

# Intelligent Video Analytics Pro



Intelligent Video Analytics (IVA) Pro is an expert suite of video analytics that delivers valuable insights for improved efficiency, simplicity, security, and safety. With IVA Pro, an AI-driven video analytics software, Bosch supports security professionals, consultants, specifiers, and end-users on their journey towards predictive solutions.

## System overview

IVA Pro is available as three different packs:

- IVA Pro Buildings Pack
- IVA Pro Perimeter Pack
- IVA Pro Traffic Pack

The different IVA Pro Packs are ideal for the following scenarios:

IVA Pro Buildings Pack	<ul style="list-style-type: none"> <li>• General surveillance</li> <li>• Indoor and outdoor people counting</li> <li>• Parking lot occupancy</li> </ul>
IVA Pro Perimeter Pack	<ul style="list-style-type: none"> <li>• Professional intrusion detection</li> </ul>
IVA Pro Traffic Pack	<ul style="list-style-type: none"> <li>• Traffic monitoring</li> <li>• Automatic Incident Detection</li> </ul>

- ▶ Application-specific AI packages for advanced intrusion detection in and around buildings, perimeter security, and traffic monitoring
- ▶ Easy evidence retrieval with forensic search
- ▶ Easy configuration and calibration
- ▶ Seamless integration with video management systems from Bosch and other partners

## Functions

### Tracking modes

The different IVA Pro Packs provide the following tracking modes:

IVA Pro Buildings Pack	<ul style="list-style-type: none"> <li>• Base tracking (2D)</li> </ul>
IVA Pro Perimeter Pack	<ul style="list-style-type: none"> <li>• Perimeter tracking (2D)</li> <li>• Perimeter tracking (3D)</li> <li>• People tracking (3D)</li> <li>• Museum mode (2D)</li> <li>• Ship tracking (2D)</li> </ul>
IVA Pro Traffic Pack	<ul style="list-style-type: none"> <li>• Traffic tracking (3D)</li> </ul>

### Object classes

The different IVA Pro Packs provide the following object classes:

IVA Pro Buildings Pack	<ul style="list-style-type: none"> <li>• Person</li> <li>• Vehicle</li> </ul>
IVA Pro Perimeter Pack	<ul style="list-style-type: none"> <li>• Person</li> <li>• Bike</li> <li>• Car</li> <li>• Truck</li> </ul>
IVA Pro Traffic Pack	<ul style="list-style-type: none"> <li>• Person</li> </ul>

- Bicycle
- Motorcycle
- Car
- Truck
- Bus

**Alarm and statistic tasks**

The following alarm and statistic tasks are available:

- Detect objects within, entering, or leaving a single or multiple (up to three) defined detection zones in specified sequence or timing
- Detect multiple line crossings from a single line up to three lines combined in specified sequence or timing
- Detect objects traversing a route
- Detect loitering in an area related to radius and time
- Detect objects that have started or stopped moving
- Detect left or removed objects (IVA Pro Perimeter Pack only)
- Detect objects with properties, such as size, speed (IVA Pro Perimeter Pack and IVA Pro Traffic Pack only), direction, and aspect ratio, that change within a configured time according to specification
- Count objects crossing a virtual line
- Count objects within an area and alarm if a predefined threshold is reached
- Combine tasks using scripts

**Filters**

All IVA Pro Packs can be configured to ignore specified image areas and small objects to enhance robustness. Furthermore, object size, two-way direction, aspect ratio, color, and speed (IVA Pro Perimeter Pack and IVA Pro Traffic Pack only) filters can be used in any combination to create specific detection rules for objects. Statistics on object properties are stored and can be displayed for fine-tuning the object filters. Object properties can also be defined by selecting an appropriately similar object in the video.

**Real-world size, speed, and location**

The IVA Pro Perimeter Pack and the IVA Pro Traffic Pack include the calibration possibility to transform 2D pixels into 3D real-world measures, including size, speed, and geolocation of objects for tracking use cases.

**Intelligence-at-the-edge concept**

The intelligence-at-the-edge technology allows users to reduce bandwidth and storage in the absence of action and switch back to full image quality in case of video analytics alarms. Alarm conditions can be signaled by a relay output on the unit or an alarm connection to stream video to a decoder, a roadside unit (IVA Pro Traffic Pack), or a video management system. Alarms can also be transmitted to a video

management system to start extended alarm scenarios. As well as creating alarms, the IVA Pro Packs produce metadata describing the content of the analyzed scene. This metadata is sent over the network and may also be recorded with the video stream or used independently of the video stream.

**Forensic search**

The recorded metadata can be used for a full forensic search in which the rules can be changed within Bosch Video Management System (BoschVMS), even after the fact. New tasks can be defined and adapted for each search, and the recorded metadata is then scanned and evaluated accordingly. Forensic search is very time efficient and can scan a huge recording database for events within seconds.

**Intuitive graphical user interface**

The setup is available via the Configuration Manager. A wizard-based graphical user interface guides the user through the configuration. It provides all the necessary tools to set up the IVA Pro Packs and specify detection or counting tasks. All configuration options are visualized as feedback overlays and can be edited directly for intuitive configuration. When movement is detected, the object is outlined in yellow on the display and its motion is displayed as a green trajectory. If an object and its motion match the rule conditions defined for one of the detector tasks, an alarm is created and the object outlines change to red. Additionally, an idle object is marked with [I] and a removed object is marked with [X].

**Configuration**

With minimal configuration, the following detection and alarm scenarios are possible:

IVA Pro Buildings Pack	Detects upright persons and vehicles and alarms on any object in the scene while suppressing any other objects or motion, with minimal configuration and without calibration. Select a task and mark the area of interest in the image. Up to 64 objects can be tracked in real time.
IVA Pro Perimeter Pack	Detects and alarms on any moving object in the scene. To achieve the best performance with respect to detection rate, detection distance, and false alarm resistance, add calibration and switch to 3D processing.
IVA Pro Traffic Pack	Detects pedestrians, bicycles, motorcycles, cars, trucks, and buses and alarms on any object in the scene while suppressing any other objects or motion such as shadows, headlights, and changing weather conditions. Select a task and mark the area of interest in the image. Camera calibration and switching to Traffic (3D) tracking mode enables speed data and geolocation of all objects. Up to 64 objects can be tracked in real time.

Scenario defaults provide example configurations for the most common tasks. More complex setups are also supported: Up to 16 independent tasks can be set up in the GUI, and the alarm objects for each task can be restricted according to their properties. A task script editor is available for fine-tuning and combining predefined tasks.

### Assisted calibration for IVA Pro Perimeter Pack and IVA Pro Traffic Pack

The calibration uses internal sensors from the camera and user input. User input can be given by marking ground points on a map or by measuring heights and distances on the ground, for example, by marking a person walking through the scene. The calibration tool guides users through all necessary steps. It supports calibration from recordings, allowing a person to walk through the scene and be used as a known reference in the calibration process afterwards.

The IVA Pro Buildings Pack does not need calibration.

### MVC-IVA-TRA IVA Pro Traffic Pack

Video analytics software based on deep neural network technology for traffic monitoring and Automatic Incident Detection.

Order number **MVC-IVA-TRA | F.01U.409.538**

## Technical specifications

### Compatibility

The IVA Pro Packs are compatible with the following cameras:

IVA Pro Pack	Included	Licensable option
IVA Pro Buildings Pack	FLEXIDOME 5100i FLEXIDOME 5100i IR	
IVA Pro Perimeter Pack		FLEXIDOME 5100i FLEXIDOME 5100i IR
IVA Pro Traffic Pack		FLEXIDOME 5100i FLEXIDOME 5100i IR

Configure the IVA Pro Packs with Configuration Manager, a free software available for download from the Bosch website: <https://downloadstore.boschsecurity.com/>

## Ordering information

### MVC-IVA-BLD IVA Pro Buildings Pack

Free of charge video analytics software based on deep neural network technology for intrusion detection and operational efficiency in and around buildings.

Order number **MVC-IVA-BLD | F.01U.409.536**

### MVC-IVA-PER IVA Pro Perimeter Pack

Video analytics software for mission-critical perimeter protection.

Order number **MVC-IVA-PER | F.01U.409.537**

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