AXIS T90B Illuminators
Optimized illuminations for Axis cameras
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>LED Lighting and External Triggering</td>
<td>3</td>
</tr>
<tr>
<td>I/O Software Integration</td>
<td>4</td>
</tr>
<tr>
<td>I/O Hardware Integration</td>
<td>4</td>
</tr>
<tr>
<td>Illuminator Settings</td>
<td>5</td>
</tr>
<tr>
<td>Camera Settings and Lighting Control</td>
<td>6</td>
</tr>
</tbody>
</table>
1. **Introduction**

Lighting is a key ingredient for achieving high quality CCTV images at night from any surveillance system, especially during an event on scene. LED lighting can be integrated with a whole variety of security technologies for a fully integrated and intelligent, top level security system. Technologies include cameras, detectors, fibre optic fence line technology, alarms, access control technology, video management systems and many more.

Axis network cameras provide advanced software features and applications which can be integrated with AXIS T90B Illuminators to provide advanced and intelligent illumination control. Axis cameras can trigger AXIS T90B Illuminators on detection of a subject on scene for lighting when and where it is needed. This provides the most flexible, dynamic and interactive lighting set-up intended to detect and deter crime whilst achieving the most energy and cost-efficient installation without compromising system performance.

Both Axis network cameras and AXIS T90B Illuminators allow for the most flexible technology integration across a whole site together with quick, easy set-up and operation.

![Image of LED lighting and Axis cameras](image)

2. **LED Lighting and External Triggering**

Both Infra-Red and White-Light LED illumination can be triggered via Axis cameras or other security technologies to instantly respond to an event on scene. The quick start nature of LED lighting is an important factor, especially for White-Light, in ensuring that the illumination responds quickly enough to detect and deter an intruder in order prevent a crime from taking place. White-Light can also be activated to provide general area illumination for people on site.

Triggering lighting only when needed is referred to as 'Lighting on Demand'. This approach is not possible with many older lighting technologies such as sodium and metal halide lights which are slow to start, making them unsuitable for security critical applications.

Remember: all CCTV systems need illumination at night to provide high quality CCTV images. If you are triggering your visible White-Light illumination only when needed on detection of movement, your Axis camera may still need supporting Infra-Red illumination to enable it to detect movement in the first place.
For this reason, White-Light illumination can often be used alongside Infra-Red illumination. Infra-Red illumination provides high quality covert light that is invisible to the human eye. It helps the Axis camera generate detailed video footage to successfully detect movement, and then trigger the visible White-Light illumination when needed. The White-Light is only triggered for a short and pre-determined amount of time - rather than flooding the scene continuously with unnecessary light. This approach reduces light pollution, conserves energy and reduces running costs, and also creates a much more interactive and responsive system.

Axis network cameras and AXIS T90B Illuminators must be integrated via their hardware AND the camera software to enable the lighting to be externally triggered by the camera.

3. **I/O Software Integration**

   **Camera Software**
   To enable an Axis camera to trigger lighting, you must configure the I/O ports using the Axis camera’s integrated web browser. Camera I/O ports are configured under **System Options > Ports & Devices > I/O Ports**. The output ports can be given a descriptive name and **Normal state** can be configured as **Open circuit**.

   The configuration of I/O ports can differ between camera models, please refer to the camera User Documentation for more information.

4. **I/O Hardware Integration**

   Axis cameras can be integrated with lighting to provide an output trigger to activate the illumination when an event is detected on scene. To do this, connect AXIS T90B telemetry input into the camera I/O (input/output) terminal. For this purpose utilize the purple and orange wires, and connect the purple wire (ground) into pin 1 (ground), and the orange wire into pin 4 (output).

   AXIS T90B telemetry wires are connected together for operation by photocell only as factory default. Telemetry input works in conjunction with photocell to ensure that AXIS T90B doesn't get triggered during the day. Photocell can be disabled by using remote control.
5. Illuminator Settings

External Triggering
AXIS T90B Illuminators can be externally triggered by Axis cameras via motion detection and audio detection software, including the AXIS Cross Line Detection application, following detection of a subject on scene. Infra-Red lighting can be used for continuous surveillance, whilst the quick start nature of White-Light LED technology allows an instant response to threat on alarm, and creates an extremely effective visual deterrent to help prevent crime taking place. It can also provide general area illumination for people on site. It also creates a ‘lighting on demand’ approach for the most energy and cost efficient system.

AXIS T90B IR-LED  AXIS T90B W-LED

Timer function
AXIS T90B units feature Timer Function which allows the illuminator to be triggered and remain ON for a pre-defined period of time. One of the advantages of the Timer Function is that, illumination is provided only for a limited amount of the time, during which quality images can be produced or general lighting be provided. As a result energy savings can be made without compromising safety and practicality. Additional benefit of this function is that it creates greater flexibility and it allows operation of the lighting to match the specific needs of a particular site. There are four pre-defined times: 1 minute, 3 minutes, 10 minutes and 30 minutes. This function can be activated by remote control. As a factory default setting Timer Function is disabled.

Photocell control
Telemetry Input and photocell work in conjunction, so the light will be activated only at night time. Factory default setting is 10 lux ON, 30 lux OFF. Photocell sensitivity can be changed to 5 lux ON, 15 lux OFF or 25 lux ON, 50 lux OFF. This can be done by remote control. To turn ON lamp by Axis camera at any time photocell can be disabled.
6. **Camera Settings and Lighting Control**

Once integrated, AXIS T90B can be controlled in a number of ways from the Axis camera integrated web browser.

**Live View**

The illuminator can be activated manually via the camera output from the Live View page within the Axis camera integrated web browser. Under Live View Config > Output Buttons following options are available: Pulse and Active/Inactive.

Active/Inactive buttons allow you to manually turn illuminator ON and OFF. Pulse activates the output of the Axis camera for a defined period of time. The pulse time can be set as short as 1/100 second, and as long as 60 seconds. For longer periods, the duration can be defined by utilizing timer function available on AXIS T90B remote control.

**Detectors**

Motion Detection, Audio Detection and AXIS Cross Line Detection applications can be used to trigger lighting. Axis cameras can provide an output to trigger AXIS T90B Illuminators when its detection software detects any movement on scene. Similarly when noise levels are detected on scene, the camera can provide an output to trigger the illuminator.

**Motion Detection**

Axis cameras can be configured to generate an alarm and trigger lighting when any motion is detected in a certain area in a given scene.

To set up Motion Detection Include Window follow these instructions:

1. Under the Setup page go to Detectors > Motion Detection.
2. Select a desired resolution for viewing while setting up Motion Detection from the View in list.
3. Select the Configure Included Windows option and click New. Select the new window in the list of windows and enter a descriptive name.
4. Adjust the size and the position of the active window (window with red frame), by dragging the bottom right-hand corner, and clicking on the text at the top and dragging to the desired position.
5. Adjust the Object Size, History and Sensitivity profile sliders. Any detected motion within an active window is indicated by red peaks in the Activity window.
6. Click Save.

To exclude parts of the 'include window', select the Configure Excluded Windows and position the 'exclude window' within the 'include window'.

**Audio Detection**

Axis cameras can be configured to generate an alarm and trigger lighting when audio rises above or falls below the threshold value. The threshold value can be set in the range 0–100 where 0 is the most sensitive and 100 the least sensitive.

To set up audio detection follow these instructions:

1. Under the setup page go to Detectors > Audio Detection.
2. Set the audio alarm level and click Save.

Detected audio is indicated by color peaks in the Activity indicator. An event is triggered when detected audio rises above or falls below the threshold value, which is represented by the bar.
 AXIS Cross Line Detection  
AXIS Cross Line Detection is a tripwire application installable on Axis cameras and encoders. The application can automatically trigger AXIS T90B lighting when it detects moving objects that cross a virtual line. This can act as a deterrent to warn off intruders or can simply act as general area illumination for people on site.

Axis part number for 1 license of AXIS Cross Line Detection software is 0333-011.

Installation  
To install AXIS Cross Line Detection follow these instructions:

2. Using the Axis camera web browser, under the Setup page go to Applications  
3. Under Upload Application, click the Browse button, locate the package file and then click the Upload button.

Once uploaded, a license is needed to run the application. If there is an internet connection, automatic installation will occur. If the camera does not have access to the internet, you can acquire the license key file at www.axis.com/applications from any computer with internet access. You will need a license code and the device's serial number to receive a license key. Enter the license code and customer information and click Install.

'Cross Line' will appear under Installed Applications and in the menu under Packages. AXIS Cross Line Detection will show a status of Idle until an event has been configured. Configuring the event tells the camera what action to take when this application detects an object on scene. Once configured the status will then show as ‘Running’. See the Action Rules section in this paper.

Set up AXIS Cross Line Detection  
AXIS Cross Line Detection application must be started and setup before use. To start AXIS Cross Line Detection, select it in the list and click the Start button.
To set up AXIS Cross Line Detection navigate to the Settings page by clicking Cross Line > Settings and the link AXIS Cross Line Detection Settings under Application Settings.

To set up AXIS Cross Line Detection follow these instructions:

1. Click Add
2. Select the number of segments from Segments drop-down list.
3. To position the line, click and drag it to the desired location in the image.
4. Click Toggle to change the direction the cross line will monitor.
   The direction is represented by a blue arrow. Objects crossing the line, in the direction of the arrow, will trigger the alarm or event. If both arrows are present, both directions are monitored.
   Note: The line will not trigger properly if positioned too close to the edge of the image.
   Check the Visual Confirmation box to verify the line was setup correctly. The line will flash red when touched. To remove a line, click the Remove button.

Note: Once you have set up your AXIS Cross Line detection, motion detection or audio detection, you must set the conditions which defines the action the camera takes when motion or audio is detected e.g. trigger AXIS T90B lighting. These conditions are called Action Rules.

Action Rules
Available Action Rule triggers and conditions to work in conjunction with lighting include:

- **Audio Detection** — triggers the illuminator when audio is detected.
- **Motion Detection** — triggers the illuminator when motion is detected.
- **Cross Line Detection** – triggers the illuminator when moving object cross a virtual line.

To set up an action rule follow these instructions:

1. Go to Events > Action Rules and click Add.
2. Select Enable rule and enter a descriptive name for the rule.
3. Select Detectors from the Trigger drop-down list when Motion Detection or Audio detection should be used.
4. Select Applications from Trigger drop-down list when AXIS Cross Line Detection should be used.
5. Select Motion Detection or Audio Detection from the drop-down list. Select the motion detection window to use if applicable (this option is only available if a motion detection window has been configured).
6. Select **AXIS Cross Line Detection** from the drop-down list. This option is only available if an application has been configured.

7. To activate an output to trigger AXIS T90B lighting on detection of motion or audio, under **Actions**, select **Output port** from the **Type** drop-down list.

8. Select **Output port 1** from the **Port** list and set a state to **Active**.

9. Configure the **Duration** settings. Alternatively specify **Duration of input** the utilize AXIS T90B timer function to specify duration of illumination.

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**Schedules**

Schedules can be used as action rule triggers or as additional conditions e.g. to turn on AXIS T90B lighting at specified times. Use one of the predefined schedules or create a new schedule as described below.

To create a new schedule follow these instructions:

1. Go to **Events > Schedules** and click **Add**.
2. Enter a descriptive name and the information needed for a daily, weekly, monthly or yearly schedule.
3. Click **OK**.
4. To use the schedule in an Action Rule, select the schedule from the **Schedule** drop-down list in the **Action Rule Setup** page.
5. Under **Actions**, select **Output port** from the **Type** drop-down list.
6. Select **output port 1** from the **Port** list and set a state to **Active**.
About Axis Communications

Axis offers intelligent security solutions that enable a smarter, safer world. As the global market leader in network video, Axis is driving the industry by continually launching innovative network products based on an open platform – delivering high value to its customers and carried through a global partner network. Axis has long-term relationships with partners and provides them with knowledge and ground-breaking network products in existing and new markets.

Axis has more than 1,900 dedicated employees in more than 40 countries around the world, supported by a network of over 75,000 partners across 179 countries. Founded in 1984, Axis is a Sweden-based company listed on NASDAQ Stockholm under the ticker AXIS.

For more information about Axis, please visit our website www.axis.com.