

## NetFlow-EC PSIM Video Analytics



**NetFlow-EC PSIM has built-in intelligent video and audio analytics to recognize events as they occur, and the ability to respond appropriately. NetFlow-EC PSIM provides the option of automatic and automated administration of security systems, including through user-defined scripts for reactions to events.**

### Video Detection Tools

Smart video detection tools process camera video and identify events that match certain criteria: motion, object appearance or disappearance, line crossing, and more. These events can be attached to specific system actions, such as beginning recording, sending a signal to the operator, displaying the image on a separate monitor, or starting a complicated custom script.

### People Counting

The people counting detection tool counts the number of people who go from a certain area to another and back again. The detection tool records each time when an object of a certain size moves in any direction.

### Heat Map

The Heat Map tool allows determining where visitors stop and measuring their linger time in areas of interest. With the detection tool, it is possible to view the "warmest" places at a retail store or any other trafficked location thanks to corresponding visual cues on screen.

### Forensic Search

Our system for smart search in video archives allows quickly finding archived video that matches custom criteria. The criteria (line crossing, motion in area, movement from one area to another, etc.) are set at the time of search; no pre-configuration of detection tools is necessary.

### Queue Management

Our system for smart search in video archives allows quickly finding archived video that matches custom criteria. The criteria (line crossing, motion in area, movement from one area to another, etc.) are set at the time of search; no pre-configuration of detection tools is necessary.

### Edge Analytics

Besides the video analysis functions built into the program, NetFlow-EC also supports video detectors embedded in IP cameras and can work with specialized video analysis hardware.

### Basic Video Motion Detection

**Video Motion Detection (VMD)**. A group of detection tools designed to detect moving objects in the frame. The basic motion detection tool detects motion in the scene as it looks for anything that is different from one video frame to another. An object tracker detects motion and its direction, and can track an object even if the camera is shaking or while the PTZ camera is rotating. The infrared detection tool (for its operation an infrared imager is needed) is triggered by motion in the infrared range. The motion direction detection tool captures motion in set directions.

**The abandoned object/Object disappearance detection** tool notifies of the appearance of an object in the scene or the disappearance of an object from the scene. This tool makes it possible to detect, for example, the disappearance of a laptop from a desk, a briefcase left in a building lobby, or an illegally parked automobile.

**Facial recognition** detects the appearance of a human face in the scene, distinguishing it from any other object.

### Scene Analysis

This group of detection tools makes it possible to filter set types of movement of an object in the scene. The user configures lines, polygonal zones and time intervals, and the system detects events corresponding to the set criteria. Scene video detection tools capture:

- When an object crosses a straight line in a selected direction;
- When an object crosses a polyline in a selected direction;
- Mon in a zone;
- Entry of an object into a zone;
- Exit of an object from a zone;
- Appearance of an object in a zone;
- Disappearance of an object from a zone;
- Stopping of an object in a zone;
- An object remaining in a zone more than 10 seconds;
- An object abandoned in a zone.

Any of these tools can be fine-tuned to track a specific object: a person, an automobile or all objects.

## **Camera Tampering**

Intellects camera health detection tools trigger in case of malfunctions in a video camera's operation. They not only make it possible to identify attempts to disable a camera, but also detect various kinds of interference which reduce the quality of event recording.

**The covered lens detection** tool is triggered by all instances of accidental or deliberate covering / blocking / spray-painting of the lens. This is especially important in situations when a camera is located within reach.

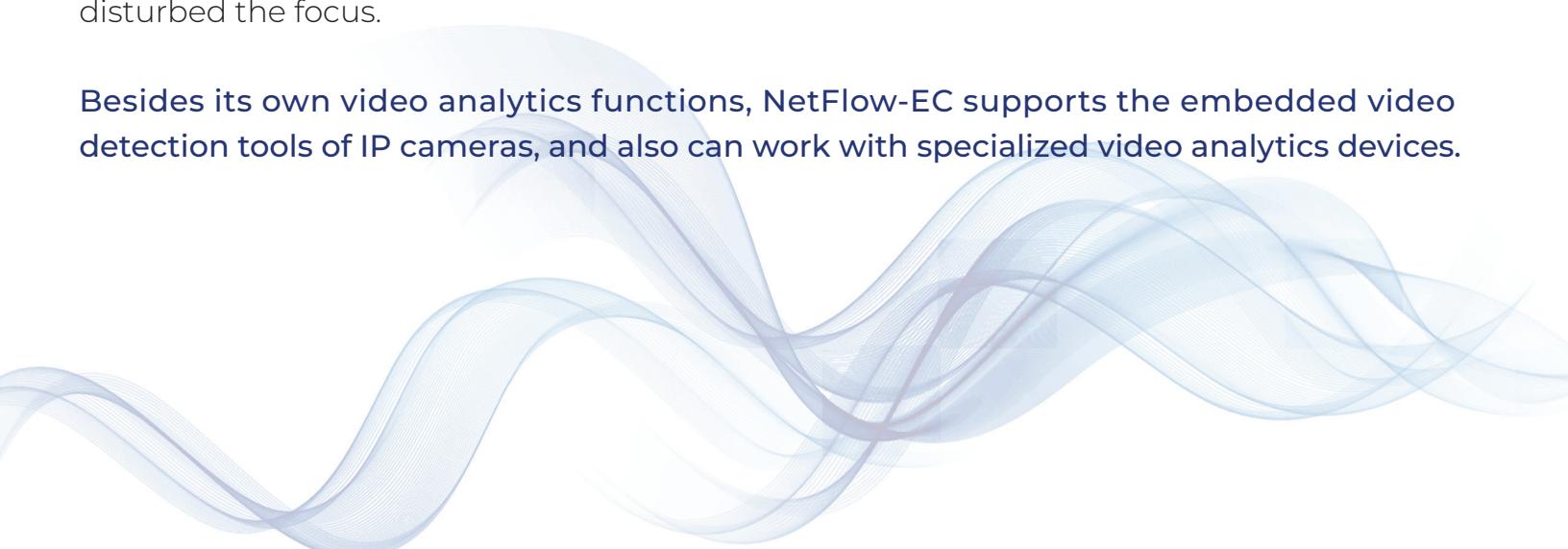
**The camera blinding detection** tool generates an alert if a beam of bright light, such as a flashlight, searchlight or automobile headlight, is directed into the lens.

**The camera shift detection** tool notifies of reorientation of a camera in space. This detection tool is especially needed in situations when a camera is located within reach and can easily be turned.

**The background change detection** tool reacts to changes in the background in front of a camera. This detection tool is very similar to the previous one, but serves somewhat different purposes. While the camera shift detection tool reacts to manipulation of the camera itself, the background change detection tool reacts to manipulations around it, for instance, an attempt to place an artificial background in front of the camera.

**The defocusing detection** tool notifies of loss of image sharpness as a result of defocusing or dirtying of the camera lens. This is possible, for example, if someone deliberately or accidentally disturbed the focus.

Besides its own video analytics functions, NetFlow-EC supports the embedded video detection tools of IP cameras, and also can work with specialized video analytics devices.



### Why Forensic Search?

The main goal of using an intelligent search engine is to find events of interest to the user in the video archive quickly if the exact time when the event occurred is unknown. Forensic Search makes it possible to raise work with the video archive to a new level of quality, from the user viewing the entire time interval which is potentially of interest to situational analysis of the archive according to set parameters.

### What is Forensic Search?

With Forensic Search, camera video is processed in real time, and metadata describing all objects in the scene and their characteristics are recorded to a special database that is synchronized with the video footage. No preliminary configuration of video detection tools is needed. To search, the user enters a query (this is similar to configuration of a video detection tool), for example, crossing a line or motion in a zone. The Forensic Search system processes the recorded metadata and in seconds finds all video fragments which correspond to the query.

### Search and Find with Forensic Search.

You can specify the following search criteria via the Forensic Search user interface:

- **Crossing a virtual straight line in a user-defined direction**
- **Motion in the zone**
- **Zone entry**
- **Zone exit**
- **Motion from one area to another**
- **Item appeared in the zone**
- **Item disappeared in the zone**
- **Stopping by in the zone**
- **Presence in the zone for over 10 seconds**
- **Abandoned object**

In addition, you can configure Forensic Search to find objects of the selected color or filter objects that cross a line/polyline with the selected speed.

## Benefits

- There is no need for preliminary configuration of video detection tools; data about all moving objects in the scene are automatically saved. This advantage is especially valuable for large systems, as it makes it possible to quickly install and start using Forensic Search.
- Instant search. The first query results appear on the screen almost immediately.
- As the system works with video recorded into the archive, a search can be performed several times while you refine your query.

### Visitor Counter Detector



The **Visitor Counter detector** counts the number of people who come and go, at a whole site or within a specific zone of observation. This information can be useful to:

- Retailers, who can use traffic management at their stores, malls, and separate zones within stores and malls
- Banks, who can calculate the number of visitors to their branches
- Hospitality and services establishments, who can count the patrons of restaurants,
- movie theaters, travel agencies, and more

Management can use this information to:

- Gauge the company's overall effectiveness
- Measure marketing success
- See the load on customer-facing spaces
- Improve service by adjusting work schedules to coincide with peak visit periods

If you are leasing out retail areas, you receive advantages worth a mention of their own:

- Measure popularity and forecast growth for your mall or other facility
- Determine which leased areas are the most attractive and adjust rates to match

## How it works

The video image detection tool counts the number of people who cross from one designated area to another and back. For the detection tool to work, you should:

- Set two areas in the image.
- Specify the direction of movement: from area 1 to area 2 is arrival, from area 2 to area 1 is exit (or vice versa).
- Calibrate the approximate size of a person in the image.

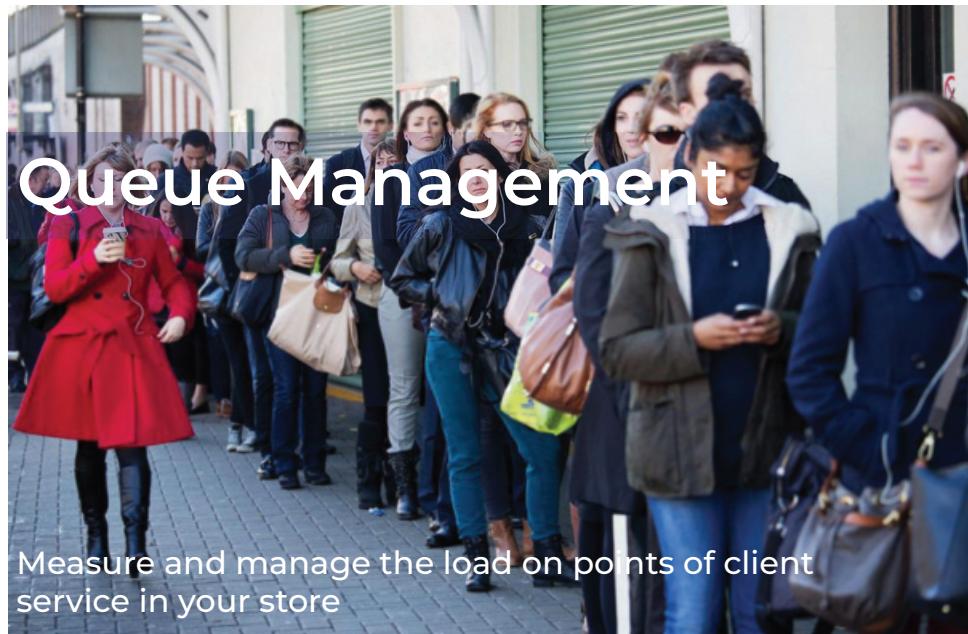


The detection tool notices each movement of an object that fits the specified dimensions, in any direction. The person is regarded as having entered or left, depending on the direction of movement. The detection tool correctly handles situations when several people are moving in different directions at the same time.

The events log in **NetFlow-EC** is updated in real time with matching Entry and Exit events. If necessary, you can use scripts to get information on the number of people coming or going. You can use web reports to get data for analysis in table or chart form.

## NetFlow-EC Advantage

- Unlike hardware sensors, the detection tool handles situations when several people walking alongside enter the store, as well as when several people move in different directions at the same time.
- Counting of the number of visitors is highly accurate as long as the recommendations for camera placement and image quantity are followed (typical accuracy is 97%).
- The detection tool is a plug-in module for NetFlow-EC, so it is quick to install and easy to configure.
- Visit statistics can be accessed through web reports (from any Internet-enabled PC) or used in numerous ways in NetFlow-EC through scripts.



The **Queue Length detection tool** measures the load on points of client service.

Information about service load is useful in:

- Retail
- Transportation (bus and railway stations, airports, subway stations)
- Banks and companies without e-queuing systems
- Entertainment and recreation establishments

By knowing the line length, management can:

- Optimize employee work schedules
- Redesign floor plans
- Increase or decrease the number of points of service

## How it Works

The detection tool counts the number of people who are standing in line, based on the image from the video camera aimed at the line area. To configure the detection tool, do the following:

- Set an area in the video image in which the detection tool will count the number of standing people.
- Calibrate the approximate size of a person in the image.



The detection tool is based on "prolonged presence": it counts people who remain in the selected area for a specified length of time, in other words, only the people who are truly waiting in line. The detection tool does not count people who stop for a short time, such as to look at a schedule or ask a cashier a question. The detection tool also correctly interprets the situation when a person standing in line moves slightly, such as when shifting weight to another leg.

The number of people in line can be viewed in real time or through web reports, as a load report in the form of a table or chart.

## NetFlow-EC Advantage

- When recommendations for camera placement and image quality are followed, counting is accurate to within a handful of visitors.
- The detection tool is a plug-in module for NetFlow-EC, so it is quick to install and easy to configure.
- Line length statistics can be accessed through web reports (from any Internet-enabled PC) or used in numerous ways in NetFlow-EC through scripts.



The Heat Map tool allows determining where visitors stop and measuring their linger time in areas of interest (promo stands, showcases, product placement areas, ads, etc.). With the detection tool, it is possible to view the "warmest" places at a retail store or any other trafficked location thanks to corresponding visual cues on screen.

### Benefits of Using the Heat Map

- **Measure the effectiveness of direct advertising** (display videos, brochures, ad posters, banners, etc.) by determining how long visitors stay in these locations and calculating the ROI on ad expenses.
- **See where to direct your promotional efforts:** compare the effect of different promotions for a particular product over time; and identify the areas of your store that are most promising for events and promotions.
- **Knowing the most highly trafficked store areas**, you can adjust the layout of the store to eliminate bottlenecks and "cold" areas.
- **Determine the effectiveness of your product placement**, in order to optimize financial propositions for product manufacturers.
- **Compare the effectiveness** of different places in your store for sales of a particular product.
- **Scale out successful experiments** with store arrangements, layout, and promotions to other stores in your chain.
- **Plan staff numbers and stationing** more efficiently.
- **Measure overall store operations and workload.**

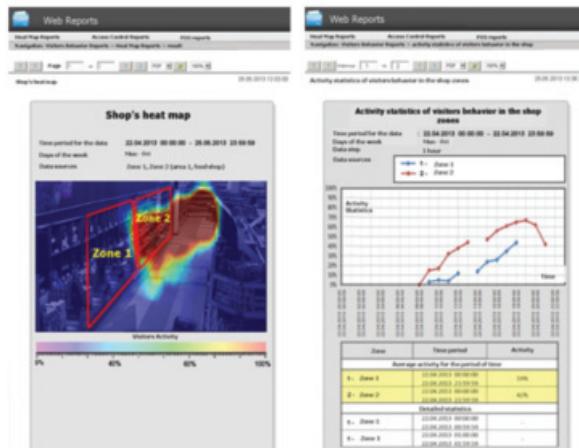
## Main Tool Functions

- Measure visitor activity in an area.
- Record visitor activity events to a database.
- Use quantitative data for reporting on visitor activity in different areas of a store.

## Report Forms

Visitor activity for any period of time can be viewed as a web report. The report can be saved as a file or sent by email automatically (according to a schedule).

Two types of reports to choose from:



The **Heat Map** is a color visual representation of detection data, providing an intuitive view of activity in different store areas for quick comparison.

Detection data for a user-selected time period is used. "Warm" colors correspond to longer linger times in a particular place, while "cold" ones mean a lack of visitor interest. This offers an at-a-glance summary of which areas customers find attractive.

The Customer activity statistics report presents detection data in the form of charts and tables for analysis and comparison of visitor behavior in areas of interest. This form offers rigorous quantitative information on changes in visitor activity by zone and over time.

Detection data for a user-selected time period is used. Users receive up-to-date information on changes in visitor activity by zone over time as well as the average value for all time recorded. Data for different zones can be compared for even deeper analysis.

