Milestone XProtect®

Analytics 2.2
User's Manual

The Open Platform Company

Target Audience for this Document

This document is aimed at end users of the Milestone XProtect Analytics solutions for license plate recognition, perimeter protection, motion detection and countless other purposes.

This document describes how to configure an existing Smart Client for use with video content analytics, and subsequently how to view analytics data together with live and recorded video in the Smart Client

For information about installing a Smart Client, and using the Smart Client for other purposes than analytics, see the separate XProtect Smart Client User's Manual available from your surveillance system administrator or from www.milestonesys.com.

For information about configuring the XProtect Analytics solution on the surveillance system, refer to the separate XProtect Analytics Administrator's Manuals, available on the XProtect Analytics software DVD as well as from www.milestonesys.com.

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Product Overview

Milestone XProtect Analytics provides an intelligent yet highly intuitive solution for video content analysis tasks such as license plate recognition (LPR), perimeter protection, left objects detection, etc. XProtect Analytics works in tight integration with Microsoft® Windows® components as well as a range of different Milestone products.

XProtect Smart Client is the client application used for viewing video combined with analytics data wherever you require.

Depending on which video content analysis plugins are used with your organization's XProtect Analytics solution, you can work with:

- License plate recognition (LPR)
- Perimeter protection
- Detection of persons, vehicles, etc. moving in unauthorized patterns or directions
- Unattended objects detection
- Loitering detection
- Tailgating detection
- Crowd formation detection
- People counting
- Detection of illegally parked vehicles
- Detection of removed items
- Advanced video motion detection (VMD)
- Countless other purposes (thanks to the XProtect Analytics Generic VA plugin, which allows third-party video content analysis applications to supply data for XProtect Analytics)

XProtect Analytics lets you easily combine video content analysis alerts with Milestone surveillance system features, such as recording, activation of outputs, etc. XProtect Analytics is therefore highly interesting in areas such as retail, transportation, education, industry, government, etc.

Basic Data Flow

In an XProtect Analytics solution, video and analytics data basically flows between the products in the following way:

Cameras send raw video streams to the surveillance system.

The video streams are passed on to an analytics component on the surveillance system, which processes the video streams in one or more steps: 1) Image analysis, for example for license plate recognition or left object detection, and 2) Match against associated positive and/or negative lists, if required.

Whenever a license plate, left object, etc. is recognized, the surveillance system stores the analytics information together with timestamp information.

In the Smart Client, users are able to the analytics data together with video from the surveillance system.

The time-linking of the analytics data and video makes sure that Smart Client users are able to view and browse the analytics data and video simultaneously.

Configuration

Plugin Required

In order to use the Smart Clients with your analytics solution, a plugin must be installed for each Smart Client you intend to use.

The Smart Client should be installed first, then the plugin. If in doubt about how to install a Smart Client, refer to the Smart Client User's Manual, available from www.milestonesys.com.

When ready to install the plugin, do the following on each computer on which you require the Smart Client to work with your analytics solution:

1. Open an Internet Explorer browser (version 6.0 or later), and connect to the URL or IP address specified by your system administrator in order to connect to the surveillance system server. When you connect to the surveillance system server, you will see a welcome page.

2. Different versions of the welcome page exist. On some versions, you will immediately see a list of available plugins. On other versions you must click a *Download and install plugins* link before you can see a list of available plugins.

3. Download the required version of the *Analytics Alert Plugin*.

   Example only; note that different versions of the welcome page exist

4. Depending on your security settings, you may receive one or more security warnings (*Do you want to run or save this file?*, *Do you want to run this software?* or similar; exact wording depends on your browser version). When this is the case, accept the security warnings (by clicking *Run* or similar; exact button names also depend on your browser version).

5. After a short while the *Milestone XProtect Smart Client Plug-in for Analytics Setup Wizard* opens. Click *Next*.

6. Select required installation folder (a default installation folder is automatically suggested). Also select whether just yourself or anyone using the computer should be able to access the plugin (if in doubt, select *Everyone*). Then click *Next* twice.

7. Read and accept the license agreement, then click *Next* to begin the actual installation.

8. When installation is complete, click the *Close* button. You are now able to view analytics data together with video recordings in your Smart Client

Creating Views for Analytics

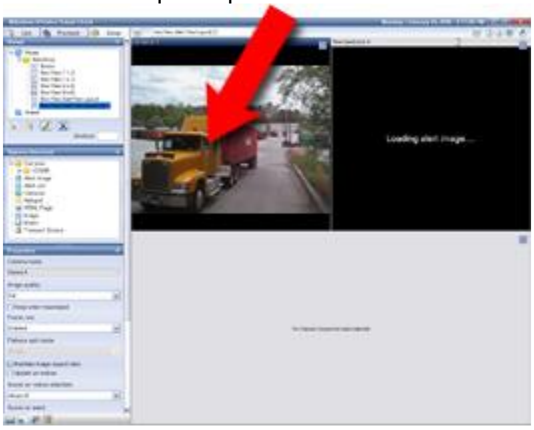
Once your Smart Client has the necessary plugin, you are able to create Smart Client views for use with analytics.

In some organizations, your surveillance system administrator will have set up the required views for you, in which case you can go straight to page 11 (for information about viewing live video and analytics data) or 13 (for information about browsing recorded video and analytics data).

1. On the Smart Client's *Setup* tab, create a new group. If in doubt about how to create groups and views in the Smart Client, see the Smart Client User's Manual, available from www.milestonesys.com.

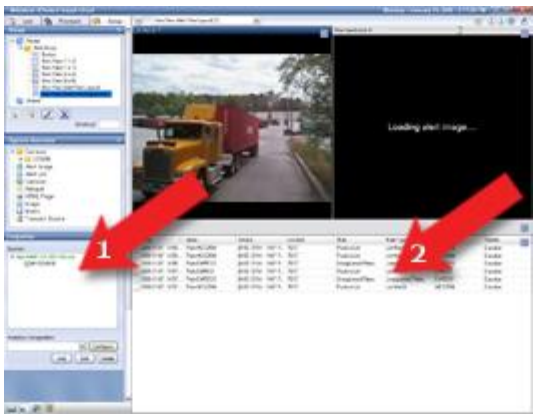
2. In the new group, create a new view of the type *Alert View Layout*. This will give you a special type of view which consists of three elements: a camera position, a special analytics image capture position, and an area for display of analytics data.

3. In the *Setup* tab's *System Overview* section, select the relevant camera, and drag it onto the view's top left position.



4. Click inside the large gray area at the bottom of the view. Then, in the *Properties* section (**1** in the example), expand the source list and select the relevant analytics source(s).

   When you select analytics source(s), a spreadsheet-like matrix will appear in the previously gray analytics data area (**2** in the example). If the selected sources already contain analytics data, the data will also be displayed.



   What is a source? By selecting a source, you basically tell your Smart Client where you want to get the view's analytics data from. If you are a Smart Client end-user creating your own views for use with analytics, ask your surveillance system administrator about the name of the source if in doubt.

5. You are now able to test your view on the Smart Client's *Live* and *Playback* tabs.

- ***Live***: Data about relevant incidents will be displayed in the view's bottom area, live video will be displayed in the view's top left position, and an image from the latest incident will be displayed in the view's top right position.

- ***Playback***: By switching to the Smart Client's *Playback* tab, you can try out the features for browsing past analytics data combined with time-linked video recordings.

Tip: If your view does not display analytics data or video as expected, see Troubleshooting in the following.

Create Many or Few Views?

Even though it is not a requirement, it is often a good idea to create a separate view for each analytics source. This way you are able to keep targeted settings (such as data filtering and time synchronization) for each source when you switch between them during day-to-day use. Note that you are able to group your views in as many groups and sub-groups as you require. This way, you can easily organize your views—even when you have many of them.

Using the Time Synchronization Slider

Analytics views feature a time synchronization slider for synchronizing images in the analytics image capture position in the view's top right position with the video displayed in the view's top left position. For more information about using the slider, see page 17.

Troubleshooting

If an analytics view in your Smart Client does not display analytics data or video as expected, verify the following:

- That you have logged in to the Smart Client with an account which has rights to view the required camera(s).
- That the camera you have specified in your view is indeed the one used for analytics.
- That you have selected source(s) for the view on the *Setup* tab.
- If you think that time-based filtering of incidents on the Smart Client's Playback tab takes very long, you can cancel the filtering, and try specifying a different time filter. The reason: The list may in some organizations contain several millions of incidents, and if such very large amounts of incidents have to be filtered, the filtering process may take time.

The fact that your Smart Client does not display analytics data or video as expected may also be due to problems on the surveillance system itself. Your surveillance system administrator can help you verify the following (information relevant for surveillance system administrators only is shown in gray text):

Surveillance System Server Services

- Verify that the required XProtect Analytics service is running on the surveillance system server. This service makes sure your XProtect Analytics configuration is applied. To verify this on the surveillance system server, click Windows' *Start* button, select *Control Panel* >

Administrative Tools > *Services*, and make sure the status of the required service is *Started*. If not, right-click the name or the service, and select *Start*.

- Verify that the Recording Server service is running on the surveillance system server(s). This service handles the display and recording of video. To verify this on the surveillance system server, click Windows' *Start* button, select *Control Panel* > *Administrative Tools* > *Services*, and make sure the status of the *Milestone Recording Server* service is *Started*. If not, right-click the name or the service, and select *Start*.
- For XProtect Enterprise and XProtect Professional surveillance systems: Verify that the Image Server service is running on the surveillance system server. This service handles the display of video in clients as well as authentication of Smart Client users. To verify this on the surveillance system server, click Windows' *Start* button, select *Control Panel* > *Administrative Tools* > *Services*, and make sure the status of the *Milestone Image Server* service is *Started*. If not, right-click the name or the service, and select *Start*.
- Verify that the Transact service is running on the surveillance system server. This service handles the sending of analytics data to the Smart Client. To verify this on the surveillance system server, click Windows' *Start* button, select *Control Panel* > *Administrative Tools* > *Services*, and make sure the status of the *Milestone Transact* service is *Started*. If not, right-click the name or the service, and select *Start*.

Surveillance System Server Setup

- Verify that the required camera is transmitting video to the surveillance system. To verify on XProtect Enterprise and XProtect Professional from version 7.0, open the Management Application, expand *Advanced Configuration*, expand *Scheduling & Archiving*, and verify that the camera in question is online at the required times. To verify on XProtect Enterprise and XProtect Professional system versions earlier than 7.0, click the *Scheduler* button in the surveillance system server's Administrator application, and verify that the camera in question is online at the required times. On XProtect Corporate systems, verify that your rules configuration allows feeds from the required camera at the required times.
- Verify that the user account specified for use with XProtect Analytics is a valid account, and that the account in question is allowed to view live and recorded video from the camera. To verify on XProtect Enterprise and XProtect Professional systems from version 7.0, open the Management Application, expand *Advanced Configuration*, expand *Users*, and verify that the user account in question exists, and that it has rights to view live and recorded video from the required cameras. To verify on XProtect Enterprise and XProtect Professional system versions earlier than 7.0, open the surveillance system server's Image Server Administrator, and click the *User Setup…* button to verify that the user account in question exists; then click the *User Access…* button to verify that user account in question has rights to view live and recorded video from the required cameras. On XProtect Corporate systems, verify that the user has a role with the required rights.

XProtect Analytics configuration

- Verify that there are no errors in the configuration specified in the XProtect Analytics administration interface. If verifying XProtect Analytics for LPR, make sure you look for possible errors in the specific configuration parameters for each connection. Select the required connection, then click the *Configuration* button below the reference images; the configuration parameters contain important information relating to license plate character size, license plates' country of origin, etc. Also make sure the minimum confidence level of the required LPR connection is not very high (e.g. 950), as this can lead to very little or no license plate recognition data to work with. Begin with a minimum confidence level value of approximately 600; once you have worked with the LPR connection for a while you can adjust the threshold.
- Verify that your surveillance system administrator has saved the configuration in the XProtect Analytics administration interface, and—if required—restarted the service.

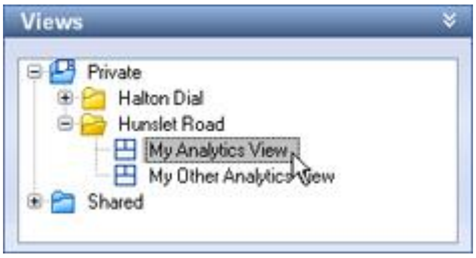
Physical Cameras

- Verify that the required cameras are correctly mounted, cabled, connected, etc.

Viewing Live Video & Analytics Data

The Smart Client lets you view real-time analytics data combined with matching live video.

Selecting an Analytics View



1. Go to the Smart Client's *Live* tab.
2. In the *Views* section, select the required view.

View's Structure

Data about relevant incidents will be displayed in the view's bottom area, live video will be displayed in the view's top left position, and an image from the latest detected incident will be displayed in the view's top right position.

Each incident can be displayed with information in the following columns:

- ***Alarm*****:** Lists the type of incident detected, for example motion or a license plate.
- ***Alert Type*****:** Lists the category of incident.
- ***Confidence*****:** Lists a value between 1 and 1000 describing the confidence level for the detection. Example: A value of 950 means that the XProtect Analytics solution is at least 950/1000 certain that it has made a correct detection. You will typically not see very low confidence values since it is possible to set a minimum acceptable confidence level on the server.
- ***Description*****:** Lists a summary of the detection.
- ***Device*****:** Lists the camera by which the incident was detected.
- ***Location*****:** Lists the location of the camera by which the incident was detected.
- ***Object*****:** Lists the object detected.
- ***Object Type*****:** Lists the category of object detected.
- ***Rule*****:** Lists the XProtect Analytics rule triggered by the detection of the incident.
- ***Rule Type*****:** Lists the category of XProtect Analytics rule triggered by the detection of the incident.
- ***Source*****:** Lists the surveillance system server hosting the camera by which the incident was detected.

- ***Time***: Lists the time at which the incident was detected.
- ***Vendor***: Lists the video content analysis software on which the incident detection was based.

Tip: You decide which columns to display in the table, and in which order they appear. To select which columns to display, click the button to the left of the column headings (see example below). To arrange the order of columns, simply drag them to the required positions.

For more information about the Smart Client's live viewing features, refer to the XProtect Smart Client User's Manual, available from your surveillance system administrator or from www.milestonesys.com.

Colored Overlays

In analytics views an image from the latest detected incident will be displayed in the view's top right position. This image contains an overlay in one or more colors. For more information about interpreting the different overlay colors, see page 16.

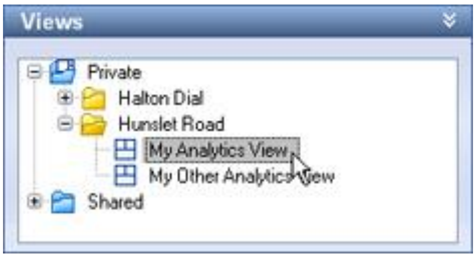
Time Synchronization Slider

Analytics views feature a time synchronization slider for synchronizing images in the analytics image capture position in the view's top right position with the video displayed in the view's top left position. For more information about using the slider, see page 17.

Browsing Recorded Video & Analytics Data

The Smart Client lets you view analytics data combined with matching, time-linked, recorded video.

Selecting an Analytics View



1. Go to the Smart Client's *Playback* tab.
2. In the *Views* section, select the required view.

View's Structure

Data about relevant incidents will be displayed in the view's bottom area, matching recorded video will be displayed in the view's top left position, and an image from the selected incident will be displayed in the view's top right position.

Each incident can be displayed with information in the following columns:

- ***Alarm***: Lists the type of incident detected, for example motion or a license plate.
- ***Alert Type***: Lists the category of incident.
- ***Confidence***: Lists a value between 1 and 1000 describing the confidence level for the detection. Example: A value of 950 means that the XProtect Analytics solution is at least 950/1000 certain that it has made a correct detection. You will typically not see very low confidence values since it is possible to set a minimum acceptable confidence level on the server.
- ***Description***: Lists a summary of the detection.
- ***Device***: Lists the camera by which the incident was detected.
- ***Location***: Lists the location of the camera by which the incident was detected.
- ***Object***: Lists the object detected.
- ***Object Type***: Lists the category of object detected.
- ***Rule***: Lists the XProtect Analytics rule triggered by the detection of the incident.
- ***Rule Type***: Lists the category of XProtect Analytics rule triggered by the detection of the incident.

- ***Source***: Lists the surveillance system server hosting the camera by which the incident was detected.
- ***Time***: Lists the time at which the incident was detected.
- ***Vendor***: Lists the video content analysis software on which the incident detection was based.

Selecting Incidents in the Table

To view video from a detected incident, you select the required incident in the table in the bottom part of the view. The table may contain large amounts of incidents, so it is important that you know how to navigate the table itself.

Table Displays 100 Incidents at a Time

To allow for optimum performance, the table displays a maximum of 100 incidents at a time. To browse to the previous/next 100 incidents, simply use the buttons in the bottom right part of the table.

You Control the Table's Content

You decide which columns to display in the table, and in which order they appear. To select which columns to display, click the button to the left of the column headings. To arrange the order of columns, simply drag them to the required positions.

Sorting Table Columns

To sort columns alphabetically, by time, etc., simply click the required column heading.

Filtering Table Columns

You can filter content in the table's columns in three ways:

- To filter on a specific date/time period, click in the row below the *Time* column heading (**1** in the example), select *Custom*, click the required date drop-down menu (**2**), select required date (**3**), then required time (**4**):

You can also filter on *Today* (that is the current day, from 00:00:00 until the current moment), *Week* (that is the current week, from Monday 00:00:00 until the current moment), or on *All* (the same as not using a time filter).

When ready, click *OK*.

Tip: The list may in some organizations contain several millions of incidents. If such very large amounts of incidents have to be filtered, the filtering process may take some time. If a time filter takes very long to apply, click the *Cancel* button and then try specifying a different filter.

- To quickly filter content in columns, simply click the drop-down menu in the row below the column heading:

- To use more advanced filtering, first select the required filtering method (**1**), then type your filtering criteria in the row below the column heading (**2**):

Browsing Video from Around Detected Incidents

1. Select the required incident in the table in the bottom part of the view.

2. Use the Smart Client's time browsing features (e.g. the time line browser in the right side of the view) to browse video from around the time of the selected incident. For more information about the Smart Client's browsing features, refer to the XProtect Smart Client User's Manual, available from your surveillance system administrator or from www.milestonesys.com.

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Time Synchronization Slider

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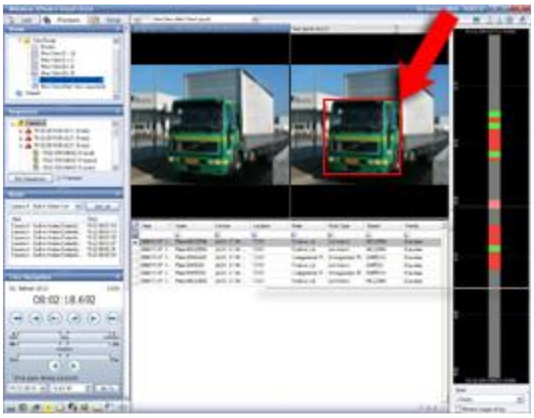
Interpreting the Colored Overlays

In analytics views an image from the latest detected incident will be displayed in the view's top right position. This image contains an overlay in one or more colors.



- A red (•) box signifies the area of interest, i.e. the detected object, license plate, person or whatever else your analytics solution has been set up to detect.
- A blue (•) line signifies an analytics rule, for example a line which objects must not cross. Only used in connection with certain types of analytics.
- A green (•) line signifies an object path. Only used in connection with certain types of analytics.
- A yellow (•) box signifies an object which has been detected, but which does not match a rule in the analytics solution. Example: An object which is moving, but not in a direction that conflicts with any analytics rules. Only used in connection with certain types of analytics.

Using the Time Synchronization Slider

The *Time Synchronization* slider is used for time-synchronizing images in the analytics image capture position in the view’s top right position with the video displayed in the view’s top left position.

Often there will be no need for synchronizing time between the two positions, but synchronization may be required if you experience network latency. Network latency may cause the time stamps for two positions' images to vary by a number of milliseconds; by moving the slider you are able to compensate for this.

Move the slider—located in the view’s top right position—to the left to compensate by up to -2000 milliseconds; move the slider to the right to compensate by up to 2000 milliseconds.

Time synchronization slider; in this case used for compensating by 20 milliseconds

To use your keyboard’s arrow keys to move the slider in convenient increments, first click the slider, then press UP ARROW to reduce compensation by five milliseconds or DOWN ARROW to increase compensation by five milliseconds.

Double-click the slider to reset compensation to 0 milliseconds.

Removal

To remove the alert plugin from a computer running a Smart Client, do the following on the computer running the Smart Client:

After you remove the alert plugin, it will no longer be possible to view analytics data in the Smart Client.

1. In Windows' *Start* menu, select *Control Panel*, and select *Add or Remove Programs*. This will open the *Add or Remove Programs* window.

2. In the *Add or Remove Programs* window's list of currently installed programs, select the *Milestone XProtect Smart Client Plug-in for Analytics [version #]* entry, and click the *Remove* button

3. You will be asked to confirm that you want to remove the software. Click *Yes*, and follow the removal instructions.

If you require information about the removing the Smart Client software itself, refer to the XProtect Smart Client User's Manual, available from your surveillance system administrator or from www.milestonesys.com.

Milestone Systems offices are located across the world. For details about office addresses, phone and fax numbers, visit www.milestonesys.com.

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