AXIS Radar Autotracking for PTZ

User manual

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About the application

AXIS Radar Autotracking for PTZ is an application that uses data from Axis radars to direct one or more PTZ cameras towards moving objects. You can install the PTZ cameras close to the radar, or distribute them throughout the site you're monitoring. The radar measures the absolute distance and speed of moving objects, and the application calculates the best pan, tilt, and zoom settings for the PTZ cameras based on their location and current view.

The tracker groups together multiple objects to fit within the camera's view, and its default behavior is to follow these priorities:

1. It tracks the same object.
2. It minimizes camera movement.
3. It tracks each object with at least one PTZ camera, if available. If not, it tracks the closest object.

Considerations

- For a list of supported PTZ cameras, see *axis.com/products/axis-radar-autotracking-for-ptz#compatible-products*
- The application is suitable for outdoor sites with a limited amount of activity, or indoor sites with ceiling heights of 7 m (23 ft) or more. Crowded sites, like train stations, are not recommended.
- The application is not designed to run at the same time as the built-in autotracking service in Axis radars. If you switch from one service to the other, reset the radar to factory default settings.
- The radar can miss some objects that are visible to the camera, for example if they are outside the radar's detection range.
- The radar can change the classification of a physical object during its path through the scene. Depending on your configuration, this could cause a changed tracking behavior.
- High latency can affect the tracking performance. To minimize latency, run the application on a computer that is connected to the same network as your radar and PTZ camera.
- An operator can always take control of the PTZ camera and override AXIS Radar Autotracking for PTZ. For more information, see .
- If you change any settings in the radar, restart the service.
- The application might disable **Proportional speed** in the PTZ camera. This setting is not restored when you remove the camera from the application.

Get started

Preparations

- Download or create a reference map, such as an aerial photo of the area you are going to monitor.
  - Include the installation points of the PTZ camera and the radar.
  - Include two calibrations points. Use landmarks, or place objects or paint markings that are visible on the map.
- Note the location where the radars and PTZ cameras are installed.
- Measure the mounting height of the PTZ cameras and radars relative to the area of interest.
- Go to the radar's web interface and calibrate a reference map. For more information, see the radar's user manual available at *help.axis.com*.

Install the application

1. Download the application from *axis.com/products/axis-radar-autotracking-for-ptz*.
2. Double-click on the downloaded file and follow the instructions in the setup assistant.

As soon as the installation is done, the application starts running in the background.

Configuration

Pair a radar with one or more PTZ cameras

In the application, you organize radars and PTZ cameras in groups. A group consists of one radar and one or more PTZ cameras that are controlled with motion data from the radar.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Select **Create group** and type a name for the group.
3. Select **Add security radar** and enter the radar's IP address.
   To connect via HTTPS, select **Options** and select **HTTPS**.
4. If you haven't configured the radar, click **Status: Not configured** and follow the instructions in the application.
5. Select **Add camera** and enter the PTZ camera's IP address.
   To connect via HTTPS, select **Options** and select **HTTPS**.
6. To configure the PTZ camera, click **Status: Not configured** and follow the instructions in the application. For more information, see .

Note

For more information about configuring your radars or PTZ cameras, see the user manuals available at *help.axis.com*.

Pair one PTZ camera with multiple radars

To pair one PTZ camera with multiple radars, create one group for each radar, and add the same PTZ camera to each of the groups.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Select **Create group** and type a name for the group.
3. Select **Add security radar** and enter the radar's IP address.
   To connect via HTTPS, select **Options** and select **HTTPS**.
4. If you haven't configured the radar, click **Status: Not configured** and follow the instructions in the application.
5. Select **Add camera** and enter the PTZ camera's IP address.
   To connect via HTTPS, select **Options** and select **HTTPS**.
6. To configure the PTZ camera, click **Status: Not configured** and follow the instructions in the application. For more information, see .

Note

We recommend that you turn off tracking for the PTZ camera until you have paired it with all intended radars. Right-click on the PTZ camera and click **Turn off**. If you pair the camera with more than two radars, turn off the PTZ tracking for each group.

7. Create a new group for each radar, and add the same camera to each group.

Note

When you pair one PTZ camera with multiple radars, the PTZ camera treats the radars the same and will track any detected objects based on the control queue settings in the camera.

Calibrate the PTZ camera

When you add a PTZ camera in the application, you have to calibrate it. To make the calibration easier, there are a few things to consider:

- The calibration is based on three positions: the location of the PTZ camera and two calibration points. These three positions create a plane.
- The calibration points are used for calibrating the camera view to the background image. This means that you can select calibration points outside the radar's detection zone.
- Select the first calibration point in the same direction as the most distant point of the detection zone. Preferably, select a calibration point that is further away. If the calibration point is close to the radar, a small angular error will result in large deviations at more distant object locations. The detected object might fall outside of the camera view.
- Select a second calibration point at, or beyond, the perimeter of the area of interest. The performance of the camera tracking works best inside the triangle made up of the PTZ camera position and the two calibration points.
- Consider the elevation in the scene when you select the calibration points. If the three positions are set on different height levels, the application assumes that the whole detection zone is a tilted plane. The radar has no information about height. If an object is detected on another level than the area set out from the calibration points, the PTZ camera might be tracking below the object of interest.

Use the tracker only outside office hours

1. Go to the radar's web interface and set up a schedule that defines the hours you want the tracker to work. You can also use the default schedule **After hours**.
2. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
3. Right-click the group and select **Group settings**.
4. Turn on **Tracking schedule**.
5. Select the schedule you created in the radar.
   If you can't find the schedule in the list, click ↻ to refresh the list.

Note

If you want to use the tracker after office hours on weekdays and during weekends, you need to invert the default schedule **Office hours**.

Follow the instructions in the list, select the default schedule **Office hours**, and then select **Turn OFF tracking according to schedule**.

Track a specific object type

You can select if you want the tracker to only track vehicles, humans, or unknown objects.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Expand the group that the camera belongs to.
3. Right-click the PTZ camera and select **Camera settings**.
4. Under **Track on**, select which object type you want to track.

Note

If you select **Only track events from this scenario**, the application automatically populates the object types under **Track on** based on the scenario configuration in the radar. For more information, see .

Use scenario-specific filters in the radar

You can set up the tracker to only track objects during radar alarms. Radar alarms are based on scenarios, which are a combination of triggering conditions and detections settings that you configure in the radar's web interface.

Before you start:

- Create a scenario in the radar where you define the object type to trigger on, and if the radar should trigger on objects moving in a defined area, or objects crossing two virtual lines.
- For detailed instructions, see the radar's user manual at *help.axis.com*.

Only track during radar alarms:

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Right-click the group of your choice and select **Group settings**.
3. Turn on **Only track during radar alarm**.

Only track objects from a radar scenario:
This limits the PTZ camera to only track objects from the scenario you have set up in the radar, instead of tracking all objects during a radar alarm.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Right-click on a PTZ camera in the group and go to **Camera settings**.
3. Turn on **Only track events from this scenario**.

Prioritize a specific scenario in the radar:
Follow these steps if you have set up more than one scenario in the radar and want the tracker to prioritize one over the others.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Right-click on a PTZ camera in the group and go to **Camera settings**.
3. Turn on **Prioritize scenario** and select a scenario from the drop-down menu.

Control when the PTZ camera returns to its home position

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Click  .
3. Go to **Global settings** > **Return to home delay** and set the time of inactivity before the PTZ camera returns to its home position.

Pause AXIS Radar Autotracking for PTZ

You can pause AXIS Radar Autotracking for PTZ in several ways.

Pause all tracking (option 1):

1. Go to Windows® task bar and right-click **AXIS Radar Autotracking for PTZ**.
2. Select **Stop service**.

Pause all tracking (option 2):

1. In the radar's web interface, go to **Radar > Settings > General**.
2. Turn off **Radar transmission**.

Pause tracking for a specific detection area:

1. In the radar's web interface, go to **System > Events**.
2. Click **+ Add a rule**.
3. Type a name for the rule.
4. In the list of conditions, under **Radar motion**, select the scenario the rule should apply to.
5. In the list of actions, select **Radar detection**.
6. Select **Detection off** as state.

Turn off tracking for one PTZ camera

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Expand the group that the camera belongs to.
3. Right-click the PTZ camera and select **Turn off**.

Additional settings

Access the radar or PTZ camera's web interface

The application handles basic settings needed for tracking. To configure the radar or PTZ camera, go to the web interface of each device.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Expand the group that the device belongs to.
3. Right-click the device and select **Copy device address**.
4. Start a web browser.
5. Paste the device address in the browser's address field.

The user manuals for Axis radars and Axis PTZ cameras are available at *help.axis.com*.

Export or import settings for backup and migration

You can export your settings for backup or migration to another system, and import them to restore your configuration or use when migrating from another system.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Click .
3. Go to **Backup & migration**.
4. Click **Export** or **Import** and follow the instructions in the application.

Learn more

Override tracking

An operator can always take control of the PTZ camera and override AXIS Radar Autotracking for PTZ.

When you add a PTZ camera to AXIS Radar Autotracking for PTZ, the application creates a new user in the camera with viewer privileges. The viewer has lower priority than an operator's or an administrator's privileges.

You can adjust the default priorities in the PTZ camera's control queue settings.

Troubleshooting

Technical issues, clues and solutions

Problems tracking objects	
The PTZ camera lose track of moving objects.	Try the following: • Go to **Camera settings** and adjust the zoom level to a lower value. • Recalibrate the camera. See .
The PTZ camera moves back and forth, missing the object (also called overshooting)	Try the following: • Check the network latency, see . Preferably, the server and cameras should be connected to the same switch. • Go to **Camera settings** and decrease the camera speed. • Limit the network load during setup. See .
The PTZ camera is spinning	Sync the time and date of the PTZ camera and the radar with an NTP server. To check the status, go to **Status > Time sync status** in the web interface of each device. If the status shows **Synchronized: No**, click on **NTP settings** and select a time source for synchronizing the device. Make sure to use the same time source for both devices.

Problems with configuration	
Your latest configuration changes haven't taken effect.	If you make any changes in the radar configuration, restart the service.

Troubleshoot the calibration

If the camera isn't tracking objects correctly after calibration, it's likely due to one of the following causes:

- The scale is not set correctly during map calibration.
- Selected points on the map don't match the calibration points.

Try the following:

- Make sure to use as much as possible of the radar stream. Position the radar so its field of detection covers as much of the stream as possible.
- Make sure that the scale of the map is correct.

To adjust the position of the radar and the scale of the map, go to **Radar > Map calibration** in the radar's web interface. For detailed instructions, see the user manual for your radar on *help.axis.com*.

To validate the calibration:

1. In the radar's web interface, go to **Radar > Settings > Object visualization** and set **Trail lifetime** to 1 minute.
2. On the site you're monitoring, ask someone to walk from the radar to the first calibration point and stop there.
3. In the radar's web interface, check that the trail on the map corresponds with reality. If the trail on the map deviates, redo the map calibration.
4. When you're happy with the map calibration, re-calibrate the PTZ camera.

Make a screen recording of the tracker's behavior

If you need to contact support, it can be helpful to record the behavior of the tracker.

1. In the Windows task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Select a group.
3. Click on the reference map.
4. Click ⋮ and select **Show extended information**.
5. Make a screen recording with a suitable application.

Lower the network load

To limit the network load during setup, you can lower the video quality used by the tracker's user interface. This does not affect the quality of the recordings.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Click ⚙.
3. Go to **Video quality** and select a lower option.
4. Click **Close and restart service**.

Turn on debug logging

If you need to contact support it can be helpful to provide debug information. The debug log is saved in the diagnostics report.

Note

The debug logging must be turned on when the issue occurs, otherwise there will not be any debug information in the diagnostics report.

If the debug logging is turned off, turn it on and reproduce the problem before saving the diagnostics report.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Click ⚙.
3. Under **Troubleshooting**, turn on debug logging.

Save a diagnostics report

The diagnostic report contains system settings, calibration reports (including images from the radars and PTZ cameras), and debug logs.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Click ⚙.
3. Under **Troubleshooting**, click **Save diagnostics report**.

Save a calibration report

A calibration report contains calibration information and images from the radar or PTZ camera of your choice.

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Expand the group that the device belongs to.

3. Right-click the device and select **Save calibration report**.

Turn on latency display

1. In the Windows® task bar, right-click **AXIS Radar Autotracking for PTZ** and select **Open AXIS Radar Autotracking for PTZ**.
2. Select a group.
3. In the overview map, click ⋮ and select **Show extended information**.

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