

RADIO FREQUENCY IDENTIFICATION (RFID) FOR PARKING LOT

How RFID Solution Works In Managing Parking Lots

RFID technology can provide independent, non-stop systems for security, parking, and access control. Our RFID technology provides businesses and communities with hands-free control to ensure only authorized vehicles have entry. The system can also provide access data for administering periodic access charges or parking fees.

- RFID tags can be affixed to automobiles for activating hands-free access to communities and parking lots.
- The RFID reader can also trigger surveillance cameras or video recorders whenever a vehicle enters or exits the controlled area.
- Each access can be recorded in the RFID reader or host computer's database to maintain a history of access activities and administer billing of daily, weekly, or monthly fees.

Operating a managed, busy parking lot can pose significant challenges, especially to a government organization that also owns some of the vehicles in the lot. The parking area has to be secure, with barrier enforced entrances and exits. It also has to have an automated, efficient monitoring system that allows for accurate vehicle tracking as well as easy in-and-out access for drivers.

Solution: Automatic Gate Access Control & Parking Lot Management:

Vehicle access control enables true campus and parking vehicle security by controlling and tracking where and when vehicles enter designated areas. When a restricted area or a parking lot entrance is approached, a reader at the site accesses the tag. If the vehicle is authorized, the gate opens and it is allowed to pass. An RFID interrogator at the gate will interrogate all vehicles at the gate and will use their drivers photograph, errand information, RFID tag and last time checked out from the database. With this information a driver that is driving a car unassigned to him will be tracked. Also, an attempt to drive the car out when he is not on errand will cause the alarm to ring which will attract the attention of a security personnel and the culprit will be tracked. This technology was deployed to Municipality of Pendik in Istanbul, Turkey, that operates a highly trafficked parking area for its municipality owned fleet of 1,000 vehicles. The lot has four gates, far away from each other. The cars move in and out of the lot four or five times each day. The municipality did not want to hire four parking lot attendants, yet funneling all the traffic through a single, congested gate was not an option. Since some of the gates are dangerously close to a motorway, municipality officials did not want to distract its drivers by having them press buttons to open the barriers. They wanted a completely automated solution that would give the drivers better ease of use with an easy in and out. To solve their problem, the municipality turned to STS Technology, an RFID solutions provider based in Turkey. STS has deployed Alien Technology products, including UHF (866 MHz) RFID EPC-complaint solutions, throughout the country. Like Falken Secure Networks, STS is a system integrator provides RFID solutions and services to customers in various industries, including retail, textile, manufacturing, transportation, and logistics. “When we heard about the problems that the Municipality was facing, we decided that RFID would be the best solution,” says Levent Yalcinkaya, STS Technology Technopark Director.



SOLUTION

STS recommended RFID solutions from Alien Technology and developed a complete RFID vehicle tracking solution for the municipality's parking lot and fleet of vehicles. Each gate has exit and entrance doors equipped with Alien ALR-8800 readers and circular antennas.

Each vehicle has an Alien M tag, which is applied inside the windshield. The M tag is a high performance tag that is ideal for plastic. The tags are encapsulated in a sticker that has the logo of the Pendik municipality.

“We are very happy with the Alien products,” says Yalcinkaya. “The reader has many options, and we can change the behavior of the reader by simply changing some parameters. It fits almost all cases of the project. The performance of the tag is perfect.” STS built software based on Alien's API, so the municipality administrators can record the vehicle movements. “The system records about 4,000 transactions to the database each day,” explains Yalcinkaya. On some gates, STS deploys one reader for the entrance and exit. On other gates, STS uses two separate readers, for a total of six Alien readers to monitor the lot traffic. Each reader can detect the vehicle tags from approximately five to six meters, he adds.

RESULTS

STS's RFID solution for the municipality was able to overcome the challenges of monitoring the fleet. “The municipality before would have to open the barriers with the help of security people or by the driver's action button. And the administrators were recording the vehicle movements manually,” says Yalcinkaya. “With RFID, we collect the data automatically and without human action. The municipality gets reports from its IT system, and it can easily track the employee's vehicles and parking lot status,” he explains. And the drivers are not busy opening the gates—they are only driving their vehicles. Yalcinkaya adds that the key to the project's success was the ongoing testing that STS did first in lab conditions and then on-site. “It's very important to test hardware and software with the real conditions,” he says.

STS also creates extensive documentation during each deployment. “We write down whatever we do on the project. That information becomes very valuable as we deploy the RFID and start work on future implementations.” STS predicts that the Turkish market will continue to embrace RFID for tracking solutions, and it will change the way businesses operate.

“Collecting data with RFID and without human intervention will change many businesses sectors,” says Yalcinkaya. “Classic methods of parking and vehicle tracking operations will be history in the near future.”

Company: Municipality of Pendik, Istanbul, Turkey
Application: EPC-compliant vehicle fleet tracking
Area of Use: 1,000 vehicles housed in parking lot with four separate entrances
Status: Production
Tag Supplier: Alien Technology
Frequency: 866MHz
Range: 6 readers, 5-6 meters of range
Reader Supplier: Alien Technology

Challenge

- Use RFID to efficiently track vehicles going in and out of a parking lot
- Parking lot is expansive and has four gates

Solution

- Municipality of Pendik worked with STS technology, a Turkish RFID solutions firm, to develop EPC-compliant vehicle tracking solution
- Toolset includes:
 - Alien® ALR-8800 series readers and circular antennas
 - Alien M tags

Benefits

- Complete, automatic traceability of 1,000-vehicle fleet
- Secure parking payment system
- Easy, automatic authorized in-and-out



Tamper Evident Technology:

The *Smart&Secure Inform* RFID tag disables the RFID functionality of tags, labels and seals if tampering occurs. This creates a unique, one-to-one relationship between the tag and the asset to which it is attached, preventing Unauthorised tag removal and transfers. Thus, a secure chain of custody is established whether in storage, or when transporting court documents and crime scene evidence.



Smart&Secure Insight tag is a pressure-sensitive RFID label incorporating a chip, antenna and dedicated tamper circuit manufactured from destructible conductive ink. Smart&Secure Insight's tamper layer causes disruption to the tamper circuit on tampering or removal of the tag without affecting the chip or antenna. During a read operation, this disruption is sensed by the chip and the tampering is reported to the reader.



Electronic Vehicle Registration (EVR): By incorporating MIKOH's process expertise and patented tamper-evident technologies, security managers can be certain that the registration and asset itself is being tracked, as opposed to just the presence of the tag. This system from FSN and MIKOH electronically identifies vehicles and validates the identity, status and authenticity of registration data, which enables automated compliance monitoring of all vehicle registration requirements within a given

parking lot, state or country. MIKOH has provided access and registration systems to Departments of Motor Vehicles, toll roads, border crossing control areas and vehicle access control systems for military bases. EVR dramatically enhances registration enforcement through the use of RFID in addition to traditional paper-based forms. The EVR tags are monitored as vehicles pass under readers at normal driving speeds. Readers can be placed at tollgates, underpasses and other convenient locations to automate the monitoring and enforcement of registration compliance. Additionally, law enforcement personnel may be equipped with handheld readers to interrogate tags while documenting traffic violations and other traffic stop encounters. Tamper-indication technology* is imperative in EVR applications to safeguard against RFID tag theft and fraud.

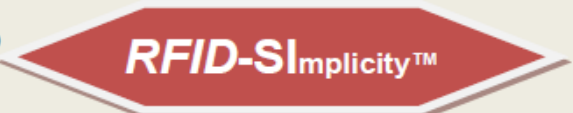

OUR RFID APPLICATION SOFTWARE – *RFID-Simplicity*TM

Despite all progress made during recent year in RFID technology and cost reduction, RFID implementation projects remain complex, tedious and involve a significant risk level. The main reason for RFID projects failures and complexity does not lay on the hardware side, but rather on the software side; Actually, 80% of a typical RFID project overall cost is being spent over development and deployment of specific software. These custom-made solutions are also hard to maintain over the years from the economic point of view as the entire maintenance cost are borne by each single customer; consequently they tend to become rapidly obsolete. Hardware Vendor software packages are always limited to their own hardware, while the success of any RFID projects starts by the freedom to select for each project the most suited hardware.

Our Software, ***RFID-Simplicity*TM** closes this major gap. Being an end-to-end software package and at the same time open to any RFID hardware, ***RFID-Simplicity*TM** reduces significantly the total cost of RFID project implementations, without compromising on RFID hardware selection.

***RFID-Simplicity*TM** offers a wide range of dedicated Application Packages for various vertical markets in order to customize the application to the specific project requirements, each ***RFID-Simplicity*TM** Application Package, includes a powerful parameterization tool, enabling the implementation of RFID projects in a very short time (days to weeks), while completely eliminating the risk inherent with specific development and System Integration projects.

The ***RFID-Simplicity*TM** Core provides services such as *communicating with the RFID hardware, database management, 3rd party integration, user permission* and more. It is shared by all Vizbee Applications, and warrants for a robust performing infrastructure. The core is highly scalable. It allows gradual implementation from a small partial project and up to large multi-site installations, thereby avoiding the risk implicitly involved in big-bang operations. The ***RFID-Simplicity*TM** Core is an open system with exhaustive APIs to facilitate its integration within other systems in the organization like *ERPs, Access control, RFID-enabled Personnel ID Badges, Video surveillance*, etc. Sharing the robust Core, dedicated Application Packages were developed, to serve the needs of different vertical markets.

HEALTHCARE-ASSET & PATIENT TRACKING	MUSEUMS & GALLERIES	ASSET TRACKING	LOGISTICS-YARD & FLEET MGMT.
DOCUMENT TRACKING	POLICE PROPERTY & EVIDENCE TRACKING	CONSTRUCTION LAY-DOWN YARDS	LIBRARIES
GUARD TOUR	PRISONS	CONTAINER TERMINALS	RAILWAY LOCOMOTIVE & WAGON TRACKING
COLD CHAIN-SECURITY, LOCATION and TEMPERATURE TRACKING	MANUFACTURING WORK-IN-PROCESS (WIP)	VEHICLE TRACKING	PERIMETER PROTECTION
WIRELESS SENSOR NETWORKS	PARKING	IT and MOBILE ASSET TRACKING	LINEN & UNIFORM LAUNDRY
WASTE MANAGEMENT	RETURNABLE CONTAINERS & PALLETS	STUDENT & SCHOOL BUS TRACKING	PRECAST CONCRETE
<div style="display: flex; justify-content: space-between; align-items: center;"> <div>CORE AND WIZARD-ENABLED BUSINESS RULES ENGINE</div> <div style="text-align: center;">  <p>RFID-SimplicityTM</p> </div> <div style="text-align: right;">  </div> </div>			
HARDWARE	API	RELAYS	DATABASE

Priority to the Graphical User Interface Domains

RFID-Simplicity™ recognizes the primordial importance of Functional and Graphical User Interface simplicity and user friendliness for the success of projects. Benchmarks and test groups are run on each interface design to validate that it is intuitive enough, so that a non-educated operator can use the system after less than 30 minutes of training.

Select the best suited RFID hardware for each project

The selection of the best suited RFID technology is critical to the project ultimate success of any RFID project. Issues like the technology, radio frequency, radio system infrastructure, the lifetime, the physical size of the tags, maintenance requirements etc., must be carefully taken into consideration in selecting the hardware that will be used for each project.

With the **RFID-Simplicity™** platform, the system integrator can freely select for each project the RFID hardware or even combine different hardware in the same project in order to optimize, both technically and economically, the performance of the system.

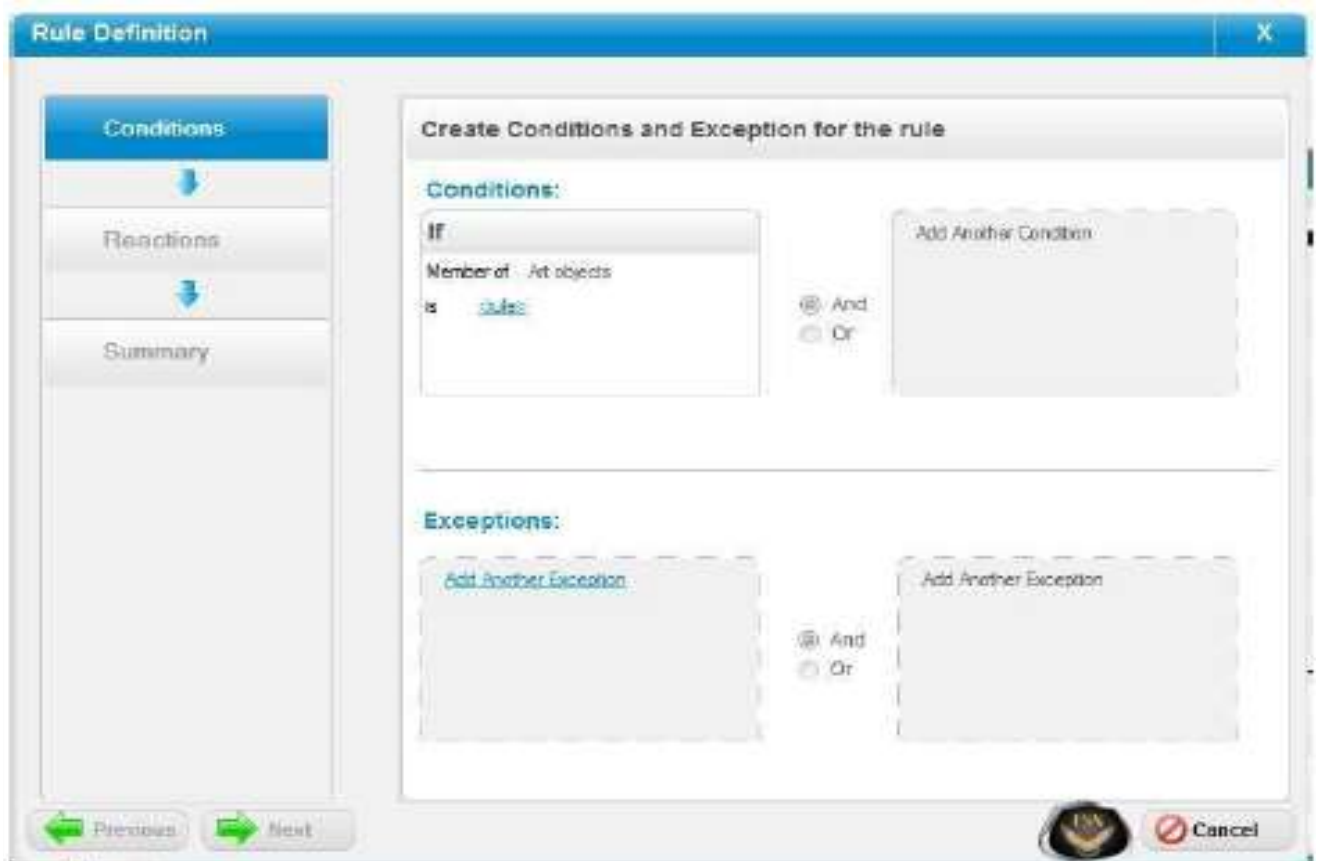
Business Rules Engine

All **RFID-Simplicity™** Applications include an advanced and intuitive Wizard-assisted Business Rules Engine enabling the seamless programming of business/security rules for every tracked item, whether it is an asset or a person. Complex rules can be programmed easily assisted by the **RFID-Simplicity™** Rules Wizard. Each rule includes the definition of the system reaction to its violation, including: *Display of the alert on the map, Audio alarm, SMS, emails, opening or closing contacts, focusing a PTZ Camera on the Alert location and commencing recording, or sending commands to third party systems.* Multiple condition actions and alerts can easily be added and modified as required.

The system works on standard PCs. Each processor can handle up to 200 RFID events / sec).The numbers of processors and servers are not limited. Web Operator Clients are available. For each dedicated application, specific functions are supported on PDAs.



RFID-Simplicity™ can be used either as the front end and even display information received from other systems. Alternatively, **RFID-Simplicity™** can be used as a service to other systems for real-time location, rule engine, settings etc, while using the other system's user interface.



The RFID-Simplicity™ parameter-driven platform enables quick and easy implementation of RFID projects –for any sized application.

The FSN generic platform is a comprehensive, fully integrated solution to drive cost out of RFID system acquisition while offering flexibility and ease-of-use. It enables a total solution include all RFID software and hardware, such as Tags, Sensors, Fixed and Handheld readers, Antennas, GPS and GPRS communications as well as world class Enterprise 802.11n WLAN as required. It can monitor in real-time thousands of tags (people or assets) their presence, location, as well as other parameters, such as movement, tampering, verticality n(tilt), temperature, humidity and more.

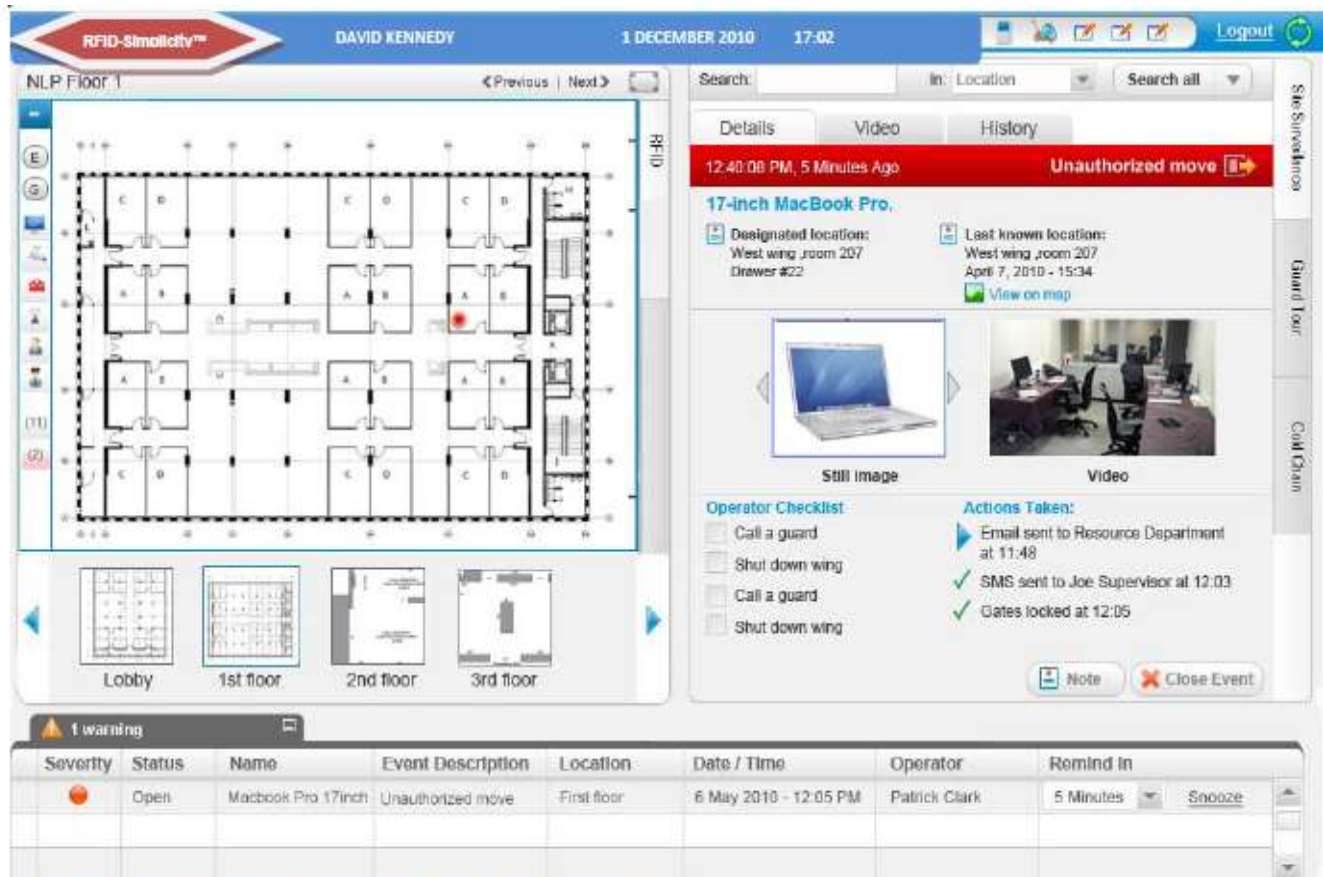
- Single, unified interface for multiple applications
- Supports all RFID technologies in a unified, single system
- Parameter-driven customization, no coding required
- Evolves with system needs , Powered by Vizbee™
- Open, flexible architecture and APIs for multi-system integration

- Easy to use SDK allows System Integrator or client modifications and is .NET compatible. Full mobility integration with GPS/GPRS/GSM and 802.11n WIFI. Seamless integration with video, alert and access control systems

Single, unified platform for maximum visibility and low cost of ownership

The **RFID-Simplicity™** generic RFID platform was designed with the user in mind. The intuitive multi-lingual human Interface is map-driven and the software and user interface delivers an intuitive, comprehensive visual overview of system status. Most actions are performed from the main screen with one button click. The system includes Administrator, Operator and Service Web access for customer provided workstations.

Single site small **RFID-Simplicity™** projects can grow gradually into multi-site and multi applications projects with hundreds of receivers and tens of thousands of tags, just by adding tags, receivers, and software licenses at each stage.. New releases of **RFID-Simplicity™** Core and Application Packages are released every year. These upgrades include new functionalities, new hardware options and warrant that the system remains state of the art over the years. Upgrades are provided automatically to all customers on the current Maintenance and Support subscription.



A SCREEN SHOT OF THE IT ASSET TRACKING APPLICATION

A handheld RFID reader can quickly and effectively take an inventory of various vehicles on packing lot. When standing six feet away, few tags were consistently read by the handheld, but when standing two feet away, almost every tag was consistently read. Users completing inventory of distributed assets within a cubicle need to make sure they are within a reasonable read range (about two feet), but they do not have to gyrate the handheld, get within inches of a tag, bend down, or shift objects in order to capture the requisite asset data, which manual and barcode data capture methods require. The physical act of using a handheld reader to complete a cubicle inventory is almost five times faster than a manual checklist and in some cases able to sweep through an entire cubicle in as little as five seconds.

Topgy Systems and FALKEN Secure Networks (FSN)—your partner for RFID automation

If you choose to pursue RFID implementation in your organization, here is the FALKEN Secure Networks commitment to you:

- FSN will provide solution architects to work with you to define system requirements for your particular installation. Multiple locations can be networked together for a central and real-time view and centralized management.
- FSN will do a RFID site survey to validate radio frequencies, tag types, system design and performance
- FSN will provide all necessary hardware and software to make the system work for you
- FSN will integrate the system with your existing enterprise management software
- FSN will provide documentation for the system, including operating procedures
- FSN will train your people
- FSN will provide warranty and continued system support For RFID-enabled Document Tracking and Management,

FALKEN Secure Networks (FSN) and partners bring together the right technologies to give you control over your files and make your office run more efficiently. Our automated and secure processes save time and labor, and prevent problems before they occur. With FSN, you get the latest, non-proprietary secure RFID technology with the most powerful and flexible RFID file tracking software available.