



# Intellect

INTELLECT PSIM: INTEGRATED SECURITY  
WITH DISTRIBUTED ARCHITECTURE

# Intellect PSIM installation sites

## RETAIL

Shoprite Retail Stores, *USA*  
E-Plus mobile phone company, *Germany*  
Segmueller, *Germany*  
IKEA Murcia, *Spain*  
Axion Energy, *Argentina*



## STADIUMS

Estadio Manuel Martínez Valero stadium, *Spain*



## TRANSPORT

Balticon terminal, *Poland*



## HOSPITALS

Provincial Integrated Hospital in Elbląg, *Poland*

## HOTELS

Eko Hotel & Suites, *Nigeria*  
Sheraton Libertador Hotel, *Argentina*

The Pan-American Highway, *Ecuador*  
Valparaiso Port, *Chile*  
Chubut Port, *Argentina*  
Pelindo Port, *Indonesia*

## EDUCATION

Instituto de Biomecanica de Valencia (IBV), *Spain*  
Academic Computer Center Cyfronet AGH,  
*Poland*

## SAFE CITY

Safe City Ulaanbaatar,  
*Mongolia*



Koszalin University of Technology, *Poland*

## PUBLIC AUTHORITIES

Jakarta National Traffic Management Centre  
(NTMC), *Indonesia*  
Abu Dhabi National Oil Company (ADNOC)  
Headquarters, *UAE*  
Madrid Stock Exchange, *Spain*

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## About AxxonSoft

*AxxonSoft is a leading global developer of open VMS (video management software) and PSIM (physical security information management) platforms. The company has over 2,500 partners, which perform over 1,500 installations every month. With more than 40 offices in Russia and around the world, the company provides its partners with quick response and exceptional support in every corner of the globe.*

To make integrated solutions as effective as possible, AxxonSoft continually collaborates with leading manufacturers of IP cameras, access control systems, fire and security alarms, and other hardware. AxxonSoft is a member of the ONVIF forum and offers integration for approximately 8,500 models of IP cameras, allowing security users to get the most out of on-board camera features. The list of integration-ready devices from major manufacturers continues to grow at a rapid rate.



*According to IMS Research (U.K.), AxxonSoft is one of the world's top four developers in the IP video surveillance category.*

### AXXONSOFT MISSION

AxxonSoft makes security systems for all sizes and types of business: from mom-and-pop stores to multinational corporations and infrastructure operators. Systems running AxxonSoft software can combine hundreds of servers and thousands of cameras into a single integrated security unit.

AxxonSoft software allows creating smart, integrated systems for securing sites of all sizes and purposes. AxxonSoft VMS and PSIM platforms power more than 150 Safe City municipal surveillance projects and security systems at airports, seaports, banks, industrial sites, retailers, gas station chains, and numerous government and business facilities around the world.

**THE FLAGSHIP OF THE AXXONSOFT LINEUP, INTELLECT IS A PLATFORM FOR PHYSICAL SECURITY INFORMATION MANAGEMENT WITH A MODULAR ARCHITECTURE, SCALING UP TO CREATE INTEGRATED SECURITY SYSTEMS OF ANY LEVEL OF COMPLEXITY.**

A key differentiator of Intellect from competing products is the ability to adapt Intellect-powered systems to the needs of specific projects, independent of system size, industry, and equipment brands used. The modular architecture allows clients to select only the features they need to build an effective system that is tailor-made for the security needs of a particular site. As a result, clients receive a robust system with a finely honed feature set at minimal cost.

Intellect-powered systems can centralize security tasks in a single interface: video surveillance, fire and security alarm systems, perimeter security, access control, audio monitoring, and much more.

### INDUSTRY PARTNERSHIP

Partnership is at the core of how AxxonSoft does business. Design and deployment of systems with AxxonSoft products is performed exclusively by partners – installers and integrators – well-versed in both AxxonSoft software and third-party hardware best-suited for client needs. This is why the company goes to great lengths to build, sustain, and maintain partnerships with an eye to long-term success.



## WHAT DOES PARTNER SUPPORT INCLUDE?

- By consulting in a timely manner, partners can offer well-designed solutions for handling even the most complicated client needs. We assist our partners with sales of integrated solutions, designing and installing security systems, system upgrades, and more.
- Courses, seminars, and certification in AxxonSoft products help our partners to become true experts in the security technologies developed by our company.
- Technical support is available to partners free of charge, helping to quickly resolve all issues related to project implementation and planning. To receive technical support, call the nearest AxxonSoft office or submit a request online at <https://support.axxonsoft.com>.
- Marketing campaigns include, among other things, print and electronic materials about products and joint solutions, as well as partner promotion programs. Together, these efforts help our partners to find new clients and drive sales.



## Intellect PSIM

*Intellect is a platform for physical security information management able to support integrated security systems of any level of complexity. With Intellect, it is possible to combine fire/security alarms, perimeter security, access control, video surveillance, audio detection, and various industry-specific solutions (Retail Intellect, Auto Intellect, ATM Intellect and Face Intellect). The open architecture makes it possible to add integration for other systems. Configuration, management, and monitoring of systems can be performed from a control center or from remote workstations.*

**Intellect allows automating system management tasks, including with user-scriptable IF...THEN event reactions.**

A single script can involve multiple systems (fire/security alarms, access control, video surveillance, and more). This makes the security process seamless and more efficient than ever.

Intellect also offers a number of specialized modules for industry-specific vertical solutions: A key differentiator of Intellect from competing products is the ability to adapt Intellect-powered systems to the needs of specific projects, independent of system size or industry. The modular architecture allows clients to select only the features they need to build an effective system that is tailor-made for the security needs of a particular site.

### INTELLECT APPLICATIONS:

- Video surveillance with audio recording and video analytics
- Access control
- Fire/security alarm systems
- Perimeter security
- Face and license plate recognition
- Point-of-sale/retail monitoring
- ATM network protection
- Comprehensive system monitoring
- Automatic recording of traffic violations
- Automatic number plate/license plate recognition for cars, railcars and cargo containers.

### INTELLECT OVERVIEW: HOW IT WORKS

Intellect software modules are installed on one or more computers, creating Intellect video servers. Different hardware is connected to these servers. Servers manage hardware and perform all security system functions. A single system can contain anywhere from 1 to an infinite number of servers. Configuration, management, and monitoring of the system is performed on operator workstations, which can be either dedicated computers or the servers themselves. Monitoring can also be performed via the Internet, from a web browser, AppleTV or mobile app on iOS and Android devices.

Servers and workstations communicate using the standard TCP/IP protocol, over a LAN (local area network), WAN (wide area network), Wi-Fi, etc. Thanks to this, the geographic location of equipment doesn't matter. No matter where the modules are located physically, they communicate over the network.

Intellect-powered security infrastructure allows securing large areas and ensuring dependable protection of complicated, geographically distributed sites. With Intellect, it is even possible to combine several sites into a single system, monitoring and managing all facilities from a master control center.

### OPEN ARCHITECTURE OF INTELLECT PSIM

Having an open platform allows both integrating new hardware and creating new solutions based on Intellect. All of this can be done by AxxonSoft or by our partners, independent software developers. AxxonSoft offers a Software Development Kit (SKD/API) for this purpose.



## Integration

*Intellect fits together all the pieces of the security puzzle. The system architecture is mix-and-match friendly: simultaneously manage all equipment with full use of all hardware-supported features, regardless of the equipment type, manufacturer, location, or specifications. Best of all, the entire range of hardware from diverse manufacturers is wrapped up in the centralized, user-friendly Intellect interface.*



### IP INTEGRATION: HYBRID SYSTEMS

Intellect supports over 8,500 models of IP cameras and IP video servers, including approximately 2,750 IP devices integrated via proprietary manufacturer interfaces. Since many video surveillance systems still rely on pre-IP CCTV hardware, Intellect goes the extra mile to make analog and IP equipment equally at home, even on the same system. This gives users the freedom to choose the equipment with best features and price, as well as gradually upgrade analog CCTV with IP cameras unit-by-unit without massive outlays or forced incompatibilities.



### DRIVERS PACK

Support for third-party IP cameras is implemented in Intellect thanks to the special Drivers Pack, which is regularly updated to add support for new devices. New versions of Drivers Pack can be downloaded free of charge from the AxxonSoft website and dropped (hot-installed) onto an existing Intellect installation. Since Drivers Pack is independent of the Intellect release cycle, support for new IP devices can be added on a frequent basis, without needing to reinstall Intellect on system servers. Drivers Pack updates are released approximately six times per year, each release adding support for around 50 new IP devices.



## INTEGRATIONS

## IP devices

360Vision	Dynacolor	LTV	Spezvision
3S Vision	EasyN	Magic Box	ST
Abron	Eneo	Mango DSP	StarDot
ABUS	Etrovision	March Networks	Stream Labs
ACTi	ETZ	MBK	Stretch
Acumen	Euresys	Mediatronix	Sunell
Adino	EverFocus	Merit Lilin	Sunkwang
Alinking	eVidence	Messo	Surveon
AMG	EVS	MicroDigital (MDi)	SVPlus
A-MTK	FineCCTV	Mobotix	Tantos
Arecont Vision	FlexWatch	MOXA	Tamron
ARH	FLIR	NEXCOM	Tattile
Arlotto	G4S	NexusIP	TBK
Asoni	Ganz	Novus	TEDD_G1
ASTR	Ganz ZNC	Oncam Grandeye	Tiandy
Astrohn	GeoVision	Optelecom-NKF	TRENDnet
Aver	Grandstream	Panasonic i-Pro	TVT
Avigilon	Grundig	Panasonic (BB/BL)	UDP
AVTech	Gunnebo	Partizan	V1netIP
Axis	Hanwha Techwin	Pelco	Veilux
Basler	HikVision	Pinetron	Vidosec
Balter	Honeywell	PixEYE Planet	ViDigi
Beward	Hunt	Probe	VIDO
Bosch	IDIS	PROvision	Visiocom
Brickcom	Infinity	Qihan	Vision
Canon	Infinova	QNAP	Visualint
Certis	InMotion	RIVA	Vitek
Cisco	Intellico	RVi	VIVOTEK
CNB	IPS	Santec	VMsistemas
ComOnyx	iPUX	Sanyo	WuT
Compotrol	IQinVision	SEEnergy	Xenics
CP Plus	iZett	Sentry360	Y-cam
Dahua	J2000IP	SimpleIP Cam	Yuan
Dallmeier	Jassun	Sinkross	Yudor Technologies
Digiever	JVC	SNR	ZAVIO
DiGieyes	Legrand	Smartec	XeronVision
Digimerge	LevelOne	Smartec_G2	
D-Link	LG	Sony	



**INTEGRATED**  
AXXONSOFT

**ACS (Access Control Systems) / FSA (Security and Fire Alarms Systems) / PPS (Perimeter Protection Systems)**

Access Net	FoxSec	Nitgen	Satel
Apollo	FSG	OPTEX	Securiton
Aritech	Gate Parking	PARADOX	Siemens Cerberus Eco
BIOSMART	HID	Paxton	SOYAL
Castle	HoneyWell	ParsecNet	Suprema
Detectomat	HunterPro	Pelco	TSS
Elsys	Intrepid	PERCO	Umirs
FFT	KeyWatcher	Polon Alpha	UniPos
FireSec	KeyKing	Rovalant	Z-line
FORTEZA	NAC	RusGuard	
FortNet	NCG-9	SALTO	

**Cash Centre Hardware**

ALOHATechnologies	E-LECLERC TACTIL	POSWare	TEC-1595
Arch Software	FIT	PowerTill	Tendo
BC4000	HRK	Retalix	TillyPad
Borlas Retail	IBM	Samsung SAM4S 7000 Series	UCS
Cash	IBS	Scheidt&Bachmann	Vectron
Casio	INTEC TPV SQL	SHARP	VIMAS Technologies
CRS 3000	IPS	Siemens	Wincor Nixdorf
Crystal UKM v3.2.3	Marketer ISM-3000	Smartfuel	XML based protocol
D-Store	Maxishop10	SP101FR-K	
D-Store	Micros	SPSR Express	
DEBUG_POS	NCRReal POS	SuperMAG	
DOS->WIN	POSitouch	SystemGroup	
Dresser Wayne AB	Posmaster	TB-003/05-D	

**Money Counters and Banknote Sorters / Checkers / Counters**

Laurel K4 4-pocket Banknote Sorter;	Newton FS Sorter;	SBM SB-2000 Banknote Sorter;
LAUREL K8 8-pocket Banknote Sorter;	Newton VS Sorter;	GLORY USF51 Banknote Counter.
DeLaRue Kalebra Counter / Sorter;	Plus P624M Sorter;	
Shinwoo SB 1100/2000 Sorter;	Glory GFR-220 Banknote Sorter;	
Kisan K500PRO Banknote Sorter;	Magner 150 Digital;	
	Unixcam 1500x Sorter;	
	GLORY UW 500 Long MC Banknote Sorter;	

**And counting.**

## Video subsystem

*One of the greatest strengths of the Intellect platform is its powerful, functional video management system, which offers a number of impressive features for distributed systems:*

- Unlimited number of video servers and cameras
- Remote monitoring and administration
- Ability to install any number of local or remote workstations
- Integration of video surveillance with other capabilities

### STABILITY

Any video surveillance system is judged by its reliability, resiliency, and uptime 24 hours a day, 7 days a week. To meet this key standard, special features have been developed for Intellect:

- System health and performance monitoring
- On-the-fly recovery in case of subsystem failure

### INTEGRATION

Video systems need to “play nice” with other systems. In Intellect, data received from one system can be passed to other systems and used to trigger automatic reactions. Here is one simple example of a script: whenever a security sensor goes off, video from the camera located in the area of the sensor is displayed on a separate monitor. Even a simple script like the one described can quickly provide the operator with scene footage and help react to alarms right away.

### SUPPORT FOR ANALOG AND IP DEVICES

Intellect supports both analog cameras (using video capture cards, including with hardware video compression) and IP cameras and video servers: over 8,500 models from various manufacturers are supported, including approximately 2,750 IP devices integrated via proprietary manufacturer interfaces. (The list of supported hardware is constantly growing, with new Drivers Pack updates released every month.) This allows creating optimized, efficient systems that use precisely the equipment that is most appropriate for the site and user requirements.

### INDUSTRY STANDARDS

Intellect is compliant with all key industry standards: ONVIF device connection protocol, GB/T28181 and RTSP, and the widely used MJPEG, MPEG-4, JPEG2000, H.264, and H.265 codecs. Intellect also supports General Device protocols from such brands as Axis, Bosch, Panasonic, Samsung, Sony and VIVOTEK. Intellect also uses its own Motion Wavelet codec, with powerful features for efficiently adapting video streams based on bandwidth loads and CPU capacity.

### ONVIF

AxxonSoft is a member of ONVIF (Open Network Video Interface Forum), an organization dedicated to developing and popularizing interface standards for IP security and surveillance systems. As a contributing member of ONVIF, AxxonSoft actively participates in shaping the direction of the industry.

The importance of an open protocol for data exchange, one that is standard between manufacturers and devices, can hardly be overstated. This protocol dramatically simplifies integration of new IP devices and implementation of new functionality. ONVIF-compliant IP devices can be plugged in to an Intellect system and used as-is, without any device-specific integration required. Simply connect the device to a TCP/IP network and add it to the system using the Intellect wizard.

Intellect is the first PSIM in the world to make it to the ONVIF Profile G compatibility. ONVIF Profile G defines the requirements for onboard video storage and retrieval.

## VIDEO ANALYTICS

Rich tools for video analytics in Intellect automate video surveillance and reduce the room for human error inherent to traditional methods. Over 10 video detection tools allow configuring video management systems to automatically recognize and monitor situations of concern. Forensic Search makes it possible to find video nearly instantly based on user-set criteria regarding object behavior in the field of view. Compared to the traditional method – rewinding hours of video to find an event of interest – this is a massive timesaver. Intellect also supports edge (on-camera) video analytics and specialized video analytics devices. Using situational analytics, Intellect can create an unlimited number of detection tools.

## EXCLUSIVE MOTION WAVELET CODEC



Motion Wavelet is a wavelet conversion-based video codec developed by AxxonSoft and Stream Labs specially for security needs, using both interframe and intraframe compression. Use of Motion Wavelet makes video systems more efficient for several reasons:

- Compared to MJPEG, Motion Wavelet compresses video to a smaller size (thanks to interframe compression and highly advanced intraframe techniques), which reduces the cost of data storage and eases streaming requirements.
- Motion Wavelet does not have the high stability and bandwidth requirements of MPEG-4, which makes the codec more flexible and reliable for data transfer.
- Motion Wavelet has a smaller CPU footprint on workstations and video servers – it offers resource-efficient scaling of video resolution and frame dropping without needing to perform decompression. Put simply, the video stream sent to the client computer has exactly the resolution and frame rate needed for the current task – no more and no less. The server does not need to decompress the video before scaling it for client needs, and the client computer does not need to unpack a higher-than-needed resolution stream to make it fit on the screen.

Because the Motion Wavelet codec adapts so well to all sorts of bandwidth conditions as well as both slower and faster computer hardware, there is enormous flexibility in the network and hardware infrastructure sufficient for Intellect-powered systems.

## NETWORKING

### Intellect offers a wide range of network-centered options for video surveillance:

- Recorded video on a server can be transferred (in real time or according to a schedule) to dedicated archive servers for long-term storage.
- Each client can access the archives of a particular server, as well as archives on dedicated archive servers.
- Video streams can be channeled through the Videogate module, so that even as additional clients get video from a specific server, the bandwidth load on the server does not increase.
- Clients can get video streams from a server on a different network segment, thanks to Videogate.
- GreenStream technology allows dynamically choosing the video stream best suited for current viewing needs.

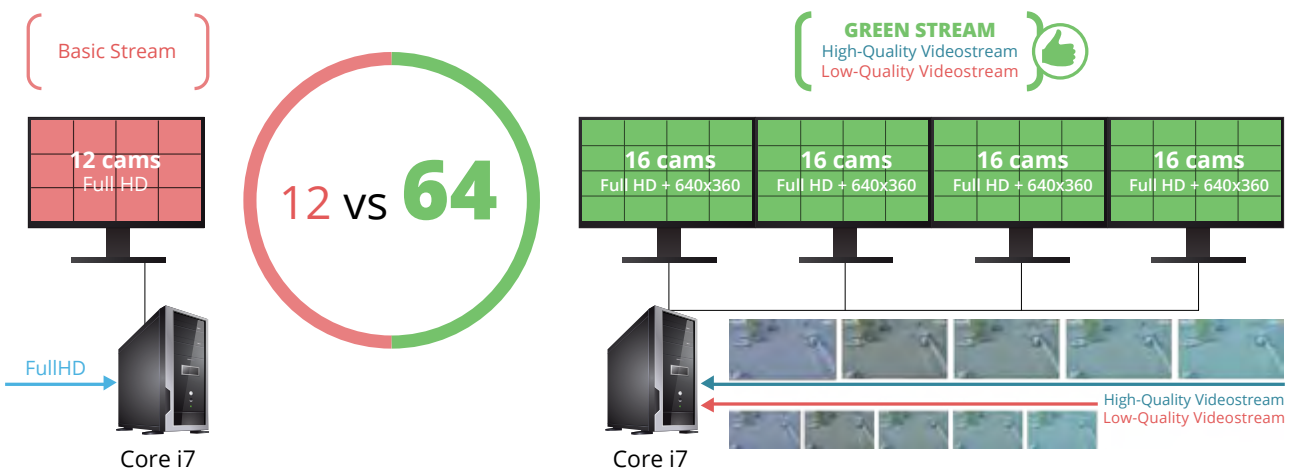
## VIDEOGATE

Videogate is a software module for routing and pruning video streams. In other words, Videogate gets video from a server and streams it to multiple clients at the resolution and frame rate needed for each individual client. This avoids unneeded loads on the network and server, since wasteful duplication of video tasks is prevented.

With Videogate, clients have fully fledged access to video servers on different network segments, allowing creation of a multilevel network hierarchy for client-server connections. If a connection drops or bandwidth is insufficient, Videogate shows a warning or continues streaming at the best available quality.

## GREENSTREAM

GreenStream reduces use of bandwidth and workstation CPU cycles by sending only as much data as is needed for a given surveillance task. This technology dynamically selects which video stream to send to a remote computer, streaming the smallest one that has sufficient resolution for that user's needs. And when the user displays the video at full screen, a higher-resolution stream is automatically selected.



## REMOTE MONITORING

Intellect also supports remote video surveillance and control of pan/tilt/zoom (PTZ) cameras from a PC web browser or iOS mobile app.

## Audio subsystem

*Intellect's audio subsystem performs the essential tasks of transferring, processing, and analyzing audio signals. This enables such functions as audio recording at guarded sites (synchronized or non-synchronized with video), recording of telephone conversations, and audible alarms.*

Audio recording dramatically enriches operator awareness of what is happening at a site. Audio recordings can be quickly searched by date and time. Recorded audio can be exported in WAV format for playback outside of Intellect using standard software.

One tool for effective audio recording is threshold levels: a particular audio channel is recorded only after the detected volume exceeds a certain level. Operators can adjust this level based on needs and site conditions, etc.

Audio can be enhanced for increased volume during playback. Hardware audio support is available through the video capture cards used in Intellect.

### UNLIMITED MICROPHONES AND PHONE LINES

There is no limit on the total number of microphones and phone lines in a system. Any server can be connected to any number of phone lines – the only limitation is the performance of the server itself.

### SOFTWARE COMPRESSION

During recording, audio is compressed in real time. The user can select the compression level and audio quality that is most appropriate. Analog-to-digital conversion depends on the type of sound card and characteristics, with 8 to 96 kHz sample rates.

### CONVENIENCE AND EASE OF USE

The Intellect interface for management of the audio subsystem has a standard player interface.

If video is recorded in sync with audio, both are played back automatically at the same time.

### NETWORKING

The Intellect audio subsystem boasts all of the networking features available to other subsystems, including remote playback of recorded audio, remote configuration, and more.

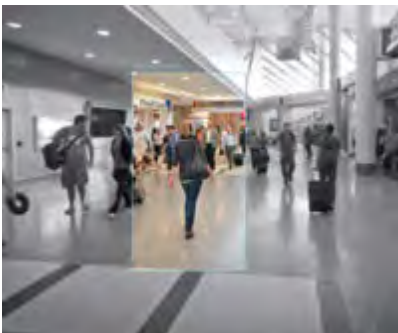
### INTEGRATION

The audio subsystem is highly integrated with security systems from other manufacturers, which allows configuring many types of reactions to audio signals, as well as a wide array of methods for passing audio alerts about security-related events.

## Video analytics

*Video analytics tools process camera video and spot user-defined events. These typically include motion in a zone, appearance or disappearance of an object, crossing of a virtual line, etc. The user tells the system how to react when these events occur. For example, this could be: start video recording, generate an alert, display camera footage on a separate monitor, or run a custom response script. This means that video analytics filter out the vast majority of irrelevant video, leaving operators to respond only to the events of interest and react accordingly. Security personnel gain a powerful tool that helps them to focus on hazards and alerts, instead of simply watching rows of monitors.*

## Video analytics in Intellect



### CORE DETECTION TOOLS

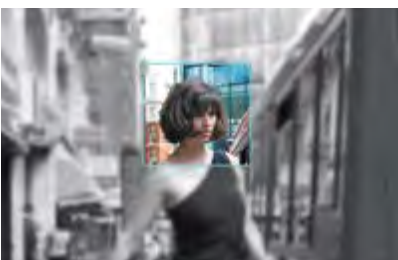
#### Motion

Motion detection tools identify moving objects in a camera's field of view. The most basic detection tool identifies motion, without regard to any other factors. Both start of motion as well as the direction of motion are detected. It also adjusts for subtle shaking. The IR detection tool (which requires an infrared camera) can spot motion of even the smallest objects. Users can also set direction-based criteria for monitoring motion in certain directions.



#### Abandoned/disappearing objects

Notifies when an object appears/disappears from the field of view. This information is valuable in many different situations: a laptop disappears from a table, a diplomat is left in a building hallway, or a car is improperly parked...



#### Face detection

Detects appearance of a human face in a camera's field of view. In addition to strictly security-related tasks, face detection can provide valuable information for businesses: the number of store visitors per day, peak store hours, and number of visitors at different times of day.

## SCENE ANALYSIS

These detection tools allow identifying certain types of object motion in a field of view. Users define lines, polylines, and schedules; Intellect detects the events that meet these criteria.

### Its scene analysis tools detect the following:

- Crossing of a virtual straight line in a user-defined direction
- Crossing of a virtual polyline in a user-defined direction
- Motion in zone
- Zone entry
- Zone exit
- Appearance of item in zone
- Disappearance of item in zone
- Stopping in zone
- Loitering / presence in zone for over 10 seconds
- Abandoned object

Any of the scene analysis tools can be configured for specific types of objects, including humans, vehicles, or all types of objects.

## CAMERA TAMPERING AND FAILURE DETECTION

These detection tools generate an alert when camera quality is compromised: attempts to disable cameras, interference that prevents event recording, and more.



### 1 Lens blocking

Unintentional or intentional blocking of a camera's lens. Particularly important when a camera is within reach of employees and/or visitors.



### 2 Camera blinding

Bright light (flashlight, searchlight, car headlights) directed at a lens.



### 3 Position shift

Any change in video camera position. Especially critical when a camera is located within reach and can be easily turned in another direction.



### 4 Background change

Change in the background of the camera image. Similar in many ways to the detection tool listed above, this detection tool solves somewhat different tasks. Position shift refers to when the position of a camera itself is changed, while background changes refer to changes in what a camera sees (such as attempts to place an artificial background in front of the lens).



### 5 Out-of-focus

Loss of image quality due to lens becoming out of focus or dirty. This can happen, for example, when a person purposefully or accidentally causes a lens to lose focus.

IN ADDITION TO THESE BUNDLED VIDEO ANALYTICS FUNCTIONS, INTELLECT SUPPORTS DETECTION TOOLS ON BOARD IP CAMERAS, AND IS COMPATIBLE WITH SPECIALIZED ANALYTICS HARDWARE.

## Forensic Search: efficient scene analysis of recorded video

*Search of recorded video, "in a nutshell": the video stream from a camera is processed in real time. Simultaneously, metadata about all objects moving in the frame and their movements is recorded to a separate database. No pre-configuration is necessary. To search, the user specifies event criteria (similarly to detection tool configuration), such as line crossing or motion in zone. Forensic Search sorts through the recorded metadata and just seconds later locates all video fragments that match the criteria specified.*

### SEARCH CRITERIA

The interactive GUI allows dynamically selecting search options. Search criteria resemble the scene analysis detection tools in Intellect, such as line crossing and motion in zone. All detection tool types are available here too, with the exception of polyline crossing. With Forensic Search, users can also search for movement from a selected zone to another selected zone, and select the color of the object to find.

### PERSPECTIVE OPTIONS

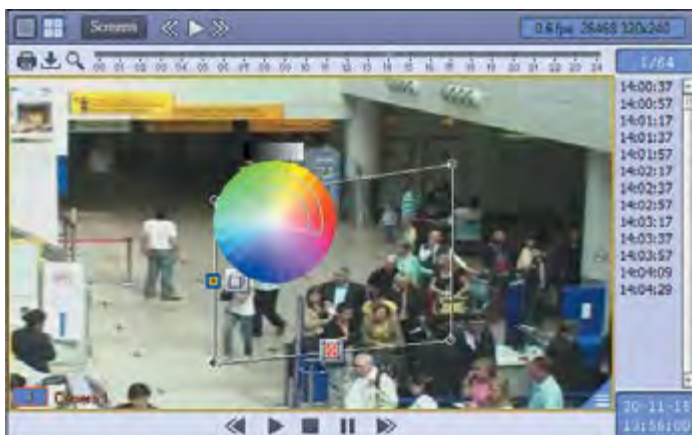
Tracking is now more useful thanks to configurable perspective options. As a result, objects can be classified by size more accurately, making tracking more precise both for foreground and for background objects.

### WHY USE FORENSIC SEARCH

Quickly find events of interest in recorded video – find the needle in the “video haystack” – even when the precise time of an event is unknown. Forensic Search takes video archive operations to a new level: instead of spending hours rewatching a tape, search through recorded video by criteria and perform follow-up searches as necessary in near-real time.

### BENEFITS

- No pre-configuration of detection tools required: information is saved about all moving objects. This is especially valuable for larger systems, since Forensic Search can be installed and configured without significant time or labor investments.
- Since search is run on previously recorded metadata, search can be repeated several times with refined criteria.
- High speed. Search is performed in near-real time, with the first results returned almost instantly.

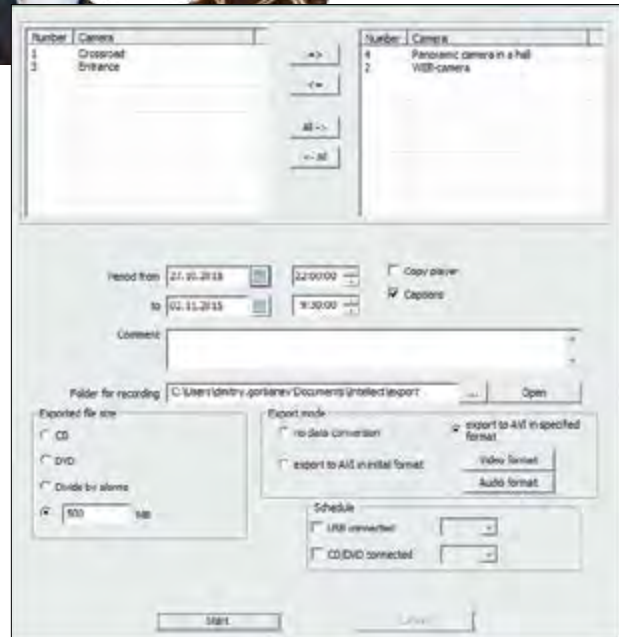




## Intellect 4.10 new features

### EXPORT OF RECORDED VIDEO

Recorded video can now be exported in the background: on-screen playback of video is no longer necessary during export. What's more, video can be exported from multiple cameras simultaneously and also digitally watermarked for authentication purposes. Privacy masking for exported video has been added in version 4.10, blocking out sensitive parts of recorded video. If masking is applied, the video stream is recoded during export to ensure full privacy. Any video comments made in Intellect are exported as separate text files.



### OVERWRITE PROTECTION FOR RECORDED VIDEO

Have important video you don't want overwritten? In the new version of Intellect, protect the video from loop recording by flagging it. If you no longer need the video, simply deflag it to remove protection.

### BOOKMARKS

Bookmarks are a major time-saver. Mark key moments in recorded video and search for video of interest based on the bookmark comments. Selecting a search result jumps precisely to the moment in the video where the bookmark was made.

### CAMERA-SERVER VIDEO SYNCHRONIZATION

Edge storage – when video is stored locally on board a camera – is a great advance for system efficiency. But we have added a feature that addresses one of the shortfalls of edge storage. For example, communication between the camera and server is lost for a short time at a critical site, such as an airport or another transport hub. What about the video recorded during this network failure? As soon as the network is restored, the edge storage (on the camera) synchronizes with the central storage (on the server), resulting in a seamless, gap-free video recording. In previous versions of Intellect, we implemented support for edge storage and for copying video archives stored in the device format. Previously, these archives could be viewed using only a standard utility or player. Now it is possible to convert the synchronized archive to the format of the Intellect file subsystem (without any significant performance penalty) with support for playback via the Intellect video monitor interface. As an additional bonus, playback is supported both on the video server and on the archive server.

# Intellect: four layers of automation

*Intellect makes it possible to automate three different levels of system functioning. This flexibility is unique to Intellect, which can be quickly configured to actuate standard reactions and/or run event-driven custom scripts.*

## STANDARD REACTIONS

The first layer of automation contains standard reaction frameworks, which are easily activated and deactivated through device settings. For example, a standard reaction for the audio subsystem is threshold-triggered audio recording (when the sound level exceeds the specified volume for a specified length of time, recording begins). A standard reaction for the video subsystem is to start recording from a camera when the motion detection tool is activated.

## MACROS

The second layer of automation consists of macros, which allow using a graphical interface to specify almost any reaction to any event in the system. What's more, a single event can be tied to an entire list of reactions spanning multiple subsystems. A reaction can be performed locally on the operator's computer or on all the computers of the security system. Macros can "cover" individual devices (e.g., microphone, camera, speaker) and groups of devices (e.g., all microphones, all cameras).

So for example, a macro could involve activating video recording on all system cameras as soon as any security sensor is triggered. Alternatively, recording could be started on a particular camera when a particular sensor is triggered. Or when a fire alarm is triggered, recording could be started on a particular camera, a PTZ camera rotated in a given direction and displayed on a separate monitor, a siren activated, and doors unlocked.

## SCRIPTS

At the third level of automation are scripted reactions to events. Intellect supports two languages for writing scripts: its own language invented by AxxonSoft, and the standard Jscript language. The advantage of the first option is its simplicity. The Intellect scripting language is intuitively easy for anyone familiar with basic programming concepts. The second option is useful for those already familiar

The screenshot shows a window titled "Script 1 - EXE" with a menu bar (File, View, Debug and edit, List of events, Help) and a toolbar. The interface is divided into three main sections:

- Left Panel:** A tree view showing "Script messages", "Debug-edit script", and "Script 1".
- Center Panel:** A text editor containing the following script code:
 

```
//This is a script for Axis F8310 control panel
if (Event.SourceType=="TELEMETRY_EXT" && Event.Action=="KEY_PRESSED")
{
  if (Event.GetParam("guid_pk")!="")
  {
    var key=Event.GetParam("param0");
    key=parseInt(key);
    var type=Event.GetParam("device"); //0-8312 1-8313
    type=parseInt(type);

    DebugLogString("Device:"+type+" Key:"+key);

    if (key<10 && type==0)
    { if (Var_var("arob")==1)
      { var WinShell = new ActiveXObject("WScript.Shell");
        WinShell.SendKeys(key); }
      else Var_var("can")+key;
    }
  }
}
```
- Bottom Panel:** An "Event" section, currently empty.

At the bottom of the window, there is a status bar with "string1\_symbcl0" on the left and "NUM" on the right.

with Jscript – in this case, all that's needed to get started is a quick review of how to refer to Intellect objects using standard Jscript syntax.

In both cases, users can create custom reaction scripts of any degree of complexity using complex rules. For example: when motion is detected on a particular camera and sound is detected by the microphone connected to the camera, if all this happens outside of working hours, the operator is given an audio alert, video from the relevant camera is displayed on a separate monitor, and an SMS message is sent to a specified phone number. This is only a small sampling of the scripting capabilities Intellect has to offer – external applications can be launched in response to events as well.

## MACROEVENTS

The fourth level of automation consists of macroevents. Macroevents allow monitoring occurrence of certain events at defined time intervals; depending on whether or not a certain chain of events occurs, a new event is generated. The macroevent can be used in macros or scripts to trigger different actions.

## BENEFITS

- The four levels of automation allow easily configuring simple reactions and, if necessary, creating more complex scripts as well.
- Scripts can involve any devices that are part of the integrated security system, in any sequence: devices in different subsystems can be both event sources and response actuators (if the device is capable).
- Reactions are configured at the level of standard Intellect objects. When writing a script, the system administrator does not even need to know which exact device models are used in the system.
- Another advantage of automation is the ability to create **virtual objects**, providing a software emulation of the entire set of Intellect objects that allows you to customize their states, reactions, and events. Virtual objects are managed using scripts, macros, and macroevents. You can use different types of virtual objects for displaying any possible custom states. Examples are an abandoned object detection tool (to find unattended belongings on a map), or a monitor for supermarket refrigeration systems (a combination of sensors to detect temperature, doors opening and closing, and so on).





## ACFA Intellect: Access Control, Fire/Security Alarm, Perimeter Security Integration

*ACFA Intellect is a comprehensive solution for access control, fire/security alarms, and perimeter security systems using the Intellect PSIM platform.*

Access control, fire/security alarm, and perimeter security infrastructure can be connected to the ACFA Intellect platform, with data exchanged between these components and Intellect. Hardware health information and management options are accessed through the standard Intellect interface. Combined with the features of ACFA Intellect, these tools are suitable for an enormous range of missions related to access control and fire/security alarm systems. The Intellect platform allows creating a vast array of scripts involving any of the subsystems connected to it.

### WHY ACFA INTELLECT

- Reliably protect facilities and intellectual property
- Prevent intrusions
- Monitor workplace time and attendance
- Reduce personnel costs by automating security tasks
- Increase security system functionality
- Improve store operations and boost profit

### ACFA INTELLECT BENEFITS AND FEATURES

*Configure IF... THEN relationships between subsystems (video surveillance, access control/fire and security alarms/perimeter security, facial recognition, license plate recognition).*

Using macros, scripts, and the Virtual Access Server module, configure interactions between the video surveillance, access control/fire and security alarm/perimeter security, facial recognition, and license plate recognition subsystems.

### Configuring and managing devices from Intellect

You can configure hardware devices (sensors, card readers, and so on) in the standard configuration manager, just like any other Intellect objects. A specialized module converts this information and sends it directly to the device using a low-level protocol or specialized software from the manufacturer. You can also set access policies from Intellect (for instance, for an ACS) without needing to use the standard software for the equipment.

Device management is also performed with the help of the built-in tools. For example, the Intellect map editor makes it possible to create a site map including locations of security system components, with sensors, readers, electronic locks, cameras, and more. A map can contain multiple layers (corresponding to floors of a building, for example). As a part of the operator interface, maps are convenient for tracking the status of components and managing them: click a component on the map to view a menu of actions, such as arm/disarm sensors and open/close electronic locks and turnstiles.

## Broad hardware compatibility

ACFA Intellect supports a wide range of hardware for monitoring, access control, fire/security alarm, and perimeter security systems. Securely manage all equipment regardless of manufacturer via Intellect, whether from a control center or an unlimited number of remote workstations.

## Monitoring hardware health using Intellect

Intellect displays information about the condition and status of passageways, doors, and sensors, as well as the number of people in a particular area and possible incidents.

## ACCESS MANAGER MODULE

*The Access Manager module automates tasks related to movement of employees and visitors around a site.*

### Use the Access Manager module to:

- Simplify creation/editing of users and access levels
- Modify user entries from client workstations
- Protect company property by restricting employee and visitor access, as well as movement of merchandise to and from facilities
- Safeguard intellectual property by creating and configuring access levels within the company, at both the individual and department levels

## EVENT MANAGER MODULE

*With the Event Manager module, operators can visually monitor access points, granting or denying access based on camera imagery received in real time combined with card data stored in the Intellect database.*

The Access Control subsystem reads a user's access card. Simultaneously, the operator is shown the photo and information of the card's rightful owner from the database. The operator can compare the database picture and the camera picture before deciding whether to allow access.



The module allows selecting which data to display (name, position, department, card number, date/time, etc.) and configuring the arrangement of these fields on screen, thanks to a convenient visual editor. Several windows with employee details are shown simultaneously, helping security staff to keep a close eye on comings and goings.

## NEXT BRIDGE MODULE

*The Next Bridge module sends events from the Intellect PSIM to the Axxon Next VMS.*

The events sent from the Intellect PSIM to the Axxon Next VMS include any events from the integrated ACS, FSA and PSS, BACnet, OPC, SNMP devices. Axxon Next processes the events into text information and then superimposes titles on video from the corresponding camera. The image with overlaid titles helps to enhance operator awareness.

## UNIVERSAL INTEGRATION MODULES

Universal integration modules allow connecting OPC-, BACnet-, and SNMP-compliant devices, enabling creation of AxxonSoft-powered security systems that consolidate diverse components in a single software interface. The universal integration modules consolidate lighting, life support, access control, electrical, elevator, and other building systems in a single system and interface. These modules also bridge with other systems (including SCADA) for other complex reaction chains.

## OPC

*The OPC integration module allows connecting all OPC-compliant devices of any brand to ACFA Intellect systems. Event and alarm information is shared between the OPC client and OPC server.*

The OPC module is compatible with any OPC device and can be installed on the same computer as the OPC server, or on any other network PC.

The module can exchange data and get events via the Data Access and Alarms & Events standards.

OPC Data Access (DA) is the most popular standard. Intended for real-time data exchange with controllers, management systems, and other hardware.

OPC Alarms & Events (AE) informs of special events: emergencies, operator actions, advisory messages, and more.





## BACNET

*Any device with support for the BACnet network protocol is compatible with ACFA Intellect, thanks to the BACnet integration module.*

BACnet (Building Automation and Control Networks) is an open communication protocol for smart buildings and management of their systems. The BACnet protocol is supported by leading manufacturers of security and building automation systems, including Siemens, Honeywell, and others.

The BACnet integration module enables ACFA Intellect to “talk” with devices over the BACnet protocol, as well as manage them.

## SNMP

*The SNMP integration module allows getting events from devices over the SNMP protocol.*

SNMP (Simple Network Management Protocol) is a standard Internet protocol for managing devices on TCP/UDP-based IP networks.

The purpose of the SNMP integration module is to exchange data and get events via the SNMP protocol using SNMPv1 traps.

## TIME AND ATTENDANCE MODULE

*The Time and Attendance module enables tracking and scheduling of employee time, as well as allocating workspace for each employee and at the department level. Using access control information about employee movements, the module calculates how much time each person has worked as well as at the department level, with account of overtime and excused leave.*

### Schedules and working areas

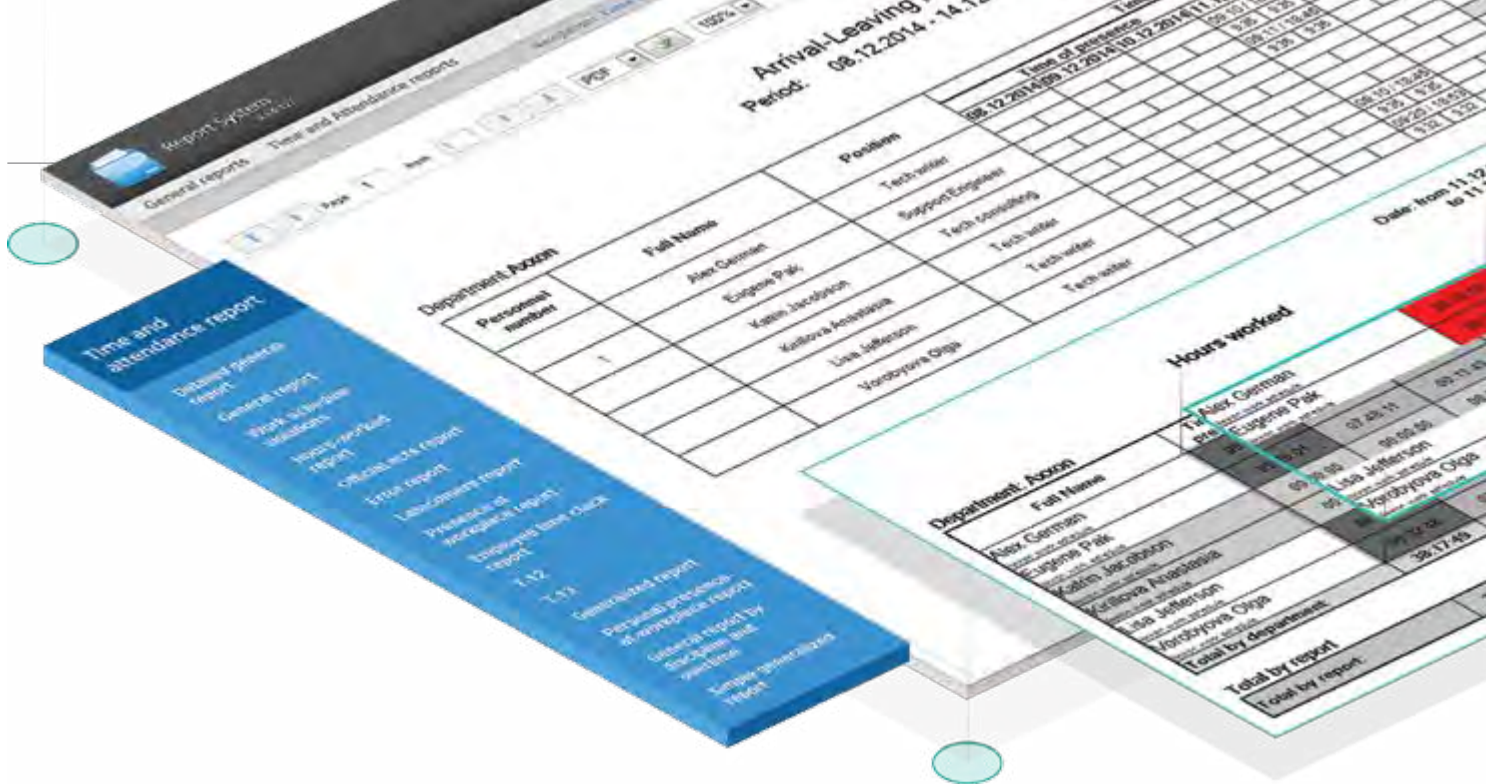
Employee worktime is calculated based on the working schedule specified in the system and specified working areas (regions). Each region is defined by doors, on both sides of which there are electronic card readers. Information from the card readers is entered in an event table. The table is used to calculate time worked.

#### Schedules supported:

- Weekly (five-day workweek)
- Shifts (one day on, two days off)
- Monthly (when all even-numbered days are working days, for example)
- Flex hours: employees must work a certain number of hours during a defined interval (8 hours between 8 AM and 10 PM, for example)

#### Time and Attendance module capabilities:

- View the personnel structure of the company for each department and get information for each employee (structure is created in Intellect).
- Obtain information about time present for each employee, nighttime work, total time worked, and overtime.
- Encourage on-the-job conscientiousness: employees “clock in” by passing through Intellect-monitored access control readers.



## Report generation

Data from the access control module is used to create reports, with the help of the Intellect Web Report System. The Time and Attendance module can support the following functions:

- ▶ Automate detection and reporting of employee absenteeism
- ▶ Generate, print, and edit time reporting forms
- ▶ Save reports as .doc, .xls, .txt, .bmp, .jpeg, .tiff and .gif

Get statistics at any time, for any reporting period, about the hours worked by an employee (taking into account night work, tardiness, work-related travel, vacations, absences, and sick leave).

## VIRTUAL ACCESS SERVER MODULE

*The Virtual Access Server module creates virtual checkpoints, integrating Auto Intellect/Face Intellect and their recognition capabilities with the Time and Attendance module.*

Create a virtual checkpoint (VC) to record when a person or vehicle listed in a database enters or leaves. Virtual readers work just like the physical access control devices that are supported by Intellect, cross-referencing employee access privileges and access levels.

When a camera recognizes a face/license plate number, the system identifies the user and, depending on the access level assigned in the database, automatically allows or blocks access to a particular part of the site. This eliminates the need for proximity cards, in turn making identification much more quick and secure.

### Features

- ▶ Integration of Auto Intellect/Face Intellect with the Time and Attendance module. Virtual readers can generate the data needed for reports on employee time and attendance. Recognition of employee faces or license plates provides all the necessary information. When a face or license plate is successfully recognized, the "Passage allowed" event is generated. This can be used to mark the beginning of an employee's workday, for example.
- ▶ System actions based on "Passage allowed" and "Passage denied" events. Virtual checkpoints can generate events (allow or deny passage) automatically based on recognition matches. This makes it easy to configure event-specific reactions (such as closing a relay contact) using macros or scripts.

# retail Intellect

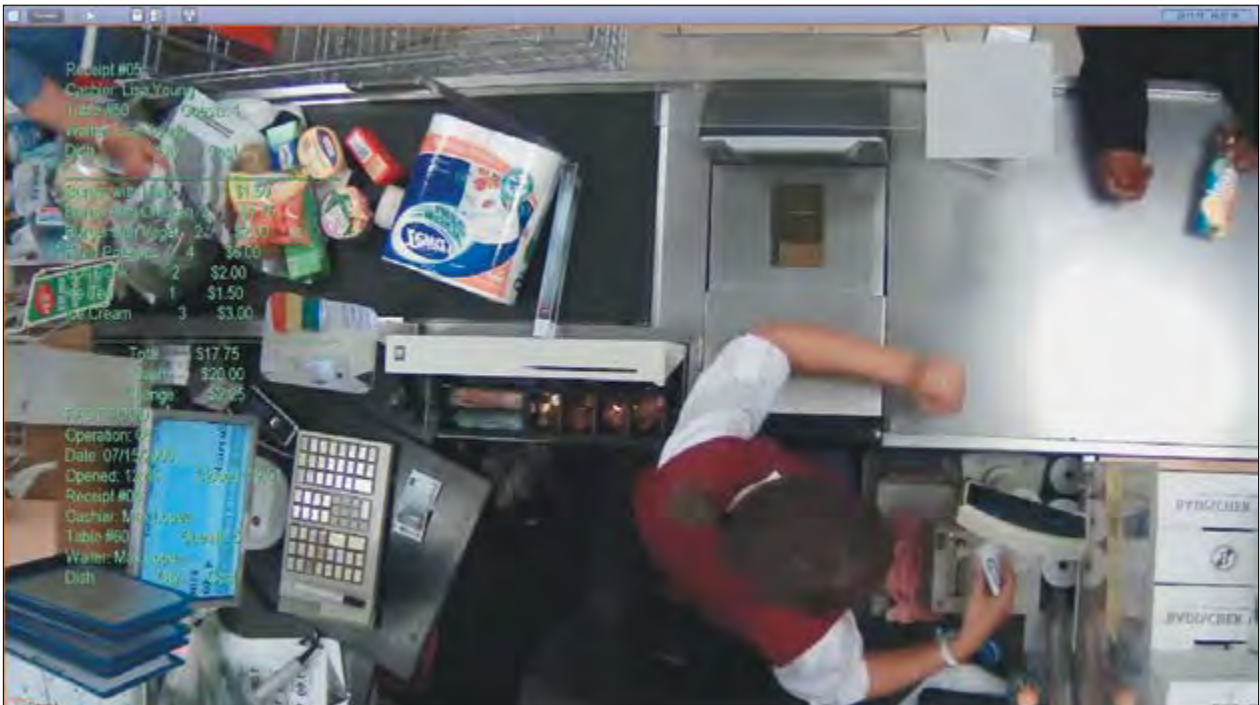
## Retail Intellect

### VIDEO MONITORING SOLUTION FOR RETAILERS

To fend off product loss and shrinkage, retailers must constantly monitor their store areas. The best systems for the task combine video surveillance with payment terminal monitoring. The Retail Intellect module enables Intellect to communicate with cash registers/point-of-sale devices, ensuring reliable protection for the entire store site, monitoring point-of-sale transactions, deterring losses, and expediting investigation.

### MONITORING OF CHECKOUT TRANSACTIONS

*Retail Intellect synchronizes text and event information from cash registers with video surveillance from cameras pointed at the register area.*



Both in real time and during later video viewing, the operator sees video of a buyer transaction with text (captions) containing information at the bottom of the screen. This information includes the text of the receipt and events at the cash register that are not displayed in the receipt, such as opening of the cash drawer or manual entry of a product code. This approach allows seeing the full picture of events occurring at the point of sale.

## Checkout transactions monitoring

**Caption search.** Retail Intellect allows searching for recorded video based on caption contents. Caption search enables finding all relevant receipts and their corresponding video recordings for a specific time period based on a specific line of text, for example: product name, presence of the word “discount”, etc.

When viewing recorded video, adjust playback speed and view frame-by-frame – such as when a particular product is swiped – to avoid missing a single detail.

**Customizable search and report display.** Use standard queries or create custom ones when searching for video recordings in an archive. The query results are displayed on the screen as a list of matching receipts.

View the video corresponding to the selected receipt with captions, print the list or save it to file. The set of standard queries in the system includes searches by: product list, product returns, receipt total, number of items on a receipt, size of discount, weight of item, multiple scans of an item, and many other parameters.

**Automatic highlighting.** To make sure that operators don't miss any events, specify special text that, when found in the captions of a transaction, will be highlighted in a unique color. Such text could be, for example, the name of a certain product or the word “total”. This function improves efficiency and reaction times for installations with real-time video surveillance.

**Automated algorithms.** The module for point-of-sale transactions allows programming IF...THEN reactions in response to certain events. One automatic reaction, for example, could consist of displaying an alarm message. With experience, this feature allows devising reactions for new and potential dangerous events and entering them in the system, increasing the effectiveness of real-time surveillance.

## WEB REPORT SYSTEM

*The Web Report System is a convenient tool for remotely viewing events and relevant video/data using an ordinary web browser.*

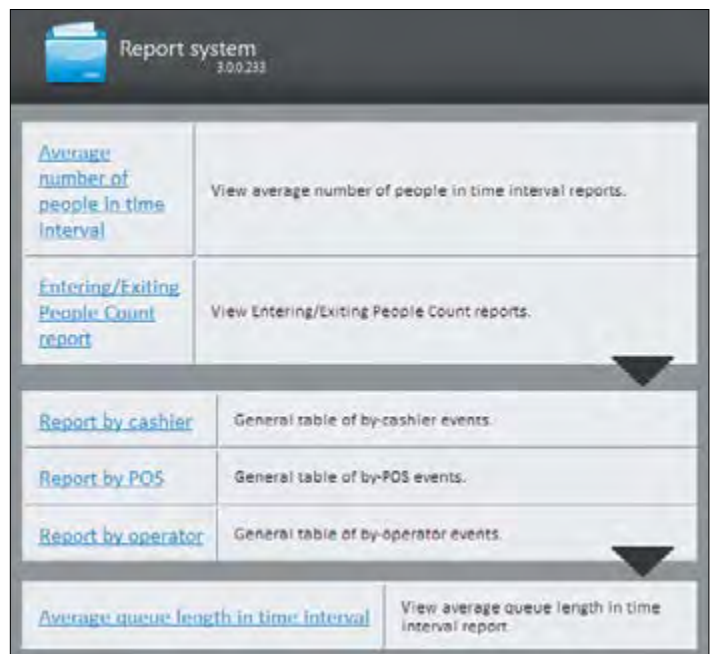
### Web report features

Reports are displayed as a table: rows correspond to point-of-sale events and columns correspond to event information such as store number, cash register number, date and time, cashier name, and more.

In addition to the event table, video of these events is displayed on screen, along with receipt text. A video fragment and receipt information can be printed or sent by email.

Report columns can be configured and hidden if necessary.

Reports can also be generated per cashier, per cash register, or per surveillance operator, as well as for standard cashier irregularities, such as cancelling a receipt, intentionally changing the number of items on a receipt, and so on. The list of standard irregularities is continually expanding. This makes it possible to get information about violations that are associated with specific actions of an employee.



## Cashier irregularity detection

The web report system allows identifying irregularities committed by cashiers, with options for:

- Selecting pre-configured sets or adding new irregularity types for a particular location/store
- Configuring criteria for certain irregularities, such as time between receipts, which allows designing reports individually for each store depending on the type of product sold
- Viewing the time spent by a surveillance operator to process cashier irregularities, thus determining the amount of time spent by an operator processing a particular irregularity
- When an irregularity type is selected in the list, it is shown in bold print for ease of viewing
- Pop-up hints for each irregularity type in the list show which criteria are used for classification
- Filtering irregularities to view only certain kinds in a given report.

## Report generation options

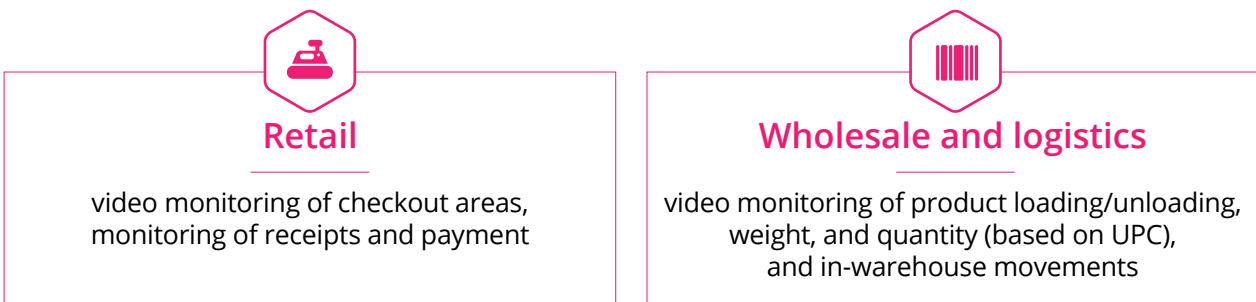
*The operator can select a reporting period and group of event statuses.*

Status groups and the statuses of the events in them are preset by the system administrator. For example, the groups Neutral Events and Suspicious Events can be created.

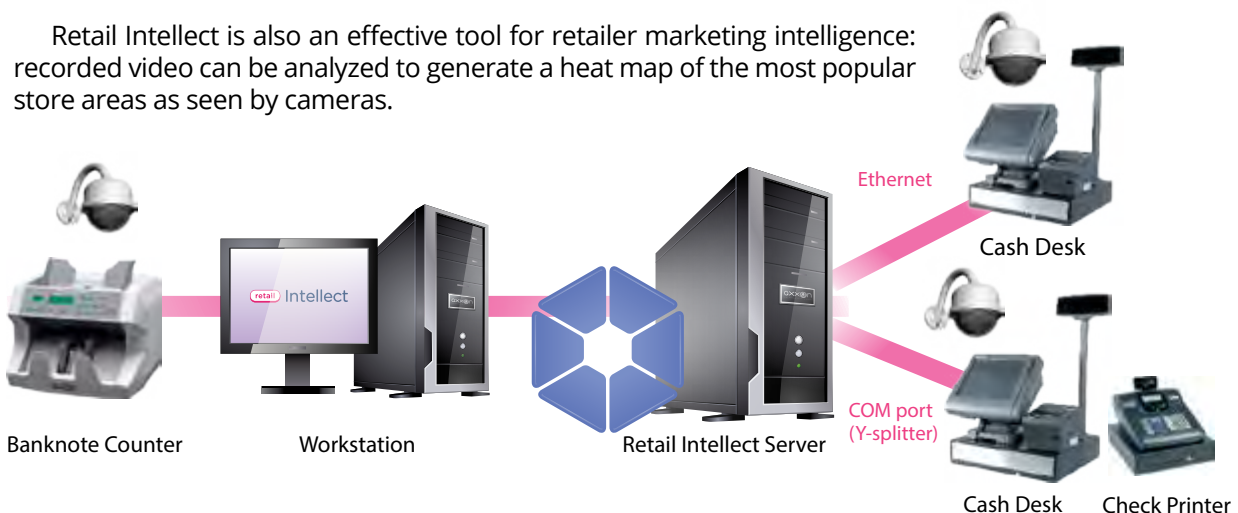
The corresponding statuses are set for each group, so the Suspicious Events group could include “Removal of product from receipt”, “Refund of product with receipt”, and other statuses. Operators assign status to events as they perform monitoring.

## RETAIL INTELLECT: USAGE CONTEXT

*Retail Intellect can combine text information from any source with the video received from a camera. This makes the system flexible for many contexts in which visual monitoring must be combined with transaction monitoring.*



Retail Intellect is also an effective tool for retailer marketing intelligence: recorded video can be analyzed to generate a heat map of the most popular store areas as seen by cameras.





**Visitor count and queue length are two other important modules in Intellect for marketing intelligence. These detection tools can:**

- Track visitor traffic in certain zones/areas
- Count incoming and outgoing visitors
- Determine peak visitor times
- Inform in real time when cash registers are busy

Thanks to these tools, companies can manage inventory, layout, and assortment in an agile way that allows them to increase profits and reduce costs.

## WHY RETAIL INTELLECT

- Prevent product loss and shrinkage
- Fight fraud and the insider threat: cancellation of receipt after payment, fake refund, refund without receipt, product removal from store, item removal from receipt, no receipt for some or all items, unauthorized cash drawer openings, credit/discount card abuse, etc.
- Improve service quality
- Resolve disputes

*For a list of cash register/POS device manufacturers with which the module is compatible, see page 9. A list of integrated cash counting and sorting machines is given there as well. Support for more and more devices is added on a regular basis.*

# auto Intellect

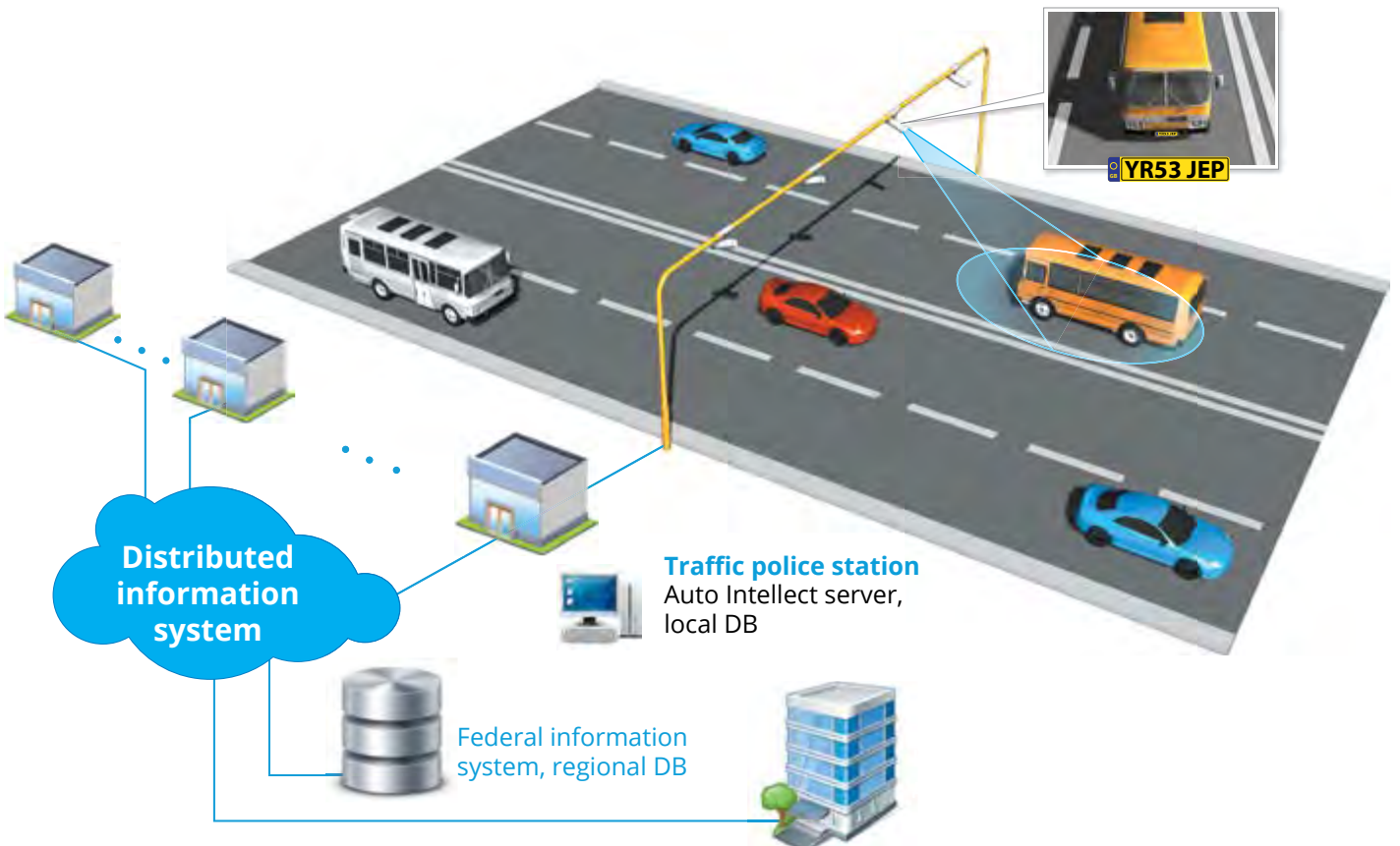
**Auto Intellect: a road traffic safety system with automatic number plate / license plate recognition for cars, railcars and cargo containers**

## PRIMARY TASKS PERFORMED BY AUTO INTELLECT

### Automatic monitoring of vehicle movements at corporate sites

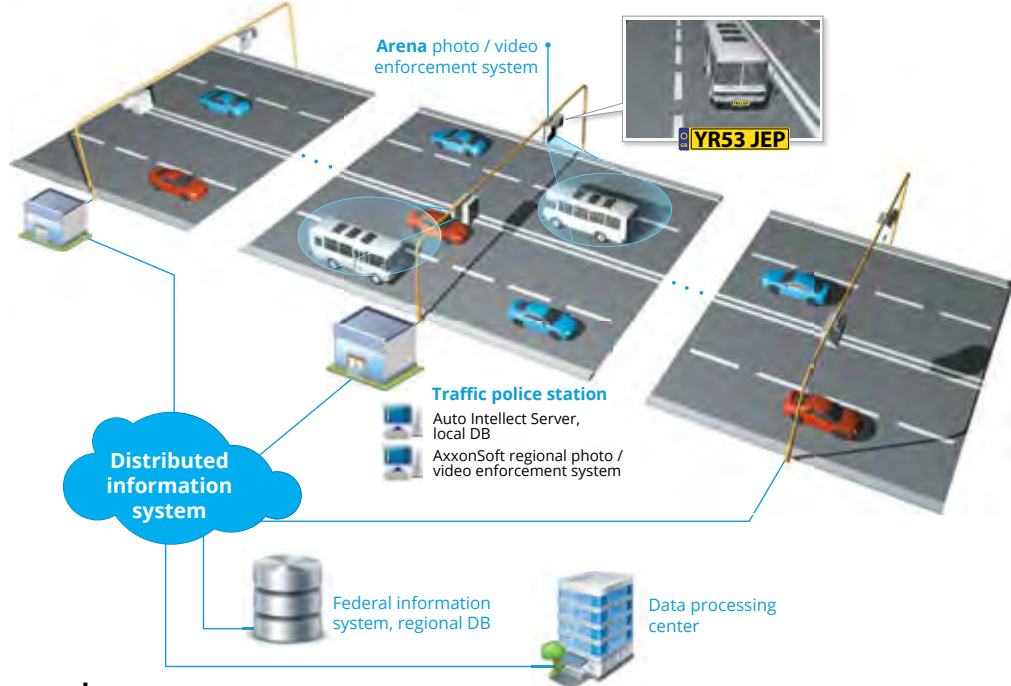
Auto Intellect performs license plate recognition of vehicles based on camera video. Auto Intellect saves the recognized license plate number, image of the vehicle, partial still frame containing the license plate, date/time stamp, location address, and more to a dedicated database. The result is a registry of all vehicles passing through monitored areas.

A single system can combine an unlimited number of cameras, data storage/processing servers, and operator workstations.



### Automatic identification of traffic violations and fine issuance

Federal and regional databases are used to identify the owners of vehicles in violation of traffic rules, who are then issued traffic fines thanks to a system that automatically processes photos and videos electronically forwarded from roadside cameras. Automatic recording of traffic violations and generation of traffic tickets is a cost-effective way of raising additional revenue for municipal budgets.



### Vehicle search

Auto Intellect runs ANPR the moment a vehicle enters the camera's field of view. The recognized license plate number is checked against federal and regional stolen vehicle databases. Operators receive alerts for full and fuzzy match events. Auto Intellect stores all records in a dedicated ANPR database. You can enter a license plate number or other data on a stolen vehicle and search the database. Auto Intellect finds all full and fuzzy matches and lets you review the event videos.

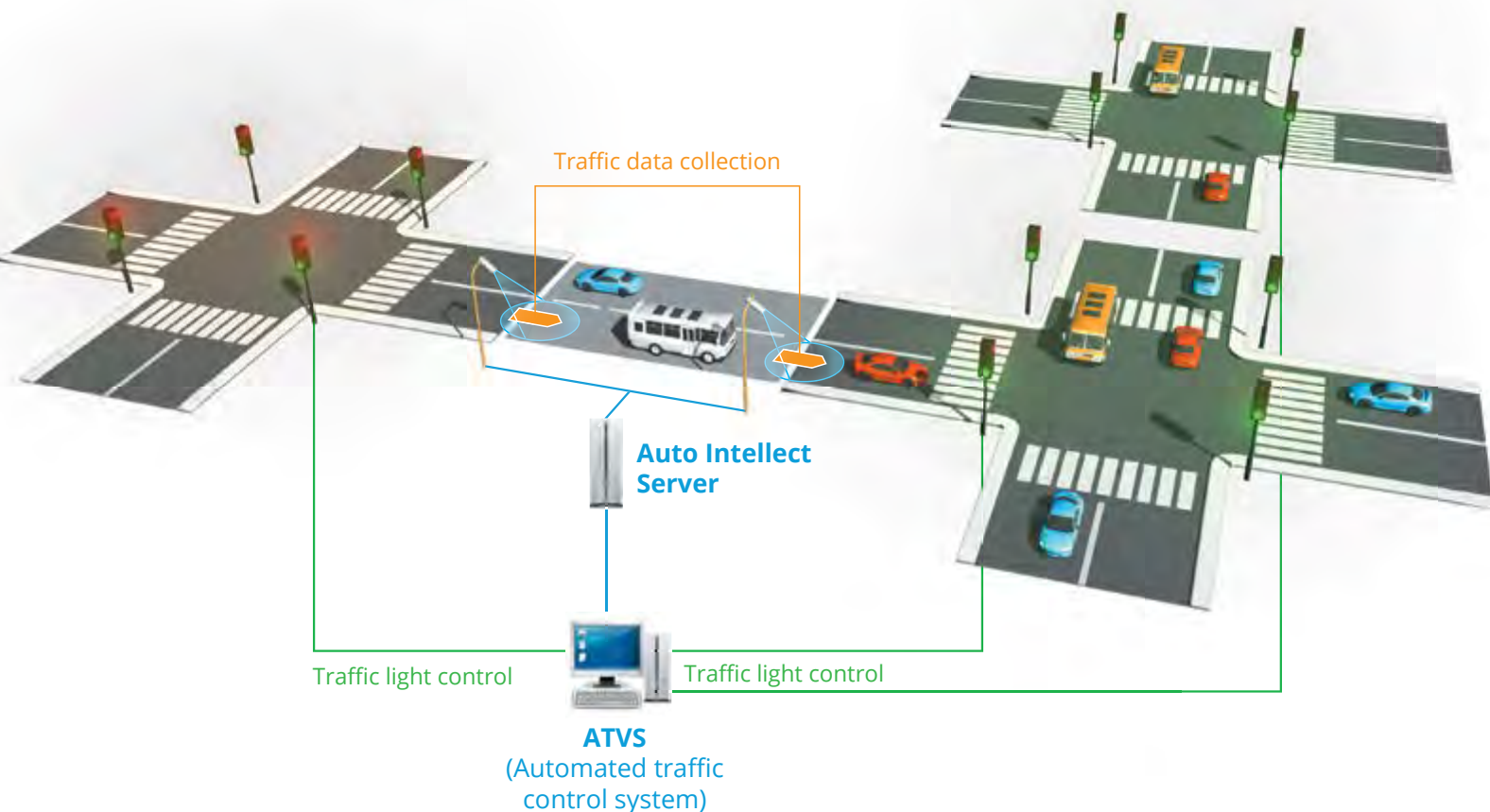
	1	2	3	4
Total number of vehicles	13	17	8	54
Series of registration	5 01 02 02 2 5 00 07 02 2 5 00 07 02 2 4 96 07 02 2			
Motorcycles	0	0	0	0
Passenger cars	2	4	1	7
Trucks less than 12 m long	1	1	0	3
Trucks more than 12 m long	9	10	3	1
Buses	1	0	0	3
Registered vehicle speed (km/h)	39	11	11	62
Vehicle length	30	28	24	6
Average speed for all vehicles (km/h)	20.15	21.71	28.25	21.00
Average speed for passenger cars (km/h)	6.08	23.33	62.09	34.29
Average speed for trucks (km/h)	25.73	20.82	31.67	7.71
Distance between vehicles (m)	71	14	18	85
Road occupancy (%)	14	16	2	34
Number of speed violations	3	2	2	3
Moving along wrong lane	4	18	15	4
Total vehicle stops	2	0	0	0
Traffic jams	Violent	Violent	Violent	Violent
Violations	7	18	17	7

## Optimize traffic flows

Vehicle detection tools can count the number of vehicles and their speed, as well as calculate the size of traffic jams.

## Automated weight stations

Special modules can be added to Auto Intellect for automating vehicle-related tasks, including weighing. The Weight Flow module offers timely reporting and monitoring of relevant vehicles. Data is exchanged with accounting and payment systems in real time.



## PRIMARY TASKS PERFORMED BY AUTO INTELLECT:

- Automatic recognition of license plate numbers
- Automatic alerts for "hot" license plates based on databases of wanted vehicles (including law enforcement databases)
- Retention of recognition data (with photos/video) in database for later use
- Integration with specialized devices: photo radar, smart cameras, etc.
- Automatic flagging of traffic violations: speeding, red light running, crossing of stop line, stopping in pedestrian crosswalk
- Traffic statistics, groupable by vehicle type.



## Auto Intellect on railways

*Ensuring rail cargo integrity is an important task in the daily work of railway companies and transporters. For incident investigation and monitoring contractors and personnel, a tool is needed for confirming that railcars have passed certain checkpoints. An example of such an integrated system is Auto Intellect from AxxonSoft.*

Auto Intellect automatically recognizes numbers on cargo and passenger railcars based on video imagery and synchronizes this information with recorded video, and records it to a database. The system can create a report for each railcar, with the time of checkpoint crossing, name of checkpoint, and relevant still frame. Thanks to this, rail movements and cargos are well protected whether on the move or at a rail depot.

### AUTO INTELLECT FEATURE SET FOR RAILWAYS

Auto Intellect offers a set of convenient tools for automatically logging movements with granularity to the level of individual railcars passing through checkpoints, verifying and adjusting data, and retrospectively searching and analyzing the data recorded.

- Video-driven automatic recognition of numbers on railcars, with confidence ratings to indicate recognition quality
- The following are recorded to the database for each railcar: railcar number, date and time of checkpoint crossing, name of checkpoint, and recognition quality estimate. Checkpoint passage and loading process are recorded by video
- Date and time of checkpoint crossing are recorded to the database for each train
- Recognized numbers can be verified and adjusted by comparison with still frames. Text comments can be added to each number
- Cars are searchable in the database, based on checkpoints, time intervals, inventory number (or partial number), and by text comments
- Reports generated per railcar. Still frames can be incorporated in reports.

### PRIMARY TASKS PERFORMED BY AUTO INTELLECT FOR RAILWAYS:

- Automatic logging of numbers on railcars as they pass through checkpoints
- Verification and adjustment of numbers for maximum accuracy
- High-confidence reporting of railcar passage through various checkpoints, for tracking movement within a rail depot or on a given route.

### RECOGNITION ALGORITHM ADVANTAGES

Requirements governing the legibility and standard format\* of railcar numbers are not always followed. Poorly visible, stenciled, and inconsistently written numbers are a common occurrence. Based on real-world experience with number recognition and in-house testing (with a sample of approximately 10,000 railcars), AxxonSoft experts selected a recognition algorithm with exceptionally high-quality results. Unlike most of the algorithms currently available on the market, the algorithm in Auto Intellect recognizes even numbers that have been painted on the railcar chassis and eight-digit internal reference numbers at rail depots.

**Note also the following advantages of the railcar recognition algorithm in Auto Intellect:**

- ▶ Number recognition cameras can be installed at a minimum offset from railcars (~1 to 1.5 meters), enabling flawless use of fisheye lenses
- ▶ For maximum recognition quality, cameras can be installed on both sides of a railway checkpoint. In that case, even if one of the sides of the railcar has an illegible number, the other side may still provide a usable image
- ▶ Recognition of numbers on passenger railcars is useful in a number of situations, such as maintenance depots
- ▶ Trains can be divided into cars for recognition purposes by means of sensors or software signaling from third-party software (such as weight-monitoring applications).

Record No.1

Parameter	Value
number_id	94fa1d4-4153-bf26-60d7-7
text	315149601793
is_complete	1
region	
region_text	

Warning:  
26-11-2015 18:56:24

Parameter	Value
Recognizer	LPR channel 1
Country	Not defined
Recognition time	2015-11-26 18:56:10
Speed	0 km/h
Validity	34 %
Direction	Undefined
Cause of alarm	Found in: External Plates DB 1

\* Governed by official agreements, such as International Union of Railways Leaflet 419-2, 428-1, 438-2, 920-1, 920-2, 920-10 and 920-14.



# face Intellect

## Face Intellect

*Face Intellect is a system for automatic facial recognition in concert with video surveillance and/or access control for increased levels of site security. Biometric indexing of facial features allows knowing the identity of visitors (and confirming the identity of employees) with a high degree of certainty.*

### PRIMARY TASKS PERFORMED BY FACE INTELLECT

#### **Security at high-visibility public sites**

Face Intellect is ideal for security at places that draw large numbers of people: rail stations, airports, subway systems, stadiums, and other critical facilities.

Face Intellect recognizes faces and automatically notifies when persons of interest are spotted. As the face database is built up over time, operators can search by photo or video frame. The facial recognition module automatically looks through past video and finds all instances when the person was in the camera field of view previously.

#### **Entertainment and hospitality establishments: know your customers**

Face Intellect can automate face control at restaurants, cafes, and the like. Unwanted patrons are flagged as soon as they step in front of a camera.

#### **Keeping lawbreakers out of stadiums**

The Football Spectators Act gives the courts power to prevent offenders who have been convicted of relevant infractions from attending at football matches. Face Intellect helps to identify football fans in the Football Banning Orders database and block their access to the stadium.

#### **Intrusion prevention and investigation**

Face Intellect instantly notifies when wanted persons (criminals or known troublemakers) are detected, helping security personnel to react without delay. Security video is retained by the system, which informs of the time and direction of movement of the person of interest. This data can be used for later investigation and follow-up.

In addition, Face Intellect can be integrated with government and/or law enforcement databases. Face Intellect supports the KARS data exchange protocol as well.

### COMPREHENSIVE INTEGRATED SECURITY SYSTEMS

As part of an integrated system, Face Intellect combines with various subsystems (video surveillance, access control/fire and security alarms/perimeter security, facial recognition, license plate recognition) for maximum site protection with multiple levels and types of security.

### ACCESS CONTROL INTEGRATION

Face Intellect can also be integrated into access management and access control systems to provide advanced anti-passback control and enhance security. In particular, the facial recognition system can verify whether the person using an access card to enter a site is actually the owner of this card.

In addition, Virtual Access Server module makes it possible to replace traditional credentials, such as proximity cards, with facial recognition.

## ADVANCED BIOMETRIC PEOPLE COUNTER

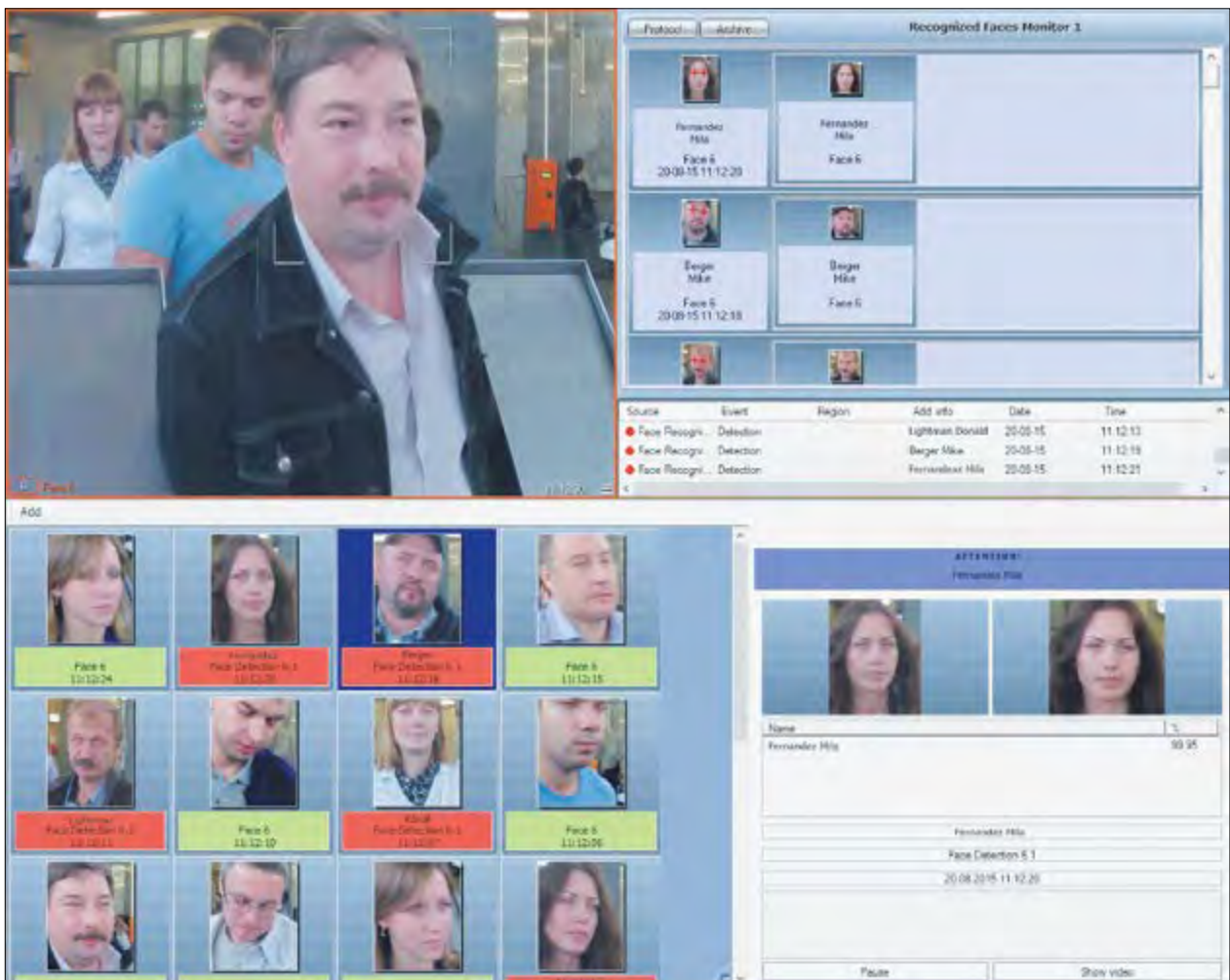
Face Intellect allows you to count unique visitors using facial recognition. The system captures and recognizes visitors' faces, and stores them in a temporary database. This database exists only for the period of time specified for counting people. During this time, a face is not counted again once it has been logged, just as employees (faces that are registered in the system's permanent database) are not counted. The number of unique visitors for the specified period of time is shown in a report.

## HOW FACE INTELLECT WORKS

Face Intellect consists of two modules, which are responsible for recognizing faces and cross-checking faces with previously recorded video.

The Face Recognition module automatically captures faces in the camera field of view. It saves a biometric profile of each face captured by the camera to a database.

You can use the Similar Face Search module to find all video episodes with a particular person. Upload someone's picture to the system. The system calculates the photograph's biometrics and compares with the database. You get a shortlist of faces ranked by the similarity percentage. Pick one to narrow down your search.





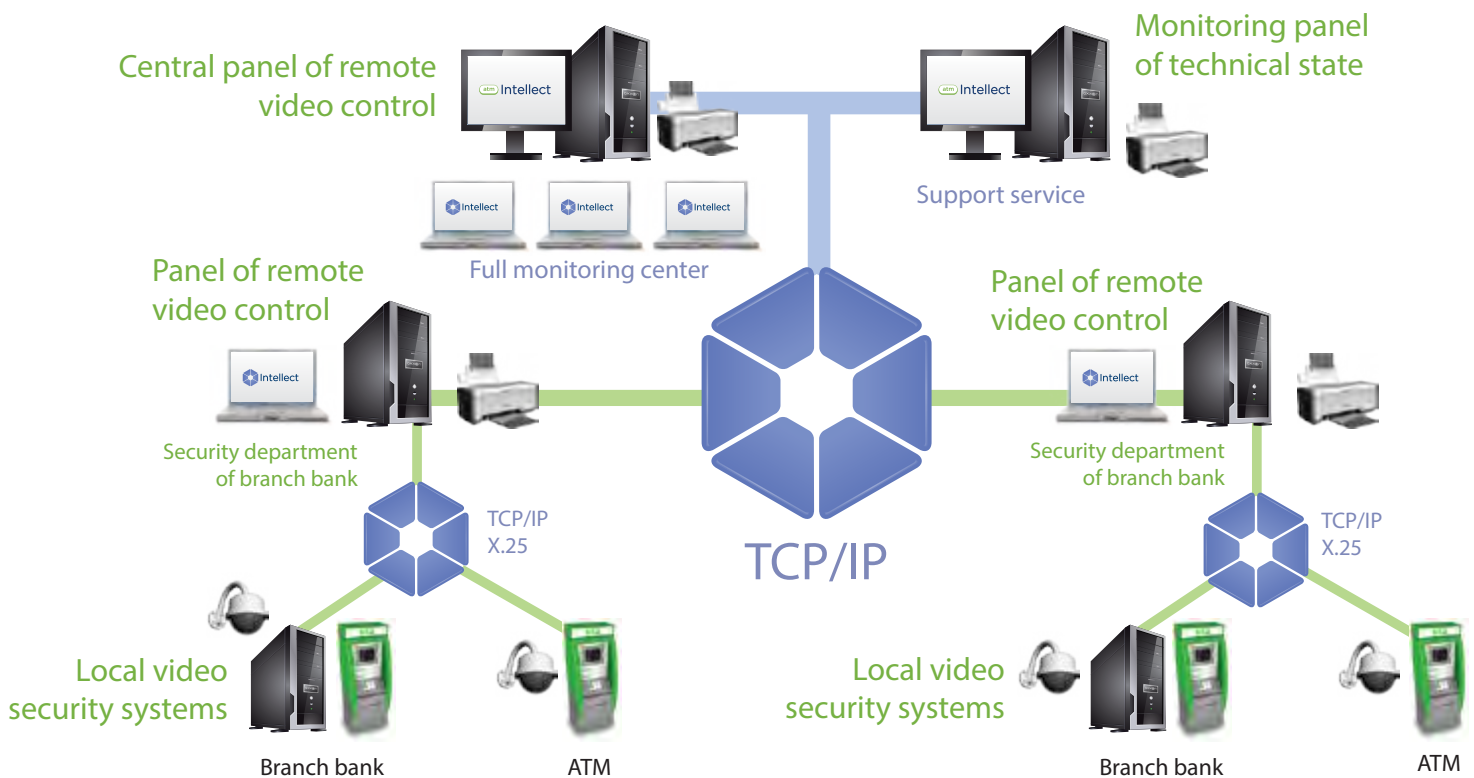
## ATM Intellect

ATM Intellect is implemented by systems integrators, who partner with AxonSoft and design security solutions for banking clients. With the Intellect platform integrators are able to create systems for protecting ATMs and meeting a wide range of end-client needs.

### ATM INTELLECT EMPOWERS CLIENTS TO:

- Record video:
  - Continuously
  - When motion detection is triggered
  - When ATM protection sensors are activated (vibration sensor, safe door opening sensor, temperature sensor, fire sensor)
  - Based on ATM events
- Synchronize ATM transaction data and sensor readings with the video archive
- View video archive stills and transaction data on a remote monitoring workstation
- Receive, process, and record sensor alarms and messages from an ATM's control computer
- Send alarm messages, still frames, and transaction data to remote monitoring workstations using existing X.25 and TCP/IP communication channels
- Perform remote search based on ATM and alarm sensor events

A screenshot of the ATM Intellect monitoring software interface. The top section shows a search filter for "CVT: 2/10/2014 10:46:59 AM". Below this is a table with columns for ID, Name, Cameras, Disk, MB, Disks, Software, and a time range from 10:30 to 10:45. The table contains two rows: "550016 ATM machine 1" and "550017 ATM machine 2". The second row has a red status indicator and a duration of "0 00:06:28". Below the table is a large empty area for video playback. At the bottom, there are two panels labeled "ATM machine 1" and "ATM machine 2", each with a grid of icons for monitoring and control. The interface also displays various system metrics and navigation controls.



- Perform centralized real-time monitoring of the health and status of the ATM protection system
- Generate reports on transactions, ATM events, alarm sensor events, and the health and status of hardware/network.

The durable, proven Intellect platform architecture makes it possible to combine an unlimited number of ATMs and remote monitoring workstations into a single system.

## ATM PROTECTION SOLUTIONS

ATM solutions created by AxxonSoft partners enable clients to effectively and efficiently meet their security needs:

- Quickly resolve transaction-related incidents, without having to visit ATMs to obtain video
- Monitor actions of staff (both in real time and retrospectively) involved with loading/unloading of ATM cash
- Protect ATMs from thieves and vandals
- Reduce costs for ATM upkeep by remotely monitoring hardware in real time

SOLUTIONS IMPLEMENTED BY AXSONSOFT PARTNERS ARE IN ACTIVE USE BY BANKS INCLUDING SBEBANK (MOSCOW, NORTHWESTERN RUSSIA, VOLGA REGION, NORTHEASTERN RUSSIA), VTB (NORTHWEST), RAIFFEISEN BANK AVAL, AND OTHER STATE-OWNED AND PRIVATE BANKS.

## System Monitoring module

*The System Monitoring module allows receiving and processing alarms from geographically dispersed sites, as well as monitoring hardware health and status. System health and status information can dramatically improve operations of large, geographically dispersed systems.*

### THE SYSTEM MONITORING MODULE IS DESIGNED TO ACCOMPLISH THE FOLLOWING TASKS:

- Effective surveillance of many sites from a single control center
- Viewing of video captured at any site (still frames and video fragments)
- Automation of routine work performed by employees of maintenance companies at distant system sites
- Analysis of past alarms and hardware failures with detailed reports
- Quality control of work by security operators

### MODULE INTERFACE

The special interface of the System Monitoring module displays site hardware in visual form, with badges indicating the status of key system components and alarms. Each site is labeled with a rectangle: the upper part contains the site name and the lower part contains a configurable number of alarm indicators grouped by source type.

In case of an alarm or failure in a system component, or if monitored parameters are outside of the allowable range, the operator is immediately informed via a red pictogram. If display of video or still frames has been configured as the response to the alarm, the video/still frames are visualized on screen. By clicking the badge, the operator can get detailed information on the alarm event, take necessary actions, and leave text comments. The operator's time-to-reaction is logged by the system, which allows measuring and rating the results of operators' work.

The interface provides access to site video, reporting options, video search of local archives, and recorded video and stills from these systems/cameras. The monitoring module can adapt to low-bandwidth conditions if they prevent receiving video from sites in real time.

### MODULE FUNCTIONS

The System Monitoring module receives, records, and visualizes messages about the state of security system components, based on the following key parameters:

- Camera operability
- Network functioning
- Operability of video subsystem software
- Amount of recorded video
- Hard disk operability

- ▶ Operability of fire/security and access control systems
- ▶ UPS signals

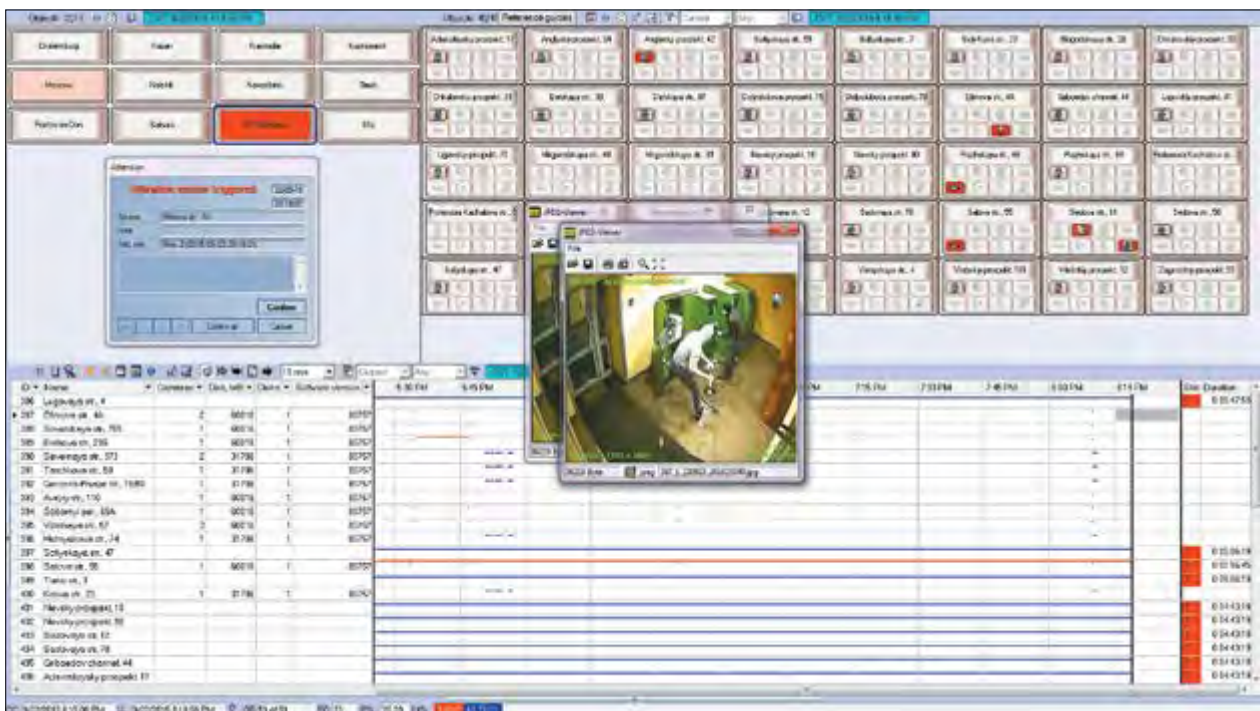
In addition, filtering options allow fine-grained selection of the system events that should be logged and visualized by the module. This means that administrators can select key alarms for sites that, when activated, will be immediately received by operators. Events can be passed to Intellect itself, so that Intellect reacts in a user-specified way to events generated by the monitoring module (SMS message or email sent to response team, audio alert, etc.).

**The built-in statistics and reporting system allows generating various general and detailed reports on functioning of the distributed security system:**

- ▶ Report on technical faults
- ▶ Report on alarm situations
- ▶ Video report
- ▶ Various statistical reports, including alarms and hardware failures

**Benefits of the System Monitoring module**

- ▶ Centralized monitoring of large numbers of geographically distant sites, even in low-bandwidth conditions
- ▶ Rapid receipt and processing of alarms
- ▶ Immediate notification of hardware failures and repair status
- ▶ Support for unlimited number of operator workstations





## Intellect Lite: perfect for small and mid-sized businesses

*Intellect Lite is a streamlined version of Intellect that includes its core features and Retail Intellect module. Thanks to this, small and mid-sized businesses are not forced to pay for features that they do not need. Intellect Lite is ideally suited for small and medium sites, including retailers.*

Being aimed at the SMB market, Intellect Lite is limited to four servers and 256 cameras, although the number of workstations is not limited.

In all other respects, Intellect Lite is a full-fledged version of Intellect with all core features: interactive site maps, event log, tools to create automatic scripts for reacting to events, and more.



A black and white photograph of a city waterfront. In the foreground, a large, multi-story building with many windows is visible. To its right, a tall church spire rises above the skyline. In the background, a river or canal flows, with several domed buildings and a bridge visible in the distance. The sky is overcast.

## SAFE CITY PROJECTS

# Safe City projects

*Today's cities are intricate, multilayer structures. With abundant subsystems – transportation, telecommunications, electricity, water supply, and many others – functioning and interplay of this infrastructure are critically important. To ensure operational integrity, citizen safety, and security of key sites, authorities need real-time and retrospective access to information about events of interest. With a real-time information system, they can accumulate, combine, analyze, and group diverse datasets from a wide range of sources. This is the mission of Safe City projects, which have been implemented on every continent.*

## WHAT IS A "SAFE CITY"?

Safe City refers to a hybrid automated system that empowers city authorities to meet public needs. Hardware and software are combined with interagency workflows to ensure video surveillance and technical monitoring on a city-wide scale. Utilities and other extensive infrastructure systems are monitored under a single umbrella.

### Safe City creates an all-encompassing network that combines:

- ▶ Video surveillance of residential areas, preschools, and public gathering places
- ▶ Fire/security alarm and access control systems at city infrastructure sites
- ▶ Utility metering
- ▶ Residential alarms
- ▶ Emergency call boxes
- ▶ Geographic information systems (GIS)
- ▶ Ecological monitoring, building automation, and other SCADA systems.

### With Safe City, authorities can:

- ▶ Monitor key city infrastructure in real time
- ▶ Ensure accurate, timely situational awareness for security and law enforcement
- ▶ View video feeds received from cameras, irrespective of distance from the control center, as well as inform relevant agencies and stakeholders in case of emergency
- ▶ Archive video and audio
- ▶ Reconstruct events based on recorded video
- ▶ Forward video by request or automatically
- ▶ Integrate other automated systems, if supported

## INTELLECT: THE UNIVERSAL SAFE CITY PLATFORM

In Safe City projects, Intellect acts as a distributed information system with control centers, combining existing subsystems with support for new ones. Automation of routine tasks allows streamlining monitoring and makes operators more efficient.

### CITIZEN-TO-POLICE EMERGENCY CALL SYSTEM

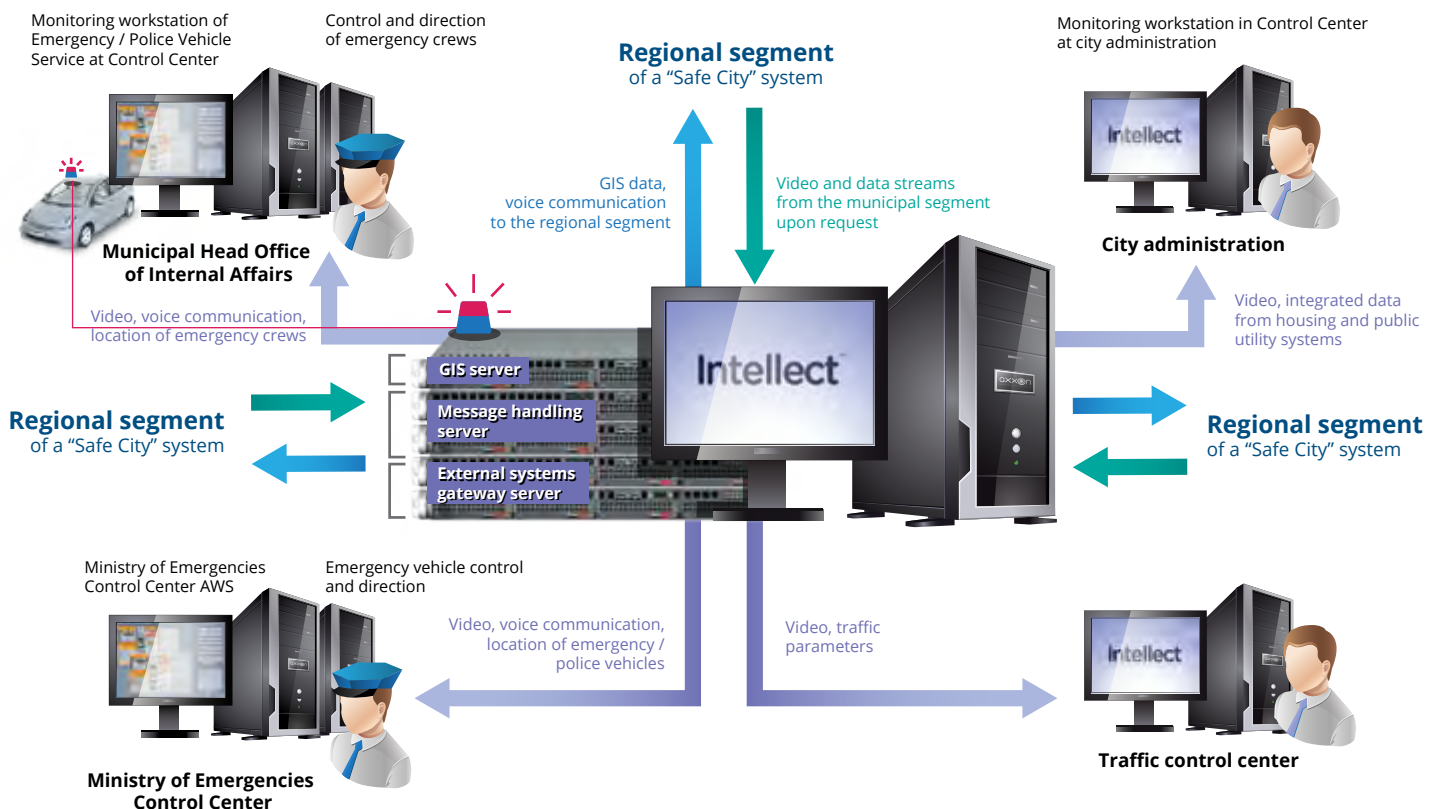
An emergency call system based on the Intellect software can quickly connect callers to the police dispatch center. Calls are made through call boxes installed on city streets, including calls using the SIP protocol. Pushing the emergency call button on the unit puts a call through to the dispatcher. At the same time, the server begins recording video from the camera installed on the call box, which syncs with the conversation between the caller and the dispatcher. The dispatcher handles the call, speaks to the caller, and dispatches police assistance to the location of the call box if necessary.

### SAFE CITY SETUP AND DEPLOYMENT

Setup and deployment of a Safe City system depend on the needs of the client (generally, the city administration) as well as the scale and objectives of the system. Outlines of the process are given below. The illustrations show the city-wide and district-level segments of the Safe City system.

### DISTRICT SEGMENT

The technical hub acts as a clearinghouse and district monitoring center. Video from all cameras in the district, as well as other information, is sent here. Operators here are responsible for monitoring video and responding to calls from emergency call boxes.

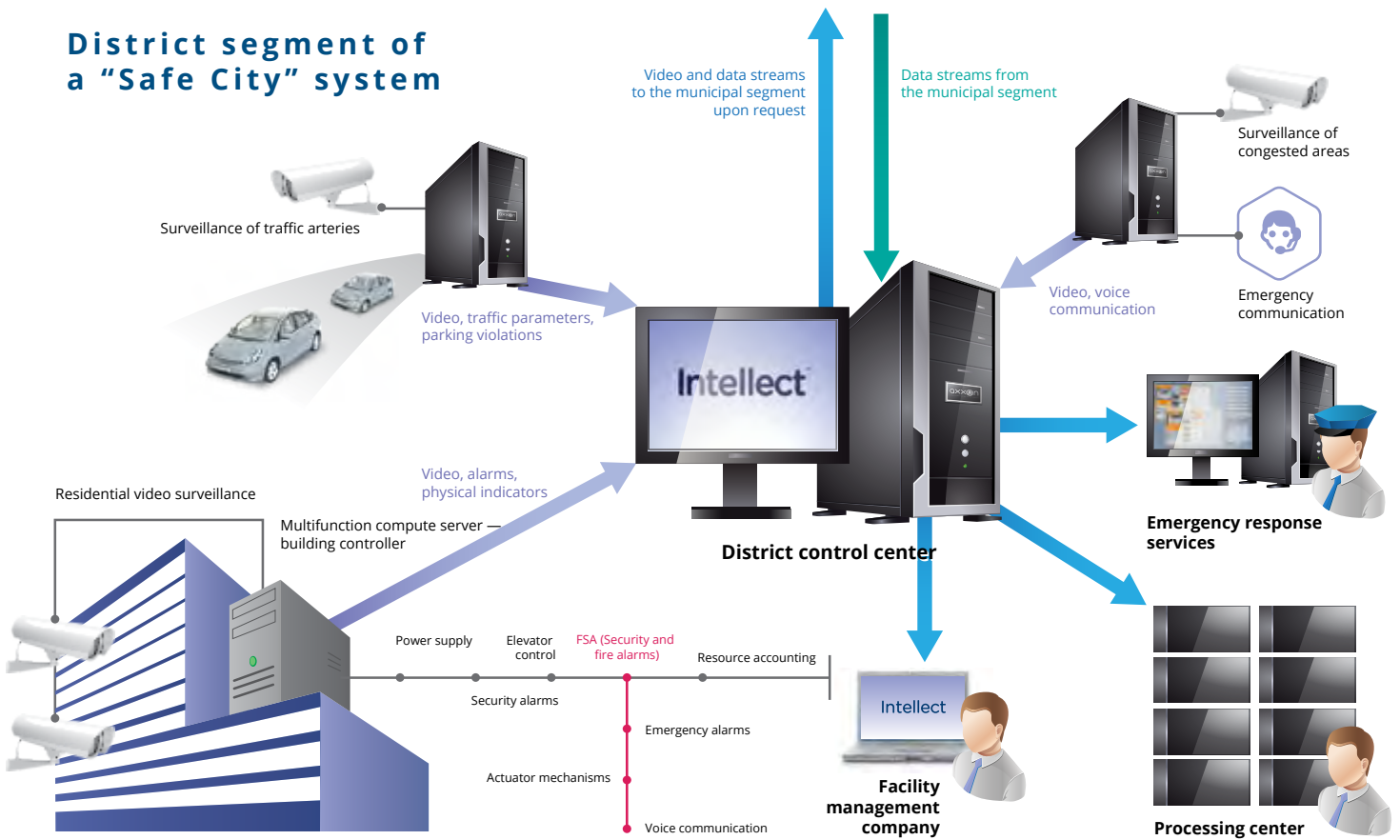


The managing company monitors the technical aspects of the system, ensures camera uptime, and calculates the amount due for technical services after the end of each billing period. Camera status is monitored by means of automated quality loss/sabotage detection tools.

First responders, including law enforcement and first aid, which receive calls based on triage by the operators at the control center.

**Billing center for the district.** Meter readings are used to generate utility bills here.

The diagram also shows city segments that are monitored as part of the Safe City system: residential areas, major roadways, and public gathering places with emergency call boxes.



### CITY-WIDE SEGMENT

At the heart of the system is the Safe City control center, which receives and stores data from all the district-level segments. The hub interfaces with GIS and the billing center. Video and audio are sent from here to workstations located at emergency response and law enforcement agencies, traffic agencies, and if necessary to city hall. Information can be shared with outside stakeholders on an as-needed basis.

For smaller cities, the district segment shown here may be sufficient. In this case, it acts as the city-wide segment as well, interfacing with all city services and agencies. Safe City systems in smaller cities can also be combined into a region-wide or province-wide network, performing the equivalent city-level functions at the regional, provincial, or equivalent level.

TO DATE, INTELLECT-POWERED SAFE CITY PROJECTS HAVE BEEN DEPLOYED IN MORE THAN 150 CITIES AROUND THE WORLD.

