

FSN Brochure 1105-Large Car Lot





RFID for

-Cable Free Deployment

The only two solution designs cost effectively providing you the precise 'XY' vehicle location in the lot.

These solution designs and associated software integration is classified as Intellectual Property of FSN and is Patent Pending.

Solution Design 1-Includes a Passive UHF RFID tag imbedded in each parking space, a re-usable Hang Tag hanging from the vehicle's Rear View Mirror and integration of a Mobile Handheld UHF RFID Reader which transmits tag read data via WLAN or Cellular GPRS back to a Server and Database in real-time or later in 'batch' mode via USB connection to a PC .This system design does have a dependency on the car-jockeys consistently following a standard operating procedure regarding scanning the tags every time a vehicle is moved.

Solution Design 2- Includes our FSN-ALLWARE Ranging Active Tag on each vehicle(magnetic external or hanging from rear-view mirror), our Zigbeeenabled Receivers positioned up to 250 meters apart, one Receiver Coordinator per network which connects wirelessly or Ethernet to a Server & Database. The Receivers and Coordinator are equipped with Solar Power. Location accuracy is +/- 1 meter at distances up to 250m assuming open air and RF visibility of at least 3 Receivers. This is a cable-free deployment.



SOLUTION DESIGN 1:

Traditionally, large car lots face the problem of locating specific vehicles which creates significant "downtime" for employees as they do their 'walk-abouts' as well as customers who have seen a particular car on line or at a self-help kiosk and now want to see it in person.

Previous approaches to try to solve this business problem have ended up being frustrated due to high costs of the required infrastructure. Either too many additional WIFI access Points were required along with very expensive location engine software or some variant of Active RFID or GPS which only worked part of the time, or the high cost of wiring both Ethernet and power to the parking spaces and never provided precise location.

Now we have the unique **Car Lot Locate** application from FSN based on our *RFID***-SImplicity[™]** Middleware and Application Software(powered by Vizbee).





Each vehicle in the lot occupies a specific space on the defined parking grid, typically 3 x 6 meters.

FSN offers a new solution to precisely locate each one. Automated realtime inventory is a free by-product



This solution records, tells you and shows you exactly the parking space which the requested vehicle is in, outdoors or in the showroom. Automated continual inventory status is a free by-product.

FSN- CS101 UHF Gen2 RFID Handheld Reader

Lower cost and better performance. CS101 delivers performance equivalent to that of a fixed reader for the recommended tags tested. The unit is designed to withstand industrial operations, yet is appropriate for the retail or office environment. It has an **IP 65 Rating** and can withstand a 1.5 meter drop to concrete in all 6 orientations. The operating temperatures are a very respectable -20 to 50°C and -40 to +85°C for storage. Its larger keypad facilitates keypad data entry requirements.

Here's how it works:

- Start out with a grid map of your lot with all spaces numbered.
- Identify Each Parking Spot: Install a low cost Passive UHF RFID Tag in each spot(We would recommend & supply a suitable rugged, weatherproof, encapsulated tag). We have qualified and selected a number of potential use tags and profiled herein. All you need is two screws into the asphalt or imbed it.
- Identify Each Vehicle: Affix a Passive (Removable and Reusable) tag on the vehicle
- Tell us the number of handheld RFID Readers you need. We Install and test our software application on each. This sw synchronizes automatically with RFID-SImplicity[™]

and the Database via WIFI or GPRS, or the next time network connectivity is available such as in the docking station.



The Driver simply scans the RFID Vehicle tag then the Parking Space tag. The precise XY parking space and the vehicle in it are now known and reported in real time



Now, when your driver parks a new car, he/she scans the vehicle tag with the mobile handheld RFID reader which instantly and automatically synchronizes with *RFID-SImplicity[™]* software WIRELESSLY via WIFI or GPRS; then simply scans the RFID tag imbedded in the parking space. Now the specific vehicle and its precise XY parking space location is known, synchronized and visually mapped on a web interface. Now a customer self-serve kiosk can be implemented or enhanced to show the customer not only the details of the car he is interested in but the precise location where it can be seen right now on the lot.

An alternative to avoid the vehicle tags is to use some other method of identification such as license plate number where the driver, after parking, manually keys in the plate ID but this does introduce a slower and manual process with the opportunity for human error. However since the vehicle tags are reusable they should not be a significant economic burden for the project. Vehicle tags can be provisioned with a magnetic case or backing to facilitate easy placement and removal.

While it is true this system design and method of operation requires a disciplined procedure by the driver(s), it is automated and does not require manual data entry which would otherwise create the opportunity for human error. And it is much less cost than creating a RFID/GPS infrastructure which only works part of the time for part of the property.

This system easily accommodates any parking space changes as well if a vehicle is to be taken for a test drive or into the shop for some detailing or maintenance work-this same procedure is used when parking the vehicle. Even the 3rd party specialty shop down the street where vehicles are frequently taken for windscreen treatment or special detailing – all you need is to have one RFID tag imbedded in the floor or even affixed to a wall. The driver simply scans it and the vehicle tag and now the new location is recorded in the database as seen as the handhold gets a network

location is recorded in the database as soon as the handheld gets a network connection.

LEVERAGING THE RFID SYSTEM INVESTMENT: Other RFID-Enabled applications may be easily added to the RFID Simplicity[™] Middleware and Application Software. It is an open platform and changes in business rules are changed with parameter changes only-no special coding skills or extra software development is required.



As soon as the driver records a new parking space or that the vehicle has exited the lot, the previous parking space is updated as now vacant and available



Specialist GPS, Video Surveillance and RFID System Integrators for Challenging Environments



SOLUTION DESIGN 2:



ZigBee is an RFID platform with a higher level of precision resulting from a mesh network of tags and readers that communicate with each other. Low power requirements also enable use of small solar panels and batteries for total cable free deployments in challenging environments

ZigBee operates in the Industrial, Scientific and Medical (ISM) radio bands; 868 MHz in Europe, 915 MHz in the USA and Australia, 2.5 GHz in India, and 2.4 GHz in most jurisdictions worldwide based on an IEEE 802 standard. Sixteen channels are allocated in the 2.4 GHz band



ZigBee is built upon the IEEE 802.15.4 standard that was strategically designed to employ channels that do not overlap with Wi-Fi channels.

Simply put, ZigBee systems and Wi-Fi systems don't interfere with each other

It is now widely acknowledged that standards such as Bluetooth[™] and WLAN are not suited for low-power applications due to their high node costs and complex, power-hungry RF ICs and protocols.

-Totally Cable-Free Deployment: The Zigbee FSN-TD2400R Receivers deployed to form a wireless mesh network are solar powered and only one Coordinator in a network requires either Ethernet, WLAN or Cellular GPRS for connectivity to the remote Server. No AC Power nor Ethernet cabling is required.

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- Low Total Cost of Ownership: FSN ALLWARE significantly reduces both the hardware costs, as well as the installation and maintenance costs, compared to traditional RTLS solutions. FSN ALLWARE also does not require an expensive license for a separate localization software application.

-Deployable Globally: FSN ALLWARE is available with global standards and deployable in any country.

-Multi-Application Software: With Vizbee's flexible and easy-to-use Business Rules Engine, customerdefined business rules and associated actions are implemented automatically when real-time threshold conditions or conditional rules are violated. FALKEN Secure Networks

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SYSTEM COMPONENTS – FSN ALLWARE – FSN's Zigbee-Enabled Active RFID Hardware Portfolio

TAG TD-2400T **RECEIVER TD2400R** Battery lifetime up to 4 yrs. 2.4GHz, IP66 2.4GHz, IP67 Zigbee Wireless Mesh Network Connectivity Variety of Sensors(Movement, Temp, etc) to other Receivers and Coordinator Emergency Alert Button optional Power- 10 Watt Solar or AC Ranging Tag, Location Accuracy +/-1 m over open air distance of up to 250m (see 3 Receivers) **RECEIVER COORDINATOR** TAG REGISTRATION DEVICE For TD2400R Receivers, one per network "Traffic Cop' Connectivity with Server/Database GPR5, WLAN, Ethernet or R5232. Power-20 Watt Solar or AC **RUGGEDIZED SMARTPHONE** IP66 Airo iSAFE28 IP67, MilSpec810 F/G Integrated Passive UHF RFID Reader SOFTWARE GPS-1 m accuracy 3.2 MP Camera, Vizbee V LOC PREMIUM Touchscreen and Back-Lit Keypad SERVER & DATABASE Wide-Spaced Keys Intrinsically Safe SIM card, Man-Down Alert Button Bluetooth, WIFI, GPRS/HSPDA Accessories

FSN-TD2400T Tag

TD2400T tags emit signals utilizing the 2.4GHz frequency band which are detected by ranging readers combining several technologies to determine accurately the distance between the tag and the reader. The tag's messages are detected simultaneously by several readers. Self-contained, self-calibrating and adaptive power reduction schemes increase the tag



battery's lifetime to up to 4 years. This tag is rated IP67 for dust and water ingress protection.

Trilateration algorithms locate accurately the tags in real-time. In outdoor environments, the location accuracy is within one meter over distances of up to 250 meters with 3 readers. In indoor environments with partitions, the typical accuracy is +/- 2 meters. A Tag Registration Reader is also included.

Optionally, the tags are available with integrated sensors such as Accelerometer to detect movement, temperature for cold chain applications, Emergency Alert Button for Personnel Safety, Tamper Detection, etc.



FSN-TD2400R Receiver

The small form factor TD2400R Receiver(Wall or Pole Mounted, AC or Solar Powered) provides a low cost solution for a variety of asset tracking problems for large coverage areas. Its wireless Zigbee Mesh network support and up to 250m read range enables low cost cable free Receiver deployment. Large populations of tags can be monitored using a single Receiver. Battery backed Receiver with a standard 100-240V power supply or 11 x 13 inch solar panel. For outdoors installations this Receiver is installed in a protective enclosure rated at IP66.

FSN-TD2400R Receiver Coordinator

The FSN-TD2400R Coordinator is a Zigbee transceiver which acts as the 'traffic cop' which receives and processes the signal transmissions from the TD2400R Receivers in each network. The connectivity to the host Server is provided from at least one

TD2400R Coordinator unit from each defined network and is achieved via several options(serial interface (RS232/USB), via Ethernet cable connectivity, Wireless LAN(WIFI 802.11b,g) or wireless Cellular GPRS). If Ethernet cabling is preferred, it also includes an automatic failover to GPRS in the event of network unavailability. Alternatively, for completely cable-free deployment, the dedicated Cellular GPRS or WLAN(WIFI 802.11b,g) is used. The connection from the Receivers to the host is achieved via a Coordinator which is either AC or Solar Powered. The FSN-2400R Coordinator is supplied as a complete unit including double solar panels, batteries and sealed protective enclosure to IP66 *standards. It may be wall or pole mounted.

* IP66 Enclosures characteristics:

Complete protection from dust, oil, and other non-corrosive material
Complete protection from contact with enclosed equipment
Protection from water, even from powerful jets of water
Equivalent to NEMA rated 4 and 4X enclosures



ALLVARF



Further Leveraging this Enterprise RFID Platform:

Vizbee RFID Software is a very flexible, multi-application, multi-RFID technology enterprise platform built on industry standard Microsoft.NET. As a result, it offers the flexibility and scalability to accommodate future business requirement changes.

Integration of IP Video: Simultaneously, upon an alert being initiated due to vehicle movement(from Accelerometer Sensor in the tag), the software can send a signal to trigger the video recorder to begin recording. If it is a PTZ(Pan, Tilt, Zoom) camera, the system can direct it to focus on the tag location which initiated the alert. In this way, significant savings in storage, bandwidth and security reviewing time are accrued while avoiding recording most of the time while nothing is happening.

Zone Alerts: Specific Zones may be created similar to 'geo-fencing' with GPS along with business rules in the Vizbee rules engine with conditional alerts for areas such as the lot entry/exit area. The direction of travel(enter or exit) could also be reported. This is especially valuable as an additional layer of security if no entry/exit gate barrier exists or as confirmation of vehicle arrivals and departures, or approaching vehicles, to alert lot officers to affix new tags and register newly arrived vehicles or retrieve tags from those vehicles departing.

Other Receiver locations: Receivers may be installed in Maintenance Bays to indicate the indoor location of the vehicle. Also receivers can also be installed in third party service dealers if vehicles are temporarily moved for detailing, washing, windshield treatment, etc.

Personnel Tags: The TD2400T tag may also function as a Personnel ID Badge which report on-site Personnel location, credential verification and may be integrated with conditional business rules associated with access control, movement of vehicles, time of day, etc.

Smartphones and Tablets: May be integrated to provide additional directional assistance for asset tracking under snow cover in large areas and also to utilize its integrated Passive UHF RFID Reader if Passive UHF tags are part of the solution. This minimizes the number of devices and lowers total cost of ownership. Vizbee software can also enable the Smartphone or Tablet to be a data entry device by presenting Work Order or Maintenance forms for completion by site personnel and then automated synchronization with the database. **Barrier Gate Integration:** This software platform easily accommodates the future integration of access control such as Barrier Arms and associated Controllers which allow automated access for authorized tagged vehicles.

Key Management: If keys are routinely left in the vehicles, a RFID Key Fob can serve double duty as the Vehicle Identification(VIN) which is scanned by the handheld reader and also to quickly locate and identify sets of keys and associate them with the specific vehicle. If not left in the vehicles, RFID can be used to identify and locate specific keys if kept in a secure cabinet or use the Handheld's "Search" function to locate them if misplaced.

Automated Access Control: For points of egress to the lot, we can install RFID Readers which will read and time stamp every compatible RFID tag which passes through its read range and if authorized then allow entry(or exit). It can also authorize a signal to lift the barrier gate upon reading a RFID-enabled Employee ID Badge which has the appropriate credentials and is authorized in the business rules for this activity. This can be changed by time of day or day of week as well.





A RFID Reader/Antenna positioned at the car wash exit will document that this car is now cleaned along with the associated time



One Antenna covers each entry/exit service bay and automatically reports when a specific vehicle has moved



FALKEN Secure Networks (FSN) is the leading System Integrator and Consulting Solution Architect for advanced Active/Passive Unified RFID, GPS and Video Surveillance systems that leverage Best-In-Class standards-based hardware technologies integrated with its *RFID*-Simplicity[™] generic software platform-

powered by Vizbee[™]. FSN integrates RF technologies for asset visibility, using EPC global standard RFID, 802.11n Wireless LANs and Real-Time Location Systems (RTLS) for cost-effective design, technology selection and turn-key project implementation in complex, harsh and challenging environments for enterprises globally. The breadth of FSN's domain expertise and applications solutions portfolio across all industries is unsurpassed.





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