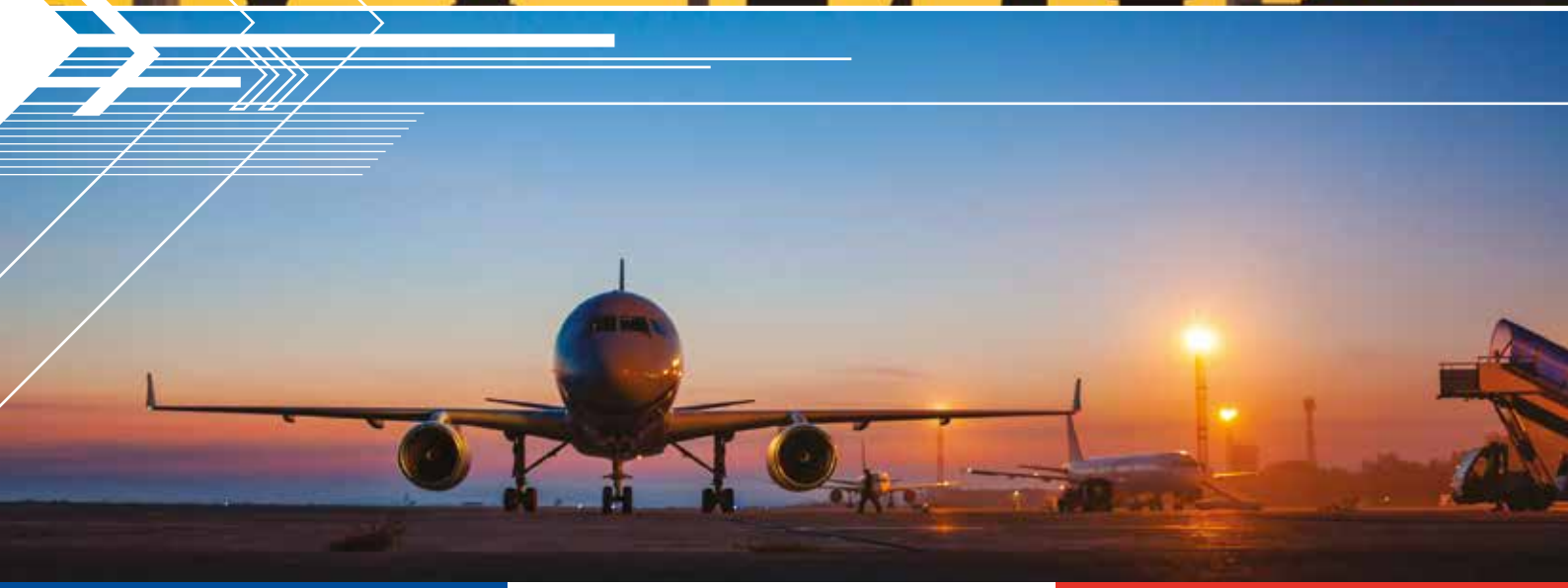
Airport protection



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PROAVIA French Airport Technology

Editorial of Alain ZABULON

Director, Security and Risk Management Group ADP

Any discussion concerning the challenges facing airport security in 2017 inevitably turns to the question of terrorist threat. Its perpetrators have long considered air transport a prime target because of the high profile of attacks via this medium.

Everyone can recall the horrific events of 9/11, a dark day in the history of air transport. Since that tragedy, some twenty attacks have been observed against aircrafts or airports.

Most recently, airport infrastructures have become targets, in Brussels on 22 March 2016, in Istanbul on 28 June of the same year, or on march 18th 2017, at Orly, an airport managed by ADP, a man was shot down after attempting to strip a young Sentinelle Operation soldier of his weapon.

The very nature of the threat has mutated. Where targeted attacks carrying a claim or specific political message once prevailed, present-day threat materialises in attempted and alas sometimes successful mass killings committed by disturbed or completely radicalised individuals.

In the face of this mutating threat, which has all experts in agreement as to its lasting nature as well, ADP has brought its security policy forward.

In the traditional understanding, airport security is aimed at securing aircraft before departure by screening 100% of passengers, personnel, as well as hand and hold luggage in order to detect any object capable of jeopardising the flight (firearms, explosives, etc.). This responsibility, entrusted to the airport operator by the public authorities, is implemented by sub-contractor firms which execute it under the tight watch of main contractor ADP, State agencies and even European authorities. These security procedures, which are subject to very tight regulations at the international level, are executed by some 4,700 agents using sophisticated, high-performance equipment to verify and screen individuals and luggage going on board. While security is priceless, it does have a cost – borne by the customer, expected to pay a tax, which goes entirely toward covering security expenditure.

In the public zone, which as its name would imply, is widely open, responding to threat proves a more complex task, because of its very status.

The State deploys significant resources through the Sentinelle Operation, visible police presence, the more covert presence of intelligence services and, in recent times, police prefecture agents in charge of surveillance of the thoroughfare leading to airports. Because security is, in these troubled times, more than ever, everyone's business, ADP has, on its own initiative, deployed special measures, in place since the state of emergency was declared in November 2015, and supplementing the protection mechanisms already mobilised by the State. These measures are aimed at airport surveillance using rounds, random access controls at terminal entry, and passenger luggage searches for possible explosives in the public zone. Also in practice is detection of unusual behaviours on the part of airport safety agents and ADP agents trained in this new observation technique.

Technology comes to the rescue of human intervention by offering additional means of observation thanks to nearly 10,000 cameras and a range of experimental initiatives that make use of artificial intelligence such as image-based facial recognition.

Aéroports de Paris maintains a state of ongoing technological watch to identify and experiment with the most recent equipment so as to guarantee a high level of security for our passengers and visitors.

Our airports are ultimately complex ecosystems combining, when it comes to security, very sophisticated technologies with well-trained and thoroughly-tested staff.

They are responsible for reconciling the highest stringency demanded by the control process with the smooth flow imperative, in the face of constantly-growing traffic levels. Close cooperation with the State, which concurrently protects us and verifies our activity, offers us an original model for co-producing safety and security, to which other major operators of critical importance look at with great interest.

Security is more than a priority – it is an unwavering obsession to make our airports into places that are safe, pleasant and true to the attractiveness of France.

Capacity segmentation

Airport protection is a tri-dimensional problem. The first dimension relates to flight security (simply put, this means ensuring that everything brought onto an aircraft is acceptable and compliant). The aim is to make this function as unassailable as possible.

The second dimension is platform protection, in particular, the decks and the taxiways. This protection does not notably differ from any standard sensitive point. The idea is to control access, monitor movement, prevent intrusion and intervene when necessary.

The third dimension is airport building protection. The building is the juxtaposition of two zones, with a protected zone that is part of the platform and a public zone with official status as an "institution open to the public", in which unrestricted movement is the rule and must thus be protected, like any open structure. The separation between the two zones is a constituent element of the platform and often forms its primary access path.

Engineering, Project Management Assistance, Project Contracting Assistance

This category includes all services essential to security assurance, but which do not require specific equipment. These are generally basic or set-up tasks. They include Auditing, Modelling, Integration and Training.

Audit, consulting and engineering

Airport protection is based upon regulations and national or international standards that change regularly. Likewise, the technologies and parties contributing, like the threats and risks, are constantly shifting. All of these factors make it very complex for those responsible for site protection to gain an in-depth understanding of this ecosystem. More often than not, they are required to call upon technical and operational experts for advice to be certain that protection is at the highest standard possible in light of existing technologies, and appropriate to the changing level of threats.

The recent attacks on airport infrastructures have demonstrated that these zones are vulnerable on the "city side" to attacks by determined assailants using ballistic equipment and powerful explosives. These, in turn, are able to multiply human and material losses, by weakening both superstructures and interior structures, which then turn into objects capable of injuring or taking lives.

It is thus necessary that from the very design phase, buildings, extensions or renovations be conceived of in such a way as to reduce their structural vulnerability and offer components capable of protecting from such effects (mechanical, thermal or perforating).

Modelling and simulation

Modelling the site to be protected makes it possible to achieve a complete mapping thereof, as well as draw up a list of assets to be protected. The models can then be used to conduct true-to-life simulations and compile the data presets to be used by the future hypervisors.

Simulation helps with operation and decision-making. It makes it possible to substitute realistic virtual situations for rarely-accessible actual situations. It will thus ultimately contribute to system selection and ergonomics of security systems and equipment to be set up. It also makes it possible to determine more appropriate operating procedures.

Integration and overall project management

Designing, deploying and implementing the changing, sometimes complex technical systems and solutions required for protection - including management, coordination and control centres - requires the skills of a turnkey-contractor capable of producing, within the allotted time, the overall protection system taking into account all security and protection requirements set out by the contractor, and ideally offering optimised maintenance procedures.

Training

Training should be aimed as much at the individual as at the units, and must enable total control of standard situations and techniques and any equipment to be implemented. These training programmes may be provided in sites specifically set aside for this purpose (schools) or on-site. Training must therefore be constantly adapted in accordance with changes in the sites, threats, feedback and regulations.

Air Transport Security

This category includes all equipment and technologies aimed at ensuring that nothing coming on-board can constitute a danger to the aircraft in flight. Several aspects need to be verified: passengers, personnel (with two dimensions: identification/authentication and security control), baggage and freight.

Identification and authentication

The purpose of this equipment is to ensure that the person coming on-board is in reality the expected passenger. For simple cases (domestic flights) this is often limited to verifying proof of ID. In order to dissipate possible doubt, or where flights involve crossing a border, a range of authentication and validity control techniques can be used, including biometrics and facial recognition for individuals, RFID for luggage and the boarding pass.

Individual security screening

The watchwords when performing this type of screening are "effectiveness" and speed. This type of screening must be run as extensively as possible, but also needs to be swift, for three reasons: 1) They significantly deteriorate the user experience, 2) each queue is another highly-vulnerable soft target and 3) they cut into the time available for passengers to visit airport shops. Although security gantries, body scanners and sniffer dogs have been positioned, the current trend is towards identifying no-stop solutions ("smart corridor") or have passengers scanned "on the fly" while they are moving, and using behavioural analysis.

Security screening for hand and hold luggage

This type of screening applies to hand-held luggage and checked-in luggage, as well as to all of passengers' personal belongings. There thus exist two distinct types of screening, but which use similar technologies and both operate "continuously". In practice, screening here involves scanning objects in search of dangerous items or objects and detecting the presence of explosive substances. The current trend is toward identifying the means for scanning certain objects on the wearer (shoes, belt, etc.) as well as improving the analysis of substances and, in particular, home-made explosives.

Security screening for freight, catering and mail

This type of screening is functionally very similar to luggage screening, but is performed on bulkier objects. They are thus often performed in a specific place and are connected with customs procedures. All items screened are then transported to the aircraft.

Counter-narcotics activities

This threat is technically not a part of civil aviation. In practice, the equipment used here helps identify narcotics transported by individuals or hidden in luggage, freight, catering or mail.

Platform Protection

This category encompasses all components used in erecting barriers or used to prevent intrusion and detect and locate any intruder who may have managed to cross the protection perimeter. However, platform protection does not stop with detection. It also includes monitoring visitors who have entered officially, recognising abnormal behaviour and intervention. Lastly, it includes a number of sensors used to detect occurrences capable of jeopardising the facility (leak, fire, etc.)

Surveillance

The first step toward ensuring protection is to provide for surveillance of the perimeter's surroundings and the zone to be protected. Detecting, recognising and identifying terrestrial, airborne or maritime vectors as well as intruders in the vicinity of or inside the zone to be protected itself are the primordial factors in the decision-making chain. They make it possible to provide the information and data required to intervene. It is essential to be able to detect, recognise and identify any potential threat, under any circumstances, at all times and sufficiently well in advance.

Optronics solutions must cover the full visible and thermal spectrum and will be generally associated with radar-type sensors, illumination solutions (visible or covert), and processing and analysis software with the related functions, such as pattern recognition, the designation of objectives and automatic scene and vector tracking;

Anti-intrusion fences and systems

The aim here is to ensure perimeter protection so as to deter, delay and, in all events, detect possible intrusion and guide vehicle and pedestrian flows toward the airport building. This protection can include several successive components and must be provided for using certified protection equipment such as: grids, gratings, concertina, walls, obstacles of various kinds, armoured doors, windows, bullet-proof glass, etc. These passive defence mechanisms will, of course, be equipped with various sensors, the aim of which will be to detect a possible intrusion.

Surveillance and neutralisation robots

Incursions by drones entering spaces where they are prohibited account for a large number of violations each year. This occurrence is a real hazard to flight security during the most critical phases (take-off and landing). It is an imperious necessity world-wide that solutions and systems be developed to detect and neutralise drones compliant with airports' operational requirements.

Protecting physical access routes

Physical access routes are a special type of vulnerability point in that they cannot be protected by fixed systems. Consequently, they must be equipped with a variety of systems (manholes, barriers, gates, cones, harrows, etc.) capable of both enabling thoroughfare and very quickly providing high resistance to powerful attacks such as during ram raids.

Personal access control

Distinct from passenger screening, this access control applies to individuals working at or required to enter regulated access security zones (ZSAR) or the platform. Its purpose is to ensure that individuals and the vehicles they may be driving are authorised and accredited to access certain places. Each entering party is associated with a profile entailing specific authorisations. Parties are generally assigned to profiles with extended prerogatives after verification of past history with the internal, private or State services, and may require verification capacity specifically for ascertaining the validity of identification or accreditation documents. . Biometric media and technologies are becoming more diverse and widespread across these applications scopes.

Tracking

The functions in this area are manifold. They include, in particular, detecting abnormal behaviour in individuals and vehicles licitly entering a site. In the years to come, the traditional badge which all visitors are required to wear, monitored and restricted access and mandatory visitor escort will be replaced by real-time tracking of all persons found on a site and by on-going verification of their position's validity compared to expectations. This will make it possible to immediately detect when a technician enters a zone having no legitimate business there, or when a visitor goes off the expected course. Furthermore, optronic tracking technologies will make it possible, as a supplement to perimeter intrusion detection systems, to track the progression of any intruders and guide and inform the units in charge of intercepting them.

Means of intervention

In the event of risk or to remove doubt, the authorities empowered by law shall intervene on-site (mine clearing, confinement, water canister, individual protection). The size of the platforms and specific nature of the traffic involved generally make it necessary to deploy ad hoc means of intervention. These may be vehicles, specialised effectors, means of accessing planes, etc.

Airport Building Protection

This category includes all material and technologies aimed at ensuring the security of the airport building. In addition to the materials listed in the platform protection category, it includes systems designed to ensure public security and effectively manage public streams.

Status Sensors

In addition to video surveillance, which uses the same technologies as those protecting the platform, this category of sensors includes multiple data sensors. The most traditional are smoke, heat, liquid leak, gas, and vibration detectors, as well as detectors of ambient light, humidity, wind, etc. This category also includes indicators of system states (equipment breakdown). These sensors provide permanent monitoring without any human intervention and in spaces that may be unoccupied, hidden or difficult to access (sewers, technical units in buildings, etc.). They provide a wide range of information to the central unit, which enable it to make better decisions, more suited to the context. They also significantly reduce maintenance by triggering intervention when required.

This segment is expected to undergo major changes in the near future, as connected objects come into widespread use.

Video analysis and sensor fusion

These functions are expected to greatly benefit from the advances made possible by deep learning. These technologies operate at two levels. In real time, any data obtained from the sensors can be analysed in order to identify alert situations, such as abnormal behaviour in individuals, or an attempted break-in. However, they also enable in-depth analyses, thus considerably improving the detection of latent threats and weak signals.

In the future, this function is expected to become an abstraction and decision-making assistance layer. This will mean that we will no longer think in terms of data or sensors but in terms of events, such as an operating incident, or an intrusion. An approach of this kind will assist operators at the time of an event by offering them decisions and response plans.

Operations

This category includes communications networks and command centres, as well as system defence equipment and alert mechanisms.

Communications and co-operation

The dedicated means of communication between central command and the surveillance and/or intervention teams are a major part of any site protection project. They must make it possible to send the information required to assess a situation, implement means of surveillance, detect and alert, whether the operational forces responsible for site protection or the police or rescue authorities.

They may be redundant, encrypted, autonomous or mobile, so as to guarantee uninterrupted connection, regardless of developments in the situation or the condition of civil telecommunications networks. It is a fundamental requirement that the network be efficient, fast, safe and capable of carrying voice, data and video, in both directions, with no risk of transmission delay, fluctuation or packet loss. Scalability must be taken into account to allow for expansion as and when new requirements and uses arise.

Hypervision and integrated control centre

Hypervision and command systems are aimed at enabling situation awareness on the site's overall security, decision-making assistance and response coordination.

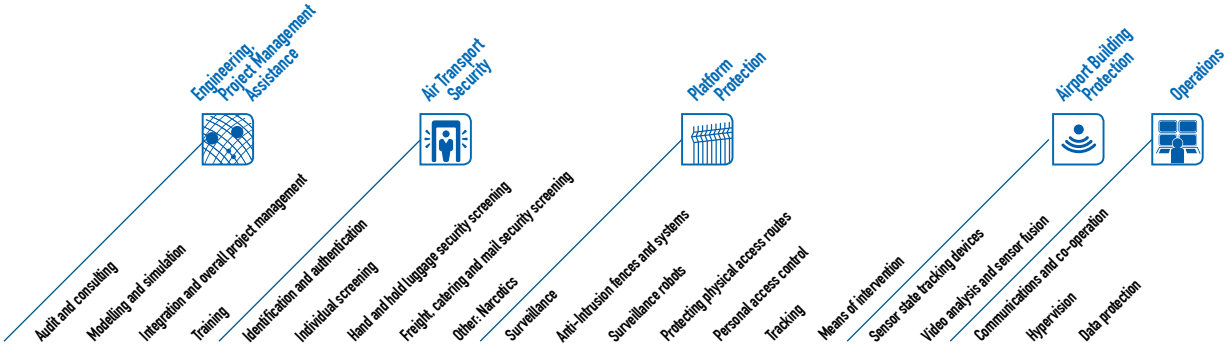
They centralise, in real time, all alerts received from the various detection, surveillance and screening systems, steer the technical resources dedicated to removing doubt, and make it possible to coordinate intervention via communication and monitoring systems. They also make it possible to report to the hierarchy, where necessary facilitate intervention, alert any back-up forces or law-enforcement agencies, and provide feedback via event replay.

The Command Centre is, however, not only a question of technology. Operational teams are required to spend long hours there in often stressful conditions. It is therefore essential to pay particular attention to ergonomics, interfaces and more generally operators' quality of living.

Designing, deploying and implementing the sometimes complex technical systems and solutions required for protection - including management, coordination and control centres - requires the skills of a turnkey-contractor capable of producing, within the allotted time, the overall protection system taking into account all security and protection requirements set out by the contractor. The development and widespread adoption of Building Information Model (BIM) technologies and media and their 3D representations bring out powerful information-providing functionalities which, when combined with hypervision systems, improve the interactiveness, exhaustiveness and changeability of information likely to be made available to integrated control centre operators.

Data protection

Information protection and network access control must be of the highest standard to ensure system integrity. Cyber-security is not limited to surveillance systems alone, but to all systems and installation robots. Cyber-attacks can trigger dysfunctioning in facilities, in some cases to such an extent as to threaten air and aircraft security. Physical security system design and implementation must by no means induce IT vulnerability.



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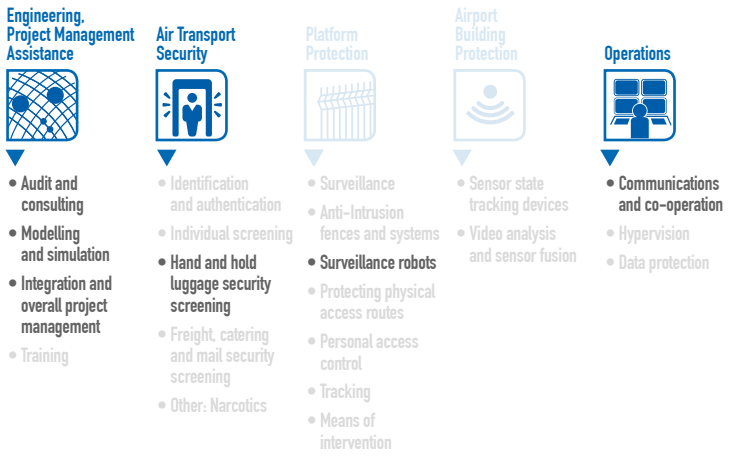

Designer and developer of international airports since 2000

Design, create, develop, protect

ADP Ingénierie, founded in 2000, is a subsidiary of Groupe ADP that designs and develops airports all over the world. Having obtained ISO 9001 in February 2003, ADP Ingénierie owns more than 300 international references on large-scale engineering and architecture projects.

Beyond the Aviation Security regulatory requirements, that recommend or enforce the implementation of systems and organizations aimed at mitigating the risks of unlawful interferences, ADP Ingénierie works towards designing and proposing scalable and efficient security solutions, suiting in a sustainable way the challenges raised by the new threats targeting air transport.

Its abilities are manifold:

- Building passive security: designing protective physical environments for airports users and staff (security by design),
- Expertise in the design of passenger, baggage, and good screening setups,
- Design of complex indoor and outdoor CCTV, access control, perimeter protection and surveillance setups,
- Consulting and support in the assessment of technical setups and organizations dedicated to airport security and in the design of operational and regulatory corrective actions,
- Design and integration of innovative solutions to enhance the global security of sensitive sites,
- Optimization of the security setups and organizations according to the specific airport risk assessment, regulatory, operational, commercial (passenger experience) and financial constraints,
- Whenever required, design of consolidated security setups: defenses against ramming vehicles and vehicles borne with IED, anti-blast and bullet resistant indoor and outdoor protections, etc.

automatique & industrie

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Cybersecurity in Automation and SCADA for Critical Infrastructure

Airports are labelled as critical infrastructure and a key resource for states. They use SCADA and automation solutions for the Technical installations such as airfield lighting control system, NAVAIDS, baggage handling system, Building Management System, Energies Management, etc. The compromise of the availability and integrity of these systems will have an impact on operations. For many years we feel safe because these systems seemed to be independent of each other and we've got no report of incidents due to cybersecurity. The landscape is moving fast: we see multiple cybersecurity incidents each year in SCADA and automation systems (aka industrial control systems), the term cyber war was coined few years ago, etc.

While cybersecurity assessments have become a standardized process in IT (Information Technology), they have only recently gained attraction in SCADA and Automation environments.

Although there are some similarities between traditional IT and SCADA systems, we cannot fully transpose IT cybersecurity methods to OT (Operational Technology). OT is about availability and integrity of cyber-physical systems whereas IT is about management of information. These differences can lead to inappropriate measure or lack of cybersecurity.

It is important to implement appropriate cybersecurity measures. We must incorporate cybersecurity in the earliest stages of design. We must also support legacy applications given the longevity of the technical airport installations.

Automatique & Industrie combines over 25 years of experiences in Engineering, Development and Integration of smart SCADA/automation systems and IT in order to serve cybersecurity for airports and other critical infrastructures. We use a multidisciplinary team in order to combine best of both OT and IT world.

We can support you in different ways:

- assess cybersecurity control systems,
- support your teams (IT, exploitation, maintenance),
- implement cybersecurity solutions (technical and organizational measures).

We have tied strong links with French industrial cybersecurity suppliers and worked to promote cybersecurity. We participate in the redaction of French cybersecurity guides for industrial systems (published by French federal agency ANSSI). We are a core member of IU Cyber (IU Cyber: The European Industrial and Urban CyberSecurity Cluster)

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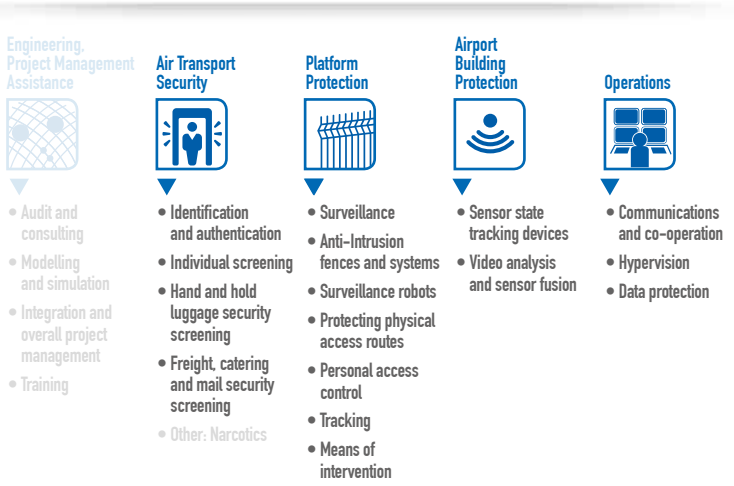

4G LTE radio networks serving aeroport authorities

An airport manages a multitude of services requiring the coordination of numerous employees in the field: airport operations, runway control, arrival / departure guide, checking of travel documents, maintenance ... 4G LTE radio networks are today indispensable for the good implementation of these missions.

A private and secure 4G LTE network

AIR-LYNX offers a private and secure version of 4G LTE public networks. It has several advantages. All the equipment and software necessary to establish communications are gathered in a single fixed system or in a mobile version. Fast, the system deploys in 90 seconds. Moreover, the system is agile in frequency, which allows it to be adjusted on several different bands, ensuring an unmatched flexibility and an adaptation to the specificities of the places and needs. Moreover, the user has full control over his 4G LTE network, since he is not dependent on an operator, since the system is under his control. Finally, the AIR-LYNX system is highly secure: it is resilient and encrypted.

Innovative services

For teams that need to ensure airport security, AIR-LYNX also develops a range of innovative services such as push to talk, individual calls, group calls, geolocation, data transmission, audio and multicast video. These services are compatible with any Android device and are perfectly adapted to public safety and critical missions. AIR-LYNX systems allow dynamic grouping and have free and documented software connectors for third-party applications.

Migration of TETRA networks to LTE radio networks

In recent years, airports have migrated their analogue radio networks to digital infrastructures. In addition to or as a replacement, AIR-LYNX designs and manufactures a range of gateways to migrate TETRA to LTE networks.

ALSTEF

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ALSTEF takes into account the aspects of safety throughout the projects, from the study of the specifications to the installation and the integration of complex systems.

Hold-baggage screening

ALSTEF installed the first hold baggage screening system in France in 1998 in Paris Orly Airport.

Since then, he latest ECAC regulations (European Civil aviation Conference) pertaining to the detection of explosives impose the integration of rapid Standard 3 tomography machines in baggage sorting systems in order to check 100% of bags. Since 2013, ALSTEF has developed unique expertise in Europe in the integration of standard 3 machines, with successful implementations in different airports, including the latest Smiths Detection, L3COM, Rapiscan et and Detection machines on the market.

In order to meet the growing needs for 100% traceable baggage in airports, especially in the framework of the IATA 753 resolution (International Air Transport Association), ALSTEF has developed several baggage tag identification systems: laser or optic reading of barcodes, optic cameras with character recognition or RFID tag reading, for departing and arriving baggages.

Baggage traceability and monitoring

This software enables the automatic management of baggage systems and makes it possible to ckeck 100% of baggages. It receives information on baggage (BSM or Baggage Source Message) from the airline DCS via multiple chanels: global platforms type SITA BAGMESSAGE, ARINC BAGLINK, local DCS, Information Broker or even directly from the airline DCS. It receives the flight plans via the AODB (Airport Operation Data Base)

It automatically directs bags to the appropriate chute(s), based on the allocations determined by the BAGWare Vol flight planning module.

Service continuity is addressed at all levels of the product, ensuring 100% baggage screening 24/7. Its highly available architecture enables the continuous operation of the system in the case of an incident.

Information system safety

Information system safety is vital for the proper operation of industrial systems but also for the security of the flights as the intrusion of hackers in the IT systems of the BHS could enable terrorists to foil the explosive detection.

ALSTEF designs and installs the IT systems in accordance with the rules defined by the ANSSI (the French Information Security Agency) and supports its customers in the deployment and management of installation security.

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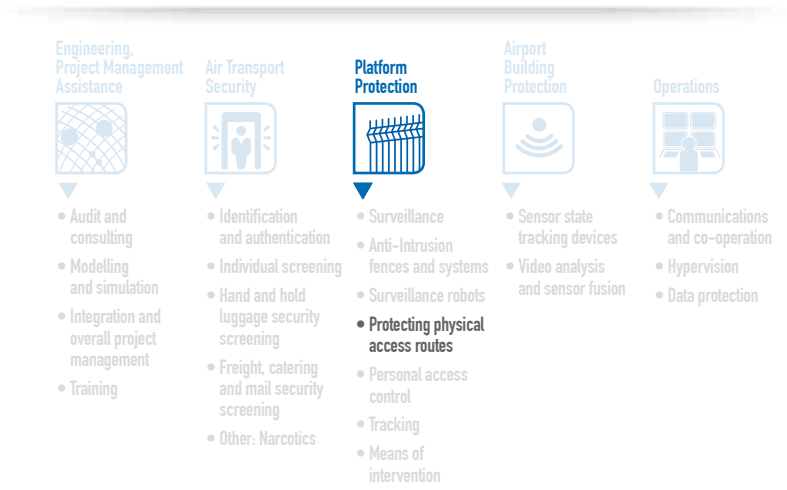

Founded in 1992, AMCO Les Escamotables, French company, designs, manufactures and distributes Roadblocks Systems (Retractable bollards, roadblockers, and barriers).

For many years, **AMCO Les Escamotables** has offered a complete range of anti-intrusion and anti-terrorism products certified by crash test.

Designed to control and secure Vehicle access, **AMCO Les Escamotables** products are among the most reliable and faster to implement

The Anti-Terrorism **AMCO Les Escamotables** range, meets the European and US most demanding standards in terms of defense against any type of vehicles: IWA14-1,CWA 16221,PAS 68, ASTM F2656-07 (K12, K8, K4 according to DOS STD-02.01).

Able to stop 2T Vehicles travelling at 136 kph, up to trucks travelling at 80 kph. **AMCO Les Escamotables** High Security products are tested and certified by an independent testing laboratory accredited by COFRAC (Accreditation French Committee). Some products have been subjected to two successive crash tests and remain functional and in working condition.

In addition to automatic systems, **AMCO Les Escamotables** also offers a range of manual and fixed. Sealed in concrete or simply laid on the ground without any civil engineering works, this range offers a high level of security with a minimum of constraint. Composed of manual barriers, fixed and removable bollards, this range of products permits to secure sites where the power supply is difficult to achieve.

From the project conception to the commissioning and the maintain in operational conditions of the systems, **AMCO Les Escamotables** provides its experience and Know-How

Move Forward with Confidence

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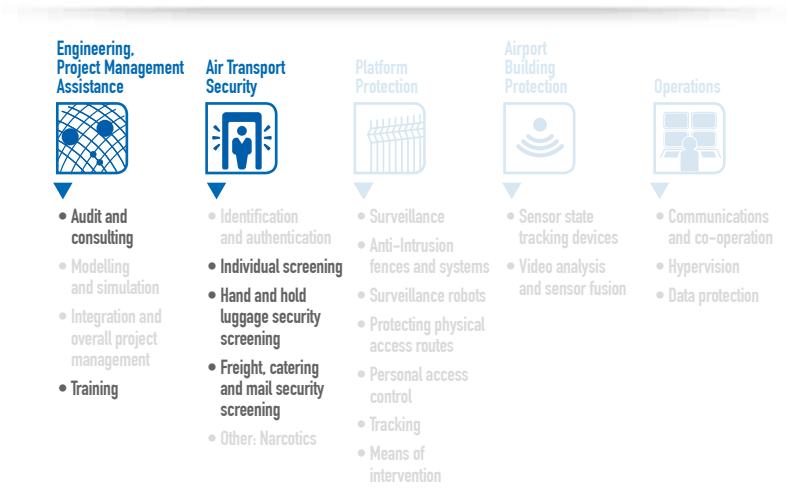

A known and recognized safety / security expertise in more than 140 countries

Bureau Veritas has been working in the aeronautical sector worlwide for more than 90 years.

Audit / Consulting

- Security audits and airport vulnerability assessments. Implementation and follow-up of recommendations to reduce the risks of vulnerability.
- Remote control of the airport security employees's training files and external service providers.
- Security audit under the Quality Assurance Program on behalf of Airport Operator.
- Security programs updates according to the regulatory changes and communication with Competent Authorities.
- Support for implementing security approvals.

Training

- Airport security employees training (all actors involved in the airport activities).
- Bureau Veritas is IATA accredited to conduct Dangerous Goods Trainings sessions (Categories 1 to 17).

The + : A complete offer dedicated to airports

- Assistance for airport compliance with international regulations, in particular EASA certification
- Risks control and compliance on airport platform : technical control / disabled accessibility / environmental compliance / energy efficiency
- Airport assets management
- HSE Conformity : work arduousness and stress, noise and vibration
- Management system implementation and/or certification achievement (ISO 9001, ISO 14001, OHSAS 18001 …)
- Assistance for implementation of an efficient environmental & energy policy

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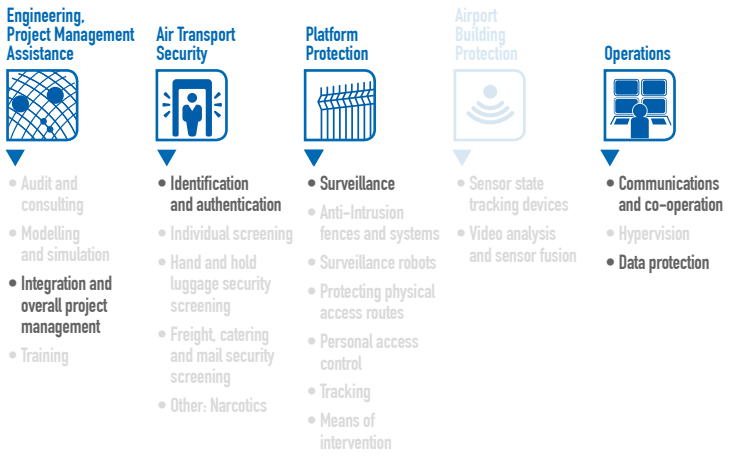

SECURICORB
The anti bomb rubbish bin

Currently, at the Louvre Museum and Trocadero in Paris, SECURICORB combines security and elegance at these famous sites.

SECURICORB, made by CEFA Company, is designed to withstand an explosion of 500g of plastic explosive, equivalent of two hand grenades.

It has the appearance of an attractive, original and contemporain fixture which merges into the urban landscapes.

SECURICORB is not only the solution for the protection of people in very busy public places (stations, airpports, commercial areas,...). But also it contributes to the protection of property and works at prestigious urban sites, such as monuments and museums, without eyesores implementation.

Two models are produced, 60 or 80 litres capacity.

The finishings are painted steel or brushed stainless steel.

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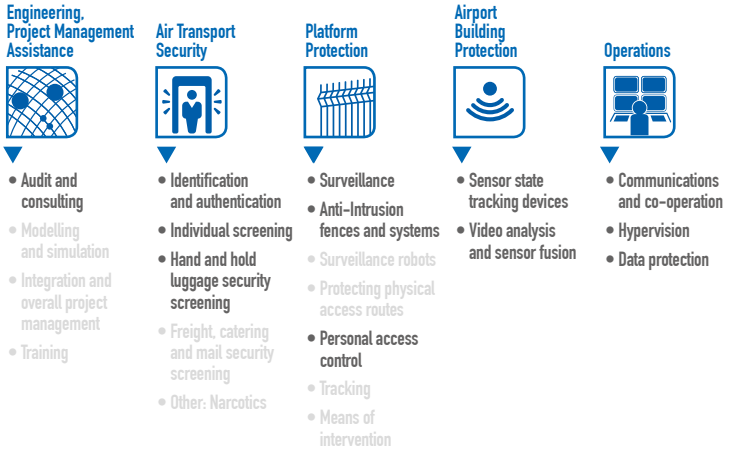

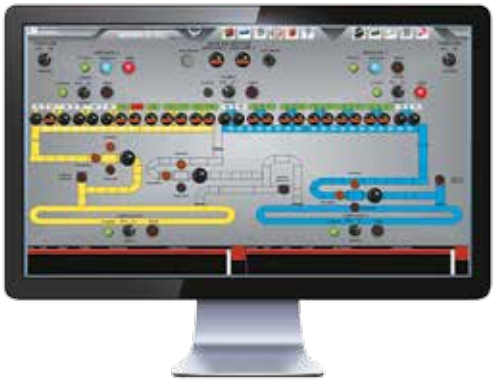

BMS/FM

Reporting

Codra developer of Panorama Suite 2017 : Communication platform, SCADA, Data Historian

Founded in 1986, Codra develops and distributes the Software "Panorama Suite 2017": Front-end communication gateway, SCADA and Data Archiving & Reporting tools. With an installed base of over 30,000 licenses, Panorama solutions are for all airport industries with production monitoring or archiving and data analysis needs.

Main SCADA challenges for air transport are safety, reliability, reduced energy consumption, and increased fluidity requiring global data analysis and instant forwarding of information for operators to make optimal decisions in real time.

The highlights of Panorama Suite 2017 in securing airport sites

Building Management, Security Hypervision (Access Control, CCTV, Fire Detection), Airport Lighting, Baggage Sorting, HV/LV monitoring

- Identification and authentication of persons,
- Security check & Baggage Sorting,
- Surveillance, Access control, Fire detection,
- Hypervision, Control Room, Aid Unit Operations,
- Building Management System, HV/LV monitoring,
- Data integrity.

Panorama Suite 2017 & Cybersecurity

IT security has always been a key focal point of Codra. Panorama Suite benefits from Cybersecurity functions designed in conjunction with the industrial systems cybersecurity working group. With Panorama Suite 2017, you protect your applications through native mechanisms for confidentiality (encryption), integrity checks and authentication.

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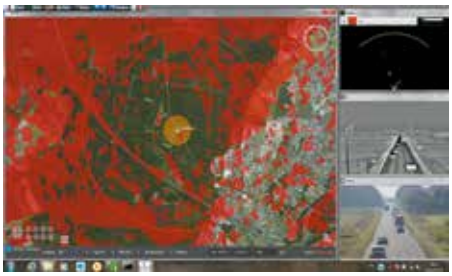

Defense, Security, Imagery, Innovation
Protecting sensitive sites

CORDON DS2i performs studies, design, development, integration and support of systems (products, services and solutions). Specialists in intelligence, surveillance, supervision and reconnaissance on the ground, at sea, in the air and in space.

Protective Dome for Sensitive Infrastructure

- Global surveillance operational in 2 hours
- Intrusion detection inside the protected area
- Intervention, real-time tracking and team guidance using tablets/smartphones
- Surveillance of « Airside » & «Landside» areas from 3200 up to 16000 ft² with exclusion zone management
- Possible integration in a global protection system
- Night and day multi-threat system
- Drone support to confirm hidings

Mobile Detection and Intelligence System Generation 2

- This mobile product is operational in only 10 minutes. It detects intrusion and follows the target through the protected area via a tracking module. The cartographic tools are intuitive to use, and show the target's predicted heading in real time. The system may be run autonomously, or connected to ComSat.
- Potential threats are located rapidly by radar. A recording module allows incidents to be replayed or reported quickly and reliably.

Those two products are innovative solutions for surveillance and reconnaissance. They use the latest imaging analysis algorithms as well as quick situation analysis.
They are robust, ruggedized, simple and easy to use.

Digit' Solutions for Cybersecurity protection

- DigitAUDIT for SSI Audit
- DigitCONSULT for SSI consulting
- DigitCRYPTFILER for Data Encryption service
- DigitCRYPTNET for Data flow Encryption
- DigitDMS for destruction of sensitive equipment
- EfficDef for definitive and secure erasure of digital Data

The power of innovation

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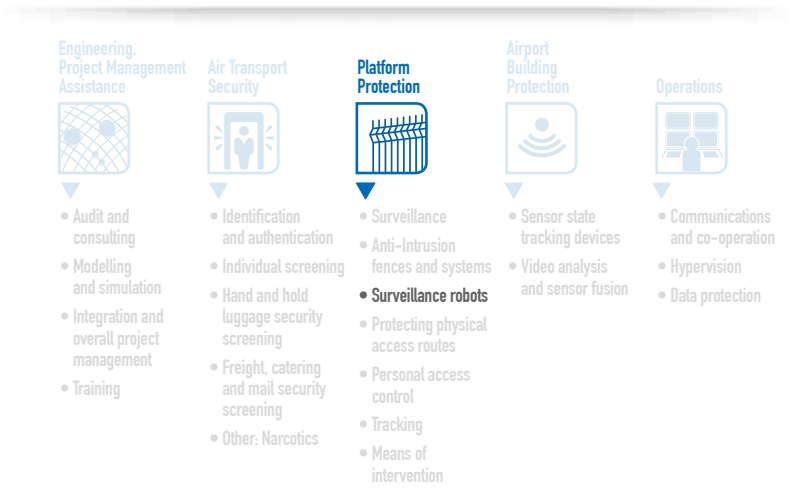

BOREADES Protection system against rogue UAVs

Winner of French National research Agency call in 2015, selected by European Union for H2020 program, operational in French law enforcement services, **BOREADES** is an efficient system for countering rogue UAVs.

BOREADES consists of command & control (C2) software, set in an adapted console, detection, tracking and identification sensors, and neutralization devices. All of these subsets are connected to C2, which manage their command, data fusion and situation presentation, events recording and links with external systems. With outstanding ergonomy, this system is a particularly easy to handle and adapt tool.

BOREADES is, by construction, adaptable to all situations. Sensors configuration is variable in number (how many do you need?) and quality (what performance do you need ?) to answer each specific situation. BOREADES is easily integrated in network to ensure coverage of wide areas.

Neutralization solutions are various, to answer airports specific constraints.

Centralized command is interesting for actions automation, simplifying operator work, and also in giving possibility to add specific high value functions, as friendly situation integration, prohited areas creation, access to social networks, air situation display, etc.

BOREADES can evolve over time. At starting point, it is possible to integrate legacy surveillance sensors, radar or video. Software will welcome new equipments, year after year. It will keep its performance in changing, following threat and technology evolutions.

CS-SI will go with you, from operational need definition to formation and maintenance, to make **BOREADES** your protection against rogue UAVs.

DAIFUKU

Daifuku Airport Technologies

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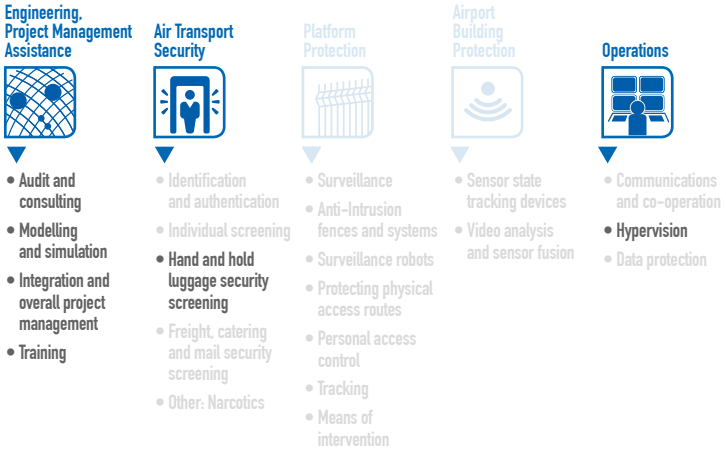

Always an edge ahead

Daifuku Airport Technologies understands a reliable and efficient baggage handling system is essential to an airport's success. That's why more than 500 airports around the world depend on us to engineer, manufacture, install, integrate, service, operate and maintain the most durable baggage handling systems in the industry.

Daifuku Airport Technologies consists of BCS Group, Daifuku Logan, Elite Line Services, Jervis B Webb and Logan Teleflex.

Our breadth of products and services are coupled with a vast range of knowledge and resources, through our global operations, to provide innovative baggage handling and airport operations and maintenance solutions.

Daifuku Airport Technologies provides a complete range of equipment, software and services to the airports:

- **BAGgate™**, automated bag drop solutions are designed to ensure that the passenger experience for bag drop is easy, intuitive and fast. Typical process time per bag is less than 20 seconds.
- **Baggage Tray System (BTS)** enables bags to move through the entire baggage handling system in an RFID equipped tray. The protected and positively tracked bag is transported at speeds up to 10m/second throughout the system.
- **Tilt Tray Sorters (TTS)** provides very high levels of throughput with an extremely controlled sorting action designed to minimize damage to bags. The tip action is controlled by radio frequency permitting unprecedented levels of control.
- **Early Bag Storage System (EBS)** allows each bag to be retrieved according to priority, which facilitates the management of baggage make-up activities effectively and efficiency, resulting in both labor and space savings.
- **Mobile Inspection Table (MIT)** replaces traditional belt conveyors and static search tables in a CBRA. Bags are automatically loaded onto MIT and delivered to the search station.
- **Sym3,** a complete SCADA/MDS package specifically designed for BHS, providing a 3D view of the system with real-time bag tracking. Standard features include: equipment monitoring and animation, on-screen pop-ups and reports and full authentication/auditing,
- **Airflow,** a high level control (HLC) for baggage handling systems developed as a completely fresh approach to traditional baggage software solutions.

DEVERYWARE

Committed to Better Security

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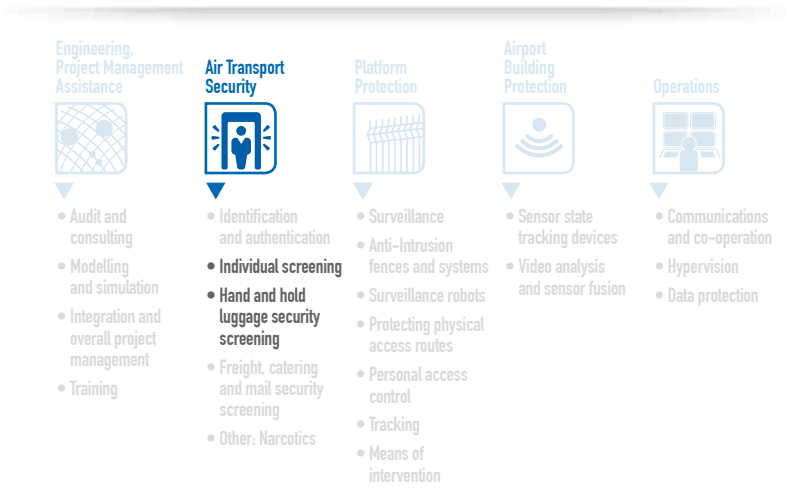

Since it was founded in 2003, Deveryware has provided constant support to the work of security professionals assigned to keep people and goods safe. A real-time geolocation expert, the group designs, develops and sells innovative solutions, in response to the changing needs of the market. Backed by this experience, the group now has an international presence in Spain, Africa and Canada and is pursuing its policy of exporting its products worldwide. Its capacity for innovation, its values of respect for privacy and its historical knowledge in the security market make it a trusted partner already recognised by many stakeholders such as the French Ministries of the Interior, Justice, the Economy and Finances. Focused on customer satisfaction, since 2012 Deveryware has implemented a Quality-Environment-Security approach for which it has received ISO 9001 and ISO 14001 certification.

Through Notico, in 2016, Deveryware created a product dedicated to businesses and local authorities, anxious to take part in the "Safe & Smart City" development. This product aims to offer both security and well-being to citizens as well as the optimisation of the costs and resources needed to organise them.

Notico SAFE

With Notico Safe, Deveryware offers a platform for broadcasting and managing alerts and geolocated information which integrates into a global security system.

Thanks to Notico Safe :

- Individuals locate loved ones and be reassured at any time
- Public authorities protect population by broadcasting massively alerts and geolocated information in a specify area
- Companies broadcast massively alerts and geolocated information to identified populations

Thus, airport security professionals can inform and protect passengers in real time in case of a crisis situation (more specifically in case of terrorist attack as we saw in Brussels and Istanbul in 2016).

Resolutely forward-looking, Deveryware constantly strives to provide the latest technological innovations, produce increasingly more sophisticated solutions and thus offer services with real added value for the security market. An ambitious and motivating project that all of Deveryware's teams constantly place at the centre of their concerns.

egidium TECHNOLOGIES

Security in all its dimensions

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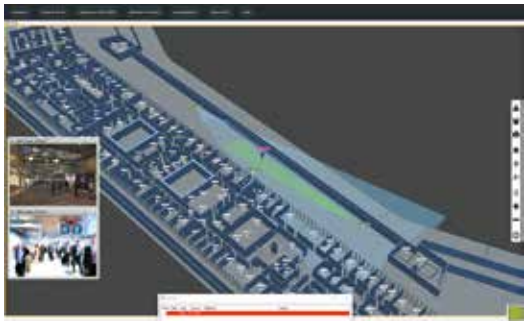

Smart & unified security supervision for Airport Operations Centers

Egidium provides hypervision software solutions for security control rooms of critical sites, including transportation infrastructure such as airports.

Set up in 2009, Egidium counts Groupe ADP (Paris Airports) as both a shareholder and a customer with ongoing deployment at Paris-Orly airport. Other Egidium references include Paris Air Show, French Ministry of Defense, Stade de France, CEA, EDF, COP21, Eurosatory.

Unified situation management for immediate security decisions in complex sites such as airports

Our **Smart Shield™** solution is dedicated to global supervision of both fire safety and security. It relies on a detailed georeferenced 3D model fed by the airport information system. As a result, it highlights the location of security alerts and triggered sensors in a very realistic fashion.

Through a unified user interface, Smart Shield™ provides actionable information from all on-site security systems, and brings global security situation awareness from any part of the airport. Among Smart Shield™ features:

- Automatic video doubt removal upon alarm, accelerated investigation of unattended luggage, computer-aided intruder tracking;
- Fire management system, intrusion detection and management of any incident with decision support and guidance for operating procedures;
- electronic logbook and dashboard;
- 3Dreal-time geolocation of security and fire safety staff
- mobile applications synched with the control room;
- Tactical editor for crisis situations and training.

A flexible middleware for the ever-changing set of airport security systems and sensors

Smart Shield™ is based on Egidium's ISAP middleware. ISAP, aka "Integrated Security Automation Platform", merges data from all kinds of security sensors and systems. Its main characteristics:

- Compatible with any security sensors, safety actuators and IoT
- Able to interface with both legacy and most recent systems , whether videosurveillance, access control, intrusion detection, fire safety, hazardeous material detection, PMR, geolocation, cybersecurity.
- Neutral vis-à-vis video management systems (VMS)
- ISAP alarm correlation engine drastically reduces the number of false alarms
- Micro-services architecture for full scalability

Today, ISAP is one of the most powerful software suites for Physical Security Information Management (« PSIM »), ready for the smart airport.

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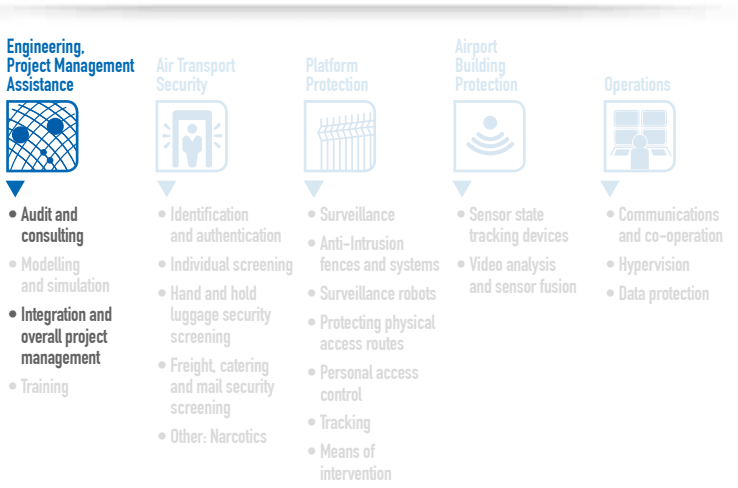

EKIUM is an engineering company with a background of 30 years experience and a workforce of 800 engineers and technicians. EKIUM provides consultancy and engineering services to key actors of air transportation sector, for risk prevention and threat containment against airports and industrial sites.

Facing increasing and sophisticating risks, and considering potentially harmful impact, public and international authorities improve regulatory framework for key actors of air transport sector. Key actors of air transportation sector enhance facilities for risk prevention and threat management.

Our safety engineers provide audit, consultancy and engineering service for risk assessment, safety system efficiency check and diagnosis of weaknesses on airports and industrial sites.

We design integrated and consistent safety systems for risk mitigation, aggression deterrence and downsizing of potential attack effect. We provide consultancy for safety proceedings and human resources operating safety systems.

We provide experience for 3 main safety issues :

- Better risk prevention of criminal threats,
- Better infrastructure protection against hostile acts,
- Better treatment of attacks in case of prevention fail.

Our clients are airport operators, airlines companies, aircraft manufacturers and maintainers, as well as institutional stakeholders of air transportation sector.

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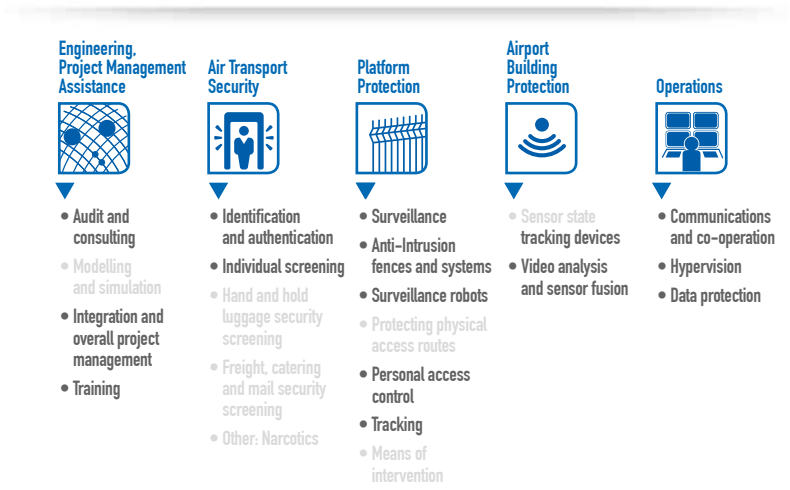

Global security and crisis management

ENGIE Ineo is more than 15 000 talents involved in the service of a changing world. With a network of 300 agencies in France and abroad, our teams innovate to support you in energy and digital transition. They are on your side to achieve your infrastructures of transport, telecommunications, and energy, your commercial and industrial projects, and those related to security and defense. From design and implementation to operation, our experts imagine and anticipate the uses of tomorrow.

A 360-degree vision for an optimal security

The optimal security of an airport requires a constant analysis of threats, local regulations, critical levels and the environment of the equipment to protect. ENGIE Ineo supports its clients to comply with the local regulations of the field and proposes its expertise in airports security, industrials sites, nuclear power plants and for cities and territories ...

Working on effective decision-making tools

A security infrastructure requires many skills: intelligent sensors, energy, networks and cybersecurity, automation, servers and peripherals, software, command centers, CCTV... By entrusting your construction, renovation or extension project to ENGIE Ineo, you will benefit from reliable, high-performance and durable products and services to suit your needs.

References

Bordeaux International Airport: Engineering and deployement of an airport security system
- Security of passengers and airport workers
- Centralisation of the video surveillance system in a global control center
- Installation of 191 cameras
- Installation of a continuous recording system

Lyon International Airport: Engineering and deployement of Terminal 3 security
- Installation of airspace monitoring and surveillance equipment: 100 CCTV IP cameras
- Installation of 40 access control system
- Provisionning of a protection equipment against fire and lightning threats

AIRBUS facilities in Toulouse: Engineering and deployement of signaling and security platforms for A350 assembly stations
- Securisaton of the authorised access zones to the 10 aircraft assembly stations
- Installation of a control center with 76 screens

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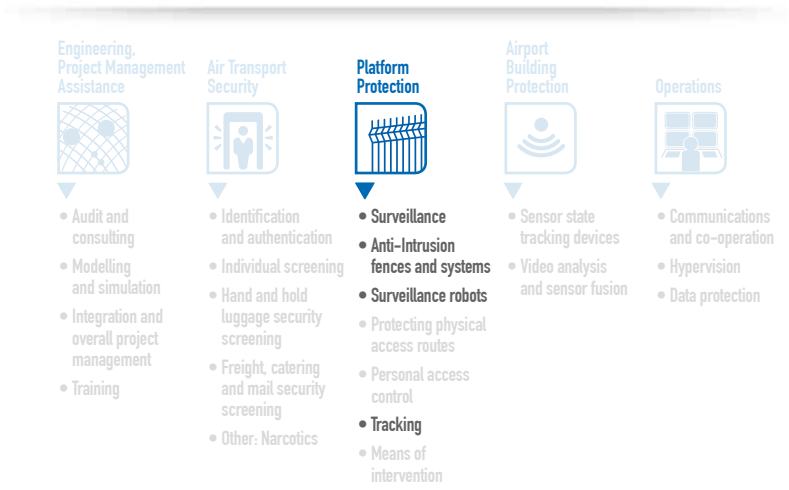

EXAVISION: Designer and Manufacturer of bespoke optronic solutions for the most demanding environments since 1990.

EXAVISION is a French SME, recognized as a leader in the delivery of complex and innovative optronic solutions dedicated to the protection of goods and people for difficult environments. Our airport observation, surveillance and protection solutions are used in projects related to military air bases and civil airport sites.

NEMOSYS range: «Multi-Sensor Optronic Systems»

The new NEMOSYS range allows automated day and night surveillance and is available in four versions: short (SR), medium (MR), long (LR) and extra long (XR) ranges. These optronic systems are mounted on a two-axis motorized Pan & Tilt and are made up of different sensors: SD or FHD day camera, cooled or non-cooled thermal cameras, LRF, GPS, DAZZLER laser ...

These optronics and modular solutions are combined with radar detection (**EXARADAR**) and with our data monitoring and management software (VIGISENS). They enable real-time detection and tracking of targets up to 20 kilometers.

EXARADAR range: «Radars coupling to optronic solutions»

Adapted to all types of terrain, radars allow the detection of intruders or vehicles upstream of the protection zone or on defined areas within the site. The proposed solution also manages the coupling of the optronic systems developed by EXAVISION with the main radars available on the market

Acoustic and Optical Effectors

We integrate non-lethal optical dissuasion effectors (ARCLIGHT-SYNCHROBEAM) or LRAD acoustic communications (up to 5.5 km, fields from 15 ° to 360 °), enabling mass notification in the event of an alert, the removal of birds during take-off / landing phases or long-distance communication for the establishment of safety perimeters.

Malware Drones Control Solutions:

To respond to the new problems of aerial threats (malicious drones), EXAVISION has partnered with several companies to propose a complete solution. The functions of detection, identification, tracking and neutralization of drones are ensured by the integration of radar, radiofrequency and optronic technologies within a single control center. The large detection distances thus make it possible to anticipate and to provide a rapid and proportionate reaction to the nature of the intrusion. The EXAVISION optronic solutions were selected and qualified by our partners on the following projects:

- HOLOGARDE, a solution co-developed by the ADP Group and DSNA Services, with the assistance of several SMEs, punctually installed at the Paris-Le Bourget airport during the international aeronautics fair 2017 and then set up at the airport from Roissy - CDG
- ANGELAS, a program co-financed by the SGDSN, carried out in cooperation with ONERA and THALES, in the framework of an ANR project on the experimentation of anti-drones solutions

GROUPE MARCK

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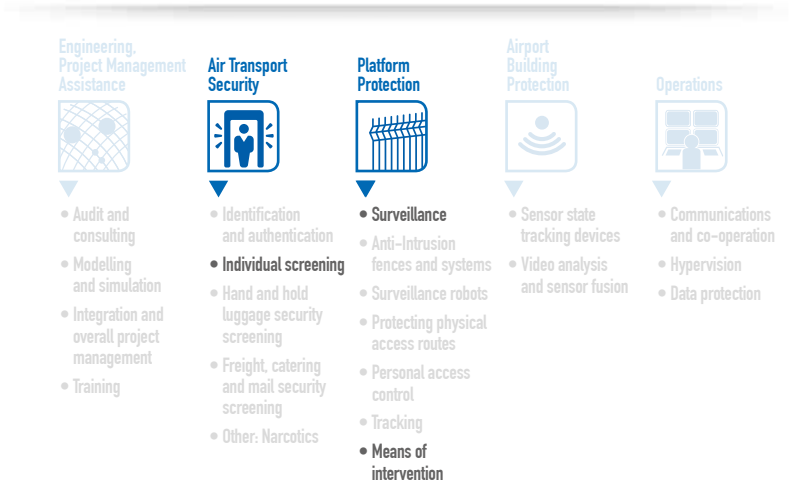

Uniform and equipment solutions

Groupe Marck is a French manufacturing group that designs and sells uniform, equipment and service solutions to public authorities and private companies in France and worldwide. Groupe Marck offers a global service that meets the requirements of a demanding and prestigious international clientele.

Key figures :
- **7** specialized subsidiaries
- **6** production sites in **France** – 1 production site in **Tunisia**
- **3** logistics sites
- **More than 900** employees

Groupe Marck, is a pioneering group **in the design and manufacture of personal protective equipment (PPE).** For almost 60 years, it has developed its **expertise in technical textiles and combining flexible materials** in order to offer its customers the best security clothing and equipment.

Working with leading international manufacturers of fabrics and technical supplies, the Group has a **large selection of technical and personal protective products certified by approved laboratories: 800 PPE category 1 to 3 products for human protection.**

Furthermore, through its R&D department and its integrated design office, the Group is able to **develop bespoke solutions for its customers, providing technical and technological solutions suited to the specifications (simple or complex).**

The group has its own **manufacturing tool which is a guarantee of quality, traceability and responsiveness.** The production of all technical and personal protective clothing is controlled and guaranteed according to the specified requirements.

It is part of a **100% secure quality and traceability approach** and policy: from receipt of materials and supplies, during manufacture and until the final product is checked.

GUNNEBO®
For a safer world

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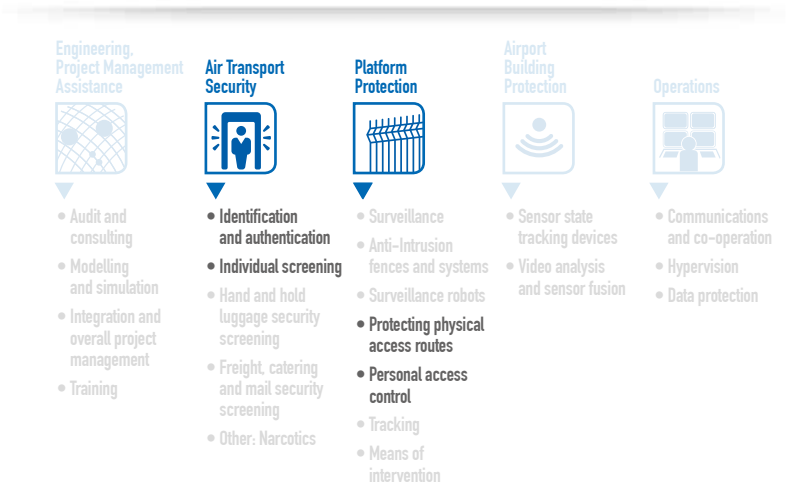

1


2


3

Passenger flow control and access security solutions for airports

A subsidiary of the international security Group Gunnebo AB, Gunnebo France has acquired unique know-how in the field of airport security equipment.* Its offer is based on its threefold expertise in the areas of electronic security, passenger flow control and the physical security of buildings.

Authorized personnel identification and access control

Gunnebo designs access control systems providing an overall security management of restricted access areas within airports.

Certified by ANSSI (France's Network and Information Security Agency), Gunnebo's SMI integrated **security management system ensures secure management of IDs and access rights.**

Faster passenger flows while maintaining security

Gunnebo is one of the world's leading providers of turnstiles and speed gates. Its offer for airports is focused on four major objectives:

- Guiding passengers while creating an efficient first security barrier prior to filtering checks with **pre-security gates (1)**
- Managing increased passenger numbers by optimizing the boarding process with **automated boarding gates** compliant with local and international regulations
- Upgrading border-control efficiency with **automated immigration gates** integrating the most recent biometric identification technologies(2)
- Ensuring free landside exits while preventing any intrusion into the airside zone using **anti-return gates and airlocks (3)**

Protecting passengers and staff against new threats

Gunnebo's puts its expertise in protecting very high-risk sites in the service of airports to bolster their infrastructures against ballistic or blast attacks.

Our specific know-how includes the protection of facades, the partitioning of areas and the creation of refuge or confinement areas.

IATA

* Gunnebo is a member of IATA and has developed a large number of strategic partnerships with civilian aviation suppliers.

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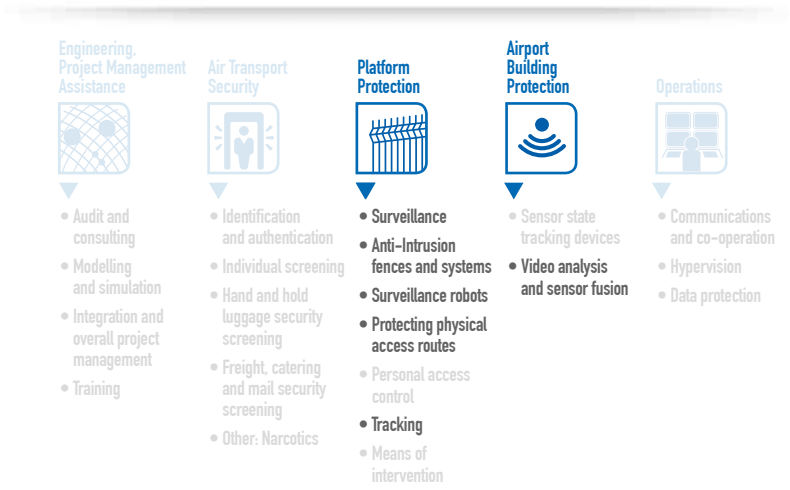

HGH Infrared Systems - The infrared reference for over 35 years.

Founded in 1982, HGH Infrared Systems designs, develops, assembles and sells optronic systems for industrial, civil, defense and security applications. In 35 years of existence, HGH has established itself as an international reference in terms of innovation in infrared technology, through the development of multiple advanced sensors. HGH Infrared Systems is a global provider of infrared solutions. For several years, HGH has achieved over 80% of revenue outside France, with sales and technical support teams in North America, Europe and Asia, as well as representatives in more than 50 countries.

SPYNEL – 24/7 panoramic surveillance system for wide area surveillance

The SPYNEL 360 degree thermal imaging systems take wide-area surveillance to the next level. It gives early intrusion alert to any type of target, such as: crawling men, small wooden boats, RIBs in heavy sea clutter, UAVs, stealth aircrafts, etc. Equipped with CYCLOPE advanced motion detection software, it provides unprecedented real-time security against conventional and asymmetrical threats. Completely passive, rugged, compact, this infrared search and track system can be set up and fully operational within minutes.

SPYNEL family comprises of 5 models to cover all surveillance applications:

- **SPYNEL-X** is the IRST (Infrared Search&Track) with the best image quality and, by far, the longest detection range on the market.
- **SPYNEL-S** captures real time images with a resolution of up to 30 Mpixels and automatically detects all human intrusions over a 12km-diameter area.
- **SPYNEL-C** is a proven system, ensuring the security of over 100 sites around the world.
- **SPYNEL-U** combines an uncooled, long-wave infrared camera system, with a high resolution 360-degree visible channel, ideal surveillance solution for commercial applications.
- **SPYNEL-M** is the latest in the SPYNEL family and benefits from HGH's 15 years of expertise in automatic intrusion detection and tracking systems. With dimensions of less than 12x20cm and weight of only 1.8 kg, the Spynel-M is a compact, rugged and cost-effective solution for wide area surveillance. One single Spynel-M sensor effectively replaces up to 16 traditional cameras and is able to perform 24/7 early human intrusion alerts over a 1.5 km-diameter area.

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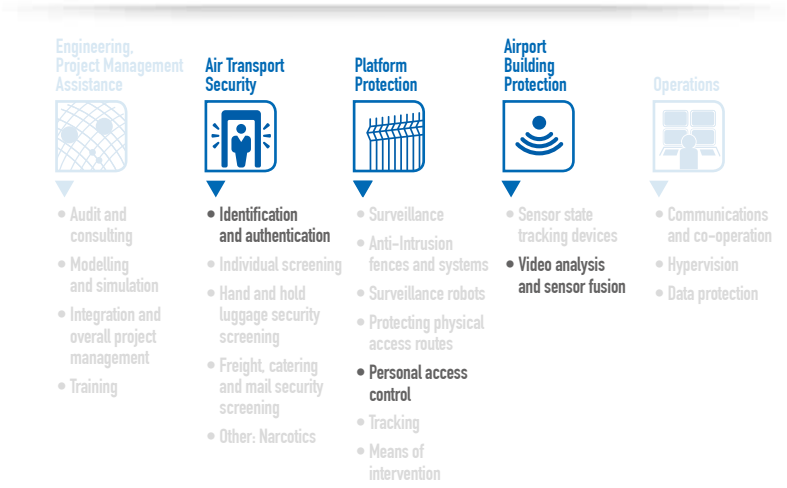

IDEMIA is the world leader in digital security & identification technologies

Security through identification

Personnel access control

IDEMIA is the world leader in access control, time & attendance biometric terminals deployed at more than 100 airports worldwide.

Fixed biometric terminals (face, fingerprint or iris biometrics) are integrated into access control systems and in gates or door systems.

MorphoTablet™ is a mobile biometric device for identity registration and verification, which proves to be particularly suitable for collecting workforce time and attendance data on very large sites like airports.

Passenger biometric processing

Passenger processing at airports is still 90% manually processed, generating bottlenecks, costs and a bad perception by passengers.

To bridge the gap between security, facilitation and passenger experience, IDEMIA has implemented Digital Biometric Passenger Processing at Changi and Bangalore international airports.

Biometrics is used as:

- a universal data model independent from language, culture and diversity of the traveling public, secured as it is difficult to forge, exchange or destroy, and ergonomic as it is the passenger itself
- a virtual token enabling tokenless, paperless and hasslefree passenger processing

MorphoPass is built on Privacy by Design principles protecting private data and dissemination, and deployed in Singapore and India.

Identification in vdeo flows

While enormously valuable information can be found in videos, the volume of data makes extraction of this information time-consuming and labor intensive. Morpho Video and Image analytic platform (MVI ©) helps video analysts and investigators by processing the video content quickly, and revealing the most relevant data in an easy-to-use interface.

MVI is deployed at Mascat International Airport in Oman.

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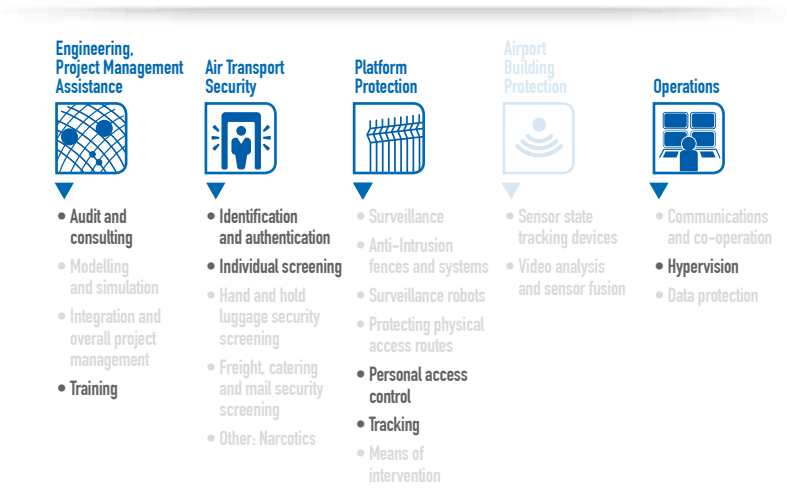

IER 710 SlimGate - For a cost effective, highly secure and seamless passenger flow control at security checks and boarding

For fast, automated and reliable passenger processing at the airport, the IER 710 SlimGate combines high throughput with advanced security thanks to high density matrix of infra-red beams. The IER 710 SlimGate can be optimized for a variety of airport configurations and used in multiple steps of the passenger journey, ranging from security checks, boarding, immigration and transfers, all within the highest levels of security.

The IER 710 SlimGate meets the stringent detection performance requirements of the passenger travel industry. The high density of infrared beams, before and after the swing doors, ensures the dynamic and predictive tracking of passengers.

The key benefit of the IER 710 SlimGate is the detection of the most challenging fraud attempts and unusual behavior:

- Tailgating attempts
- Opposite direction fraud
- Pass-Back and turnaround

In addition, it offers a highly reliable people counting function

The two lines of horizontal infrared beams provide waist high (1st line) and ankle high (2nd line) positioning. The 64 dual infrared beams, linked to an algorithm library, form a high performance detection trellis controlling each passenger and preventing unauthorized penetration in the secure zone.

Key benefits

IER 710 SlimGate features an elegant design that blends seamlessly into any type of architecture and can be easily customized and combined in multiple configurations.

- High throughput with advanced passenger detection and minimal footprint
- The most reliable detection system applied to airports
- Innovative combination of high density matrix of infra-red beams, particularly suitable for passenger motion detection and able to differentiate a luggage from a second passenger
- A modular product, with double swing doors, adapting to the most restricted installation spaces
- A total of 64 IR beams electronically controlling each passage and preventing unauthorized users in secured zone
- Future-proof design allowing integration of biometrics (facial camera, fingerprint scanner etc ...)

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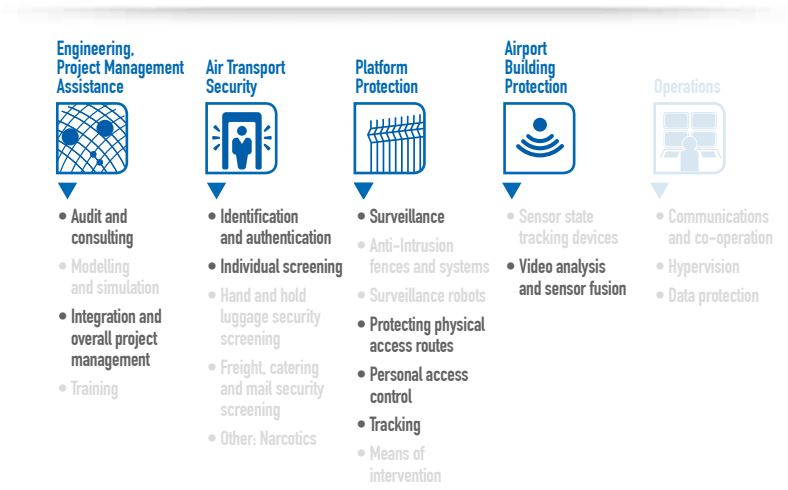

Sensitive site protection – identity management

Since 1965, KOPP has been a leading company in the field of sensitive site security. In France and around the world, KOPP is a partner of the leading state services and the most demanding private companies. Its scope of products and services is focussed around two perimeters : Protection and access control and identity management.

Protection and control of access: KOPP has built its reputation on the production of retractable obstacles (road blocker) to fight terrorist attacks using vehicles. Many embassies and consulates around the world are protected by KOPP products, as are major sensitive services and airports, including access to the PARIF (Road Access Station with Inspection Filtering). In order to provide a 360 ° offer, KOPP now offers an integrated electronic protection offering: electronic perimeter protection, access control system (ZRS), video surveillance with video analytics, under vehicle inspection system , geolocation , badge management system, security hypervisor, surveillance drones..

Identity management: Whether the accesses to be protected are those of a sensitive site, an airport, a border or entry into a country, management and verification of identity is the common denominator of all checks. Over the past 15 years, VIDOC software has verified and authenticated the identity documents presented to biometric enrollment, border control, airline boarding checks and maritime carriers; With a database of more than 3500 reference documents (passport, visa, identity cards, residency cards ...), VIDOC detects counterfeits and falsifications and assists the operator in profiling operations. Equipped with interfaces to many biometric systems including AFIS and connections to external databases, regal or private, VIDOC is a formidable tool against fraudulent documents. The competence acquired in the detection of fraudulent documents naturally made it possible for KOPP to evolve towards the design and delivery of secure documents, be they travel documents, identity documents or ultra-secure badges, as must be access badges in restricted area security.

LOGYX

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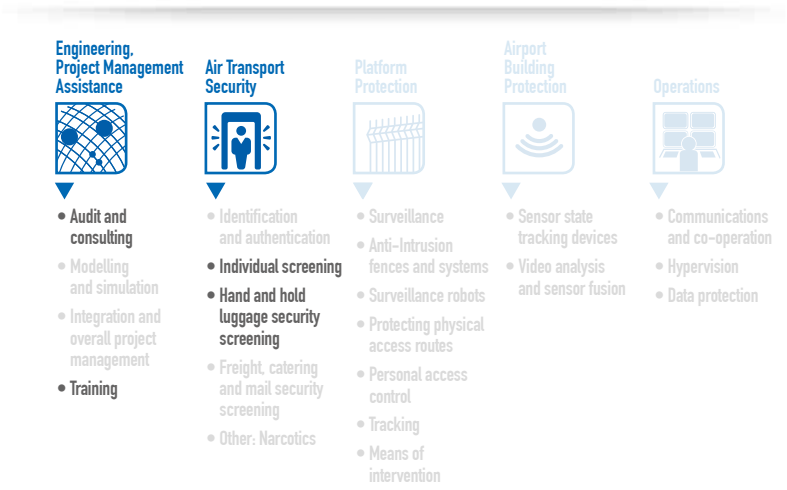

Security : a overall approach, a common challenge

How to measure effectiveness, increase competencies and motivation of airport screening operators?

Adopting a serious game approach (Game-Based learning), LOGYx has developed an innovative training platform and performance management software for x-ray operators and security managers.

LOGYx tools provide users on-demand access to x-ray training from a robust database of images for baggage categories (hold, cabin, cargo/mail and supplies...), with focus on the following elements:

- Threat category
- Possible nature of the explosive (if relevant)
- Localization of the item within the bag
- Time spent per bag
- Level of difficulty...

LOGYx is a private company based in France, offering its up-to-date solutions in the field of aeronautical security, in collaboration with the French Civil Aviation Authority (DGAC) and the French Civil Aviation University (ENAC).

LOGYx is assisting national Civil Aviation Authority from the design to the implementation of turn-key project aiming, on the one hand to the development and the strengthening of their airport security staff competencies, and on the other hand to the setting up of a certification process in compliance with training objectives.

More than a software company, LOGYx is committed to providing training solutions leading to the development of human expertise. Based on a serious game approach, LOGYx training platform is including new technologies such as 3D modelization (airport environment, security checkpoint) and/or Virtual Reality.

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WiMESH NETWORKS

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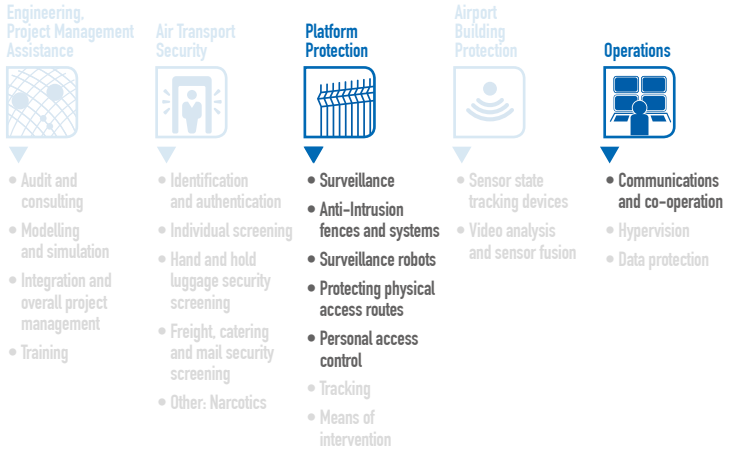

High Performance Wireless IP Network for Airport Security

Luceor's WiMesh solutions make it easy to deploy a secure, high-speed, and resilient wireless network to connect airport security equipment: CCTV cameras, intrusion detectors, access control systems, as well as new generation sensors such as drones or robots, and even patrol vehicles or security guards on the move.

Large Scale Perimeter Security

Securing an airport area is a real challenge. With a Luceor WiMesh network you can deploy security sensors along kilometres of fences and quickly connect them to your control centre without the need for expensive and complex wiring.

Need an extra camera to secure a blind zone? Looking for a way to connect your gatekeeper's bungalow without having to dig trenches across the parking lot? Whatever the size of your site, a Luceor WiMesh network is the easiest and most affordable solution to complement your existing IP network and bring it exactly where you need it.

Mobile Security

Your WiMesh infrastructure is also a private mobile network connecting vehicles, drones, robots and security guards to your IP network wherever they are on site. With instant handoff and latency <2ms, you receive live HD videos from all your mobile devices to see what your guards see. No need for government licenses or complex and expensive cellular technologies. It's as simple as deploying your WiMesh network.

Performance and Resilience

Because Luceor's WiMesh technology is based on military concepts developed in cooperation with the French Police elite units, it has unique security and resilience mechanisms to operate in the most demanding environments: Broadband network entirely dedicated to your critical applications, dynamic link encryption, self-healing mesh architecture highly resilient to interferences, etc.

References

- **Industrial sites:** Total, LyonDellBasel, EDF, Areva, Engie, SNCF, ArcelorMittal, Airbus, etc.
- **Administrations:** over 200 cities in France including Paris, Bordeaux, Boulogne, Deauville, Nanterre, etc.
- **Special Forces:** French Police (CRS, RAID) and firefighter forces, Belgian Federal Police, etc.

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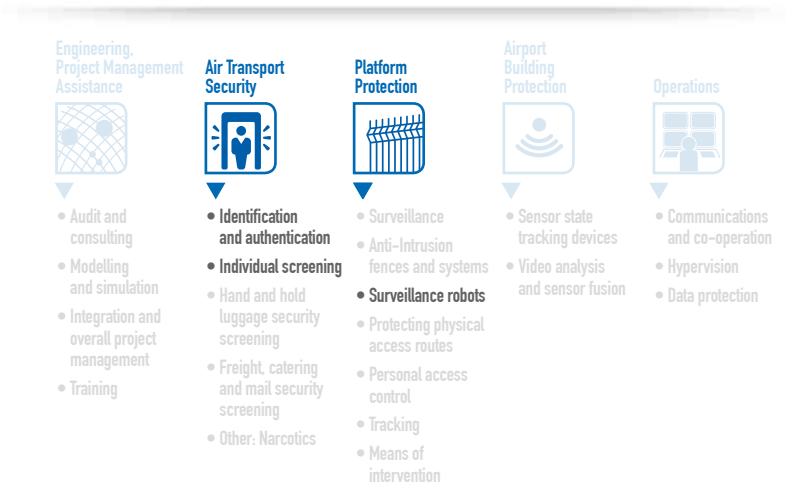

Expert in Microwave, Millimeter Wave, Terahertz Solution

MC2-Technologies - Microwave Characterization Center Technologies - is a spinoff from the research laboratory IEMN (Institute of Electronics, Microelectronics and Nanotechnology) of Lille University.

The company created in 2004 by Nicolas VELLAS and Christophe GAQUIERE is based in Sainghin-en-Mélantois near Lille (Nord).

MC2-Technologies, French SME, develops innovative equipment for the protection of sensitive sites or infrastructures. Its main products are MM-Imager : a passive THz camera for the detection of hidden objects carried by people or the UAV Scrambler system for drones' neutralization.

MM-Imager offers unique performances with real-time operation, high detection level, wide field of view and good resolution. The device currently deployed in China is perfectly suited for the security of stations, metros, airport halls... MM-Imager are based on innovative sensors with very high detection level and are totally passive. Indeed, these cameras don't emit any radiation and are completely safe for operators and screened people. Due to their modularity, they can be used for both civil and military applications.

Faced to the growing threat of UAVs MC2-Technologies developed an equipment capable for jamming protocols between a drone and its remote. The UAV Scrambler, available in mobile or fixed versions, is an efficient neutralization system whose the performances of which has been approved by the French authorities. Our devices are efficient against frequency hopping. Moreover, our expertise enables us to perform an optimal scrambling in the strictly desired bandwidth.

MIRION TECHNOLOGIES

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Radiological Detection & Identification System – SPIR-Pack


Global Supervision Software - SpirVIEW

60 years of expertise and innovation to protect people, property and the environment from the harmful effects of ionizing radiation.

For 60 years, the activities of the Mirion Technologies group have been focusing on the protection of people, properties and the security of critical infrastructures to face the radiological terrorist threat. Mirion Technologies has become an international reference in the supply of cutting-edge radiological equipment and systems, and ruggedized devices in compliance with the military and civil defense requirements.

Passenger and Luggage Screening

Any passenger and luggage going through the airport terminal gates of an airport has to be monitored. The SPIR-Ident Pedestrian, a fixed spectroscopic portal associated to a CCTV system, provides a real-time alarm in case of detection of nuclear material.

The SPIR-Ident Pedestrian is capable of discriminating any natural radioactive material (NORM) medical, industrial or Special Nuclear Materials (SNM) that do not represent a threat. In case of a real threat, the security officer wearing a highly-sensitive handheld equipment, SpiR-ID or SPIR-Ace, is able to identify and localize the radiological source.

Mobile Detection

The SPIR-Pack, a standalone human portable system carried in a backpack, is a solution for mobile detection. Discreet and highly sensitive, it can be used for on the fly control or as a temporary radiological system.

Freight and Container Screening

The screening of freight and containers requires a higher detection capability to be able to face any type of shielding or hiding scenario, without disrupting the flow of traffic.

The first screening is operated with a plastic scintillation portal, the RTM910-XL, associated with cameras and traffic lights. In case of alarm, the container is directed to a secondary screening area.

Henceforth, the advanced radioisotope identification device, the SpiR-ID, can identify and localize the source inside the container thanks to its enhanced and a very fast detection capability.

Real-Time Radiological Supervision

The SpirVIEW supervision software maps out the airport and clearly displays the location of each device, its status, alarms, measurements, detailed spectra, and associated video records.

The control station can have access to any measurement for a better assessment of the radiological situation, and to provide clear guidance to the security officers.

MULTIX®
Xray Spectrometric Imaging

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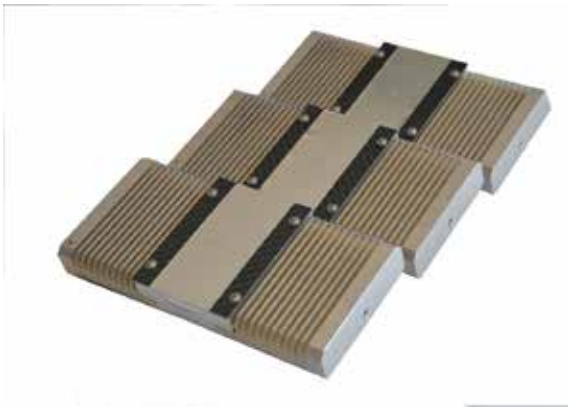

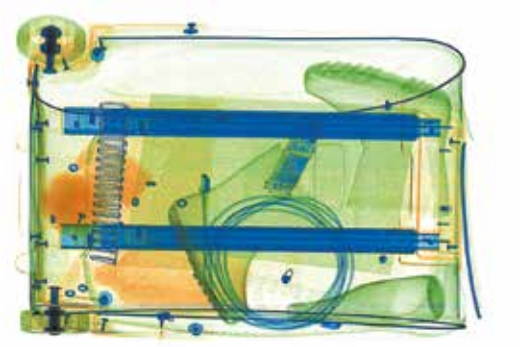

A revolution for security

MultiX supplies x-ray system manufacturers with advanced multi energy x-ray detector technology allowing to significantly reduce the false alarm rate of baggage screening systems for airports and sensitive infrastructure. The new x-ray detectors are also applicable to non-destructive testing (NDT) applications such as food, mining, recycling and many others. MultiX has developed the ME100 that can be integrated and retrofitted into conventional transmission x-ray systems and airport scanner. MultiX provides then a better image quality and penetration ensuring that operator-based alarm resolution is as efficient as possible.

MultiX X-ray technology removes the need for the laptop ban.

The US and certain EU member states have banned electronic items from being carried on flights. There is a possibility that this ban will be extended more broadly causing significant operational issues as well as lost revenue for the airline and airport industries.MultiX, a developer of advanced x-ray technology has demonstrated that it can detect the range of threats that caused the electronics ban and hence if deployed would satisfy regulators that security is being maintained. This would remove the need for the ban and allow the carriage of electronics onto flights as before. The tests carried at the MultiX facility in Moirans (France), using their MultiX multi-energy X-ray detectors integrated into a conventional airport checkpoint x-ray system with state of the art Multi-Energy algorithms, have demonstrated the ability of the MultiX solution to accurately identify the presence of skillfully concealed explosives in electronics, in particular tablets and laptops.

This development gives regulators, airports and airlines opportunities to maintain security in light of this new threat while ensuring passenger facilitation is kept at an operationally viable level. MultiX technology is retrofitable to any existing x-ray system for checkpoint making it easier to acquire and deploy. MultiX demonstrates its leadership in X-ray spectrometry.

x-ray multi-energy data acquisition system for x-ray scanner.

Multi energy spectrometric technology allows for much improved material discrimination to identify solid, liquid and homemade explosives (HME) at a much lower false alarm rate. MultiX has shown a factor of 3 reduction in false alarm rate for a conventional X-Ray system retrofitted with its multi energy x-ray detector.

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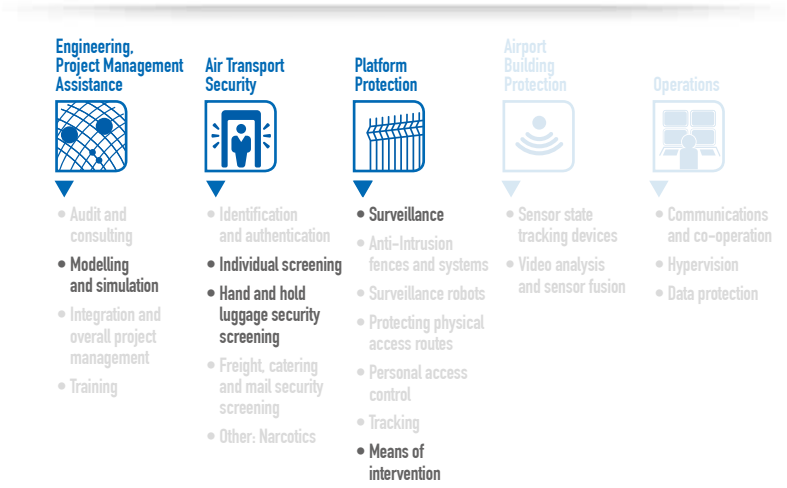

Nexter, a company of KNDS, is committed to meeting the needs of both French and foreign armies, by designing, developing and producing complete defense and security solutions: range of armored vehicles VBCI 8x8, TITUS® 6x6 and ARAVIS® 4x4. Its activity also includes the supply of systems and ammunition for Air and Naval Forces.

As one of the leading partner of the Land Defense industry, Nexter is also capable of providing solutions to meet the needs of Security Forces and therefore security of Airport sites.

In order to respond to these new threats, Nexter has developed an Homeland Security version of its latest generation 6x6 armored vehicle for French and export markets. TITUS®, « Homeland Security », is designed to fulfil a broad spectrum of missions, from troop transport operations to combat support and logistic support missions, including security, peace-keeping missions and counter-insurgency. It addresses Homeland Security needs by securing operations in high-risk zones, in urban, extra-urban and off-road areas.

Protected from advanced ballistic attacks, but also from CBRN threats, and benefitting from an exceptional level of mobility, the TITUS® is a clear asset for Security Forces and rapid intervention worldwide. It brings Nexter's technology and expertise into the heart of the action. It was used during the COP 21 conference by the French Police's RAID unit and has been assessed by other Police Forces.

The Nexter Robotics subsidiary also provides high-performance, innovative solutions for urban protection. The highly-versatile Nexter Robotics NERVA® lightweight robots are able to fulfil facility surveillance and safeguarding missions, thanks to their wide range of mission kits (reconnaissance, detection and surveillance, CBRN threats detection).

NBC-Sys, a Nexter subsidiary, has developed the TRex® Portable explosives detector, the first device to detect and identify explosive traces and vapours combining 3 technologies. The successful identification capacity is based on direct analysis of explosive vapours (no radioactive source). This explosives detector is reliable and provides quick detection with specific and innovating signal processing (data fusion). TRex® can be used in a variety of applications: parcel bombs, cars, containers, etc.

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VIGIPLANE: Electronic Security Guard
24/7 Monitoring of your aircraft on-ground

SECURITY
- Establishes an electronic barrier around the aircraft
- Real time alerts via cellular or satellite networks.

VISIBILITY
- 24/7 monitoring of your aircraft
- Full HD cameras color during the day and B&W/infrared vision during the night.

CONTROL
- Non-authorized people or vehicles are detected and reported by the device.

SIMPLICITY
- GSE: No need for aircraft certification.
- Versatile, fits all types and sizes of aircraft.
- Fast & easy installation.

An aircraft can be subject to a variety of threats, especially when parked in layover or storage at minor airfields, isolated aircraft aprons or war operation theaters, where security is often rudimentary. These risks, quite apart from the obvious dangers that terrorism brings in today's world, include: vandalism, theft, prevent illegal cargo transport and damages caused by ground operations.

Your plane requires constant surveillance, and the people responsible for security should be immediately informed of any threats. It has been developed to provide a 24/7 guard - one with 360 degree night and day vision, wherever you or your plane are in the world.

Vigiplane is dedicated to aircraft security and airport environment: variable weather conditions, heavy traffic around the aircraft, animals and ground equipment. Vigiplane provides the latest features in term of security technologies, applicable to all size and types of airplanes

Key facts
- 360 degree night and day vision
- Completely autonomous
- Accessible from all devices: tablet, computer, smartphone...
- Real-time video and picture wireless alarms
- Can be deployed on Business Jet, Narrow and Wide Body aircraft
- Only 2 minutes needed to be setup and activated (patented)

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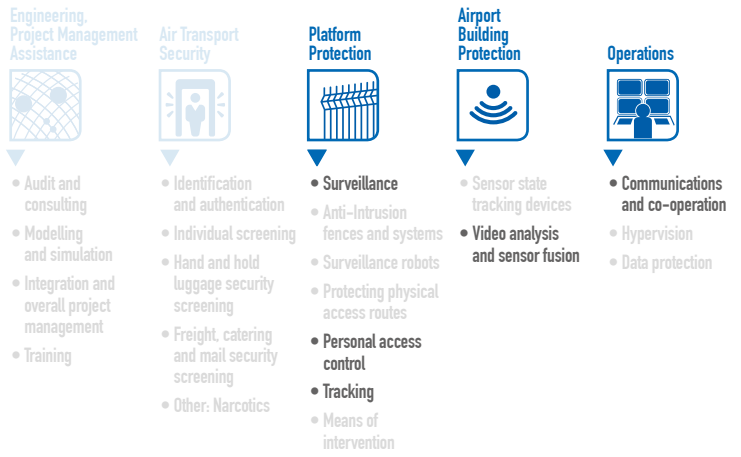

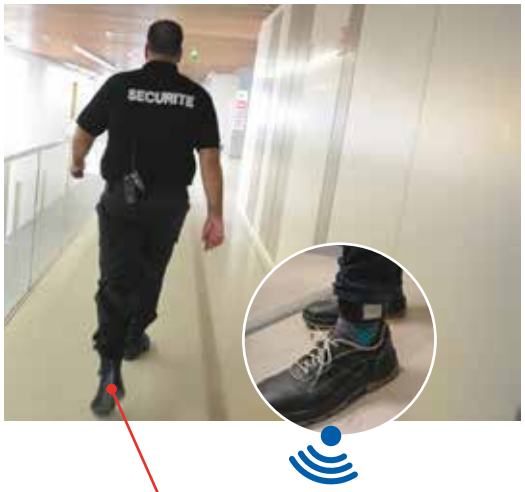

Increase protection at the airport using 3D indoor location of personnel. No beacons, or infrastructure required.
Monitor guards, maintenance workers activities and whereabouts anywhere in the Airport.

SYSNAV WATA*: Offers Available, Reliable and Accurate indoor & outdoor location information in real time (RTLS version) to your on site staff and contractors

3D INDOOR POSITION
SUB-METER PRECISION

LONE WORKER PROTECTION
NO INFRASTRUCTURE REQUIRED

1 - Ultra light, our wearable follows with precision every move where ever they are located.
2 - It records (28g version) and transmits (60g version) the location, loss of verticality to the Supervisor platform via Saas or directly to your server which allows you to:

- Compare planned rounds to actual and identify problems / mitigate risks
- Be aware of entry into protected areas or in case of a fall or loss of consciousness (LWP features)
- Trigger alarms using logical escalation procedures
- Optimize rounds or itineraries in real time or via full data logs analysis

The **Analysis** features provide efficient means to retrace incidents, proof of completion, mitigate risks and more. It is also unique by enabling new Key Performance Indicators, crucial to reducing costs, increasing protection and optimizing overall staff management .

Contact us to receive our video or book an on-site demonstration !

* WATA = Wearable Ankle Trajectory Analyzer

**The presented information relating to products or services are non-contractual and are of an informative nature. Sysnav reserves the right to modify/amend said products and services.

SYSNAV - experts in navigation and 3D geo-positioning have pioneered the way by developing proven embedded magneto-inertial technology, always available, precise and robust in even the most demanding environments : Defence & Security, Medical, Autonomous Vehicles. .
ISO9001 and ISO13485 certified for embedded navigational equipment.

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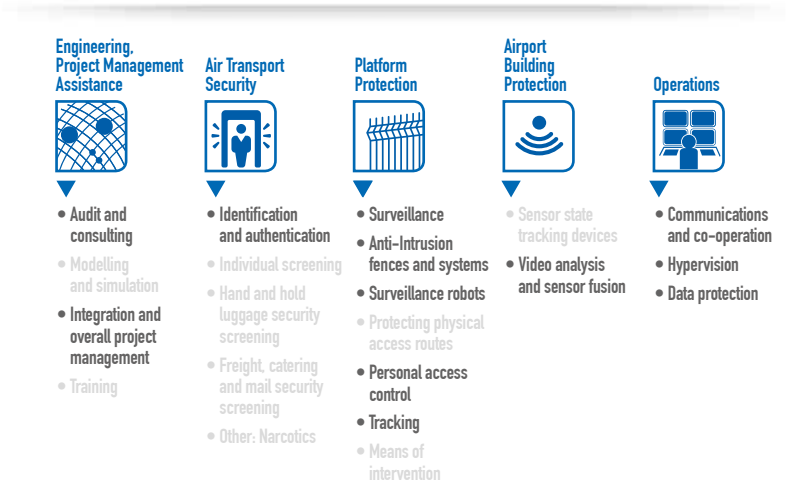

Smarter, Safer, Smoother Airport Operations

As a world leader in avionics, air traffic management, airspace surveillance, airport security and cybersecurity, Thales is a valued partner for all the stakeholders in the civil aviation sector. For more than 15 years, the Group has been working to make airports smarter, safer and more efficient. With a full range of products, systems and services, Thales develops integrated, modular and scalable solutions to protect infrastructure, operations, data and people and to increase the overall operational efficiency of airports around the world. The company also proposes its solutions «as a service» to meet the critical requirements of its customers with maximum flexibility.

Smarter: streamlining and supervising operations

As part of its comprehensive approach to airport systems management, Thales has developed the Airport Operation Control Centre (AOCC), a unified integration platform that supervises and optimises processes to manage airport operations seamlessly and efficiently, handles alerts, monitors activities in real time and optimises resource utilisation and staffing.

Safer: protecting infrastructure, people and data

Thales offers a unique set of skills to support the design, installation and integration of innovative security solutions (video feed management, forensic video analysis, access control, intrusion detection, etc.) in line with the specific requirements of each customer. These solutions enable airport operators to manage security issues, significantly improve incident detection rates and reduce response times.

All Thales solutions are built around hardware and software components that guarantee the highest level of security protection, helping customers to deploy the best protective measures and technical solutions to fight even the most sophisticated cyberattacks.

Smoother: enhancing the passenger experience

Thales integrated solutions simplify people management to enhance the passenger experience at airports, checking all the passenger information required by airlines, speeding up the boarding process and providing operators with key performance indicators as required.

CAME URBACO

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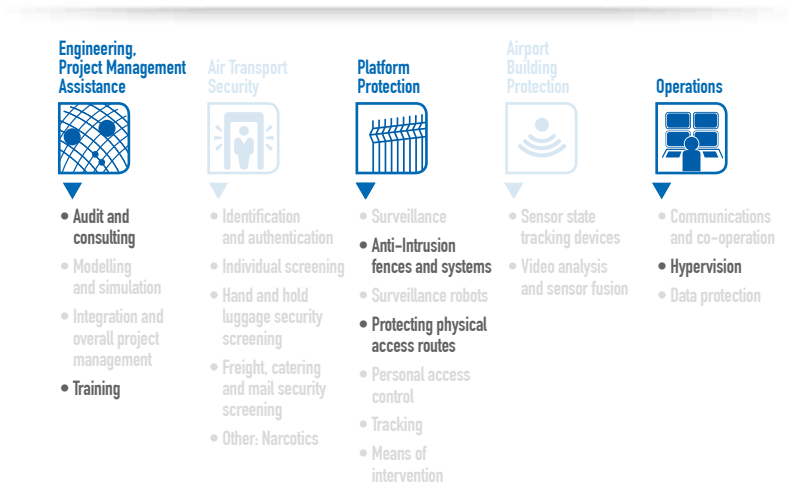


Access control and security solutions for airport areas by retractable bollards

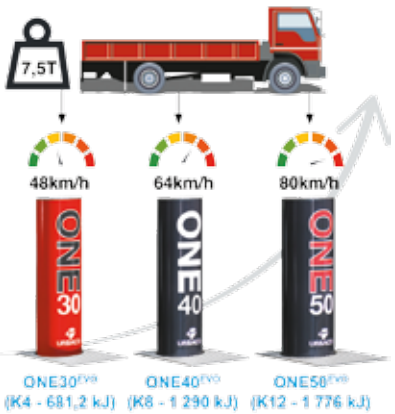
As a worlwide historical and key player, Urbaco designs, manucfature, maintains and sells technological solutions to divide and delimit urban, residential or non-residential areas, but also to protect sensitive sites where securing buildings and people is critical. We provide to our customers, products, project support, commissioning, as well as training and maintenance.

SAFE & SMART solutions:

Came Urbaco's vision is to provide a safe and comfortable environment on a daily basis where traveling would go together with serenity. More than ever, the safety of sensitive industries and sites has become a major national and international issue. Came Urbaco offers airport solutions for access control and security in accordance with the needs of sites. It's in this spirit that the brand has developed a wide range of products for the access control and the security of sensitive infrastructures, by developing a range of High Security bollards with standing ram-vehicules attacks.

CAME URBACO innovation : 1st Manufacturer of high security bollards certified according to the latest international standards

As a result of our constant innovation efforts, the ONEEVO High Security bollards, designed and manufactured by Came Urbaco, now all comply with the latest international standards IWA14-1 :2013, PAS68:2013, DOS and ASTM. Moreover, according to ISO EN 124, class F 900, they are perfectly adapted to aircraft pavements. Certified crash-tests have demonstrated their ability to meet the 3 following security levels :



Our References :
Madinah Airport in Saudi Arabia, the US military base in Kuwait, the Rabat space center in Morocco and the Promenade des Anglais in Nice are among the places equipped with Came Urbaco bollards.

In France, around one out of three bollards is Came Urbaco's.

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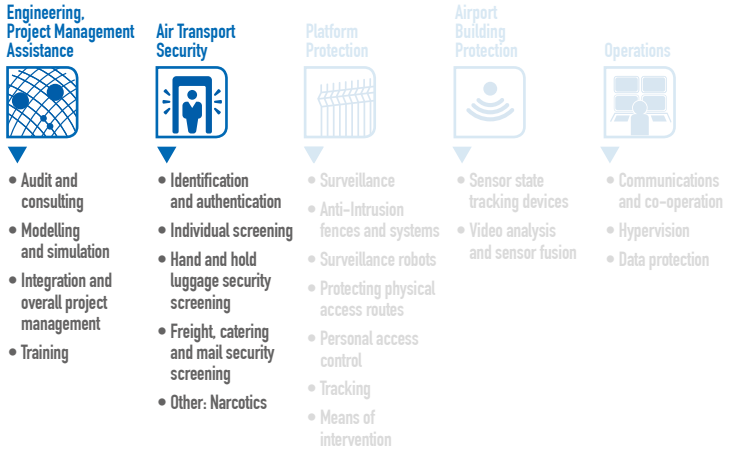

The security reference

With 20 years of experience in automated airport security with our EDS systems and conventional X Ray detectors (Passagix range of products), metal gate detectors, explosive trace detectors, Visiom is the security reference for high technology solutions required by civil aviation, port, nuclear fields and for many applications in public and private sectors throughout France and export.

Moving into the world of connectivity, our offer covers as well network services and customization to respond to an ever changing threat and cyber security requirements.

We are a major actor in Europe & Africa of the hold baggage screening transformation going to standard 3, and we proactively support as well the redesign of security checkpoints in airport with multiplexed solution, EDS cabin and safety scanners latest technologies.

We are a stakeholder for French Civil Aviation 'Safety Vision program', and exhibited for the first time in France the ClearScan EDS cabin, showing the full potential of this solution for hand luggage treatment.

The tragic events that affected and still affect the international community as a whole, force us to reconsider the aviation public zones safety. In close connection to the manufacturers, we work on bringing innovative multi-technology solutions so that our action even more fits within air transport safety and user comfort. The EVOLV EDGE solution, innovation prized by the last ExpoProtection show jury, allows the simultaneous detection of metal and explosive belts on people without breaking the passenger flow.

The confidence and interest our customers have in us, as well as lawmakers and suppliers for the last 20 years drive us to go a step further in our 2.0 Safety mission.

VISIOM is an ISO 9001: 2008 certified company.

Notes

GICAT is a trade association founded in 1978 with a membership of over 220, major groups, intermediary enterprises and SMEs. The membership covers a wide spectrum of businesses in industry, research, services and consulting for national and international military and civilian components in land and air-land security and/or defense systems.

GICAT represents the interests of the French land and air-land defense and security industry with four objectives:

- Organize a dialogue between sector institutions and industry
- Provide member services that foster their growth in France and around the world
- Create an environment conducive to industrial exchanges
- Promote the industry's expertise and image

GICAT gains global exposure by attending the international trade shows EUROSATORY in France, Expodefensa in Colombia and ShieldAfrica in Ivory Coast that are organized by its subsidiary COGES, as well as a number of defense and security trade shows outside of France.

www.gicat.com

PROAVIA is the French official trade association of airport and air traffic control equipment manufacturers and consultants.

Founded in 1976 as a joint initiative of the French Directorates of Civil Aviation and Industry, Proavia brings together sixty French companies. A non-profit organization, its mission is to promote the know-how of French OEMs and consultants to civil aviation authorities and airports worldwide.

With in-depth expertise in all aspects of the airport environment, from the control tower to the terminal to ground operations, Proavia members design solutions tailored to the needs of worldwide airport operators.

Ensuring the security of the airport and its perimeter is a major challenge and the solutions deployed must use the latest, most reliable technologies. Whether in consultancy, baggage sorting and scanning, hypervision or telecommunications, French companies meet this challenge in France and abroad.

The latest information on the French airport sector is available on

www.proavia.com

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