Matrix Barcode Reader Integration App-note

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1. Introduction

This document will detail the integration of the Matrix Barcode reader, with the CathexisVision software. Functionally this integration will entail the triggering of standard CathexisVision Events, based on the triggers from the Matrix reader.

1.1 Requirements

1.1.1 General Requirements

- CathexisVision 2016 Service Pack 3 and later.
- Win 7 - 64bit and later; Win Server 2008 R2 and later.
- Minimum of 4 GB of RAM required.

Note:

1. For information regarding the regular operation of a Matrix device, please consult the relevant Matrix documentation.
2. There is a General Integration section in the main ***CathexisVision Setup Manual***. It has vital information about creating an integration database, as well as a general introduction to the Integration Panel. Read over this section.
3. When using an ESP1204 the Communication channel will only show it is disconnected if the network connection to the ESP1204 is down.

1.1.2 License Requirements

License	Name
CDEV-2000	Other Device License

Note: In this integration, a single license will cover multiple linked devices.

A NOTE ON CAMERA CHANNELS

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

1.2 Integration Components

All CathexisVision integrations have two component levels: **Device** and **Object**.

Device	The device is CathexisVision software's interface, which handles all the interaction between CathexisVision and the integrated hardware. When an integration is added to the CathexisVision system, a device is added. The messages received from the device are called Device Events.
Objects	Objects are the individual pieces of hardware that comprise the integration. There may be multiple "object types" under the objects group. For example, the main controller and door nodes of an access control system are both objects. They are different types of objects.

USEFUL LINKS

*To view **tutorial videos** on CathexisVision setup, visit https://cathexisvideo.com/resources/videos*

*Find answers to Cathexis **Frequently Asked Questions**: https://cathexis.crisp.help/en/?1557129162258*

2. Device Addition and Configuration

This section will detail the procedure for setting up the two systems to effectively communicate with each other.

2.1 Matrix Setup

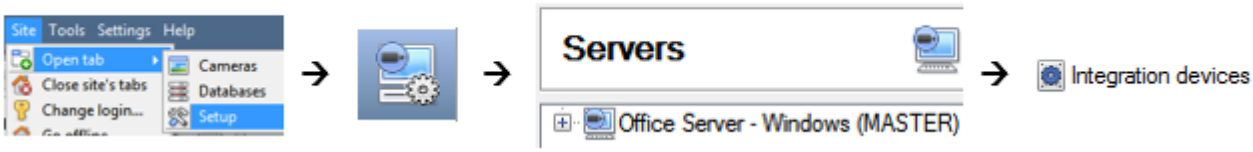
2.1.1 Connection Options

The Matrix device sends information to CathexisVision over a network, using UDP.

2.2 Devices Section (Add a New Device in CathexisVision)

Integrations are added on a server-by-server basis. They are managed in the Integration Devices panel, under the Setup Tab of the servers to which they are added. To get to the Integration Panel follow this path:

2.2.1 The Integrations Panel

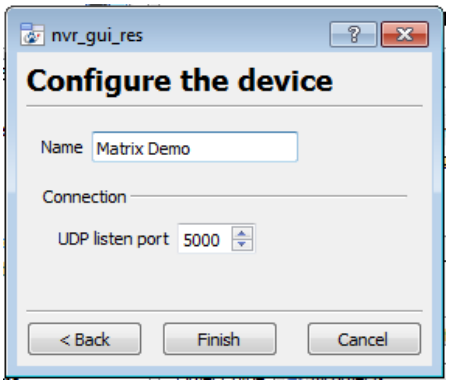


There are two sections in the Integration Panel:

1. The **Devices** list shows the integration devices attached to the integration database.
2. The **Configuration** section enables editing/reviewing the device selected in the **Devices** section.

2.2.2 Device Addition

1. Once in the Integration Panel, click on the **New device** button, in the Devices section. This will open the addition dialogue.
2. Select **Matrix Barcode Reader** from the list.



Give the device a descriptive **name**.

Also make sure that the UDP listening port is the same as the port that the Matrix device is broadcasting at.

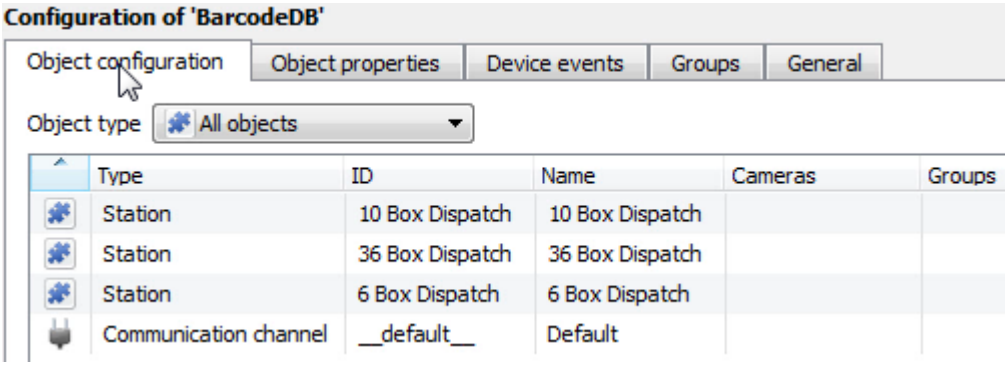
3. Configuration Section (Tabs)

The configuration section is divided up into a number of tabs. These tabs are: **Object configuration, Object properties, Device events, Groups,** and **General.**

3.1 Object Configuration Tab

The object configuration tab is where all the individual objects that comprise the integration may be viewed.

The Matrix integration has one object type: **Station.**



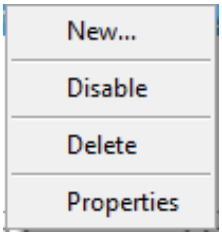
3.1.1 Object Configuration Buttons

Click **New** to add a new object.

Click **Edit** to change an existing object.

Click **Delete** to remove an existing object from the CathexisVision configuration.

3.1.2 Object Configuration Right-click Options



New will open up the dialogue to add a new object.

Disable/Enable allows objects to be enabled/disabled manually.

Delete will permanently remove this object from the list.

Properties will open up the object properties. The object may be edited from here. Specifically, assign cameras to this object, as well as define user access levels for it.

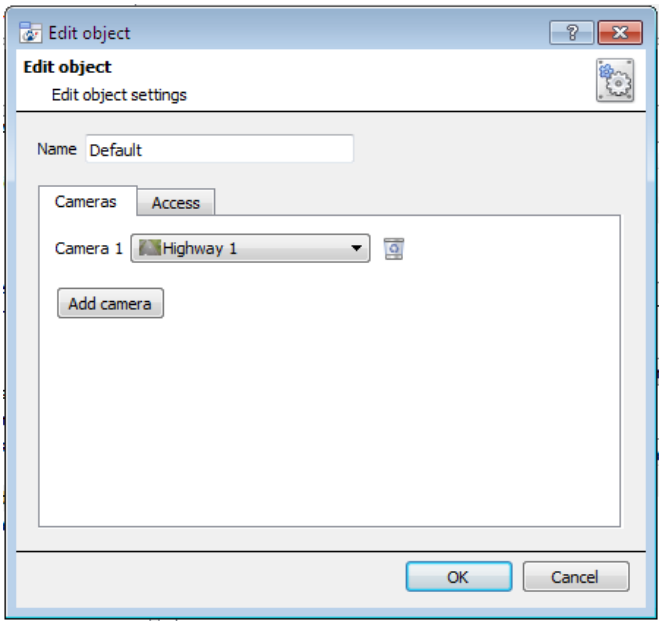
3.1.3 Edit Object

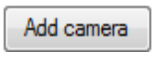
Open object **editing window** by selecting object and clicking **Edit button**, or **right-click Properties**.

This window is where cameras are added to objects, overlays are configured, and access rights to the integration are added. These are dealt with in two tabs: **Cameras** and **Access**.

3.1.3.1 Properties: Camera

Adding a camera to an object will mean that whenever there is an event on that object, the recording from that camera will be related to the time and date of the object event, in the Integration database.





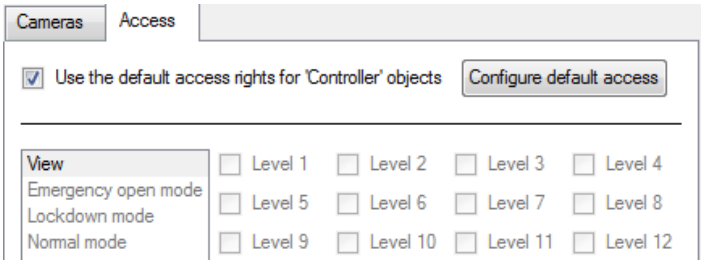
To **add** a camera, click Add camera, and select the relevant camera from the drop-down menu.

To **delete** a camera, click the trash icon.

Notes:

- While multiple cameras can be added here, only the first camera added with the object will be linked in the integration database.
- If ***continuous recording*** **is not** set up on associated cameras, there is the risk of an object event triggering while the cameras are not recording. To record cameras only when an object triggers, set up **Events** that trigger a recording, when one of these objects is activated.

3.1.3.2 Properties: Access



Access can be used to protect sensitive objects, by only allowing certain user levels access to them.

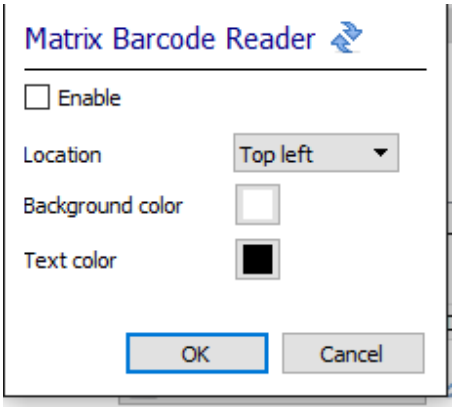
There will be a list of objects, whose access level may be set.

Note: If ***Use default access rights*** is checked, make sure that those default rights have been correctly defined. Click on **Configure default access** to do this.

3.1.4 Configure Overlays

Open the Overlay settings dialogue window by following one of the steps below:

1. Select the Station object from the drop-down menu to display the Overlay Settings icon .
2. Right-click object / Properties / Add camera / Click



Check Enable to enable the overlays.

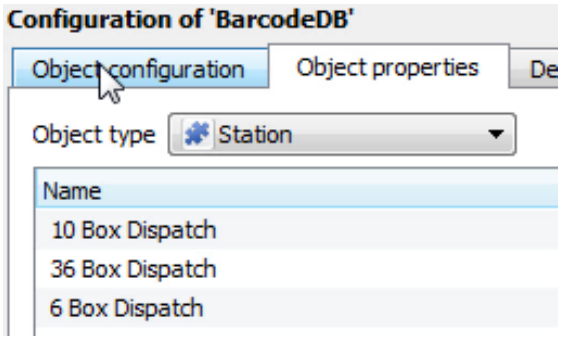
Select the **Location** of the overlay.

Select the **Background color**.

Select the **Text color**.

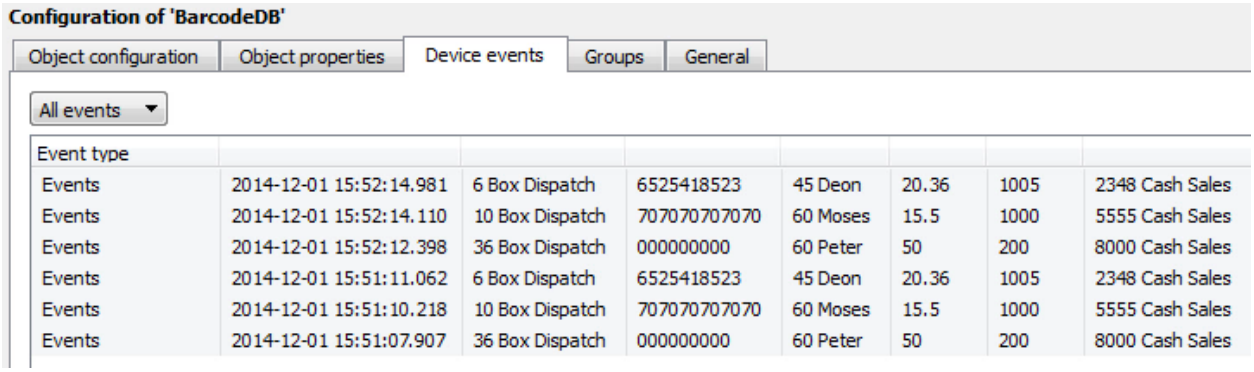
3.2 Objects Properties Tab

The Object properties tab allows viewing objects, sorted by type. In the case of the Matrix device, there is the option of viewing by **Station.**



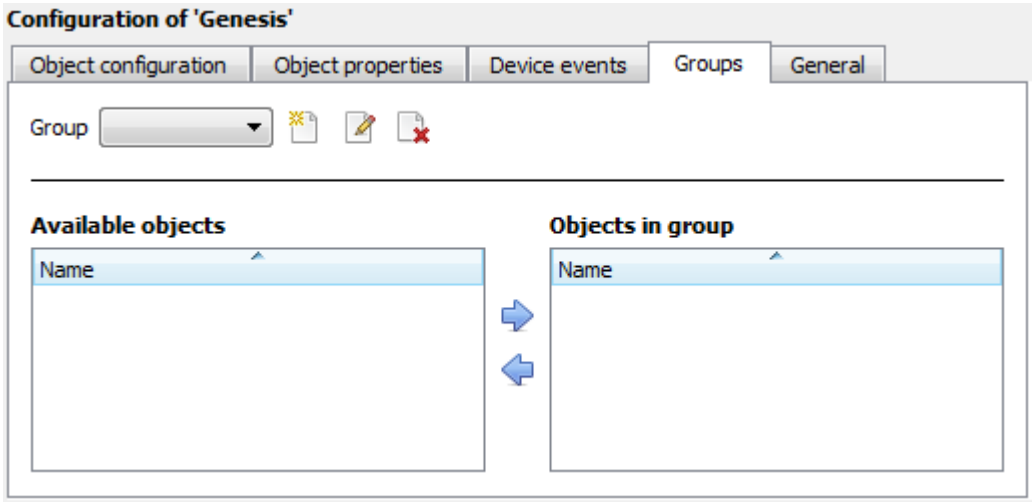
3.3 Device Events Tab

The Device events tab lists real-time events happening on this device. Installers can ensure that the integration is functioning, and monitor the Events happening on site.



3.4 Groups Tab

Groups of the same type of object can be created.



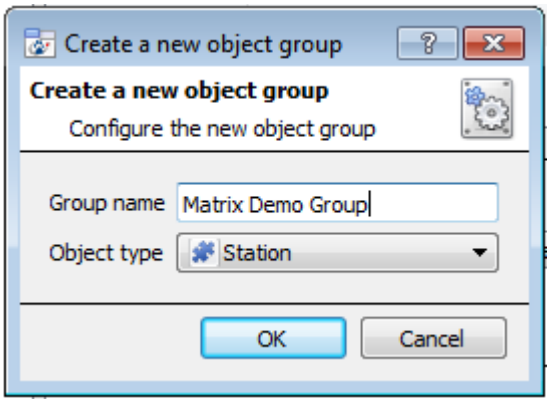
Tip: This is useful when setting up events, because events can be triggered by an object group. (E.g. a group will trigger an event if any of the doors in that group are triggered.)

3.4.1 Create a Group

To **create** a group, click on this icon.

To **edit** a group, click on this icon.

To **delete** a group, click on this icon.

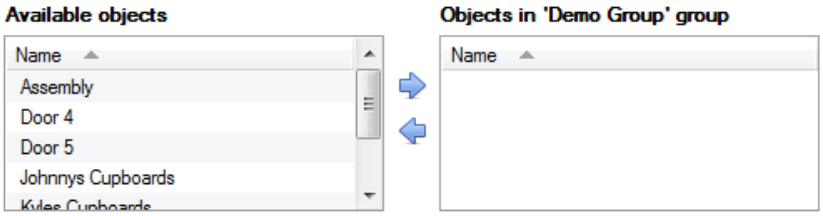


Give the group a descriptive **Group name.**

Click on the drop-down menu to select the **object type** to group.

Note: Once a group has been created, the object type of the group cannot be edited.

3.4.2 Add or Remove Objects



A list of available objects will be displayed in the Available objects panel.

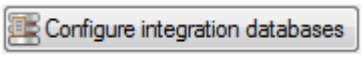
3.5 General Tab

The General tab deals with the integration database. Here, select a pre-created database, or configure a new database.

Note: Each integrated device needs to be attached to an integration database. Without setting up/adding a database here, the integration will not function properly within the CathexisVision system.

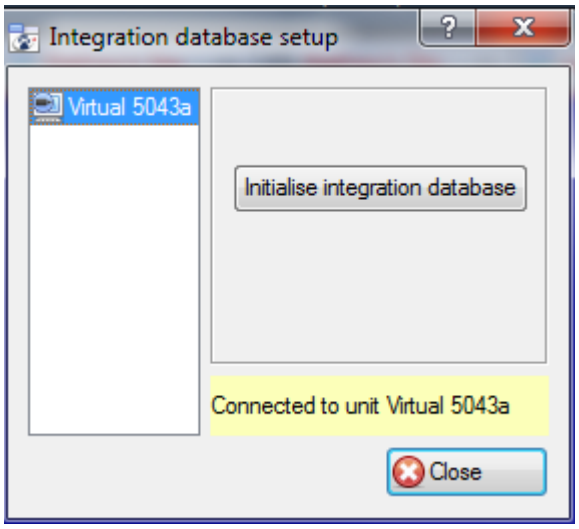
3.5.1 Configure a New Database

The first time an integration database is added, the general integration database will need to be **initialised**. Thereafter, a database for a specific integration can be **created.**



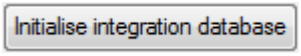
To create a new database, click the **Configure integration databases** button from the General tab. This opens the integration database setup.

3.5.1.1 Initialise the Integration Database



Select the unit the database will be added to from the list on the left.

Click **Initialise integration database**.

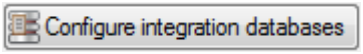


Choose the partition on which the database will be created.

Select disk space allocation.

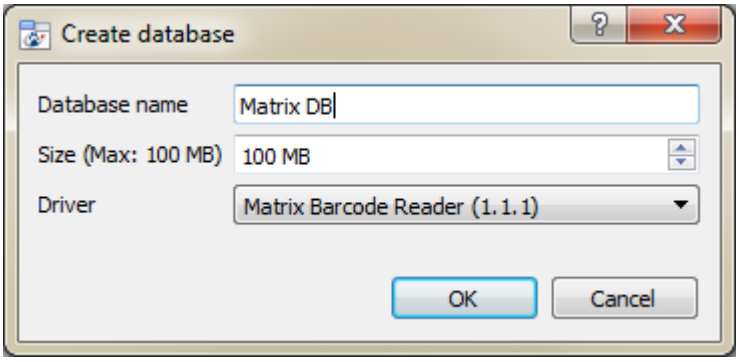
3.5.1.2 Add a New Device Database

After initialisation, the database can be added to the integration.



To create a new database, click the Configure integration databases button from the General tab.

Click the New button at the bottom of the **Integration database setup** window.



Give the Integration database a descriptive **Database Name**.

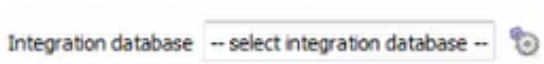
Allocate a **Size** to the new device database.

Select the device **Driver, Matrix DB** from the drop-down list.

Click **OK** to create the database.

3.5.2 Select an Integration Database

After setting up an integration database, select the correct database from the options in the General Tab.



From the **General Tab**, **click** the gear icon .

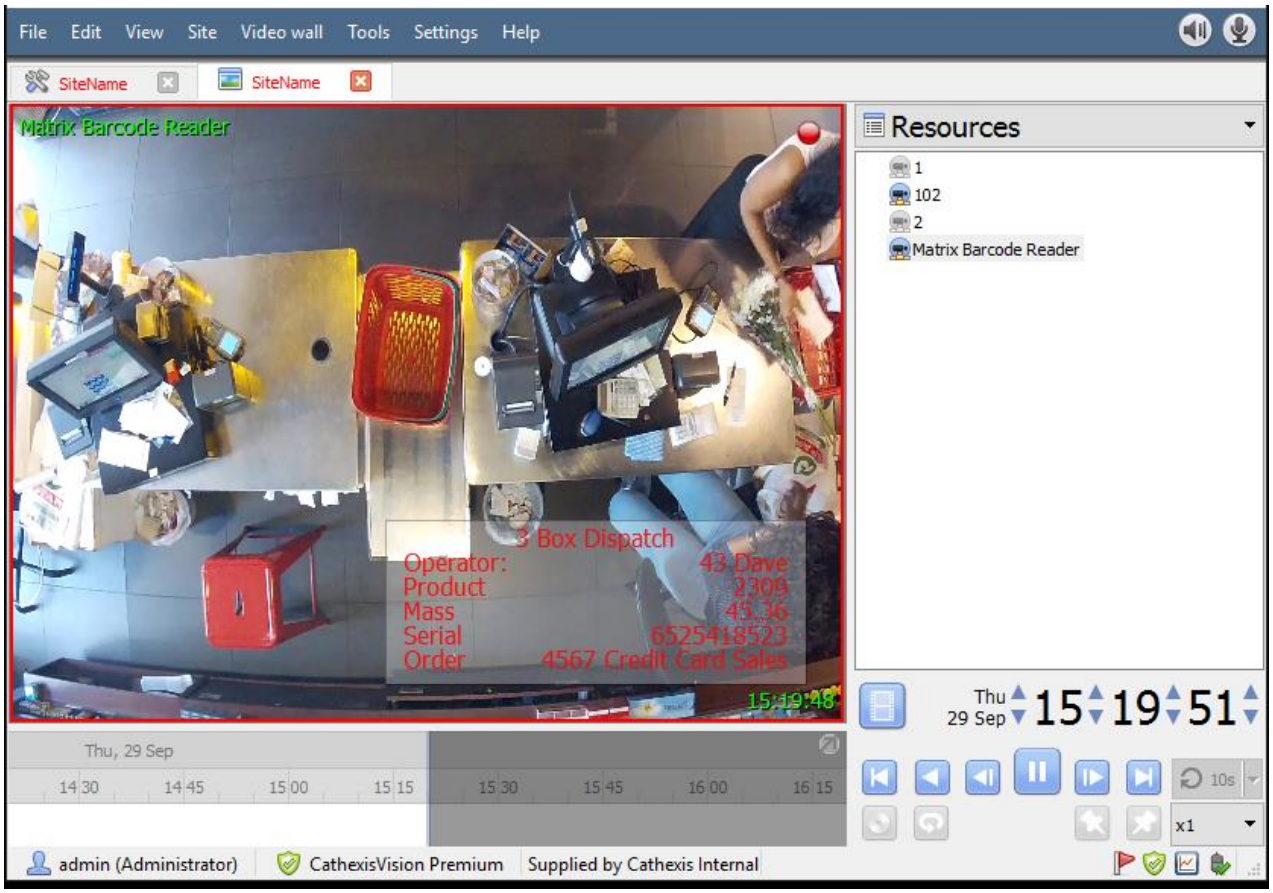
In the dialogue that appears, **select** the relevant integration database.

Only databases which relate to the device being added should appear.

Note: The information on setting up an integration database may be found in the **Integration Devices General Settings** section of the ***CathexisVision Setup Manual***.

4. Camera Tab Overlay Setup

Once all the relevant settings have been configured, the Barcode Reader overlay can be pulled through over the relevant camera feed.



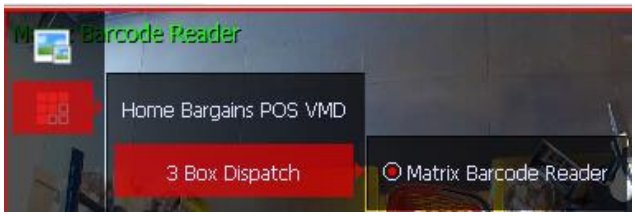
Note: Cameras must have already been added to the station objects.

4.1 Video Feed Options Panel

To bring up the overlay, click the arrow to the left of the screen, to pop out the Video feed options panel.

The Video feed options panel will present a number of options specific to the settings configured for that video feed.

4.1.1 Select the Overlay



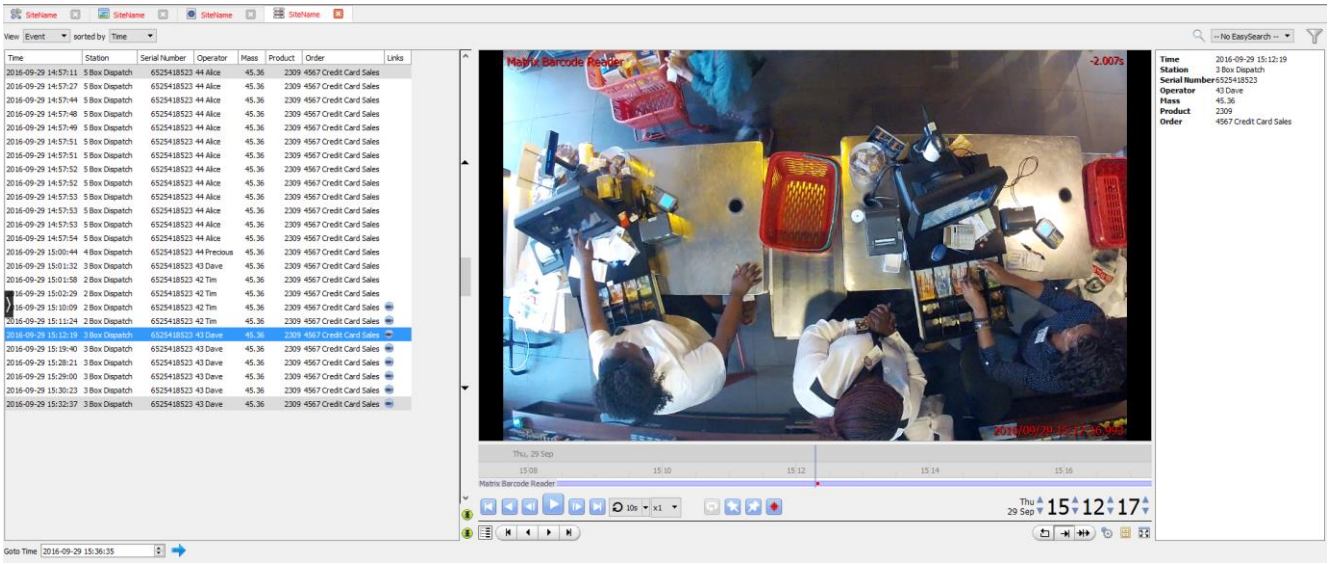
Clicking this icon will bring up the overlay options for this video feed.

Select the **device**, **enable** the overlay, and it will appear over the video feed, as above.

5. Database

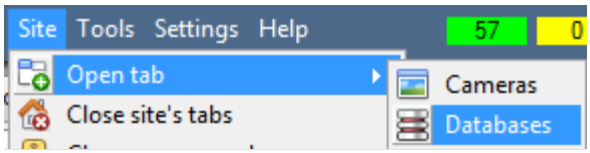
The Databases tab allows the user to navigate to the databased entries, for each individual database. In the Databases tab, each database is presented as a table. It has built in filters, and the ability to navigate by timestamp. If a database entry has an associated recording, this recording can be launched from within the Databases tab.

Most integrations will have a different database presentation, and unique filters, due to the different parameters sent to CathexisVision by the integrated device.

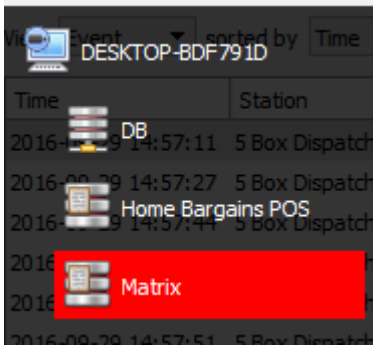


5.1 Navigate to the Database

To view information stored in the Integration, first navigate to the Databases Tab.



Follow the path on the left: **Site** / **Open tab** / **Databases**.

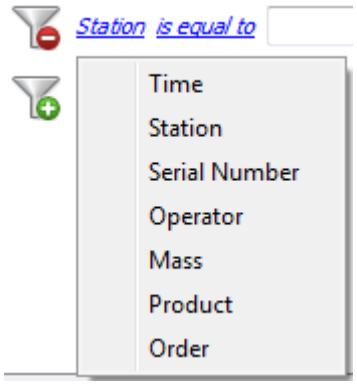


Select the **Matrix** integration database from the database panel that opens on the left-hand side.

The databases are ordered under the NVRs that they are attached to.

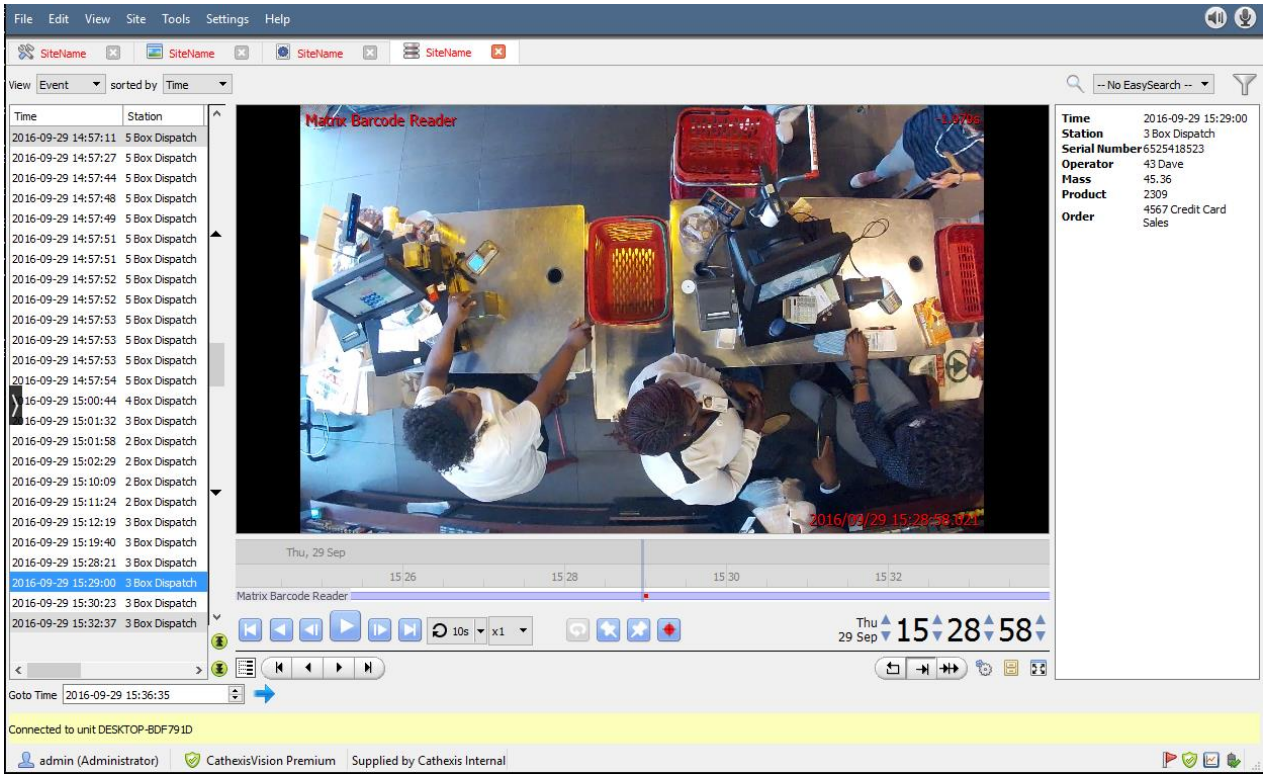
To open and close this list click on the arrow in the centre of the list: ⟨ and ⟩.

5.2 Database Interface

① **View**	Change the way that the database is presented. Some integration databases have multiple view options. The Matrix database only has one, **Events**, option.
② **Sorted By**	Sort the Matrix Events based on the following parameters: **Time**.
③ **Easy Search**	The easy search option allows quick searching of the database within one of the following options: **Station, Serial Number, Operator, Product,** and **Order**.
④ **Filter**	Filter offers a more advanced manner of sorting information in the Integration Database table. Filter the search based on the following parameters: **Time, ID** and **Description**. Once the filters dialogue is open, the following options are available: 1. To **enable** filters check this box: Enable filters 2. To **add** a new filter click on . The filter icon will change to when filters are active. 3. To **delete** an added filter click on . The Matrix database allows for filtering on the following parameters:  **Note**: 1. Multiple filters may be run simultaneously. Filters with the same parameters may be run more than once. 2. To change a filter, click on the blue hyperlinked text.
⑤ **Go to Time**	This navigates to a specific point in time, down to the second. To navigate to a timestamp, set the time using the time and date boxes. Then click on the arrow icon.

5.2.1 Viewing an Entry's Associated Recording

If cameras are attached to device objects in the Integration setup, and these cameras are set up to record continuously, each Integration database entry will have a corresponding recording. See the image below.



To view an associated recording, simply left-click on a database entry which has the camera icon in the **Links** column.

Then click **play** in the video player.

To see the video in a new window, click the **pop-out icon**.

6. Events

A CathexisVision event has a trigger, which causes an action. Set integrated devices to act as triggers, or as actions. This document will detail the Matrix specific aspects of Events. There is a comprehensive guide to CathexisVision Events in the main setup manual.

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

6.1 Event Window

Events in CathexisVision are set up via the Event Window, which has four tabs. In the **General Tab**, an event is given a name, description, schedule and priority. In the **Triggers Tab** the trigger/s for the event is defined. In the **Actions Tab** the action/s which the event takes, is defined. In the **Resources Tab** the various site resources which can be used as part of an event are defined.

6.2 Creating an Event

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

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

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

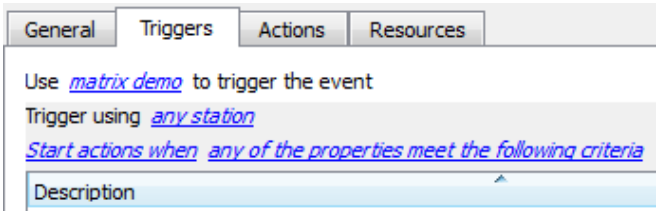
2. Once in this window, select the **Triggers Tab** and click on the hyperlink called standard triggers.

3. From the menu that drops down, left-click the Matrix device that will be used to trigger the event.

6.3 Triggers Tab

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

6.3.1 Set the Device as the Trigger



When creating a new event, the trigger type will default to: Use *standard triggers* .

To define what should trigger the event, click on the hyperlink after the word "Use".

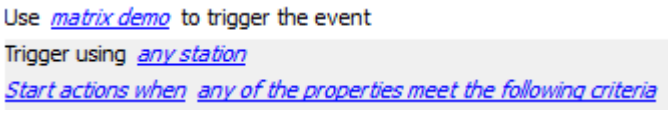
To set the the Matrix device as the trigger, **select the device name** (Matrix) from the drop-down menu.

6.3.2 While/When and Any/All

The user can choose the option to:

- **start actions when** any of the properties meet user-configured criteria, or any user-configured device events occur, or
- **perform actions while** any/all of the properties meet user-configured criteria.

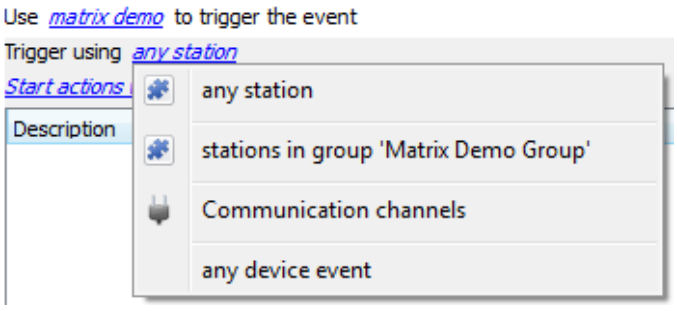
Start actions when	*any of the properties meet the following criteria* *any of the following device events occur*
Perform actions while	*any* of the properties meet the following criteria *all* of the properties meet the following criteria



To change these settings, click on the related blue hyperlinks, as shown in the image on the left.

6.3.3 Trigger Types (Trigger Using)

It is useful to think of this as a **master trigger type**.

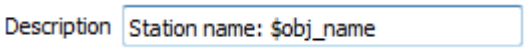


Any station will trigger if anything happens in any of the zones.
Stations in group...will trigger when an event occurs in any of the zones in the chosen group.
Any device event will trigger when any event occurs on the device. Further constraints may be setup from this option.

Note for group triggers: For an event to be databased under the name of a specific object, and not the name of the triggering group, modify the Description field in the **General tab** of the Event setup.

Click on the question mark icon to see a list of available descriptions.

As an example here is a Matrix group event setup to database using the name of the object that triggered the event:

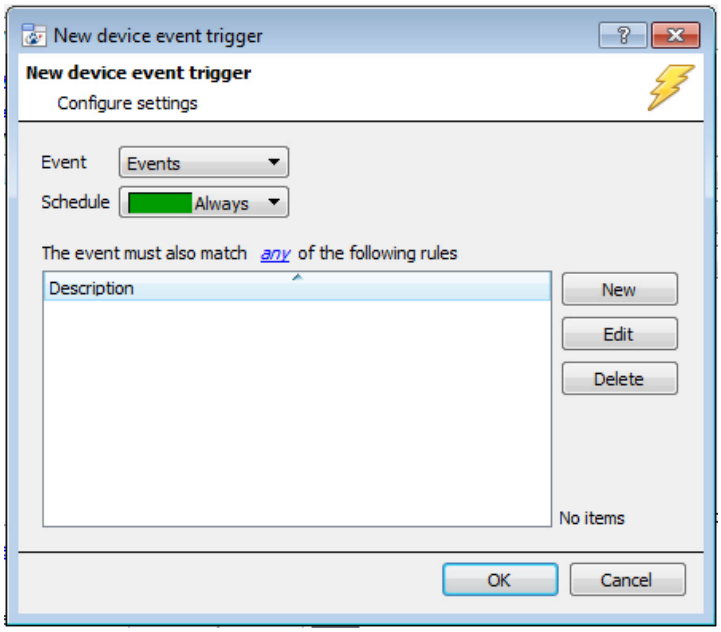


6.3.4 Define the Trigger (Any Device Event)

After selecting a master trigger type, add a trigger to the event. The following example is based on a user having selected "Trigger using **Any device event**".

Click on **New** in the Triggers tab. Clicking on New will bring up the **New device event trigger** dialogue box.

6.3.4.1 New Device Event Trigger



From the *any device event* option, choose the **type of device event** that will be the trigger. Choose from the **drop-down menu**.

Choose whether *any*, or *all* constraints need to be fulfilled to set off a trigger.

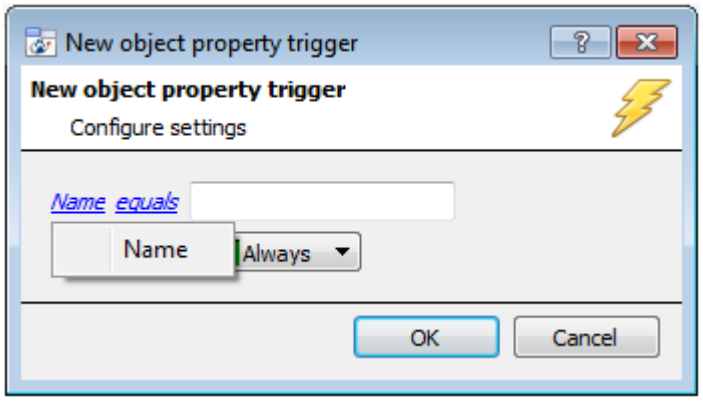
(If no constraints are defined, *every* single device event will trigger this event.)

To add/edit/delete a **Device Event rule** (a constraint) use the **New, Edit,** and **Delete** buttons on the right-hand side.

Note: Multiple constraints can be set (Device Event Rule). If constraints are not defined, every device event will trigger this event.

New Device Event Rule

To configure a **New device event rule**, click on New in the **New device event trigger** window. This will bring up the **New device event rule** dialogue.



To change the constraint, click on the first hyperlink. This will bring up the full list of available rules.

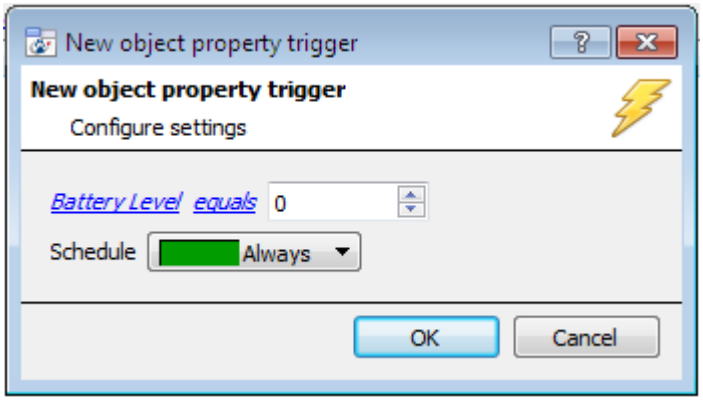
To modify the way this rule will be treated, click on the second hyperlink (which is *equals* in the example). This will display the rules options.

Note: When all available options are known to CathexisVision, a drop-down menu will appear. When these variables are not pre-defined, fill them in.

The information pulled through to the events is information sent to CathexisVision from the Matrix device. See the **Matrix Settings** for the **strings** needed here.

6.3.4.2 "Any Station" and "Group" Triggers

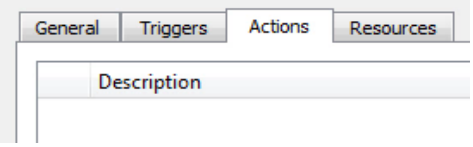
If the **Any Device Event** is *not* chosen, the triggers have a slightly different setup window. Constraints, do not need to be set, since they are being added one at a time. This option is better if a select few triggers are to be used.



Since only one type of object will be used to trigger the event, the dialogue will appear as the **New object property** window did previously (new device event rule).

Note: This is true for groups as well, since a group may only be made up of one object type.

6.4 Actions Tab

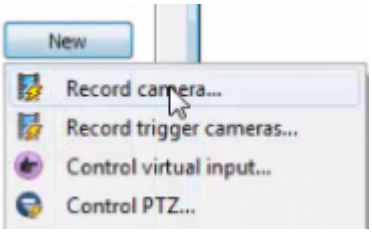


Having defined the triggers that will initiate an event, the user will need to define Actions.

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

6.4.1 Adding an Action

To add an action, click New in the Actions tab.



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

Select an option.

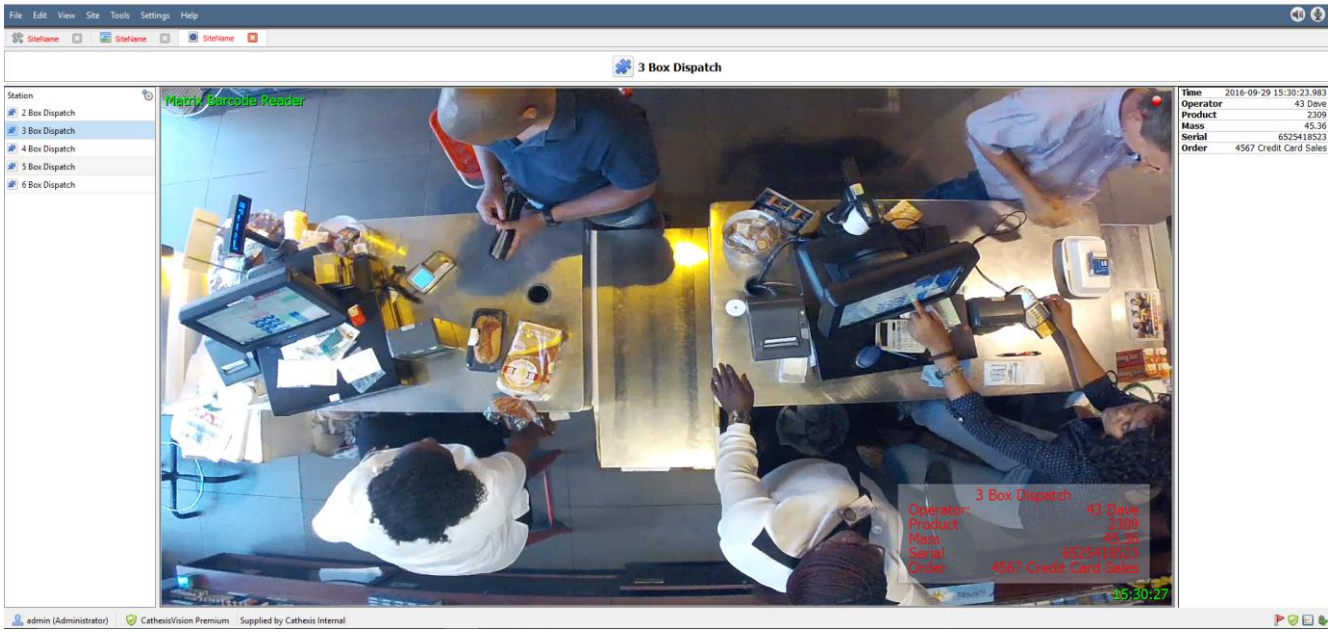
With many integrations there will be the option to control the integrated device, as one of the actions. Because of the nature of this integration this option is not available with the Matrix device.

7. POS View Tab

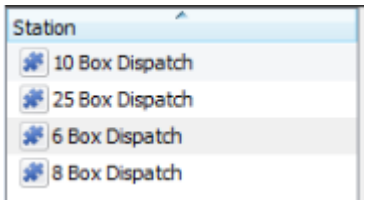
Note: While this tab is still available, much of its functionality has been replaced by the overlays which can be pulled through over the camera image in the cameras tab. In the POS View Tab, the metadata will be displayed as both an overlay (if configured) and in a separate panel.

To view this tab:

1. **Site / Open Tab / matrix_device_name**
2. **Right click on an open tab / Open Tab / matrix_device_name**



7.1 Stations



In the **station** panel, on the left of the video footage, the user will see a list of available Matrix stations.

7.2 Overlays

The metadata that comes through from the barcode reader will be displayed in an overlay (if one has been configured) in real time.

7.3 Metadata

Time	2016-09-29 15:30:23.983
Operator	43 Dave
Product	2309
Mass	45.36
Serial	6525418523
Order	4567 Credit Card Sales

In the panel to the right of the video footage the user will see the information that has come through from the barcode reader, as it comes through.

8. Conclusion

This app-note was designed to deal specifically with this integration. For further information about the CathexisVision software please consult the main manual (http://cathexisvideo.com/).

For support, please contact support@cat.co.za