## Guideline

## **MOBOTIX ActivitySensor AI App**

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**MOBOTIX** 

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## **Before You Start**

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### Support

#### **MOBOTIX Support**

If you need technical support, please contact your MOBOTIX dealer. If your dealer cannot help you, he will contact the support channel to get an answer for you as quickly as possible.

If you have internet access, you can open the MOBOTIX help desk to find additional information and software updates.

Please visit www.mobotix.com > Support > Help Desk.



#### **MOBOTIX eCampus**

The MOBOTIX eCampus is a complete e-learning platform. It lets you decide when and where you want to view and process your training seminar content. Simply open the site in your browser and select the desired training seminar.

Please visit www.mobotix.com/ecampus-mobotix.



#### **MOBOTIX Community**

The MOBOTIX community is another valuable source of information. MOBOTIX staff and other users are sharing their information, and so can you.

Please visit **community.mobotix.com**.



## **Safety Notes**

- This camera must be installed by qualified personnel and the installation should conform to all local codes.
- This product must not be used in locations exposed to the dangers of explosion.
- Do not use this product in a dusty environment.
- Protect this product from moisture or water entering the housing.
- Install this product as outlined in this document. A faulty installation can damage the product!
- Do not replace batteries of the camera. If a battery is replaced by an incorrect type, the battery can explode.
- External power supplies must comply with the Limited Power Source (LPS) requirements and share the same power specifications with the camera.
- When using a power adapter, the power cord shall be connected to a socket-outlet with proper ground connection.
- To comply with the requirements of EN 50130-4 regarding the power supply of alarm systems for 24/7 operation, it is highly recommended to use an uninterruptible power supply (UPS) for backing up the power supply of this product.

#### **Legal Notes**

#### **Legal Aspects of Video and Sound Recording**

You must comply with all data protection regulations for video and sound monitoring when using MOBOTIX AG products. Depending on national laws and the installation location of the cameras, the recording of video and sound data may be subject to special documentation or it may be prohibited. All users of MOBOTIX products are therefore required to familiarize themselves with all applicable regulations and to comply with these laws. MOBOTIX AG is not liable for any illegal use of its products.

#### **Declaration of Conformity**

The products of MOBOTIX AG are certified according to the applicable regulations of the EC and other countries. You can find the declarations of conformity for the products of MOBOTIX AG on <a href="https://www.mobotix.com">www.mobotix.com</a> under **Support > Download Center > Marketing & Documentation > Certificates & Declarations of Conformity**.

#### **RoHS Declaration**

The products of MOBOTIX AG are in full compliance with European Unions Restrictions of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive 2011/65/EC) as far as they are subject to these regulations (for the RoHS Declaration of MOBOTIX, please see <a href="www.mobotix.com">www.mobotix.com</a>, **Support > Download Center > Marketing & Documentation > Brochures & Guides > Certificates**).

#### **Disposal**

Electrical and electronic products contain many valuable materials. For this reason, we recommend that you dispose of MOBOTIX products at the end of their service life in accordance with all legal requirements and regulations (or deposit these products at a municipal collection center). MOBOTIX products must not be disposed of in household waste! If the product contains a battery, please dispose of the battery separately (the corresponding product manuals contain specific directions if the product contains a battery).

#### **Disclaimer**

MOBOTIX AG does not assume any responsibility for damages, which are the result of improper use or failure to comply to the manuals or the applicable rules and regulations. Our General Terms and Conditions apply. You can download the current version of the **General Terms and Conditions** from our website at <a href="https://www.nobotix.com">www.-www.nobotix.com</a> by clicking on the corresponding link at the bottom of every page.

It is the User's responsibility to comply with all applicable local, state, national and foreign laws, rules, treaties and regulations in connection with the use of the Software and Product, including those related to data privacy, the Health Insurance Portability and Accountability Act of 1996 (HIPPA), international communications and the transmission of technical or personal data.

## **About MOBOTIX ActivitySensor AI App**

#### **Smart Activity Analytics**

The app's artificial intelligence-based algorithms detect and classify user-defined motion and objects in up to 20 detection areas. Best suited for: Utilities, Health Care, Energy & Mining; Industry & Production; Government; Traffic & Transportation; Retail; Healthcare; Education & Science

- Motion detection of user-defined objects such as persons and/or vehicles
- Detection and classification of objects based on artificial intelligence
- Detection and specification of the motion direction MOBOTIX events via MxMessageSystem
- Consolidated event search via MxManagementCenter Smart Data Interface
- Definition of up to 20 detection areas within the camera's field of view

**CAUTION!** Thermal sensors are not supported by this app.

#### **Smart Data Interface to MxManagementCenter**

This app has a Smart Data interface to MxManagementCenter.

With the MOBOTIX Smart Data System, transaction data can be linked to the video recordings made at the time of the transactions. Smart Data source can be e.g. MOBOTIX Certified Apps (no license required) or general Smart Data sources (license required) like POS systems or license plate recognition systems.

The Smart Data System in MxManagementCenter enables you to quickly find and review any suspicious activities. The Smart Data Bar and the Smart Data View are available for searching and analyzing transactions. The Smart Data Bar provides a direct overview of the most recent transactions (from the last 24 hours) and for this reason it is convenient to use it for reviews and searches.

**NOTE!** For information on how to use the Smart Data System, see the corresponding online help of the camera software and MxManagementCenter.

## **Technical Specifications**

#### **Product Information**

Product Name	MOBOTIX ActivitySensor AI App
Order Code	Mx-APP-MX-THD
Supported MOBOTIX Cameras	M73, S74, D71

Minimum Camera Firmware v7.3.1.x

MxManagementCenter compatibility

min. MxMC v2.5

Configuration: Advanced Config license required

Event Search: Smart Data Interface license included

#### **Product Features**

App Features	•	Motion detection of user-defined objects such as persons and/or vehicles
	•	Detection and classification of objects based on artificial intelligence
	•	Detection and specification of the motion direction MOBOTIX events via MxMessageSystem
	•	Consolidated event search via MxManagementCenterSmart Data Interface
	•	Definition of up to 20 detection areas within the camera's field of view
Maximum number of recog- 20 nition areas		

ONVIF Events	Yes (Generic Message event)
MOBOTIX Events	Yes
MxMessageSystem sup- ported	Yes
Dual / Multi Sensor usage	No (See Hardware Requirements below)
Supported image sensor types	Day, Night, Day/Night
Recognized objects	Persons, Cars, Trucks, Buses, Motorcycles, Bicycles

#### **Hardware / Scene Requirements**

Camera Sensor Connector Connector 1

NOTE! Only one image sensor can be used

Object Recognition as basis for MOBOTIX ActivitySensor AI

Recommended installation wall-mounted

position (camera)

Recommended installation 2m - 5m

height (camera)

Recommended viewing 0° - 30° (wall mount perspective)

angle on object

Minimum object size 1/20 of image height (15px at CIF resolution)

#### **Technical App Specifications**

Synchronous / Asynchronous App asynchronous

Processed frame rate typ. 5 fps

Detection average accuracy Persons: >90%; Vehicles: >85%

## **Licensing Certified Apps**

There is no license required for MOBOTIX ActivitySensor AI App.

The usage period begins with activation of the app interface (see Activation of the Certified App Interface, p. 11)

**NOTE!** For buying or renewing a license, contact your MOBOTIX Partner.

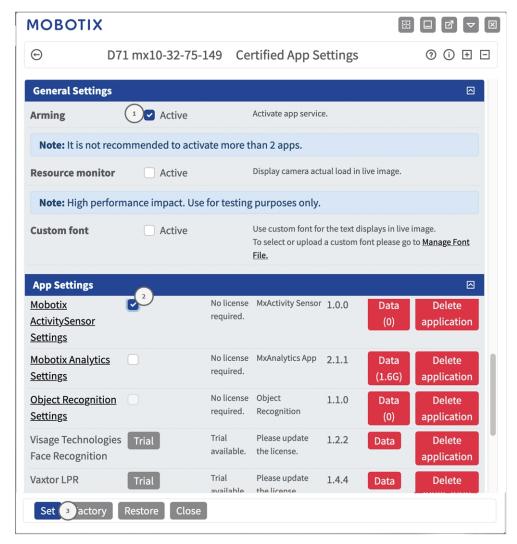
**NOTE!** Apps are usually pre-installed with the firmware. In rare cases, apps must be downloaded from the website and installed. In this case see <a href="https://www.mobotix.com">www.mobotix.com</a> > Support > Download Center > Marketing & Documentation, download and install the app.

## **Activation of the Certified App Interface**

**CAUTION!** The MOBOTIX ActivitySensor AI App does not consider obscure areas defined for the live image. Therefore there is no pixelation in obscure areas while configuring the app and during image analysis by the app.

**NOTE!** The user must have access to the setup menu (http(s)://<camera IP address>/control). Therefore check the user rights of the camera.

In the camera web interface, open: Setup Menu / Certified App Settings (http(s)://<camera IP address>/control/app\_config).



- 2. Under **General Settings** activate the **Arming** ① of the app service.
- 3. Under **App Settings** check the **Active** option ② and click **Set**③.

- 4. Click on the name of the App to be configured to open the Apps user interface.
- 5. For configuration of the App see Configuration of MOBOTIX ActivitySensor AI App, p. 13.

# Configuration of MOBOTIX ActivitySensor Al App

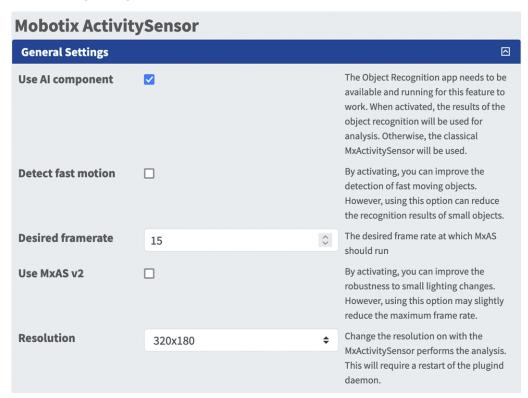
**NOTE!** The user must have access to the setup menu (http(s)://<camera IP address>/control). Therefore check the user rights of the camera.

- 1. In the camera web interface, open: **Setup Menu / Certified App Settings** (http(s)://<camera IP address>/-control/app\_config).
- 2. Click on the name of the MOBOTIX ActivitySensor AI App.

The configuration window of the app appears with the following options:

#### **General Settings**

The following configurations should be taken into account:



**Use AI component:** Check, if the AI based video analytics should be used to recognize and classify Persons, Vehicles (Car, Truck, Bus, Motorcycle, Bicycle, Boat, Airplane, Train) and Animals: Bird, Cat, Dog, Horse, Sheep, Cow, Elephant, Bear, Zebra, Giraffe

**NOTE!** The Al component requires the Object Recognition App to run properly. To do so: In the camera web interface, open Admin Menu / Hardware Configuration / Camera Mode MOBOTIX  $\Theta$ M73 mx10-32-6-96 Camera Mode ② ① ± Ξ **Camera Mode**  $\triangle$ Configure the camera mode here. You can choose (1) ΑI between Streaming and AI. **AI Settings** Select the desired AI support here. To do this, also Object Detection (2) activate the appropriate app. Set 3 Close Set the Camera Mode to "AI" ① . Set the AI Settings to "Object Detection" ②. Click Set. Reboot the camera. Setup Menu / Certified App Settings activate "Object Recognition Settings". Click Set.

www.mobotix.com > Support > Download Center > Marketing & Documentation > Manuals.

**NOTE!** For further information about the MOBOTIX Object Recognition App see the Apps Guideline:

**Detect fast motion:** Check to improve the detection of fast moving objects.

**NOTE!** Using this option can reduce the recognition results of small objects.

**Desired framerate:** Define the frame rate of the video stream to be analyzed by Mx Activity Sensor.

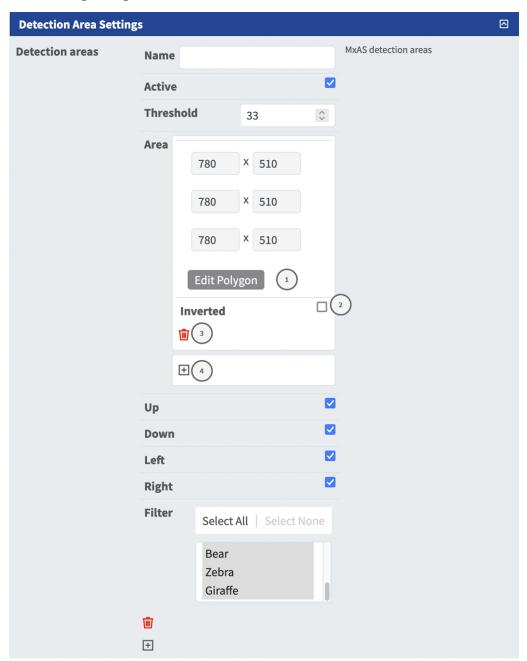
**Use MxAS v2:** Check to improve the robustness to small lighting changes.

**NOTE!** Using this option may slightly reduce the maximum frame rate.

**Resolution:** Select the resolution of the video stream to be analyzed by Mx Activity Sensor.

## **Detection Area Settings**

The following configurations should be taken into account:



#### **Detection Areas:**

Name: Provide a meaningful name for the Detection Area.

Active: Check to activate the configured detection areas.

Threshold: Sensitivity of the activity detection algorithm.

Area: Specify the Detection Areas here

- 1. Click **Edit Polygon** to switch into the live image.
- 2. In the live image click and drag a rectangular recognition area.
- 3. Drag the corner points to refine the recognition area.
- 4. In the top right corner of the live view click **Submit** to adopt the coordinates of the rectangle.
- 5. Optionally click **Invert** icon ② to invert the detection area.
- 6. Optionally click the **bin** icon ③ to delete the detection area.
- 7. Optionally click the **plus** icon ④ to define another Detection Area.

**Inverted:** Check to mark the area as an inverted area which is excluded from motion detection. **Direction:** Select the directions in which detected objects must move to trigger an alarm:

Uр

Down

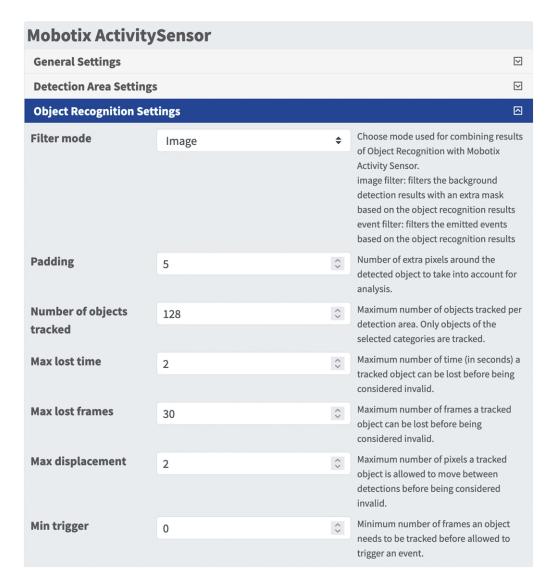
Left

Right

Filter: Select the objects which trigger an alarm when detected.

### **Object Recognition Settings**

Here you can calibrate the object recognition algorithm.



Filter Mode: Filter mode used for combining results of object recognition with MOBOTIX Activity Sensor.

**Image:** filters the background detection results with an extra mask based on the object recognition results

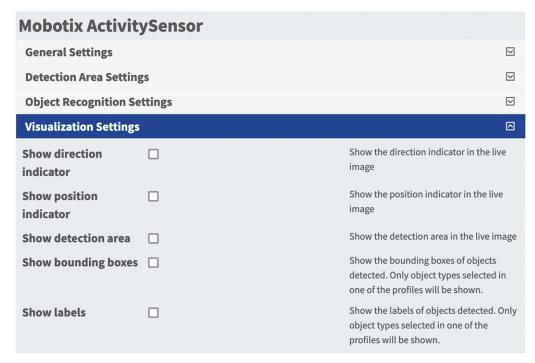
**Event:** filters the emitted events based on the object recognition results

Padding: Number of pixels around the detected object to be taken into account for image analysis.
Number of objects tracked: Number of objects tracked. Only objects of the selected categories are tracked.
Max lost time: Maximum number seconds a tracked object can be lost before being considered invalid.
Max lost frames: Number of video frames a tracked object can be lost before being considered invalid.
Max displacement: Number of pixels a tracked object is allowed to move between detections before being considered invalid.

Min trigger: Number of video frames an object needs to be tracked before allowed to trigger an event.

### **Visualization Settings**

Here you can define the visualization settings for detected objects.



**Show direction:** Check to show the direction indicator in the live image.

**Show position indicator:** Check to show the position indicator in the live image.

**Show detection area:** Check to show the detection area in the live image.

**Show bounding boxes:**Check to show the bounding boxes of objects detected. Only object types selected in one of the profiles will be shown.

**Show labels:** Check to show the labels of objects detected. Only object types selected in one of the profiles will be shown.

### **Storing the Configuration**

To store the configuration you have the following options:



- Click Set to activate your settings and to save them until the next reboot of the camera.
- Click Factory to load the factory defaults for this dialog (this button may not be present in all dialogs).
- Click Restore to undo your most recent changes that have not been stored in the camera permanently.

Click Close to close the dialog. While closing the dialog, the system checks the entire configuration for changes. If changes are detected, you will be asked if you would like to store the entire configuration permanently.

After successfully saving the configuration, the event and meta data are automatically sent to the camera in case of an event.

## **MxMessageSystem**

#### What is MxMessageSystem?

MxMessageSystem is a communication system based on name oriented messages. This means that a message must have a unique name with a maximum length of 32 bytes.

Each participant can send and receive messages. MOBOTIX cameras can also forward messages within the local network. This way, MxMessages can be distributed over the entire local network (see Message Area: Global).

For example, a MOBOTIX 7 series camera can exchange a MxMessage generated by a camera app with an Mx6 camera that does not support certified MOBOTIX apps.

#### **Facts about MxMessages**

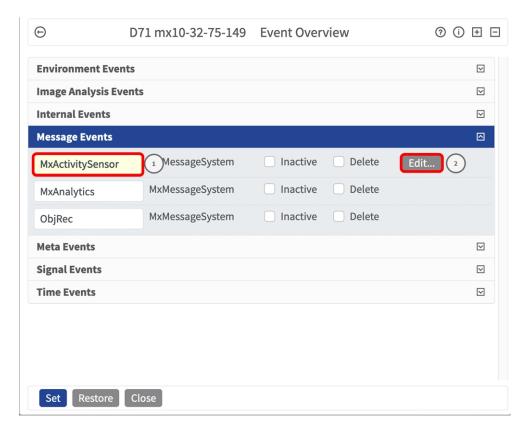
- 128-bit encryption ensures privacy and security of message content.
- MxMessages can be distributed from any camera of the Mx6 and 7 series.
- The message range can be defined individually for each MxMessage.
  - **Local:** Camera expects a MxMessage within its own camera system (e.g. through a Certified App).
  - **Global:** the camera expects a MxMessage that is distributed in the local network by another MxMessage device (e.g. another camera of the 7 series equipped with a certified MOBOTIX app).
- Actions that the recipients are to perform are configured individually for each participant of the MxMessageSystem.

# MxMessageSystem: Processing the automatically generated app event

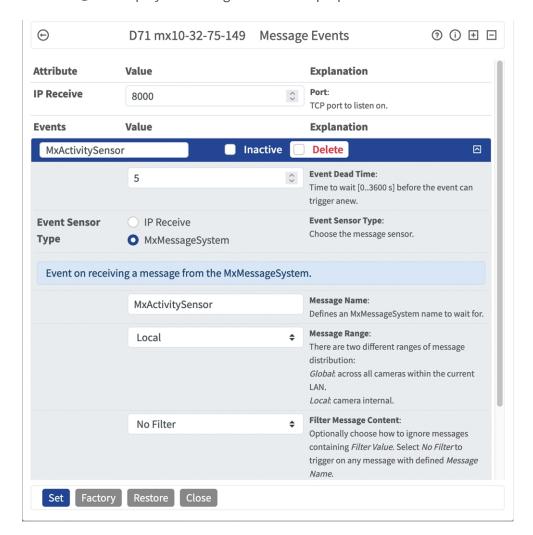
#### Checking automatically generated app events

**NOTE!** After successfully activating the app (see Activation of the Certified App Interface, p. 11), a generic message event for this specific app is automatically generated in the camera.

1. Go to **Setup-Menu / Event Control / Event Overview**. In section **Message Events** the automatically generated message event profile is named after the application ① (e.g. MxActivitySensor).



2. Click **Edit**② to display and configure the event properties in detail.

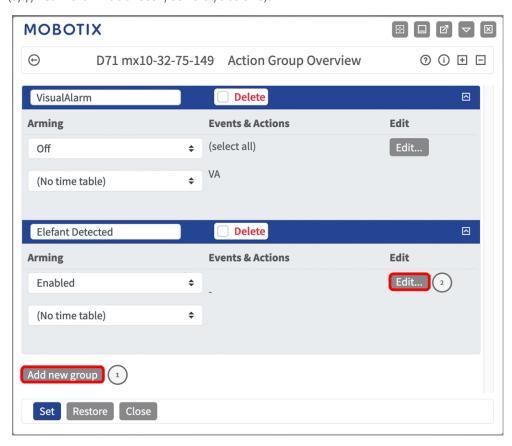


### **Action handling - Configuration of an Action Group**

**CAUTION!** To use events, trigger Action Groups or record images the general arming of the camera must be enabled (http(s)/<camera IP address>/control/settings)

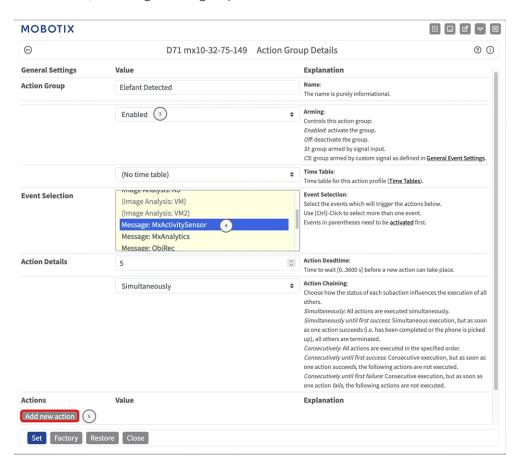
An Action Group defines which action(s) is (are) triggered by the MOBOTIX ActivitySensor AI App event.

1. In the camera web interface, open: **Setup Menu / Event Control / Action Group Overview** (http (s)://<camera IP address>/control/actions).

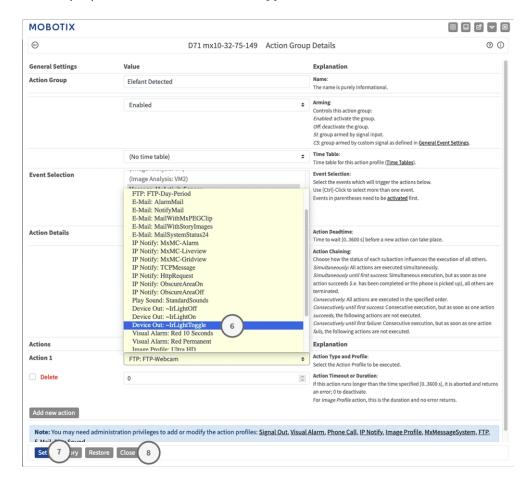


2. Click **Add new group** ① and give a meaningful name.

3. Click **Edit**②, to configure the group.



- 4. Enable **Arming** of the Action Group.
- 5. Select your message event in the **Event selection** list ④ . To select multiple events, hold the shift key.
- 6. Click Add new Action 5.



7. Select a proper action from list **Action Type and Profile 6** .

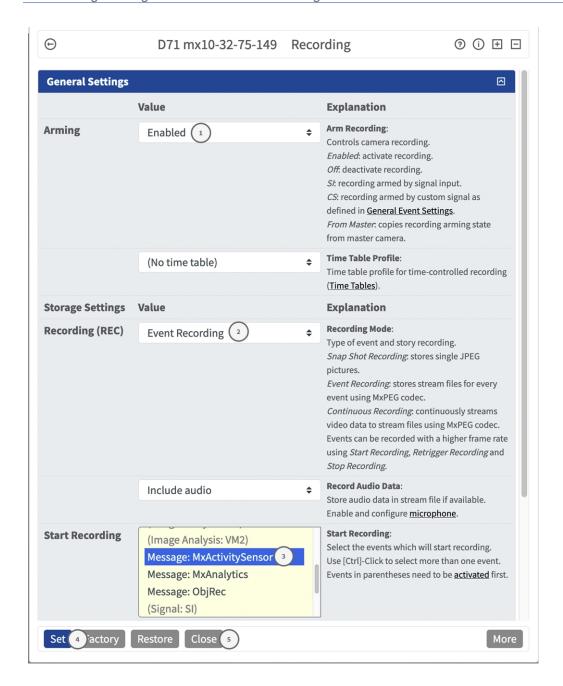
**NOTE!** If the required action profile is not yet available, you can create a new profile in the Admin Menu sections "MxMessageSystem", "Transfer Profiles" and "Audio and VoIP Telephony".

If necessary, you can add further actions by clicking the button again. In this case, please make sure that the "action chaining" is configured correctly (e.g. at the same time).

- 8. Click **Set** at the end of the dialog box to confirm the settings.
- 9. Click on **Close** to save your settings permanently.

## Action settings - Configuration of the camera recordings

1. In the camera web interface, open: **Setup Menu / Event Control / Recording** (http(s)/<camera IP address>/control/recording).



- 2. Activate **Arm Recording** ①.
- 3. Under **Storage Settings** / **Recording (REC)** select a **Recording mode**②. The following modes are available:
  - Snap Shot Recording
  - Event Recording
  - Continuous Recording
- 4. In list **Start recording** select the message event just created.
- 5. Click on the **Set** 4 button at the end of the dialog box to confirm the settings.

6. Click on **Close** (5) to save your settings permanently.

**NOTE!** Alternatively, you can save your settings in the Admin menu under Configuration / Save current configuration to permanent memory.

# MxMessageSystem: Processing the meta data transmitted by apps

## Meta data transferred within the MxMessageSystem

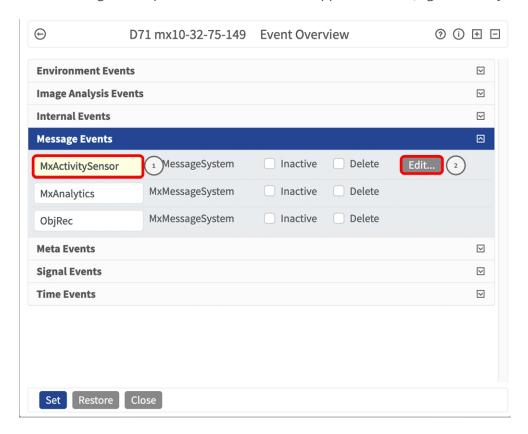
For each event, the app also transfers meta data to the camera. This data is sent in the form of a JSON schema within a MxMessage.

```
10.32.6.96/api/json/messages
    \rightarrow C
              10.32.6.96/api/json/messages
                                                              Q Suchen
                                                                                         >>
Meistbesucht 🦫 📵 🦑 mobiles Login 🕀 Intranet News 🗀 MOBOTIX 🗀 MadCap
                                                                            JSON
       Rohdaten
                 Kopfzeilen
Speichern Kopieren Einheitlich formatieren
 {
          "local":
               "ColorRecognition":
               "RGB": "138,114,68",
               "level ": 24,
               "timestamp": 1652180197
          }
 }
```

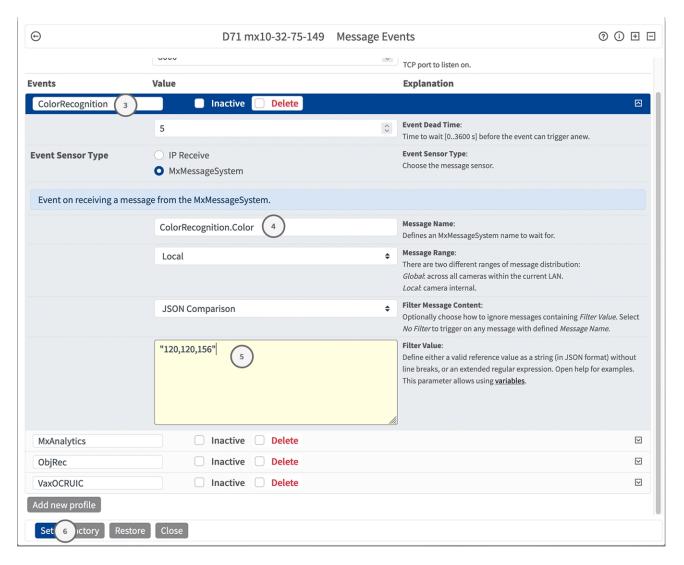
**NOTE!** To view the meta data structure of the last App event, enter the following URL in the address bar of your browser: http(s)://IPAddresseOfYourCamera/api/json/messages

## **Creating a Custom Message Event**

1. Go to **Setup-Menu / Event Control / Event Overview**. In section **Message Events** the automatically generated message event profile is named after the application ① (e.g. MxActivitySensor).



2. Click **Edit**② to display and configure the event properties in detail.



3. Click on the event (e.g. MxActivitySensor) ③ to open the event settings.

- 4. Configure the parameters of the event profile as follows:
  - Message Name: Enter the "Message Name" ④ according to the event documentation of the corresponding app (seeExamples for message names and filter values of the MOBOTIX ActivitySensor AI App, p. 31)
  - Message Range:
    - Local: Default settings for the MOBOTIX ActivitySensor AI App
    - Global: (MxMessage is forwarded from another MOBOTIX camera in the local network.
  - Filter Message Content:
    - No Filter: Trigger on any message according to the defined Message Name.
    - **JSON Comparison:** Select if filter values are to be defined in JSON format.
    - **Regular Expression:** Select if filter values are to be defined as regular expression.
  - **Filter Value:** ⑤ seeExamples for message names and filter values of the MOBOTIX ActivitySensor AI App, p. 31.

**CAUTION!** "Filter Value" is used to differentiate the MxMessages of an app / bundle. Use this entry to benefit from individual event types of the apps (if available).

Choose "No Filter" if you want to use all incoming MxMessages as generic event of the related app.

2. Click on **Set** (a) at the end of the dialog box to confirm the settings.

## Examples for message names and filter values of the MOBOTIX ActivitySensor AI App

	MxMessage-Name	Filter value
Generic Event	ColorRecognition	
Color Event	ColorRecognition.RGB	"120,155,99"
Level Event	ColorRecognition.level	"90"
Timestamp Event	ColorRecognition.timestamp	Date string e.g.:
		"2021-10-
		11T11:48:52+0200"

