BERNARD GRUPPE

Operating Instructions

Control Center

Device Management & Monitoring

11/2026

The **Control Center** provides centralized **configuration and management** of BERNARD devices, **monitoring** of their operational state, and **administration** of your organization.

BERNARD
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Control Center

Use Control Center to configure and manage BERNARD devices, monitor their operational state, and administer your organisation.

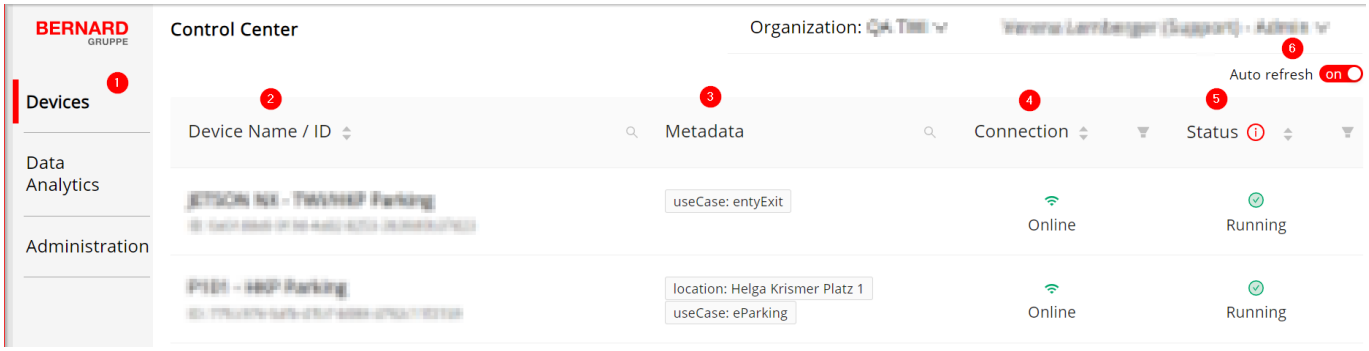
Common tasks

- **Configure and monitor devices:** Set up cameras and data transmission, create schedules, review device health, inspect audit logs, and manage monitoring alerts.
- **Administer your organisation:** Manage users, licences, and device updates.
- **Integrate with Control Center:** Access configuration and device information through the API.
- **Work with events:** Use the event schema when consuming device events in your own systems.

Devices

Under the **Devices** menu item in the Control Center, you can centrally manage your BERNARD devices and configure the cameras so that they generate data according to your requirements for your use cases.

Below you will find a description of the different parts of the device configuration:



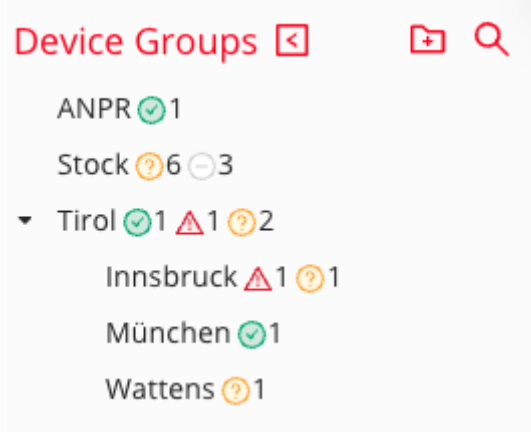
Overview Control Center

Number	Description
1	Switch between devices, Data Analytics and administration
2	***Device Name/ID*** of your hardware. You can customize the device name as you wish. The ID is used for communication between the edge device and Azure Cloud.
3	**Metadata** Organize your devices and create events with predefined metadata. You can define up to five key and value pairs for a device. The keys and values can be freely defined, we support the automatic completion of keys to avoid annoying typing errors. After defining metadata, you can filter the list of devices by metadata values, and the generated events contain the predefined metadata for further processing by your application. Details can be found in the event schema.
4	This connection status (***Connection***) indicates whether a connection has been established between your hardware and the Management Hub (Azure). Available statuses are *Online*, *Offline* or *Unknown*. If a device is unexpectedly offline, please contact our support.
5	The ***Status*** column provides information on whether the software is running on the respective device. Please refer to the section Camera and device control.
6	***Auto refresh*****:** This option allows you to automatically refresh the page as soon as changes are made or a status changes.

Device groups

With Device Groups, devices can be organized and managed in a structured way. This allows you to always keep track of the status of all devices within a group.

The device detail page shows the assigned group below the serial number.



Device groups

Functions

Function	Description
View	Display devices of a specific group or all devices you can access; toggle the filter by selecting or deselecting a group.
Search	Search for groups in your list.
Group Management	Users can create, rename, and delete groups within their access scope; admins can manage all groups. Viewers cannot modify groups.
Assignment	Users can move devices between groups they can access; viewers cannot move devices.
Monitoring	Shows the number of devices in their respective device state. Running: everything is fine. Standby: devices are in standby mode. Unknown: needs attention, the devices are offline. Warning: needs attention, the devices have warnings. Not running: action required, devices have errors. Aggregated: devices that are in the state not configured, pending, or disabled.

Monitoring & status

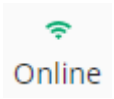
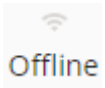
General monitoring

In the Control Center, you will find a basic monitoring status at both camera and device level. This status indicates whether your cameras are operational or whether action is required to get them running.

> **NOTE**
>
> You can find out how to configure automatic e-mail notifications for status changes in this section.

In the camera overview of your devices and dashboards, you will find the camera monitoring, which shows you whether your camera is working as expected. In the device configuration, you will find the device monitoring, which shows the worst status of all cameras running on the device. This allows you to see directly if something is wrong.

Status of the device connection

Status	Description
	The device is ready for operation and connected to power and the Internet.
	The device is offline (no power, no internet, etc.).

> **NOTE**
>
> If, contrary to your expectations, your device is displayed as offline, please contact our support team.

Device status

> **“RUNNING” AND “UNLICENSED”**
>
> At least one enabled camera stream has no license assigned, its license is missing from your organisation's license list, or its license has expired. While the new license management is being introduced, existing streams keep working without an assigned license. This indicator itself does not stop them. You assign licenses yourself in the Control Center. See What does “Unlicensed” mean? for the steps and which settings you can change.

> **WARNING**
>
> Device monitoring depends on the overall worst status to give you a good overview directly in your device list if a camera is not working as expected.

Status	Description
Running	**Everything is fine** - all cameras configured on your device are working as they should.
Not configured	At least one camera on the device is **not configured**. Check the status in the camera monitoring for more details.
Not Running	At least one camera **is not sending data** as expected.
Warning	At least one camera on the device has the status *Warning*.
Unknown	The device is **offline**. Check that the hardware is connected to the power supply and that there is a network connection.
Pending	If you have just changed the **configuration of one of the cameras**, this status is displayed for a maximum of five minutes before the status is determined again.
Disabled	At least one camera is **deactivated**.

Status of the streams

> **TIP**
>
> This status takes into account the system, the camera input, the MQTT connection and, if configured, the connection to the I/O device.

Status	Description
Running	Everything is fine and your camera is running as expected. The software is also running smoothly, the camera connection is available and the MQTT broker is connected.
Not configured	The camera is not configured. You must configure the camera and data connection as well as your respective configuration according to your use case.
Warning	Data is still being generated and delivered, but there are problems that could affect the accuracy of the data. **Problem types:** a) **Video images** cannot be retrieved correctly; at least 10% of the images are incorrect b) **Performance issues**: The number of fps is below the minimum limit of the configured event types c) **I/O event delivery unreliable:** more than 5% and up to 80% of the events cannot be delivered to the I/O device (BMC or Quido). Some events may not reach the traffic controller. Check the cabling, power supply and I/O device configuration. The error rate also includes the periodic BMC heartbeat, so this warning can appear even if no rule is configured.
Not Running	The stream is not operational: the software does not run, or events cannot be delivered. **Problem types:** **a) Docker container and/or software is not running correctly**, please contact support. **b) Data cannot be sent to MQTT endpoint:** there are more than 10 MQTT events that have been sent

Status	Description
	to MQTT broker for at least 10 seconds without success. Please check whether the broker is active. Events generated during temporary connectivity interruptions are stored according to the documented offline event buffering limits. **c) Camera not connected:** The camera connection cannot be established. Check whether the camera is switched on and whether the camera data (user name, password) is configured correctly. **d) I/O event delivery unreliable:** more than 80% of the events cannot be delivered to the I/O device (BMC or Quido). Check the cabling, power supply and I/O device configuration.
Unknown	The device might be offline or not powered. Check the power supply and network connection.
Pending	If you have recently adjusted the configuration, the status is set to *Pending* for about five minutes until the correct status is determined.
Disabled	The stream is deactivated and can only be reactivated if sufficient licenses are available. This status can also be used to save a configuration for a later point in time without the device currently being required.

Configuration

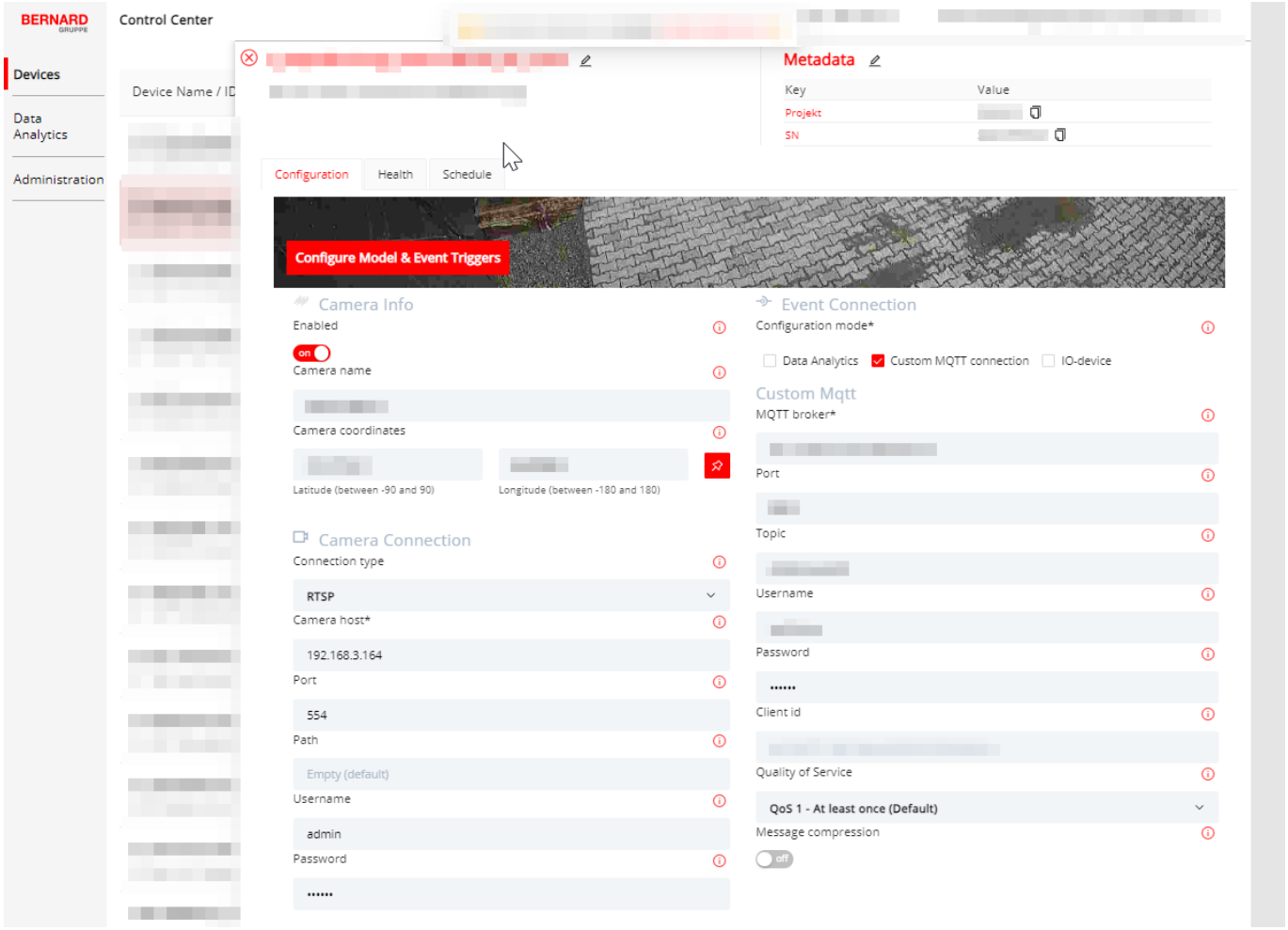
Management of your devices

To access the device configuration page, simply click on the respective device in the "Devices" list view.

> **TIP**
>
> Use a **logical naming scheme** for your devices to keep the configuration organized.

Camera configuration

Clicking on one of the displayed cameras opens its settings. Once you've configured the camera connection, you'll see a live image.



Camera Configuration

Data transmission

Your devices send events to an MQTT broker whenever a trigger condition is met.

Custom MQTT lets you send events to an MQTT broker that you provide. The event format definition is available here.

- Use the `ssl://` prefix for the broker address to enable transport encryption.
- Message compression can save up to 50% of the bandwidth used to send events. Ensure that both the broker and the consuming application support decompressing zlib/deflate payloads.

Offline event buffering

If a configured MQTT connection is temporarily unavailable, the device stores outgoing events locally. Buffered events are forwarded automatically after the connection is restored.

Each configured Custom MQTT or Data Center connection has its own independent buffer:

- Up to **24,000 event messages per connection** are retained.
- For connections configured to embed ANPR images, up to **100 event messages per connection** are retained.
- When a buffer reaches its limit, the **oldest messages are discarded first** to make room for new messages.

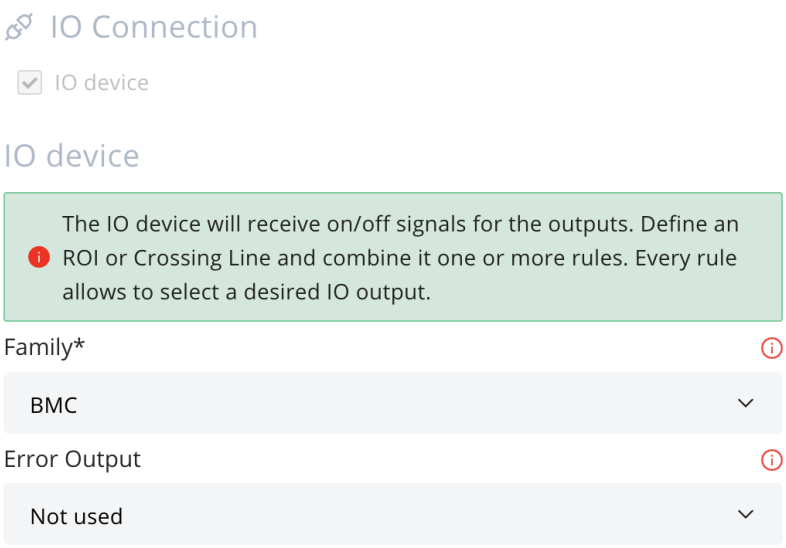
The effective buffering duration depends on the event rate and whether embedded ANPR images are enabled for the connection.

> **NOTE**
>
> Local event buffering is intended to bridge temporary connectivity interruptions. It is not a permanent event archive. For long-term retention, the receiving system must store the delivered events.

IO connection

The IO connection enables external IO devices that receive on/off signals to drive outputs. Define an ROI or a Crossing Line and combine it with one or more rules. Each rule allows you to select a desired IO output.

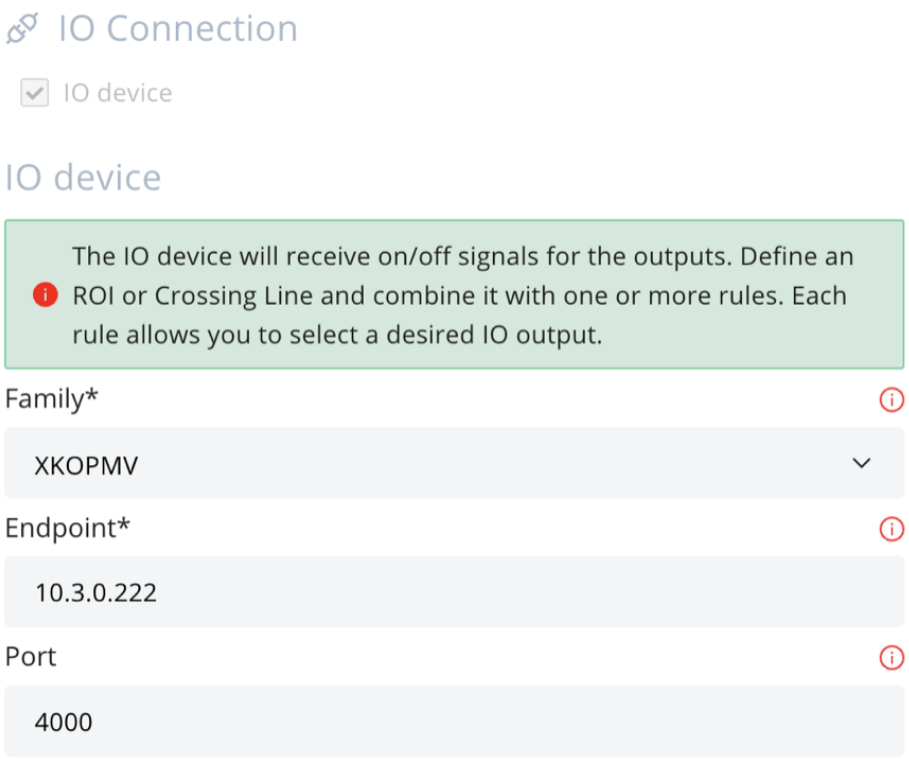
Output behavior is configured per camera stream. Enable **IO device** and select the required **Family** for the connected IO device.



IO connection settings.

Supported IO device families:

Family	Description
BMC	Uses potential-free contacts. Up to 12 contact outputs can be configured. The BMC connects up to 4 BMAs and is used as an interface between BMA TLC and a traffic light controller. An optional error output can be configured.
Quido	Uses potential-free contacts. Supported variants are Quido 4/4, Quido 8/8, Quido 2/16, and Quido 2/32 with 4, 8, 16, or 32 outputs. Control Center warns if the same output is assigned more than once.
XKOPMV	Ethernet-based protocol for traffic light controllers. Each camera stream uses its own IP address and port. Up to 12 contacts can be configured for each stream.



XKOPMV IO connection settings.

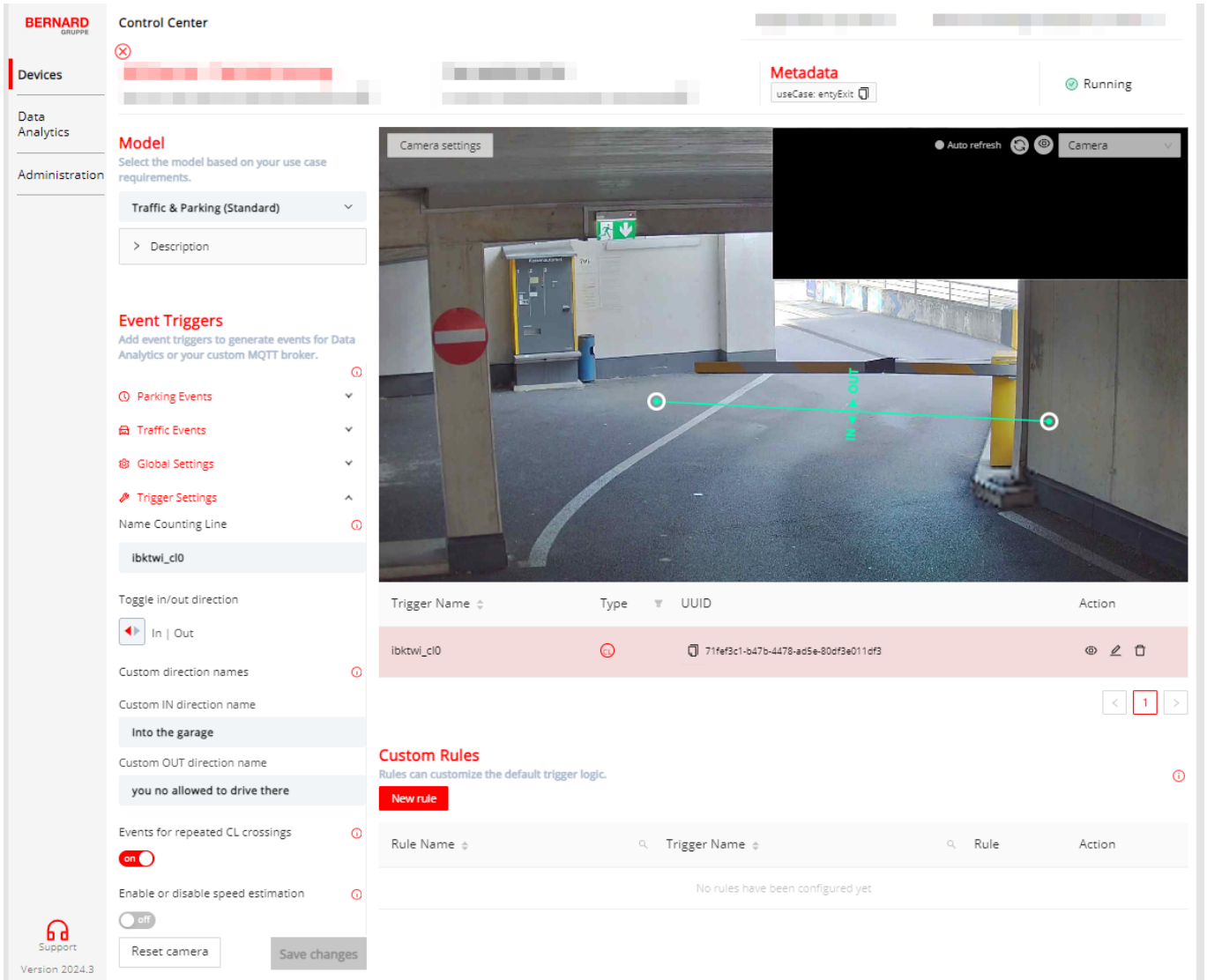
Rules and outputs are configured in **Models & Event Triggers**. Rules can be based on a **Region of Interest (ROI)** or a **Crossing Line (CL)**:

- For an ROI, the output remains active while the configured condition is fulfilled.
- For a Crossing Line, the output closes briefly when the configured rule is fulfilled.
- With Presence and Counting, the output remains active while at least one matching object is present in the ROI and briefly toggles when a new matching object enters the ROI.

One contact can be used as an error output to signal device errors to the controller. For details, see Configuration of the error output.

Models & Event Triggers

In the configuration, you can select the model that suits your use case and configure event triggers. For guidance, consult the corresponding section in the solution areas.



Configuration of the model and event triggers

Models

Below you will find a brief description of each model. Different models are recommended depending on the solution.

Traffic & Parking (Standard)

Detection of 12+1 object classes in the context of traffic and parking.

Typical use cases	• Traffic counting • Turning movement counting • Traffic flow

	• Adaptive traffic control • Entry/exit counting
Classes	• car • van • car with trailer • single unit truck • articulated truck • truck with trailer • bus • tram • motorbike • person • bicycle • scooter • other

See the class definition for a detailed description of the classes.

Traffic & Parking (Accuracy+)

Detection of 12+1 object classes in the context of traffic and parking. Optimized for higher accuracy while processing with roughly half the speed (measured in FPS) compared to Traffic & Parking (Standard).

Typical use cases	• Parking – Single Space Detection
Classes	• car • van • car with trailer • single unit truck • articulated truck • truck with trailer • bus • tram • motorbike • person • bicycle • scooter • other

See the class definition for a detailed description of the classes.

ANPR

ANPR detects single-line and two-line number plates and recognizes plate text, area code, and country code.

Typical use cases	Parking – ANPR
Format	EU licence plate standard format **Examples of single-line**   **Examples of two-line**  
Classes	numberplate
Countries	EU countries + (Switzerland, Norway, Liechtenstein)
Recognition of region of the licence plate	Austria, Germany, Switzerland, Bulgaria, Czech Republic, Greece, Croatia, Ireland, Norway, Poland, Romania, Slovakia, Slovenia

> **What is the difference to Traffic & Parking (with Parking Mode ANPR)?**
>
> Traffic & Parking (with Parking Mode ANPR) first detects a vehicle and then detects a number plate within that region. ANPR mode skips vehicle detection and instead detects number plates within the full camera image. Both modes use the same underlying ANPR models for plate detection, classification, and recognition.
>
> In comparison to Traffic & Parking (with Parking Mode ANPR enabled):
>
> - Only the number plate must be clearly visible; the full vehicle is not required, and only the plate is pixelated in Control Center.
> - All number plates in the camera frame are detected; vehicles with multiple plates (for example, trailers) are fully captured.
> - No other objects like cars, buses, or people are detected or classified.
> - Only available via Custom MQTT connection; Data Center is not supported.

People: Full Body

The full body of a person is detected.

Typical use cases	People counting
Classes	Person

People: Head

The head of a person is detected, beneficial if the full body is not visible and if distance to objects is less than 5m.

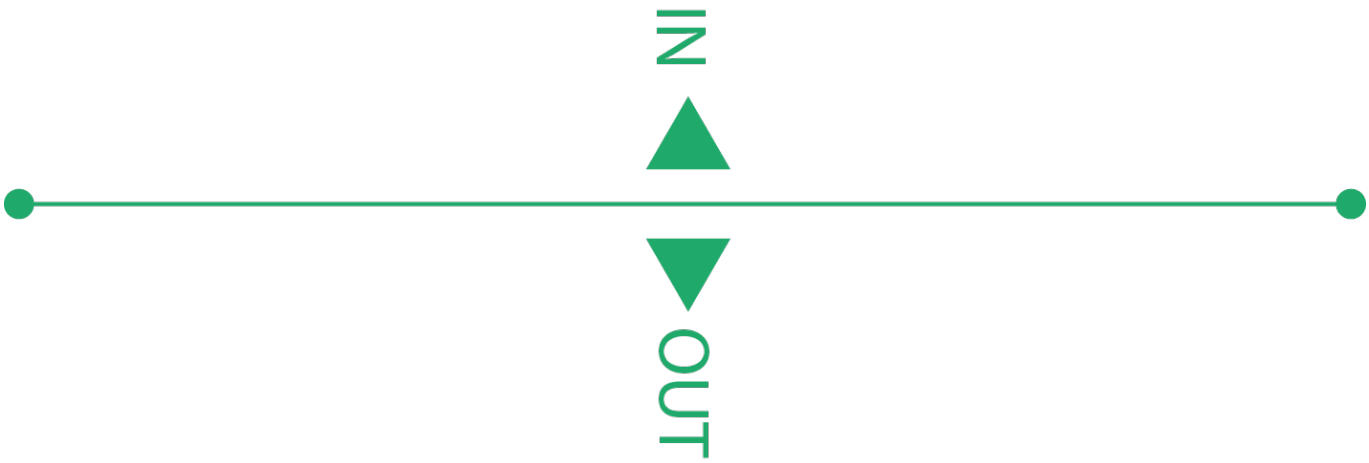
Typical use cases	People counting
Classes	Person

Event triggers

Event triggers create an event when a defined condition is met.

Crossing Line (CL)

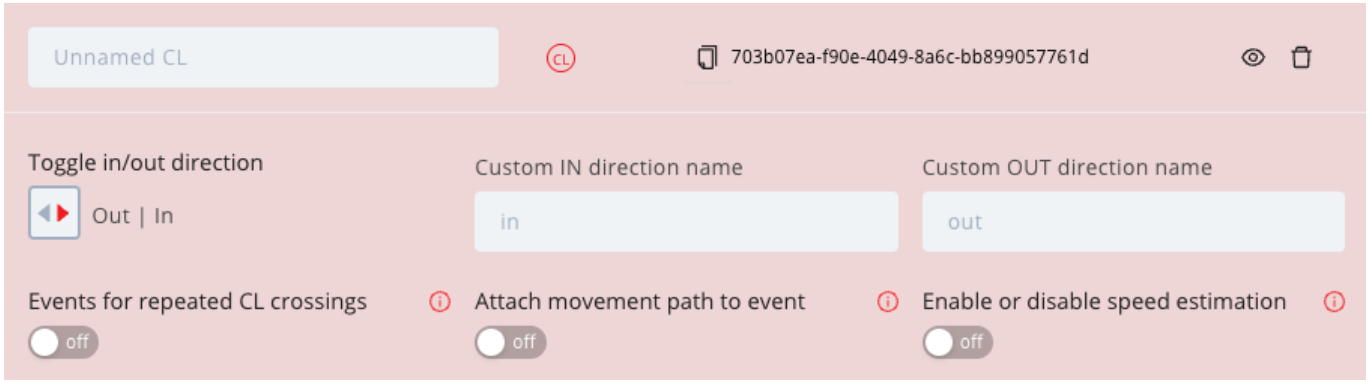
A **Crossing Line (CL)** triggers an event as soon as the center point of an object crosses the line.



The CL also logs the **direction of travel** in which the object crossed the line, distinguishing between **In and Out directions**. You can swap the In and Out directions at any time. Furthermore, a custom name can be assigned to both directions.

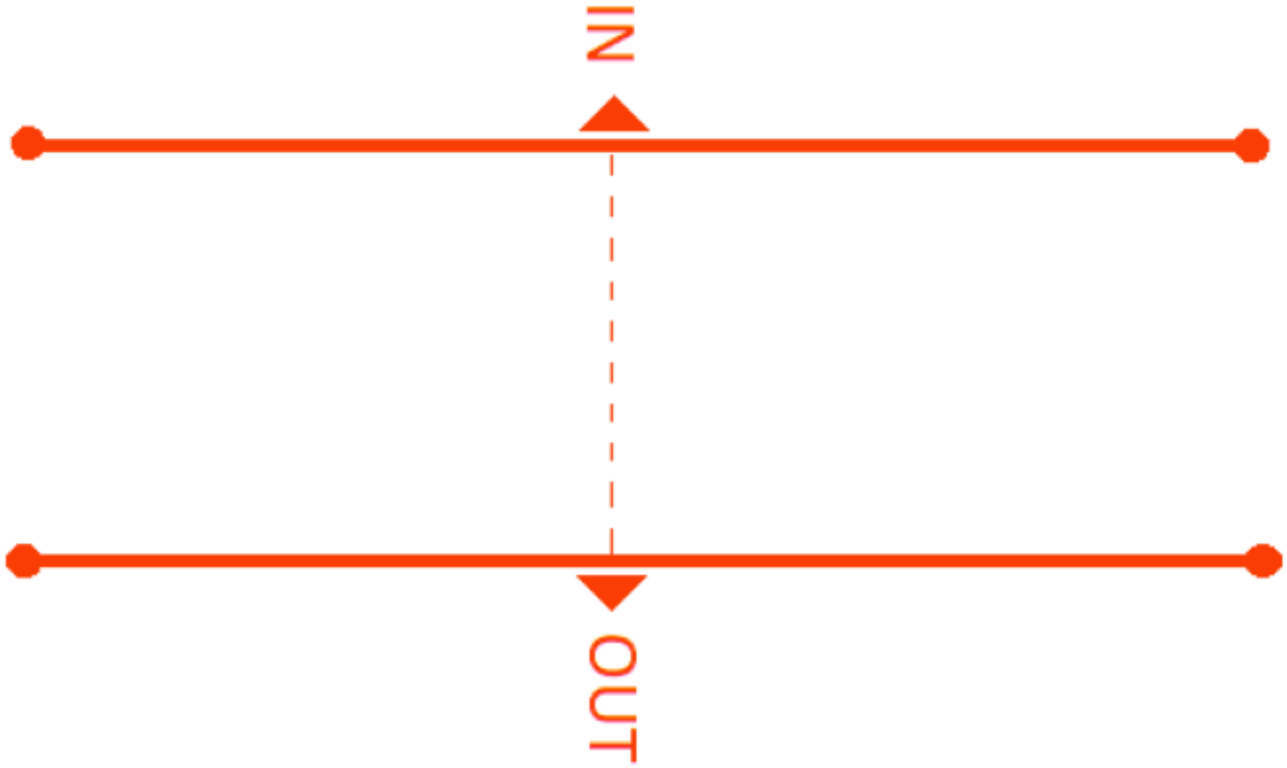
By default, a CL counts each object only once. If every crossing is to be counted, there is an option to activate events for repeated CL crossings, with the caveat that counts are only considered if there's a five-second interval between them.

Enable **Attach movement path to event** to include up to 10 track points in the payload; if a path has more than 10 points, intermediate points are skipped.



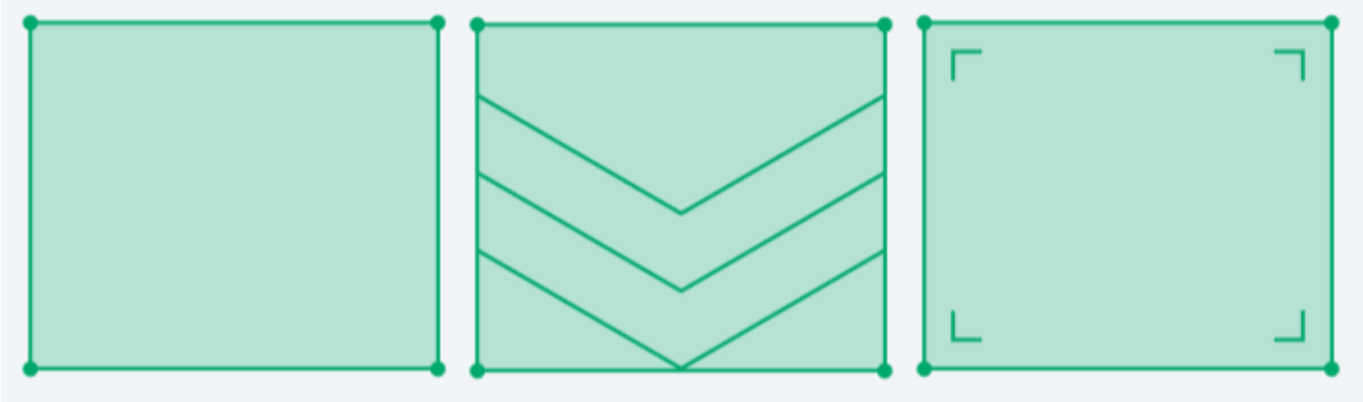
Crossing Line options

Speed estimation can be activated as a trigger option for a CL. Configure the physical distance in meters between the lines. For optimal results, use a straight section without curves or inclines.



Region of Interest (ROI)

A **Region of Interest (ROI)** consists of four points that form an area. An ROI triggers an event after a defined time interval or when the occupancy changes from occupied to unoccupied (or vice versa).

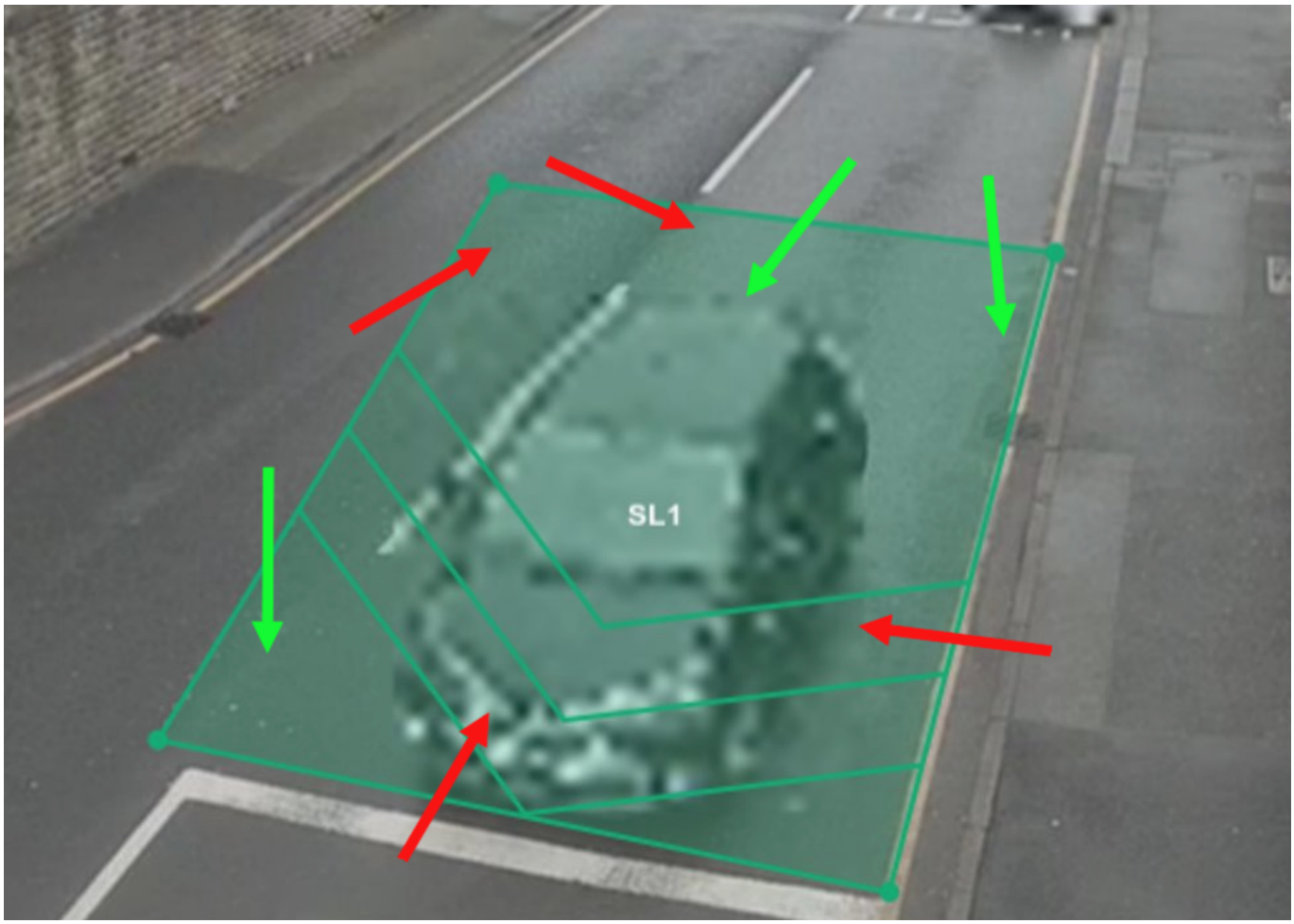


Options	Description
ROI type	• **Generic**: Default mode. Detects objects whose center is inside the ROI. • **Directed**: Detects objects entering the ROI from a specified direction (tolerance ±60°). • **Occlusion**: Detects objects whose center is inside the ROI or that fully occlude the ROI with their bounding box. • **Parking**: Deprecated and not supported by the Data Center. Use Generic instead.
Trigger action	• **Time**: By default, an event is generated every 10 seconds. The time can be adjusted.

Options	Description
	• **Occupancy**: An event is generated when the ROI's occupancy changes. If the number of detected objects in the ROI reaches the defined maximum capacity, the ROI is considered occupied. • **Rule**: If a rule has been defined for the ROI, this field becomes active. By default, an event is generated at most every 10 seconds; this cool-down time can be adjusted.

ROI type "Directed"

The valid range for entry angles of a directed ROI is represented in the Control Center by the three arrowheads in the ROI. The following image shows examples of valid (green) and invalid (red) entry angles of object trajectories. Tracks that start within a directed ROI are always considered valid, regardless of direction.

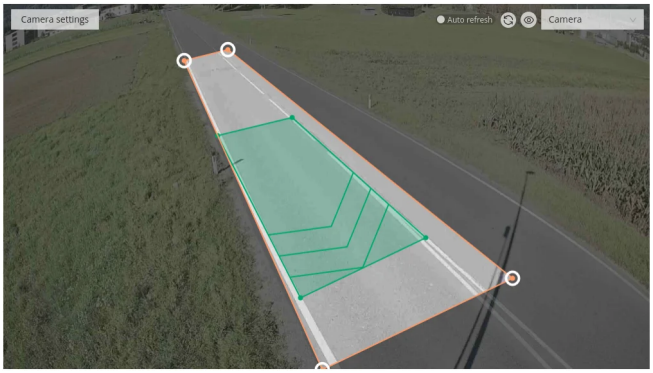
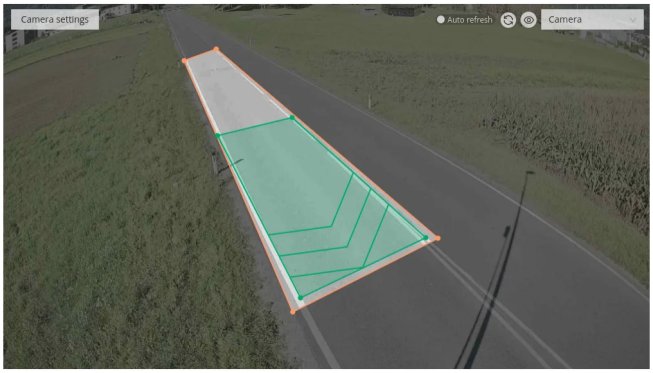


To filter out objects entering a directed ROI from the wrong direction, objects must have been tracked for at least **0.1 seconds before entering the ROI**. Allow enough space for this tracking when positioning the ROI:

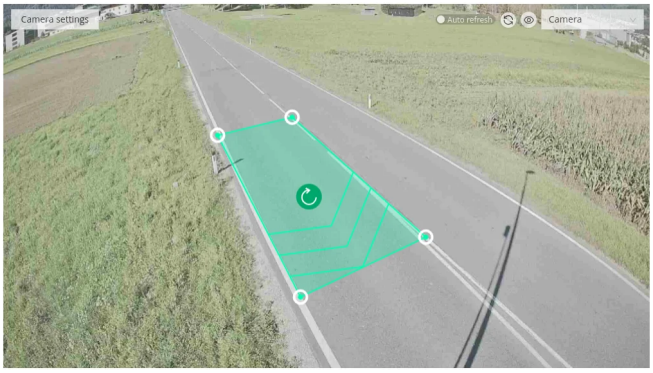
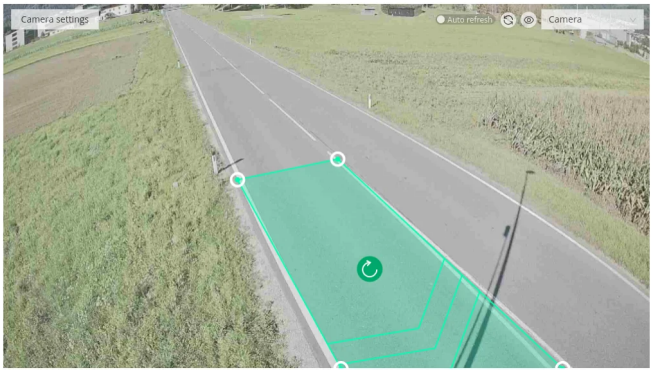
- **Keep the Focus Zone boundary far enough from the directed ROI.** No tracking is performed outside Focus Zones. If a Focus Zone is drawn too tightly around the ROI, an object may enter the ROI before it has been tracked long enough to determine its entry direction, so it will not be filtered out even if it is moving in the wrong direction.

- **Keep directed ROIs far enough from the image border.** An object entering the image must be tracked for at least 0.1 seconds before reaching the ROI. If the ROI is too close to the image border, an object may enter it before enough tracking history is available and will not be filtered out when moving in the wrong direction.

Focus Zone placement (orange boundary around the green directed ROI):

Good configuration	Bad configuration
	
Space before the ROI allows objects to be tracked before entry.	The Focus Zone is too tight around the ROI to allow sufficient tracking before entry.

Distance from the image border:

Good configuration	Bad configuration
	
Space between the image border and the ROI allows tracking before entry.	Objects entering at the bottom image border can trigger the ROI without prior tracking.

Origin Destination Zone (OD)

An event is triggered when an object's trajectory has moved across at least two **OD zones**, with the first and last zones of the event being used.

The first zone an object passes through is called the **Origin** zone, and the last zone the object passes through is called the **Destination** zone. The event is triggered when the object's sighting ends, for example, when the object moves beyond the edge of the image.

Raw Track Event

A **Raw Track Event** records the full trajectory of an object. The trigger fires once the track is finished—for example, when the object leaves the camera view.

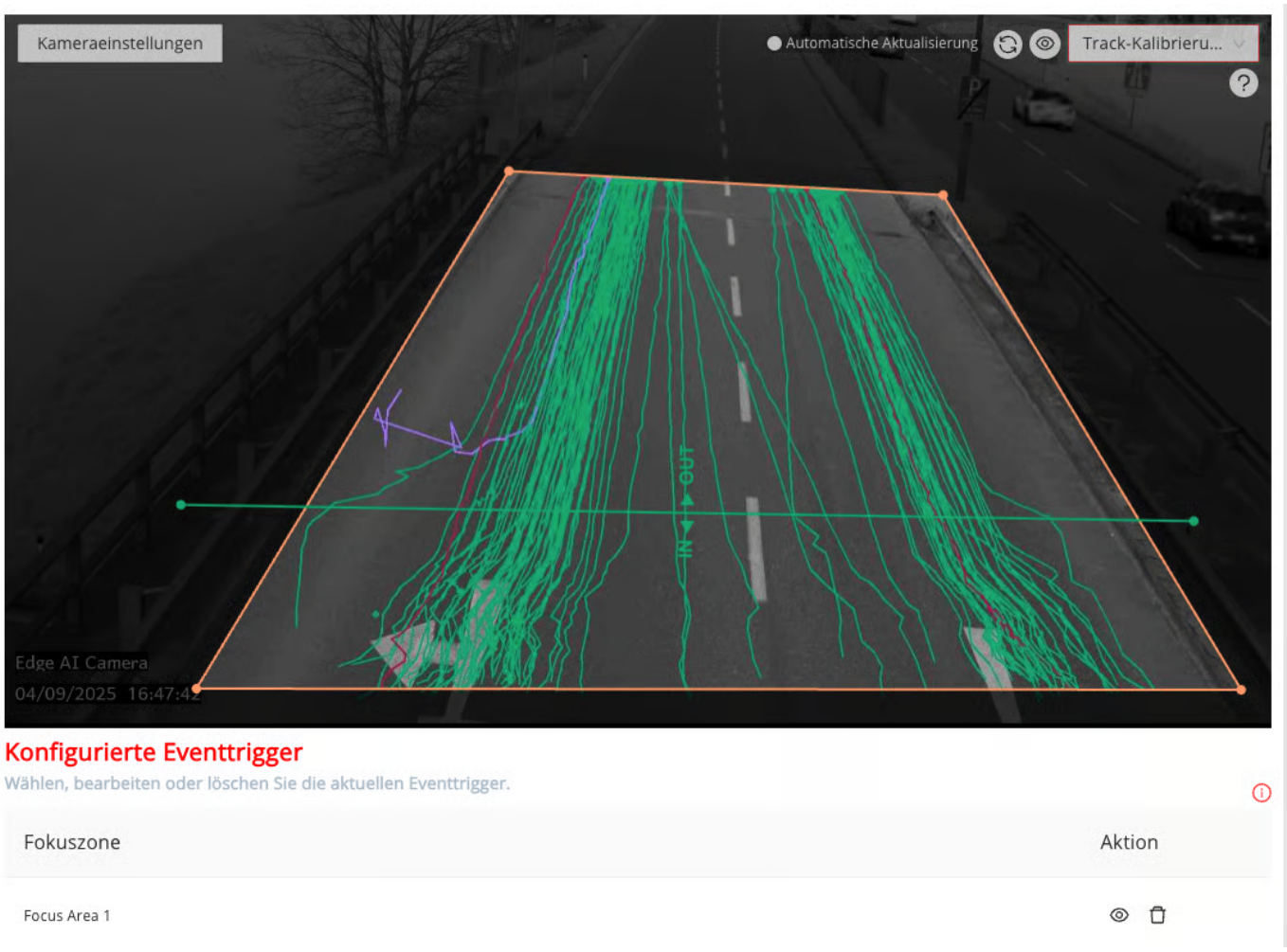
Focus Zone

A **Focus Zone** defines an image area where object detection for tracks is considered. Object detection is active even outside the Focus Zone, but objects detected outside it aren't used for creating tracks. This means objects are pixelated throughout the entire image, regardless of the Focus Zone.

Classification and license plate recognition (if activated) only occur for objects detected *within* the defined Focus Zone.

Using Focus Zones allows for targeted system optimization:

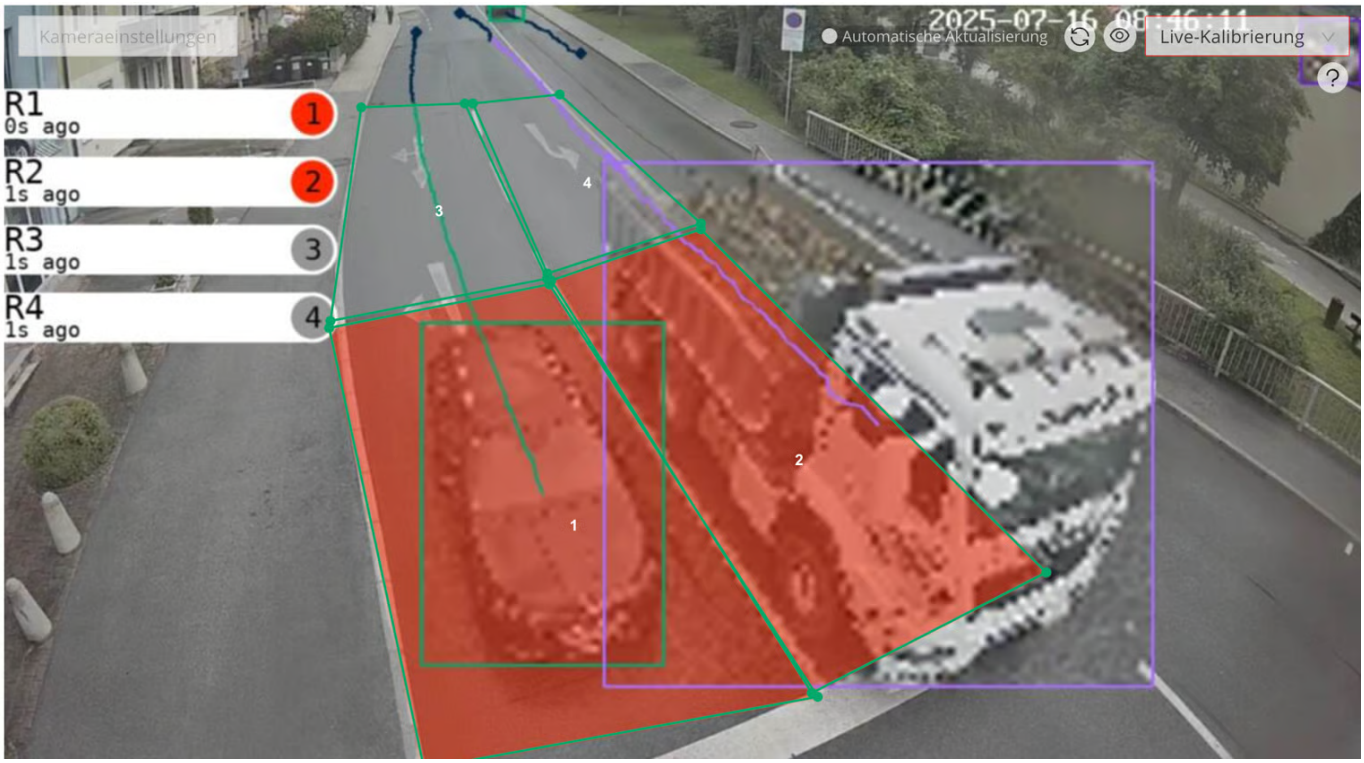
- **Improved Tracks:** The Focus Zone can limit where tracks are formed. For instance, Focus Zones can be defined to exclude the image's border areas, preventing unwanted merging of tracks.
- **Improved Classification:** The Focus Zone can restrict the area where classification takes place. For example, areas where vehicles are too small for successful classification can be excluded by Focus Zones.
- **Increased Performance:** Concentrating on essential image sections reduces the computational effort for classification and license plate recognition (if activated) for objects. This positively impacts the accuracy of object tracking, classification, and potentially license plate recognition.



Calibration

Live Calibration

For optimal system calibration during commissioning, **Live Calibration** provides a real-time visualization of detected and classified objects. In addition, it also displays the triggering of events and rules – including the associated **BMC contacts**.



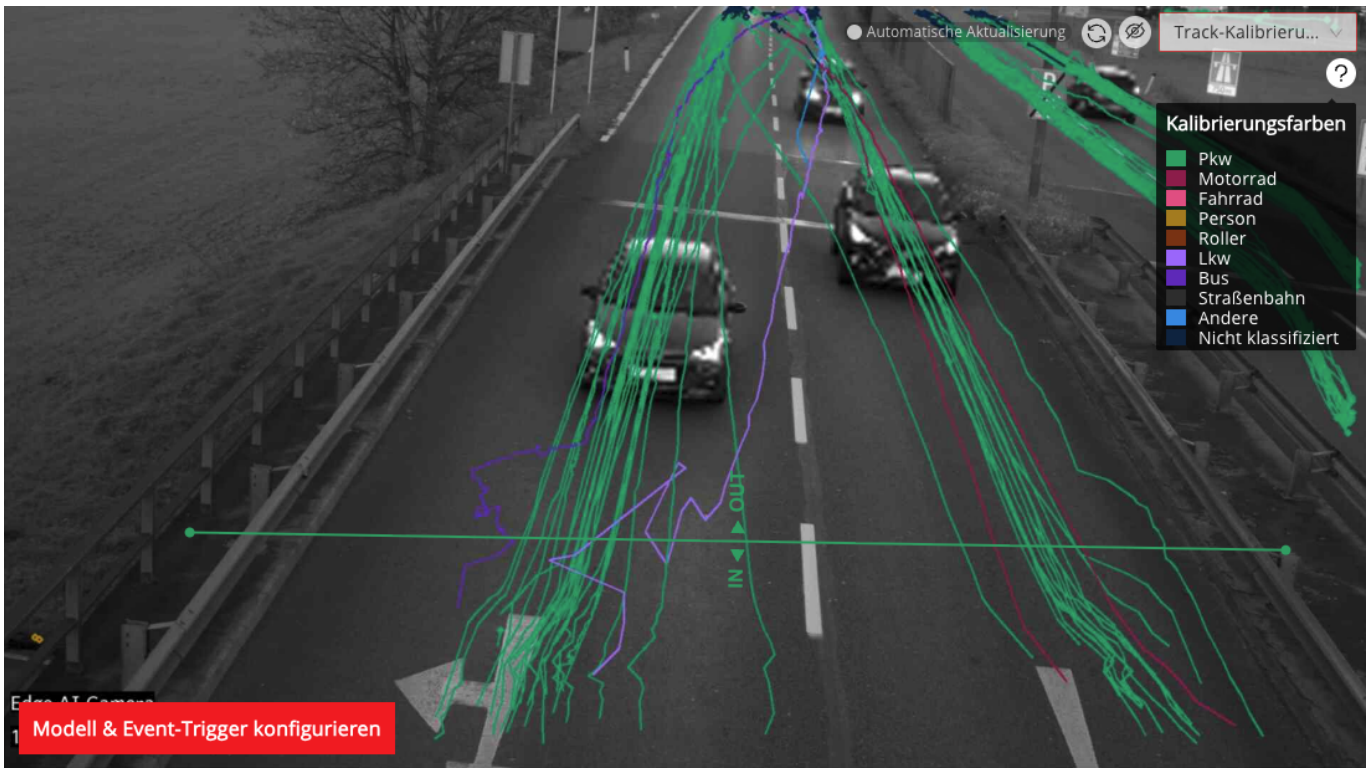
Features

- **Object Detection & Classification**
- Objects detected by the selected model are highlighted with bounding boxes.
- The center point of each object is tracked and visualized as a trajectory.
- To ensure privacy, objects are pixelated.
- Overlays are color-coded according to the object class (e.g., Green = Car, Violet = Truck, Pink = Bicycle). A legend on the right-hand side explains the applied colors and classifications.
- **Rules & BMC Contacts**
- Configured rules are displayed in an overview in the upper left corner of the screen.
- The following information is shown:
  - Rule name
  - Time of the last trigger
  - Optionally, the associated BMC contact
- **Status display:**
- Gray = Rule inactive

- Red = Rule active

Track Calibration

The **Track Calibration** is an important tool for **optimal positioning** of the **Event Triggers**: It displays a live camera image and overlays it with the last 100 tracks, where each track visualizes the trajectory of a detected object.



Track Calibration helps to determine:

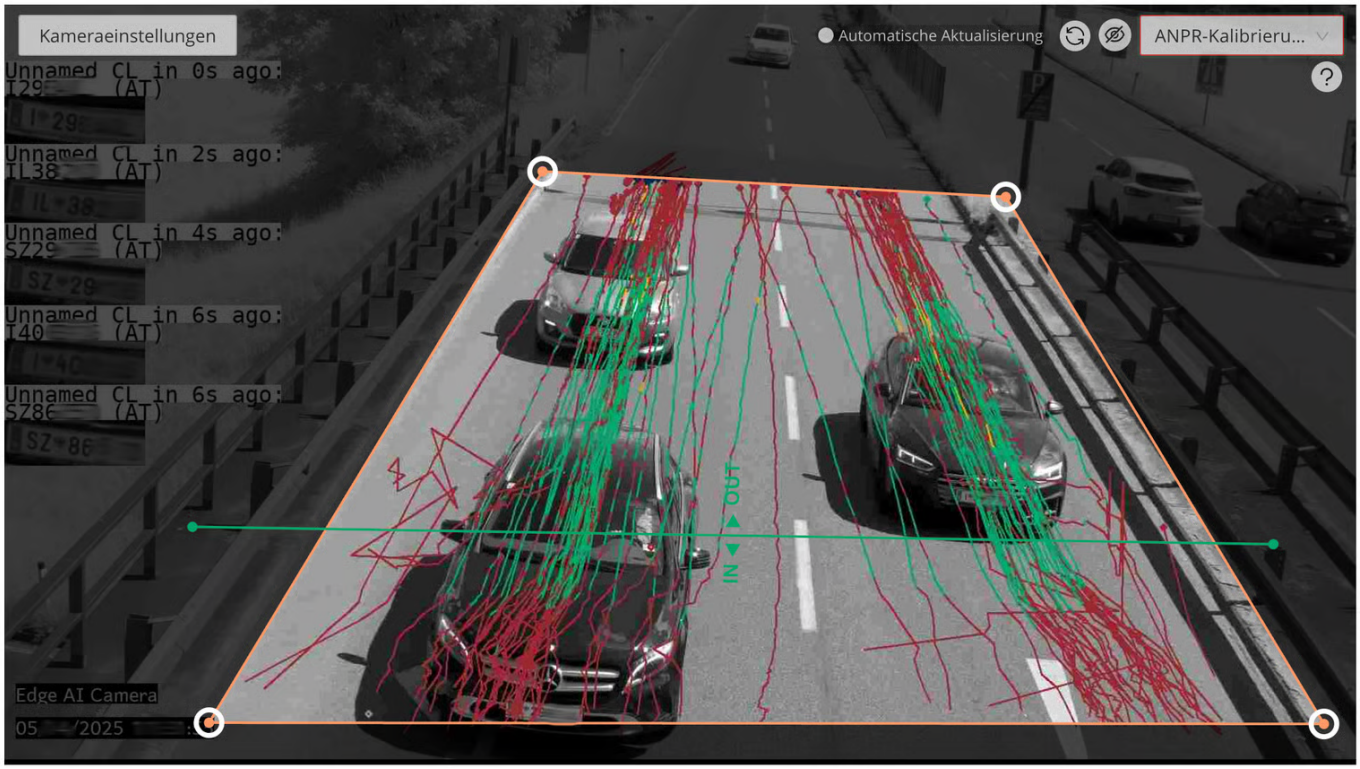
- How objects and their tracks were classified.
- If tracks are continuous or interrupted, for example by obstructions.
- From what point objects are large enough for classification.

ANPR Calibration

The **ANPR calibration** is used for **visual verification** and **fine-tuning** of automatic license plate recognition. ANPR calibration enables:

- **Optimization of device mounting and alignment** for optimal automatic license plate recognition.
- **Optimal positioning of Crossing Lines** for optimal results.
- **Diagnosis of the data quality** of license plate acquisition.

> **TIP**
>
> Set the Crossing Line at the end of the green tracks in the direction of travel.



ANPR overlay description

The most recently recognized license plates (top-left in the image):

- The **Crossing Line name, direction of travel, and time** of the last five recognized license plates are displayed.
- The **recognized license plate text and image cutout** are shown, allowing for manual verification of the results.

Color-coded trajectories in the focus area (center of the image):

- Real-time camera image with **color-coded trajectories** for vehicle movements and ANPR recognition quality.
- **Best ANPR**: Optimal recognition – license plates were read correctly.
- **Inconsistent ANPR**: Ambiguous or unstable recognition.
- **License plate not detected**: Vehicle detected, but no license plate found.
- **Object too small for ANPR**: Vehicle too far away or too small, ANPR not possible.
- **Class not relevant for ANPR**: Object detected, but the vehicle class is not relevant for ANPR (e.g., pedestrians, bicycles, scooters, trams).

Focus Zone: A rectangular detection area with an orange border, within which ANPR recognition occurs.

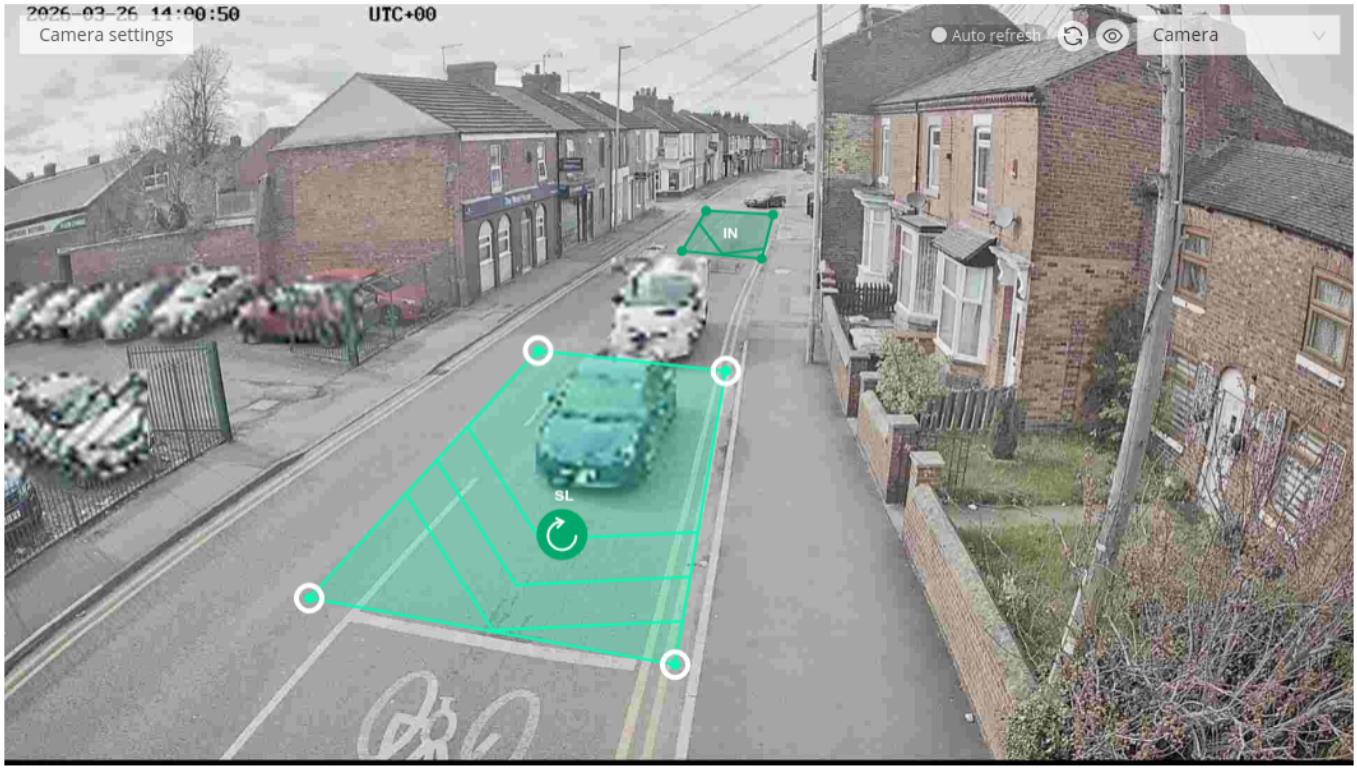
Camera settings

Changing camera settings requires the User or Admin role and access to the device.

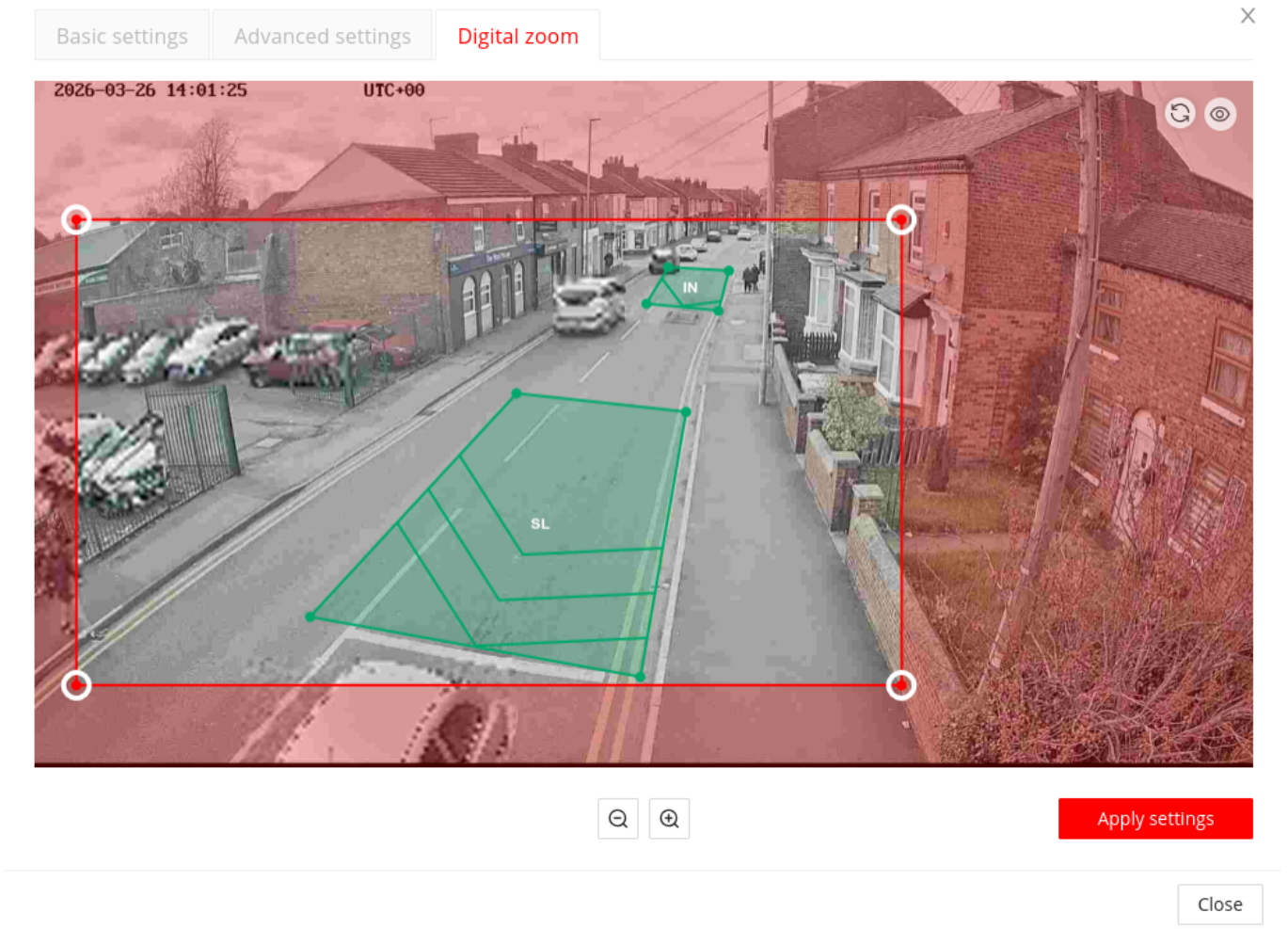
Digital zoom

Object detection can be improved by increasing the digital zoom to exclude irrelevant areas of the full camera image. This can also increase the effective detection distance because distant objects appear larger in the processed camera view.

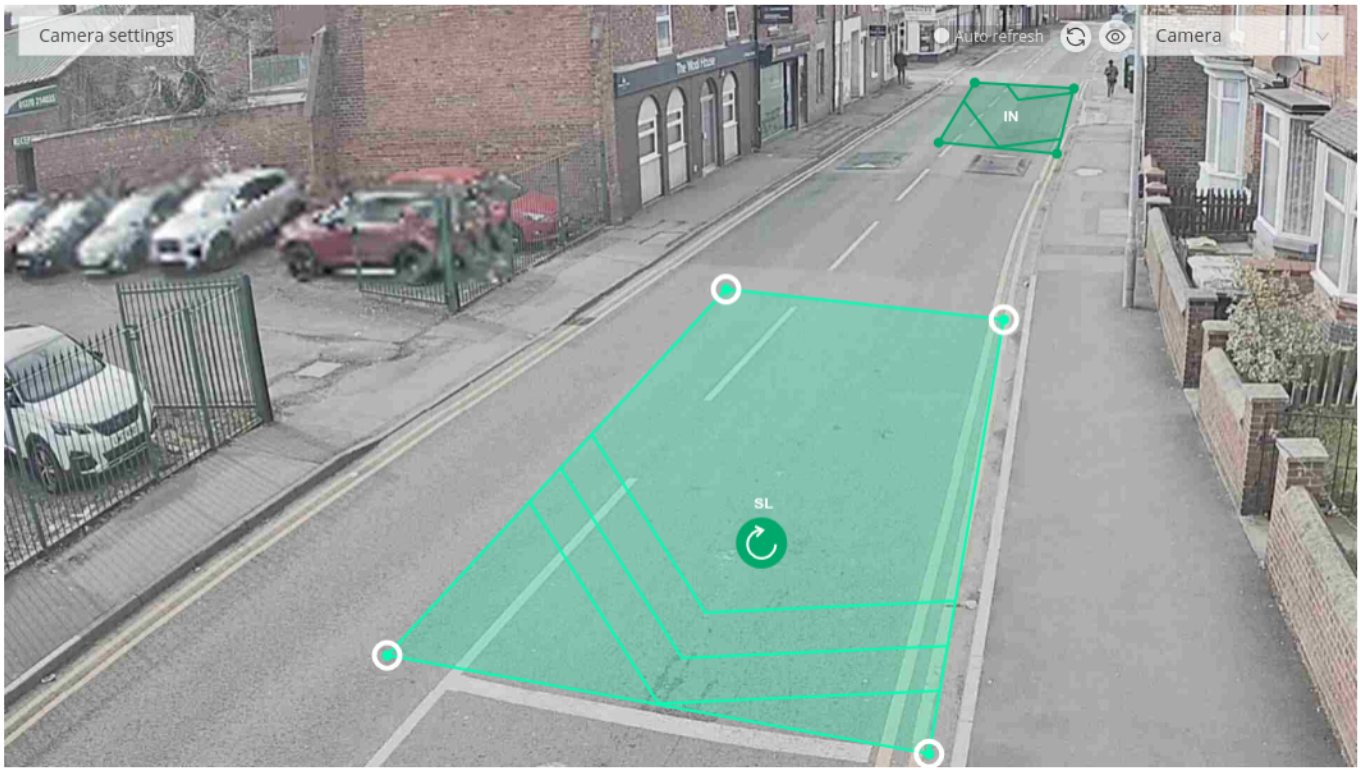
In the following example, the houses beside the road and the sky above are not relevant for object detection.



By clicking the **Camera settings** button, the digital zoom level can be adjusted. Move the red zoom area by dragging the corner points or by using the zoom in/out buttons below. Existing event triggers are automatically adjusted to the new zoom level.



After applying the settings, the camera image will display the zoomed-in view.


Camera settings
Auto refresh
Camera
IN
SL

Object classes

> **NOTE**
>
> The following images are only intended as **examples** and are not intended to provide information about exact camera distances or perspectives.

Class	Subclass	Definition
car	-	*Car* includes small to medium-sized cars up to SUVs, pickups and minivans (e.g., VW Caddy, Renault Kangoo). This class does not include cars with trailers.



Class	Subclass	Definition





Class	Subclass	Definition
		
car	*van*	*Vans* transport six to nine people (e.g., VW Multivan) or are used for deliveries (e.g., VW Transporter, Fiat Ducato). Delivery vans with closed or open cargo space (e.g., Iveco Daily) are included.
		

Class	Subclass	Definition







Class	Subclass	Definition
		
car	*car with trailer*	Cars and vans towing a trailer are classified as *car with trailer*. The entire vehicle and at least one axle of the trailer must be visible.  

Class	Subclass	Definition
		
truck	*single unit truck*	*Single unit trucks* are unit transporters with two or more axles. The tractor and semi-trailer cannot be separated.
		

Class	Subclass	Definition
		
		
truck	*articulated truck*	*Articulated trucks* have more than two axles and a separable tractor and semi-trailer. An articulated truck without a semi-trailer is classified as a *single unit truck*.

Class	Subclass	Definition
		
truck	*truck with trailer*	*Single unit trucks* or *articulated trucks* towing an additional trailer are considered *truck with trailer*.
		
bus	-	A *bus* transports a large number of people, including coaches, double-decker buses, motor coaches and school buses.

Class	Subclass	Definition
		
		
motorbike	-	The *motorbike* class covers a person riding a motorized single-track vehicle. Motorcycles with sidecars are included; e-bikes and riderless motorcycles are not.

Class	Subclass	Definition
		
bicycle	-	The *bicycle* class includes a person actively riding a bicycle. People pushing a bicycle count as *person*, and riderless bicycles are excluded.

Class	Subclass	Definition
		
person	-	The *person* class includes pedestrians and people using segways, skateboards, etc., as well as those pushing a bicycle or stroller.

Class	Subclass	Definition
		
scooter	-	The *scooter* class includes a person riding a scooter, motorized or not, typically with two wheels and a handlebar.

Class	Subclass	Definition
		
tram	-	The *tram* class covers rail-based public transport operating along streets or dedicated tram lines, usually powered via overhead lines.

Class	Subclass	Definition
		
other	-	Vehicles or objects not covered above fall into the *other* class, e.g., tractors (with or without trailers), ATVs, quads, forklifts, road rollers, excavators and snowplows.

Class	Subclass	Definition



Event Schema

Our products (BMA, BCA, B101, B401, BMA TLC, BMA Embedded, BMA Mobile) publish structured MQTT events whenever a configured trigger fires, streaming them to your custom broker as configured under Control Center → Data transmission.

Event JSON Schema

Download the canonical schema at events/schema/6.0/schema.json and treat it as the contract for generated models or validators. Paste payload and schema into any JSON Schema tool (for example, jsonschemavalidator.net) to confirm compatibility.

Common fields

Every payload consists of a common envelope and exactly one event-specific section.

- `version`, `eventSchema`: identify the schema release (currently `6.0`) and the canonical reference URL.
- `uuid`: globally unique identifier per event.
- `tenantId`: Control Center tenant that owns the device emitting the event.
- `node`: nested object describing the hardware node (device) that emitted the event, including `node.id`, `node.name`, and optional `node.metadata`.
- `stream`: nested object describing the video or sensor stream on the node, including `stream.id`, `stream.name`, and optional `stream.geoLocation.coordinates`, an array in the order `[longitude, latitude]` that pins the stream location.

Crossing Line Event

A Crossing Line trigger fires as soon as an object's center point crosses the configured line and emits a `crossingLineEvent` object with the following fields.

- `crossingLineEvent.class` and optional `crossingLineEvent.subClass`: detected object category (for example, `person`, `car`, `truck`) based on the Object Classes taxonomy.
- `crossingLineEvent.direction` plus optional `crossingLineEvent.directionName`: normalized direction (`in`, `out`) and optional custom label from the trigger configuration.
- `crossingLineEvent.lineId`, `crossingLineEvent.lineName`: identifier and name of the configured crossing line.
- `crossingLineEvent.timestamp`: UTC timestamp of the crossing in ISO 8601 format.
- `crossingLineEvent.trackId`, `crossingLineEvent.trackUuid`: correlate the event with the underlying trajectory of the object.

Example: Crossing Line event


```
{
   "crossingLineEvent":{
      "class":"car",
      "subClass":"van",
      "direction":"in",
      "lineId":"e8f82efd-82bf-499d-be17-b66371f16375",
      "lineName":"cl0",
      "timestamp":"2025-11-05T14:07:28.918328Z",
      "trackId":1048578,
      "trackUuid":"28e3681f-5398-4347-8c3d-ca64a3c25537"
   },
   "node":{
      "id":"99031920-6239-471e-a3d7-f241b7753fd0",
      "name":"BMA"
   },
   "stream":{
      "id":"79031920-6239-471e-a3d7-f241b7753fd0",
      "name":"Stream1"
   },
   "version": "6.0",
   "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
   "uuid": "123456a7-dd2d-4016-b9ff-530ab24e5f98",
   "tenantId": "e1df4def-6770-41bd-b3a8-9876549251e6"
}
```


Movement Path

When **Attach movement path to event** is enabled, a path with absolute pixel coordinates of the object trajectory is included in the event. Up to 10 track points are sent; longer paths skip intermediate points.

Example: Crossing Line event with path


```
{
   "crossingLineEvent":{
      "class":"car",
      "subClass":"van",
      "direction":"in",
      "lineId":"e8f82efd-82bf-499d-be17-b66371f16375",
      "lineName":"cl0",
      "timestamp":"2025-11-05T14:07:28.918328Z",
      "trackId":1048578,
      "trackUuid":"28e3681f-5398-4347-8c3d-ca64a3c25537",
      "path":[
         {
            "h":311.0,
            "timestamp":"2025-11-05T14:07:20.228986Z",
            "w":325.0,
            "x":1080.0,
            "y":355.0
         },
         {
            "h":348.0,
            "timestamp":"2025-11-05T14:07:21.106134Z",
            "w":376.0,
            "x":1037.0,
            "y":367.0
         },
         {
            "h":454.0,
            "timestamp":"2025-11-05T14:07:28.867676Z",
            "w":536.0,
            "x":826.0,
            "y":447.0
         }
      ]
   },
   "node":{
      "id":"99031920-6239-471e-a3d7-f241b7753fd0",
      "name":"BMA"
   },
   "stream":{
      "id":"79031920-6239-471e-a3d7-f241b7753fd0",
      "name":"Stream1"
   },
   "version": "6.0",
   "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
   "uuid": "123456a7-dd2d-4016-b9ff-530ab24e5f98",
   "tenantId": "e1df4def-6770-41bd-b3a8-9876549251e6"
}
```

Automatic Number Plate Recognition (ANPR)

When the **ANPR model** or the option **Parking Mode ANPR** (available with the Traffic & Parking models — Standard or Accuracy+) is enabled for a camera stream, the following additional fields will be present.

- `crossingLineEvent.numberPlate`: detected plate text.
- `crossingLineEvent.numberPlateOrigin`: country/region of the plate (ISO 3166-1 alpha-2).
- `crossingLineEvent.numberPlateArea`: regional area code of the plate text.
- `crossingLineEvent.numberPlateLines`: indicates one-line or two-line plate layouts.
- `crossingLineEvent.numberPlateRect`: bounding box of the plate.
- `crossingLineEvent.vehicleRect`: bounding box around the whole vehicle. Only available with Parking Mode ANPR.
- `crossingLineEvent.numberPlateImage`: JPEG image from the camera, base64-encoded and attached to the event. Only available when **Attach image to event** is enabled for an ANPR-enabled Crossing Line trigger and events are sent via a custom MQTT connection.

> **INFO**
>
> With the **ANPR model** selected, only the `numberplate` class is emitted; `vehicleRect` is omitted. The position of the number plate in the image is expressed in absolute coordinates.

Example: Crossing Line event with Parking Mode ANPR


```
{
  "crossingLineEvent": {
    "class": "car",
    "subClass": "van",
    "direction": "in",
    "lineId": "e8f82efd-82bf-499d-be17-b66371f16375",
    "lineName": "ibktwi_cl0",
    "timestamp": "2025-11-05T14:07:28.918328Z",
    "trackId": 1048578,
    "trackUuid": "28e3681f-5398-4347-8c3d-ca64a3c25537",
    "numberPlate": "I1544AM",
    "numberPlateOrigin": "AT",
    "numberPlateArea": "I",
    "numberPlateLines": 1,
    "numberPlateRect": {
      "h": 47,
      "w": 150,
      "x": 128,
      "y": 344
    },
    "vehicleRect": {
      "h": 445,
      "w": 535,
      "x": 836,
      "y": 437
    }
  },
  "node": {
    "id": "99031920-6239-471e-a3d7-f241b7753fd0",
    "name": "test"
  },
  "stream": {
    "id": "79031920-6239-471e-a3d7-f241b7753fd0",
    "name": "streamname"
  },
  "version": "6.0",
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "uuid": "123456a7-dd2d-4016-b9ff-530ab24e5f98",
  "tenantId": "e1df4def-6770-41bd-b3a8-9876549251e6"
}
```

Example: Crossing Line Event with ANPR model


```
{
  "crossingLineEvent": {
    "class": "numberplate",
    "direction": "in",
    "lineId": "e8f82efd-82bf-499d-be17-b66371f16375",
    "lineName": "ibktwi_cl0",
    "numberPlate": "I1544AM",
    "numberPlateArea": "I",
    "numberPlateLines": 1,
    "numberPlateOrigin": "AT",
    "numberPlateRect": {
      "h": 36,
      "w": 134,
      "x": 1139,
      "y": 661
    },
    "timestamp": "2025-11-05T12:48:09.175453Z",
    "trackId": 493,
    "trackUuid": "7854a1b7-c9d4-4519-b081-464a1b182cb7"
  },
  "node": {
    "id": "99031920-6239-471e-a3d7-f241b7753fd0",
    "name": "test"
  },
  "stream": {
    "id": "79031920-6239-471e-a3d7-f241b7753fd0",
    "name": "streamname"
  },
  "version": "6.0",
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "uuid": "123456a7-dd2d-4016-b9ff-530ab24e5f98",
  "tenantId": "e1df4def-6770-41bd-b3a8-9876549251e6"
}
```

Region of Interest Event

A Region of Interest trigger emits a `regionOfInterestEvent` that lists tracked objects and dwell times.

- `regionOfInterestEvent.objects[]`: current occupants, including `regionOfInterestEvent.objects[].class` / `subClass` that follow the Object Classes reference, `regionOfInterestEvent.objects[].trackId`, and `regionOfInterestEvent.objects[].dwellTime` in seconds.
- `regionOfInterestEvent.roiId`, `regionOfInterestEvent.roiName`: configured ROI identifier and name.
- `regionOfInterestEvent.state`: `occupied` when at least one object is inside the ROI; otherwise `vacant`.
- `regionOfInterestEvent.triggerType`: indicates why the event fired (`time` or `change`).

Example: Region of Interest event


```
{
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "node": {
    "id": "c44d31c4-de0c-4933-b562-0d627c7db2b6",
    "name": "2021110040"
  },
  "regionOfInterestEvent": {
    "capacity": 1,
    "objects": [
      {
        "class": "car",
        "dwellTime": 0,
        "trackId": 2,
        "trackUuid": "e5c1606c-5b2e-41c4-a445-7a89fb3934b9"
      }
    ],
    "roiId": "cb2ed4b3-b200-4f0e-90b5-cd00aa999328",
    "roiName": "roi links",
    "state": "occupied",
    "timestamp": "2025-12-03T16:39:07.809630Z",
    "triggerType": "change"
  },
  "stream": {
    "geoLocation": {
      "coordinates": [
        11.40,
        47.26
      ]
    },
    "id": "f0b5f1dd-d1a5-47de-b1f7-ffe1704baf7c",
    "name": "Stream1"
  },
  "tenantId": "3bb3ed7e-4c92-4db3-b317-1e06a4bc4995",
  "uuid": "ed78e199-a306-4c13-828f-9d54b5555e44",
  "version": "6.0"
}
```


Automatic Number Plate Recognition (ANPR)

When the **ANPR model** or the option **Parking Mode ANPR** (available with the Traffic & Parking models — Standard or Accuracy+) is enabled for a camera stream, the following additional fields will be present on ROI objects.

- `regionOfInterestEvent.objects[].numberPlate`: detected plate text.
- `regionOfInterestEvent.objects[].numberPlateOrigin`: country/region of the plate (ISO 3166-1 alpha-2).

- `regionOfInterestEvent.objects[].numberPlateArea`: regional area code of the plate text.
- `regionOfInterestEvent.objects[].numberPlateLines`: indicates one-line or two-line plate layouts.
- `regionOfInterestEvent.objects[].numberPlateRect`: bounding box of the plate.
- `regionOfInterestEvent.objects[].vehicleRect`: bounding box around the whole vehicle. Only available with Parking Mode ANPR.
- `regionOfInterestEvent.objects[].numberPlateImage`: JPEG image from the camera, base64-encoded and attached to the event. Only available when **Attach image to event** is enabled for an ANPR-enabled ROI trigger and events are sent via a custom MQTT connection.

> **INFO**
>
> With the **ANPR model** selected, only the `numberplate` class is emitted; `vehicleRect` is omitted. The position of the number plate in the image is expressed in absolute coordinates.

Example: Region of Interest event with ANPR model


```
{
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "node": {
    "id": "c44d31c4-de0c-4933-b562-0d627c7db2b6",
    "name": "2021110040"
  },
  "regionOfInterestEvent": {
    "capacity": 1,
    "objects": [
      {
        "class": "numberplate",
        "dwellTime": 0,
        "numberPlate": "ILXXXXX",
        "numberPlateArea": "IL",
        "numberPlateLines": 1,
        "numberPlateOrigin": "AT",
        "numberPlateRect": {
          "h": 28,
          "w": 85,
          "x": 812,
          "y": 517
        },
        "trackId": 180355079,
        "trackUuid": "119ffff9-ffa7-4fb7-b865-e957aee9bfda"
      }
    ],
    "roiId": "cb2ed4b3-b200-4f0e-90b5-cd00aa999328",
    "roiName": "roi links",
    "state": "occupied",
    "timestamp": "2025-12-03T15:05:59.378959Z",
    "triggerType": "change"
  },
  "stream": {
    "geoLocation": {
      "coordinates": [
        11.40,
        47.26
      ]
    },
    "id": "f0b5f1dd-d1a5-47de-b1f7-ffe1704baf7c",
    "name": "Stream1"
  },
  "tenantId": "3bb3ed7e-4c92-4db3-b317-1e06a4bc4995",
  "uuid": "b5cb3844-3743-4cc5-ac39-36448bfd47f9",
  "version": "6.0"
}
```

Example: Region of Interest event with Parking Mode ANPR

```
{
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "node": {
    "id": "c44d31c4-de0c-4933-b562-0d627c7db2b6",
    "name": "2021110040"
  },
  "regionOfInterestEvent": {
    "capacity": 1,
    "objects": [
      {
        "class": "car",
        "dwellTime": 0,
        "numberPlateRect": {
          "h": 18,
          "w": 60,
          "x": 124,
          "y": 190
        },
        "trackId": 53477380,
        "trackUuid": "7c3b0a5d-964f-4f1b-9d3c-e01b790be382",
        "vehicleRect": {
          "h": 222,
          "w": 244,
          "x": 694,
          "y": 233
        }
      }
    ],
    "roiId": "cb2ed4b3-b200-4f0e-90b5-cd00aa999328",
    "roiName": "roi links",
    "state": "occupied",
    "timestamp": "2025-12-03T16:17:40.482253Z",
    "triggerType": "change"
  },
  "stream": {
    "geoLocation": {
      "coordinates": [
        11.40,
        47.26
      ]
    },
    "id": "f0b5f1dd-d1a5-47de-b1f7-ffe1704baf7c",
    "name": "Stream1"
  },
  "tenantId": "3bb3ed7e-4c92-4db3-b317-1e06a4bc4995",
  "uuid": "3f245256-7092-417e-b488-f65dc0ba342f",
  "version": "6.0"
}
```

Origin Destination Event

An Origin Destination trigger emits an `originDestinationEvent` when an object's trajectory moves across at least two OD zones, using the first and last zones traversed for the event.

- `originDestinationEvent.entry.zone.zoneId`, `originDestinationEvent.entry.zone.name`, `originDestinationEvent.entry.timestamp`: entry zone details and when the object entered.
- `originDestinationEvent.exit.zone.zoneId`, `originDestinationEvent.exit.zone.name`, `originDestinationEvent.exit.timestamp`: exit zone details and when the object left.
- `originDestinationEvent.movementPath[]`: object trajectory with absolute pixel coordinates.

Example: Origin Destination event

```
{
  "version": "6.0",
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "uuid": "123456a7-dd2d-4016-b9ff-530ab24e5f98",
  "tenantId": "e1df4def-6770-41bd-b3a8-9876549251e6",
  "node": {
    "id": "99031920-6239-471e-a3d7-f241b7753fd0",
    "name": "test"
  },
  "stream": {
    "id": "79031920-6239-471e-a3d7-f241b7753fd0",
    "name": "streamname"
  },
  "originDestinationEvent": {
    "classification": "truck",
    "subClass": "articulated-truck",
    "entry": {
      "zone": {
        "zoneId": "56317209-9B83-43A6-A63E-58C9191A7869",
        "name": "entryZoneName"
      },
      "timestamp": "2019-12-29T10:31:14.373202Z"
    },
    "exit": {
      "zone": {
        "zoneId": "c28ed4e8-bf1b-4c2e-9938-aeb28687f7aa",
        "name": "exitZoneName"
      },
      "timestamp": "2019-12-29T10:31:20.373202Z"
    },
    "trackId": 23,
    "trackUuid": "5609fb4b-cf2b-426d-8f75-0a639a932b90",
    "movementPath": [
      {
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "h": 554.192138671875,
        "w": 766.527587890625,
        "x": 0.0,
        "y": 525.807861328125
      },
      {
        "timestamp": "2019-12-29T10:31:15.173212Z",
        "h": 757.237060546875,
        "w": 1013.7042236328125,
        "x": 137.61514282226563,
        "y": 161.38143920898438
      },
      {
        "timestamp": "2019-12-29T10:31:16.229202Z",
        "h": 757.23712158203125,
```

```
        "w": 789.47369384765625,
        "x": 249.73042297363281,
        "y": 108.07360076904297
      },
      {
        "timestamp": "2019-12-29T10:31:17.343202Z",
        "h": 757.23712158203125,
        "w": 1013.704345703125,
        "x": 149.989990234375,
        "y": 157.84721374511719
      },
      {
        "timestamp": "2019-12-29T10:31:18.373202Z",
        "h": 757.237060546875,
        "w": 789.47369384765625,
        "x": 184.40171813964844,
        "y": 161.38143920898438
      },
      {
        "timestamp": "2019-12-29T10:31:19.373202Z",
        "w": 1013.7042236328125,
        "h": 757.23712158203125,
        "x": 131.88348388671875,
        "y": 157.84721374511719
      },
      {
        "timestamp": "2019-12-29T10:31:20.373202Z",
        "h": 757.23712158203125,
        "w": 1013.7042236328125,
        "x": 131.88348388671875,
        "y": 157.84721374511719
      }
    ]
  }
}
```

Raw Track Event

The Raw Track Event trigger records the full trajectory of an object. It fires once the track is finished—for example, when the object leaves the camera view, and emits a `heatmapEvent` object with the following fields.

- `heatmapEvent.class` and optional `heatmapEvent.subClass`: detected object category following the Object Classes taxonomy.
- `heatmapEvent.trackId`, `heatmapEvent.trackUuid`: tie the event back to the originating trajectory.
- `heatmapEvent.path[]`: object trajectory with absolute pixel coordinates.

Example: Raw Track event

```
{
  "heatmapEvent": {
    "class": "car",
    "trackId": 23,
    "trackUuid": "5609fb4b-cf2b-426d-8f75-0a639a932b90",
    "path": [
      {
        "h": 554.192138671875,
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 766.527587890625,
        "x": 0.0,
        "y": 525.807861328125
      },
      {
        "h": 757.237060546875,
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 1013.7042236328125,
        "x": 137.61514282226563,
        "y": 161.38143920898438
      },
      {
        "h": 757.2371215820313,
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 789.4736938476563,
        "x": 249.7304229736328,
        "y": 108.07360076904297
      },
      {
        "h": 757.2371215820313,
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 1013.704345703125,
        "x": 149.989990234375,
        "y": 157.8472137451172
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        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 789.4736938476563,
        "x": 184.40171813964844,
        "y": 161.38143920898438
      },
      {
        "h": 757.2371215820313,
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 1013.7042236328125,
        "x": 131.88348388671875,
        "y": 157.8472137451172
      },
      {
        "h": 757.2371215820313,
```
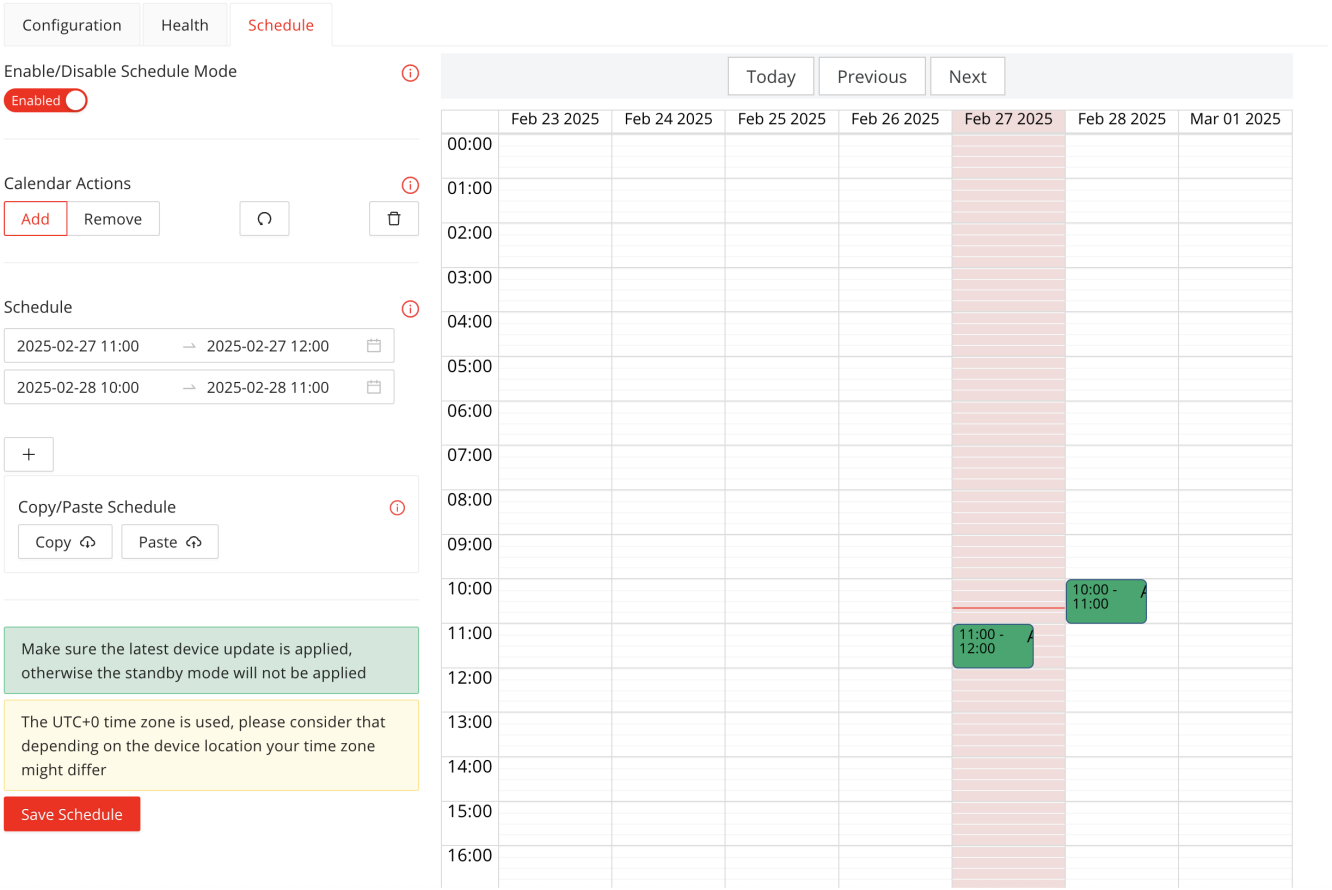

```
        "timestamp": "2019-12-29T10:31:14.373202Z",
        "w": 1013.7042236328125,
        "x": 131.88348388671875,
        "y": 157.8472137451172
      }
    ]
  },
  "node": {
    "id": "99031920-6239-471e-a3d7-f241b7753fd0",
    "name": "test"
  },
  "stream": {
    "id": "79031920-6239-471e-a3d7-f241b7753fd0",
    "name": "streamname"
  },
  "version": "6.0",
  "eventSchema": "https://docs.bernard-gruppe.com/events/schema/6.0",
  "uuid": "123456a7-dd2d-4016-b9ff-530ab24e5f98",
  "tenantId": "e1df4def-6770-41bd-b3a8-9876549251e6"
}
```

Schedule

The schedule allows the device to be fully active only during defined measurement periods. Outside of these periods, energy savings are achieved by switching off individual services. This extends the runtime in battery mode or when using a PV system.



How it works

- **Schedule**: If the schedule is not activated, the device is continuously active. If the schedule is enabled, the device is only active during the defined schedule.
- **Active mode**: In the active state, the processing is running and the device generates events or controls outputs of the BMC.
- **Standby mode**: Outside the defined measuring periods, the device switches to standby mode.
- The standby mode reduces power consumption by approx. 50%.
- This results in a longer battery life.
- The Internet connection remains active even in standby mode, which means that monitoring and deactivation of the schedule are possible at any time.

> **INFO**
>
> All times in the schedule refer to UTC+0. Users must take their local time zone and any summer/ winter time changes into account.

Configuration

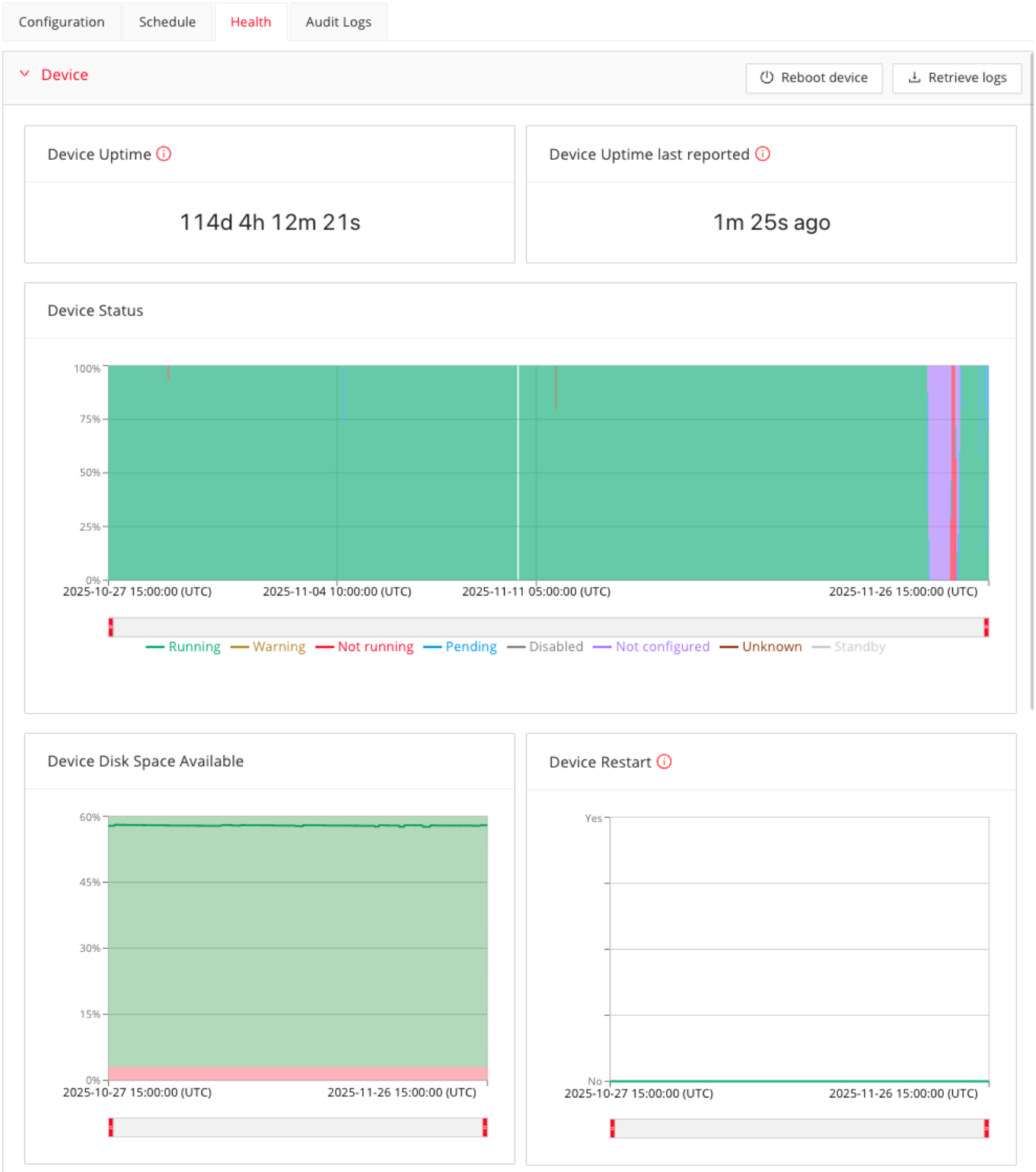
- The function can be activated/deactivated via the “Schedule” tab.
- Measurement periods can be created by clicking “Add” and deleted by selecting “Remove”.
- Start and end times are defined for each period.
- Multiple measurement periods can be configured.
- Schedules can be copied and pasted between devices via the clipboard.
- Changes must be confirmed by clicking “Save schedule”.

> **INFO**
>
> This function is only available for devices with version **2024.2** or higher.

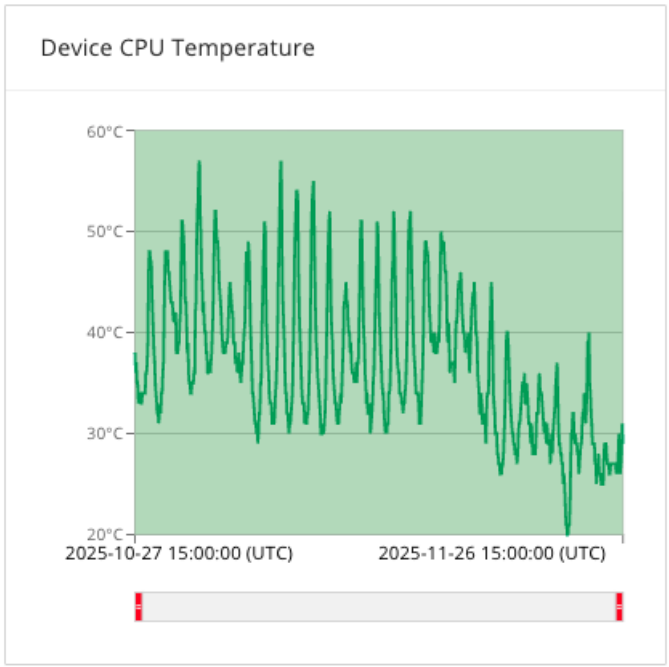
Device health

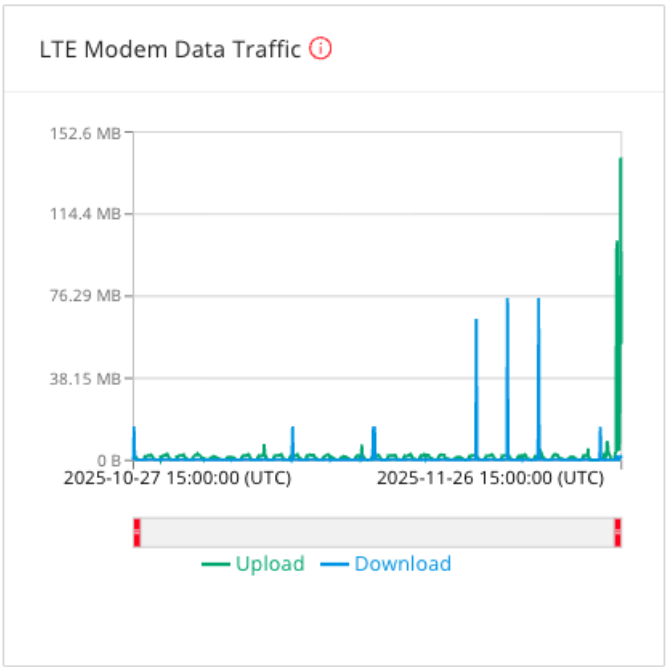
The device health metrics allow you to provide evidence of reliable and continuous data collection and diagnose potential problems yourself (e.g. regarding a stable network connection, power supply, etc.). A rolling 30-day history is available. The following metrics are supported:

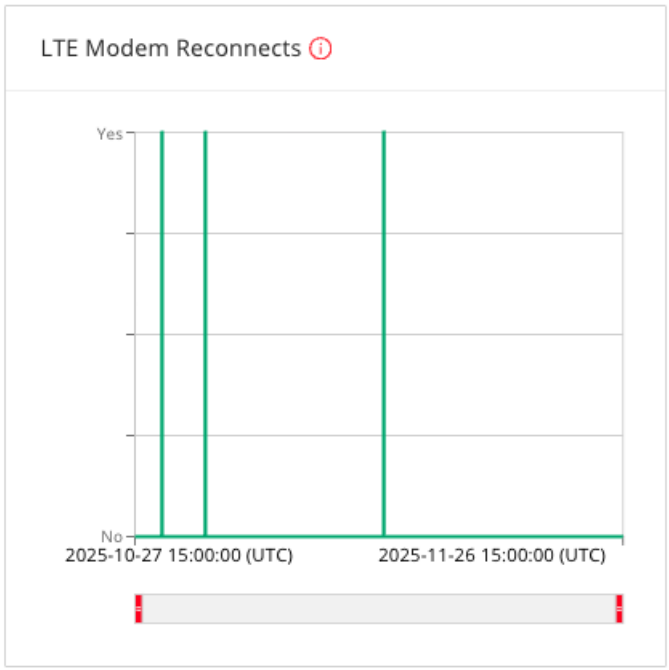
- Device uptime, status, reboots, available disk space
- Device temperature
- LTE modem traffic, signal strength and reconnects
- Camera status and processing speed of the camera (FPS)
- Created and pending events
- Vision Quality — detection of visual disturbances (fog, glare, dirty or blocked lens) that can affect reliable operation

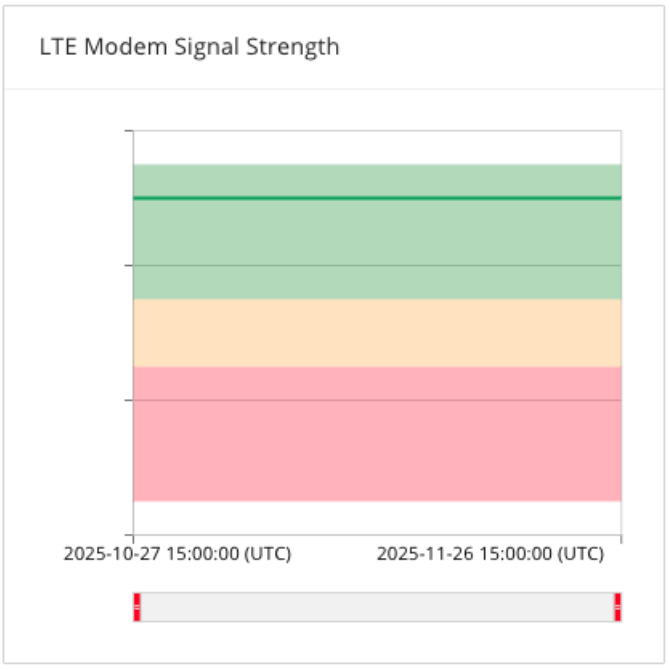


Device Health 1









Device Health 2

Vision Quality

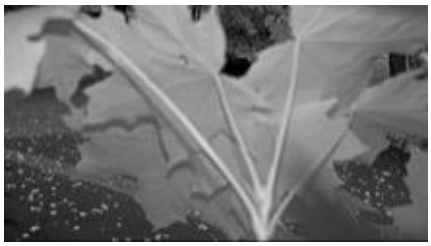
Vision Quality monitors whether the camera has a clear enough view for reliable operation. It detects common visual disturbance sources such as fog, sun glare, heavy rain or snow, blurred or unfocused images, unusually high brightness or contrast, camera artifacts or defects, dirty or covered lenses, objects blocking the view such as trees or leaves, spider webs, and very unusual installations the system was not trained for, such as an indoor ceiling view.

The Vision Quality metric supports fleet-level monitoring by highlighting devices where reliable operation may be affected by visibility issues.

Examples of conditions that can reduce Vision Quality:



Unsupported indoor ceiling view



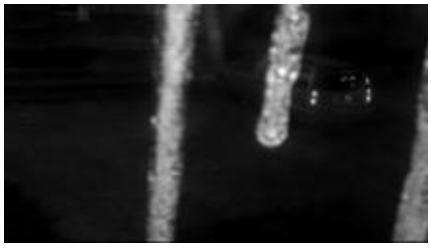
Leaves blocking the camera view



Heavy fog



Spider web in front of the camera



Lens contamination



Image artifacts / pixelation



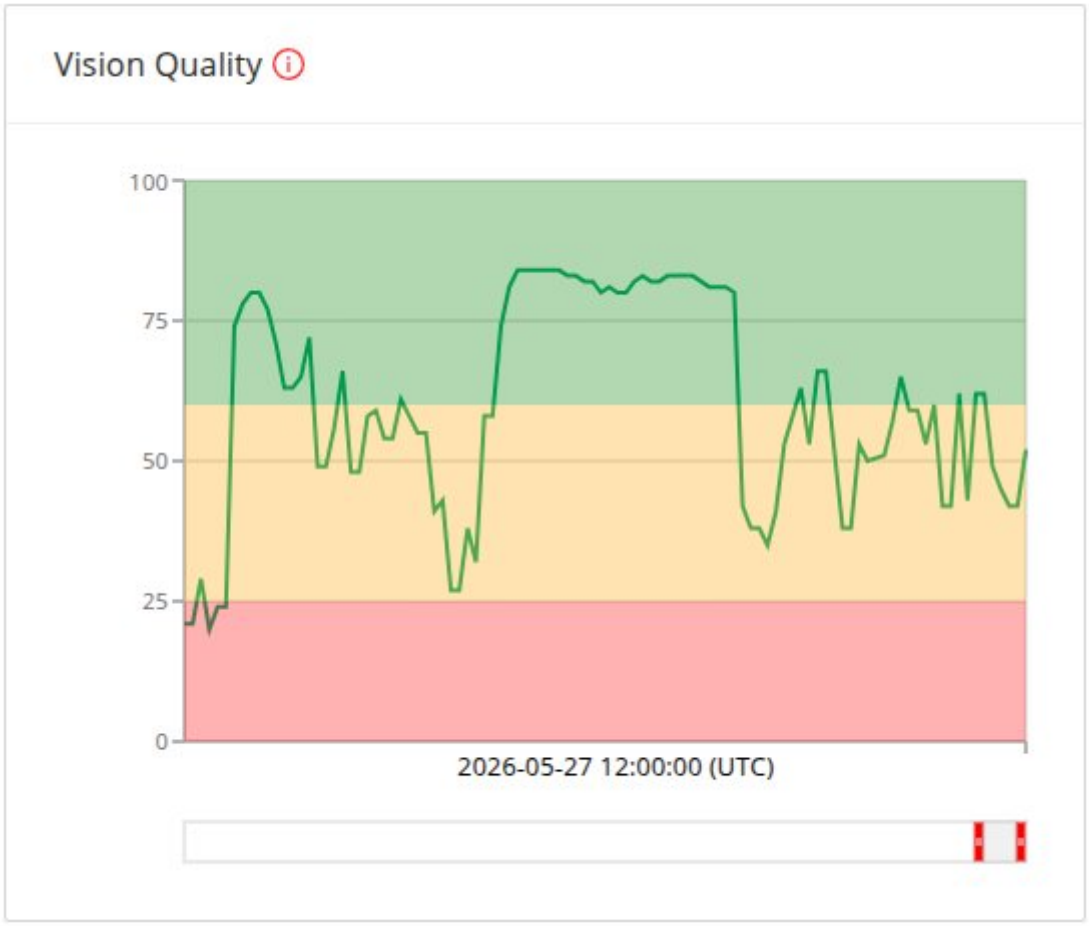
Overexposed camera image



Raindrops on the lens

The metric is shown in three ranges:

- **Green:** low probability of a visual disturbance source.
- **Yellow:** moderate probability of a visual disturbance source.
- **Red:** very high probability of a visual disturbance source; action required.



Vision Quality metric in Device Health.

Audit Logs

Use the **Audit Logs** tab on a device to see a record of configuration changes, retained for 30 days.

The log captures:

- Who made the change (user)
- When the change occurred (timestamp)
- What was changed (action/details)

This helps trace configuration history and supports troubleshooting and accountability.

Configuration | Schedule | Health | Audit Logs

Occurred At	Action	Performed By	Details
11/26/2025, 3:41:37 PM GMT+1	Stream updated	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:44 PM GMT+1	Deleted IO trigger configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:44 PM GMT+1	Updated MQTT configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:44 PM GMT+1	Updated camera configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:29 PM GMT+1	Updated ANPR-Setting	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:08 PM GMT+1	Updated MQTT configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:08 PM GMT+1	Updated camera configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:58:08 PM GMT+1	Deleted IO trigger configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:55:24 PM GMT+1	Updated camera configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b
11/26/2025, 2:55:24 PM GMT+1	Updated MQTT configuration	[redacted]	Stream ID 00789594-8ea7-4335-9ca4-b39f1e6c5c0b

< 1 2 3 4 5 ··· 14 > 10 / page

Audit Logs

Administration

- License management
- User management

Monitoring alerts

General

Monitoring alerts send automatic e-mail notifications when selected devices enter a problematic state. Alerts are created for specific devices and are managed in the *Monitoring Alerts* section of the Control Center.

An alert belongs to a Control Center user. Notifications are sent to that user's current e-mail address.

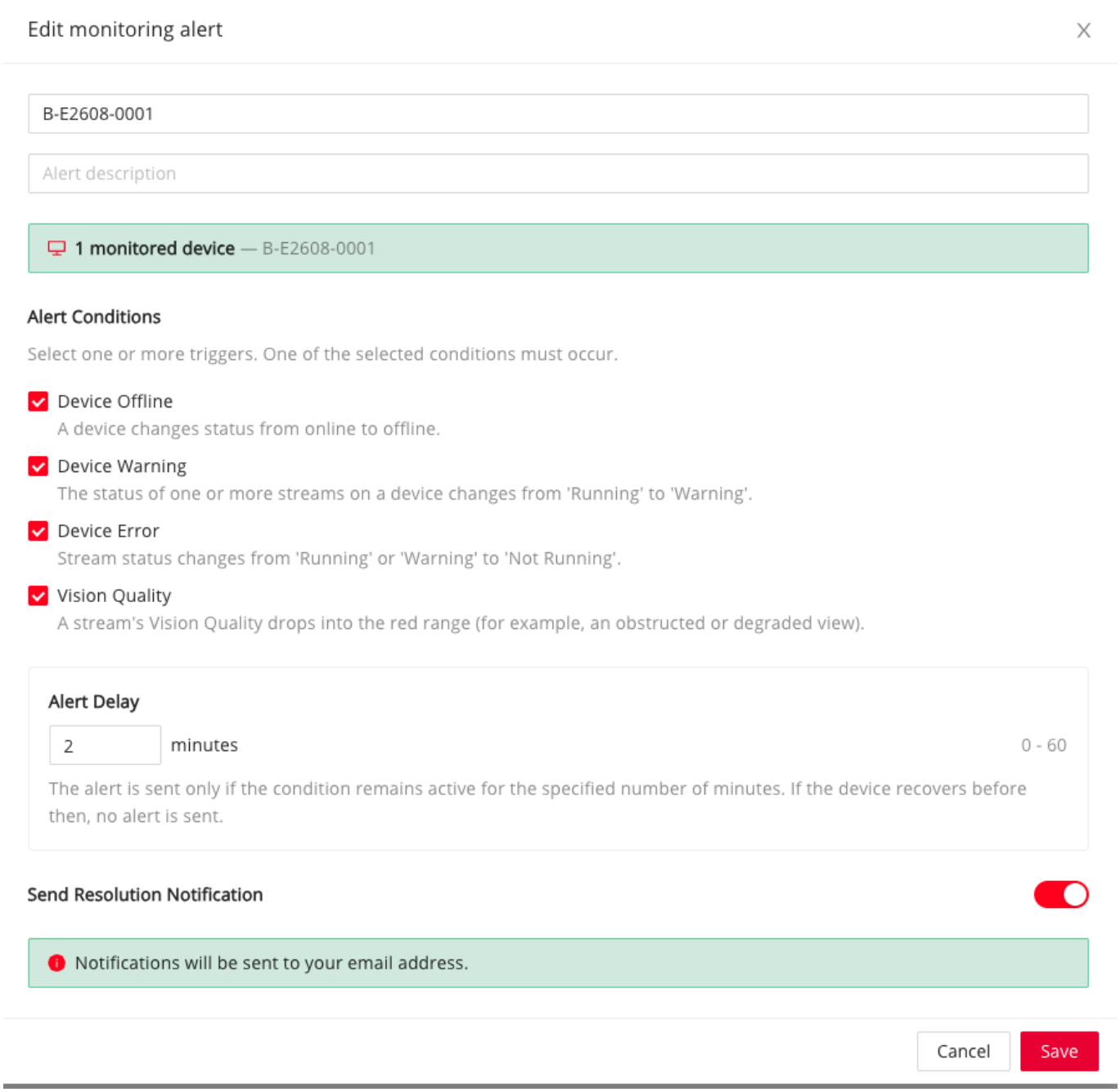
> **INFO**
>
> Users with the *User* or *Admin* role can create and manage monitoring alerts. Users with the *Viewer* role cannot create or manage monitoring alerts.

Creating alerts from the device list

To create a monitoring alert:

1. Open the device list, select the devices, and click *Create monitoring alert* in the floating action bar.
2. Enter a name and, optionally, a description. Review the selected devices.
3. Select the alert triggers, set the delay, and enable or disable resolution notifications.
4. Save the alert.

The selected devices are added to the alert automatically. The alert is saved only if at least one device and at least one trigger are selected.



Edit monitoring alert

Alert triggers

The alert triggers are based on device connection state, stream state, and Vision Quality.

Trigger	Description
Device Offline	Triggers when a device changes its status from online to offline.
Device Warning	Triggers when the status of one or more streams on a device changes from *Running* to *Warning*.
Device Error	Triggers when a stream status changes from *Running* or *Warning* to *Not Running*.

Trigger	Description
Vision Quality	Triggers when a stream's Vision Quality drops into the red range, for example because of an obstructed or degraded view. For more information, see Device Health.

At least one trigger must be selected. If multiple triggers are selected, the alert is sent when any selected condition occurs.

Alert delay

The alert delay defines how long a condition must remain active before an e-mail notification is sent. The delay can be set from `0` to `60` minutes.

If the device recovers before the delay expires, no alert e-mail is sent.

Resolution notifications

If *Resolution Notification* is enabled, the Control Center also sends an e-mail when the alert condition is resolved. The same delay is applied before sending the resolution notification.

If resolution notifications are disabled, an e-mail is sent when the alert triggers, but not when the condition is resolved.

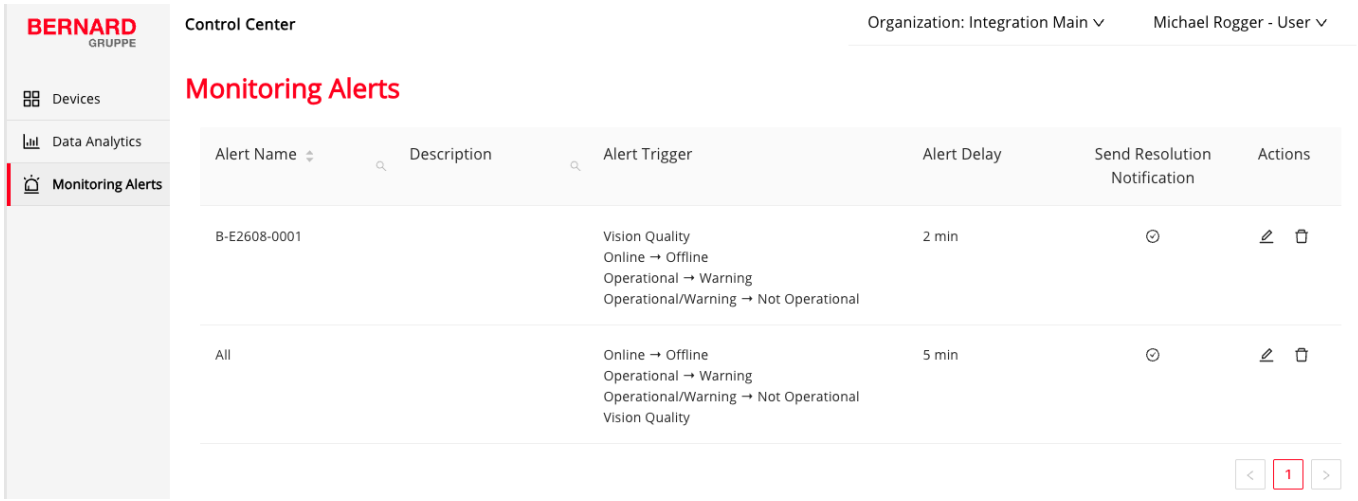
Recipients

Each monitoring alert notifies only the Control Center user it belongs to, at the e-mail address currently stored in their account. Additional recipients cannot be added.

Edit or delete alerts

The *Monitoring Alerts* section shows all alerts belonging to the current user. The table includes the alert name, description, triggers, alert delay, resolution notification setting, and available actions.

Use the pencil icon to edit an alert or the trash can icon to delete it.



Monitoring alerts overview

License management

The License Management page provides an overview of your available license capacity, license usage, and the current status and validity of each license.

What does “Unlicensed” mean?



“Unlicensed” license indicator in the device overview.

Unlicensed means that you need to check the license assignment for at least one **enabled camera stream** on the device. This can happen when:

- No license is assigned to the stream.
- The assigned license has expired.
- The assigned license is missing from your organisation's license list.

> **EXISTING STREAMS CONTINUE WITHOUT INTERRUPTION**
>
> The new license management is being introduced in stages. During this introduction, existing streams keep working even without an assigned license. The **Unlicensed** indicator itself does not stop data processing or delivery. A device can therefore show both **Running** and **Unlicensed**: it is working, but a stream's license needs attention.

Changing settings: You can still change some settings without a license. The Control Center checks license requirements when you:

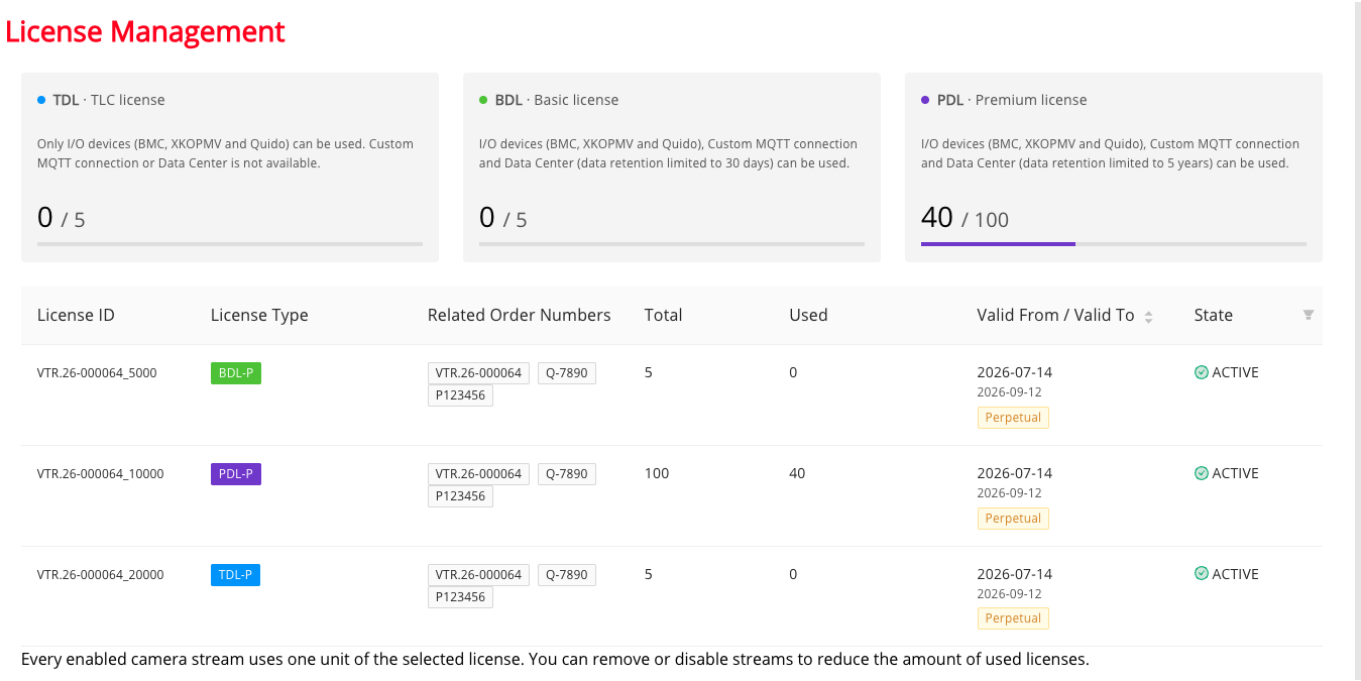
- Enable or disable a stream.
- Change its MQTT connection modes or I/O connection type.
- Assign, change, or remove its license.

Assigning a license: You assign the licenses yourself in the Control Center:

1. Open **Administration** → **License management**. Check your licenses' validity dates and how many streams they can still cover.
2. In the **device overview**, select the affected streams and click **Assign streams to license**. You can also select a license in the stream configuration form.
3. Choose a license that has not expired. It must support the features you use and have room for the selected enabled streams. Confirm the assignment.

To enable a new stream or enable a disabled stream again, assign a suitable license with enough free stream capacity. A disabled stream can keep its license assignment. It does not use any stream capacity while disabled.

License capacity and usage



License Management overview with summary cards and license table.

The summary cards show the total license capacity and current usage for each license type. The progress bar indicates the proportion of licenses in use. These values are aggregated across all licenses of the respective type.

The license table provides the following information:

- **License ID:** Unique identifier of the license.
- **License Type:** TDL, BDL, or PDL.
- **Related Order Numbers:** Orders associated with the license.
- **Total:** Number of streams included in the license.
- **Used:** Number of streams currently activated.
- **Valid From / Valid To:** Start and end of the license validity period. A **Perpetual** label indicates that the license has no fixed expiration date.
- **State:** Current status of the license:
  - **Active:** The license is currently valid. Its expiration date is in the future, or the license is perpetual.
  - **Expired:** The license has reached its end date and is no longer valid.
  - **Inactive:** The license term begins on a future date.

INFO

Adding or activating additional streams is only possible if sufficient licenses are available. Streams that are no longer required can be deactivated at any time. Deactivated or deleted streams are not counted.

NOTE

Licensing per stream: Each active camera stream requires its own valid license. A device with multiple active streams therefore requires multiple licenses. Existing streams continue to work during the phased rollout as described above.

License types

	Control Center	IO connection	Custom MQTT	Data Center API	Data Center UI
TDL Traffic Detection Licence	✓	✓	—	—	—
BDL Basic Data Licence	✓	✓	✓	• Events • Parking* • Cross-section survey* • Turning-movement survey* Data retention: 30 days	—
PDL Premium Data Licence	✓	✓	✓	• Events • Parking • Cross-section survey • Turning-movement survey Data retention: 5 years	• Parking • Cross-section survey • Turning-movement survey Data retention: 5 years

* Each parking survey and each traffic-counting or turning-movement survey configured with a Basic Data Licence requires a one-time setup fee.

- **Control Center UI/API:** Centralized configuration, monitoring, and update management for BMA family devices. Access is available through a web browser or via API integration.
- **IO connection:** Control of I/O devices such as BMC and Quido, and integration via the XKOPMV protocol. These capabilities are primarily used to interface with traffic signal controllers.
- **Custom MQTT:** Enables delivery of events to a user-defined MQTT endpoint for integration with and downstream processing by external systems.
- **Data Center API:** Enables external systems to access events and data from traffic-counting, turning-movement, and parking surveys. Scope and data retention depend on the license type.
- **Data Center UI:** Browser-based user interface for creating and evaluating traffic-counting and turning-movement surveys and parking surveys.

Device update

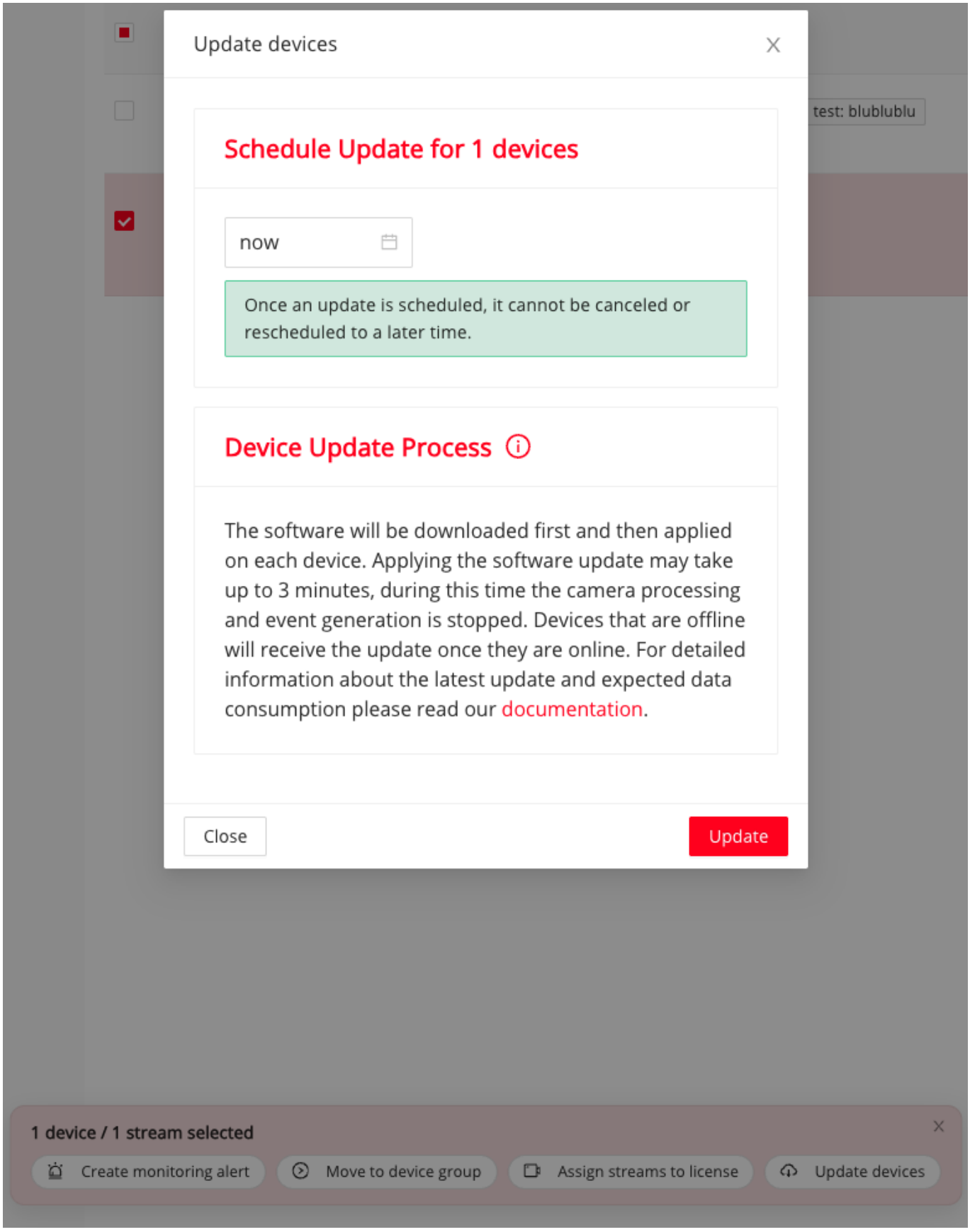
The Control Center is updated on the release date, and the corresponding device update becomes available the same day. You decide when to update your devices. We recommend updating promptly to receive new features, model improvements, bug fixes, and security updates.

Administrators and users with the User role can schedule updates from the device list. Viewers have read-only access and cannot schedule updates.

Scheduling updates

1. Open the device list and select one or more devices.
2. Choose **Update devices** from the action bar.
3. In the dialog, choose **now** or select a date and time, then confirm with **Update**.

The update starts once the scheduled time has been reached and the device is online. If a device is offline at that time, its update starts when it comes online.



Schedule an update for selected devices directly from the device list.

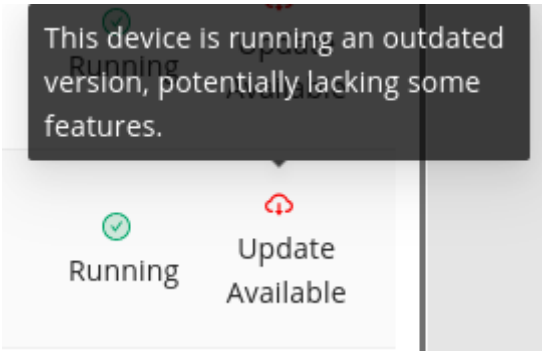
> **WARNING**
>
> Once scheduled, an update cannot be canceled or moved to a later time. Choose a suitable maintenance window before confirming.

Checking update status

In the device list, the update status shows whether an update is available, scheduled, or pending. Hover over the status icon for details.

Update available

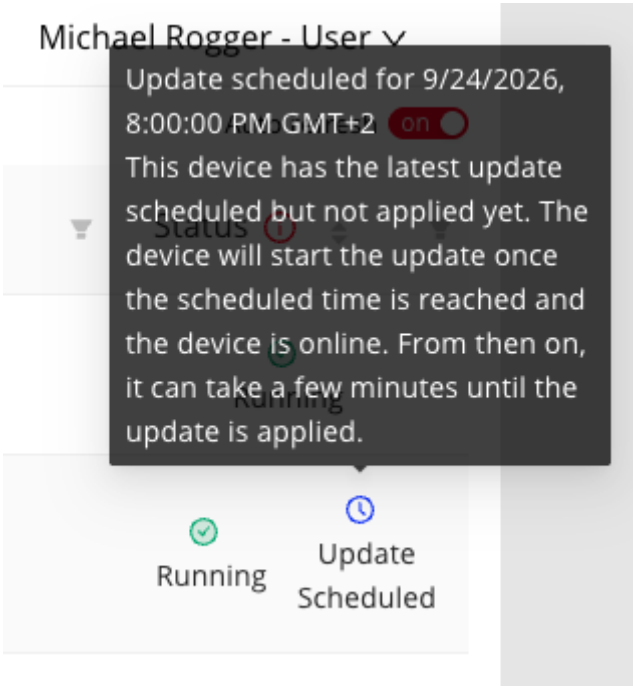
An update is available for this device.



The tooltip indicates that an update is available for this device.

Update scheduled

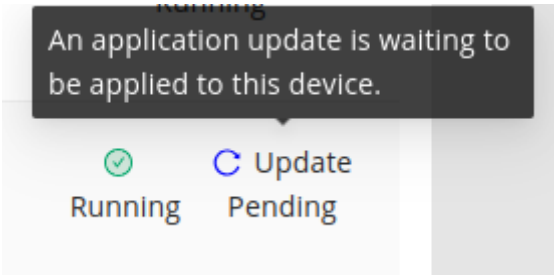
An update has been scheduled for the device. If the device is offline at the scheduled time, it keeps this status until it comes back online.



The tooltip shows the scheduled time and the scheduled state.

Update pending

The scheduled time has been reached and the device is online, but the update has not been applied yet.



The tooltip shows whether an application or OS update is still pending.

Update process

1. The device downloads the update. It continues to operate normally during the download.
2. The device applies the update. This can take up to five minutes. During this time, camera processing and event generation stop, so event-controlled BMC contacts do not switch. If an error contact is configured, it remains in the error state while the device is not operational.
3. After the update completes, the device returns to normal operation.

Recommended rollout

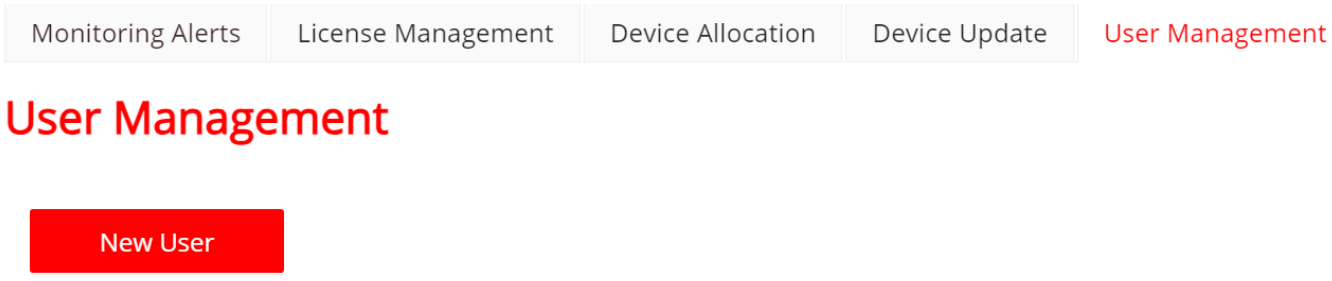
1. Update test devices first to check integrations and compatibility.
2. Update a small production batch during a planned maintenance window, preferably outside peak hours.
3. Update the remaining devices after confirming that the first batch works as expected.

User management

This area provides an overview of all users who have access to your Control Center Tenant, as well as the ability to add, remove, or edit users and user roles.

Adding a new user profile

To add a new user profile, click *New User* and fill in all required fields. The new user must set a personal password by verifying the email address via the *Forgot your password?* workflow on the login page.



User Management

Editing an existing user profile

Only the role or access rights can be changed. If you need to change the name or email address of a user, delete the profile and create a new one.

User roles

The permissions build on one another: each role also has the permissions listed above it.

Role	Additional permissions
Data Analytics Viewer	View all Data Analytics dashboards, including the camera images shown there. **DEPRECATED DATA ANALYTICS** Data Analytics is deprecated. This role, formerly called *Viewer*, is relevant only for tenants that still use it. It does not grant access to the device list or device groups, and cameras cannot be configured.
Viewer	View accessible devices and device groups, including device, model, and event-trigger configurations.
User	Change device, model, and event-trigger configurations and Data Analytics; create, rename, and delete device groups within their access scope; move devices between accessible groups; create and manage own monitoring alerts; schedule device updates.
Admin	Access all devices and groups; manage licenses, users, and device-group access.

Device Group Access Control

Device-group access determines which groups and devices Users and Viewers can access. Their role determines what they can do with them. Admins manage access assignments and can access all devices and device groups of the tenant.

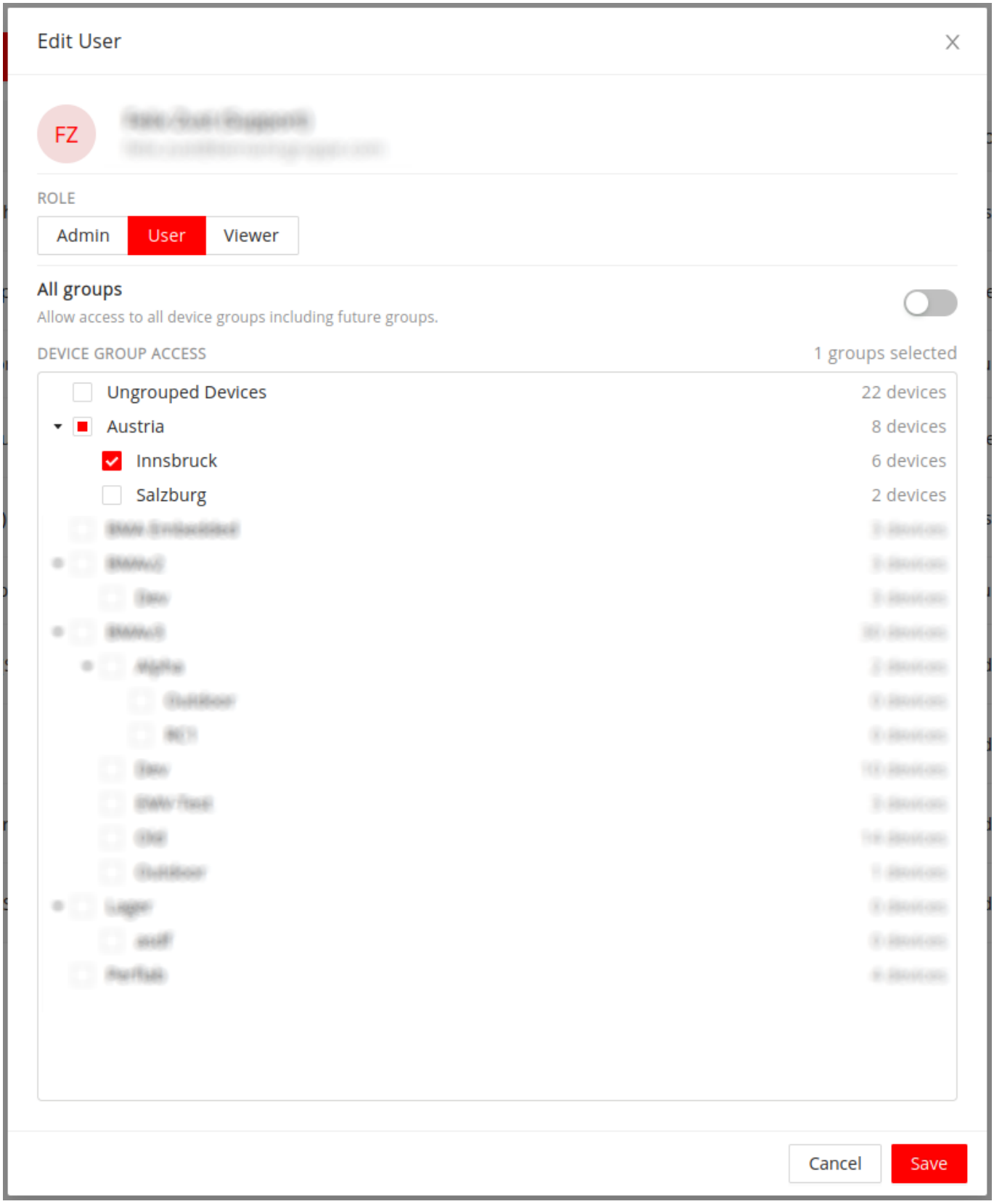
User-centric access management

Device-group access for **User** and **Viewer** roles can be edited in User Management by clicking *Edit User* or when creating a new user. The options are:

- **All Groups**: The user has global access to all devices and device groups of the tenant. This includes ungrouped devices, all current device groups, and all future device groups.
- **Selected Groups**: Select individual groups or **Ungrouped Devices** in the tree. Access to a selected group includes its devices and all its subgroups.

New users and viewers have no device-group access by default.

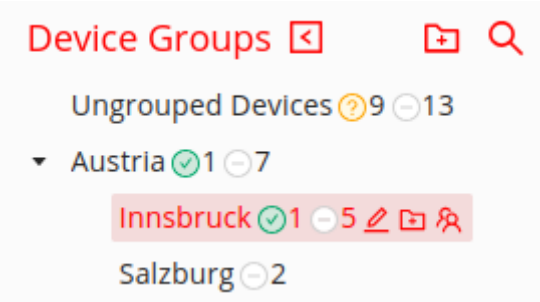
Users can create, rename, and delete device groups within their access scope and move devices between groups they can access. Access to a device follows its group: if the device is moved to a group that a user cannot access, that user loses access to it.



User-centric access management

Group-centric access management

Access can also be changed in the **Devices** view by selecting a device group in the tree and clicking on the user icon.



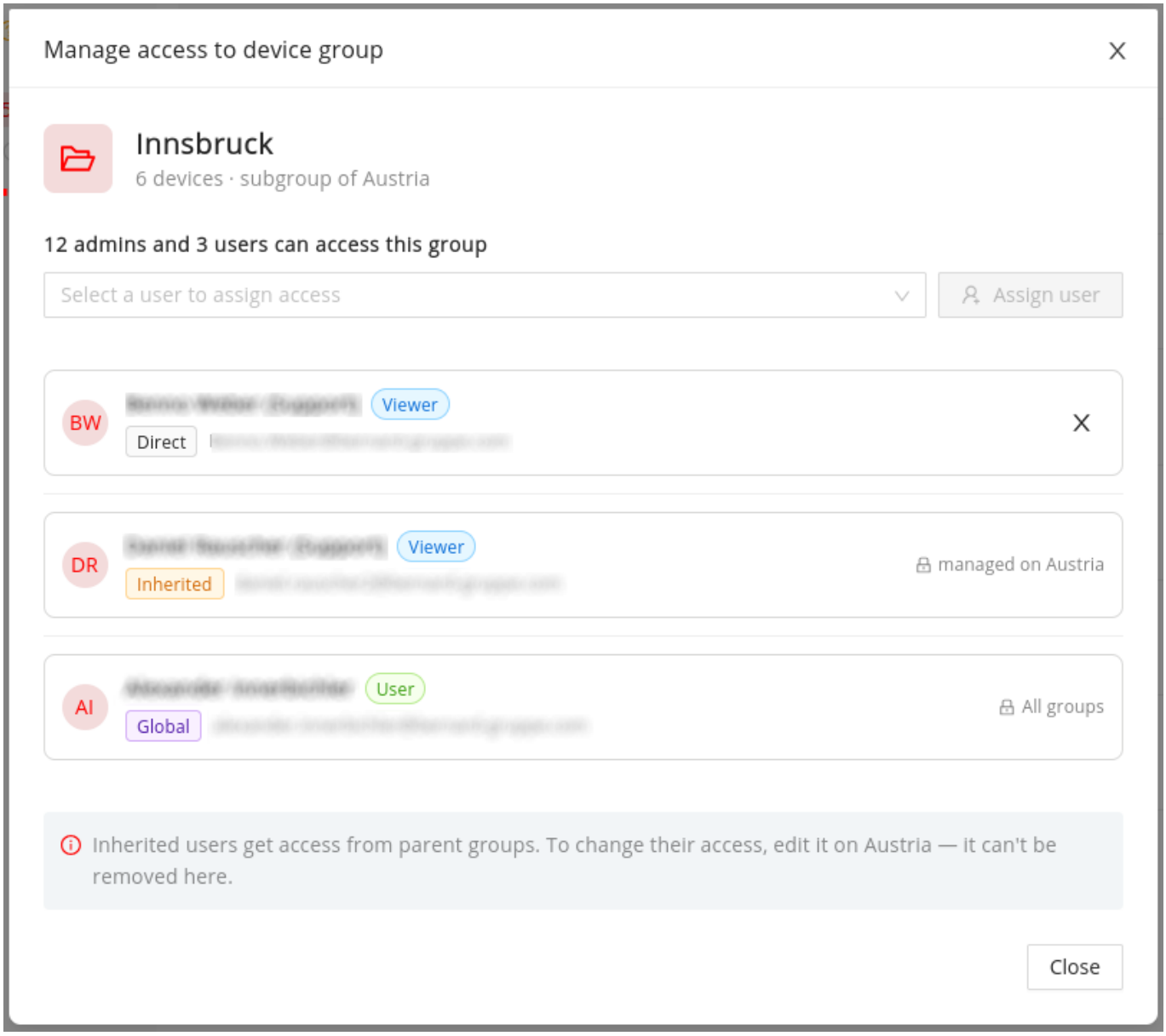
Device group tree with user icon for access control

A dialog opens showing the users who currently have access to the group, along with the number of admins with access. For each user, it displays:

- **Role**: The user's role, such as User or Viewer.
- **Access Type**: How access is obtained (Direct, Inherited, or Global).

For users with **Direct** access, permissions can be revoked by clicking the **x**. To change **Inherited** access, edit the assignment on the parent group shown in the dialog. To change **Global** access, edit the user's **All Groups** setting in User Management.

To grant additional users access to the device group, search for them in the dropdown and click **Assign User**. The user will receive direct access to the selected group and inherit access to all its subgroups.



Group-centric access management

Control Center API

You can easily retrieve all settings and information available in the Control Center via an API. Below you will find the Swagger documentation. Here is an example: BMA Control Center

In general, we stick to the OAuth 2.0 Client Credentials Flow (Microsoft) documented here.

Make sure to include your Tenant ID as a header in the authentication flow.

How to get the URL for your specific API

To get the **first part of the URL** for your specific API documentation or Swagger UI, you can either contact our support team or retrieve it from the source code of your Control Center.

> **NOTE**
>
> In our example, the URL is:
>
> https://bernard-control-center-api-dc814a25.azurewebsites.net/v3/documentation/swagger-ui/index.html#

Example

Retrieve device status

1. Call the Swagger UI.
2. The API call returns the device status as follows:

```
{
  "boxStatus": {
    "connectionState": "CONNECTED",
    "runtimeState": "DISABLED"
  },
  "id": "676cac42-f3d6-416d-ac83-3f54f1c0bb43",
  "name": "7th NE parking garage entrance",
  "statusId": "676cac42-f3d6-416d-ac83-3f54f1c0bb43",
  "tags": [
    {
      "name": "Roxxon Energy Corporation"
    }
  ],
  "type": "P100"
}
```

1. The device statuses are defined in the API documentation as follows:

BoxScheduleAction >

BoxStatus {
connectionState string
Enum:
[CONNECTED, DISCONNECTED]
runtimeState string
Enum:
[OPERATIONAL, PENDING, NOT_OPERATIONAL, NOT_CONFIGURED, DISABLED, WARNING, UNKNOWN, STANDBY]
}

Box Status

1. You can also retrieve the status of the individual streams. The API returns the following:


```
[
  {
    "id": "fd02a4c9-5e55-4100-a2fd-d76d16993bce",
    "name": "",
    "model": "traffic-detector-urban-standard-fast",
    "streamStatus": {
      "state": "NOT_OPERATIONAL",
      "errorReason": [
        "ENGINE"
      ]
    },
    "enabled": true
  }
]
```


StreamStatus {
errorReason
[
uniqueItems: true
string
Enum:
Array [5]
]
state string
Enum:
[DISABLED, NOT_CONFIGURED, NOT_OPERATIONAL, OPERATIONAL, PENDING, UNKNOWN, WARNING]
}