Essen RFID your window to the interconnected world

ESSEN

CASE STUDY

www.essenrfid.com

Large Trucker's Association implements RFID-based VEHICLE TRACKING SYSTEM

Automated dispatch and trip management of trucks

Ensures sequential equal number of trips for each truck

Built-in authentication, validation, logging and instant alerts prevent fraud and misuse

Improved dispatch planning and increased efficiency

INSIDE:

TECHNOLOGY

Solution:
EPC Gen2 compliant vehicle tracking solution

Tag Type:
Parka™ UHF Passive

Reader/Antenna:
Xtenna™
Xtenna Proximity™

Method:
Multiple Tracking via Integrated Reader/Antenna modules

Integration Platform:
RFID Middleware:
Xtenna™ WebToolkit
Xtenna™ Studio
Application: Essen RFID's Vehicle Tracking System
Database: SQL Server 2005 Exp. ed.

Tag Manufacturer/Supplier:
Essen RFID, with US based chip inlay

Reader/Antenna Manufacturer:
Essen RFID, with US based module

Systems Integrator:
Essen RFID

Xtenna™ Integrated RFID Antenna/Reader

For further details contact:
Essen RFID
24-B, Jolly Maker II
Nariman Point
Mumbai 400021 India
www.essenrfid.com

CASE STUDY

KEY REQUIREMENTS:

Sundargarh Truck Owners' Association (STOA) is the largest association of truck owners in Orissa, comprising over 2000 truck owners and managing 4500 trucks. STOA provides coal transportation from the coal mines to the mines' client industries located in eastern Orissa. The association's purpose is to provide an equal number of trips to each truck without favour to any association member.

The association currently uses a manual numbering system, wherein each truck arrives at a numbering point a short distance before the coal mine and gets a serial number. Trucks are then called for loading at the mine as per their serial number, after which they transport their load to the destination provided by the mining company. On returning after dispatching its load, the truck enrols for a new serial number.

However in this manual process, often truck drivers enrol for another serial number before dispatching their load, due to which they get their next trip assignment within a few hours instead of a few days. Preventing this misuse and out-of-turn trips among thousands of trucks is difficult in a system that is dependent only on an excel sheet for retrieving trip details. The company required an automated system for accurate vehicle tracking, prevention of double numbering and efficient allocation of equal number of trips to each truck.

Main challenges in implementation:

- Prevention of misuse caused by double numbering and out-of-turn trips.
- Allocation of equal number of trips for each truck.
- Verification and authentication of trucks undertaking trips and checking for fraud number plates.

SOLUTION:

Essen RFID provided STOA with an efficient solution for managing and tracking vehicles deployed for coal transportation. Using RFID technology, the system detects RFID tags on vehicles and efficiently tracks and manages the trips of each truck with an auto sequence number.

IMPLEMENTATION:

Xtenna™ RFID Antenna-Readers are installed at source and destination points along with one Xtenna™ antenna-reader at the numbering point. A PARKA™ RFID tag is issued to each truck and affixed to its windshield. The tags are registered into the database using an Xtenna Proximity™ Reader.

The Vehicle Tracking System uses MS SQL Server for storing data, while the application software has been developed using .NET.

CASE STUDY

WORKING:

1. The Vehicle Tracking System requires that a PARKA™ RFID tag is issued to each truck. When the tag is issued to a particular truck, all relevant owner details are obtained for the system database. Details of each truck, including Vehicle License Plate number, are also entered into the system database.
2. The tag is then assigned to each vehicle by being read using the Xtenna Proximity™ Reader and is registered in the database. The tag is then affixed on the truck's windshield.

3. When an order is received at the coal mine, the supervisor enters its details such as order number and date, order quantity, dispatch location and order expiry date.
4. Using the Vehicle Tracking System, he then pre-calculates the number of trips required to complete the order dispatch. For example, if x = ordered quantity of 150 MT, y = each truck's carrying capacity of 1.5 MT and z = available trucks are 20, then total trips required would be (x/y) i.e. 100, and therefore maximum number of trips per truck would be (x/y)/z, i.e. a maximum of 5 trips allowed per truck. Hence each truck is allowed the same number of trips. The order is then taken up for loading and the supervisor starts issuing the numbering for that order.
5. Each truck first approaches the numbering point to receive a unique sequence number for a particular order. The Xtenna™ Antenna-Reader mounted there checks the vehicle tag ID to confirm that it is an authorized truck that has been registered into the database.

CASE STUDY

6. The system then checks if the ordered quantity has been completely lifted for dispatch. If there is still any balance remaining in order quantity completion, the system then checks if this particular truck has closed its previous trip by completing its earlier delivery.
7. The next validation is to check if the truck is exceeding the maximum number of trips per truck for the particular order. If that is not so, then the truck trip count is increased by 1 and the truck is issued a printed unique sequence number along with dispatch destination. Alert messages are popped up at each stage of the validation process.
8. On receiving the sequence number, the truck moves into the loading area for loading the coal into the truck. Each truck gets loaded according to its number sequence. The Xtenna™ mounted at the loading source reads the truck's tag ID and logs in the time and weighment information into the system. The trucks then leave for their destination.
9. On reaching the destination, the Xtenna™ at the unloading area reads the truck's tag ID, logs in the arrival time into the system and closes the trip.
10. When the truck arrives back at the coal mine, it goes to the numbering area once again to receive its next sequence number for the next trip in the order. The system checks the total time of the previous trip with the mapped route for that trip which contains the minimum route time required from source to destination. If the previous trip time is significantly less than the standard route time, the system alerts that the particular truck driver is attempting to take a double sequence number.
11. If the total dispatch quantity of a particular order is not equally divisible amongst all fully loaded trucks, then those trucks that have not received an additional trip get priority for the next order received. In this way, over a given period, all trucks are issued an equal number of dispatch trips.

CASE STUDY

BENEFITS:

- Automated system that is transparent and neutral, promotes both efficiency as well as harmony amongst association members.
- Prevents unregistered trucks from undertaking trips.
- Built-in pre-calculation features enable improvements in dispatch planning.
- Accurate vehicle tracking at source and destination.
- Prevents misuse caused by double numbering and out-of-turn trips.
- Automatic trip validation and order completion alert features.
- Equal trip allocation for each truck by a streamlined and hassle-free process.
- Reduction in manual entries through automated system processes.
- Automated report generation for orders, dispatches, trips and vehicles.

LINKS:

Hardware:

Xtenna™

Xtenna Proximity™

Tags:

PARKA™

Software:

Xtenna WebToolkit™

Xtenna Studio™

Reference Example:

http://www.essenrfid.com/Mailer/accessparking-flash-demo.pdf