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Milestone Systems

XProtect® Professional VMS 2017 R1

Administrator Manual

XProtect® Professional
XProtect® Express
XProtect® Essential

Contents

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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

This covers all three products in the XProtect Professional VMS suite:

- XProtect® Professional
- XProtect® Express
- XProtect® Essential

The manual describes all settings and functionality available to you when you use the most feature-rich XProtect Professional VMS product, XProtect Professional.

If you are using one of the other XProtect Professional VMS products, you may have less functionality available to you. Topics may mention functionality or settings that are only available in a more advanced version of the XProtect Professional VMS products. In such cases, notes in the top of the relevant topic indicate that you may not have this functionality available to you.

For more information about available functionality in your system, see the product comparison chart (on page 12).

From the 2016 R3 release, the XProtect Go product is discontinued and XProtect Essential can be downloaded and installed for free. Among other things, it means that:
- The maximum number of cameras changes to 8.
- XProtect Essential systems can no longer be interconnected to XProtect Corporate systems.
- XProtect Smart Client 2016 R2 and earlier versions cannot connect to XProtect Essential 2016 R3 systems or newer.
For more information about changes to XProtect Essential, visit our website (https://www.milestonesys.com/our-products/video-management-software/xprotect-essential/).

Product comparison chart

XProtect Professional VMS is available in three different versions:

- XProtect Professional
- XProtect Express
- XProtect Essential

The complete product comparison chart is available on the product overview page on the Milestone website (http://www.milestonesys.com/our-products/xprotect-software-suite).

Below is a list of the main differences between the products:

Name	XProtect Essential	XProtect Express	XProtect Professional
Type of deployment	Single-server	Single-server	Multi-server
Maximum number of connected cameras per system	8	48	Unlimited

Name	XProtect Essential	XProtect Express	XProtect Professional
Maximum number of supported recording servers	1	1	Unlimited
Maximum number of viewing client users	5	5	Unlimited
Microsoft Active Directory support	-	-	✓
Alarm Manager	Not fully	Not fully	✓
Map function	Single-layer only	Single-layer only	✓
Archiving to network storage	-	✓	✓
Third-party application integration with MIP SDK	-	✓	✓
Milestone Interconnect™	-	Remote site	Remote site
Customer Dashboard	✓ (requires a subscription package)	✓	✓
Remote connect services	✓ (requires a subscription package)	✓	✓
Browse DVR recordings	-	-	-
Audio support	One-way	One-way	Two-way
Preset patrolling	-	✓	✓
Combine patrolling and go-to preset on event	-	-	✓
Generic events from external systems	-	✓	✓
Event-based matrix control	-	-	✓
Supports XProtect Access	-	✓	✓
Supports XProtect LPR	-	✓	✓
Supports XProtect Transact	-	✓	✓
Supports Milestone ONVIF Bridge	-	✓	✓
Supports XProtect Retail	-	✓	✓

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 follow 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, you may not be able to establish a connection between the system and the host machine.

You must have administrator rights on the computer that should run the surveillance system. If you do not have administrator rights, you cannot configure the surveillance system.

About important port numbers

Your system uses specific ports when it communicates with computers, cameras and other devices. To be sure that your system runs as smoothly as possible, 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. File Transfer Protocol (FTP) 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 because 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. It is 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.

Name	Description
Port 1234 (inbound and outbound)	Used for event handling.
Port 1237 (inbound and outbound)	Used for communication with XProtect Central.
Port 8081 and 8082	Used for communication with the Mobile service.
Port 22331	Used for communication with the Event Server service.

You or your organization may also use other port numbers. An example could be that you have changed the server access (on page 156) 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.

Example:

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.

Example:

The clock jumps backward from 02:00 DST to 01:00 standard time, repeating that hour, and the day has 25 hours. 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 01:30 would be overwritten by the second instance of 01:30.

To solve such an issue from happening, your system archives the current video in the event the system time changes by more than five minutes. You cannot view the first instance of the 01:00 hour directly in any clients, but the data is recorded and safe. You can browse this video in XProtect Smart Client by opening the archived database directly.

About time servers

When your system receives images from cameras, these images are instantly time-stamped. Since hardware devices are separate units which may have separate timing devices, the hardware device time and your system time may not be fully synchronized. The result is that your system may stop recording from the hardware devices all together if there is a discrepancy between hardware device time and your system time.

To prevent this from happening, use a time server to auto-synchronize camera and system time. This allows you to have consistent time-synchronization. Not all cameras support timestamps, so make sure your camera supports this before you begin to use a time server.

You can use the recording server as a time server if you want to (see "Connecting Hardware Devices" on page 265).

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. The recording server directories are set to c:\mediadatabase\ by default, 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 Professional VMS products	80, 25, 21, 1234, 1237, 22331
Milestone Mobile	8081

or

- Exclude network scanning of the following processes:

Product	Processes
XProtect Professional VMS products	RecordingServer.exe, ImageServer.exe, ManagementApplication.exe, ImageImportService.exe, RecordingServerManager.exe, VideoOS.ServiceControl.Service.exe, VideoOS.Event.Server.exe
Milestone Mobile	VideoOS.MobileServer.Service.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

Software and system components

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

Software components

Management Application	The Management Application is the main application in which you add cameras, set up users and configure your system. You do not use the Management Application to view live, playback or archived video. Instead, you use one of the viewing clients.
XProtect® Smart Client	XProtect Smart Client is a client 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. You must install XProtect Smart Client on any computer that should be able to connect to your system and view 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	A free application designed by Milestone that allows you to view video from your system from almost anywhere on your smartphone or tablet. You must install Milestone Mobile on all devices that should be able to connect to your system and view video. 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.
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. You do not need to install any software to access XProtect Web Client. To access your system through XProtect Web Client, you must know the address of the surveillance system's server.

System components

Recording Server service	The Recording Server service runs to ensure that devices transfer video streams to your system. The Recording Server service is installed 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. The Event Server service 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 and 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.

Clients

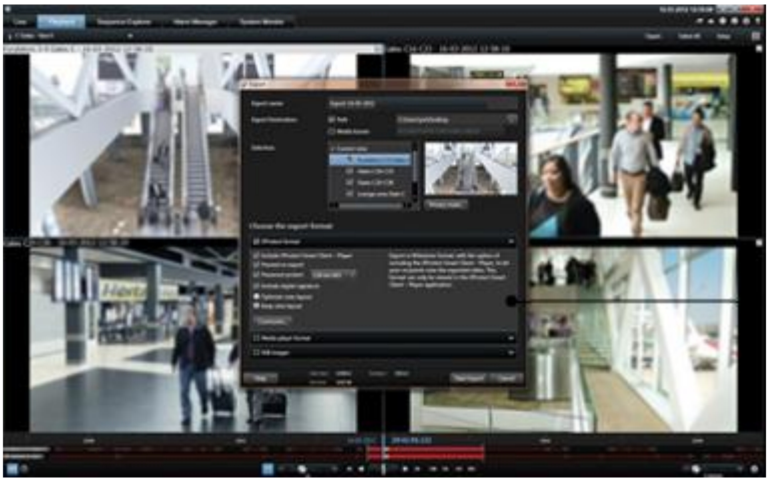
Clients are applications used for viewing live and recorded video from the hardware devices set up in the Management Application. Your system supports three different clients:

- 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.

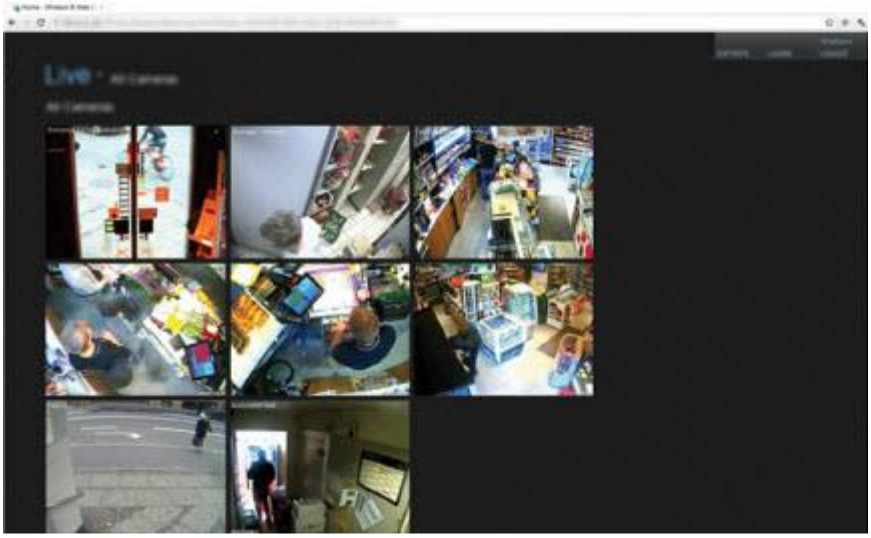
If you want to use Milestone Mobile client with your system, you must have a Mobile server to establish the connection between the Milestone Mobile client and your system. Once the Mobile server is set up, download the Milestone Mobile client for free from Google Play, App Store or Windows Phone Store 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 have 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. Because you do not need to install XProtect Web Client, you can access it from the computer where 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. If you are using the computer where Milestone Mobile server is installed, you can right-click the Milestone Mobile Server icon in the system tray, and select **Open XProtect Web Client**.
3. If you are not using the computer where Milestone Mobile server is installed, you can access it from a browser. Continue with step 4 in this process.
4. Open an Internet browser (Internet Explorer, Mozilla Firefox, Google Chrome or Safari).
5. 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.

6. 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 their browser cache after upgrading, 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 about every 10 seconds.

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

The XProtect Download Manager allows you to manage the system-related features your organizations can access. You can reach XProtect Download Manager from a targeted welcome page on the surveillance system server.

- To 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-bit 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

If you have installed and registered your XProtect Essential system, you can run the system and eight hardware device licenses for a year for free. The hardware device licenses are pre-activated and you can change and replace your hardware devices, as many times you want. They will never enter a grace period or an expired grace period and they will never appear without licenses.

Only when you upgrade (see "About upgrading to a more a feature-rich XProtect Professional VMS product" on page 37) to a more advanced VMS product, the rest of this topic and the other licensing related topics in this documentation is relevant.

When you purchase your software and licenses, you receive:

- An order confirmation.
- A software license file (SLC) with the .lic extension and named after your SLC (Software License Code).

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**.

To get started, you download the software from our website. While you are installing (see "Install your system software" on page 33) 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 37) 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 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.

You have purchased at least two types of licenses:

Base licenses: As a minimum, you have a base license for one of the XProtect products. Except for XProtect Essential, 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 Milestone 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 73) 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 148)
- XProtect LPR (see "LPR licenses" on page 173)
- XProtect Transact
- For add-on product licenses for XProtect Retail and XProtect Screen Recorder, see the documentation for these products.

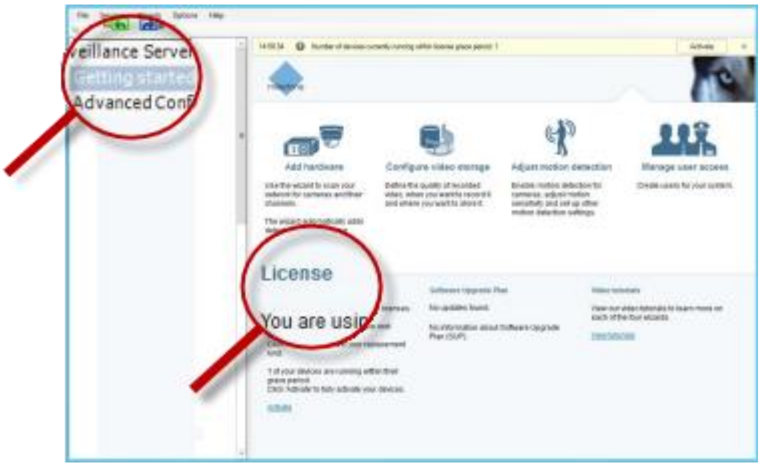
For XProtect Express and XProtect Essential

If you install your VMS product on a virtual server, you need to activate your licenses and all descriptions about license activation, grace periods and other licensing related in this documentation is applicable for your installation.

However, if you install your VMS product on a physical server, all your purchased licenses are pre-activated and you can change and replace as many hardware devices you want. You cannot have licenses in a grace period, in an expired grace period or without licenses because you cannot add more hardware devices or other licensed devices than you have purchased licenses for. If you buy more licenses or upgrade your VMS product, you must make a manual activation to get access to the new licenses or new functionality. For more information, see Get additional licenses (on page 30) or About upgrading (on page 36).

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.

  Only XProtect Professional supports the master/slave setup feature.

  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).

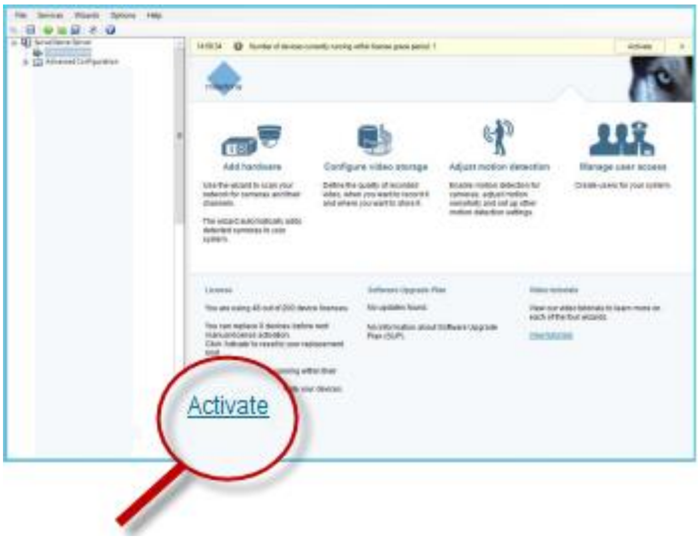
- The maximum number of hardware devices you can add to each server in your VMS system. To exceed this maximum, you must upgrade to a more advanced XProtect VMS product. For more information about how to do this, contact your reseller.

- 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 29) 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 30).



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 45), 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 29) 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 28).

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.

Hardware Device Name	The name of your hardware device
License	The licensing status of your hardware devices. You can see 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 your hardware devices' web addresses.
Port	The ports your hardware devices use.
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 64) 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 31) or Activate licenses online (on page 31).

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 31) and Activate licenses online (on page 31).

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 30). You can also disable (see "Delete/disable hardware devices" on page 64) 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 45)
- 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 31) and Activate licenses online (on page 31).

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 36) 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. Select the checkbox 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 Professional.

You can now begin to configure your system (see "Configure the system in the Management Application" on page 39).

Install XProtect Smart Client

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

Before you begin, visit the Milestone website and verify that your computer meets the XProtect Smart Client's minimum system requirements (http://www.milestonesys.com/SystemRequirements).

Install XProtect Smart Client from the management server

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 XProtect Smart Client 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 **XProtect Smart Client 2017 R1 Installer x64.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:

   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:

     XProtect Smart Client 2017 R1 Installer x64.exe --quiet

     Your system:

     Milestone XProtect Professional VMS Products 2017 R1 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:

  XProtect Smart Client 2017 R1 Installer x64.exe --generateargsfile=[path]

- Your system:

  Milestone XProtect Professional VMS Products 2017 R1 System Installer.exe --generateargsfile=[path]

b) 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:

  XProtect Smart Client 2017 R1 Installer x64.exe --arguments=[full path]args.xml --quiet

- Your system:

  Milestone XProtect Professional VMS Products 2017 R1 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, restart the Recording Server service.

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 and gain access to more or expanded functionality, you can do this in different ways. You can:

- 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 36), for example upgrading from XProtect Professional 2013 to XProtect Professional 2016.
- Upgrade from one XProtect product to another XProtect product (see "Upgrading from a current version of your product to a different current XProtect Professional VMS product" on page 36), for example upgrading from XProtect Express to XProtect Professional. You can also downgrade a product if you need to.

About updates

Milestone releases 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

You can upgrade your entire system configuration from one product version to another, for example from XProtect Professional 2016 R1 to XProtect Professional 2016 R2 fairly fast and easily. Install the new product on top of the old version without any need to remove 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 configuration.

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.

Upgrading from a current version of your product to a different current XProtect Professional VMS product

About upgrading from one current XProtect Professional VMS product to another current XProtect Professional VMS product (see "Importing a new software license file" on page 37)

Importing a new software license file (on page 37)

About upgrading to a more a feature-rich 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 37).

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 Express to XProtect Professional, you should, among other things, be aware of:

- XProtect Smart Client: In XProtect Express, only five instances of 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 Express, the Management Application is set to only allow five connected XProtect Smart Clients 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 Express allows you to use up to 48 cameras at the same time, while the number is unlimited in XProtect Professional. The number of cameras you have added are inherited by the upgraded product, but you must **manually** 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, including 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.

First time use

Configure the system in the Management Application

This following checklist outlines the tasks typically involved when you set up a system.

Although the following information is presented as a checklist, a completed checklist does not in itself guarantee that the system matches your exact needs. To make the system match the needs of your organization, Milestone recommends that you monitor and adjust the system once it is running.

It is often a good idea to spend time on testing and adjusting the motion detection sensitivity settings for individual cameras under different physical conditions including day or night, windy or calm weather. Carry out such tests once the system is running. The set up of events and associated actions also depends on your organization's needs.

You can print and use this checklist as you go along.

□	**Install your system** See Install your system software (on page 33). If you are upgrading an existing version of your system, see Upgrading from one product version to another product version (on page 36).
□	**Activate your software license file** You may not need to go through this step as your vendor often takes care of the process for you. To activate your software license file, see About license activation (on page 30).
□	**Open the Management Application** Open the Management Application after installation. This is where you configure and maintain your system and features.
□	**Add hardware devices to your system** When you open your system for the first time, the **Advanced configuration** wizard help assists you to add hardware devices (cameras, encoders and dedicated I/O boxes) to your system and configure them with user names and passwords. See Automatic configuration wizard (on page 45).
□	**Activate your hardware device licenses** You may not need to go through this step as your vendor often takes care of the process for you. If your surveillance system is online, you can also skip this step. You have now added your hardware devices, it is time to activate your hardware devices licenses (see "About license activation" on page 30).
□	**Configure cameras** You can specify a wide variety of settings for each camera connected to your system. Settings include video format, resolution, motion detection sensitivity, where to store and archive recordings, any pan-tilt-zoom (PTZ) preset positions, association with microphones, speakers and more. See About video and recording configuration (on page 69).

□	**Configure events, input and output** Use system events, for example based on input from sensors, to automatically trigger actions in your system. Examples of actions: starting or stopping recording on cameras, switching to a particular video frame rate, making PTZ cameras move to specific preset positions. Also use events to activate hardware output, such as lights or sirens. See Overview of events (see "Overview of events and output" on page 108).
□	**Configure scheduling** Set up when do you want to archive and if you want cameras to transfer video to your system at all times, and other cameras to transfer video only within specific periods of time as well as when specific events occur. Also specify when you want to receive notifications from the system. See Configure general scheduling and archiving (on page 129) and Configure camera-specific schedules (on page 71).
□	**Configure clients' access to your system** A number of different client applications are included with your system. Specify whether you want clients to access the system server from the Internet, how many clients you want to be able to connect simultaneously and more. See Configure server access (on page 156).
□	**Configure master/slave servers** You only need to follow this step if you want to run several servers together. The functionality is only available if you run XProtect Professional. A master/slave setup (see "About master and slave" on page 158) 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. 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. See Configure master and slave servers (on page 158).
□	**Configure users** Specify who should access your system and how. Set a password protection for the Management Application if needed. Decide who should have client access and which rights they should have. See Manage user access wizard (on page 60), Add basic users (on page 160), Add user groups (on page 161) and Configure user and group rights (on page 161).
□	**Configure XProtect Download Manager** Manage which features users see on a targeted welcome page when they connect to the system server. The features can include access to client applications, additional client language versions, plug-ins and more. XProtect Download Manager comes with a default configuration that ensures that users get access to XProtect Smart Client in the same language as the system server. See Use XProtect Download Manager (on page 23).

The above list represents the configuration steps that most administrators are likely to cover. You can configure and edit system settings to match the exact needs of your organization.

Best practices

About protecting recording databases from corruption

You can select which action to take if a camera database becomes corrupted. The actions include several database repair options. While it is good to have such options, Milestone recommends that you take steps to ensure that your camera databases do not become corrupted.

Power outages: use a UPS

The single-most common reason for corrupt databases is the recording server being shut down abruptly, without files being saved and without the operating system being closed down properly. This may happen due to power outages, due to somebody accidentally pulling out the server's power cable, or similar.

The best way of protecting your recording servers from being shut down abruptly is to equip each of your recording servers with a UPS (Uninterruptible Power Supply).

The UPS 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.

Selecting the right type of UPS for your organization's environment is an individual process. When you assess your needs, however, bear in mind the amount of runtime you require the UPS to be able to provide if the power fails. Saving open files and shutting down an operating system properly may take several minutes.

Windows Task Manager: be careful when you end processes

When you work in Windows Task Manager, be careful not to end any processes which affect the surveillance system. If you end an application or system service by clicking **End Process** in the Windows Task Manager, the process is not be given the chance to save its state or data before it is terminated. This may lead to corrupt camera databases.

Windows Task Manager typically displays a warning if you attempt to end a process. Unless you are absolutely sure that ending the process is not going to affect the surveillance system, click **No** when the warning message asks you if you really want to terminate the process.

Hard disk failure: protect your drives

Hard disk drives are mechanical devices and are vulnerable to external factors. The following are examples of external factors which may damage hard disk drives and lead to corrupt camera databases:

- Vibration (make sure the surveillance system server and its surroundings are stable)
- Strong heat (make sure the server has adequate ventilation)
- Strong magnetic fields (avoid)
- Power outages (make sure you use a UPS (on page 284))
- Static electricity (make sure you ground yourself if you are going to handle a hard disk drive).
- Fire, water and more (avoid).

About saving changes to the configuration

As you set up your system, you must save any changes you make to the configuration in order for these to be applied to the system. When you change the configuration in the Management Application, for example in the **Camera Summary** or **User Properties**, a yellow notification bar informs you that you have made changes to the configuration. The bar appears in order to make sure that your changes are applied to the system. If you want to apply the changes, click **Save**. If you do not want to save your changes, click **Discard**.

Once you have made changes to the configuration and saved these, your system contacts the system services, including the Recording Server service and the Image Server service. If you make changes to your configuration, for example if you change the name of a camera or change motion detection settings, the relevant system services load the new configuration and the changes appear in your client immediately. In contrast, more resource-demanding configuration changes, for example if you add a new event, require that you restart the relevant services before they work properly.

If you need to restart services, your system carries out the restart automatically once you have saved the changes. If you make changes to settings in the Milestone Mobile server, your system applies all changes when you click **Save**, without restarting the Milestone Mobile server service.

Important: While your system restarts services, you cannot view or record video. Restarting services typically only takes a few seconds, but in order to minimize disruption, you may want to restart services at a time when you do not expect that any important incidents take place. Users connected to your system through clients can remain logged in during the restart of services, but may experience a short video outage.

Note that the system stores changes in a restore point (see "Restore system configuration from a restore point" on page 275) (so that you can return to a working configuration if something goes wrong).

About using the help

- To use the help, click the **Help** button in the Management Application or press the **F1** key on your keyboard.

The help is a built-in set of HTML files that opens in your default Internet browser. As the help opens outside of the system, this allows you to switch between the help and the system itself. The help system is context-sensitive. This means that when you access the help while you work in a particular window or setting, help that matches that window/setting opens.

Use the help system

Use the help tabs **Contents**, **Index**, **Search** or use the links inside the help topics.

- **Contents:** go through the help system based on a tree structure.
- **Index:** contains an alphabetical indexation of help topics.
- **Search:** search for help topics that contain particular terms of interest. As an example, you can search for the term **zoom** and every help topic that contains the term **zoom** is listed in the search results. When you double-click a help topic title in the search results list, the relevant topic opens.

Print help topics

If you need to print a topic, use your Internet browser's printing function.

About restarting services

Some changes in the Management Application require that your system restarts the Image Server service or Recording Server service. See a list of these below:

Image Server	Recording Server
Change of port number	Changing licenses
Maximum number of clients	Changing event database path
Enabling or disabling of master servers	Turning on manual recording
Adding or removing slave servers	Starting on remote
Change of log path	Enabling and disabling of notifications
Change of license	Changing events
Change of privacy mask	Changing outputs
Removal of hardware devices	Adding or removing a dynamic archiving path
	Adding or removing archiving time
	Changing of scheduling
	Setting up the Matrix functionality
	Replacing hardware devices
	Changing camera driver
	Changing camera IP address
	Deletion of all devices
	Enabling or disabling of alarm on Customer Dashboard

Monitor storage space usage

To view how much storage space you have on your system—and not least how much of it is free—do the following:

1. Expand **Advanced Configuration**, and select **Cameras and Storage Information**.
2. View the **Storage Usage Summary** for information about, which drives are available, what drives are used for, the size of each drive, as well as how much video data, other data, and free space there is in each drive.

View video from cameras in Management Application

You can view live video from single cameras directly in the Management Application:

1. Expand **Advanced Configuration**, and expand **Cameras and Storage Information**.
2. Select the relevant camera to view live video from that camera. Above the live video, you find a summary of the most important properties for the selected camera. Below the live video, you find information about the camera's resolution and average image file size. For cameras using MPEG or H.264, you also see the bit rate in Mbit/second.

Important: Viewing of live video in the Management Application may under certain circumstances affect any simultaneous recording from the relevant camera.

Especially three scenarios are important to consider:

Some cameras supporting multistreaming may halve their frame rate or respond with other negative effects if you open a second stream.

If a camera delivers live video in a very high quality, de-coding of images may increase the load on the Recording Server service, which may in turn affect ongoing recordings negatively.

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 168) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

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 62) 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).

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: All manufacturers are selected by default. If you want to reduce the scanning time or know the specific manufacturers of your cameras, only select the checkboxes that represent 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.

If a device/camera has been added to your system previously and you removed it, the device cannot be discovered automatically and 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:

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 47)

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 48). 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 49).

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 48)-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: All manufacturers are selected by default. If you want to reduce the scanning time or know the specific manufacturers of your cameras, only select the checkboxes that represent 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 49). 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.

Name	Description
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 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 131).

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)

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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.

Pre-recording	You can store recordings from periods preceding detected motion and/or start events. Select the check box to enable this feature. Specify the relevant 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 *124*) 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.
Frame Rate	Required average frame rate for video from the camera. Select the 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 the number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and you have enabled dual stream, the **Live Frame Rate** column is read-only with the value Dual streaming. You cannot change this.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select the 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.

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.

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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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.

Live Frame Rate	The required average frame rate for live video from the camera. Select the number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and you have enabled dual stream, the **Live Frame Rate** column is read-only with the value Dual streaming. You cannot change this.

Record on	Select under which conditions video from the camera should be recorded: • **Always:** Record whenever the camera is enabled (see "General" on page *89*) and scheduled to be online (see "Online period" on page *133*). The latter option allows for time-based recording. • **Never**: Never record. Live video is shown, but users cannot play back video from the camera because no video is kept in the database. • **Event**: Select this to record video when motion (see "Motion detection & exclude regions" on page 98) is detected. Unless you add post-recording, recording stops immediately after the last motion is detected. 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.
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 *124*) 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.
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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 124).

Drive	For example, the C:\ drive.
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	The path to the folder in which to store the camera's database. The default path 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, you cannot 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, leave them at the old location, or delete them. 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	You can only edit this if you do not use dynamic paths for archiving (see "About archiving" on page *124*). 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.

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 124) paths for each individual camera.

You can edit all properties on a white background. you cannot edit properties on a **light blue** background.

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, you cannot 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, leave them at the old location, or delete them. 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 *124*). 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 168) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

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 168) the Recording Server service when you configure such devices for motion detection and PTZ. See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

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 configure 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 **Exclude 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 **Include** All button, you can quickly clear all sections.

Adjust motion detection: Motion detection

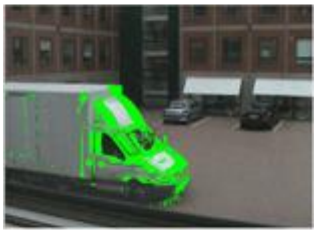
Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 168) the Recording Server service when you configure such devices for motion detection and PTZ. See also View video from cameras in Management Application (on page 44).

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.



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.

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.
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.
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 161) separately, see Configure server access (on page 156). You cannot add users to groups (see "Add user groups" on page 161).

Manage user access: Basic and Windows users

Active Directory® is supported in XProtect Professional 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

1. 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 161).

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 46). 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 listen to recordings through XProtect Smart Client if the computer running 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 115). 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 67), PTZ device (see "PTZ device (properties)" on page 68), 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 168) 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 168) the Recording Server service.

About replacing hardware devices

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 64), 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:

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.

Device driver

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 is 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 69) for specific cameras, you can determine when to record audio. Your choice applies for all cameras on your system.

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:

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 is listed. Other hardware devices, typically video encoder devices, have several video channels.

Network, device type, and license

When you configure hardware devices (on page 63), specify the following properties:

IP Address	The IP address or host name of the hardware device.
HTTP Port	The port to use for HTTP communication with the hardware device. The default is port 80. To use the default port, select **Use default HTTP port**.
FTP port	The port to use for FTP communication with the hardware device. The 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. To do so, 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	Edit the password. Remember to repeat the password to be sure you have specified it correctly. You can only edit this if the selected user is a basic user.
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 *64*) that you can use to 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 including deciding what to do with recordings from cameras attached to the old hardware device.

PTZ device (properties)

The PTZ device tab is only available if you configure (see "Configure hardware devices" on page 63) video encoder hardware devices on which you can use PTZ:

Connected cameras have Pan-tilt-zoom capabilities	Select the check box 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 and so on.

Name	Name of the camera attached to the relevant video channel.
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 124) 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 76), 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 166) 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.

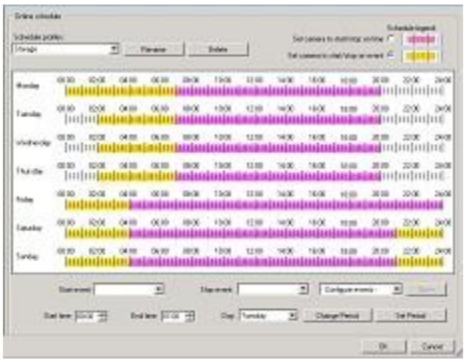
In order to activate unwanted recordings, notifications and more, the system automatically disables motion detection while a PTZ camera moves between two preset positions. After a number of seconds has passed, the system automatically enables motion detection again. This period of time is known as the transition time and is specified on the PTZ camera's PTZ patrolling properties (see "PTZ patrolling (properties)" on page 102).

Configure camera-specific schedules

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 69).

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

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

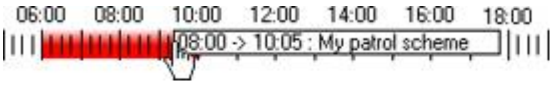
- Periods of time (example: Mondays from 08.30 until 17.45), shown in olive green: 🟩

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.

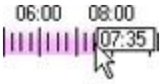


SMS notification

- 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 129) and Configure camera-specific schedules (on page 71).

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 69).
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 58) by selecting it with your mouse.
4. Fill in the relevant properties (see "Motion detection & exclude regions" on page 98). Note that there are some differences in motion-detection behavior for PTZ cameras (see "About motion detection and PTZ cameras" on page 71).

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 133).

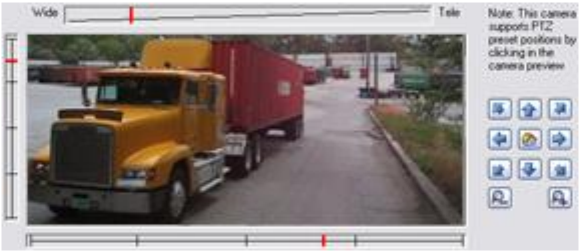
To **disable** a camera:

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 64). 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:



Note: This camera supports PTZ preset positions by clicking in the camera preview

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 69), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the relevant properties 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.

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, you cannot 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, leave them at the old location, or delete them. 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 *124*). 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 69), you can specify certain properties for many cameras in one go. In the case of dynamic path selection, all cameras share the properties.

With dynamic archiving (see "About archiving" on page 124) 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.

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	For example, the C:\ drive.
Path	Path to where you save the files, for example C:\ or \\OurServer\OurFolder\OurSubfolder\.
Drive Size	The 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 Universal Naming Convention (UNC) 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 that you have added manually 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 69), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the relevant properties 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 93).

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.

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.
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 and scheduled to be online. The latter option allows for time-based recording. • **Never**: Never record. Live video is shown, but users cannot play back video from the camera because no video is kept in the database. • **Motion Detection**: Select this to record video when motion is detected. Unless you add post-recording, recording stops 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 (see "Overview of events and output" on page 108) 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 the relevant start event. Recording will begin when the start event occurs (or earlier if using pre-recording; see the following).
Stop Event	Select the relevant 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 *124*) times. That can be problematic since pre-recording does not work well during archiving.

Name	Description
Post-recording	You can store recordings from periods following detected motion and/or stop events. Select the 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. If you specify 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 the button to select all cameras in the **Apply Template** column.
Clear All	Click the 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.

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:

Frame Rate	Required average frame rate for video from the camera. Select the 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 the 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 the 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:

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 the 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.
Live Frame Rate	Required average frame rate for live video from the camera. Select the 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 the 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.

You do not have to base speedup on motion or events. You can also use scheduling (see "Speedup" on page 133) to configure speedup based on particular periods of time. If you prefer 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 camera's resolution.
FPS	Select the camera's live frame rate per second (FPS)

Important: This feature is only available on cameras supporting dual stream.

If the camera uses the MPEG video format

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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

Frame rate per second	Frame rate for viewing live and recorded video from the camera. Select number of frames per second.
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 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 and Event.** Select the relevant start event. The camera begins recording all frames when the start event occurs.
Stop Event	Select the relevant stop event. The camera stops recording 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 camera's resolution.
FPS	Select the camera's live frame rate per second (FPS)

Important: This feature is only available on cameras supporting dual stream.

Manual recording

When you configure video and recording (see "About video and recording configuration" on page 69), 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. User-driven recording always takes place for a fixed time, for example for five minutes.

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.

If manual recording is enabled, this can take place even if recording for individual cameras (see "Recording" on page 93) is set to **Never** or **Conditionally**.

Frame rate - MJPEG

When you configure video and recording (see "About video and recording configuration" on page 69), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the relevant properties 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 93) 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 the button to select all cameras in the **Apply Template** column.
Clear All	Click the 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

Specify the following frame rate properties:

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

Name	Description
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.
Live Frame Rate	The required average frame rate for live video from the camera. Select the number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and you have enabled dual stream, the Live Frame Rate column is read-only with the value Dual streaming. You cannot change this.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select the 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 the 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 the 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.

Name	Description
Speedup On	- **Motion Detection:** Select this option to speed up when the system detects motion (see "Motion detection & exclude regions" on page *98*). The system goes back to using normal frame rates once it has detected the last motion. - **Event:** Select this option to speed up when an event occurs and until another event occurs. You can only use speedup on event if you have defined events, and if you have selected 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 option to speed up when the system detects motion, 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 option to speed up according to the camera's speedup schedule (see "Speedup" on page *133*) only.
Start Event	Select the relevant start event. The camera begins to use the speedup frame rates when the start event occurs.
Stop event	Select the relevant start event. The camera returns 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.
Live Frame Rate	The required average frame rate for live video from the camera. Select the 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 you have enabled dual stream, the **Live Frame Rate** column is read-only with the value Dual streaming. You cannot change this.
Recording Frame Rate	The required average frame rate for recorded video from the camera. Select the number of frames, then select the time unit interval (second, minute or hour).

Frame Rate - MPEG

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you configure video and recording (see "About video and recording configuration" on page 69), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the relevant properties 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 93) using H.264/MPEG4.

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 *90*) 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 the 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.
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 *98*) 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 (see "Overview of events and output" on page 108) 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 and 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 133) only.
Start Event	**Use when recording on Event or Motion Detection and Event.** Select the relevant start event. The camera begins recording all frames when the start event occurs.
Stop Event	Select the relevant stop event. The camera only stops recording keyframes when the stop event occurs.

Audio recording

When you configure video and recording (see "About video and recording configuration" on page 69) for specific cameras, you can decide whether to record audio or not. Your choice applies for all cameras on your system.

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.

Audio recording and video storage capacity

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. The result is 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 124) 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 (properties)

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you configure video and recording (see "About video and recording configuration" on page 69), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the relevant properties are shared by all cameras rather than being specific to individual cameras. With a default microphone or speaker selected for a camera, audio from the microphone or speaker is automatically in use when you view video from the camera. Note that all of the properties can also be specified individually for each camera.

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.
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 69) for specific cameras, properties include:

Enabled	Cameras are by default enabled, meaning that provided they are scheduled to be online (see "Online period" on page *133*) 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you configure video and recording (see "About video and recording configuration" on page 69) 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

Frame Rate	Required average frame rate for video from the camera. Select the number of frames, then select the time unit interval (second, minute or hour).
Live Frame Rate	The required average frame rate for live video from the camera. Select the number of frames, then select the time unit interval (second, minute or hour). If the camera supports dual stream and you have enabled dual stream, the **Live Frame Rate** column is read-only with the value Dual streaming. You cannot change this.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select the 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

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 the 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 the relevant start event. The camera begins using the speedup frame rates when the start event occurs.
Stop Event	Select the relevant stop event. The camera returns to the normal frame rates when the stop event occurs.
Live Frame Rate	The required average frame rate for live video from the camera. Select the 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 you have enabled dual stream, the **Live Frame Rate** column is read-only with the value Dual streaming. You cannot change this.
Recording Frame Rate	Required average frame rate for recorded video from the camera. Select the 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 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

Frame rate

Frame rate per second	Frame rate for viewing live and recorded video from the camera. Select number of frames per second.
Record keyframes only	Key frames 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 and Event.** Select the relevant start event. The camera begins recording all frames when the start event occurs.
Stop Event	Select the relevant 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 (properties)

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you configure video and recording (see "About video and recording configuration" on page 69) 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 or a speaker is attached to the same hardware device as the camera, the particular microphone/speaker is the camera's default microphone/speaker if you do not select otherwise.

Default Microphone	Select a default microphone.
Default Speaker	Select a default speaker.

You can only select a default microphone or speaker for the camera 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 69) for specific cameras, recording properties include:

Always	Record whenever the camera is enabled (see "General" on page *89*) and scheduled to be online (see "Online period" on page *133*). The latter option allows for time-based recording.
Never	Never record. Live video is shown, but users cannot play back video from the camera because no video is kept in the database.

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 *98*) 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 (see "Overview of events and output" on page *108*) 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 the relevant start event. Recording will begin when the start event occurs, or earlier if you use pre-recording. See the following.
Stop Event	Select the relevant stop event. Recording will end when the stop event occurs, or later if you use 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.
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 82) 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 that 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 69) for specific cameras, properties include:

Recording Path	A path to the folder in which the camera's database should be stored. The default folder 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, you cannot 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, leave them at the old location, or delete them. 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	The path to the folder in which the camera's archived recordings should be stored. The default folder is C:\MediaDatabase. You can only edit this if you do not use dynamic paths for archiving. 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, leave them at the old location, or delete them. Milestone recommends that you move the archiving recordings to a new location. 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.
Retention time	The 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 is attempted: a fast repair and a thorough repair. If both repair methods fail, the contents of the database are deleted. • **Repair, delete if fails**: If the database becomes corrupted, a fast repair is attempted. If the fast repair fails, the contents of the database are deleted. • **Repair, archive if fails**: If the database becomes corrupted, a fast repair is attempted. If the fast repair fails, the contents of the database are archived. • **Delete (no repair)**: If the database becomes corrupted, the contents of the database are deleted. • **Archive (no repair)**: If the database becomes corrupted, the contents of the database are archived. • **Scan, archive if fails**: If the database becomes corrupted, all files in the database are scanned for errors and a thorough repair of the database is attempted. This action takes more time to complete than the other repair actions, but ensures that a restore of all content in the database takes place. 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.
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 76).

Event notification

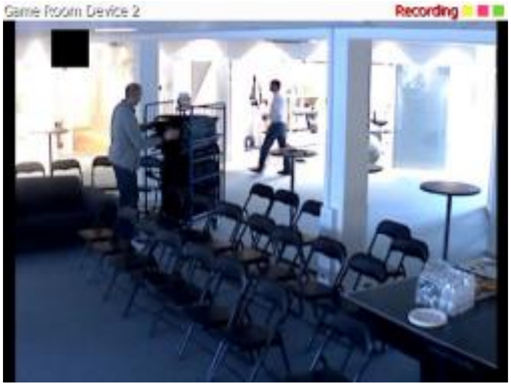
When you configure video and recording (see "About video and recording configuration" on page 69) for specific cameras, properties include event notification. Event notifications inform XProtect Smart Client users that an event has occurred on your system. Event notifications can be valuable for client 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 69) for specific cameras, you can also associate a camera with particular hardware output (see "Add a hardware output" on page 110), 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 XProtect Smart Client users with the necessary rights (see "Configure user and group rights" on page 161) 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 relevant, 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 69) 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 89) 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 168) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

Enable	Enable or disable (see "About motion detection" on page *69*) 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.

Manual sensitivity	Enable this functionality 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 setting 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 the system regards it 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 is 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.
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

Set the following properties for privacy masking:

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.

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 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 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 ImmerVision, 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 pan-tilt-zoom (PTZ) 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 161) 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, 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 168) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

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.
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 (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 168) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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:

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.

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 101), you can make the PTZ camera automatically go to a particular preset position when a particular event occurs (see "Overview of events and output" on page 108). 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 168).

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 168) the Recording Server service when you configure such devices for motion detection and PTZ.

See also View video from cameras in the Management Application (see "View video from cameras in Management Application" on page 44).

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 listen to recordings through XProtect Smart Client if the computer running 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 66) 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 69) 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

Always	Always record audio on all applicable cameras.
Follow video	Recording audio only when video is recorded from a camera that has a microphone attached.
Never	Never record audio on any cameras. Note that even though the system never records audio, 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 operation. 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 110) and Configure hardware output on event (on page 112).

About events and output

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 analyze, 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 113).

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.

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 110) and Configure hardware output on event (on page 112).

When you are ready to **configure events**, see Add a hardware input event (on page 110), Add a generic event (on page 112), and Add a manual event (on page 111). If you want to use timer events with your other events, see Add a timer event (on page 112).

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. 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 (see "Overview of events and output" on page 108) 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 98) 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 118). When ready, click **OK**, or click the **Add button** to add a timer event (on page 112) 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 (see "Overview of events and output" on page 108) 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 118).
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 112). 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 97).

Add a manual event

With manual events, your users with required rights (see "Configure user and group rights" on page 161) 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 133). 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 105).
- For triggering output. Particular output can be associated (see "Configure hardware output on event" on page 112) with manual events.
- For triggering event-based notifications (see "About notifications" on page 141).
- 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 118). When ready, click **OK**, or click the **Add** button again to add a timer event (on page 112) 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

Your system can analyze received TCP and/or UDP data packages, and automatically trigger events (see "Overview of events and output" on page 108) when specified criteria are met. This way, you can easily integrate your surveillance system with a range of external sources, for example access control systems and alarm systems.

1. Expand **Advanced Configuration**, then expand **Events and Output**. Right-click **Generic Events** > **Properties**.
2. In the **Generic Event Properties** window, click the **Add** button, and specify the relevant properties. For more information, see Generic event (on page 121).
3. To add a timer event to the generic event, click the **Add** button.
4. 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 (see "Overview of events and output" on page 108), 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 120). 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 110), such as lights, sirens, door openers and more, you can associate the hardware output with events (see "Overview of events and output" on page 108). 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 124). 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 115). 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 244).

As mentioned, a third-party VCA is most often 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. For more information, contact Milestone.

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 that triggers the generic event and the event notification.

Telnet is installed by default on older versions of Windows. For more information, see https://technet.microsoft.com/en-us/library/cc771275(v=ws.10).aspx (https://technet.microsoft.com/en-us/library/cc771275(v=ws.10).aspx).

For this example, we have created a generic event called **Video**. The 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 these principles:

1. Expand **Advanced Configurations**, then expand **Cameras and Storage Information**, right-click a camera that you have access to in XProtect Smart Client, and select **Properties**.

2. Select **Event Notification** and then 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 that 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 that you configured the event notification for is displayed and that you have camera title bars enabled in XProtect Smart Client, so you can see the yellow event indicator.

5. Run Telnet and type the following in the

6. In Windows' **Start** menu, select **Run**, and type the following in the **Open** field:

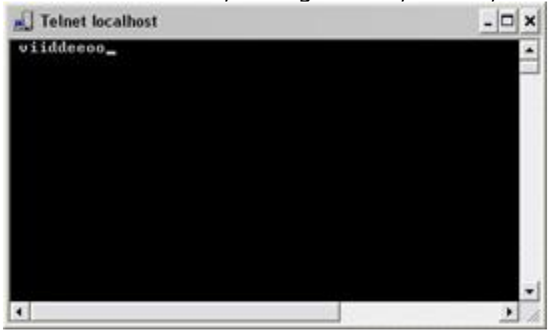
   - If you are performing the test on the system server itself: `telnet localhost 1234`

   - 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 113). 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**.

7. In the **Telnet** window, type the terms (**event substring**) required to trigger your generic event. In our case, a single term, **video**, is required:



```
viiddeeoo_
```

   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.

8. Close the **Telnet** window☒. You must close the window, since your input is not sent to the surveillance system until you close the window.

9. 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

In the **General Event Properties** window you can specify network settings to be used in connection with event handling.

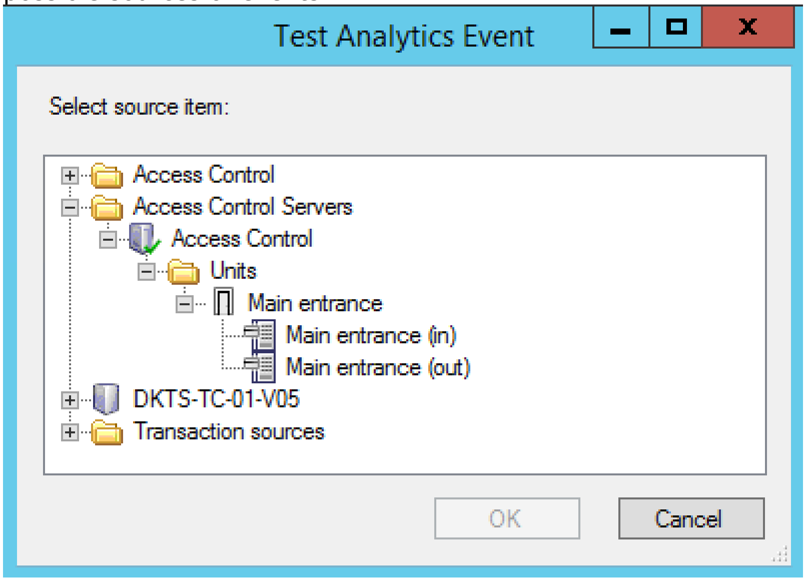
Alert and generic event port	Specify port number to use for handling events. Default port is port 1234.
SMTP event port	Specify the port number to use for sending event information from hardware devices to the system via SMTP. The default port is port 25.
FTP event port	The port to use for FTP communication with the hardware device. The 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 *63*), 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 notes.

Events and output properties

Test an analytics event

After you create an analytics event, you can test the requirements (see "Test Analytics Event (properties)" on page 116), for example that the analytics events feature has been enabled in Management Application.

1. Select an existing analytics event.
2. In the properties, click the **Test Event** button. A window appears that shows all the possible sources of events.



3. Select the source of your test event, for example a camera. The window is closed and a new window appears that goes through four conditions that must be fulfilled for the analytics event to work.

As an additional test, in XProtect Smart Client you can verify that the analytics event was sent to the event server. To do this, open XProtect Smart Client and view the event in the **Alarm Manager** tab.

See also

About analytics events

Test Analytics Event (properties)

When you test the requirements of an analytics event, a window appears that checks four conditions and provides possible error descriptions and solutions.

Condition	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. To do this, click **Tools** > **Options** > **Analytics Events** and select the **Enabled** check box.

Condition	Description	Error messages and solutions
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 or host names. **Error resolving the local host name.** Solution/Explanation: The IP address or host name of the machine cannot be found or is invalid.
Send analytics event	Did sending a test event to the Event Server succeed?	See table below.

Each step is marked by either failed: ✗ or successful: ✓.

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

Event server not found	Unable to find the event server on the list of registered services.
Error connecting to event server	Unable to connect to the event server on the stated port. The error occurs most likely because of network problems, or the event server service has stopped.
Error sending analytics event	The connection to the event server is established, but the event cannot be sent. The error most likely occurs because of network problems, for example a time out.
Error receiving response from event server	The event has been sent to the event server, but no reply received. The error most likely occurs because of network problems or a port that is busy. See the event server log, typically located at *ProgramData\Milestone\XProtect Event Server\logs\*.
Analytics event unknown by event server	The event server service does not know the event. The error most likely occurs because the event or changes to the event have not been saved.
Invalid analytics event received by event server	The event format is incorrect.
Sender unauthorized by event server	Most likely your machine is not on the list of allowed IP addresses or hostnames.
Internal error in event server.	Event server error. See the event server log, typically located at *ProgramData\Milestone\XProtect Event Server\logs\*.
Invalid response received from Event server	The response is invalid. Possibly the port is busy or there are network problems. See the event server log, typically located at *ProgramData\Milestone\XProtect Event Server\logs\*.

Unknown response from event server	The response is valid, but not understood. The error occurs possibly because of network problems, or the port is busy. See the event server log, typically located at *ProgramData\Milestone\XProtect Event Server\logs\*.
Unexpected error	Please contact Milestone support for help.

Hardware input event

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you add hardware input events (see "Add a hardware input event" on page 110), properties may depend on the selected type of input:

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 93) particular to your system.
Number of pre-alarm images	Specify the relevant number of pre-alarm images. The allowed number of images may differ from camera to camera. The allowed range is shown to the right of the field. This is only relevant if you are using pre-alarm images which is a feature that is available for selected cameras only.
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 *142*) 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 *142*) 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 *112*) to the selected hardware input event.
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 110), specify the following properties:

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. See the documentation for the relevant camera for exact information.
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	Specify the amount of time for which the output should be applied. Specify the relevant 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. See the documentation for the relevant hardware device for exact information.

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

Manual event

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you add manual events (see "Add a manual event" on page 111), specify the following properties:

[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 *142*) 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 *142*) 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 *112*) to the selected manual event.
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 112), specify the following properties:

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. See 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you add generic events (see "Test a generic event" on page 113), specify the following 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.
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 *113*).
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 appear 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 @, #, +, 籔~ and more within the text string to be analyzed.

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.

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/analyze packages using TCP as well as UDP protocol. • **TCP:** Listen for/analyze packages using TCP protocol only. • **UDP:** Listen for/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 *142*) 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 *142*) 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 *112*) 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 112), specify the following properties:

Event	Select the required event.
Output	Select the relevant 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 a 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 266) (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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 50), 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.

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 50), 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 132).

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 for downloading manuals and guides (http://www.milestonesys.com/support/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 130), Scheduling options (on page 131), and Archiving (on page 132).
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 16) of camera databases and archiving locations.

General scheduling properties

Scheduling all cameras

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you configure general scheduling and archiving (see "Configure general scheduling and archiving" on page 129), you can specify certain properties for many cameras in one go. Either in order to speed up things, or because the relevant properties 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.

Template	The template can help you set similar properties for cameras and reduce the time you need to spend on changing settings if you have multiple cameras connected to your system. Example: You have 20 cameras and want to change the recording path, archiving path, and retention time for all cameras. You can enter the settings you want to use once and then apply the template to the 20 cameras to make all cameras have the same settings.
Apply Template	Select which cameras you want to apply the template for. Use one of the two **Set** buttons to 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 *71*) for the relevant camera(s). 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: 🟨 You can combine the two options 🟪🟨🟪, but they cannot overlap in time.
E-mail	Select the relevant profile for the e-mail notification schedule for the relevant camera(s). 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 the button to select all cameras in the **Apply Template** column.

Clear All	Click the 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.
SMS	Select the required profile for the SMS notification schedule for the relevant camera(s). 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 cameras with patrolling, the continuous movement of a PTZ camera between a number of preset positions. Select the required profile for the PTZ patrolling schedule (see "PTZ patrolling" on page 134) for the relevant camera(s). 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 129), 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.

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 *133*), in which case client users cannot view live video from the cameras. If you select **Start cameras on client requests**, client users can view live video from the camera outside online schedule, but without recording. This technically means to 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 *164*), selecting **Enable recording when started on client request**, does **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 later 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 are always online, 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 by default attempts 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

To control when your system archives and how the system should respond in the event of failure, set the following settings. Your system automatically archives (see "About archiving" on page 124) recordings if a camera's database becomes full.

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 *142*).
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.
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 71) for specific cameras, you can specify the following:

Online	Select the required profile (for example **Always on**) for the online schedule (see "Configure camera-specific schedules" on page *71*) 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.

For many users, the **Online Period** settings may be the most important scheduling settings to set, since the scheduling settings 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. You can change this default setting as part of the general scheduling options (see "Scheduling options" on page 131), 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. You configure recording separately. See Configure video and recording (see "About video and recording configuration" on page 69).

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 131) and the Enable recording when started on client request (see "Scheduling options" on page 131) options to set up your scheduling properties for a relevant camera.

Speedup

Specify speedup periods for specific MJPEG cameras. Before you can define this type of schedule, you must enable (see "Frame rate - MJPEG" on page 83) speedup.

Speedup	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: 🟩

Speedup may also take place based on events, but you configure this elsewhere. See Frame rate - MJPEG (General recording and storage properties) (see "Frame rate - MJPEG" on page 83) and Video (Camera-specific properties) (see "Video" on page 90).

PTZ patrolling

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you configure scheduling (see "Configure camera-specific schedules" on page 71) for PTZ (pan-tilt-zoom) cameras capable of patrolling (see "PTZ patrolling (properties)" on page 102), 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.

PTZ Patrolling	Only available for PTZ cameras that have PTZ patrolling capabilities. Select the required profile for the PTZ patrolling schedule (see "PTZ patrolling" on page 134) for the camera(s) in question. 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 71) for one camera, you can reuse it with other cameras if required.

Matrix

About Matrix video-sharing

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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

Matrix recipients are computers on which you can view Matrix-triggered video. To become a Matrix-recipient, the computer must have 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, see 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 135), or, for automatically triggered video sharing, select **Matrix Event Control** and configure Matrix Event Control properties (see "Matrix event control" on page 136). 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

Use the **Matrix Recipients** tab 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.

Enable Matrix	Select the 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. Use this 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. Milestone recommends that you use a name for this that is descriptive and easy to remember. 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 use when sending commands to the Matrix recipient. Use when you add a new Matrix recipient or edit the properties of an existing one. The Matrix recipient listens for commands on this port. By default, the system uses port 12345. You can change the port if you need to.
Password	Specify the password to be use when the system communicates with the Matrix recipient. Use this when you add a new Matrix recipient or edit 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

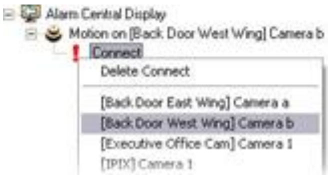
Use the **Matrix Event Control** tab to configure the automatic sending of live video based on predefined events. You can define exactly which events and cameras to use on a per-Matrix recipient basis. The **Matrix Event Control** tab displays the list of Matrix recipients defined on the **Matrix Recipients**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

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

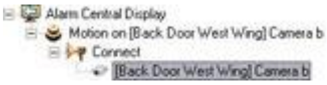
Delete [selected event]	Deletes selected event on the selected device.
Connect	Connects to the camera (actual camera is specified after selecting action to be taken).

Disconnect, then connect	Disconnect any existing connections, then connect again. With this option the live video appears 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 are not displayed prominently as coming from the latest event 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 indicates that there is still some configuration to do. Right-click an action to select which camera to apply the action on.


Alarm Central Display
Motion on [Back Door West Wing] Camera b
Connect
Delete Connect
[Back Door East Wing] Camera a
[Back Door West Wing] Camera b
[Executive Office Cam] Camera 1
[IPIX] Camera 1

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


Alarm Central Display
Motion on [Back Door West Wing] Camera b
Connect
[Back Door West Wing] 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.

Name	Description
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 140) 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

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.

Event Log

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

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.
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 142).
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:

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 *146*).

Attachment Settings (email)

Specify the following attachment settings:

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:

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 that 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	Specify the user name required for using the SMTP server. Only relevant when you have selected **Server requires login**.
Password	Specify the password required for using the SMTP server. Only relevant if you have selected **Server requires login**.
Max attachment size (MB)	Specify a maximum size of attached images.

SMS

About SMS

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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)

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

Specify the following message settings for SMS:

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 *146*).

Server Settings (SMS)

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

Specify the following server settings for SMS:

Serial port	Select the serial port to use for your USB/3G modem. The list that allows you to 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 142) and SMS (see "Message Settings (SMS)" on page 145) notifications.

Notification Scheduling properties

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

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 MIP, this is also the dialog that lets you specify the login settings for the MIP 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

Specify the following propeties for Central:

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 your system and Central servers or the MIP. The name must match the name specified on the Central server or in the MIP.
Password	Type the password used for the connection between system and Central servers or the MIP. The password must match the password specified on the Central server or in the MIP.
Port	Type the port number to which the XProtect Central server or the MIP 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 MIP. 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 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.

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 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.

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 an 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)

This tab 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.

Name	Description
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 display 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.

Name	Description
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

You can configure client's access to the system server or server access. Specify the following:

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 maximum number of clients 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.

If you click the **Add** button, you can set:

Start Address	Specify the first IP address in the range.
End Address	Specify the last IP address in the range.

Repeat the process 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.

Character encoding/Language	Select relevant the language/character set. Example: Select Japanese if your surveillance system server is running on a Japanese version of Windows. If the clients you use to access the system also run on a Japanese version of Windows, the Japanese language/character set ensure that the correct language and character encoding is in the communication between clients and the server. If you are running a master/slave setup, remember to specify the same language/character set on all relevant servers. Only XProtect Professional supports master/slave functionality.

Master/Slave

About master and slave

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 Professional master servers can only use 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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

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.

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

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 refer 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 160) and Add Windows users (on page 160)).

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 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.

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.

By grouping users, you can specify rights (see "Configure user and group rights" on page 161) 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 162) and Camera access (on page 164) 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 160) or** Add Windows users (on page 160) 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 160), Add Windows users (on page 160) and Add user groups (on page 161). Note that you can also add basic and Windows users through the Manage user access wizard (on page 60). 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

You can change the following user information:

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	Edit the password. Remember to repeat the password to be sure you have specified it correctly. You can only edit the password for basic users.
User type	You cannot edit this field. It shows whether the selected user is a basic user or a Windows user group.

Group information

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 160), Windows users (see "Add Windows users" on page 160) or groups (see "Add user groups" on page 161):

Client access settings

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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

When you add or edit basic users (see "Add basic users" on page 160), Windows users (see "Add Windows users" on page 160) or groups (see "Add user groups" on page 161), 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: Use SHIFT or CTRL to select multiple cameras 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:

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 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 *82*) by the surveillance system administrator).
Outgoing audio	Talk to audiences through speakers related to the selected camera(s). This feature is available in XProtect Smart Client only.

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 162) 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 160), Windows users (see "Add Windows users" on page 160) or groups (see "Add user groups" on page 161), specify their XProtect Smart Client alarm management rights:

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 160), Windows users (see "Add Windows users" on page 160) or groups (see "Add user groups" on page 161), specify access control settings:

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 168).

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 XProtect Smart Clients on other computers than the surveillance server itself cannot 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 93).
Milestone Log Check service	Performs integrity checks on your system's log files.
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.
Notification server service	Manages sending email or SMS notifications from the system to users.
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 Event Server. If you do so, the Event Server service is not seen in your Services overview.

About the tray icons

The tray icons in the table represent the possible states of the services running on Management Server, Recording Server, Failover Recording Server, and Event Server. They are all visible on the computers where the servers are installed, in the notification area:

Management Server service icon	Recording Server service icon	Event Server service icon	Failover Recording Server service icon	Description
▶	▶	▶	▶	**Running** Appears when a server service is enabled and started. If the Failover Recording Server service is running, it can take over if the standard recording servers fails.
🟥	🟥	🟥	🟥	**Stopped** Appears when a server service has stopped. If the Failover Recording Server service stops, it cannot take over if the standard recording server fails.
▷	▷	▷	▷	**Starting** Appears when a server service is in the process of starting. Under normal circumstances, the tray icon changes after a short while to **Running**.
🟨	🟨	🟨		**Stopping** Appears when a server service is in the process of stopping. Under normal circumstances, the tray icon changes after a short while to **Stopped**.
	□	□		**In indeterminate state** Appears when the server service is initially loaded and until the first information is received, upon which the tray icon, under normal circumstances, changes to **Starting** and afterwards to **Running**.

Management Server service icon	Recording Server service icon	Event Server service icon	Failover Recording Server service icon	Description
	☒		☒	**Running offline** Typically appears when the Recording Server or Failover recording service is running but the Management Server service is not.
	?			**Must be authorized by administrator** Appears when the Recording Server service is loaded for the first time. Administrators authorize the recording server through the Management Client: Expand the **Servers** list, select the **Recording Server** node and in the **Overview** pane, right-click the relevant recording server and select **Authorize Recording Server**.

Start and stop services

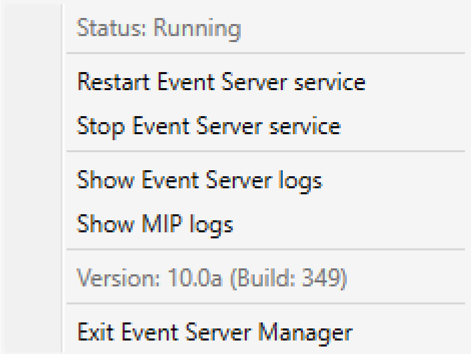
On a system server, several services by default run in the background. If you need to, you can start and stop each service separately:

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.

Start, stop, or restart the Event Server service

In the notification area, a tray icon indicates the state of the Event Server service, for example **Running**. Through this icon, you can start, stop, or restart the Event Server service. If you stop the service, parts of the system will not work, including events and alarms. However, you can still view and record video. For more information, see Stopping the Event Server service (on page 169).

1. In the notification area, right-click the tray icon for the Event Server. A context-menu appears.


Status: Running
Restart Event Server service
Stop Event Server service
Show Event Server logs
Show MIP logs
Version: 10.0a (Build: 349)
Exit Event Server Manager

2. If the service has stopped, click **Start Event Server service** to start it. The tray icon changes to reflect the new state.

3. To restart or stop the service, click **Restart Event Server service** or **Stop Event Server service**.

For more information about the tray icons, see About the tray icons (on page 167).

See also

Start or stop the Recording Server service

Stopping the Event Server service

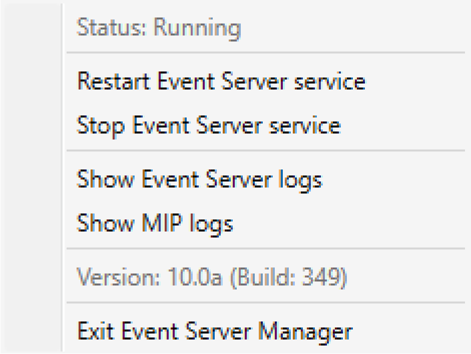
When installing MIP plug-ins in the Event Server, first you must stop the Event Server service and then, afterward, restart it. However, while the service is stopped, many areas of the VMS system will not function:

- No events or alarms are stored in the Event Server. However, system and device events still trigger actions, for example start recording.
- XProtect Access, XProtect LPR, and XProtect Transact do not work in the configuration or in XProtect Smart Client.
- Analytic events do not work.
- Generic events work in XProtect Professional VMS, but are not stored in the Event Server.
- No alarms are triggered.
- In XProtect Smart Client, map view items, alarm list view items, and the Alarm Manager workspace do not work.
- MIP plug-ins in the Event Server cannot run.
- MIP plug-ins in Management Application and XProtect Smart Client do not work correctly.

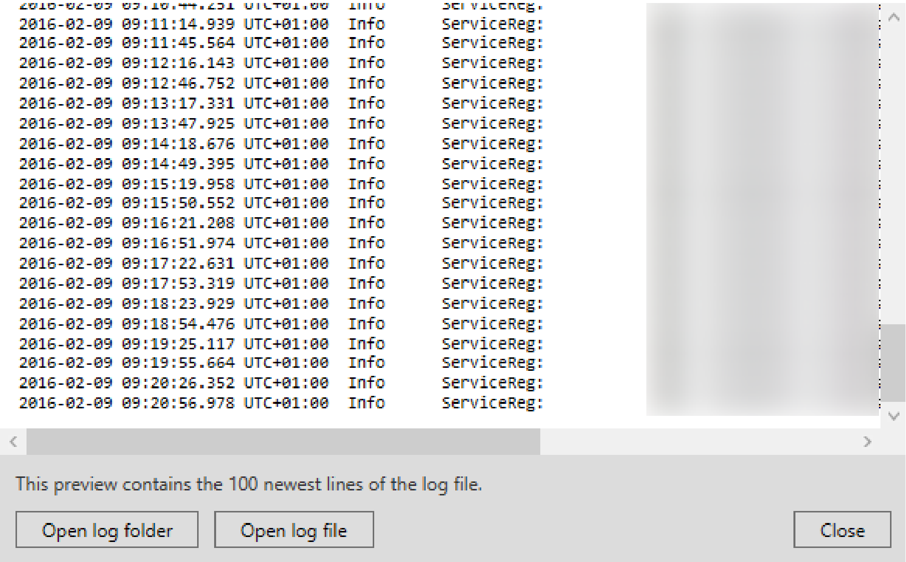
View Event Server or MIP logs

You can view time-stamped information about Event Server activities in the Event Server log. Information about third party integrations is logged in the MIP log in a sub-folder in the **Event Server** folder.

1. In the notification area, right-click the relevant tray icon. A context-menu appears.


Status: Running
Restart Event Server service
Stop Event Server service
Show Event Server logs
Show MIP logs
Version: 10.0a (Build: 349)
Exit Event Server Manager

2. To view the 100 most recent lines in the Event Server log, click **Show Event Server Logs**. A log viewer appears.



```
2016-02-09 09:10:44.251 UTC+01:00 Info     ServiceReg:
2016-02-09 09:11:14.939 UTC+01:00 Info     ServiceReg:
2016-02-09 09:11:45.564 UTC+01:00 Info     ServiceReg:
2016-02-09 09:12:16.143 UTC+01:00 Info     ServiceReg:
2016-02-09 09:12:46.752 UTC+01:00 Info     ServiceReg:
2016-02-09 09:13:17.331 UTC+01:00 Info     ServiceReg:
2016-02-09 09:13:47.925 UTC+01:00 Info     ServiceReg:
2016-02-09 09:14:18.676 UTC+01:00 Info     ServiceReg:
2016-02-09 09:14:49.395 UTC+01:00 Info     ServiceReg:
2016-02-09 09:15:19.958 UTC+01:00 Info     ServiceReg:
2016-02-09 09:15:50.552 UTC+01:00 Info     ServiceReg:
2016-02-09 09:16:21.208 UTC+01:00 Info     ServiceReg:
2016-02-09 09:16:51.974 UTC+01:00 Info     ServiceReg:
2016-02-09 09:17:22.631 UTC+01:00 Info     ServiceReg:
2016-02-09 09:17:53.319 UTC+01:00 Info     ServiceReg:
2016-02-09 09:18:23.929 UTC+01:00 Info     ServiceReg:
2016-02-09 09:18:54.476 UTC+01:00 Info     ServiceReg:
2016-02-09 09:19:25.117 UTC+01:00 Info     ServiceReg:
2016-02-09 09:19:55.664 UTC+01:00 Info     ServiceReg:
2016-02-09 09:20:26.352 UTC+01:00 Info     ServiceReg:
2016-02-09 09:20:56.978 UTC+01:00 Info     ServiceReg:
```

This preview contains the 100 newest lines of the log file.

   1. To view the log file, click **Open log file**.

   2. To open the log folder, click **Open log folder**.

3. To view the 100 most recent lines in the MIP log, go back to the context-menu and click **Show MIP logs**. A log viewer is displayed.

If someone removes the log files from the log directory, the menu items are grayed out. To open the log viewer, first you need to copy the log files back into one of these folders: *C:\ProgramData\Milestone\XProtect Event Server\logs* or *C:\ProgramData\Milestone\XProtect Event Server\logs\MIPLogs*.

Servers

LPR servers

LPR system overview

About XProtect LPR

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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.

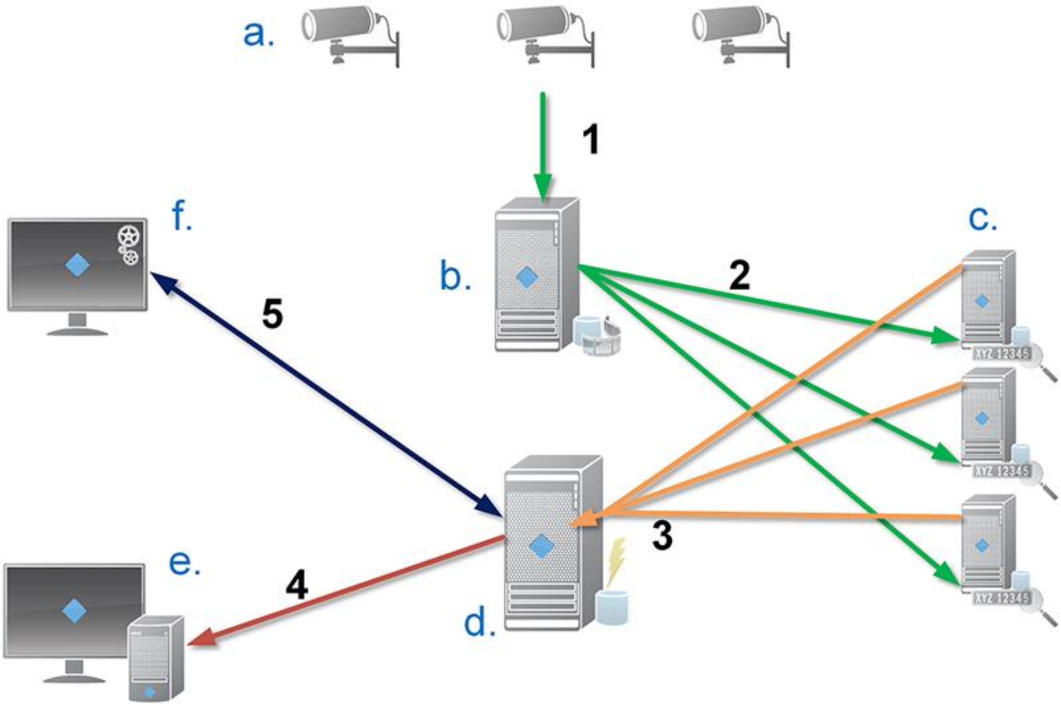
Examples of events in XProtect LPR:

- 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 is compatible with the version 2014 SP3 or newer of:

- XProtect Professional
- XProtect Express

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 196) 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 187).

To buy additional LPR licenses or country modules, contact your vendor.

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 clearer and more 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.

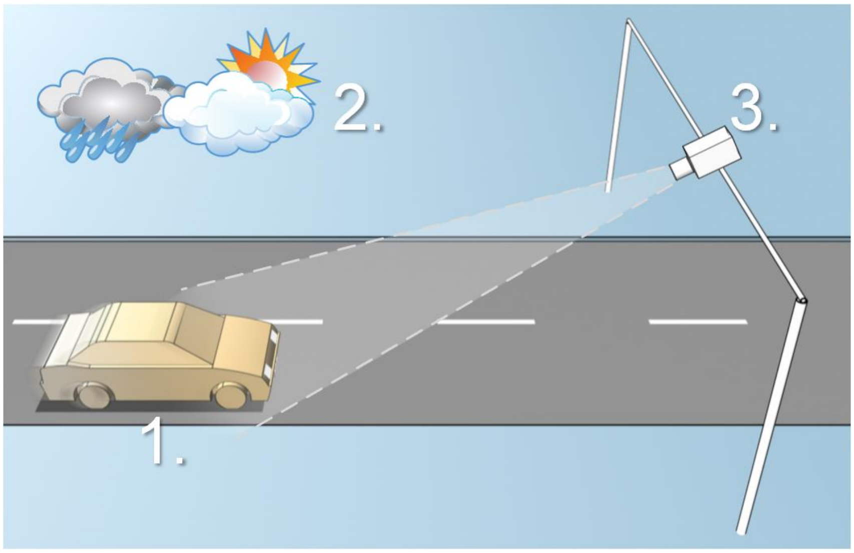


Illustration of an LPR solution

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 successfully 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 175)

Camera angles (on page 176)

Plate width recommendations (on page 177)

Image resolution (on page 178)

Understanding camera exposure (on page 179)

Physical surroundings (on page 182)

Lens and shutter speed (on page 183)

Contrast (on page 184)

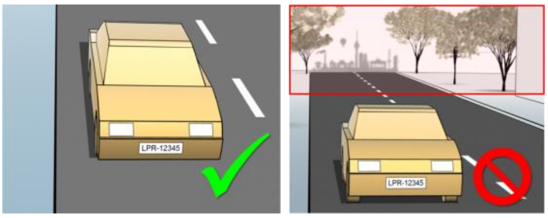
Unwanted camera features (on page 185)

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.

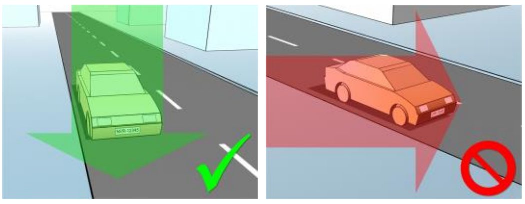


Left image shows a correct mounting without interference in the field of view. Right image shows an incorrect mounting. The camera is mounted too low and with too much background 'noise' in the view.

To help you obtain a clear and undisturbed view, you can:

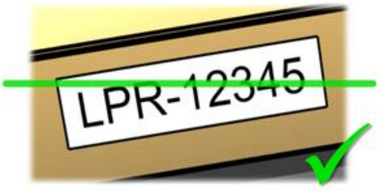
- Mount the camera as close as possible to the area of interest.
- Angle your camera.
- Zoom. If you zoom, always use the camera's optical zoom.

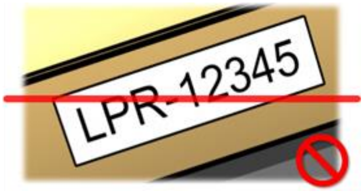
Mount the camera so the license plate appears from the top of the image (or bottom if traffic is driving away from the camera) instead of from the right or left side. In this way you make sure that the recognition process of a license plate only starts when the whole plate is in the view:



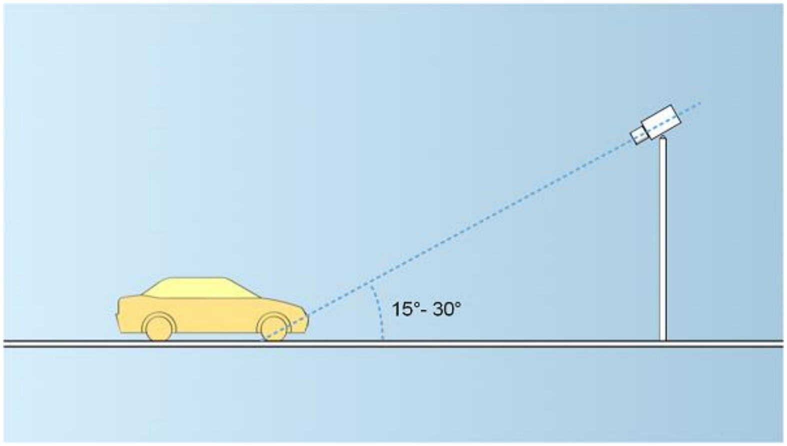
Camera angles

- **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°.

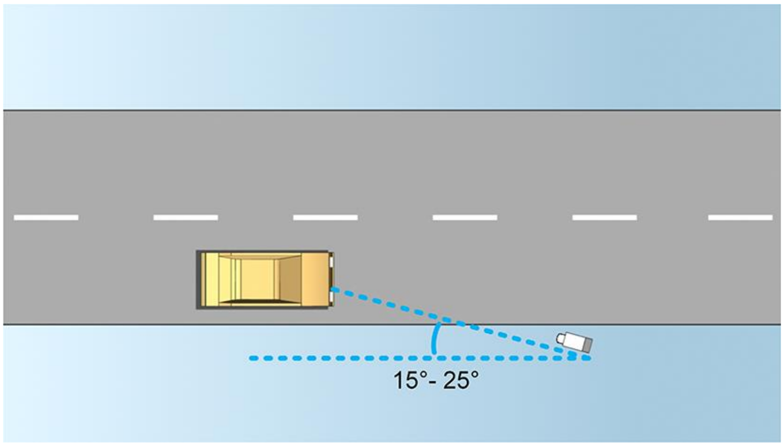
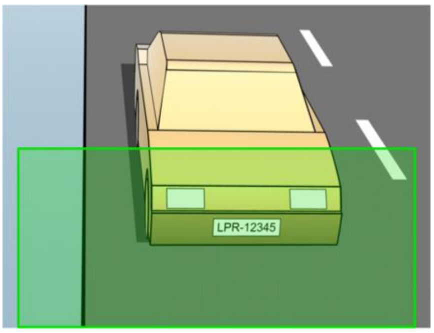


Plate width recommendations

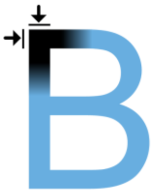
Mount the camera so that the ideal snapshot of the license plate is captured when the license plate is in the center or lower half of the image:



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

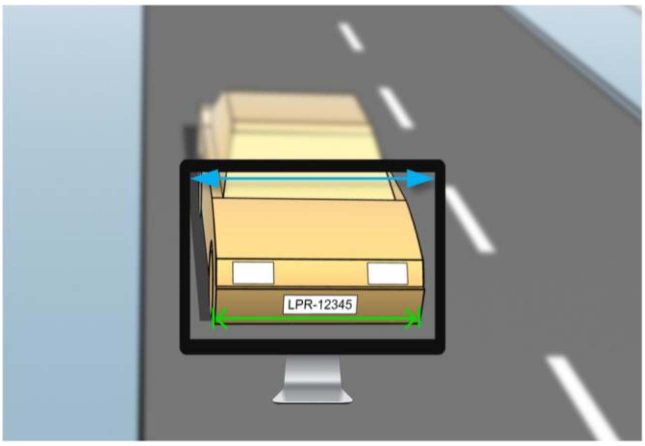
Plate type	Plate width	Setup	Minimum plate width (pixels)
Single line US plates	- plate width 12 inches - stroke width around ¼ inches	vehicles stopped; no interlacing	130
		vehicles are moving; interlaced	215
Single line European plates	- plate width 52 cm - stroke width around 1 cm	vehicles stopped; 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.

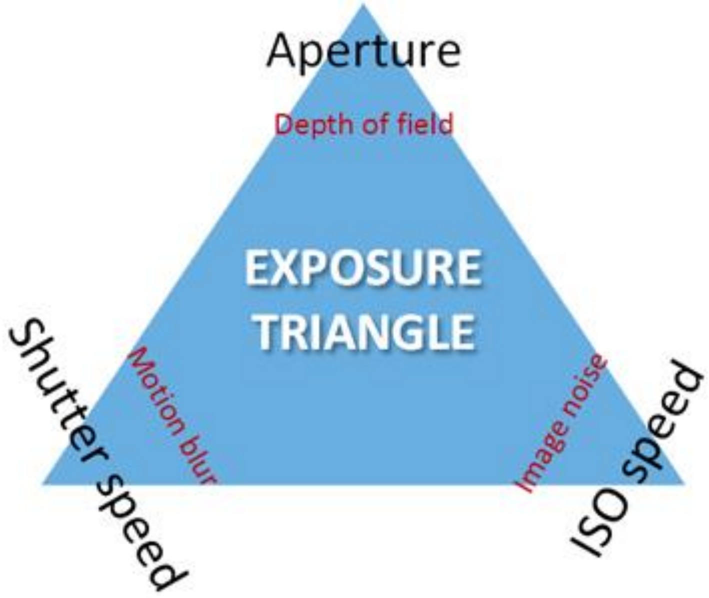
Common video resolutions

Name	Pixels (W×H)
QCIF	176×120
CIF	352×240
2CIF	704×240

Name	Pixels (W×H)
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

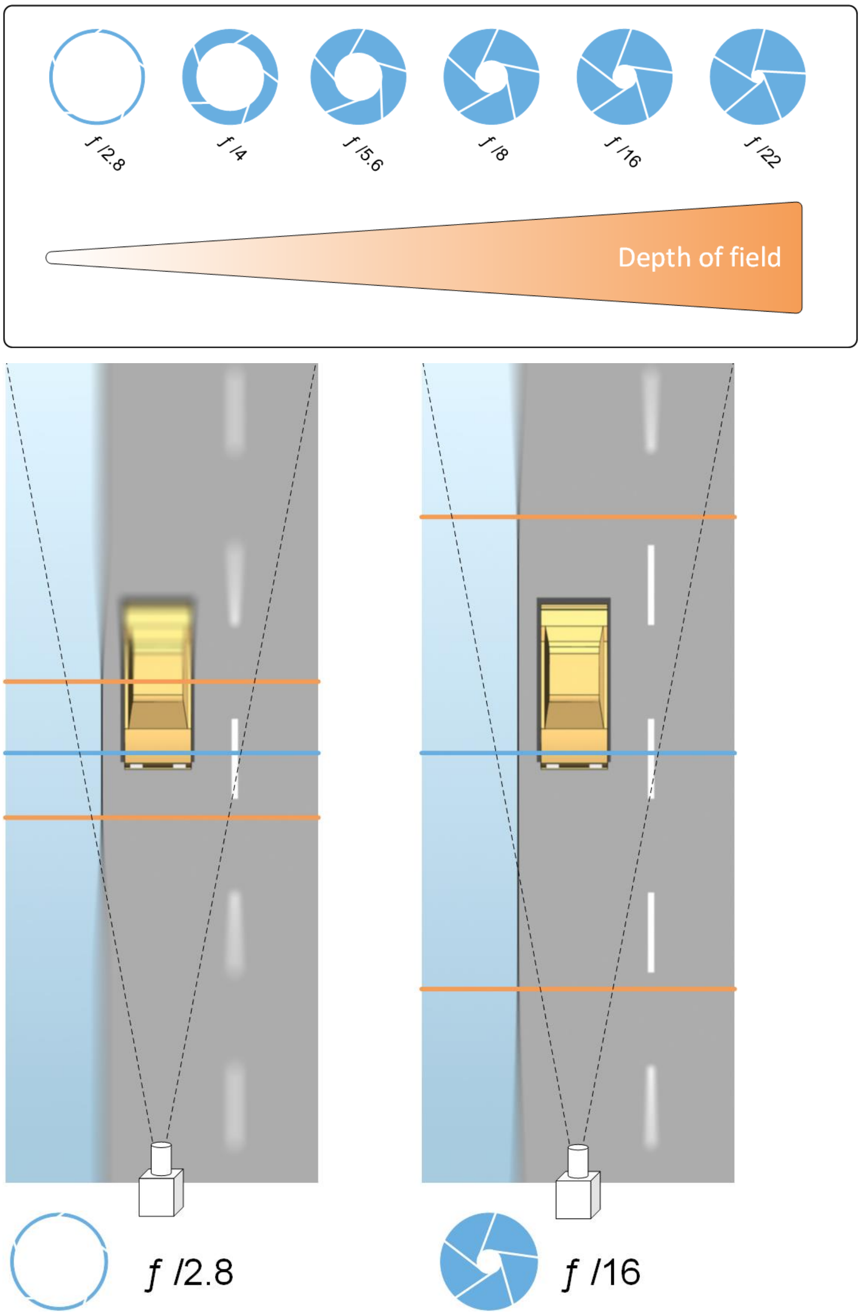
The next sections describe how each setting is specified, what it looks like, and how a given camera exposure mode affects this combination:

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.

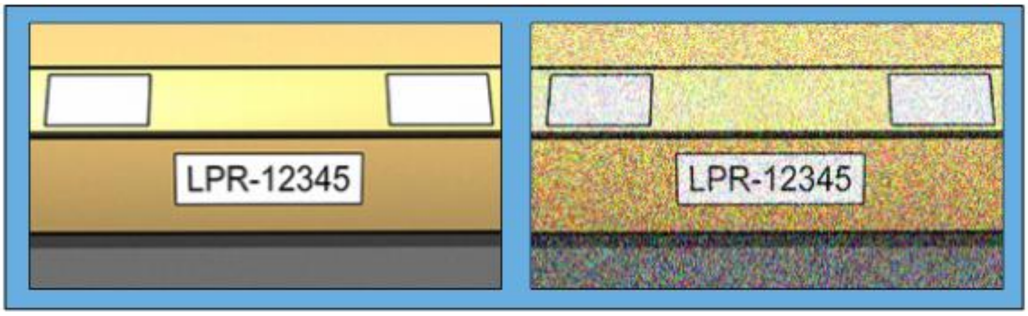
Shutter speed

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.

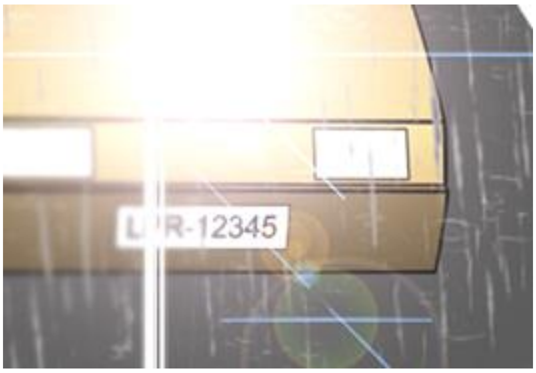
Common ISO speeds include 100, 200, 400 and 800, although many cameras also permit lower or higher values. With digital single-lens reflex (DSLR) cameras, a range of 50-800 (or higher) is often acceptable.

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 184). When auto-gain (see "Unwanted camera features" on page 185) cannot be disabled or when you are not able to configure a maximum allowed shutter time (see "Lens and shutter speed" on page 183) 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 179).

- **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 formula 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 185), the use of compression (see "Unwanted camera features" on page 185), 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’ 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 177) 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, you 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 Management Application's 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 173).
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 196) 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.

If an antivirus program is installed on a computer running XProtect software, it is important that you exclude the C:\ProgramData\Milestone\XProtect LPR folder. Without implementing this exception, virus scanning uses a considerable amount of system resources and the scanning process can temporarily lock files.

Upgrade XProtect LPR

To upgrade XProtect LPR, you follow the same steps as for installation (see "Install XProtect LPR" on page 186).

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 Management Application's navigation pane, expand **Servers** and select **LPR servers**. Go to the Overview pane.

   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 187).

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*.

Field	Description
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 or H.265 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 173).

About snapshots

The system uses snapshots to optimize the configuration automatically and to visualize the effect of the recognition settings as they are applied.

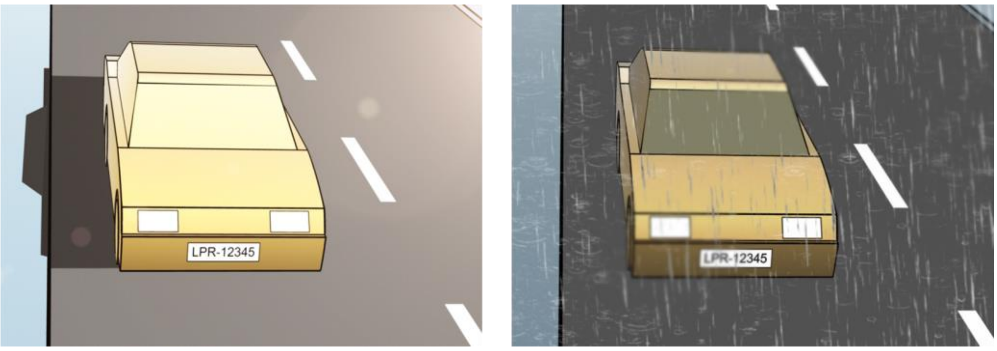
You need to provide at least one valid snapshot in order to complete the initial configuration of a camera.

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.

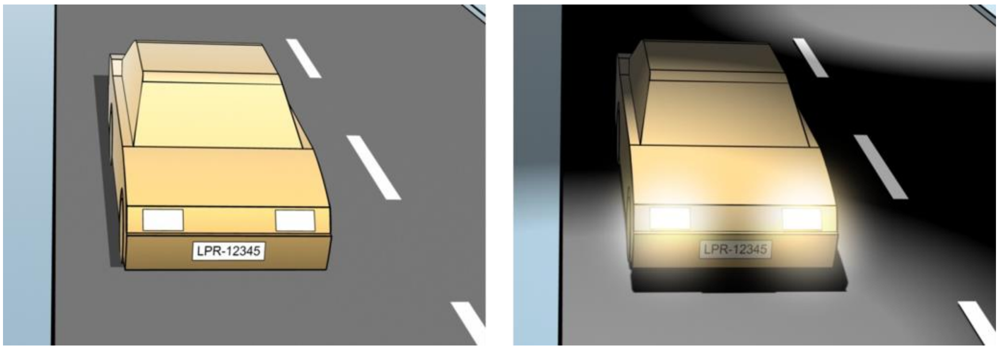
The list below illustrates examples of the situations that you should consider when you capture and select snapshots. Not all may be applicable for your surroundings.

Milestone recommends that you select minimum 5-10 snapshots that represent typical conditions of:

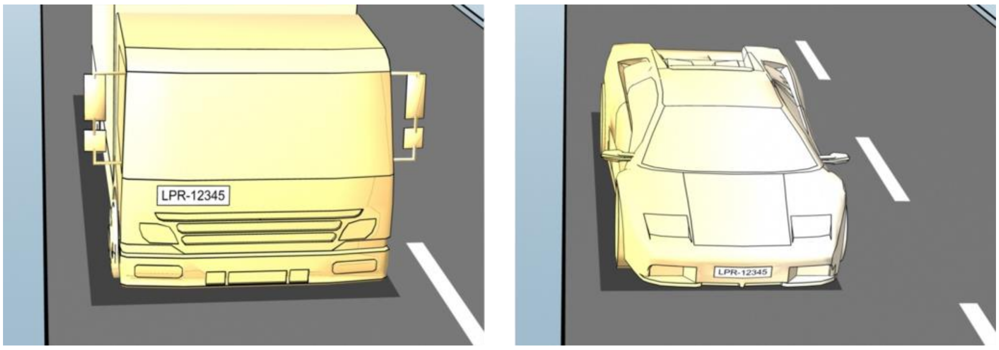
- **The weather; for example sunlight and rain**



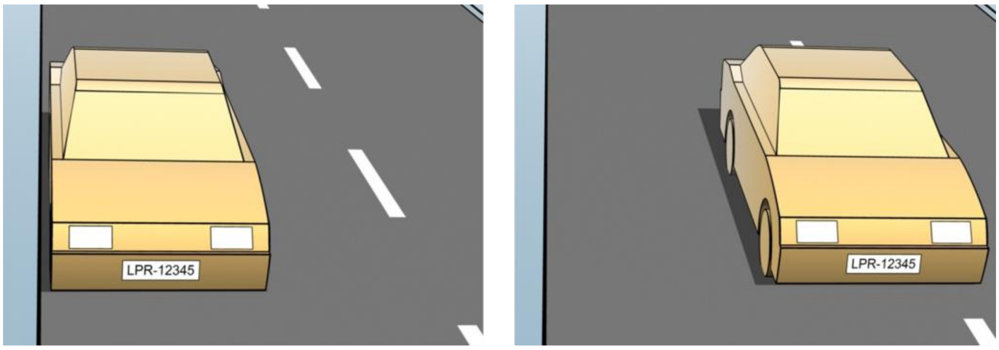
- **The light; for example daylight and nighttime**



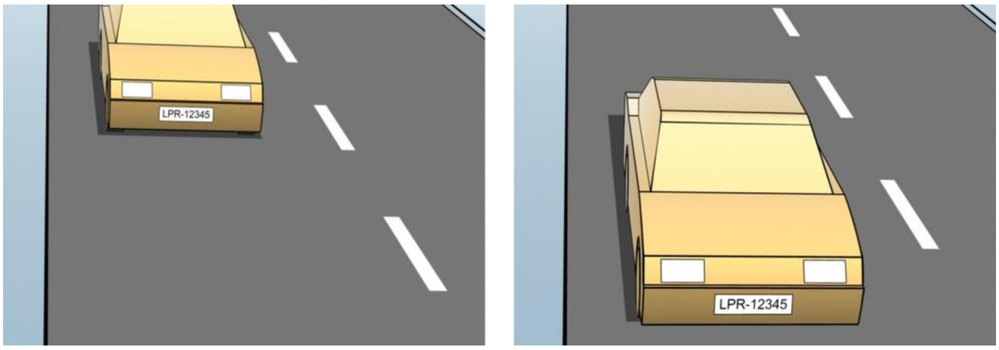
- **Vehicle types; to define the top and bottom of the recognition area**



- **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 Management Application's navigation pane, expand **Servers**, expand **LPR servers**, and select **LPR camera**.

2. Go to the Overview pane. 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 196).
   - Select snapshots to use for validating the configuration (see "About snapshots" on page 189).
   - Validate the result of the snapshot analysis (see "Validate configuration" on page 198).
   - Select which license plate match lists to use (see "About license plate match lists" on page 199). 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 192).
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 198).

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 191).
- Adjust and validate the recognition settings (see "Recognition settings tab" on page 192).
- Add more license plate match lists (see "Match lists tab" on page 196).
- Enable additional country modules (see "Country modules tab" on page 196).

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).

Name	Description
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.

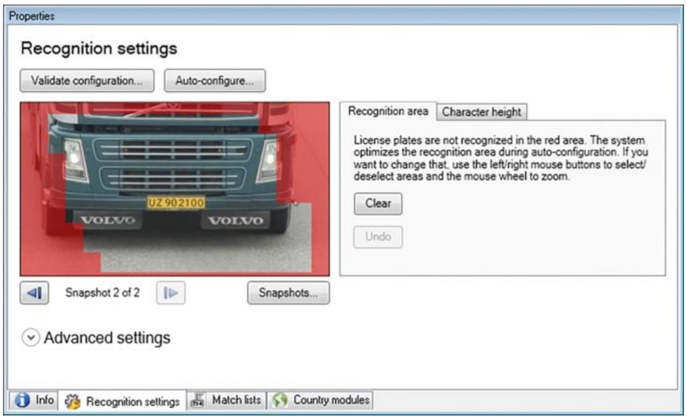
Name	Description
Snapshots	Add or delete snapshots (see "Select snapshots" on page *197*).
Validate configuration	Test that license plates are recognized as expected (see "Validate configuration" on page *198*).
Auto-configure	Disregard manual changes and optimize settings (see "Auto-configure" on page *198*).

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 175).

License plates are not recognized in the red area.



License plates are not recognized in the red area. The system optimizes the recognition area during auto-configuration. If you want to change that, use the left/right mouse buttons to select/ deselect areas and the mouse wheel to zoom.

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 198) to see if the system recognizes license plates as well as expected.

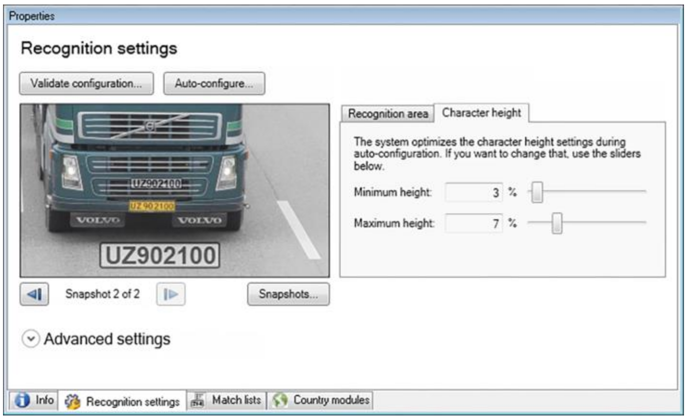
Character height

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.



Properties

Recognition settings

Recognition area | Character height

The system optimizes the character height settings during auto-configuration. If you want to change that, use the sliders below.

Minimum height: 3 %

Maximum height: 7 %

Snapshot 2 of 2

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.

Name	Description
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 198) to see if the system recognizes license plates as well as expected.

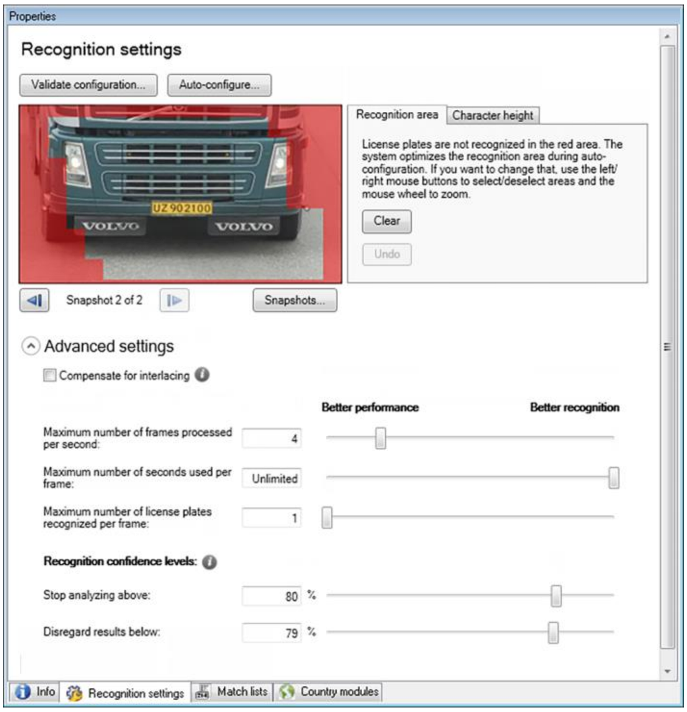
Advanced settings

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.



License plates are not recognized in the red area. The system optimizes the recognition area during auto-configuration. If you want to change that, use the left/right mouse buttons to select/deselect areas and the mouse wheel to zoom.

□ Compensate for interlacing

Maximum number of frames processed per second: 4

Maximum number of seconds used per frame: Unlimited

Maximum number of license plates recognized per frame: 1

Recognition confidence levels:

Stop analyzing above: 80 %

Disregard results below: 79 %

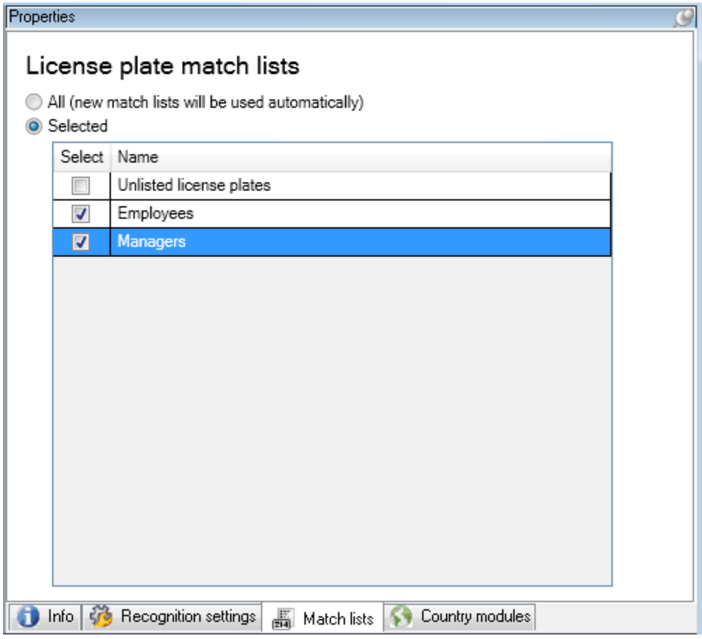
By adjusting the advanced settings, you define the trade-off. The recognition process stops if any of the stop criteria are met and returns the license plate it recognized at that point.

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 198) 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 199).



Properties

License plate match lists

○ All (new match lists will be used automatically)
● Selected

Select	Name
□	Unlisted license plates
☑	Employees
☑	Managers

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.

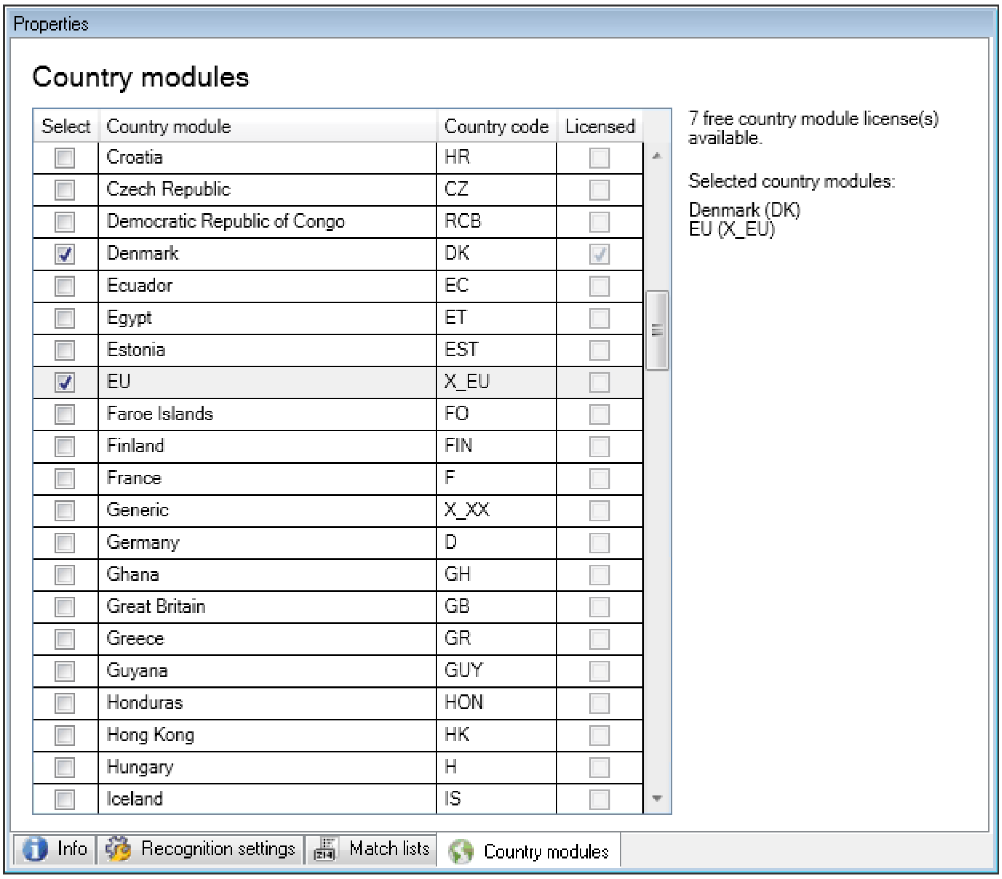
When you have changed the settings for your LPR camera, validate your configuration (see "Validate configuration" on page 198) to see if the system recognizes license plates as well as expected.

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 173).

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.



Country modules

Select	Country module	Country code	Licensed
□	Croatia	HR	□
□	Czech Republic	CZ	□
□	Democratic Republic of Congo	RCB	□
☑	Denmark	DK	☑
□	Ecuador	EC	□
□	Egypt	ET	□
□	Estonia	EST	□
☑	EU	X_EU	□
□	Faroe Islands	FO	□
□	Finland	FIN	□
□	France	F	□
□	Generic	X_XX	□
□	Germany	D	□
□	Ghana	GH	□
□	Great Britain	GB	□
□	Greece	GR	□
□	Guyana	GUY	□
□	Honduras	HON	□
□	Hong Kong	HK	□
□	Hungary	H	□
□	Iceland	IS	□

7 free country module license(s) available.

Selected country modules:

Denmark (DK)
EU (X_EU)

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 198) 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 189). 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 is mounted and configured correctly (see "About preparing cameras for LPR" on page 173).
5. When you have approved all snapshots, click **Next** and close the wizard.
6. On the **Recognition settings** tab, click **Validate configuration** (on page 198).

Validate configuration

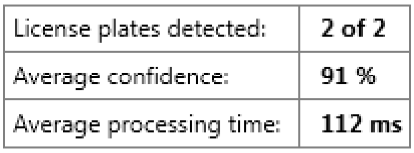
You can validate your current configuration to see if you need to change any settings or provide more snapshots. The validation function informs you about how many license plates your system recognizes, and if they are recognized correctly.

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 198) 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 196) and set it up like any other list (see "Events triggered by LPR" on page 202).

Add new license plate match lists

1. In the Management Application's 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 202).
4. To update the match list, use the **Add**, **Edit**, **Delete** buttons (see "Edit license plate match lists" on page 200).
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 200).
6. If prompted, confirm to save changes.

Edit license plate match lists

1. In the Management Application's navigation pane, select **License plate match lists**.
2. Go to the Overview pane. 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 existing 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:

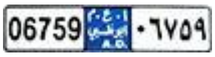
1. In the Management Application's navigation pane, click **License plate match lists** and select the relevant list.
2. To import a file, click **Import**.
3. In the dialog box, specify the location of the import file and the import type. Click **Next**.

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 *202*).
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 *200*).
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 *200*).

Name	Description
Rows per page	Select how many license plates to display in one page (one screen). You can choose between 50 to 1000 rows.
Events triggered by list match	Select which event(s) should be triggered by a list match (see "Events triggered by LPR" on page *202*). 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 199), 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 199) 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 199) you want to match license plates against.
2. Add and configure your LPR camera(s) (see "Add LPR camera" on page 190).
3. In the Management Application's 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 203).
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 203).

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 199).

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

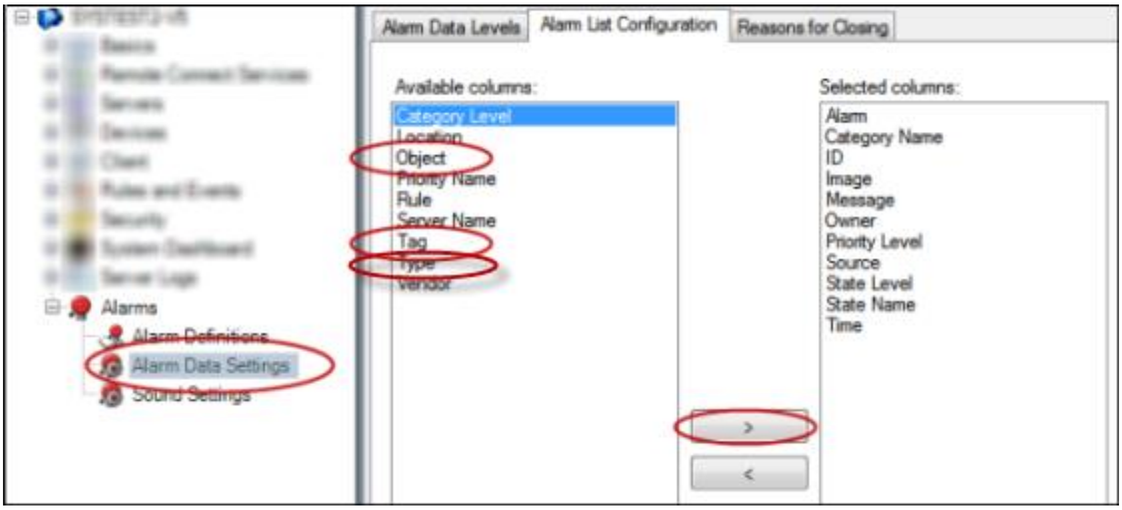
In the Management Application, you must make two specific **Alarm List Configuration** elements available for selection in XProtect Smart Client.

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 Management Application's 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 187).

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 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 204) 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.*

Milestone Mobile

Milestone Mobile introduction

About Milestone Mobile

Milestone Mobile consists of three components:

- **Milestone Mobile client**
- **Milestone Mobile server**
- **Milestone Mobile plug-in**

The Milestone Mobile client is a mobile surveillance app that you can install and use on your Android device, Apple device or Windows Phone device. You can use as many installations of Milestone Mobile client as you need.

For more information, download the Milestone Mobile Client User Guide from the Milestone Systems website (http://www.milestonesys.com/support/manuals-and-guides/).

The Milestone Mobile server and Milestone Mobile plug-in are covered in this manual.

Prerequisites for using Milestone Mobile

Before you can start using Milestone Mobile, you must make sure that you have the following:

- A running VMS installed and configured with at least one user.
- Cameras and views set up in XProtect Smart Client.
- A mobile device running Android, iOS or Windows with access to Google Play, App Store℠ or Windows Phone Store from which you can download the Milestone Mobile client application.

Milestone Mobile system requirements

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

- To find requirements for the Milestone Mobile client, click the **Milestone Mobile** entry.
- To find requirements for the Milestone Mobile server, click the XProtect product that you have installed.
- Requirements for the Milestone Mobile plug-in are:
  - A running Management Application.
  - The Milestone plug-in is installed to integrate with your VMS.

Milestone Mobile configuration

About Milestone Mobile server

Milestone Mobile server handles logins to the system from Milestone Mobile client from a mobile device or XProtect Web Client.

A Milestone Mobile server distributes video streams from recording servers to Milestone Mobile clients. This offers a secure setup where recording servers are never connected to the Internet. When a Milestone 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 Milestone Mobile server on any computer from which you want to access recording servers. When you install Milestone Mobile server, make sure you log in using an account that has administrator rights. Otherwise, installation will not complete successfully.

About Milestone Federated Architecture and master/slave servers

If your system supports Milestone Federated Architecture or servers in a master/slave setup, you can access such servers with your Milestone Mobile client. Use this functionality to gain access to all cameras on all slave servers by logging in to the master server.

If in a Milestone Federated Architecture setup, you gain access to child sites via the central site. Install the Milestone Mobile server only on the central site.

This means that when users of the Milestone Mobile client log in to a server to see cameras from all servers in your system, they must connect to the IP address of the master server. Users must have administrator rights on all servers in the system in order for the cameras to show up in the Milestone Mobile client.

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.

About Smart Connect

Smart Connect enables you to verify that you have configured the mobile server correctly without logging in with a mobile device or a tablet to do the validation. It also simplifies the connection process for the client users.

This feature requires that your Milestone Mobile server uses a public IP address and that your system is licensed with a Milestone Care Plus subscription package.

The system gives you instant feedback in the Management Application if the remote connectivity setup has been set up successfully and confirms that the Mobile Server server is accessible from the Internet.

Smart Connect enables the Milestone Mobile server to switch seamlessly between internal and external IP addresses and connect to the mobile server from any location.

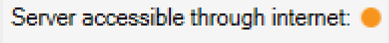
To make it easier to set up customers’ mobile clients, you can send an email directly from within the Management Application to the end-user. The email includes a link that adds the server directly to Milestone Mobile. This completes the setup without any need to enter network addresses or ports.

Set up Smart Connect

Enable Universal Plug and Play discoverability on your router

To make it easy to connect mobile devices to Milestone Mobile servers, you can enable Universal Plug and Play (UPnP) on your router. UPnP enables Milestone Mobile server to configure port forwarding automatically. However, you can also manually set up port forwarding on your router by using its web interface. Depending on the router, the process for setting up port mapping can differ. If you are not sure how to set up port forwarding on your router, see the documentation for that device.

Note: Every five minutes, the Milestone Mobile server service verifies that the server is available to users on the Internet. The status displays in the upper left corner of the **Properties** pane:



Server accessible through internet: ●

.

Requirements

- Your Milestone Mobile server must use a public IP address. The address can be static or dynamic, but typically it's a good idea to use static IP addresses.
- You must have a valid license for Smart Connect.

Configure connection settings

1. In Management Application, in the navigation pane, expand **Servers**, and select **Mobile Server**.
2. Select the server and click the **Connectivity** tab.
3. Use the options in the **General** group to specify the following:
   - To make it easy for users to connect mobile devices to Milestone Mobile servers, select the **Enable Smart Connect** check box.
   - Specify the protocol to use in the **Connection type** field.
   - **Note:** If you turn on secure connections, devices running iOS 9.0 or later, or Windows Phone, can connect only if you have a certificate from a certificate authority (CA) installed on your Milestone Mobile server. CAs issue digital certificates that verify the identities of users and websites that exchange data on the Internet. Examples of CAs are companies like Comodo, Symantec, and GoDaddy.
   - Before you turn on secure connections, make sure that you are familiar with digital certificates. To learn how to add a certificate in Milestone Mobile server, see Edit certificates (see "Edit certificate" on page 223).
   - Specify the number of seconds before the connection times out.
   - To let mobile devices find the Milestone Mobile servers that are within range, select the **Enable UPnP discoverability** check box.
   - To enable routers to forward mobile devices to a specific port, select the **Enable automatic port mapping** check box.

Send an email message to help users connect

You can make it easy for users to get started with Milestone Mobile by sending them an email message that includes connection information. You can send the message directly from Management Application, or you can copy the information to the messaging program you use.

1. In the **Email invitation to** field, enter the email address for the recipient, and then specify a language.
2. Next, do one of the following:
   - To send the message, click **Send**.
   - Copy the information to the messaging program you use.

Enable connections on a complex network

If you have a complex network where you have custom settings, you can provide the information users need to connect.

In the **Internet Access** group, specify the following:

- If you use UPnP port mapping, to direct connections to a specific connection, select the **Configure custom Internet access** check box. Then provide the **IP address or hostname**, and the port to use for the connection. For example, you might do this if your router does not support UPnP, or if you have a chain of routers.
- If your IP addresses often change, select the **Check to retrieve IP address dynamically** check box.

About sending notifications

You can enable Milestone Mobile to notify users when an event occurs, such as when an alarm triggers or something goes wrong with a device or server. Notifications are always delivered, regardless if the app is running or not. When Milestone Mobile is open on the mobile device, the app delivers the notification. System notifications are also delivered even when the app is not running. Users can specify the types of notifications they want to receive. For example, a user can choose to receive notifications for the following:

- All alarms
- Only alarms assigned to them
- Only alarms related to the system. These might be when a server goes offline or comes back online.

You can also use push notifications to notify users who don't have Milestone Mobile open. These are called push notifications. Push notifications are delivered to the mobile device, and are a great way to keep users informed while they're on the go.

Using push notifications

Note: To use push notifications, your system must have access to the Internet.

Push notifications use cloud services from Apple, Microsoft, and Google:

- Apple Push Notification service (APN)
- Microsoft Azure Notification Hub

- Google Cloud Messaging Push Notification service

There is a limit to the number of notifications that your system is allowed to send during a period of time. If your system exceeds the limit, it can send only one notification every 15 minutes during the next period. The notification contains a summary of the events that occurred during the 15 minutes. After the next period, the limitation is removed.

Set up sending notifications to mobile devices

You can enable Milestone Mobile to notify users when an event occurs, such as when an alarm triggers or something goes wrong with a device or server.

Requirements

- You must associate one or more alarms with one or more events and rules. This is not required for system notifications.
- Make sure that your Milestone Care™ agreement with Milestone Systems is up-to-date.
- Your system must have access to the Internet.

Set up system notifications

To send notifications related to the system, such as when a server goes offline, follow these steps:

1. In Management Application, select the mobile server, and then click the **Notifications** tab.
2. Select the **Notifications** check box.

Set up push notifications on the Milestone Mobile server

To set up push notifications, follow these steps:

1. In Management Application, select the mobile server, and then click the **Notifications** tab.
2. To send notifications to all mobile devices that connect to the server, select the **Notifications** check box.
3. To store information about the users and mobile devices that connect to the server, select the **Maintain device registration** check box.

   Note: The server sends notifications only to the mobile devices in this list. If you clear the **Maintain device registration** check box and save the change, the system clears the list. To receive push notifications again, users must reconnect their device.

Stop sending push notifications to specific mobile devices, or all mobile devices

There are several ways to stop sending push notifications to mobile devices.

1. In Management Application, select the mobile server, and then click the **Notifications** tab.
2. Do one of the following:
   - For individual devices, clear the **Enabled** check box for each mobile device. The user can use another device to connect to the Milestone Mobile server.

- For all devices, clear the **Notifications** check box.

To temporarily stop for all devices, clear the **Maintain device registration** check box and then save your change. The system sends notifications again after users reconnect.

Set up investigations

Set up investigations so that people can use Web Client and Milestone Mobile to access recorded video and investigate incidents, and prepare and download video evidence.

To set up investigations, follow these steps:

1. In Management Application, click the mobile server, and then click the **Investigations** tab.
2. Select the **Enabled** check box. By default, the check box is selected.
3. In the **Investigations folder** field, specify where to store video for investigations.
4. In the **Limit size of investigations to** field, enter the maximum number of megabytes that the investigation folder can contain.
5. Optional: To allow users to access investigations that other users create, select the **View investigations made by others** check box. If you do not select this check box, users can see only their own investigations.
6. Optional: To include the date and time that a video was downloaded, select the **Include timestamps for AVI exports** check box.
7. In the **Used codec for AVI exports** field, select the compression format to use when preparing AVI packages for download.

   Note: The codecs in the list can differ, depending on your operating system. If you do not see the codec you want to use, you can install it on the computer where Management Application is running and it will display in this list.

   Additionally, codecs can use different compression rates, which can affect video quality. Higher compression rates reduce storage requirements but can also reduce quality. Lower compression rates require more storage and network capacity, but can increase quality. It's a good idea to research the codecs before you select one.

8. In the **Failed export data (for MKV and AVI export)** field, specify whether to keep the data that was successfully downloaded, although it can be incomplete, or delete it.
9. To enable users to save investigations, you must grant the following permissions to the security role assigned to the users:
   - In XProtect Advanced VMS products, grant the **Export** permission.
   - In XProtect Professional VMS products, grant the **Database** permission.

Clean up investigations

If you have investigations or video exports that you no longer need to keep, you can delete them. For example, this can be useful if you want to make more disk space available on the server.

- To delete an investigation, and all of the video exports that were created for it, select the investigation in the list, and then click **Delete**.
- To delete individual video files that were exported for an investigation, but keeping the investigation, select the investigation in the list. In the **Investigation details** group, click the **Delete** icon to the right of the **Database**, **AVI**, or **MKV** fields for exports.

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.

Set up Video Push to stream video

To let users stream video from their mobile devices to the XProtect system, set up Video Push on the Milestone Mobile server.

Requirements

- Each channel requires a hardware device license.

In Management Application, 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.

This topic describes each of these steps.

Set up a channel for streaming video

To add a channel, follow these steps:

1. In the navigation pane, select **Mobile Server**, and select the 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 (added under **Roles**) that will use the channel. This user account must be allowed to access the Milestone Mobile server and recording server (on the **Overall Security** tab).

   Note: To use Video Push, users must log in to Milestone Mobile on their mobile device using the user name and password for this account.

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 navigation pane, click **Recording Servers**.
2. 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 click **Next**.

4. Enter credentials for the camera, as follows:
   - For user name, enter the factory defaults or the user name specified on the camera.
   - For password: Enter ***Milestone***, 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.

5. 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.

6. In the **Address** field, enter the IP address of the computer where Milestone Mobile server is installed.
7. 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.
8. In the **Hardware model** column, select **Video Push Driver**, and then click **Next**.
9. When the system detects the new hardware, click **Next**.
10. In the **Hardware name template** field, specify whether to display either the model of the hardware and the IP address, or the model only.
11. 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.

12. 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 then 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.

About actions

You can manage the availability of the **Actions** tab in the Milestone Mobile client by enabling or disabling this on the **General** tab. Actions are by default enabled, and all available actions for the connected devices are shown here.

About naming an output for use in Milestone Mobile

In order to get actions shown correctly together with current camera, it is important that the output uses the exact same name as the camera.

Example:

If you have a camera named "AXIS P3301,P3304 - 10.100.50.110 - Camera 1", you must also name the action "AXIS P3301,P3304 - 10.100.50.110 - Camera 1".

You can add a further description to the title afterwards, for example "AXIS P3301,P3304 - 10.100.50.110 - Camera 1 - Light switch".

Important: If you do not follow these naming conventions, actions are not available in the action list for the associated camera's view. Instead, actions appear in the list of other actions on the **Actions** tab.

Mobile server settings

General

The following table describes the settings on this tab.

General

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 appear in the list.
Login method	Select the authentication method to use when users log in to the server. You can choose between: • **Automatic** • **Windows authentication** • **Basic authentication**

Features

Name	Description
Enable XProtect Web Client	Enable access to XProtect Web Client. This feature is enabled by default.
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. This feature is enabled by default.
Enable actions (outputs and events)	Enable access to actions in Milestone Mobile clients. This feature is enabled by default.
Enable keyframes	Stream only keyframes when users stream video on mobile devices and in XProtect Web Client. This uses less bandwidth.

Name	Description
Deny the built-in Administrator role access to the Milestone Mobile server	Enable this to exclude users assigned to the built-in administrator role from accessing video on mobile devices and XProtect Web Client.

Log settings

Name	Description
Enabled	Enable or disable logging of Milestone Mobile client's actions in a separate log file.
Log file location	Specify where the system saves log files.
Keep logs for	Specify the number of days to keep logs for (default three days).

Configuration backup

Name	Description
Import	Import an XML file with a new Milestone Mobile server configuration.
Export	Export your Milestone Mobile server configuration. Your system stores the configuration in an XML file.

Connectivity

Settings on the **Connectivity** tab are used in the following tasks:

- Configure connection settings.
- Send an email message to help users connect their mobile device to Milestone Mobile servers.
- Enable connections to Milestone Mobile servers on a complex network.

For step-by-step descriptions of these tasks, see Set up Smart Connect (on page 208).

General

Name	Description
Connection type	Choose how clients should connect to the Milestone Mobile server. You can choose between the following options: **HTTP only**, **HTTP and HTTPS** or **HTTPS Only**. **Note:** If you select **HTTPS Only**, devices running iOS 9.0 or later, or Windows Phone, can connect only if you have a certificate from a certificate authority (CA) installed on your Milestone Mobile server. CAs issue digital certificates that verify the identities of users and websites that exchange data on the Internet. Examples of CAs are companies like Comodo, Symantec, and GoDaddy. Before you turn on secure connections, make sure that you are familiar with digital certificates. To learn how to add a certificate in Milestone Mobile server, see Edit certificate (on page *223*).
Client timeout (HTTP)	Set a time frame for how often the Milestone Mobile client must indicate to the Mobile server that it is up and running. The default value is 30 seconds. Milestone recommends that you do **not** increase the time frame.

Internet Access

Name	Description
Configure custom Internet access	If you use UPnP port mapping, to direct connections to a specific connection, select the **Configure custom Internet access** check box. Then provide the **IP address** or **hostname**, and the port to use for the connection. For example, you might do this if your router does not support UPnP, or if you have a chain of routers.
Select to retrieve IP address dynamically	If your IP addresses often change, select the **Check to retrieve IP address dynamically** check box.
Automatically discovered addresses	Lists the IP addresses of this Mobile Server that the system has discovered by itself.

Smart Connect notification

Name	Description
Email invitation to	Enter the email address for the recipient of the Smart Connect notification.
Email language	Specify the language used in the email.
Smart Connect token	A unique identifier that users of mobile devices can use to connect to the Mobile Server server.
Link to Smart Connect	A link that users of mobile devices can use to connect to the Mobile Server server.

Server Status

See the status details for your 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.
External bandwidth	Shows the current bandwidth in use between the mobile devices and the Mobile server.

Active users

See the status details for the mobile devices connected to your Mobile server.

Name	Description
User Name	Shows the user name for each Mobile client user connected to the Mobile server.
State	Shows the current relation between the Mobile server and the Mobile Server client user in question. Possible states are: • **Connected**: A state preliminary to servers exchanging keys and encrypting credentials. • **Logged In**: The Mobile client user is logged into the XProtect system.
Bandwidth Usage (kB/s)	Shows the level of bandwidth used by the Mobile client user in question.
Transcoded streams	Shows the number of transcoded video streams currently open for each mobile client user.

Performance

On the **Performance** tab, you can set the following limitations on the Milestone Mobile server's performance:

Settings

Name	Description
Enable full-size images	Enable the Milestone Mobile server to send full-size images to the Milestone Mobile clients or XProtect Web Client. Enabling full-size images uses more bandwidth. Additionally, enabling this option disables all rules set up in the **Levels of video stream limitations** settings described below.
Limit playback streams	Enable and specify the maximum number of playback video streams currently open for the relevant mobile client user.

Levels of video stream limitations

Level 1

Level 1 is the default limitation placed on the Milestone Mobile server. Unless you have enabled sending full-size images above, 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 third 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.

Name	Description
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.

Investigations

Investigations settings

You can enable investigations so that people can use XProtect Web Client and Milestone Mobile to access recorded video and investigate incidents, and prepare and download video evidence.

Name	Description
Investigations folder	Specify where to store video for investigations.
Limit size of investigations folder to	Enter the maximum number of megabytes that the investigations folder can contain. Default size is 2000 MB.
View investigations made by other users	Select this check box to allow users to access investigations that they did not create.
Include timestamps for AVI exports	Select this check box to include the date and time that the AVI file was downloaded.
Used codec for AVI exports	Select the compression format to use when preparing AVI packages for download. The codecs you can choose from can differ, depending on your operating system. If you do not see the codec you want, you can add it to the list by installing it on the computer where the Milestone Mobile server is running.
Keep or delete data when exports fail (MKV and AVI)	Select whether to keep the data that was not successfully prepared for download in an investigation, or delete it.

Investigations

Name	Description
Investigations	Lists the investigations that have been set up so far in the system. Use the **Delete** or **Delete all** buttons if you no longer want to keep an investigation. This can be useful if, for example, you want to make more disk space available on the server.

Name	Description
Investigation details	To delete individual video files that were exported for an investigation, but keeping the investigation, select the investigation in the list. In the **Investigation details** group, click the delete icon to the right of the **Database**, **AVI**, or **MKV** fields for exports.

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	Shows the number of enabled Video push channels in your XProtect system.
Channel	Shows the channel number for the relevant channel. Non-editable.
Port	Port number for the relevant Video push channel.
MAC Address	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 212), click **Find Cameras** to search for the relevant camera.

Notifications

Use the **Notifications** tab to turn on or turn off system notifications and push notifications.

If you turn on notifications, and have configured one or more alarms and events, Milestone Mobile notifies users when an event occurs. When the app is open, notifications are delivered in Milestone Mobile on the mobile device. Push notifications notify users who don't have the Milestone Mobile open. These notifications are delivered to the mobile device.

For more information, see Set up sending notifications to mobile devices (on page 210).

The following table describes the settings on this tab.

Name	Description
Notifications	Select this check box to turn on notifications.
Maintain device registration	Select this check box to store information about the devices and users who connect to this server. The system sends notifications to these devices. If you clear this check box, you also clear the list of devices. For users to start receiving notifications again, you must select the check box, and the users must connect their devices to the server again.

Registered devices

Name	Description
Enabled	Select this check box to start sending notifications to the device.
Device Name	A list of the mobile devices that have connected to this server. You can start or stop sending notifications to specific devices by selecting or clearing the **Enabled** check box.
User	Name of the user that will receive notifications.

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 21)
- Start, stop and restart the Mobile service (see "Start, stop and restart Mobile service" on page 225)
- Fill in or change surveillance server credentials (see "Fill in/edit surveillance server credentials" on page 224)
- Show/edit port numbers (on page 224)
- Edit certificate (on page 223)
- Open today's log file (see "About accessing logs and investigations" on page 223)
- Open log folder (see "About accessing logs and investigations" on page 223)
- Open investigations folder (see "About accessing logs and investigations" on page 223)
- Show Mobile server status (see "About show status" on page 223)

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. Because you do not need to install XProtect Web Client, you can access it from the computer where 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. If you are using the computer where Milestone Mobile server is installed, you can right-click the Milestone Mobile Server icon in the system tray, and select **Open XProtect Web Client**.
3. If you are not using the computer where Milestone Mobile server is installed, you can access it from a browser. Continue with step 4 in this process.
4. Open an Internet browser (Internet Explorer, Mozilla Firefox, Google Chrome or Safari).
5. 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.

6. 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 their browser cache after upgrading, or force this action remotely (you can do this action only in Internet Explorer in a domain).

About show status

Right-click the Mobile Server Manager icon 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 investigations

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 investigations 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 Investigation 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 Milestone 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 the connection. The certificate confirms that the certificate holder is authorized to establish the connection.

When you install Milestone Mobile server, you generate a self-signed certificate if you run a **Typical** installation. If you run a **Custom** installation, you can choose between generating a self-signed certificate or loading a file that contains a certificate issued by another trusted site.

Note: If you want to use secure connections (HTTPS), devices running iOS 9.0 or later, or Windows Phone, can connect only if you have a certificate from a certificate authority (CA) installed on your Milestone Mobile server. CAs issue digital certificates that verify the identities of users and websites that exchange data on the Internet. Examples of CAs are companies like Comodo, Symantec, and GoDaddy. Before you turn on secure connections, make sure that you are familiar with digital certificates.

If you want use a different certificate, you can do the following.

1. On a computer with Management Application installed, right-click the **Milestone Mobile Server** icon and select **Edit certificate**.
2. Choose one of the following:
   - Generate a self-signed certificate.
   - 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. When finished, a window opens and informs you that the certificate was installed successfully. The Mobile service restarts to apply the change.

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**.

Fill in/edit surveillance server credentials

1. On a computer with Management Application installed, right-click the **Milestone Mobile Server** icon 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. On a computer with Management Application installed, right-click the **Milestone Mobile Server** icon 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 **Milestone Mobile Server** icon and select **Start Mobile service**, **Stop Mobile service** or **Restart Mobile service** respectively**.**

Frequently asked questions (FAQs)

1. **Why can't I connect from my Milestone Mobile client to my recordings/Milestone Mobile server?**

   In order to connect to your recordings, the Milestone Mobile server must be installed on the server that runs your XProtect system or alternatively on a dedicated server. The relevant Milestone Mobile settings are also needed in your XProtect video management setup. These are installed as either plug-ins or as part of a product installation or upgrade. For details on how to get the Milestone Mobile server and how to integrate the Milestone Mobile client-related settings in your XProtect system, see the configuration section (see "Milestone Mobile configuration" on page 207).

2. **I installed the Milestone Mobile server to XProtect Corporate, but I can't connect to the server from my device. What is the problem?**

   After you have installed the Milestone Mobile server to your XProtect Corporate (4.0+), you must install the Milestone Mobile plug-in to see the Milestone Mobile server in your XProtect Corporate setup. When you have installed the Milestone Mobile plug-in, locate the plug-in under **Servers** > **Mobile Servers** and right-click to add a new mobile server. Here, you add the details about your Milestone Mobile server (Server name, Description (optional), Server Address, Port and more). Once you finish, restart the Milestone Mobile Service (from Windows Services) and try to reconnect with your device.

3. **How do I add a Milestone Mobile server/location/site to my Milestone Mobile client?**

   You do this from the Milestone Mobile client. When you open it for the first time, you must add one or more mobile servers in order to retrieve video from your cameras. Your added Milestone Mobile servers will be listed alphabetically. You can add as many Milestone Mobile servers as needed, as long as you have the needed log-in credentials.

4. **Why is the image quality sometimes poor when I view video in the Milestone Mobile client?**

   The Milestone Mobile server automatically adjusts image quality according to the available bandwidth between the server and client. If you experience lower image quality than in the XProtect® Smart Client, you might have too little bandwidth to get full resolution images through the Milestone Mobile client. The reason for this can either be too little upstream bandwidth from the server or too little downstream bandwidth on the client. See the **XProtect Smart Client User Manual** which you can download from our website (http://www.milestonesys.com/support/manuals-and-guides/).

   If you are in an area with mixed wireless bandwidth, you may notice that the image quality improves when you enter an area with better bandwidth.

5. **How do I create views?**

   You cannot create or configure views in the Milestone Mobile client. It uses views and related names already created in the XProtect Smart Client. If you do not have any views set up, you can use the **All cameras** view to see all the cameras in your system. You can always add more views to the XProtect Smart Client at a later time.

6. **How do I add a new Milestone Mobile user?**

   A Milestone Mobile user is just like any other XProtect user. You add a new Milestone Mobile user the same way you normally add a new user in your Management Application: right-click on **Users** in the Navigation Pane and select **Add new basic user** or **Add new Windows user**. If you select new basic user, you must change the server login method to **Automatic** or **Basic Only** depending on your system. You change your server login method from the **Login method** drop-down menu on the **General** tab of the Mobile Server entry under **Servers** > **Mobile Servers** in the Management Application.

7. **Can I control my pant-tilt-zoom (PTZ) cameras and use presets from Milestone Mobile client?**

   Yes, in the Milestone Mobile client, you can control your connected PTZ cameras and use presets in live mode.

8. **How can I navigate my recordings?**

   Android: You can navigate through your recordings in playback mode. Select the camera you wish to view in playback mode and choose **Menu** > **Playback**. Once you are in playback mode you can search through your recordings using the control buttons. You also have the option to go to a specific time by choosing **Menu** > **Go to time**. Once you have chosen **Go To time**, select the date and time you want to view.

   iOS: You can navigate through your recordings in playback mode. Select the camera you wish to view in playback mode and tap Playback. Once you are in playback mode, you can search through your recordings using the control buttons. You also have the option to go to a specific time by choosing **Menu** > **Go to time**. Once you have chosen **Go to time**, select the date and time you want to view and click **Confirm**.

9. **Can I view live and recorded video at the same time?**

   Yes, in playback mode, you get a small picture-in-picture (PiP) view live from the same camera.

10. **Can I use the Milestone Mobile client without a 3G data plan?**

    Yes, you can use Milestone Mobile through Wi-Fi. Either locally on the same network as your XProtect system or at a different location, such as a public network in a café or a home network. Note that bandwidth on public networks vary and may affect the image quality of the video streams.

11. **Can I use the Milestone Mobile client with a 4G/LTE data plan?**

    Yes, you can use any data connection on your mobile device that allows you to access the internet to connect to your XProtect video management system.

12. **Can I add multiple servers to the Milestone Mobile client?**

    When you open the Milestone Mobile client for the first time, you must add one or more mobile servers in order to retrieve video from your cameras. These mobile servers are listed alphabetically. If you want to retrieve video from additional servers, repeat this process. You can add as many mobile servers as needed, as long as you have the relevant log-in credentials.

13. **Why is the image quality poor when I connect to my XProtect video management system at home through Wi-Fi at my office?**

Check your home internet bandwidth. Many private internet connections have different download and upload bandwidths often described as, for example, 20 Mbit/2 Mbit. This is because home users rarely need to upload large amounts of data to the internet, but consume a lot of data instead. The XProtect video management system needs to send video to the Milestone Mobile client and is limited by your connection's upload speed. If low image quality is consistent on multiple locations where the download speed of the Milestone Mobile client's network is good, the problem might be solved by upgrading the upload speed of your home internet connection.

14. **Where are my screenshots saved?**

    Android: Snapshots are saved to your device's SD card at: **/mnt/sdcard/XProtect**.

    iOS: Snapshots are saved to your device and can be accessed from **Photos** on your device.

    You cannot change the default settings on neither Android nor iOS.

15. **How do I avoid the security warning when I run XProtect Web Client through an HTTPS connection?**

    The warning appears because the server address information in the certificate is incorrect. The connection will still be encrypted.
    The self-signed certificate in the Milestone Mobile server needs to be replaced with your own certificate matching the server address used to connect to the Milestone Mobile server. These certificates are obtained through official certificate signing authorities such as Verisign. Consult the chosen signing authority for more details.
    Milestone Mobile server does not use Microsoft IIS. This means that instructions provided for generating certificate signing request (CSR) files by the signing authority using the IIS is not applicable for the Milestone Mobile server. You must manually create CSR-file using command line certificate tools or other similar third-party application. Note that this process should be performed by system administrators and advanced users only.

16. **Does my processor support hardware-accelerated decoding?**

    Only newer processors from Intel support hardware accelerated decoding. Check Intel website (http://ark.intel.com/search/advanced?s=t&MarketSegment=DT&QuickSyncVideo=true) if your processor is supported.

    In the menu, make sure **Technologies** > **Intel Quick Sync Video** is set to **Yes**.

    If your processor is supported, hardware-accelerated decoding is enabled by default. You can see the current status in **Show status** in the Mobile Server Manager (see "About show status" on page 223).

17. **Does my operating system support hardware-accelerated decoding?**

    Only Windows 8 and Windows Server 2012 or newer are supported.

    Make sure you install the newest graphic drivers from the Intel website on your system. These drivers are not available from Windows Update.

    Hardware-accelerated decoding is not supported, if the mobile server is installed in a virtual environment.

18. **How do I disable hardware-accelerated decoding on the mobile server? (Advanced)**

    If the processor on the mobile server supports hardware accelerated decoding, it is by default enabled. To turn hardware-accelerated decoding off, do the following:

    1. Locate the file VideoOS.MobileServer.Service.exe.config. The path is typically: C:\Program Files\Milestone\Milestone Mobile Server\VideoOS.MobileServer.Service.exe.config.
    2. Open the file in Notepad or a similar text editor. If necessary, associate the file type .config with Notepad.
    3. Locate the field <add key="HardwareDecodingMode" value="Auto" />.
    4. Replace the value "Auto" with "Off".
    5. Save and close the file.

19. **I just turned on my firewall, and now I can't connect a mobile device to my server. Why not?**

    If your firewall was turned off while you installed Milestone Mobile server, you must manually enable TCP and UDP communications.

Milestone ONVIF Bridge

About Milestone ONVIF Bridge

Available functionality depends on the system you are using. See the Product comparison chart (https://www.milestonesys.com/our-products/video-management-software) for more information.

ONVIF is an open, global forum that is working to standardize and secure the way that IP video surveillance products communicate. The goal is to make it easy to exchange video data. For example, to enable law enforcement, surveillance centers, or similar organizations to quickly access live and recorded video streams in any IP-based surveillance system.

Milestone Systems wants to support this goal, and has developed the Milestone ONVIF Bridge toward that end. Milestone ONVIF Bridge is a part of the Milestone Open Platform, and offers an interface that supports the parts of the ONVIF standard for retrieving live and recorded video from any Milestone video management software product.

This document provides the following:

- Information about the ONVIF standard and links to reference materials.
- Instructions for installing and configuring the Milestone ONVIF Bridge in your XProtect VMS product.
- Examples of how to enable various types of ONVIF clients to stream live and recorded video from XProtect VMS products.

Milestone ONVIF Bridge and the ONVIF standard

The ONVIF standard facilitates information exchange by defining a common protocol. The protocol contains ONVIF profiles, which are collections of specifications for interoperability between ONVIF compliant devices.

Milestone ONVIF Bridge is compliant with the parts of ONVIF Profile G and Profile S that provide access to live and recorded video, and the ability to control pan-tilt-zoom cameras:

- Profile G - Provides support for video recording, storage, search, and retrieval. For more information, see ONVIF Profile G Specification (https://www.onvif.org/Portals/0/documents/specs/ONVIF_Profile_G_Specification_v1-0.pdf)
- Profile S - Provides support for streaming live video using the H.264 codec, audio streaming, and pan-tilt-zoom (PTZ) controls. For more information, see ONVIF Profile S Specification (http://www.onvif.org/Portals/0/documents/op/ONVIF_Profile_S_Specification_v1-1-1.pdf).

For more information about the ONVIF standard, see the ONVIF® website (http://www.onvif.org/).

ONVIF Profiles support “get” functions that retrieve data, and “set” functions that configure settings. Each function is either mandatory, conditional, or optional. For security reasons, Milestone ONVIF Bridge supports only the mandatory, conditional, and optional “get” functions that do the following:

- Request video
- Authenticate users

- Stream video
- Play recorded video

About ONVIF clients

ONVIF clients are computer appliances or software programs that use ONVIF Webservices. Examples of ONVIF clients are servers, media players, IP-based surveillance systems, or bridges like the Milestone ONVIF Bridge.

The Real Time Streaming Protocol (RTSP) is used to establish and control media sessions between two or more endpoints. The Milestone ONVIF Bridge uses ONVIF Profile S and RTSP to handle requests for video from an ONVIF client, and to stream video from an XProtect installation to the ONVIF client.

By default, communication between ONVIF clients and the ONVIF Bridge server uses the following ports:

- ONVIF port 580. ONVIF clients use this port to submit requests for video streams
- RTSP port 554. Milestone ONVIF Bridge uses this port to stream video to ONVIF clients

ONVIF clients can access the RTSP port on the Milestone ONVIF Bridge directly. For example, the VLC media player or a VLC plug-in in a browser can retrieve and display video. This is described in this document in Use a media player to view a video stream.

You can use different ports, for example, to avoid a port conflict. If you change the port numbers, you must also update the RTSP stream for the ONVIF client URI.

RTSP supports only the H.264 codec. Cameras must be able to stream video in the H.264 codec.

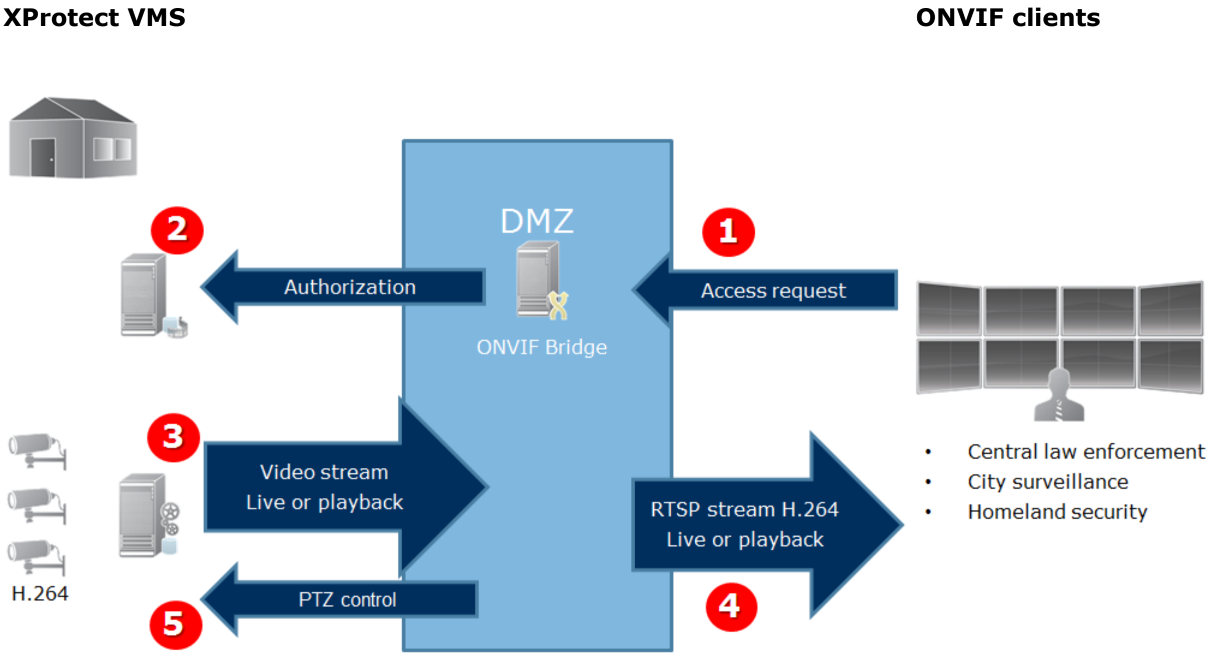
Milestone ONVIF Bridge

The Milestone ONVIF Bridge is comprised of the following components:

- Milestone ONVIF Bridge server
- Milestone ONVIF Bridge 32-bit plug-in for Management Application
- Milestone ONVIF Bridge 64-bit plug-in for Management Client

The following image shows a high-level view of the interoperability between an ONVIF client, the Milestone ONVIF Bridge, and XProtect VMS.

Note: Milestone recommends that you install the ONVIF Bridge server in a demilitarized zone (DMZ).



1. An ONVIF client connects to the XProtect VMS via the ONVIF Bridge server through the Internet. To do this, the ONVIF client needs the IP address or domain name (domain/hostname) of the server where the Milestone ONVIF Bridge is installed, and the ONVIF port number.

2. The ONVIF Bridge server connects to the management server to authorize the ONVIF client user.

3. After authorization, the recording server starts sending H.264 video streams from the cameras to the ONVIF Bridge server.

   Note: If a camera supports multiple streams, only the default stream is sent.

4. The ONVIF Bridge server sends the video as RTSP streams to the ONVIF client.

5. If available, the ONVIF client user can pan-tilt-zoom PTZ cameras.

Setting up Milestone ONVIF Bridge security controls

Milestone ONVIF Bridge enforces user authorization of ONVIF clients. This controls the ONVIF client’s ability to access cameras, and the types of operations the ONVIF clients can perform. For example, whether ONVIF clients can use pan-tilt-zoom (PTZ) controls on cameras.

Milestone recommends that you create and add a dedicated user account for the Milestone ONVIF Bridge, and for each ONVIF client, as follows:

1. Create a basic user in the Management Application, or a Windows user.

2. In the Management Client, assign the user to a role that can access cameras, and specify permissions for the ONVIF Bridges security group on the Overall Security tab for the role.

3. Assign the user to the Milestone ONVIF Bridge during installation, and in the Management Application for each ONVIF client afterward.

Milestone ONVIF Bridge allows ONVIF clients only to request and receive video streams from cameras. ONVIF clients cannot configure settings in the XProtect VMS system or the Milestone ONVIF Bridge.

As a security precaution, Milestone recommends that you install the ONVIF Bridge server in a demilitarized zone (DMZ). If you install the bridge in a DMZ, you must also configure port forwarding for the internal and external IP addresses.

Installing Milestone ONVIF Bridge

When you install Milestone ONVIF Bridge, you install a server and a plug-in for the Management Application, which are the central administration components for XProtect Advanced VMS and XProtect Professional VMS products, respectively. For example, you use these components to manage cameras, set up users, grant permissions, and so on.

You can install and add one or more Milestone ONVIF Bridges to your system. However, this increases the load on the network, and can impact performance. Typically, only one Milestone ONVIF Bridge is added to a system because multiple ONVIF clients can connect via one bridge.

ONVIF licensing

Milestone ONVIF Bridge does not require additional licenses. You can download and install the software for free from the Milestone Systems website (http://www.milestonesys.com).

System requirements

The computer where you want to install the Milestone ONVIF Bridge server component must have access to the Internet, and the following software installed:

- Microsoft® .NET Framework 3.5.
- Microsoft® .NET Framework 4.5.1 or higher.
- Visual C++ Redistributable Package for Visual Studio 2013 (x64).

Important: Cameras must support H.264 streaming via the Internet.

What's installed?

During installation, the following components are installed:

- Milestone ONVIF Bridge server, including the Milestone ONVIF Bridge service, the Milestone RTSP Bridge service, and the Milestone ONVIF Bridge Manager.
- Milestone ONVIF Bridge plug-in. The plug-in is available in the Servers node in Management Application. This happens automatically when you use a **Typical** installation method. If you use a **Custom** installation method, you install it at a later stage of the installation.

Installation also does the following:

- Registers and starts the Milestone ONVIF Bridge service and the Milestone RTSP Bridge service
- Starts the Milestone ONVIF Bridge Manager, which is available in the Windows notification area on the server where the ONVIF Bridge Server is installed

Note: The actions in the ONVIF Bridge Manager apply to both the Milestone ONVIF Bridge service and the Milestone RTSP Bridge service. For example, when you start or stop the ONVIF Bridge service, the Milestone RTSP Bridge service also starts or stops.

Before you install

Before you start the installation, get the following information:

- The domain name and password for the dedicated user account that was created for the Milestone ONVIF Bridge. For more information, see Setting up Milestone ONVIF Bridge security controls (on page 231).
- The URL or IP address, and the port number of the management server.

You will need this information during installation.

Install the Milestone ONVIF Bridge

Download the installation file:

1. On the computer where you want to install Milestone ONVIF Bridge, go to the Milestone website (https://www.milestonesys.com/support/download-software/) and locate the Milestone ONVIF Bridge product.
2. Click the Milestone ONVIF Bridge installer file.
3. Run the installer and follow the instructions.

Run the installer:

1. Select the language you want to use, and then click **Continue**.
2. Read and accept the license agreement, and then click **Continue**.
3. Select the installation type, as follows:
    - To install the ONVIF Bridge server and plug-in on one computer, and apply default settings, click **Typical**.
        1. Verify that the server URL, user name and password are correct and click **Continue**.
        2. Select the file location and product language, and then click **Install**.

        When the installation is complete, a list of successfully installed components displays. Click **Close**.
    - To install the ONVIF Bridge server and plug-ins on separate computers, click **Custom**. Use this method if you have a distributed system.
        1. To install the server, select the **Milestone ONVIF Bridge Server** checkbox, and then click **Continue**.
        2. Establish a connection to management server by specifying the following:
            - The URL or IP address, and the port number, of the management server. The default port is 80. If you omit the port number, the system will use port 80.
            - Keep the **Log in as** field set to **User account**.

- The domain user name and password of the Windows user or Basic user that the service will use.
- Click **Continue**.

3. Select the file location and product language, and then click **Install**.

When the installation is complete, a list of successfully installed components displays.

Click **Close**, and then install the ONVIF Bridge plug-in on the computer where the Management Application is installed. To install the plug-in, run the installer again on that computer, select **Custom** and select the respective plug-ins.

The following components are now installed:

- Milestone ONVIF Bridge server
- Milestone ONVIF Bridge plug-in that is visible in Management Application in the **Servers** node
- Milestone ONVIF Bridge Manager that is running and accessible from the notification area on the server with the ONVIF Bridge server installed
- Milestone ONVIF Bridge service that is registered as a service

You are ready for initial configuration (see "Configuring the Milestone ONVIF Bridge" on page 234).

Configuring the Milestone ONVIF Bridge

After you install the Milestone ONVIF Bridge, the ONVIF Bridge service is running and the icon in the system tray turns green. The next steps are to:

- Add the ONVIF Bridge plug-in to the Management Application
- Enable ONVIF clients to access your XProtect video management software product

Add a Milestone ONVIF Bridge to the Management Application

1. Open the Management Application.
2. Expand **Servers**, right-click **ONVIF Bridge**, and select **Add New**.
3. Enter a name for the Milestone ONVIF Bridge, and then click **OK**.

Configure user settings for an ONVIF client

Before you can complete these steps, you must have already created a basic user in Management Application, or a Windows user in Active Directory for the ONVIF client. The user must be assigned to a role that has permission to view cameras and access the Milestone ONVIF Bridge. For more information, see Setting up Milestone ONVIF Bridge security controls (on page 231). For information about how to set up a basic user in Management Application, see the Help for those programs.

To provide an ONVIF client access to your XProtect video management software, follow these steps:

1. Open the Management Application.
2. Expand **Servers**, select **ONVIF Bridge**, and then select the bridge you just added.

3. On the **User settings** tab, enter the domain user name (domain/user) and the password of the dedicated user created for the ONVIF client.
4. Click the **Add user** button.

The name of the ONVIF client user appears in the list of **ONVIF user credentials**.

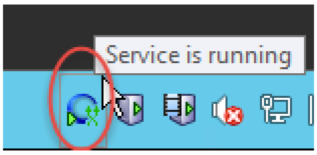
Managing Milestone ONVIF Bridge

After you configure the Milestone ONVIF Bridge, you can monitor the service and change configuration settings in several ways.

Check the status of the ONVIF Bridge service

To view the status of the ONVIF Bridge service, follow these steps.

1. On the computer where the ONVIF Bridge server is installed, look in the notification area. The ONVIF Bridge tray icon indicates the status of the ONVIF Bridge service. If the service is running, the icon is green.

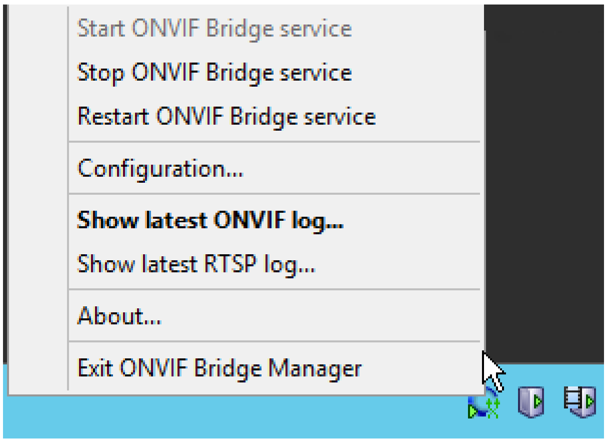


2. If it is not running, the icon is yellow or red. Right-click the icon and select **Start ONVIF Bridge service**.

View logs

The ONVIF Bridge Manager saves the log information about the ONVIF Bridge server and the RTSP streams.

1. In the notification area on the computer where the ONVIF Bridge server is installed, right-click the ONVIF Bridge tray icon.


Start ONVIF Bridge service
Stop ONVIF Bridge service
Restart ONVIF Bridge service
Configuration...
Show latest ONVIF log...
Show latest RTSP log...
About...
Exit ONVIF Bridge Manager

2. Select **Show latest ONVIF log** or **Show latest RTSP log**.

Change the level of information in your logs

The ONVIF Bridge Manager saves the log information about the ONVIF Bridge server and the RTSP streams.

To change the level of information, follow these steps:

1. Right-click the ONVIF Bridge tray icon, and then stop the ONVIF Bridge service.
2. Right-click the ONVIF Bridge tray icon again, and select **Configuration**.
3. In the **Log level for ONVIF** and **Log level for RTSP** fields, specify the type of information, and how much information you want to save in your ONVIF and RTSP logs. The default value is **Information**.

   Note: From top to bottom in the list, the options are ordered from lowest level to highest level. Each level includes the level above it in the list. For example, the **Warning** level includes the **Error** level. Milestone recommends that you use only the **Error**, **Warning**, and **Information** levels. The **Trace** and **Message** levels capture more information and use more disk space, which can decrease performance.

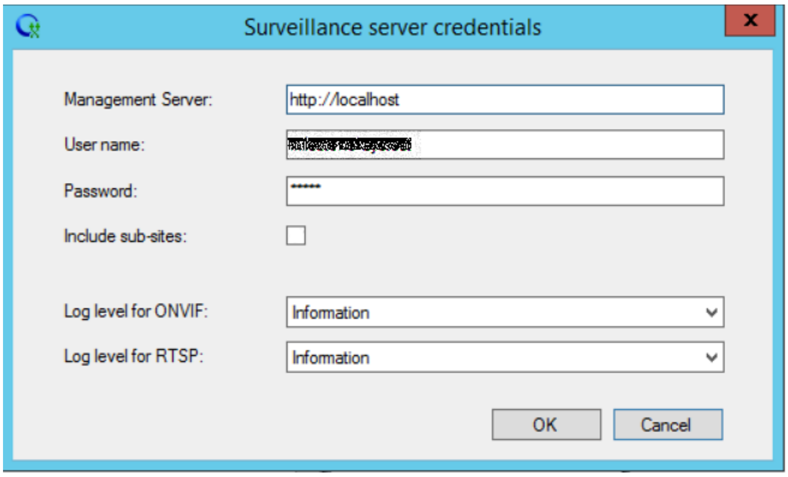
4. Click **OK**.
5. Right-click the ONVIF Bridge tray icon, and then start the ONVIF Bridge service.

Change configuration settings for the Milestone ONVIF Bridge

If you change the IP address or host name of the surveillance server, or if you have changed the user accounts that have access to the surveillance server service, you must update this information for Milestone ONVIF Bridge.

To change the VMS address or login credentials, follow these steps:

1. On the computer where Milestone ONVIF Bridge server is installed, right-click the ONVIF Bridge tray icon, and then stop the ONVIF Bridge service.
2. Right-click the ONVIF Bridge tray icon again, and select **Configuration**.



Management Server: http://localhost

User name: [redacted]

Password: *****

Include sub-sites: □

Log level for ONVIF: Information

Log level for RTSP: Information

3. Specify the new information, and then click **OK**.

> **Note:** You must use the fully qualified domain name or the IP address of the server where the management server is installed.

4. Right-click the ONVIF Bridge tray icon, and then start the ONVIF Bridge service.

The ONVIF Bridge service is now running and the tray icon turns green.

Include sub-sites

By default, the Milestone ONVIF Bridge is configured to exclude sub-sites. This means that ONVIF client users cannot access video from cameras that are installed on sub-sites.

You can change this to include sub-sites. However, Milestone recommends that you do so only for systems where sub-sites do not contain large numbers of cameras. The Milestone ONVIF Bridge aggregates and displays all cameras, including those from sub-sites, in one list. For example, if the system and sub-sites have more than 50 cameras, the list will be difficult to use.

Tip: If you must include sub-sites, consider installing the Milestone ONVIF Bridge on each management server. You will have more than one list of cameras, however, the cameras will be easier to identify and navigate.

To include sub-sites:

1. Right-click the ONVIF Bridge tray icon, and then stop the ONVIF Bridge service.
2. Right-click the ONVIF Bridge tray icon again, and click **Configuration**.
3. Select the **Include sub-sites** checkbox, and then click **OK**.
4. Right-click the ONVIF Bridge tray icon, and then start the ONVIF Bridge service.

Tips and tricks

The configuration created by ONVIF Bridge Manager is stored locally in a file at ProgramData\Milestone\Milestone ONVIF Bridge. The name of the file is serverconfiguration.xml. If this file is deleted, you must update the configuration in the ONVIF Bridge Manager.

To update a configuration, follow the steps described in Change configuration settings for a Milestone ONVIF Bridge in this document.

Milestone ONVIF Bridge properties

This section provides information about the settings for managing users and connections, and configuration settings for cameras.

Open the Management Application and select the **ONVIF Bridges** node.

User settings tab (properties)

The following table describes the settings for the ONVIF Bridge server and ONVIF clients.

Name	Description
ONVIF port	The port number of the ONVIF port. ONVIF clients use this port to connect to the ONVIF Bridge server. The default port number is 580.

Name	Description
RTSP port	The port number of the RTSP port. The ONVIF Bridge server sends RTSP video streams through this port to ONVIF clients. The default port number is 554.
ONVIF user credentials	Lists the ONVIF client users that have access to the XProtect VMS system through the ONVIF Bridge server.
User name	The domain user name of the user created for an ONVIF client. Prerequisite: You have set up the ONVIF client users as users in Management Application with access to cameras and the Milestone ONVIF Bridge.
Password	The password for the ONVIF client user.
Add user	After you enter a domain user name and password, click the **Add user** button to add the user.
Remove user	Prevent an ONVIF client from accessing the Milestone ONVIF Bridge. Remove a selected user from the **ONVIF user credentials** list.

Advanced settings tab (properties)

The advanced settings for the ONVIF Bridge list the default settings for all cameras that the ONVIF Bridge provides to the ONVIF clients when the clients connect and request video streams.

The settings do not reflect the actual configuration of the cameras, and do not affect the video stream. The system uses the settings to speed up the exchange of video between the ONVIF Bridge and the ONVIF client. The ONVIF client will use the actual settings from the RTSP stream.

You can change the default settings that ONVIF Bridge provides to the ONVIF client, for example, if you want the values to reflect the actual configuration of the cameras.

Name	Description
Max days of retention	Default value is 30.
Frame per seconds	Default value is 5.
Width	Default value is 1920. This corresponds to full HD quality.
Height	Default value is 1080. This corresponds to full HD quality.
Bitrate Kbps	Default value is 512.
GOP size	Default value is 5.
Codec	Select one of the H.264 codec profiles. The default value is H.264 Baseline Profile.
Use configurations from cameras	Enable this to use the actual configuration of the cameras instead of the default average values defined above. **Note:** If you enable this setting, the response time between the XProtect system and the ONVIF clients increases.

Name	Description
Return sequences on command	Enable this to return information for sequences on the DESCRIBE command response.
Maximum number to return	Set the maximum number of sequences to be sent to the client. Default value is 10.
Return from start or end of recording	Select from where to start searching the sequences. from the start or from the end of the recording.
Prefer absolute time over normalized	This setting defines the RTSP server playback response, where the client's time interval for playback is not specified. Select this option if you want your RTSP server to use real time as opposed to scaled or normalized playback. However, if your client application is set to use either relative time intervals or real time intervals (in UTC), the RTSP server replies with those intervals defined in the client.

Manage video playback

Playback controls comply with RTSP standards and the ONVIF Streaming Specification (http://www.onvif.org/specs/stream/ONVIF-Streaming-Spec-v210.pdf).

Initiating playback

When viewing video playback, the default speed is 1 (normal playback in the forward direction).

Playback is initiated by means of the RTSP PLAY method. A range can be specified. If no range is specified, the stream is played from the beginning and plays to the end, or, if the stream is paused, it is resumed at the point it was paused. In this example, "Range: npt=3-20" instructs the RTSP server to start playback from the 3rd second until 20th second.

For example:

```
PLAY rtsp://basic:basic@bgws-pvv-04:554/vod/943ffaad-42be-4584-bc2c-
c8238ed96373 RTSP/1.0

CSeq: 123

Session: 12345678

Require: onvif-replay

Range: npt=3-20

Rate-Control: no
```

Reverse playback

ONVIF devices MAY support reverse playback. Reverse playback is indicated using the Scale header field with a negative value. For example to play in reverse without data loss, a value of –1.0 would be used.

The Milestone ONVIF Bridge supports values [-32 : 32].

```
PLAY rtsp://basic:basic@bgws-pvv-04:554/vod/943ffaad-42be-4584-bc2c-
c8238ed96373 RTSP/1.0

CSeq: 123
```

```
Session: 12345678

Require: onvif-replay

Range: clock=20090615T114900.440Z

Rate-Control: no

Scale: -1.0
```

Change speed

Speed is controlled by the RTSP Rate-Control header. If "Rate-Control=yes", then the server is in control of the playback speed. The stream is delivered in real time using standard RTP timing mechanisms. If "Rate-Control=no", then the client is in control of the playback speed. Rate-controlled replay will typically only be used by non-ONVIF specific clients because they will not specify “Rate-Control=no”.

To control playback speed in a client, use the provided controllers. For example, with the VLC media player, select **Playback** > **Speed** > **Faster** or **Slower**. This increases or decreases the speed by 0.5.

Faster Fine and **Slower Fine** change the speed by 0.25.

Manage VLC media player playback with command line entries

You can manage video playback in the VLC media player by using command lines. Refer to the VLC command line help (https://wiki.videolan.org/VLC_command-line_help/) for details.

Such commands allow you to, for example, reverse playback and change the start time of the playback.

An example of a typical command line:

```
>vlc.exe --rate=-1.0 --start-time=3600 "rtsp://basic:basic@bgws-pvv-04:554/vod/943ffaad-42be-4584-bc2c-c8238ed96373"
```

Where:

- rate is the scale and speed parameter
- start-time is seconds after the database start

Following are the playback controls for the VLC media player:

input-repeat=	<integer [-2147483648 .. 2147483647]> Input repetitions Number of time the same input will be repeated
start-time=	<float> Start time The stream will start at this position (in seconds)
stop-time=	<float> Stop time The stream will stop at this position (in seconds)

run-time=	<float> Run time The stream will run this duration (in seconds)
input-fast-seek no-input-fast-seek	Fast seek (default disabled) Favor speed over precision while seeking
rate=	<float> Playback speed This defines the playback speed (nominal speed is 1.0)
input-list=	<string> Input list You can give a comma-separated list of inputs that will be concatenated together after the normal one
input-slave=	<string> Input slave (experimental) This allows you to play from several inputs at the same time. This feature is experimental, not all formats are supported. Use a '#' separated list of inputs
bookmarks=	<string> Bookmarks list for a stream You can manually give a list of bookmarks for a stream in the form "{name=bookmark-name,time=optional-time-offset,bytes=optional-byte-off set},{...}"

Alarms

About alarms

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

The Alarms feature is a 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 244). 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 Smart Client

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 243). The Alarms feature is a powerful monitoring tool, providing instant overview of alarms and possible technical problems.

Alarms and XProtect Central

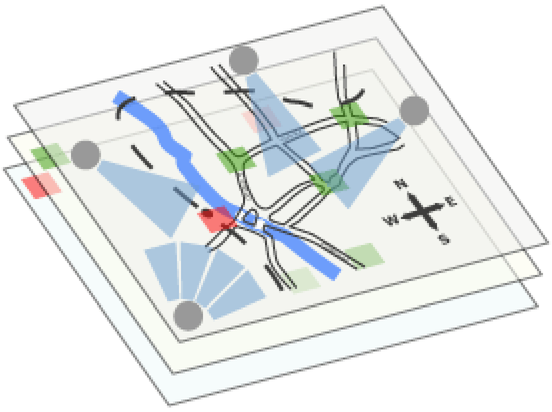
The alarms feature covers almost the same functionality as XProtect Central and configuration of XProtect Central functionality is now included in the alarms feature.

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.

About maps

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 including cities, neighborhoods, streets and floor plans.



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 33).

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 244). 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 242).

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 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 244), specify the following:

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 *244*), you will only be able to select **Always**. If you have defined one or more time profiles, you can select them 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 (see "Overview of events and output" on page *108*). You can also use global/manual event definitions (see "Add a manual event" on page *111*). 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 within 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.
Related map	Select a map to associate with the alarm definition. The selected map is automatically shown in XProtect Smart Client whenever the alarm is listed. This might help you to quicker identify the physical location of the alarm.
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 246) and Alarm sound settings (see "Sound settings" on page 247) 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**). Use these priority levels to configure the **Initial alarm priority** setting (see "Alarms definition" on page *244*).
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 *247*).

Alarm Data Levels tab, States

Name	Description
Level	Add new states with level numbers of your choosing. The state levels are only visible in the **Alarm List** in XProtect Smart Client. You cannot edit or reuse the default state levels **1**, **4**, **9** and **11.**
Name	Type a name for the entity. You can create as many as you like.

Alarm Data Levels tab, Categories

Name	Description
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 *244*).
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

Name	Description
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:

Sounds	Select the sound to be associated with the alarm. The list of sounds contains 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	Add sounds to the system. Browse to the sound to upload one or several .wav files.
Remove	Remove a selected sound from the list of manually added sounds. You cannot remove default sounds.
Test	Lets you test the sound. In the list, select the sound. The sound is played once.

Time profile

When you configure Time profiles (see "Add a time profile (for alarms)" on page 244), specify the following:

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 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 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 161).

XProtect Transact

XProtect Transact introduction

About XProtect Transact

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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.

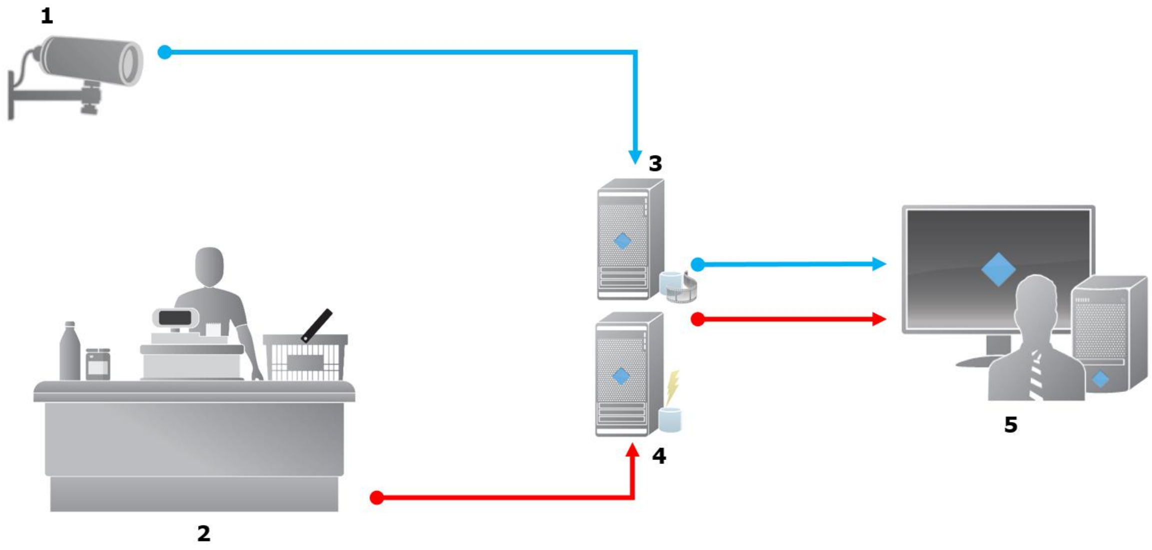


Illustration:

- 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) (on page 252)

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 (on page 254)

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 257)

Create a transaction alarm (see "Create alarms based on transaction events" on page 258)

Compatibility

XProtect Transact is compatible with version 2016 of these products:

- 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 252).
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 252).

See also

Setting up transactions (on page 252)

Setting up events (see "Setting up transaction events and alarms" on page 257)

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 Management Application's navigation pane, expand **Transact**.
2. Go to the Overview pane. 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 253). 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 (on page 254)

About connectors (on page 250)

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 252)

Add transaction definitions (on page 254)

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 Management Application's navigation pane, expand **Transact**.
2. Select **Transaction definitions**.
3. Go to the Overview pane. 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) (on page 255).

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.
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.

Name	Description
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 (on page 254)

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

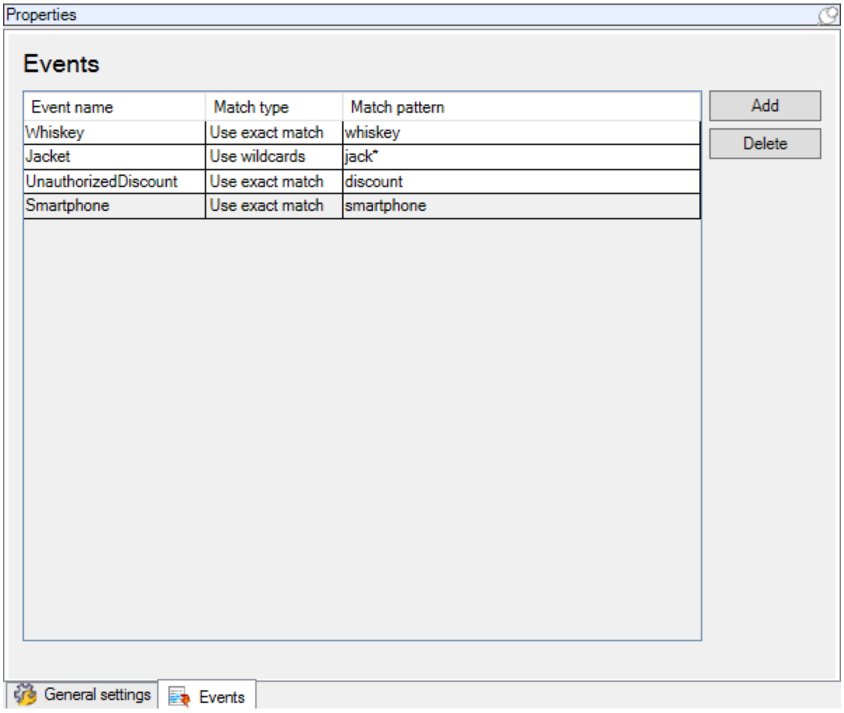
To track and investigate transaction events in XProtect Smart Client, first you need to define what the events are, for example the acquisition of a smartphone. You define transaction events on a transaction definition, so that the events defined apply to all transaction sources, for example cash registers, that use the transaction definition.

Steps:

1. In the Management Application's navigation pane, expand **Transact**.

2. Go to the Overview pane. Select the transaction definition, where you want to define an event.

3. Click the **Events** tab.



Events

Event name	Match type	Match pattern
Whiskey	Use exact match	whiskey
Jacket	Use wildcards	jack*
UnauthorizedDiscount	Use exact match	discount
Smartphone	Use exact match	smartphone

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) (on page 255).

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 250)

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 Management Application's navigation pane, expand **Alarms**.

2. Go to the Overview pane. 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

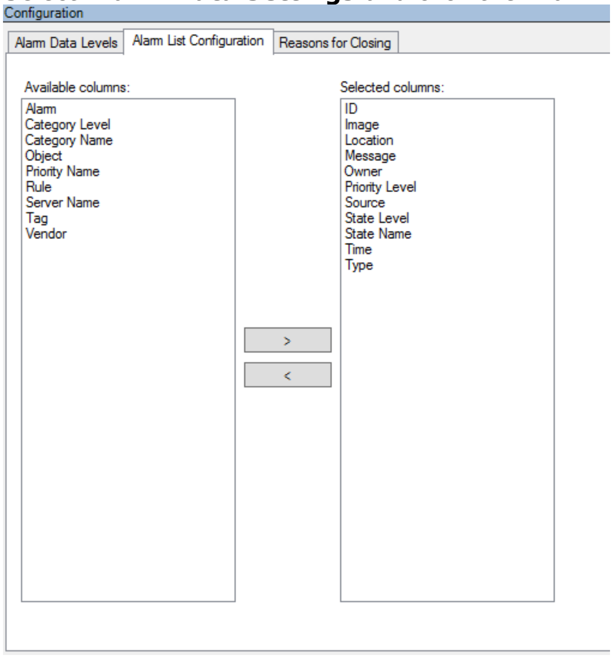
Define transaction events (on page 257)

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 Management Application's navigation pane, expand **Alarms**
2. Select **Alarm Data Settings** and click the **Alarm List Configuration** tab.



Available columns:
Alarm
Category Level
Category Name
Object
Priority Name
Rule
Server Name
Tag
Vendor

Selected columns:
ID
Image
Location
Message
Owner
Priority Level
Source
State Level
State Name
Time
Type

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 Management Application's navigation pane, expand **Transact**.
2. Select **Transaction sources**.
3. Go to the Overview pane.
4. Make the required changes and save them. For more information, see Transaction sources (properties) (on page 253).

See also

Add transaction source (wizard) (on page 252)

Disable transaction sources (on page 260)

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 Management Application's navigation pane, expand **Transact**.
2. Select **Transaction sources**.
3. Go to the Overview pane.
4. Clear the **Enable** check box and save the changes. The transaction source is disabled.

See also

Add transaction source (wizard) (on page 252)

Delete transaction source (see "Delete transaction sources" on page 260)

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 Management Application's navigation pane, expand **Transact**.
2. Select **Transaction sources**.
3. Go to the Overview pane. 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) (on page 252)

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.

Options

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 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, leave them at the old locations, or delete them. Milestone recommends that you choose to move the recordings to a new location.
4. Once changes are confirmed, restart all services.

About Customer Dashboard

Customer Dashboard is an online monitoring service that provides a graphical overview of the current status of your system, including possible technical issues such as camera failures, to system administrators or other people that have been given access to information about your system installation.

You can select or clear the check box to change your Customer Dashboard settings at any time.

Settings

General

In the **General** settings, you can change a number of settings that affect the general behavior and look of the Management Application.

Customer Dashboard

Select if your system should send system information to the Customer Dashboard (see "About Customer Dashboard" on page 262).

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.

	Classic mode	Evidence collection mode
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: 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, **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.

Camera preview	Specify if you want to show live video or a snapshot when you preview a camera in Management Application, or if you do not want previewing at all.
Behavior settings	Specify how you want the Management Application to behave for a number of actions, you and other Management Application users perform. The Management Application asks you to confirm many of the actions. If you think this is not necessary, you can change the behavior of the Management Application to not ask you again. 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.
Restore Default Settings	Click this button if you want to restore all behavior settings to their default values.

Connecting Hardware Devices

Automatic device discovery

Automatic device discovery (see "About automatic device discovery" on page 262) is turned off by default in your system. Select the check box to enable this functionality.

If the discovered cameras must use another 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 devices and add them to your system, you must manually add the device.

Synchronize time on connected hardware devices

To ensure that the time stamp on connected hardware devices and the system is the same, enable the use of time servers (see "About time servers" on page 15). If you hardware device do not link up against a time server that ensures that the time on the hardware devices and the system is synchronized, you risk that the system stops recording from the hardware devices all together.

Setting	Description
Use the recording server as a time server (Recommended)	The default system setting if you have upgraded from a previous installation of the system's software. Use the recording server to synchronize time between hardware devices and your system. Milestone recommends that you use this setting.
Use this Network Time Protocol (NTP) server	Use an NTP server for time-synchronization instead of using the recording server. You must type the exact address of the NTP server to be able to use it. Milestone recommends that you only use this setting if you are an experienced system administrator.
Do not synchronize time on connected hardware devices	The default setting if you have upgraded from a previous installation of the system' software. If you do not want any time synchronization to take place between hardware devices and the system, use this setting. Note that your hardware devices may stop recording if the system notices a constant time drift between the hardware devices and the system.

IP address assignment settings

The system includes three different settings for assigning IP addresses to your hardware devices when you connect them to the network. Each of the settings have their own advantages and disadvantages. Note that not all cameras support the use of DHCP servers.

Setting	Description	Advantage	Disadvantage
Use of a DHCP server to assign IP addresses to connected devices	Use a Dynamic Host Configuration Protocol (DHCP) server to automatically assign IP addresses to devices you connect to the system. If your system does not use a DHCP server, devices keep their pre-assigned IP addresses or use a self-configured IP address which might not work.	The DHCP servers keep track of available IP addresses and add them to the devices when they are added to your network. You can move devices from one network to another without having to reconfigure them. This is the default system setting if you have upgraded from a previous installation of the system's software.	Devices can change IP addresses so that the IP addresses in the configuration do not match anymore.
Do not assign an IP address when connecting a device	No IP addresses are assigned to devices connected to the system. The devices keep their current setup, for example having a static IP address or a DHCP-assigned IP address.	Control everything related to assigning IP addresses yourself. This is the default system setting if you have upgraded from a previous installation of the system's software.	You must keep track of available IP addresses yourself.
Assign a static IP address to connected devices from this range:	A static IP address from your indicated range is assigned to each individual device added to the system.	Assigned IP addresses never change.	You must reconfigure all devices to change network as devices must be reconfigured before you can move them to another network.

A Dynamic Host Configuration Protocol (DHCP) server is a standardized network protocol used on IP networks for dynamically distributing network configuration parameters. With DHCP, devices request IP addresses and networking parameters automatically from the DHCP server. The use of a DHCP server reduces the need for a network administrator or a user to configure such settings manually.

Default File Paths

Your system uses a number of default file paths. You can change the path of these if you need to.

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 94), 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 *124*). 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 76) for archiving.
Configuration path	The default path used for storing your system configuration.

Access Control Settings

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

Specify the following Access Control Settings:

Name	Description
Show development property panel	If selected, developer information is shown under Access Control properties. This setting is only meant to be used by developers of access control system integrations.
Keep access control events for:	Specify the number of days for which to keep access control events. The default is 30 days. The value of 0 indicates that you want to keep events indefinitely (server space permitting).

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 Events (properties)

Analytics Events let you specify the following:

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.
Events allowed from: **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: 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 are allowed in the list. You have two ways of adding addresses to the list: • Manually: type the required IP address/host name in the address list. Repeat for each required address. • Import an external list: read below.
Import	Click the **Import...** button to browse for the required external list of addresses. To import an external list, save the list in a .txt file format. Each IP address or host name must appear on a separate line in the file.

Event Server Settings

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

The event server has a number of settings that can change its behavior. You can specify the following Event Server settings:

Keep closed alarms for	Specify the number of days you want the system to keep closed alarms. Closed alarms are in the states **Closed**, **Ignore**, and **Reject**. This value is normally set to a low number to keep the capacity requirements low, but you can define any number up to 99999 days, dependant on server space. To keep closed alarms indefinitely, use the value 0 (dependant on server space).
Keep all other alarms for	Specify the number of days you want the system to keep all other alarms, meaning alarms not in the states **Closed**, **Ignore**, and **Reject**. This value is normally set to a somewhat higher number, such as 30 days, but you can define any number up to 99999 days, dependant on server space. To keep all other alarms indefinitely, use the value 0 (dependant on server space).

Keep logs for	Specify the number of days you want the system to keep the Alarms log. Default is 30 days. To keep logs indefinitely, use the value 0 (dependant on server space).
Log server communication	Specify if you want to save a separate log for server communication in addition to the regular log for the number of days specified.

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.

System maintenance

Backing up and restoring configuration

About backup 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

In the following, Milestone assumes that you have not changed your system's default configuration path (see "Default File Paths" on page 266), 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 log files, event 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 274), 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

Available functionality depends on the system you are using. See the Product comparison chart (on page 12) for more information.

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 (see "Configure the system in the Management Application" on page 39).

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 277) for a step-by-step guide and About required fields for CSV files when you import changes to configurations (on page 276) 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 276).

Glossary of Terms

A

Access control door license

A license that gives you permission to configure doors for access control in XProtect Access.

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.

B

Base license

A license that gives you permission to use the software of an XProtect VMS product and/or XProtect add-on product.

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.

Device changes without activation

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.

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.

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

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.

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.

Hardware device license

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.

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.

L

LPR camera license

A license that gives you permission to configure a camera for use with XProtect LPR.

LPR country module license

A license that gives you access to different country or regional license plate formats that you can use with XProtect LPR.

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 Corporate 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 camera 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 camera 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)

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.

Software license file

A file that contains all the permissions you have for your system, including base licenses and other licenses.

The filename is based on your Software License Code (SLC).

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.

Transaction source license

A license that gives you permission to associate cameras with ATMs and POSs and configure them for XProtect Transact.

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

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.

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