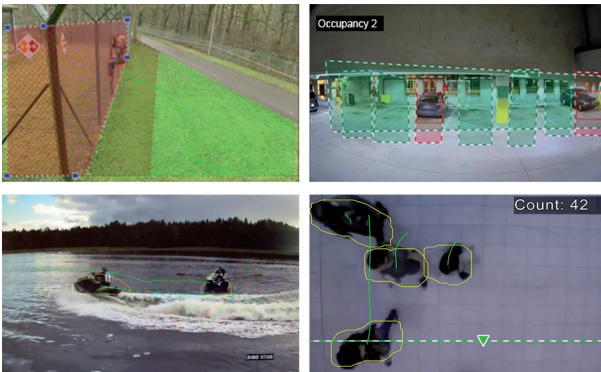# Intelligent Video Analytics 7.10

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BOSCH

Invented for life

- ▶ Mission-critical, long-distance intrusion detection in extreme weather conditions
- ▶ High-performance people counting and asset protection
- ▶ Camera Trainer for user-defined object detection
- ▶ Live alarming and forensic search

Intelligent Video Analytics 7.10 by Bosch is the guard-assistant system of choice when you need mission-critical, long-distance intrusion detection in extreme weather conditions or other high-performance video analytics.

The software system is state-of-the-art intelligent video analytics that reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image.

Advanced tasks like multiple line crossing, loitering, crowd density estimation, and people counting are available. Object filter based on size, speed, direction, aspect ratio, and color can be defined.

For calibrated cameras, the software automatically distinguishes between the object types upright person, car, bike, and truck.

Ease of setup has been improved by providing scenario defaults and allowing alarm field combinations via the user interface.

Furthermore, the new Camera Trainer module within Intelligent Video Analytics 7.10 allows the user to define objects to be detected by providing examples of them.

Intelligent Video Analytics 7.10 allows you to record all of the object information and change the rules even after the fact for fully configurable forensic search.

The software system is fully prepared in many Bosch cameras and the Camera Trainer module is a licensable add-on to it.

Functions

Robust motion detection

Intelligent Video Analytics 7.10 brings the latest level of intelligence to video analytics. Continuously developed in-house by the Bosch research group it adapts to difficult conditions like changes in lighting or environment such as rain, snow, clouds, and leaves blowing in the wind. It also compensates automatically for camera shaking.

Tamper detection

The built-in tamper detection generates alarms on camera hooding/masking, blinding, defocusing, and repositioning.

Dedicated tracking modes

Intelligent Video Analytics includes dedicated tracking modes optimized for the following tasks:

- Intrusion detection
- Indoor people counting
- Asset protection (don't touch!)
- Tracking of ships

Camera Trainer
Based on examples of target objects and non-target objects, the new Camera Trainer module uses machine learning to allow the user to define objects of interest and generate detectors for them. In contrast to the moving objects detected in general by Intelligent Video Analytics 7.10, Camera Trainer allows to detect both moving and non-moving objects and immediately classifies them. Training is possible via the Configuration Manager software both on live video as well as on recordings available through the respective camera. The resulting detectors can be down- and uploaded for distribution to other cameras.

Alarm and statistic tasks
The following alarm and statistic tasks are available:
- Detect objects within, entering, or leaving a single area or up to 3 areas in a specified order
- Detect multiple line crossing from single line up to 3 lines combined in a specified order
- Detect objects traversing a route
- Detect loitering in an area related to radius and time
- Detect objects which are idle for a predefined time span
- Detect removed objects
- Detect objects who's properties such as size, speed, direction, and aspect ratio change within a configured time span according to specification (for example something falling down)
- Count objects crossing a virtual line
- Count objects within an area and alarm if a predefined limit is reached
- Detect a certain crowd level in a predefined field
- Detect specified motion direction and speed even in crowds (for example a person moving the wrong way in a one-way gate)
- Detect objects that move contrary to the motion of all other objects in the scene, even in crowds
- Take snapshots of frontal faces
- Combine tasks using scripts

Filters
To enhance robustness, the software can be configured to ignore specified image areas and small objects. For calibrated cameras, the software automatically distinguishes between upright persons, bikes, cars, and trucks. Furthermore, object size, speed, two-way direction, aspect ratio, and color filters can be used in any combination to create specific detection rules for exactly the objects you are looking for. 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.

Intelligence-at-the-edge concept
The video analytics software is available in Bosch IP cameras. This intelligence-at-the-edge concept allows a decision on which videos are captured based on video content analysis (VCA). Bandwidth and storage can be reduced by recording alarm situations only or by selecting the best video encoding quality and frame rates exclusively for alarms. Alarm conditions can be signaled by a relay output on the unit or an alarm connection, to stream video to a decoder or video management system. Alarms can also be transmitted to a video management system to start extended alarm scenarios. As well as creating alarms, the software produces metadata that describes the content of the analyzed scene. This metadata is sent over the network, and may also be recorded, together with the video stream.

Forensic Search
The recorded metadata can be used for a full forensic search where the rules can be changed even after the fact within Bosch Video Management System (BVMS) or Video Client. 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
Setup is available via device web page as well as via Configuration Manager. A wizard-based graphical user interface guides through the configuration. All configuration options are visualized exemplarily as overlays for feedback and can directly be manipulated 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 are switched to red. Additionally, an idle object is marked with an [I] and a removed object with an [X].

Support for specific use cases
The video analytics software offers easy setup by providing optimal default values for several applications. Calibrate the camera, then simply select the desired use case and adapt the offered alarm fields and lines to your field of view. This is available for the following scenarios:
- Intrusion detection: small area, single alarm field
- Intrusion detection: long distance, two alarm fields have to trigger
- People counting
- Traffic monitoring: wrong way detection
- Traffic monitoring: automatic incident detection with wrong way detection, pedestrian detection, slow vehicles, stopped vehicles and dropped objects

Automatic calibration
Perspective can be taught to give the software the power of 3D understanding of the scene, resulting in real sizes, object speed, automatic object classification, best-performance long-distance detections and people counting.

The newest generation of IP cameras from Bosch include sensors automatically detecting the angle of the camera to the ground. Whenever a predefined lens is within the camera, whether fixed or variofocal, the

calibration will also know the focal length of the lens. Thus teaching the video analytics software perspective can often be done by simply entering the elevation of the camera.

Configuration complexity on demand
The video analytics software automatically alarms on any object in the scene. More complex setups are supported as well: up to 8 independent tasks can be set up in the GUI, and the alarm objects for each task can be restricted according to their properties. Camera calibration can be added for perspective correction and to obtain object properties in metric or imperial systems. A wizard is available to support the calibration by marking lines and angles in the scene. A task script editor is available for fine tuning and combining predefined tasks, and additional 8 tasks can be set up there.

Installation/configuration notes

IP cameras from Bosch are grouped by their common product platform (CPP) generation. Intelligent Video Analytics 7.10 is a licensed option already fully prepared in many cameras from Bosch. It is available on CPP4, CPP6, CPP7, and CPP7.3 based IP cameras, provided these cameras have an additional dedicated hardware unit (FPGA) for computing video analytics. Best performance, doubled detection range, ship tracking, compensation of shaking cameras, and Camera Trainer are only available on CPP6, CPP7, and CPP7.3 based IP cameras.
The Intelligent Video Analytics 7.10 software functionality is a free-of-charge upgrade of Intelligent Video Analytics 6.60 and already part of all Intelligent Video Analytics 7.10 enabled products with the firmware version 7.10 or later. It upgrades automatically from an already installed Intelligent Video Analytics 6.60 when installing the firmware version 7.10 to the device.
Intelligent Video Analytics is set up using either the device web page or the Configuration Manager software that is included with the product and available for download from the Bosch website as well.

Configuration Manager can be installed as often as required on any PC that will be used for configuration of Intelligent Video Analytics and the products themselves.

Technical specifications

Common product platform (CPP)

Intelligent Video Analytics 7.10	Available on 7000 - 9000 series IP cameras from Bosch based on CPP generations CPP4, CPP6, CPP7, and CPP7.3
Camera Trainer module	Only available on 7000 - 9000 series IP cameras from Bosch based on CPP generations CPP6, CPP7, and CPP7.3

Ordering information

MFT-IVA Intelligent Video Analytics
Free-of-charge Intelligent Video Analytics software, available on 7000 - 9000 series IP cameras from Bosch based on common product platform generations CPP4, CPP6, CPP7, and CPP7.3.
Order number **MFT-IVA**

MVC-CT-PTZ License for PTZs
Camera Trainer license for Intelligent Video Analytics 7.10 on PTZ cameras.
Free-of-charge software module.
Order number **MVC-CT-PTZ**

MVC-CT-FLX License for FLEXIDOMEs
Camera Trainer license for Intelligent Video Analytics 7.10 on FLEXIDOME cameras.
Free-of-charge software module.
Order number **MVC-CT-FLX**

MVC-CT-DIN License for DINIONs
Camera Trainer license for Intelligent Video Analytics 7.10 on DINION cameras.
Free-of-charge software module.
Order number **MVC-CT-DIN**