

Focus your attention

Bosch Intelligent Video Analysis



BOSCH

Invented for life



Take action with Bosch Intelligent Video Analysis

No matter how few or how many cameras your system uses, monitoring everything effectively presents a serious challenge. Even observing just a single screen for long periods pushes concentration to the limit – after only 20 minutes, an operator can miss as much as 90% of the activity in a scene.



Bosch Intelligent Video Analysis (IVA) helps operators stay focused by introducing a new level of automation to CCTV monitoring. Edge-based, real-time processing identifies alert conditions, giving your security team the information it needs to react swiftly and take action.

CCTV surveillance re-invented

A major asset to overall surveillance, Bosch IVA technology supports your security personnel with a comprehensive and efficient event detection and alarm system. This next-generation, intelligent digital image processing system greatly improves security and safety, keeping a constant, unblinking eye on any scene.



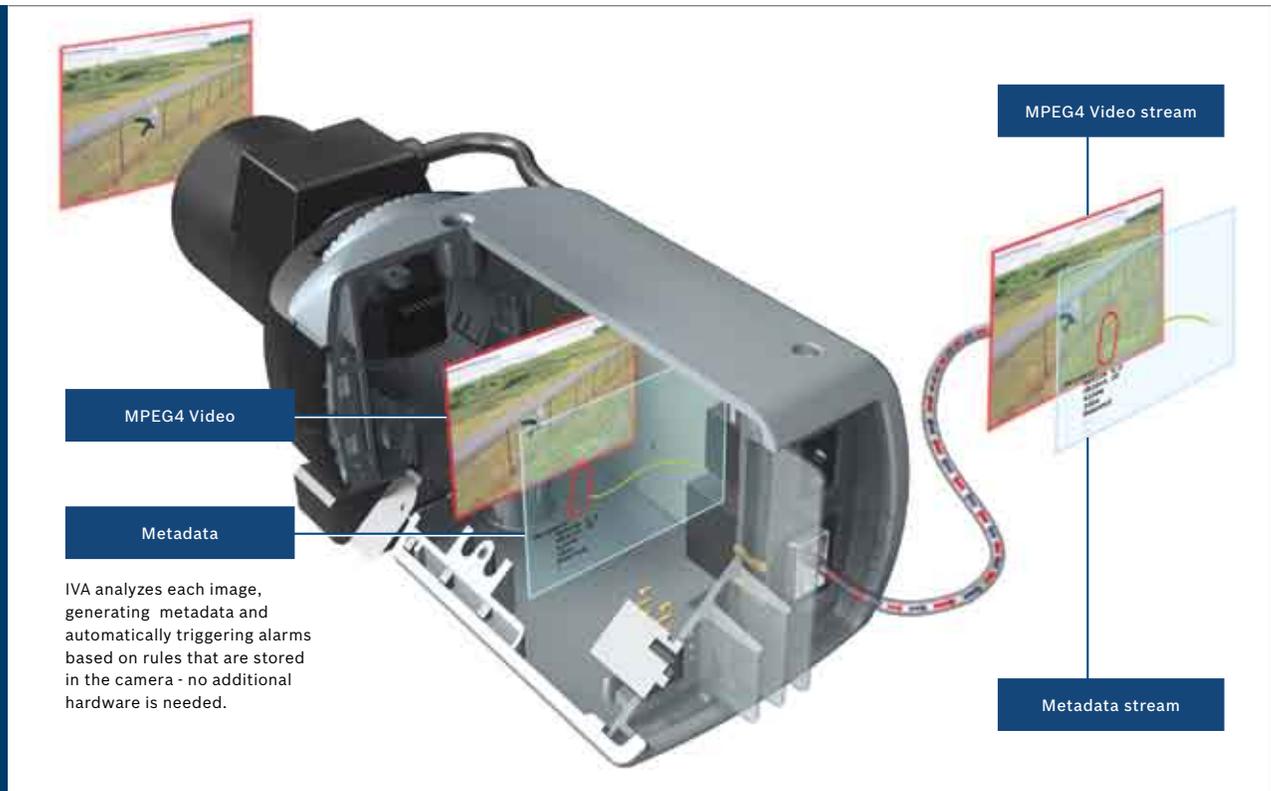
Working independently on each camera, Bosch IVA operates without a central analytics server. You can choose a wide variety of advanced detection functions, ranging from idle object to trajectory tracking. Live images are analyzed instantly and the resulting data stream accompanies the video feed.

Events are immediately displayed, while the data can also be stored for later review. As a complete system solution it captures comprehensive details of recorded scenes, giving you the power to find any event – even those not originally set up as alerts.

Bosch Intelligent Video Analysis – focus your attention, and take action.

Intelligence at the edge

Taking a unique approach to video content analysis, Bosch IVA puts the image processing power inside the camera or video encoder. Able to automatically recognize key events in a scene and alert the operator, it delivers "intelligence at the edge."



Bosch IVA helps your security team react quickly to suspicious activities or potential threats. Each surveillance camera in the system becomes an active member of your team, automatically:

- ▶ Identifying events during continuous real-time image analysis
- ▶ Alerting the operator by sending an alarm when it detects a critical event – turning your cameras into a virtual security team

Furthermore, whether your existing system uses analog cameras or Bosch IP cameras, adding Bosch IVA capability is simple and cost effective.

Intelligent Video Analysis: an extra set of eyes

Accurate, efficient and convenient, Bosch IVA performs multi-level image analysis of pixel, texture and motion content inside the camera. Intelligent Video Analysis tracks the trajectory (speed and

direction) of all objects, and can detect loitering as well as idle or removed objects.

Bosch IVA uses advanced algorithms to deliver the most reliable solution for surveillance monitoring. Ongoing development ensures new techniques are continually applied, improving 'intelligence' and enhancing current functionality via software upgrades.

While offering a very high degree of sophistication, Bosch IVA is very easy to implement, set up and control. Fine-tuning of sensitive areas, detection fields, object shapes and movements lets you configure the system the way you want, quickly and accurately.

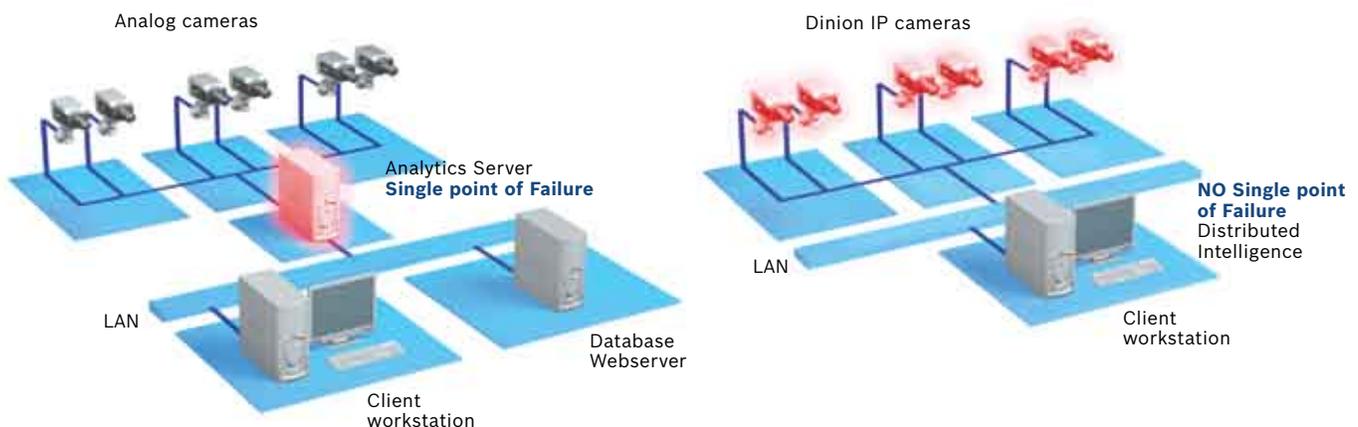
Traditional solutions use a central server to analyze video content. This involves hardware and maintenance costs, puts the system at risk for computer viruses and requires full data streams from each connected camera. Most critically, relying on a single server creates an inherently weak system: if the server fails, analysis fails for every camera.

Using 'distributed intelligence', Bosch IVA creates a far more robust system – it has no central server and therefore no single point of failure. Intelligent Video Analysis operates independently in each component. Even if one camera or encoder fails, the rest of the system remains fully functional.

Further benefits include:

- ▶ Reduced costs and enhanced reliability: no need for analysis servers or operating systems
- ▶ Operates with multiple cameras without any centralized hardware
- ▶ Reduced data load and storage requirements - all video analysis is done at the edge in the camera.
- ▶ Minimizes your overhead: a single licence fee covers all detection capabilities enabled in the camera

Bosch IVA gives you far-reaching benefits in system effectiveness and reliability.



A more robust and powerful system

By themselves, cameras with Bosch Intelligent Video Analysis make your surveillance setup more effective. But as part of a complete system they bring a wealth of additional benefits.



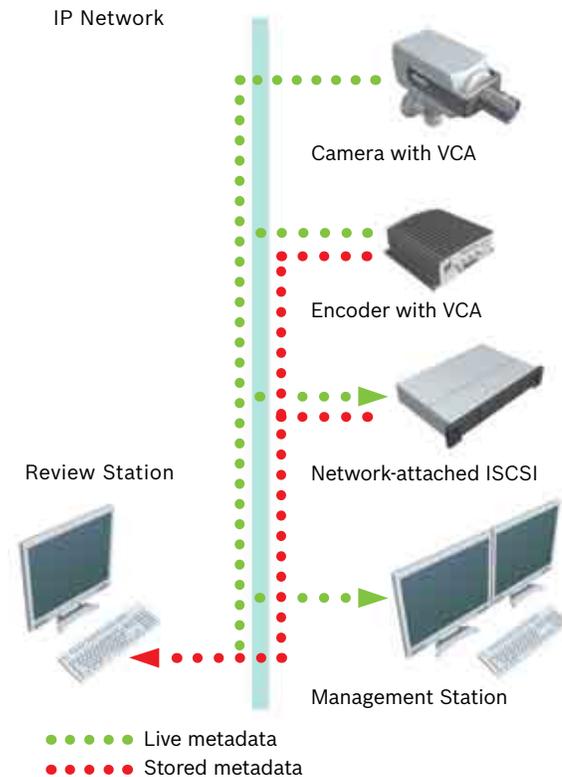
▲ IVA alerts operators when critical events occur enabling them to focus their attention when really necessary.

▲ Forensic searching through recorded metadata enables operators to find specified events in seconds.

Capturing details in metadata

IVA captures data on everything that happens within the active areas of each monitored scene. Content analysis information, in the form of metadata, is generated and stored with the video images. The metadata contains details on all objects within, entering or leaving the monitored areas. And the analysis doesn't stop with live scenes,

Bosch IVA can also provide event recognition during playback of recorded video. The recorded metadata, comprised of simple text strings describing specific image details, is much smaller and easier to search through than the recorded video images. By searching the metadata with smart search facilities like those provided with an Internet search engine, IVA quickly takes you to the relevant



footage without having to scan through the entire recording.

Real forensic search

What if something happens in a scene that your system was not set up to detect? Bosch IVA forensic search offers you a unique solution – simply review the archive video using new detection criteria.

With our Intelligent Video Analysis forensic search, you can search for different events compared to those detected during live viewing. For example, you can reconfigure the system to detect a 'left object' when searching your archived video, even if the system was not originally configured to detect this event.

User-friendly set-up and control

With Bosch Intelligent Video Analysis, the system analyzes video content based on your input criteria. These are entered via the 'rule wizard', which takes you through the process step-by-step. Areas to watch within each view, object size and shape, motion direction and many more parameters can be set for each camera. The intuitive menu makes set-up straightforward and allows you to specify what event, or combination of events, will trigger an alarm.

Wizard-based configuration guides the user through every step during setup.



Any events detected by the system that fit the pre-defined criteria are depicted clearly on-screen. Object outlines, color-coded according to the alarm status, overlay the monitor images to show their position. Factors such as aspect ratio and perspective are automatically accounted for.

Extra reliability

To help ensure alarms are only triggered for real events, features such as camera calibration and perspective correction greatly enhance Intelligent Video Analysis accuracy and reliability. Also, special filters for size, speed, direction and aspect ratio minimize false alarm rates.

Statistical analysis of the captured images makes the system highly weather resilient. It can filter out rain or even snow. Image stabilization ensures that only movement within the captured areas is detected, and not movement caused by the camera swaying in the wind.

Guarding against physical interference, Intelligent Video Analysis also features tamper protection that highlights any sudden changes to the input signal compared with a reference frame.

| Feature | Description | |
|-------------------------------|---|---|
| Line crossing | Imaginary lines have a real effect – someone has passed into a restricted area. Bosch IVA raises the alarm. |  |
| Loitering | Bosch IVA alerts the operator that someone has lingered for too long in this parking area. |  |
| Idle object | Whether it's a car parked illegally or an object left behind, Bosch IVA can alert the operator immediately. |  |
| Removed object | Nothing escapes Bosch IVA – if an object disappears from its usual position, an alert is raised automatically. |  |
| Condition change | This person has raised an alert because he changed aspect ratio (crouching). |  |
| Trajectory tracking | Finding out which vehicles followed a specified path is easy using Bosch IVA forensic search. |  |
| Filters | You can define detection characteristics for an object such as aspect ratio, speed, size, direction and object color. |  |
| Image stabilization | This camera performs precise analysis even though its mount is not completely stable. |  |
| Thermal camera support | Bosch IVA even supports thermal (Far Infra-Red) camera sources. |  |

Your virtual Bosch security team

Working as an integrated part of your surveillance system, Intelligent Video Analysis reinforces your security capability. It ensures monitoring performance does not degrade due to fatigue, distractions or having large amounts of activity to observe.

Ready to go

Bosch IVA is already built into many of our IP cameras. Integration into existing systems is also easy, by adding one or more encoders and purchasing a license for each camera using IVA.

And you only need to activate Bosch IVA for cameras that cover critical areas, keeping costs down and helping your security personnel keep a watchful eye on the most important views.

A dual heritage in image analysis

Bosch Security Systems' achievements in video content analysis technology include the industry's first digital recording system with motion detection, in 1999. We have continued research intensively, improving motion detection and developing advanced object tracking and event detection algorithms.

We have also benefited from Bosch's R&D experience in the exacting field of vision-based systems for automotive applications. Our extensive research in this area brings future motoring applications such as road sign recognition and pedestrian detection ever closer to reality. In fact, some of our solutions are already appearing in cars today.



IP cameras

Many of our IP cameras have Intelligent Video Analysis embedded in them including our Dinion IP, FlexiDome IP and AutoDome fixed camera families.



Bosch Intelligent Video Analysis encoders

For existing analog surveillance systems, it's easy to add IVA functionality using our VIP X1600 and VideoJet X10/X20/X40 series of video encoders.



iSCSI storage

Bosch leads the market in video storage with the latest iSCSI solutions for storing both video and related IVA metadata.



Bosch IVA Forensic Search license

Bosch IVA Forensic Search provides the ability to rapidly scan through even the largest video archives for specific metadata contents using freely-definable search criteria.



Bosch Video Management System

Bosch VMS provides complete surveillance, video management and alarm handling. Alarms from Intelligent Video Analysis are combined with general motion alarms for quick detection. BVMS lets you combine and prioritize specific alarm conditions to create intricate rules for executing alarm scenarios.

Take your security to the edge with Bosch's IVA technology. To get started, contact your local Bosch sales representative or call 866-CCTV-REP today.

A tradition of quality and innovation

For over 100 years, the Bosch name has stood for quality and reliability. Bosch is the global supplier of choice for innovative technology backed by the highest standards for service and support.



Bosch Security Systems proudly offers a wide range of security, safety, communications and sound solutions that are relied upon every day in applications around the world, from government facilities and public venues to businesses, schools and homes.

Bosch Security Systems, Inc.

130 Perinton Parkway
Fairport, NY 14450 USA
Phone: 800.289.0096
Fax: 585.223.9180

For more information please visit
www.boschsecurity.us

© Bosch Security Systems, Inc. 2008
Modifications reserved
Printed in United States | 8/08