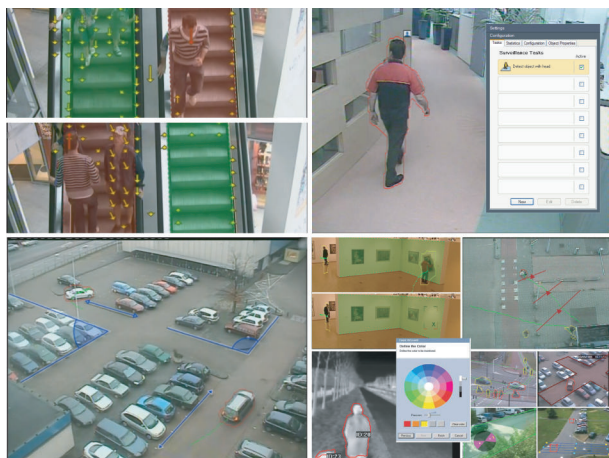# IVA 4.0 Intelligent Video Analysis

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BOSCH
Invented for life

- ▶ Embedded analytics eliminates dedicated PCs and associated software maintenance

- ▶ Detects idle/removed object, loitering, and line-crossing

- ▶ Displays/detects object trajectories, speed, direction, heads and color

- ▶ Optical flow detection of objects in a surveillance scene

- ▶ Creates metadata for forensic searching of recorded video

The fourth generation of the Bosch Intelligent Video Analysis system, IVA 4.0, is the guard-assistant system of choice when you need reliable video motion detection for indoor or outdoor use. IVA 4.0 is state-of-the-art intelligent video analysis that reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image. IVA 4.0 is a licensed option already fully prepared in Dinion IP, Extreme IP, FlexiDome IP, and AutoDome IP cameras, as well as the VIP X1600 and VideoJet X families of encoders. The functionality built into IVA 4.0 cameras and encoders is able to detect idle and removed objects as well as loitering, multiple line crossing, and trajectories.

IVA 4.0 supports head detection as a new feature. And Bosch for the first time also supports optical flow detection of objects in a video surveillance scene. Configurable detection filters and advanced tracking improve reliability and reduce operator work load. IVA 4.0 comes with the new enhanced calibration tool to allow the calibration of the camera within a few minutes.

Functions

Robust Motion Detection
The improved algorithm in IVA 4.0 intelligently adapts to difficult conditions like changes in lighting or environment such as rain, snow, clouds, and leaves blowing in the wind. The background learning algorithm is continuously developed in-house by the Bosch research group and brings the latest level of intelligence to IVA.

The increased functionality combines with the built-in tamper detection that generates alarms on camera hooding/masking, blinding, defocusing, and repositioning. Image stabilization ensures detection even with shaky video sources such as cameras mounted on poles or simple vibrations.
The following tasks can be selected:
- Detect objects entering, leaving, or just being within an area (detector field)
- Detect loitering in an area related to radius and time
- Detect idle objects within a configurable time span
- Detect removed objects within a configurable time span
- Detect trajectories/routes of objects, passing in the scene, displayed with tracking lines
- Detect multiple line crossing from single line up to three lines combined in a logical row

- Detect condition change properties such as size, speed, direction, and aspect ratio change within a specified time span (for example something falling down)
- Detect heads within a configurable area
- Detect flow of a constant moving object
- Detect object that moves against a flow of objects
- Alarm task script manager in the expert mode to combine tasks logically

Filters

It is easy to configure IVA 4.0 to select sensitive areas of the image, minimum object size, and the motion direction that will trigger an alarm. IVA 4.0 will only detect the relevant moving objects in a scene. Use the object size, speed, two-way direction, aspect ratio, head detection and color filters to create specific detection rules. These filters can be used in any combination to exactly determine the object features you are looking for. Detection statistics for objects are stored for fine tuning the object filters.

Intelligence-at-the-Edge Concept

Embedded Video Content Analysis (VCA), that decides which video is captured, is an implementation of the Intelligence-at-the-Edge concept. By only selecting alarm video for streaming or recording, less bandwidth and storage is used.

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, IVA 4.0 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. It can be used for providing a forensic search capability for recordings together with the Archive Player program and a Forensic Search license. Forensic searching is very time efficient and can scan a huge recording database for events within seconds.

Intuitive Graphical User Interface

A new wizard-based GUI guides you through the configuration with ease. The Configuration Manager program with an intuitive plug-in is part of the product CD and provides all the necessary tools to set up IVA 4.0.

A wizard-based graphical display within the IVA Task Manager, allows you to set the sensitive area, size, speed, perspective, and aspect ratio as well as the movement direction and object color, which are then simply superimposed upon the image.

The pick object functionality enables configuration to be carried out just by clicking an object of interest in the live scene. All specific information regarding size, speed, direction, aspect ratio, and color are automatically set for task configuration.

Up to eight independent tasks can be selected and combined in the scene to build sophisticated detection rules, each one individualized with its own parameters. This allows the detection of multiple object states in parallel, generating separate triggers that can be handled independently or in combination. The interface allows a flexible selection of each sensitive area through polygons with up to 16 corner points.

A further improved calibrator is used for easy perspective correction and camera calibration making measurements more accurate for both metric and imperial systems.

When movement is detected, the object is outlined in yellow on the display and motion is tracked on the monitor. If an object and its motion match the rule conditions defined for one of the detector fields, it creates an alarm and its outlines are switched to red. Additionally, an idle object is marked with an [I] and a removed object with an [X].

Installation/Configuration Notes

The IVA 4.0 software functionality is a free-of-charge upgrade of IVA 3.5 and already part of all IVA 4.0 enabled-products with the firmware release of 4.0 or higher. It upgrades automatically from an already installed IVMD 2.0, IVA 3.0 or IVA 3.5 when installing the 4.0 firmware to the device. New IVA 4.0 customers only need to enable the 4.0 license to make it operational.

The IVA 4.0 license enabling all IVA 4.x features, can be installed in parallel with an IVMD 1.0 license on the same unit (not on VIP X1600 XF). IVA 4.0 is set up using the Configuration Manager program that is included with the product and available for download from the Bosch website.

Configuration Manager can be installed as often as required on any PC that will be used for configuration of IVA 4.0 and the products themselves.

Video content analysis may require up to 40% of the available calculation power of an encoder or camera. As priority is always given to recording and live video streams, video content analysis may be affected if the calculation power it requires is not available. Correct selection of encoder settings should resolve this. The performance meter on the Web page of the product may be helpful for set-up. IVA 4.x is not available for VIP X1 and VIP X2 because of technical restrictions.

Ordering Information

MVC-FIVA4-CAM
IVA 4.x VCA software license for IP camera/dome (e-license)
Order number **MVC-FIVA4-CAM**

MVC-FIVA4-ENC1

IVA 4.x VCA software license for single channel
encoder (e-license)
Order number **MVC-FIVA4-ENC1**

MVC-FIVA4-ENC2

IVA 4.x VCA software license for dual channel encoder
(e-license)
Order number **MVC-FIVA4-ENC2**

MVC-FIVA4-ENC4

IVA 4.x VCA software license for quad channel encoder
(e-license)
Order number **MVC-FIVA4-ENC4**