MVC-IVA-TRA IVA Pro Traffic
IVA Pro

- Detects, classifies, and locates vehicles, motorcycles, bicycles, trucks, and buses in heavy traffic, day or night, and delivers high accuracy even in the most challenging situations
- Pedestrian detection to enable real-time safety solutions for vulnerable road users
- Industry-proven to deliver accuracy levels beyond 95% for real-time event detection and aggregation of valuable data
- Comprehensive and reliable metadata with location, speed, and direction
- Seamless integration with video management systems from Bosch and other partners

Founded on deep learning, Intelligent Video Analytics (IVA) Pro Traffic is designed for ITS applications such as counting and classification, as well as Automatic Incident Detection. It supports strategies that enhance mobility, safety, and the efficient use of roadways and solutions for intersection monitoring. It achieves accuracy levels beyond 95% for real-time event detection and aggregation of comprehensive data necessary for highway and urban infrastructure planning.
Data collected provides actionable insights for improving the efficient use of roadways and the safety of persons and vehicles at intersections, on highways, and in tunnels. Robust algorithms based on deep neural networks are trained to ignore potential disturbances caused by vehicle headlights or shadows, extreme weather, sun reflections, and shaking cameras.

Functions

Traffic monitoring for intersections, tunnels, and highways
IVA Pro Traffic comes with new deep neural network-based video analytic detectors for cars, trucks, buses, motorcycles, bicycles, and pedestrians. It allows for traffic monitoring at intersections, highways, and tunnels. The software improves detection capabilities in congested scenes for accurately counting vehicles at traffic lights or in traffic jams. Automatic detection of safety risks and other traffic events, include alerts for pedestrian presence, slow and stopped vehicles, traffic queues and congestion, and vehicles traveling the wrong way.

Tracking mode
IVA Pro Traffic comes with a dedicated tracking mode: Traffic tracking (3D).

Additional object classes
IVA Pro Traffic classifies vehicles and vulnerable road users:
- Pedestrian
- 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 objects with properties, such as size, speed, 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
IVA Pro Traffic 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 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
IVA Pro Traffic includes 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, 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, IVA Pro Traffic produces 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 (Bosch VMS), 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 software. A wizard-based graphical user interface guides the user through the configuration. It provides all the necessary tools to set up IVA Pro Traffic 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, IVA Pro Traffic 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. Up to 64 objects can be tracked in real time. Camera calibration and switching to Traffic (3D) tracking mode enables speed data and geolocation of all objects. 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.

Autocalibration
IVA Pro Traffic offers Autocalibration in combination with selected cameras. These cameras use AI technology to detect and analyze cars and persons in the scene in order to determine calibration parameters. The calibration itself is therefore reduced to a single click, followed by the usual manual verification.

Assisted calibration
The calibration uses internal sensors from the camera and user input. The map-based calibration allows fast and easy calibration by marking ground points on map and image. Alternatively user input can be given 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.

Parts included

Quantity	Component
1	License

Technical specifications

Compatibility
For information on supported cameras, refer to the Bosch Video Product Selector:
www.videoselector.boschsecurity.com

Configuration
Configure IVA Pro with Configuration Manager, a free software available for download from this website:
https://downloadstore.boschsecurity.com/.

Ordering information

MVC-IVA-TRA IVA Pro Traffic
Video analytics software based on deep neural network technology for traffic monitoring and Automatic Incident Detection.
Order number **MVC-IVA-TRA**

https://www.boschsecurity.com

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