

3XLOGIC VISIX GEN III CAMERAS

EDGE-BASED DEEP LEARNING VCA ANALYTICS
USER GUIDE - V2.0.0



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1 INTRODUCTION

This manual will describe how to license, enable and configure VCA (video content analysis) analytics on capable 3xLOGIC VISIX Gen III cameras. An edge-based deep learning analytics engine is utilized for VCA rules on capable (indicated by -X in product number) VISIX Gen III Cameras. A standard object tracking engine is used for 3xLOGIC's VISIX thermal cameras and legacy analytics cameras with VCA support.

VCA Analytics are used to detect events of interest and trigger actions on-camera or within VIGIL Server to react to those events. Deep-learning engines specifically excel for rules created in shallow close-ups and busy environments where traditional movement-based object tracking tends to struggle.

1.1 Getting Started

VCA is applied through the use of VCA rules configured on individual cameras. Some basic VCA rules are included with older VISIX Gen III cameras. These Base Analytics are detailed [here](#) for legacy reference.

If a camera is purchased with the advanced analytics license included (-A [legacy], -X), no further activation should be required as the camera is shipped with the advanced license activated and the proper tracking engine enabled (i.e Deep-learning engine is enabled for capable -X models, standard object tracker engine for thermal). Advanced Analytics are detailed [here](#).



Note: If you have purchased an advanced analytics license for a previously-purchased / older VISIX Gen III model, the license must be applied at the `VCA>License` page. Further details regarding licensing are given in the [License](#) section of this guide.

Before continuing, ensure that you are familiar with the camera's interface and have the username and password available. See the VISIX Gen III User Guide for information on standard operation of VISIX Gen III cameras.

Proceed through the remaining sections of this guide for information on how to install the VCA plugin, license advanced analytics as well as enabling and configuring the features of the VISIX Gen III VCA video analytics ruleset. After creating VCA rules, always add the rules to VIGIL Server to ensure rule data is stored in the VIGIL database. See [How to Add a Rule to VIGIL Server](#) on page [7](#) for detailed instructions on this process.

2 VCAEDGE PLUGIN



For cameras purchased with an analytics license (-A, -X), the VCAEdge plugin is installed and enabled by default. If the VCA menu is not visible on your VISIX Gen III camera, this section provides instructions on installing the VCA analytics plugin so that VCA rules can be activated and created on your VISIX Gen III Camera.

VCA analytics are installed on 3xLOGIC VISIX Gen III Cameras as a plugin. A plugin extends camera functionalities by installing additional software modules. A plugin can be installed and upgraded without rebooting the camera.

Plugin files take the form of a separate firmware file, which is different and operates independently of the camera's main firmware. In the case of the VCAEdge plugin, a single plugin firmware can be used for all VISIX Gen III Cameras, meaning users do not need to acquire different versions of the VCA plugin file for different VISIX Gen III models

2.1 Installing the VCAEdge Plugin

After acquiring the latest VCAEdge plug-in firmware from your 3xLOGIC representative, the plugin must be installed on your VISIX Gen III Camera(s) in order to activate VCA. After logging in to your 3xLOGIC VISIX Gen III Camera:

1. Click the **Setup** button.
2. On the left-side menu, click **PLUG-IN**, located under the *SYSTEM* menu. The Plug-In page will deploy.



Figure 2-1: PLUG-IN Menu

- **Plug-in List** - Lists installed plugins.
- **Information** - Shows detailed information about the selected plugin.

- **Plug-in Update** - Allows the user to choose a plugin to install. Also displays the amount of flash memory currently in use.
- **Uninstall** - Remove a plugin permanently
- **Start / Stop** - Manually start or stop an actively installed plugin.

3. Click **Select File**. Select the plugin firmware to install.



Note: The file name of plugin firmware is composed of 'plugin-<module>-<version>-<build information>.enc'. For example, VCAedge 1.0.23 has the following file name: plugin-vcaedge-V1.0.23-g0142a451.655.enc

4. Click the **Upload Plug-In** button to install the plugin.

When the plugin is successfully installed, plugin status will appear as depicted below.

PLUG-IN

Name	Version	Status
VCAedge	1.0.23	running

Configuration Stop Uninstall Logs

Plug-in Settings

Import plug-in setting File **Select Import File**

*Events attached to VCA rules are not imported or exported.

Import Export Default Settings

Information

Description Video contents analytics for the edge device

Minimum required

Firmware	2020.02.12
Plug-in	none

Plug-in Update

Current storage usage 46 %

Select plug-in File **Select File**

Upload Plug-In

Select a plugin to see additional information as pictured above.

The VCA sub-menu should now be visible on the left-side *SYSTEM* menu. Navigate there to activate VCA and start creating VCA rules.

2.1.1 Update an Existing Plug-In

When you need to install a new version of an existing VCA plugin:

1. Navigate to the **Plug-In** menu. Installed plugins will populate the list. Select a plug in from the list to see detailed information
2. Click **Select File** to choose a new version of the plugin

3. Click **Upload Plug-in** to begin the update process. The old version of the plugin will be removed automatically before installing the new plugin.

3 ENABLE/DISABLE VCA

After installing the VCAEdge plugin or confirming the plugin is already installed, the VCA engine can be activated. This will permit the creation and use of VCA rules. By default, VCA is disabled.



For cameras purchased with an analytics license (-A, -X), the VCAEdge plugin is installed and enabled by default. If the VCA menu is not visible on your VISIX Gen III camera, this section provides instructions on enabling the VCA analytics plugin after completing [plugin installation](#).

3.1 Activation

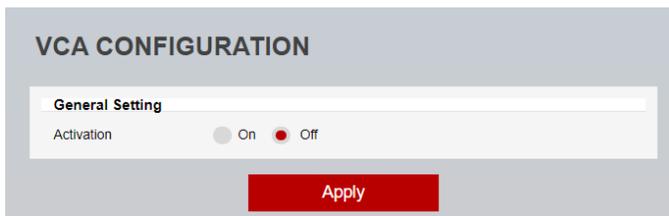


Figure 3-1: Activation Settings

1. Login to your VISIX Gen III Camera and click the **Setup** button.
2. Using the left-hand menu, navigate to the VCA > Enable page, select On and Apply to turn VCA on. Select Off and Apply to turn the VCA off.



Note: The menu system will reload after each Apply to reflect the features that are available, the availability will depend on the license that has been applied.



Note: If you have purchased an advanced analytics license, the license must be applied to allow the use of advanced analytics rules and features. See the License section on page 58 for more information on applying licenses.

3.2 Tracker Engine



Figure 3-2: Tracker Engine Selection

The tracker engine settings form is enabled for Gen III -X (CV22) analytics cameras.

- **Object Tracker:** This is a motion based detection engine, based on changes detected in the image, the algorithm separates the image into foreground and background, tracking any foreground object that is moving above a set threshold.



This option is unavailable for -X cameras running the latest (Q3 2023 and newer) firmware.

- **Deep Learning People Tracker (DLPT):** Designed to track people in situations where the camera field of view is relatively close. It is based on Pose Estimation technology, providing the location of a person in the field of view as well as additional key point metadata on parts of the body.
- **Deep Learning Object Tracker (DLOT):** Designed for accurate detection and tracking of people, vehicles and other key objects in challenging environments where motion based tracking methods would struggle. It is based on a classification and detection model, providing the location of an object in the field of view.



Note: The menu system will reload after each apply to reflect the features that are available, the features that are visible / available will depend on the license and camera (hardware) model.

4 RULE(S) TABLE

Navigate to VCA> Rules to view the Rules Table. The Rules table will show the VCA rules that have been defined on the camera.

- **Add** is used to add additional rules.
- **Modify** is used to change the settings on a selected rule.
- **Delete** is used to remove the selected rule.



Note: Rules cannot be deleted if they are linked to an action or counter. Remove these links before attempting to delete.

4.1 Rules

Rules are used to create reactions to events within a scene and trigger appropriate actions. To manage rules, navigate to the Rules feature from the VCA menu.

The Rules page displays a live view from the camera and allows you to add, modify or delete rules.

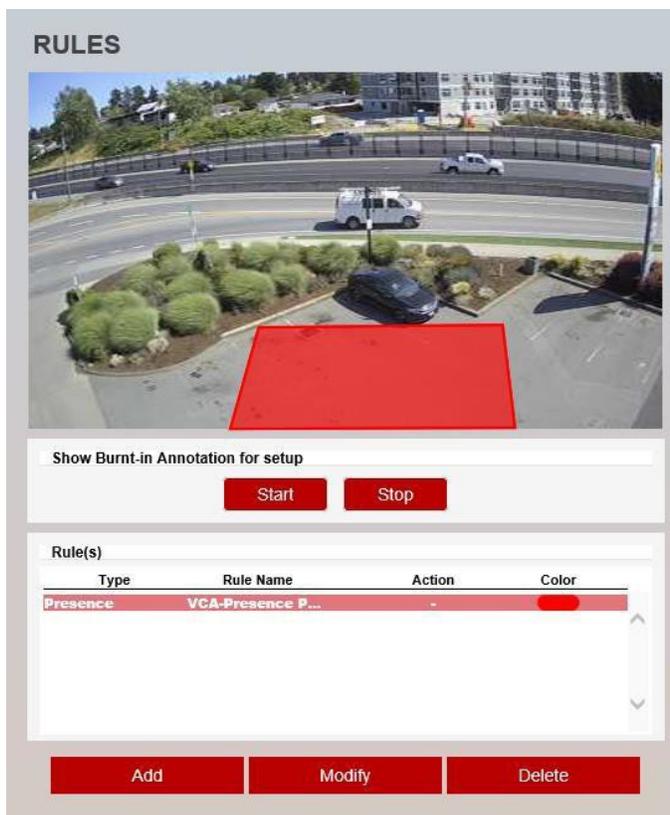


Figure 4-1: Rules Screen

4.1.1 Show Annotation

Use this option to show analytic data (zones, lines, counters) on the camera view. Select Start to show the data and Stop to hide the data



Note: This does not affect the processing of analytic data.

4.1.2 How to Add a Rule

1. Select **Add** to display the available rules.
2. Select the rule to be added.
3. Configure the rule accordingly.
4. Select **Save**.

4.1.3 How to Modify a Rule

1. Highlight the rule to be modified.
2. Select **Modify** to open the settings for the rule.
3. Modify the rule accordingly.
4. Select **Save**.

4.1.4 How to Delete a Rule

1. Highlight the rule to be deleted.
2. Select **Delete**.



Note: Rules cannot be deleted if they are linked to an action or counter. Remove these links before attempting to delete.

4.1.5 How to Add a Rule to VIGIL Server

After creating a VCA rule on the camera, the rule must be added to VIGIL Server so that related data can be stored in the VIGIL database. To begin:

1. Login to VIGIL Server.
2. Open **Advanced Settings**(VSMU) and navigate to the **Camera Setup** tab.
3. Select the camera channel associated with the camera you have created the VCA rule on.
4. With the camera selected, open **Network Camera Settings**.
5. Click the **On-Board Analytics** button to launch the *On-Board Analytics Utility*.

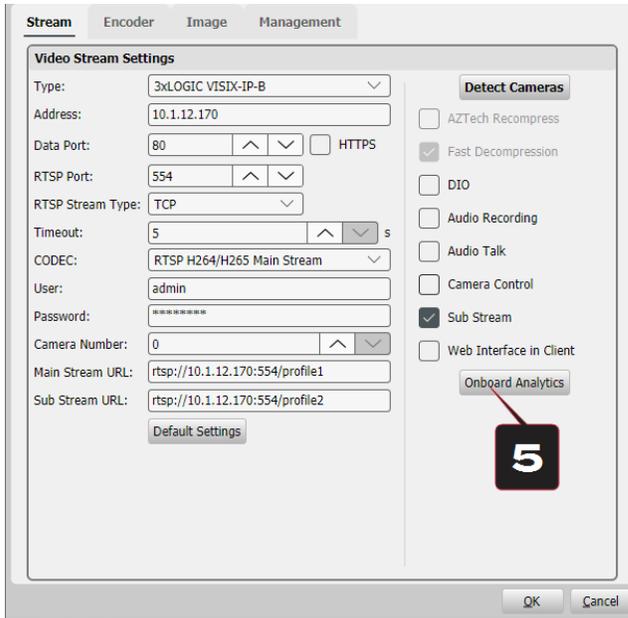


Figure 4-2: Launch VIGIL Server's On-Board Analytics

This utility will display connection information for the camera (automatically populated by VIGIL Server) as well as VCA rules options. It will also list all VCA analytic rules that have been constructed on the camera. VCA rules will populate the *Event Trigger* list.

6. Enable the On-board Analytics interface.

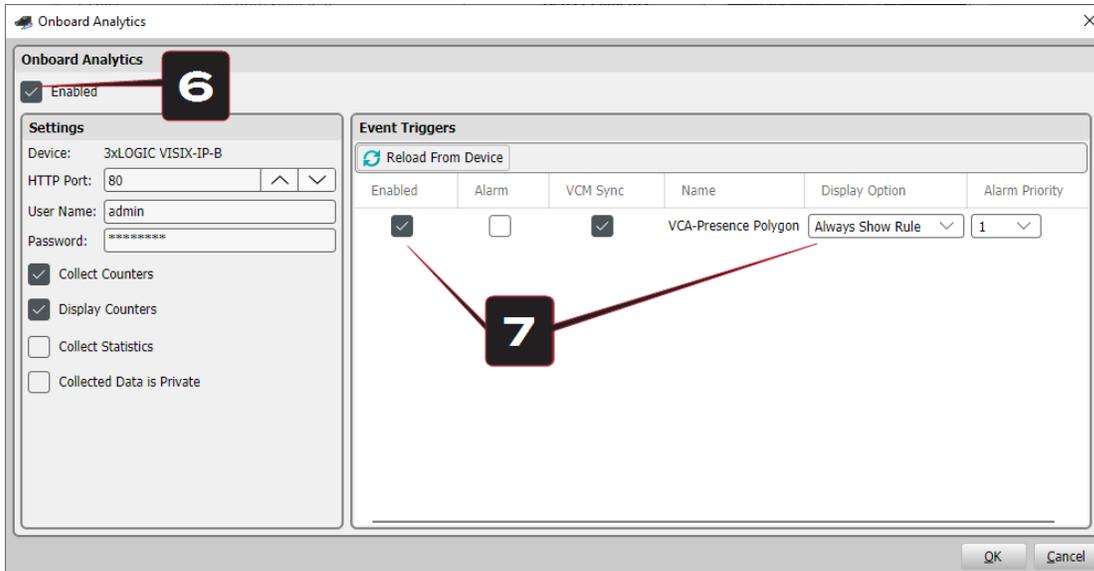


Figure 4-3: Interfacing VCA Rules with VIGIL via VIGIL On-Board Analytics UI

7. Enable the desired rules by toggling the **Enabled** checkbox for each desired rule, under the *Event Trigger* list. Using the provided drop-down for each rule, set **Display Options** (*Never Show Rule*, *Always Show Rule*, *Show Rule When Alarmed*) and **Alarm Priority** (alarms can be filtered in VIGIL utilities based on priority level).

8. If desired, toggle **Alarm**(the rule will trigger an alarm in VIGIL Server when activated) and **VCM Sync** (rule data will be synchronized to the VIGIL Central Management analytics database) options can also be enabled at this time.
9. Click **OK** to save the settings and add the enabled rules to VIGIL Server.

5 BASE ANALYTICS – AVAILABLE RULES

Some basic rules are available with older VISIX Gen III cameras without the need for an additional license. Base analytics rules and features are described below for legacy reference:

Rules

- **Presence Polygon** - The Presence Polygon Rule triggers an event when an object is first detected in a selected zone.
- **Presence Line** - The Presence Line Rule triggers an event when an object is first detected crossing a selected line.

Features

- **Tamper Detection** - The Tamper feature is intended to detect camera tampering events such as bagging, defocusing and moving the camera. This is achieved by detecting large persistent changes in the image.
- **Object Tracker** - Base analytics includes on-screen trackers around detected objects.

Please read through the proceeding sections of this guide for specific details pertaining to each individual rule or feature.

5.1 Presence Filters - Presence Polygon

The Presence Polygon Rule triggers an event when an object is first detected in a selected zone.



Note: The Presence Polygon Rule will trigger in the same circumstances as the Enter and Appear Rules. The appropriate rule will depend on the scenario.

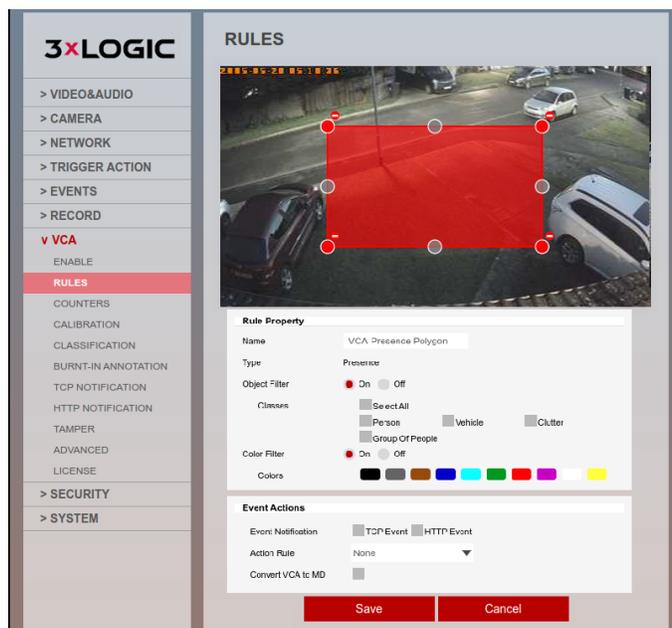


Figure 5-1: Presence Polygon

The Presence Polygon Rule will create a zone and overlay it on the live view. The zone can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. In order to remove a segment, select the minus sign next to a red node.

5.1.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	The classifier defined in the classification

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	the classifiers defined in the classification
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- **Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

5.1.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs. The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule,

as it leaves the zone. A notification will be sent for each object triggering the rule.

- ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

5.2 Presence Filters - Presence Line

The Presence Line Rule triggers an event when an object is first detected crossing a selected line.



Note: The Presence Line Rule will trigger in the same circumstances as the Direction and Counting Line Rules, the most appropriate rule will depend on the scenario.

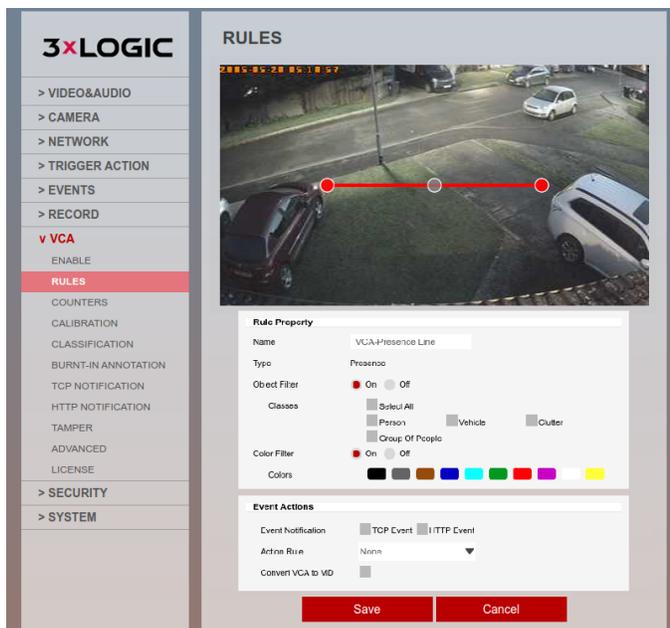


Figure 5-2: Presence Line

The Presence Line Rule will create a line and overlay it on the live view. The line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the minus sign next to a red node to remove a segment.

5.2.1 Rule Properties

- **Name:** Define the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	The classifier defined in the classification

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	the classifiers defined in the classification
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

5.2.2 Event Actions

- Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs. The following applies for the notification methods selected.
- Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.

- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

5.3 Tamper Detection

The Tamper feature is intended to detect camera tampering events such as bagging, defocusing and moving the camera. This is achieved by detecting large persistent changes in the image.

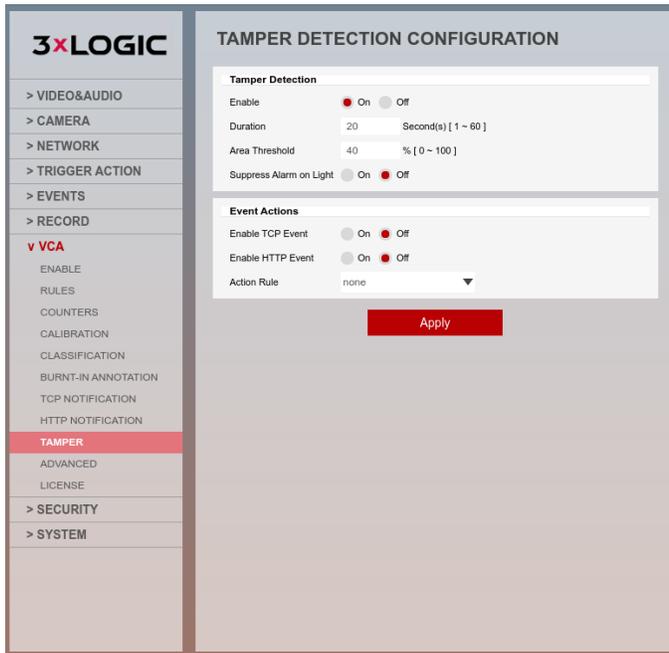


Figure 5-3: Tamper

5.3.1 Tamper Detection Configuration

- **Enable:** Defines if the tamper detection feature will be on or off.
- **Duration:** Defines the length of time that the image must be persistently changed before the alarm is triggered.
- **Area Threshold:** Defines the percentage area of the image which must be changed for tampering to be triggered.
- **Suppress Alarm on light:** In scenarios where sudden changes in lighting such as switching on/off indoor lighting can cause false tamper events.



Note: The Tamper Detection option will reduce sensitivity to genuine alarms and should be used with caution.

5.3.2 Event Action

- **Enable TCP Event:** Defines if a TCP notification will be sent on tamper detection.
- **Enable HTTP Event:** Defines if a HTTP notification will be sent on tamper detection.
- **Action rule:** Allows actions, defined in the camera, to be triggered when an event occurs.

6 ADVANCED ANALYTICS – AVAILABLE RULES

An advanced analytics license is included with -X and -A (legacy) VISIX Gen III cameras. Alternatively, a license can be purchased and applied to existing Gen III cameras (analytics-capable models only) at any time to unlock additional analytic rules and features. Advanced analytics includes all [base rules and tools](#) plus the following:

- **Enter Rule** - The Enter Rule triggers an event when an object crosses from outside of a zone to inside of a zone.
- **Exit Rule** - The Exit Rule triggers an event when an object crosses from inside of a zone to outside of a zone.
- **Appear Rule** - The Appear Rule triggers an event when an object starts to be tracked from within a zone.
- **Disappear Rule** - The Disappear rule triggers an event when an object stops being tracked from within a zone.
- **Stopped Rule** – The Stopped Objects rules detects objects that are stopped inside a zone for longer than the defined amount of time and will trigger an event accordingly.
- **Dwell (Loitering) Rule** – The Dwell rules detects objects loitering (but not fully at a stop) inside a zone for longer than the pre-defined amount of time and will trigger an event accordingly.
- **Direction Rule** - The Direction rule triggers an event when an object crosses the detection line in a selected direction and within the defined parameters.
- **Removed Object Rule** – The Removed Objects rule can be used in conjunction with size- based object classification to monitor significant objects and trigger an event when an object is detected in a rule zone, outside of its expected placement.
- **Abandoned Object** - The Abandoned Object rule detects the abandoning of an object in a predefined zone e. g. a bag or suitcase left on the street.
- **Tailgating** –Object Tailgating rules detects when two objects cross a virtual line or zone within in a pre-defined time frame.
- **Counting Line (Tripwire / People Counting)** - The Counting line triggers an event when an object crosses the detection line in a selected direction, regardless of the angle of the crossing.
- **Logical Rules** - The logical rules option allows rules to be combined to form a complex filter for events to check against which can help to reduce false alerts.
- **Non-Detect Zone** – The non-detect zone option can be used to exclude areas of the scene from being processed.
- **Size Based Object Classification** – Classify objects based on their size. See the “[Classification](#)” section for more info.

Please read through the proceeding sections of this guide for specific details pertaining to each individual rule or feature.

6.1 Enter Rule

The Enter rule triggers an event when an object crosses from outside of a zone to inside of a zone.



Note: The Enter rule detects already-tracked objects crossing the zone border from the outside to the inside.

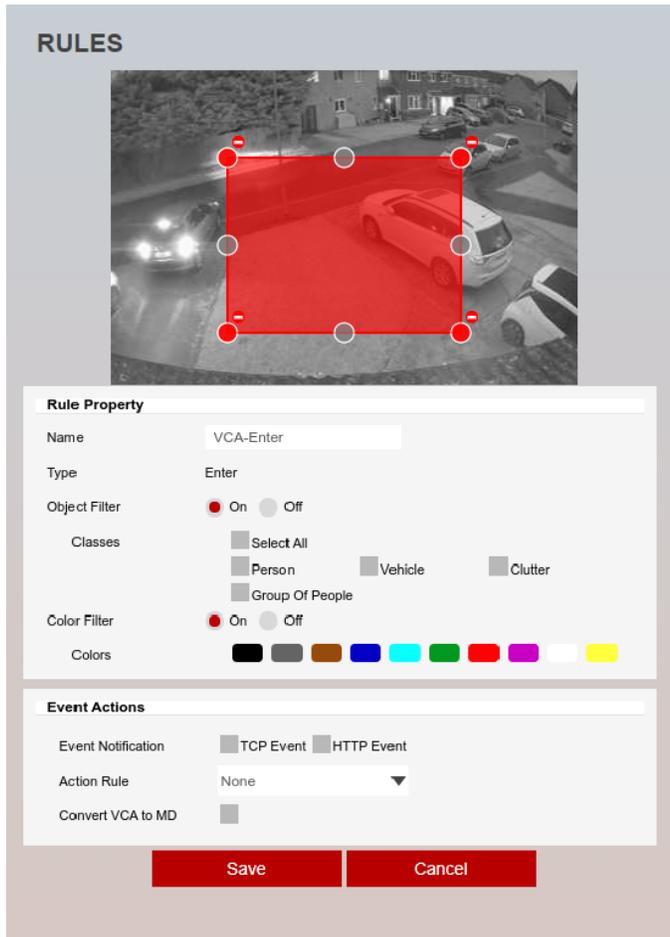


Figure 6-1: Enter

The Enter rule will create a zone and overlay it on the live view. The line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the minus sign next to a red node to remove a segment.

6.1.1 Rule Properties

- **Name:** Define the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifiers defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.1.2 Event Actions

- Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs. The following applies for the notification methods selected.
- Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.2 Exit Rule

The Exit rule triggers an event when an object crosses from inside a zone to outside a zone.



Note: The Exit rule detects already-tracked objects, crossing the zone border from inside to outside.

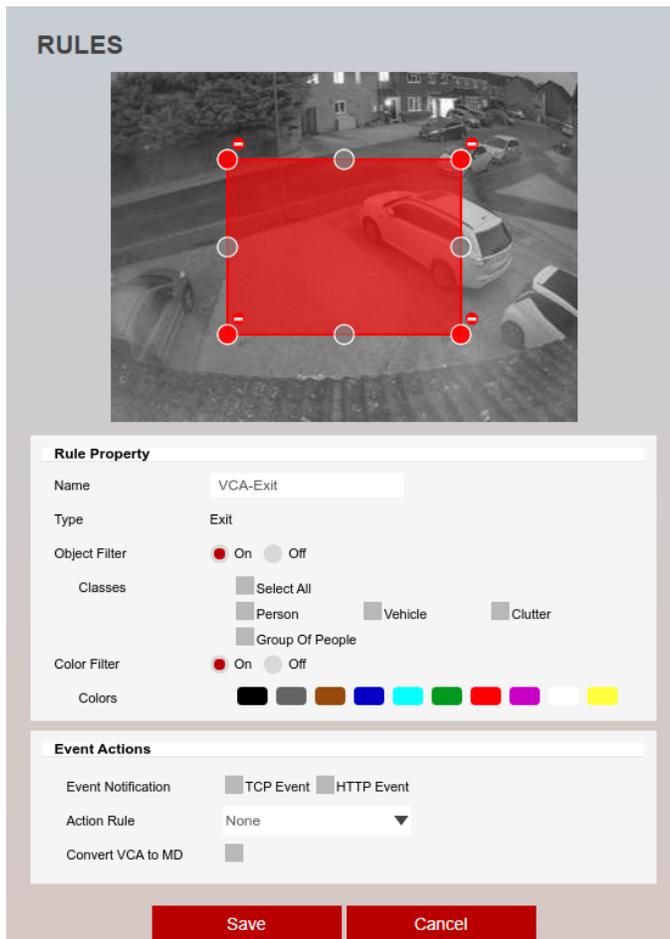


Figure 6-2: Exit

The Exit rule will create a zone and overlay it on the live view. The line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the minus sign next to a red node to remove a segment

6.2.1 Rule Properties

- **Name:** Define the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifiers defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.2.2 Event Actions

- Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs. The following applies for the notification methods selected.
- Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.3 Appear Rule

The Appear rule triggers an event when an object starts to be tracked from within a zone.



Note: The Appear rule detects objects that start being tracked from within a zone.

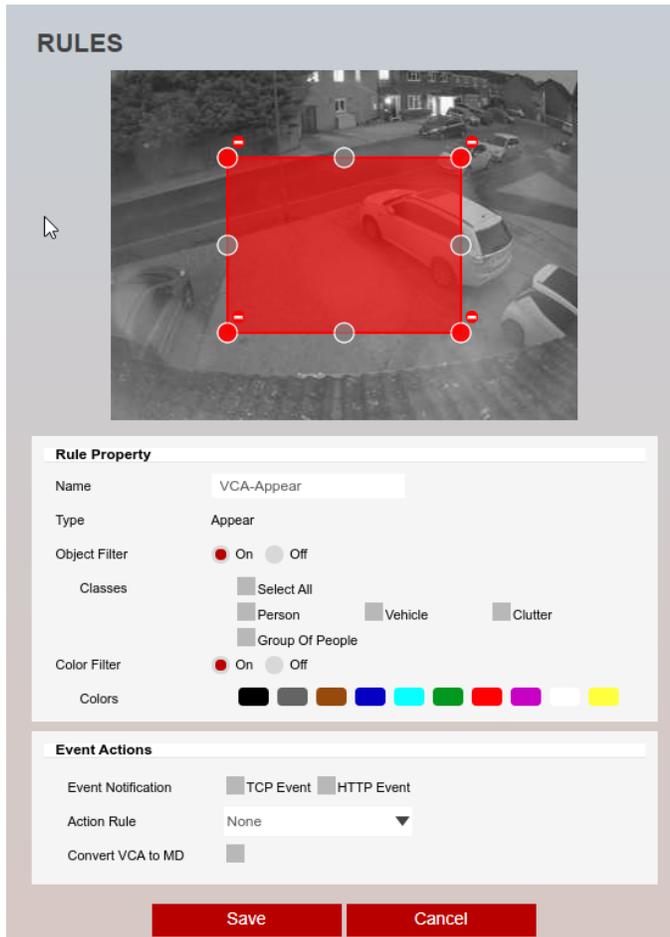


Figure 6-3: Appear

The Appear Rule will create a zone and overlay it on the live view. The line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the minus sign next to the red node to remove a segment.

6.3.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifiers defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- **Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.3.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.
The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.
Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.
- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.4 Disappear Rule

The Disappear rule detects objects that stop being tracked within a defined zone.

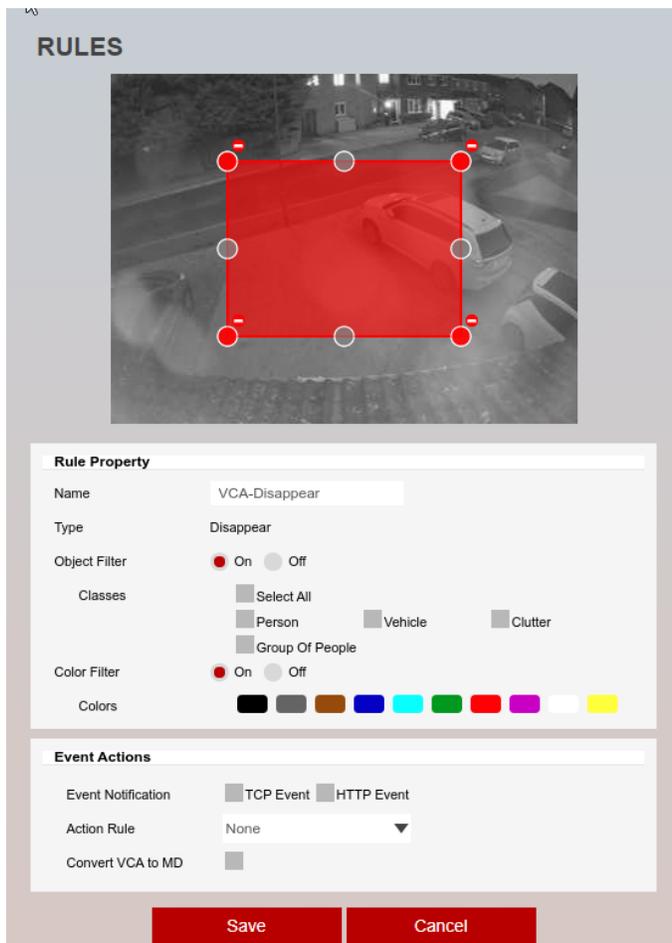


Figure 6-4: Disappear

The Disappear Rule will create a zone and overlay it on the live view; the line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape.

Select the minus sign next to a red node to remove a segment.

6.4.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifier defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- **Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.4.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.

The following applies for the notification methods selected.

- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.5 Stopped Rule

The stopped rule detects objects which are stationary inside a zone for longer than the specified amount of time.

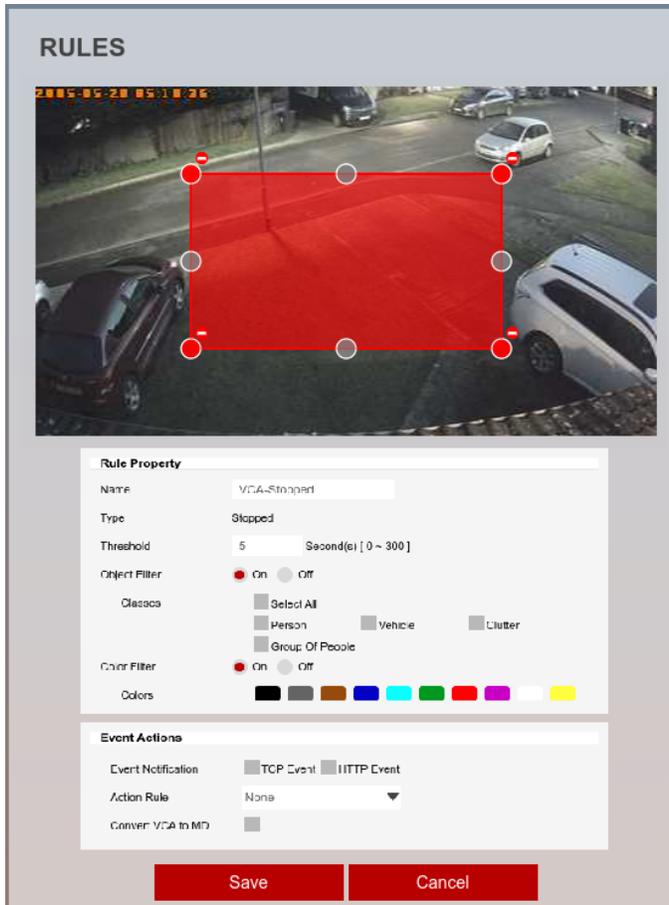


Figure 6-5: Stopped

The rule will create a zone and overlay it on the live view; the line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the minus sign next to a red node to remove a segment.

6.5.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifier defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- **Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.5.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.
The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.
Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.
- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.6 Dwell (Loitering) Rule

The Dwell Rule triggers an event when an object is present in a selected zone for a predefined time period.

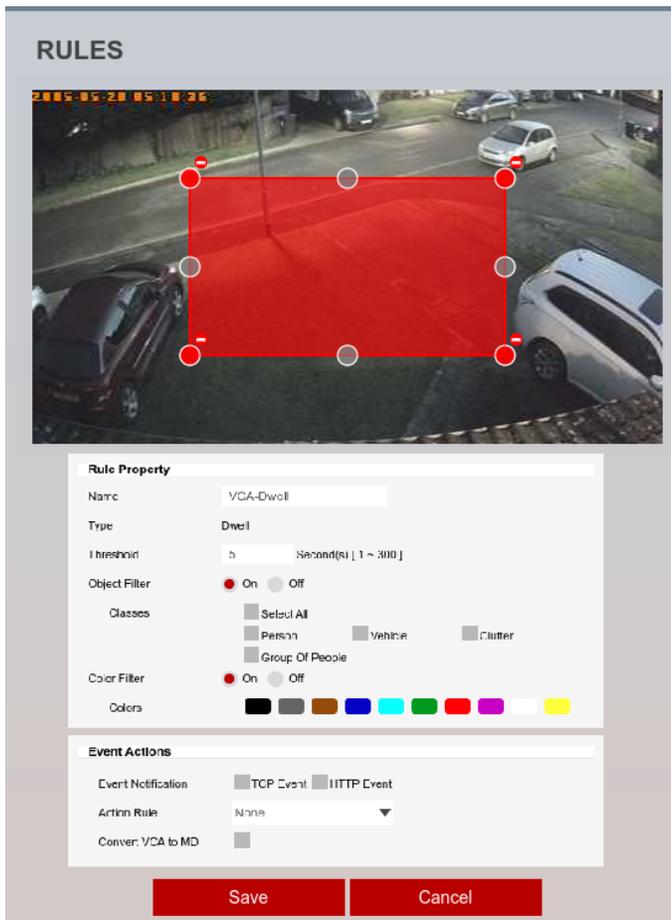


Figure 6-6: Dwell

The Dwell Rule will create a zone and overlay it on the live view; the line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the minus sign next to a red node to remove a segment.

6.6.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Threshold:** Defines, in seconds, the time period an object needs to be present in a zone to trigger an event.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifier defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- **Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.6.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.

The following applies for the notification methods selected.

- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.7 Direction Rule

The Direction Rule triggers an event when an object crosses the detection line in a selected direction and within the acceptance parameters.

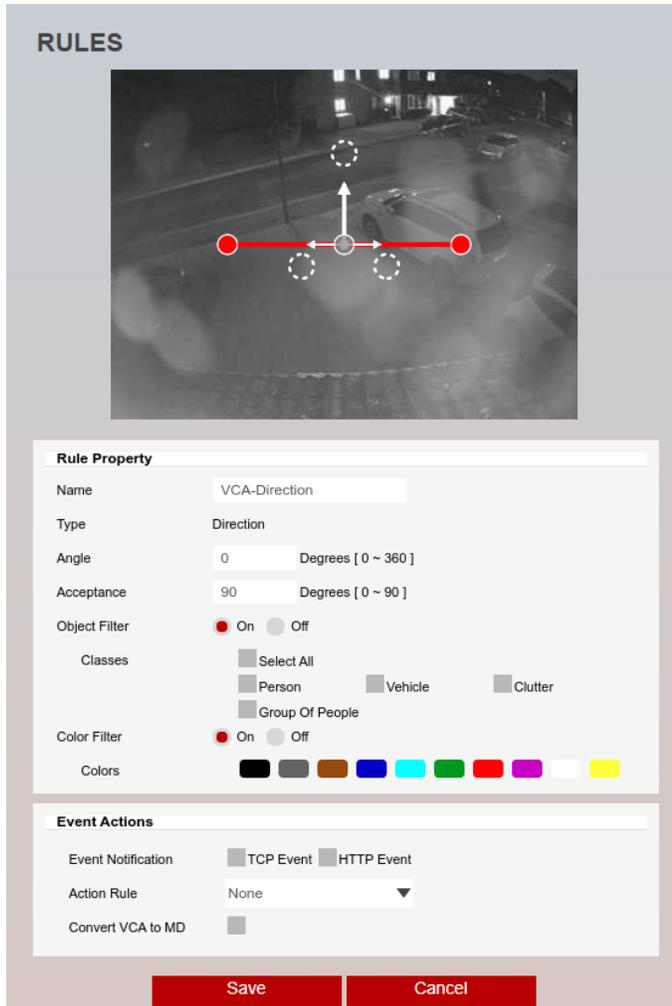


Figure 6-7: Direction

The Direction Rule will create a zone and overlay it on the live view. The line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape.

Select the minus sign next to a red node to remove a segment.

6.7.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Angle:** Defines the direction the objects move in order to trigger an event.
- **Acceptance:** Defines the allowed variance each side of the direction that will still trigger an event.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifier defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.7.2 Event Actions

- Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs. The following applies for the notification methods selected.
- Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.8 Removed Rule

The Removed Rule triggers an event when the area within a zone has changed for the specified time.



Figure 6-8: Removed

The rule will create a zone and overlay it on the live view, the zone can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape, to remove a segment select the minus sign next to a red node.

6.8.1 Rule Properties

- **Name:** Defines the name of the rule.

6.8.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.

The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.

- ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
- ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.9 Abandoned Object Rule

The abandoned rule triggers an event when an object is left in a zone for the specified time. It works in a similar way to the removed rule in that the scene is monitored for change and measured against the conditions defined in order to produce an event.



Figure 6-9: Abandoned

The rule will create a zone and overlay it on the live view, the zone can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape, to remove a segment select the minus sign next to a red node.

6.9.1 Rule Properties

- **Name:** Defines the name of the rule.

6.9.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.

The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.

- ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
- ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.10 Tailgating Rule

The tailgating rule triggers an event when objects cross over a line within quick succession of each other.

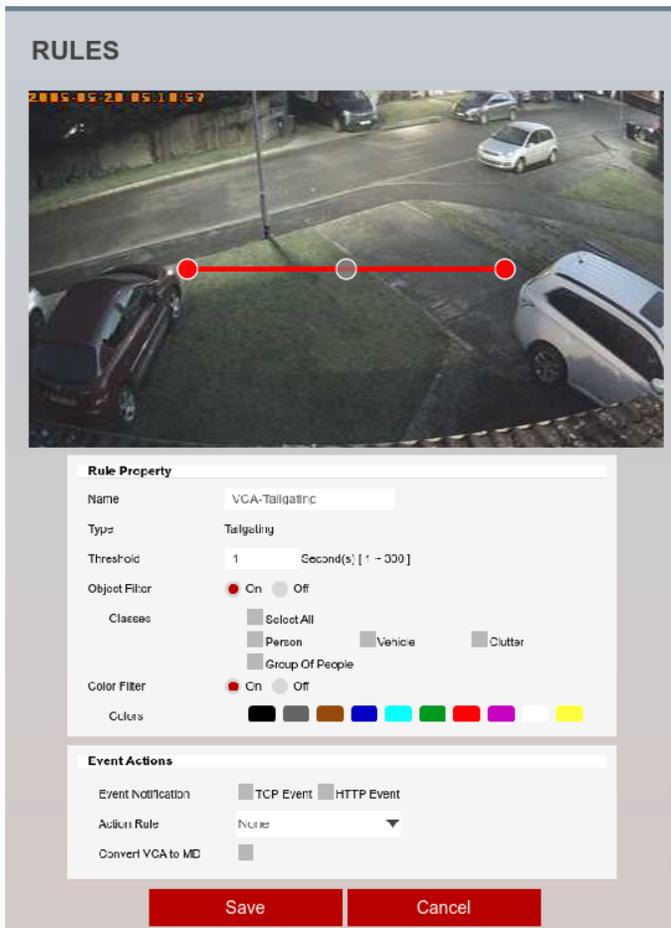


Figure 6-10: Tailgating

The rule will create a zone and overlay it on the live view, the zone can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape, to remove a segment select the minus sign next to a red node.

6.10.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Threshold:** Defines, in seconds, the time period from the first object passing the line to the next object passing the line to trigger an event.
- **Object Filter:** Allows the rule to be configured to only trigger based on an object's classification (e.g. person, vehicle). Any combination of the available options is possible.



Note: The calibration process must be completed before object filtering is available. The available classes are defined in the Classification section of the menu.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifier defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

- Colour Filter:** Provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.10.2 Event Actions

- Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.
The following applies for the notification methods selected.
- Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

6.11 Counting Line (Tripwire / People Counting) Rule

The Counting Line Rule triggers an event when an object crosses the line in the direction indicated.



Note: The Tripwire Rule differs from the Direction Rule, each segment of the line can have a different direction defined.



Figure 6-11: Counting Line

The Counting Line (Tripwire) Rule will create a zone and overlay it on the live view. The line can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape. Select the Minus Sign next to a red node to remove a segment.

The direction indicator shows the direction objects must take to cause an event to be triggered. Segments can be configured to point in any direction required.

6.11.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Direction:** Defines the direction that will be monitored for movement.
 - ▶ **A :** Defines that only direction A will be monitored across the counting line.
 - ▶ **B :** Defines that only direction B will be monitored across the counting line.

- ▶ **Both** : Defines that both directions across the counting line will be monitored.
- **Enable Width Calibration:** Allows you to define the width of objects passing the line that will cause the rule to trigger.
 - ▶ **Width Calibration** : Defines the width calibration value, used to adjust the minimum and maximum width of objects crossing the line that will trigger an event.



Note: Enabling the width calibration will enable additional on-screen guidelines. As objects pass the line a line will appear to indicate their widths. Use this to adjust the width calibration setting. The calibration feature includes a min and max width that will trigger the rule.

- **Enable Shadow Filter:** The counting line features a shadow filter which is designed to remove the effects of object shadows affecting the counting algorithm. Shadows can cause inaccurate counting results by making an object appear larger than its true size or by joining two or more objects together. If shadows are causing inaccurate counting, the shadow filter should be enabled by selecting the Shadow Filter check box for the line. It is recommended that the shadow filter only be enabled when shadows are present because the algorithm can mistake certain parts of an object for shadows and this may lead to worse counting results. This is especially the case for objects that have little contrast compared to the background (e.g. people wearing black coats against a black carpet.)



Note: The object filtering feature is not available when using the Tripwire Rule.

6.11.2 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.

The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the camera's event engine which is compatible with ONVIF.

6.12 Logical Rules

Logical rules extend the standard rules to allow various inputs to be combined using logical expressions, this helps to reduce false events.

Figure 6-12: Logical Rule

The rule allows you to combine other rules into a logical expression using the AND operator and can be used to filter and reduce false events.

6.12.1 Rule Properties

- **Name:** Define the name of the rule.

6.12.2 AND operator

The AND operator combines two or more rules and only fires events if all the rules have triggered. By default, a new logical rule allows two rules to be combined, for example, trigger an event when the presence polygon AND the presence line rules are true.

Figure 6-13: AND operator

6.12.3 WITHIN x seconds

This is the same as a PREVIOUS operator and holds the event as true for the defined period of time. It allows an object to trigger one of the rules and then trigger the next rule within x seconds to cause an event to occur. This is sometimes known as the double knock rule.

Figure 6-14: Previous operator



Note: The object filtering feature is not available in logical rules, they can be used within the individual rules.

6.12.4 Object Filter

Object Filter allows the rule to be configured to only trigger based on an objects classification (e.g. person, vehicle), any combination of the available options is possible.

Note: The object filter of the rules that are included in the logical rule are disabled.

Note: The available classifiers are different depending on the hardware platform and the installed license.

- Hardware Platform or License that Tracker Engine Selection is not available

Calibration	Available classifiers of Object Filter
Disabled	Not available (Object Filter Off)
Enabled	Classifier defined in the classification settings

- Hardware Platform or License that Tracker Engine is selectable

Tracker Engine	Calibration	Available classifiers of Object Filter
Object Tracker	disabled	Not available (Object Filter Off)
Object Tracker	enabled	Classifiers defined in the classification settings
DL Object Tracker	-	Person, and Vehicle
DL People Tracker	-	Person

6.12.5 Colour Filter

Colour filter provides the ability to pick up objects based on an object's colour components that are grouped into 10 colours.



Note: The colour filter of the rules that are included in the logical rule are disabled.



Note: If object colour is turned on at BURNT-IN ANNOTATION menu, the top four colours which make up more than 5% of the object are represented by the colour swatch attached to the object.

6.12.6 Event Actions

- **Event Notifications:** Define the action that will occur on an event being triggered.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.
The following applies for the notification methods selected.
- **Triggered By:** Define when the notification will be sent.
 - ▶ **Object:** Send notification for each object triggering the rule. Choose between the begin of the object triggering the rule, as it enters the zones. and/or the end of the object triggering the rule, as it leaves the zone. A notification will be sent for each object triggering the rule.
 - ▶ **Rule:** Send a notification every time the rule is triggered, from the begin point of the first object to trigger the rule to the end point of the last object to trigger the rule. A notification will be sent for each triggering of the rule, regardless of the number of objects triggering at any one time.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

- **Action Rule:** Allows actions, defined in the camera, to be triggered when an event occurs.
- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.



Note: Remember to configure the TCP/HTTP notification actions for the action rules feature to function. Any combination of the available options is possible.

6.13 Non-detect Zone Rule

The non-detection rule creates a zone which identifies an area of the scene that will not be processed through the analytics engine.

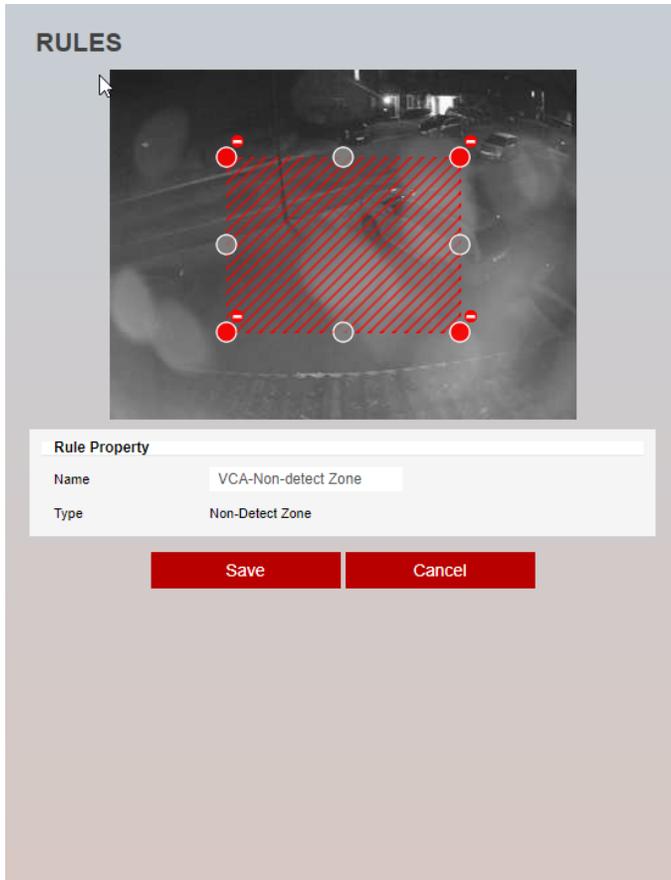


Figure 6-15: Non-detect zone

The rule will create a zone and overlay it on the live view, the zone can be reshaped accordingly. Selecting a grey node will split the segment and create a more complex shape, to remove a segment, select the minus sign next to a red node.

6.13.1 Rule Properties

- **Name:** Defines the name of the rule.

7 COUNTERS

Counters can be configured to count the number of times a rule is triggered, for example the number of people crossing a line. The Counter Rule is designed to be utilized in the following way:

- **Increment:** The counter is incremented on each trigger of an event.
- **Decrement:** The counter is decremented on each trigger of an event.
- **Occupancy:** The counter reflects the number of objects that are currently triggering rule.

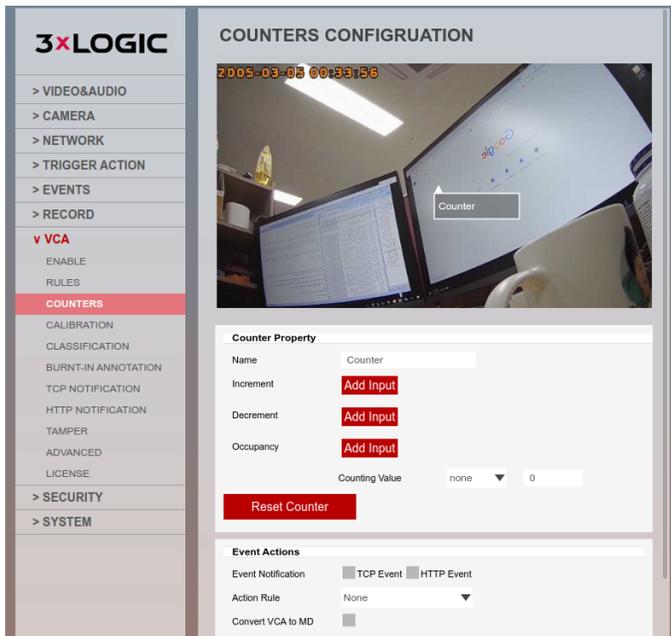


Figure 7-1: Counter

More than one rule can be assigned to any of a counter's three inputs. This allows, for example, the occupancy of two rules to be reflected in a single counter or more than one entrance/exit gate can update a single counter.

7.0.1 Rule Properties

- **Name:** Defines the name of the rule.
- **Increment:** The rule which, when triggered, will add one to the counter.
- **Decrement:** The rule which, when triggered, will subtract one from the counter
- **Occupancy:** Sets counter to current number of the rule's active triggers.

Select **Add input** to show a list of available rules that can be added. To remove rules from the counter, select the cross next to the rules already added.

7.0.2 Event Actions

- **Event Notification:** Define the action that will occur on an event being triggered.
- **Action Rule:** Allows actions from the camera to be triggered when an event occurs.
 - ▶ **TCP Event:** Enables/disables the triggering of the TCP notification when an event occurs.
 - ▶ **HTTP Event:** Enables/disables the triggering of the HTTP notification when an event occurs.



Note: Remember to configure the TCP/HTTP notification actions for this feature to function. Any combination of the available options is possible.

- **Convert VCA to MD:** Allows the event to be passed to the cameras event engine which is compatible with ONVIF.

7.1 How to Create a Counter

The method is the same, regardless of the intended use of the counter.

- Position the counter on the screen.



Note: This is just for reference and does not affect the counter feature.

- Define a name for the counter.
- Select **Add Input** against the desired action (increment, decrement or occupancy).
- Select the rule that the counter will link to.
- When the rule triggers an event, the counter will change its value accordingly.

8 CALIBRATION

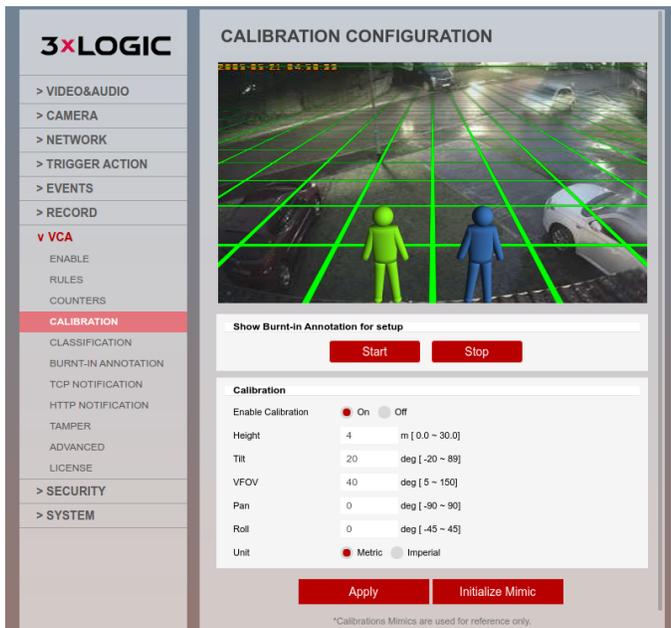


Figure 8-1: Calibration

Camera calibration is required for object identification and classification to occur. If the height, tilt and vertical field-of-view are known, these can be entered as parameters in the appropriate fields. However, if these parameters are not known then using the camera, a grid can be overlaid on the image and mimics can be created to adjust expected object sizing and effectively allow you to test the accuracy of your settings.

8.1 Calibration Settings

- **Enable Calibration:** Used for turning the calibration feature on or off.
- **Height:** Defines the height on the camera.
- **Tilt:** Defines the tilt of the camera.
- **Vertical Field of View (VFOV):** Defines the vertical field of view of the camera.
- **Unit:** Defines the unit measure that will be displayed.
 - ▶ **Metric**
 - ▶ **Imperial**

8.1.1 Advanced Calibration Parameters

Pan and Roll allow the ground plane to be panned and rolled without affecting the camera calibration parameters. This can be useful to visualize the calibration setup if the scene has pan or roll with respect to the camera.



Note: The pan and roll advanced parameters only affect the orientation of the 3D ground plane so that it can be more conveniently aligned with the video scene, and does not actually affect the calibration parameters.

8.2 3D Graphics Overlay

During the calibration process, the features in the video image need to be matched with a 3D graphic overlay. The 3D graphic overlay consists of a green grid that represents the ground plane. Several 3D mimics (people-shaped figures) are placed on the ground plan, that represent the dimensions of a person with the current calibration parameters.

The mimics are used to verify the changes that you make to the calibration settings and represent a person 1.8 meters tall. The mimics can be moved around the scene to line up with people or objects of a known size, to aid in the calibration process.

8.3 How to Calibrate a Camera

1. Use the mimics to match against people.

Position the mimics on top or near people within the camera scene.

Note: During the calibration process, as you change settings, you may need to reposition the mimics.

2. Enter the VFOV.

Entering the correct VFOV is important for accurate calibration. The following table shows pre-calculated values for VFOV for different sensors.

Focal Length(mm)		1	2	3	4	5	6	7	8	9	10	15	20	30	40	50
CCD Size (in)	CCD Height (mm)															
1/6"	1.73	82	47	32	24	20	16	14	12	11	10	7				
1/4"	2.40	100	62	44	33	27	23	19	17	15	14	9	7			
1/3.6"	3.00	113	74	53	41	33	28	24	21	19	12	11	9	6		
1/3.2"	3.42	119	81	59	46	38	32	27	24	21	16	13	10	7		
1/3"	3.60	122	84	62	48	40	33	29	25	23	20	14	10	7	5	
1/2.7"	3.96	126	89	67	53	43	37	32	28	25	22	15	11	8	6	
1/2"	4.80	135	100	77	62	51	44	38	33	30	27	18	14	9	7	5
1/1.8"	5.32	139	106	83	67	56	48	42	37	33	30	20	15	10	8	6
2/3"	6.60		118	95	79	67	58	50	45	40	37	25	19	13	9	8
1"	9.60		135	116	100	88	77	69	62	56	51	35	27	18	14	11
4/3"	13.50			132	119	107	97	88	80	74	68	48	37	25	19	15

If the table does not contain the relevant parameters, the VFOV can be estimated by viewing the extremes of the image at the top and bottom.



Note: Without the correct VFOV, it may not be possible to get the mimics to match people at different positions in the scene.

3. **Enter the camera height.**

Enter the camera height, if it is known. If the height is not known then it is recommended to obtain an accurate reading, otherwise estimate based on known object heights in the scene.

Note: A correct camera height measurement is required for accurate video analytics.

4. **Enter the camera tilt angle.**

Enter the tilt angle of the camera if it is known. If the tilt angle is not known, estimate it and use the mimics as a guide to confirm and change as required.

5. **Verify and change as required.**

The objective is to ensure the mimics match people or other known objects in the scene. Both the height and angle of the mimic should represent the objects in the scene and adjustment of the height. Tilt and VOFV may be required to achieve this.

Select **Apply** to save your changes.

9 CLASSIFICATION



This menu is only visible on legacy analytics (-S, -A) and thermal VISIX Gen III models. For deep-learning capable models (-X), classification is handled by the deep learning filter.

Detected objects are assessed and assigned to one of the classifiers listed in the classification configuration settings. This section has been pre-programmed with the most commonly used classifiers however, users that have purchased the advanced analytics license for their camera can add, modify or delete size classifications as desired.

Use the *Add*, *Modify* and *Delete* options to change these settings.



Note: The calibration process must be completed before objects can be classified.

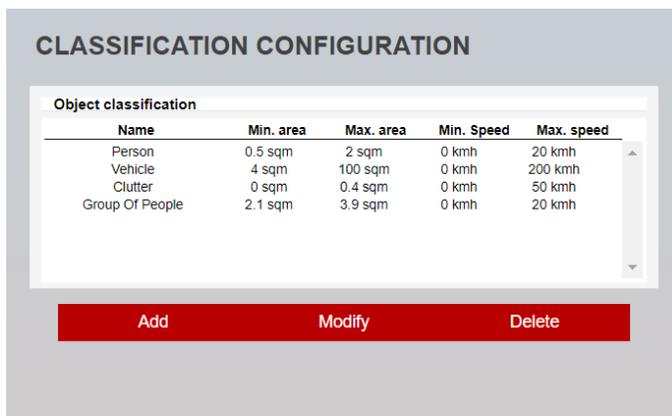


Figure 9-1: Classification

9.1 How to Add a New Classifier

1. Select **Add**.
2. Define the parameters for the new classifier.
3. Select **Save**.

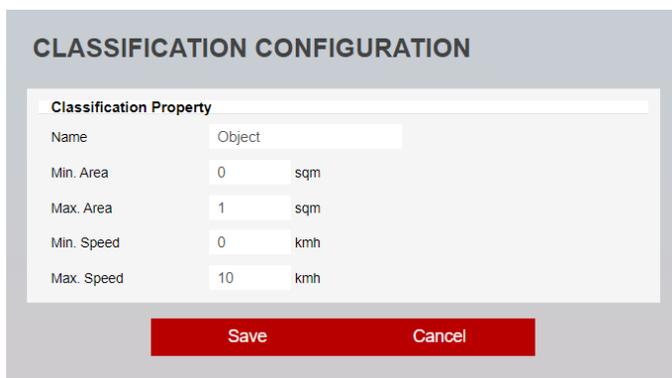


Figure 9-2: Classification- New Classifier

- **Name:** Defines the name of the new classifier.
- **Min. Area:** Defines the minimum area for the new classifier.
- **Max. Area:** Defines the maximum area for the new classifier.
- **Min. Speed:** Defines the minimum speed for the new classifier.
- **Max. Speed:** Defines the maximum speed for the new classifier.



Note: When creating or modifying classifiers, avoid overlapping parameters with other classifiers as this will cause the analytics engine to incorrectly identify objects.

10 BURNT-IN ANNOTATION

The Burnt-in Annotation feature allows analytical data to be burnt into the raw video stream of the camera. Annotations can include tracked objects, counters and system messages.

BURNT-IN ANNOTATION CONFIGURATION

Burnt-in Annotation

Activation On Off

Display on Main Stream Sub Stream 3rd Stream

*The BIA can only be displayed when the stream resolution is lower than 1920x1080.

BIA Setup

Display zones On Off

Display objects On Off

Object classification On Off

Object height On Off

Object speed On Off

Object area On Off

Display event message On Off

Display system message On Off

Display line counter On Off

Display counter On Off

Apply

Figure 10-1: Burnt-in Annotation

- To display object parameters such as speed, height, area and classifications, the device must be [calibrated](#).
- The stream intended for use with burnt-in annotation must have a resolution lower than 1920x1080.

10.1 Burnt In Annotation (OSD) Setup

For descriptions of BIA setup and configuration options, see below:

- **Display zones:** Displays the zone outline on the video feed.
- **Display objects:** Displays the object bounding boxes on the video feed.
 - ▶ **Object classification:** Displays the classifier for objects on the video feed.
 - ▶ **Object height:** Displays the height for objects on the video feed.
 - ▶ **Object speed:** Displays the speed for objects on the video feed.
 - ▶ **Object area:** Displays the area for objects on the video feed.

- ▶ **Object ID:** Displays the unique ID of each tracked objects.
- ▶ **Object Dwell Time:** Displays the elapsed time since the object started being tracked.
- ▶ **Object Colour:** Displays the top four colours that which make up more than 5% of the object are represented.
- **Display event message:** Displays event messages on the video feed.
- **Display system message:** Displays the system messages on the video feed.
- **Display line counter:** Displays the line counter information on the video feed.
- **Display counter:** Displays the counters on the video feed.

10.2 How to Enable Burnt-in Annotation

- Turn on the feature by select **ON** next to Activation.
- Select the stream that will have the annotation.



Note: The streams resolution must be lower than 1920x1080.

- Select the metadata that will appear on the stream.



Note: The calibration process must be completed for information such as speed, height, area and classification to appear.

11 TCP NOTIFICATION

The TCP notification sends data to a remote TCP server when triggered. The format is configurable with a mixture of plain text and tokens. Tokens are used to represent the metadata event that will be included when a rule is triggered.

The screenshot shows the 'TCP NOTIFICATION' configuration page. It features a 'General Setting' section with an 'On' radio button selected. Below it is the 'TCP Settings' section with 'Host url' and 'Port' (0 ... 65535) input fields. The 'Message' section contains three rows: 'Rule', 'Counter', and 'Tamper'. Each row has a text input field and a dropdown menu labeled 'Select a token to add'. A red 'Apply' button is located at the bottom of the form.

Figure 11-1: TCP Notification

11.1 General Setting

- **On:** Turns the action on.
- **Off:** Turns the action off.



Note: Changing this setting will turn on/off any of the rules' abilities to send notifications through this action. Rules can still show a link to this action, but the action will not occur when the rule triggers.

11.2 TCP Settings

- **Host URL:** The IP address or hostname of the remote TCP server, where the event data should be transmitted.
- **Port:** The port where the TCP notification should be sent.

11.3 Message

- **Rule:** Defines the message body of the TCP notification, when linked to rules. You can include tokens from the list available, token values will be replaced with the event metadata when triggered.
- **Counter:** Defines the message body of the TCP notification, when linked to counters. You can include tokens from the list available, token values will be replaced with the event metadata when triggered.
- **Tamper:** Defines the message body of the TCP notification, when linked to the tamper feature. You can include tokens from the list available, token values will be replaced with the event metadata when triggered.



Note: See the token's topic for full details about the token system and example templates.

11.4 How to Enable TCP Notification

1. Select **On** to enable.
2. Define the *Host URL* (Remote server URL/IP that will be receiving this notification).
3. Define the *Port* where the notification will be sent.
4. Define the body of the message to be sent with the notification. This can be a combination of plain text and tokens. Tokens will be replaced with event-specific data at the time an event is generated.
5. Select **Apply** to save the notification.



Note: The available tokens can be selected from the drop-down menu below the query window.

12 HTTP NOTIFICATION

The HTTP notification sends a text/plain HTTP request to a remote endpoint when triggered. The URL, HTTP header and message body are all configurable with a mixture of plain text and tokens. Tokens are used to represent the event metadata that will be included when a rule is triggered.

Figure 12-1: HTTP Notification

12.1 General Setting

- **On:** Turns the action on.
- **Off:** Turns the action off.



Note: Changing this setting will turn on/off any of the rules ability to send notifications through this action. Rules can still show a link to this action, but the action will not occur when the rule triggers.

12.2 HTTP Settings

- **URL:** The remote URI to request when executing the HTTP action. The URI can contain tokens, which will be replaced with event-specific data at the time an event is generated.
- **Method:** The HTTP request method, this can be, GET, POST or Milestone.

- **User ID:** The username to use for authentication.
- **Password:** The password to be used for authentication.

12.3 Query/Body

- **Rule:** Defines the message body of the HTTP notification, when linked to rules. You can include tokens from the list available, token values will be replaced with the event metadata when triggered.
- **Counter:** Defines the message body of the HTTP notification, when linked to counters. You can include tokens from the list available, token values will be replaced with the event metadata when triggered.
- **Tamper:** Defines the message body of the HTTP notification, when linked to the tamper feature. You can include tokens from the list available, token values will be replaced with the event metadata when triggered.
- **Enable URL encoding:** Defines if the notification will use URL encoding.
 - ▶ **On**
 - ▶ **Off**



Note: See the tokens topic for full details about the token system and example templates.

12.4 How to Enable HTTP Notification

1. Select **On** to enable.
2. Define the URL (HTTP server that will be receiving this notification).
3. Define the method to be used.
4. Define the user ID used to authenticate the notification.
5. Define the password used to authenticate the notification.
6. Define the contents of the query to be sent with the notification. This can be a combination of plain text and tokens (tokens will be replaced with event-specific data at the time an event is generated).
7. Define if URL encoding will be used.
8. Select **Apply** to save the notification.



Note: The available tokens can be selected from the drop-down menu below the query window.

13 ADVANCED SETTINGS

The Advanced section contains settings relating to how the analytics engine tracks objects.



Note: In most installations, default configurations will apply



Some settings will only be visible for applicable camera models / specific tracker engines.

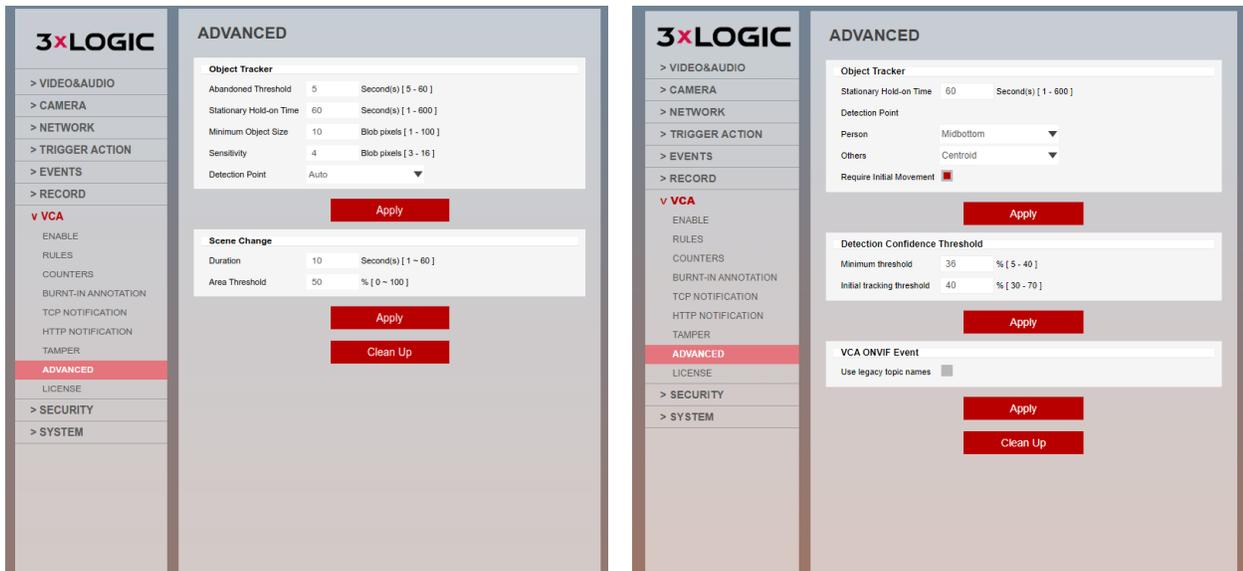


Figure 13-1: Advanced VCA Settings- Legacy Settings (Left) and Deep-Learning Settings (Right)

13.1 Object Tracker

- **Abandoned Threshold:** Defines the amount of time an object must be classed as abandoned or removed before an Abandoned / Removed rule will trigger.
- **Stationary Hold-on Time:** Defines the amount of time an object will continue to be tracked and classified once it becomes stationary.
- **Minimum Object Size:** Defines the size of the smallest object that will be considered for tracking.
- **Sensitivity:** Allows the object tracker to be tuned to ignore movement below a certain threshold. Combined with the Blob Map burnt in annotation, which visualizes the area of the scene the object tracker is detecting movement, this value can be adjusted to filter out environmental noise. The default setting is 4.
- **Detection Point:** Defines the tracking point that will be used to evaluate objects against rules.
 - ▶ **Automatic:** The detection point is automatically set based on how the calibration is configured.
 - ▶ **Centroid:** The detection point for each object is located at the middle of the bounding box.
 - ▶ **Mid-bottom:** The detection point for each object is located along the bottom line of the bounding box, in the center.



Note: Changing the detection point that is used by the system can affect the point at which objects will trigger an event.

13.2 Scene Change

- **Duration:** Defines the period of time the scene needs to have changed before triggering the scene change process.
- **Area Threshold:** Defines the percentage area of the scene that must change in order to trigger the scene change process.

13.3 Detection Confidence Threshold

- **Minimum Threshold** - Defines the minimum confidence level (percentage) required by the tracking engine to trigger detection of an object.
- **Initial Tracking Threshold** - Defines the initial tracking threshold for objects.

13.4 VCA ONVIF Event

- **Use Legacy Topic Names** - Enables the use of legacy topic names for ONVIF VCA Events for compatibility with older ONVIF protocols.

13.5 Clean Up

Click **Clean Up** to perform a system clean-up process. Unused analytics data and artifacts will be purged.

14 LICENSE

For older 3xLOGIC VISIX Gen III Cameras, some VCA analytic features on a camera are pre-activated in the factory (see [Base Analytics](#) for more information), however further activation is necessary to enable additional advanced VCA rules and tools.

When purchasing a “-A” advanced analytics license for a older or previously purchased VISIX Gen III camera, the provided activation code is linked to the cameras hardware configuration and is not transferable. This code can be entered on the VCA > License settings to unlock advanced VCA analytics.

To manage activation codes, navigate to the license feature from the VCA menu.

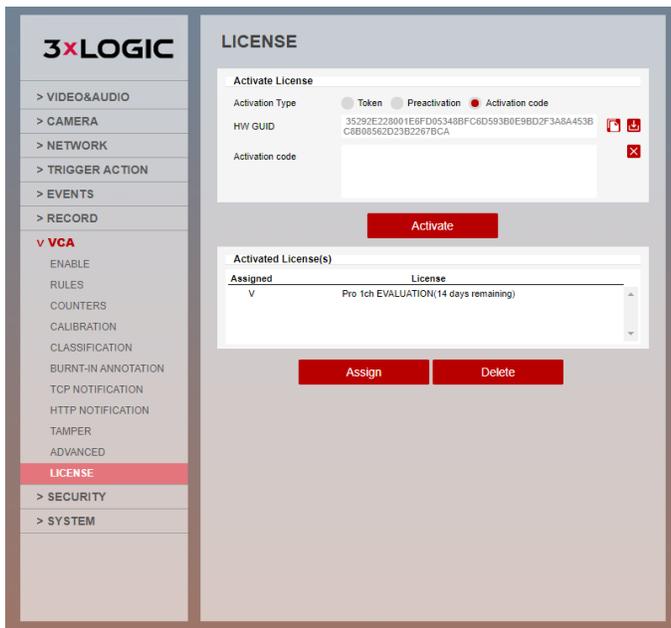


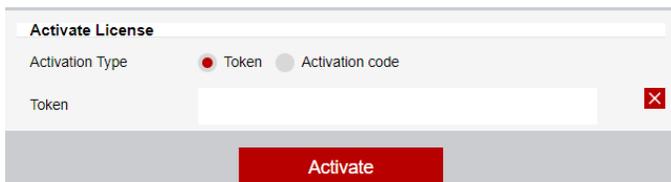
Figure 14-1: License

14.1 Activate License

See below for different license activation methods.

14.1.1 Activation Type

TOKEN

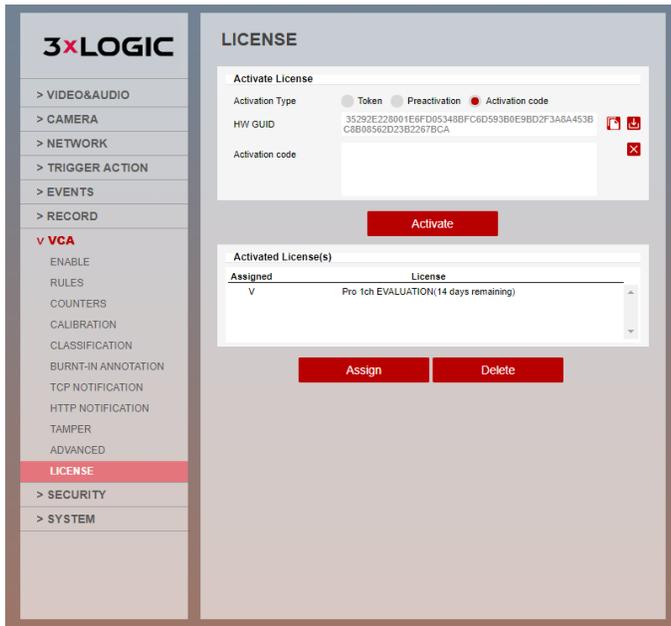


Where an activation token has been provided, it can be entered into the token field to apply a license model.

PRE-ACTIVATION:

Defines that software has been pre-licensed and no further action is required

ACTIVATION CODE:



This displays a unique hardware code (HW GUID) for this device, which is required to generate an activation code. When purchasing an advanced analytics license after already buying your camera, you will need to give 3xLOGIC or your reseller this code so they can generate the activation code for the license.

- **Activation code:** This is where you enter activation codes to apply licenses and enable features of the VISIX Gen III VCA plug-in.



Note: Multiple licenses can be installed but are generally not required for most applications.

14.2 Activated License(s)

- **Activated License(s):** This provides a list of the installed licenses with the option of deleting highlighted licenses
- **Assign:** Allows the user to define which license will be used with the camera.
- **Delete:** Allows the user delete the highlighted license



Note: A license cannot be deleted if it is being used by an analytical feature.

14.3 How to Apply licenses using Tokens

1. Type or paste the token code into the space provided and select Activate.
2. Verify the license has applied by confirming it is present in the activated license(s) section, and it is valid.

14.3.1 How to Apply licenses using HW GUID (Activation Code)

1. Take note of the HW GUID. This will be required to obtain an activation code for a VISIX Gen III Advanced Analytics license from 3xLOGIC or your reseller. When purchasing the license, be sure to include this code.



Note: For cameras purchased at the same time as the advanced VCA license, the license will already be applied, and no further activation should be required.

2. The reseller or 3xLOGIC will send you an activation code after purchasing.
3. Type or paste the activation code into the space provided and select Activate.
4. Verify the license has applied by confirming it is present in the activated license(s) section, and it is valid.

14.3.2 How to Assign License(s)

1. Highlight the license you would like to assign.
2. Select **Assign** and confirm the action to assign the license.

14.3.3 How to Delete License(s)

1. Highlight the license you would like to delete.
2. Select **Delete** and confirm the action to delete the license

15 TOKENS

Tokens are used within actions events such as TCP and HTTP and are automatically filled in with the metadata for the event. This allows the details of the event to be specified in the message that the action sends, e.g. the location of the object, type of event, etc.

List of tokens - Below is a list of the available tokens along with a description of the data they will provide.

- `{{name}}` - The name of the event.
- `{{id}}` - The unique id of the event.
- `{{type}}` - The type of the event. This is usually the type of rule that triggered the event.
- `{{status}}` - The status of the event.
- `{{iso8601}}` - The event time in the ISO 8601 format. An example of this would be:
- Start time (ISO 8601 format): `{{iso8601}}` Start time (ISO 8601 format): 2017-04-21T10:09:42+00:00
- `{{time}}` - The event time in Unix time stamp format. An example of this would be: time: `{{time}}` time: 1582308244.376
- `{{ip}}` - The IP address of the device.
- `{{host}}` - The hostname of the device that generated the event.
- `{{datetime}}` - The event time in the format DD MM D HH:MM:SS YYYY 'Tue Jan 1 12:00:00 2019'. An example of this would be : time: `{{datetime}}` time: Tue Jan 1 12:00:00 2019
- `{{zoneid}}` - The zone ID of the event.
- `{{ruleid}}` - The rule ID of the event.
- `{{bb}}` - The bounding box of the object.
- `{{objectclass}}` - The object class of the object triggering the rule.
- `{{mac}}` - The MAC address of the device.

An example for using tokens is given below:

Event `#{{id}}`: `{{name}}` Event Actions: `{{type}}` Start time (ISO 8601 format): `{{iso8601}}` time: `{{time}}`

Device: `{{host}}`: `{{ip}}`: `{{mac}}` Object bounding box: `{{bb}}` Classification: `{{objclass}}`

This would produce the following text:

Event #350: My event name Event Actions: presence Start time (ISO 8601 format): 2017-04-21T10:09:42+00:00time: 1492769382 Device: Camera: 10.0.5.2: AB:CD:EF:GH:01:02 Object bounding box: [45251:12069:14004:8563] Classification: Vehicle.

16 CONTACT INFORMATION

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