FALKEN Secure Networks

RFID for Railways

In the US, some 40 % of all intercity freight goes by rail, including 67 % of the coal used by electric utilities to produce power. According to the American Association of Railways, in the US, railroads transport 1.7 million carloads of hazmat each year.

A RFID Railway system is available from FALKEN Secure Networks in a number of configurations designed to economically meet a full range of service requirements. Reader systems provide automated tracking of railcars via RFID tags, Readers and integrated Middleware, and make railcar and locomotive identification and location information available to railroads for asset management and other purposes.

- *Traffic and Passenger Information:* The system provides accurate and reliable information about where a train is located. This real-time information is forwarded to IT systems and used to update the passenger information displays at stations and terminals.
- *Operation and Maintenance:* Precise information about the configuration of wagons within a train can be provided automatically by the system. This information can be integrated with other systems such as track inspection systems, so that the recorded information can be automatically matched to the actual wagon, thus eliminating errors.
- *Location of the Train:* The System with the help of the reader determines the location of the train by reading the tag identity as the train passes over the tag at speed. This location data is transferred to the onboard system and can be used to update passenger information automatically
- *Controlling and Positioning of Trains:* Some onboard systems require a precise position of the train, for example to control stopping positions. The reader accurately reports the position when the train passes over an ID-tag. An alternative configuration would be positioning readers on poles at trackside and reading the tagged wagons as they pass. If tags are consistently positioned, for example, at the mid-point of the train, the identification of the tag would be correlated with the length of the wagon and exact

speed could be determined in the software application.

In combination with requirements, new applications and various report formats can be rapidly prototyped and deployed. In addition to the standard configuration, our team of experienced engineers can design systems to meet specific application requirements. Some of the customized applications developed to integrate with the system include:

- Track Inspection System
- Signal Asset Tracking System
- Safety Audit
- Inventory and Maintenance
- Equipment Distribution and Management
- Car Accounting Systems
- Rail Yard Information Management

FEATURES/BENEFITS

- The System stores tag data including time, date, train direction and speed.
- It also responds to inquiries via modem and interfaces to scales, video systems and diagnostic and monitoring devices.
- Timely data to increase capacity, speed, automation and operational flexibility
- Arrival and departure data for signal and control operations

Products are now available for demanding RAIL RFID Applications

A range of readers and ID-tags that fulfill the tough requirements of the rail industry are now available. These products are used worldwide in railway applications which require identification and positioning at high speed, with high precision and in demanding environments.

We propose IPICO Inc. iRAIL technology for such Rail applications. Its patented IP-X Air Interface protocol enables the highest read rates involving multiple simultaneous tag reads in dynamic environments, and in motion at high speed exceeding 260 km/hr. which regular UHF RFID tags and readers cannot achieve. This mission critical railway application is a perfect fit for the key differentiating strengths of IPICO.

For those operating a railway, information is the engine of efficiency as well as safety.

The vastness of railways – cars, cargo, track, countries and conditions – presents a massive challenge for management of rolling stock and rail operations. IPICO's low cost, passive RF technology enables consistently accurate identification and control of assets in virtually any operating environment:

- At speeds of up to 260 KPH
- In challenging weather or extreme electromagnetic conditions
- In crowded rail yards
- In both online and off line modes of operation

Because IPICO overcomes limitations of conventional RFID, it opens a wide range of management solutions including:

Train Configuration and Capacity Management: Simply and accurately, identifying the location and status of every piece of rolling stock, making and breaking trains, and routing cars – saving huge amounts of time and labour.

Safety: Preventing trains from heading onto the wrong track at the wrong time, even in remote, offline environments. And preventing the wrong cargo from being loaded onto the wrong car – for example, loading coal onto a car that formerly held fuel.

Maintenance: Management of repairs and cleaning of each engine or car, with the history housed on the RFID tag as well as on a central database.

RFID tags

The ID-tags are mounted on the front, side, top or underneath each individual vehicle or on the sleepers in special tag fixings. The ID-tag is an extremely resistant, totally encapsulated and maintenance free.

)))(((IPICO **IPICO HEAVY DUTY RAIL TAG** Contact us for a Datasheet and Pricing Information
RFID REALISED

IPICO RFID Transponders are mounted on the front, side, top or underneath each individual vehicle. The tag is robust, totally encapsulated and maintenance free. As it is based on Passive RFID technology, the tag has unlimited service life. In the case of the Belgian or French Rail, the tags have been fixed with screws directly to the site of the wagons.

- Frequency Range : 860 to 950 MHz
- Working Distance : 0.5 to 6 m
- Memory : Unique ID 64 bits TTO mode 1024 bits, User data 896 bits
- Physical : 236*35*18mm, 150g,
- Material : Waterproof/Dustproof IP68 Rated, UV-Stabilized, Grey color
- Life Expectancy : Unlimited Service Life
- Mounting : Rivets, Fasteners. Magnets(for temporary attachment) can be provided as an Option
  - **For the carriage of hazardous cargos our i - Rail tag comes with intrinsically safe EXII certification**
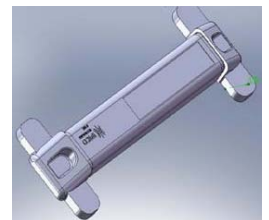
OPTIONAL - Magnet Tag Holder for temporary tag placement

IPICO RFID RAIL STATIONARY READER

Standard readers are suitable for Rail track-side installations. Readers can be installed at key locations such as stations, track-side, loading point terminal entrances or maintenance shed locations. The reader identifies the ID-tag at a range of up to 6 meters and at passage speeds of up to 300km/h.

IP-X UHF Single Antenna Integrated Reader

IPICO RFID HANDHELD & TAG REGISTRATION READERS

IP-X UHF Long Range Integrated Reader *HPEVI*

IPICO's Mobile i-Rail Reader allows wireless connectivity across existing Wireless environments and greatly reduces the implementation cost as well as providing for industrial PDAs to be associated easily allowing the integrating of safety and legacy management systems.

Heavy Duty HandHeld Reader

The IPICO Heavy Duty Handheld Reader is designed to withstand environmental factors such as explosive gas, moisture, shock and vibration, etc.

The IP-X™ UHF Mobile Read/Write Reader consists of an integrated antenna, RF Unit, rechargeable/replicable battery. Data communication between reader and application host (typically any PDA) is done by BluetoothTM (Class II) or WiFi. Software maintenance can also be done via an USB port. The complete reader is integrated into an ergonomically shaped ABS housing.

When the trigger switch is activated, any tags in the beam will be read, and the reader will transmit the codes via the BT/WiFi link to the host controller. This reader allows the user to do remote registration and inventory control and process the data in real time as long as it remains in BT/WiFi range of the host controller. Onboard Memory and Real Time Clock capability allows for off-line data processing. Allow manual entry of vehicle identification information in the event a tag cannot be read or is not available; Allow additional data to be added about vehicles when building train consist e.g. Commodity code,net tonnes and gross tonnes.

The read range is up to 4.5 m, depending on the tag and conditions.

Spare Battery and charger included

The reader can write to and read from all pages of a Read/Write tag (using appropriate reader commands), and can read user data from tags configured in "TTO"(Tag Talk Only) mode.

Information transmitted by the device is sent to the Asset Management middleware platform and software, enabling the railway administration to receive regular updates of the railcars' locations and alerts in the event that something goes wrong. The middleware is responsible to:

- Establish and maintain a connection to the reader.
- Filter and parse the IPICO reader's constant stream into discrete First-Seen and Last-Seen events.
- Manage the date and timestamps of the data to be accurate
- Send the discrete read events to the backend system
- Data will be processed on the middleware locally allowing for future development

Wagon tracking

A transaction is created each time a wagon passes a reader. The date, time, wagon ID and reader location are captured and sent to the system. Speed and Direction is calculated and also populated accordingly to the database. This allows an operator to track the movements and location of the wagons. It will also give an accurate stock of all wagons on site and will allow for better wagon management. Train composition can also be managed.

Readers are typically installed at each <u>entrance/exit for each end destination / intermediate parking area</u> which provides the wagon UID, reader location and date/time of the wagon passing.

> **Advantage:** Real-time information on wagon type, registration number, date and time of entering / exiting loading facility enabled by automated read-event. Also, Real-Time order-leaving-loading-facility information – wagon number and date/time stamp.

Special Screening

Little known to most in the industry, is a tag reading issue which occurs when two trains are passing each other. The phenomenon is termed "shadow tag reading reflections" whereby typical RFID tag readers will read a number of tags and report incorrect data. Obviously, this is a very significant safety issue. FALKEN Secure Networks understands this problem and mitigates it by including 'special screening' for each reader in the system design and installation.

Sample screens: The sample screens provided below are representative of the information which can be collected and presented but may vary in format depending on the whether the registration device is a desktop PC or a handheld PDA. The desktop PC graphical user interface can be translated into the language of choice by the customer once a commitment to purchase the system is made.

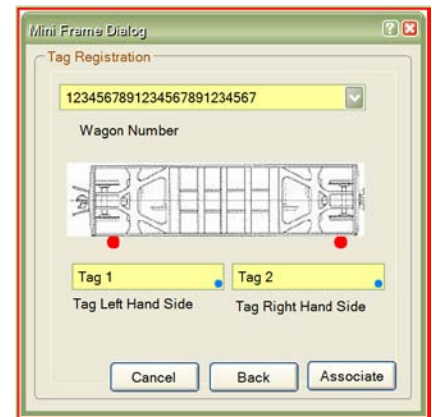**IN FIELD APPLICATION (PDA Device) – Sample Screens.**
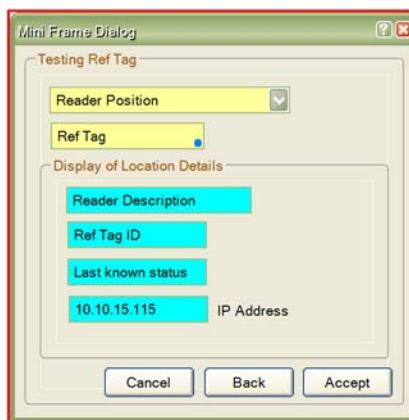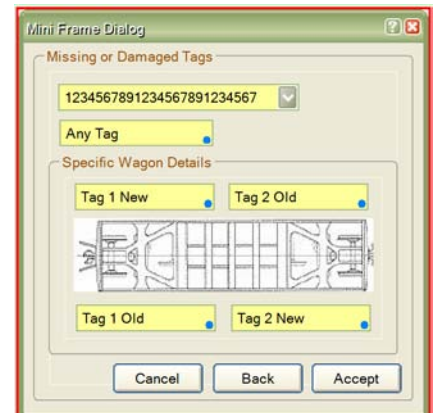
LOGIN SCREEN

MAIN MENU
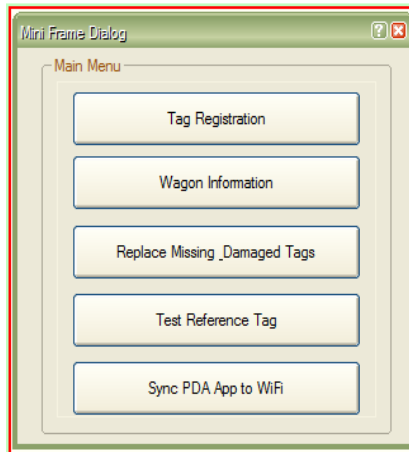
TAG REGISTRATION

WAGON INFORMATION – READ A TAG

. TEST INFIELD REFERENCE TAG

REPLACE MISSING / DAMAGED TAG

For Mass-Transit Passenger Trains – RFID tickets and Monthly Passes

Speed of Passenger throughput and Ticket fraud are "major problems" for the Guangshen Railway. The current single-use bar-code tickets" can easily be duplicated using a photocopy machine."

Moving to RFID tickets will enable the company to eliminate counterfeit tickets because the RFID inlays in the tickets will be factory-encoded with an encrypted number that train personnel will read using authorized handheld interrogators. Once the railway completely transitions to the RFID-based tickets, it may replace the manual ticket-checking process with RFID readers embedded into turnstiles, which patrons would need to pass through before boarding.

Employing RFID-enabled smart cards with USB connectivity, in order to allow users to plug the cards into a PC or laptop, automatically connect to the SNCF Web site in France and add funds to the cards from home.
Approximately 1,000 SNCF customers have piloted the smart cards as part of the company's home-payment effort.

Patrons can upload payments onto the cards using contactless payment readers in a particular station, then use the payments for train rides.

Similarly monthly RFID-enabled pass cards are increasingly being introduced to eliminate counterfeiting as well as speed up service.

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

FSN has World Class RFID Partners

FSN has established partnerships and integration agreements with these leading manufacturers to deliver complete RFID and Wireless Sensor - based, asset-tracking and RTLS solutions:

Contact Us

FALKEN Secure Networks Inc.(FSN) is the leading System Integrator and Solution Architect for advanced Active/Passive Unified RFID and Wireless Sensor systems that leverage 'Best-In-Class' technologies for national and global enterprises. FSN integrates RF technologies for Real-Time asset visibility, using RFID, Wireless Sensors, Wi-Fi and Real-Time Location Systems (RTLS) for cost-effective design, and turn-key project implementation. FSN also provides industry-leading communications security for enterprise networks.   www.falkensecurenetworks.com

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