

MxAnalytics

Camera-Integrated Video Analysis
With The MOBOTIX Q24



Compact knowledge:

Basic information and the best practical tips for
optimal use of MxAnalytics

MxAnalytics Camera-Integrated Video Analysis

New Video Analysis Tools For The MOBOTIX Q24M-Sec Camera

MOBOTIX cameras differ from all other video systems due to their decentralized system architecture. Each camera includes a high-speed processor with flash memory for long-term recording. The video control center serves only for viewing, not for analysis or recording. This results in reduced total costs (less hardware and cabling) while simultaneously increasing the performance of the video system (higher resolution and frame rates).

MOBOTIX cameras automatically detect movement within a monitored area. MOBOTIX has enhanced image data processing inside the camera with the MxAnalytics video analysis tools, thus offering new and valuable information sources for process optimization or marketing purposes, for example. How many people go in and out of which entrance during the day? Which shelves in the shop attracted the most customers this month?

MxAnalytics makes it possible to track the movement of people and objects in the image and to collect statistical behavior data. For this purpose heat maps can be created and defines counting lines can be defined. The camera then records how often each counting line is crossed within a specified period. The most frequented areas are highlighted in color on a heat map.

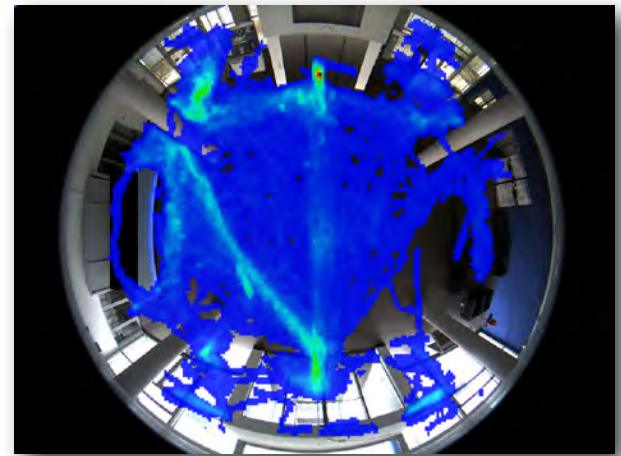
Video motion analysis can be activated and deactivated manually, based on a signal, or following a time table. The results are saved in the camera every 15 minutes, and can be exported over a range of interfaces and at specified times (report profiles). Only around 30 MB per day or 1 GB per month are required for continuous analysis. Analysis can only be carried out using a Hemispheric Q24 camera. For optimal results, the camera should be mounted on a ceiling, at least four meters high. MxAnalytics is not a separate program. Instead, it is available free of charge with the latest camera software version 4.1.4.11, which may be downloaded free of charge from the MOBOTIX website (www.mobotix.com). MxAnalytics is also partially integrated in the MxControlCenter.

Important Advantages Of MxAnalytics:

- Live analysis decentralized in the camera, without network load
- No additional devices like computers, servers or black boxes
- Free video analysis software with no usage restrictions
- Easy configuration and operation for the user
- Automatic counting lines and heat map reports

Tracking And Evaluating Movements (Heat Maps)

Which shelves in the shop are attracting the most customers this Saturday? Which paintings by the new artist hold the most attention of the visitors? Which waiting areas in the departure hall are preferred in the afternoon? All movements of objects of a particular size are recorded and evaluated, either in the live image or in a previously defined detection area, to provide answers to questions like these. The frequency of the movements is shown visually through different colors in a heat map.



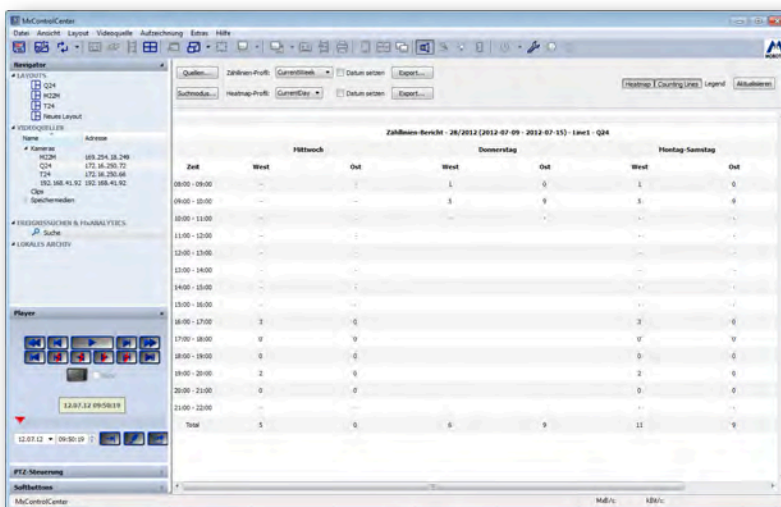
Heat Map

Counting People And Objects (Counting Lines)

You can define counting lines in appropriate locations in the camera live image to find out, for example, how many people walk in and out of each entrance of a shop over the course of a week. The system records how often each counting line is crossed within a specified period of time. The reliability of the count depends on the similarity of the sizes and shapes of the persons or objects in the image and how effectively they can be visually distinguished from one another and from the underlying surface or background. For this reason, it is not possible to count groups forming at entrances or cashiers using MxAnalytics.



Counting Lines



Zählzeilen-Bericht - 26/12/2012 (2012-07-09 - 2012-07-15) - Einzel - Q04

Zeit	Freitag		Donnerstag		Freitag-Samstag	
	West	Out	West	Out	West	Out
08:00 - 09:00	-	-	1	0	1	0
09:00 - 10:00	-	-	3	9	3	6
10:00 - 11:00	-	-	-	-	-	-
11:00 - 12:00	-	-	-	-	-	-
12:00 - 13:00	-	-	-	-	-	-
13:00 - 14:00	-	-	-	-	-	-
14:00 - 15:00	-	-	-	-	-	-
15:00 - 16:00	-	-	-	-	-	-
16:00 - 17:00	3	0	-	-	3	0
17:00 - 18:00	0	0	-	-	0	0
18:00 - 19:00	0	0	-	-	0	0
19:00 - 20:00	2	0	-	-	2	0
20:00 - 21:00	0	0	-	-	0	0
21:00 - 22:00	-	-	-	-	-	-
Total	5	0	6	9	11	0

Counting Lines in MxControlCenter

Overview: Basic Technical Specifications

Camera	Q24M-Secure with day or night sensor
Camera firmware	Version 4.1.4.11 and higher
Partial integration*	MxControlCenter 2.5.2
Lens	L11 (1.8 mm) or L22 (4.0 mm)
Camera view	Full image (recommended)
Resolution	VGA (recommended)
Installation site	Ceiling mounting in indoor locations (wall installation not recommended)
Installation height with L11	2.5–6 m
Installation height with L22	6–10 m
Storage location**	MicroSD card, specially formatted for MxAnalytics
Max. storage requirement	1 GB/month (to save MxAnalytics results data daily and around the clock)
MxAnalytics activation	<ul style="list-style-type: none"> • Manual (on/off) • Via time table (for example, Mon.–Fri., 8 a.m.–6 p.m.) • Via camera signal inputs (for example possible via ExtIO)
Counting precision	Very high when sources of errors such as unsuitable light conditions or insufficient distance between objects (for example, pairs or groups) are minimized
Detection areas	1 to x areas individually definable (with the option to exclude certain areas)
Heat maps and counting lines	Results selectable by report profile, automatic e-mail notification
Report profiles	Freely configurable, predefined default profiles (day/week/month)
Export format	Heat map: JPEG (last live image displayed or reference image) Counting lines report: HTML or CSV (table view)

* It is necessary to go to the camera configuration using your web browser and set up the necessary profiles to use MxAnalytics reports.

** When formatting the card using the special one-time procedure (memory card partitioning for MxAnalytics and for all other camera recordings), any recorded data you need to preserve needs to be transferred to another storage medium first (for example, a hard drive).

In general:

The quality of the MxAnalytics results improves depending on the attainable frame rate. For this reason, processor-intensive camera functions should not be additionally used while analyses are running (recommendation: only use a low VGA live image resolution, avoid image distortion correction, avoid event recording, audio, etc.).

Tips And Tricks For Better Analysis Results

Create consistent lighting conditions

It is crucial to keep lighting both as constant as possible and sufficiently bright to obtain optimal results. All optical factors that may negatively impact MxAnalytics results should be avoided. The results may be flawed if this is not possible.

The following factors may negatively affect MxAnalytics:

- Direct sunlight
- Constantly changing lighting
- Insufficient light
- Overexposed areas
- Reflective surfaces (mirrors, windows, etc.)

The MxAnalytics environment settings provide the option to diminish the adverse effects of disruptive lighting such as sunlight glare or shadows in order to improve the analysis result.

Limit detection areas

Always mark only the areas in the camera live image that you actually want to evaluate using MxAnalytics (heat maps and counting lines). Omitting non-relevant areas (for example, window surfaces, walls, ceilings, etc.) reduces the processing power required by the camera, which in turn leads to higher frame rates and improved analysis results. The distance from a counting line to the edge of the detection area should be at least the maximum object size on both sides of the line.

Limit object size

A minimum object size for detection should be specified to ensure that the system only tracks and evaluates movement of the relevant objects inside this detection area.

Use time tables for MxAnalytics

If the camera should only be used for MxAnalytics during specific times (for example, Monday to Friday, 9 a.m. to 12 p.m.), it makes sense to configure the camera to use an appropriate time table. This provides an advantage by freeing up the full processing power of the camera in the remaining time for other (security) functions such as event-controlled recording and makes more efficient use of the storage space on the MicroSD card.

Reduce image resolution

The current resolution of the camera should be kept as low as possible (MOBOTIX recommend using VGA) to achieve the highest possible frame rates for MxAnalytics.

Use a high-contrast underlying surface

The more the objects to be recognized differ in color from the underlying surface or background, the more reliable are the MxAnalytics results. An underlying surface with high contrasts (for example, large black and white checkerboard pattern) further improves analysis results.

MxAnalytics In The Web Browser – The Ten Most Important Steps

Procedure	Details
1. Update the Q24 (Sec) camera firmware	MxAnalytics is provided from version 4.1.4.11 or higher.
2. Format the SD card for MxAnalytics (Admin Menu > Storage)	Any recordings that need to be preserved need to be exported first
3. Configure camera presets for optimal analysis results	Full image, VGA, Recording: Off
4. Open the special MxAnalytics menus	Under MxAnalytics Control in the Setup menu
5. Enable MxAnalytics under 'General MxAnalytics Settings	The settings under 'More' are normally not necessary
6. Edit the 'Time Table' selection list	Specify here the times at which MxAnalytics should be enabled permanently in the camera. If 'no time table' is selected, MxAnalytics will be enabled. It is also possible to automatically deactivate MxAnalytics if light falls below a configurable minimum luminous intensity (5/10/15/20 lux).
7. Specify detection areas, counting lines, object sizes and other relevant settings. Click on 'Set' and then 'Close.'	Detection areas should be defined for both heat maps and counting lines.
8. Create report profiles (Setup menu > MxAnalytics Control > Counting lines/Heat map report profiles)	All collected MxAnalytics data will be saved on the MicroSD card according to the 'time table.' It is possible to view selected data only using report profiles (for example, last week's values for counting line 3). Common report profiles are predefined in the system.
9. Create reports manually (Setup menu > MxAnalytics Control > Counting lines/Heat map report profiles)	MxAnalytics reports (heat map and counting line value tables) are displayed using a selected report profile in the browser ('Create report' function). They can then be printed and saved locally to the computer.
10. Generate reports automatically and send e-mail (Setup menu > MxAnalytics control > MxAnalytics overview)	<p>Reports can also be prepared regularly and sent as an e-mail attachment. Click on one of the points under 'E-mail profile' (green point = e-mail profile configured, red point = no e-mail profile configured yet) in the 'Counting lines/Heat map report profiles' section. Then add a new e-mail profile. Select 'Counting lines or heat map report' as the e-mail attachment and select the desired report profile. Click on 'Set' and then 'Close.'</p> <p>Go back to the 'Counting lines/Heat map report profiles' section in the MxAnalytics overview and click on one of the points under 'Time Task' (red point = no time task configured yet). Select the corresponding e-mail profile under 'Task' and enter the time at which the e-mail should be sent. Click on 'Set' and then 'Close.'</p>