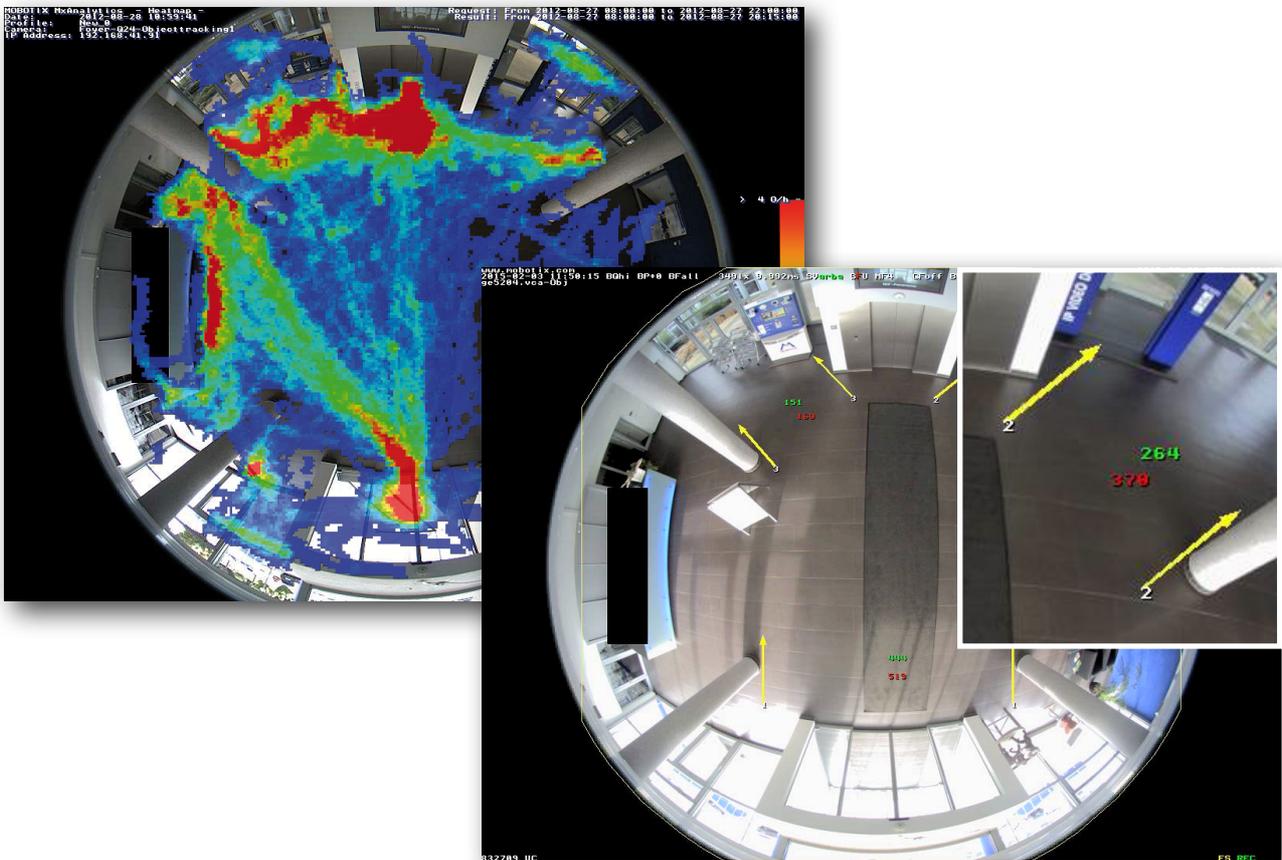


# COMPACT GUIDE

## Basic Information And Practical For Optimal Use Of MxAnalytics



## Camera-Integrated Video Analysis With MOBOTIX Cameras

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## MxAnalytics: Camera-Integrated Video Analysis With MOBOTIX Cameras



How many people go in and out of which entrance during the day? How many people take the stairs and how many take the elevator? MxAnalytics – the camera-integrated video analysis tool designed by MOBOTIX – is being relaunched, starting with the Q25M-Sec, offering valuable added information users can leverage to optimize processes or for marketing purposes.

MxAnalytics makes it possible to collect statistical behavior data on people and objects. This is done by defining recognition zones (full live feed or a partial area) and counting corridors. The camera then records how often each counting corridor is crossed within a specified period. The most frequented areas in the recognition zone are highlighted in color as a heat map.

MxAnalytics 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 manually or at specified times (report profiles). Only around 30 MB per day or 1 GB per month of the camera's internal memory are required for continuous analysis.

### MxAnalytics Available Via Firmware (MX-V4.3.2.45 or higher)

MxAnalytics is available **free of charge for all Q25M-Sec and c25** (with L12, L23 or L25 lens, day or night version) with **firmware MX-V4.3.2.45** or higher. Later firmware versions will make **MxAnalytics available for other MOBOTIX camera models** (free updates).

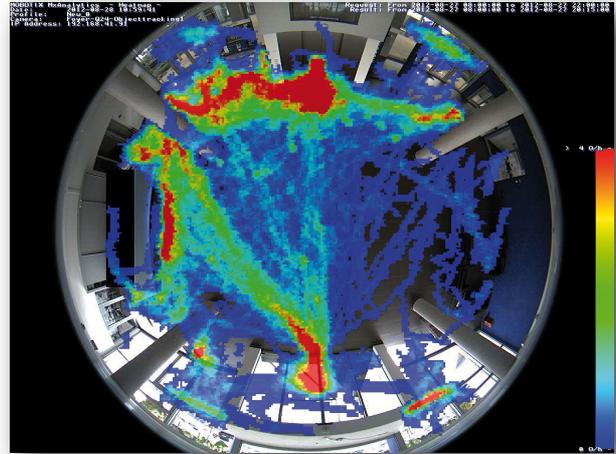
For more information and news, please see the **release notes** of the firmware on the MOBOTIX website: [www.mobotix.com](http://www.mobotix.com) > [Support](#) > [Software Downloads](#) > [Cameras](#) > [MX-System Release 4.3.2.45](#)

### MxAnalytics – Highlights

- Live analysis without network load, decentralized in the camera
- No additional devices like computers, servers or black boxes required
- Free video analysis software with no usage restrictions
- Also available for previously installed Q25M-Sec cameras via firmware update
- Easy configuration and operation for the user
- Automatic counting corridor and heat map reports
- Counting corridor solution can be configured to only count objects that move in a predefined direction (e.g., people who directly move from a supermarket's entrance to a shelf with special offers)
- Up to 16 different counting corridors can be defined and evaluated in parallel for each camera

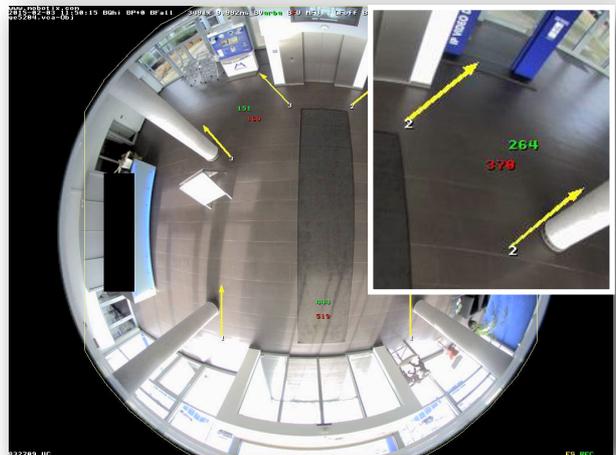
### Visualize Highly Frequented Areas (Heat Maps)

Which shelves in the shop are attracting the most customers this Saturday? Which paintings by the new artist hold the attention of the visitors most? 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 by means of different colors in a heat map.



### Count People And Objects (Counting Corridors)

You can define counting corridors in appropriate locations in the camera feed 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 always generates two counts). The camera records how often each counting corridor is crossed within a specified period. The reliability of the count depends (a) on the similarity of the sizes and shapes of the persons or objects in the image, (b) on the distance between them (in terms of time or spatial distance), (c) on how effectively they can be visually distinguished from the underlying background, and (d) how close the counting corridor is to the center of the image (camera focus).



Counting Corridor Report - 07/2015 (2015-02-09 - 2015-02-15) - Corridor 1 - mx10-16-172-42						
Zeit	Montag		Mittwoch		Montag-Samstag	
	Nord	Süd	Nord	Süd	Nord	Süd
08:00 - 09:00	0	0	5	9	6	9
09:00 - 10:00	0	0	8	27	8	27
10:00 - 11:00	1	0	2	19	3	20
11:00 - 12:00	0	0	0	60	2	60
12:00 - 13:00	0	0	0	0	0	0
13:00 - 14:00	0	0	6	9	6	9
14:00 - 15:00	0	0	0	0	0	1
15:00 - 16:00	0	0	0	9	0	9
16:00 - 17:00	1	0	2	0	3	0
17:00 - 18:00	0	0	0	3	0	3
18:00 - 19:00	0	0	-	-	0	0
19:00 - 20:00	-	-	-	-	0	0
20:00 - 21:00	-	-	-	-	1	0
21:00 - 22:00	-	-	-	-	-	-
<b>Total</b>	<b>2</b>	<b>0</b>	<b>23</b>	<b>136</b>	<b>29</b>	<b>138</b>

Example of a counting corridor weekly report (browser view)

## Defining Counting Corridors

The three factors that define a counting corridor in the live feed, **direction**, **length** and **width**, are easily configured using the shift and control key (Shift and Ctrl) and a mere **three clicks of the mouse**:

Click 1 (for 1st reference point): Shift+Ctrl+mouse click  
 Click 2 (for length and direction): Ctrl+mouse click  
 Click 3 (for width): Single mouse click

Clicks 2 and 3 can be corrected (repeated) at any time. When redoing click 1, the other points are cleared.



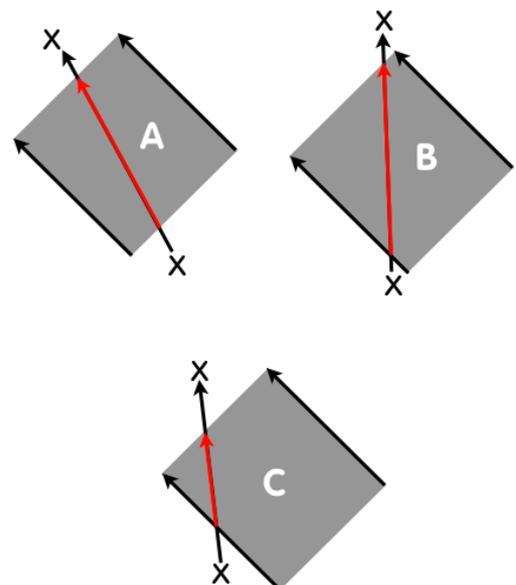
The image shows a counting corridor at the entrance of a foyer, indicated by two yellow arrows, which was defined with three mouse clicks (click 1–3): **click 1** defines the first reference point, **click 2** determines the north direction and length of the corridor, while **click 3** defines the width. The system counts all objects that cross the entire corridor (from north to south and vice versa). Since the counting started, 444 people entered the foyer (green upper number in the center of the corridor; i.e., objects crossing the corridor alongside the arrow towards the north), and 519 people crossed the counting corridor in the opposite direction (red bottom number, movement from top to bottom).

### Examples Providing Additional Details

**Image A:** Object x crosses the counting corridor and is **counted**. It will even be registered if the object moves very quickly or remains within the counting corridor for a long time before leaving it.

**Image B:** Object x enters the corridor somewhat to the side of the lower border, but the distance covered within the corridor (red line) is long enough for the system to **count** it.

**Image C:** Object x enters the corridor even farther up and to the side of the lower border. The distance covered within the corridor is too short, so the system **does not count** it.



## Tips & Tricks For Optimized 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 (for heat maps only)

Always mark only the areas in the camera live image that you actually want to evaluate in the heat map using MxAnalytics. 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.

### 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 online help in the browser

A comprehensive description of the individual MxAnalytics setting options is available in the online help of the camera's user interface. To open the help, go to **Setup Menu > MxAnalytics Control** and then click the **question mark icon** in the top right corner.



## Configuring MxAnalytics In The Web Browser – The Ten Most Important Steps

Procedure	Details
1. Update the Q25 (Sec) camera firmware (when needed).	MxAnalytics is contained in the firmware version 4.3.2.45 and can only be configured via its Web user interface.
2. Format the microSD card for MxAnalytics (Admin Menu > Storage).	Any recordings that need to be preserved need to be exported first. Open the required menus by clicking the Player button and then the Save button in the browser (see figure). 
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 in the camera. If "no time table" is selected, MxAnalytics will be enabled permanently. 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 corridors, object sizes and other relevant settings. Click "Set" and then "Close."	Detection areas are only relevant for the heat maps (not for counting corridors).
8. Create report profiles (Setup Menu > MxAnalytics Control > Counting Corridors/ 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 corridor 3). Common report profiles are predefined in the system.
9. Manually create reports (Setup Menu > MxAnalytics Control > Counting Corridors/ Heat Map Report Profiles).	MxAnalytics reports (heat map and counting corridor 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 via e-mail (Setup menu > MxAnalytics Control > MxAnalytics Overview).	Counting corridor and heat map reports can also be prepared regularly and sent as an e-mail attachment.  Click the <b>left red point</b> under "E-mail profile" (red point = no e-mail profile configured yet, green point = e-mail profile successfully configured) in the "Report profiles" section. Then add a new e-mail profile and click "Set" and "Close."  By clicking on the <b>right red point</b> under "E-mail profiles" in the "Report profiles" section, it is possible to set the sending time of the e-mail (green point = time control already set up) for the new e-mail profile just created (profile name is shown). Next, click "Set" and "Close."

## Basic Technical Specifications

MxAnalytics with the Q25M	
Required camera	Q25M-Secure or c25 (with day or night sensor)
Camera firmware required	Version MX-V4.3.2.45 and higher
Lens	L12 (180° x 160°) or L23 (92° x 68°) or L25 (82° x 61°)
Camera view	Full image (recommended)
Resolution	VGA (recommended)
Installation site	Ceiling mounting indoors (wall installation suitable only for heatmaps)
Installation height for L12 lens	2.5–6 m
Installation height for L25 lens	6–10 m
Storage location	Camera-integrated microSD card, specially formatted for MxAnalytics: 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).
Max. storage requirement	1 GB/month (to save MxAnalytics results data daily and around the clock)
MxAnalytics activation	<ul style="list-style-type: none"> <li>- Manual (on/off)</li> <li>- Via time table (for example, Mon–Fri, 8 a.m.–6 p.m.)</li> <li>- Via camera signal inputs (for example, possible with MX-Input-Box)</li> </ul>
Counting precision	Very high given suitable lighting conditions and when individual persons/objects are far enough apart
Detection areas (for heat maps)	1 to n areas individually definable (defined areas can be excluded)
Heat maps and counting corridors	<ul style="list-style-type: none"> <li>- Results selectable by report profile</li> <li>- Automatic e-mail notification or FTP upload</li> <li>- A maximum of 16 counting corridors can be defined</li> </ul>
Report profiles	Freely configurable, predefined default profiles (day/week/month)
Export format	<ul style="list-style-type: none"> <li>- Heat map: JPEG (displayed in last live image or reference image)</li> <li>- Counting corridor report: HTML or CSV (table view)</li> </ul>
Specific information	It is no longer necessary to define an “event dead time.”

### 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.).