

Store Occupancy Manager

Technical guide for system integrators

Store Occupancy Manager ACAP application

Store Occupancy Manager is a new ACAP application for AXIS IP cameras that enable retailers to **track, count, and limit people inside the store**. It runs directly **onboard the cameras** and is **extremely easy to install, setup, and integrate with other systems**.

How does the Store Occupancy Manager work?

The application **aggregates data on the number of people in the store** (from an AXIS camera with AXIS Occupancy Estimator or AXIS People Counter installed or XOVIS counters) and **displays it to incoming customers - together with a live shot** from inside the store - on a **big-screen TV**.

If the **store's maximum capacity is reached**, the application **asks others to wait and not enter the store**. In the meantime, the app **displays marketing messages**. The graphics can be easily personalized and display information, banners, images, and even animated GIFs.



What do you need for this solution?

- Occupancy counter** - an AXIS camera with AXIS Occupancy Estimator or AXIS People Counter ACAP app on-board or from XOVIS counters
- Store Occupancy Manager ACAP app** from CamStreamer on-board
- A **big-screen TV** with an internet browser or HDMI input **as a public-view monitor** at the store entrance

Store Occupancy Manager is the right solution for the following tasks:



Limiting store occupancy

A large TV screen next to the store entrance showing **overlay graphics** and **animation** based on the **number of customers inside the store**. When the limit has been reached, the **screen shows the STOP sign**, different overlay graphics, and or animation, so people know they have to wait.



Preventing shoplifting

The source of the video for the TV screen can be an **overview camera that monitors the store**. This **public-view monitor** prevents shoplifting by letting customers know the **store is being monitored**.



Showing marketing promos

Big-screen TV can show **other overlay graphics** (up to four at the same time), such as **animation with a logo**, text **info ticker**, **simple video**, or a **promo banner to attract customers** to the store. The overlay graphics can also be **automatically displayed per set conditions, scheduled**, and **remotely managed via API**.



Triggering other actions

Store Occupancy Manager can also **trigger other actions** to meet different process requirements. It can, for example, **switch indication LEDs on and off**, **play audio messages** on connected speakers, **control automatic doors**, remotely **notify a security officer** of excess occupancy, or **send notifications to external systems** over the network.

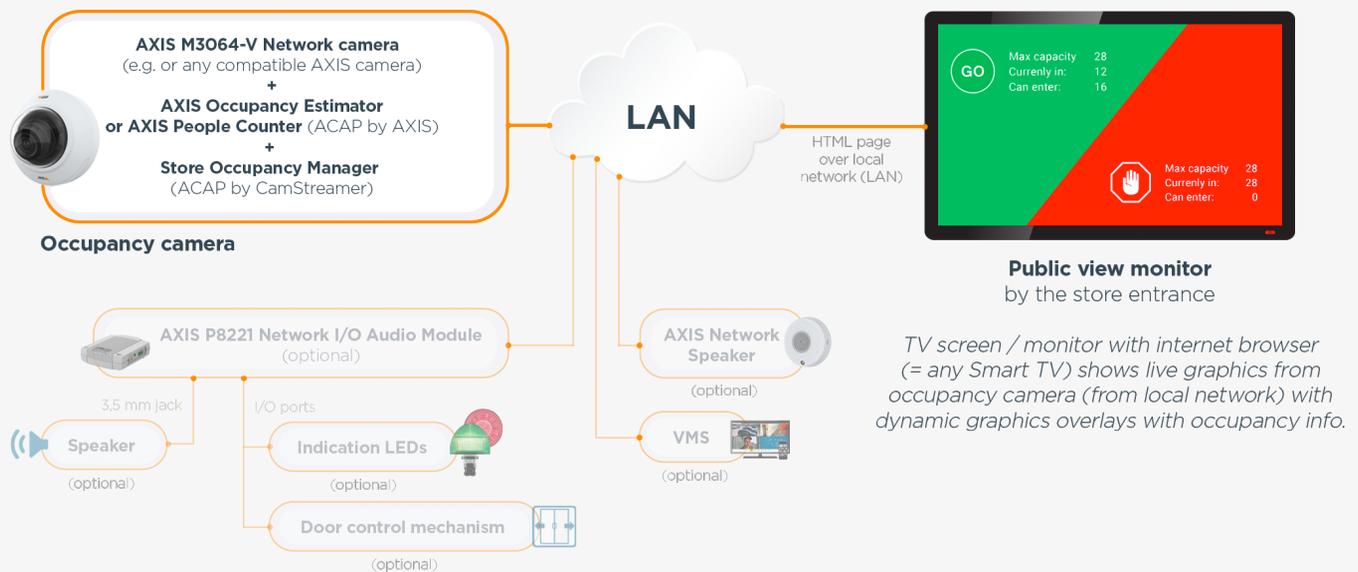
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I. Hardware selection and integration scenarios

- The **Store Occupancy Manager ACAP app (SOM)** determines the number of customers in the store by gathering **occupancy data**. It then **inserts overlay graphics into the video being streamed** to the big-screen TV, including store occupancy and either a **green or red alert sign** to let people know they can enter or need to wait.
- SOM can send the video (with inserted graphics) to a **big screen TV/monitor via a local network**. SOM runs inside a camera local webserver and there is a generated dynamic HTML page with live video. The TV screen/monitor has to have an **internet browser** and open web address from a local network. The address is generated by SOM inside the camera. Everything runs on the local network so there is not necessary internet connection for this functionality. **No additional HW is needed.**
- With cameras (**AXIS FA54 Main unit**), **video can be sent directly to the big-screen TV via the camera's HDMI output**, thus eliminating the need for **additional HW**. Video with overlay graphics generated by many other compatible cameras (see below) can also be displayed on the TV screen by means of the tiny **AXIS T8705 Video Decoder**. The multiple configuration options make it easy to find the right fit for your particular case.
- One of the most important aspects is **occupancy data**, which is provided by the app on-board the counting camera located at the store entrances. There is a possibility to use one of the AXIS ACAP apps running on cameras - **AXIS Occupancy Estimator** or **AXIS People Counter**. AXIS Occupancy Estimator can run on one or more supported cameras, with one camera serving as the master and the others as slaves. **Store Occupancy Manager communicates with the master only**. Counting app **can run on a dedicated camera** (e.g. **AXIS M3064-V**), or it can even run on the same camera as Store Occupancy Manager, which keeps the **setup very minimalistic**. We'll describe these scenarios in greater detail below. **Store Occupancy Manager can work with up to four cameras with AXIS People Counter on-board.**
- The **output of Store Occupancy Manager is a video with overlay graphics**, the **source of which is typically an overview camera**. Because the video with occupancy information is **displayed on a public-view monitor**, it also serves to prevent shoplifting.
- Let's look at **some common connection scenarios...**

Scenario 1: Minimalistic design, everything works on a single camera

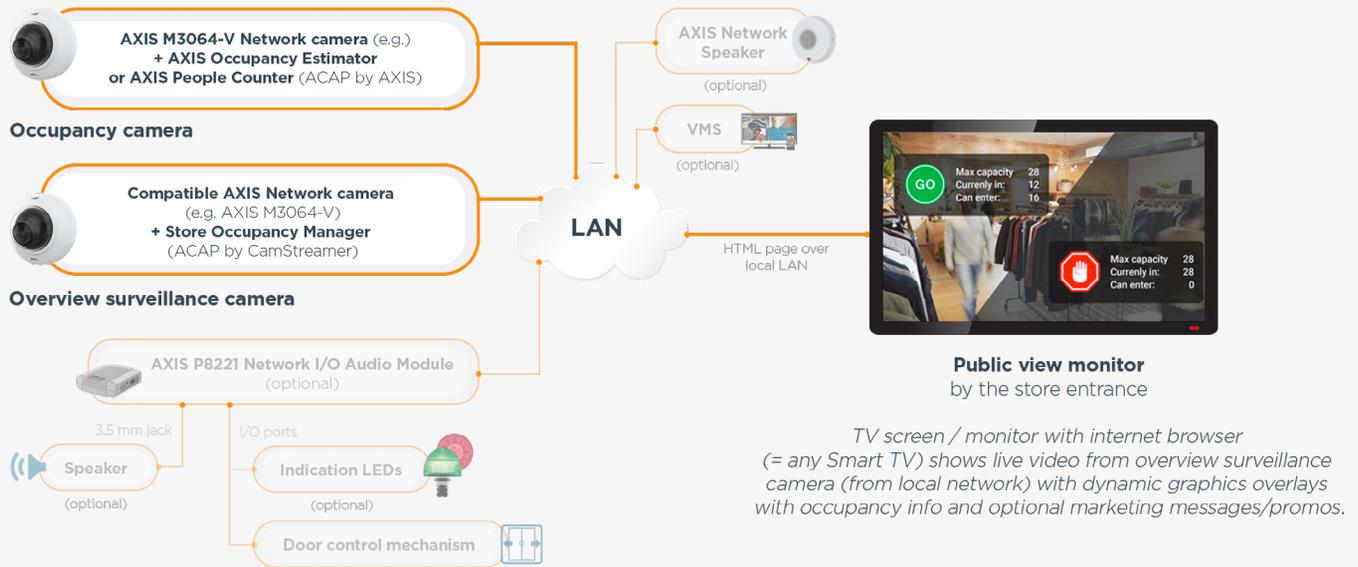


- This setup is based on an **AXIS M3064-V** (but it can be any AXIS IP camera compatible with AXIS People Counter / AXIS Occupancy Estimator ACAP / Store Occupancy Manager ACAP - check the compatibility list in Chapter IV of this document) with the **AXIS Occupancy Estimator** ACAP app (or **AXIS People Counter**) and the **Store Occupancy Manager** ACAP app (SOM) on board.
- SOM sends the video (with full screen graphics) to a big screen TV/monitor via a local network. SOM generates a **dynamic HTML page with occupancy graphics** and publishes it via camera's webserver. The TV screen/monitor has to have an **internet browser** and just opens that HTML page. The TV screen/monitor has to be connected to the same network as the camera.
- If you wish to **trigger various actions based on occupancy data**, you can do so with the **AXIS Events Engine** inside the camera, using the "Store Occupancy Manager - No Entry" event as a trigger. This, for instance, lets you **play audio messages** on an **AXIS C1410 Network Speaker** (MSRP \$299.00) or **activate different devices (indication LEDs, door control mechanisms, etc.)** via an **AXIS P8221 Network I/O Audio Module** (MSRP \$359.00) and its eight configurable I/O ports.
- MSRP prices:** AXIS M3064-V (Product Number US: 01716-001) \$199.00 + AXIS People Counter E-license (Product Number US: 01147-011) \$249.00 + Store Occupancy Estimator E-license (Product Number: 505-001) \$299.00 = **Total MSRP costs for this scenario** (excl. installation, public-view monitor, cables, and network parts): **\$747.00**

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Scenario 2: Dedicated camera(s) for AXIS Occupancy Estimator/AXIS People Counter and a camera for Store Occupancy Manager with better view to the store



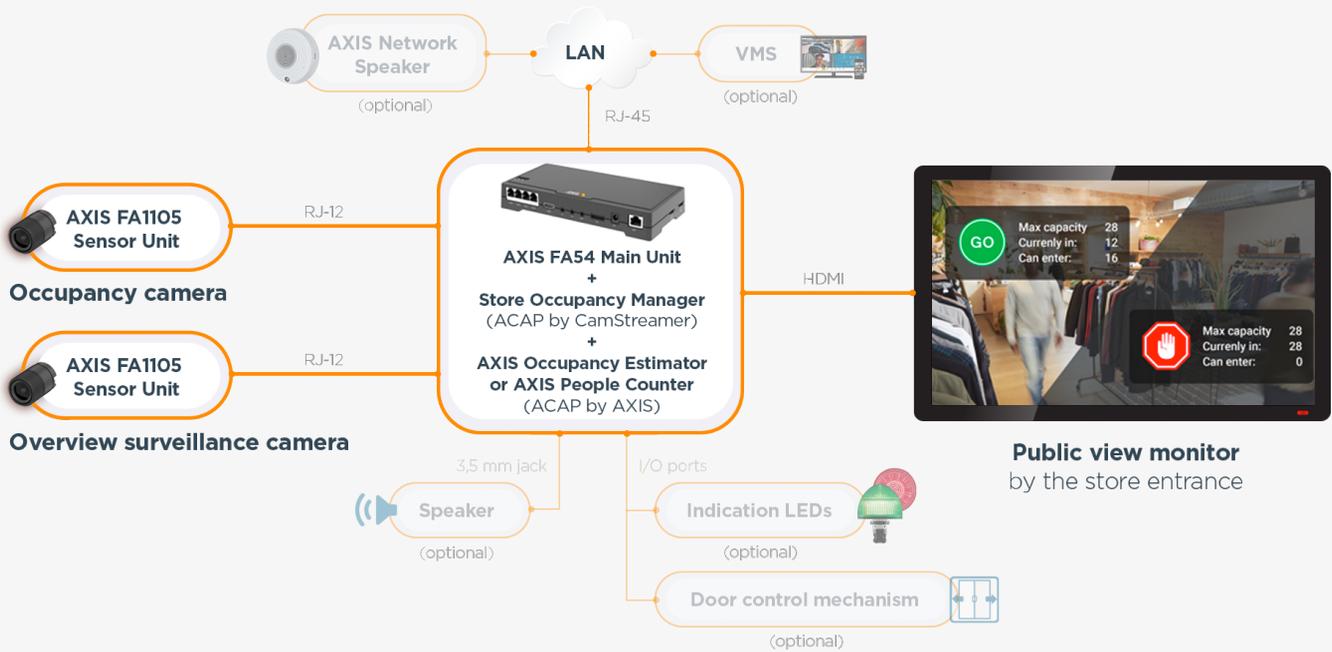
TV screen / monitor with internet browser
 (= any Smart TV) shows live video from overview surveillance camera (from local network) with dynamic graphics overlays with occupancy info and optional marketing messages/promos.

- This setup is based on:
 - An AXIS IP camera with the [AXIS Occupancy Estimator](#) ACAP app (or [AXIS People Counter](#)) on board as an **occupancy camera** (e.g. the [AXIS M3064-V](#) in the diagram). A list of compatible models can be found in Chapter 4 of this document, or at www.axis.com. **This scenario can work even with current AXIS counting (occupancy) cameras in stores even with older models. Basically with any camera with AXIS People Manager or older Cognimatics People Counter.**
 - Compatible AXIS network camera with the [Store Occupancy Manager](#) ACAP app (SOM) on board as an **overview surveillance camera**. A list of compatible cameras can be found in Chapter 4 of this document, or at www.camstreamer.com.
 - All devices must be on the same LAN network.
- SOM sends the video (with full screen graphics) to a big screen TV/monitor via a local network. SOM generates a **dynamic HTML page with live video** and publishes it via camera's webserver. The TV screen/monitor has to have an **internet browser** and just opens that HTML page. The TV screen/monitor has to be connected to the same network as the camera.
- If you wish to **trigger various actions based on occupancy data**, you can do so with the **AXIS Events Engine** inside the camera, using the "Store Occupancy Manager - No Entry" event as a trigger. This, for instance, lets you **play audio messages** on an [AXIS C1410 Network Speaker](#) (MSRP \$299.00) or **activate different devices** (**indication LEDs**, **door control mechanisms**, etc.) via an [AXIS P8221 Network I/O Audio Module](#) (MSRP \$359.00) and its eight configurable I/O ports.
- MSRP prices:** 2x AXIS M3064-V (Product Number US: 01716-001) \$199.00 + AXIS People Counter E-license (Product Number US: 01147-011) \$249.00 + Store Occupancy Estimator E-license (Product Number: 505-001) \$299.00 = **Total MSRP costs for this scenario** (excl. installation, public-view monitor, cables, and network parts): **\$946.00**

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Scenario 3: Everything works on an AXIS FA54 Main Unit with two sensor units



- This setup is based on an **AXIS FA54 Main Unit** with the **AXIS Occupancy Estimator** ACAP app (or **AXIS People Counter**) and the **Store Occupancy Manager** ACAP app on board.
- **Two camera sensor units (AXIS FA1105 Sensor Unit)** are connected to the AXIS FA54 Main Unit; **the first one is used as an occupancy camera, the second as an overview surveillance camera.** The second camera provides the video stream for the occupancy graphics to be displayed on a **public-view monitor**.
- The AXIS FA54 Main Unit has an **HDMI output port with graphics overlay support**, so it can be connected **directly to a big-screen TV** to provide a **public-view monitor**.
- The AXIS FA54 Main Unit is a powerful device with many interfaces. Besides its HDMI output, it has **line audio input and output ports** and **four configurable binary I/O ports**, which means an **analog speaker, LED indicators, or door control mechanisms** can be connected directly to the main unit. The logic for activating these devices is **set in AXIS Events**, as is the logic for controlling external network speakers and or I/O devices.
- **MSRP prices:** AXIS FA54 Main Unit (Product Number US: 0878-004) \$449.00 + 2x AXIS FA1105 Sensor Unit (Product Number US: 0913-001) \$139.00 + AXIS Occupancy Estimator E-license (Product Number US: 01147-051) \$249.00 + Store Occupancy Estimator E-license (Product Number: 505-001) \$299.00 = **Total MSRP costs for this scenario** (excl. installation, public-view monitor, cables, and network parts): **\$1,275.00**

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II. Graphics overlays

- One of the key features of the Store Occupancy Manager app is its ability to **display triggered graphics overlays in the video** stream directly **using camera hardware**.
- In addition to occupancy limit control, it's possible to show other overlay graphics at the same time (logos, ads, etc.). On ARTPEC-5 cameras, there's a limit of two concurrent graphics overlays, and up to four **on the Ambarella/ARTPEC-6/7 cameras**.

Graphics insert options provided by the Store Occupancy Manager app:

Occupancy widget

- Basic functionality of the Store Occupancy Manager – graphics widget **showing GO/STOP signs and occupancy limits**.
- Shows data from AXIS Occupancy Estimator **plus store occupancy limit set** in Store Occupancy Manager (number of customers allowed for the particular store).
- Once the limit is reached, the widget **automatically switches the GO sign to a STOP sign**.
- In the Store Occupancy Manager application, you can **set the occupancy limit**, widget **size**, and **offset X, Y** (i.e. how many pixels from the edges the graphics will be positioned).
- The widget can be **enabled or disabled**, meaning you don't have to use it if you don't want to.
- Widget can run in the **full-screen version** as well - it means that it can work even without live video from the overview camera on the screen.

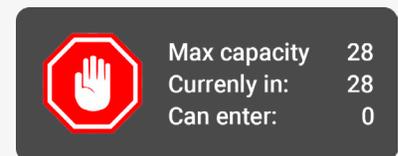
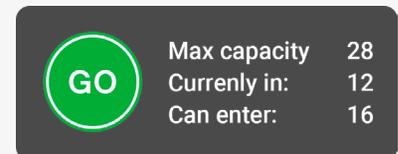
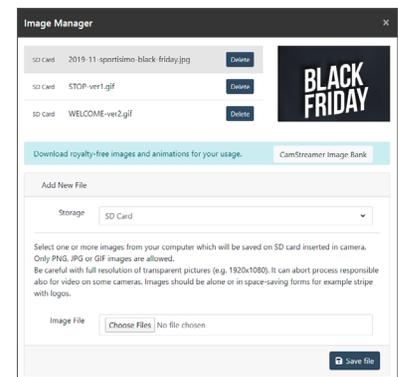


Image overlays

- Image overlays can be **images of any size with transparency support**.
- You can use a **static image, such as a logo or promo offer**, and set the size and position in the video stream.
- Supported formats: **JPG, PNG (with transparency), static GIF, animated GIF (not supported on HTTP output)**
- Images are managed in the **Image Manager** (part of the Store Occupancy Manager app), which is where you upload images or link them to an external URL.
- **Images can be located/stored:**
 - in the **camera's internal flash memory** (please keep in mind that each camera model has a different flash memory size, and you need to check the available space in the app's Image Manager prior to uploading);
 - on an **SD card** in the camera (**highly recommended**);
 - at a **remote location**, such as a local network or network URL; by pulling images from a remote location, image updates become much more flexible. Storing images in marketing shared drive, for instance, lets you update them on the fly. You can also synchronize images with your digital signage system..
- **Trigger options** – each graphics overlay can be displayed based on the following triggers:
 - **the number of people inside the store is lower than the set occupancy limit** – you can display a **large GO graphic** and an **animated woman prompting customers to enter the store**;
 - **the number of people inside the store is the same or higher as the set occupancy limit** – you can display a **large STOP graphic** and an **animated man asking customers to wait**;
 - **display always** – you can show selected images and animations no matter what the occupancy is (**great for logos, banners, and various promotions**).



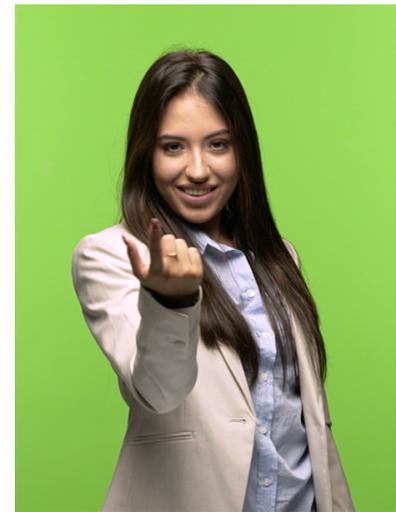
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- **Controlled via API** – all image inserts can be controlled via API commands over the network, giving you multiple integration possibilities.
- **Time scheduling** – you can show one set of graphics overlays to be displayed during business hours (occupancy graphics, animations, banners) and another set outside of business hours (e.g. “We’re closed now. Please come back tomorrow.”).

Animated GIFs

- Support of animated GIFs offers a **wide range of possibilities**.
- Occupancy limits can be presented to customers in an **interesting, attractive way using realistic video animations** that **catch the attention of passers-by** and increase interest in the store.
- You can use an **animated GIF** (there are thousands of **GIF stickers** online). Just be careful with copyrights – in order to use animations, you need to have the permission of the author or the website you find them on.
- **We’ve prepared a few preset animations (and some static images) for you to use. You can find them in the [CamStreamer Image Bank](#).**
- **How to create your own overlay animated GIF from a video?**
 - You need to shoot the video with **chroma-key** (green background), which allows video software to remove the background and make the video transparent. This can be done using almost any video editing software, such as iMovie, Filmora, Adobe Premiere, etc.
 - You can also find a lot of existing chroma key animations in video data banks like [Shutterstock](#), etc.
 - You need to convert your transparent video into an animated GIF – some video programs can do this directly, or you can use the free online tool [EZGIF.com](#), with which you can convert, edit, and optimize animated GIFs.
 - **Note: the final animated GIF must not be a big file – ideally, the animation will not be longer than five seconds with a maximum of ten frames per second and file size of less than 2 MB. Resolution should be no more than 1/3 to 1/2 of a full screen. Bigger animations can encounter difficulty with camera processing power.**



**Check our
CamStreamer Image Bank**
and use some prepared
animations or images



Info ticker widget

- You can add a **useful info ticker widget** to the video as well.
- With this widget, you can communicate directly via your **public-view monitor**. This is ideal for promo events, displaying information about your store, etc.
- The widget can be displayed **with or without a clock**, and you can select the **size and color of the text and background**.
- Text can be **static**, or it can have a **crawling effect** (on ARTPEC-6/7 cameras).
- The source of text can be **managed locally or remotely via an API**, or it can be a **TXT file stored on a network shared drive or URL**.



III. AXIS Events engine

- Store Occupancy Manager **generates events directly** to the standardized **AXIS Events Engine**.
- This means you can take advantage of the **sophisticated triggering logic that AXIS uses on its network cameras**.
- It can, for example, **switch LED indicators on and off, play audio messages on connected speakers, remotely notify a security officer of excess occupancy, or send notifications to external systems over the network**.
- All devices can be connected to the camera using **configurable I/O ports**, which are then managed in the Events Engine. You can also manage devices in different parts of the store, such as LEDs at multiple entrances and much more.
- **Store Occupancy Manager communicates with the AXIS Events engine only.** AXIS Events Engine then controls all other devices directly.



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IV. Compatibility

List of camera models compatible with the **Store Occupancy Manager** ACAP app:

Ambarella processor cameras

(support up to 4 overlay graphics, do not support animated GIFs, support video output via a generated HTML page)

AXIS M3064-V	AXIS M3066-V	AXIS M3206-LVE
AXIS M3065-V	AXIS M3205-LVE	

ARTPEC-6/7 processor cameras

(support up to 4 overlay graphics, fully compatible, support video output via a generated HTML page or via RTSP stream)

AXIS A8207-VE	AXIS M3057-PLVE	AXIS P1375-E	AXIS P3227-LV	AXIS P3717-PLE	AXIS Q1647-LE	AXIS Q3517-LV	AXIS Q6075-E
AXIS A8207-VE Mk II	AXIS M3058-PLVE	AXIS P1377	AXIS P3227-LVE	AXIS P3807-PVE	AXIS Q1659	AXIS Q3517-LVE	AXIS Q6215-LE
AXIS FA54 Main Unit	AXIS M3067-P	AXIS P1377-LE	AXIS P3228-LV	AXIS P5654-E	AXIS Q1700-LE	AXIS Q3517-SLVE	
AXIS M1134	AXIS M3068-P	AXIS P1378	AXIS P3228-LVE	AXIS P5655-E	AXIS Q1785-LE	AXIS Q3518-LVE	
AXIS M1135	AXIS M3115-LVE	AXIS P1378-LE	AXIS P3245-LV	AXIS P7304	AXIS Q1786-LE	AXIS Q3527-LVE	
AXIS M1135-E	AXIS M3116-LVE	AXIS P1445-LE	AXIS P3245-LVE	AXIS Q1645	AXIS Q1798-LE	AXIS Q6074	
AXIS M1137	AXIS M7104	AXIS P1447-LE	AXIS P3245-V	AXIS Q1645-LE	AXIS Q3515-LV	AXIS Q6074-E	
AXIS M1137-E	AXIS P1375	AXIS P1448-LE	AXIS P3245-VE	AXIS Q1647	AXIS Q3515-LVE	AXIS Q6075	

ARTPEC-5 processor cameras

(support up to 2 overlay graphics, do not support animated GIFs, support video output via a generated HTML page or via RTSP stream)

AXIS M2025-LE	AXIS M5525-E	AXIS P1265	AXIS P3374-LV	AXIS P3375-VE	AXIS Q1941-E PT	AXIS Q6055-C	AXIS Q8742-E
AXIS M3104-L	AXIS P1244	AXIS P1275	AXIS P3374-V	AXIS P5624-E Mk II	AXIS Q1942-E	AXIS Q6154-E	AXIS Q8742-LE
AXIS M3104-LVE	AXIS P1245	AXIS P1280-E	AXIS P3375-LV	AXIS Q1615 Mk II	AXIS Q1942-E PT	AXIS Q6155-E	AXIS V5914
AXIS M3105-L	AXIS P1254	AXIS P1290-E	AXIS P3375-LVE	AXIS Q1615-E Mk II	AXIS Q3615-VE	AXIS Q8741-E	AXIS V5915
AXIS M3105-LVE	AXIS P1264	AXIS P1435-LE	AXIS P3375-V	AXIS Q1941-E	AXIS Q3617-VE	AXIS Q8741-LE	

The current list of compatible cameras is available on the [CamStreamer website](#).

List of camera models compatible with the **AXIS People Counter / AXIS Occupancy Estimator** ACAP apps:

AXIS FA54 Main Unit	AXIS M3044-V	AXIS M3057-PLVE	AXIS M3068-P	AXIS M3106-L Mk II	AXIS M4206-LV
AXIS F41 Main Unit	AXIS M3044-WV	AXIS M3064-V	AXIS M3104-L	AXIS M3106-LVE Mk II	AXIS M4206-V
AXIS P1244	AXIS M3045-V	AXIS M3065-V	AXIS M3104-LVE	AXIS M3115-LVE	AXIS P3245-LV
AXIS M3015	AXIS M3045-WV	AXIS M3066-V	AXIS M3105-L	AXIS M3205-LVE	AXIS P3245-V
AXIS M3016	AXIS M3046-V	AXIS M3067-P	AXIS M3105-LVE	AXIS M3206-LVE	

This is the official compatibility list from the [AXIS website](#). All models are compatible with the **Store Occupancy Manager** ACAP app.

V. API

- Store Occupancy Manager **can also be controlled via its application interface (API) commands**, which means you can **configure it remotely** or **feed it with graphics and texts from your network shared drive**, all in a matter of seconds.
- **Obtaining SOM configuration:**
<http://user:password@IPaddress/axis-cgi/param.cgi?action=list&group=storeoccupancymanager.Configuration>
- **Changing SOM configuration:**
http://user:password@IPaddress/axis-cgi/param.cgi?action=update&storeoccupancymanager.Configuration=URL_ENCODED_CONFIGURATION

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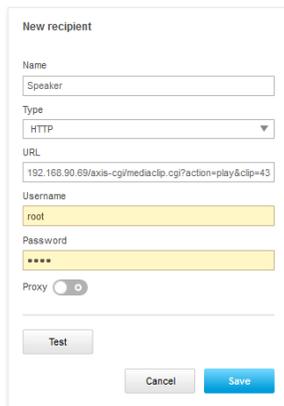
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VI. Two-level triggering

- With Store Occupancy Manager and AXIS Events, you can also **use two-level triggering**. This means you can set one limit for graphics to insert (e.g. 20) and another limit for generating the „SOM Occupancy Estimator – No Entry“ event to be used in AXIS Events (e.g. 25). With this event, you can trigger playback of an audio clip on a network speaker or switch indication lights on and off.
- **This is how you play an audio clip via the [AXIS C1410 Network Mini Speaker](#)** :
API request to list available clips: <http://user:password@IPaddress/axis-cgi/param.cgi?action=list&group=MediaClip>
API request to play a particular clip: <http://user:password@IPaddress/axis-cgi/mediaclip.cgi?action=play&clip=43>

Setup of recipient on an SOM AXIS Camera:

Rules Schedules **Recipients** Manual triggers



New recipient

Name:

Type: HTTP

URL:

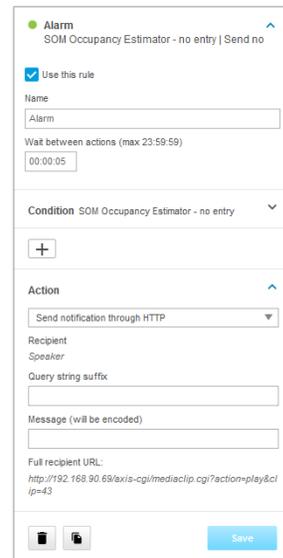
Username:

Password:

Proxy:

Buttons: Test, Cancel, Save

This is how you set up an audio clip playback every five seconds based on an SOM event:



Alarm
SOM Occupancy Estimator - no entry | Send no

Use this rule

Name:

Wait between actions (max 23:59:59):

Condition: SOM Occupancy Estimator - no entry

Action: Send notification through HTTP

Recipient: Speaker

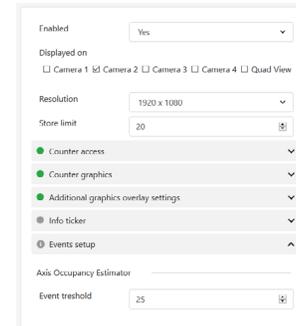
Query string suffix:

Message (will be encoded):

Full recipient URL: <http://192.168.90.69/axis-cgi/mediaclip.cgi?action=play&clip=43>

Buttons: Save

Event threshold setup in Store Occupancy Manager:



Enabled: Yes

Displayed on: Camera 1 Camera 2 Camera 3 Camera 4 Quad View

Resolution: 1920 x 1080

Store limit:

Counter access:

Counter graphics:

Additional graphics overlay settings:

Info ticker:

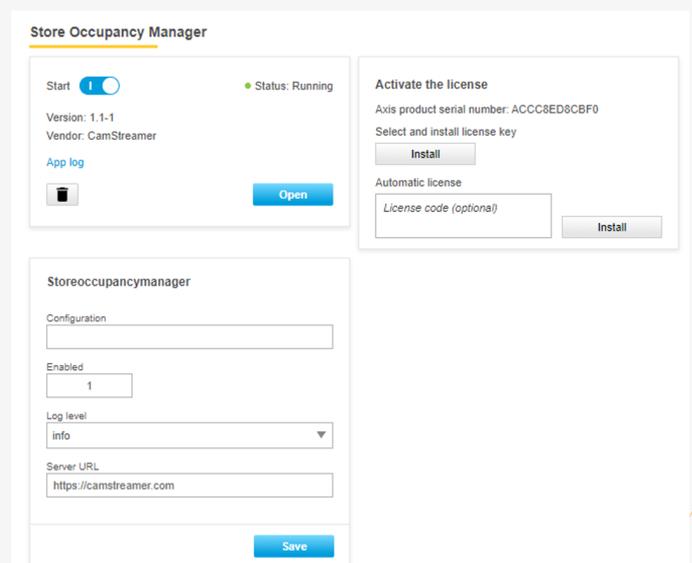
Events setup:

Axis Occupancy Estimator

Event threshold:

VII. Store Occupancy Manager Licensing

- To **obtain a 30-day trial license or buy a full license key**, just follow these steps:
 - **Visit** Axis.com > Products & solutions > Analytics & other applications > **License key registration**.
 - **Enter the serial number** of your camera.
 - **Choose:** I'd like to create a trial or a free license.
 - **Choose** our application and press generate.
 - Download the **license key**.
 - **Download our app** from <https://camstreamer.com/download-app>.
 - **Install the app in the App section** on an AXIS camera.
 - **Import the application and the license key in the AXIS user interface** by clicking the "Install" button.



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Start: Status: Running

Version: 1.1-1
Vendor: CamStreamer
App log:

Buttons: Open

Storeoccupancymanager

Configuration:

Enabled:

Log level: info

Server URL:

Buttons: Save

Activate the license

Axis product serial number: ACCC8ED8CBF0

Select and install license key

Buttons: Install

Automatic license

License code (optional):

Buttons: Install

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VIII. User interface

Counter access

Select the source of counting data.

Source: AXIS People Counter

Counter 1 | Counter 2 | Counter 3 | Counter 4

IP address: 192.168.91.132

Port: 80

User: root

Password: pass

Schedule

Image overlay will be shown on start times and hidden on end times defined below. Schedule times should be set in the camera's local time - check the Date & Time settings.

No schedule set.

Start: Mon 00:00:00 End: Mon 23:59:59

Save

Counter graphics

General

Enabled: Yes

Position: Top Left

Offset X: 10 px

Offset Y: 10 px

Scale: 100 %

Picture ENTER: Default

Picture STOP: Default

Fullscreen: No

Schedule: Set day and time

Custom text labels

Max. limit: Max capacity

In store: Currently in

May enter: Can enter

Additional graphics overlay settings

Image 1 | Image 2 | Image 3 | Image 4 | Image 5 | Image 6

Image 1

Visibility: None

Visibility: Always

Position: Top Left

Offset X: 10 px

Offset Y: 10 px

Scale: 100 %

Schedule: Set day and time

Event Threshold

Create Event to trigger actions via Axis Event Manager. An Event Threshold is an event that sends a notification when a set limit is reached. The pool of events' numbers is shared between both types of thresholds.

Event threshold 1: Add new

Alarm Threshold

Create Event to trigger actions via Axis Event Manager. An Alarm Threshold is a stateless event that sends a notification for each increment above the set limit. It can be used e.g. for audio alarm. The pool of events' numbers is shared between both types of thresholds.

Alarm threshold 2: Add new

Info ticker

Enabled: Yes

Show clock: Yes

Clock format: 24h

Text color: #000000

Background color: #ffffff

Number of lines: 1

Switching time: 5 sec

Crawl left: No

Text size: 40

Source type: Own text

Source: Use Enter to break the line

Variables for text: #date, #datous, #time, #timeSec

Schedule: Set day and time

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Want to know more?

Contact us at
sales@camstreamer.com

