

Integration with Mobotix Q24 Camera

This is the third tutorial from the series of tutorials describing integration of the **DOMIQ** system with **Mobotix** devices. In the previous tutorials we described the integration of the **Mobotix T24** video door station and usage of the SIP protocol and Mobotix devices in order to perform the function of the video door station. This time we focus on integration of the **Mobotix Q24** video camera inside the house.



Source: www.mobotix.com

From this tutorial you will learn how to:

- control the camera functions using **DOMIQ** user interfaces,
- define the areas of movement detection and react on the movement in these areas,
- integrate the camera with the **Satel Integra** alarm system,
- use the SIP protocol to inform about alarm events.

Before you start reading, please read also the previous tutorials from this series, as this tutorial contains references to procedures described before.

1. Camera control

Using the programming (API) interface of the camera, you can control all functions of the camera directly from the **DOMIQ** user interface. So you can create a visualization screen or page in **Remote**, in which you put the buttons invoking the most frequently used functions of the camera.

The commands are sent to the camera using the `Get` method of the HTTP protocol. In order to get access to the full description of the programming interface of the camera, enter the following text in the browser address box: `http://<camera ip>/help`, and then in section **Remote-Controlling the Camera** (at the bottom of the site) choose **The HTTP API**.

The further part of this chapter shows three examples of usage the programming interface in order to control the camera from the visualization. In the described examples we present usage of commands in the **Command** field of the **Button**. Please bear in mind that in the **Command** field there is no need to use "C." prefix. In any other case the described commands must be preceded by the prefix.

The presented commands can also be used in other functionalities of the **Base** module, e.g. events, timers, logic etc.

1.1. Change the image format

Mobotix Q24 camera enables displaying the image in different formats. You can change the format using `display_mode` parameter. The available values of the parameter are: **simple, lenscorr_l11, surround, panorama, pano_focus, pano_dbl**.

The general syntax of the command changing the image format is as follows:

```
C.HTTP.get=http://<login>:<password>@<camera_ip>/control/control?set&section=general&display_mode=<image_format>.
```



```
HTTP.get=http://admin:test@192.168.10.100/control/control?set&section=general&display_mode=pano_dbl
```

Setting the double panorama mode.

In order to create the full interface to switch the image format, add 6 **Buttons** to the visualization and then in **Command** field enter the above command and change the value of the `display_mode` parameter.

1.2. Change the image size

The camera software allows you to change the image resolution in the following range: 160x120, 320x240, 352x288, 384x288, 640x480, 704x576, 768x576, 800x600, 1024x768, 1280x960, 2048x1536. Therefore the image can be easily adjusted to the current needs and the speed of your Internet connection (especially remote connections). You can also define a rule in events or timers that will automatically change the resolution of the image in your absence in order to provide a smoother image in case of the remote connections and increase the resolution, when you are in the local network.

The general syntax of the command is as follows:

```
C.HTTP.get=http://<login>:<password>@<camera_ip>/control/control?set&section=imagecontrol&size=<size>
```



```
HTTP.get=http://admin:test@192.168.10.100/control/control?set&section=imagecontrol&size=640x480
```

Setting the resolution of 640x480 pixel.

1.3. Zoom in and out the image

Using this function you can see the details of the displayed image. The camera provides 8x zoom. The zoom can be absolute (a given value of the zoom, e.g. 5x) or relative (towards the previous settings, e.g. by 1). The change of zoom is expressed in per milles, so the value of 1000 corresponds to the zoom by 1.

The general syntax of the command (absolute change) is as follows:

```
C.HTTP.get=http://<login>:<password>@<camera_ip>/control/click.cgi?zoom=<zoom>
```



```
HTTP.get=http://admin:test@192.168.10.100/control/
click.cgi?zoom=4000
```

The image zoomed 4 times.

The image can be zoomed in using the following command:

```
HTTP.get=http://<login>:<password>@<camera_ip>/control/
click.cgi?zoomrel=<zoom_change>
```



```
HTTP.get=http://admin:test@192.168.10.100/control/
click.cgi?zoomrel=1000
```

The image zoomed in by 1.

Each time the command is performed, the size is zoomed 1x. In order to zoom out the image, enter the negative number as a relative zoom value.



```
HTTP.get=http://admin:test@192.168.10.100/control/
click.cgi?zoomrel=-1000
```

The image zoomed out 4x.

Please remember to change login, password and IP address of the camera in the above examples.

2. Integration of the camera with the Base module

The integration of the camera with the **Base** module is the starting point to integration with other systems of the intelligent building. The camera software works with the external software, so it is possible to fully integrate the camera with the **DOMIQ** system, and thus the entire installation of the intelligent building. The integration is bi-directional and proceeds according to the following procedure:

2.1. Sending the information to the Base module

If you create a simple rule, the **Base** module will receive information about any event which is invoked in the camera. Therefore the **Base** can react on e.g. pressing buttons on the video door station, the detection of motion, sound detection, etc.

1. Log in the configuration interface of the camera.
2. Choose **Admin setup** (a new window is opened).
3. In section **Transfer Profiles** choose **IP Notify Profiles**:
 - Press **Add new profile** at the bottom of the screen.
 - In **IP Notify Profile** enter the profile name e.g. *Base*.
 - From the list **IP Notify Type** choose *Custom Configuration*.
 - In the field **Destination Address** enter: IP:4224 np. 192.168.10.20:4224
 - Choose *Raw TCP/IP* in **Data Protocol** and *Plain text* in **Data Type**.
 - The messages are defined in the last window. These are the messages which will be passed to the **Base** module when the previously defined event is invoked. In this case we will only pass the name of the action which invoked the event. In order to do this, enter the following text:

- `MOBOTIX.event.q24=${EVT.EST.ACTIVATED}`. It means that the name of the action which invoked the event will be received by the **Base** as the following command: `C.MOBOTIX.event.q24=<event>`. If the door bell is pressed, it is: `C.MOBOTIX.event.q24=CameraBellButton`.

The below picture shows the example of the configuration:

4. Click on **Set** in order to approve changes and then **Close** to save them in the memory of the device.

2.2. Receiving the information from the Base module

The events can be invoked in the camera by any message which is received via TCP/IP. In this example the TCP/IP message will be used to invoke recording. The action is defined as follows:

1. Choose option **Setup Menu** and then **Event Settings**.
2. Mark the check box in the section **IP Receive (RC) Events** and fill in the following parameters:
 - Leave the default number **8000** in the field **IP Receive Port**.
 - From the list **IP Receive Compare** choose **String Compare**.
 - In the field **IP Receive Message** enter any message that will invoke the event. Do not use spaces. We used the word: **recording**.
3. Click on **Set** in order to approve changes.
4. Go back to the main level of the **Setup Menu** and choose **Recording**. Fill in the following parameters in the new window:
 - In the section **Arming** choose **Enable** from the list.
 - In the section **Recording** choose **Event Recording**. Choose the option **Include audio**, if you want to have the voice recorded.
 - In the section **Start Recording** choose the action which should invoke the recording. Można wybrać kilka pozycji trzymając wciśnięty klawisz **Ctrl** (PC) lub **cmd** (Mac). W naszym przypadku wybraliśmy opcję: **RC: IP Receive**.
 - The next three options specify the parameters and time of the recorded image.

The below picture shows an example configuration:

Storage Settings	Value	Explanation
Recording (REC)	Event Recording	Recording Mode: Type of event and story recording. <i>Snap Shot Recording:</i> stores single JPEG pictures. <i>Event Recording:</i> stores stream files for every event using MxPEG codec. <i>Continuous Recording:</i> continuously streams video data to stream files using MxPEG codec. Events can be recorded with a higher frame rate using <i>Start Recording</i> , <i>Trigger Recording</i> and <i>Stop Recording</i> .
	Include audio	Record Audio Data: Store audio data in stream file if available. Enable and configure microphone .
Start Recording	BR - Button Right BL - Button Left RC - IP Receive TP - Temperature IL - Illumination	Start Recording: Select the events which will start recording. Use (Ctrl)-Click to select more than one event. Events in brackets need to be activated first. EC or EL for filtered events.
	12 fps	Event Frame Rate: Recording speed if an event is detected, in frames per second.
	2 s	Recording Time Before Event: Additional recording time before an event stream.
	30 s	Recording Time: Time to include in recorded stream after an event has occurred.

- The configuration is ready. From now on if the camera gets the TCP/IP message with the contents *recording* the recording of the image will be started.
- Click on **Set** in order to approve changes and then **Close** to save them in the memory of the device.

In the next part of the tutorial we describe how to send TCP/IP commands from the **Base** module.

Having configured the camera, enter the **Satel** alarm system.

3. Integration with the Satel alarm system

The integration of the alarm system and monitoring provides an even better and more complete supervision of the building/apartment in your absence. By defining the motion detection zone you can get an immediate information about the zone violation in the form of a notification or a SIP connection to your mobile phone or tablet. The live preview will allow you to assess the risks and take a quick decision. Thanks to the automatically invoked recording, nothing will escape your attention.

3.1. Automatic recording

Thanks to the automatic invoking of the recording you can be sure, that you will not miss any alarm event. The recording can be invoked after the motion detection area is violated or the alarm sensor is activated (PIR sensor, reed relay, sensor of breaking the window, smoke sensor, flooding sensor etc.).

3.1.1. Recording invoked by the motion detection

Definition of the areas of the motion detection

Motion detection areas should be defined after setting the camera in the target place. The area definition is as follows:

- Press the Shift key and double click on the preview in the camera configurator. There will appear a little yellow box.
- Release the Shift key and click in the place where the opposite corner of the area should be located. The area appears as a rectangle with a yellow outline.
- Choose **Setup Menu > Event Settings**.

4. In section **Video Motion Windows** choose **Hide but highlight on event** from the drop-down menu (the area will be marked red if the frame is crossed).
5. The camera has two profiles defined by default: **VM** and **VM2**. In the **VM** profile click on **Add Rectangle** in order to add the defined area. In the field **Video Motion Definitions (VM)** appear the parameters of the defined rectangle. You can define several areas within one profile. In order to do this, repeat points 1 and 2, and then click on **Add Rectangle**. As a result, another area will be added in the field **Video Motion Definitions (VM)**.

The below picture shows an example configuration:

Events	Value	Explanation
Video Motion Window (VM)	<input checked="" type="checkbox"/> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">0, 476, 70, 72, 103, s=20, a=25</div> <div style="margin: 5px 0;"> <input type="text" value="Hide but highlight on event"/> </div> <div style="margin: 5px 0;"> <input checked="" type="checkbox"/> </div> <div style="margin: 5px 0;"> <input type="text" value="Off"/> </div> <div style="margin: 5px 0;"> <input type="text" value="1000"/> </div>	<p>Video Motion Enable: Motion detection using digital image analysis.</p> <p>Video Motion Definitions (VM): [[lens, x, y, width, height [, "a="min. area(%)] [, "ama="max. area(%)] [, "s="sensitivity] lens: 0=right, 1=left min. area: [%] 0..99, default: 25 max. area: [%] 0..99, default: not used sensitivity: [%] 0..99 Add an exclamation mark ("!") at the beginning of a definition line to declare a "reference window", which is used to avoid false video motion alarms. Note that you can use special variables to fine-tune the video motion definitions for difficult situations. For details refer to the Video Motion help page.</p> <p>Note: All user-defined coordinates are relative to the whole sensor. The origin (0,0) corresponds to the lower left corner, 1279,959 to the upper right corner.</p> <p><input type="button" value="Add Rectangle"/></p> <p>Video Motion Style for Group 1: Appearance of motion window border.</p> <p>Show Video Motion Window ID: Display the line number from the definition list above in the upper left corner of each window.</p> <p>Low-Light Suppression: Disables motion detection if illumination drops below selected value. Can be set independently for each camera lens.</p> <p>Video Motion Suppression Time: Disable motion detection for this duration [0..30000 ms] after a reference window has triggered. Factory default: 0 (disables motion detection in current image only).</p>

6. The next step is to define the reaction of the camera to the motion detection. This can be for example starting of the recording, playing of the sound etc. In this case the reaction will be sending the IP notification to the **Base** module.
7. Return to the main level of the **Setup Menu**, then choose **Action Group Overview** and add a new group (the **Add new group** button).
8. Fill in the parameters of the group in the new window:
 - Enter the name of the group, e.g. *Motion*.
 - Choose *Enable* from the drop-down menu.
 - In the section **Event Selection** choose *VM - Video Motion*.
 - In the section **Actions** choose a new action (the **Add new action** button) and then choose *IP Notify:<profile name>*, in this case: *IP Notify: Base*.
9. Click on **Set** in order to approve the changes and then **Close** to save them in the memory of the device.

Reaction of the Base module

The recording can be started as a direct response to the detection of motion. However, in this case the recording should be invoked only when there is no one in the building/apartment. In order to do this, create an event that will check the status of the alarm system and decide to start recording.

1. Go to the **Events** tab in the **Base** configurator.
2. Add a new event and fill in its parameters:
 - Enter the description (optional)
 - In the **Channel** field enter: `C.MOBOTIX.event.q24` (as described in chapter 2.1 Sending the information to the Base.)
 - In the **Data** field enter the name of the motion detection profile. In this case `VM`.
 - In the **Condition** field enter: `E.IDS.armed.<zone>==1`, where `<zone>` stands for the zone number, which determines if there is anyone in the building.
3. Click on **Add command...** In the opened window enter the following text in the **Name** field: `C.TCP.send.<IP of the camera>:8000`, in the field **Value** enter the message which should be sent to the camera. In this case it is: *recording* (it invokes the previously defined rule to start recording). The command will be performed only if the **Condition** is fulfilled.

The **Base** module can optionally send the notification to all the registered **Remote** applications or make a SIP call to a person/persons. These functions were described in chapter 4.

3.1.2. Recording invoked by the alarm sensors

This way of invoking the recording is fuller, because it allows to take into account the work of any kind of sensor connected to the alarm system. It is also more reliable, because the mistakes in the motion detection can be avoided. The procedure is limited to a single event, which is defined as follows:

1. Add a new event and fill in its parameters:
 - Enter the description (optional)
 - In the **Channel** field enter: `E.IDS.input.(%d+)` - any input of the alarm system.
 - In the **Data** field enter `1`.
 - In the **Condition** field enter: `E.IDS.armed.<zone>==1`, where `<zone>` stands for the zone number, which determines if there is anyone in the building.
2. Click on **Add command...** In the opened window enter the following text in the **Name** field: `C.TCP.send.<IP of the camera>:8000`. In the **Value** field enter the message which should be sent to the camera. In this case it is: *recording* (it invokes the previously defined rule to start recording). The command will be performed only if the **Condition** is fulfilled.

The **Base** module can optionally send the notification to all the registered **Remote** applications or make a SIP call to a person/persons. These functions were described in chapter 4.

4. Optional reactions

Automation system reaction to the violation of the standby or the motion detection zones does not have to be limited to record the image. In this chapter we will show you how to send alarm notifications and make a SIP alarm connection with mobile devices.

4.1. Alarm notifications

The **Base** module enables sending notification with any message to all currently paired **DOMIQ/Remote** applications. In order to define such action, add an additional command to the event which invokes the recording.

In the **Name** field enter `C.REMOTE.notify` and in **Value** enter any contents of the message.

Having defined this action the users will be notified about invoking of the alarm recording.

4.2. Alarm SIP connection

In reaction to the motion detection zone violation or alarm sensors the **Base** module can initiate a SIP connection to notify users about the incident.

Configuration of the server, clients' accounts and clients' SIP applications was described in details in the tutorial "DOMIQ, SIP and Mobotix cameras" so we will just present the parts of the configuration, which should be changed.

In the case of alarm SIP connections, we recommend to define a separate profile of SIP connections in order to separate the alarm connections from the normal ones. When defining an alarm profile, you should also (this is not necessary) choose sound message (**Message name**), which will be played at the beginning of each alarm call and thanks to which the user will be able to recognize if this is an alarm connection. You can use ready sounds available in the camera (e.g. sound called *Alarm*) or upload your own audio file. In the tutorial "**MOBOTIX T24 Video Door Station**" we described how to upload audio files.

In relation to the procedure described in the previous tutorial, the way of starting the connection with mobile devices will be changed. Instead of IP notifications we will use the programming interface of the camera.

In addition to the command which initiates the connection with devices that are assigned to connections profile, we will also present a command establishing the connection with the selected SIP client.

Both commands have the `C.` prefix, as in this case they will be used in the definition of a event, if it is required.

In order to establish connection with all devices within a profile, use the command with the following syntax:

```
C.HTTP.get=http://<login>:<password>@<camera_ip>/control/rcontrol?action=voipphone&profile=<profile_name>
```



```
C.HTTP.get=http://admin:test@192.168.10.31/control/rcontrol?action=voipphone&profile=alarm
```

Connection with the SIP clients with the assigned profile: *alarm*.

The general syntax of the command connecting with any SIP client is as follows:

```
C.HTTP.get=http://<login>:<password>@<camera_ip>/control/rcontrol?action=voipcall&sipaddr=<SIP_address_of_the_customer>
```



```
C.HTTP.get=http://admin:test@192.168.10.31/control/rcontrol?action=voipcall&sipaddr=user1@192.168.10.31:5061.
```

Connection with the SIP client with the following SIP address:
user1@192.168.10.31:5061.

Please remember to change login, password and the IP of the camera in the presented examples.

Automation of the SIP connection initialization consists in adding one of the described commands to the list of actions that will be done after violation of the motion detection area or alarm sensors.