

Store Occupancy Manager

Technical guide for system integrators

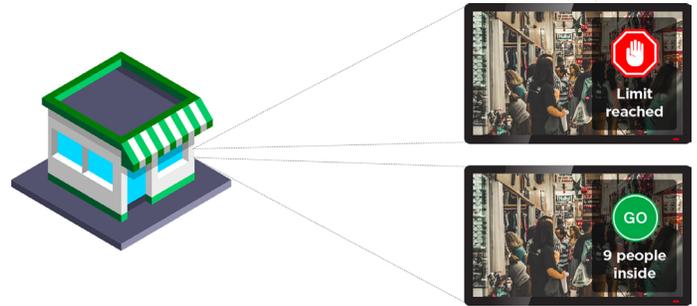
New Store Occupancy Manager ACAP application

Store Occupancy Manager is a new ACAP application for ARTPEC-5/6/7 AXIS IP cameras that enables retailers to **track, count and limit the number of people inside the store**. It runs directly **onboard the cameras** and is **extremely easy to install, setup and integrate with other systems**.

How does Store Occupancy Manager work?

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

If the **maximum capacity of the store 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 can display information, banners, images and even animated GIFs.



What do you need for this solution?

- Occupancy counter** - an AXIS camera with AXIS Occupancy Estimator ACAP app on-board
- An AXIS camera with **Store Occupancy Manager** ACAP app from CamStreamer on-board
- A large TV screen with HDMI input** - as public view monitor by the store entrance

Store Occupancy Manager is the solution to the following tasks:



Limit store occupancy

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 that they have to wait.



Theft prevention

The source of the video for the TV screen is an **overview camera that monitors the store**. On this „**public view monitor**“ customers are therefore **aware that the store is monitored to prevent theft**.



Show marketing promos

On the large TV screen there can be **another overlay graphics** (up to 4 at the same time) - like **animation with a logo**, text **info ticker**, **simple video** or **promo banner to attract customers** to visit the store. The overlay graphics can also be **automatically displayed by set conditions** and **managed via API remotely**.



Trigger other actions

Store Occupancy Manager can also **trigger other actions** to meet different process requirements. It can, for example, **switch on / off indication LEDs**, **play audio messages** via connected speakers, control **door control mechanism**, remotely **notify security officer** on an exceeded occupancy limit or **send notifications to external systems** over the network.

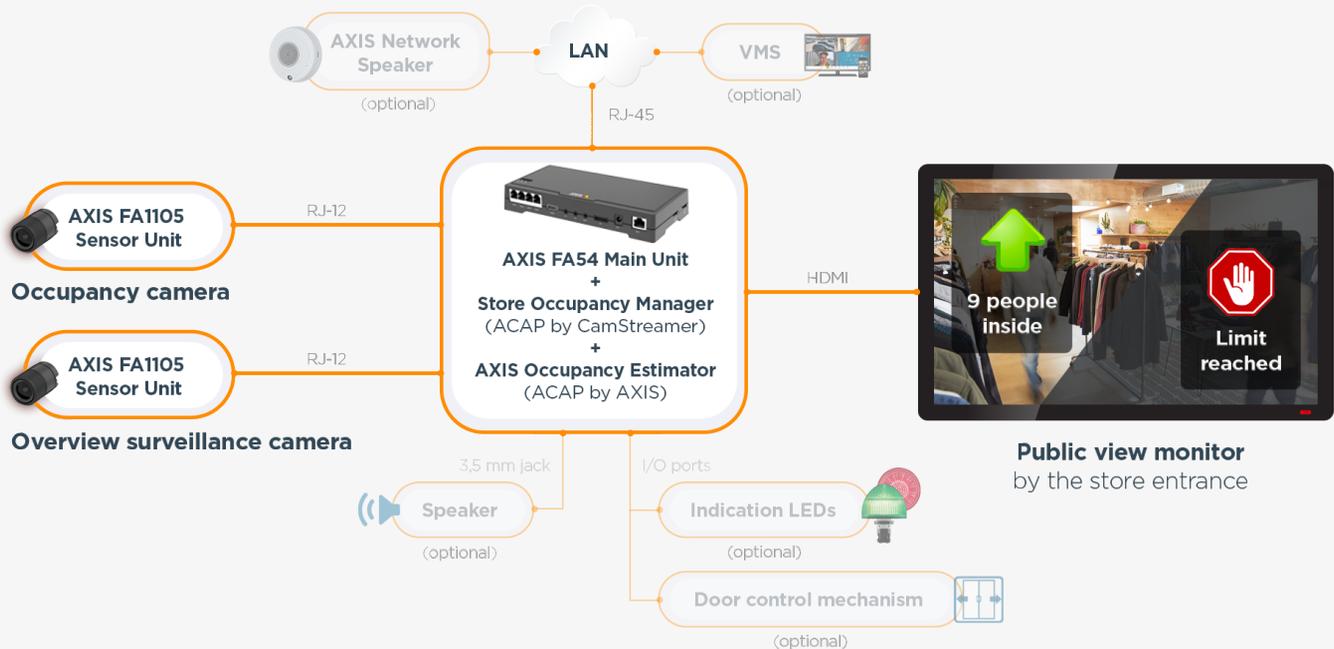
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I. Hardware selection and integration scenarios

- **Store Occupancy Manager ACAP app** gathers the **occupancy data** and based on the number of customers inside the store it inserts **overlay graphics into the video stream** with either **green or red alert sign** to allow or stop people from entering the store, all that with the total number of people present inside the store. On selected cameras (**AXIS FA54 Main unit**) this **video can be sent directly to the camera's HDMI output** connected to a **large TV screen**, so **no additional HW is needed** to make the solution work. Video with an overlay graphics generated by many other compatible cameras (see below) can be displayed on a TV screen via a tiny **AXIS T8705 Video Decoder**. There are several configuration scenarios, one of them will for sure fit your particular case.
- There is an important element in the whole setup and that is the **source of the occupancy data**, which is an **AXIS Occupancy Estimator ACAP app** running on one or more cameras at the store entrances. AXIS Occupancy Estimator can run on one or more supported cameras, one is the master and the others are slaves, while **Store Occupancy Manager talks only with the master**. AXIS Occupancy Estimator **can run on a dedicated camera** (e.g. **AXIS M3064-V**) or it can even run on the same camera as the Store Occupancy Manager and thus the whole **setup can be very minimalistic**. We will describe these scenarios further in the document.
- The **output of the Store Occupancy Manager is the video with overlay graphics**. The **source for that video is usually an overview camera** and as such a live video stream with occupancy graphics is **displayed on a public view monitor**, it plays the **theft prevention role**.
- Let us take you **through a set of typical connection scenarios...**

Scenario 1: Minimalistic design, everything works on just one AXIS FA54 camera with two sensor units

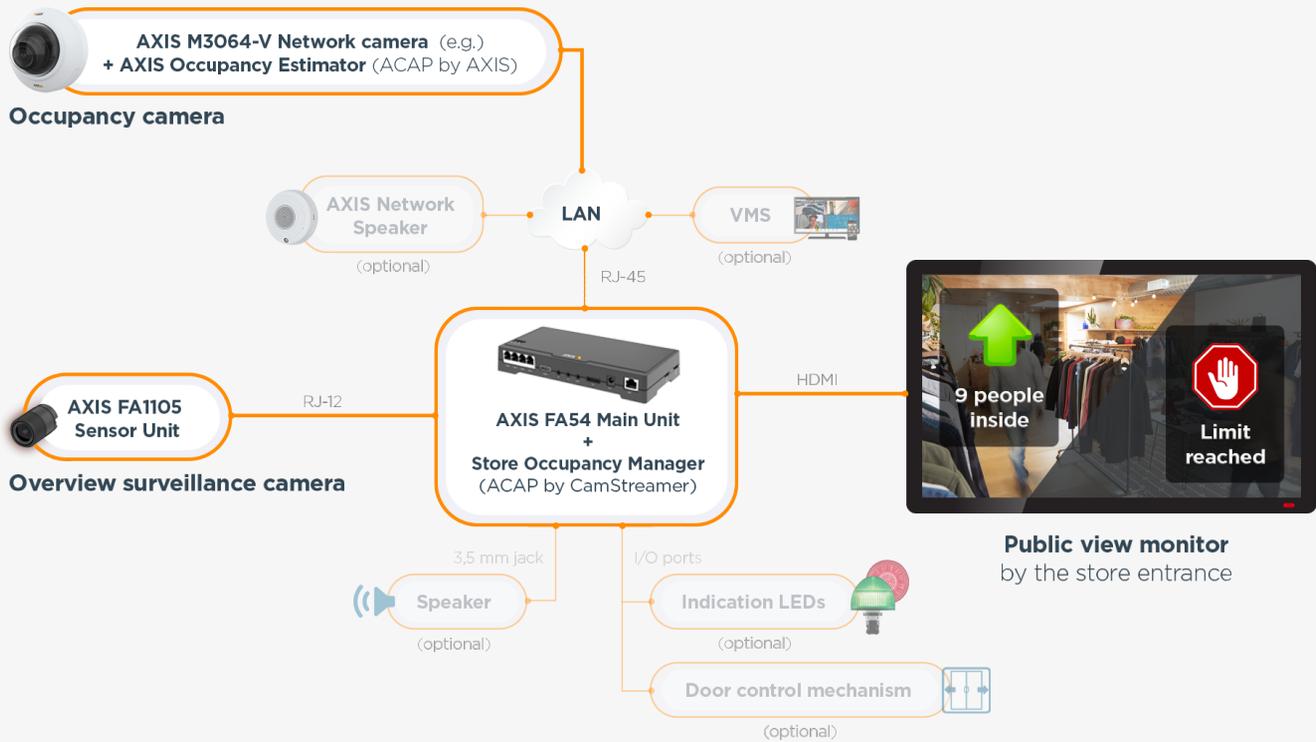


- This setup is based on **AXIS FA54 Main Unit** with **AXIS Occupancy Estimator ACAP app** and **Store Occupancy Manager ACAP app** on-board.
- **Two camera sensor units (AXIS FA1105 Sensor Unit)** are connected to the **AXIS FA54 Main Unit**, **the first one is used as an occupancy camera, the second one as an overview surveillance camera**. The second camera provides the video stream for the occupancy graphics and this is the one, that is **displayed on a public view monitor**.
- AXIS FA54 Main Unit has an **HDMI output port with graphics overlay support**, so it can be connected **directly to a large TV screen** in the role of a **public view monitor**.
- AXIS FA54 Main Unit is a pretty powerful device with many interfaces. Besides its HDMI output, it has **line audio input and output ports** and **4 configurable binary I/O ports**. One thus can connect an **analog speaker** and/or **indication LEDs** or **door control mechanism** directly to the main unit. The logic for activating these devices is **set in AXIS Events**, so 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) \$429,00 + Store Occupancy Estimator E-license (CamStreamer Product Number: 505-001) \$499,00 = **Total MSRP costs for this scenario is \$1.655,00** (excl. installation, public view monitor, cables and network parts).

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Scenario 2: Dedicated camera(s) for AXIS Occupancy Estimator and AXIS FA54 Main Unit for Store Occupancy Manager

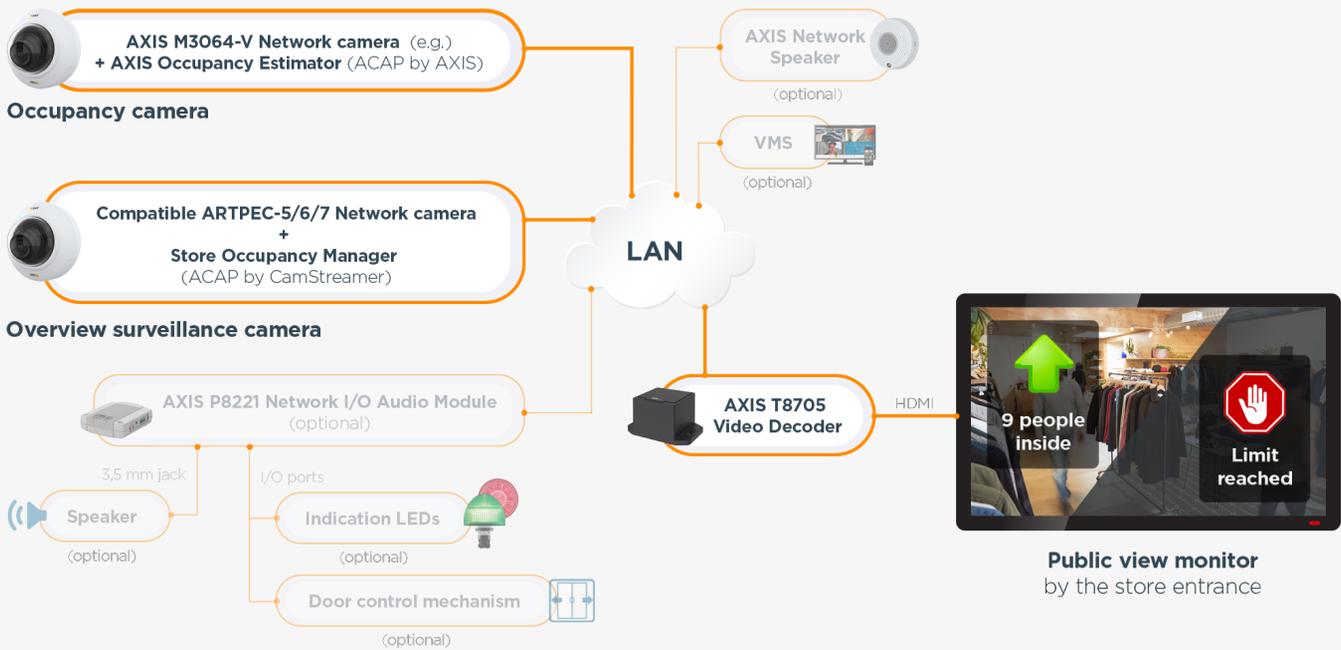


- This setup is based on a **dedicated occupancy camera** (e.g. [AXIS M3064-V](#)) with [AXIS Occupancy Estimator](#) ACAP app on-board and [AXIS FA54 Main Unit](#) with [Store Occupancy Manager](#) ACAP app on-board. All the cameras have to be on the same LAN.
- Any **AXIS Occupancy Estimator compatible AXIS network camera** can be used in this scenario as a **source of the occupancy data**. List of the compatible models is available in Chapter 4 of this document or at www.axis.com.
- AXIS FA54 Main Unit has an **HDMI output port with graphics overlay support**, so it can be connected **directly to a large TV screen** in the role of a **public view monitor**.
- AXIS FA54 Main Unit is a pretty powerful device with many interfaces. Besides its HDMI output, it has **line audio input and output ports** and **4 configurable binary I/O ports**. One thus can connect an **analog speaker** and/or **indication LEDs** or **door control mechanism** directly to the main unit. The logic for activating these devices is **set in AXIS Events**, so is the logic for controlling external network speakers and/or I/O devices.
- **MSRP prices:** AXIS M3064-V Network camera (Product Number US: 01716-001) \$199,00 + AXIS Occupancy Estimator E-license (Product Number US: 01147-051) \$429,00 + AXIS FA54 Main Unit (Product Number US: 0878-004) \$449,00 + 1x AXIS FA1105 Sensor Unit (Product Number US: 0913-001) \$139,00 + Store Occupancy Estimator E-license (CamStreamer Product Number: 505-001) \$499,00 = **Total MSRP costs for this scenario is \$1.715,00** (excl. installation, public view monitor, cables and network parts).

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Scenario 3: Dedicated camera(s) for AXIS Occupancy Estimator and a compatible AXIS ARTPEC-5/6/7 camera for Store Occupancy Manager



- This setup is based on:
 - An AXIS IP camera with **AXIS Occupancy Estimator** ACAP app on-board as an **occupancy camera** (e.g., **AXIS M3064-V** in the diagram).
 - A compatible ARTPEC-5/6/7 AXIS network camera with **Store Occupancy Manager** ACAP app on-board as an **overview surveillance camera** (see the compatibility list further in the document).
 - AXIS T8705 Video Decoder** as a network RTSP **video converter to HDMI output**.
 - All devices have to be on the same LAN network.
- Any compatible AXIS network camera** can be used as an **occupancy camera** with AXIS Occupancy Estimator ACAP app on-board. The list of compatible models is available in Chapter 4 of this document or at www.axis.com.
- Any compatible AXIS network camera with an ARTPEC-5/6/7 processor inside** can be used as an **overview surveillance camera** with Store Occupancy Manager app on-board. The list of the compatible cameras is available in Chapter 4 of this document or at www.camstreamer.com.
- RTSP video stream** from an overview camera **with added occupancy graphics overlay** can be pulled by **AXIS T8705 Video Decoder** over the **local network**, sent to its **HDMI output**, and **displayed on a TV screen (public view monitor)**.
- If you wish to **trigger various actions based on the occupancy data**, you can do it **via AXIS Events engine** inside the camera with the use of the „Store Occupancy Manager - no entry“ event as a trigger. Thus you can e.g. **play audio messages** on **AXIS C1410 Network Speaker** (MSRP \$299,00) or **activate different devices (indication LEDs, door control mechanisms, etc.)** via e.g. an **AXIS P8221 Network I/O Audio Module** (MSRP \$359,00) and its 8 configurable I/O ports.
- MSRP prices:** 2x AXIS M3064-V Network camera (Product Number US: 01716-001) \$199,00 + AXIS Occupancy Estimator E-license (Product Number US: 01147-051) \$429,00 + Store Occupancy Estimator E-license (CamStreamer Product Number: 505-001) \$499,00 + AXIS T8705 Video Decoder (Product Number US: 01186-004) \$299,00 = **Total MSRP costs for this scenario is \$1.625,00** (excl. installation, public view monitor, cables and network parts).

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II. Graphics overlays

- One of the key functions of the Store Occupancy Manager app is feature to display **triggered graphics overlays into the video** stream directly **utilizing camera hardware**.
- Besides the occupancy limit control, it is possible to show other overlay graphics at the same time (logos, Ads, ...). On ARTPEC-5 cameras there is a limit of 2 concurrent graphics overlays, **on ARTPEC-6/7 cameras it is even 4!**
- Here comes the **list of graphics insert options** Store Occupancy Manager app offers:

Occupancy widget

- Basic functionality of the Store Occupancy Manager - graphics widget that **shows 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 STOP sign**.
- In the Store Occupancy Manager you can **set the occupancy limit, size of the widget** and **offset X, Y** (which means how many pixels from the edges graphics will be positioned).
- The widget can be **enabled or disabled**, that means you don't have to use it if you don't want to.

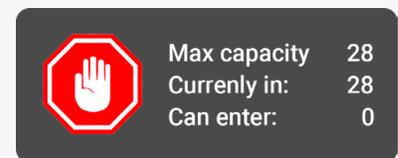
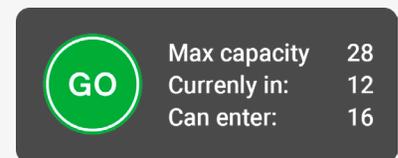
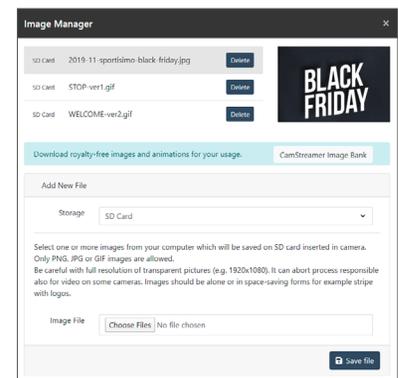


Image overlay

- Image overlays can be **images of any size with a transparency support!**
- You can use **a static image like logo, or promo offer**, set the size and position in the video stream.
- Supported formats - **JPG, PNG (with transparency), static GIF, animated GIF**
- Images are managed in the **Image Manager** - part of the Store Occupancy Manager app. That is the place where you upload images or link them to the 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 available and you have to check the available space in app's Image Manager before upload.
 - On the **SD card** inserted into the camera. **This is a strongly recommended option**.
 - At the **remote location** - on a local network or a network URL. By pulling images from a remote location you can make image updates much more flexible, as you can store images in e.g. marketing shared drive and update them on the fly. Or you can synchronize images with your digital signage system.
- **Trigger options** - every graphics overlay can be displayed based on the following triggers:
 - **Number of people inside the store is lower than the set occupancy limit** - you can display **large GO graphics** and an animated **woman prompting customers to enter the store**.
 - **Number of people inside the store is the same or higher as the set occupancy limit** - you can e.g. display **large STOP graphics** and an **animated man asking customers to wait**.
 - **Display always** - you can show selected images and animations no matter what the occupancy is. This is **great for logos, banners, and various promotions**.
- **Controlled via API** - all image inserts can be controlled via API commands over the network, which gives you many integration possibilities.
- **Time scheduling** - you can e.g. show one set of graphics overlays to be displayed during the business hours (occupancy graphics, animations, banners) and the other set for the out of business hours (e.g. „We are CLOSED now, come in the morning please!“ animation).

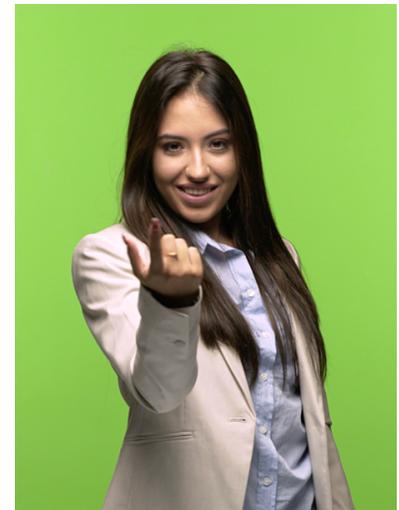


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Animated GIFs

- Support of animated GIFs brings a **wide range of possibilities**.
- Occupancy limitation can be given to customers **by an interesting, attractive way - by video realistic animations**. This can **catch passerby** and increase interest in entering the store.
- You can use **an animated GIF**, on the Internet, there are thousands of **GIF stickers**, etc. Just be careful with author copyrights - you need to have permission for usage of concrete animation from the author or site where you found it.
- **We have prepared a few preset animations (and even static images) for your use and you find it at [CamStreamer Image Bank](#).**
- **How to create your own overlay animated GIF from the video?**
 - You need to shoot the video with **chroma-key** (green background) - that allows video software to remove background and make video transparent - it can do almost any video editing software like iMovie, Filmora, Adobe Premiere, etc.
 - You can also find a lot of existing chroma key animations at video data banks like [Shutterstock](#), etc.
 - You need to **convert** your transparent video to animated GIF - some video programs can do it directly or you can use free online tool [EXGIF.com](#). There you can convert, edit and optimize animated GIFs.
 - **Note that final animated GIF cannot be a big file - the ideal is an animation not longer than 5 seconds, max. 10 frames per second and size of file less than 2 MB. Resolution is ideal max 1/3 to 1/2 of full-screen. Bigger animations can have problems with camera processing power.**



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



Info ticker widget

- You can add an **useful info ticker widget** into the video as well.
- With this widget, you can communicate directly via your **Public view monitor**. It's ideal for uses such as promo events, displaying information about your store, etc.
- It can be displayed **with or without the clock**, you can select **size** and **color of text and background**.
- Text can be **static** or it can have a **crawl effect** (on ARTPEC-6/7 cameras).
- 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**.
- It means that you can **use sophisticated triggering logic that AXIS uses on network cameras**.
- It can, for example, **switch on / off indication LEDs**, **play audio messages via connected speakers**, **remotely notify security officers on an exceeded occupancy limit** or **send notifications to external systems over the network**.
- All devices can be connected to the camera by **configurable I/O ports** and these are then managed in the Events engine. You can manage also devices in different locations as well - like indication LEDs by more entrances, and many other use-cases.
- **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 compatible camera models for **Store Occupancy Manager ACAP** app

ARTPEC-6/7 cameras

(support up to 4 overlay graphics, fully compatible)

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

ARTPEC-5 cameras

(support max. 2 overlay graphics, don't support animated GIFs)

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

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

List of compatible camera models for **AXIS Occupancy Estimator ACAP** app

AXIS F41 Main Unit	AXIS M3044-WV	AXIS M3057-PLVE	AXIS M3068-P	AXIS M3106-L Mk II	AXIS M4206-V
AXIS P1244	AXIS M3045-V	AXIS M3064-V	AXIS M3104-L	AXIS M3106-LVE Mk II	AXIS P3245-LV
AXIS M3015	AXIS M3045-WV	AXIS M3065-V	AXIS M3104-LVE	AXIS M3205-LVE	AXIS P3245-V
AXIS M3016	AXIS M3046-V	AXIS M3066-V	AXIS M3105-L	AXIS M3206-LVE	
AXIS M3044-V	AXIS M3047-P	AXIS M3067-P	AXIS M3105-LVE	AXIS M4206-LV	

This is the official compatibility list from the [AXIS website](#). AXIS FA54 Main Unit isn't on this list, but we have tested it and it works fine.

V. HDMI / video output

- Video output from the camera with graphics overlays is connected **via AXIS FA54 camera's HDMI port directly to the big TV screen**, so **no additional computer is needed!**
- **If you do not use AXIS FA54 camera** (setups 2 or 3 from Chapter 2), **then it is necessary to have another video output device - [AXIS T8705 Video Decoder](#).**
- In this setup the overview camera with added graphics overlays sends RTSP video stream over the network to an AXIS T8705 Video Decoder, that **converts it to its HDMI output.**
- **You can use more AXIS T8705 Video Decoders and display the occupancy video on more TV screens as needed.**
- **Important - there are more AXIS camera models with HDMI output, but these cameras do not support overlay graphics (e.g. [AXIS M3065-V](#) camera)!**
- **Please note that AXIS FA54 Main Unit has a limit in the actual firmware 9.80.1 in the graphics overlay color space. You can either have correct colors on its HDMI output or in the RTSP video stream, one or the other. In order to make this work correctly on the HDMI output, please change the rotation of the HDMI output image to 180° in System -> HDMI.**



VI. API

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

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VII. Two-level triggering

- With **Store Occupancy Manager** and AXIS Events you can also use **two-level triggering** - It means you can set one limit for graphics insert (e.g. 20) and the second 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 audio clip playback on a network speaker or switch on/off an indication light.
- This is how you play audio clip via [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`

Set up of recipient on SOM AXIS Camera:

Rules Schedules **Recipients** Manual triggers

This is how you set up an audio clip playback every 5 seconds based on SOM event:

Event threshold setup in Store Occupancy Manager:

VIII. 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**.
 - Insert 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 **license key**.
 - Download our app** from <https://camstreamer.com/download-app>.
 - Install the app** to the App section on AXIS camera.
 - Import license key** in AXIS user interface besides the application via button **install**.

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IX. User interface

Want to know more?
 Contact us at
sales@camstreamer.com

