recipient.
Add	Adds the new Matrix-recipient to the list. Available only if you have added properties of a new Matrix-recipient in the **Name**, **Address**, **Port**, **Password**, and possibly XProtect Smart Client fields.

Matrix event control

The **Matrix Event Control** tab is used to configure the automatic sending of live video based on predefined events. You can define exactly which events and cameras to use on a per-Matrix recipient basis. The **Matrix Event Control** tab displays the list of Matrix recipients defined on the **Matrix Recipients** tab.

Right-clicking a Matrix recipient brings up a list of devices with belonging events. When you select an event, it will initially be highlighted by a red exclamation mark, indicating that there is additional configuration to be done. Right-clicking an event brings up a list of options for the selected event:

Component	Requirement
Delete [selected event]	Deletes selected event on the selected device.
Connect	Connects to the camera (actual camera is specified after selecting action to be taken).
Disconnect, then connect	Disconnect any existing connections, then connect again. With this option the live video will appear in the Matrix recipient on a first-in-first-out basis. Each time a new event occurs, video from the latest event is displayed prominently in a specific position on the Matrix recipient, while at the same time video from the older events is shifted to less prominent positions and eventually ”pushed out” of the Matrix recipient in order to make space for the latest event's video. With the **Connect** option, you may experience that if video triggered by one event on a camera is already shown on the Matrix recipient, videos triggered by another event on the same camera will not be displayed prominently as coming from the latest event – simply because the Matrix recipient is already showing video from the camera in a less prominent position. By selecting **Disconnect, then connect** you can avoid this issue, and ensure that video from the latest event is always displayed prominently.
Disconnect	Disconnects any existing connection. Use if a particular event should cause video to stop being displayed in the Matrix-recipient, even if they are not yet old enough to be “pushed out” of the Matrix-recipient.

If you selected **Connect**, another red exclamation mark will indicate that there is still some configuration to be done. Right-click an action to select which camera to apply the action on.



In this example, we have specified that when motion is detected on Camera b, the selected Matrix-recipient should connect to Camera b:



Logs

About logs

Your system can generate various logs that shows the activity on system functionality. The following log types are available in your system:

Name	Description
Management Application log files	Shows Management Application activity. The system creates a new log file for every day you use the Management Application. You cannot disable this type of logging. Management Application log files are named according to the structure AdminYYYYMMDD.log, for example Admin20091231.log.
Recording Server service log files	Shows Recording Server service activity. A new log file is created for each day this service is used. You cannot disable this type of logging. Recording Server service log files are named according to the structure RecordingServerYYYYMMDD.log, for example RecordingServer20091231.log.
Image Server service log files	Shows Image Server service activity. A new log file is created for each day the service is used. You cannot disable this type of logging. Image Server service log files are named according to the structure ISLog_YYYYMMDD.log, for example ISLog_20091231.log.
Image Import service log files	Shows Image Import service activity, when this service is used for fetching pre-alarm images, and storing the fetched images in camera databases. Pre-alarm images is a feature available for selected cameras only. It enables sending of images from immediately before an event took place from the camera to the surveillance system via e-mail. A new log file is created for each day the service is used. You cannot disable this type of logging. Image Import service log files are named according to the structure ImageImportLog_YYYMMDD.log, for example ImageImportLog20091231.log.
Event log files	Shows registered events' activity. A new log file is created for each day on which events occur. You cannot disable this type of logging. Event log files should be viewed using XProtect Smart Client (use the **Playback** tab's **Alerts** section).
Audit log files	Shows XProtect Smart Client user activity (if audit logging is enabled). A new log file is created for each day with audit logging enabled and client user activity. Audit log files are named according to the structure is_auditYYYMMDD.log, for example is_audit20091231.log. The _is prefix is due to the fact that the audit log files are generated by the Image Server service.

Log locations

All log files are by default placed in the appropriate **All Users** folder for the operating system you are using. By default, they are stored there for seven days. Note that you can change log file locations as well as the number of days to store the logs when you configure logging.

Log structures

Most log files generated by your system use a shared structure complying with the W3C Extended Log File Format. Each log file consists of a header and a number of log lines:

- The header outlines the information contained in the log lines.
- The log lines consist of two main parts: the log information itself as well as an encrypted part. The encrypted part makes it possible, through decryption and comparison, to assert that a log file has not been tampered with.

Log integrity checks

All log files, except Management Application log files, are subjected to an integrity check once every 24 hours. The integrity check is performed by your system's Log Check service. The result of the integrity check is automatically written to a file named according to the structure LogCheck_YYYYMMDD.log, for example LogCheck_20091231.log. Like the log files themselves, the log check files are by default placed in the appropriate **All Users** folder for the operating system you are using.

Any inconsistencies are reported in the form of error messages written in the log check file.

Possible error messages:

Name	Description
Log integrity information was not found. Log integrity can't be guaranteed.	The log file could not be checked for integrity.
Log information does not match integrity information. Log integrity can't be guaranteed.	The log file exists, but does not contain the expected information. Log integrity cannot be guaranteed.
[Log file name] not found	The log file was not present.
[Log file name] is empty	The log file was present, but empty.
Last line changed/removed in [log file name]	The last line of the log file did not match the validation criteria.
Encrypted data missing in [log file name] near line [#]	The encrypted part of the relevant log line was not present.
Inconsistency found in [log file name] near line [#]	The log line does not match the encrypted part.
Inconsistency found in [log file name] at beginning of log file	The log file header is not correct. This situation is most likely to occur if a user has attempted to delete the beginning of a log file.

Note: Other messages that are not error-related may also appear in the log check file.

Configure system, event and audit logging

Your system can generate various logs. To configure logging, do the following:

1. Expand **Advanced Configuration**, right-click **Logs** and select **Properties**.
2. Specify properties (see "Log properties" on page 166) for your system logs, including the event log and the audit log. Administrators can only disable/enable audit logging. All other logs are compulsory.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Log properties

Your system can generate various types of logs. When you configure logs, you can define the following:

General Logs

Management Application log, Recording Server service log, Image Server service log, and Image Import service log

Name	Description
Path	These log files are by default placed in the appropriate **All Users** folder for the operating system you are using. To specify another location for your log files, type the path to the required folder in the **Path** field, or click the browse button next to the field to browse to the required folder.
Days to log	A new log file is created each day the Management Application and/or the services are used. A log file older than the number of days specified in the field is automatically deleted. By default, the log file will be stored for seven days. To specify another number of days (max. 9999), simply overwrite the value in the field. The current day's activity is always logged, even with a value of 0 in the field. Therefore, if you specify 0, you will log current day's activity; if you specify 1, you will keep one day plus the current day's activity, and so on.

Event Log

Name	Description
Path	These log files are by default placed in the appropriate **All Users** folder for the operating system you are using. To specify another location for your log files, type the path to the required folder in the **Path** field, or click the browse button next to the field to browse to the required folder.
Days to log	A new log file is created for each day on which events occur. A log file older than the number of days specified in the field is automatically deleted. By default, the log file will be stored for seven days. To specify another number of days (max. 9999), simply overwrite the value in the field. The current day's activity is always logged, even with a value of 0 in the field. Therefore, if you specify 0, you will log current day's activity; if you specify 1, you will keep one day plus the current day's activity, and so on.

Audit Log

Name	Description
Enable audit logging	Audit logging is the only type of system logging which is not compulsory. Select/clear the check box to enable/disable audit logging.

Name	Description
Path	These log files are by default placed in the appropriate **All Users** folder for the operating system you are using. To specify another location for your log files, type the path to the required folder in the **Path** field, or click the browse button next to the field to browse to the required folder.
Days to log	A new log file is created for each day with audit logging enabled and client user activity. A log file older than the number of days specified in the field is automatically deleted. By default, the log file is stored for seven days. To specify another number of days (max. 9999), overwrite the value in the field. The current day's activity is always logged (provided audit logging is enabled and there is user activity). Therefore, if you specify 1, you keep one day plus the current day's activity. Note that if you specify 0 (zero), audit log files are kept indefinitely (disk space permitting).
Minimum logging interval	Minimum number of seconds between logged events. Specifying a high number of seconds between logged events may help reduce the size of the audit log. Default is 60 seconds.
In sequence timespan	The number of seconds to pass for viewed images to be considered to be within the same sequence. Specifying a high number of seconds may help limit the number of viewed sequences logged and reduce the size of the audit log. The default is ten seconds.

Notifications

About notifications

In case of problems with hardware, activation of motion detection on your camera or similar incidents, you can set up your system to send notifications through SMS and/or email.

Email

About email

With email notifications, you can instantly get notified when your surveillance system requires attention. Your system can automatically send e-mail notifications to one or more recipients when:

- Motion is detected
- Events occur. You can select individually for each event whether you want to receive an email notification or not.
- Archiving fails (if email notification has been selected as part of the archiving properties)

Configure email notifications

To set up email notifications, do the following:

1. Expand **Advanced Configuration**, expand **Notifications**, right-click **Email** and select **Properties**.
2. Enable the use of email by selecting the **Enable email** check box.
3. Specify required properties (see "Message Settings (email)" on page 169).
4. Choose a schedule profile to associate with your email notifications. Your system comes with two simple schedule profiles, **Always on** and **Always off**, which you cannot edit or delete. If these do not meet your needs, you can create any number of customized schedule profiles for each camera. You can reuse a customized schedule profile for more than one purpose if you want to.

Email (Properties)

Message Settings (email)

Specify the following message settings for email:

Name	Description
Enable	Select to enable the use of email notifications, allowing you to specify further properties.
Recipient(s)	Specify the email addresses to which the system should send email notifications. To specify more than one e-mail address, separate the e-mail addresses with semicolons (example: aa@aa.aa; bb@bb.bb; cc@cc.cc).
Subject text	Enter a subject text for email notifications.
Message text	Enter a message text for email notifications. Note that camera information as well as date and time information is automatically included in email notifications.
Variables	Click a link to include a variable to the notification. The options are: • Name of triggering event • Camera name • Trigger time (the time when the notification was registered) • Error text (for example, camera failure)
Ignore similar messages for:	Specify the number of seconds to ignore sending similar notifications. This function is to ensure that you do not receive too many notifications before you have solved the relevant problem.
Use schedule profile	Select the schedule profile you want to use. By default, you can choose between Always On, Always Off or choose Add new... to set up a custom schedule (see "Notification Scheduling properties" on page 175).

Attachment Settings (email)

Specify the following attachment settings:

Component	Requirement
Include images	Select the check box to include still images in email notifications. When selected, each email notification includes one or more attached still JPEG images. Attached images includes images of before the incident, after the incident and the actual incident, with the incident that triggered the notification in the middle. **Important:** If your device does not record any images while the sending of notifications are turned on, no images are included in the email notification you receive.
Number of images	The number of images you want to include in the email. You can include between 1 and 20 images.
Time between images (ms)	Minimum time (in milliseconds) to be between each image. You can set any time range between 0 and 300 seconds (5 minutes).
Embed images in email	Select the check box to embed images directly in the email.

Server Settings (email)

Specify the following server settings for email:

Component	Requirement
Sender e-mail address	Enter the email address you wish to use as the sender of the email notification.
Outgoing mail server address (SMTP)	Type the name of the SMTP (Simple Mail Transfer Protocol) server which you want to use to send the email notifications. Compared with other mail transfer methods, SMTP has the advantage that you avoid automatically triggered warnings from your email client. Such warnings may otherwise inform you that your email client is trying to automatically send email messages on your behalf. TLS (Transport Layer Security) and its predecessor, SSL (Secure Socket Layer), are supported.
Outgoing mail server port (SMTP)	Type the port for your mail server. The default port number is 25.
Server requires login	Select the check box if you must use a user name and password to use the SMTP server.
Security type	Choose the type of security you want to use.
User name	Only relevant when you have selected **Server requires login**. Specify the user name required for using the SMTP server.
Password	Only relevant if you have selected **Server requires login**. Specify the password required for using the SMTP server.
Max attachment size (MB)	Specify a maximum size of attached images.

SMS

About SMS

With SMS notifications, you can instantly get notified on your mobile device when your surveillance system requires attention. To use the SMS notification feature, you must connect a 3G/USB modem to the server on which you have installed your system.

Your system can automatically send SMS notifications when:

- Motion is detected
- Events occur. You can select individually for each event whether you want to receive an SMS notification or not.
- Archiving fails (if an SMS notification has been selected as part of the archiving properties).

Configure SMS notifications

To configure SMS notifications, do the following:

1. Expand **Advanced Configuration**, expand **Notifications**, right-click **SMS** and select **Properties**.
2. Enable the use of SMS by selecting the **Enable SMS** check box.
3. Specify required properties.
4. Choose a schedule profile to associate with your SMS notifications.

Note: Your system comes with two simple schedule profiles, **Always on** and **Always off**, which you cannot edit or delete. If these do not meet your needs, you can create any number of customized schedule profiles for each camera. You can reuse a customized schedule profile for more than one purpose if you want to.

SMS properties

Message Settings (SMS)

Specify the following message settings for SMS:

Component	Requirement
Enable SMS	Enables the use of SMS notifications, allowing you to specify further properties.
Recipient(s)	Indicate the telephone number of the recipient. To send SMS to more than one recipient, separate the phone numbers with a semicolon.
Message text	Specify required message text for the SMS notification. Message text must only contain the following characters: a-z, A-Z, 0-9 as well as commas (,) and full stops (.). Note that camera information, date and time information are all automatically included in SMS notifications.
Variables	Click a link to include a variable to the notification. The options are: • Name of triggering event • Camera name • Trigger time (the time when the notification was registered) • Error text (for example, camera failure)
Ignore similar messages for:	Specify the number of seconds to ignore sending similar notifications. This function is to ensure that you do not receive too many notifications before you have solved the relevant problem.
Use schedule profile	Select the schedule profile you want to use. By default, you can choose between Always On, Always Off or choose Add new... to set up a custom schedule (see "Notification Scheduling properties" on page 175).

Server Settings (SMS)

Specify the following server settings for SMS:

Component	Requirement
Serial port	Select the serial port to use for your USB/3G modem. The list from which you can choose ports shows open serial ports on the computer running your system.
Speed	The baud speed of your USB modem device. The default value is 9600 baud. Although you can set any custom value for the baud rate, Milestone does not recommend that you change the baud rate unless you are a highly advanced user.
SIM card PIN code	Specify PIN code for the SIM card inserted in the USB/3G modem.
SMS encoding	Different types of SMS encodings exist to accommodate various language needs in the world. Your system offers you the following options: • 7-bit • 8-bit (default) • 16-bit 7-bit encryption allows you to use up to 160 characters per SMS, however it also limits the type of characters you can use. 8-bit encryption is the standard form of encryption with more special characters allowed. It allows you to use up to 140 characters per SMS. 16-bit encryption is necessary for non-Latin alphabet languages. Characters from, for example, Arabic, Chinese, Korean, Japanese or Cyrillic alphabet languages require 16-bit SMS encoding. If you use any of these languages in your organization, you must set your system to use 16-bit encoding. 16-bit has a limit of 70 characters per SMS.

Scheduling

About scheduling of notifications

Scheduling of notifications allows you to set up schedule profiles which you can use with Email (see "Message Settings (email)" on page 169) and SMS (see "Message Settings (SMS)" on page 173) notifications.

Notification Scheduling properties

When you set up schedules to use with email or SMS notifications, specify the following:

Component	Requirement
Notification profile	Select the relevant profile (for example **Always on**) for your notification schedule profile. You specify a notification schedule profile by creating schedule profiles based on: • Periods of time (example: Mondays from 08.30 until 17.45), shown in blue: 

Central

About Central

Central Settings lets you specify the login settings required for an XProtect Central server to access the surveillance system in order to retrieve status information and alarms. If you are a user of the Milestone Integration Platform, this is also the dialog that lets you specify the login settings for the Milestone Integration Platform to access the surveillance system.

Enable XProtect Central

1. Expand **Advanced Configuration**, right-click Central and then select **Properties**.
2. Enable the use of Central connections by selecting the **Enable Milestone XProtect Central** check box.
3. Specify required properties.
4. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Central properties

Name	Description
Enable Milestone XProtect Central connections	Enables the use of Central connections, allowing you to specify further properties.
Login Name	Type the name used for the connection between the your system and Central servers or the Milestone Integration Platform. The name must match the name specified on the Central server or in the Milestone Integration Platform.
Password	Type the password used for the connection between system and Central servers or the Milestone Integration Platform. The password must match the password specified on the Central server or in the Milestone Integration Platform.
Port	Type the port number to which the XProtect Central server or the Milestone Integration Platform should connect when accessing the surveillance system server. The port number must match the port number specified on the XProtect Central server or in the Milestone Integration Platform. The default port is 1237.

Access control

About access control integration

The use of XProtect Access requires that you have purchased a base license that allows you to access this feature within your XProtect VMS system. You also need an access control door license for each door you want to control.

You can use XProtect Access with access control systems from vendors where a vendor-specific plug-in for XProtect Access exists.

The access control integration feature introduces new functionality that makes it simple to integrate customers' access control systems with XProtect. You get:

- A common operator user interface for multiple access control systems in XProtect Smart Client.
- Faster and more powerful integration of access control systems.
- More functionality for the operator (see below).

In XProtect Smart Client, the operator gets:

- Live monitoring of events at access points.
- Operator aided passage for access requests.
- Map integration.
- Alarm definitions for access control events.
- Investigation of events at access points.
- Centralized overview and control of door states.
- Cardholder information.

Apart from a base license and access control door licenses, you need a vendor-specific integration plug-in installed on the event server before you can start an integration.

The maximum number of doors that you can integrate with XProtect Professional VMS Products is 1000. If more doors are available in the configuration that you import from your access control system, the integration stops.

XProtect Access is supported by the following XProtect Professional VMS Products:

- XProtect Enterprise
- XProtect Professional
- XProtect Express

And the following Milestone Husky™ NVR Series:

- Milestone Husky M30
- Milestone Husky M50

XProtect Access licenses

XProtect Access requires the following access control-related licenses:

- A **base license** for XProtect Access that covers an unlimited number of Access servers.
- An **access control door license** per door you want to integrate and control in XProtect Access. **Two** access control door licenses are included with the XProtect Access base license. All door licenses are automatically installed when you install your XProtect Access product. However, the installed door licenses are by default disabled which means that you must enable the doors that you want to use. You can only enable as many doors as you have door licenses for.

Example: You have five access control door licenses and you have added 10 doors. Once you have added five doors, you cannot select any more. You must remove some of your doors before you can add another door.

To find information about the current status of your access control door licenses, expand the **Access Control** node.

To buy additional XProtect Access base licenses or door licenses, contact your vendor, or go to the Milestone website http://www.milestonesys.com.

Wizard for access control system integration

The **Access control system integration** wizard is for step-by-step configuration of the initial integration with an access control system. Use the wizard to get through the most basic configuration tasks. You can do more detailed configuration afterwards.

Before you start the access control integration wizard make sure you have the integration plug-in installed on the event server.

Some of the fields to fill out and their default values are inherited from the integration plug-in. Therefore the appearance of the wizard may differ depending on the access control system you integrate with.

To start the wizard, select **Access Control** in the node tree, right-click, and click **Create new**.

Create access control system integration

Enter the name and specify the connection details for the access control system you want to add. The parameters that you must specify depend on the type of system, but are typically the network address of the access control system server and an access control administrator user name and password.

The video management system uses the specified user name and password to log into the access control system for retrieving the full configuration.

The integration plug-in may also define secondary parameters which are not listed in the wizard, but you can change these in **General Settings** after setting up the integration. The default values for the parameters are supplied by the plug-in or the XProtect system.

Connecting to the access control system

When the plug-in has been successfully integrated, a summary of the retrieved access control system configuration appears. Review the list to ensure that all items have been integrated before you continue to the next step of the wizard.

Associated cameras

Map access points in the access control system with the cameras in the XProtect system, to show related video for events from the doors.

You can map several cameras to one access point. The XProtect Smart Client user is then able to view video from all the cameras when investigating events, for example.

The XProtect Smart Client user is also able to add one of the cameras when configuring **Access Monitor** view items.

Licensed doors are by default enabled. Clear the check box to disable a door and thereby free a access control door license.

Final summary

Your access control system integration has been successfully created in XProtect with default settings inherited from the integration plug-in. Client users must log into XProtect Smart Client to see and use the new access control system.

You can refine the configuration if needed.

Access control properties

General Settings tab (Access Control)

Name	Description
Enable	Systems are by default enabled, meaning that they are visible in XProtect Smart Client for users with sufficient rights and that the XProtect system receives access control events. You can disable a system, for example during maintenance, to avoid creating unnecessary alarms.
Name	The name of the access control integration as it appears in the management application and in the clients. You can overwrite the existing name with a new one.
Description	Provide a description of the access control integration. This is optional.
Integration plug-in	Shows the type of access control system selected during the initial integration.
Last configuration refresh	Shows the date and time of the last time the configuration was imported from the access control system.
Refresh configuration	Click the button when you need to reflect configuration changes made in the access control system in XProtect, for example if you have added or deleted a door. A summary of the configuration changes from the access control system appears. Review the list to ensure that your access control system is reflected correctly before you apply the new configuration.
Operator login required	Enable an additional login for the client users, if the access control system supports differentiated user rights. This option is only visible if the integration plug-in supports differentiated user rights.

The naming and content of the following fields are imported from the integration plug-in. Below are examples of some typical fields:

Name	Description
Address	Type the address of the server that hosts the integrated access control system.
Port	Specify the port number on the server to which the access control system is connected.
User name	Type the name of the user, as defined in the access control system, who should be administrator of the integrated system in XProtect.
Password	Specify the password for the user.

Doors and Associated Cameras tab (Access Control)

Provides mappings between door access points and cameras, microphones or speakers. You associate cameras as part of the integration wizard, but you can change the setup at any time. Mappings to microphones and speakers are implicit through the related microphone or speaker on the camera.

Name	Description
Doors	Lists the available door access points defined in the access control system, grouped by door. For an easier navigation to the relevant doors, you can filter on the doors in your access control system with the dropdown list box at the top. **Enabled**: Licensed doors are by default enabled. You can disable a door to free a license. **License**: Shows if a door is licensed or if the license has expired. The field is blank when the door is disabled. **Remove**: Click **Remove** to remove a camera from an access point. If you remove all cameras, the check box for associated cameras is automatically cleared.
Cameras	Lists the cameras configured in the XProtect system. Select a camera from the list, and drag and drop it at the relevant access point to associate the access point with the camera.

Access Control Events tab (Access Control)

Event categories allow you to group events. The configuration of event categories affects the behavior of access control in the XProtect system and allows you to, for example, define an alarm to trigger a single alarm on multiple event types.

Name	Description
Access Control Event	Lists the access control events imported from the access control system. The integration plug-in controls default enabling and disabling of events. You can disable or enable events any time after the integration. When an event is enabled, it is stored in the XProtect event database and is, for example, available for filtering in the XProtect Smart Client.
Source Type	Shows the access control unit that can trigger the access control event.
Event Category	Assign none, one or more event categories to the access control events. The system automatically maps relevant event categories to the events during integration. This enables a default setup in the XProtect system. You can change the mapping at any time. Built-in event categories are: ▸ Access denied ▸ Access granted ▸ Access request ▸ Alarm ▸ Error ▸ Warning Events and event categories defined by the integration plug-in also appear, but you can also define your own event categories, see **User-defined Categories**. **Important**: If you change the event categories in a Corporate system, ensure that the existing access control rules still work.
User-defined Categories	Allows you to create, modify or delete user-defined event categories. You can create event categories when the built-in categories do not meet your requirements, for example, in connection with defining triggering events for access control actions. The categories are global for all integration systems added to the XProtect system. They allow setting up cross-system handling, for example on alarm definitions. If you delete a user-defined event category, you receive a warning if it is used by any integration. If you delete it anyway, all configurations made with this category, for example access control actions, do not work anymore.

Access Control Actions tab (Access Control)

Actions specify the behavior of the access control system in XProtect Smart Client, based on the configuration of the triggering events.

You can specify one or more actions related to:

- An event category
- Events from the access control system
- Events from the XProtect system

Triggering events are from a specific access control unit or from a group of access control units.

Name	Description
Trigger Event	Select from the list an event category that should trigger an action. The list includes built-in, plug-in and user-defined event categories. Select **Access control event**, to create a trigger based on specific access control events instead of an event category. Select **External event**, to create a trigger based on an input event in the XProtect system. Specify the input source in the **Source** field for each trigger.
Source	Select the source which the action affects. The options depend on the setting of the **Trigger Event** field. For event categories and access control events, select: • All doors • Individual doors • Other... Click **Other** to select multiple doors, door access points or other units in the access control system. For external event: Select the source from a list of events and input devices in the XProtect system.
Time Profile	Select the time profile in which you want the action to be performed if triggered. Configure time profiles as part of **Advanced Configuration**.
Action	Select the type of action: • Display access request notification • Go to PTZ preset • Start recording • System action For each action, specify action details. To set up multiple actions, click **Add access control action**. You can do this, for example, if you want different actions triggered by the same event depending on weekend vs. office hours.
Add access control action	Click to add and define actions as required.

Action details	Configure the parameters for an action: Display access request notification: ▸ Specify which cameras, microphones or speakers the XProtect Smart Client user connects to via the notification user interface when a given event occurs. Also specify the sound to alert the user when the notification pops up. To enable more commands in the notification, see **Add Command**. Go to PTZ preset: ▸ Specify the camera and select from the pre-configured presets a pattern for the camera and the time of return to preset when a given event occurs. Start recording: ▸ Specify the cameras that should start recording and the duration when a given event occurs. System action: ▸ Specify an action predefined in the XProtect system.
Add command	Select which commands that should be available as buttons in the access request notification dialogs in the XProtect Smart Client. Related access request commands: ▸ Enables all commands related to access request operations available on the source unit. For example **Open door**. All related commands: ▸ Enables all commands on the source unit. Access control command: ▸ Enables a selected access control command. System command: ▸ Enables a command predefined in the XProtect system. To delete a command, click **X** on the right side.

Cardholders tab (Access Control)

Use the **Cardholders** tab to review information about cardholders in the access control system.

Name	Description
Search cardholder	Type the characters of a cardholder name and it appears in the list, if it exists.
Name	Lists the names of the cardholders retrieved from the access control system.
Type	Lists the type of cardholder, for example: ▸ Employee ▸ Guard ▸ Guest

If your access control system supports adding/deleting pictures in the XProtect system, you can add pictures to the cardholders. This is useful if your access control system does not include pictures of the cardholders.

Name	Description
Select picture	Specify the path to a file with a picture of the cardholder. This button is not visible if the access control system manages the pictures. Allowed file-formats are .bmp, .png, and .jpg. Pictures are resized to maximize the view. Milestone recommends that you use a quadratic picture.
Delete picture	Click to delete the picture. If the access control system had a picture, then this picture is shown after deletion.

Server access

About server access

You can configure clients' access to your system's server in two ways:

- **Wizard-driven:** Specify how clients access the server and which users can use clients through guided configuration. When you use the wizard, all users that you add have access to all cameras, including new cameras added at a later stage. If

this is not what you want, specify access settings, users and user rights separately.

- **Through advanced configuration:** This was known as Image Server administration in previous versions.

About registered services

Registered services displays the services installed and running on your system. It displays the following information about the individual services:

Name	Description
Enabled	Indicates if the relevant service is enabled.
Name	The name of the service.
Description	A description of the service.
Addresses	The inside and outside addresses used by the service.

You can change the inside and outside addresses for a service. To do this, click the **Edit** button and enter the relevant inside and/or outside addresses. Note that you cannot edit all services. You can delete a service registration from the system by clicking the **Delete** button. You are prompted for confirmation before the service is deleted.

Configure server access

1. Expand **Advanced Configuration**, right-click **Server Access** and select **Properties**.
2. Specify required properties for Server Access, Local IP Ranges, and Language Support and XML Encoding. Your system comes with two simple schedule profiles, **Always on** and **Always off**, which you cannot edit or delete. If these do not meet your needs, you can create any number of customized schedule profiles for each camera. You can reuse a customized schedule profile for more than one purpose if you want to.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

When you use this option, you configure client users separately from clients' access. See Add individual users, Add user groups, and Configure user and group rights.

Server access properties

Server access

When you configure server access (on page 189) (that is clients' access to the system server), specify the following:

Name	Description
Server name	Name of the surveillance system server as it appears in clients. Client users with rights to configure their clients see the name of the server when they create views in their clients.
Local port	Port number to use for communication between clients and the surveillance server. The default port number is 80; you can change the port number if port 80 is used for other purposes in your organization.
Enable Internet access	Select the check box if the server should be accessible from the internet through a router or firewall. If you select this option, also specify the public ("outside") IP address and port number in the following fields. When using public access, the router or firewall used must be configured so requests sent to the public IP address and port are forwarded to the local ("inside") IP address and port of the surveillance system server.
Internet address	Specify a public IP address or hostname for use when the system server should be available from the Internet.
Internet port	Specify a port number for use when the system should be available from the Internet. The default port number is 80. You can change the port number if needed.
Max. number of clients	You can limit the number of clients allowed to connect at the same time. Depending on your system configuration and the performance of the hardware and network used, limiting the number of simultaneously connected clients may help reduce server load. If more than the allowed number of simultaneously connected clients attempt to log in, only the allowed number of clients are allowed access. Any clients in excess of the allowed number receive an error message when attempting to log in. By default, a maximum of ten simultaneously connected clients are allowed. To specify a different maximum number, overwrite the value. To allow an unlimited number of simultaneously connected access clients, type **0** (zero) in the **Max. number of clients** field. A four-minute session timeout period applies for client sessions on the system. In many cases, client users may not notice this at all. Note that the session timeout period is very evident if you set the max. number of clients value to 1. When that is the case, and the single allowed client user logs out, four minutes must pass before you can log in again.

Local IP ranges

You can specify IP address ranges which your system should recognize as coming from a local network. This can be relevant if different subnets are used across your local network.

1. Click the **Add** button.
2. In the **Start Address** column, specify the first IP address in the range.
3. In the **End Address** column, specify the last IP address in the range.

   Repeat if you want to add other local IP address ranges.

Language support and XML encoding

You can select the language/character set that should be used by your system's server and clients.

Component	Requirement
Character encoding/Language	Select required language/character set. Example: If the surveillance server runs a Japanese version of Windows, select Japanese. Provided access clients also use a Japanese version of Windows, this will ensure that the correct language and character encoding is used in clients' communication with the server. If you are using a master/slave setup, remember to specify the same language/character set on all relevant servers. Only XProtect Enterprise and XProtect Professional support master/slave.

Master/Slave

About master and slave

The functionality is only available if you run XProtect Enterprise or XProtect Professional.

A master/slave setup allows you to combine several servers and extend the total number of cameras you can use beyond the maximum allowed number of cameras for a single server. A master/slave setup also allows remote users to transparently connect to more than one server at the same time. When remote users connect to the master server, they instantly get access to feeds from hardware devices on the slave servers as well.

You can designate an unlimited number of master and slave servers per software license file. XProtect Enterprise master servers can only use XProtect Enterprise slave servers

while XProtect Professional master servers can use both XProtect Enterprise and XProtect Professional slave servers.

You can have different product versions on the master and the slaves servers, but the master server must use the newest version of the software and the slave servers must not run versions that go more than two versions back compared to the product running on the master server.

You can verify the connection to your slaves by clicking **Update Status** and let the system report the number of connected slaves back to you.

Configure master and slave servers

1. Expand **Advanced Configuration**, right-click **Master/Slave** and select **Properties**.
2. Select the **Enable as master server** check box.
3. Click **Add** to add a slave server.
4. Specify slave server properties. When ready, click **OK.**

Master/slave properties

You can set the following properties for master servers and slave servers:

Master server properties

Properties available in XProtect Enterprise and XProtect Professional only:

Name	Description
Enable as master server	Select to enable as master server.
Timeout	Set timeout of slave update. See **Update Status on Slaves** further below.
Add	Lets you add slave servers. Select **Master Server** in the list and click the **Add** button.

Properties available in XProtect Enterprise only:

Pre version 8.0 slaves	Select this to enable support of slaves running XProtect Enterprise versions prior to version 8.0. Selecting Pre version 8.0 slaves disables the update slave status feature for all slaves, both pre 8.0 and beyond.

When you select **Master Server**, the **Delete** button is disabled and the **Add** button is enabled (provided you have selected **Enabled as master server**). This allows you to add slave servers to the master server, but prevents you from deleting the master server.

Slave server properties

Name	Description
Address	IP address of the slave server.
Port	Port number of the slave server.
Delete	Remove a slave server from the list of slave servers. Select the slave server in the list and click the **Delete** button.

If you want a slave server to become a master server, clear **Enable as master server** on the original master server and click **OK**. In the navigation pane, right-click the slave server which you want to become master server and select **Properties**. Then select **Enable as master server**. Next click **Add** to add slave servers to the new master server.

Update status on slaves

In the **Master Settings Summary** and **Slave Settings Summary** table area, you can verify/update added slaves by clicking **Update Status**. A status dialog runs and afterwards informs you of the status of your slave server(s).

If you select **Pre version 8.0 slaves**, you cannot update slave status on any slaves and **Update Status** is therefore disabled. In the **Slave Settings Summary** table, slave status on all slaves is **Not applicable**.
If you do **not** select **Pre version 8.0 slaves**, slave status for pre version 8.0 slaves is **Unreachable**. Slave status for 8.0 slaves and beyond reflects the actual status.

Users

About users

The term **users** primarily refers to users who connect to the surveillance system through their clients. You can configure such users in two ways:

- As **basic users**, authenticated by a user name/password combination.
- As **Windows users**, authenticated based on their Windows login

You can add both types of users through the Configure User Access wizard or individually (see Add basic users (on page 194) and Add Windows users (on page 194)).

By grouping users, you can specify rights for all users within a group in one go. If you have many users performing similar tasks, this can save you significant amounts of work. User groups are logical groups created and used for practical purposes in the Management Application only. They are not in any way connected with user groups from central directory services. If you want to use groups, make sure you add groups before you add users: you cannot add existing users to groups.

Finally, the Administrators group is also listed under Users. This is a default Windows user group for administration purpose which automatically has access to the Management Application.

Add basic users

When you add a basic user, you create a dedicated surveillance system user account with basic user name and password authentication for the individual user. Note that creating Windows users provides better security. If you want to include users in groups, make sure you add required groups before you add users. You cannot add existing users to groups.

You can add basic users in two ways: One is through the **Configure User Access** wizard. Alternatively, add basic users this way:

1. Expand **Advanced Configuration**, right-click **Users**, and select **Add New Basic User**.
2. Specify a user name. Specify a password, and repeat it to be sure you have specified it correctly. Click **OK**.
3. Specify General Access and Camera Access properties. These properties determine the rights of the user. Click **OK**.
4. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Add Windows users

When you add Windows users, you import users defined locally on the server (or from Active Directory®, supported in XProtect Enterprise 2013+ and XProtect Professional 2013+ only) and authenticate them based on their Windows login. This generally provides better security than the basic user concept, and it is the method Milestone recommends. If you want to include users in groups, make sure you add required groups before you add users. You cannot add existing users to groups.

Add Windows users in two ways: One is through the Manage user access wizard. Alternatively, add Windows users this way:

1. Expand **Advanced Configuration**, right-click **Users**, and select **Add New Windows User**. This opens the **Select Users or Groups** dialog.

   Note that you can only make selections from the local computer, even if you click the Locations... button.
2. In the **Enter the object names to select** box, type the relevant user name(s), then use the **Check Names** feature to verify it. If you type several user names, separate each name with a semicolon. Example: **Brian; Hannah; Karen; Wayne**
3. When done, click **OK**.
4. Specify General Access and Camera Access properties. These properties determine the rights of the user.

5. Click **OK**.
6. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

Users added from a **local database** logging in with a client should not specify any server name, PC name, or IP address as part of the user name. Example of a correctly specified user name: USER001. Example of an incorrectly specified user name: PC001/USER001. The user should still specify a password and any required server information.

Add user groups

User groups are logical groups created and used for practical purposes in the Management Application only. They are not in any way connected with user groups from central directory services such as, for example, Active Directory®.

By grouping users, you can specify rights (see "Configure user and group rights" on page 195) for all users within a group in one go. If you have many users performing similar tasks, this can save you significant amounts of work. Make sure you add groups before you add users: you cannot add existing users to groups.

1. Expand **Advanced Configuration**, right-click **Users**, and select **Add New User Group**.
2. Specify a name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
3. Click **OK**.
4. Specify General access (on page 196) and Camera access (on page 198) properties. These properties will determine the rights of the group's future members.
5. Click **OK**.
6. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.
7. Now you can add users to the group: in the navigation pane, right-click the group you just created, and Add basic users **(on page 194) or** Add Windows users (on page 194) as required.

Configure user and group rights

User/group rights are configured during the process of adding users/groups, see Add basic Users (on page 194), Add Windows users (on page 194) and Add user groups (on page 195). Note that you can also add basic and Windows users through the Manage user access wizard (on page 62). When you use the wizard, all users you add gain access to all cameras, including any cameras added at a later stage.

If you want to edit the rights of a user or group:

1. Expand **Advanced Configuration**, expand **Users**, right-click the required user or group, and select **Properties**.

2. Set the required user rights under the relevant tabs shown. The properties you set here determine the rights of the user/group. Click **OK**.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

User properties

User information

Name	Description
User name	Edit the user name. You can only edit this if the selected user is a Basic user. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**
Password	Only editable if the selected user is of the type basic user. Edit the password. Remember to repeat the password to be sure you have specified it correctly.
User type	Non-editable field, displaying whether the selected user is of the type basic user or Windows user group.

Group information

Name	Description
Group name	Edit the group name. Names must be unique, and must not contain any of these special characters: **< > & ' " \ / : * ? | [ ]**

General access

Specify the following settings for General access when you add or edit basic users (see "Add basic users" on page 194), Windows users (see "Add Windows users" on page 194) or groups (see "Add user groups" on page 195):

Client access settings

Name	Description
Live	Enables access to the **Live** tab in XProtect Smart Client.
Playback	Enables access to the **Playback** tab in XProtect Smart Client.
Setup	Enables access to setup mode in XProtect Smart Client.
Edit shared views	Enables the user to create and edit views in shared groups in XProtect Smart Client. Every user can access views placed in shared groups. If a user/group does not have this right, shared groups are protected, indicated by a padlock icon in XProtect Smart Client.
Edit private views	Enables the user to create and edit views in private groups in XProtect Smart Client. Views placed in private groups can only be accessed by the user who created them. If a user/group does not have this right, private groups will be protected, indicated by a padlock icon in XProtect Smart Client. Denying users the right to create their own views may make sense in some cases, for example, to limit bandwidth use. For more information about shared and private views, see the separate XProtect Smart Client documentation.

Clear the **Live**, **Playback** and **Setup** check boxes to disable the user/group's ability to use XProtect Smart Client. You can use this as a temporary alternative to deleting the user/group if a user/group is not going to use an account for a period of time.

Management Application access

Administrator Access	Enables the user to access and work with the Management Application. If you have more than one Administrator member, you can clear the check box to ensure that other administrators cannot access the Management Application.

Login authorization

This user/group requires authorization from another user to log in	Enables a restriction on the user/group which means that a second user must authorize the log in before the user/group can log in to XProtect Smart Client or the Management Application.
This user/group can authorize logins from other users	Enables the right for this user/group to authorize the log in for other users in XProtect Smart Client or the Management Application.

At least one person on the system must have a full administrator access with no authorization of log in. This is why the administrator should ensure that all proper user rights are given to other users of the system. If there are no users to authorize, the **This user/group requires authorization from another user to log in** checkbox is not available and you cannot change its settings.

If there is only one user on the system, the **This user/group can authorize logins from other users** check box is not available and you cannot change its settings.

Camera access

When you add or edit basic users (see "Add basic users" on page 194), Windows users (see "Add Windows users" on page 194) or groups (see "Add user groups" on page 195), you can specify camera access settings.

In the list of cameras, select the camera(s) you want to work with. Note the last item in the list, **Rights for new cameras when added to the system**, with which you can allow the user/group access to any future cameras.

Tip: If the same features should be available for access for several cameras, you can select multiple cameras by pressing SHIFT or CTRL on your keyboard while you select.

For the selected camera(s), in the **Access** check box, specify if the user/group should have access to live viewing and playback at all. If so, specify if they should have access to **both** live viewing and playback and—if this is the case—which sub-features should be available when you work with the selected camera(s). The sub-features are listed in two columns in the lower part of the window: the left column lists features related to live viewing, the right column lists features related to playback.

The **Camera access settings** check boxes work like a hierarchy of rights. If the **Access** check box is cleared, everything else is cleared and disabled. If the **Access** check box is selected, but, for example, the **Live** check box is cleared, everything under the **Live** check box is cleared and disabled.

Depending on the selected column, the following default features for live or playback from the selected camera(s) give you the ability to:

Properties available in all XProtect software versions:

Live	Features
PTZ	Use navigation features for PTZ (Pan-tilt-zoom) cameras. A user/group can only use this right if the user has access to one or more PTZ cameras.
PTZ preset positions	Use navigation features for moving a PTZ camera to particular preset positions. A user/group can only use this right if the user/group has access to one or more PTZ cameras with defined preset positions.
Manage PTZ presets	Manage PTZ positions in XProtect Smart Client.
Output	Activate output (lights, sirens, door openers, etc.) related to the selected camera(s).
Events	Use manually triggered events related to the selected camera(s). This feature is available in XProtect Smart Client only.
Incoming audio	Listen to incoming audio from microphones related to the selected camera(s). This feature is available in XProtect Smart Client only.
Manual recording	Manually start recording for a fixed time (defined (see "Manual recording" on page 90) by the surveillance system administrator).

Properties available in XProtect Enterprise and XProtect Professional only:

Outgoing audio	Talk to audiences through speakers related to the selected camera(s). This feature is available in XProtect Smart Client only.

Properties available in all XProtect software versions:

Playback	Features
AVI/JPEG export	Export evidence as movie clips in AVI format and as still images in JPEG format.
Database export	Export evidence in database format. This feature is available in XProtect Smart Client only.
Sequences	Use the **Sequences** feature when playing back video from the selected camera.
Smart search	Search for motion in one or more selected areas of images from the selected camera. This feature is available in XProtect Smart Client only.
Recorded audio	Listen to recorded audio from microphones related to the selected camera(s).

You cannot select a feature, if the selected camera does not support the relevant feature. For example, PTZ-related rights are only available if the relevant camera is a PTZ camera. Some features depend on the user's/group's General Access (on page 196) properties.

Square-filled check boxes can appear in the lower part of the window if you have selected several cameras and a feature applies for some but not all of the cameras. Example: For camera A, you have selected that use of the Events is allowed, for camera B, you have not allowed this. If you select both camera A and camera B in the list, the Events check box in the lower part of the window is square-filled. Another example: Camera C is a PTZ camera for which you have allowed the PTZ preset positions feature whereas camera D is not a PTZ camera. If you select both camera C and camera D in the list, the PTZ preset positions check box is square-filled.

Alarm management

When you add or edit basic users (see "Add basic users" on page 194), Windows users (see "Add Windows users" on page 194) or groups (see "Add user groups" on page 195), specify their XProtect Smart Client alarm management rights:

Name	Description
Manage	Allows users of XProtect Smart Client to: • Manage alarms (for example, change priorities of alarms and redelegate alarms to other users) • Acknowledge alarms—in the XProtect Smart Client's alarm list and maps. • Change state (for example from **New** to **Assigned**) of several alarms simultaneously (otherwise state must be changed on a per-alarm basis).
View	Allows users of XProtect Smart Client to: • View alarms • Print alarms reports.
Disable	Allows users of XProtect Smart Client to disable alarms.

Access control management

When you add or edit basic users (see "Add basic users" on page 194), Windows users (see "Add Windows users" on page 194) or groups (see "Add user groups" on page 195), specify access control settings:

Name	Description
Use Access Control	Allows the relevant user to use any access control-related features in XProtect Smart Client.

Services

About services

The following services are all automatically installed on the system server if you run a Typical installation. By default, services run transparently in the background on the system server. If you need to, you can start and stop services separately, see Start and stop services (on page 202).

Service	Description
Milestone Recording Server service	A vital part of the surveillance system. Video streams are only transferred to your system while the Recording Server service is running.
Milestone Image Server service	Provides access to the surveillance system for users who log in with XProtect Smart Client. **Note:** If the Image Server service is configured in Windows Services to log in with another account than the Local System account, for example as a domain user, installed instances of XProtect Smart Client on other computers than the surveillance server itself are not able to log in to the server using the server's host name. Instead, those users must enter the server's IP address.
Milestone Image Import service	Used for fetching pre- and post-alarm images, and storing the fetched images in camera databases. Pre- and post-alarm images is a feature available for selected cameras only that enables sending of images from immediately before and after an event took place from the camera to the surveillance system via e-mail. Pre- and post-alarm images should not be confused with the system's pre- and post-recording feature (see "Recording" on page 105).
Milestone Log Check service	Performs integrity checks on your system's log files. For more information, see Overview of Logs.
Milestone Event Server service	Manages all alarms and map-related communication. It stores events, image files and map configurations, and makes status information about the surveillance system available.
Milestone Mobile service	Manages the communication between the Recording Server and mobile devices (such as smartphones and tablets) and between the Recording Server and web browsers.

If you run a **Custom** installation, you can choose not to install the Mobile server and/or the Event Server. If you do so, the Mobile service and/or the Event Server service will not be seen in your Services overview.

Start and stop services

On an system server, several services by default run in the background. If you need to, you can start and stop each service separately:

1. Expand **Advanced Configuration** and select **Services**. This displays the status of each service.
2. You can now stop each service by clicking the **Stop** button. When a service is stopped, the button changes to **Start**, allowing you to start the service again when required.

Servers

LPR servers

LPR system overview

About XProtect LPR

XProtect LPR offers video-based content analysis (VCA) and recognition of vehicle license plates that interacts with your surveillance system and your XProtect Smart Client.

To read the characters on a plate, XProtect LPR uses optical character recognition on images aided by specialized camera settings.

You can combine LPR (license plate recognition) with other surveillance features such as recording and event-based activation of outputs.

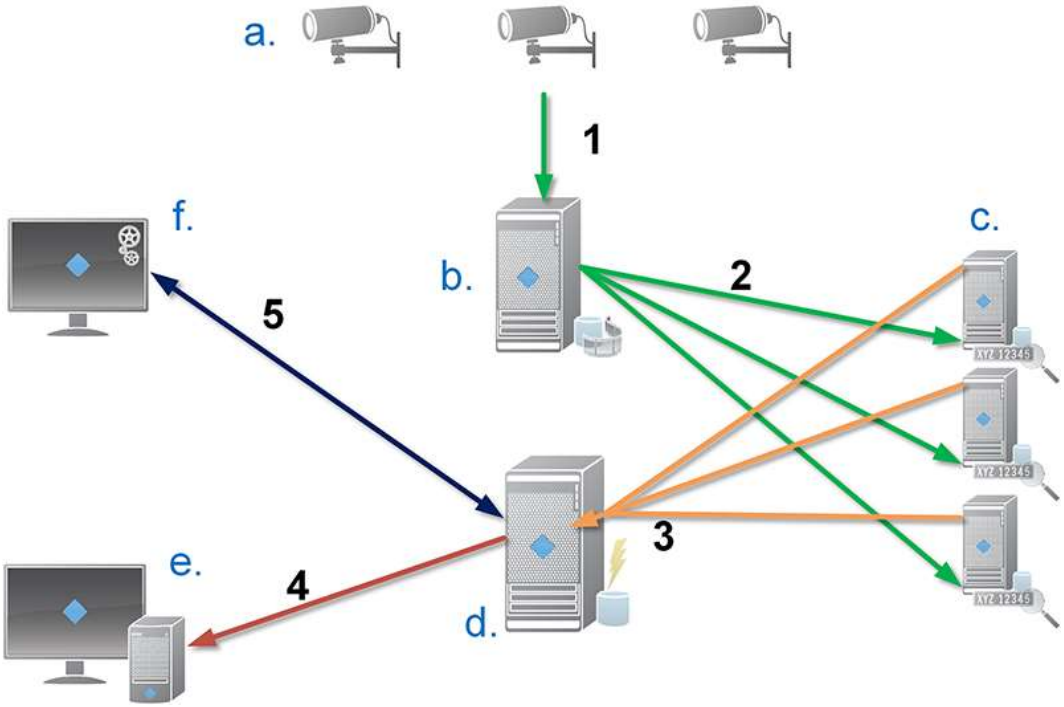
Examples of events in XProtect LPR:

- Trigger surveillance system recordings in a particular quality.
- Activate alarms.
- Match against positive/negative license plate match lists.
- Open gates.
- Switch on lights.
- Push video of incidents to computer screens of particular security staff members.
- Send mobile phone text messages.

With an event, you can activate alarms in XProtect Smart Client.

LPR system architecture

Basic data flow:



1. LPR cameras (a) send video to the recording server (b).
2. The recording server sends video to the LPR servers (c) to recognize license plates by comparing them with the license plate characteristics in the installed country modules.
3. LPR servers send recognitions to the event server (d) to match with the license plate match lists.
4. The event server sends events and alarms to XProtect Smart Client (e) when there is a match.
5. The system administrator manages the entire LPR configuration, for example, setting up events, alarms, and lists from the Management Application (f).

LPR server: The LPR server handles LPR video recorded by your surveillance system. It analyzes the video and sends information to the event server that uses it for triggering the defined events and alarms. Milestone recommends that you install the LPR server on a computer especially allocated for this purpose.

LPR camera: The LPR camera captures video as any other camera, but some cameras are dedicated for LPR use. The better suited camera you use, the more successful recognitions you will get.

Country module: A country module is a set of rules that defines license plates of a certain type and form as belonging to a certain country or region. It dictates plate and character specifics such as color, height, spacing, and similar, which is used during the recognition process.

License plate match list: A license plate match list is a user-defined list that you create. License plate match lists are collections of license plates that you want your system to treat in a special way. Once you have specified a list, you can set up events to recognize license plates on these lists and in this way trigger events and alarms.

Compatibility

XProtect LPR 2016 is compatible with the version 2014 SP3 or newer of:

- XProtect Enterprise
- XProtect Professional
- XProtect Express
- Milestone Husky™ M30
- Milestone Husky™ M50.

XProtect LPR 2016 is compatible with Milestone Husky M30 and Milestone Husky M50, but these products do not currently support the full functionality of XProtect LPR 2016.

Minimum system requirements

For information about the minimum system requirements for the various components of your system, go to the Milestone website http://www.milestonesys.com/SystemRequirements.

Milestone recommends that you install the LPR server on a computer especially allocated for this purpose.

LPR licenses

XProtect LPR requires the following LPR-related licenses:

- A **base license** for XProtect LPR that covers an unlimited number of LPR servers.
- One **LPR camera license** per LPR camera you want to use in XProtect LPR.
- A **LPR country module license** for each country, state or region you need in your XProtect LPR solution. **Five** LPR country module license are included with the XProtect LPR base license. All country modules are automatically installed when you install your XProtect LPR product. However, the installed modules are by default disabled and you must enable the modules (see "Country modules tab" on page 232) that you want to use. You can only enable as many country modules as you have LPR country module licenses for.

Example: You have five LPR country module licenses and you have installed 10 country modules. Once you have selected five country modules, you cannot select any more. You must clear some of your selections before you can select other modules.

To find information about the current status of your licenses, see View LPR server information (on page 221).

To buy additional LPR licenses or country modules, contact your vendor, or go to the Milestone website http://www.milestonesys.com.

About preparing cameras for LPR

LPR differs from other kinds of video surveillance. Normally, you choose cameras based on their ability to provide the best possible images for viewing by the human eye. When you choose cameras for LPR, only the area where you expect to detect license plates is important. The more clear and consistent you capture an image in that small area, the higher recognition rate you will get.

This section helps you to prepare cameras for license plate recognition, but it also introduces you to important theories about cameras and lenses that are crucial to understand in order to get optimal images.

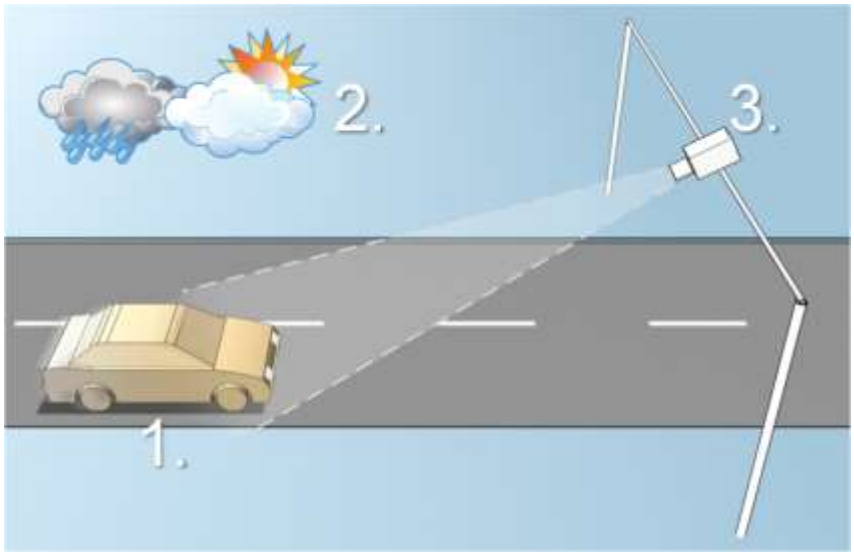


Illustration of an LPR solution

Factors that influence your configuration of LPR:

1. Vehicle

- Speed
- Plate size and position

2. Physical surroundings

- Lightning conditions
- Weather

3. Camera

- Exposure
- Field of view
- Shutter speed
- Resolution
- Positioning

It is important to take these factors into consideration as they have a critical influence on successful license plate recognition. You must mount cameras and configure XProtect LPR in a way that matches each specific environment. You cannot expect the product to run succesfully without configuration. A camera used for LPR has a CPU consumption that is about five times higher than a normal camera. If a camera has not been set up correctly, it will highly affect the level of successful recognitions and the CPU performance.

Read the following sections to learn about the factors that influence your LPR solution:

Positioning the camera (on page 207)

Camera angles (on page 208)

Plate width recommendations (on page 209)

Image resolution (on page 210)

Understanding camera exposure (on page 212)

Physical surroundings (on page 215)

Lens and shutter speed (on page 217)

Contrast (on page 218)

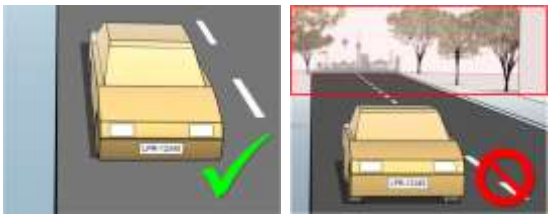
Unwanted camera features (on page 218)

Positioning the camera

When you mount cameras for LPR use, it is important to get a good, clear view of the area of interest so the plate can be detected consistently. This ensures the best possible performance and low risk of false detection:

- The area should cover **only** the part of the image where the license plate is visible as the vehicle moves in and out of the image.
- Avoid to have objects that block the view path of the camera, such as pillars, barriers, fences, gates.
- Avoid irrelevant moving objects such as people, trees, or traffic in

If too many irrelevant items are included, they will interfere with the detection, and the LPR server will use CPU resources on analyzing irrelevant items instead of license plates.

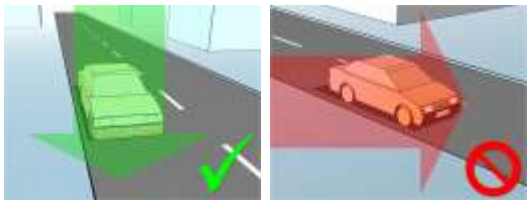


Left image shows a correct mounting without interference in the field of view. Right image shows an incorrect mounting. The camera is mounted too low and with too much background 'noise' in the view.

To help you obtain a clear and undisturbed view, you can:

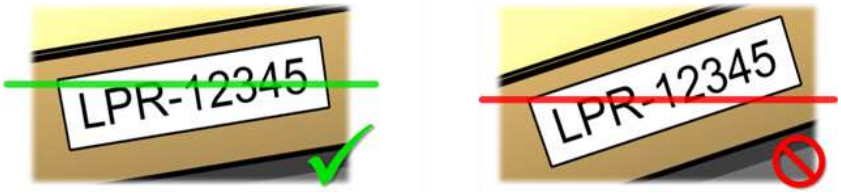
- Mount the camera as close as possible to the area of interest.
- Angle your camera.
- Zoom. If you zoom, always use the camera's optical zoom.

Mount the camera so the license plate appears from the top of the image (or bottom if traffic is driving away from the camera) instead of from the right or left side. In this way you make sure that the recognition process of a license plate only starts when the whole plate is in the view:

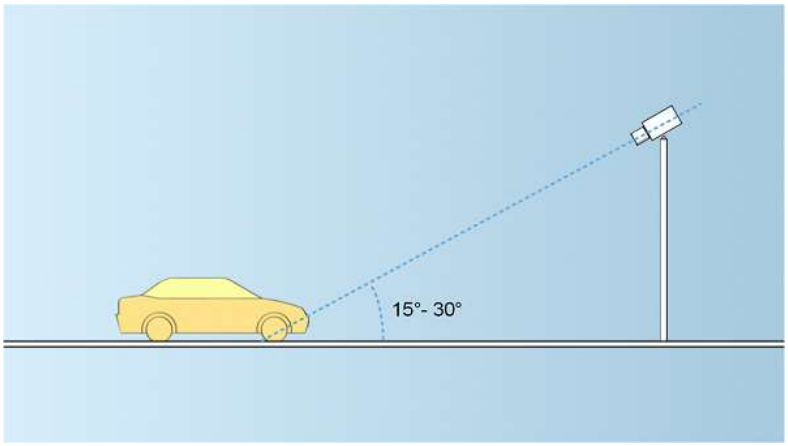


Camera angles

- **Single-line rule:** Mount the camera so that you can draw a horizontal line that crosses both the left and right edge of the license plate in the captured images. See the illustrations below for correct and incorrect angles for recognition.



- **Vertical angle:** The recommended vertical view angle of a camera used for LPR is between 15°-30°.



- **Horizontal angle:** The recommended maximum horizontal view angle of a camera used for LPR is between 15°-25°.

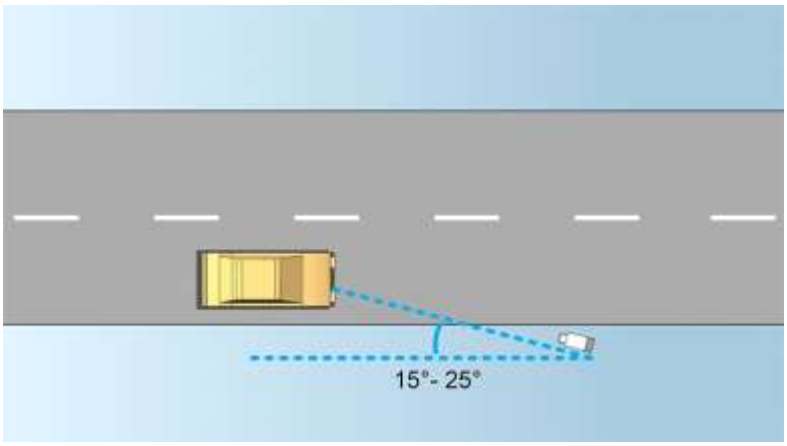
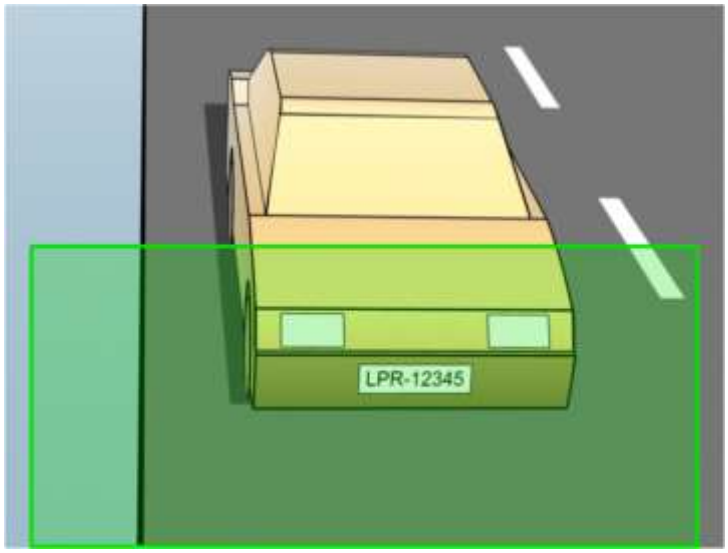


Plate width recommendations

Mount the camera so that the ideal snapshot of the license plate is captured when the license plate is in the center or lower half of the image:



Take a snapshot and make sure that the requirements to stroke width and plate width as described below are fulfilled. Use a standard graphics editor to measure the amount of pixels. When you start the process of reaching the minimum plate width, begin with a low resolution on the camera, and then work your way up in a higher resolution until you have the required plate width.

Stroke width

The term *pixels per stroke* is used to define a minimum requirement for fonts that should be recognized. The following illustration outlines what is meant by *stroke*:



Because the thickness of strokes depends on country and plate style, measurements like pixels/cm or pixels/inch are not used.

The resolution for best LPR performance should be at least 2.7 pixels/stroke.

Plate width

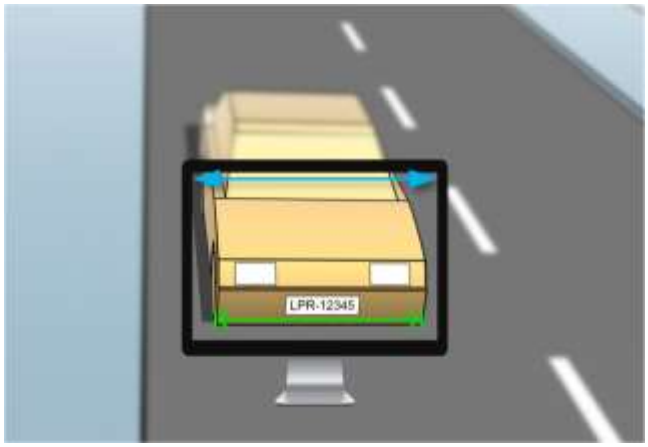
Plate type	Plate width	Setup	Minimum plate width (pixels)
Single line US plates	▸ plate width 12 inches ▸ stroke width around ¼ inches	vehicles stopped; no interlacing	130
		vehicles are moving; interlaced	215
Single line European plates	▸ plate width 52 cm ▸ stroke width around 1 cm	vehicles stopped; no interlacing	170
		vehicles are moving; interlaced	280

If vehicles are moving when recorded, and an interlaced camera is used, only a half of the image can be used (only the even lines) for recognition compared with a camera configured for stopped vehicles and no interlacing. This means that the resolution requirements are almost double as high.

Image resolution

Image quality and resolution is important for a successful license plate recognition. On the other hand, if the video resolution is too high, the CPU might be overloaded with the risk of skipped or faulty detections. The lower you can set the acceptable resolution, the better CPU-performance and the higher detection rate you get.

In this example we explain how to do a simple image quality calculation and find a suitable resolution for LPR. The calculation is based on the width of a car.



Example of a capture where we want to calculate a suitable resolution.

We estimate that the horizontal width is 200 cm/78 inches, as we assume the width of a standard car is 177 cm/70 inches, and besides that we add ~10% for the extra space. You can also do a physical measuring of the area of interest if you need to know the exact width.

The recommended resolution of the stroke thickness is 2.7 pixels/stroke, and the physical stroke thickness is 1 cm for a European plate and 0.27 inches for a US plate. This gives the following calculation:

Calculation for European plates in cm:

200 × 2.7 ÷ 1 = 540 pixels

Recommended resolution = VGA (640×480)

Calculation for US plates in inches:

78 × 2.7 ÷ 0.27 = 780 pixels

Recommended resolution = SVGA (800×600)

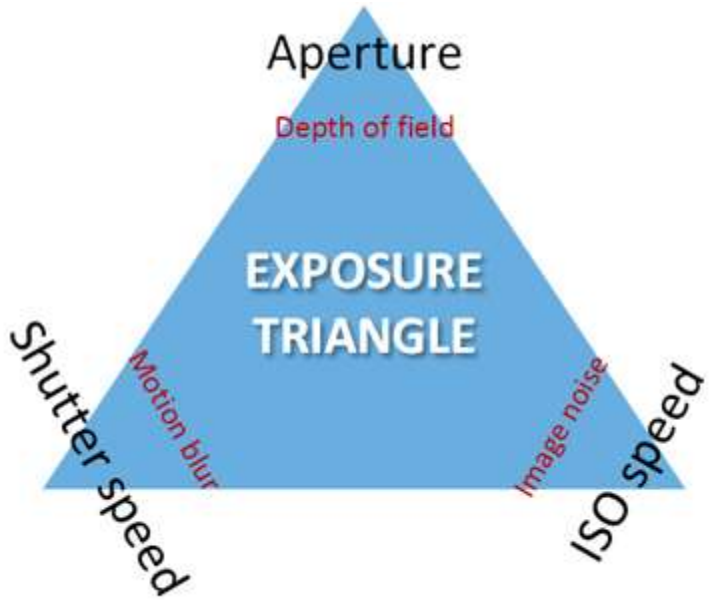
Because US plates use a font with a narrow stroke, a higher resolution is needed than for European plates.

Common video resolutions

Name	Pixels (W×H)
QCIF	176×120
CIF	352×240
2CIF	704×240
VGA	640×480
4CIF	704×480
D1	720×576
SVGA	800×600
XGA	1024×768
720p	1280×1024

Understanding camera exposure

Camera exposure determines how light/dark and sharp/blurry an image appears when it has been captured. This is determined by three camera settings: aperture, shutter speed, and ISO speed. Understanding their use and interdependency can help you to set up the camera correctly for LPR.



Exposure triangle

You can use different combinations of the three settings to achieve the same exposure. The key is to know which trade-offs to make, since each setting also influences the other image settings:

Camera settings	Controls...	Affects...
Aperture	The adjustable opening that limits the amount of light to enter the camera	Depth of field
Shutter speed	The duration of the exposure	Motion blur
ISO speed	The sensitivity of the camera's sensor to a given amount of light	Image noise

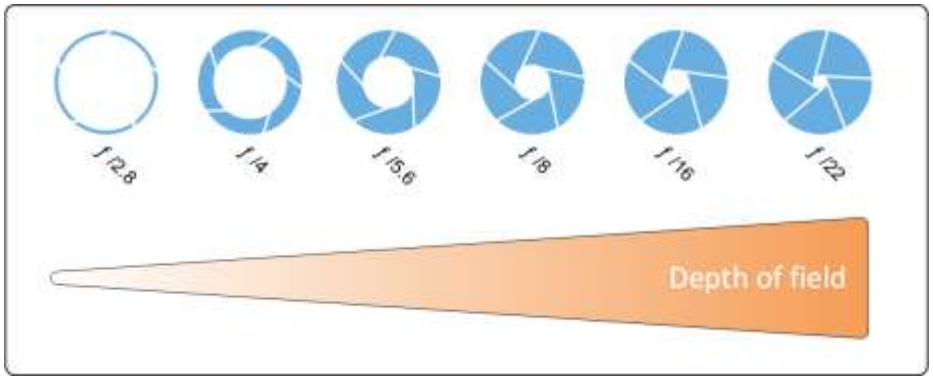
The next sections describe how each setting is specified, what it looks like, and how a given camera exposure mode affects this combination:

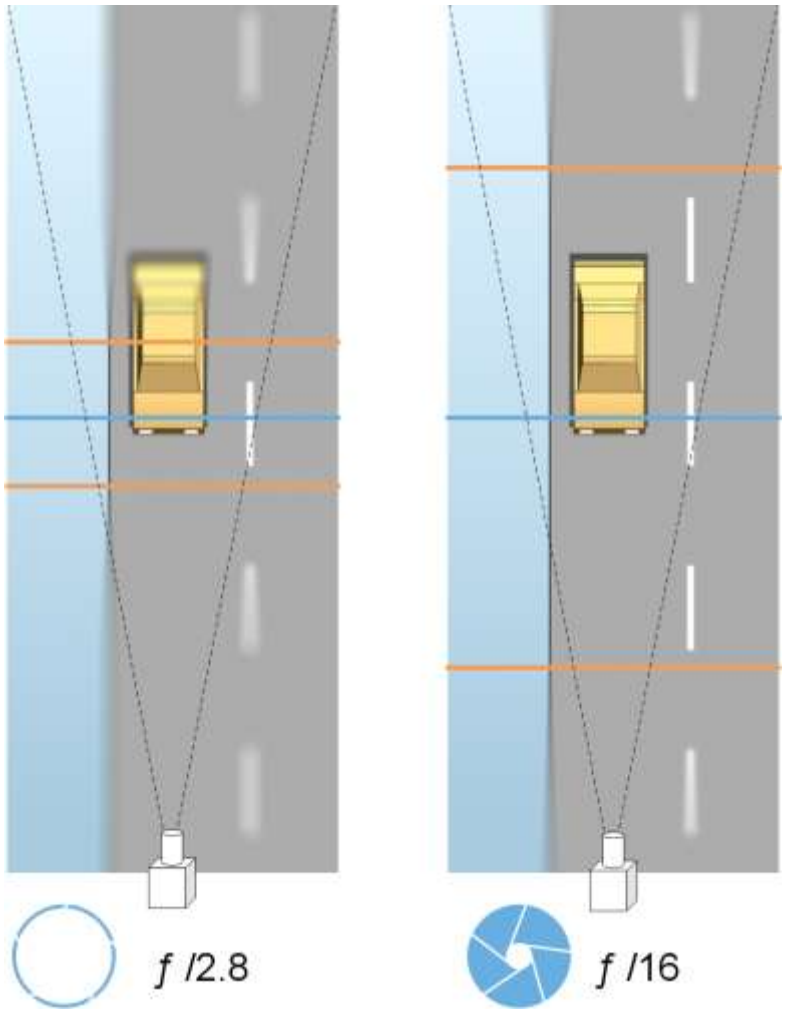
Aperture settings

The aperture setting controls the amount of light that enters your camera from the lens. It is specified in terms of an f-stop value, which can at times be counterintuitive, because the area of the opening increases as the f-stop decreases.

Low f-stop value/wide aperture = shallow depth of field

High f-stop value/narrow aperture = large depth of field





The example illustrates how the depth of field is affected by the f-stop value. The blue line indicates the focus point.

A high f-stop value makes it possible to have a longer distance where the license plate is in focus. Good light conditions are important for sufficient exposure. If lightning conditions are insufficient, the exposure time needs to be longer, which again increases the risk of getting blurry images.

A low f-stop value reduces the focus area and thereby the area used for recognition, but is suitable for conditions with low light. If it is possible to ensure that vehicles are passing the focus area at a low speed, a low f-stop value is suitable for a consistent recognition.

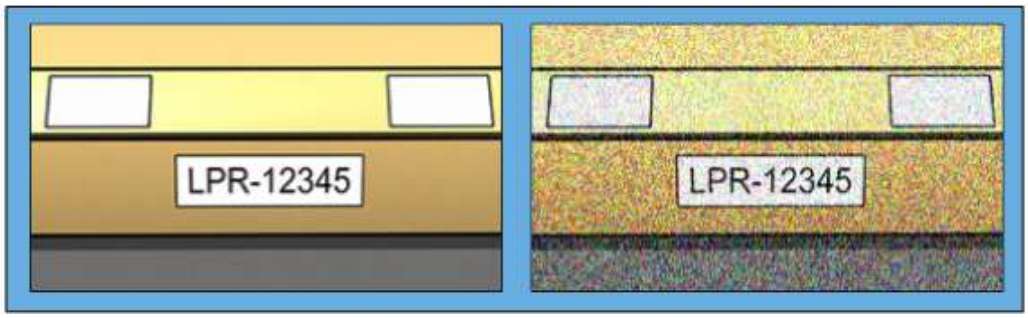
Shutter speed

A camera's shutter determines when the camera sensor is open or closed for incoming light from the camera lens. The shutter speed refers to the duration when the shutter is open and light can enter the camera. Shutter speed and exposure time refer to the same concept, and a faster shutter speed means a shorter exposure time.

Motion blur is undesired for license plate recognition and surveillance. In many occasions vehicles are in motion while license plates are detected which makes a correct shutter speed an important factor. The rule of thumb is to keep the shutter speed high enough to avoid motion blur, but not too high as this may cause under-exposed images depending on light and aperture.

ISO speed

The ISO speed determines how sensitive the camera is to incoming light. Similar to shutter speed, it also correlates 1:1 with how much the exposure increases or decreases. However, unlike aperture and shutter speed, a lower ISO speed is in general desirable, since higher ISO speeds dramatically increase image noise. As a result, ISO speed is usually only increased from its minimum value if the desired image quality is not obtainable by modifying the aperture and shutter speed settings solely.



Example of low and high ISO speed images. High ISO speed on the right image affects the level of image noise negatively.

Common ISO speeds include 100, 200, 400 and 800, although many cameras also permit lower or higher values. With digital single-lens reflex (DSLR) cameras, a range of 50-800 (or higher) is often acceptable.

Physical surroundings

When you mount and use cameras for LPR, note the following factors related to the surroundings:

- **Much light:** Too much light in the surroundings can lead to overexposure or smear.

- **Overexposure** is when images are exposed to too much light, resulting in a burnt-out and overly white appearance. To avoid overexposure, Milestone recommends that you use a camera with a high dynamic range and/or use an auto-iris lens. **Iris** is the adjustable aperture. For that reason, iris has a significant effect on the exposure of images.

  - **Smear** is an effect that leads to unwanted light vertical lines in images. It is often caused by slight imperfections in the cameras' charge-coupled device (CCD) imagers. The CCS imagers are the sensors used to digitally create the images.



License plate image with smear because of overexposure

- **Little light:** Too little light in the surroundings or too little external lighting can lead to underexposure.

  - **Underexposure** is when images are exposed to too little light, resulting in a dark image with hardly any contrast (on page 218). When auto-gain (see "Unwanted camera features" on page 218) cannot be disabled or when you are not able to configure a maximum allowed shutter time (see "Lens and shutter speed" on page 217) for capturing moving vehicles, too little light will initially lead to gain noise and motion blur in the images, and ultimately to underexposure. To avoid underexposure, use sufficient external lighting and/or use a camera that has sufficient sensitivity in low-light surroundings without using gain.

- **Infrared:** Another way to overcome difficult lighting conditions is to use artificial infrared lighting combined with an infrared-sensitive camera with an infrared pass filter. Retro-reflective license plates are particularly suitable for use with infrared lighting.

  - **Retro-reflectivity** is achieved by covering surfaces with a special reflective material which sends a large portion of the light from a light source straight back along the path it came from. Retro-reflective objects appear to shine much more brightly than other objects. This means that at night they can be seen clearly from considerable distances. Retro-reflectivity is frequently used for road signs, and is also used for different types of license plates.

- **Weather:** Snow or very bright sunlight may for example require special configuration of cameras.

- **Plate condition:** Vehicles may have damaged or dirty license plates. Sometimes this is done deliberately in an attempt to avoid recognition.

Lens and shutter speed

When configuring cameras' lenses and shutter speeds for LPR, note the following:

- **Focus:** Always make sure the license plate is in focus.
- **Auto-iris:** If using an auto-iris lens, always set the focus with the aperture as open as possible. In order to make the aperture open, you can use neutral density (ND) filters or—if the camera supports manual configuration of the shutter time—the shutter time can be set to a very short time.
    - **Neutral Density** (ND) filters or gray filters basically reduce the amount of light coming into a camera. They work as "sunglasses" for the camera. ND filters affect the exposure of images (see "Understanding camera exposure" on page 212).
- **Infrared:** If using an infrared light source, focus may change when switching between visible light and infrared light. You can avoid the change in focus by using an infrared compensated lens, or by using an infrared pass filter. Note that if you use an infrared pass filter, an infrared light source is required—also during daytime.
- **Vehicle speed:** When vehicles are moving, cameras' shutter time should be short enough to avoid motion blur. A formular for calculating the longest suitable shutter time is:
    - **Vehicle speed in km/h:** Shutter time in seconds = 1 second / (11 × max vehicle speed in kilometers per hour)
    - **Vehicle speed in mph:** Shutter time in seconds = 1 second / (18 × max vehicle speed in miles per hour)

    where / denotes "divided by" and × denotes "multiplied by."

The following table provides guidelines for recommended camera shutter speeds for different vehicle speeds:

Shutter time in seconds	Max. vehicle speed in kilometers per hour	Max. vehicle speed in miles per hour
1/50	4	2
1/100	9	5
1/200	18	11
1/250	22	13
1/500	45	27
1/750	68	41
1/1000	90	55
1/1500	136	83
1/2000	181	111
1/3000	272	166
1/4000	363	222

Contrast

When you determine the right contrast for your LPR camera, consider the difference in gray value (when images are converted to 8-bit grayscale) between the license plate's characters and the license plate's background color:



Good contrast



Acceptable contrast; recognition is still possible

Pixels in an 8-bit grayscale image can have color values ranging from 0 to 255, where grayscale value 0 is absolute black and 255 is absolute white. When you convert your input image to an 8-bit grayscale image, the minimum pixel value difference between a pixel in the text and a pixel in the background should be at least 15.

Note that noise in the image (see "Unwanted camera features" on page 218), the use of compression (see "Unwanted camera features" on page 218), the light conditions, and similar can make it difficult to determine the colors of a license plate's characters and background.

Unwanted camera features

When you configure cameras for LPR, note the following:

- **Automatic gain adjustment:** One of the most common types of image interference caused by cameras is gain noise.
  - **Gain** is basically the way that a camera captures a picture of a scene and distributes light into it. If light is not distributed optimally in the image, the result is gain noise.

    Controlling gain requires that complex algorithms are applied, and many cameras have features for automatically adjusting gain. Unfortunately, such features are rarely helpful in connection with LPR. Milestone recommends that you configure your cameras' auto-gain functionality to be as low as possible. Alternatively, disable the cameras's auto-gain functionality.

    License plate image with gain noise

    In dark surroundings, you can avoid gain noise by installing sufficient external lighting.
- **Automatic enhancement:** Some cameras use contour, edge or contrast enhancement algorithms to make images look better to the human eye. Such algorithms can interfere with the algorithms used in the LPR process. Milestone recommends that you disable the cameras' contour, edge and contrast enhancement algorithms whenever possible.
- **Automatic compression:** High compression rates can have a negative influence on the quality of license plate images. When a high compression rate is used, more resolution (see "Plate width recommendations" on page 209) is required in order to achieve optimal LPR performance. If a low JPEG compression is used, the negative impact on LPR is very low, as long as the images are saved with a JPEG quality level of 80% or above, and images have normal resolution, contrast and focus as well as a low noise level.

  Left: License plate image saved with a JPEG quality level of 80% (i.e. low compression); acceptable

  Right: License plate image saved with a JPEG quality level of 50% (i.e. high compression); unacceptable

LPR installation

Install XProtect LPR

To run XProtect LPR your must install:

- At least one LPR server.
- The LPR plug-in on all computers that run the Management Application and the event server.
- Make sure that the user selected for running the LPR Server service can access the management server.

Milestone recommends that you do not install the LPR server on the same computer as your management server or recording servers.

Start installation:

1. Go to the download page on the Milestone website http://www.milestonesys.com/downloads.
2. Download the two installers:
   - *Milestone XProtect LPR Plug-in* installer to all computers that run the Management Application and the event server.
   - *Milestone XProtect LPR Server* installer to all computers allocated for this purpose. You can also create virtual servers for LPR on one computer.
3. First, run all the *Milestone XProtect LPR Plug-in* installers.
4. Then, run the *Milestone XProtect LPR Server* installer(s).

   During installation, specify the IP address or hostname of the management server for XProtect Advanced VMS products or the image server for XProtect Professional VMS products including the domain user name and password of a user account that has administrator rights to the surveillance system.
5. Launch the Management Application.

   In the navigation pane, your Management Application automatically lists the installed LPR servers in the **LPR Servers** list.
6. Make sure that you have the necessary licenses (see "LPR licenses" on page 205).
7. All country modules are automatically installed when you install your XProtect LPR product. However, the installed modules are by default disabled and you must enable the modules (see "Country modules tab" on page 232) that you want to use. You can only enable as many country modules as you have LPR country module licenses for.

You cannot add LPR servers from the Management Application.

If you need to install more LPR servers after the initial installation, run the *Milestone XProtect LPR Server* installer on these servers.

Upgrade XProtect LPR

To upgrade XProtect LPR, you follow the same steps as for installation (see "Install XProtect LPR" on page 220).

if you upgrade from XProtect LPR 1.0 to XProtect LPR 2016, some recognition settings are not compatible with those from the previous configuration. To apply the new settings, you must save your configuration. The settings that previously allowed you to flip, rotate and invert the colors of the video have been removed. If you still need these functions, you must change the settings on the cameras themselves.

LPR configuration

View LPR server information

To check the state of your LPR servers:

1. In the navigation pane, expand **Servers** and select **LPR servers**.

   The **LPR server information** window opens with a summary of the server status:

   - Name
   - Host name
   - Status

2. Select the relevant LPR server and review all details for this server (see "LPR server information properties" on page 221).

LPR server information properties

Field	Description
Name	Here you can change the name of the LPR server.
Host name	Shows the LPR server host name. The first part of the name of the LPR server consists of the name of the host computer for your LPR server installation. Example: *MYHOST.domainname.country*.
Status	Shows the status of the LPR server. If the server has just been added, the status is: ▸ *No LPR cameras configured*. If the system is running without problems, the status is: ▸ *All LPR cameras are running*. Alternatively the system returns: ▸ *Service not responding.* ▸ *Not connected to surveillance system.* ▸ *Service not running.* ▸ *Event Server not connected.* ▸ *Unknown error.* ▸ *X of Y LPR cameras running.*
Service up time	Shows the up time since the LPR server was last down and the LPR server service started.
Computer CPU usage	Shows the current CPU usage on the entire computer with the LPR server(s) installed.
Memory available	Shows how much memory is available on the LPR server.
Recognized license plates	Shows the number of license plates that the LPR server has recognized in this session.
LPR cameras	Shows a list of enabled LPR cameras that run on the LPR server and their status.
LPR cameras available	Based on your license, this number shows how many additional LPR cameras you are allowed to add and use on all your LPR servers in total.
Country modules available	Based on your license, this number shows how many additional country modules you are allowed to use on all your LPR servers in total. It also lists the number of country modules already in use.

Configuring cameras for LPR

Prerequisites in the Management Application

Once cameras have been mounted and added in the Management Application, adjust each camera's settings so that they match the requirements for LPR. You adjust camera settings on the properties tabs for each camera device.

For the relevant cameras Milestone recommends to:

- Set the video codec to JPEG.

  Note that if you use H.264 codec, only key frames are supported. This is usually only one frame per second which is not enough for LPR. For higher frame rates, always use a JPEG codec.

- Specify a frame rate of four frames per second.
- Avoid compression, so set a fine quality.
- If possible, specify a resolution below one megapixel.
- If possible, keep automatic sharpness at a low level.

To learn about LPR fundamentals, make yourself familiar with the information in About preparing cameras for LPR (on page 206).

About snapshots

The system uses snapshots to optimize the configuration automatically and to visualize the effect of the recognition settings as they are applied.

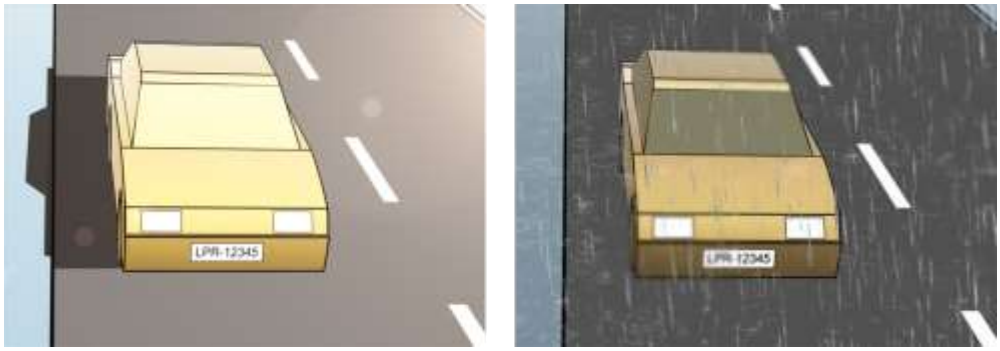
You need to provide at least one valid snapshot in order to complete the initial configuration of a camera.

As a guideline, capture snapshots of vehicles in the real physical surroundings and conditions, in which you want to be able to recognize license plates.

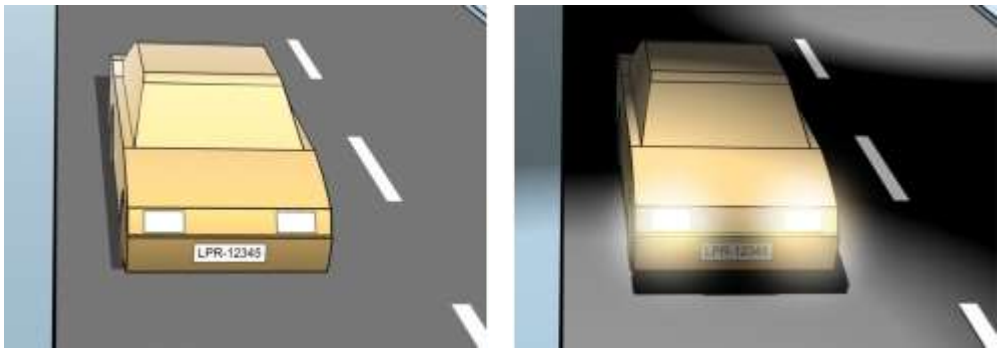
The list below illustrates examples of the situations that you should consider when you capture and select snapshots. Not all may be applicable for your surroundings.

Milestone recommends that you select minimum 5-10 snapshots that represent typical conditions of:

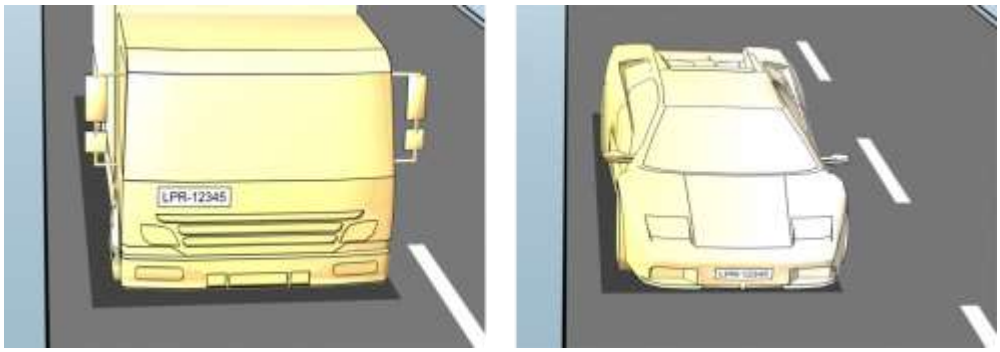
- **The weather; for example sunlight and rain**



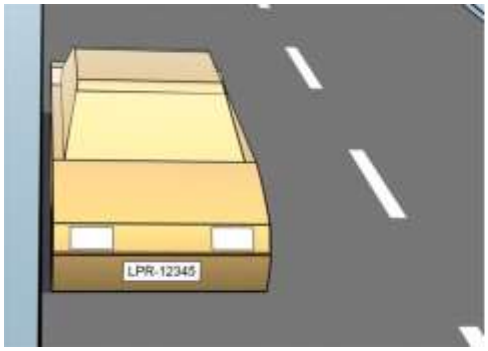
- **The light; for example daylight and nighttime**



- **Vehicle types; to define the top and bottom of the recognition area**

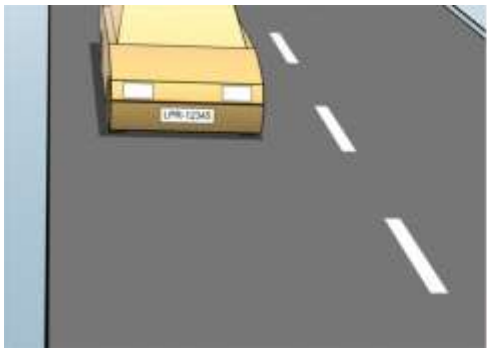


- **Position in the lane; to define the left and right of the recognition area**





- **Distance to the car; to define the area where LPR analyzes license plates**




Add LPR camera

To configure cameras for LPR, you initially run the **Add LPR camera** wizard. The wizard takes you through the main configuration steps and automatically optimizes the configuration.

To run the wizard:

1. In the navigation pane, expand **Servers**, expand **LPR servers**, and select **LPR camera**.
2. Right-click **LPR camera**.
3. From the menu that appears, select **Add LPR camera** and follow the instructions in the wizard:
   - Select the camera you want to configure for LPR.
   - Select which country modules you want to use with your LPR camera (see "Country modules tab" on page 232).
   - Select snapshots to use for validating the configuration (see "About snapshots" on page 223).

- Validate the result of the snapshot analysis (see "Validate configuration" on page 234).
- Select which license plate match lists to use (see "About license plate match lists" on page 235). Choose the default selection, if you have not yet created any lists.

4. On the last page, click **Close**.

   The LPR camera appears in the Management Application and based on your selections, the system has optimized the recognition settings for the camera (see "Recognition settings tab" on page 227).

5. Select the camera you have added and review its settings. You only need to change the configuration if the system does not recognize license plates as well as expected.
6. In the **Recognition settings** tab, click Validate configuration (on page 234).

Adjust settings for your LPR camera

The system automatically optimized the configuration of your LPR camera, when you added the LPR camera with the **Add LPR camera** wizard. If you want to make changes to the initial configuration, you can:

- Change the name of the server or change server (see "Info tab" on page 226).
- Adjust and validate the recognition settings (see "Recognition settings tab" on page 227).
- Add more license plate match lists (see "Match lists tab" on page 231).
- Enable additional country modules (see "Country modules tab" on page 232).

Info tab

This tab provides information about the selected camera:

Name	Description
Enable	LPR cameras are by default enabled after the initial configuration. Disable any camera that is not used in connection with LPR. Disabling an LPR camera does not stop it from performing normal recording in the surveillance system.
Camera	Shows the name of the selected camera as it appears in the XProtect Management Application and the clients.
Description	Use this field to enter a description (optional).
Change Server	Click to change LPR server. Changing the LPR server can be a good idea if you need to load balance. For example, if the CPU load is too high on an LPR server, Milestone recommends that you move one or more LPR cameras to another LPR server.

Recognition settings tab

Recognition settings are auto-configured and optimized by the system during the initial configuration of your LPR camera, primarily based on the snapshots you have provided.

Action buttons

Use these buttons to update and validate your settings after the initial configuration.

Name	Description
Snapshots	Add or delete snapshots (see "Select snapshots" on page 233).
Validate configuration	Test that license plates are recognized as expected (see "Validate configuration" on page 234).
Auto-configure	Disregard manual changes and optimize settings (see "Auto-configure" on page 235).

Recognition area

The system optimizes the recognition area during auto-configuration, but you can change it manually.

To ensure the best possible performance and low risk of false detection, Milestone recommends that you always select a clearly defined and "well-trimmed" recognition area. The area should cover only the part of the image where the license plate is visible as the vehicle moves in and out of the image. Avoid irrelevant moving objects such as people, trees, or traffic in the recognition area (see "Positioning the camera" on page 207).

License plates are not recognized in the red area.



When you specify an area of recognition, you have the following options:

Name	Description
Clear	Click to remove all selections, so no areas are used for LPR. Select new areas.
Undo	Click to revert to your latest saved configuration of the recognition area.

When you have changed the settings for your LPR camera, validate your configuration (see "Validate configuration" on page 234) to see if the system recognizes license plates as well as expected.

Character height

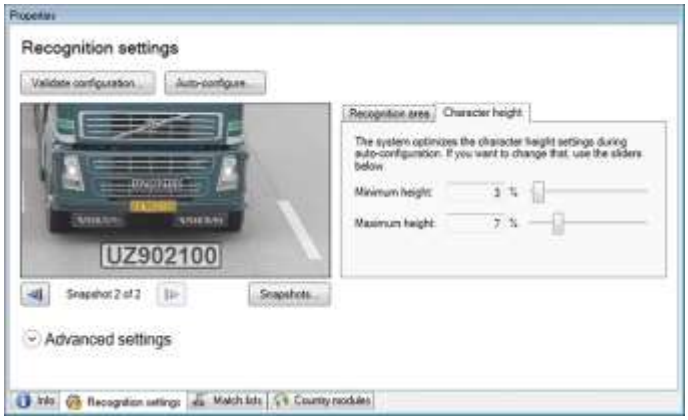
The system optimizes the character height during auto-configuration, but you can change it manually.

You define the minimum and maximum height of the license plate characters (in percent). Select character heights as close as possible to the height of the characters in the real license plate.

These character settings influence the recognition process as they partly determine the recognition time. As a rule, the larger the difference between the minimum and the maximum character height:

- The more complex the LPR process is.
- The higher the CPU load is.

- The longer you have to wait for the results.



The overlay in the snapshot displays the currently defined character height setting. The overlay grows and shrinks proportionally with the character height settings to the right. For easy comparison, you can drag the overlay on top of the real license plate in the snapshot. If needed, use the mouse wheel to zoom.

Name	Description
Minimum height	Use the sliders to set the minimum character height to be included in a recognition process. The system will not start the recognition process on license plates that contain characters below the specified value.
Maximum height	Use the sliders to set the maximum character height to be included in a recognition process. The system will not start the recognition process on license plates that contain characters above the specified value.

When you have changed the settings for your LPR camera, validate your configuration (see "Validate configuration" on page 234) to see if the system recognizes license plates as well as expected.

Advanced settings

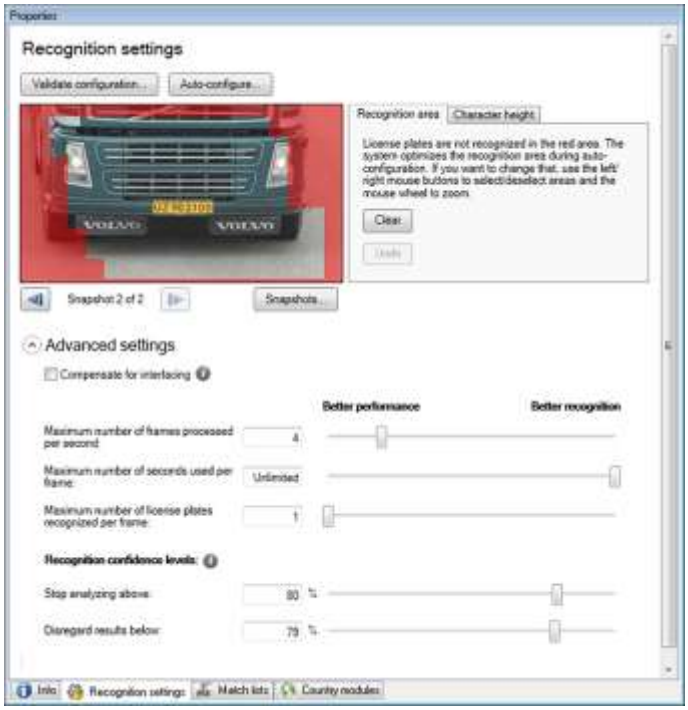
The system optimizes the advanced settings during auto-configuration, but you can change them manually.

The recognition process can be divided into two steps: finding the plate(s) and recognizing the characters on the plates. The advanced settings allow you to define a trade-off between processing speed and recognition quality.

The general rule is that high recognition quality:

- needs the highest computational effort,
- results in higher CPU load,

- requires more time to return results.



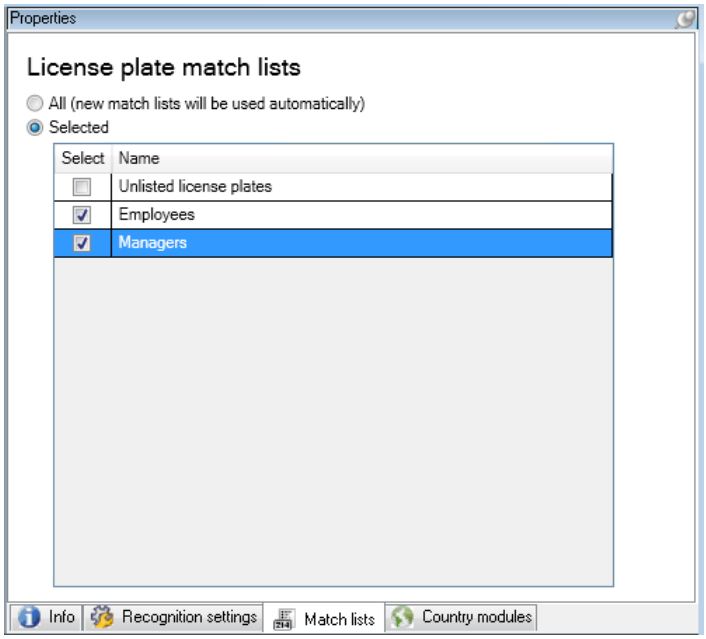
By adjusting the advanced settings, you define the trade-off. The recognition process stops if any of the stop criteria are met and returns the license plate it recognized at that point.

Name	Description
Compensate for interlacing	In case your LPR camera sends interlaced video and you observe combing effects in the de-interlaced image in LPR, you can enable this function. This may improve the quality of the image and thereby your recognition results.
Maximum number of frames processed per second	Specifies a limit to the number of frames that your LPR solution processes per second. If you keep the number of frames low for LPR processes, you can apply a higher frame rate on the camera for recording without adding unnecessary load to the LPR Server. **Unlimited** means that you have not defined a stop criterion for this setting.
Maximum number of seconds used per frame	Specifies a limit to the number of seconds that your LPR solution is allowed to spend on recognition of one frame. If adjusted, recommended value is *200* ms per frame. **Unlimited** means that you have not defined a stop criterion for this setting.
Maximum number of license plates recognized per frame	Specifies a limit to the number of recognized license plates returned per frame. Do only change this setting if really needed, for example, if you are detecting multiple lanes with one LPR camera. **Unlimited** means that you have not defined a stop criterion for this setting.
Stop analyzing above	Specifies a minimum confidence level (in percent). The recognition process continues until the system can return a license plate reading with a confidence level equal to or higher than the specified value.
Disregard results below	The system rejects license plate readings with a confidence level equal to or lower than the specified value. As a rule, the smaller you keep the difference between the **Stop analyzing above** and **Disregard results below** values, the lower is the CPU load and the system returns recognition results faster.

When you have changed the settings for your LPR camera, validate your configuration (see "Validate configuration" on page 234) to see if the system recognizes license plates as well as expected.

Match lists tab

On this tab you select which license plate match list(s) you want a specific LPR camera to match license plates against. You can create as many lists as you need (see "Add new license plate match lists" on page 236).



Name	Description
All	License plates are matched against all available and future lists.
Selected	License plates are matched against the selected lists only. Select one or more from the available lists.

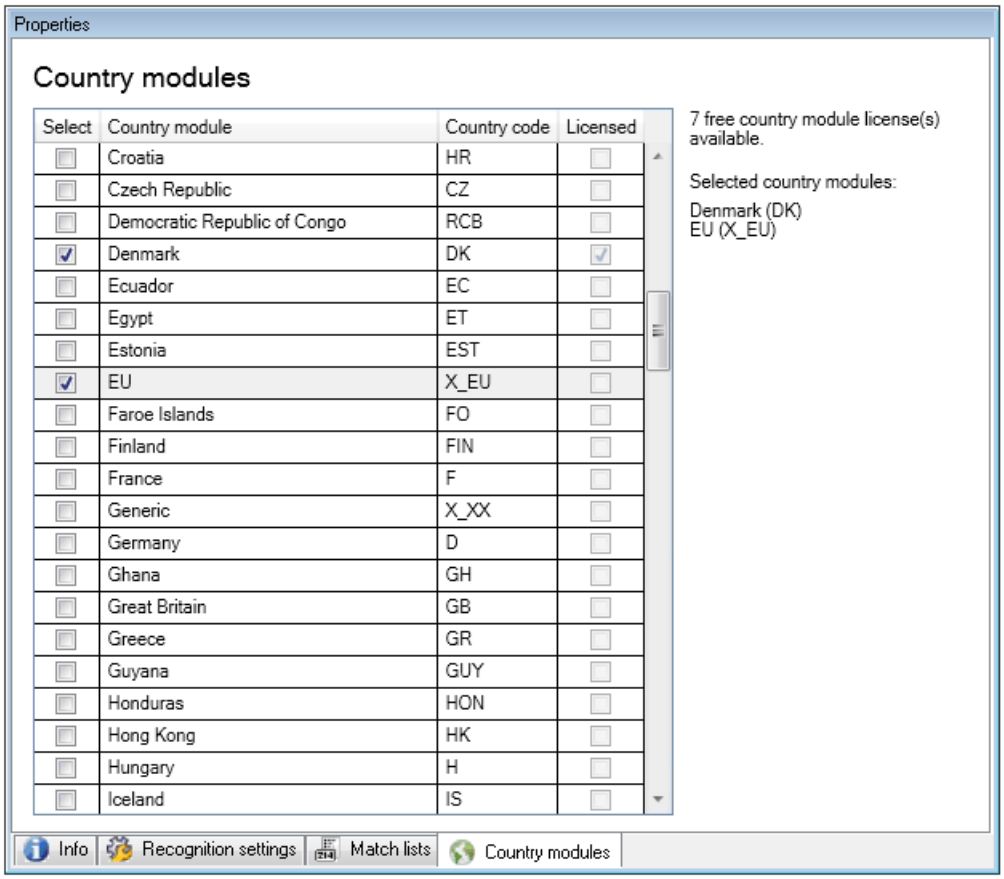
When you have changed the settings for your LPR camera, validate your configuration (see "Validate configuration" on page 234) to see if the system recognizes license plates as well as expected.

Country modules tab

Here you select the country modules that you want to use with a specific LPR camera. The list that you can select from, depends on which modules you have installed and your licenses (see "LPR licenses" on page 205).

A country module is a set of rules that defines license plates of a certain type and form belonging to a certain country, state or region.

Already licensed modules appear with a check mark in the **Licensed** column. If the country module you are looking for is not on your list, contact your vendor.



Name	Description
Select	Click to select or deselect a country module. The list of selected country modules on the right side updates automatically.
Country Module	Lists the installed country modules.
Country Code	Letters that identify a country module.
Licensed	Shows if a country module is already licensed. You can select a licensed country module for as many cameras as you like.

When you have changed the settings for your LPR camera, validate your configuration (see "Validate configuration" on page 234) to see if the system recognizes license plates as well as expected.

Select snapshots

When you configured the LPR initially with the Add LPR camera wizard, you also added snapshots (see "About snapshots" on page 223). You can always add additional representative snapshots to improve the optimization of the configuration.

1. Select the relevant camera.
2. In the **Recognition settings** tab, click **Snapshots**.
3. Capture snapshots from live video or import them from an external location. Click **Next**.

   The system analyzes the snapshots you have selected for the camera.
4. On the next page, approve or reject each of the snapshots. If the system could not recognize any license plates, click **Previous** to add new snapshots in a better quality. If the system still cannot provide correct recognitions, you probably need to change your configuration. Check that the camera have been mounted and configured correctly (see "About preparing cameras for LPR" on page 206).
5. When you have approved all snapshots, click **Next** and close the wizard.
6. On the **Recognition settings** tab, click **Validate configuration** (on page 234).

Validate configuration

You can validate your current configuration to see if you need to change any settings or provide more snapshots. The validation function informs you about how many license plates your system recognizes, and if they are recognized correctly.

It can help you decide if your confidence level is set correctly and if your system configuration is optimal.

1. Select the relevant camera.
2. From the **Recognition settings** tab, click **Validate configuration**.

   Based on the current settings, the system analyzes the snapshots you have selected for the camera and provides a result summary:

   - **License plates detected:** The number of recognized license plates, for example, 3 of 3.
   - **Average confidence:** The average percent of confidence with which the license plates have been recognized.
   - **Average processing time**: The average time it took to analyze a snapshot and return a reading measured in ms.

License plates detected:	**2 of 2**
Average confidence:	**91 %**
Average processing time:	**112 ms**
3. If the current configuration meets your requirements, click **Close**.

4. If you want to investigate the results further, click **Next**, and you can review the results for each snapshot. This helps you to identify the situations that cause problems.

You can validate the configuration as many times as you like and on any LPR camera and with different settings.

Auto-configure

Auto-configuration of the LPR camera overwrites any manual changes you have made to the settings. You can select this option if, for example, you have made manual changes that have not given you good recognition results.

1. From the **Recognition settings** tab, click **Auto-configure**.

   A new dialog box appears.

2. Confirm that you want to return to auto-configured settings by clicking **Next**.

   The system optimizes the settings.

3. Click **Close**.

4. If prompted, confirm to save the configuration.

5. Review and validate (see "Validate configuration" on page 234) the new settings.

Working with license plate match lists

About license plate match lists

License plate lists are collections of license plates that you want your LPR solution to treat in a special way. License plate recognitions are compared with these lists and if there is a match, the system triggers an LPR event. The events are stored on the event server and can be searched for and viewed on the **LPR** tab in XProtect Smart Client.

By default, events are only stored for 24 hours. To change this, open the **Options** dialog box in the Management Application and on the **Event Server Settings** tab, in the **Keep events for** field, enter a new time frame.

When you have specified a license plate match list, you can set up additional events and alarms to be triggered on a match.

Examples:

- A company headquarter uses a list of executive management's company car license plates to grant executives access to a separate parking area. When executives' license plates are recognized, the LPR solution triggers an output signal that opens the gate to the parking area.
- A chain of gas stations creates a list of license plates from vehicles that have previously left gas stations without paying for their gas. When such license

plates are recognized, the LPR solution triggers output signals that activate an alarm and temporarily block the gas supply to certain gas pumps.

Triggered events can also be used for making cameras record in high quality or similar. You can even use an event to trigger combinations of such actions.

About Unlisted license plates list

Often you would trigger an event when a license plate that is included in a list is recognized, but you can also trigger an event with a license plate, which is **not** included in a list.

Example: A private car park uses a list of license plates to grant residents' vehicles access to the car park. If a vehicle with a license plate that is not on the list approaches the car park, the LPR solution triggers an output signal which lights a sign telling the driver to obtain a temporary guest pass from the security office.

To trigger a surveillance system event, when a license plate that is not on a list is recognized, use the Unlisted license plates list. You select it for a camera like any other list (see "Match lists tab" on page 231) and set it up like any other list (see "Events triggered by LPR" on page 239).

Add new license plate match lists

1. In the navigation pane, select **License plate match lists**, right-click and select **Add New**.
2. In the window that appears, give the list a name and click **OK**.

   As soon as you have created a license plate list, it becomes visible in the **License plate match list** and on the **Match lists** tab for all your LPR cameras.
3. If you want to add columns to the match list, click **Custom field** and specify the columns in the dialog box that opens (see "Edit custom fields properties" on page 239).
4. To update the match list, use the **Add**, **Edit**, **Delete** buttons (see "Edit license plate match lists" on page 236).
5. Instead of defining the match list directly in the Management Application, you can import a file (see "Import/export license plate match lists" on page 237).
6. If prompted, confirm to save changes.

Edit license plate match lists

1. In the navigation pane, select **License plate match lists**.
2. Click the relevant list.
3. The **License plate match list** i**nformation** window opens.
4. To include new rows to your list, click **Add** and fill out the fields:
   - Do not include any spaces.
   - Always use capital letters.

Examples: *ABC123* (correct), *ABC 123* (incorrect), *abc123* (incorrect)

- You can use wildcards in your license plate match lists. Do this by defining plates with a number of ?'s and the letter(s) and/or number(s) which must appear at specific places.

  Examples: *?????A*, *A?????*, *???1??*, *22??33*, *A?B?C?* or similar.

5. If prompted, confirm to save changes.

Import/export license plate match lists

You can import a file with a list of license plates that you want to use in a license plate match list. You have the following import options:

- Add license plates to the existing list.
- Replace the exisiting list.

This is useful if, for example, the lists are managed from a central location. Then all local installations can be updated by distributing a file.

Similarly you can export the complete list of license plates from a match list to an external location.

Supported file formats are .txt or .csv.

To import:

1. In the navigation pane, click **License plate match lists** and select the relevant list.
2. To import a file, click **Import**.
3. In the dialog box, specify the location of the import file and the import type. Click **Next**.
4. Await the confirmation and click **Close**.

To export:

1. To export a file, click **Export**.
2. In the dialog box, specify the location of the export file and click **Next**.
3. Click **Close**.
4. You can open and edit the exported file in, for example, Microsoft Excel.

License plate match list properties

Name	Description
Name	Shows the name of the list. If needed, you can change the name.
Custom fields	Click to specify which license plate entry columns that you or the client user can add additional information to. See Custom fields (properties) (see "Edit custom fields properties" on page 239).
Search	Search the list for specific license plates, numbers, patterns or similar. If needed, you can use *?* as a single wildcard
Add	Click to add a license plate. ▸ Do not include any spaces. ▸ Always use capital letters. **Examples:** *ABC123* (correct), *ABC 123* (incorrect), *abc123* (incorrect) ▸ You can use wildcards in your license plate lists. Do this by defining plates with a number of ?'s and the letter(s) and/or number(s) which must appear at specific places. **Examples:** *?????A*, *A?????*, *???1??*, *22??33*, *A?B?C?* and similar. Some regional areas might have exceptions to these rules. For example, personalized plates with spaces. Plates with two sets of characters which must be recognized separately by an underscore character (_). Or plates from certain regions with letters on a different background color on parts of the license plate. **Example:** 
Edit	Click to edit a license plate. You can select multiple rows for editing.
Delete	Click to delete the selected license plate(s).
Import	Click to import license plates from any comma-separated file, for example a .txt-file or .csv-file (see "Import/export license plate match lists" on page 237).
Export	Click to export the entire license plate list to a comma-separated file, for example a .txt-file or .csv-file (see "Import/export license plate match lists" on page 237).
Rows per page	Select how many license plates to display in one page (one screen). You can choose between 50 to 1000 rows.

Name	Description
Events triggered by list match	Select which event(s) should be triggered by a list match (see "Events triggered by LPR" on page 239). You can choose between all available types of events defined in your system.

Edit custom fields properties

You can add columns to your license plate match lists for additional information. You define the name and number of columns as well as the field content.

The XProtect Smart Client users can update the information in the columns but not the columns themselves.

Name	Description
Add	Adds a column to the match list. Type a name for the column.
Edit	Click to edit the name of the column.
Delete	Deletes a column.
Up	Changes the order of the columns.
Down	Changes the order of the columns.

Events triggered by LPR

After you have created license plate match lists (see "Add new license plate match lists" on page 236), you can associate them with all types of events defined in your system.

The type of events available depends on the configuration of your system. In connection with LPR, events are used to trigger output signals for, for example, raising of parking barrier or making cameras record in high quality. You can also use an event to trigger combinations of such actions. See About license plate match lists (on page 235) for more examples.

Set up system events triggered by list matches

1. Expand **Servers**, click **License plate match list** and select the list to which you want to associate an event.
2. In the **License plate match list information** window, next to the **Events triggered by list match** selection field, click **Select**.
3. In the **Select triggered events** dialog box, select one or more events.
4. If prompted, confirm to save changes.

5. The event is now associated with recognitions on the selected license plate match list.

To trigger a surveillance system event, when a license plate that is **not** on a list is recognized, configure the **Unlisted license plates** list.

Alarms triggered by LPR

You can associate some types of alarms with events from XProtect LPR. Do the following:

1. Create the license plate match list (see "Add new license plate match lists" on page 236) you want to match license plates against.
2. Add and configure your LPR camera(s) (see "Add LPR camera" on page 225).
3. In the navigation pane, expand **Alarms**, right-click **Alarm Definitions** and select to create a new alarm.
4. The **Alarm Definition Information** window appears. Select the relevant properties (see "Alarm Definitions for LPR" on page 240).
5. If prompted when done, confirm to save changes.
6. Configure the alarm data settings for LPR (see "Alarm Data Settings for LPR" on page 240).

Alarm Definitions for LPR

Except for defining **Triggering events**, the settings for **Alarm Definitions** are the same for LPR as for the remaining part of the system.

To define triggering events related to LPR, select the event message to use when the alarm is triggered:

a) In the **Triggering events** field, in the top drop-down list, decide what type of event to use for the alarm. The list offers **License plate match lists** and **LPR server** events (see "Working with license plate match lists" on page 235).

b) In the second drop-down list, select the specific event message to use. If you selected **License plate match lists** in the drop-down above, select a license plate list. If you selected **LPR server**, select the relevant LPR server event message:

- LPR camera connection lost
- LPR camera running
- LPR server not responding
- LPR server responding

For information about the remaining alarm definition settings, see the **Alarms** section.

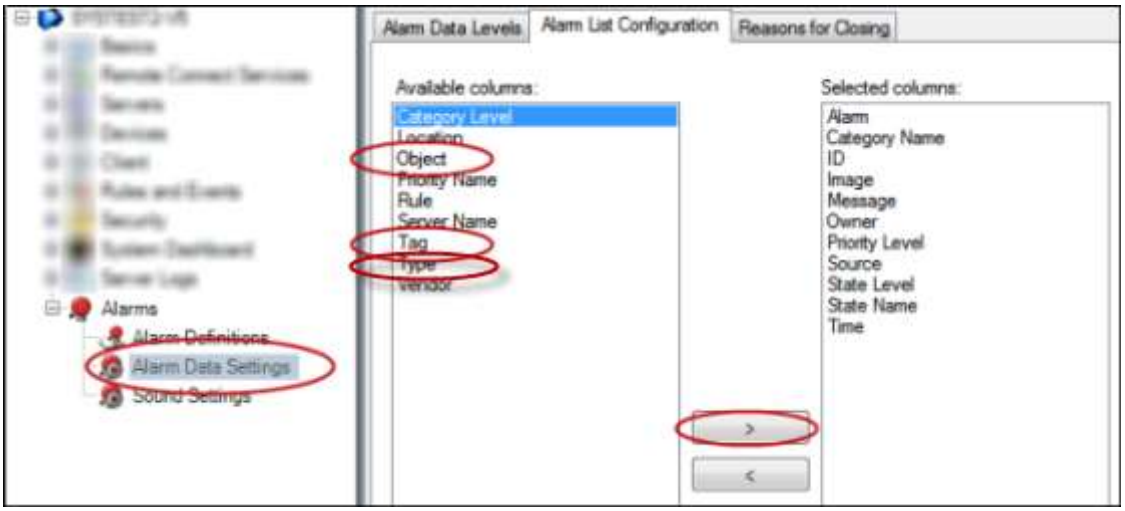
Alarm Data Settings for LPR

In the Management Application, you must make two specific **Alarm List Configuration** elements available for selection in XProtect Smart Client.

These two elements are used for configuring alarm lists in the **Alarm Manager** tab in XProtect Smart Client. The relevant elements are **Object**, **Tag**, and **Type**, which are essential for recognizing license plate numbers (Object) and country codes (Tag).

Do the following in the Management Application:

1. In the navigation pane, expand **Alarms**, select **Alarm Data Settings**.
2. On the **Alarm List Configuration** tab, select **Object**, **Tag**, and **Type** and click **>**.



3. If prompted, confirm to save changes.

LPR maintenance

About LPR Server Manager

When you have installed an LPR server, you can check the state of its services with the XProtect LPR Server Manager. You can, for example, start and stop the LPR Server Service, view status messages, and read log files.

- You access LPR server state information via the **LPR Server Manager** icon in the notification area of the **computer running the LPR server**.



Example: LPR Server Manager icon in notification area.

In the Management Application, you can get a full overview of the status of all your LPR servers (see "View LPR server information" on page 221).

Start and stop LPR Server Service

The LPR Server Service starts automatically after installation. If you have stopped the service manually, you can restart it manually.

1. Right-click the **LPR Server Manager** icon in the notification area.
2. From the menu that appears, select **Start LPR Server Service**.
3. If needed, select **Stop LPR Server Service** to stop the service again.

Show LPR server status

1. On your LPR server, right-click the **LPR Server Manager** icon in the notification area.
2. From the menu that appears, select **Show LPR server status**.

   If the system is running without problems, the status will is: *All LPR cameras running*.

   Other statuses are:

   - *Service not responding*
   - *Not connected to surveillance system*
   - *Service not running*
   - *Event Server not connected*
   - *Unknown error*
   - *X of Y LPR cameras running*

Show LPR server log

Log files are a useful tool for monitoring and troubleshooting the status of the LPR Server Service. All entries are time-stamped, with the most recent entries at the bottom.

1. In the notification area, right-click the **LPR Server Manager** icon.
2. From the menu that appears, select **Show LPR server Log File**.

   A log-viewer lists the server activities with time stamps.

Change LPR server settings

The LPR server must be able to communicate with your management server. To enable this, you specify the IP address or hostname of the management server during the installation of the LPR server.

If you need to change the address of the management server, do the following:

1. Stop (see "Start and stop LPR Server Service" on page 241) the LPR Server Service.
2. In the notification area, right-click the **LPR Server Manager** icon.
3. From the menu that appears, select **Change settings**. The **LPR Server Service settings** window appears.
4. Specify the new values and click **OK**.

5. Restart the LPR Server Service.

Uninstall XProtect LPR

If you want to remove XProtect LPR from your system, uninstall the two components separately using the regular Windows removal procedure:

- On the computers where the LPR plug-in is installed, uninstall *Milestone XProtect LPR [version] Plug-in.*
- On the computers where the LPR server is installed, uninstall *Milestone XProtect LPR [version] Server.*

Mobile server

About Mobile server

A Mobile server handles log-ins to the system from Milestone Mobile client from a mobile device or XProtect Web Client.

Upon correct login, the Mobile server distributes video streams from relevant recording servers to Milestone Mobile client. This offers an extremely secure setup, where recording servers are never connected to the Internet. When a Mobile server receives video streams from recording servers, it also handles the complex conversion of codecs and formats allowing streaming of video on the mobile device.

You must install the Mobile server on any computer from which you want to access recording servers. Before you begin the installation of the Mobile server, make sure you are logged in with an account that has administrator rights. Installation cannot complete successfully if you use a standard user account.

About direct streaming

By default, when your system transfers video from cameras to your system, the Milestone Mobile server decodes video images from the codec used on the camera into JPEG files. This decoding process is somewhat resource-intense for the Milestone Mobile server. Direct streaming allows the Milestone Mobile server to transfer the images to XProtect Web Client in the original codec format, and, thereby, reduce the strain on the Milestone Mobile server as no decoding is necessary.

Under the Milestone Mobile server's **General** Settings, you can enable direct streaming on the Milestone Mobile server to enable the use of direct streaming for users of the XProtect Web Client. However, administrators can also select to make it mandatory for all users to use direct streaming in XProtect Web Client. If administrators enable this setting, all users will always use direct streaming. If you enable mandatory direct streaming, all instances of Milestone Mobile client is no longer able to connect, so administrators should only use this setting if users strictly use the Milestone Mobile server to connect to XProtect Web Client.

To use direct streaming, you must install a plug-in on the PC on which you access XProtect Web Client. XProtect Web Client automatically asks users if they wish to install this plug-in (if they connect through a supported browser).

About using Video Push to stream video

You can set up Video Push so that users can keep others informed about a situation, or record video to investigate it later, by streaming video from their mobile device's camera to your XProtect surveillance system.

About saving configuration changes in XProtect Enterprise 8.1 and the XProtect Professional VMS products

The following applies to XProtect Enterprise 8.1, XProtect Professional 8.1, XProtect Express 1.1, XProtect Essential 2.1 and XProtect Go 2.1 software versions only.

If you are logged into the Milestone Mobile client and are watching one or more cameras views while at the same time changing configuration in the Management Application, the live video from the camera may freeze in the Milestone Mobile client if you click **File > Save** in the Management Application**.**

To avoid this scenario, you must restart the Milestone Mobile service manually. See the Windows Help for information about how to do this.

If you are using newer versions of XProtect, the Milestone Mobile service restarts with the other services and no user action is required.

Add or edit a Mobile server

1. Go to **Servers** > **Mobile Servers**. From the menu that appears, select **Create New**. Enter or edit the settings.

Important: If you edit settings for **Login method**, **All cameras view** and **Outputs and events** while you or others are connected to the Milestone Mobile client, you must restart the Milestone Mobile client for the new settings to take effect.

Set up Video Push to stream video

To let users stream video from their mobile devices to an XProtect surveillance system, set up Video Push on a Milestone Mobile server.

Perform these steps in the following order:

1. Set up a channel that the mobile device can use to stream video to the recording server.
2. Add the Video Push Driver as a hardware device on the recording server. The driver simulates a camera device so that you can stream video to the recording server.
3. Assign the Video Push Driver device to the channel.

Note: When you set up a channel for streaming, you specify a user name for an account that can access the Milestone Mobile server. To use Video Push, users must log in to Milestone Mobile on their mobile device by entering the user name and password for this account.

Set up a channel for streaming video

Note: Each channel requires a hardware device license.

To add a channel, follow these steps:

1. In the **Site navigation** pane, click the Milestone Mobile server.
2. On the **Video Push** tab, select the **Video Push** check box.
3. In the bottom right corner, click **Add** to add a video push channel under **Channels mapping**.
4. Enter the user name of the user account that will use the channel. This user account must be allowed to access the Milestone Mobile server and recording server.
5. Make a note of the port number. You will need it when you add the Video Push driver as a hardware device on the recording server.
6. Click **OK** to close the Video Push Channel dialog box and the save the channel.

Add the Video Push Driver as a hardware device on the recording server

1. In the **Site navigation** pane, click **Recording Servers**.
2. In the **Recording Server** pane, right-click the server that you want to stream video to, and click **Add Hardware** to open the Add Hardware wizard.
3. Select **Manual** as the hardware detection method, and then click **Next**.
4. Enter credentials for the camera, as follows:

- To use the factory default credentials from the camera factory, click **Next**. Typically, factory settings are used.
- If you have changed the credentials on the device, enter that information, and then click **Next**.

Note: These are the credentials for the hardware, not for the user. They are not related to the user name for the channel.

1. In the list of drivers, expand **Other**, select the **Video Push Driver** check box, and then click **Next**.

Note: The system generates a MAC address for the Video Push Driver device. We recommend that you use this address. Change it only if you experience problems with the Video Push Driver device. For example, if you need to add a new address and port number.

2. In the **Address** field, enter the IP address of the computer where Milestone Mobile server is installed.

3. In the **Port** field, enter the port number for the channel you created for streaming video. The port number was assigned when you created the channel.
4. In the **Hardware model** column, select **Video Push Driver**, and then click **Next**.
5. When the system detects the new hardware, click **Next**.
6. In the **Hardware name template** field, specify whether to display both the model of the hardware and the IP address, or the model only.
7. Specify whether to enable related devices by selecting the **Enabled** check box. You can add related devices to the list for **Video Push Driver**, even though they are not enabled. You can enable them later.

   Note: If you want to use location information when you stream video, you must enable the **Metadata** port.
8. Select the default groups for the related devices on the left, or select a specific group in the **Add to Group** field. Adding devices to a group can make it easier to apply settings to all devices at the same time or replace devices.

Add the Video Push Driver device to the channel for video push

1. In the **Site navigation** pane, click **Mobile Servers**, and the click the **Video Push** tab.
2. Click **Find Cameras**. If successful, the name of the Video Push Driver camera displays in the Camera Name field.
3. Save your configuration.

Remove a channel that you don't need

You can remove channels that you no longer use.

- Select the channel to remove, and then click **Remove** in the lower right corner.

Mobile server settings

General

The following table describes the settings on this tab.

Name	Description
Server name	Enter a name of the Milestone Mobile server.
Description	Enter an optional description of the Milestone Mobile server.
Mobile server	Choose between all Milestone Mobile servers currently installed to the specific system. Only Milestone Mobile servers that are running are shown in the list.
Login method	Select the authentication method to use when users log in to the server. You can choose between the following options: **Automatic**, **Windows authentication,** or **Basic authentication**.
Enable XProtect Web Client	Enable access to XProtect Web Client.
Enable all cameras view	Include the **All Cameras** view. This view displays all of the cameras that a user is allowed to view on a recording server.
Enable actions (outputs and events)	Enable access to actions in Milestone Mobile clients.
Enable keyframes	Stream only keyframes when streaming video. This uses less bandwidth.
Enable full-size images	Enable the Milestone Mobile server to send full-size images to the Milestone Mobile client or XProtect Web Client. Note that enabling full-size images uses more bandwidth. Additionally, enabling this option disables all rules set up in the **Performance** settings.
Enable direct streaming	Choose how to handle direct streaming in XProtect Web Client. Choose between enforcing the use of direct streaming, enforcing it when possible, or never enforcing it.
Enabled	Enable/disable logging of Milestone Mobile client's actions in a separate log file.
Log file location	Path to where log files are saved.
Keep logs for	Number of days to keep logs for (default three days).
Configuration backup	Import or export your Milestone Mobile server configuration. Your system stores the configuration in an XML file.

Server Status

See the status details for your Milestone Mobile server. The details are read-only:

Name	Description
Server active since	Shows how long the Mobile server has been running since it was last stopped.
CPU usage	Shows current CPU usage on the Mobile server.
Internal bandwidth	Shows the current bandwidth in use between the Mobile server and the relevant recording server.
External bandwidth	Shows the current bandwidth in use between the mobile device and Mobile server.
User Name column	Shows user name(s) of the Mobile server user(s) connected to the Mobile server.
State column	Shows the current relation between the Mobile server and the Milestone Mobile client user in question. Is the user connected (a state preliminary to servers exchanging keys and encrypting credentials) or is he/she actually logged in? Possible states are: **Connected** and **Logged In** XProtect.
Bandwidth Usage column	Shows the level of bandwidth used by the Mobile server client user in question.
Live Streams column	Shows the number of live video streams currently open for the Milestone Mobile client user in question.
Playback Streams column	Shows the number of playback video streams currently open for the relevant mobile client user.
Video Push streams	Shows the number of Video Push stream currently open for the relevant mobile client user.
Direct Streams	Shows the number of live video streams using Direct Streaming that are currently open for the relevant mobile user.

Video Push

You can specify the following settings if you enable Video push:

Name	Description
Video push	Enable Video push on the Mobile server.
Number of channels	Specify the number of enabled Video push channels in your XProtect system.
Channel column	Shows the channel number for the relevant channel. Non-editable.
Port	Port number for the relevant Video push channel.
MAC	MAC address for the relevant Video push channel.
User Name	Enter the user name associated with the relevant video push channel.
Camera Name	Shows the name of the camera if the camera has been identified.

Once you have completed all necessary steps (see "Set up Video Push to stream video" on page 244), click Find Cameras to search for the relevant camera.

Performance

On the **Performance** tab, you can set the following limitations on the Milestone Mobile server's performance:

Level 1

Level 1 is the default limitation placed on the Milestone Mobile server. Any limitations you set here are always applied to the Milestone Mobile's video stream.

Name	Description
Level 1	Select the check box to enable the first level of limitations to Milestone Mobile server performance.
Max FPS	Set a limit for the maximum number of frames per second (FPS) to send from the Milestone Mobile server to clients.
Max image resolution	Set a limit for the image resolution to send from the Milestone Mobile server to clients.

Level 2

If you would rather like to enforce a different level of limitations that the default one in **Level 1**, you can select the **Level 2** check box instead. You cannot set any settings higher than what you have set them to in the first level. If you, for example, set the Max FPS to 45 on **Level 1**, you can set the Max FPS on **Level 2** only to 44 or below.

Name	Description
Level 2	Select the check box to enable the second level of limitations to Milestone Mobile server performance.
CPU threshold	Set a threshold for the CPU load on the Milestone Mobile server before the system enforces video stream limitations.
Bandwidth threshold	Set a threshold for bandwidth load on the Milestone Mobile server before the system enforces video stream limitations.
Max FPS	Set a limit for the maximum number of frames per second (FPS) to send from the Milestone Mobile server to clients.
Max image resolution	Set a limit for the image resolution to send from the Milestone Mobile server to clients.

Level 3

You can also select a **Level 3** check box to create a third level for limitations. You cannot set any settings higher than what you have set them to in **Level 1** and **Level 2**. If you, for example, set the **Max FPS** to 45 on **Level 1** and to level 32 on **Level 2**, you can set the **Max FPS** on **Level 3** only to 31 or below.

Name	Description
Level 3	Select the check box to enable the second level of limitations to Milestone Mobile server performance.
CPU threshold	Set a threshold for the CPU load on the Milestone Mobile server before the system enforces video stream limitations.
Bandwidth threshold	Set a threshold for bandwidth load on the Milestone Mobile server before the system enforces video stream limitations.
Max FPS	Set a limit for the frames per second (FPS) to send from the Milestone Mobile server to clients.
Max image resolution	Set a limit for the image resolution to send from the Milestone Mobile server to clients.

The system does not instantly switch from one level to another level. If your CPU or bandwidth threshold goes less than five percent above or below the indicated levels, the current level stays in use.

Note that if you enable **Enable full-size images** on the **General** tab, none of the **Performance** levels are applied.

Log Settings

Fill in and specify the following log settings:

Name	Description
Enabled	Enable/disable logging of Milestone Mobile client's actions in a separate log file.
Log file location	Path to where log files are saved.
Keep logs for	Number of days to keep logs for (default three days).
CPU usage	Default level of CPU usage which will trigger a warning in the log.
Internal bandwidth	Default internal bandwidth usage which will trigger a warning in the log.
External bandwidth	Default external bandwidth usage which will trigger a warning in the log.
Check every	Default time frame (30 sec.) for checking warning levels.

Mobile Server Manager

About Mobile Server Manager

The Mobile Server Manager is a tray-controlled feature connected to the Mobile server. Right-clicking the Mobile Server Manager icon in the system tray opens a menu from which you can easily access Mobile server functionality.

You can:

- Open XProtect Web Client (see "Access XProtect Web Client" on page 20)
- Start, stop and restart the Mobile service (see "Start, stop and restart Mobile service" on page 254)
- Fill in or change surveillance server credentials (see "Fill in/edit surveillance server credentials" on page 253)
- Show/edit port numbers (on page 253)
- Edit certificate (on page 252)
- Open today's log file (see "About accessing logs and exports" on page 252)
- Open log folder (see "About accessing logs and exports" on page 252)
- Open export folder (see "About accessing logs and exports" on page 252)
- Show Mobile server status (see "About show status" on page 252)

About show status

Right-click the Mobile Server Manager and select **Show Status...** or double-click the Mobile Server Manager icon to open a window that shows the status of the Mobile server. You can see the following information:

Name	Description
Server running since	Time and date of the time when the Mobile server was last started.
Connected users	Number of users currently connected to the Mobile server.
Hardware decoding	Indicates if hardware accelerated decoding is in action on the Mobile server.
CPU usage	How many % of the CPU is currently being used by the Mobile server.
CPU usage history	A graph detailing the history of CPU usage by the Mobile server.

About accessing logs and exports

The Mobile Server Manager lets you quickly access the log file of the day, open the folder to which logs files are saved, and open the folder to which exports are saved.

To open any one of these, right-click the Mobile Server Manager and select **Open Today's Log File**, **Open Log Folder** or **Open Export Folder** respectively**.**

Important: If you uninstall Milestone Mobile from your system, its log files are not deleted. Administrators with proper rights can access these log files at a later timer, or decide to delete them if they are not needed any longer. The default location of the log files is in the ProgramData folder. If you change the default location of log files, existing logs are not copied to the new location nor are they deleted.

Edit certificate

If you want to use a secure HTTPS protocol to establish connection between a Mobile server and your mobile device or the XProtect Web Client, you must have a valid certificate for the device or web browser to accept it without warning. The certificate confirms that the certificate holder is authorized to establish the connection.

When you install the Mobile server, you generate a self-signed certificate if you run a **Typical** installation. If you run a **Custom** installation, you get the choice between generating a self-signed certificate or loading a file containing a certificate issued by another trusted site. If you, at a later point, want change the certificate you use, you can do this from the Mobile Server Manager.

1. Right-click the Mobile Server Manager and select **Edit Certificate...**
2. Choose whether you want to either:

- Generate a self-signed certificate or
- Load a certificate file.

Generate a self-signed certificate

1. Choose the **Generate a self-signed certificate** option and click **OK**.
2. Wait for a few seconds while the system installs the certificate.
3. Once finished, a window opens and informs you that the certificate was installed successfully. The Mobile service is restarted for the changes to take effect.

Locate a certificate file

1. Choose the **Load a certificate file** option.
2. Fill in the path for the certificate file or click the ... box to open a window where you can browse for the file.
3. Fill in the password connected to the certificate file.
4. When finished, click **OK**.

Note that HTTPS is not supported on Windows XP and Windows 2003 operating systems and works on Windows Vista or newer Windows OS only.

Fill in/edit surveillance server credentials

1. Right-click the Mobile Server Manager and select **Surveillance Server Credentials...**
2. Fill in the **Server URL**
3. Select what user you want to log in as:
   - Local system administrator (no credentials needed) or
   - A specified user account (credentials needed)
4. If you have chosen a specified user account, fill in **User Name** and **Password**.
5. When finished, click **OK**.

Show/edit port numbers

1. Right-click the **Mobile Server Manager** and select **Show/Edit Port Numbers...**
2. To edit the port numbers, type the relevant port number. You can indicate a standard port number (for HTTP connections) and/or a secured port number (for HTTPS connections).
3. When you are done, click **OK**.

Start, stop and restart Mobile service

If needed, you can start, stop and restart the Mobile service from the Mobile Server Manager.

- To perform any of these tasks, right-click the **Mobile Server Manager** and select **Start Mobile service**, **Stop Mobile service** or **Restart Mobile service** respectively**.**

Alarms

About alarms

The Alarms feature is a Milestone Integration Platform (MIP)-based feature that uses functionality handled by the event server. It provides central overview and control of alarms in any number of system installations throughout your organization.

You can configure alarms to be generated based on either:

- **Internal events (system-related):** for example, motion, server responding/not responding, archiving problems, lack of disk space, and more.
- **External events (integrated):** for example, MIP plug-in events.

The Alarms feature also handles general alarms settings and alarm logging.

Configuring alarms

An alarm configuration may include:

- Dynamic setup of alarm handling based on users access rights
- Central overview of all components: servers, cameras, and external units
- Setup of central logging of all incoming alarms and system information
- Handling of plug-ins, allowing customized integration of other systems, for example external access control systems.

Viewing alarms

The following can play a role with regards to alarms and who can view/control/manage them and to what degree. This is because alarms are controlled by the visibility of the object causing the alarm.

- Source/device visibility: if the device causing the alarm is not set to be visible to the user, the user cannot see the alarm in the alarm list in XProtect Smart Client.
- Right to trigger manually defined events: if manually defined events are available in your system, these can determine if the user can trigger selected manually defined events in XProtect Smart Client.

- External plug-ins: if any external plug-ins are set up in your system, these may control user's rights to handle alarms.
- General access rights: can determine whether the user is allowed to (only) view or also to manage alarms.

Time profiles for alarms

Alarms can be based on time profiles (for alarms) (see "Add a time profile (for alarms)" on page 256). Time profiles for Alarms are periods of time to use when you create alarm definitions. You can, for example, create a time profile for alarms covering the period from 2.30 PM till 3.30 PM on Mondays and use that time profile to make sure that certain alarm definitions are only enabled within this period of time.

Alarms and XProtect Central

The alarms feature covers almost the same functionality as XProtect Central and configuration of XProtect Central functionality is now included in the alarms feature.

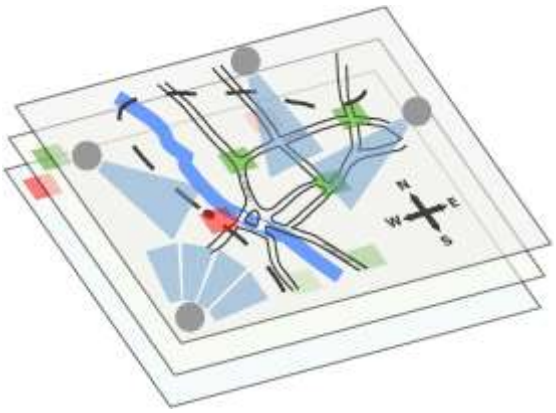
XProtect Central was an independent product consisting of two parts: a dedicated server and a number of dedicated clients. Alarms, on the other hand, is an integrated part of your system. This means that much configuration needed in XProtect Central has become redundant with the introduction of Alarms. Client-wise, the Alarms feature uses XProtect Smart Client. However, you must still configure the features Alarms, Time Profiles (for Alarms) and General Settings in the Management Application. These features are very similar to XProtect Central. You cannot reuse old alarm and map definitions from XProtect Central. You must redefine your alarms and maps definitions in the Alarms feature.

Alarms appear in the alarm list in XProtect Smart Client. Here, you can view and manage alarms to ease overview and to delegate and handle alarms. You can, for example reassign alarm, change their status or comment on alarms.

You can integrate alarms with the map functionality (see "About maps" on page 256). The Alarms feature is a powerful monitoring tool, providing instant overview of alarms and possible technical problems.

About maps

With maps as an integrated part of alarms, you get a physical overview of your surveillance system: with the possibility to assign cameras to a map, you can always tell where alarms originate, which cameras are placed where, and in what direction are they pointing. Also, you can use maps to navigate from large perspectives to detailed perspectives, and vice versa: for example, a state map can have hot zones (small icons on the map) that point to more detailed maps of cities, neighborhoods, streets, floor plans, and so on.



Example: Hierarchy of maps

All user-interaction with maps, including adding and maintaining maps, takes place in XProtect Smart Client. For detailed information, see the XProtect Smart Client documentation. In order to use maps, the Event Server service must be running. The Event Server service is automatically included if you run a Typical installation of your surveillance server installation (see "Install your system software" on page 34).

Add an alarm

To add/configure an alarm:

1. Expand **Alarms**, right-click **Alarm Definition** and select **Create New**.
2. Specify required properties (see "Alarms definition" on page 257). Click **OK**.
3. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

For a detailed overview of Alarms and how the feature works, see About alarms (on page 254).

Add a time profile (for alarms)

Time profiles are periods of time used for the Alarms feature only.

To add a time profile for an alarm, do the following:

1. Expand **Alarms**, right-click **Time Profiles**, and select **Create New**. The small month overview in the top right corner of the **Time Profile Properties** window

can help you get a quick overview of the time periods covered by the time profile, as dates containing specified times are highlighted in bold.

2. In the calendar, select the **Day View**, **Week View**, or **Month View** tab, then right-click inside the calendar and select either Add Single Time... or **Add Recurring Time...**.
3. If you select **Add Single Time...**, specify **Start time** and **End time**. If the time is to cover whole days, select the **All-day event** box.
   —or—
   If you select **Add Recurring Time...**, specify time range, recurrence pattern, and range of recurrence. Click **OK**.
4. Save your configuration changes by clicking **Save** in the yellow notification bar in the upper-right corner of the Management Application.

When you edit an existing time profile, remember that a time profile may contain more than one time period, and that time periods may be recurring.

Analytics events are typically data received from external third-party video content analysis (VCA) providers. An example of a VCA-based system could be an access control system.

Alarms properties

Alarms definition

When you configure Alarm definitions (see "Add an alarm" on page 256), specify the following:

Name	Description
Enable	Enables the Alarms feature.
Name	Enter a name. The alarm's name appears whenever the alarm is listed. Alarm names do not have to be unique.
Description	Enter a description (optional).
Triggering event	This first list shows both system-related events and events from plug-ins (for example access control systems or similar). From the second list, select the event message to use when the alarm is triggered.
Sources	Select which cameras and/or other devices the event should originate from in order to trigger the alarm. Plug-in defined sources, for example license plate recognition, access control systems and MIP-plugins appear in the list if installed. Your options depend upon which type of event you have selected.
Time profile	If you select **Time profile**, you must select when the alarm should be enabled for triggering. If you have not defined alarm time profiles (see "Add a time profile (for alarms)" on page 256), you will only be able to select **Always**. If you have defined one or more time profiles, they will be selectable from this list.
Event based	If you select **Event based**, you must select which events should start and stop the alarm. Events available for selection are hardware events defined on cameras, video servers and input. You can also use global/manual event definitions (see "Add a manual event" on page 129). Note that when you select **Event based**, you cannot define alarms based on outputs—only on inputs.
Time Limit	Select the time-limit within which the operator must respond to the alarm.
Events triggered	Select the event to be triggered if the operator does not react withing the time limit specified in **Time limit**. This could be, for example, sending an email, SMS or similar.
Related cameras	Select (a maximum of 15) cameras for inclusion in the alarm definition even though they are not themselves triggering the alarm. This can be relevant, for example, if you have selected an external event message (such as a door being opened) as the source of your alarm. By defining one or more cameras near the door, you could attach the cameras' recordings of the incident to the alarm.

Name	Description
Related map	Associate a map with the alarm definition. The selected map displays when XProtect Smart Client shows the alarm so that you can quickly identify where the alarm was triggered.
Initial alarm owner	Select a default user responsible for the alarm. You can only select from users allowed to view **all** cameras and/or other devices selected as source(s) for the event causing the alarm.
Initial alarm priority	Select a priority (**High**, **Medium** or **Low**) for the alarm. Priorities can be used for sorting purposes and workflow control in XProtect Smart Client.
Initial alarm category	Select a category to which the alarm should initially be assigned. This could be, for example, **Building01**, **Burglary**, **ElevatorEast** or similar, depending on which categories have been defined.
Event triggered by alarm	Define an event to be triggered by the alarm in XProtect Smart Client (if needed).
Auto-close alarm	Select if the alarm should automatically be closed upon a particular event. This is possible for alarms triggered by some (but not all) events.

See also Alarm data settings (on page 259) and Alarm sound settings (see "Sound settings" on page 261) for further information on how to configure alarm settings.

Alarm data settings

When you configure alarm data settings, specify the following:

Alarm Data Levels tab, Priorities

Name	Description
Level	Add new priorities with level numbers of your choosing or use/edit the default priority levels (numbers **1**, **2** or **3**). These priority levels are used to configure the **Initial alarm priority** setting (see "Alarms definition" on page 257).
Name	Type a name for the entity. You can create as many as you like.
Sound	Select the sound to be associated with the alarm. Use one if the default sounds or add more in Sound Settings (on page 261).

Alarm Data Levels tab, States

Level	In addition to the default state levels (numbers **1**, **4**, **9** and **11**, which can not be edited or reused), add new states with level numbers of your choosing. These state levels are only visible in XProtect Smart Client's **Alarm List**.
Name	Type a name for the entity. You can create as many as you like.

Alarm Data Levels tab, Categories

Level	Add new categories with level numbers of your choosing. These category levels are used to configure the **Initial alarm category** setting (see "Alarms definition" on page 257).
Name	Type a name for the entity. You can create as many as you like.

Alarm List Configuration tab

In **Available columns**, use **>** to select which columns should be available in the XProtect Smart Client **Alarm List**. Use **<** to clear selection. When done, **Selected columns** should contain the items to be included.

Reasons for Closing tab**Enable**	Select to enable that all alarms must be assigned a reason for closing before they can be closed.
Reason	Add reasons for closing that the user can choose between when closing alarms. Examples could be "**Solved-Trespasser**" or "**False Alarm**". You can create as many as you like.

Sound settings

When you configure Sound Settings, specify the following:

Name	Description
Sounds	Select the sound to be associated with the alarm. The list of sounds contain a number of default Windows sounds. These cannot be edited. However, you can add new sounds of the file type .wav, but only if these are encoded in Pulse Code Modulation (PCM). Although the default sounds are standard Windows sound-files, local Windows settings might cause these to sound different on different machines. Some users might also have deleted one or more of these sound-files and will therefore be unable to play them. To ensure an identical sound all over, you should import and use your own .wav files encoded in PCM.
Add	Lets you add sounds. Browse to the sound to upload one or several .wav files.
Remove	Remove a selected sound from the list of manually added sounds. Default sounds cannot be removed.
Test	Lets you test the sound. In the list, select the sound. The sound will be played once.

Time profile

When you configure Time profiles (see "Add a time profile (for alarms)" on page 256), specify the following:

Component	Requirement
Name	Type a name for the time profile.
Description	Enter a description (optional).
Add Single Time	Right-click the calendar and select **Add Single Time**. Specify **Start time** and **End time**. If the time covers whole days, select **All-day event**.
Add Recurring Time	Right-click the calendar and select **Add Recurring Time**. Specify the time range, recurrence pattern, and range of recurrence.
Edit Time	Right-click the calendar and select **Edit Time**. Specify **Start time** and **End time**. If the time covers whole days, select **All-day event**. When you edit an existing time profile, remember that a time profile may contain more than one time period, and that time periods may be recurring. If you want your time profile to contain additional periods of time, add more single times or recurring times.

MIP plug-ins

About MIP plug-ins

MIP (Milestone Integration Platform) plug-ins are add-ons you can install to your system. If you install a MIP plug-in, you can find information about the plug-ins here. Some MIP plug-ins can be Milestone add-on products. If you have installed an add-on product, you can also see the number of add-on product licenses you have bought and how many of them you have activated.

You can assign MIP-related user rights to users and user groups. See Configure user and group rights (on page 195).

XProtect Transact

XProtect Transact introduction

About XProtect Transact

XProtect Transact is an add-on to Milestone's IP video surveillance solutions XProtect Advanced VMS and XProtect Professional VMS.

XProtect Transact is a tool for observing ongoing transactions and investigating transactions in the past. The transactions are linked with the digital surveillance video monitoring the transactions, for example to help you prove fraud or provide evidence against a perpetrator. There is a 1-to-1 relationship between the transaction lines and video images.

The transaction data may originate from different types of transaction sources, typically point of sales (PoS) systems or automated teller machines (ATM).

XProtect Transact system architecture

There are several components in the XProtect Transact communication flow. The input data originates from the video surveillance cameras and the transaction sources providing the transaction data, for example cash registers or ATMs. The transaction data is stored on the event server, whereas the video stream is stored on the recording server. From the servers, the data is passed on to XProtect Smart Client.

If you are using Advanced VMS, there may be several recording servers.

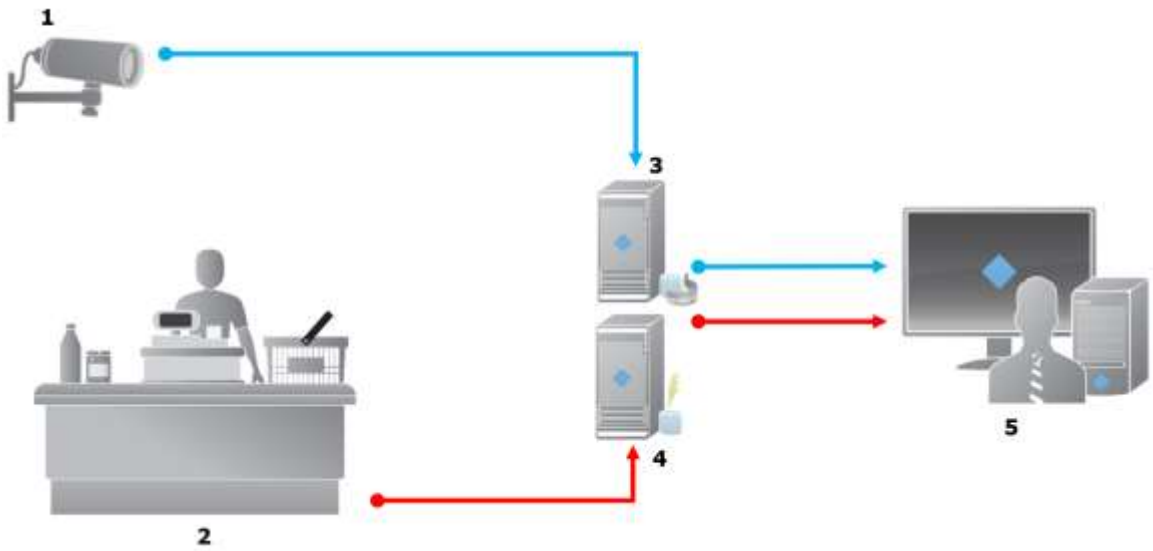


Illustration:

- 1 = Camera.
- 2 = Cash register.
- 3 = Recording server.
- 4 = Event server.
- 5 = Smart Client.
- The blue arrows outline video recordings from the surveillance system.
- The red arrows outline transaction data from the transaction sources.

By standard, XProtect Transact supports two types of transaction sources:

- Serial port clients.
- TCP server clients.

Additional types of transaction sources may be supported through custom connectors developed with the MIP software development kit (SDK), for example a connector that retrieves transaction data from an enterprise resource planning (ERP) system.

About connectors

A connector facilitates import of raw transaction data from the transaction source, for example the ATM, into the event server associated with the video management software.

The built-in connectors available are described in the table:

Name	Description
TCP client connector	Use when the transaction source delivers the transaction data through a TCP server interface. This connector has two settings that you can specify: host name and port number.
Serial port connector	Use when receiving transaction data as input on a serial port on the event server.

Connectors developed through the MIP software development kit may also be available.

See also

Add transaction source (wizard)

About transaction definitions

A transaction definition is a group of settings that help you control how raw data from the transaction sources are displayed in XProtect Smart Client together with the video recordings. The output is a reader-friendly format that resembles real-life receipts, for example till receipts and receipts from automated teller machines.

More specifically, transaction definitions let you:

- define when the individual transactions begin and end.
- insert line breaks as required.
- filter out unwanted characters or text strings, for example if the data comes from a printer connection and contains unprintable characters for indicating line breaks, when to cut off a till receipt.
- substitute characters with other characters.

You can use the same transaction definition on multiple transaction sources.

See also

Add transaction definitions

About transaction events

A transaction event is the occurrence of specific words, numbers, or characters in the stream of transaction data that flows from the transactions sources, for example the cash registers, to the event server. As a system administrator, you need to define what the events are. This allows the operator to track and investigate transaction events in XProtect Smart Client. For each event, a method (match type) must be specified to identify strings in the transaction data: exact match, wildcard, or regular expression.

See also

Define a transaction event (see "Define transaction events" on page 273)

Create a transaction alarm (see "Create alarms based on transaction events" on page 275)

Compatibility

XProtect Transact 2016 is compatible with version 2016 of these products:

- XProtect Enterprise
- XProtect Professional
- XProtect Express.

Getting started

The XProtect Transact functionality is standard in Management Application. Before using the XProtect Transact features in XProtect Smart Client, you should:

1. verify that your base license for XProtect Transact has been activated. In addition, verify that you have a transaction source license for each transaction source that you need to monitor. License information is available under the **MIP Plugins** node.

If you do not have the sufficient number of transaction source licenses, make sure that you acquire additional licenses before the 30 days grace period expires.

2. add and configure the sources providing the transaction data, for example the cash registers. For more information, see Add transaction source (wizard) (on page 266).
3. (optional) define the transaction events and potentially configure them to trigger rules or alarms. In XProtect Smart Client, the operator can investigate the transaction events.

Even if you have not purchased any XProtect Transact licenses, you can try out XProtect Transact with a trial license. For more information, see XProtect Transact trial license (on page 266).

See also

Setting up transactions

Setting up events (see "Setting up transaction events and alarms" on page 273)

XProtect Transact trial license

With an XProtect Transact trial license, you can try out the XProtect Transact functionality up to 30 days. All related features are enabled, and you can add one transaction source, for example a cash register. When the 30 days trial period expires, all XProtect Transact features are deactivated, including the **Transact** workspace and transaction view items. By purchasing and activating an XProtect Transact base license and the transaction source licenses you need, you can use XProtect Transact again, and your settings and data are maintained.

If you are using products from the Advanced VMS product suite, you need to acquire the trial license from Milestone. The system administrator must activate the trial license in the configuration.

If you are using products from the Professional VMS product suite, the trial license is a built-in license. The trial license is activated when the system administrator adds a transaction source in the configuration.

XProtect Transact configuration

Setting up transactions

In this section, you will learn how to add and configure the transaction sources, and how to create the transaction definitions.

Add transaction source (wizard)

To connect data from a transaction source to XProtect Transact, you need to add the sources of the transactions, for example an automated teller machine. In the wizard, you select a connector, and you can connect one or more cameras.

If you do not have a transaction source license for the transaction source you are about to add, the system will work during the 30 days grace period. Make sure that you acquire an additional transaction source license and activate it in due time.

Steps:

1. In the navigation pane, expand **Transact**.
2. Right-click the **Transaction sources** node and select **Add source**. The wizard appears.
3. Follow the steps in the wizard.
4. Depending on the connector you select, different fields appear that you need to fill in. For more information, see Transaction sources (properties) (on page 267). You can change these settings after completing the wizard.
5. If the transaction definition you need is not available, click **Add new** to create a new transaction definition.

See also

Add transaction definitions

About connectors

Transaction sources (properties)

The settings for transaction sources are described in the table.

Name	Description
Enable	If you want to disable the transaction source, clear this check box. The stream of transaction data stops, but the data already imported remains on the event server. You can still view transactions from a disabled transaction source in XProtect Smart Client during its retention period. Even a disabled transaction source requires a transaction source license.
Name	If you want to change the name, enter a new name here.
Connector	You cannot change the connector you selected when you created the transaction source. To select a different connector, you need to create a new transaction source, and during the wizard, select the connector you want.
Transaction definition	You can select a different transaction definition that defines how to transform the transaction data received into transactions and transaction lines. This includes defining: • when a transaction begins and ends. • how transactions are displayed in XProtect Smart Client.
Retention period	Specify, in days, for how long transaction data is maintained on the event server. The default retention period is 30 days. When the retention period expires, automatically the data is deleted. This is to avoid the situation, where the storage capacity of the database is exceeded. The minimum value is 1 day, whereas the maximum value is 1000 days.
TCP client connector	If you selected **TCP client connector**, specify these settings: • **Host name**: enter the host name of the TCP server associated with the transaction source. • **Port**: enter the port name on the TCP server associated with the transaction source.

Name	Description
Serial port connector	If you selected **Serial port connector**, specify these settings and make sure that they match the settings on the transaction source: • **Serial port**: select the COM port. • **Baud rate**: specify the number of bits transmitted per second. • **Parity**: specify the method for detecting errors in the transmissions. By default, **None** is selected. • **Data bits**: specify the number of bits used to represent one character of data. • **Stop bits**: specify the number of bits to indicate when a byte has been transmitted. Most devices need 1 bit. • **Handshake**: specify the handshaking method determining the communication protocol between the transaction source and event server.

See also

Add transaction source (wizard) (on page 266)

Add transaction definitions

Add transaction definitions

As part of defining a transaction source, you specify a definition for the source. A definition transforms the raw data received into presentable data, so that users can view the data in XProtect Smart Client in a format that matches real-life receipts. This is necessary, because typically the raw data consists of a single string of data, and it can be difficult to see where the individual transactions begin and end.

Steps:

1. In the navigation pane, expand **Transact**.
2. Select **Transaction definitions**.
3. Right-click **Transaction definition** and select **Add new**. A number of settings appear in the **Properties** section.
4. Use the **Start pattern** and **Stop pattern** fields to specify what data defines the start and end of a receipt.
5. Click **Start collecting data** to collect raw data from the connected data source. The more data you collect, the smaller the risk of missing characters, for example control characters, you want to replace or omit.

6. In the **Raw data** section, highlight the characters you want to replace or omit. If you want to type the characters manually, skip this step and click **Add filter**.
7. Click **Add filter** to define how the selected characters from the transaction source data are displayed in XProtect Smart Client.
8. For each filter, select an action to determine how the characters are transformed. The **Preview** section gives you a preview of how data is presented with the filters defined.

For detailed information about the fields, see Transaction definitions (properties).

You can also load previously collected data stored locally on your computer. To do this, click **Load from file**.

Transaction definitions (properties)

The settings for transaction definitions are described in the table.

Name	Description
Name	Type a name.
Encoding	Select the character set used by the transaction source, for example the cash register. This helps XProtect Transact convert the transaction data to understandable text that you can work with when configuring the definition. If you select the wrong encoding, the data may appear as non-sense text.
Start collecting data	Collect transaction data from the connected transaction source. You can use the data to configure a transaction definition. Wait for at least one, but preferably more, transactions to complete.
Stop collecting data	When you have collected sufficient data to configure the definition, click this button.
Load from file	If you want to import data from an already existing file, click this button. Typically this is a file that you have created previously in the file format .capture. It can be other file formats. What is important here is that the encoding of the import file matches the encoding selected for the current definition.
Save to file	If you want to save the collected raw data to a file, click this button. You can reuse it later.

Name	Description
Match type	Select the match type to use to search for the start mask and the stop mask in the collected raw data: • Use exact match: The search identifies strings that contain exactly what you have entered in the **Start mask** and **Stop mask** fields. • Use wildcards: The search identifies strings that contain what you have entered in the **Start mask** and **Stop mask** fields in combination with a wild card symbol (*, #, ?). * matches any number of characters. For example, if you have entered "Start tra*tion", the search identifies strings that contain "Start transaction". # matches exactly 1 digit. For example, if you have entered "# watermelon", the search identifies strings that contain, for example, "1 watermelon". ? matches exactly 1 character. For example, you may use the search expression "Start trans?ction" to identify strings that contain "Start transaction". • Use regular expression: Use this match type to identify strings that contain specific notation methods or conventions, for example a date format or credit card number. For more information, see the Microsoft website https://msdn.microsoft.com/en-us/library/az24scfc(v=vs.110).aspx.
Raw data	Transaction data strings from the connected transaction source are displayed in this section.
Start mask	Specify a start mask to indicate where a transaction begins. Horizontal lines are inserted in the **Preview** field to visualize where the transaction starts and ends, and will help to keep individual transactions separated.
Stop mask	Specify a stop mask to indicate where a transaction ends. A stop mask is not mandatory, but is useful if the received data contains irrelevant information, such as information about opening hours or special offers, between actual transactions. If you do not specify a stop mask, the end of the receipt is defined in terms of where the next receipt starts. The start is determined by what is entered in the **Start mask** field.

Name	Description
Add filter	Use the **Add filters** button to point out the characters that you want to be omitted in XProtect Smart Client or replaced by other characters or a line break. Replacing characters is useful when the transaction source string contains control characters for non-printing purposes. Adding lines breaks is necessary to make receipts in XProtect Smart Client resemble the original receipts.
Filter text	Displays the characters currently selected in the **Raw data** section. If you are aware of characters that you want to be omitted or replaced, but they do not occur in the collected raw data string, you can enter the characters manually in the **Character** field. If the character is a control character, you need to enter its hexadecimal byte value. Use this format for the byte value: {XX} and {XX,XX,...} if a characters consists of more bytes.
Action	For each filter you add, you should specify how the characters you have selected are handled: • Omit: the characters you select are filtered out. • Substitute: the characters you select are replaced with the characters you specify. • Add line break: the characters you select are replaced by a line break.
Substitution	Type the text to replace the characters selected. Only relevant if you have selected the action **Substitute**.
Preview	Use the **Preview** section to verify that you have identified and filtered out unwanted characters. The output you see here resembles what the real-life receipt looks like in XProtect Smart Client.

See also

Add transaction definitions

Setting up transaction events and alarms

In this section, you will learn how to define the transaction events and set up alarms.

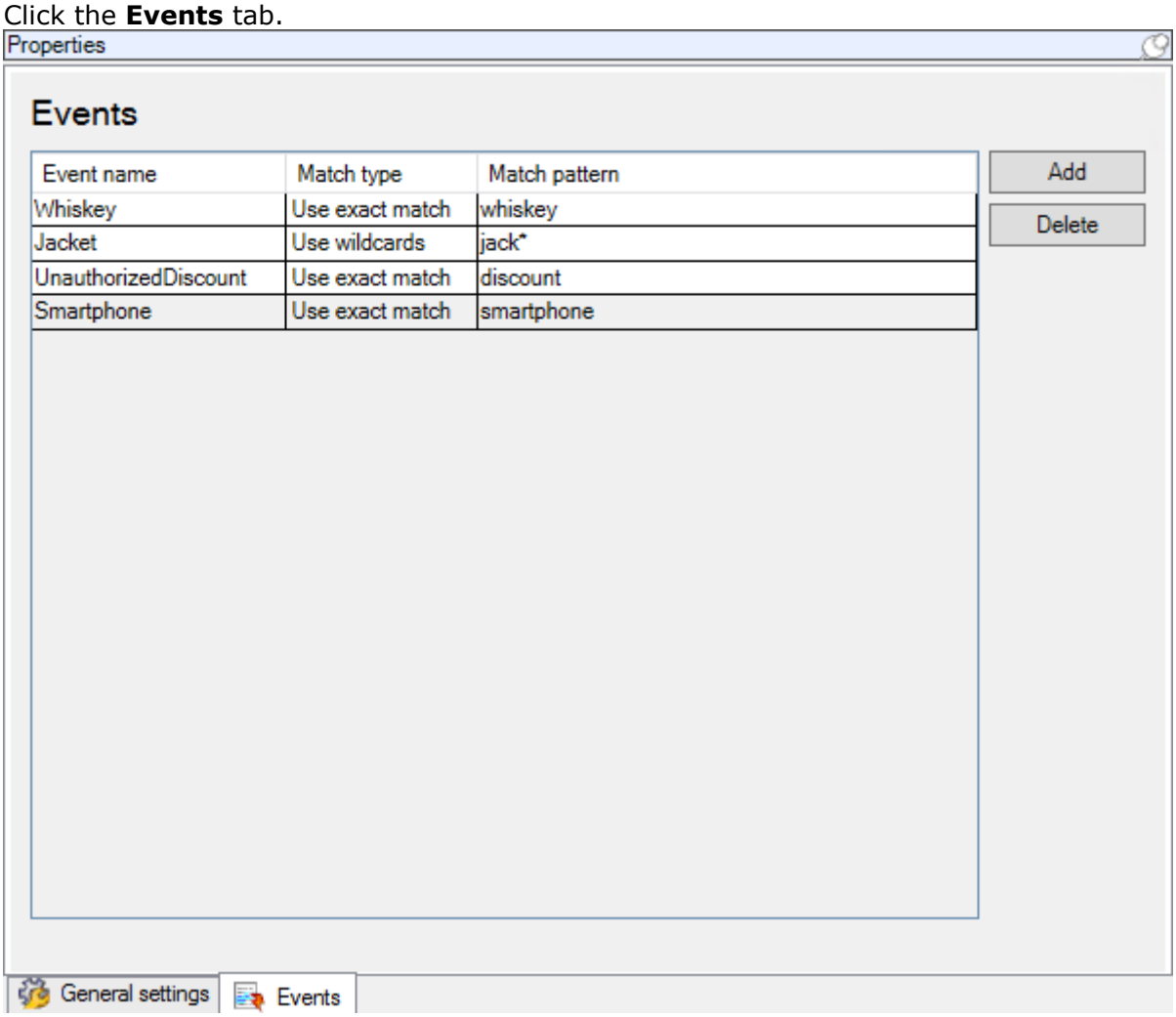
Define transaction events

To track and investigate transaction events in XProtect Smart Client, first you need to define what the events are, for example the acquisition of a smartphone. You define

transaction events on a transaction definition, so that the events defined apply to all transaction sources, for example cash registers, that use the transaction definition.

Steps:

1. In the navigation pane, expand **Transact**.
2. Select the transaction definition, where you want to define an event.
3. Click the **Events** tab.



4. In the **Properties** pane, click **Add**. A new line is added.
5. Type a name for the event.
6. Select the match type to use to identify a specific string in the transaction data as an event. You can choose between exact match, wildcard symbols, and regular expressions. For more information, see the description of match type in Transaction definitions (properties).
7. In the **Match pattern** column, specify what you want the system to identify as an event, for example "smartphone".

8. For each event, repeat the steps above.

See also

About rules and events

About transaction definitions (on page 264)

Create alarms based on transaction events

To notify the XProtect Smart Client operator whenever a specific transaction event occurs, first you need to create a transaction alarm in Management Application. The alarm will appear on the **Alarm Manager** tab in XProtect Smart Client allowing the operator to investigate the event and, if required, take action.

Steps:

1. In the navigation pane, expand **Alarms**.
2. Right-click the **Alarm Definitions** node and select **Add New...**. The settings in the **Properties** pane become active.
3. Type a name for the alarm and, in the **Description** field, possibly also instructions for XProtect Smart Client operator on what action to take.
4. In the **Triggering event** drop-down menu, select **Transaction events.**
5. In the drop-down menu below **Transaction events**, select the specific event.
6. In the **Sources** field, click the **Select...** button. A pop-up window appears.
7. Click the **Servers** tab and select the transaction source.
8. Specify additional settings. For more information, see Alarm Definitions.

See also

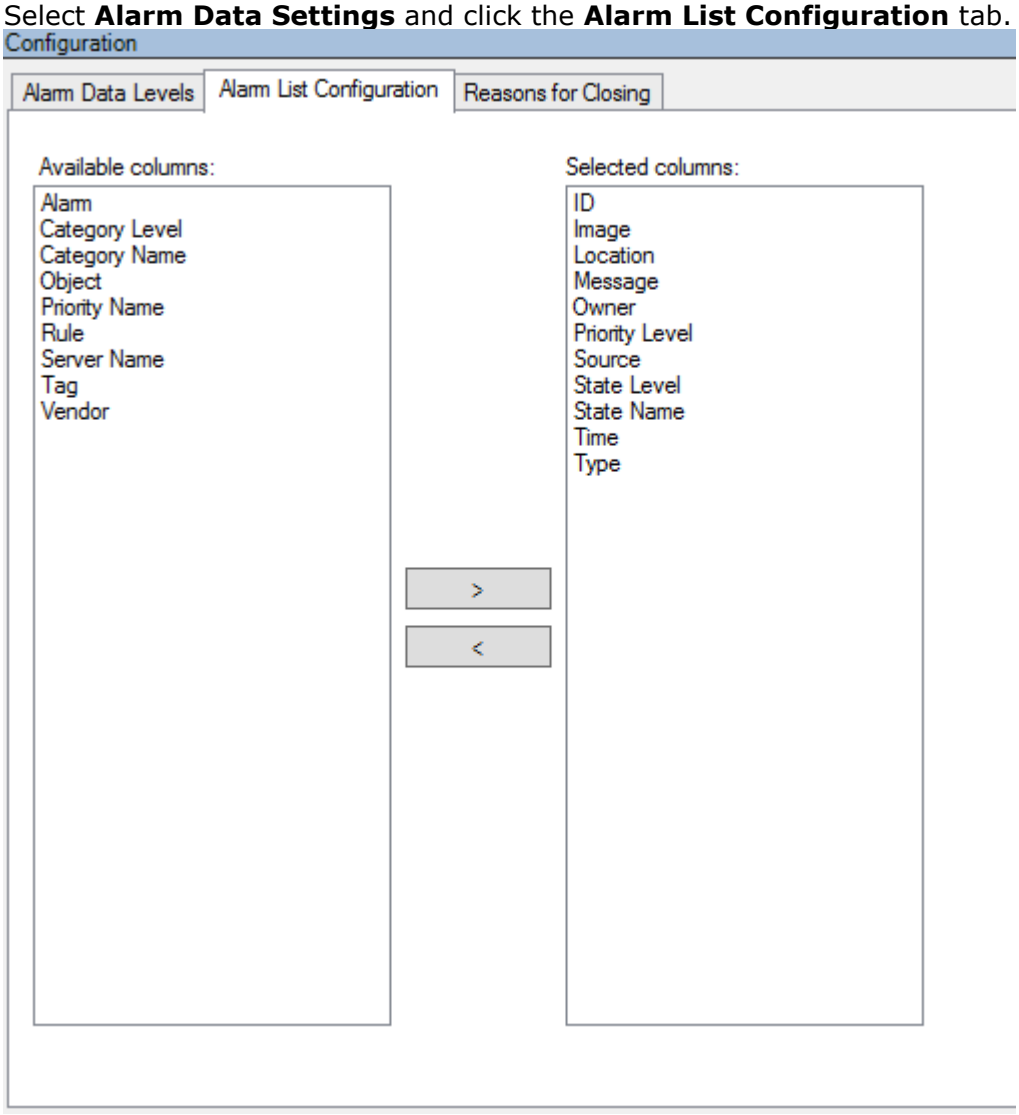
Define transaction events (on page 273)

Enable filtering of transaction events or alarms

If you want the XProtect Smart Client operator to be able to filter events or alarms by transactions, first you need to enable the **Type** field in Management Application. Once enabled, the field is available in the filter section on the **Alarm Manager** tab in XProtect Smart Client.

Steps:

1. In the navigation pane, expand **Alarms**
2. Select **Alarm Data Settings** and click the **Alarm List Configuration** tab.



3. In the **Available columns** section, select the **Type** field.
4. Add the field to **Selected columns**.
5. Save the changes. Now, the field is available in XProtect Smart Client.

Maintaining transaction setup

In this section, you will learn how to edit, disable, and delete transaction sources.

Edit transaction source settings

After adding a transaction source, you can change the name or select a different transaction definition. Depending on the connector selected, there may be additional settings you can modify, for example the host name and port number of a connected TCP

server. In addition, you can disable a transaction source. This will interrupt the flow of transaction data from the transaction source to the event server.

Once you have selected a connector, you cannot change it.

Steps:

1. In the navigation pane, expand **Transact**.
2. Select **Transaction sources**.
3. Right-click the transaction source and select **Properties**
4. Make the required changes and save them. For more information, see Transaction sources (properties) (on page 267).

See also

Add transaction source (wizard)

Disable transaction sources (on page 277)

Disable transaction sources

You can disable a transaction source, for example if an ATM is temporarily out of order, or a service on a registered cash register is disabled. The flow of transaction data to the event server is disrupted.

Steps:

1. In the navigation pane, expand **Transact**.
2. Select **Transaction sources**.
3. Right-click the transaction source and select **Properties**
4. Clear the **Enable** check box and save the changes. The transaction source is disabled.

See also

Add transaction source (wizard)

Delete transaction source (see "Delete transaction sources" on page 277)

Delete transaction sources

You can delete the transaction sources you have added. The stored transaction data from that source is deleted from the event server.

As an alternative, you can disable the transaction source to avoid that stored transaction data is deleted. A disabled transaction source also requires a transaction source license.

Steps:

1. In the navigation pane, expand **Transact**.

2. Select **Transaction sources**.
3. Click the **Transaction sources** item. Right-click the source you want to delete.
4. Select **Delete**. A dialog box appears.
5. Click **OK** to confirm that you want to delete the transaction source.

See also

Add transaction source (wizard)

Verify XProtect Transact configuration

When you are done configuring XProtect Transact and its components, you can test that Transact works as expected in XProtect Smart Client.

1. Verify that the all required transaction sources have been added correctly in Management Application:
    1. Open XProtect Smart Client and click the **Transact** tab.
    2. Click the **All sources** drop-down menu and verify that all the transaction sources appear.
2. Verify that the transaction definitions have been configured correctly in Management Application. If configured correctly, there is one receipt per transaction, and the lines break correctly:

1. Open XProtect Smart Client and click the **Transact** tab.
    2. Select a transaction source that you know is active and click . The transaction lines for today appear.
    3. Click a line to view the associated receipt and video recordings.
3. Verify that transaction events are configured correctly:

1. Define a transaction test event in Management Application, for example an item that is likely to be purchased and registered on a connected transaction source, for example a cash register.
    2. When the event has occurred, open XProtect Smart Client and click the **Alarm Manager** tab.
    3. Open the alarm list and select **Event**. The most recent events are displayed at the top of the list. The test event you created should appear in the list.

Settings

About automatic device discovery

Automatic device discovery allows you to automatically add hardware devices to your system as soon as you connect these to your network. When you enable automatic device discovery, your system configures and sets up hardware devices automatically without the need for any user interaction, making the hardware devices instantly accessible in XProtect Smart Client's default view after the automatic installation has completed.

Note that:

- Not all hardware devices support automatic device discovery.
- Hardware devices respond differently to automatic device discovery. The system adds some hardware devices (such as Axis models P3301 and P3304) to the system automatically, while you must turn off some devices from other vendors (such as Sony models SNC-EB520, EM520 and E521) and back on again before they are automatically added to your system.
- If your system is not online, remember to activate your hardware device licenses offline.

Change default file paths

To change any of the default file paths:

1. If you want to change the configuration path, stop all services. This step is not necessary if you want to change the default recording or archiving path.
2. Go to **Options** > **Default File Paths...**
3. You can now overwrite the necessary paths. Alternatively, click the browse button next to the field and browse to the location. For the default recording path, you can only specify a path to a folder on a **local** drive. If you are using a network drive, you cannot save recordings if the network drive becomes unavailable.

   If you change the default recording or archiving paths and there are existing recordings at the old locations, you must select whether you want to move the recordings to the new locations (recommended), leave them at the old locations, or delete them.
4. Once changes are confirmed, restart all services.

Options

General

In the **General** settings, you can change a number of settings that affect the general behavior and look of the Management Application.

Automatic device discovery

Automatic device discovery (see "About automatic device discovery" on page 279) is turned off by default in your system. Select the check box to enable this functionality. If the camera should use an additional user name and password besides the camera's default user name and password, select the Use the camera's default user name and password as well as the following credentials check box and type the relevant credentials.

Not all devices support automatic device discovery. If your system does not detect your camera and add it to your system, you must manually add the camera.

Customer Dashboard

Choose if your system should send system information to the Customer Dashboard.

System mode

Important: Do **not** change system mode unless you are absolutely sure that you want the new setting to be in effect immediately after saving.

At some point in time when you save recordings on your system, the storage you save recordings on may become full. Your system offers you two system modes which handle this scenario differently, **Classic or Evidence collection**.

- **Classic** mode means that the system automatically deletes the oldest saved recordings in order to make room for new recordings. This is how saved recordings have been handled so far in all previous versions of your system. When you remove a hardware device in the Management ApplicationManagement Application, recordings from the relevant device are deleted from your storage. You can no longer play back recordings from the removed camera in XProtect Smart Client as these recordings will be deleted from your storage.

- **Evidence collection** mode means that the system stops recording when you reach full storage capacity. All your old recordings are kept in the storage and the system does not save any new recordings. This ensures that video recorded as evidence is never deleted automatically and remains on the hard disk drive until you change system settings in your system or you manually remove the recordings from your storage. Similarly, if you remove a hardware device from the Management Application, recordings from the device are still kept on your storage. You can playback recordings in XProtect Smart Client even if you have removed the device in the Management Application.

Summary:

	Classic mode	Evidence collection mode
When the storage on which you are recording becomes full	The system deletes oldest recordings to make room for new recordings.	The system stops saving new recordings and keeps the oldest recordings.
When you delete a device in the Management Application	The system deletes all recordings from the removed device.	The system keeps all recordings from the removed device.
Playback in XProtect Smart Client	If you have removed the device from the Management Application, playback is no longer possible in XProtect Smart Client because the system deletes recordings from the device when you remove it.	Even if you have removed the device from the Management ApplicationManagement Application, playback is still possible in XProtect Smart Client as the system keeps the recordings.
Retention time	You can set and customize retention time for your recordings.	You cannot set retention time for your recordings as your system never deletes recordings.

Choose a system mode that fits your system needs. Most users need the most recent recordings to be available in their storage and should select **Classic** mode. **Evidence** mode provides an alternative in cases where all recorded video is considered evidence and therefore must remain on your storage.

Important: Evidence Collection mode is only supported in XProtect Enterprise 2013+. If you run your system in trial mode, only **Classic** mode is available.

Important: If you have upgraded from a previous version of your system, for example XProtect Enterprise 8.1, **Classic** mode is the default selection in your system. You must manually change your selection to use **Evidence** mode.

Language

The Management Application is available in several languages. From the list of languages, select the language you want to use. Restart the Management Application to make the change of language take effect.

User Interface

You can change the way the Management Application behaves. For example, by default, the Management Application asks you to confirm many of your actions. If you feel this is not necessary, you can change the behavior of the Management Application to not ask you again. Go to **User Interface** to make changes for each action.

Examples of actions you can change:

- When you attempt to delete a hardware device, should the Management Application ask you to confirm that you want to delete the hardware device, or should it delete the hardware device straight away without asking?

- Depending on the system you are using, you may have a limit on the number of cameras you can use in your system. Select if the system should warn you if you add more cameras than the allowed number of cameras.
- If your system should show live video when you preview camera or if you would rather see a snapshot or no preview of the camera.

Click **Restore Default Settings** below the behavior list to restore your system to its default behavior.

Default File Paths

Your system uses a number of default file paths:

File paths	Description
Default recording path for new cameras	All new cameras you add use this path by default for storing recordings. If required, you can change individual cameras' recording paths as part of their individual configuration (see "Recording and archiving paths" on page 107), but you can also change the default recording path so all new cameras you add use a path of your choice.
Default archiving path for new cameras	All new cameras you add use this path by default for archiving (see "About archiving" on page 146). If required, you can change individual cameras' archiving paths as part of their individual configuration, but you can also change the default recording path so all new cameras you add use a path of your choice. Note that camera-specific archiving paths are not relevant if you use dynamic path selection (see "Dynamic path selection (properties)" on page 81) for archiving.
Configuration path	The default path used for storing your system configuration.

Audio Recording

Specify the default setting for audio recording when you add new cameras to the system.

Never	The system never records audio from your cameras.
Only when recording video	The system only records audio from your cameras when your system is recording video.
Always	The system always records audio for your cameras.

You can change the setting later for each camera individually.

Analytics Event Settings

Analytics Event Settings let you specify the following:

Name	Description
Enabled	Enable the analytics event feature.
Port	Specify the port used by this service. Default port is 9090. Make sure that relevant VCA tool providers also use this port number. If you change the port number, make sure that VCA tool providers change their port number accordingly.
All network addresses or Specified network addresses	Specify whether events from all IP addresses/host names are accepted, or only events from IP addresses/host names specified in a list—see the following. In the **Address** list specify a list of trusted IP addresses/host names that you want this service to recognize. The list is used to filter incoming data so that only events from certain IP addresses/host names are allowed. Both Domain Name System (DNS) and IPv4 address formats can be used in the list. You have two ways of adding addresses to the list: either manually or by importing an external list of addresses. Manual entering: type the required IP address/host name in the address list. Repeat for each required address.
Import	Click the **Import...** button to browse for the required external list of addresses. To import an external list, the list must be saved in a .txt file format and each IP address or host name must appear on a separate line in the file.

Event Server Settings

Specify the following Event Server settings:

Name	Description
Keep closed alarms for	Specify the number of days for which to keep closed alarms, that is alarms in the states **Closed**, **Ignore**, and **Reject**. This is normally set to a low number, such as three days, but you can define any number up to 99999 days, server space permitting. You can use the value 0 to indicate keep closed alarms indefinitely (server space permitting).
Keep all other alarms for	Specify the number of days for which to keep all other alarms, meaning alarms not in the states **Closed**, **Ignore**, and **Reject**. This is normally set to a somewhat higher number, such as 30 days, but you can define any number up to 99999 days, server space permitting. You can use the value 0 to indicate that you want to keep all other alarms indefinitely, server space permitting. **Important:** Alarms often have associated video recordings. While the alarm information itself is stored on the event server, the associated video recordings are fetched from the relevant surveillance system server when users wish to view them. Therefore, if it is vital that you have access to video recordings from all your alarms, make sure that video recordings from relevant cameras are stored on relevant surveillance system servers for at least as long as you intend to keep alarms on the event server.
Keep logs for	Specify the number of days for which to keep the Alarms log. Default is 30 days. The value of 0 indicates that you want to keep logs indefinitely (server space permitting).
Log server communication	Specify if you want to save a separate log of server communication in addition to the regular log for the number of days specified.

System maintenance

Backing up and restoring configuration

About back up and restore of configuration

Milestone recommends that you make regular backups of your system configuration (cameras, schedules, views, and so on) as a disaster recovery measure. While it is rare to lose your configuration, it can happen under unfortunate circumstances. Luckily, it takes only a minute to back up your existing configuration.

Back up system configuration

The following describes how to back up your configuration in XProtect Professional 10.0. If you need information about how to back up a configuration from an earlier version of the system, see Upgrade from a previous version (see "Upgrading from one product version to another product version" on page 38).

In the following, we assume that you have not changed your system's default configuration path (see "Default File Paths" on page 282), which is **C:\Program Data\Milestone\Milestone Surveillance** on servers running all supported operating systems. If you have changed the default configuration path, you must take your changes into consideration when using the method described in the following.

The backup described here is a backup of your entire surveillance system setup (including, among other things, log files, event and Matrix configuration, restore points, view groups as well as Management Application and XProtect Smart Client configuration). Alternatively, you can export your configuration as a backup (see "Export and import Management Application configuration" on page 289), which is limited to the Management Application configuration.

To back up:

1. Make a copy of the folder **C:\Program Data\Milestone\Milestone Surveillance** and all of its content.
2. Open the folder **C:\Program Files\Milestone\Milestone Surveillance\devices**, and verify if the file **devices.ini** exists. If the file exists, make a copy of it. The file exists if you have configured video properties for certain types of cameras. For such cameras, changes to the properties are stored in the file rather than on the camera itself.
3. Store the copies away from the server, so that they are not affected if the server is damaged, stolen or otherwise affected.

Remember that a backup is a snapshot of your system configuration at the time of backing up. If you later change your configuration, your backup does not reflect the most

recent changes. Therefore, back up your system configuration regularly. When you back up your configuration as described, the backup includes restore points. This allows you to not only restore the backed-up configuration, but also to revert to an earlier point in that configuration if you need to.

Restore system configuration

1. If you use the system on a server running any supported operating system, copy the content of the backed-up **Milestone Surveillance** folder into **C:\Program Data\Milestone\Milestone Surveillance**.
2. If you backed up the file **devices.ini**, copy the file into **C:\Program Files\Milestone\Milestone Surveillance\devices**.

Back up and restore alarm and map configuration

It is important that you regularly back up your alarm and map configurations. You do this by backing up the event server, which handles your alarm and map configuration as well as the Microsoft® SQL Server Express database, which stores your alarm data. This enables you to restore your alarm and map configuration in a possible disaster recovery scenario. Backing up also has the added benefit that it flushes the SQL Server Express database's transaction log.

When you back up and restore alarm and/or map configuration, you must do it in the following order:

Prerequisites

- **You must have administrator rights on the SQL Server Express database** when you back up or restore your alarm configuration database on the SQL Server Express. Once you are done backing up or restoring, you only need to be a database owner of the SQL Server Express database.
- **Microsoft® SQL Server Management Studio Express**, a tool you can download for free from the Microsoft website http://www.microsoft.com/downloads. Among its many features for managing SQL Server Express databases are some easy-to-use backup and restoration features. Download and install the tool on your existing surveillance system server and on a possible future surveillance system server (you need it for backup as well as restoration).

Step 1: Stop the Event Server service

Stop the event server service to prevent configuration changes from being made:

1. On your surveillance system server, click **Start** > **Control Panel** > **Administrative Tools** > **Services**.
2. Right-click the Event Server, click **Stop**.

This is important since any changes made to alarm configurations—between the time you create a backup and the time you restore it—are lost. If you make changes after the

backup, you must make a new backup. Note that the system does not generate alarms while the Event Server service is stopped. It is important that you remember to start the service again once you have finished backing up the SQL database.

Step 2: Back up alarms data in SQL Server Express database

If you do not have SQL Server Management Studio Express, you can download it for free from the Microsoft website http://www.microsoft.com/downloads.

1. Open Microsoft SQL Server Management Studio Express from Windows' **Start** menu by selecting **All Programs** > **Microsoft SQL Server 2008** > **SQL Server Management Studio Express**.
2. When you open the tool, you are prompted to connect to a server. Specify the name of the required SQL Server and connect with administrator user credentials. You do not have to type the name of the SQL server: if you click inside the Server name field and select **<Browse for more...>**, you can select the SQL Server from a list instead.
3. Once connected, you see a tree structure in the **Object Explorer** in the left part of the window. Expand the SQL Server item, then the **Databases** item, which contains your entire alarm configuration.
4. Right-click the **VIDEOOSDB** database, and select **Tasks** > **Back Up...**
5. On the **Back Up Database** dialog's **General** page, do the following:
   - Under **Source** verify that the selected database is **VIDEOOSDB** and that the backup type is **Full**.
   - Under **Destination** A destination path for the backup is automatically suggested. Verify that the path is satisfactory. If not, remove the suggested path, and add another path of your choice.
6. On the **Back Up Database** dialog's **Options** page, under **Reliability**, select **Verify backup when finished** and **Perform checksum** before writing to media.
7. Click **OK** to begin the backup. When backup is finished, you see a confirmation.
8. Exit Microsoft SQL Server Management Studio Express.

Step 3: Reinstall your system

Do not install your surveillance software on a mounted drive. A mounted drive is a drive that is attached to an empty folder on an NTFS (NT File System) volume, with a label or name instead of a drive letter. If you use mounted drives, critical system features may not work as intended. You do not, for example, receive any warnings if the system runs out of disk space.

Before you start: Shut down any existing surveillance software.

1. Run the installation file. Depending on your security settings, you may receive one or more security warnings. Click the **Run** button if you receive a warning.

2. When the installation wizard starts, select language for the installer and then click **Continue**.
3. Select if you want to install a trial version of your system or indicate the location of your software license file.
4. Read and accept the license agreement, and indicate if you want to participate in the Milestone data collection program.
5. Select **Typical** or **Custom** installation. If you select **Custom** installation, you can select application language, which features to install and where to install them. Let the installation wizard complete.

You can now begin to configure your system, see Configure your system in Management Application.

Step 4: Restore alarms data in SQL Server Express database

Luckily, most users never need to restore their backed-up alarm data, but if you ever need to, do the following:

1. In the Windows Start menu, open Microsoft SQL Server Management Studio Express.
2. Connect to a server. Specify the name of the required SQL Server, and connect using the user account the database was created with.
3. In the **Object Explorer** on the left, expand **SQL Server** > **Databases**, right-click the **VIDEOOSDB** database, and then select **Tasks** > **Restore** > **Database...**
4. In the **Restore Database** dialog, on the **General** page, under **Source for restore**, select **From device** and click **<Browse for more...>**, to the right of the field. In the **Specify Backup** dialog, make sure that **File** is selected in the **Backup media** list. Click **Add.**
5. In the **Locate Backup File** dialog, locate and select your backup file **VIDEOOSDB.bak**. Then click **OK**. The path to your backup file is now listed in the **Specify Backup** dialog.
6. Back on the **Restore Database** dialog's **General** page, your backup is now listed under **Select the backup sets to restore**. Make sure you select the backup by selecting the check box in the **Restore** column.
7. Now go to the **Restore Database** dialog's **Options** page, and select **Overwrite the existing database**. Leave the other options as they are, and then click **OK** to begin the restoration. When the restore is finished, you see a confirmation.
8. Exit Microsoft SQL Server Management Studio Express.

Note: If you get an error message telling you that the database is in use, try exiting Microsoft SQL Server Management Studio Express completely, then repeat steps 1-8.

Step 5: Restart the Event Server service

During the restore process, the Event Server service is stopped to prevent configuration changes being made until you are done. Remember to start the service again:

1. On your surveillance system server, click **Start** > **Control Panel** > **Administrative Tools** > **Services**.
2. Right-click the Event Server, click **Start**.

About the SQL Server Express transaction log and reasons for flushing it

Each time a change in the system's alarm data take place, the SQL Server logs the change in its transaction log. The transaction log is essentially a security feature that makes it possible to roll back and undo changes to the SQL Server Express database. The SQL Server by default stores its transaction log indefinitely, and, therefore, the transaction log builds up more and more entries over time.

The SQL Server's transaction log is by default located on the system drive, and if the transaction log just keeps growing, it may in the end prevent Windows from running properly. Flushing the SQL Server's transaction log from time to time is therefore a good idea, however flushing it does not in itself make the transaction log file smaller, rather it prevents it from growing out of control. Your system does not, however, automatically flush the SQL Server's transaction log at specific intervals. This is because users have different needs. Some want to be able to undo changes for a very long time, others do not care.

You can do several things on the SQL Server itself to keep the size of the transaction log down, including truncating and/or shrinking the transaction log (for numerous articles on this topic, go to support.microsoft.com http://support.microsoft.com and search for SQL Server transaction log). However, backing up the system's database is generally a better option since it flushes the SQL Server's transaction log and gives you the security of being able to restore your system's alarm data in case something unexpected happens.

Export and import Management Application configuration

You can export the current configuration of your Management Application, either as a safety measure in order to have a backup file of your configuration, or as a clone allowing you to use a similar Management Application configuration elsewhere. You can, at a later time, import previously exported Management ApplicationManagement Application configurations.

Export Management Application configuration as backup

With this option, all relevant Management Application configuration files are combined into one single .xml file, which you can specify a location for. Note that if there are unsaved changes to your configuration, these are automatically saved when you export the configuration.

1. In the **File** menu, select **Export Configuration - Backup**.
2. Browse to the location at which you want to store the exported configuration, specify a suitable file name, and click **Save**.

If you intend to set up an identical version of your surveillance system elsewhere, **do not** export your configuration as **backup**, since this may lead to the same device information being used twice, in which case clients may get the following error message: **Application is not able to start because two (or more) cameras are using the same name or ID.** Instead, export your configuration as a **clone**. When you export as a clone, the export takes into account the fact that you are not using the exact same physical cameras, etc. even though your new system may otherwise be identical to your existing one.

Note that there is a difference between this Management Application configuration backup and the system configuration backup done from the Milestone Surveillance folder because these are two different things. The backup described here is limited to a backup of the Management Application configuration. The type of system configuration backup done from the Milestone Surveillance folder is a backup of your entire surveillance system setup (including, among other things, log files, event configuration, restore points, view groups as well as the Management Application and XProtect Smart Client configuration).

Export Management Application configuration as clone

With this option, all relevant Management Application configuration files are collected, and GUIDs (Globally Unique IDentifiers, unique 128-bit numbers used for identifying individual system components, such as cameras) are marked for later replacement. GUIDs are marked for later replacement because they refer to specific components (cameras and so on). Even though you wish to use the cloned configuration for setting up a new similar system using similar types of cameras, the new system does not use the exact same physical cameras as the cloned system. When you use the cloned configuration later in a new system, the GUIDs are replaced with GUIDs representing the specific components of the new system.

After you have marked GUIDs for replacement, the configuration files are combined into one single .xml file, which you can then save at a location specified by you. Note that if there are unsaved changes to your configuration, they are automatically saved when you export the configuration.

1. In the **File** menu, select **Export Configuration - Clone**.
2. Browse to the location at which you want to store the exported configuration, specify a suitable file name, and click **Save**.

Import previously exported Management Application configuration

The same import method is used regardless of whether the Management Application configuration was exported as a backup or a clone.

1. In the **File** menu, select **Import Configuration**.
2. Browse to the location from which you want to import the configuration, select the relevant configuration file, and click **Open**.
3. Only relevant if the system into which you import the configuration contains devices (cameras, etc.) which are not present in the imported configuration: you are asked whether you want to delete or keep recordings from affected devices. If you want to keep the recordings, note that they are not accessible until you add

the affected devices to the system again. Select the option you need, and click **OK**.

4. Expand **Advanced Configuration** > **Services**.
5. For the Recording Server and Image Server services respectively, click the **Restart** button. Restarting the two services applies the imported Management Application configuration.

Restore system configuration from a restore point

Restore points allow you to return to a previous configuration state. Each time you apply a configuration change in the Management Application, a new restore point is created.

All restore points in the current and previous five sessions are stored and can be selected again. A new session begins each time you start the Management Application as well as each time you save the whole configuration. For sessions older than the last five sessions, only the latest restore point of each session is stored. With the **Number of old sessions to keep** field, you can control how many old sessions are kept.

When you select to restore a configuration from a restore point, the configuration from the selected restore point is applied and used once the services are restarted.

If you have added new cameras or other devices to the system after the restore point was created, they are missing if you load the restore point. This is because they were not in the system when the restore point was created. In such cases, you are notified and must decide what to do with recordings from the affected devices.

1. From the **File** menu, select **Load Configuration from Restore Point...**
2. In the left part of the **Restore Points** dialog, select the relevant restore point.
3. Click the **Load Restore Point** button.
4. If you are sure that you want to overwrite the current configuration with the one from the selected restore point, click **OK**.
5. Only relevant if the current configuration contains cameras or other devices which were not present in the selected restore point: you are asked whether you want to delete or keep recordings from affected devices. If you keep the recordings, note that you cannot access them until you add the affected devices to your system again. Select the relevant option, and click **OK**.
6. Click **OK** in the Restore Points dialog.
7. Expand **Advanced Configuration**, and select **Services**.
8. For the Recording Server and Image Server services respectively, click the **Restart** button. When the two services are restarted, the configuration from the selected restore point is applied.

Note: When you select a restore point, you can see information about the configuration state at the selected point in time in the right part of the dialog. This can help you select the best possible restore point.

Importing changes to configuration

About importing changes to configuration

You can import changes to a configuration. This can be relevant if you install many similar systems, for example in a chain of shops where the same types of server, hardware devices, and cameras are used in each shop. In such cases, you can use an existing configuration as a template for the other installations.

Since such installations are not exactly the same, as the hardware devices and cameras are of the same type, but they are not physically the same, and therefore they have different MAC addresses, there is an easy way of importing changes to the template configuration. You can import changes about hardware devices and cameras as comma-separated values (CSV) from a file.

See Import changes to configuration (on page 293) for a step-by-step guide and About required fields for CSV files when you import changes to configurations (on page 292) for which fields you must include in the CSV files.

When you import changes, no hardware detection takes place nor does the software change the camera's hardware capabilities. For example, if you replace a PTZ camera with a non-PTZ camera, the software continues to show the replaced camera as a PTZ camera.

About required fields for CSV files when you import changes to configurations

The CSV file must have a header line (determining what each value on the following lines is about), and the following lines must each contain information about one hardware device only. The field names are case sensitive, so you should ensure that you have written the fields exactly as shown below.

For each hardware device, the following information is required:

HardwareOldMacAddress	Used to find the device that is going to have its properties changed. This is a mandatory field that you must enter in order to be able to import changes to the configuration from a CSV file.
HardwareNewMacAddress	The new IP address for the hardware device.
HardwareAddress	The IP address of the hardware device.
HardwarePort	The port for the hardware device.
HardwareUserName	The user name for hardware device's administrator account.
HardwarePassword	The password for hardware device's administrator account.
HardwareDriverID	If cameras and server are offline: specify a **HardwareDriverID** for each hardware device you want to add. Example: **ACTi ACD-2100 105** indicates that you should use **105** as the ID if adding an ACTi ACD-2100 hardware device.

When you import changes, no hardware detection takes place and no hardware functionality is changed. For example, if you replace a PTZ device with a device that does not have PTZ functionality, the new device still lists as a PTZ device.

The following applies for the information present in CSV files:

- The first line of the CSV file must contain the headers, and following lines must contain information about one hardware device each
- Separators can be commas, semicolons or tabs, but you cannot mix them
- All lines must contain valid values. All camera names, user names and similar items must be unique, and cannot contain any of the following special characters: **< > & ' " \ / : * ? | [ ]**
- There is no fixed order of values, and you can omit optional parameters entirely

Import changes to configuration

1. From the menu bar, select **File** > **Import Changes to Configuration...**
2. Select **Online verification** if the new hardware devices and cameras listed in your CSV file are connected to the server and you want to verify that you can reach them.
3. Point to the CSV file, and click the **Import Configuration from File** button.

See also About importing changes to configuration (on page 292).

Glossary of Terms

A

Administrator

1) System administrator. 2) In previous versions of your system: the main application used by system administrators for configuring the surveillance system server. Now called the Management Application.

Analytics Events

Analytics events are data received from an external third-party video content analysis (VCA) provider. An example of a VCA-based system is an access control system. Analytics events integrates seamlessly with the **Alarms** feature.

API

Application Program Interface—set of tools and building blocks for creating or customizing software applications.

Aspect ratio

The height/width relationship of an image.

ATM

Automatic teller machine—machine that dispenses money when a personal coded card is used.

AVI

A popular file format for video. Files in this format carry the .avi file extension.

C

Carousel

A feature for displaying video from several cameras, one after the other, in a single camera position. The required cameras and the intervals between changes are specified by the system administrator. The carousel feature is available in XProtect Smart Client.

Central

XProtect Central is a feature that provides a complete overview of status and alarms from any number of the system's servers, regardless of location.

Codec

A technology for compressing and decompressing audio and video data, for example, in an exported AVI file. MPEG and Indeo are examples of frequently used codecs.

CSV

Comma-separated values data format that stores tabular data, where the lines represent rows in a table and commas define the columns, in a simple file. For example, data about cameras may appear as comma-separated values in a .csv file, which you can then import into your system. It is an effective method if you set up several similar systems.

D

Device

In an XProtect surveillance system: a camera, video encoder, input device, or output device connected to a recording server.

DirectX

A Windows extension providing advanced multimedia capabilities.

DNS

Domain Name System—system allowing translation between alphabetic host names (for example, mycomputer) or domain names (for example, www.mydomain.com) and numeric IP addresses (for example, 192.168.212.2). Many people find alphabetic names easier to remember than numeric IP addresses.

Driver

A program used for controlling/communicating with a device.

DST

Daylight saving time: temporarily advancing of clocks during the summer so that afternoons have more daylight and mornings have less.

Dual stream

Some cameras support two independent streams (which can be sent to the recording server): one for live viewing and another for playback purposes. Each stream has its own resolution, encoding, and frame rate.

DVR

Digital video recorder—device that records video in a digital format to a hard disk drive embedded in the DVR itself.

E

Event Server

A server that stores and handles incoming alarm data and events from all surveillance system servers. The Event Server enables powerful monitoring and provides an instant overview of alarms and possible technical problems within your systems.

F

Fisheye

A type of lens that allows the creation and viewing of fisheye images.

FPS

Frames per second—measurement indicating the amount of information contained in a motion video. Each frame represents a still image, but when frames are displayed in succession, the illusion of motion is created. The higher the FPS, the smoother the motion appears. Note, however, that a high FPS may also lead to a large file size when video is saved.

Frame rate

A measurement indicating the amount of information contained in motion video—typically measured in FPS.

G

Generic events

Your system can receive and analyze input in the form of TCP or UDP data packages which, if they match specified criteria, you can use to generate events. Such events are called generic events.

GOP

Group of pictures: individual frames grouped together, forming a video-motion sequence.

Grace period

A license that gives you permission to configure a camera for use with XProtect LPR.

Grace period

A license that gives you permission to run a camera or encoder on your XProtect system. If you want to use the video push feature on a mobile device or tablet, you also need a hardware device license per device.

Grace period

When you install and configure your system and add recording servers and cameras, the different devices run in a trial period until you activate your licenses. This period of trial is the grace period. You must activate you licenses before the grace period expires or your system will stop working. If your system is online, your licenses are activated automatically.

Grace period

A license that gives you permission to associate cameras with ATMs and POSs and configure them for XProtect Transact.

Grace period

A license that gives you access to different country or regional license plate formats that you can use with XProtect LPR.

Grace period

A license that gives you permission to configure doors for access control in XProtect Access.

Grace period

A license that gives you permission to use the software of an XProtect VMS product and/or XProtect add-on product.

Grace period

A threshold on the number of hardware devices you can replace or add if your XProtect system is offline before you must make a manual license activation.

GUID

Globally unique identifier—unique 128-bit number used to identify components on a Windows system.

H

H.264

A standard for compressing and decompressing video data (a codec). H.264 is a codec that compresses video more effectively than older codecs, and it provides more flexibility for use in a variety of network environments.

Hardware device

When you add a digital camera to your system, you are not adding the camera itself only, but rather hardware devices. Hardware devices have their own IP addresses or host names. Being IP-based, your system primarily identifies units based on their IP addresses or host names.

Even though each hardware device has its own IP address or host name, you can attach several cameras, microphones and speakers to a single hardware device and share the same IP address or host name. This is typically the case with cameras attached to video encoder devices.

You can configure each camera, microphone and similar channels on the hardware device individually, even when

several of them are attached to a single hardware device.

Host

A computer connected to a TCP/IP network. A host has its own IP address, but may—depending on network configuration—also have a **host name to make it easily identifiable.**

Hotspot

Particular position for viewing enlarged and/or high quality video in XProtect Smart Client.

I

I/O

Input/Output: refers to the communication between a computer and a person. Inputs are the signals or data received by the system and outputs are the signals or data sent from it.

I-frame

Short name for intra-frame. Used in the MPEG standard for digital video compression. An I-frame is a single frame stored at specified intervals. The I-frame records the entire view of the camera, whereas the frames that follow (P-frames) record only the pixels that change. This helps greatly reduce the size of MPEG files. An I-frame is similar to a keyframe.

Image Server

A service that handles access to the system for remote users logging in with XProtect Smart Client.

The Image Server service does not require separate hardware as it runs in the background on the surveillance system's server. The Image Server service is not configured separately but is configured through the system's Management Application.

IPIX

A technology that allows the creation and viewing of panomorph Fisheye images.

J

JPEG

(Also JPG) Joint Photographic Experts Group—widely used lossy compression technique for images.

K

Keyframe

Used in the MPEG standard for digital video compression, a keyframe is a single frame stored at specified intervals. The keyframe records the entire view of the camera, whereas the frames between the keyframes record only the pixels that change. This helps greatly reduce the size of MPEG files.

M

MAC address

Media Access Control address—12-character hexadecimal number uniquely identifying each device on a network.

Manual events

You can generate an event manually from the client. These events are called manual events.

Master/Slave

A setup of servers where one server (the master server) is of higher importance than the remaining servers (the slave servers). With a master/slave setup in your system, you can combine several surveillance system servers and extend the number of cameras you can use beyond the maximum allowed number of cameras for a single server.

In such a setup, clients still have a single point of contact: they connect to the master server but also get access, transparently, to cameras and recordings on the slave servers.

Matrix

A feature that enables the control of live camera views on remote computers for distributed viewing. Once configured, you can view Matrix-triggered live video in XProtect Smart Client.

Matrix-recipient

A computer equipped with XProtect Smart Client-software and therefore capable of displaying Matrix-triggered live video.

MJPEG

Motion JPEG—compressed video format where each frame is a separately compressed JPEG image. The method used is quite similar to the I-frame method used for MPEG, but no interframe prediction is used. This allows for somewhat easier editing, and makes compression independent of the amount of motion.

Monitor

1) A computer screen. 2) An application used in previous versions of XProtect Professional for recording and displaying video. The Monitor application has been discontinued.

MPEG

Compression standards and file formats for digital video developed by the Moving Pictures Experts Group. MPEG standards use so-called lossy compression as they store only the changes between frames, removing often considerable amounts of redundant information. Keyframes stored at specified intervals record the entire view of the camera, whereas the frames that follow record only pixels that change. This helps greatly reduce the size of MPEG files.

N

NTLM

In a Windows network, NT LAN Manager is a network authentication protocol.

P

Panomorph

A type of lens that allows the creation and viewing of Fisheye-technology images.

Pan-tilt-zoom (PTZ)

Pan-tilt-zoom. A highly movable and flexible type of camera.

P-frame

Predictive frame—the MPEG standard for digital video compression uses P-frames together with I-frames. An I-frame, also known as a keyframe, is a single frame stored at specified intervals. The I-frame records the entire view of the camera, whereas the frames that follow (the P-frames) record only the pixels that change. This helps greatly reduce the size of MPEG files.

PIN

Personal identification number (or personal identity number)—number used to identify and authenticate users.

Ping

A computer network administration utility used to determine whether an IP address is available, by sending a small amount of data to see if it responds. The word ping was chosen because it mirrors the sound of a sonar. You send the ping command using a Windows command prompt.

Polling

Regularly checking the state of something, for example, whether input has been received on a particular input port of a device. The defined interval between such state checks is often called a polling frequency.

Port

Logical endpoint for data traffic. Networks use different ports for different types of data traffic. Therefore it is sometimes, but not always, necessary to specify which port to use for particular data communication. Most ports are used automatically based on the types of data included in the communication. On TCP/IP networks, port numbers range from 0 to 65536, but only ports 0 to 1024 are reserved for particular purposes. For example, port 80 is used for HTTP traffic, which is used when viewing web pages.

POS

(Also PoS) Point of sale: the physical place where a sale is made, for example, at the cash register.

Post-recording

The ability to store recordings from periods following motion and/or specified events.

It is based on incoming video buffered on the system server in case it is needed for a motion- or event-triggered recording.

It can be a good idea to use post-recording if, for example, you have defined that the system should record video while a gate is open and you would like to see what happens immediately after the gate closes.

Pre-alarm

Pre-alarm images is a feature available for selected cameras only. It enables the sending of images from immediately before an event took place from the camera to ÿour system via email.

Pre-buffer

See the description of Pre-recording.

Pre-recording

The ability to store recordings from periods before your system detected motion and/or specified events. This ability is based on incoming video buffered on the system server in case it is needed for a motion- or event-triggered recording.

It can be a good idea to use pre-recording if, for example, you have defined that the system should record video when someone opens a door, it may also be important to be able to see what happened right before the doors opened.

Privacy masking

The ability to define if and how selected areas of a camera's view should be masked before distribution. For example, if a camera films on a street, you can

highlight certain areas of a building (for example, windows and doors) with privacy masking in order to protect residents' privacy.

PUK

Personal Unblocking Key or PIN Unlock Key—number used as an extra security measure for SIM cards.

R

Recording

On IP video surveillance systems, recording means **saving video and, if applicable, audio from a camera in the cameraâ€™s database on the surveillance system**. In many IP surveillance systems, all the video/audio received from cameras is not necessarily saved. Saving of video and audio in a cameraâ€™s database is in many cases started only when there is a reason to do so, for example, when motion is detected, when an event occurs, or when a specific period of time begins. Recording is then stopped after a specified amount of time, for example, when motion is no longer detected, when an event occurs, or when a time period ends. The term **recording** originates from the analog video era, when images were taped only when the record button was pressed.

Recording Server service

Windows service (without any user interface) used by your system for recording and displaying video. Video is only transferred to the surveillance system while the Recording Server service is running.

Restore point

Restore points allow you to return to a previous configuration state. When a configuration change is applied in your system, a restore point is created. If something goes wrong in your configuration, you can browse through restore points, and return to a suitable one.

S

SCS

A file extension (.scs) for a script type targeted at controlling clients.

SDK

Software Development Kit—programming package enabling software developers to create applications for use with a specific platform.

SIM

Subscriber identity module—circuit stored on a small card inserted into a mobile phone or computer, or other mobile device. The SIM card is used to identify and authenticate the user.

SMTP

Simple Mail Transfer Protocol—standard for sending e-mail messages between mail servers.

Software License Code (SLC)

A file that contains all the permissions (base licenses and other licenses) you have for an XProtect system. The file is named after your Software License Code (SLC).

Software License Code (SLC)

Software license code (SLC) is a product registration code required to use the surveillance system software. Your software licenses file is named after your

Software License Code (SLC). If you do not have system administration responsibilities, you do not have to work with SLCs. System administrators use SLCs during the installation and registration of the software.

Subnet

A part of a network. Dividing a network into subnets can be advantageous for management and security reasons, and may in some cases also help improve performance. On TCP/IP-based networks, a subnet is basically a part of a network on which all devices share the same prefix in their IP addresses, for example 123.123.123.xxx, where the first three numbers (123.123.123) are the shared prefix. Network administrators use subnet masks to divide networks into subnets.

T

TCP

Transmission Control Protocol—protocol (or standard) used for sending data packets across networks. TCP is often combined with another protocol, IP (Internet Protocol). The combination, known as TCP/IP, allows data packets to be sent back and forth between two points on a network for longer periods of time, and is used when connecting computers and other devices on the internet.

TCP/IP

Transmission Control Protocol/Internet Protocol—combination of protocols (or standards) used when connecting computers and other devices on networks, including the internet.

Telnet

Terminal emulation program used on TCP/IP networks. With Telnet, you can connect to a server from a computer on the network and execute commands through Telnet as if you were entering them directly on the server. Windows includes a client for use with Telnet.

U

UDP

User Datagram Protocol—connectionless protocol for sending data packets across networks. Primarily used for broadcasting messages. UDP is a fairly simple protocol, with less error recovery features than, for example, the TCP protocol.

UPS

A UPS (Uninterruptible Power Supply) works as a battery-driven secondary power source, providing the necessary power for saving open files and safely powering down your system in the event of power irregularities. UPSs vary in sophistication, but many UPSs include software for automatically saving open files, for alerting system administrators, etc.

V

VCA

Video content analysis (VCA) is a system that detects various types of previously specified behavior, both of humans and vehicles. A VCA-based system provides third-party video content analysis, spanning from face recognition, over advanced motion detection, to complex behavioral analysis. VCA systems and their output can seamlessly be integrated with the **Alarms** feature and used for, for example, triggering alarms.

The events resulting from VCA systems are called analytics events.

Third-party VCA tools are developed by independent partners delivering solutions based on an a Milestone open platform. These solutions can impact performance on your system.

Video encoder

A device, typically a standalone device, that can stream video from a number of connected client cameras. Video encoders contain image digitizers, making it possible to connect analog cameras to a network.

Video motion detection (VMD)

Video motion detection. A way of defining activity in a scene by analyzing image data and the differences in a series of images.

Video server

Another name for a video encoder.

View

A collection of video from one or more cameras, presented together in XProtect Smart Client. A view may include other content, such as HTML pages and static images, in addition to video from cameras.

W

Wizard

A utility to help perform a particular task quickly, while also ensuring coverage of all relevant parameters. For example, the **Adjust Motion Detection** wizard quickly helps you configure motion detection on each of the system's cameras without the risk of forgetting to set any key parameters.

X

XProtect Transact

An add-on to your surveillance system.

XProtect Transact can help you prevent loss and shrinkage through video evidence combined with time-linked POS or ATM transaction data.

Index

A

About access control integration • 162

About accessing logs and exports • 232, 233

About alarms • 235, 237

About archiving • 48, 51, 52, 54, 55, 70, 77, 78, 81, 91, 100, 135, 144, 260

About archiving audio • 137

About archiving locations • 136

About archiving schedules • 138

About archiving to other locations • 136

About automatic device discovery • 257, 258

About automatic license activation • 26, 27, 31

About back up and restore of configuration • 263

About Central • 161

About connectors • 244, 247

About database resizing • 70

About daylight saving time • 12

About dedicated input/output devices • 62, 124

About device changes without activation • 26, 27, 32, 40

About direct streaming • 224

About dynamic archive paths • 136

About email • 155

About events and output • 115

About hardware devices • 61

About important port numbers • 12

About importing changes to configuration • 270, 271

About input and output • 115

About license activation • 26, 31, 40

About license plate match lists • 207, 216, 220

About licenses • 24

About logs • 150

About LPR Server Manager • 222

About maps • 236

About master and slave • 174

About Matrix video-sharing • 146

About Matrix-recipients • 147

About microphones • 61, 113

About Milestone Mobile client • 18

About minimum system requirements • 11

About MIP plug-ins • 242

About Mobile server • 224

About Mobile Server Manager • 19, 232

About motion detection • 70, 74, 104

About motion detection and PTZ cameras • 72, 75

About naming of host names • 11

About notifications • 120, 154

About preparing cameras for LPR • 188, 205, 215

About recording audio • 62

About registered services • 171

About removing system components • 39

About replacing hardware devices • 29, 64

About required fields for CSV files when you import changes to configurations • 270

About saving configuration changes in XProtect Enterprise 8.1 and the XProtect Professional VMS products • 225

About scheduling • 134

About scheduling of notifications • 160

About server access • 171

About services • 70, 183

About show status • 232

About SMS • 158

About snapshots • 205, 207, 215

About speakers • 61

About the Getting started page • 27, 31, 40

About the Replace Hardware Device wizard • 29, 64, 68

About this manual • 11

About time servers • 13

About transaction definitions • 244, 253

About transaction events • 244

About Unlisted license plates list • 217

About updates • 36

About upgrading • 36

About upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product • 38

About upgrading from one product version to another product version • 37

About users • 176

About using Video Push to stream video • 225

About video and recording configuration • 66, 69, 72, 76, 78, 79, 85, 86, 89, 91, 92, 93, 94, 97, 98, 99, 102, 103, 114, 145

About viewing archived recordings • 140

About virus scanning • 13, 141

About XProtect LPR • 185

About XProtect Smart Client • 17

About XProtect Transact • 242

About XProtect Web Client • 19

Access control • 162

Access Control Actions tab (Access Control) • 168

Access Control Events tab (Access Control) • 166

Access control management • 183

Access control properties • 165

Access XProtect Web Client • 19, 232

Activate licenses after grace period • 32

Activate licenses offline • 30, 31, 32

Activate licenses online • 30, 31, 32

Add a generic event • 118, 120

Add a hardware input event • 118, 127

Add a hardware output • 103, 115, 118, 119, 121, 128

Add a manual event • 118, 119, 129, 238

Add a time profile (for alarms) • 236, 237, 238, 241

Add a timer event • 118, 119, 120, 128, 129, 130, 134

Add an alarm • 237, 238

Add an analytics event • 118, 124

Add basic users • 176, 178, 179, 181, 183

Add hardware

- Import from CSV file - CSV file format and requirements • 45
- Scanning options • 43
- Select hardware manufacturers to scan for • 43

Add Hardware Devices wizard - Import from CSV File - example of CSV file • 45

Add hardware wizard • 42, 61

Add LPR camera • 207, 221

Add new license plate match lists • 213, 217, 220, 221

Add or edit a Mobile server • 225

Add transaction definitions • 244, 247, 248, 251

Add transaction source (wizard) • 244, 245, 246, 248, 255, 256

Add user groups • 59, 177, 178, 179, 181, 183

Add Windows users • 176, 177, 178, 179, 181, 183

Adjust motion detection

- Exclude regions • 56, 74
- Motion detection • 57

Adjust motion detection wizard • 56

Adjust settings for your LPR camera • 208

Administrator • 272

Advanced configuration • 40, 61

Alarm data settings • 239

Alarm Data Settings for LPR • 221

Alarm Definitions for LPR • 221

Alarm management • 183

Alarms • 235

Alarms definition • 122, 237, 238, 239, 240

Alarms properties • 238

Alarms triggered by LPR • 221

Analytics event • 118, 124

Analytics Event Settings • 261

Analytics Events • 272

API • 272

Archiving • 138, 141, 144

Aspect ratio • 272

Associated cameras • 164

ATM • 272

Attachment Settings (email) • 156

Audio • 97

Audio recording • 91

Audio Recording • 260

Audio selection • 92

Auto-configure • 209, 216

Automatic configuration wizard • 40

- Continue after scan • 41
- First page • 40
- Scanning for hardware devices • 41
- Scanning options • 41
- Select hardware manufacturers to scan for • 41

Automatic response if running out of disk space • 138

AVI • 272

B

Back up and restore alarm and map configuration • 264

Back up system configuration • 37, 263

Backing up and restoring configuration • 263

Before you start • 11

C

Camera access • 143, 178, 181

Camera and database action • 65

Camera angles • 189, 190

Camera properties • 93

Cameras and storage information • 69

Camera-specific scheduling properties • 144

Cardholders tab (Access Control) • 170

Carousel • 272

Central • 161, 272

Central properties • 161

Change default file paths • 257

Change LPR server settings • 223

Clients • 17

Codec • 272

Compatibility • 186, 245

Configure camera-specific schedules • 72, 74, 142, 144, 145, 146

Configure email notifications • 127, 129, 133, 134, 155

Configure general event handling • 117, 121, 123, 130

Configure general scheduling and archiving • 74, 140, 141, 143

Configure hardware devices • 63, 67, 68

Configure hardware output on event • 115, 118, 119, 120, 121, 134

Configure master and slave servers • 174

Configure Matrix • 147

Configure microphones or speakers • 114

Configure motion detection • 74

Configure server access • 59, 172

Configure SMS notifications • 158

Configure storage

- Drive selection • 52
- Live and recording settings - H.264/MPEG4 cameras • 50
- Live and recording settings (motion JPEG cameras) • 48
- Online schedule • 47
- Recording and archiving settings • 55
- Video settings and preview • 46

Configure storage wizard • 46, 136, 138

Configure system, event and audit logging • 152

Configure user and group rights • 59, 60, 103, 108, 119, 177, 178, 242

Configure when cameras should do what • 74

Configuring cameras for LPR • 204

Connecting to the access control system • 164

Contrast • 189, 198, 200

Copyright, trademarks and disclaimer • 10

Country modules tab • 187, 202, 207, 208, 213

Create access control system integration • 164

Create alarms based on transaction events • 245, 253

CSV • 272

D

Default File Paths • 136, 260, 263

Define transaction events • 245, 251, 253

Delete transaction sources • 255

Delete/disable hardware devices • 31, 63, 75

Device • 272

DirectX • 272

Disable or delete cameras • 24, 75

Disable transaction sources • 255

DNS • 273

Doors and Associated Cameras tab (Access Control) • 166

Driver • 273

DST • 273

Dual stream • 273

DVR • 273

Dynamic path selection (properties) • 70, 78, 102, 260

E

Edit certificate • 232, 233

Edit custom fields properties • 217, 219, 220

Edit license plate match lists • 217

Edit transaction source settings • 254

Email • 155

Email (Properties) • 144, 155

Enable filtering of transaction events or alarms • 253

Enable XProtect Central • 161

Event notification • 102

Event Server • 273

Event Server Settings • 261

Events and output • 115

Events and output properties • 124

Events triggered by LPR • 217, 220

Export and import Management Application configuration • 263, 267

Express • 42

F

Fill in/edit surveillance server credentials • 232, 234

Final summary • 164

Fisheye • 273

Fisheye lens (properties) • 107

FPS • 273

Frame rate • 273

Frame rate - MJPEG • 86, 145

Frame Rate - MPEG • 89

G

General • 51, 80, 93, 98, 103, 227, 258

General access • 178, 179, 182

General event properties • 124

General scheduling properties • 141

General Settings tab (Access Control) • 165

Generate alarms based on analytics events • 122

Generic event • 130

Generic events • 273

Get additional licenses • 30, 31

Getting started • 40, 245

GOP • 273

Grace period • 274

Group information • 179

GUID • 274

H

H.264 • 274

Hardware detection and verification • 43

Hardware device • 274

Hardware device summary • 26, 27, 29

Hardware devices • 61

Hardware input event • 119, 120, 127

Hardware name and video channels • 67

Hardware output • 128

Hardware properties • 67

Host • 275

Hotspot • 275

How the number of device changes without activation is calculated • 27, 28

I

I/O • 275

If the camera uses the MJPEG video format • 82

If the camera uses the MPEG video format • 84

I-frame • 275

Image resolution • 189, 192

Image Server • 275

Import changes to configuration • 270, 271

Import from CSV file • 42, 44, 45

Import/export license plate match lists • 217, 218, 219

Importing a new software license file • 24, 38, 39

Importing changes to configuration • 270

Info tab • 208

Information, driver selection and verification • 44

Install and upgrade • 33

Install from the management server • 34

Install silently • 34

Install video device drivers • 35

Install XProtect LPR • 201, 202

Install XProtect Smart Client • 34

Install your system software • 24, 33, 237

IPIX • 275

J

JPEG • 275

K

Keyframe • 275

L

Language support and XML encoding • 173

Lens and shutter speed • 189, 198, 199

License information overview • 24, 25

License plate match list properties • 218

Licenses • 24, 40

Local IP ranges • 173

Log properties • 152, 153

Log Settings • 231

Logs • 150

LPR configuration • 203

LPR installation • 201

LPR licenses • 25, 187, 202, 213

LPR maintenance • 222

LPR server information properties • 203

LPR servers • 185

LPR system architecture • 185

LPR system overview • 185

M

MAC address • 275

Maintaining transaction setup • 254

Manage user access

Access summary • 60

Basic and Windows users • 59

Manage user access wizard • 59, 178

Manual • 42, 43, 44

Manual event • 129

Manual events • 275

Manual recording • 85, 99, 182

Master/Slave • 174, 275

Master/slave properties • 175

Match lists tab • 208, 212, 217

Matrix • 146, 276

Matrix event control • 147, 149

Matrix properties • 147

Matrix recipients • 147

Matrix-recipient • 276

Message Settings (email) • 155, 160

Message Settings (SMS) • 158, 160

Microphone (properties) • 114

Microphones • 113

Milestone Mobile client • 18

Minimum system requirements • 187

MIP plug-ins • 242

MJPEG • 276

Mobile server • 224

Mobile Server Manager • 232

Mobile server settings • 227

Monitor • 276

Motion detection & exclude regions • 51, 75, 80, 88, 90, 99, 103, 118

Move PTZ type 1 and 3 to required positions • 75

MPEG • 276

N

Network, device type, and license • 63, 67

New hardware device information • 64

Notification Scheduling properties • 156, 159, 160

Notifications • 154

NTLM • 276

O

Online period • 51, 75, 80, 93, 98, 119, 143, 144

Options • 258

Output • 103, 119

Output control on event (Events and Output-specific properties) • 121, 134

Overview of events and output • 116

P

Panomorph • 276

Pan-tilt-zoom (PTZ) • 276

Performance • 230

P-frame • 276

Physical surroundings • 189, 197

PIN • 277

Ping • 277

Plate width recommendations • 189, 191, 201

Polling • 277

Port • 277

Ports and polling • 62, 122, 124

POS • 277

Positioning the camera • 188, 189, 209

Post-recording • 277

Pre-alarm • 277

Pre-buffer • 277

Pre-recording • 277

Prerequisites in the Management Application • 204

Privacy masking • 106, 277

PTZ device (properties) • 63, 68

PTZ on event • 112, 119

PTZ patrolling • 72, 110, 142, 145, 146

PTZ preset positions • 108, 112

PUK • 278

R

Recognition settings tab • 207, 208

Recording • 79, 85, 86, 89, 98, 127, 184, 278

Recording and archiving paths • 99, 260

Recording and archiving paths (properties) • 76

Recording and storage properties • 76

Recording Server Manager • 20

Recording Server service • 278

Regular frame rate properties • 87

Restore point • 278

Restore system configuration • 264

Restore system configuration from a restore point • 269

S

Scheduling • 160

Scheduling all cameras • 141

Scheduling and archiving • 134

Scheduling options • 47, 141, 143, 144, 145

SCS • 278

SDK • 278

Select snapshots • 209, 214

Server access • 12, 171, 172

Server access properties • 172

Server Settings (email) • 157

Server Settings (SMS) • 159

Server Status • 228

Servers • 185

Services • 183

Set up Video Push to stream video • 225, 230

Setting up transaction events and alarms • 245, 251

Setting up transactions • 245, 246

Settings • 257

Show LPR server log • 223

Show LPR server status • 223

Show or hide microphones or speakers • 63, 114

Show/edit port numbers • 232, 234

SIM • 278

SMS • 158

SMS properties • 158

SMTP • 278

Software License Code (SLC) • 278

Sound settings • 239, 240

Speaker properties • 66, 114

Speedup • 83, 88, 90, 145

Speedup frame rate properties • 87

Start and stop LPR Server Service • 222, 223

Start and stop services • 56, 57, 63, 103, 108, 110, 113, 183, 184

Start, stop and restart Mobile service • 232, 234

Storage capacity required for archiving • 138

Storage information • 93

Subnet • 279

System components • 15

System maintenance • 263

System overview • 15

T

TCP • 279

TCP/IP • 279

Telnet • 279

Template and common properties • 86

Test a generic event • 122, 130

Time profile • 241

Timer event • 121, 130

Transaction definitions (properties) • 249, 252

Transaction sources (properties) • 246, 247, 255

U

UDP • 279

Understanding camera exposure • 189, 194, 199

Uninstall XProtect LPR • 224

Unwanted camera features • 189, 198, 200

Upgrade • 36

Upgrade XProtect LPR • 202

Upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product • 36, 38

Upgrading from one product version to another product version • 33, 36, 37, 263

UPS • 279

User information • 179

User Interface • 259

User properties • 179

Users • 176

V

Validate configuration • 207, 208, 209, 210, 212, 213, 214, 215, 216

VCA • 122, 279

Verify XProtect Transact configuration • 256

Video • 89, 94, 145

Video encoder • 280

Video motion detection (VMD) • 280

Video Push • 229

Video recording (properties) • 79

Video server • 280

View • 280

View LPR server information • 187, 203, 222

W

Wizard • 280

Wizard for access control system integration • 163

Working with license plate match lists • 216, 221

X

XProtect Access licenses • 25, 163

XProtect Download Manager • 21

XProtect Smart Client • 17

XProtect Transact • 242, 280

XProtect Transact configuration • 246

XProtect Transact introduction • 242

XProtect Transact system architecture • 243

XProtect Transact trial license • 245

XProtect Web Client • 19

About Milestone Systems

Milestone Systems is a global industry leader in open platform IP video management software, founded in 1998 and now operating as a stand-alone company in the Canon Group. Milestone technology is easy to manage, reliable and proven in thousands of customer installations, providing flexible choices in network hardware and integrations with other systems. Sold through partners in more than 100 countries, Milestone solutions help organizations to manage risks, protect people and assets, optimize processes and reduce costs. For more information, visit:

http://www.milestonesys.com.