art sentry

Zone Tuning Guide

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Getting Started

Recording Options Explained

There are several different recording options to choose from when deciding how you would like a camera to store video, but only 3 of the options involve the use of motion/alarm zones:

- **Motion / Alarm**: Video from the camera will be saved when motion is detected in user-drawn motion zones. These are light blue zones on the image. A simple red zone can also be drawn, which will generate alerts when motion is detected within. These simple zones cannot be named, and it does not allow for individual motion thresholds like Advanced Analytics.

- **Advanced Analytics**: An advanced version of Alarm Recording, with additional functionality and options for multiple, unique alarm zones per camera. Motion zones are also available to set up within this mode.

Below are some of the more important settings to consider within each of the recording options. These may be set before or after configuring zones:

- **Codec:** Art Sentry offers h.264 and MJPEG codecs for video streaming. Based on which codec is chosen and the settings configured, a low latency time is achievable. This helps ensure a near-immediate detection time for any zone breaches. Art Sentry recommends configuring cameras for h.264 codec, with a minimum FPS of 10.

- **Threshold:** This setting represents how sensitive the zone is in identifying motion. The lowest sensitivity setting will trigger recording on the lowest amount of detected motion.

- **Time Before(s):** This setting represents the number of seconds that the system should include in the stored video before motion begins.

- **Time After(s):** This setting represents the number of seconds that the system should include in the stored video after motion has stopped.

Zone Tuning Process

In order for the Art Sentry Object Protection software to function properly and perform at its highest capabilities, care must be taken during the process of setting up motion and alarm zones. Motion and alarm zones should be optimized over a period of time for best long-term results and most accurate alarming.

There are 3 important phases that should be planned out over the lifetime of the Art Sentry system involving alarm zones:

- **Zone Tuning** - Initial Motion, Alarm, and Lighting Zone Setup

- **Zone Optimization** - Review Results and Improve Zone Settings

- **Zone Audit** - Zone Checkup and Audit

Zone Tuning

Zone Tuning Explained

Zone tuning is the setup of motion and alarm zones once the Art Sentry system has been installed. It involves physically drawing the motion and alarm zones over surveillance or object protection cameras' views for video recording and alarming. There are four different types of possible zones: Motion, Alarm, Loitering, and Lighting.

Motion Zones

Motion zones are used to tell the system when to start and stop the recording of a camera. For motion zones, any time the Art Sentry system detects movement within the zone, the system will record and store the video. The zone is represented as cyan in the Administrator Utility, and will trigger recording whenever the zone is breached.

The first step in setting up motion zones is to identify the areas in the view where you would like to record video on detected movement. These areas should all be protected with a motion zone.

The next step is identifying areas in the camera's view where motion will occur, possibly repeatedly, but it is not necessary to record. These areas should not have a motion zone covering them. Making sure unnecessary motion isn't stored will not only save storage space on the server but will also save the user's time while reviewing video. There will be less unnecessary video to go through when searching recordings looking for a specific event. Some examples of areas in a cameras view that may have continuous motion without need for recording are:

- Exterior camera view that has a tree in the background. The tree may always be moving with the wind, which would cause continuous recording if covered with a motion zone.

- Exterior camera parking lot view with a busy street in the background. If the parking lot is what is of interest in the view, the street should not be covered with a motion zone, as it would result in near continuous recording.

- Areas of direct sunlight, where non-repetitive shadows from the exterior of the building may occur. The software does filter out repeated motions, such as escalators, screensavers, etc.

Alarm Zones

Alarm zones have the same functionality of motion zones, but will also set off an alarm whenever breached and store the video as an "incident", definable by the user. The alarm may be an audible alarm on the Client, the camera's view will be highlighted with a flashing red border on the live view screen, and the alarm instance will be added to the Unacknowledged Alarms list. The alarm can also be automatically sent to a pager or cell phone via text message or email.

The first step in setting up alarm zones is to identify the areas in the view where you would like to alarm and record video on detected movement. These areas should all be protected with an alarm zone. Object protection cameras are set up to best enable the user to create accurate alarm zones that limit false alarms. Below are some helpful tips to consider when setting up alarm zones:

- **Avoid alarm zones on reflective backgrounds**
  Avoid adding alarm zones over reflective backgrounds. Reflective backgrounds may inaccurately alarm from movement in a reflection. Try utilizing a border drawn on a non-reflective surface to create your zone.

  - **Example:**
    If you want to protect a painting on the wall that has a glass cover - don't create an alarm zone that covers the entire painting. Try to create an alarm zone that only covers the

wooden, non reflective frame of the painting. This will yield the same results as if you had fully covered the painting with an alarm zone without the false alarms due to reflections.

- **Avoid alarm zones on objects with strongly casted shadows**
  Strong shadows may cause false alarms. Try to avoid creating zones in areas where a strong shadow may be cast on the object from normal patron activity. For example, a painting that has lighting which causes a shadow as the patron approaches.

  - **Potential Workarounds:**
    One recommendation is to talk to the curatorial staff or responsible party about the lighting setup. This may be an opportunity to improve the visibility of the art as well as increase the accuracy of your alarm zone.

    If lighting changes aren't feasible, you can increase the alarm threshold parameter and draw the alarm zone over areas of the view without a drastic change in shadows. Dark colored objects see less of a visual change when a shadow is cast over them and will yield less false alarms when utilized properly.

- **Always start with high motion thresholds (80s-90s) and work your way down over time**
  When initially tuning alarm zones, it is recommended to start working with higher thresholds versus using lower, more sensitive thresholds. If the sensitivity is too low, you could be inundated with false alarms. Over time, if you are noticing the zone is not alarming as it should, adjust the threshold level downwards.

- **Avoid setting alarm zones on objects with views that may be obstructed or have activity in the background**
  Alarm zones should be set up so that normal patron behavior, like walking through a doorway, should not set off an alarm. Zones should also not be breached by background activity. For instance, consider the position of the sculpture relative to the camera and the alarm zone to avoid background activity setting the alarm off.

Loitering Zones

Loitering zones are essentially a delayed version of an alarm zone. A loitering zone allows movement to occur within the zone for a specified period of time before an alarm is triggered.
To use a loitering zone, first draw your zone as a regular alarm zone within the Motion/Alarm Zone Configuration dialog. Select the zone, and click the "Delayed Alarming" checkbox. The two settings you will need to configure from here are:

- Motion Duration - time of motion before alarm should trigger

- Allowed Gap - the allowed gap of no-movement during a motion event before resetting

Loitering zones are best used for outdoor alarming, or in situations where difficult shadows occur and are unavoidable.

Lighting Zones

The purpose of using a lighting zone is to prevent any zone within a view from alarming when the lights in the room are turned on or are turned off during normal activity.

To use a lighting zone in your view, first find an area in the view where there is no chance any movement will occur. Typically this area would be somewhere high on a wall or ceiling. It is important that nothing in the lighting zone changes except when the lights are turned on or off. It is only necessary to have one lighting zone per view.

When to Tune Zones

- Upon initial system installation

- During follow up zone optimization tuning

- Whenever stationary objects in the camera's frame of view are moved to new locations

- Whenever the camera's aim or focus is adjusted

How to Tune Zones

1. Log in to the Art Sentry client

2. Click the "Admin" button dropdown from the toolbar at the top of the window.

3. Click "Admin Utility" from the drop down (Note: this option is only available to system administrators)

4. Once the Admin Utility opens, click the "Cameras" tab

5. Review the list on the left side of the screen and click the camera name that you would like to tune zones for. The camera's information page will be shown.

6. Under the "Recording Options" menu, select the "Analytics" radio button.

7. Click the "Configure Analytics" button to the right of the recording option radio buttons

8. The Zone Configuration Dialog will open up.

    a. To create or edit a zone, first select "Zone Type"

    b. Name your zone. Choose a name that describes the item or piece you are protecting. This name will allow you to easily report on particular pieces. For best results, try to add a different alarm zone for each individual piece you are protecting so that different thresholds can be set and alarming and reporting is much more granular.

    c. Next, select the "Drawing Tool" you would like to use to draw your zone

    d. Draw your custom zones on screen

    e. Set the zone's Motion Threshold

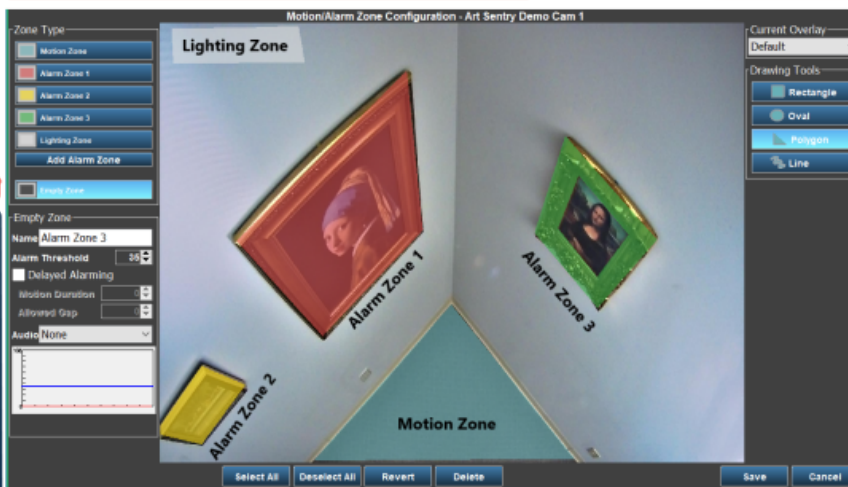   f. Click Save once all zone settings are set

Zones Types

Motion Zone - This zone is represented as blue. The motion zone triggers recording whenever breached.

Alarm Zones - There can be multiple unique alarm zones added, representing colors other than blue/white. Alarm zones trigger a recording as well as an alarm whenever breached

Lighting Zone - This zone is represented as white. A lighting zone is added to the frame in an area where no motion will ever occur. This zone will prevent lights on/lights off from triggering

Overlay

Select the overlay from this drop down that you would like to edit. Cameras are able to have multiple overlays assigned to a daily/weekly/monthly schedule

Zone Drawing Tools

Rectangle - Click, hold, and drag on the screen to draw a rectangle shaped zone

Oval - Click, hold, and drag on the screen to draw an oval shaped zone

Polygon - Click each corner of a custom shape to fill in a polygon. Each click on the screen will add a corner to the polygon shape.

Line - Click, hold, and drag on the screen to draw a freestyle line

Select All - Highlight the entire frame with the selected zone
Deselect All - Remove all zones from the frame
Revert - Revert to the last saved zone overlay
Delete - Delete the current zone selection

Zone Customization

Name - Customize the name of the zone. This name will appear in the alarms list whenever the zone is triggered for added information.

Alarm Threshold - This is the sensitivity setting of the alarm zone (0-100). A low sensitivity setting will trigger on a smaller amount of detected motion.

Delayed Alarming - Also known as "loitering zone". This setting is used when the alarm should only be triggered after motion is active in the zone for a preset amount of time.

Audio - Customize the audio file that is played when the alarm is triggered.

Graph - This is a tool used for zone optimization. The red line represents the zone alarm threshold reading. The blue line represents the preset alarm threshold

Empty Zone

Select Empty Zone and a Drawing Tool to remove parts or all of a zone. The Empty Zone tool is similar to an "eraser"

Example: The above graphic displays the Zone Configuration dialog with field definitions

Zone Optimization

Zone Optimization Explained

Zone optimization is the continuous process of adjusting and improving zone setup to get the most effective and accurate results possible. Optimization starts after the initial zone is set up and some time has passed in order to have results to review. The process of optimization includes a few key areas to consider:

- Is the zone recording too much unnecessary activity?

- Is the zone missing activity that should be recorded?

- Is the zone producing too many false alarms?

- Is the zone not alarming on activity when there should be an alarm?

- Is the zone alarming when the lights are turned on or off?

When to Perform Zone Optimization

- 1-2 weeks after initial zone setup (week should consist of typical facility activity)

- ~1 month after initial zone setup (month should consist of typical facility activity)

- Whenever the system is receiving too many false alarms on a specific zone

- When motion recording storage level of a specific camera is too high

How to Perform Zone Optimization

There are a few different techniques to utilize in the Art Sentry system to help with the zone optimization process. The details are described below:

Motion View Technique

The Motion View gives insight into what the motion tracking software is processing. This View is a special mode of viewing camera footage, selectable during video review or live screen viewing.

The Motion View will open a lower resolution view of the selected camera, with the exact pixels seeing motion highlighted in either red or green. The red pixels highlight areas in the view that are seeing a high amount (larger clusters) of change/movement, while the green pixels show the areas within the view that are seeing slight changes/movement.

While viewing live or recorded footage, the Motion View may be used to figure out why certain zones are not getting triggered when they should be or are getting triggered when they should not be. This view function will show exactly which pixels in the frame are picking up movement.

To use the Motion View, just right click on any camera view in the live view or during a video review, and select the "Motion View" option from the list.
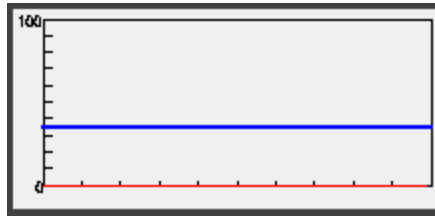

Example: *The above picture shows an example of the Motion View*

Analytics Zone Configuration View Technique

Another option in zone optimization is to use the Analytics Zone Configuration dialog to test each of your zones in real time. The Analytics Zone Configuration dialog is the same dialog that is used when first setting up motion and alarm zones. This technique is best utilized with two people, one person actively viewing and editing the zones on an Art Sentry Client, and one person on the floor coordinating which zones to breach for testing purposes:

1. From the Zone Configuration dialog, select the zone you want to test from the "Zone Type" list

2. Once the zone has been selected, the Recent Motion graph in the lower left corner of the screen will now show data for this zone. The graph shows an updating line graph of what levels of motion the selected zone has had over the last 60 seconds. The level of motion detected is

represented by a red line. The blue horizontal line on the graph represents the current Motion Threshold that is set for the zone. This graph is used for testing purposes, to show the user at which points their zone would go off during testing (red line exceeds the blue line threshold). Here is an example of a Recent Motion graph showing no recent motion (red), and a threshold set at 35 (blue):

Example: The above picture shows a non-active Recent Motion graph

3. At this point, the person in front of the camera would then begin testing the zone. Here are a few things to try:

   a. Different actions that should always set the alarm off
      i. Graph Check - Is the red line always exceeding the blue line when the zone is breached?
         1. Yes - The zone is working correctly
         2. No - The zone is not working how it should.
            a. If the red line is increasing on motion, but not exceeding the blue line - try lowering your threshold on the zone
            b. If the red line is not moving when you are expecting it to - try adjusting your zone to ensure all required areas are covered

   b. Different actions that should not set the alarm off
      i. Graph Check - Is the red line staying below the blue line during this test?
         1. Yes - The zone is working correctly
         2. No - The zone is not working how it should.
            a. If the red line ever exceeds the threshold while the zone has not been physically breached, increase the motion threshold
            b. If the red line is moving when you are expecting it not to - try adjusting your zone to ensure all required areas are covered, and no unnecessary areas have coverage. Watch for strong shadows, reflections or background motion that may be triggering the alarm falsely.

   c. Different actions where a natural shadow would breach the zone

i. Note: if the shadow is breaching the zone and causing an alarm to go off, try to increase the motion threshold to prevent picking up shadows as motion. If the shadows are too strong, physical lighting adjustments may be a better option.

d. Breach zone from different angles

e. Breach zone with lights on vs. off

f. Turn lights on/off to test lighting zones
   i. If the lighting zone is set up correctly, turning lights on and off should not set off alarms.
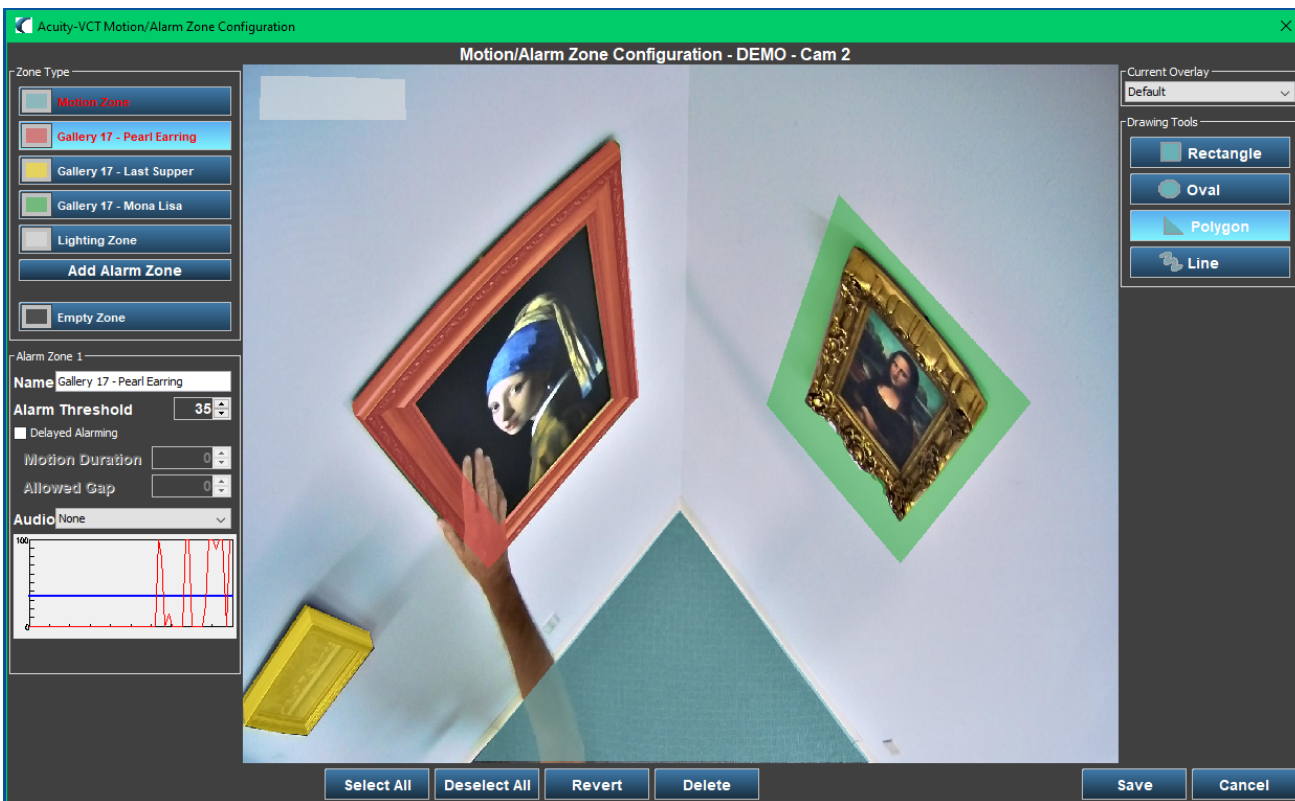
Example: The above picture shows a screenshot taken during zone optimization, displaying 3 different zone drawing techniques over paintings.

Zone Audit

Zone Audit Explained

The zone audit is an important part of maintaining a highly accurate Art Sentry system over a long period of time. It entails checking on zones and making sure that everything is set correctly and working as it should be.

When to Perform Zone Audit

- Zone audit should be performed on a quarterly basis during maintenance mode

- Zone audit should be performed if a camera is re-aimed or refocused

- Zone audit should be performed whenever objects being protected are moved or substituted, or whenever stanchions are re-arranged around the objects being protected

How to Perform Zone Audit

Performing a zone audit is simple. First, open the Administrator Utility and select the camera from the Cameras tab. Next, open the "Configure Analytics" dialog to view the current zone overlay. Things to check on:

- Alarm zones are covering what they are meant to cover, not offline in any way

- Motion zones are covering the areas they are meant to cover

- Motion thresholds are at a reasonable setting

- All required objects are covered with an alarm zone

Contacts

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