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ESSEN

CASE STUDY

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South Eastern Coalfields Ltd.

Major national coal mine adopts RFID-based VEHICLE TRACKING SYSTEM

Efficient automated tracking of thousands of trucks

Real-time automated truck verification and prevention of unauthorized entry

Automated operation of entry/exit gates and boom barriers

Automated trip logging and alerts

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: Oracle

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

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

Systems Integrator:
Essen RFID

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Xtenna™ Integrated RFID Antenna/Reader

CASE STUDY

KEY REQUIREMENTS:

South Eastern Coalfields Limited (SECL) is a subsidiary of Coal India Limited, the country's monopoly coal mining company and one of the largest in the world. At SECL, coal is mined and transported daily in huge quantities. It deploys its own trucks as well as those of contracted vendors and truck operators for coal transport. These trucks are required to be tracked and entry/exit verified since considerable theft takes place when coal is transported out from vast open coalfields.

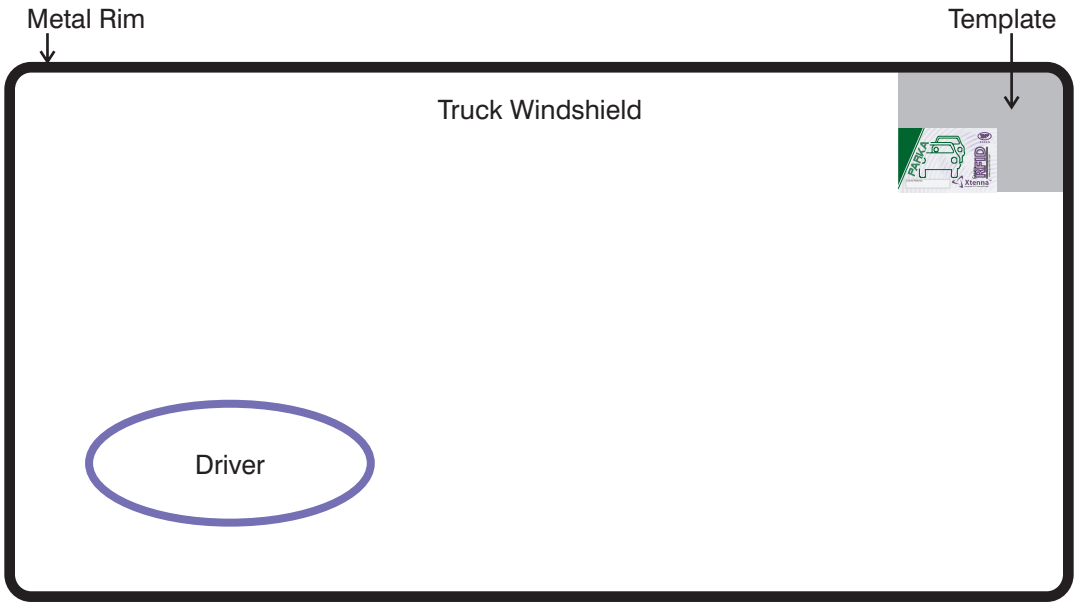
Since the existing manual system was inadequate in coping with a large flow of thousands of trucks, a need was felt for an automated system that would monitor truck movement to and from the mines. The targeted mining areas for truck monitoring were two in Dipka and one in Kusmunda. Both places are in the Korba district of Chhatisgarh state.

Main challenges in implementation:

- Identify each truck automatically with minimal supervision.
- Automate entry and exit of verified trucks at the mines.
- Prevent entry of unauthorized trucks into the mines.
- Maintain an automated record of truck movement into and out of the mines.

SOLUTION:

Essen RFID proposed a RFID-based system that identifies trucks at each entry/exit gate, automates the operation of a boom barrier at the entry gate that allows entry, and logs individual truck movement and trips into and out of the mining area. These details are updated into the server with reports generated for the management.



IMPLEMENTATION:

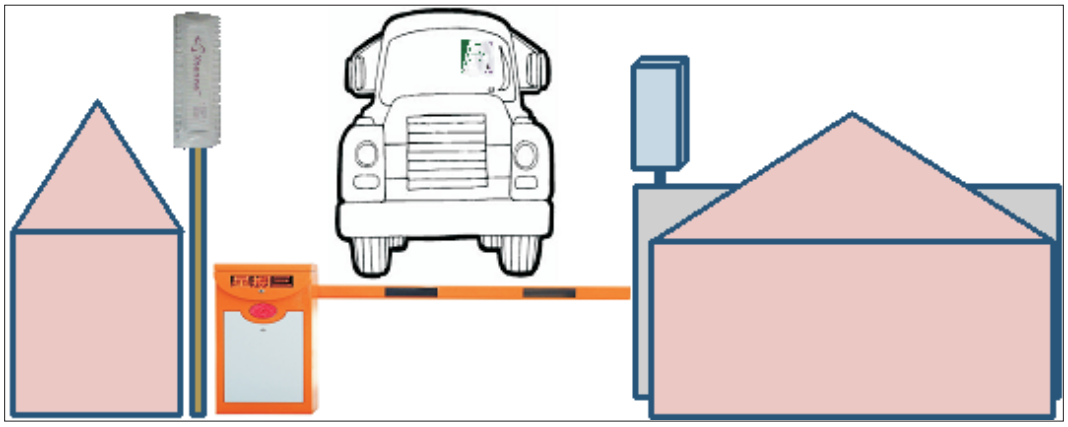
Xtenna™ RFID Antenna-Readers are installed at the IN and OUT gates in the target areas. In the Dipka area, two Xtenna™ antenna-readers are deployed for IN tracking and two for OUT tracking, whereas in Kusmunda area, one Xtenna™ antenna-reader each is deployed for IN and OUT tracking.

A PARKA™ RFID tag is issued to each authorized truck and affixed to its windshield. Each tag is registered into the database for the respective vehicle, using a Xtenna Proximity™ reader. Essen RFID's Vehicle Tracking System (VTS) software is installed at each of these locations with Oracle as their back-end database.

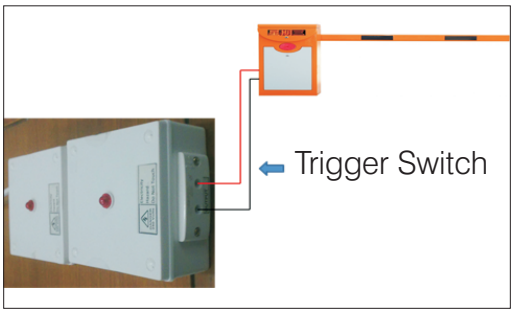
WORKING:

The system is designed to restrict the entry of unauthorized vehicles and lifting the boom barrier to only allow the entry of authorized vehicles.

A truck entering the mining area approaches the IN gate. The Xtenna™ antenna-reader mounted at the IN gate reads the PARKA™ tag affixed to the



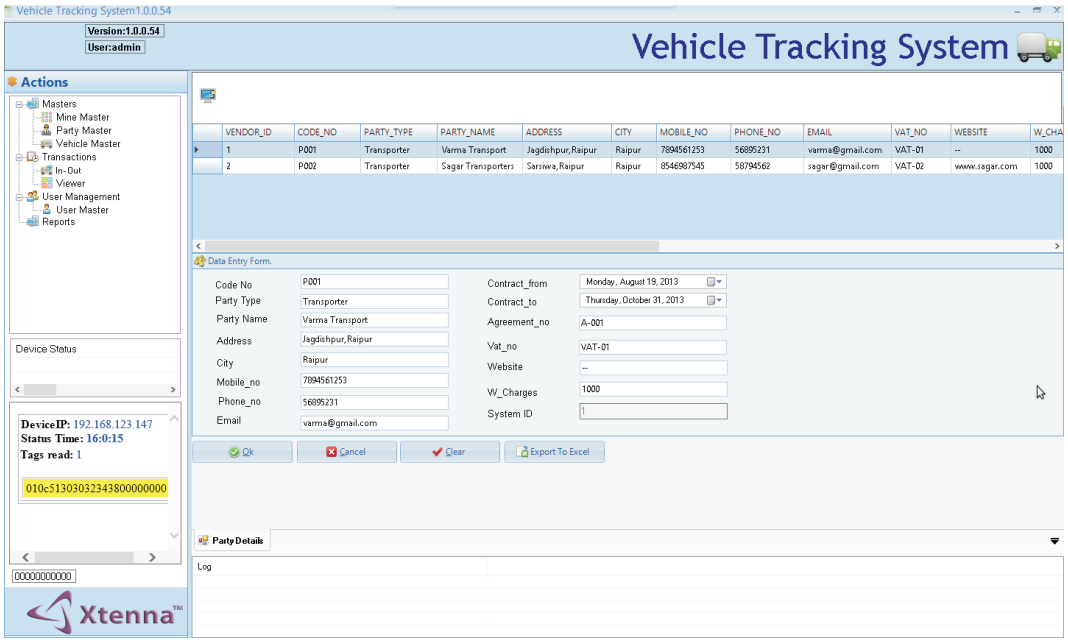
windshield of the truck and sends the tag details to the server. The system checks if the truck is registered in the database. If it finds the truck registered, it sends a command to the trigger switch that controls the boom barrier. The boom barrier is lifted, the truck is allowed to enter and its entry time is logged into the system.



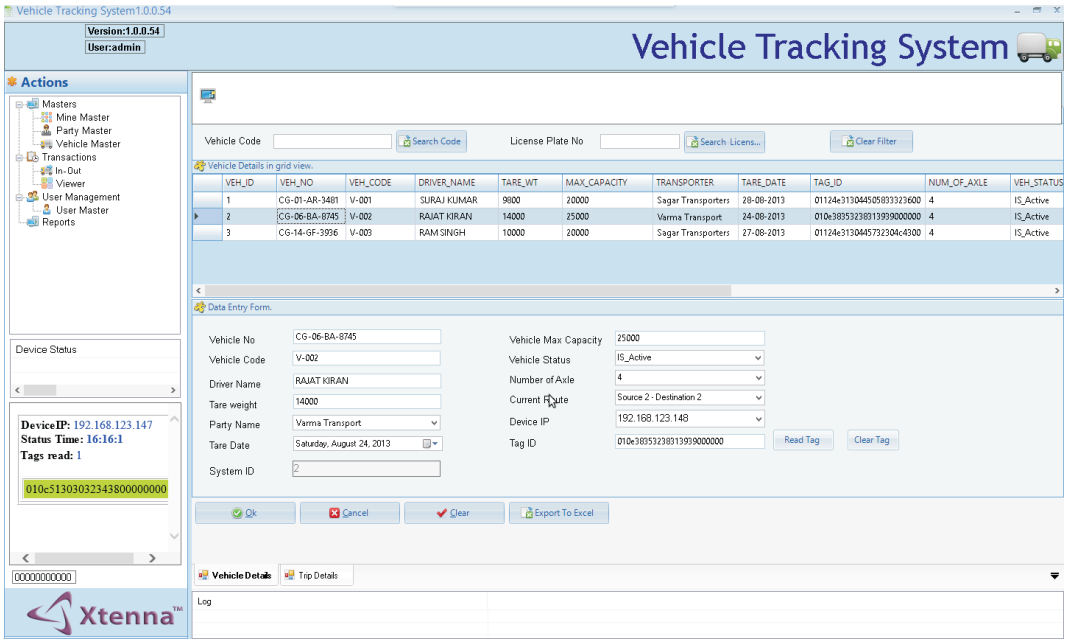
At the OUT gate, the Xtenna™ mounted there reads the tag of the truck exiting the mine and logs the exit time into the system. The security administrator can view detailed reports of entry and exit timings of each truck.

CASE STUDY

Details of each transport contractor/vendor are entered into the Vehicle Tracking System in the Transport Party Master file. These include party's name, address and contact details as well as contract validity dates.

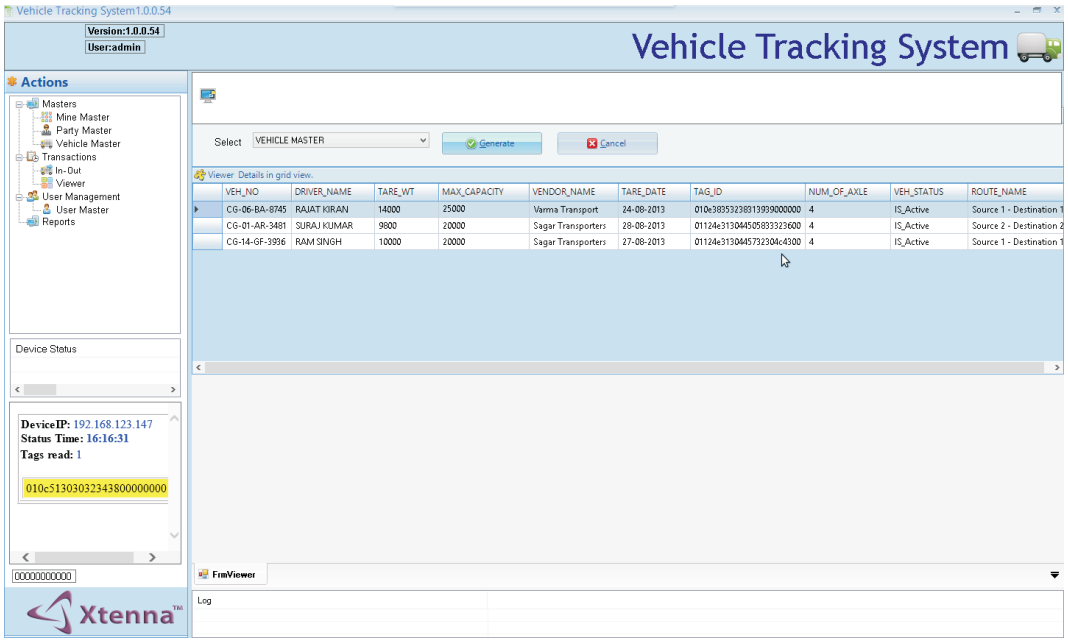


Individual truck details are registered in the Vehicle Master. These include the truck license plate number, driver name, contact number and address, etc. A PARKA™ RFID tag is read using the Xtenna Proximity™ reader and assigned to the vehicle in the database. The tag is then affixed on the truck's windshield. The truck owner (vendor/contractor) is selected from the previously entered screen and assigned to the vehicle in the database.

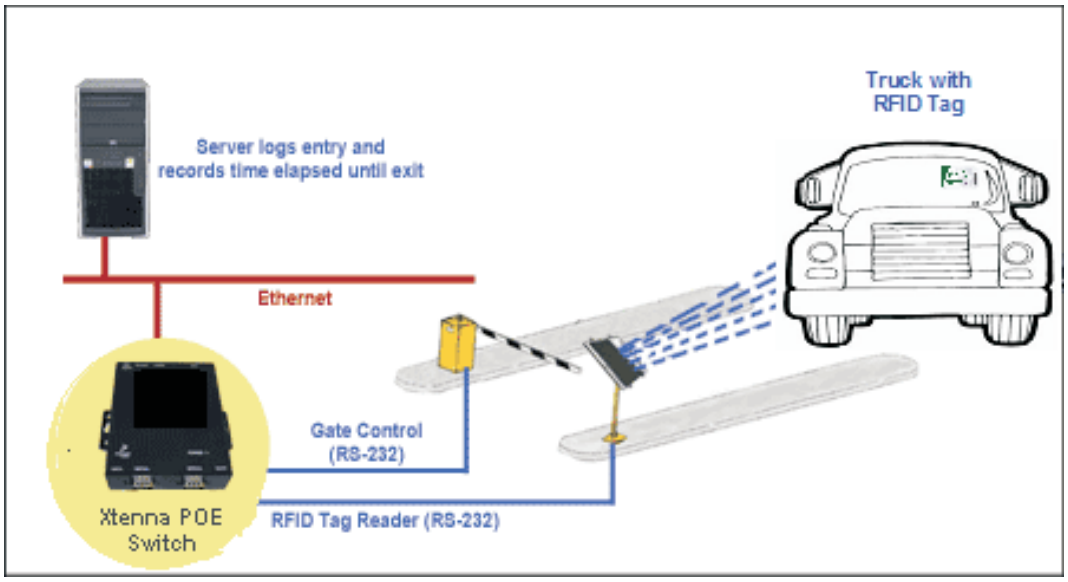


CASE STUDY

The Viewer module allows the operator to view data without permitting any modification. It can display details of records from the party master, vehicle master and trip in-out details.



The vehicle log data for entry and exit displays the truck contractor's name (party name), the driver's name, vehicle license plate number, contracted period and the date, time and location of tag reading at the gate.



The Vehicle Tracking System displays alerts on screen if it detects an unregistered tag or if the tag indicates that the vehicle's contract period has expired and the truck driver is attempting entry after the valid date has lapsed.

CASE STUDY

The system has centralized web-based reporting features that display details of all registered trucks, truck owners/contractors, drivers, date-wise entry/exit reports and summary reports. These reports can be generated in real-time, enabling up-to-date information to administrators.

BENEFITS:

- Verification of each truck entering the mining area.
- Prevents unauthorized entry of trucks.
- Manual entry of trucks is not required due to automated RFID detection.
- Automated identification of truck contractor and validation of contract period in the database for each entering truck.
- Automated logging of entry and exit at IN and OUT gates.
- Automated entry/exit logging enables automated calculation of trips made.
- Saves time and brings ease of use through reduction in manual operations.
- Improved efficiency through automated processes.
- Enables report generation and analysis in real time.

LINKS:

Hardware:

Xtenna™

Xtenna Proximity™

Tags:

PARKA™

Software:

Xtenna WebToolkit™

Xtenna Studio™

Reference Example:

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