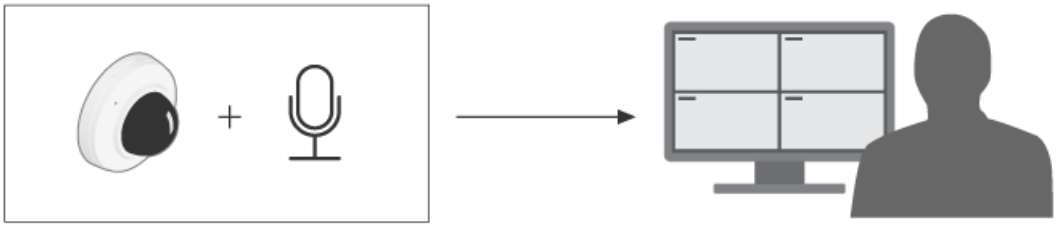
AXIS Audio Analytics

User manual

Table of Contents

Solution overview



About the application

AXIS Audio Analytics detects changes in sound volume and specific types of sounds, such as screams or shouts, within range of the device it's installed on. You can configure these detections to trigger a response such as recording video, playing an audio message, or alerting security staff.

The application has three key features:

- **Sound pressure level (SPL)**: Measures the loudness of noises by detecting changes in air pressure as sound travels through the air within range of the device. SPL is an absolute value measured in decibels (dB).
- **Adaptive audio detection**: Dynamically adjusts to the ambient sound level near the device and triggers alerts when sudden sound spikes occur.
- **Audio classification**: Detects certain types of sounds that the application is trained to recognize.

You can use SPL to detect when the overall noise level falls above or below a certain threshold, and adaptive audio detection to detect sound spikes that are louder than the usual noise level.

Considerations

Consider the following when setting up a device that will use AXIS Audio Analytics:

- The application is optimized to detect sounds up to a distance of 10 meters from the device it's installed on.
- A high level of background noise in busy environments and heavy traffic can impact performance.
- Avoid placing the microphone next to a source of direct noise, such as a fan.

For product-specific considerations, see the user manual for your product at .

Get started

Set up the application

1. Log in to the device interface as an administrator and go to **Analytics** > **AXIS Audio analytics**.
2. Configure **Sound pressure level**:
   2.1. Turn on **Show threshold and events in graph** to see a visual representation of the threshold values and whenever the sound pressure level (SPL) goes below or above those values.
   2.2. Set the **Threshold** values. Any time the sound pressure level goes below or above those values, the application will register it as an audio event.
3. Configure **Adaptive audio detection**:
   3.1. Turn on **Show events in graph** to see a visual representation of whenever the device detects a sudden increase in sound volume.
   3.2. Adjust the **Threshold** slider to raise or lower the detection threshold. Only sounds that pass the threshold trigger a detection.

Note

The **Threshold** slider allows you to adjust how significant an increase in sound volume is required to trigger a detection. Adjust the slider according to where the device is installed and what the device is intended to detect.

4. Configure **Audio classification**:
   4.1. Turn on **Show events in graph** to see a visual representation of whenever the device detects a specific type of sound.
   4.2. Under **Classifications**, select which types of sounds you want the device to detect.

Configuration

Set up rules for events

To learn more, check out our guide *Get started with rules for events*.

Record video when a sound triggers a detection

This example explains how to set up the Axis device to record video to an SD card as soon as a sound triggers a detection.

1. In the device's web interface, go to **Analytics** > **AXIS Audio analytics** > **Adaptive audio detection** and set the threshold slider to an appropriate level.
2. Go to **System** > **Storage** to make sure the SD card is mounted.
3. Go to **System** > **Events** and add a rule.
4. Enter a name for the rule.
5. In the list of conditions, under **Audio analytics**, select **Audio level above threshold**.
6. In the list of actions, under **Recordings**, select **Record video**.
7. In the list of storage options, select **SD-DISK**.
8. Select a **Camera** and a **Stream profile**.
9. If you want to start the recording before the sound was detected, enter a **Prebuffer** time.
10. Click **Save**.
11. To test the rule, go to **Analytics** > **Audio analytics** > **Adaptive audio detection** and click **Test alarms** to generate a false detection event.

Activate a strobe siren when a sound triggers a detection

You can use an Axis strobe siren to let intruders know that the area is under surveillance.

This example explains how to activate a profile in the strobe siren whenever AXIS Audio Analytics detects a sound that's louder than the upper threshold value you've set for **Sound pressure level**.

Before you start:

- In the camera's web interface, go to **Analytics** > **AXIS Audio analytics** > **Sound pressure level detection** and make sure that you have set an appropriate upper **Threshold** value.
- In the strobe siren's web interface: go to **System** > **Accounts** and click + **Add account** to create a new account with Operator or Administrator privileges
- In the strobe siren's web interface, create a profile called: "Strobe siren profile".

Create a recipient in the camera:

1. In the camera's web interface, go to **System > Events > Recipients** and add a recipient.
2. Enter the following information:
   - **Name**: Strobe siren
   - **Type**: **HTTP**
   - **URL**: http://<IPaddress>/axis-cgi/siren_and_light.cgi
     Replace <IPaddress> with the address of the strobe siren.
   - The **Account** name and **password** of the newly created strobe siren user.
3. Click **Test** to make sure all data is valid.
4. Click **Save**.

Create two rules in the camera:

1. Go to **Rules** and add a rule to activate the strobe siren once AXIS Audio Analytics makes a detection.
2. Enter the following information:
   - **Name**: Activate strobe siren on detection
   - **Condition**: **Audio analytics > SPL: Above threshold upper**
   - **Action**: **Notifications > Send notification through HTTP**
   - **Recipient**: **Strobe siren**.
     The information must be the same as you previously entered under **Events > Recipients > Name**.
   - **Method**: **Post**
   - **Body**:

```
{  "apiVersion": "1.0",  "method": "start",  "params": {
"profile" : "Strobe siren profile"  } }
```

Make sure to enter the same information under '**"profile" : <>**' as you did when you created the profile in the strobe siren, in this case: "Strobe siren profile".

3. Click **Save**.
4. Add another rule to deactivate the strobe siren after 15 seconds. Enter with the following information:
   - **Name**: Deactivate strobe siren 15s after detection
   - **Wait between actions**: 00:00:15
   - **Condition**: **Audio analytics > SPL: Above threshold upper**
   - Select **Invert this condition**.
   - **Action**: **Notifications > Send notification through HTTP**
   - **Recipient**: **Strobe siren**
     The information must be the same as you previously entered under **Events > Recipients > Name**.
   - **Method**: **Post**
   - **Body**:

```
{  "apiVersion": "1.0",  "method": "stop",  "params": {    "profile" : "Strobe siren
profile"  } }
```

Make sure to enter the same information under '**"profile" : <>**' as you did when you created the profile in the strobe siren, in this case: "Strobe siren profile".

5. Click **Save**.

Record video when the device detects a person and a shout

This example explains how to set up the Axis device to record video to an SD card as soon as both the following conditions are met:

- AXIS Object Analytics detects a person.
- AXIS Audio Analytics detects a shout.

1. In the camera's web interface:
   1.1. Go to **Analytics** > **AXIS Audio analytics** > **Audio classification** and make sure that **Shout** detection has been turned on.
   1.2. Go to **Apps** and make sure that **Axis Object Analytics** is on.
   1.3. Go to **System** > **Storage** to make sure the SD card is mounted.
2. In AXIS Object Analytics:
   2.1. Click **+ New scenario**.
   2.2. Select **Object in area** and click **Next**.
   2.3. Select **Human** and click **Next**.
   2.4. Adjust the area of interest if necessary.

2.5. Click **Finish**.

3. In the camera's web interface:
   3.1. Go to **System** > **Events** and add a rule.
   3.2. Enter a name for the rule.
   3.3. For the first condition, select **Shout detected** under **Audio analytics**.
   3.4. Add a second condition and select the AXIS Object Analytics scenario you created under **Applications**.
   3.5. In the list of actions, under **Recordings**, select **Record video**.
   3.6. In the list of storage options, select **SD-DISK**.
   3.7. Select a **Camera** and a **Stream profile**.
   3.8. If you want to start the recording before the sound was detected, enter a **Prebuffer** time.
   3.9. Click **Save**.

Learn more

Audio classification

The application can classify distinct types of sounds from an audio stream within a range of 10 meters in open spaces:

- **Scream**: A loud and high-pitched vocalization.
- **Shout**: A person speaking in a loud voice.
- **Glass break**: A sharp, cracking sound produced when glass is shattered or broken.
- **Speech**: The acoustic signal produced by the human voice.

This feature allows you to detect and respond to potentially critical situations.

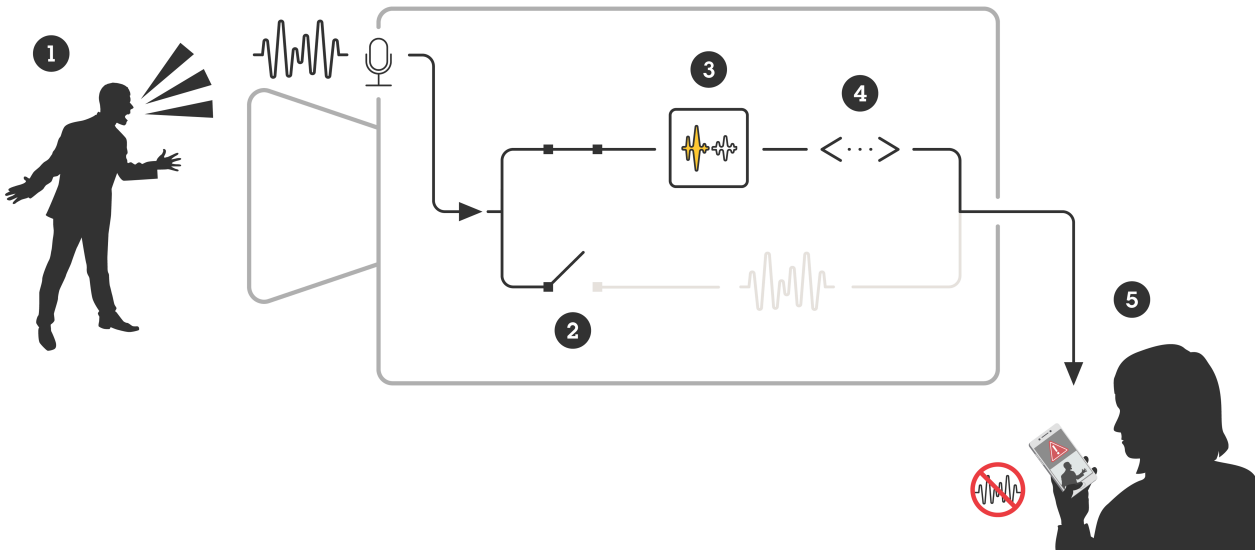
If you configure the application to detect any of these sounds, it visualizes them as color-coded bars in the user interface. The output consists of metadata that provides more detailed information about the detected sounds.

Privacy control

For privacy considerations, audio streaming is turned off by default on all Axis devices. You do not need to enable audio streaming to use AXIS Audio Analytics, as the application can still visualize and generate metadata about captured audio without storing it anywhere.

This means that you only have to enable audio streaming if you want to configure the application to process and encode captured audio for storage.

Example



1 *An Axis device with a microphone picks up the sound of a man shouting at someone.*
2 *Audio streaming is disabled on this device, which means that the man's shouting is not recorded.*
3 *AXIS Audio Analytics detects a shout.*
4 *AXIS Audio Analytics generates metadata and an event associated with the shout.*
5 *A security staff member receives an alert about someone shouting, but no recording from the event.*

Integration

Set up alarms in AXIS Camera Station

This example explains how to set up a rule in AXIS Camera Station to alert the operator and record video when AXIS Audio Analytics detects a scream.

Before you start

You will need:

- an Axis network camera with AXIS Audio Analytics set up and running. For more information, see .
- a computer with AXIS Camera Station installed.

Add the camera to AXIS Camera Station

1. In AXIS Camera Station, add the camera. See the *user manual for AXIS Camera Station*.

Create a device event trigger

1. Click + and go to **Configuration > Recording and events > Action rules** and click **New**.
2. Click **Add** to add a trigger.
3. Select **Device event** from the list of triggers and click **Ok**.
4. In the **Configure device event trigger** section:
   - In **Device**, select the camera.
   - In **Event**, select **Scream detected** from the options for **AXIS Audio Analytics**
   - In **Trigger period**, set an interval time between two successive triggers. Use this function to reduce the number of successive recordings. If an additional trigger occurs within this interval, the recording will continue and the trigger period starts over from that point in time.
5. In **Filters**, set **active** to **Yes**.
6. Click **Ok**.

Create actions to raise alarms and record video

1. Click **Next**.
2. Click **Add** to add an action.
3. Select **Raise alarm** from the list of actions and click **Ok**.

Note

The alarm message is what the operator sees when an alarm is raised.

4. In the **Alarm message** section, enter an alarm title and description.
5. Click **Ok**.
6. Click **Add** to add another action.
7. Select **Record** from the list of actions and click **Ok**.
8. In the list of cameras, select the camera to use for recording.
9. Select a profile and set the prebuffer and postbuffer.
10. Click **Ok**.

Specify when the alarm is active

1. Click **Next**.
2. If you only want the alarm to be active during certain hours, select **Custom schedule**.
3. Select a schedule from the list.
4. Click **Next**.
5. Enter a name for the rule.
6. Click **Finish**.

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