Setup Tab: Configure Servers

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[1] While Cathexis has made every effort to ensure the accuracy of this document, there is no guarantee of accuracy, neither explicit, nor implied.
Specifications are subject to change without notice.

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1 Configure Servers General Information

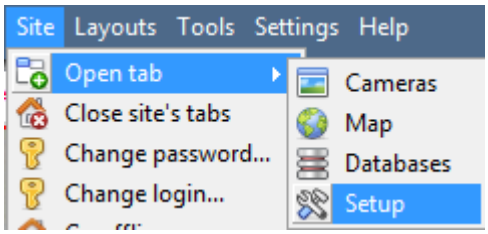
Configure Servers is where all server based settings take place. A CathexisVision Site is a collection of one or more individual units which are consolidated in the software as an individual Site. This means that you can add and remove units from sites, as well as change settings on a unit by unit basis.

In the Configure Servers panel you will see a list of all servers, and under each server a list of setting options available on that server:

These options include: **Cameras, Algorithms, Databases Schedules Network I/O Scheduled Recordings, Scheduled Archives, Events, Monitors, Access Rights, Technical Alarms, Virtual Inputs, Keyboards, Integration Devices, and IOs.**

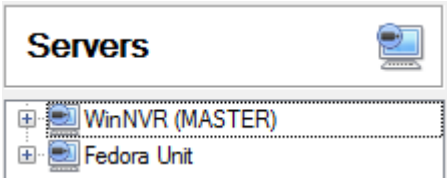
a. Open Configure Servers

To open the Configure Servers setup, follow the instructions below.



After logging into your site, to open Configure Server simply click on **Site —> Open Tab —> Setup.** Once in the Setup Tab click on the Configure Servers icon:

Note: Right-Clicking on the tab of any open site will bring up the same menu as the one accessed via the method above.

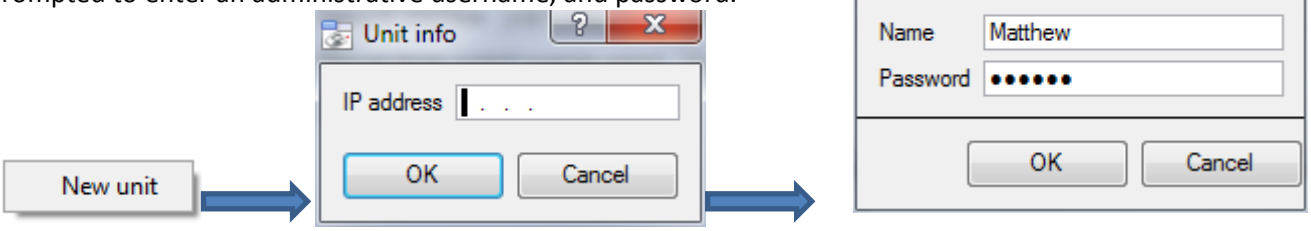


You will see the servers list to the right, and the panel to the right of that will contain the options for the current selection.

b. Add/Detach/Delete/Replace a Unit

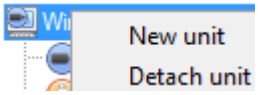
Add a Unit

To add a new unit to your site right-click on any white-space in the servers list panel (you may even click on an existing server), and click on New server. Then enter the IP Address of the server. You will be prompted to enter an administrative username, and password.

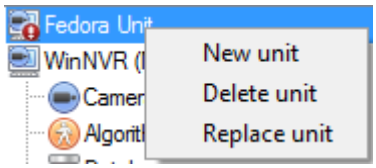


Note: The server must already be running CathexisVisionNVR. You may however add an unlicesned unit, as you may license all servers from the Configure Servers panel.

Detach, Delete, Replace a Unit



To **Detach** a unit, right-click on the unit in the Servers list, and click on Detach Unit. You will be prompted to enter an administrative username and password.



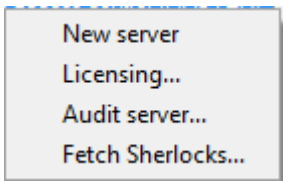
A Detached unit will still appear in the servers list. If you wish to fully delete the unit you must right-click on the detached unit, and select **Delete** Unit.

To **Replace** detached unit with another unit, right click on the detached unit and click on Replace Unit. The steps after this are the same as adding a unit.

Note: You may only replace a unit that has been Detached.

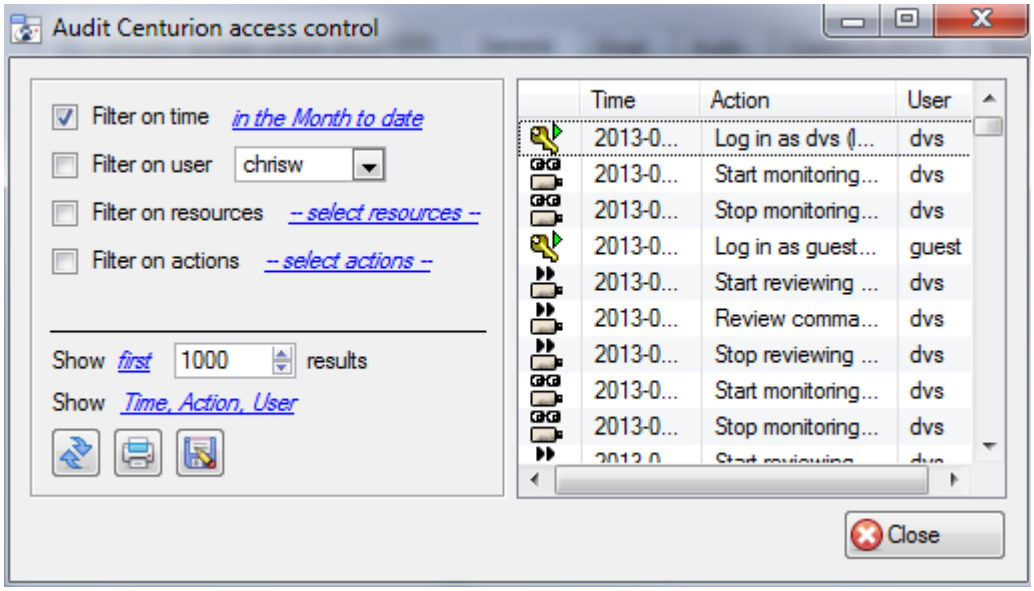
c. Right Click on a Unit

Right clicking on a unit allows you to perform a number of vital actions.

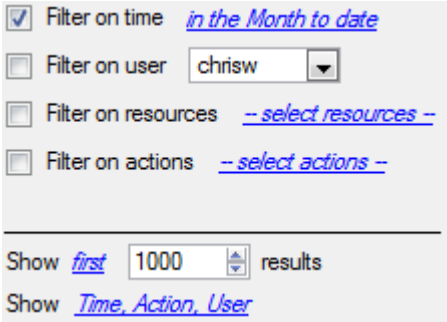


New Server is dealt with in Add a Unit (1.a) above.
Licensing this is how you licence an individual recording server, and is dealt with in the installation section of the manual.
Audit Server allows you to audit the specific unit. Auditing is explained below. It is also dealt with in the GUI Document
Fetch Sherlocks will allow you to fetch the Sherlocks for this device. See below.

Audit Site



Audit trails are the historical "footprints" left by various processes. They are used primarily as diagnostic tools to identify exactly what happened in the system. Each audit trail is in the form of a textual list of historical actions.



There are multiple options for filtering the audits, as there can be an overwhelming amount of information in the audit logs. All the hyperlinks open up a full list of options for you to filter on.

You may filter **Time, Users, Resources, and Actions**.

The **Show first/last** option allows you to limit how many of the results are brought up.
Show time/action/user option allows you to add/remove columns to the audit report, and will list the selected variables.

- ***Print, Save, Refresh***

The report is not live, so if you want to update the information, click on Refresh

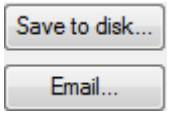
If you would like to print the Report for reference, click on the printer icon

If you would like a digital copy of the Report, click on the disk icon.

Sherlocks

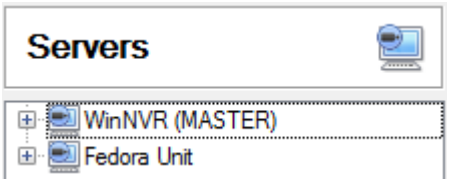
Sherlock files are a diagnostic tool, used by the Support Desk. The normal procedure is to email the Sherlock file to the Support Desk (support@cat.co.za), with a description of the problem, but you may also save it to disk.

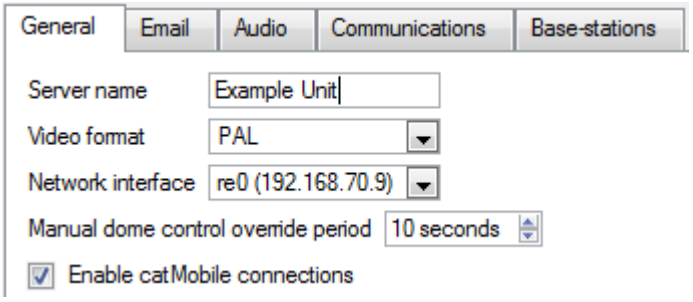
To get the Sherlock files, Click on Fetch Sherlocks..., this will generate the Sherlock pack. Then either Email the Sherlocks, or Save them to disk.



Note: clicking on *Email to Recipients*, will open up your Operating Systems default email client. *Save to Disk* will allow you to save the Sherlock files to any storage attached to your workstation.

d. General



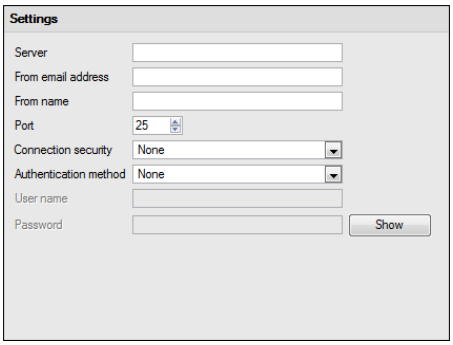


When you click on the actual server name (not the ⊞ used to expand the options) the right hand panel will fill with the General Unit Setup options.

Server Name	The descriptive name that you give to the individual unit. That identifies the unit in the GUI.
Video Format	Choose between PAL and NTSC. **Note**: It is not advisable to mix formats across units on the same site.

Network Interface	Will list the Network Interfaces on this unit, and their current IP Addresses.
Manual Dome Control Override Period	The period of time the controller must be inactive on a particular PTZ camera before it resumes its automatic responses. (E.g. tours, pre-sets etc.)
Enable CatMobile Connections.	CatMobile connections are connections to the unit via a web browser, or the iPhone/Android Apps that are available online. **Note**: The mobile connections are made on a unit by unit basis, with no site knowledge. This means that you will need to enable this on each unit that you wish to be available via our mobile interface.
Allow transcoded live video	This is currently only available on Windows units. It uses software encoding to add another, lower quality MPEG, stream to send to the cameras tab. This is useful for remote viewing, but will put extra strain on the processor of the unit.

e. Email



Emailing is now an option for notifying a Site Contact, and as an **Action** associated with an **Event**.

For example: a possible Event Action would be to send an email to a specific email address, when there is movement on a camera.

The settings are standard email settings, associated with your email account.

Note: As mentioned above these are all standard email settings. The Port number is your SMTP port.

- ***Test Your Settings***

Opposite **Settings** is the **Test Email** box, from which you can send a test email to another email account, just as you would from a normal email client.

Note: before attempting to send a test email, remember to click

f. Audio

A full list of all available audio devices is available in the respective drop-down menus. The device that you select from the menu will become the device used if this unit is used as a Viewing Station as well as an NVR.

Local System Audio is the name that you give to the on-board audio device located on this server.

My audio devices
Is a list of the audio devices available on this server. The device that you select here will determine the audio devices which are used as calling/listening devices, if this server is ever used as a Viewing Station.

This will change the name of the device as reflected in the **Resources Panel**

g. Communications

A Heartbeat is a signal sent from the capture unit (recording server) to an Alarm Management Gateway unit, which tells the Gateway that the server is still active. If the message fails to come through the Gateway will generate an alarm.

This will generate an alarm if the server goes down, or if the communications medium goes down.

Note: This needs to be setup on both the capture station and the Alarm Management Gateway.

- ***Enable Heartbeat***

To enable sending the heartbeat on your unit: check the ☑ Send gateway heartbeat tick box.

- ***Select a Base-Station***

The base station referred to here is the Alarm Management Gateway unit that you are going to be sending the heartbeat message to.

- ***Select an interval for your Heartbeat***

This will define how often your unit will send a Heartbeat to the Gateway.

h. Gateway

This section deals with the Alarm Gateway, as such you will only see this option if the selected server is setup as a gateway.

Send heartbeat monitoring alarms

☑ Send heartbeat monitoring alarms to -- select base-station --

If a heartbeat alarm is triggered, the gateway needs to take an action (send an alarm).

In general you would want this alarm to go to the gateway itself. So simply select the gateway from the drop down menu. If you want the heartbeat alarms to go to some other unit, then select/add that unit.

Note: If this is not checked, these heartbeat alarms will not be sent anywhere.

If an alarm is not handled

If an alarm in the gateway has not been handled in - minutes then

if it is a technical alarm forward it to -- select base-station --

if it is an event alarm forward it to -- select base-station --

☐ Move to History after forwarding

If they have not been handled for a while, you may want to send unhandled alarms to other gateways, or base stations,

Decide on the time frame, as well as where specific types of alarms are sent.

Note: If you send an alarm to another gateway, this alarm will appear in the incoming queue of both gateways. If one is handled, the other will remain in the incoming list. To avoid confusion you may want to check the ☐ Move to History after forwarding box, which will move the alarm to the history queue of the forwarding unit.

Move to history

Move gateway alarms to History if they have not been handled in 20 minutes

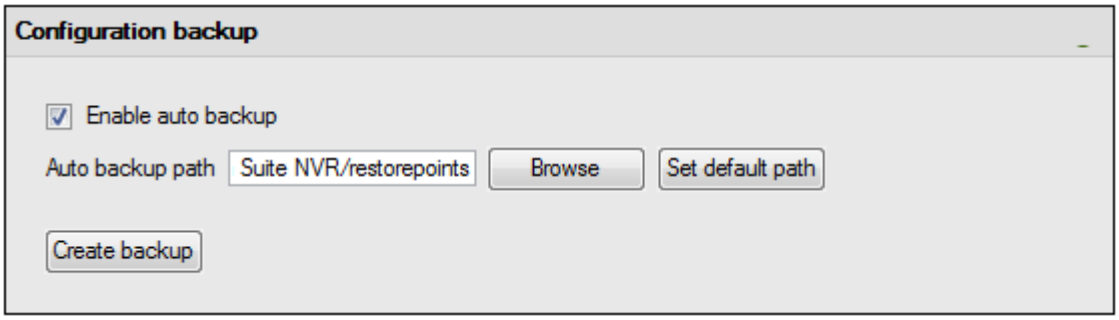
The number of alarms can build up very fast, especially on large sites. If you are dealing with a site where alarms are only relevant for a short period of time you may have them automatically moved to the history queue.

i. Configuration Backup

This will back up all this unit's CathexisVision settings, except for the database settings. The databases will remain on the drives you have chosen, but will have to be re-imported manually.

Note: You will only be able to **set default path,** and **Enable auto backup** from a Base-Station. To **create a manual backup**, and to **restore an existing backup,** you must be on the NVR unit itself. This is one of the very few things that you cannot do from anywhere on the site.

Configure your Backup



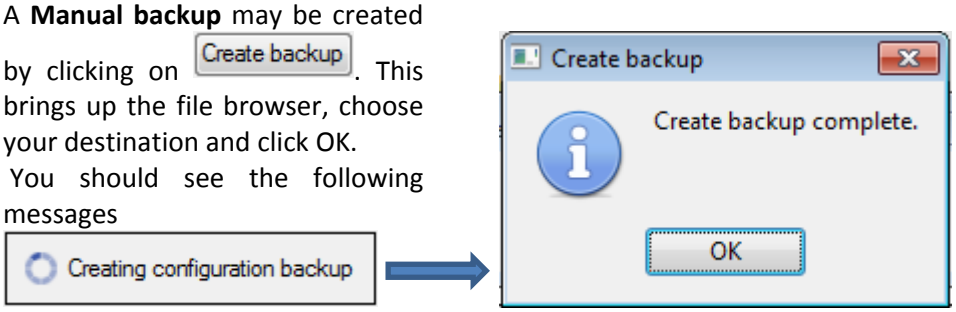
Note: you may choose to back-up all your units to a central location, such as a network drive.

- ***Automatic Backup***

With **Enable auto backup** checked the unit will update the Configuration Backup every day at 2 a.m. local time. You will need to set the location for the automatic backup, by entering the path (or browsing to it), and clicking on Set default path.

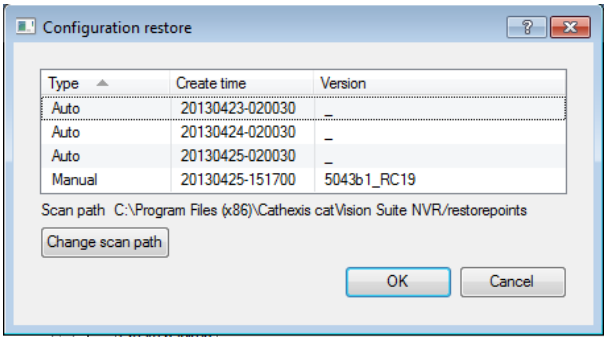
- ***Manual Backup***

A **Manual backup** may be created by clicking on Create backup. This brings up the file browser, choose your destination and click OK.
You should see the following messages



Configuration Restore

To restore a backup click on Restore existing backup. This will bring up the dialogue seen on the right hand side here.



Choose anyone of the restore points that are visible in the list.

If you need a restore point from a different location, click the Change scan path button, and select the correct folder.

Note:

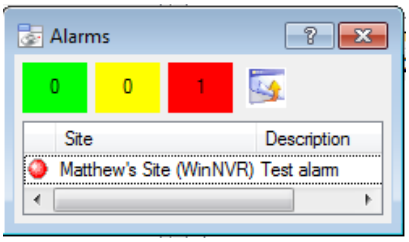
1. You will not have the option to do a Configuration Restore unless you on the NVR itself, either physically, or logged in via a remote desktop application.
2. On a Linux (Fedora) server, you have to be logged in as a Root user to perform a configuration restore. Even an administrative login level is insufficient.

j. Base Stations

The Base Stations that you set here are the stations to which Alarms will be sent, when one is triggered by an Event. These alarms can be sent either to individual viewing stations in a control room, or to an Alarm Management Gateway.

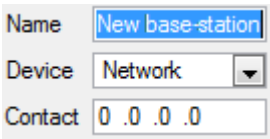
If you are sending an alarm to an Alarm Management Gateway, it will appear in the alarm queue; if you are sending the alarm to an individual Viewing Station it will appear as a pop-up window.

The window to the right is an example of such an alarm, on a Viewing Station



Add a New Base Station

To add a New Base Station Click New



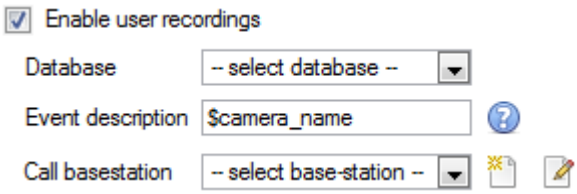
Name. Give the Base Station a descriptive name.
Device. Choose the connection medium. Non-Network options are there for legacy purposes.
Contact. This will be the address of the unit you wish to send the alarms to.

Send Test Alarm

You may test your Base Station settings by clicking on Send test alarm. This will send a test alarm to the selected Base Station.

k. User Recordings

The user recordings facility allows a user to manually trigger a recording if he sees something live in the Cameras Tab. This is useful as it may not be something that would have triggered a recording otherwise.



Database will define which database User Recordings are saved to. (Tip: Create a User Recordings database.)
Event Description is the name that will be given to the User Recording entry into the Database.
Call Base Station will send an alarm to a Base Station whenever a User Recording is triggered.

- ***Trigger a User Recording***

Start the Recording

Middle Click on a camera in the Cameras Tab and you should see Start recording as an option in the drop down Menu. Click this to start the recording. If the recording has started you should get a flashing & in the top right hand corner of the camera panel.

Stop the Recording

To stop the recording middle-click on the camera panel and click on Stop recording , in the drop-down menu.

Note:

1. you may only trigger one camera at a time.
2. It is advisable to create a seaparate database just for User Recordings.

2 Cameras

a. Introduction

There are two ways to add a camera in CathexisVision.

1. The camera Addition Wizard. (This will also give you the option to add databases, schedules, and events to system.)
2. The Copy/Paste Function.

This section of the manual will detail these two addition methods, followed by an examination of the Camera Edition options, and some extra information on the right-click menu.

b. Wizard Addition

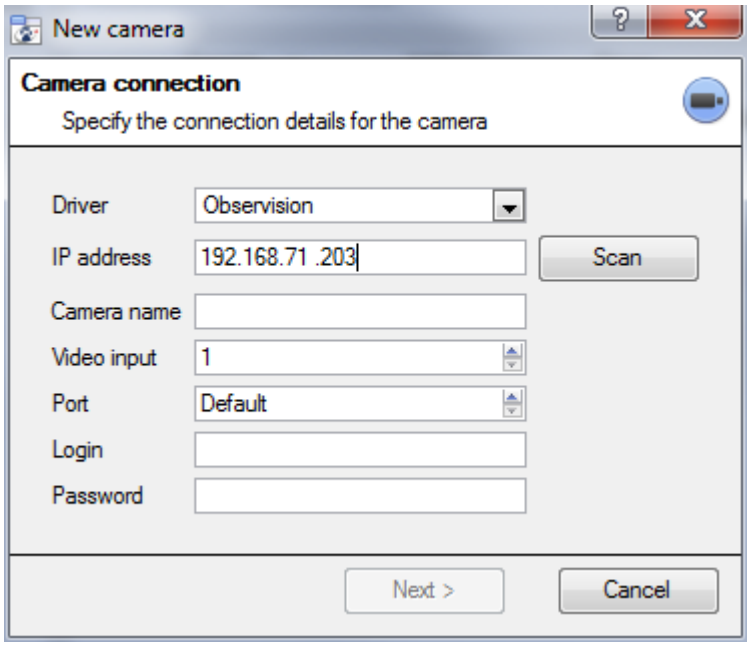
The camera addition wizard will take you through all the steps needed to add a camera, as well as allowing you to create databases, schedules, and events along the way. So there are two phases in the addition wizard:

1. The addition of the camera, and
2. Setting up the system to record from that camera. (Either via a VMD event, or via a scheduled recording.)

To start the camera addition wizard click on the New button at the bottom of the cameras panel. This will begin the wizard. The following will take you through each step in the wizard.

Camera Connection

The first step in the Wizard is the Camera Connection step. Here you setup all the connection details of the camera



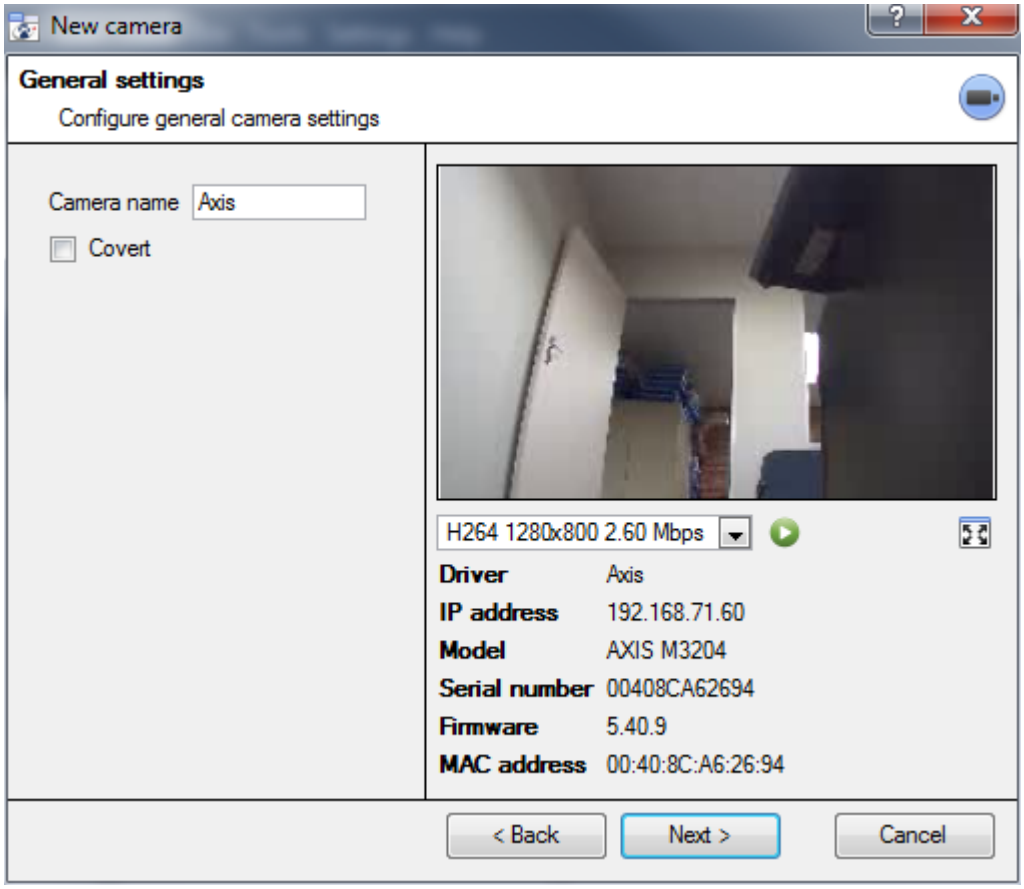
Driver: Select the relevant driver for your camera.
IP Address: Set the IP address of the Camera you want to add.
Scan will scan the network for cameras that have been setup to make themselves available. You may then click on a camera and it will automatically have its driver and IP address set.
Camera name is a descriptive name that you give the camera.
Video Input will be used if you are connecting to an encoder that has multiple analogue inputs. (Otherwise, leave it on 1.)
Port will have a default setting, but if you wish to connect through a specific port, set it to the port of your choice.
Login and password are the cameras current login details.

Note: Under scan you will have the option to list cameras that are already linked to other servers. To do this check the Show devices used by servers box.

- ***Note on Scanning:***

1. Some Cameras do not support automatic location requests, and will not be found using **Scan.**
2. Universal Plug and Play (UPnP) will have to be enabled on the cameras that do support location requests.

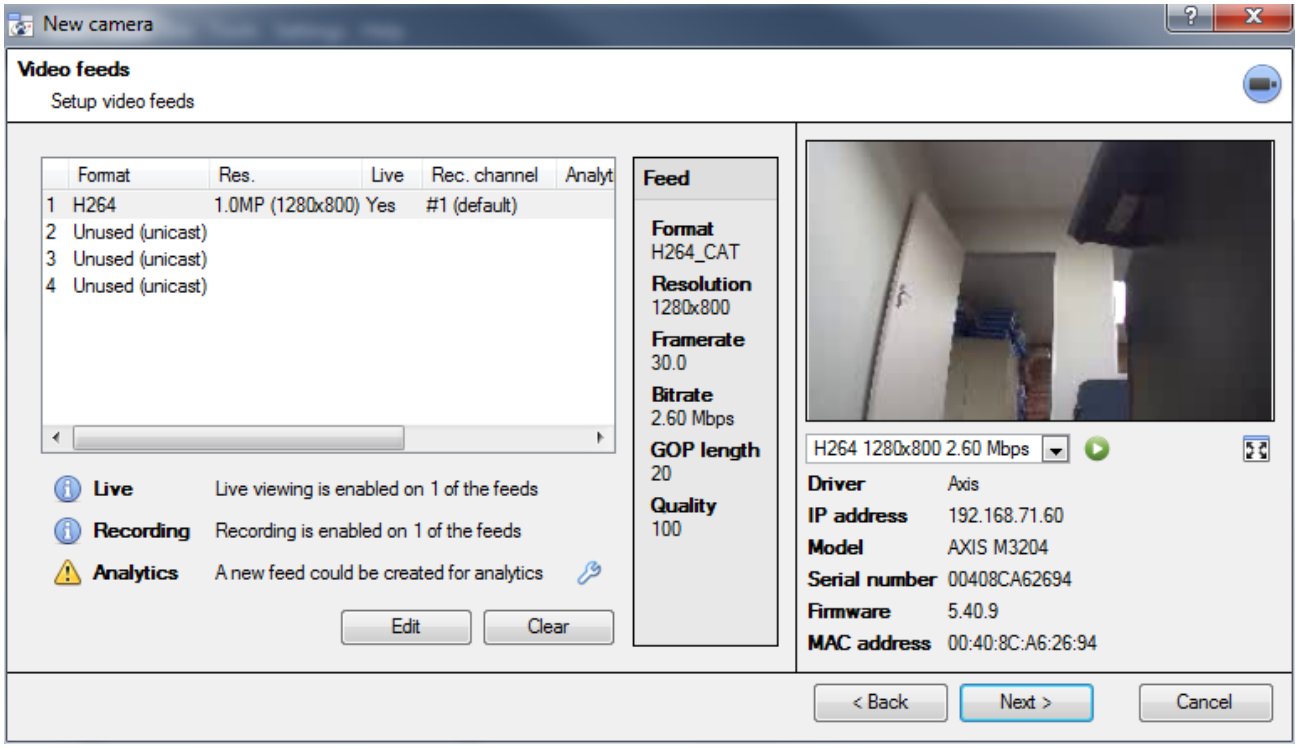
General Settings



Name	Give the camera a descriptive name. So as to make it easily identifiable in a list.
Covert	CathexisVision gives you the option to create a covert camera. There is a difference between a camera being covert, and a user not having access to it. **Covert vs.** — Will only be present in the Resources List of an Administrator, or an access level that has been granted access to this camera **Access Level Defined** — Will still appear in the Resources List of lower log in levels, but they will not be able to view the feed.
Device Information	This will be a list of all the relevant information, pertaining to the device itself. You can see it underneath the image preview.
Live Preview	H264_CAT 1280x800 3.20 Mbps Paused H264_CAT 1280x800 3.20 Mbps The image you see is a frame grab from the video feed that you have chosen To play the live preview click on: To enlarge the image click on:

Note: The image in the preview will not reflect the actual quality of the feed, as it is transcoded when viewed in the camera addition wizard.

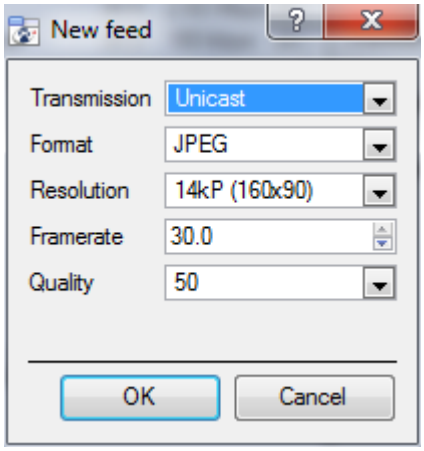
Video Feeds



- ***Add/Edit a Video Feed***

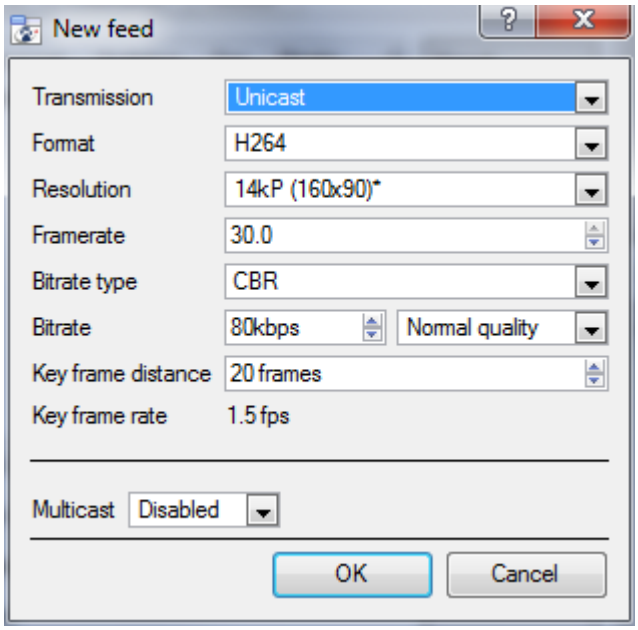
To add/edit a video feed click on one of the available feeds in the list, and click on the **Edit** button. This will bring up a feed dialogue with the available video feeds, and the options that pertain to them. The two most common IP feeds are JPEG and H.264.

JPEG



Transmission will show the transmission type
Format is the compression format used by this stream. Click the drop-down menu to choose the one you desire.
Resolution is the amount of pixels in the image.
Framerate is the amount of frames recorded per second
Quality defines how lossy the compression of the image is. At 100 the image will have the best quality; at 50 it will have the lowest quality.

H.264

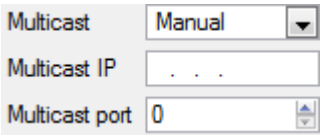


Transmission will show the transmission type
Format is the compression format used by this stream. Click the drop-down menu to choose the one you desire.
Resolution is the amount of pixels in the image.
Framerate is the amount of frames recorded per second
Bitrate Type this is the way that your bitrate is handled. A constant bitrate will be more predictable, but will lose more information the more the image changes. Variable bit-rate is less predictable, but will have better images when the picture has more motion.
Bitrate is the amount of information, in bits, that the feed will send per second. (**Quality** defines how lossy the compression of the image is.)
Key Frame Distance is the number of frames between each I-Frame (Key Frame).

Multicast

You may setup Multicast on your feeds by selecting the relevant option from the feed dialogue. There are three options **disabled, auto,** and **manual**. (Leave disabled if you do not want to use multicast.)

Manual

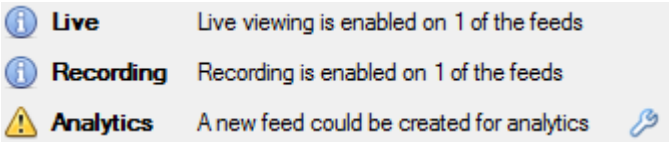


With manual selected you will have to enter in your own Multicast IP, and Multicast Port.

Auto

On auto the Multicast address will be automatically assigned. The core settings for this may be found in the document on the **General Site Setup** section of the **Setup Tab**.

- ***Feed Notifications***



This area will show you the status of the feeds you have created. Whether you have enabled **Recording**, **Live Viewing**, or **Analytics**.

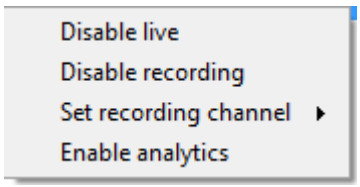
Note: If you click on any of the icons it will display some detailed information about the feed/problem.

Automatic Configuration

If there is an icon at the end of the feed notification, this means that there is a potential problem with your feed setup. Clicking this will automatically fix the problem for you.

- ***Right-Click Menu (Live, Recording, and Recording Channel Settings)***

Right-clicking on a feed, after you have set it up, will bring up the menu seen below. These are setting that can only be accomplished after the feed has been setup.



Disable Live	viewing of the feed
Disable Recording	of the feed
Set Recording Channel	Define which channel number will represent this feed
Enable Analytics	Enable Video Analytics.

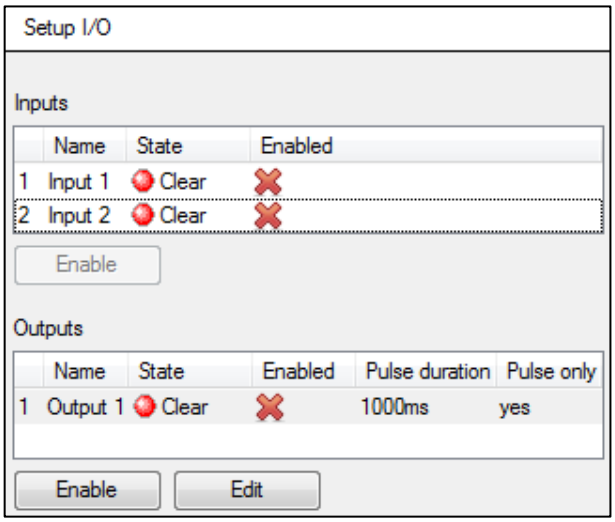
Analytics

In order to enable analytics on a unit you will need to setup a second feed, right-click on that feed, and click **Enable Analytics**. There are a few rules when it comes to enabling analytics.

1. If you do not setup an analytics enabled channel here you will not be prompted to add Video Motion Detection (VMD) later in this wizard, nor will you be able to add VMD, using this feed later.
2. Only Feeds that are QVGA resolution, and lower, will give you the option to enable analytics.
3. If you see a at the end of the Analytics feed notification, you do not have a feed enabled for analytics. Clicking on the will automatically enable one.

I/O

The next step in the addition is the I/O setup. The I/O values represented in the GUI will depend on the I/Os provided by the encoder.



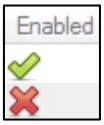
I/O

Inputs are used to trigger an event; **Outputs** are used to give a desired output as a result of a triggered event.

Renaming

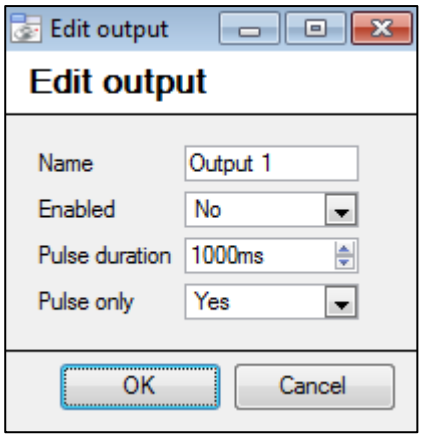
Double click on the I/O name to rename it.

Enabling



Double click on the red cross or click the enable button. Once enabled it may be used to trigger an event.

Edit an Output



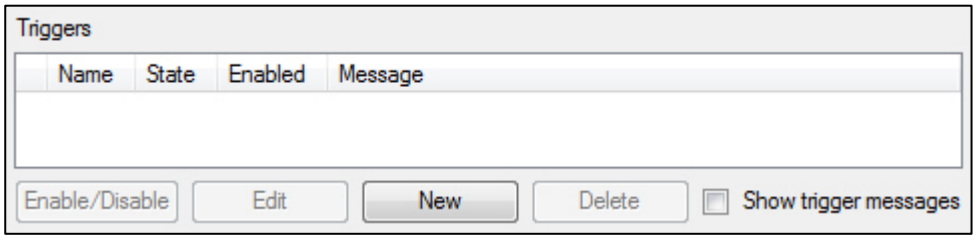
Name
Give your output a descriptive name

Enabled
Will tell you whether the output is disabled/enabled.

Pulse duration
Will set the amount of time (in milliseconds) that the output will pulse for, if it is set to pulse.

Pulse only
If set to Yes, the output will not allow itself to be permanently Set.

Triggers

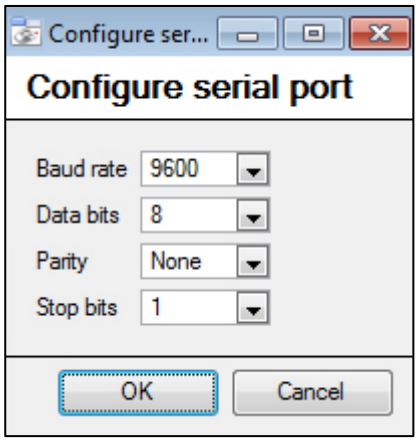


Certain cameras will have their own event triggers, and encoders will often have I/O options.

Note:

- Double clicking on any of the column values of an I/O will toggle the value. E.g. double clicking on a Clear state will change the state to Set. (These options are also available via the Right-Click menu.)
- Give your I/Os descriptive names, otherwise they will not be identifiable.

Serial Ports



Highlight the serial port you wish to configure then click the

button.

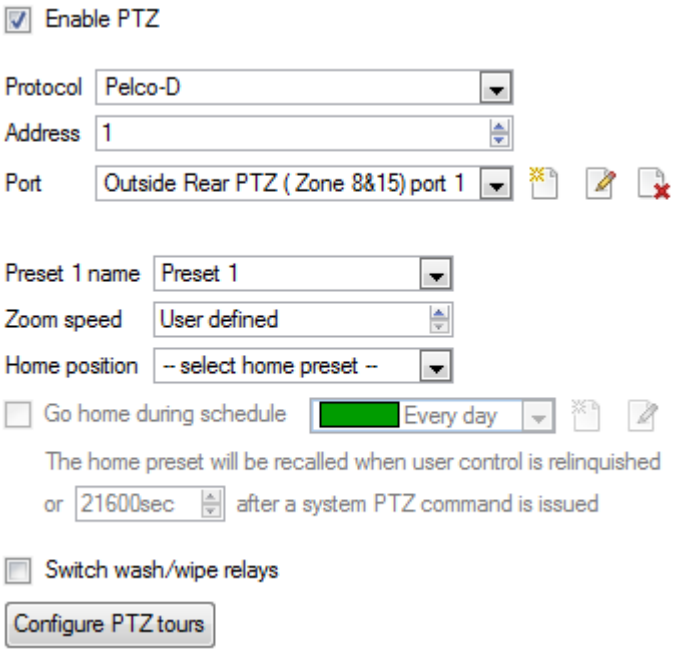
This will give you the option to change the **Baud rate**, **Data bits**, **Parity** and **Stop bits**, and other camera dependent settings.

Note: This option will only be available if the camera has serial ports.

PTZ

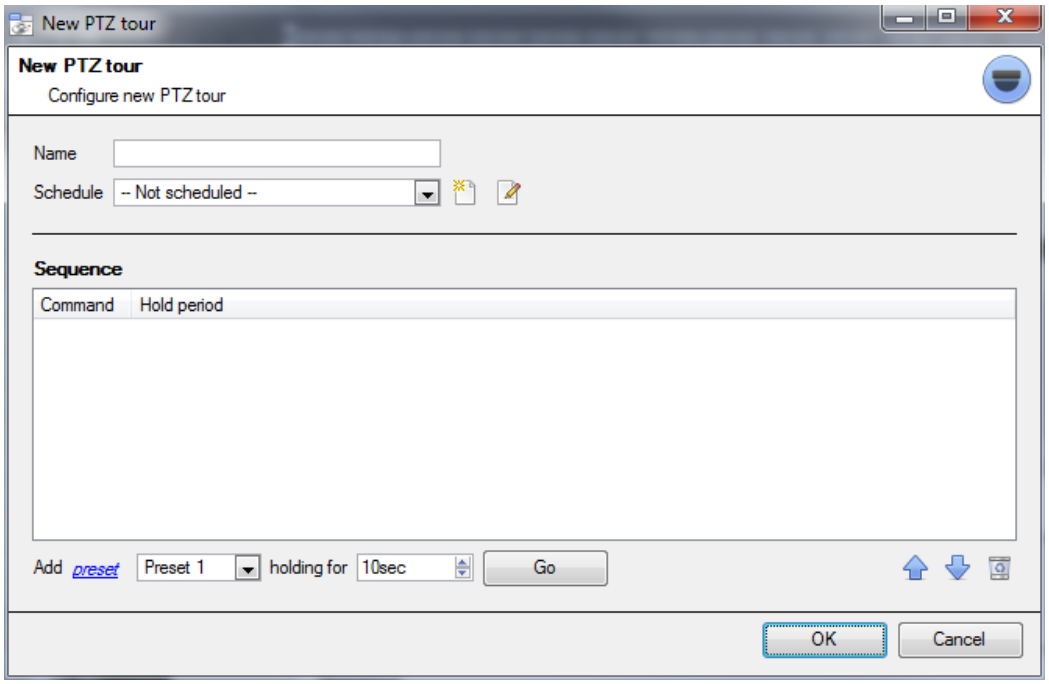
Check the ☑ Enable PTZ box, if you are adding a PTZ camera. After this all the available PTZ options will appear in the wizard interface:

- ***General Settings***



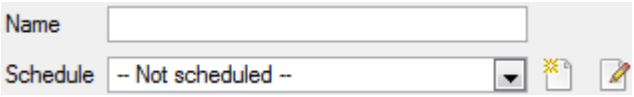
Preset Name	You may give your Presets descriptive names (such as 'front door' etc.)
Zoom Speed	This defines how fast your camera will zoom in when using the PTZ controls. **Note**: Use the live view panel, to the right, to see if the zoom speed is satisfactory. Test this by clicking on Zoom on the PTZ control wheel.
Home Position	A home position is a pre-set position to which the camera will return to after a set period of inactivity. **Automatic Return to Home** You may set a **schedule** during which the camera will return to its home position. When the schedule (see: 5 Schedules) is inactive the camera will remain in the last position that it was left in. If there is no schedule set, the camera will never return automatically to its home position. To have it always return home after a period, simply enable the Every Day schedule.
Switch Wash and Wipe Relays	In the case that the Wash and Wipe relays are incorrectly attributed, this will swap them over to the correct order.
Configure PTZ tours	A ptz tour will run through a sequence of pre-set positions. (See section immediately below.)

- ***Configure PTZ Tours***



If your device supports Tours, to create/edit a PTZ tour click on Configure PTZ tours, this will take you to the list of tours. To create a new tour click on New.

Name and Schedule

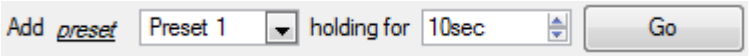


Give the tour a **descriptive name**, and, if you desire, a schedule (see: 5 Schedules)

Sequence
This is the sequence that the Presets will run in.

Add Preset, Multiple Presets, or a Pattern, to the tour

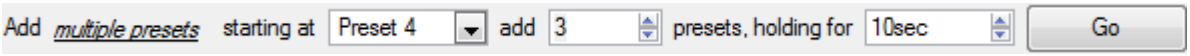
Preset
Select the preset, set how long you want the camera to linger at this preset



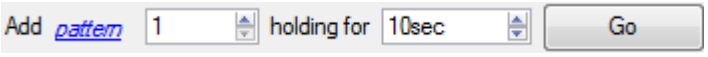
Multiple Presets

- Starting at: Select the first preset you want to add.
- Add: This is the number of Presets, you want to add.

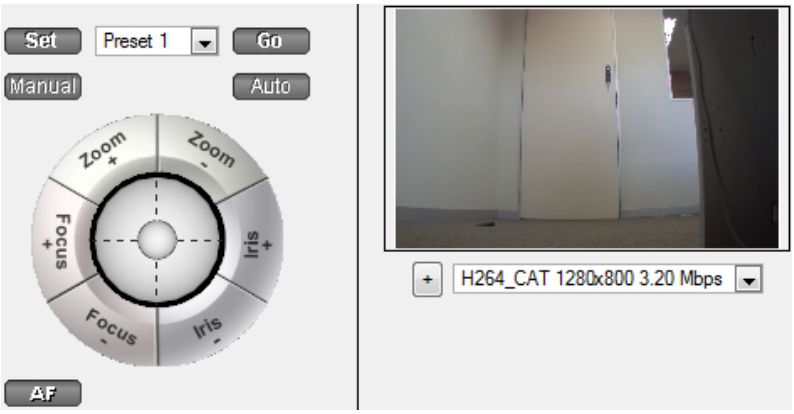
In the example below you will be adding Presets 4 to 6.



Pattern
Select the pattern that you want to add.



- ***PTZ Procedures***



Note: Don't forget to select/play a live feed.

With a Pan-Tilt-Zoom (PTZ) camera an operator can manipulate the camera's direction, Zoom, focal distance (Focus) and amount of light (Iris). He / she can also control pre-configured camera views called "Presets".

A Dome Control Panel becomes available when you select a Live PTZ camera in the CathexisVision interface.

Click the panel's dropdown menu and select **PTZ** (see below). The software joystick displays:

Using the PTZ Control Panel

To pan left / right from the PTZ panel

Drag joystick left / right

To move the camera faster from the PTZ panel

Distance determines speed - drag joystick out, in required direction

To zoom in / out from the PTZ panel

Watch the live camera as you press the Zoom + and Zoom - button

To go to a preset from the PTZ panel

Select the preset from the dropdown, and then click GO

> The camera view will change to the preset.

To relinquish manual control of the dome / PTZ camera from the PTZ panel

Click Auto. > If your system runs remote tours automatically, or switches display based on events, these automated responses will take over.

To allow more or less light in the image (lighten and darken the live camera view) from the PTZ panel

Watch the live camera as you press the **iris+, or iris –** button. You will see the image lighten or darken

To tilt up / down from the PTZ panel

Drag joystick up / down

To move the camera slower from the PTZ panel

Distance determines speed - drag joystick closer in, in required direction

To focus further / closer from the PTZ panel

Watch the live camera as you press the Focus + and Focus - button

To gain manual control of the dome / PTZ camera from the PTZ panel

(This applies if you system runs remote tours automatically, or switches display based on events)

Either click **manual**, or simply move the software joystick

Define a Preset (To set a preset from the PTZ panel)

1. Select the preset number, from the dropdown menu.
2. Use the joystick controls to establish the camera View, Zoom, Focus and Light (Iris).
3. Click SET.
4. Go to this preset to check it.

Database

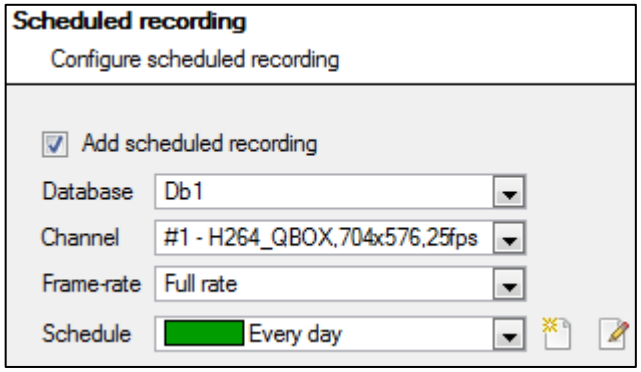
All cameras need to record to a database. If you have not yet created a database you will be taken to the database setup, after you are done with the PTZ setup. If you have already created a database you can either proceed straight to the **Scheduled Recordings/Video Motion Detection setup** and use the current database.

You may create a new database for this camera by checking the Create a new database option in the bottom left hand corner of the screen.

Note: this will setup the database on the recording server that you added the camera to, and not the unit on which you are working (if you are using a client, or other remote unit). This means that you will have no file system knowledge of the remote unit, and will need to enter the path manually. (You will know whether you are on a remote unit, because you will not have the Browse option.)

For further information on setting up a database, please consult the 4Databases section, below.

Schedule

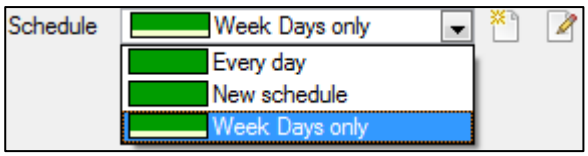


Schedule recording

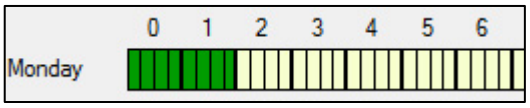
Set your camera to only record at certain times, to increase efficiency and save disk space.

Select the **database**, **channel** and **frame-rate** that you want to apply a schedule to.

Setup a Schedule



Select your schedule from the drop down menu. You can create a new schedule by clicking on the icon. To change an existing schedule click on the button.



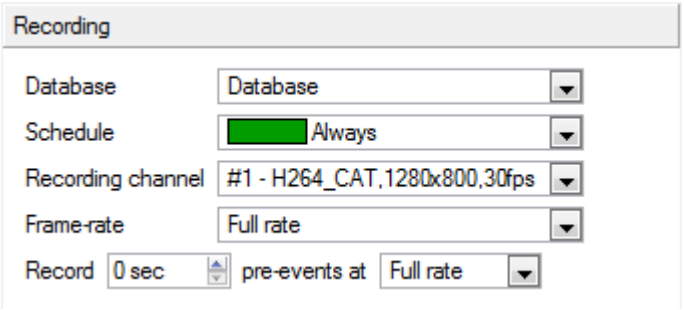
Select/Deselect time cells
Left click to **select recording time** – the green bars.
Right click to **unselect recording time** – the yellow bars.
In the above image, Monday will be recording from 00:00 – 02:00 in the morning.

Activity Recording (VMD Event).

Note: This does a number of things. This will add Video Motion Detection, pre-event recordings, and add an Event to the system.

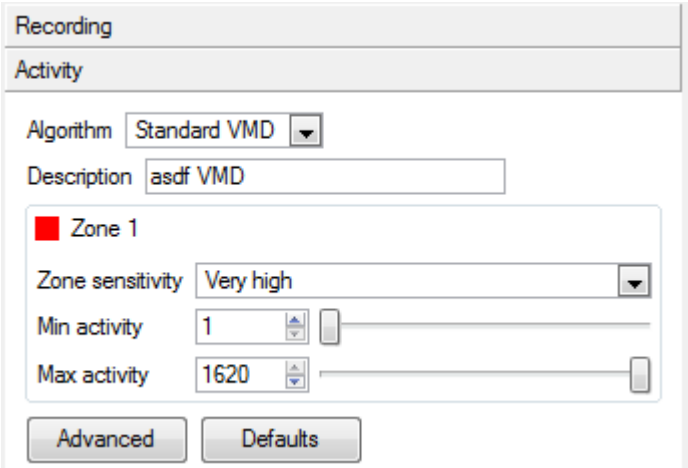
- Check the box to enable the event that you are creating.
- Enter a descriptive **Event Name.**

- ***Recording***



The recording option allows you to setup the recording settings.
Database is the database this event will record to.
Schedule defines when this event will be active.
Recording channel defines which video channel will be recorded.
Frame rate defines the frame-rate that recordings will take place in.
Pre-events define a time that will be buffered, and recorded, from before the initial trigger.

- ***Activity***



Selecting **Activity** will bring up the Video Motion Detection settings.

You may Choose either Standard VMD, or Smart VMD.

The settings for Video Motion Detection are too detailed to go into under this section, for a full description see the 3. **Algorithms** section.

c. Copy/Paste Cameras

Copy/Paste is accessible by right-clicking on an existing camera.

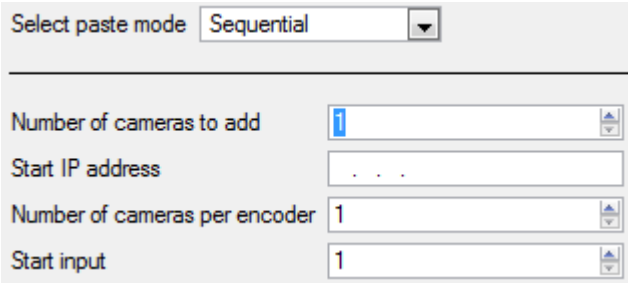
Copy/Paste a camera

If you are adding more than one camera that operates on the same driver CathexisVision offers a very easy solution. You may copy and paste entire new cameras, using the addition information of one preciously added camera.

To do Paste New cameras right click on the previously added camera and click on Copy. Then right click anywhere in the Cameras Panel and click on Paste new... .

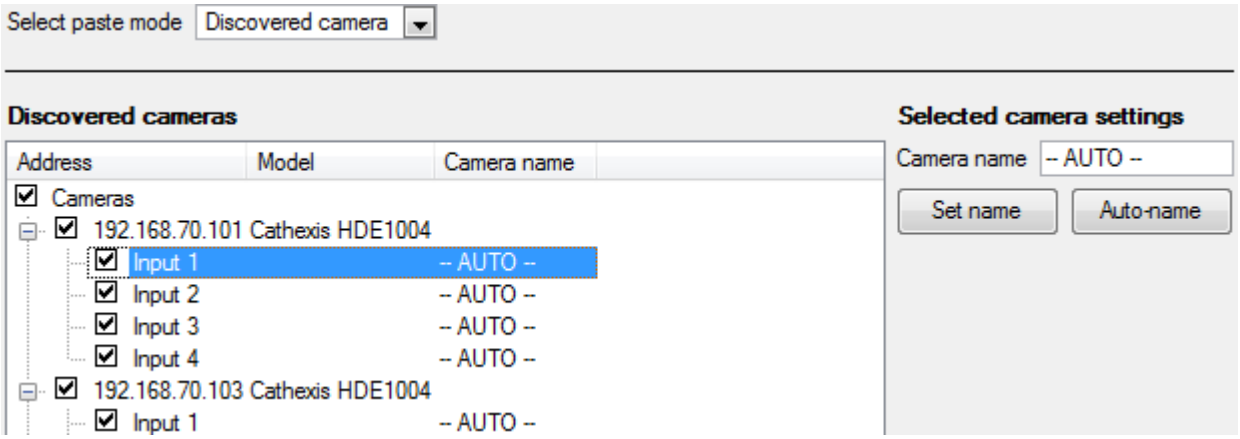
- ***Paste Mode: Sequential***

The paste mode sequential window gives you the option to add the new cameras as a direct copy of the camera that you copied.



Start IP Address will determine the IP address of the first new camera that you are adding. The IP addresses will be incremented from here. (So make sure you have no used IP addresses in this range.)
Number of cameras per encoder must be the full amount of channels available on this encoder
Start Input is the actual physical channel that you want to add the first camera to.

- ***Paste Mode: Discovered***



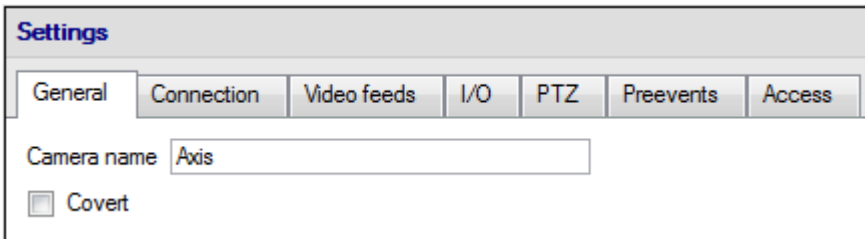
Note: This will copy the video settings from the copied camera onto the discovered cameras that you select.

Copy/Paste Video Settings

If you have already added a number of cameras with the same drivers and simply wish to transfer the Video Settings of each camera across, then you may right-click and select Copy. Then right-click on the camera you wish to add the video settings to and select Paste video settings.

Note:
- This is just the Video Feed settings; it will not add Video Motion Detection analytics.
- You may only copy onto cameras that have the same driver as the camera that has been copied.

d. Editing of an Added Camera (Tabs Based)[2]



You may edit an already added camera by selecting it and clicking on Edit. This will bring up an interface with tabs containing the cameras editable details.

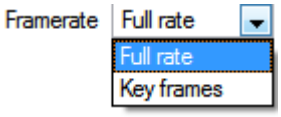
[2] If you make any changes to the setup of a camera, that is currently multicasting, you will need to restart the streams. This simply entails removing and reselecting the cameras in the Cameras tab, after you have saved your settings.

- ***Repeated Options***

The camera setup options of *General*, *Connection*, *Video Feeds*, *I/0*, and *PTZ* are all dealt with verbatim, in section b.Wizard Addition (above), they will not be repeated here; Two options are added in the Editing Tabs, these are: **pre-events,** and **Access Levels**. These two options will be dealt with here.

Note:
In the Wizard you may have gone through the process of setting up a Database, Scheduled Recordings, and Video Motion Algorithm triggered recordings. The Tab Edition only changes camera settings, and therefore does not have these extra options. (*Databases*, *Scheduled Recordings*, *Algorithms* and *Events* all have their own panels under Configure Servers.)

Pre-events

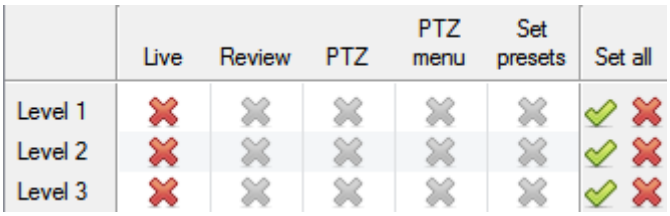


Pre-events were setup under the Activity Recording Section of the Wizard. You cannot define the amount of pre-events here, but you may define the frame rate of the pre-events in this tab.

Note: JPEG is recorded in Key Frames, so you will only be given the option of *Frames per Second* when setting the pre-events on a MJPEG stream.

Access

Under the Access tab you will setup which user access levels have control of the different facets of the camera.



Live	This controls which Access Levels can view the camera's live feed
Review	This controls which Access Levels can review recorded footage form this camera.
PTZ	This controls which Access Levels can control PTZ movement.
PTZ Menu	This controls which Access Levels have the ability to change PTZ menu.
Set Presets	This controls which Access Levels can change PTZ preset positions.
Set All	Selecting will give this level access to all settings; selecting will give this level access to none.

- ***Important Note on Access Rights:***

1. All access levels on this unit are managed in the Access Rights Panel of the Server (**Site —> Open Tab —> Setup —> Configure Servers —> Expand the Server —> Access Rights**).

2. Access rights pertain to the access levels that you will assign to specific users. If you give a user a level 1 access level, and only assign this camera to other levels, that user will not see this camera. (Users are managed in the **Site —> Open Tab —> Setup —> Users**)

e. Analogue Cameras

This section will deal with the details that are specific to the Analogue Capture Cards. Cathexis provides two analogue-to-digital capture cards that work on its non-windows systems.

Analogue cards offer 5 editable options:

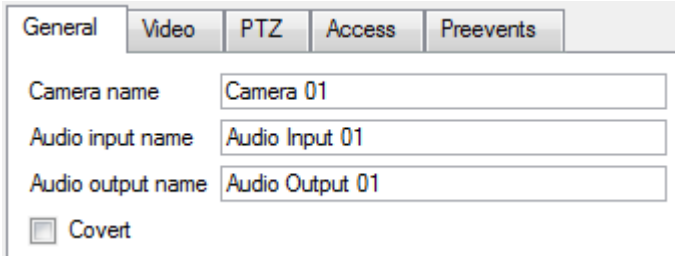
1. General settings
2. Video settings
3. PTZ settings
4. Access settings
5. Pre-events

Aside from the video settings, and the settings under General, all of these settings are identical to the settings you encountered above, in the IP setups. This section will deal with those aspects of camera setup which are different to the above sections.

AVM Capture Card

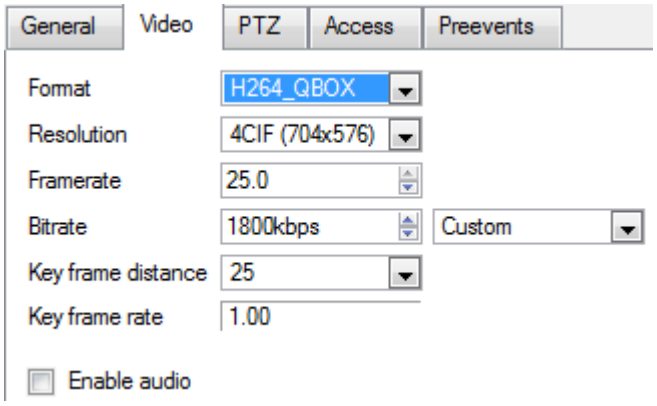
AVM cards convert the analogue input into H.264 video. They also have the ability to synchronise audio, via on-board audio inputs.

- ***General***



Camera name is a descriptive name that you give the camera.
Audio Input Name is the audio input that you will associate with this camera.
Audio Output Name is the name of the audio output that you will associate with this camera.
Covert cameras will only be visible to administrators, and those people whose user accounts have a relevant access level.

- ***Video***



Format is the compression format used by this stream.
Resolution is the quantity of pixels in the image.
Framerate is the amount of frames recorded per second.
Bitrate is the amount of information, in bits, that the feed will send per second. (**Quality** defines how lossy the compression of the image is.)
Key Frame Distance is the number of frames between each I-Frame (Key Frame).
Key frame rate is the rate of key frames, per second.
Enable Audio will enable recording synchronised audio, using the audio channel on the AVM card.

- ***PTZ***

See the **PTZ** section in under Wizard Addition, above.

- ***Access***

See the Access section, under Editing of an Added Camera, above.

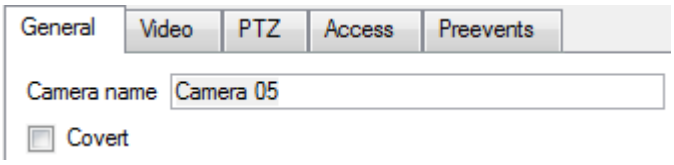
- ***Preevents***

This will determine the frame-rate that pre-events will be recorded at. (These pre-events are added in the events setup.)

VOM 1400/1500/1512 Capture Card

VOM capture cards convert the analogue video input to either MJPEG video, or MPEG-4 video. They have the ability to record synchronised audio, but only when using an MPEG-4 profile.

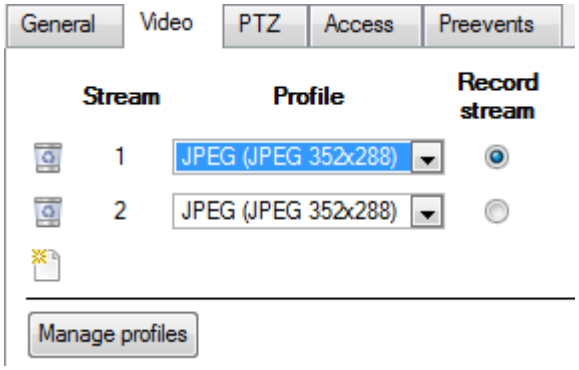
- ***General***



Give your camera a descriptive **name**.

Covert cameras will only be visible to, administrators, and those people whose user accounts have a relevant access level.

- ***Video***



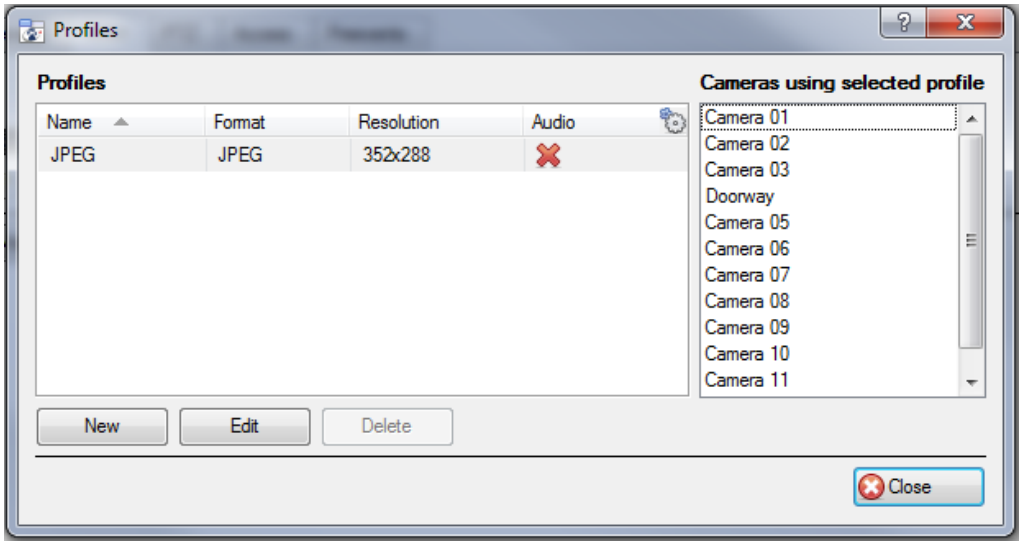
You may have a maximum of 4 streams on any VOM camera.

Stream The stream numbers are for the specific camera you are configuring.

Profile is a drop down menu. You may choose from any of the configured profiles. These are user configured stream profiles. (See Manage Profiles, below.)

Record Stream being checked indicates that the stream is recordable.

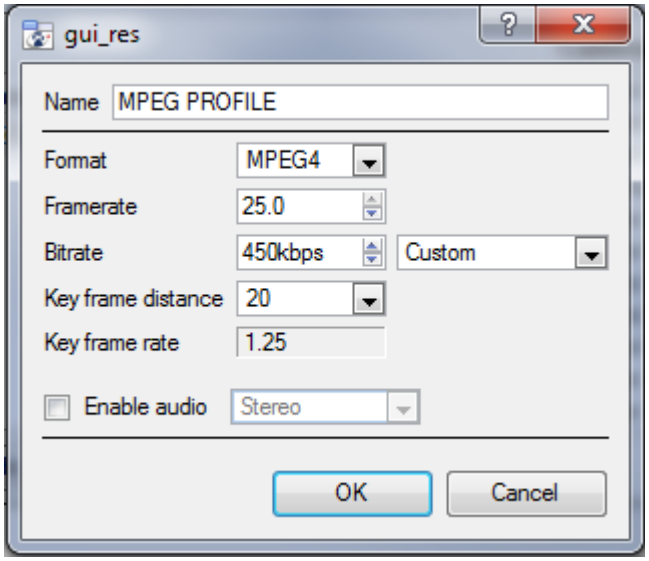
Manage profiles



The **Profiles** dialogue box will give you the information about the currently existing profiles.

The **Cameras using selected profile** list will provide you with a list of all cameras currently using the selected profile.

- ***MPEG4***

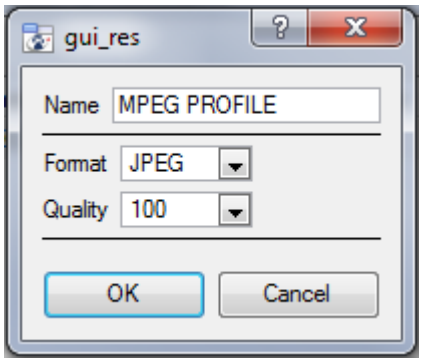


Enable Audio allows you to synchronise audio on any camera attached to the VOM card. This audio will be synced with the audio input on the motherboard of the DVR.

Note:

- Only use one physical input on the motherboard at a time. When there are mic, and line, options available: only use the mic input **OR** the line input. The mic and line inputs **cannot** be used simultaneously.

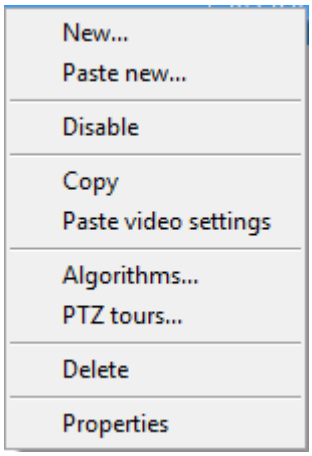
- ***JPEG***



The JPEG setup is very simple, you simply choose the **format** (JPEG), and set the quality that you want.

The **quality** number is a representation of the image quality. (E.g. 100 is the highest, and will give you the best image quality.)

f. Right Click on a Camera



There are a number of unique options under the right click menu in the Cameras Panel.

Algorithms

If you right click on a camera you may also add a Video Motion Detection algorithm to it.

Note: If you have not already added a Video Analytics enabled feed it will add one for you. For more information on CathexisVision Algorithms see 3 Algorithms

PTZ Tours

Right Clicking on a Camera will give you access to the PTZ Tours Manager. For more information on PTZ Tours see 2.f. Configure PTZ Tours below.

Disable

Will disable the camera, but not delete it from the system.

Note: **New**, **Paste New**, **Copy**, and **Paste Video Settings** are all dealt with above under Copy Paste Cameras.

3 Algorithms

a. Introduction

There are a number of Algorithms that CathexisVision Supports. In this section you will be introduced to some procedures that are common to all of them.

Access Algorithm Settings/Setup

There are two ways to access the Algorithms, from within **Setup Tab —> Configure Servers**.

- ***Via the Cameras Tab***

You may access the Algorithms associated with a particular camera by clicking on that camera, and then clicking on the Algorithms button on the bottom of the tab. (You may also right-click a camera and select Algorithms...).

This will bring up a dialogue box with a list of algorithms associated with this camera. In the box you may select algorithms to edit them, or create new algorithms.

Note: when you access algorithms via this channel you will not be given an opportunity to associate this algorithm with any camera, other than the one you clicked on.

- ***Via the Algorithms tab***

This will list all Algorithms that are related to cameras on this Server.

Note:

- As above if you are editing an already existing algorithm you may not change the camera that it is designated to.
- If you are creating a new algorithm you will then have the Camera Analog One above the Algorithm option.
- You may not change the algorithm type after you have clicked OK, and created the algorithm.

Copy/Paste an Algorithm

You may copy/paste Algorithm settings either from one algorithm to another, or from one algorithm to a new camera. **These settings may be copied across servers, and even across sites.**

- ***Copy algorithm settings from one algorithm to another***

Right-click on an existing algorithm, and then click on Copy. Then right-click on the algorithm you want to overwrite and click Paste

- ***Copy Algorithm settings as a new algorithm***

Here you will be copying the algorithm settings onto a camera, so you right-click and Copy the existing algorithm. Then right-click anywhere and select Paste new... this will bring up a list of cameras that are attached to this unit (e.g. ☑ Analog One).

You may select any number of cameras to paste the algorithm onto, and click OK.

Note:

- When a copied algorithm is pasted over an existing algorithm, everything is transferred, except the zone masks.
- When a copied algorithm is pasted as a new algorithm, the new algorithms will have their mask completely set.
- You cannot:
    - Paste a VMD algorithm over a still object algorithm.
    - Paste a smart VMD algorithm onto a unit that is not licensed for smart VMD. (This applies when copy/pasting across sites.)

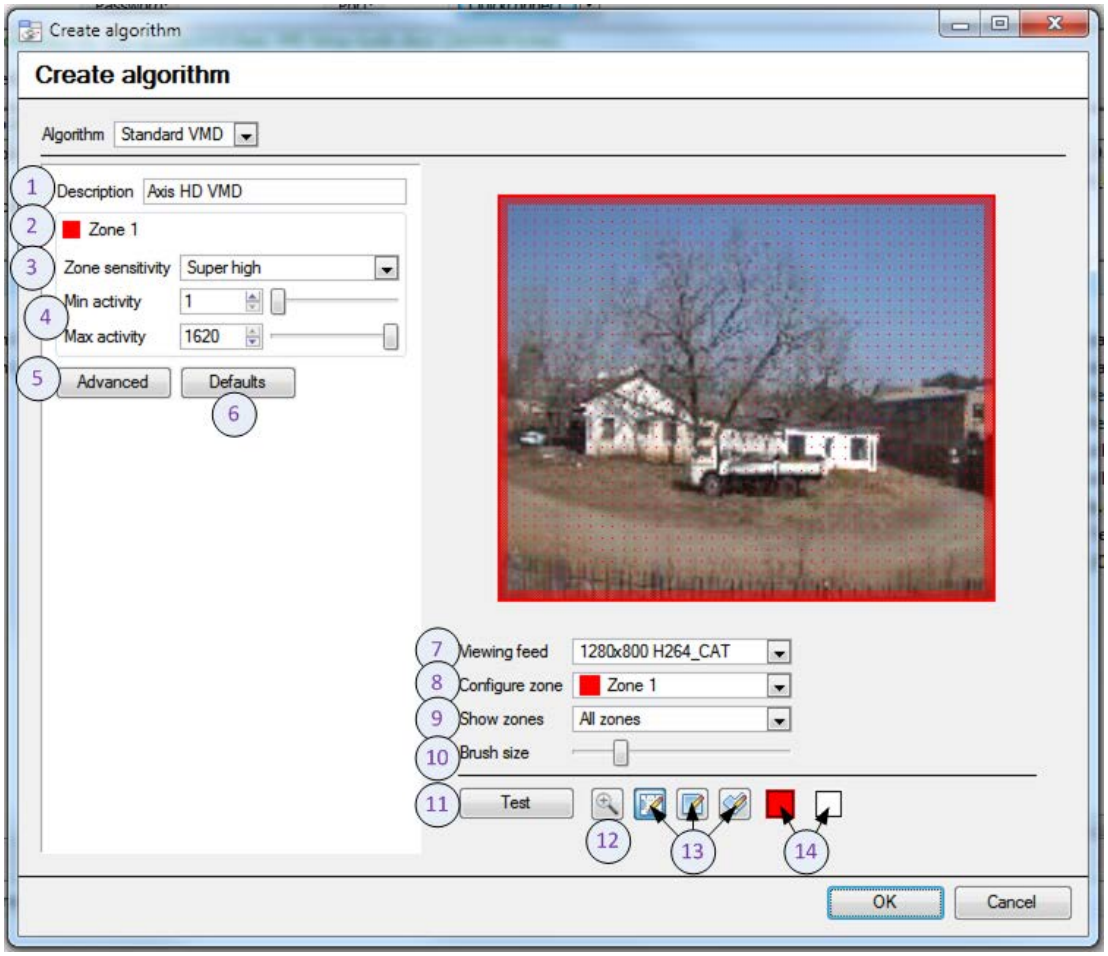
b. Basic Video Motion Detection

Introduction

This Guide will walk you through the Video Motion Detection setup process. To do so it will necessarily go into detail about the individual parameters which are available to the user, this will give you a deeper understanding of the algorithm, and allow you to make informed setup decisions.

It is important to remember that the setup process will be iterative, and will require 'tweaking' in order to get right. This is because VMD algorithms do not work in the same way as the human eye/brain combination. Rather they observe changes in light intensity at the level of the individual pixel and use this to set off triggers. As a result any changes in the image can set off a trigger, and these need to be adjusted for on a situation by situation basis. In other words, there is no one-size-fits-all solution to VMD setups.

Basic Video Motion Detection Setup Window



1	**Description** is simply the name of the specific algorithm setup that you are creating, and can be named at your discretion.
2	**Zone:** This will reflect whichever zone you have selected in 8, and any changes made to the settings below will be made to the specific zone that you have selected.

3

In order to explain **Zone Sensitivity** an explanation of the basics of the Video Motion Detection algorithm is necessary. VMD works by measuring changes in light intensity on a pixel level. The image that the system analyses is segmented into **Pixels, and Cells.**

A **pixel** is the smallest element of a digital image that is utilized by the motion detection algorithm. A pixel can produce up to 256 different levels of visible light, and it is these variations in light intensity that are registered by the VMD.

A **Cell** consists of 4*4 pixels (16 pixels per cell)

The **Sensitivity** of the algorithm relates to the number of **Pixels per Cell** that must register a change in light intensity for the cell to trigger [register the change as significant].

Pixel values per setting:

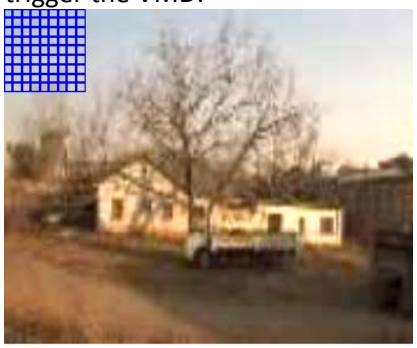
Low	8 Pixels
Medium	4 Pixels
High	3 Pixels
Very High	2 Pixels
Super High	1 Pixel

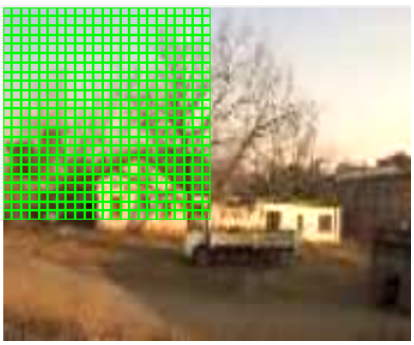
4

Min Activity is the numbers of **Cells** [as defined above] that need to trigger to trigger a motion detection event. This defines the smallest amount of change in an image area that can trigger the VMD.

Max Activity is the inverse of **Min Activity**. It sets the largest amount of movement [defined by triggered **Cells**] that can trigger the VMD. This is useful if you want to filter out vehicles or, smaller objects too close to the camera (i.e. birds or bugs).

In the images below the blue blocks represent the **Min Activity**, and the green blocks represent the **Max Activity.** At Min activity 81 the 81 number corresponds to the 81 blue blocks on the screen, which in turn represent 81 individual VMD Cells. Anything in between these two block sizes will trigger the VMD.



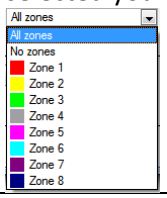
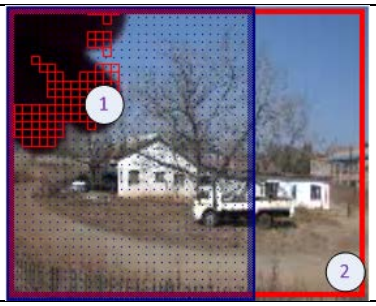


*Note: The position of these min/max activity cells have nothing to do with zones, they merely represent the size of the change in image that will set off a VMD trigger, at any point in the zone for which you set it.

Also note that these are set on a zone by zone basis.

5

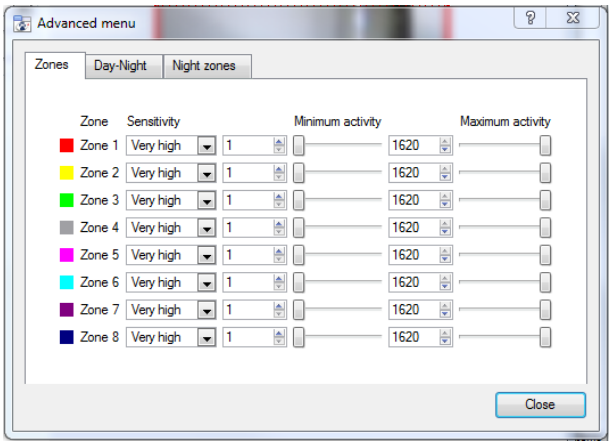
Advanced Settings will be dealt with below, outside of this table.

6	**Reset Defaults:** This allows the user to set the VMD settings back to the default settings. *Note: The default settings are, by no means, the correct settings. This merely allows the user to reset the VMD, in order to tinker from a set base.
7	**Viewing Feed:** This is one of the feeds that the camera is capable of producing, which you may use when designing the structure of your VMD. This will not be the feed that the analytics is performed on. The analytics feed is set when you define the Video Feeds in the camera addition process.
8	**Configure Zone:** Select a zone from the drop down menu; this will be the zone on which you draw with the left click, and delete with the right click. The drop down menu will give you all available zones; you have 8 possible zones. Once a zone is selected you will see its name in the editing panel on the left, and be able to adjust it from there. 
9	**Show Zones** has three options • Current Zone: Is the specific zone that you are drawing, and working on. • All Zones: will display all the zones which you have created. • No Zones: will hide all the zones and give you an unobstructed view of the test image.
10	**Brush Size** determines how large the blocks, with which you draw the VMD Zones are.
11	To **Test** the VMD, and the zones that you have just drawn, you may click the **Test** button. This will change the image that you have been editing in the setup window to a live feed. If there is a trigger you will see a red border flash around the entire image, and the individual cells inside your zones, that have triggered, will light up as red squares. (See an example image below)  1 The red blocks at the point of motion the are VMD cells triggering within the Blue Zone. 2 The red line around the image indicates that a zone has triggered.
12	This turns off zone drawing, and activates the middle mouse button for zooming into the image.
13	These three options pertain to how the zones are drawn onto the image, from left to right: • **Draw in Paint Mode** is a free form drawing tool that allows you to draw a zone in any shape. To draw in this mode simply left click and hold, then drag the mouse to draw your shape: • **Draw Rectangles** allows you to draw shapes with 4 straight sides, and four 90° angles.

	To draw in this mode left click to define your first node, then drag the mouse away to define the shape of the rectangle: Double click your second node/corner to set the shape of your zone. • **Draw Polygons** allows you to draw multifaceted shapes, of any design, with straight lines. To draw in this mode left click to set a node, and move the mouse around to set the lines, left clicking to set corners as you go: Double click the last node, to set your zone. *Note: With all modes the mouse's Left-Click is used to draw in zoned areas, and the Right-Click is used to remove zoned areas. You can use them across modes too. So you could draw a Rectangle, and then remove a polygon from within it. If you need to draw a thin straight line it is easier to do so using either the polygon, or the rectangle tool, than using the painting tool.
14	**Fill Zone Mask** will paint the entire image as a VMD zone. **Clear Zone Mask** will clear the entire zone that you are currently editing from the image. *Note: This affects the entire image, not the part of the image that you can see. So if you are zoomed in it will still affect the image outside of the area you can currently see.

Advanced Settings

Click on the Advanced button. This will take you to the following window, where you will be able to adjust the **Zones**, and **Day-Night** settings.



- ***Zones***

A good example of why zones are necessary is a border fence. The perspective of the receding fence means that a human 200m away from the camera will take up far less pixel space than a human 10m away. This means that being able to set up different zones with increasing/decreasing sensitivity is very valuable.

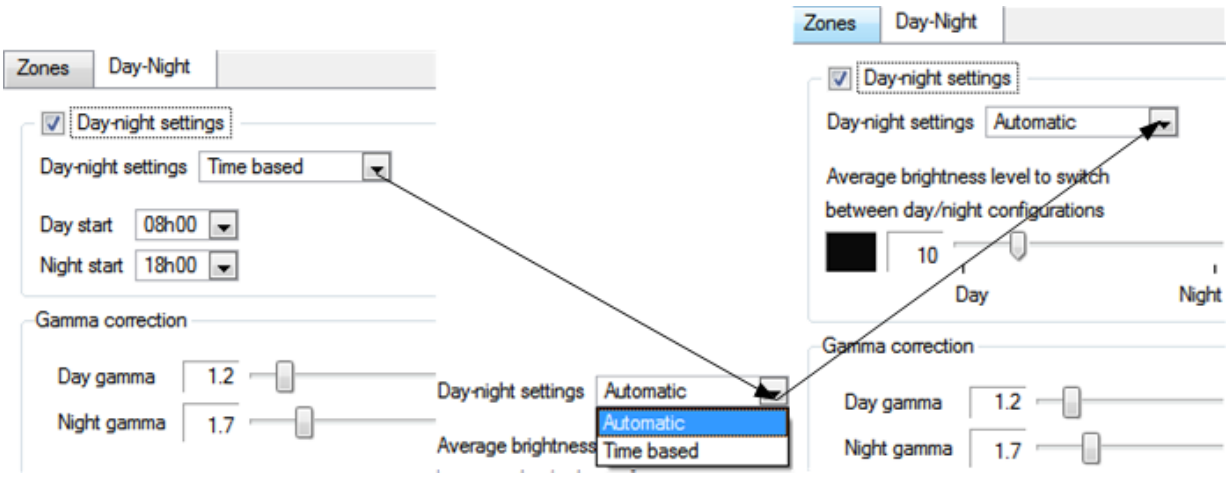
In this same example being able to set up both a minimum cell value, and a maximum cell value, for triggers is also invaluable.

- ***Day-Night***

Lighting conditions will obviously change depending on what time of day it is. These changes can be disruptive to the motion detection algorithms, which is why CathexisVision provides alternate settings for day and night.

Gamma is a brightening tool that works on a gradient. In other words it brightens the dark parts the most, and the lightest parts the least. This causes an evenly brightened image with no overexposed areas, and no dark patches.

To set the timing of the **Day/Night** settings you can either use *automatic* settings that rely on ambient light levels in the camera's image, or *Time Based* settings.



*Note: In the *Automatic* setting the slider levels are abstract, so you will have to make adjustments incrementally, and at different times of the day, to decide which settings are best. The *Automatic* setting will be the most accurate, but will also take the longest to set up.

- ***Night Zones***

When you have enabled Day/Night mode you will be able to make changes to the settings in the Night Zones tab. This allows you to change the sensitivity of the zones when the Night mode is enabled.

The mechanics of the settings here are identical to those set under the Zones tab.

Final Words

For most purposes the Basic VMD will be sufficient. However, if you have a very dynamic environment (swaying grass, trees, flashing lights etc.), there are other algorithms available in the CathexisVision suite that will suit almost any need.

These are:

- Smart VMD
- Still Object Detection

c. SMART Video Motion Detection

Introduction

This section will walk you through the Smart Video Motion Detection setup process. It will go into detail about the individual parameters which are available to the user, so as to better explain the setup process.

It is important to remember that the setup process (**especially with Smart VMD**) will be iterative, and will require 'tweaking' in order to get it right. This is because VMD algorithms do not work in the same way as the human eye/brain combination. Rather they observe changes in light intensity at the level of the individual pixel and use this to set off triggers. As a result changes in the image, such as clouds rushing over a field, or a flashing light, can cause a false trigger.

Differences between Smart and Standard VMD

Smart VMD is specifically designed to work in more dynamic environments than Standard VMD. It uses a number of methods to learn environmental noise patterns, and filter them, to avoid false alarms. The following guide will explain how Smart VMD does this, and in the process, how to set it up.

One of the major differences between Smart VMD and Standard VMD is the threshold for how much movement/change is needed in an image to trigger the VMD.

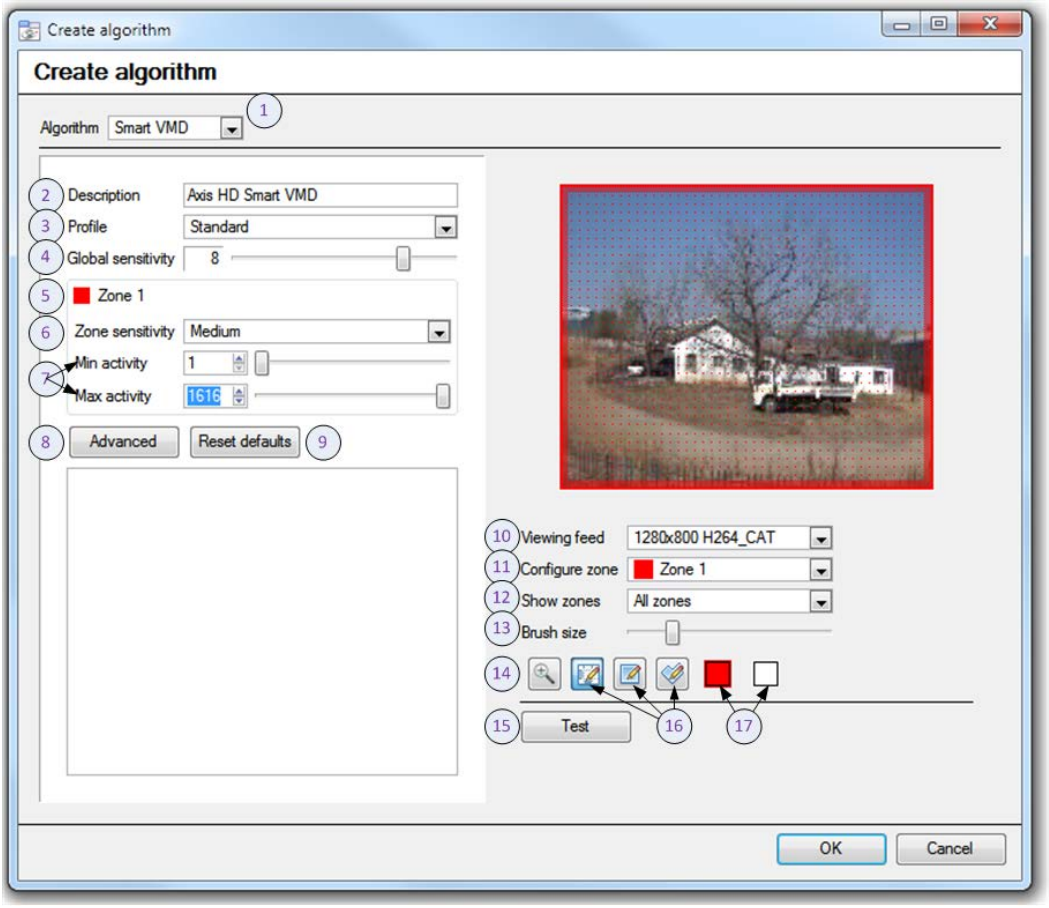
- In Standard VMD this threshold is static, and defined by the Sensitivity, Minimum Activity, Maximum Activity, and Zone that the user sets. Anything affecting enough pixels per cell, and enough cells per zone will set off a trigger.
- The Smart VMD goes beyond these settings, as its threshold is a dynamic one that is determined by the average movement in the image over time; anything sufficiently high enough over this threshold will set off a trigger, but also momentarily shift the threshold up. If the environmental motion is

consistent the threshold will be maintained, and in so doing prevent false triggers set off by rhythmic environmental movement.

Smart VMD Setup Window

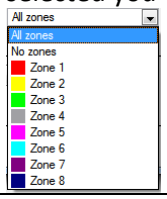
When you first add a camera, and define an analytics video feed, you will be asked if you want to configure scheduled and/or activity triggered recordings. This section will focus on Smart VMD setup via the *Site -> Setup -> Configure Servers -> Cameras -> Algorithms* channel.

All setups are centralized in the setup tab, and every setup follows a 'wizard' process that will be familiar to anybody who has used Windows.

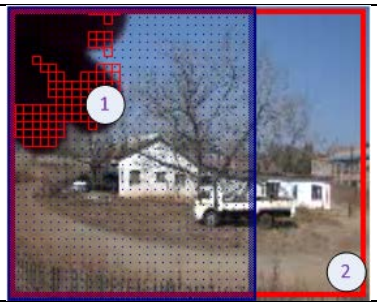


1	This is the drop down menu from which you select the VMD algorithm you wish to create/edit. Smart VMD Standard VMD Smart VMD Still Object
2	**Description** is simply the name of the specific algorithm setup that you are creating, and can be named at your discretion.
3	Under **Profile** is a selection of pre-defined settings with descriptive names. Standard Standard Short grass Long grass For a table comparing the Advanced settings of these profiles see 0

4	Sliding this bar to the right will make the algorithm more sensitive to motion, and to changes in the amount of motion in the image. Changes to **Global Sensitivity** affect the Smart VMD settings, and sensitivities therein, not the sensitivities of the VMD Cells [Explained in the **Zone Sensitivity** section below]. It has a direct effect on the **Minimum Threshold, and Threshold Plus/Minus Settings.** Increasing the global sensitivity will lower the **Minimum Threshold**, which is the parameter that sets the smallest change in the image that will trigger the VMD. At the same time, increasing the global sensitivity will reduce the width **Threshold Plus/Minus** envelope that surrounds the Threshold. This means that the amount of motion over the dynamic threshols required to push the threshold higher is smaller [it is easier to push it up], AND the amount of motion required to restart the count before the threshold begins to descend back to the **Minimum Threshold** is also smaller [it is harder to keep it up].
5	**Zone:** This will reflect whichever zone you have selected in 11, and any changes made to the settings below will be made to the specific zone that you have selected.
6	In order to explain **Zone Sensitivity** an explanation of the basics of the Video Motion Detection algorithm is necessary. VMD works by measuring changes in light intensity on a pixel level. The image that the system analyses is broken up into **Pixels, and Cells.** A **pixel** is the smallest element of a digital image that is utilized by the motion detection algorithm. A pixel can produce 256 different levels of visible light, and it is these variations in light intensity that are registered by the VMD. A **Cell** consists of 4*4 pixels (16 pixels) The **Sensitivity** of the algorithm relates to the number of **Pixels** per **Cell** that must register a change in light intensity for the cell to trigger [register the change as significant]. Pixel values per setting: Low — 8 Pixels Medium — 4 Pixels High — 3 Pixels Very High — 2 Pixels

7	**<u>Min Activity</u>** is the numbers of **Cells** [as defined above] that need to trigger to trigger a motion detection event. This defines the smallest amount of change in an image area that can trigger the VMD. **Max Activity** is the inverse of **Min Activity**. It sets the largest amount of movement [defined by triggered **Cells**] that can trigger the VMD. This is useful if you want to filter out vehicles or, smaller objects too close to the camera (i.e. birds or bugs). In the images below the blue blocks represent the **Min Activity**, and the green blocks represent the **Max Activity.** At the 81 number corresponds to the 81 blue blocks on the screen, which in turn represent 81 individual VMD Cells. Anything in between these two block sizes will trigger the VMD. *Note: The position of these min/max activity cells have nothing to do with zones, they merely represent the size of the change in image that will set off a VMD trigger, at any point in the zone for which you set it. Also note that these are set on a zone by zone basis.
8	**Advanced Settings** will be dealt with below, outside of this table.
9	**Reset Defaults:** This allows the user to set the VMD settings back to the default settings. *Note: The default settings are, by no means, the correct settings. This merely allows the user to reset the VMD, in order to tinker from a set base.
10	**Viewing Feed:** This is one of the feeds that the camera is capable of producing, which you may use when designing the structure of your VMD. This will not be the feed that the analytics is performed on. The analytics feed is set when you define the Video Feeds in the camera addition process.
11	**Configure Zone:** Select a zone from the drop down menu; this will be the zone on which you draw with the left click, and delete with the right click. The drop down menu will give you all available zones; you have 8 possible zones. Once a zone is selected you will see its name in the editing panel on the left, and be able to adjust it from there. 
12	**Show Zones** has three options • Current Zone: Is the specific zone that you are drawing, and working on. • All Zones: will display all the zones which you have created. • No Zones: will hide all the zones and give you an unobstructed view of the test image.

13	**Brush Size** determines how large the blocks, with which you draw the VMD Zones are.
14	**Zoom** turns off zone drawing, and activates the middle mouse button for zooming into the image.
15	To **Test** the VMD, and the zones that you have just drawn, you may click the **Test** button. This will change the image that you have been editing in the setup window to a live feed. If there is a trigger you will see a red border flash around the entire image, and the individual cells inside your zones, that have triggered, will light up as red squares. (See an example image below)



1 The red blocks at the point of motion the are VMD cells triggering within the Blue Zone.

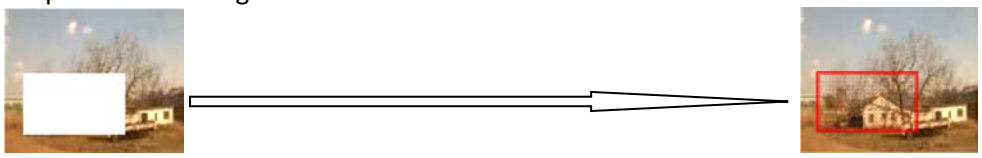
2 The red line around the image indicates that a zone has triggered.

16

These three options pertain to how the zones are drawn onto the image, from left to right:

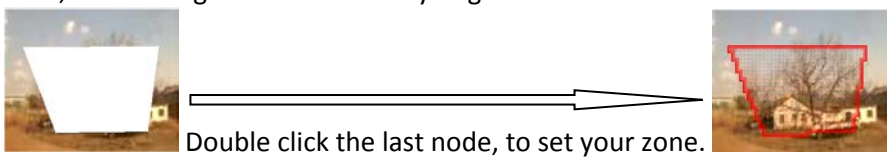
- **Draw in Paint Mode** is a free form drawing tool that allows you to draw a zone in any shape. To draw in this mode simply left click and hold, then drag the mouse to draw your shape:

- **Draw Rectangles** allows you to draw shapes with 4 straight sides, and four 90° angles. To draw in this mode left click to define your first node, then drag the mouse away to define the shape of the rectangle:



Double click your second node/corner to set the shape of your zone.

- **Draw Polygons** allows you to draw multifaceted shapes, of any design, with straight lines. To draw in this mode left click to set a node, and move the mouse around to set the lines, left clicking to set corners as you go:



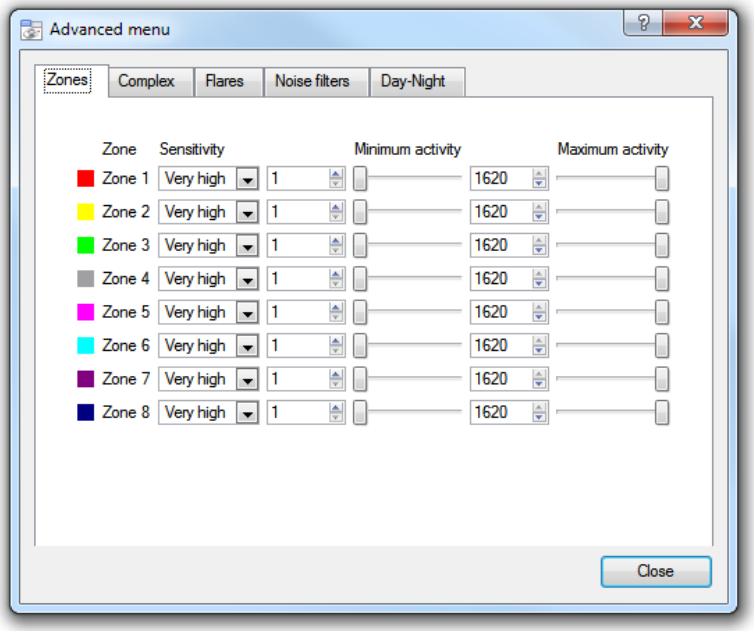
Double click the last node, to set your zone.

*Note: With all modes the mouse's Left-Click is used to draw in zoned areas, and the Right-Click is used to remove zoned areas. You can use them across modes too. So you could draw a Rectangle, and then remove a polygon from within it.

	If you need to draw a thin straight line it is easier to do so using either the polygon, or the rectangle tool, than using the painting tool.
17	**Fill Zone Mask** will paint the entire image as a VMD zone. **Clear Zone Mask** will clear the entire zone that you are currently editing from the image. *Note: This affects the entire image, not the part of the image that you can see. So if you are zoomed in it will still affect the image outside of the area you can currently see.

Advanced Settings

Click on the Advanced button. This will take you to the following window.



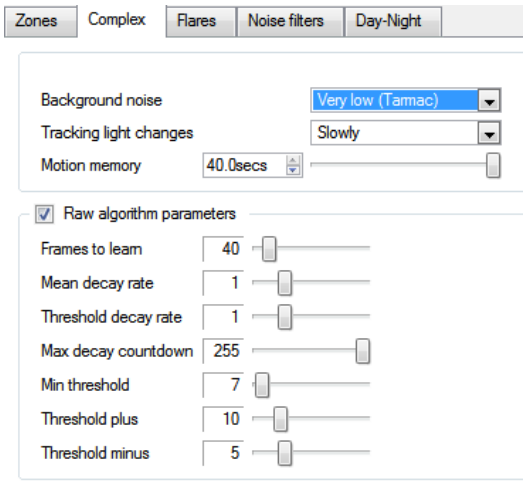
- ***Zones***

A good example of why zones are necessary is a border fence. The perspective of the receding fence means that a human 200m away from the camera will take up far less pixel space than a human 10m away. This means that being able to set up different zones with increasing/decreasing sensitivity is very valuable.

In this same example being able to set up both a minimum cell value, and a maximum cell value, for triggers is also invaluable.

- ***Complex***

In order to follow this section, and get a better understanding of the Smart VMD, check the ☑ Raw algorithm parameters box in the Complex tab.



Background Noise

This setting and **Min Threshold** are the same setting. It is one of the most important settings on the sensitivity of your algorithm.

The threshold defines how much difference there has to be between the mean pixel intensity value/Expected Value (EV), and the current intensity value of the pixel, for the VMD to trigger.

This threshold is dynamic, and is determined by the amount, and extremity, of motion. This means that the size of the threshold envelope that surrounds the EV gets bigger and smaller depending on the type of motion in the image.

The **Minimum Threshold** is the lowest value that your threshold will drop to. The lower the threshold, the more sensitive the algorithm is to motion. This means that this setting will determine the highest possible sensitivity of your algorithm.

Tracking light changes

This setting and **Mean Decay Rate** are the same setting. The algorithm determines a mean pixel value for each pixel in the image [this is an average brightness level per pixel, and each pixel has 256 levels of brightness that it can achieve]. This value is known as the Expected Value (EV).

Note: Because this mean is calculated using past images it will lag slightly behind the current image. It is the difference between the mean and the current pixel value that is compared to the threshold to determine whether the threshold stays high, is increased, or triggers.

Mean Decay rate sets how far behind the current pixel value the mean will lag. If it is fast the mean will track quickly. This will decrease the amount of alarms, by decreasing the distance (and therefore the difference) between mean and current pixel values. If it is slower there will be more alarms.

Usage Note: The settings range from 1-4, 4 is the fastest 0 is the slowest.

Motion memory

This setting and **Max Decay Countdown** are the same setting. It defines how many seconds the Expected Value of a pixel will remain static after it has been pushed upwards, by a change close enough to, or over, the Expected Value.

Motion close enough to [within the **threshold minus**] the EV will reset this count; motion over the EV, [within, or over, the **threshold plus** will reset the count]

Frames to learn

This is the learning period, during which the VMD will set the initial EV based on the number of frames you set for it to learn from. During this period no triggers will be set off, as the VMD is still learning the environment.

Mean Decay Rate

See Tracking Light Changes, above

Threshold decay rate

This sets how the speed at which the threshold drops back to ambient levels, or, to the Minimum Threshold setting.

Max Decay Countdown

See Motion Memory, above

The main difference is that Motion Memory is adjusted in time (i.e. seconds), and Max Decay Countdown is adjusted in Frames [to get the seconds from this setting divide the Max Decay Countdown setting by the frame-rate you set for your analytics feed. At about 6 frames per second Max Decay Countdown, and Motion Memory should be about in line].

Min Threshold

See Background Noise, Above

This setting ranges from 0 to 255, this reflects the 1-256 brightness level each pixel has. This means that if you set it at 255, the pixel will have to burn at its brightest just to go above the threshold, which is unpractical in almost every VMD setting.

A good guide is that, when selecting Very High in the Background Noise setting it only takes this threshold up to 25; and when setting Global Sensitivity at its *least* sensitive, this setting goes up to 50.

Threshold Plus

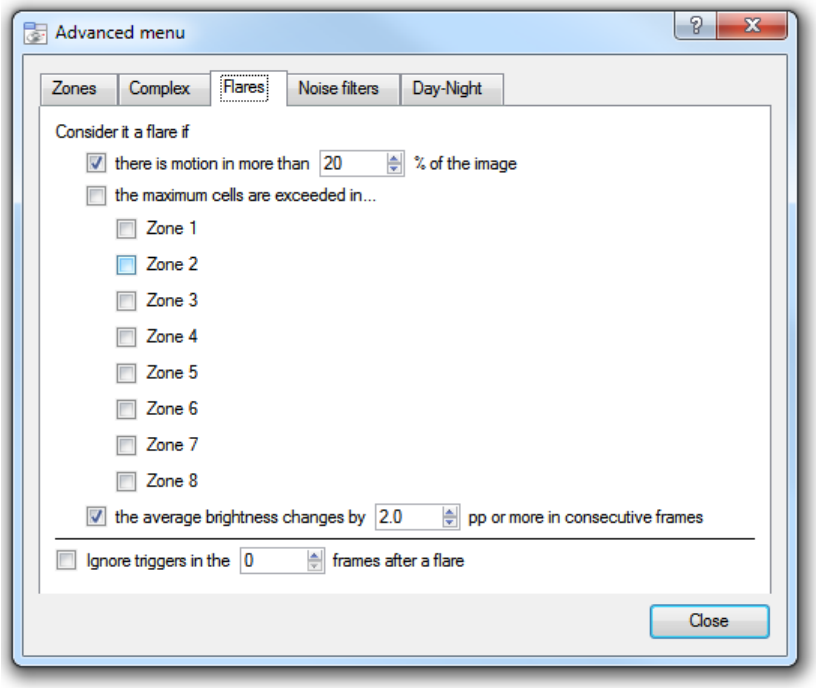
This is the amount which a change in pixel intensity has to break over the EV in order to send a trigger. Any motion over the EV, but under this line will reset the Max Decay Countdown/Background Noise, and push the EV up [I.e. be incorporated into the mean], but will not trigger.

Threshold Minus

This is the area below the EV in which, if there is a change in pixel intensity, the Max Decay Countdown will reset. It will not trigger the pixel.

The space in between Threshold Minus and Threshold plus, that surrounds the EV is known as the Threshold Envelope.

- ***Flares***



A Flare is any motion that is immediately dismissed as insignificant. This can be a sudden change in lighting, or a change that affects to large a percent of the image than is reasonable.

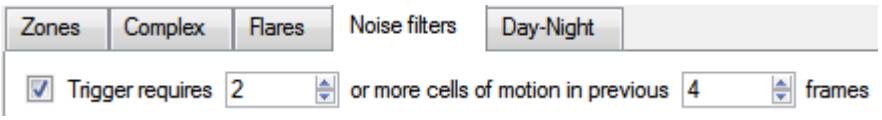
- **Percentage** based flare detection simply assumes that, if a certain percent of the image suddenly changes, it will be dismissed as a flare.
- **Zone** based flare detection is set to dismiss changes in the image as flares if they exceed the threshold of one or more specified zones
- In the **Average Brightness** setting 'pp' stands for percentage points. This setting measures the average change in brightness between two consecutive frames. The maximum setting is 10 percentage points. At this setting, if there is a total change in brightness of over 10% then the change will be considered a flare.

  *Note: the 10% max may seem small, but it is in fact a large average change for any image. 2 to 3% may be considered a substantial lighting change.

- ***Noise Filters***

The noise filter is there to prevent triggers created by the compression of the image, or errors on the CCD/CMOS chip in the camera. This is done by requiring a set amount of motion in a set amount of previous frames [minimum] to set off an alarm.

This is similar to, but more exact than, the minimum activity setting.

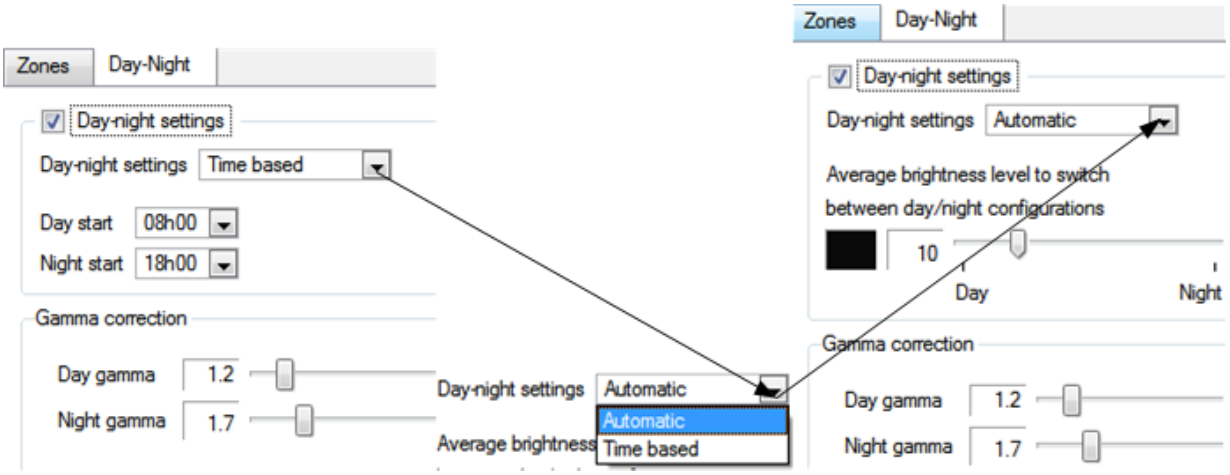


- ***Day-Night***

Lighting conditions will obviously change depending on what time of day it is. These changes can be disruptive to the motion detection algorithms, which is why CathexisVision provides alternate settings for day and night.

Gamma is a brightening tool that works on a gradient. In other words it brightens the dark parts the most, and the lightest parts the least. This causes an evenly brightened image with no overexposed areas, and no dark patches.

To set the timing of the **Day/Night** settings you can either use *automatic* settings that rely on ambient light levels in the camera's image, or *Time Based* settings.



*Note: In the *Automatic* setting the slider levels are abstract, so you will have to make adjustments incrementally, and at different times of the day to decide which settings are best. The *Automatic* setting will be the most accurate, but will also take the longest to set up.

- ***Night Zones***

When you have enabled Day/Night mode you will be able to make changes to the settings in the Night Zones tab. This allows you to change the sensitivity of the zones when the Night mode is enabled.

The mechanics of the settings here are identical to those set under the Zones tab.

Comparison of default profiles

	Standard	**Short Grass**	**Long grass**
Flare	20% pp change of 2	5% pp change of 2	5% pp change of 2
Noise Filer	NA	1 or more cells in previous 5 frames	1 or more cells in previous 5 frames
Background noise [Min Threshold]	Moderate [long grass]	Low [Short Grass]	Moderate [Long Grass]
Tracking Light Changes [Mean	Slowly [1]	Fast [Clouds] [2]	Fast [Clouds] [3]

Decay]			
Motion Memory [Max Decay Countdown]	40 seconds/ 255 frames	3 seconds	5 seconds
Frames to learn	100	100	100 same
Threshold decay Rate	1 [slow, no retriggers]	1 [Slow, not many retriggers]	0 [very slow less retriggers]
Threshold plus/minus	100	100	100

d. Still Object Detection

Introduction

Still Object Detection is used to monitor introduced, or removed, stationary objects. This means that an object that was stationary in the image, such as a painting, that is removed will trigger the Still Object Detection(SOD). An object that is introduced into the camera view will also trigger the Still Object Detection, such as a car that parks in a handicapped parking zone.

This algorithm has the same event actions available to it as the other motion based algorithms, such as Standard and Smart VMD

It can be used in any number of situations. For example: airports to monitor busy areas where people might leave a bomb, handicapped parking, stock areas etc.

As with other algorithms the Still Object Detection does not detect object in the same way that a human eye/brain does; instead it measures changes, over time, in light intensity on the level of the individual pixel. In doing this it identifies 'blobs' of intensity change. If a blob is big enough, and still enough the algorithm will begin a countdown to determine whether it is stationary, once this countdown stops it the algorithm will trigger. This trigger can be linked to any one of the events mentioned above.

It is important to note that, as with all of the Video Motion algorithms, the setup process will be iterative. You will have to adjust them to suit the environment, and the objects that you are tracking. For this reason the following guide will not give you a list of generic settings. But it will provide the meanings of the different terms, and explain how the algorithm works, so as to allow you to understand it and make intelligent and informed adjustments.

Setup Window

- ***Setup Window***

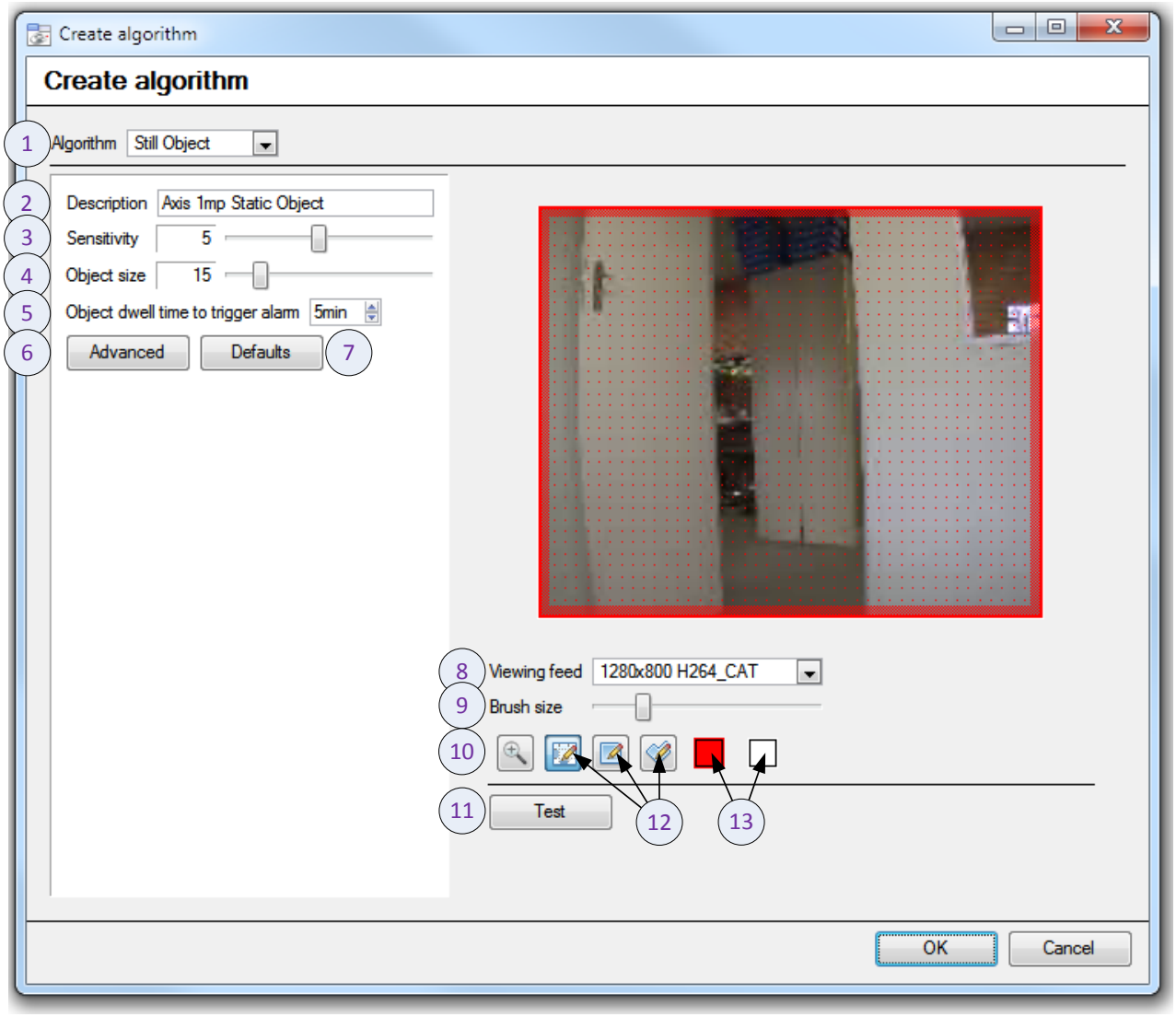
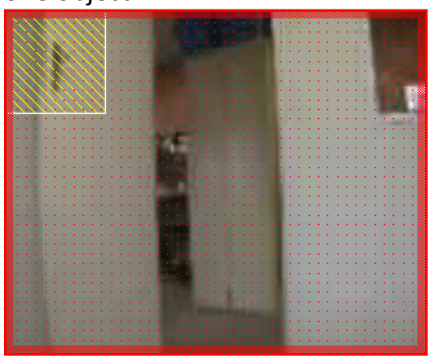
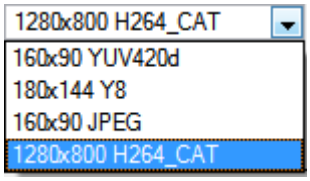
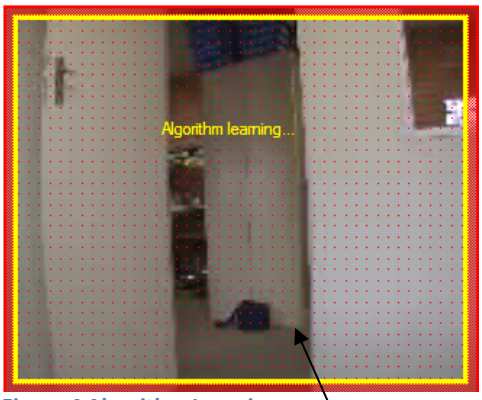
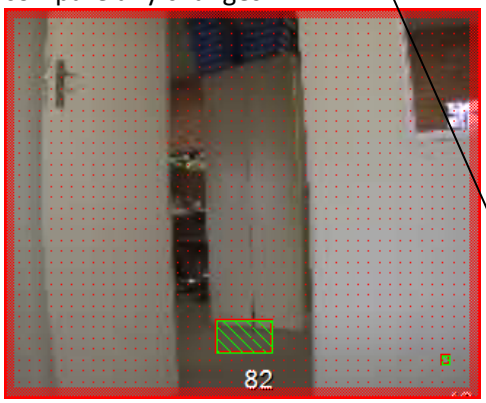
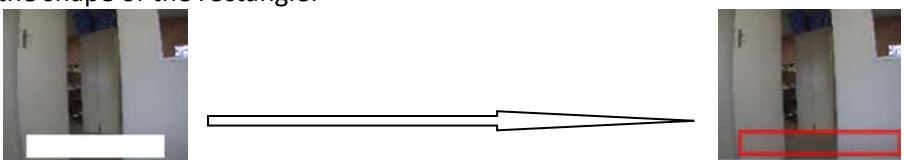
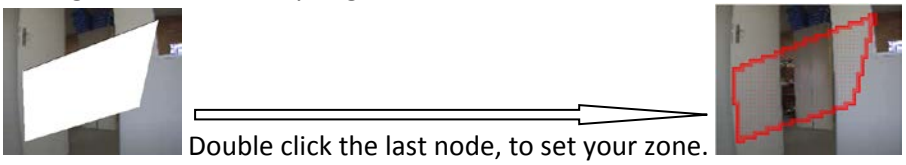


Figure 1 Setup Window

1	This is the drop down menu from which you select the VMD algorithm you wish to create/edit. Smart VMD Standard VMD Smart VMD Still Object
2	**Description** is simply the name of the specific algorithm setup that you are creating, and can be named at your discretion.
3	This defines the **Sensitivity** to *changes in light intensity*. For simplicities sake the sensitivity in the regular setup have values from one to 10. With 1 being extremely sensitive (noticing minute changes), and 10 being extremely insensitive (only noticing large scale changes). So, if you have an environment with many constantly occurring small changes in the image, and the object that you want to record will cause a larger change in the image, you need to set the sensitivity such that the smaller changes are not noted. Another example may be where the object that you want to record has an extremely different colour intensity to its surroundings (a black box against a white wall), then you can afford to have an insensitive setting, as there will be a gross change in light intensity if it is moved.

4	The **object size** setting is a little more nuanced than a mere size setting (such as the min/max settings in the VMD's). It defines size of the area within which the algorithm will combine distinct blobs into one object.  Figure 2 Setting Object Size This is related to the way the algorithm sees blobs (mentioned in the introduction). There will often be more than one distinct area of light intensity on a individual object. This is due to colouring, and shadows etc. The algorithm compensates for this by combining smaller blobs in individual areas into single objects. For instance, in Figure 3, you can clearly see that the tree has set off 4 blobs (the green blocks). The algorithm has grouped them together as one object. Figure 3 Blobs in a Block For this reason you should make the **object size** setting a little smaller than the actual size of the objects which you wish to track.
5	**Object dwell time to trigger alarm** is the time period that it takes for the algorithm to trigger an alarm, after a still object is either placed in, or removed from, an image. This time is important, as it will rule out objects that are momentarily placed, as well as momentary compression issues, and bugs on the screen etc.
6	**Advanced Settings** will be dealt with below, outside of this table.
7	**Defaults:** This allows the user to set the SOD settings back to the default settings. *Note: The default settings are, by no means, the correct settings. This merely allows the user to reset the SOD, in order to tinker from a set base.
8	**Viewing Feed:** This is one of the feeds that the camera is capable of producing, which you may use when designing the structure of your SOD. This will not be the feed that the analytics is performed on. The analytics feed is set when you define the Video Feeds in the camera addition process. 
9	**Brush Size** determines how large the blocks, with which you draw in areas where SOD will be active.

10	**Zoom** turns off zone drawing, and activates the middle mouse button for zooming into the image.
11	**Test** allows you to test the current settings. After clicking test you will see the screen in Figure 4, below.  Figure 4 Algorithm Learning Since the SOD algorithm senses changes in the image, it needs an initial image for comparison. So while it says Algorithm Learning on the screen it is developing an historical image, against which it will compare any changes.  Figure 5 Object Dwell Time Count You will see in Figure 5 that there was a small bag at the base of the cupboard. That bag was removed, and in its place you will see a green block with the number 82 on it. The SOD has identified a change in the historic image that it has identified as a 'blob', and is counting up to the **object dwell time.** Once it reaches that time a trigger will be set off. Note: For setting up these overlays outside of the Algorithm setup box (i.e. in the Cameras Tab), see the last section of this chapter.

12	These three options pertain to how the zones are drawn onto the image, from left to right: • **Draw in Paint Mode** is a free form drawing tool that allows you to draw a zone in any shape. To draw in this mode simply left click and hold, then drag the mouse to draw your shape: • **Draw Rectangles** allows you to draw shapes with 4 straight sides, and four 90° angles. To draw in this mode left click to define your first node, then drag the mouse away to define the shape of the rectangle:  Double click your second node/corner to set the shape of your zone. • **Draw Polygons** allows you to draw multifaceted shapes, of any design, with straight lines. To draw in this mode left click to set a node, and move the mouse around to set the lines, left clicking to set corners as you go:  Double click the last node, to set your zone. *Note: With all modes the mouse's Left-Click is used to draw in zoned areas, and the Right-Click is used to remove zoned areas. You can use them across modes too. So you could draw a Rectangle, and then remove a polygon from within it. If you need to draw a thin straight line it is easier to do so using either the polygon, or the rectangle tool, than using the painting tool.
13	**Fill Zone Mask** will paint the entire image as a SOD zone. **Clear Zone Mask** will clear the entire zone that you are currently editing from the image. *Note: This affects the entire image, not the part of the image that you can see. So if you are zoomed in it will still affect the image outside of the area you can currently see.

Advanced Settings

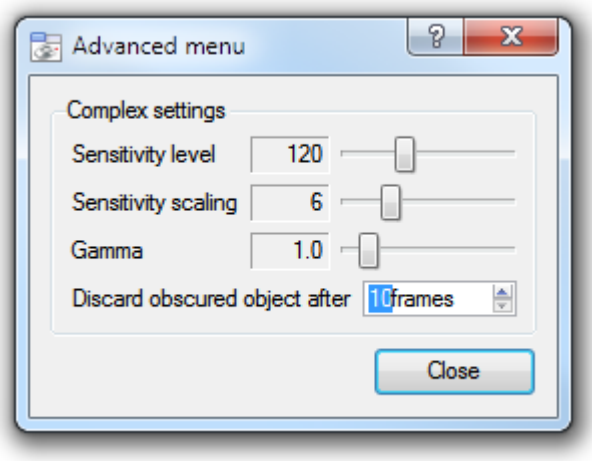


Figure 6 Advanced Menu

- ***Sensitivity Level***

This is the same sensitivity level that was set in the regular settings. The difference is instead of the abstracted 1-10 setting in the setup window; this setting (between 50-250) reflects the actual light intensity changes on the pixel.

Each pixel is capable of producing light of 256 different levels of intensity. The sensitivity setting will measure the change from this historical image to the current image. The change in intensity will be reflected as a value between 1 and 256. 50 is considered the smallest significant change in object detection, and 250 is the highest likely change that would occur.

Remember this is not the actual intensity of the pixel; it is the amount of change in intensity. So if the pixel was at 50, and then jumped to 110 the change would be 60. If you had your sensitivity set to 50, this change would be considered significant.

- ***Sensitivity Scaling***

This setting has an effect on both gamma and sensitivity, effectively multiplying the difference between the background image and the foreground image. Increasing it will make the algorithm more sensitive to smaller changes in the image; decreasing the number will make it less sensitive.

The default setting is 5, and the settings range from 1-20.

Adjust this as your last setting change, if you cannot get the algorithm to track objects.

- ***Gamma***

Gamma changes the brightness and contrast of an image. The important way that gamma changes these settings is that it changes them on a curve. Increasing the gamma will brighten darker areas, but have little effect on already bright areas. This will allow you to eliminate shadows. If the objects that you are tracking are generally a similar colour to the background they are set in then you should have a higher gamma setting (>10).

Decreasing gamma will darken lighter areas and have little effect on darker regions of the image. If the objects that you are tracking are generally lighter than the background it is often useful to darken the gamma.

- ***Discard Obscured Object***

In busier environments, such as train stations, a Still Object will constantly be covered and uncovered by people passing by. This setting allows you to set the time period that an object is 'remembered' after something has obscured it.

It is measured in frames, which are the individual images captured by the camera, and can go from 10-500 frames. This goes on the frame rate of your analytics channel, which usually runs at about 6 frames per second.

At 6 frames per second 500 frames will take roughly 83 seconds to pass by.

It should be obvious that the busier your environment the longer you will want to remember objects. There is a balance however as a busy environment will have many objects constantly being left and then taken away. This means that you must set a good balance between this setting and the **object dwell time** setting.

Tips and Notes

Bumping the camera

If you happen to bump the camera after setting up the SOD you will be greeted with something along the catastrophic lines seen in Figure 7. Where there are suddenly 'objects' being recorded everywhere, and numerous counts beginning, which will all set off events when they reach their countdown.

The best thing to do in this situation is to go back into the algorithm setup.

Note: usually you wouldn't have the whole image being tracked for still objects, as the applications for this generally require only that specific zones within an image be monitored.

Figure 7 A Bumped Screen

To see the Overlays while in the Cameras Tab

Right-Click on the image of the camera whose overlays you want to see, hover the mouse over Algorithms, chose the Algorithm whose overlays you want to show, and select the ones that you desire.

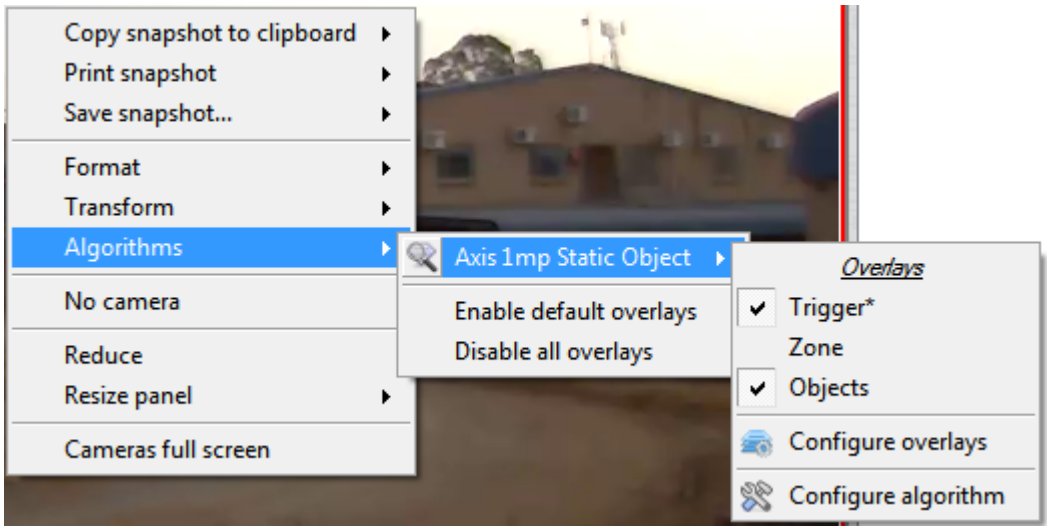


Figure 8 Selecting the SOD overlays in a live camera

4 Databases

Databases are added on a Server-by-Server basis. As such, each server under **Configure Servers** will have a Databases section where you manage that server's databases.

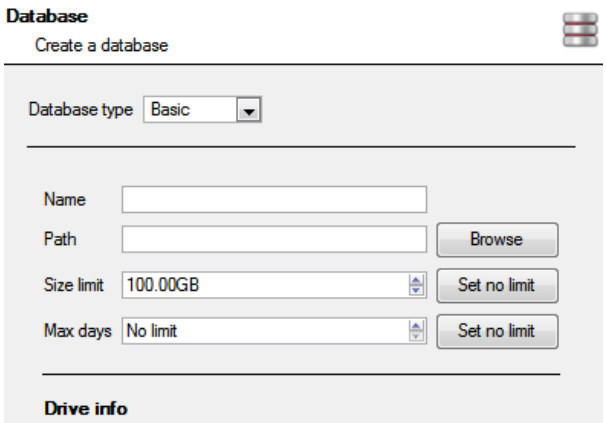
a. Add a Database

To create a new database click on the **New** button in the **Databases** panel. There are two types of database:

1. Basic Database: This is a database that is situated on a single partition on a single drive.
2. Advanced Database: This can span multiple partitions, across multiple drives.

Note: If you are Adding/Importing a database to an NVR from another unit, or via a Client, you will not have the **Browse** option. You will need to know the file path and enter it in manually.

Basic Database Setup



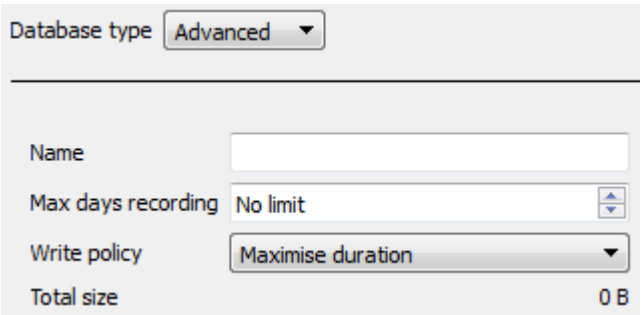
Use the Basic option, enter the name of your database and set the path.

Set the limits on your database, once one of these limits is reached, the database will start to record over the oldest information.

If "No Limit" is used, then the database will use all available space, but it will delete old data when there is less than 10GB free on the partition.

Advanced Database Setup

An Advanced database is used for databases that span multiple partitions, and drives. It is the most powerful database structure in the CathexisVision suite.



The **Max days recording** setting will define how many days the database will record for, before overwriting the oldest recordings. With **no limit** set, it will simply wait until the database is full to begin overwriting old data.

Write policy will give you the option of maximising the duration of your recording, or the performance speeds of your database.

With **maximise duration** the database will pick the oldest video present when overwriting old data to add new data.

With **maximise performance** the database will split the cameras across all the disk slices in a manner that ensures the most even load across the disks possible. To do this sometimes the database has to delete data that may not be the oldest data for a particular camera.

- ***Adding a Slice***

An Advanced Database is comprised of a number of slices, which are sections of partitions. To Add a Slice:

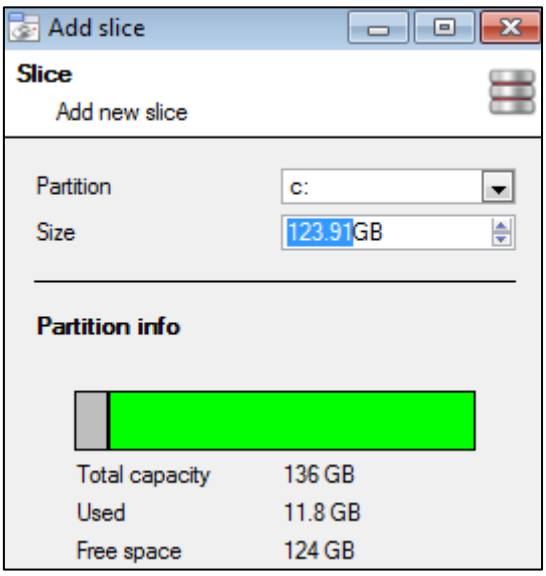
Click on [New] —> Select the relevant partition —> define the size of the slice —> click OK.

Your newly added slices will appear in the Slices section of the New Database window:

Slices

Path/Device	Type	Size	State
c:	file	399 GB	New
e:	file	594 GB	New

Once you have added as many slices as you need click on OK to create your Advanced Database.



Important Recommendations

1. Ideally the database should be in its **own partition**, on its **own Hard Drive.**
2. If the database must share a drive with other information, then put it in its **own partition**.
3. It is recommended that you do not create a database in the Primary Windows Partition, however, if you have to do so:
    a. Do not create it within the CathexisVisionNVR installation folder.
    b. Do not make the database size unlimited. Leave between 50 and 100GB of disk space free when setting the size.

b. Edit an Existing Database

There are two ways to edit an existing database, either:

1. Select the database —> Click on the [Edit] button.
2. Double-click on the Database you wish to edit

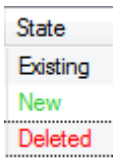
Basic Database

You may edit the **Description, Size Limit,** and **Max Days** Settings of a basic database; not the path of that database.

To edit the path of an existing Basic Database you would have to move the database folder and re-import the database.

Advanced Database

You may edit the **Name, Max Days,** and **Slices** of an Advanced Database.

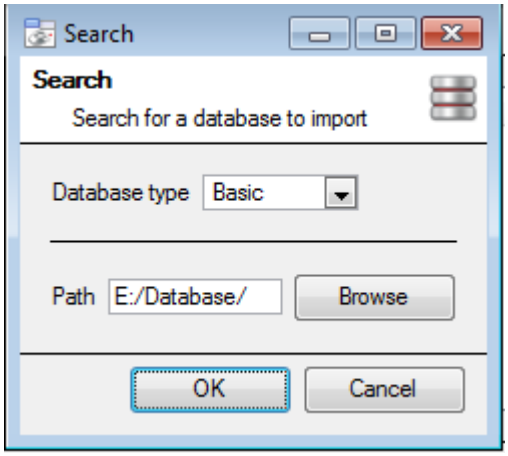


When editing an Advanced Database, editions to the slices will appear in the State column.

c. Import a Database

You may import an already existing database. To import a database click on Import. There are two steps in importing a database:

- ***Navigate to the Database Folder***



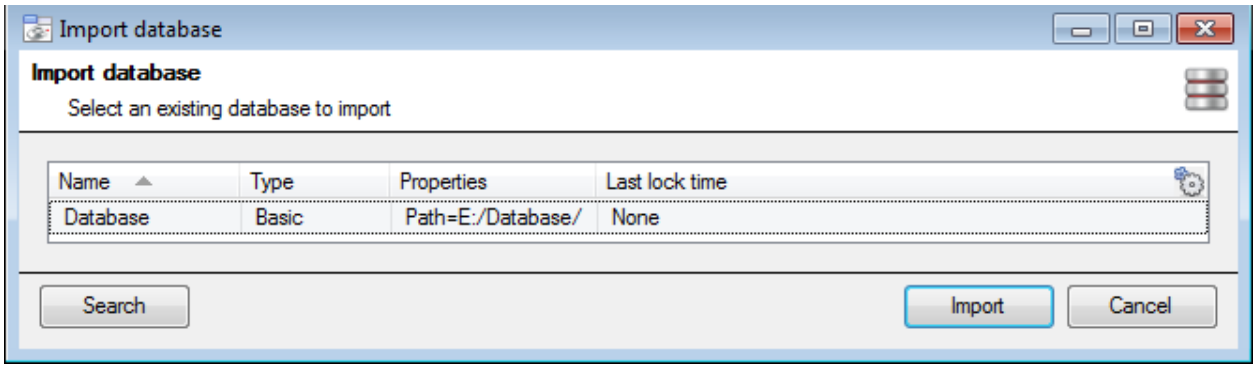
There may be multiple databases stored in one folder, and a database isn't represented as a single file. For this reason, when importing a database you need only navigate into the folder that contains the database that you wish to import.

Select the Database Type
You will also need to define whether or not you are importing a Basic, or an Advanced, database.

Note: If you are Importing a database to an NVR from another unit, or a Client, you will not have the **Browse** option. You will need to know the file path and enter it in manually.

- ***Select Your Database***

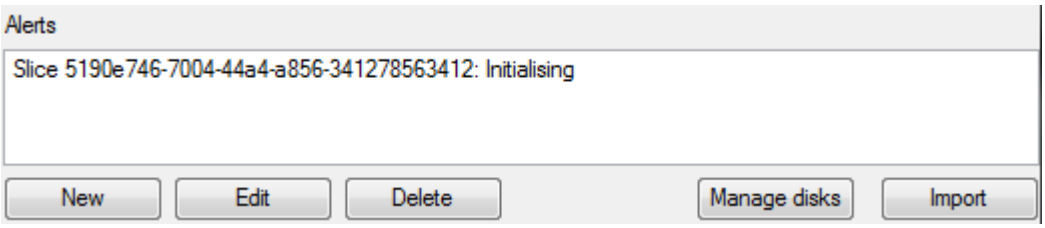
CathexisVision will populate the database list, with all databases found in this folder. Select the database you wish to add from the list of databases.



d. Alerts

Presently, you only see alerts for the Advanced Database. The alerts are specific to the currently selected database, and will show the *individual slice status*, if a slice in that database is not in a ready state.

For example if the slice in a database is busy initialising or if there is an error you'll see an alert (with the slice ID) if that database is selected:



e. Manage Disks

This is specific to our software running on Linux servers, for information on this consult our Fedora APP note.

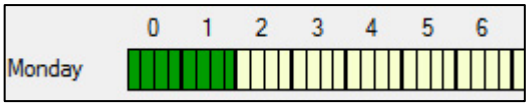
5 Schedules

All your unit's schedules for recording, and events, will be maintained under Schedules in the configure servers options.

Add/Edit a Schedule

To add/edit a schedule click on the relevant button, and follow the following instructions. Give your schedule a descriptive name, and then define your recording times (as shown below)

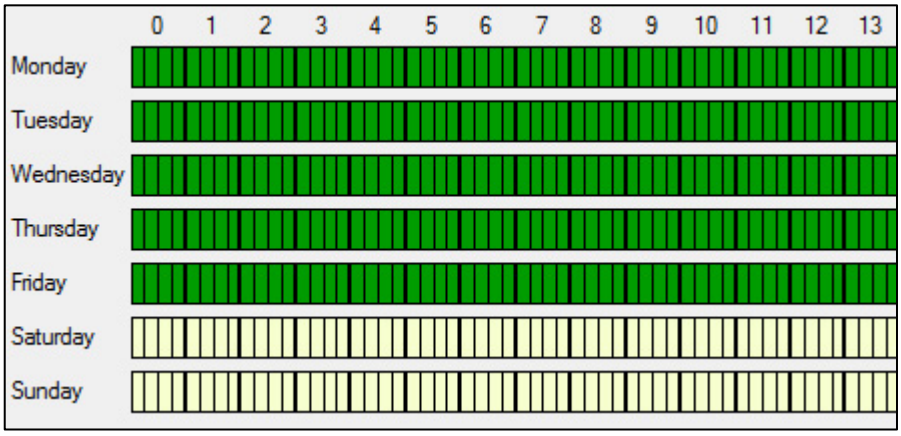
- ***Set Recording up, and down-times.***



Left click to select recording time – the green bars.

Right click to unselect recording time – the yellow bars.

To **select multiple cells** hold the left mouse button down and drag it across the desired time-frame.



Recording week days only

To record only week days, you would your set your schedule as seen on the left.

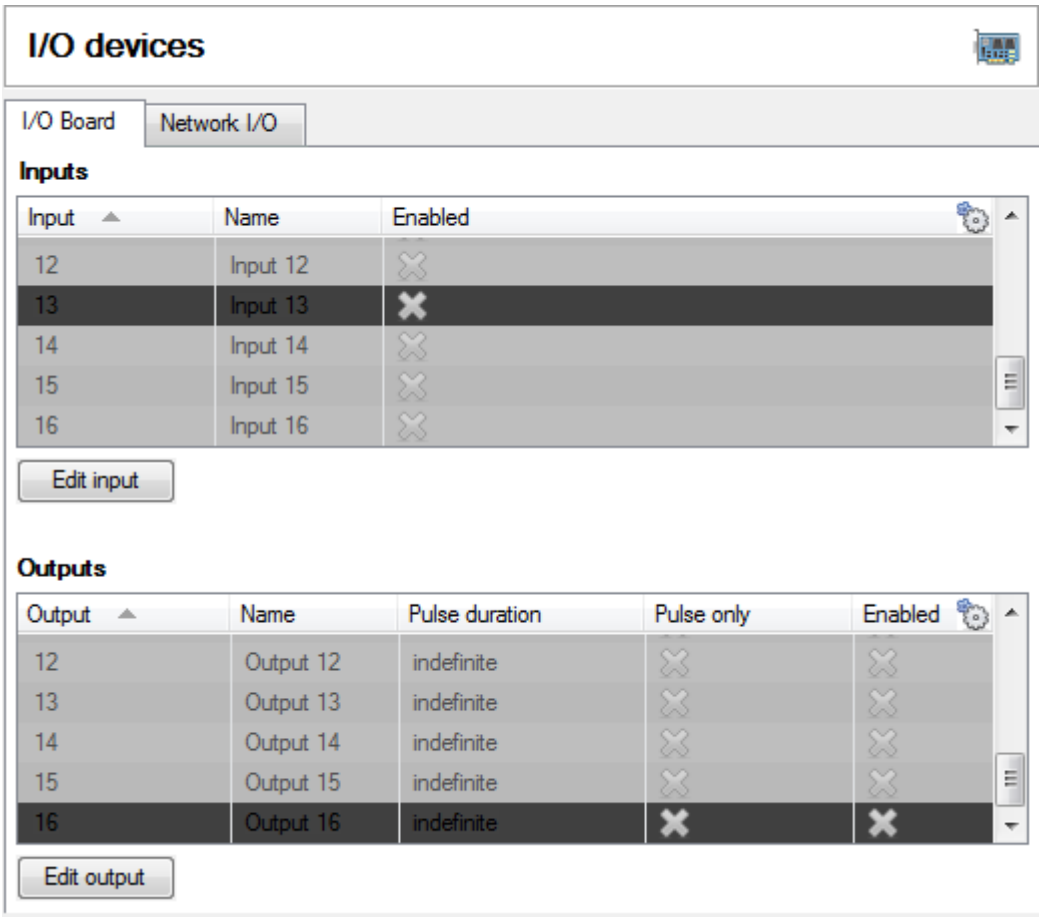
Cross-section selecting

To select, or deselect, areas in more than one day at a time: hold the mouse button and drag it across the days.

It is as simple as that. Click OK, and your schedule has been created. This schedule may now be used for recording, and events on this unit.

6 Network I/O

CathexisVision is capable of taking in relay inputs, and sending out relay outputs, via both analogue and digital channels. These relays may then be incorporated into the CathexisVision Events, and used as native triggers, and actions in the CathexisVision software.



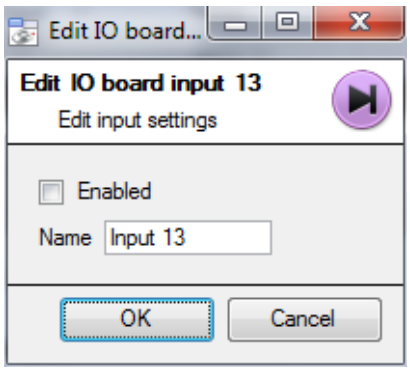
a. Analogue

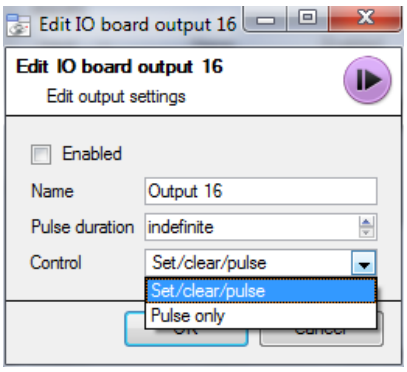
Relay connection on an analogue unit will be via the IO Board, on the back of the unit. This is connected to a PIA-mod card that comes standard on all of our analogue units.

The IO panel allows for 16 inputs, and 16 outputs

Edit Input/Output

IOs are edited by selecting an input/output and clicking Edit input, or Edit output.





Enable
To enable an input check the box titled Enabled

Name
Give your input a descriptive name

- ***Output Specific***

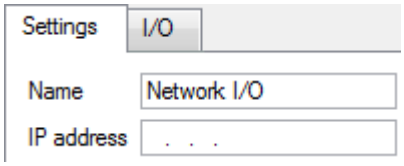
Pulse Duration
You may set the duration of the output pulse, in milliseconds
Control
You may also set how the Relay is controlled. You may give Set, Clear, and Pulse control; or set it to Pulse exclusively.

b. Network

Network Based IOs are handled by the EIO-1148 Network Base IO Expander.

This device enables comprehensive access, and control of remote in/output relays over an Ethernet network. Through the CathexisVision software control, opening and closing of integrated relay contacts can be incorporated into any response of a critical event.

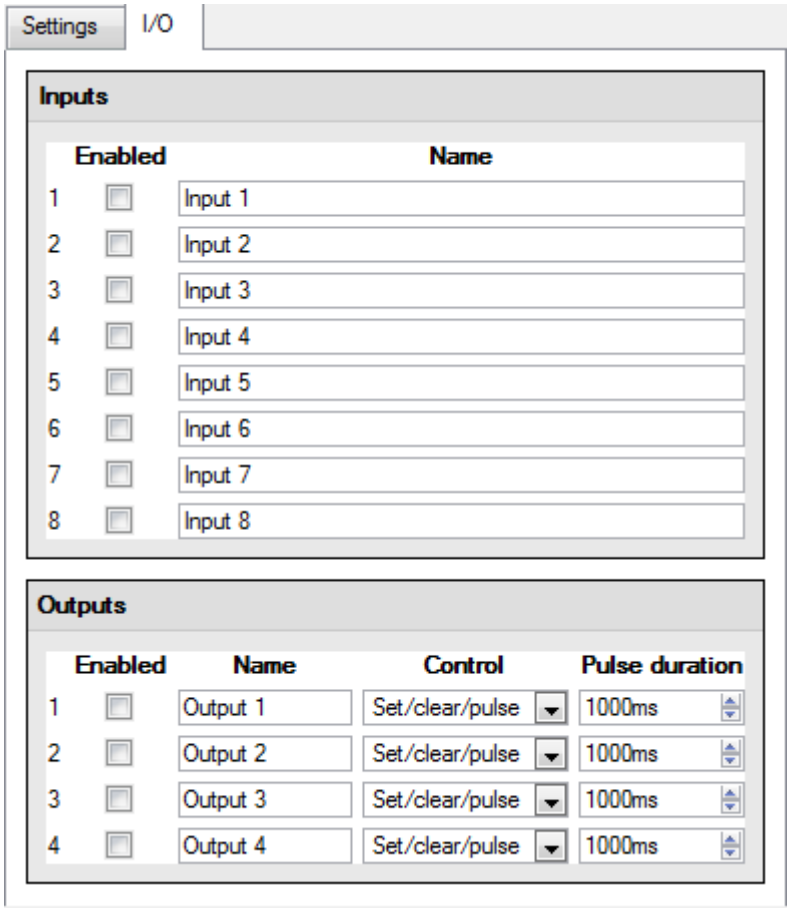
Settings Tab



Name
Give your device a descriptive name.
IP Address
This is the IP address of the IO unit.

Note: if you do not know the IP address of the EIO unit that you are adding you can find the unit using the Cathexis Encoder Setup tool, which is installed with your CathexisVision software. You can find it in the CathexisVision install folder, or under: **Start—>Cathexis—>CathexisVision Encoder Setup**. On startup this will bring up a full list of available devices.

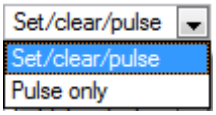
IO Tab



General:
Give your input a descriptive name.

To enable an input check the box in the column titled Enabled.

Output Specific:
Set the way the relay is controlled using the dropdown menu in the Control column:



Pulse Duration:
Set the pulse duration of the relay, in milliseconds.

Note: make sure that you give these inputs descriptive names.

7 Scheduled Recordings

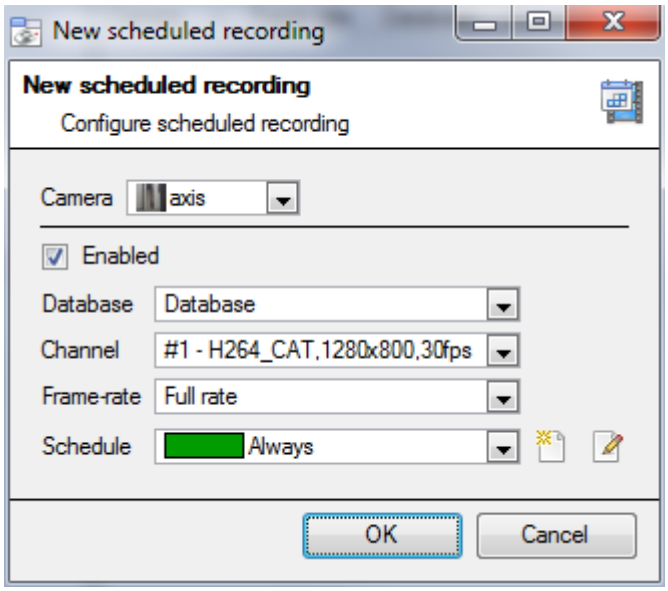
You may set your cameras to record on a fixed schedule. This is done in Scheduled recordings under **Configure Servers**.

Add/Edit a Scheduled Recording

You may either:

1. Click on New or Edit. Or
2. Right clicking
   a. white-space and clicking on **New** (for a new Schedule)
   b. on an existing schedule and selecting P**roperties** (to edit this existing schedule)

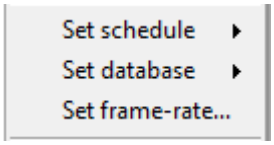
This will bring up the Scheduled recording dialogue:



Camera	Select the camera you wish to record.
Enabled	To enable the schedule check the box, to disable the schedule uncheck the box.
Database	The database you wish to record to.
Channel	The video channel you want to record from the camera.
Frame Rate	The frame rate at which you want to record.
Schedule	The particular schedule you wish to assign to this Scheduled Recording.

Note: The schedules that are available are the schedules that are maintained under Schedules on each server. You may also create/edit these schedules here, using the options.

Drop-Down Menu



You may make a quick adjustment to a schedule by right-clicking on it.

To change the recording Channel you must edit the schedule via **Right-Click —> Properties**; or by selecting the Schedule and clicking Edit.

- ***Copy Paste***

You may copy/paste schedule settings either from one schedule to another, or from one schedule to a new camera.

Copy schedule settings from one schedule to another
Right-click on an existing algorithm, and then click on Copy. Then right-click on the algorithm you want to overwrite and click Paste.

Copy schedule settings to a new schedule

Here you will be copying the schedule settings onto a camera, so you right-click and Copy the existing schedule. Then right-click anywhere and select Paste new... this will bring up a list of cameras that are attached to this unit (e.g. ☑ Analog One).

You may select any number of cameras to paste the schedule onto, and click OK.

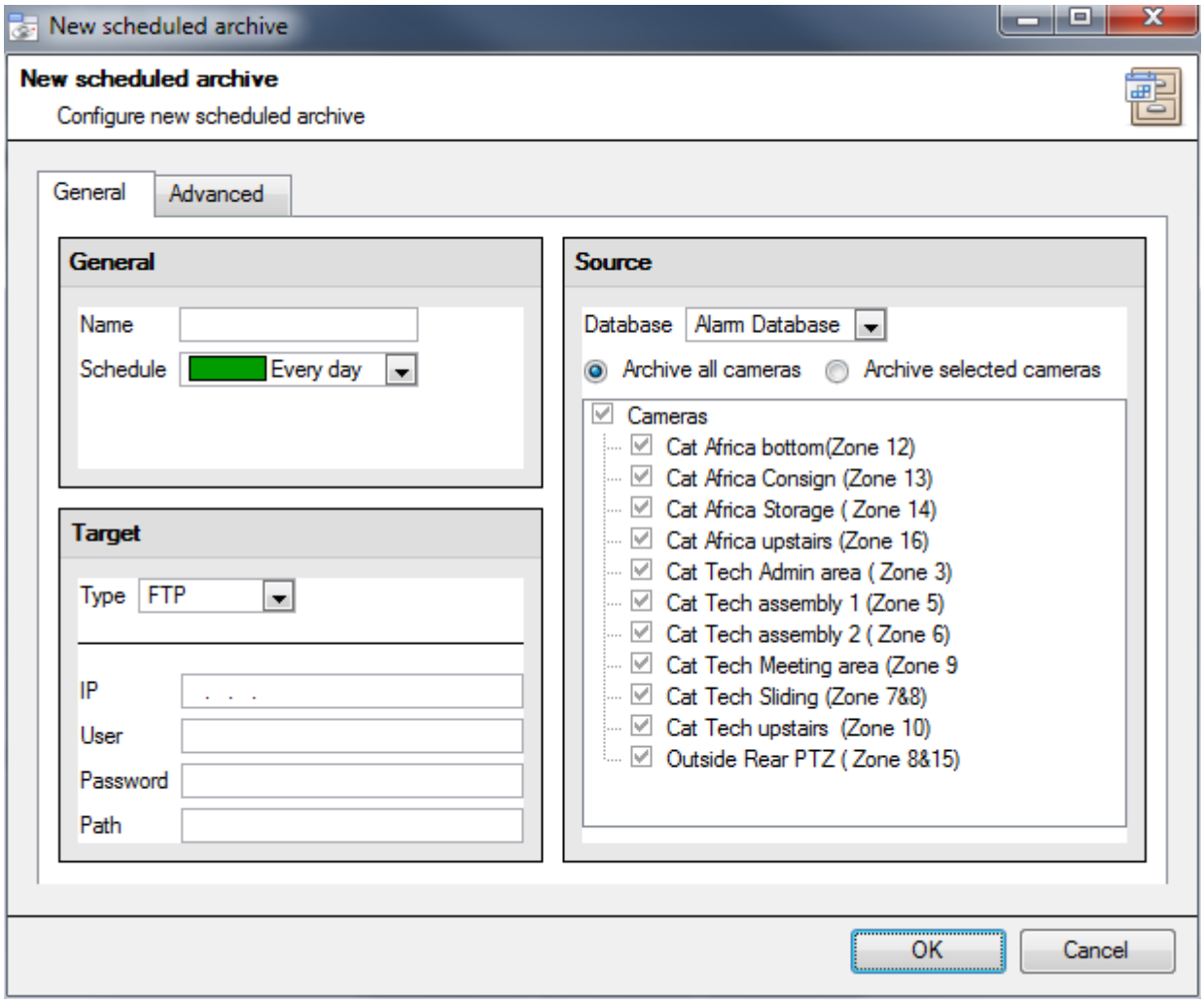
8 Scheduled Archives

Archiving is a facility to enable you to copy select recordings (from specific databases) to an archiving media, such as a Local disk, or an FTP server. Unlike normal recordings, archived recordings retain their authenticity, and can be verified as authentic (unaltered) on replay, making them suitable for use in courts of law.

The Scheduled Archive feature allows you to periodically archive selected cameras, from selected databases, on a schedule.

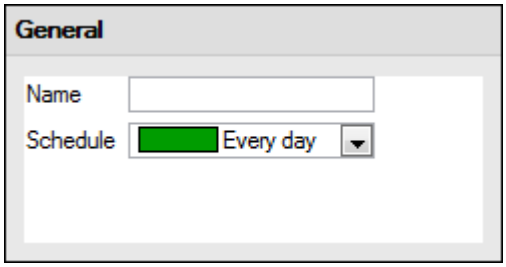
This is useful for a number of reasons. An important function is to create an archive of important cameras. As databases fill up they start to write over the oldest recordings. If you want to keep some cameras recordings for extended periods of time it is important to archive them.

Note: When you first enable this it will start from the beginning of the database, subsequent archives will pick up from where it left off the previous time.



a. General

General

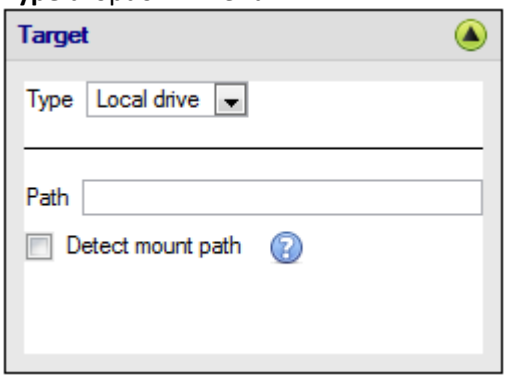


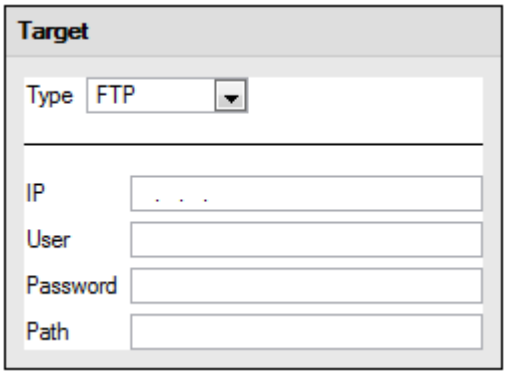
General settings consist of assigning this archive a name, and a schedule.

Note: the schedules available are the same schedules set under **Configure Servers —> Schedules**.

Target

Under Target you define where the archives are going to be recorded to. Select the relevant option from the **Type** dropdown menu.





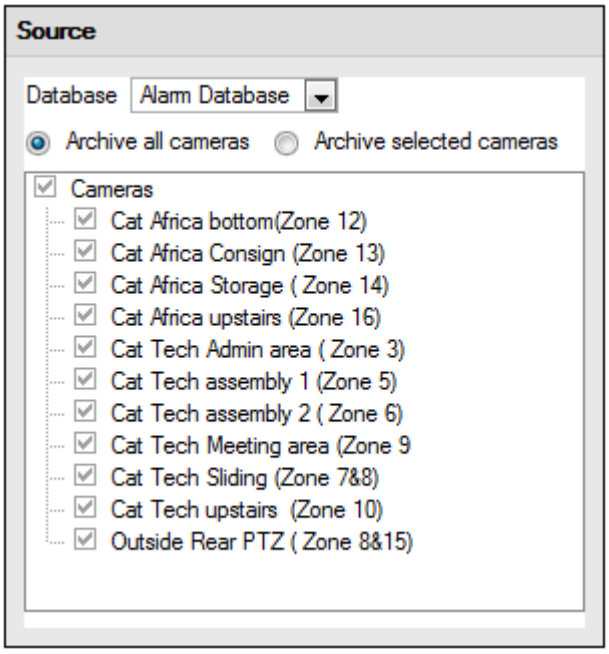
Local drive
This will write to a selected path on the local hard drive, of the recording unit.

FTP
This option allows for network archiving to any accessible FTP server. This is incredibly useful, as FTP servers may be accessed across LANs, and WANs.

Note: The only target available for a NetBSD-based system is a FTP server (i.e. scheduled archiving to a local disk is not supported on NetBSD).

Source

Source will define which cameras are to be archived, and which database to draw the cameras' recordings from.

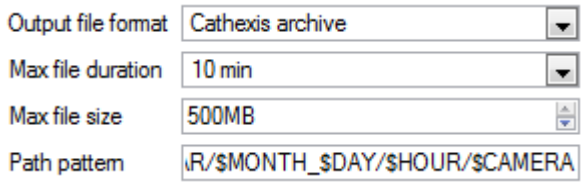


Database
You may have multiple databases, for groups of cameras. Or you may be sending camera recordings from different triggers, to different databases (e.g. VMD input, Access Control, Alarm Panels).

The database drop-down menu will provide a list of all available databases.

Cameras
You may check the Archive all Cameras option, or Archive Selected Cameras.

b. Advanced



Note: By default these settings are set to maximum.

Output File Format. The only available format is the Cathexis Archive Format
Max File Duration Is the maximum time length of an individual archive file.
Max File Size Is the maximum size on an individual archive file.
Path Pattern is the file naming convention used for the Archive files. There are written instructions in this window, in the GUI, detailing how to modify the Path Pattern

9 Events

a. Introduction

One of the most powerful features of the CathexisVision suite is the flexibility of our events system. These events can take multiple inputs, and perform multiple actions based on them. A common example of such an event would be triggering the recording of a camera stream, based on input from Video Motion Detection.

The CathexisVision suite offers much more in the way of event handling than this simple example though, and this document will introduce you to the available Event options.

b. Events Window

You get to the events window via the Setup Tab. The path to follow is ***Site -> Setup -> Configure Servers -> Events***:

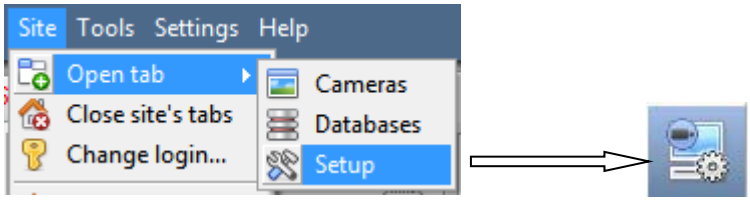
- ***Important Note***

It is important to remember that Events depend on triggers that are predefined. This means that before you get to the events window you should already have these inputs and outputs ready. An example [which will be discussed later] is recording based on motion. In order to set up an event based on motion detection, you first need a number of things:

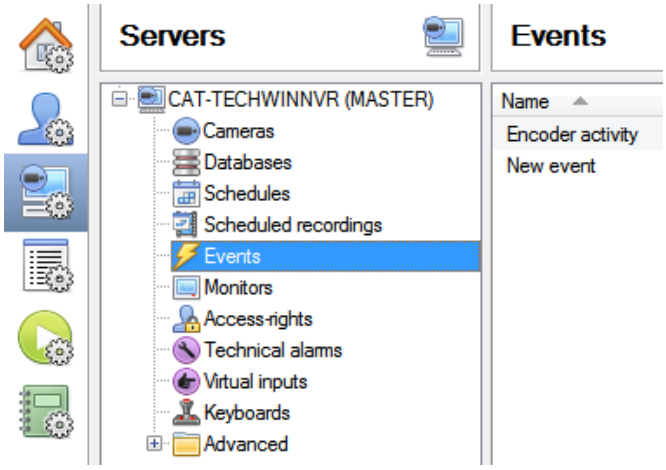
1. A camera that has been successfully added to the system [to provide the images]
2. A Video Motion Detection algorithm needs to have been set up [to *trigger* the event]
3. A database needs to be set up [as a point where the *action* of recording takes place]

It is easy to forget this, and head straight to the Events window to create an event, before you have all the resources to do so.

Site -> Open Tab -> Setup – Configure Servers

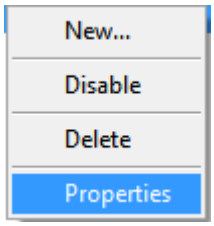


Select the Events from the Servers menu.

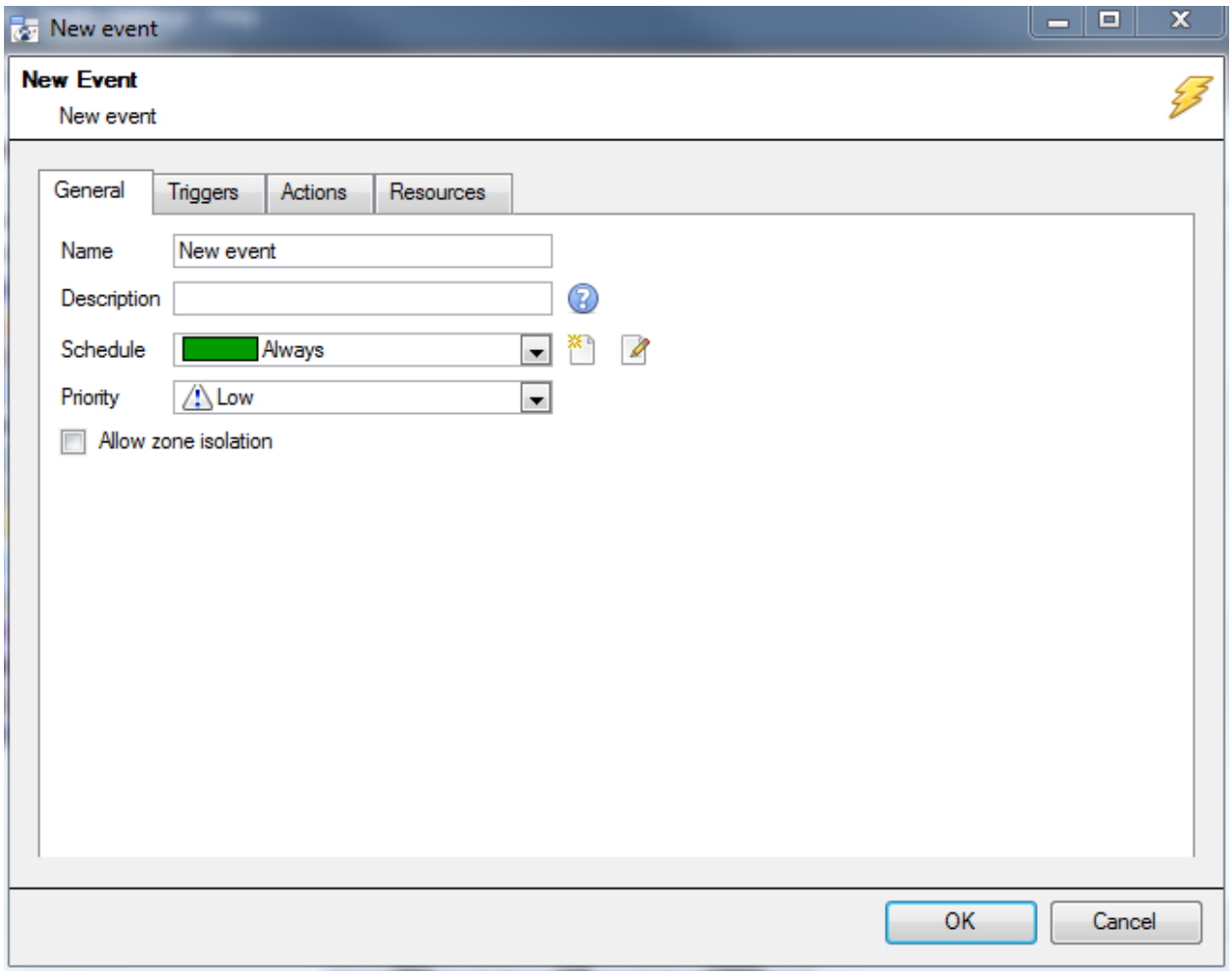


The Events panel will appear on the right. To add, edit, or remove, Events list use one of the New Edit Delete buttons at the bottom of the panel.

- ***The Events Window***



To enter the events window either click on ***New*** or ***Edit***, as described above. Or use the right-click menu in the Events Panel. Clicking on white space will give the option to create a new Event. Right clicking on an existing event will give you a dropdown menu, with the following options:



The Events Addition Window

c. Adding and Editing Events

Introduction

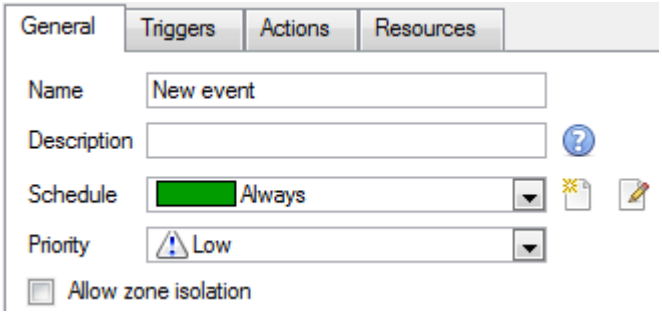
Events can be very complex things, with multiple triggers and actions; but they all have the same three core aspects.

General Settings	Name, Schedule
Trigger	Initiates the event
Actions	The action taken by CathexisVision (as a result of the trigger).

Below we will look at the four individual sections that you can edit when creating an event (General Settings, Triggers, Actions, and Resources). These are visible as tabs in the above screen capture of the Events Window.

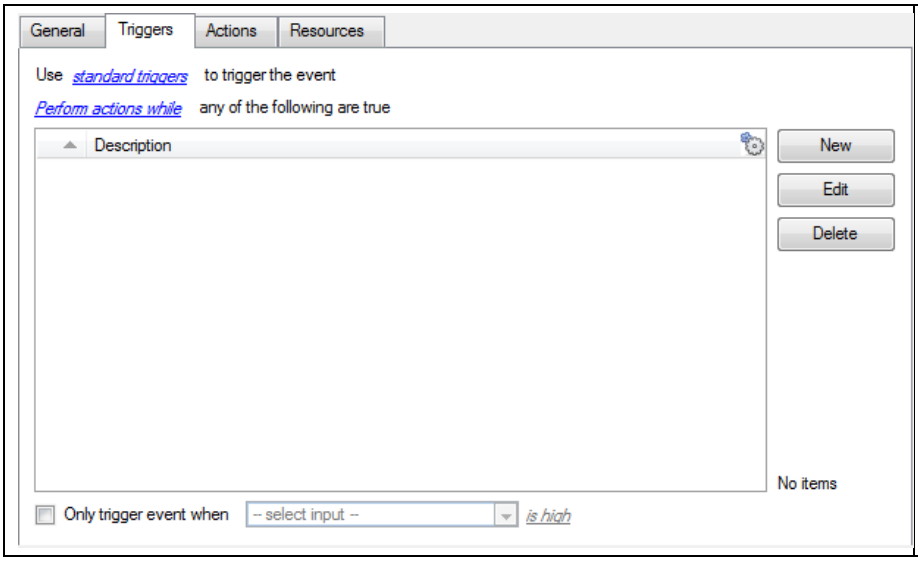
The following subsections will give you an idea of how to create an event by breaking the Events Window down into its constituent parts, and explaining the settings under each part.

General Settings Tab



Name	This is a descriptive name that you will give to the event, to make it identifiable later on.
Description	This is the name the event is given when databased, or sent as an alarm. If this field is left empty, the Event Name is used. Clicking on the will give you a list of available description variables. ***Note:*** 1. The options that you have available here will change, depending on the triggers that you choose in the Triggers Tab, so set this parameter **after** you set your triggers. 2. The format for adding the variable is: `Descriptive_Name: $Variable_Name` 3. You may add multiple variables.
Schedule	This will define the times during which the Event will be active
Priority	This relates the alarm that will be set of under Call Base Station (this will be discussed below).
Allow Zone Isolation	Check this if you wish to give the operator the option to disable this event alarm for a short period. This is useful in cases where there are repeat false alarms. This doesn't disable the event. It prevents the alarm from popping up on the operator's workstation, or alarm queue.

Triggers Tab



As discussed above, a trigger is what initiates an event. There are three types of triggers:

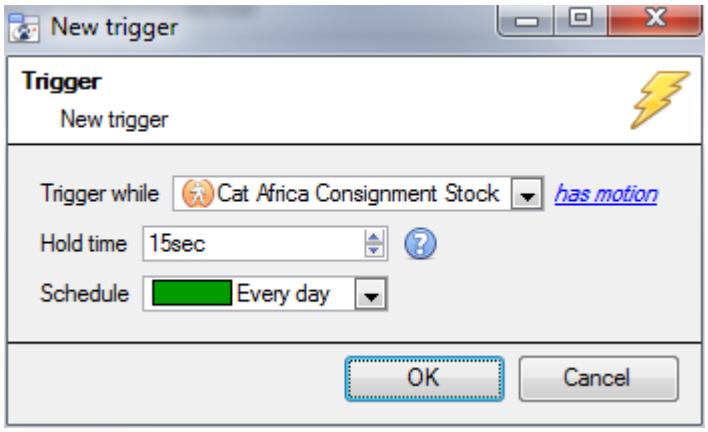
1. **Standard triggers**
2. **Trigger templates**
3. **Integrated device triggers**

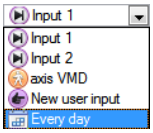
You choose between these options by by clicking on the blue hyperlinked text, in the Use *standard triggers* to trigger the event area.

- ***Standard Triggers***

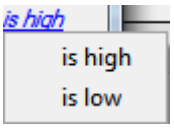
Standard triggers come in the form of **Video Motion Detection** triggers, **Relay I/Os**, **Schedules**, and **Virtual Inputs**.

To add, or edit trigger click on New, or Edit.





Trigger While, is the dropdown menu from which you select the relevant triggers



The hyperlink to the right of the trigger, will give you all the state options of this trigger.

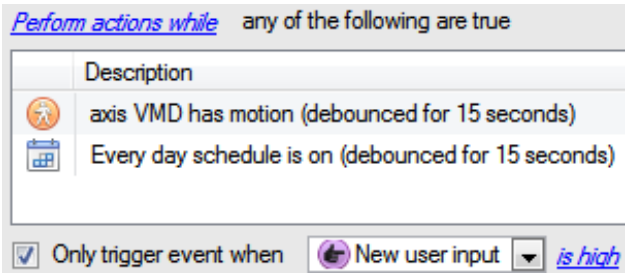
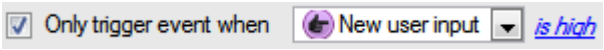
Click on it to access its options.

Hold Time will extend the event for this duration after the trigger has terminated. (See table directly below, for a graphic representation).

Schedule defines when this specific Trigger is active within this specific Event.

Hold Time VMD level: _____| _____ |____| _____ |_____ Event: _____| _____ xxxxxx|_____	xxxxxx is the hold time. You can see how the little dip (where the trigger is inactive) in the middle is filtered out by the hold time. Creating a continuous event.

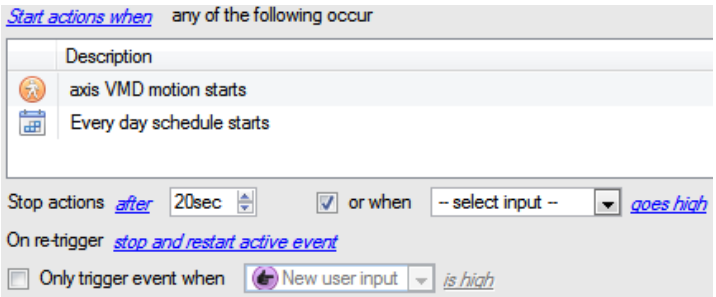
Standard Triggers can either trigger *while* a specific variable is true, or they can trigger *when* that variable is true. *When* events are more complex, as you will need to specify when the event will end. *While* events are simpler as they will automatically end when the trigger variable ends.

Perform Actions While	
Perform actions while is a simpler trigger setting. Where an action will be performed while certain triggers are active.  	The user can set an absolute parameter, so the event will not trigger unless this parameter is true; even if all the other event triggers have been set off.  This also comes with multiple input options, that depends only on how many triggers have been setup.

Start Actions When

Under *Start actions when* a user can define multiple conditions that must be met for an event to trigger.

This is useful if you don't want an event to end when the initial trigger for that event changes state again.



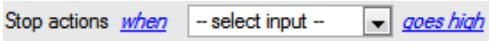
- ***Stop Actions After***

If you have *Stop Actions After* selected you can choose to stop an event after a certain amount of time.

You may also check the *or When* checkbox. This defines a further trigger that may stop the event before the timer has run down.

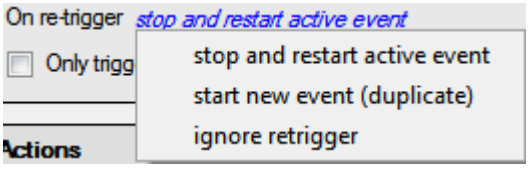
- ***Stop Actions When***

If you do not wish to have a timer, but still want an input that will terminate the event then select *Stop Actions When*



- ***On Retrigger***

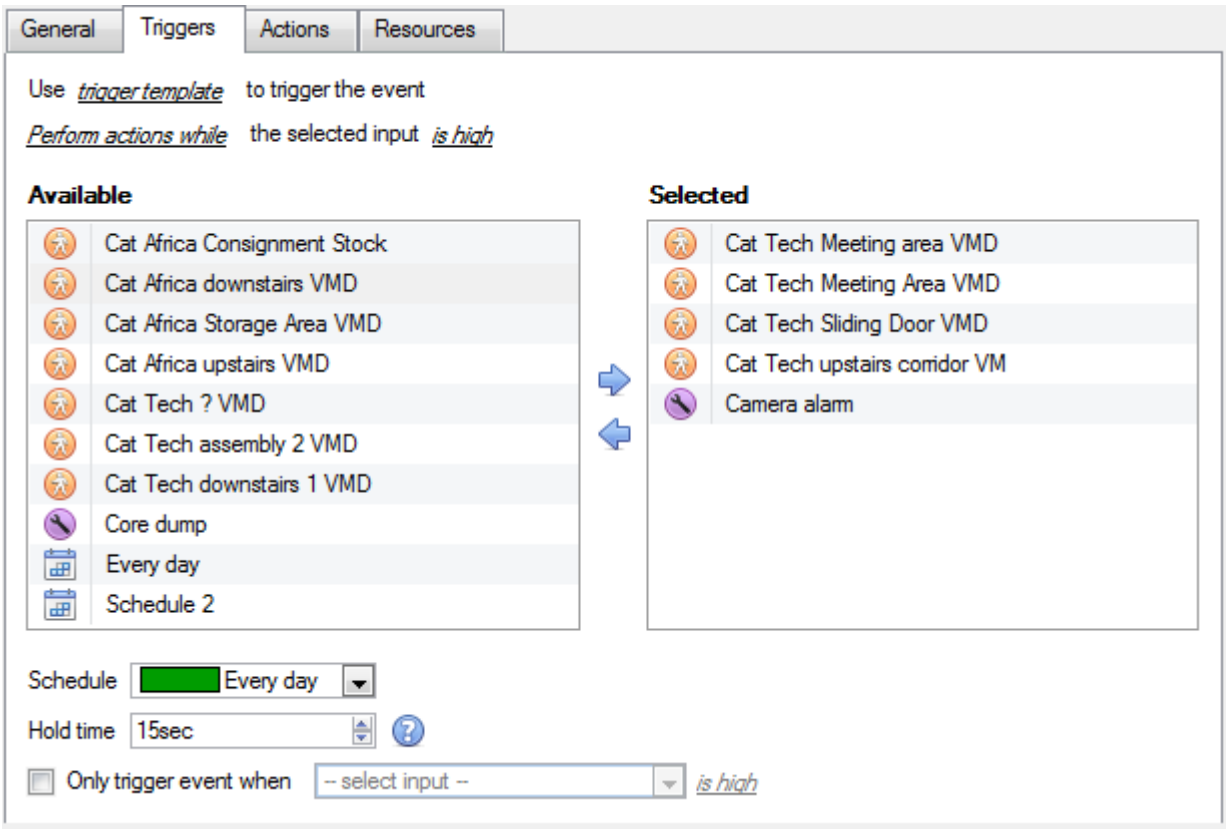
If one of the event's triggers is set off, while an event is already occurring, you have three options.



- ***Only Trigger an Event When***

This defines an absolute parameter, without this trigger the event will not occur.

- ***Trigger Template***



A trigger template allows you to add multiple triggers simultaneously to a single event. You will have all **available** triggers in the left hand column, and all triggers that will be used in the event in the right hand column. To move triggers back and forth select your desired triggers and click on the icon that represents the direction that you want to send the trigger.

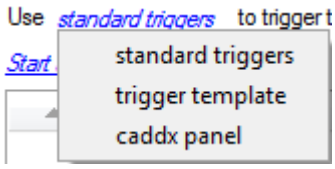
Note: there are two important things to remember when using a trigger template

1. This is useful in relation to the **Record Trigger Cameras** option (dealt with in the Actions section, Actions).
2. You may set the database entry for this event to either take on the name of the event every time, or the name of the trigger. (This is defined in the General Settings Tab, dealt with above.)

- ***Integrated Device Triggers***

The core feature here is that you may set any of the devices Objects as a trigger type, and then add New triggers based on that type.

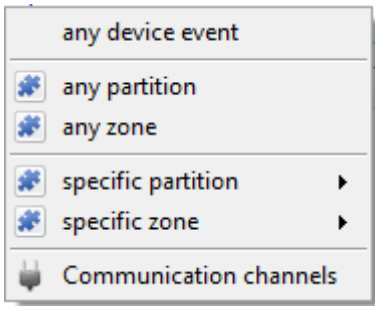
Select a Device



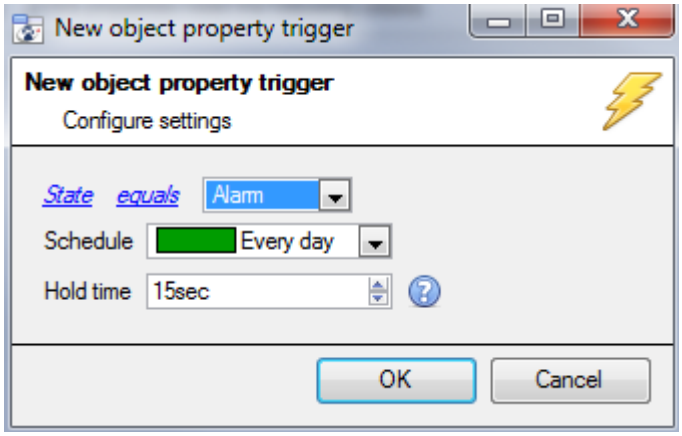
Integrated devices are also viable Event Triggers. This means that any integrated device may be used to trigger a CathexisVision Event.

You will need to select a specific integrated device from the trigger type menu.

Select a Device Parameter



Clicking on Trigger using *any device event* will give you a full list of the integrated devices own objects that you may use as trigger bases. Once you have selected one you may add a new trigger, by clicking on New.

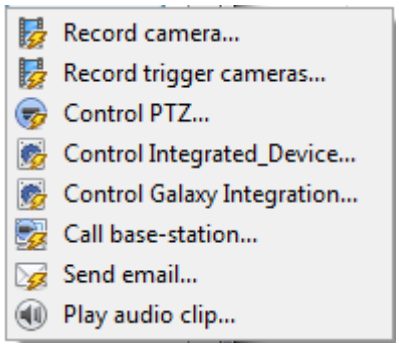


Clicking new will give you all the options that the Object provides as triggers.

For example:
If you select State equals **Alarm,** and you selected any partition above:

The event will trigger when any of the Caddx Zones alarm.

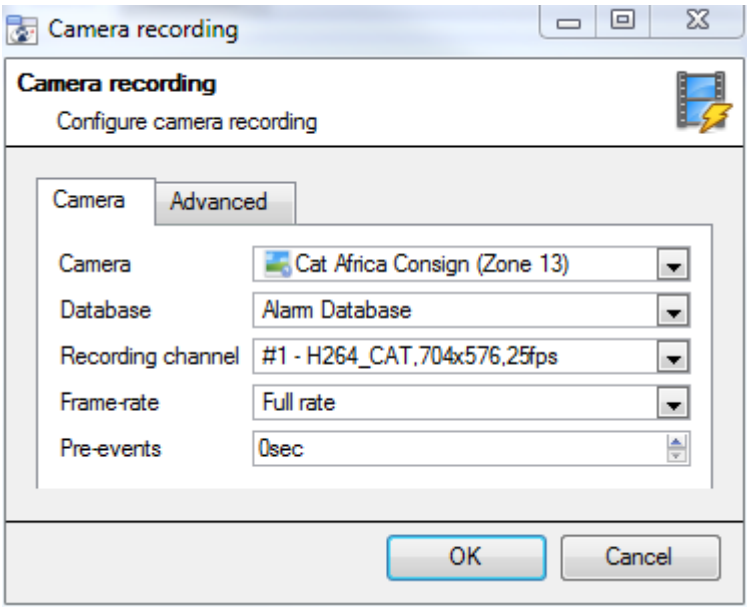
Actions Tab



To add an action click on the New button, to edit an action click on Edit.

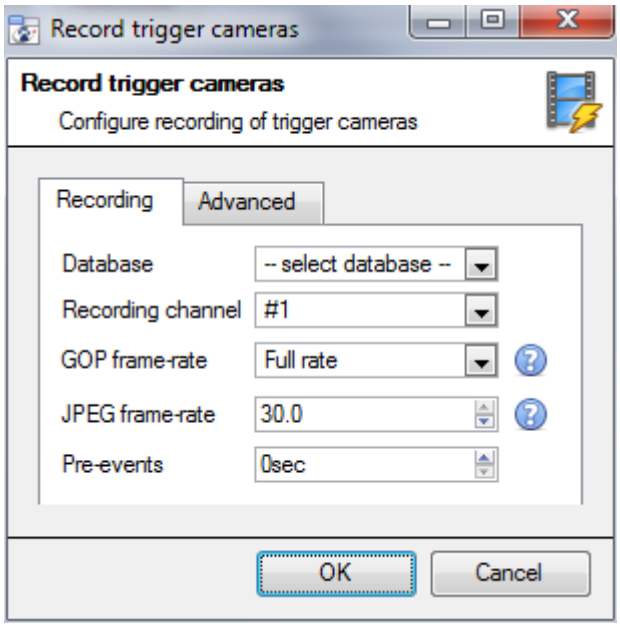
At present the actions you see to the left are the available actions, and they will be dealt with below.

- ***Camera Recording***



Database database	Select a preconfigured database to which you want to record your camera. You can select multiple databases to record the same event to, on multiple servers.
Camera axis	Select a preconfigured camera to record to the specified database. The drop down menu will contain all cameras on your system.
Channel #1 - H264_CAT,1280x800,30fps	If you have more than one video feed coming from your camera (perhaps one for recording and one for Video Analytics) then select the relevant feed for your recording.
Frame-rate Full rate	Select the frame rate that you require your video to be recorded at.
Pre-events 0sec	Setting a pre-events timeframe will set the recording to start a few seconds before the event actually triggered. <u>Note</u>: You need to have setup pre-events in the camera addition process, under the pre-events tab.
Camera Advanced Schedule Every day	The *Advanced Tab* when setting up recording offers the option to schedule when you want this recording setup to be active **within** this event. This schedule does not impact on anything beyond this specific setting.

- ***Record Trigger Cameras***

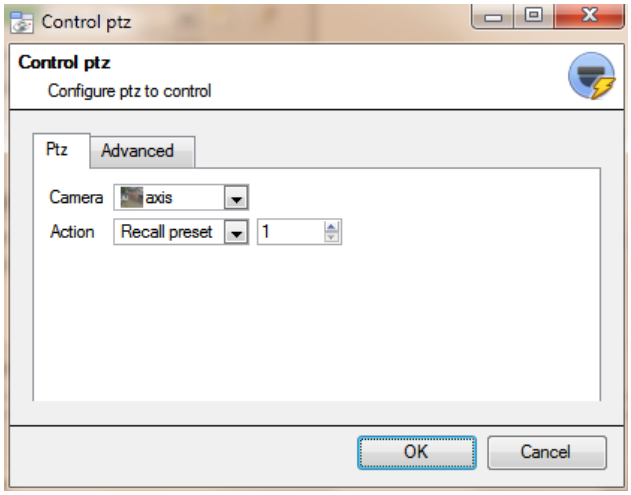


If you chose *integrated device* or a *trigger template*, in the Triggers Tab (above) you may select the option to record **trigger cameras**. This means that the action will record any of the cameras associated with triggers in the triggers tab.

Database is the database the cameras will record to.
Recording Channel is the default channel that will be recorded from the camera. (make sure that all selected trigger cameras have the same channel set for recording.)
GOP Frame-rate is the frame rate to record GOP based video compression streams, such as MPEG4, or H.264.
JPEG frame-rate is the frame rate to record single frame based compression streams, such as MJPEG.
Pre-events are the amount of seconds of footage that are recorded from before the event was triggered.

Tip: by adding a second *Record Database* action, and assigning a second database, you will effectively clone this event to another database. This is useful, if you want to clone an event to, say, a Network Attached Storage.

- ***Control PTZ***



Camera is the camera whose PTZ the action will control

Action

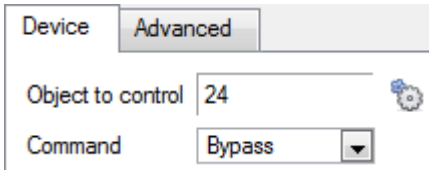
Recall preset will send the PTZ to a preconfigure position

Run pattern will cycle through a number of preconfigured positions, that have been grouped into a *Pattern*

Advanced Tab

The advanced options are identical to those discussed under Control Output, below.

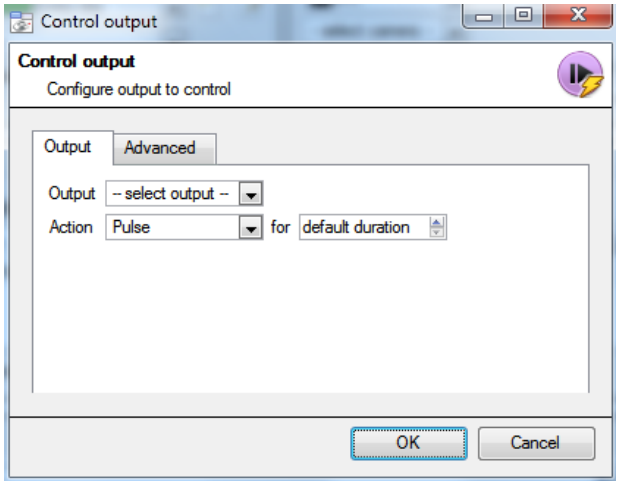
- ***Control Integrated Device***



You may take an action on an integrated device's Objects in the action of an event. The options that you are presented with will differ based on the device that you are controlling. (E.g. set an alarm, or open a door…)

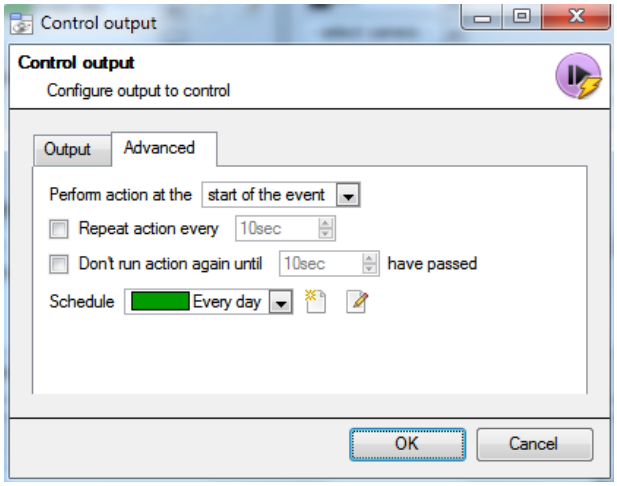
For Advance tab information see the Control Output, below.

- ***Control Output***



Output will provide a list of pre-configured outputs, that you may control as part of this action.

There are 4 **Actions** available:



You have the option to **Perform action at the** beginning, or the end of the event.

Repeat Action Every

Check this box to define how often you want the action to occur during an event

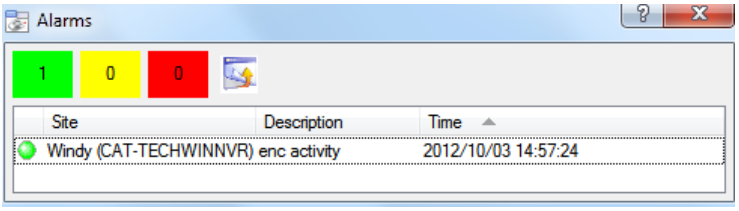
Note: This action, logically, is not available under *Perform action at the end of the event*

Don't run action again… gives you the ability to define how long after the action has run the software must wait before repeating it

Schedule creates a schedule under which this output will be controllable by this event.

- ***Call a Base Station***

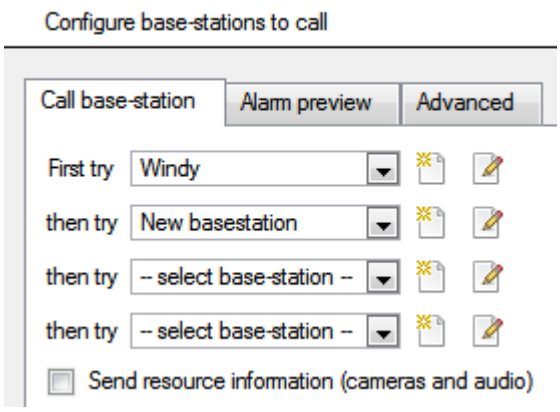
This will define which Base Station is 'called' when an event triggers. It will send an alarm pop up box like this:



To the base station that you choose.

- The three colours Green, Yellow, Red indicate the priority of the alarm. They relate to Low, medium, and High respectively. (The priority setting was defined under 9. C. General Settings Tab, earlier.)
- The number within the coloured block indicates how many unattended alarms of that severity the base station has received.

Call Base Station Tab

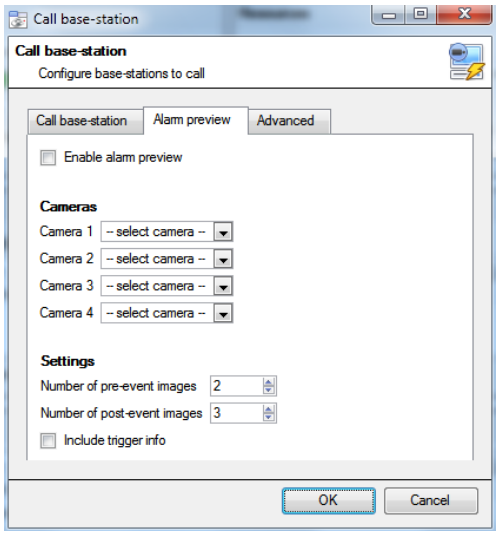


First Try: Select, from the drop down menu, the primary base station that you want an alarm sent to.

Then Try: If the connection to the first base station fails then the base station that you select here will be the one that is the alarm is sent to next.

Send resource information (cameras and audio): If the base station has an alarm management gateway this will send extra information about the cameras and audio that were involved in the event

Alarm Preview Tab



This applies to the Alarm Management Gateway. It will send information in the form of snapshots of the selected cameras along with the alarm.

Enable alarm preview enables the alarm preview

Under **Cameras** you choose predefined cameras to send with the alarm preview

Under **Settings** you define the number of pre-, and post-, event images to send along with the alarm

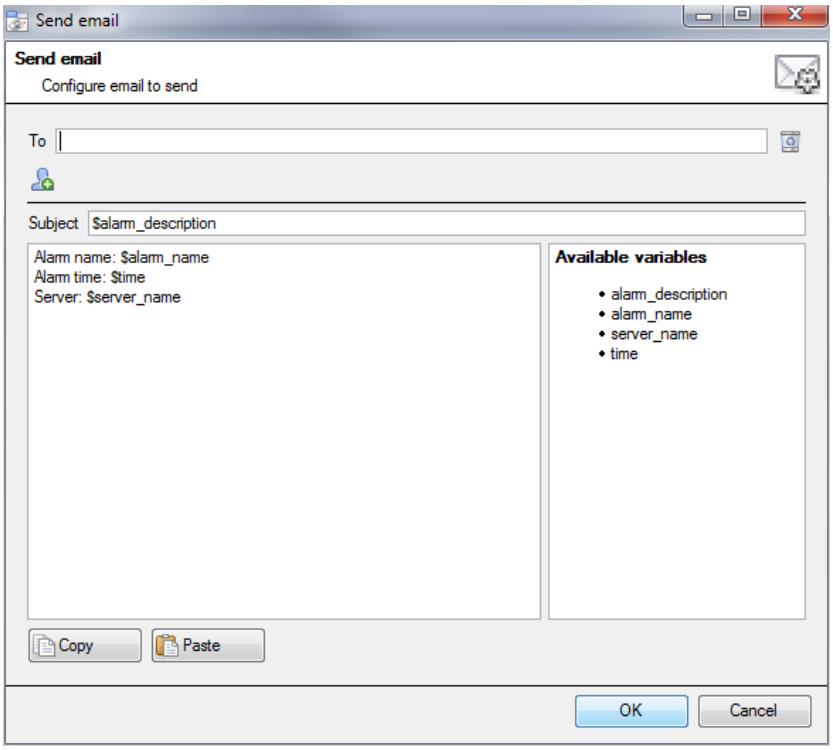
Include trigger info will include trigger information if you are using a third party system as an event trigger

Advanced Tab

The advanced options are identical to those discussed under Control Output.

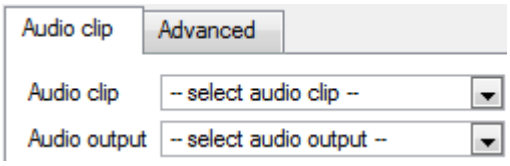
- ***Send Email***

The initial email setup must be done under 1e.Email. However the options of recipient, and the information that will be sent in the email, are set here.



Set the Recipient	Add an email address in the *To* field. To add another recipient click on the icon, this will add another *To* field.
Set the Variable	There is a list of Available Variables in the Send Email window. These define what information is sent in the email. To add variable add the Variable name in the text box to the left of the Available Variables list. The format for adding the variable is: *Descriptive_Name: $Variable_Name*
Copy/Paste	You may copy/past your variable settings from one Technical Alarm to another. This is very handy if you are doing a batch of Technical alarms, across multiple servers.

- ***Play Audio Clip***



Audio Clip is the actual audio file that you may play as an action. The sounds are stored in the installation folder under \sounds.
Audio Output is the audio device that will output the sound.

Advanced Tab

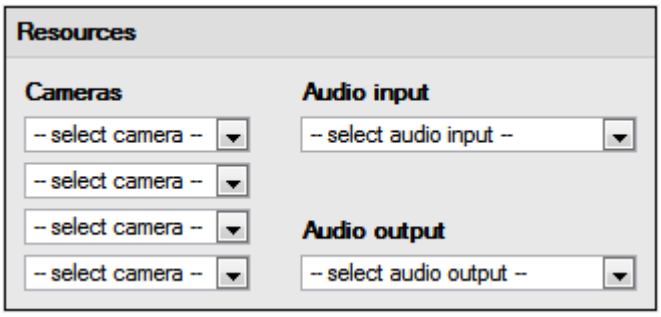
The advanced options are identical to those discussed under Control Output.

Resources Tab

There are two scenarios in which the resources set here will be sent:

1. **Gateway**
   When a user responds to an alarm in a gateway the system will show the cameras and start the audio listed in the resources.
2. **Camera Tab**
   When a camera tab is unlocked, and the event triggers, the display will switch to show the cameras listed in the resources.

- ***Resources Tab***

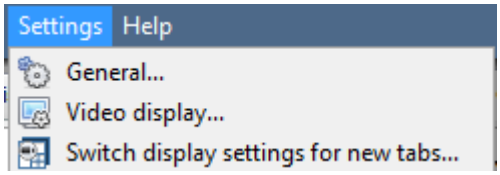


You can send up to 8 cameras, an audio output, and an audio input.

This will be broadcast to all operators viewing this site, details on this are explained below.

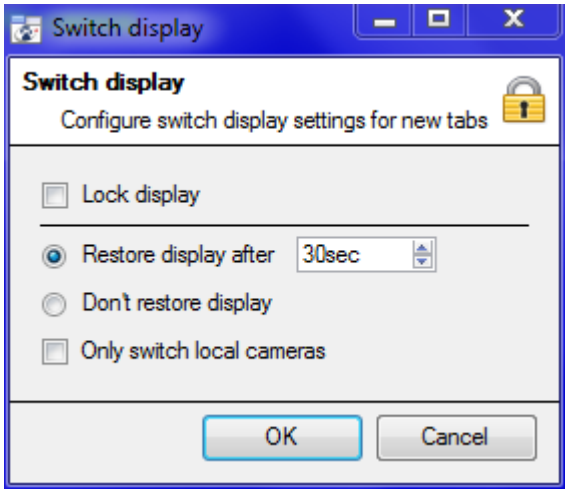
Use trigger resources will automatically send resources that have been associated with the trigger.

- ***Default Switch Display Settings***



If you decide to send Resources. Then you will need to define whether or not you want your Operator's cameras tab to change when these resources arrive. These settings are made outside of the Setup Tab, under **Settings Menu —> Switch display settings for new tabs…**

Note: The settings here will apply to any new Cameras Tabs, opened after you change the settings.



Lock Display
Will prevent the Cameras Tab from displaying any video feeds sent to it by the Event.

Restore display after
Will define how long after switching to the Event Cameras the Cameras Tab will return to the original display settings.

Don't restore display
Will leave the Cameras Tab on the Event Cameras until an operator, or administrator, resets the display.

Only Switch Local Cameras
Will only switch to Event cameras originating from a local site.

Note: you may also lock, or unlock, the currently opened Cameras Tab by clicking on the little lock located at the end of the Timeline on the Review Controls.

10 Monitors

The Monitors option will give you the ability to send video from a server to a Video Wall. This is usually a selection of screens that are dedicated to showing video feeds.

a. General Settings

Licensing
Each monitor running on a Video Wall server needs to be licensed with a VGA license. The license is necessary on the Server sending out video, not on the Client. (This is easy to remember if you think "The license needs to be on the server I am adding the monitor to".)

Video Wall Software
The CathexisVision Video Wall software is installed along with the CathexisVision Suite. It is called **cat_vgaserver.exe**, in the installation folder. In the Start Menu, under Cathexis you will find it under the name **CathexisVision VideoWall.**

When running the Video Wall software will show in the icon tray as the icon.

Run on Startup
If this unit is going to be a permanent Video Wall it is advisable to have the software run on startup. To do so, add the exe to the Startup Folder:

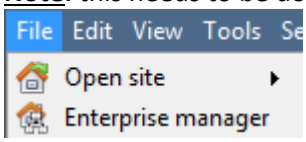
- C:\Users\User_Name\AppData\Roaming\Microsoft\Windows\StartMenu\Programs\Startup . (Replace Username with the name of the user profile that the software will be running on.)
- You may also navigate straight to the Startup folder of the currently logged in Windows User by copy-pasting the following into the Windows Explorer Navigation bar: %appdata%\Microsoft\Windows\Start Menu\Programs\Startup

Resources Site

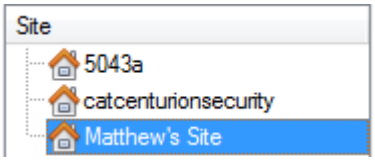
The Monitors Tab will be automatically present in CathexisVision on the Server which you have added monitors to. But, if you want the Monitors Tab on a Base Station, you will need to make the relevant site a Resources Site. This must be done in the Enterprise Manager of the Base Station that you are adding the Monitors Tab to.

- ***Create a Resources Site***

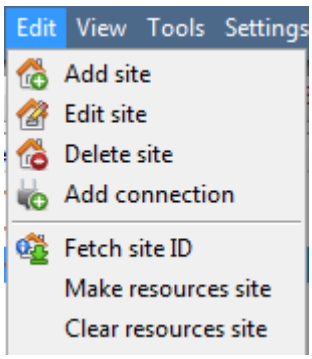
Note: this needs to be done on the Base Station which you want to have the Monitors Tab on.



Open the Enterprise Manager



Select the site you wish to edit
Here the site that we are editing is called Matthew's Site



Select Edit from the Menu Bar
With the site still selected click on **Edit—>Make Resources Site**,

To remove the Site's status as a resources site, you may follow the same procedure, but click on **Clear Resource Site**.

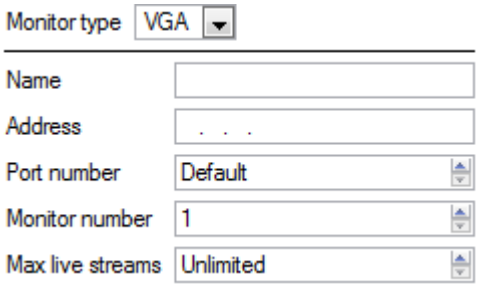
b. Adding a Monitor

Monitor type

There are two types of Monitor that you may add to your system. A VGA monitor and an XP switcher monitor.

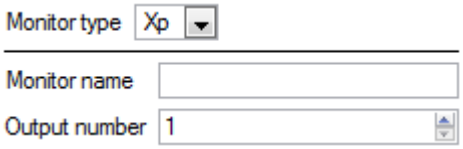
- ***VGA***

This will work via a VGA Server computer, with the CathexisVision Video Wall software running on it.



Address This is the address of the unit you are sending the video too (or the address of the router you are sending the information to, if the Video Wall is on another network).
Port Number. Leave this at default. Unless the video wall is on another network to the recording server, and you need to forward specific ports.
Monitor Number corresponds to the physical monitory on the wall.
Max Live Streams will limit the quantity of live streams this monitor will support. (Set based on the monitor unit's streaming capacity.)

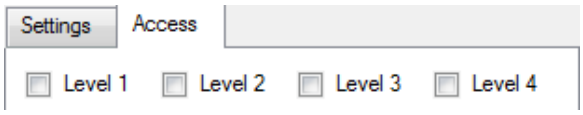
- ***XP***



XP monitors, attached to the unit via a rear-panel cross-point switcher (This will be added to a Linux based system, most probably Fedora).

Monitor name is a descriptive name that you give the monitor.
Output Number is the number on the XP switch that you attach to the screen.

c. Access



Under the Access Tab you define which user Access Levels have rights to make changes to this Monitor, via the Monitors Tab. (Discussed Below.)

11 Access Rights

Under Access Rights you will setup which Site Resources are available to which Access Levels. Each User was assigned an access level when you added him/her. This user level corresponds to the Levels that you assign to Site Resources here in **Access Rights**.

You may view Access Rights on a resource by resource basis (Show All Levels setting), or on an Access Rights Level basis (Show Level setting).

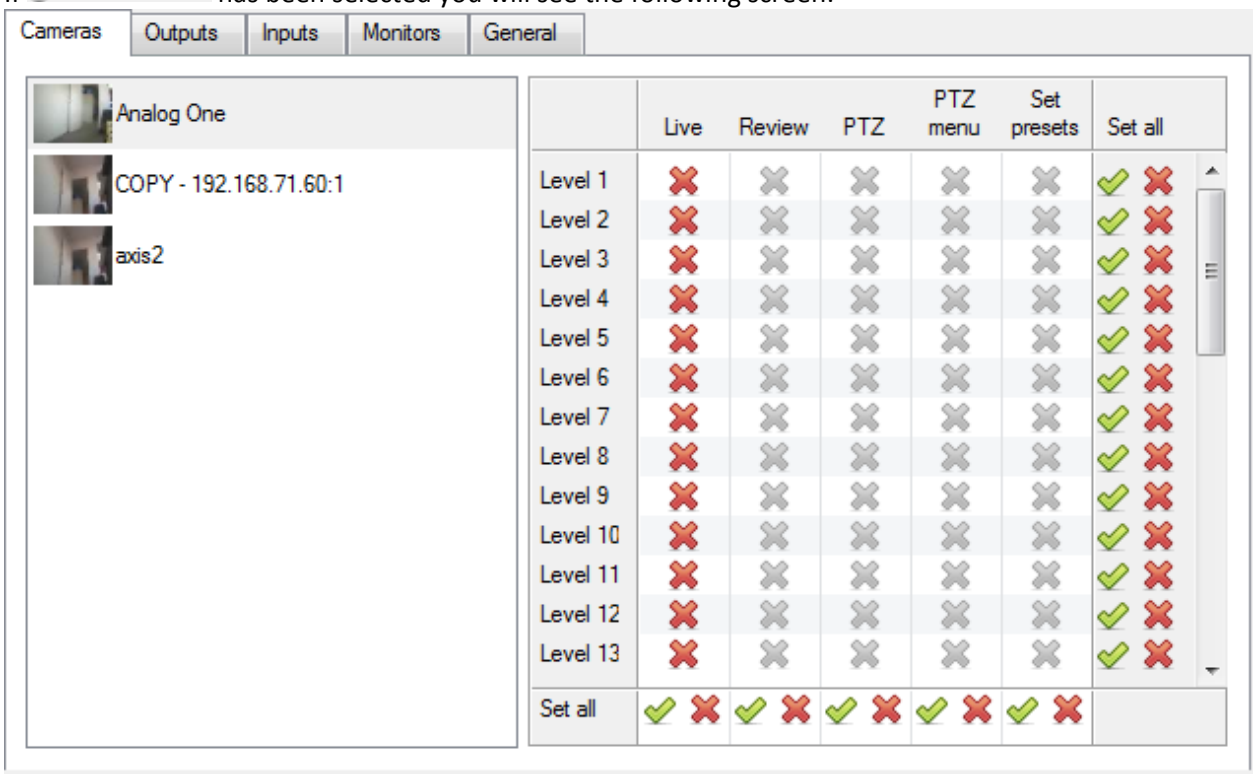
Tabs

The procedure is identical for Cameras, Outputs, Inputs, Monitors, and General):
Select the resource from the list on the left, and check the level you wish to have access to this resource.

a. Show All Levels

This setting allows you to set the Access Rights for each resource individually.

If Show all levels has been selected you will see the following screen:

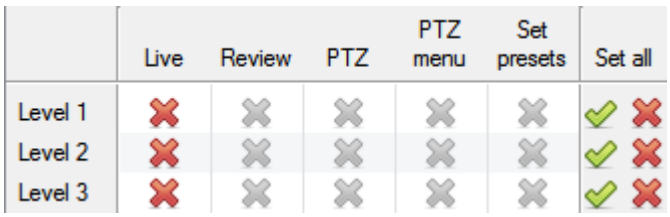


The tabs (Cameras, Outputs, Monitors, General) represent classes of resource whose access level you may control. The one you have selected will have all the resources that fall into this class displayed in the left hand panel. (In the above image you can see all the server's cameras displayed, as the Cameras Tab has been selected.)

On the right hand side you will see the access rights associated with the selected resource (here only Level 1 has any access to the Cat Tech Sliding camera).

Cameras

Under cameras there a number of options for rights on each level.



Live	This controls which Access Levels can view the camera's live feed.
Review	This controls which Access Levels can review recorded footage form this camera.
PTZ	This controls which Access Levels can control PTZ movement.
PTZ Menu	This controls which Access Levels have the ability to change PTZ menu.
Set Presets	This controls which Access Levels can change PTZ preset positions.
Set All	Selecting will give this level access to all settings; selecting will give this level access to none.

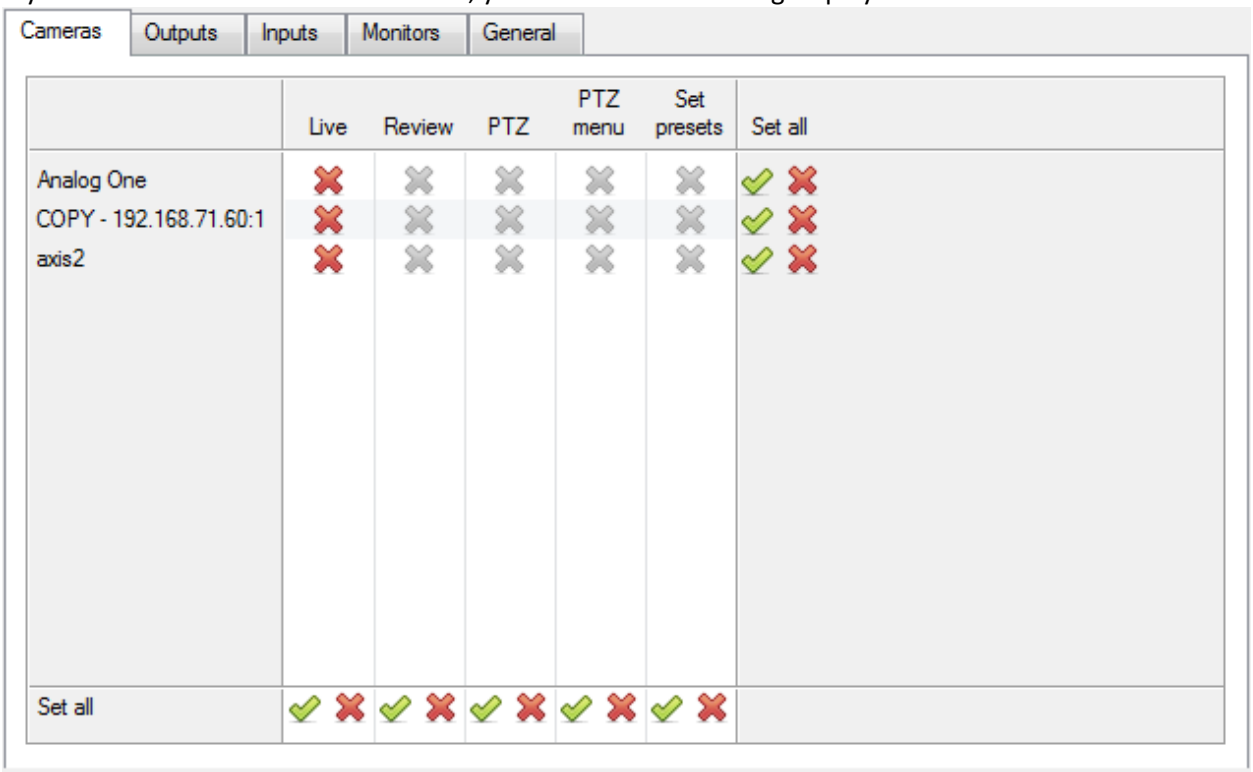
- A means that this level has access.
- A means that this right has been denied to this level.
- A greyed-out cross ( ) means that this right requires another right to be set, in order for it to be enabled. (For instance, you cannot give a user rights to Review, or use PTZ unless you have already enabled Live Viewing.)

Note: To change the status of an access right, left-click on the tick/cross to change its designation.

b. Show Level

Here you set Access Rights by level, and can edit all resources at once, for each chosen level.

If you select Show level Level 1, you will see the following display:

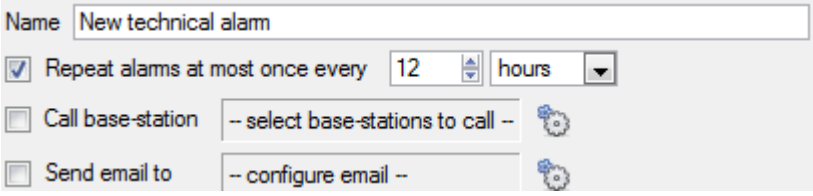


12 Technical Alarms

This is a facility to set up alarm conditions in the event of a technical problem. A single **Technical Alarm** can send on multiple different alarms, in this way you may setup an alarm to send only information regarding hardware, or software, or cameras.

Technical Alarms are set on a server-by-server basis, and as such are located in the configure servers settings under **Site—>Setup—>Configure Servers—>Technical Alarms**.

a. General Settings



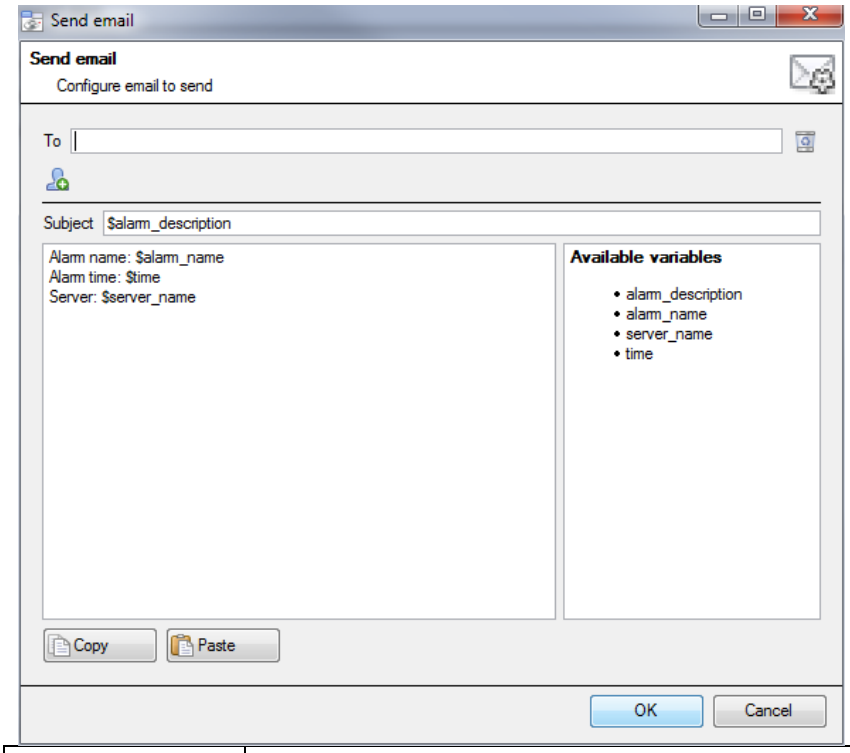
Give your Alarm a descriptive **name.**

You may set a global maximum amount of alarm repeats.

Select whether you want your alarms to be sent via email or go to a Base-Station.

Email Configuration

The initial email setup must be done under 1e.Email. However the options of recipient, and the information that will be sent in the email, are set here.

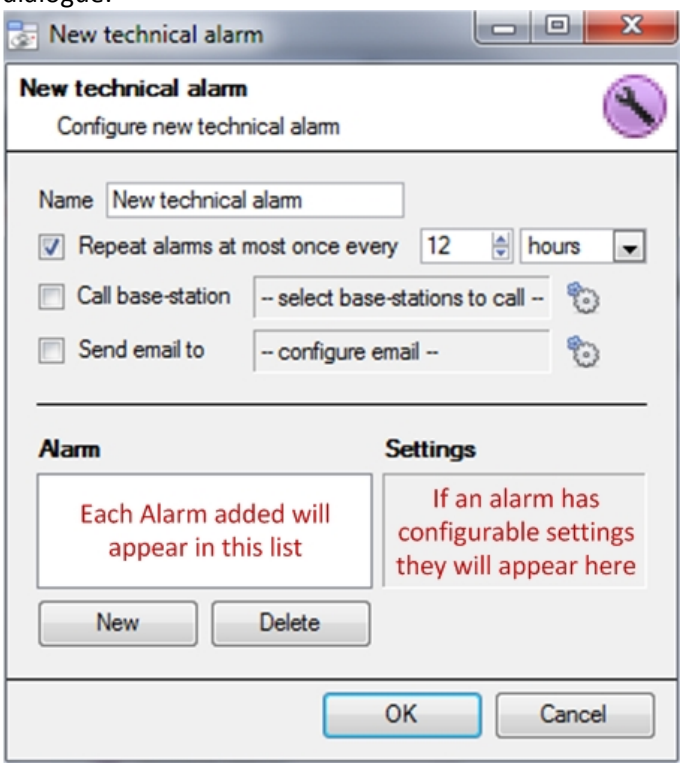


Set the Recipient	Add an email address in the *To* field. To add another recipient click on the icon, this will add another *To* field.
Set the Variable	There is a list of Available Variables in the Send Email window. These define what information is sent in the email. To add a variable add the Variable name in the text box to the left of the Available Variables list. The format for adding the variable is: *Descriptive_Name: $Variable_Name*

Copy/Paste	You may copy/past your variable settings from one Technical Alarm to another. This is very handy if you are doing a batch of Technical alarms, across multiple servers.

b. Add/Edit a Technical Alarm

To add a technical alarm click on New, in the Technical Alarms panel. This will bring up the following dialogue:



Name
Give your Technical alarm a descriptive name.

Repeat alarm at most…
This setting sets a 'global' repeat setting, which will define how often individual alarms may repeat.

Call Base Station
This is if you want your alarms to be send to a Base Station. Click on to set the Base Station/s.

Base Station setup is dealt with under section 1j Base Stations.

Send Email
You also have the option to send an email in the event of an alarm. If you want to setup a new email click on .

Email Setup is dealt with under section 1e Email.

Available Alarms

Clicking **New**, in the New Technical Alarm dialogue, will initiate a drop-down menu with the following possible options:

Test	Triggers an alarm at a set frequency. This is intended to test the system, to see if it will receive alarms.
Camera Faults (Configurable)	Will trigger based on cameras being up for a certain percent of the time, or cameras failing a certain number of times in a given period (configurable) **Configure:** Here you may set whether alarms trigger from one, or both options listed above. You may also select to have alerts from all cameras, or from selected cameras.
Frame-Grabber	Triggers when a frame-grabber has a problem, such as frame-grabber reboot, card stalled.
Scheduled Archive	Triggers when a scheduled archive encounters a problem, such as the archive destination not being accessible.
Disk	Triggers when disk errors occur.
Environment	Triggers off environment warnings, such as high CPU temperature, fans running at low RPM. (NetBSD only)
Software Failure	Triggers when a software module fails.
Database	Triggers when the database encounters an error, such as failing to write data to the

	database.
File-System	Triggers when file-systems become full (NetBSD only).
Meta-Database	Triggers when the meta-database (typically used in integrations) encounters a problem, such as running out of disk space.
Base-Station Alarms	Trigger when a base-station is configured to send alarms via a capture station. The base-station can generate alarms such as software failures.
Reboots	Triggers when a unit reboots frequently, or has a watchdog, or hard-reboots (configurable, NetBSD only).
Server Monitoring	This a technical alarm that is generated when a unit on the site goes down.
Recording failure	Triggers when a recording should be taking place, but for some reason isn't. **Configure:** All that needs to be set here is the cameras that you don't want to trigger this alarm.
Recording Period	Will trigger when a database stops recording before its predefined period is complete. E.g. if you set a database to record for 30 days, but it only records for 25.
Gateway alarm	Only applies to gateway systems, and triggers when the gateway experiences a problem, such as an error connecting to the alarm database.
Integration Database	Triggers when the integration database is down.
Network I/O	Will trigger when an EIO is down.

- ***Important Note on Operating Systems***

The technical alarms have different levels of integration with the different Operating Systems. The following is a table indicating the Operating Systems, and the technical alarms that are supported.

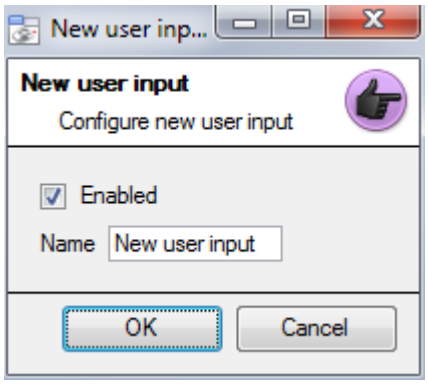
Technical alarm	Windows	Fedora	NetBSD
Cameras	X	X	X
Frame Grabber		X	X
Disk	X	X	X
Archive	X	X	X
Environment			X
File System			X
Reboot			X
Gateway	X	X	X
Software Failure	X	X	X
Database	X	X	X
Meta-db	X	X	X
Base-stations Alarms	X	X	X

13 Virtual Inputs

Virtual Inputs are user initiated triggers. They may be added to events, and used as manual triggers. This takes the place of a physical button (which is why the icon for Virtual Inputs is a finger).

For instance a virtual input may be created, and added to an event that starts a camera recording. The Virtual Input would then function as a record button for that camera.

a. Add a Virtual Input



To add the Virtual Input click New.

Give the input a descriptive **name.**

That is all you need to here. Whether the input is normally closed, or normally open, and other event-based information is all dealt with when adding it to an event, as a trigger.

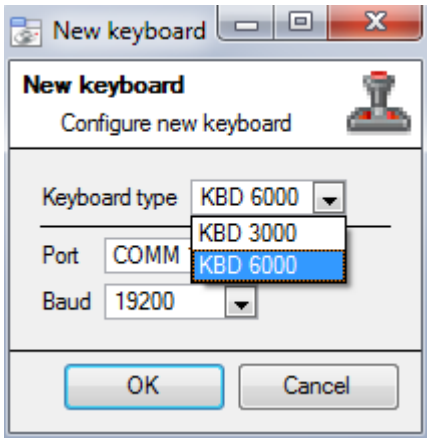
This Input works the same way as other triggers in an event, you may look to 9 Events for more information.

14 Keyboards

When adding a Keyboard to a unit there are two possible situations. You may either be adding it to a **Recording Server**, via the Setup Tab; or to a **Base/Viewing Station**, via the CathexisVision Menu Bar.

a. Recording Server

Adding a Keyboard to a Recording server is done on the server, and as such you need to access **Site—>Setup Tab—>Configure Servers—>Keyboard**.



Simply choose the Keyboard type and enter the port number that corresponds to the port that the keyboard is plugged into.

KBD3000

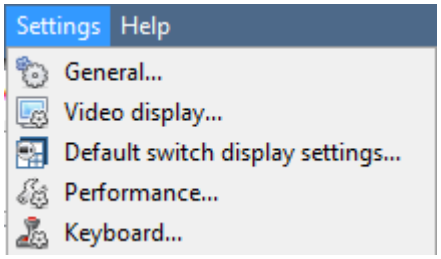
For the KBD3000 there are no settings beyond the selection of the correct port.

KBD6000, Baud Rate

For the KBD6000 you will have the option to select a baud rate.

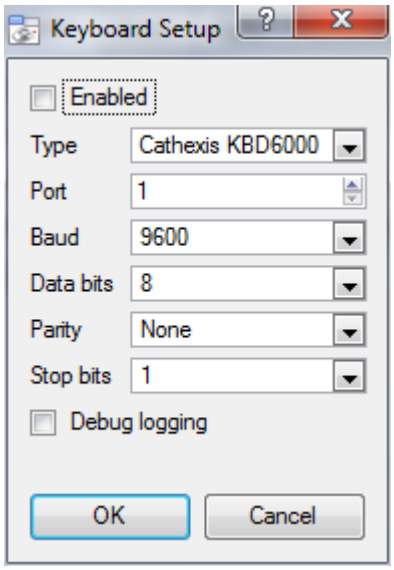
This keyboard has an internal dipswitch that you may set. If this hasn't been changed the default baud rate of 19200 will be the right one.

b. Base Station



If you are adding a Keyboard to a base-station, you need to be on that specific base station.

Go to the menu bar and select **Settings—>Keyboard**.



Enable

Check the box titled Enabled to enable the added keyboard.

KBD3000

The only setting that you need to change for the KDB3000 is the port number. (In fact, other changes will be ignored.)

KBD6000

The correct settings for the KBD6000 are as follows:

Baud	19200
Data Bits	8
Parity	None
Stop Bits	1

Again, these should be the default settings, and probably won't need to be changed.

15 Integration Devices General Settings

a. General Setup

Because there are many different integrated devices, and each device will have different options this General Setup section is designed to introduce you to the Integration Panel, and the features that are common to all integrations.

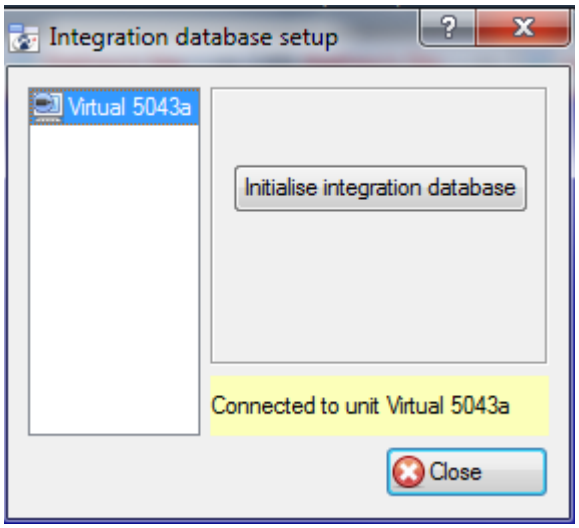
One major benefit of our Integration Devices panel is that it ***centralises all integrations to one point***. The addition, edition, and management of all integrations added to a server/site is done from this one point.

Integration Database Management

This is actually done outside of the Setup Tab—>Configure Servers. This is because integration databases are not specific to servers, but should be considered as Site resources. For this reason you add/edit integration databases via the Site Menu: Once you have logged into your site you need to navigate to the Integration Database Manager via **Site—>Integration Database…**

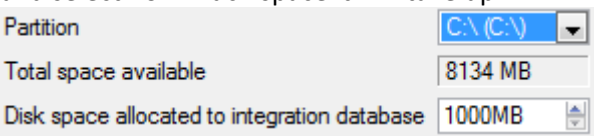
- ***Initialise the Integration Database***

This will add a broad database, within which you will be adding all of your integrated device's databases.



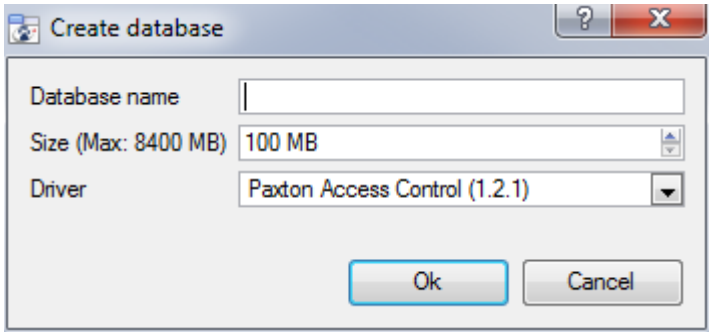
The first time you add an integration database you will have to initialise this feature on the unit.

Select the unit you wish to add the database to, from the list on the left, and click Initialise integration database. You will have to choose which partition the database will be formed on, and select how much space it will take up.



- ***Add a New Devices Database***

Right click on the white space that was occupied by Initialise integration database before you initialised your database, and click on New.



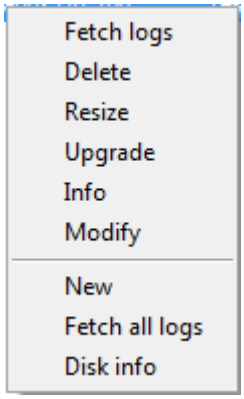
Give your database a descriptive **Database Name**.

Allocate a **Size** to your new device database.

Then choose the device **Driver** that your device will be using.

- ***Integration Database Procedures***

Once you have added at least one database you will see the following procedures if you right click on a database:



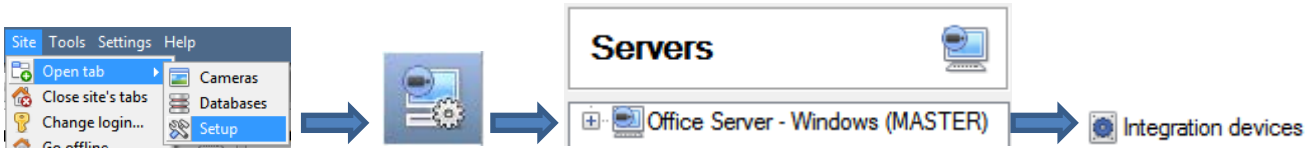
Fetch Logs will fetch the logs for the unit you have right-clicked on.
Delete will delete the database you have selected.
Resize allows you to resize this database. You will have Min and Max options, which will either fill the database to the maximum, or the smallest, sizes allowed.
Upgrade upgrades the metadata base.
Info will give you a full list of all available information on the database.
Modify will simply allow you to rename the Database.
New will open the New Database Dialogue.
Fetch All Logs will pull a consolidated log for all integrations databases on this unit.
Disk Info will provide detailed information about the hard drive the database is on, as well as the Databases on it.

Open the Integration Setup Panel

First we need to navigate to the Integration Setup Panel.

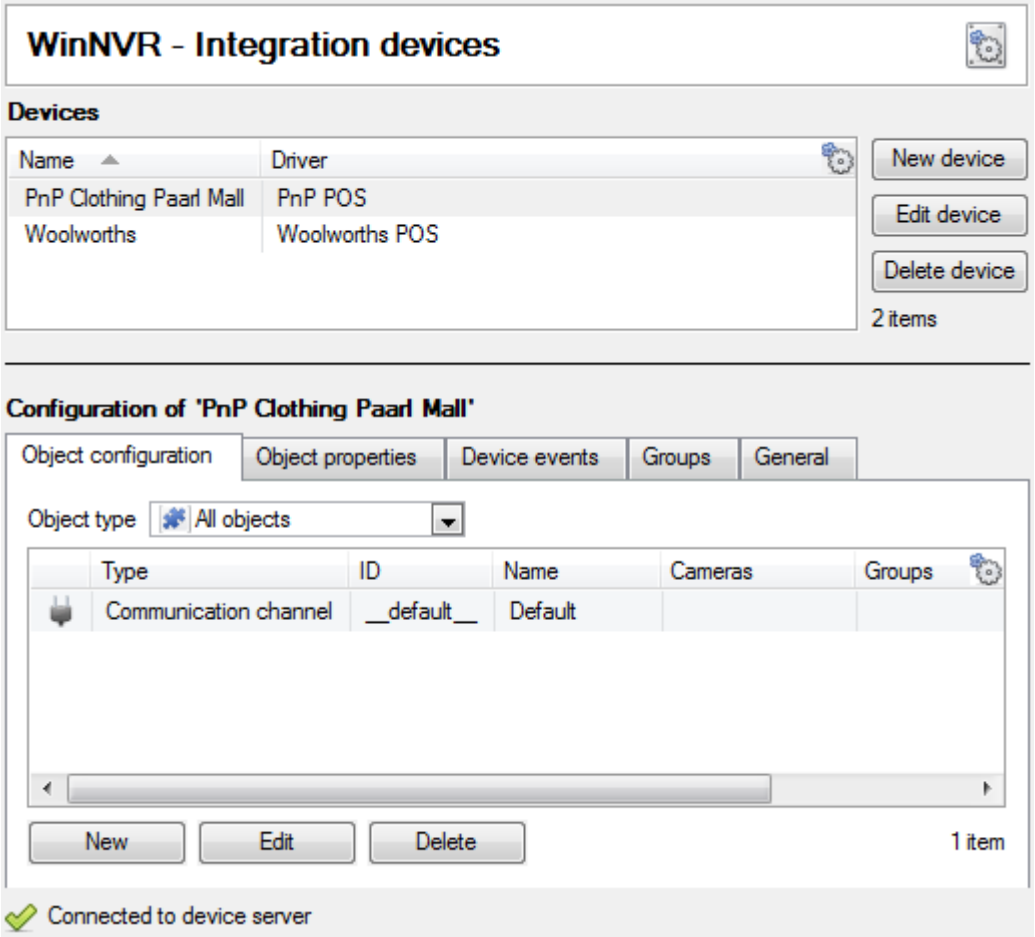
- ***Enter Configure Servers***

Once in Configure servers left-click on Integration devices



This will bring up the Integration Devices Panel on the right. This is the central point at which integrations are managed.

The Integration Devices Panel

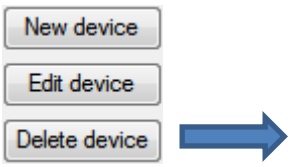


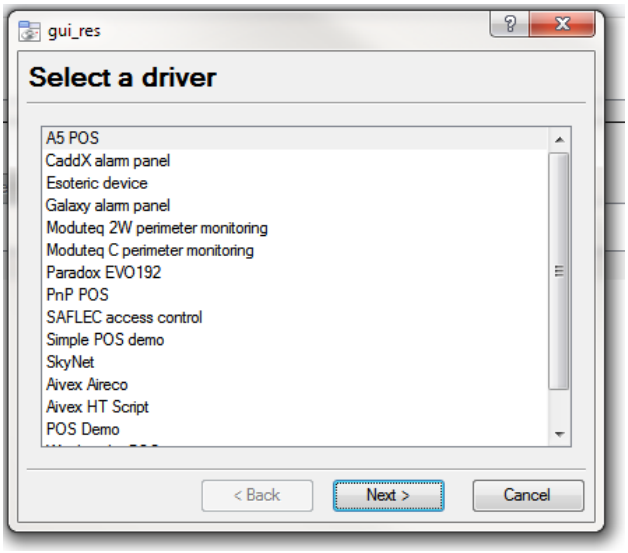
Adding an Integrated Device

Adding an integrated device is incredibly simple.

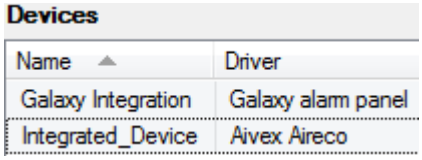
- ***Add the device***

Click *New*, and select the drivers for the device that you wish to add.





- ***Devices***



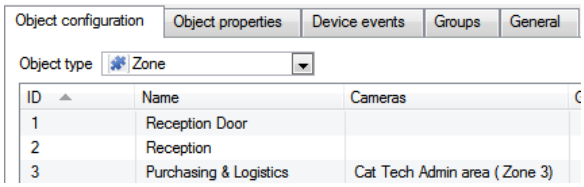
Once you have added your device it will show up in the **Devices** panel. Left-click on a specific device to access its Configuration Settings.

- ***Configuration Tabs***

Initially the configuration panel will be titled **Select device**. Once you have added an integration the title will become **Configuration of Device_Name**. This is the area where you will be able to view your device's objects, and change settings.

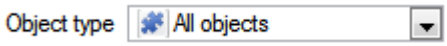
The Configuration section will be automatically populated with the information received from the device.

Object Configuration Tab



Individual units attached to a specific device are called **objects**. For example, on a Point of Sale integration, individual tills are objects; or, in access control integrations, the individual access nodes are objects.

Objects can have cameras assigned to them, so that camera recordings can be linked to the till via a meta-database.



Each integration will obviously offer different objects.

Object Properties Tab

Object properties are the specific information about each object. For instance the different names that have been given to an access control node, its armed status etc.

Device Events Tab

This gives a live stream of all device events as they occur. For POS this would be sales, for Access Control this would be access events, and so on.

Groups Tab

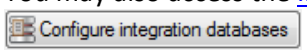
You can create groups of the same type of object. When creating a group you will select what object type you want to include in the group, once the group is created the available objects panel will fill up with all available objects of that type. From this list you will choose which objects you want to use in your Group.

This is incredibly useful in setting up Events as you can use an entire group as an Event Trigger.

General Tab

Offers general information, such as the meta-database that the integration is attached to.

You may also access the Integration Database Management dialogue from here, by clicking on



b. Important Considerations

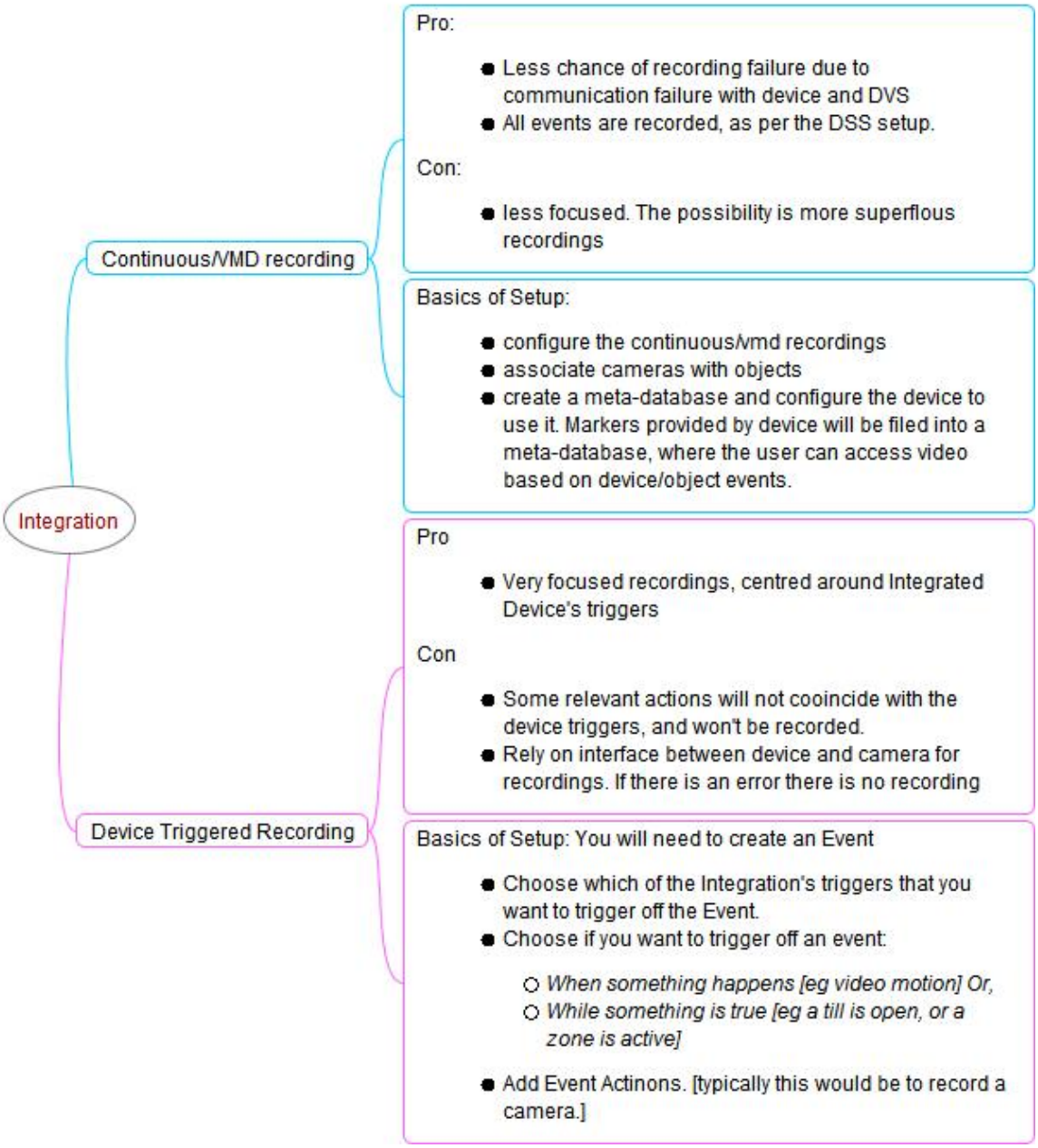
There are some things that you need to take into consideration when adding an integrated device.

Device Triggered Recordings; or Continuous Recording with Device Provided Markers

One of the first things to take into consideration when using an integrated device is how you want it to interact with your Surveillance System.

- Do you want the device itself to trigger recordings? Or,
- Do you want continuous recording with the integration creating time markers on this recording?

There are pros and cons to both. These, along with basic setup designs are provided in the mind-map below:

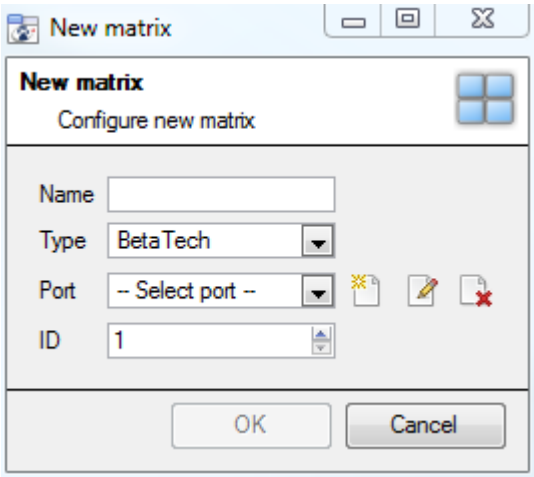


16 Analogue Matrix

CathexisVision has the ability to support an analogue matrix. Click on Analogue matrix to access the setup.

a. Add/Edit an Analogue Matrix

New Matrix Dialogue



After clicking on NEW you will see the dialogue box.

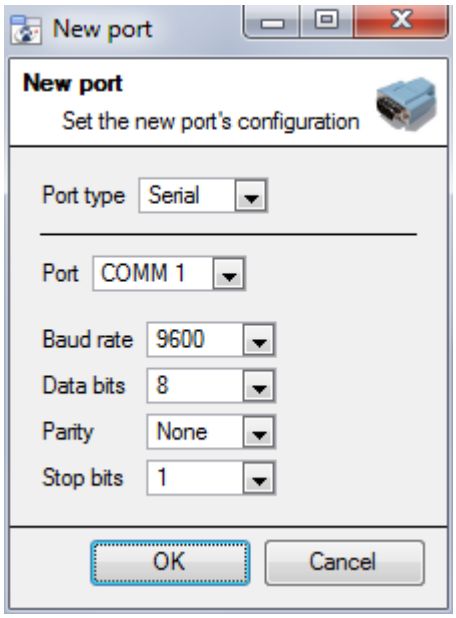
Give your matrix a descriptive **name**.

Select the **type** of matrix that you will be using.

Select/Configure a **port** (dealt with below).

Set the **ID** of the matrix.

- ***Port Edition Dialogue***



If you need to add/edit a port you will see this menu. To add a new port click on the icon, to edit one click on the icon, and to delete the currently chosen one click on the icon.

Select the **port type** that you will be using.

The **port** option relates to the physical port on the unit.

Select the relevant **Baud Rate**, **Data Bits, Parity, and Stop Bits** for the specific matrix that you will be using.