

SICK ACAP plug-in

Function block for ACAP Axis cameras



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1 About this document

Please read this chapter carefully before you begin working with these instructions and the SICK ACAP plug-in for Axis cameras.

1.1 Described software version

Software	Version
SICK ACAP plug-in for Axis cameras	1.0

Tab. 1: Software version

1.2 Purpose of this document

This documents describes how to use the SICK ACAP plug-in for Axis cameras (also referred to simply as plug-in in the document). It provides instructions on project planning and commissioning for planners and installers of security systems with laser-supported object and video monitoring.

1.3 Target group

This document is aimed as persons who plan and operate security systems with laser-supported object monitoring and camera control.

1.4 Depth of information

Note This document contains information about the SICK ACAP plug-in on the following topics:

- System construction and integration
- Installation
- Configuration
- Definition of action rules
- Logging applications events

When planning and using security systems with laser-supported object monitoring and camera control, technical skills are required that are not covered by this document.

The official and legal regulations for operating the plug-in must always be observed.



Further information on laser-supported object monitoring can be found in the **Planning aids for perimeter and object monitoring** manual.

1.5 Abbreviations used

ACAP	AXIS camera application platform
VMS	Video management system
SOPAS	SICK configuration software

1.6 Symbols used

Recommendation	Recommendations are designed to assist you in the decision-making process with respect to the use of a certain function or technical measure.
Note	Notes provide information about the features of a device, application tips, or other useful information.
1. / 2. ... Step by step	Instructions that must be carried out in the order described are referred to as step-by-step instructions and are indicated by numbered lists. Carefully read and follow the instructions for action.
➤ Action	Instructions for taking action are indicated by an arrow. Carefully read and follow the instructions for action.

2 Safety

This chapter concerns your own safety and the safety of users of security systems with plug-ins.

► Please read this chapter carefully before you begin working with the plug-in.

2.1 Qualified safety personnel

The plug-in must only be planned and commissioned by adequately qualified personnel.

A qualified person

- has sufficient skills in the field of the respective equipment based on their technical training and experience **and**
- has been instructed by the manufacturer in system operation and all applicable safety guidelines **and**
- is familiar with all relevant country-specific occupational safety regulations, work safety regulations, guidelines, and generally accepted technical rules and standards (e.g., DIN standards, VDE regulations, country-specific rules) to such an extent that he/she is able to evaluate the safe condition of the power-operated equipment, **and** he/she
- has access to and has read the operating instructions.

2.2 Area of application of the plug-in

The SICK ACAP plug-in is installed in ACAP-capable Axis cameras.

It is used for communication between SICK laser scanners of types LMSxxx and TiM3xx. With the plug-in, ACAP-capable Axis cameras understand the switching signals of laser scanners transmitted via Ethernet connection.

Cameras can then execute defined actions based on the switching signals. This makes it possible for pan-tilt-zoom cameras (PTZ cameras) from Axis to, for example, move to a preset position if the associated monitoring field of the laser scanner is violated.

2.3 Intended use

The plug-in may only be used as described in section **2.2 Applications of the system**. It may only be used by qualified personnel in the environment in which it was mounted and initially commissioned by qualified safety personnel in accordance with these instructions.

Note If the plug-in is used for any other purpose or modified in any way, any warranty claim against SICK AG shall become void.

3 System description and integration

This chapter describes the function of the SICK ACAP plug-ins for Axis cameras.

Note Read this chapter before you install and commission the plug-in.

Laser-supported camera monitoring

CCTV is frequently used as a sensible addition to laser technology in fence, facade, or open space monitoring.

If an area monitored by the laser scanner is violated, a digital output signal of the laser scanner of the camera is used to trigger a camera pre-setting or direct a camera with a panning – tilting and zooming mechanism to the place where the event occurred.

Cameras with I/O interfaces can be directly addressed via the respective digital switching signal. However, in many cases, this requires extensive wiring. As an alternative, the laser scanner switching signals can also be transmitted to the cameras via a video management system or via the SICK OPC server.

Transmission of the switching signals via Ethernet

With the SICK ACAP plug-in, an Ethernet connection can be used to transmit the statuses of the digital outputs to the Axis camera, to evaluate them and to use them as control information for the camera. Additional wiring is then no longer required.

The plug-in is installed on the Axis camera. The digital outputs are configured easily via the camera web interface.

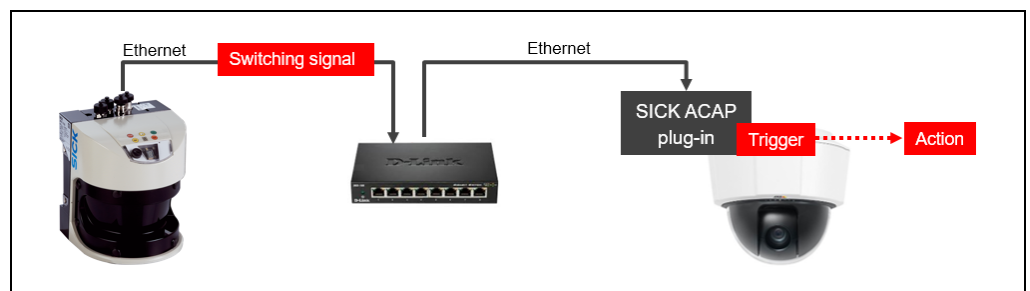


Fig. 1: System construction - overview

System construction - integration

An Axis camera can process switching signals from a maximum of three laser scanners using the SICK plug-in. Conversely, a SICK laser scanner can be connected to a maximum of two Axis cameras via Ethernet with the plug-in.

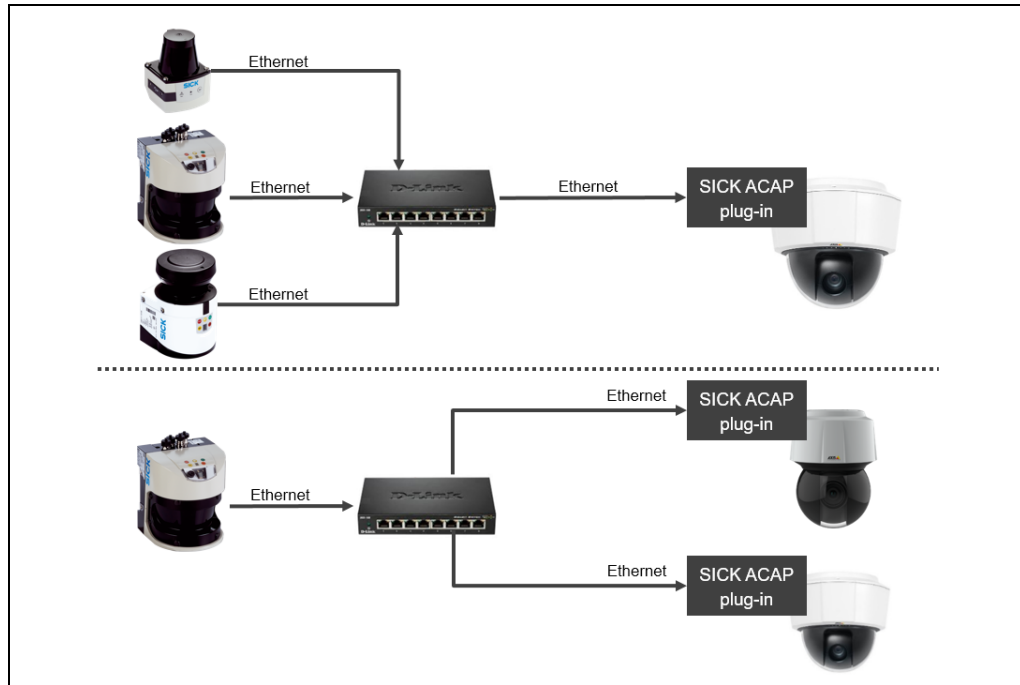


Fig. 2: System construction - construction levels

Configuration of the laser scanners

The monitored areas of the laser scanner are configured in accordance with the respective operating instructions of the device. A digital output is assigned to a monitored area in the SOPAS configuration software in this case.

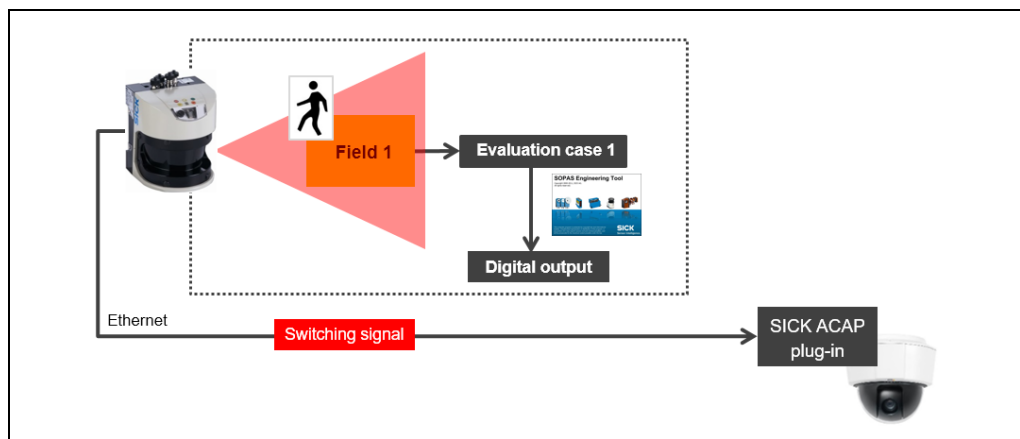


Fig. 3: System construction - configuration of laser scanners

The Ethernet data log can store a maximum of 14 switching signals per connected laser scanner.

4 Installation

4.1 Downloading plug-in

Download the SICK ACAP plug-in for Axis cameras from the SICK homepage onto a local computer.

1. Open the www.sick.com website in the browser.
2. Enter **SICK ACAP plug-in** in the search field and start the search.
3. Download the latest version of the SICK ACAP plug-in for Axis cameras and save it in a directory on the configuration PC.

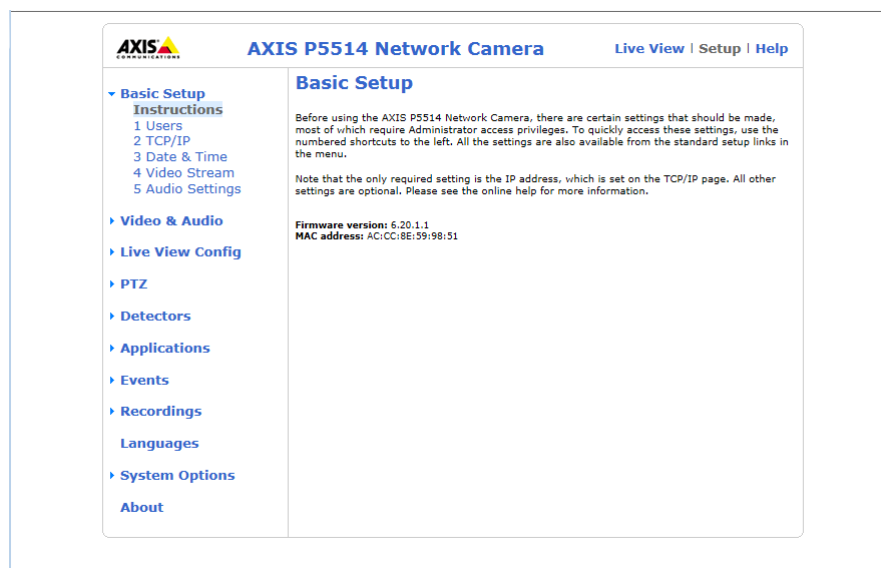
Note Installation is done via the web interface of the Axis camera.

4.2 Connecting the configuration PC to the camera

Connect the configuration PC to the network through which the Axis camera will be operated.

Note If the IP address of the configuration PC deviates from the number range of the camera network, you must change the address range of the Axis camera.

1. Start the web browser on the configuration PC.
2. Enter the IP address of the Axis camera into the address line at which you want to install the plug-in.
3. Log into the camera with your user name and password.
4. As soon as the connection to the camera has been established, the web interface of the Axis camera opens.
5. Change to the **Set-up** page.

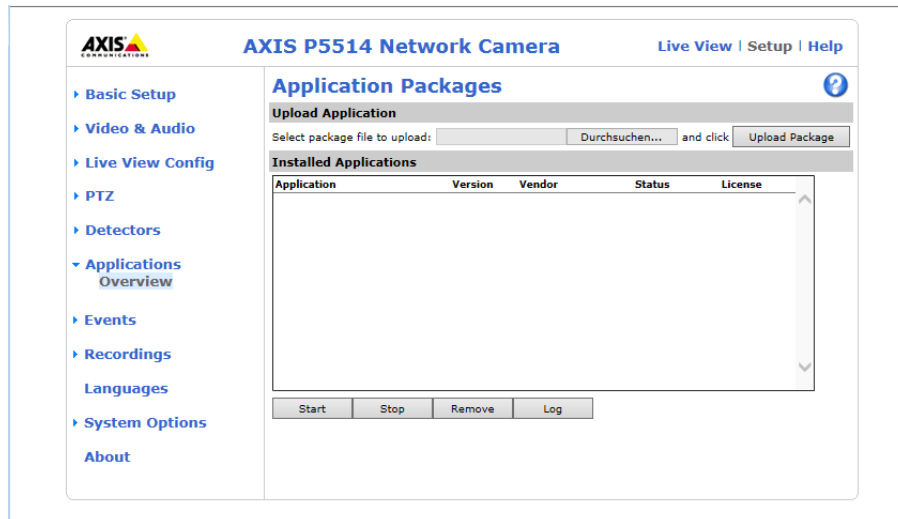


4.3 Installing the plug-in in the camera

Installation of the plug-in is done via the web interface of the Axis camera.

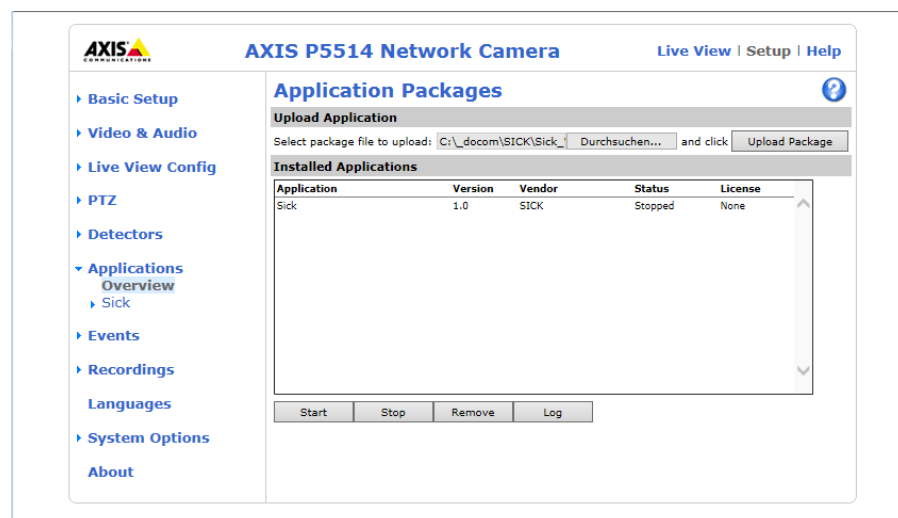
Getting started

- Click the **Settings** page and in the **Applications** menu in the menu tree. The overview page is displayed.

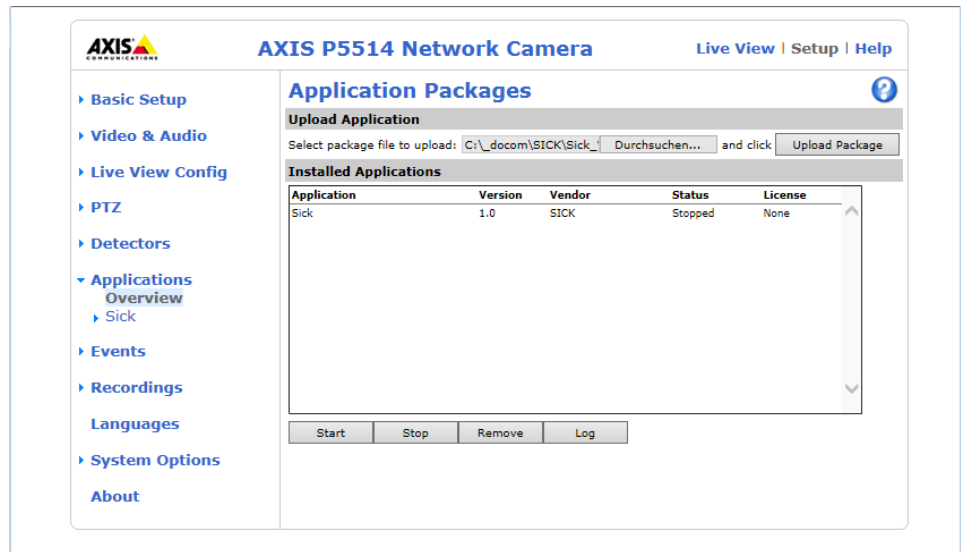


Starting installation

1. Click on the **Search** button under **Upload application**.
2. Select downloaded installation file **Sick_1_0_mipsisa32r2el.eap**.



- Click on the **Upload package** button. After uploading, the SICK plug-in is executed in the list of installed applications. It has the status **Stopped**.

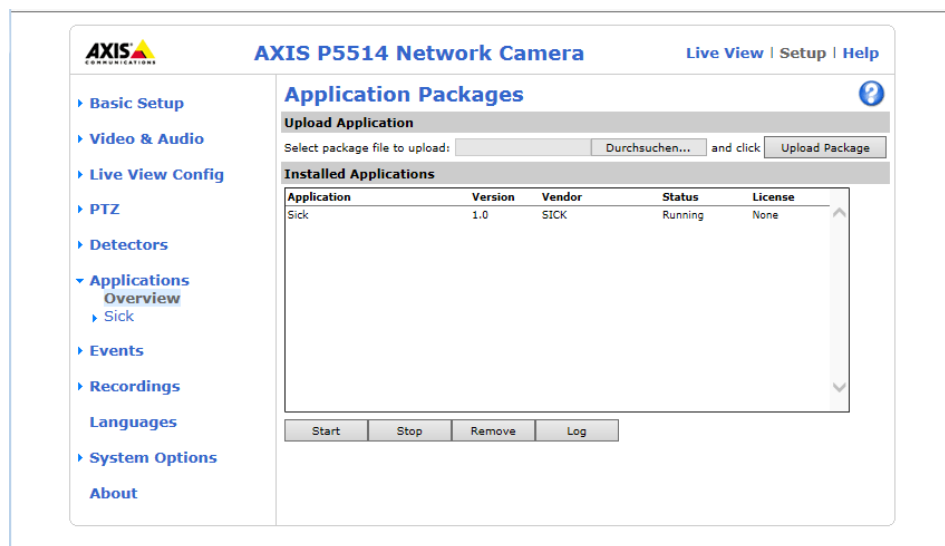


4.4 Starting plug-in

The plug-in must be started in order to use it.

- Mark the SICK plug-in in the list of installed applications.
- Click the **Start** button under the list.

The plug-in has the status **Running**.



5 Configuration

5.1 Preliminary considerations

Before assigning the laser scanner to the camera and linking the digital outputs to the camera triggers, you must consider a few things.

How many laser scanners can be assigned?

A camera can process the digital outputs from a maximum of **three** laser scanners using the plug-in. Depending on the scanner type, a maximum of six internal and eight external digital outputs can be assigned per laser scanner.

Which digital outputs are configured in the laser scanner?

Get an overview of which monitored areas in the laser scanners have been linked to which digital outputs.

The digital outputs in the SOPAS configuration software have meaningful names, e.g. **Alarm**, **Error** and **Output *n*** or **External output *n***.

How are digital outputs and triggers assigned?

The status of a digital output delivered by the laser scanner in the Ethernet data log becomes the trigger for the camera and therefore the trigger of an action.

The Ethernet data log can store a maximum of 14 switching statuses per laser scanner and transmit them to the camera.

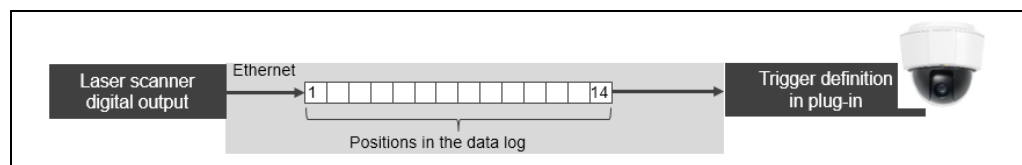


Fig. 4: Structure of Ethernet data log

The digital output and trigger must be linked so that the camera knows to which digital output a trigger is supposed to react. Since the number of internal digital outputs varies depending on the scanner type and external digital outputs can also be taken into account via CAN module, linking is done on the basis of an assignment table.

For each scanner type supported by the plug-in, this table assigns the SOPAS name of the digital output to an output number from 1 to 14. The output number corresponds to the storage position of the digital output in the data log. It is stored in the trigger definition depending on the laser type.

If, for example, you want to query the status of the **Error** digital output of a **LMS13x** laser scanner in the trigger, output number **2** must be stored for the scanner type in the trigger definition in accordance with the assignment table.

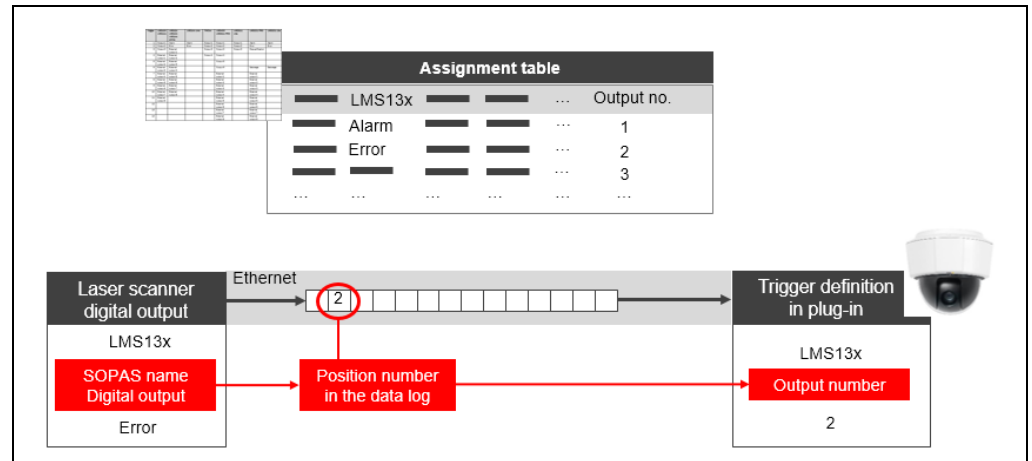


Fig. 5: Linking of digital output and camera trigger in accordance with the assignment table

Assignment table								
LMS100 LMS111	LMS12x LMS13x LMS14x prime	LMS14x core	TiM3xx	LMS400 LMS511 PRO	LMS511 Lite	LMS531 PRO	LMS531 Lite	Output number
Output 1	Alarm	Alarm	Output 1	Output 1	Output 1	Alarm	Alarm	1
Output 2	Error	Error	Output 2	Output 2	Output 2	Error	Error	2
Output 3	External output 1		Output 3	Output 3	Output 3	Disqualification		3
External output 1	External output 2		Output 4	Output 4				4
External output 2	External output 3			Output 5				5
External output 3	External output 4			Output 6		Sabotage	Sabotage	6
External output 4	External output 5			External output 1		External output 1		7
External output 5	External output 6			External output 2		External output 2		8
External output 6	External output 7			External output 3		External output 3		9
External output 7	External output 8			External output 4		External output 4		10
External output 8				External output 5		External output 5		11
				External output 6		External output 6		12
				External output 7		External output 7		13
				External output 8		External output 8		14

Tab. 2: Assignment table (digital output - trigger)

Interpreting assignment table

In the following example, triggers are configured for laser scanners of types **LMS531 PRO** and **LMS13x**. Both triggers evaluate the seventh position in the data log via output number 7.

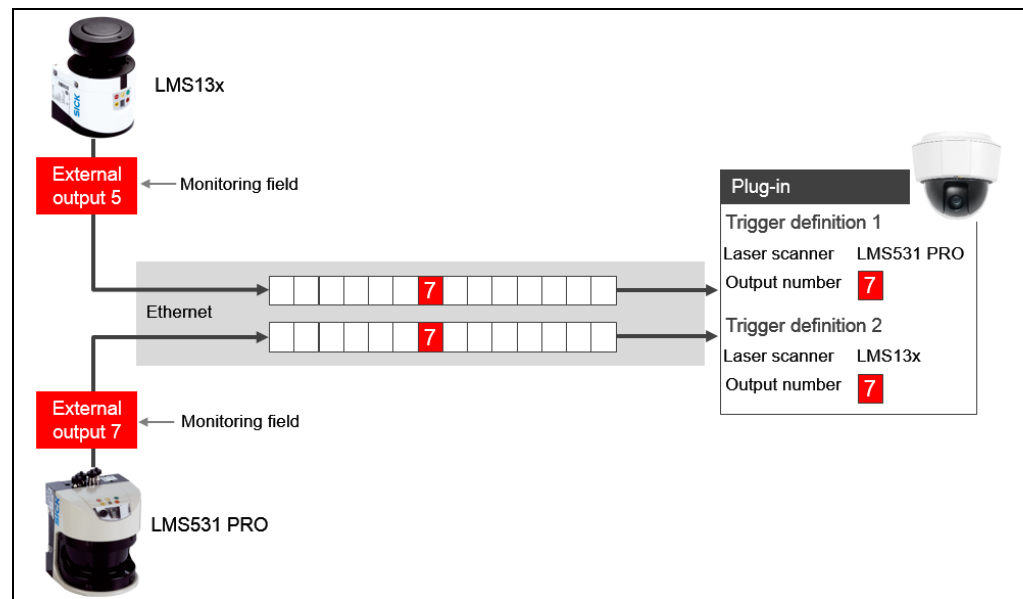


Fig. 6: Interpreting assignment table (example)

In accordance with the assignment table, the status of the **External Output 1** digital output is saved in the seventh position of the data log for a **LMS531 PRO**.

For a connected laser scanner of type **LMS13x**, the seventh position of the data log provides the status of the **External Output 5** digital output.

5.2 Configuring application settings

All parameters of the SICK plug-in are defined via the **Applications** menu.

- ▼ Applications
 - Overview
 - ▼ Sick
 - Settings

- Click on the **Applications → SICK → Settings** menu in the menu tree of the web interface. The window with the application settings of the plug-in opens.

AXIS P5514 Network Camera Live View | Setup | Help

Application Settings: Sick ?

Application Settings

Status: Running

Parameter Settings

Activation state:

A preset duration:

Detector01 IP address:

Detector01 name:

Detector01 port:

Detector02 IP address:

Detector02 name:

Detector02 port:

Detector03 IP address:

Detector03 name:

Detector03 port:

Pooling time:

Trigger01 detector no:

Trigger01 output no:

Trigger01 priority:

5.2.1 Configuring camera behavior

In the first step, configure the camera behavior when receiving switching signals.

Parameter Settings

Activation state:

A preset duration:

Parameter	Meaning
Activation state	<p>Define which switching state of the laser scanner the camera should react to.</p> <p>Possible values:</p> <p>0 = Low</p> <p>1 = High</p> <ul style="list-style-type: none"> With Activation state=0 the Axis camera executes an action if the digital output of the laser scanner has the status Low (switches from High to Low). With Activation state=1 the Axis camera executes an action if the digital output of the laser scanner has the status High (switches from Low to High).
A preset duration	<p>Time in seconds during which the camera stays in a pre-defined camera position if several monitoring fields have been simultaneously violated, meaning several switching signals must be processed by the camera via the associated action rules.</p> <p>The setting is only supported by the PTZ camera.</p> <p>With setting A preset duration=10 for 10 seconds the camera stays in the position which belongs to the first violated field before it processes another switching signal and changes to the next position.</p>

Tab. 3: Parameter - camera behavior

5.2.2 Assigning laser scanners

A camera can evaluate digital outputs from a maximum of three laser scanners using the plug-in. The laser scanners are stored in the camera with their IP address, a freely assignable name and the port.

Detector01 IP address:	<input type="text" value="192.168.0.20"/>
Detector01 name:	<input type="text" value="LMS531"/>
Detector01 port:	<input type="text" value="2111"/>
Detector02 IP address:	<input type="text" value="192.168.0.11"/>
Detector02 name:	<input type="text" value="LMS141"/>
Detector02 port:	<input type="text" value="2111"/>
Detector03 IP address:	<input type="text"/>
Detector03 name:	<input type="text"/>
Detector03 port:	<input type="text"/>

Parameter	Meaning
DetectorXX IP address	IP address of the laser scanner whose digital outputs are to be processed.
DetectorXX name	Name of the laser scanner. The name can be freely assigned.
DetectorXX port	Ethernet port through with the connection cable to the laser scanner is established. Possible values: 2111 2112 The port can only be used once per scanner. This means: If a laser scanner is connected to two cameras, one camera must use port 2111 and the other must use port 2112.

Tab. 4: Parameter - laser scanner assignment

5.2.3 Determining query frequency

Define how often the camera should query the Ethernet log according to the switching states of the laser scanner.

Polling time:	<input type="text" value="10"/>
---------------	---------------------------------

Parameter	Meaning
Polling time	Cycle time in milliseconds for querying switching statuses. Possible values: 10 to 10,000

Tab. 5: Parameter - query frequency

5.2.4 Assigning trigger with digital outputs

In the last step, assign the camera triggers in accordance with the assignment table. Enter the laser scanner and the output number when doing so. The output number corresponds to the storage position of the digital output in the Ethernet data log.

Trigger01 detector no:	<input type="text" value="1"/>
Trigger01 output no:	<input type="text" value="1"/>
Trigger01 priority:	<input type="text" value="0"/>

Parameter	Meaning
TriggerXX detector no.	<p>Number of the laser scanner whose digital output is to be assigned.</p> <p>Permissible values: 1 (corresponds to the laser scanner in the Detector01 name field) 2 (corresponds to the laser scanner in the Detector02 name field) 3 (corresponds to the laser scanner in the Detector03 name field)</p>
TriggerXX output no.	<p>Output number or position in data log which delivers the status of the digital output.</p> <p>Based on the assignment matrix, the camera “knows” which digital output to which the trigger should react depending on the type of selected laser scanner.</p> <p>Possible values 1 to 14</p> <p>Example Value 1 for a laser scanner of type LMS531 PRO determines that the trigger is linked to the Alarm digital output.</p>
TriggerXX priority	<p>Priority with which the trigger is processed by the camera.</p> <p>Two priorities can be assigned: 0 = Low 1 = High</p> <p>If several monitoring fields of the <u>same</u> priority are violated, the camera positions assigned to the triggers are activated in sequence after the defined holding time. The holding time is defined by the A Preset duration setting (see above).</p> <p>If monitoring fields with different priorities have been violated, only those camera positions which are controlled via triggers with higher priority are taken into account.</p> <p>Example: Trigger 1 and 2 have priority 1 (high), trigger 3 has priority 0 (low). If all three triggers simultaneously receive the signal of the assigned digital output, only the triggers with priority 1 (high) are taken into account for camera activation.</p>

Tab. 6: Parameter - trigger definition

5.2.5 Saving settings

Save the settings in the plug-in.

► To do so, click on the **Save** button in the application settings window.

Trigger20 detector no:

Trigger20 output no:

Trigger20 priority:

Note The **Reset** button deletes all entries and sets the **Activation state**, **A preset duration** and **Polling time** parameters back to the standard values.

Parameter	Default value
Activation state	1 = High
A preset duration	10 s
Polling time	10 ms

Tab. 7: Parameter - standard values

5.3 Changing application settings

The application settings saved for the SICK plug-in can be changed and saved again at any time. To do so, the plug-in must be stopped.

1. You have called up the window with the application settings.
2. Stop the plug-in using the **Stop** button.

AXIS P5514 Network Camera Live View | Setup | Help

Application Settings: Sick

Application Settings

Status: Running

Parameter Settings

Activation state:

A preset duration:

Detector01 IP address:

Detector01 name:

Detector01 port:

Detector02 IP address:

Detector02 name:

Detector02 port:

Detector03 IP address:

Detector03 name:

The button changes the designation to **Start**.

Applikationseinstellungen

Status: Stopped

3. Edit the parameters.
4. Close editing by pressing the **Save** button.
5. Click on **Start** to reactivate the plug-in.

6 Definition of action rules

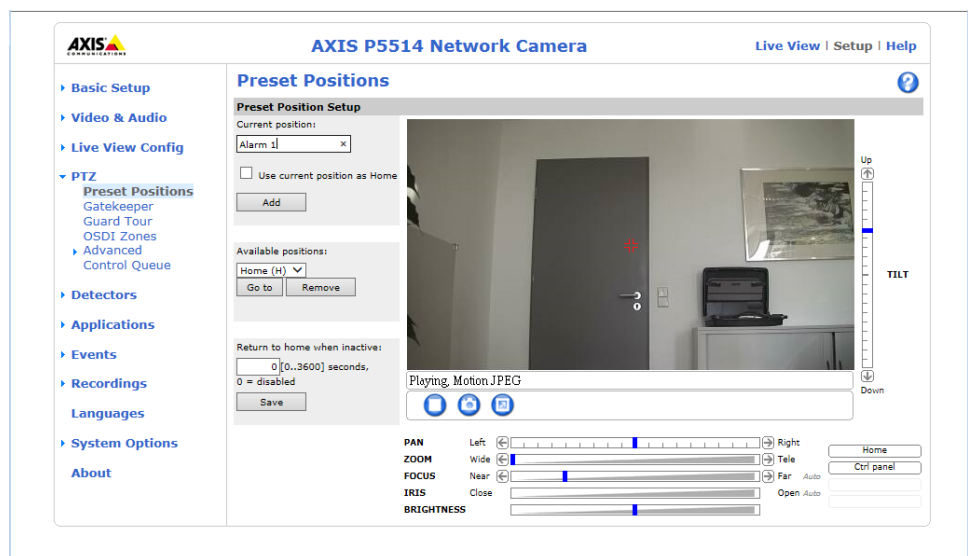
6.1 Defining camera position

Preset positions (presets) are pre-defined camera displays which can be called up easily with corresponding action rules.

Note Preset positions can only be defined for PTZ cameras.

Defining preset positions

1. Change to the **PTZ → PTZ positions** menu.
2. Position the camera using the controls for panning, tilting and zooming (PTZ) as desired.



3. Enter a suitable designation for the position in the **Current position** field.
4. Click on **Add**. The camera position is saved as a preset position and can be used in the action rules.

6.2 Defining action rules

Conditions are defined using actions rules; these conditions must apply for the camera to execute an action. Depending on the camera type, for example a recording can be started, an e-mail message sent or a certain camera position approached.

An action rule consists of one or several conditions and an action. Triggers of an action could be movements detected by the camera, time factors or network information, to name a few examples. In addition, information from the applications installed in the Axis camera can be used as triggers.

If the SICK plug-in installed in the Axis camera is used as a trigger, switching statuses of the connected laser scanners can be systematically queried.

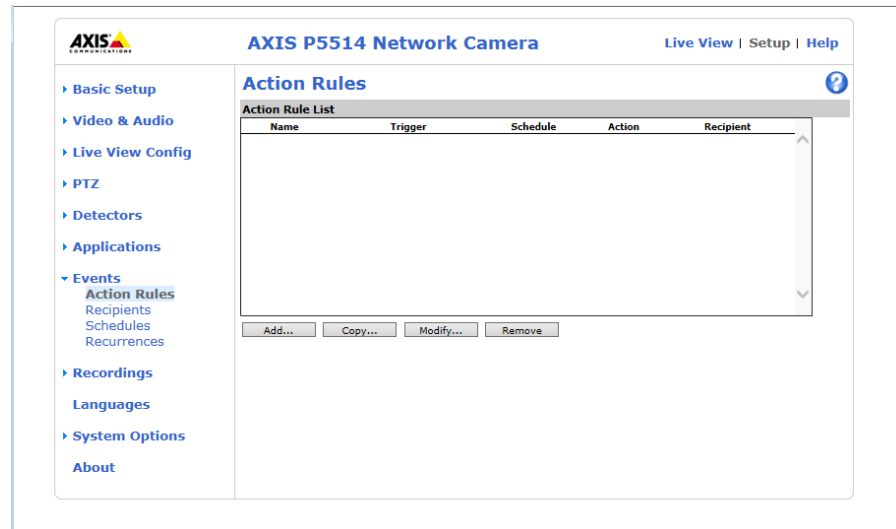
6 DEFINITION OF ACTION RULES

Getting started

Action rules are defined in the **Events** menu.

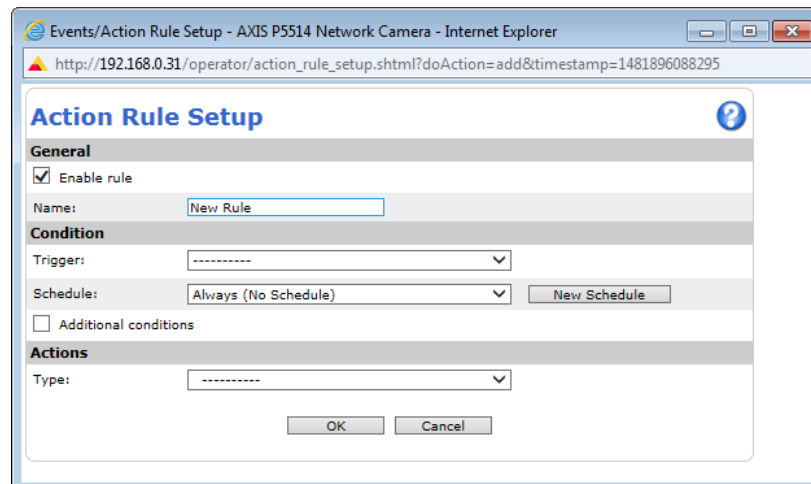
- ▼ **Events**
- Action Rules**
- Recipients
- Schedules
- Recurrences

- Click on the **Events** → **Action rules** menu in the menu tree of the web interface. The list of action rules opens. In this example, no action rules have been defined yet.



5. Click on **Add** to create a new rule.

Rules are defined in a separate browser window.



Every action rule consists of a name, a trigger and an action.

Note The action rule is automatically activated when it is created. The **Activate rule** checkbox contains a tick.

6.2.1 Action rule for approaching the home position

An action rule for approaching the home position is typically used for PTZ cameras. The rule is valid if no switching signals are received by the laser scanners.

Defining condition

1. Enter a meaningful designation for the action rule in the **Name** field, e.g. **Home Position**.
2. Select the **Applications** entry in the **Trigger** field to evaluate information from the SICK plug-in.
3. An additional field is displayed through which you can specify the trigger which is to be considered in the action rule.
4. Select the **HomePosition** entry in the example. This mode is used for PTZ cameras to activate the defined **Home (H)** camera position (see the **PTZ → PTZ position menu**).

5. In the **Schedule** field, you can define which action rule should be active. If you select the **Always (No Schedule)** entry, the rule is always triggered as soon as the condition applies.

Limit the period of validity of the action rule, if necessary, using pre-defined schedules (e.g. workdays, during business hours, etc.). Use the **New Schedule** button to define individual periods of validity.

Determining action

The actions available in the **Functions** area are dependent on the camera type used.

1. You can use the **PTZ camera** entry to move PTZ cameras to a certain position by triggering an action rule.
2. The **Control** field is displayed for position determination,

3. If you select the **Preset position** entry, the **Go to** field appears. The selection list of the field contains all positions which were configured in the **PTZ → PTZ positions** menu.

4. We select the **Home (H)** entry for approaching the home position.

Adopting action rules

- End definition of the action rule with **OK**.

The browser window for rule definition closes. The rule is now executed in the list of action rules.

Name	Trigger	Schedule	Action	Recipient
<input checked="" type="checkbox"/> Home Position	Applications - Applications	-	PTZ Control	-

6.2.2 Action rules for alarm positions

The switching statuses of the connected laser scanners are evaluated via the respective triggers for approaching alarm positions.

Defining condition

1. Use **Add** to create a new action rule and assign a meaningful designation.
2. Select the **Applications** entry in the **Trigger** field and select the trigger in the field displayed below. The selection list contains all laser scanner with the assigned triggers. The list entries are composed of the name specified in the **DetectorXX name** parameter and the trigger assigned in the **TriggerXX output no.** parameter.

The screenshot shows the 'Action Rule Setup' window for an AXIS P5514 Network Camera. The 'General' section has 'Enable rule' checked, 'Name' set to 'Alarm', 'Trigger' set to 'Applications', and 'Schedule' set to 'Always (No Schedule)'. The 'Actions' section shows 'Type' set to 'PTZ Control'. There are 'OK' and 'Cancel' buttons at the bottom.

3. Select the period of validity of the action rule as described for the home position.

Determining action

Define the action to be triggered depending on the camera type.

1. You can use the **PTZ camera** entry to move PTZ cameras to a certain position by triggering an action rule.
2. The **Control** field is displayed for position determination,

This screenshot shows the 'Actions' section with 'Type' set to 'PTZ Control' and an empty 'Control' dropdown menu.

3. If you select the **Preset position** entry, the **Go to** field appears. The selection list of the field contains all positions which were configured in the **PTZ → PTZ positions** menu.

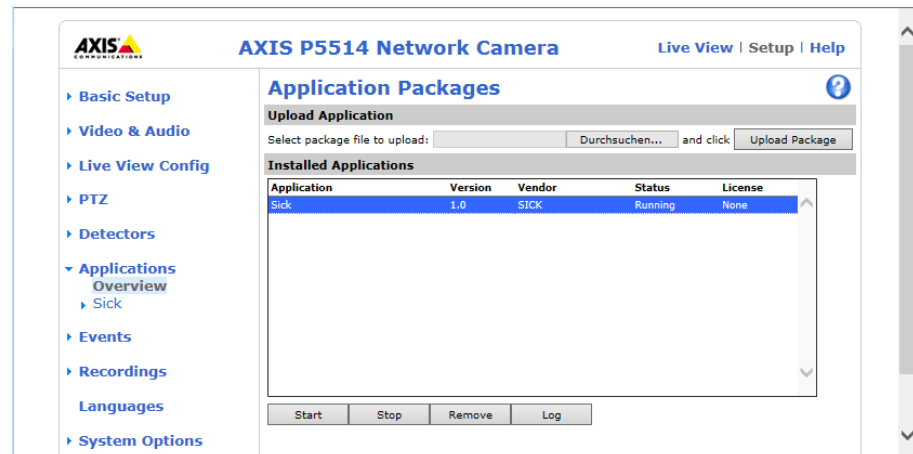
This screenshot shows the 'Go to' dropdown menu open, displaying a list of preset positions: 'Home (H)', 'Alarme1', 'Left', 'Right', and 'Alarme 2'. The 'Return to home pos' checkbox is checked, and the 'Wait at least' field is set to 1.

4. Select the desired position which is to be approached when the trigger is set off.

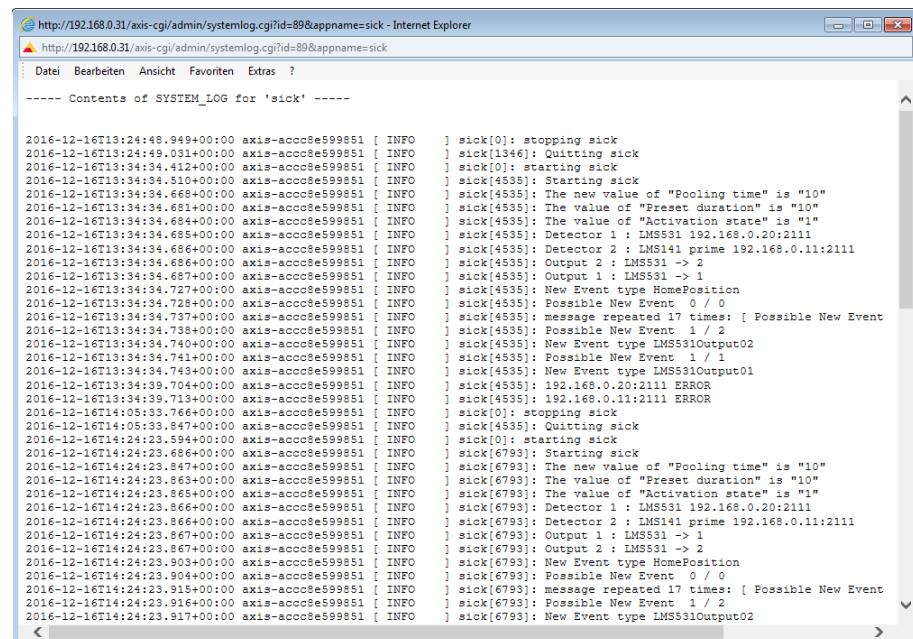
7 Logging applications events

All application events are logged and can be called up via the web interface of the camera.

1. Change to the **Applications → Overview** menu in the menu tree.
2. Mark the SICK plug-in in the list.



3. Click the **Log** button. The log events are displayed in a separate browser window.



8 **Figures and tables**

8.1 List of Tables

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