



Dahua AI Camera (DH-IPC- HFW7442HP-Z4)

Integration App-note

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1. Introduction

This document will detail the integration of the Dahua AI Camera, with CathesisVision software.

Functionally, this integration will entail the triggering of standard CathesisVision Events, based on the triggers from the Dahua AI Camera. Cathesis receives trigger messages from the camera, and those trigger messages can be used to set up custom and pre-defined events with the following actions:

1.1 Model and Firmware

The following camera model and firmware were used to test this integration:

Model	DH-IPC-HFW7442HP-Z4
Firmware	V2.800.0000000.2.R
Build date	2019-07-09
Web Version	V3.2.1.758498

1.2 Requirements

1.2.1 General Requirements

- CathesisVision 2019.3 and later.
- Win 10-64bit and later, Win Server 2008 R2 and later.
- Minimum 4 GB of RAM required.

Note:

For information regarding the regular operation of a Dahua AI Camera, please consult the relevant Dahua documentation.

1.2.2 License Requirements

Note: This camera requires an IP camera license as per the selected CathesisVision Software – Lite, Core, Pro or Premium.

1.3 Features and Abilities

This section indicates the features/abilities of the Dahua AI Camera when integrated with CathesisVision.

1.3.1 General Device Features

- CathesisVision receives event messages from the Dahua device.
- System and device event messages can be used to trigger a CathesisVision system event.

1.3.2 Device Objects

Objects are populated automatically as soon as communication between the Dahua camera and CathesisVision is established.

Object Type		Abilities
General		<ul style="list-style-type: none"> • This integration has LPR Detector, LPR Server and “Rules” objects. • Objects are automatically created as soon as communication between the CathesisVision unit and device is established. • Device objects can be commanded as an action of a CathesisVision system event. • LPR events on the device can be used to trigger CathesisVision system and map events. • Device objects support overlays • Objects may be linked to cameras to associate device events with video footage. • LPR Detectors can be associated with a camera. Object group and a LPR license can be assigned to the Camera LPR detector.
LPR Detector	Object Properties	<ul style="list-style-type: none"> • Name. • Enabled. • Online. • Plate Position. • Lane Position. • Licensed.
LPR Server	Object Properties	<ul style="list-style-type: none"> • Name. • State.
	States	<ul style="list-style-type: none"> • Online. • Offline.
Rules	Object Properties	<ul style="list-style-type: none"> • Name. • Enabled.

1.3.3 Device Events

The CathesisVision Dahua integration generates Camera Events, which are triggered on the device and reflected in CathesisVision.

Event Element	Features/Abilities	
<p>General</p>	<ul style="list-style-type: none"> • Events triggered on the device are sent to CathesisVision. 	
<p>Camera Events</p>	<p>Video Detection</p>	<ul style="list-style-type: none"> • Motion Detection. • Video Tampering. • Defocus Detection. • Scene Changing.
	<p>Audio Detection</p>	<ul style="list-style-type: none"> • Audio Detection.
	<p>IVS</p>	<ul style="list-style-type: none"> • Tripwire. • Intrusion. • Abandoned Object. • Fast-moving. • Parking Detection. • Crowd Gathering Estimation. • Missing Object.
	<p>People Counting</p>	<ul style="list-style-type: none"> • People Counting. • In Area No.
	<p>Face Detection</p>	<ul style="list-style-type: none"> • Face Detection.
	<p>ANPR</p>	<ul style="list-style-type: none"> • ANPR.
<p>CathesisVision Event Actions</p>	<ul style="list-style-type: none"> • Events generated by the device are reflected in CathesisVision, and can be used to create CathesisVision system events. • Two custom events are possible: Display message and Display popup. • The device and device objects cannot be controlled as part of the system events. 	

1.3.4 Metadatabase

A unique metadatabase is created on the CathesisVision server for this integration. It is fully searchable, with configurable filters based on device event information (as above), and time stamping. The filtered event/s, and the associated video, will then be available for review in a new window from which an archive can be created and exported.

Database Element	Features/Abilities
General	<ul style="list-style-type: none"> • All device events are databased. • Database entries include the footage from cameras linked to device objects. • Multiple cameras may be linked to multiple objects. • Device event metadata is displayed where applicable. • Databased device events may be viewed in the embedded video player, which includes the usual CathesisVision video review tools.
View Options	<ul style="list-style-type: none"> • Licenses (groups). • Licenses (extended). • Licenses (full). • Licenses (minimal). • Average speed. • Average speed (all). • Loitering. • Loitering (all).
Sort Options	<ul style="list-style-type: none"> • Time. • License. • LPR detector. • Prefix.
Easy Search	<ul style="list-style-type: none"> • License plate. • License plate (partial match). • Group. • LPR detector.
Filter	<ul style="list-style-type: none"> • Detection confidence level. • Plate Number. • Time of Capture. <p>Additional values can be configured for a captured plate, and also be used as filters:</p> <ul style="list-style-type: none"> • Name. • Colour of vehicle. • Vehicle type. • Vehicle make.
Export	Database entries may be exported in CSV and PDF format.

1.3.5 Maps

The CathesisVision GUI provides for configurable site maps that feature multi-layered, hierarchical, interactive interfaces providing representation and control of a site and its resources.

Map Element	Features/Abilities
General	Device objects can be embedded in a site map, which offers multiple action options when messages are received from the device, the device triggers an event, and/or the user manually initiates a map action.
Map Action Triggers	<ul style="list-style-type: none"> • All device objects may be set to trigger a map action if the user left-clicks on map. • Some device objects may be set to trigger a map action if a state change message is received from the device. • All device objects may be set to perform a map action if <i>any</i> event occurs on the device. • Device objects, which can be configured to trigger CathesisVision events, may also be set to perform a map action when specific CathesisVision events are triggered.
Map Actions Options	When triggered (see above), objects may perform the following map actions (where applicable): <ul style="list-style-type: none"> • Connect to a site. • Perform an animation. • Go to a camera preset. • Load a map. • Set a PTZ relay output. • Show a popup menu. • Set a relay output. • Show an HTML block.

A NOTE ON CAMERA CHANNELS

The CathesisVision software packages have **limits on camera channels**. A multi-sensor camera is physically a single device (camera) but it **requires a camera channel for each one of the internal cameras**. The same applies to an encoder: a 16-channel encoder will account for 16 camera channels on the CathesisVision software, even though it is a single device. Even when a camera or device only uses a single IP license, the camera channel limit will still apply.

USEFUL LINKS

To view **tutorial videos** on CathesisVision setup, visit <https://cathesisvideo.com/resources/videos>

Find answers to Cathesis **Frequently Asked Questions**: <https://cathesis.crisp.help/en/?1557129162258>

2. Device Addition and Configuration

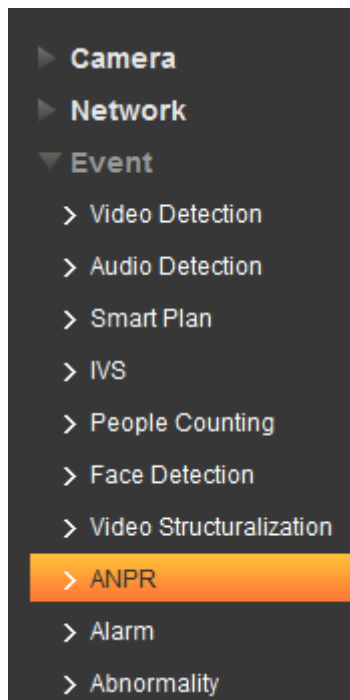
This section will detail the procedure for setting up the two systems to effectively communicate with each other. For this documentation, the IVS event is used as an example, please note that other events can be configured in a similar way.

2.1 Dahua Web Interface Setup

1. Login to the **Dahua camera web interface** with the provided camera credentials and go to the **Settings Tab**.
2. Navigate to the **Event menu** found on the left-hand side, choose enable and configure the desired triggers.

Dahua AI Camera Events:

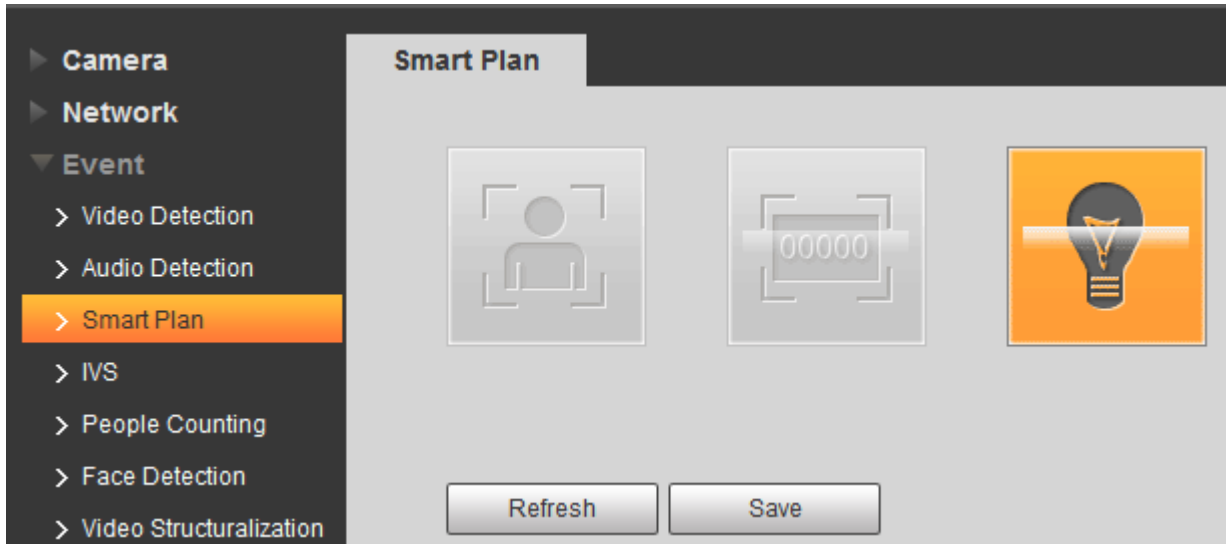
- Video Detection
 - Motion Detection
 - Video Tampering
 - Defocus Detection
 - Scene Changing
- Audio Detection
- IVS
 - Tripwire
 - Intrusion
 - Abandoned Object
 - Fast-Moving
 - Parking Detection
 - Crowd Gathering Estimation
 - Missing Object
 - Loitering Detection
- People Counting
 - People Counting
 - In Area No.
- Face Detection
- ANPR



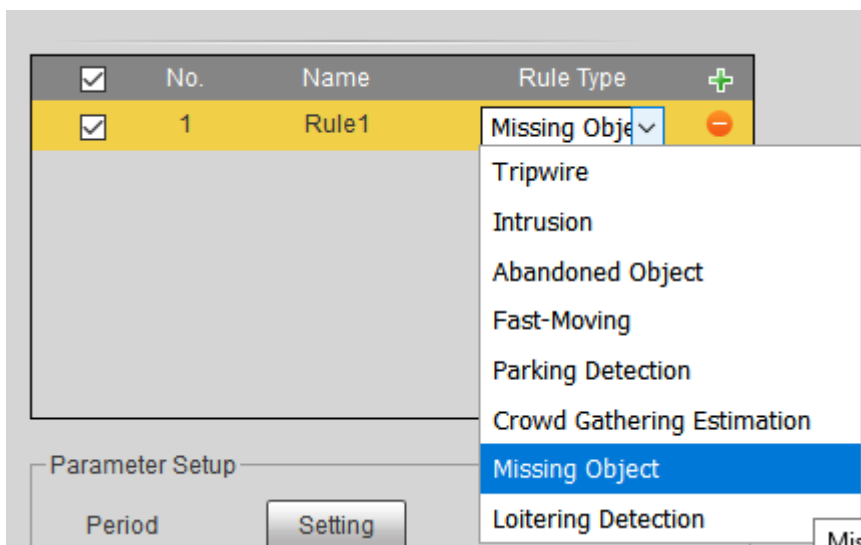
Note: For this document, missing object will be used as a trigger.

2.2 Setting Up Missing Object Trigger

1. Go to **Event** on the left-hand menu, then select **Smart Plan** to visit the **smart plan setup menu**.
2. **Select IVS (bulb icon)** and save to apply the settings.



3. Go to **Event** on the left-hand menu, then select **IVS**.
4. Select **Rule Config** tab.
5. There will be a table on the right-hand side of the screen, **click + icon next to Rule type to add a rule**.
6. Choose **any Rule Type** to configure.
7. Set up the desired rules, then click save.



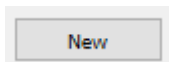
2.3 Add a Camera in CathesisVision

2.3.1 The Cameras Panel

To get to the Cameras Panel, follow this path: **Site / Open tab / Setup / Configuration icon / Choose server / Cameras.**



2.3.2 Add a New Camera



1. Click **New** at the bottom of the Cameras panel to add a new camera.

2. Choose the **driver as Dahua** and enter connection details.

3. If successful, **give the camera a descriptive name**, then click next.
4. **Configure the camera as per the site specification**, then click Ok to save.

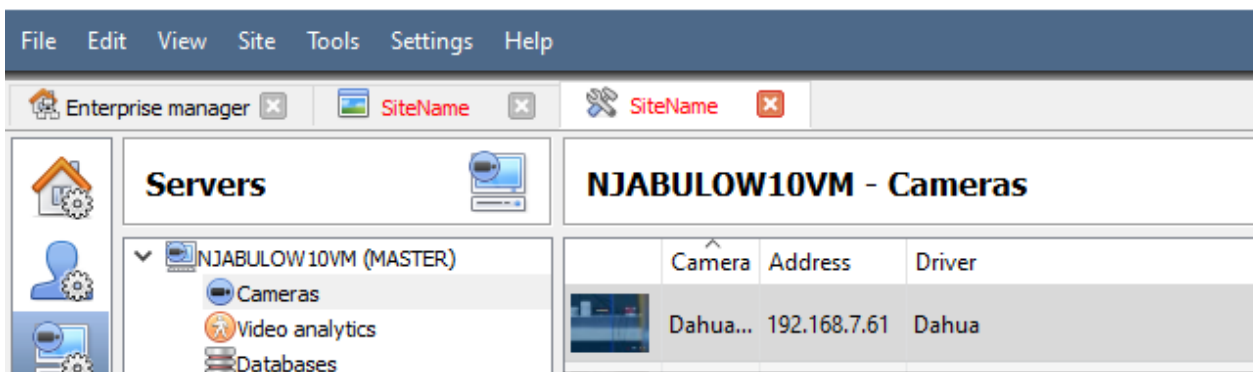
2.4 Cathexis Camera Setup

2.4.1 The Cameras Panel

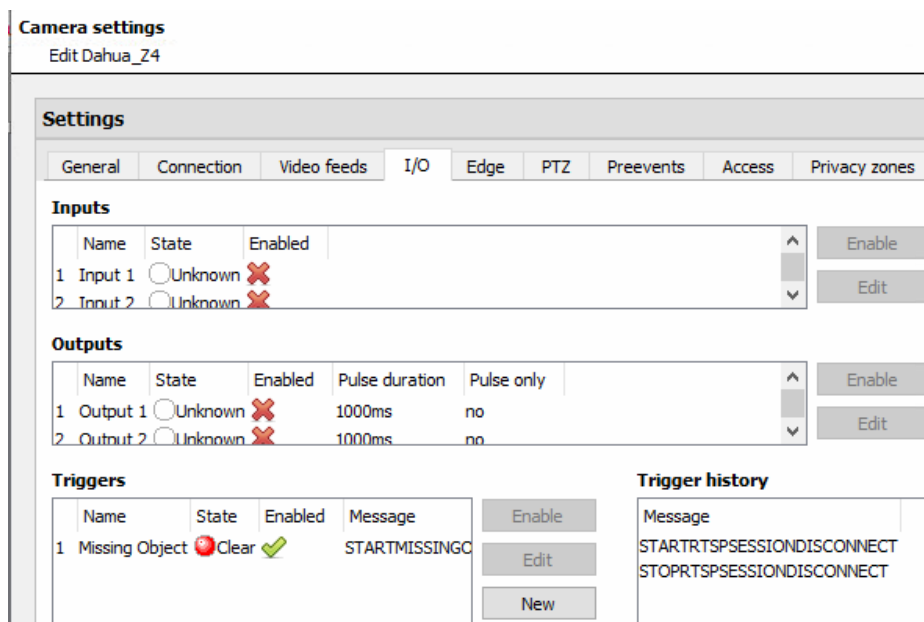
To get to the Cameras Panel, follow this path: **Site / Open tab / Setup / Configuration icon / Choose server / Cameras.**



The cameras will open in a panel on the right-hand side.



2.2.2 Camera Setup



1. **Double click** on the **Dahua camera** to go to camera edit menu.
2. Then go to the **I/O** tab.

Triggers

Name	State	Enabled	Message

Enable

Edit

New

3. Go to Triggers, and click **new** to configure a new trigger.

New trigger

New trigger

Name

Message

Latch time

4. Give it a descriptive name, choose *STARTMISSINGOBJECT* as a message.

5. Click OK to save the new trigger and OK to save and exit the camera edit menu.

3. Events

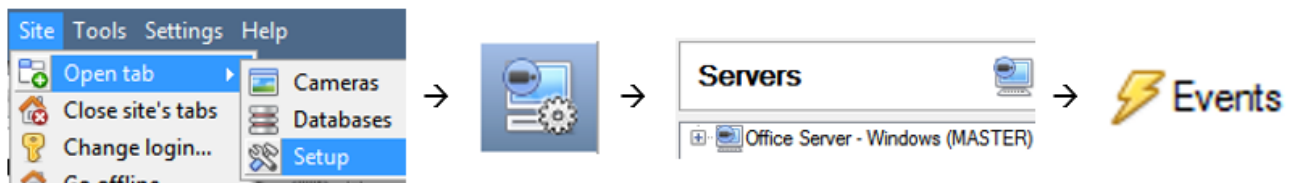
A CathesisVision event has a trigger, which causes an action. Set integrated devices to act as triggers, or as actions. This document will detail the Dahua AI Camera integration specific aspects of Events. There is a comprehensive guide to CathesisVision Events in the *CathesisVision Setup Manual*.

Most of the data that CathesisVision receives from a device is presented in the Events interface. This is done in order to give the user a full range of options. As a result, some of the options presented in the interface may be *impractical* as an event trigger, or action.

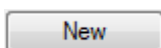
3.1 Setting Up CathesisVision Pre-Defined Events

3.1.1 Creating an Event

To create an event, navigate to Events by following the sequence: **Open Tab / Setup / Servers / Master Server / Events**. This is shown below.



This will allow the user to enter the Events management area.



Once in Events management area, click the New icon at the bottom of the screen. This will open up the **New Event window**. Alternatively, right-click and select **New**.

3.1.2 General Tab

Missing Object

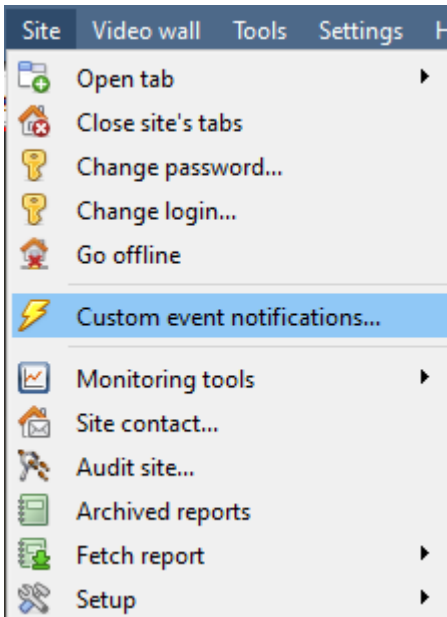
New Event

Missing Object

General	Triggers	Actions	Resources
Name	Missing Object		
Description	Object moved		
Schedule	Always		
Priority	High		

Give the event a **descriptive name** and **priority level**.

3.2 Setting Up Cathesis Custom Events



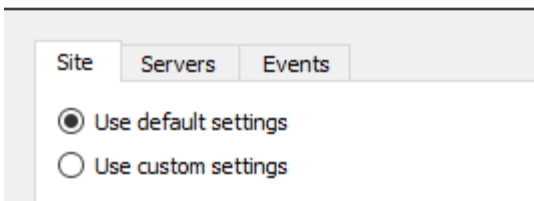
To set up Custom Events, go to **Site**, then choose **Custom event notification**.

Custom event notifications for SiteName

Leave Site tab settings as **default (Use default settings)**.

Custom event notifications for SiteName

Configure custom event notifications



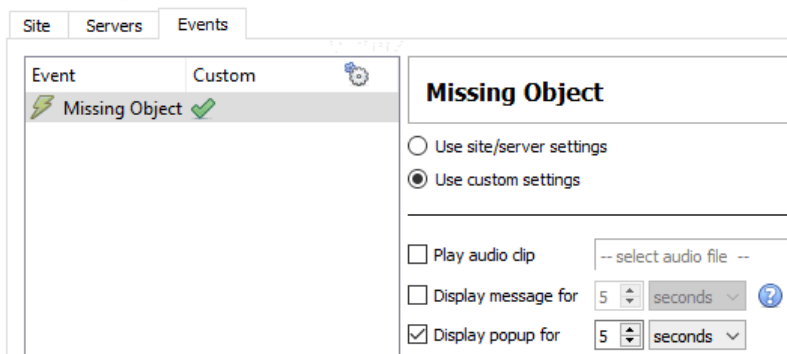
Custom event notifications for SiteAudit

Go to the **Events tab**.

Custom event notifications for SiteAudit

Configure custom event notifications

Select the **event by clicking on the name**.



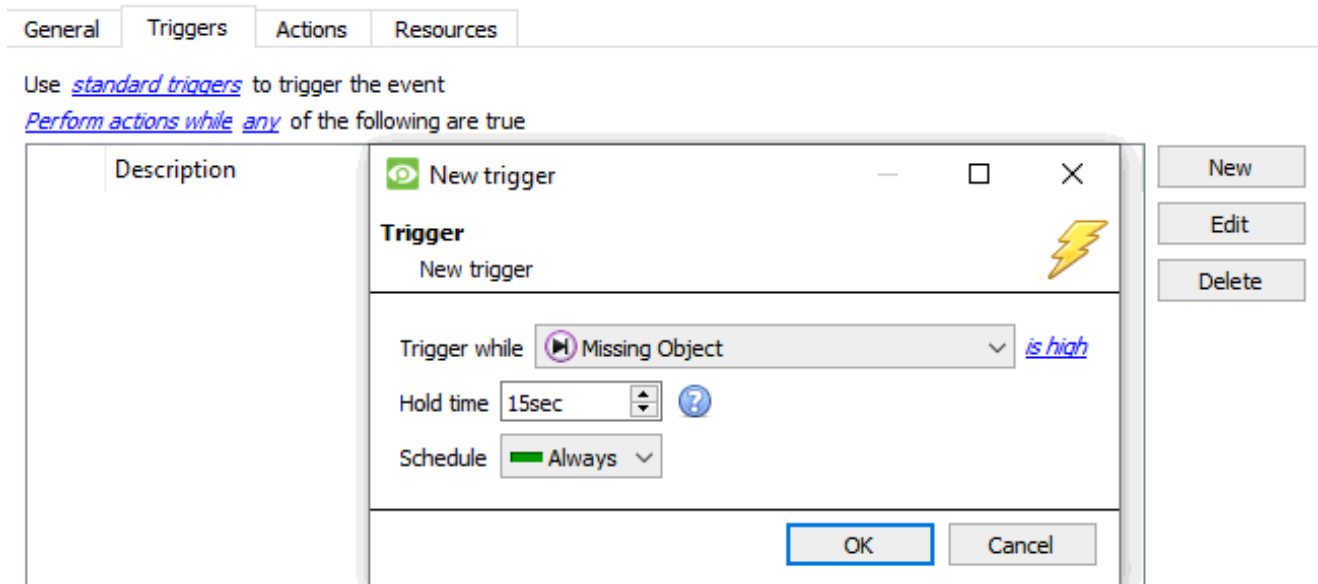
Then choose **Use custom settings**.

Choose the **notification** and **adjust** the duration as per the specifications.

Then click Ok to save.

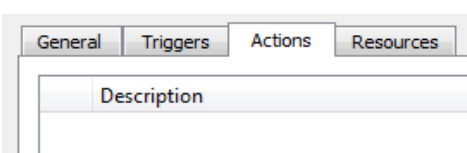
3.3 Triggers Tab

A trigger is the user defined input that notifies the event to start. The trigger causes the subsequent action (which the user will also define).



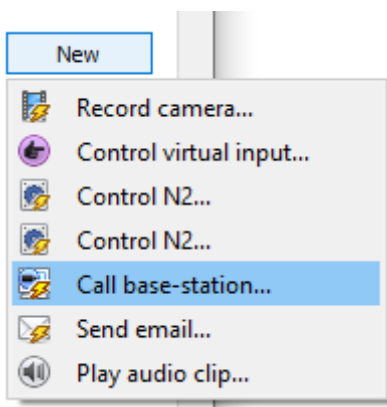
1. Select the **Trigger tab** and click **new** to set a new trigger.
2. Choose a trigger to use.
3. Make sure it is triggered while “triggername” is true or else conditions will be inverted.
4. Then click **Ok**.

3.3 Actions Tab



Having defined the triggers that will initiate an event, the user will need to define Actions.

Select the **Actions tab** from the **New event** window.



A list of **available actions** will appear. The drop-down contains all the available **action types**. The icons represent the device action **type**.

Select an option.

Click OK to save.

3.3.1 Actions (Pre-Defined Events)

Note:

- There are two actions available: **Call base-station** and **record camera**.
- With base-station, review the recorded footage and clear the alarm.

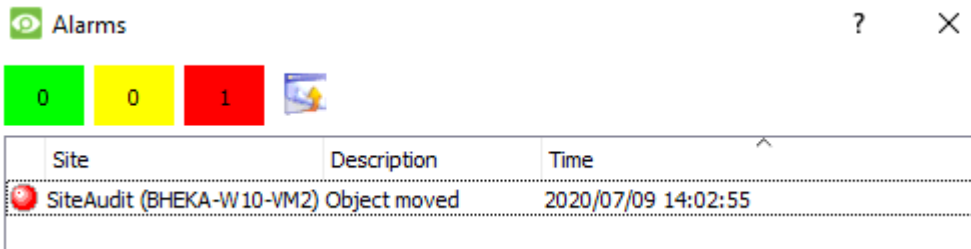


Figure A: Alarm triggered by a missing object.

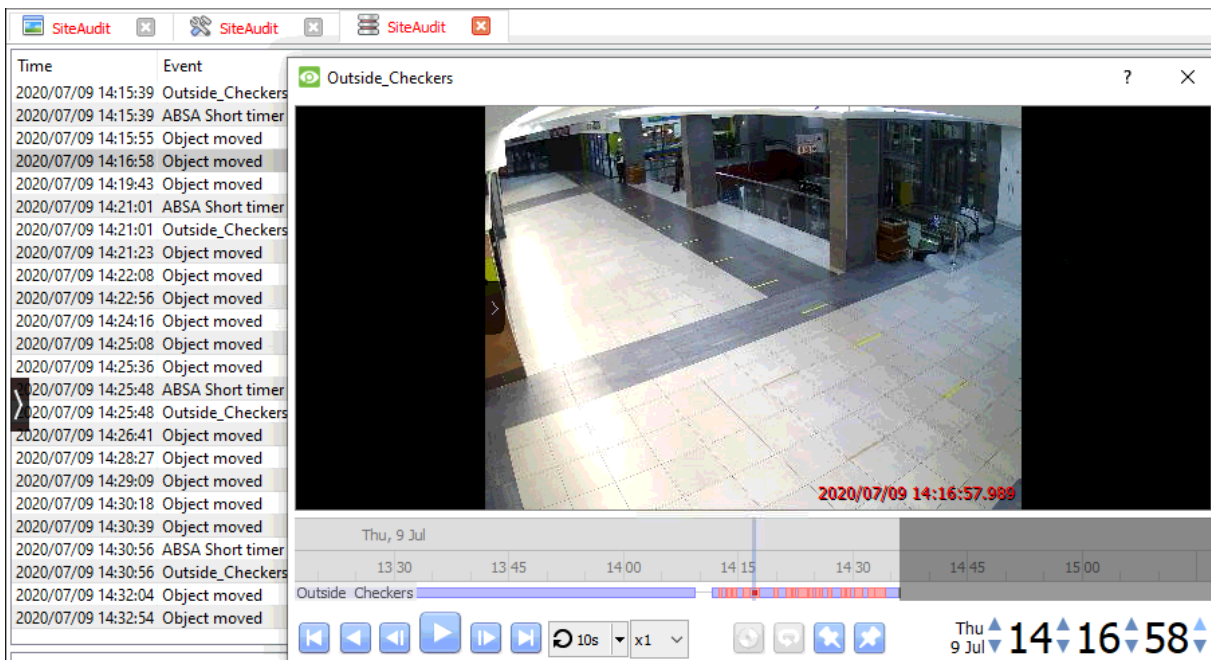


Figure B: Recorded footage on the database

3.3.2 Actions (Custom Events)

There are two actions: **Display message** and **Display popup**:

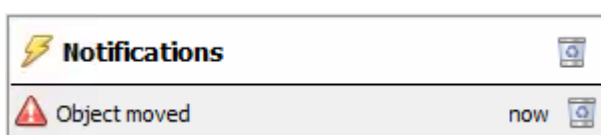


Figure C: Display message action for custom events



Figure D: Display popup action for custom events

4. Conclusion

This app-note was designed to deal specifically with this integration.

For further information about the CathesisVision software, consult the main manual (<http://cathesisvideo.com/>). For support, email support@cat.co.za.