AXIS Fence Guard

User Manual

AXIS Fence Guard

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About the application

AXIS Fence Guard monitors a virtual fence and sends an alarm if a person or object crosses the fence. The alarm can be used by Axis network video devices, and by third-party software, to, for example, record video and alert security staff.

To reduce false alarms, use filters to ignore objects such as small animals, light beams from passing cars and quickly moving shadows.

Use profiles to create multiple configurations, for example for daytime and nighttime or for different parts of the scene. Each profile has its own settings and generates its own alarms.

Requirements

The application can be installed on Axis network video devices that support AXIS Camera Application Platform. A complete list of compatible devices and firmware versions is available at *axis.com/applications*

We recommend the following browsers:

- Chrome^{TM}

- Firefox®

Camera mounting recommendations

Before you start to use the application, consider the following recommendations:

- Position the camera so that the virtual fence is not too close to the image edges. The application must be able to detect objects on both sides of the virtual fence.

- If the monitored area has significant differences in elevation, create multiple profiles and set up the perspective in each profile. See *How to work with profiles on page 6* .

- Detection accuracy may be affected by weather conditions such as heavy rain or snow.

- Make sure that the lighting conditions are within the product's specification. Use additional lighting if needed.

- Make sure that the camera is not subject to excessive vibrations. Vibrations might trigger false alarms.

- Each time a PTZ preset position changes, the application needs to recalibrate. We recommend to wait at least 10 seconds before changing between preset positions in a guard tour.

- Each time the filters change, the application recalibrates. Objects detected before you change filters therefore need some time to be redetected by the application.

- Small and distant objects might not be detected.

- Objects approaching in a straight line towards the camera need to move a longer distance before they are detected compared to other objects.
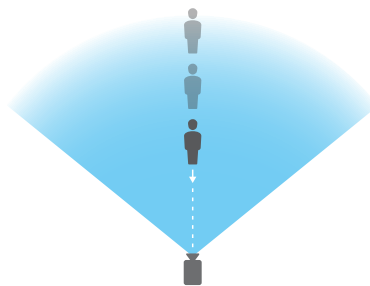
Install the application

> **Note**
>
> To install applications on the product you need administrator rights.

1. To download the application, go to *axis.com/applications*.

2. Log in to the camera's webpage.

3. Go to **Settings > Apps** and click **Add**.

4. Upload the application file (.eap) to the camera.

Start the application

1. Log in to the product's webpage and go to **Settings > Apps**.

2. Select the application.

3. Turn on the app with the toggle button.

Stop the application

1. Log in to the product's webpage and go to **Settings > Apps**.

2. Select the application.

3. Turn off the application with the toggle button.

Set up the application

This is an overview of how to set up the application.

1. Log in to the product's webpage as an administrator and go to **Settings > Apps > AXIS Fence Guard**.

2. Select the application and click **Open**.

3. Use **profiles** to create multiple configurations, for example for daytime and nighttime or for different parts of the scene. Each profile has its own settings and generates its own alarms.

4. Set up the **virtual fence**.

5. Use **visual confirmation** to make sure that all objects that should be detected are detected.

6. Trigger an alarm with the **test alarm** function.

7. If the application triggers too many unwanted alarms, use one or more of the **filters**.
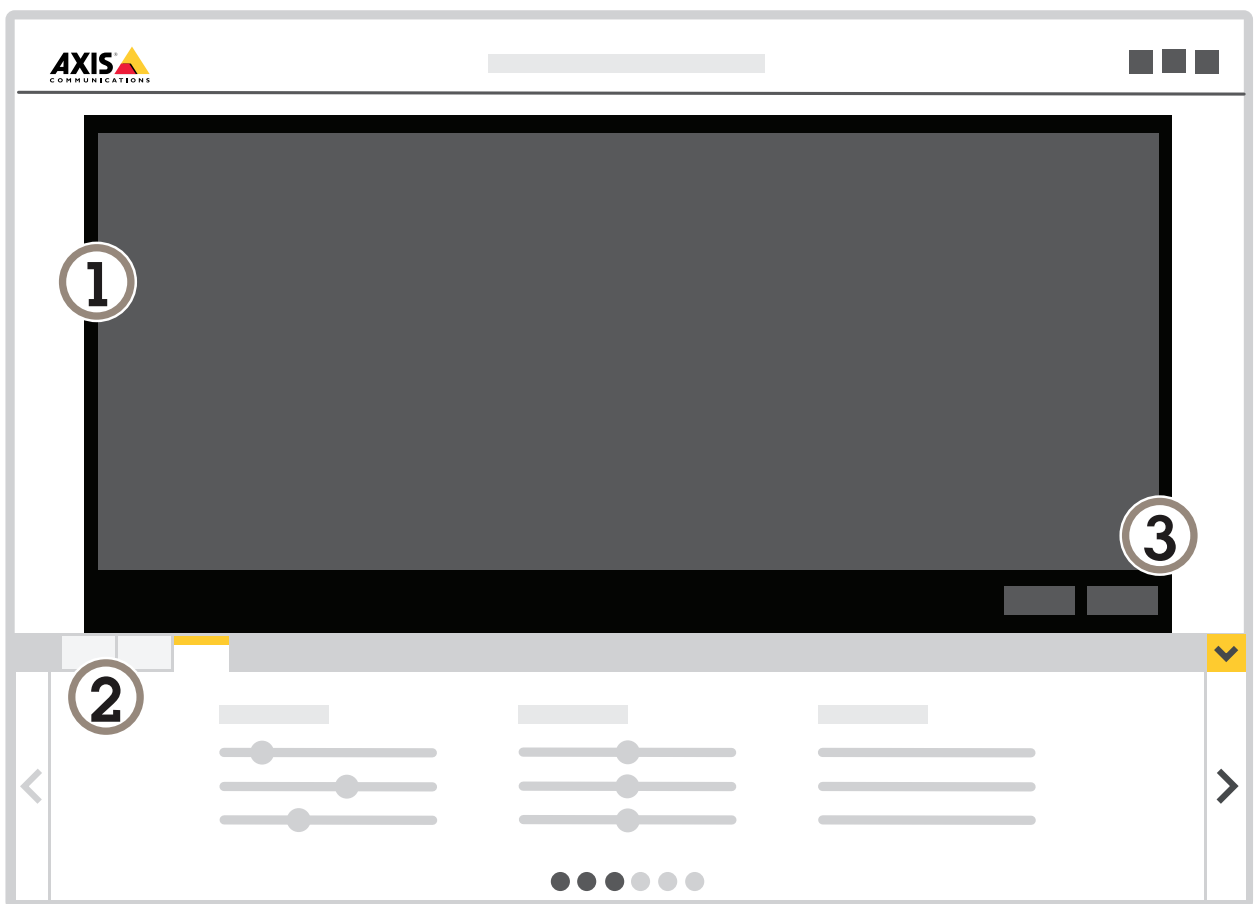
1   Live view
2   Profile settings
3   Test alarm and visual confirmation

How to work with profiles

Each profile triggers its own alarms and has its own settings, making it possible to create events with different actions in the camera and third-party software. For example, to use one configuration during the day and one during the night, create two profiles with different settings. Then create one action rule for each profile and use daytime and nighttime schedules as additional conditions.

When to use multiple profiles:

- to set up different configurations for day and night

- to set up different configurations for different PTZ preset positions

- when you want to use multiple virtual fences

- to trigger an alarm when the virtual fence is passed in any direction

- if the camera monitors an area with differences in elevation, profiles with different perspective setups can be used to filter small objects. Divide the area into regions without significant elevation differences and create one profile for each region. In each profile, set up a virtual fence and calibrate perspective in the region instead of in the whole image. See *Filter small objects in a scene with depth on page 11*.

How to create a profile

1. Go to the application's webpage and click

2. To copy the settings from a previously created profile, select a profile from the list **Import settings from**.

3. To rename the profile, go to **Profile properties** and click

4. Type the name in the text field and click **Done**.

How to delete a profile

Note

If you delete a profile that is used by an action rule or by a third-party software, remember to delete or edit the action rule or third-party software as well.

Click the cross on the profile's tab or do the following:

1. Select the profile's tab.

2. Go to **Profile properties** and click

3. Click and confirm by clicking **Done**.

How to connect a profile to a PTZ preset position

Note

Each time the preset position changes, the application needs to recalibrate.

To restrict detection to a specific preset position, you can connect the profile to a preset position.

1. Go to the application's webpage and select an existing profile, or click ![+] to create a new profile.

2. Turn on **Connected preset position** with the toggle button.

3. From the drop-down-list, select a preset position.

   To detect motion in all preset positions, select **All preset positions**.

Add alarm overlays to video streams

To show what triggered an alarm in the live and recorded video stream, turn on alarm overlay. When alarm overlay is turned on, a rectangle is shown around objects that trigger alarms.

Important

The alarm overlays are burnt in to the video stream. You cannot remove them from recorded video.

Note

If you use view areas, the alarm overlays only appear in the first view area. The default name of the first view area is View area 1.

1. Go to the application's webpage and select an existing profile, or click ![+] to create a new profile.

2. Turn on **Alarm overlay**.

3. Select in which resolution alarm overlays should appear. You can only select one resolution and it will be applied to all profiles with alarm overlay.

4. Click **Next**.

5. Open your video management software (VMS) and place the windows side-by-side.

6. To make sure that the alarm overlays show up in the video streams, go back to the application's webpage and click **Test alarm**.

7. Click **Finish**.

The virtual fence

What is it?

The virtual fence is a line in the image. The application can send alarms when objects pass the line in one direction. The arrows on the line show the current direction. Alarms are triggered when objects cross the line in the direction indicated by the arrows.

How does it work?

To trigger an alarm the object must pass the line. As illustrated in the image, the lower part of the object must pass the line for the alarm to be triggered. Objects that only touch the line do not trigger alarms.

- The green man does not trigger an alarm, as he has only one foot across the line.

- The green woman does not trigger an alarm, as she has only passed the line with her head and upper body.

- The red man triggers an alarm, as his lower body has passed the line.
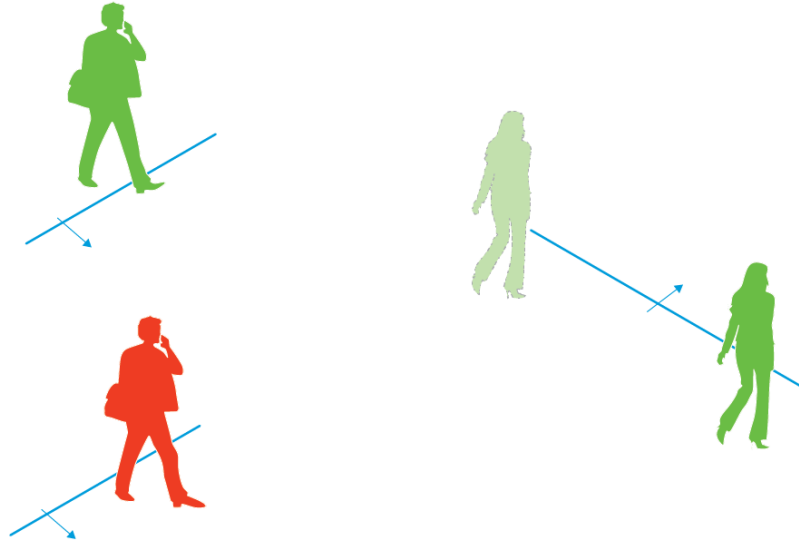
To trigger an alarm, people need to pass the line with their lower body.

Virtual fence recommendations

Configure the virtual fence so that objects cannot enter the protected area without passing the line and so that the application is able to detect objects before they cross the line. If alarm triggering in both direction is desired, create one profile for each alarm direction.
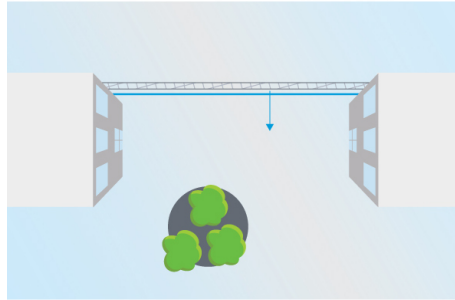
Example A
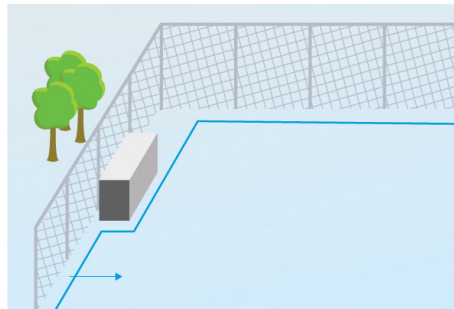
Example A: Camera monitors a fence.

In example A, the camera monitors a fence where a container is placed just inside the fence. Draw the line inside the fence, on the ground and close to the fence. The distance between the container and the line should be larger than the distance between the fence and the line. If the line is drawn too close to the container, a person hidden by the container might be able to enter the protected area without triggering an alarm as the application would not detect the intruder until the person is already inside the area.
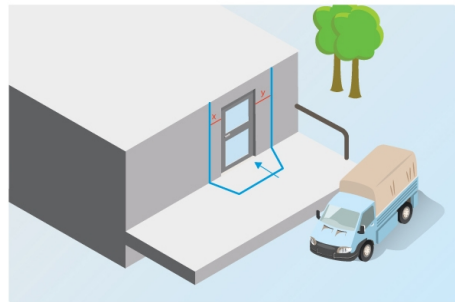
Example B

Set up the application

Example B: Bird's eye view. The camera monitors an area between two buildings. The area is protected by a fence.

In example B, the camera has a bird's eye view and monitors an area between two buildings. Draw the line close to the fence and extend the line onto the building walls and to the image edges so that objects cannot enter the protected area without crossing the line. If you use the small object filter, select no depth.

Example C

Example C: Camera monitors a delivery area.

In example C, the camera monitors a door at a delivery area. The application should generate alarms if someone tries to access the door. Draw the line so that a protected area is created in front of the door. Here, the line is also extended onto the wall. Make sure that the protected area is large enough so that people have to pass the line in order to access the door. If the line is drawn close to or across the door, only people who enter through the door trigger alarms. In example C, the line is drawn so that all people who approach and touch the door trigger alarms.

How to set up a virtual fence

To watch this video, go to the web version of this document.

www.axis.com/products/online-manual/21524

1. Use the mouse to move the fence. Click on the line to add more corners. Right-click on a corner to remove it.

2. To change the alarm direction, click ⟷ . The arrows on the line show the current direction. Alarms are triggered when objects cross the line in the direction indicated by the arrows.

Filters

If the application triggers too many unwanted alarms, use one or more of the filters:

Short-lived objects – Use this to ignore objects that only appear in the image for a short period of time.

Small objects – Use this to ignore small objects.

Filter recommendations

- Filters are applied to all moving objects found by the application and should be set up with care to make sure that no important objects are ignored.

- Use as few filters as possible.

- Set up one filter at a time and use visual confirmation to check the settings before you turn on another filter.

- Change the filter settings carefully until you've reached the desired result.

The short-lived objects filter

Use the short-lived objects filter to avoid alarms for objects that only appear for a short period of time, such as light beams from a passing car or quickly moving shadows.

When you turn on the short-lived objects filter and the application finds a moving object, the object does not trigger an alarm until the set time has passed. If the alarm is used to start a recording, configure the pre-trigger time so that the recording also includes the time the object moved in the scene before triggering the alarm.

Set up the short-lived objects filter

1. Go to the application's webpage and select an existing profile or click ➕ to create a new profile.

2. Go to **Filters > Short-lived objects** and click ⚙

3. Turn on the filter with the toggle button.

4. Enter the number of seconds in the field. The number of seconds is the minimum time that objects must pass before the object triggers an alarm. Start with a small number.

5. Click **Done**.

6. Use visual confirmation to verify the setting.

7. If the result is not satisfactory, increase the filter time in small steps.

The small objects filter

The small objects filter reduces false alarms by ignoring objects that are small, for example small animals.

Available small objects filters:

- **No depth** is suitable if there is no or only a small depth in the image, and in situations where perspective cannot be used. It could, for example, be situations when the camera has a bird's-eye view or monitors an area with significant differences in elevation. See *How to filter small objects in a scene with no depth on page 12*.

- **Depth** provides the best false alarm reduction and is recommended for most installations. Select this option when the image has a significant depth, that is, when objects far from the camera appear smaller than objects close to the camera. See *Filter small objects in a scene with depth on page 11*.

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When the image has a significant depth, the perspective needs to be calibrated. During calibration, the application compares the height of the objects as they appear in the image with the actual heights of the corresponding physical objects. The application uses the calibrated perspective to calculate the object size before applying the small objects filter.

Note
- The filter applies to all objects in the image, not just objects in the same position as the setup rectangle.
- The application ignores objects that are smaller than **both** the entered height and the entered width.

Filter small objects in a scene with depth

1. Go to the application's webpage and select an existing profile, or click ➕ to create a new profile.

2. Go to **Filters > Small objects** and click ⚙.

3. Turn on the filter with the toggle button.

4. Select **depth**.

5. Calibrate the perspective. See *Calibrate perspective on page 11*.

6. Set the size of objects to exclude.

   If you select **An adult**, objects smaller than 75 x 75 cm are excluded.

   If you select **A custom size**, you set the size of objects to exclude. To not trigger alarms, objects must be smaller than **both** the entered height and the entered width.

7. To check the filter settings, move the rectangle in the live view and make sure objects that should not trigger alarms fit inside the rectangle.

   When you drag the rectangle in the live view, it adapts to show how large an object of the entered height and width is at that position in the image.

8. Click **Finish**.

Calibrate perspective

Place vertical bars in the image to calibrate perspective. The bars represent physical objects at different distances from the camera.

1. In the live view, choose two or more objects of known height, for example humans or fence poles, that are located on the ground and at different distances from the camera.

2. Click ➕ and place one bar at each object in the live view.

3. To adjust the length of the bars to match the height of the object as it appears in the image, click and drag at the end points.

4. For each bar, enter the corresponding object's height.

5. To improve the calibration, add additional bars.

Example

If you monitor a fence with 2 meter high poles, position the bars at the fence poles, adjust their lengths and enter 200 cm (6 ft 7 in) in the fields.

How to filter small objects in a scene with no depth

1. Go to the application's webpage and select an existing profile, or click [+] to create a new profile.

2. Go to **Filters > Small objects** and click [⚙]

3. Turn on the filter with the toggle button.

4. Select **no depth**.

5. Change the object size by doing one of the following:

   - To resize the rectangle in the live view, use the mouse. The application ignores all objects that fit inside the rectangle. To compare the filter size with the size of real objects in the image, place the rectangle in different places in the live view.

   - Enter the width and height in the fields.

6. Click **Finish**.

Visual confirmation

Use visual confirmation to make sure that all objects that should be detected are detected.

The visual confirmation shows outlines on all moving objects. A green outline indicates that the application has detected the object. A red outline indicates that the object has crossed the fence and an alarm is triggered.

Note

- Visual confirmation can cause video latency and affect performance during configuration.
- If you change PTZ preset position, the application needs a few seconds to recalibrate. This causes a delay before visual confirmation shows up again.
- To improve performance, visual confirmation automatically turns off after 15 minutes.

To turn on visual confirmation, click **Visual confirmation**.

1. Go to...

How to use the application in multichannel products

In multichannel products, the application can be used on several channels simultaneously. Each video channel has its own profiles with fences and filters.

For a complete list of supported multichannel products, see *www.axis.com*

Note

- Running the application on several channels simultaneously may affect the product's performance.
- To use the application on multiple channels, the application must be turned on and configured for each channel.
- To switch between channels, select from the list of channels in the live view.
- To disable a channel remove all its profiles.

Record video when there is an alarm

The following example explains how to set up the Axis device to record video to an SD card when the application triggers an alarm.

1. In the product's webpage, go to **Settings > Apps** and make sure the application is running.

2. To check that the SD card is mounted, go to **Settings > Storage**.

3. Go to **Settings > System > Events** and add a rule.

4. Type a name for the rule.

5. In the list of conditions, under **Applications**, select the application profile. To trigger the same action for all profiles, select **Any Profile**.

6. In the list of actions, under **Recordings**, select **Record video**.

7. Select an existing stream profile or create a new one.

8. In the list of storage options, select **SD card**.

   Make sure the SD card is mounted.

9. Go back to the application's webpage. To test the rule, click **Test alarm** in the live view.