Synology

Synology Camera BC800Z Setup Guide

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Introduction

Optimal image quality is essential for leveraging the advanced features of Synology Camera device, including people and vehicle detection, intrusion detection, license plate recognition, smoke detection, and Instant Search. This guide provides an overview of crucial factors and recommended practices to consider when installing a Synology Camera BC800Z. Additionally, it offers detailed instructions on how to configure your camera settings to achieve superior image quality for maximum performance.

Hardware Installation

Camera Placement

Proper camera placement and angle are essential for achieving the desired image quality and coverage.

Define your monitoring objective

Before installation, decide what you want to monitor and which area needs to be captured. This helps you select the best camera position and adjust settings accordingly.

- For full area coverage: If your aim is to monitor a broad area like a yard or a room for overall activity, position the camera to maximize its field of view.
- For specific detection: If you need to detect people, vehicles, or certain events, you might need another camera focused on a specific capture point to ensure a clear image of your target.

Position the camera

Place the camera where you want to capture the image, such as on a wall or ceiling. Make sure it is pointing in the right direction and the viewing angle is correct.

To confirm that the camera's position will meet your needs and cover the intended area, you can check its DORI (Detection, Observation, Recognition, Identification) specifications.

Camera DORI:

- DORI stands for Detection, Observation, Recognition, and Identification. It is an industry standard that defines how much detail a surveillance camera can capture at specific distances.
  - **Detection**: The distance at which the camera can determine if a person or object is present.
  - **Observation**: The distance at which you can see characteristic details, such as a person's clothing, while having a view of the activity surrounding an incident.
  - **Recognition**: The distance at which you can recognize a person you already know.
  - **Identification**: The distance at which you can identify a person beyond a reasonable doubt.
- For more information about your camera's DORI performance, refer to its datasheet.

Adjust the camera angle

Set the camera angle to clearly capture your target area. Avoid pointing the camera too far up, down, or to the side, as steeper angles make it harder to see specific features. For clear facial recognition, the ideal angle is between 10 and 15°.

For corridor views, you can physically roll the camera lens to 90° or 270° and then use the Rotate function to digitally orient the image correctly.

In high-risk locations, consider mounting the camera higher to keep it out of reach from vandals.

Positioning the camera for detection

For effective detection of people and vehicles, follow these recommendations:

- Installation height: 1.5 to 5 m
- Camera tilt angle: 30°
- Maximum detection distance: Refer to your camera's specifications.

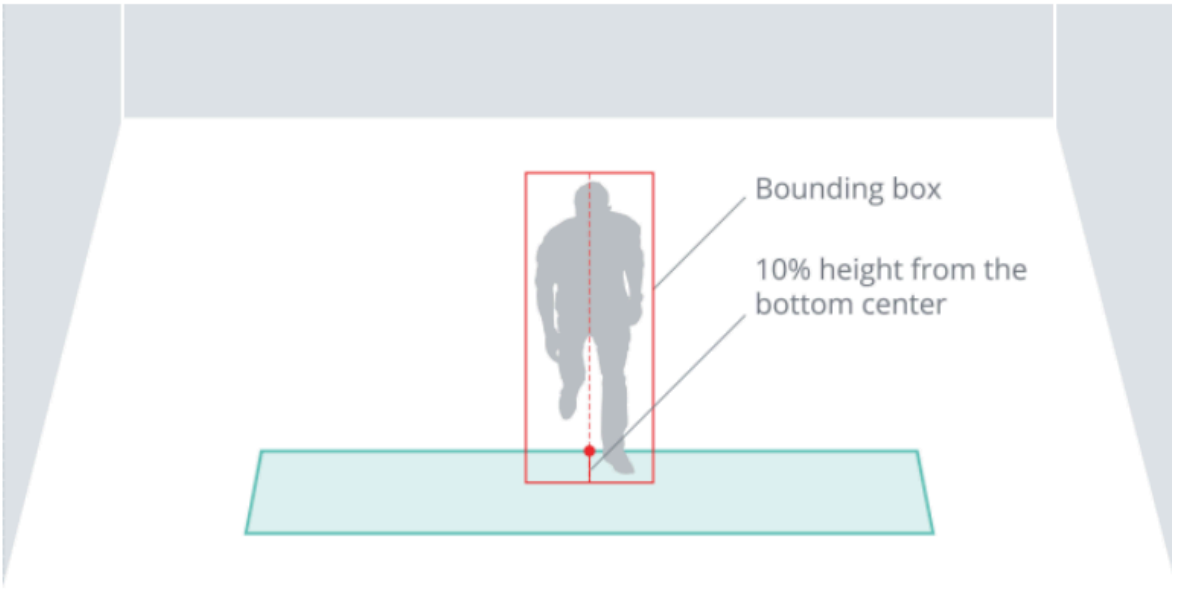
Detection Mechanisms

Once you have confirmed the camera's height and angle, it is also essential to configure the appropriate detection mechanisms. Properly setting up triggers for people & vehicle detection, intrusion detection, license plate recognition, and smoke detection will help ensure accurate and reliable results.

People Detection

A people detection event is triggered when at least 10% of a person's bounding box (measured from the bottom center) enters the detection zone and meets one or more of these conditions:

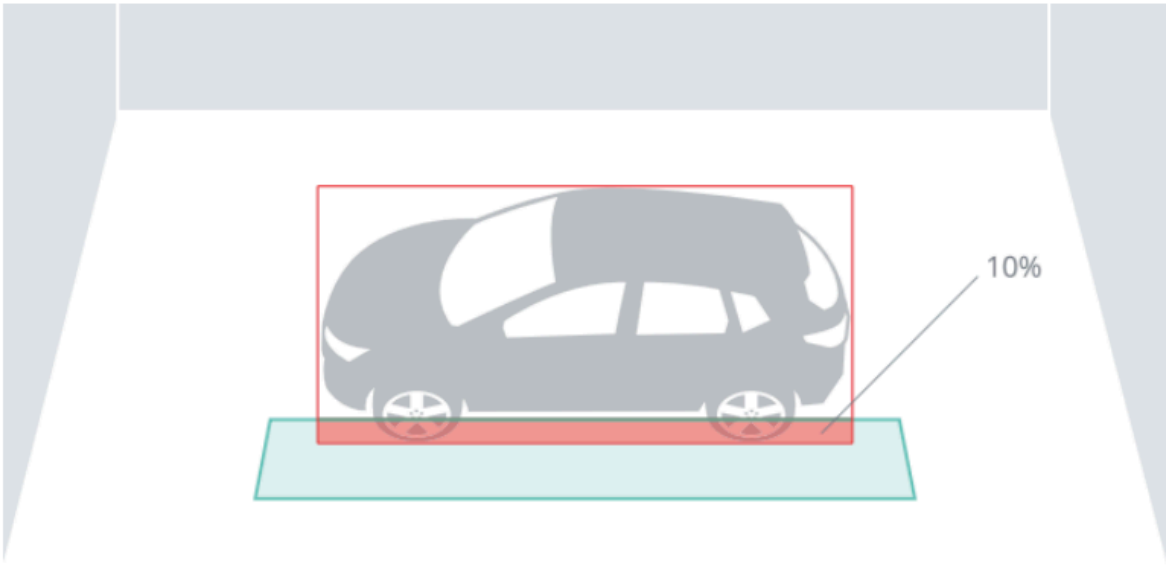
- At least one person is detected
- The number of detected people reaches the specified threshold
- A person remains in the zone for the configured duration



Vehicle Detection

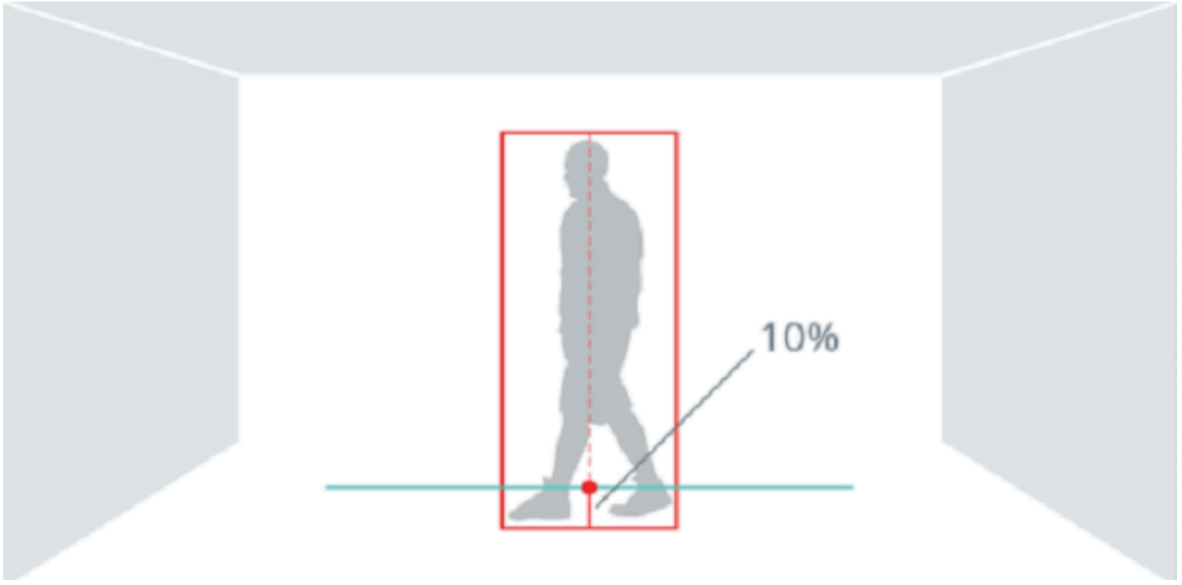
A vehicle detection event is triggered when at least 10% of a vehicle enters the detection zone and meets one or more of these conditions:

- A vehicle is detected
- A vehicle remains in the zone for the configured duration



Intrusion Detection

An intrusion detection event is triggered when a person or vehicle enters the camera's view and the bottom 10% of their bounding box crosses the defined detection fence.

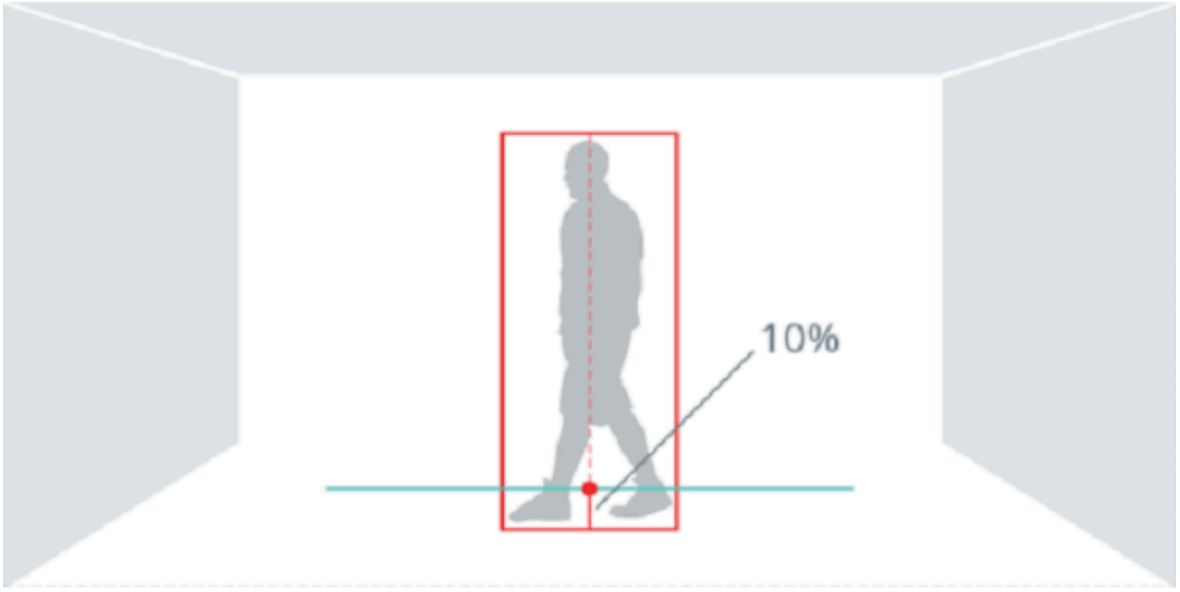


Counting

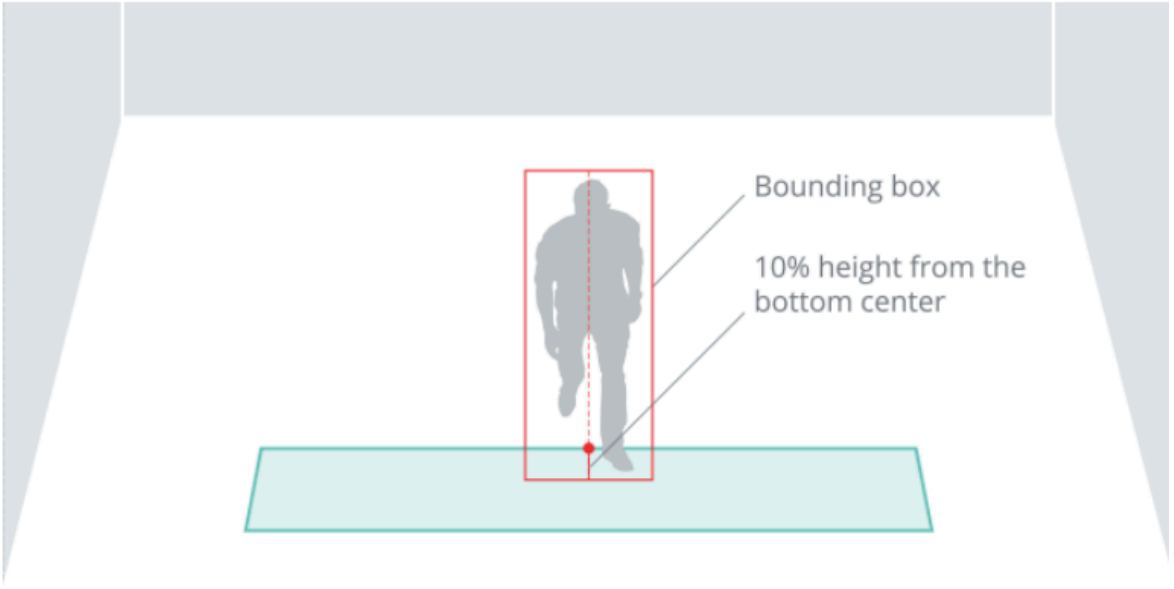
Counting is triggered based on the selected detection method:

- **Line crossing**: The system counts when people or vehicles enter the camera view and the bottom 10% of their bounding box crosses the detection line, according to the specified entry

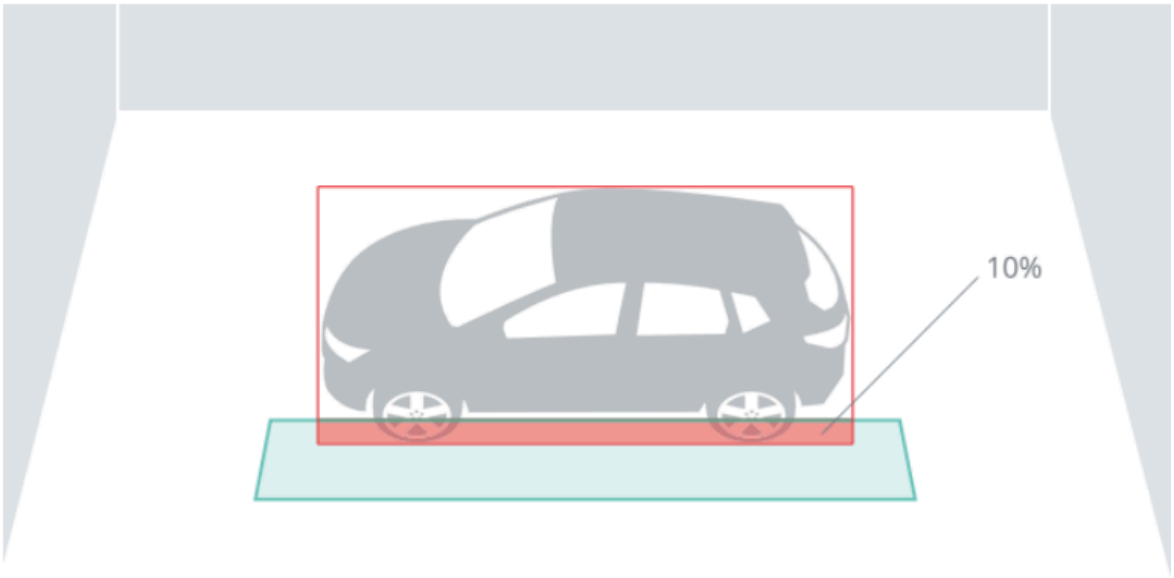
or exit direction.



- **Area**:
  - **People**: The count updates when the number of detected people changes within the area. A detection is registered when at least 10% of a person's bounding box (measured from the bottom center) enters the area.



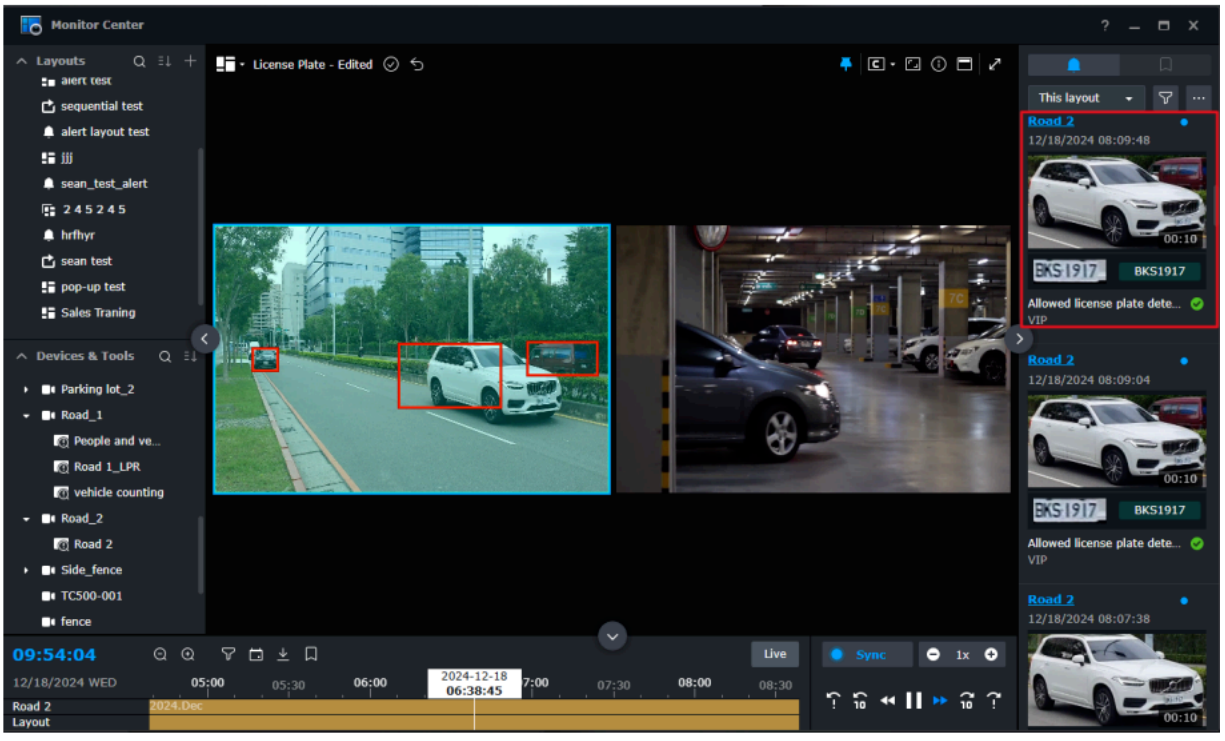
  - **Vehicle**: The count updates when the number of detected vehicles changes within the area. A detection is registered when at least 10% of a vehicle enters the area.



License Plate Recognition

Synology Camera BC800Z specializes in license plate recognition for vehicles accessing designated locations. It supports license plates from specific countries and lets users assign custom labels to plate numbers for managing access rules.

For more information about supported countries, refer to this article.



Smoke Detection

Synology Camera BC800Z offers video-based smoke detection, enabling identification of smoke in both indoor and outdoor environments. For more details about this feature, refer to this document.

IMPORTANT NOTICE:

- The smoke detection feature in the Synology BC800Z does not replace certified smoke detection solution. Synology BC800Z is not a firefighting or fire safety equipment. Users must continue to use certified smoke detection devices to meet regulatory and safety requirements.

Disclaimer:

- The smoke detection feature in the Synology BC800Z is a video analytics tool designed to supplement traditional fire safety systems by identifying visible smoke in surveillance footage. This feature is not certified as a fire or smoke detection system under standards such as EN54 or FM Approval, and should not be relied upon as the sole method for smoke or fire detection—especially in safety-critical or regulated environments.
- Synology does not guarantee that this feature will detect all instances of smoke or prevent fire-related damage, loss, or injury. Users are fully responsible for maintaining adequate, compliant fire safety measures. Use of this feature is at the user's own risk.

Image Optimization

Lighting

Synology Camera is designed for both indoor and outdoor environments, but achieving the best image quality in low-light conditions may require additional lighting. Test your camera under different lighting scenarios and adjust settings as needed to optimize performance.

Avoid backlight

Backlighting can make subjects appear dark and difficult to identify. Position the camera so subjects are not directly in front of strong light sources.

Consider sun direction

For outdoor installations, take into account how sunlight shifts throughout the day. Avoid placing the camera in direct sunlight, as this can impair image sensor performance. Whenever possible, position the camera with the sun behind it.

Other considerations

- Avoid direct reflections from nearby surfaces by pointing the camera and its IR beam away from walls, ceilings, windows, and other reflective objects.
- External lights, such as those from other cameras or white light lamps, aimed at the camera can cause unwanted reflections.
- Small amounts of water, dust, or debris (like spider webs) on the camera dome can reflect IR light and reduce image quality. Mount the camera in a sheltered area when possible, and regularly clean the lens to prevent buildup and contamination.

Software Adjustment

Note:

- For setup instructions, refer to Surveillance Station **Help** > **IP Camera** > **Edit Camera Settings** > **Configure Synology Camera** and and its sub-articles.

Adjust the following settings to improve image quality. You can preview changes using the **Show pre-edited image** feature.

Brightness

Controls the overall lightness or darkness of the image. Increase brightness to lighten dark areas, or decrease it to reduce glare from overly bright scenes.

Contrast

Sets the difference between light and dark areas. Higher contrast makes images clearer and more dynamic, while lower contrast produces a softer, flatter look.

Note:

- Increasing contrast in very dark images may cause more noise or graininess.

Sharpness

Defines the clarity and detail of the image. Higher sharpness enhances the edges and contours of subjects.

Saturation

Adjusts the intensity of colors. Increasing saturation makes colors appear richer and more vibrant.

White balance

Set white balance to a fixed color temperature that matches your scene's lighting (such as fluorescent or tungsten). For more natural colors, switch to manual mode if the image looks too blue and adjust the blue balance as needed.

HDR

HDR (High Dynamic Range) improves image detail and lighting balance by combining multiple frames at different exposures into one image. This produces clearer images with more even lighting across bright and dark areas.

Noise reduction

Noise, which appears as graininess or discoloration in low-light images, can be reduced using denoising features. This helps produce clearer, more natural-looking images.

Exposure mode control

Synology Camera offers Outdoor, Flicker-free, and Manual exposure modes. For outdoor use, select Outdoor mode and adjust the shutter speed and gain to suit your environment.

Shutter

Shutter speed controls how long the camera sensor is exposed to light. Use faster shutter speeds in bright conditions, and slower speeds in low light to capture enough detail. However, slow

shutter speeds can cause motion blur if subjects move, which may affect image quality and video clarity.

Flicker-free

Fluorescent lighting can cause video flicker at certain shutter speeds due to the power frequency —especially in an indoor environment. Enable flicker-free mode to match the camera's frame rate to the local power frequency (usually 50 Hz or 60 Hz) and reduce flicker.

- Set flicker-free to 50 Hz with a shutter speed of 1/100
- Set flicker-free to 60 Hz with a shutter speed of 1/120

If flickering remains after adjustment, try disabling HDR.

Gain

Gain boosts the camera's signal to capture brighter images in low light without changing shutter speed or depth of field. However, increasing gain can also amplify noise and imperfections in the image.

Day-night mode

Synology Camera offers several modes to adapt to changing light conditions: Day (color), Night (black and white), Auto, and Schedule.

- **Day mode**: Provides color images in daylight.
- **Night mode**: Switches to black and white with infrared (IR) light for low-light conditions, or uses White LED for full-color images at night.
- **Auto**: Automatically switches between day and night based on a set illuminance (lux) threshold. The current light level is displayed in the settings to help you choose the right threshold.
    - **Hybrid** (Supplement light mode): The camera can switch modes according to different triggering conditions.
- **Schedule**: Allows you to set specific times for the camera to switch between day and night modes automatically.

Defog

The defog feature uses image processing to enhance clarity in foggy or hazy conditions. This helps reduce the effects of low visibility, making image details easier to see.

Appendix

Further Reading

Manuals

- BC800Z Product Manual
- BC800Z License Plate Recognition Guide
- BC800Z Smoke Detection Guide

Knowledge Center

- Surveillance