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ESSEN

CASE STUDY

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Large fertilizer manufacturing company pilots a RFID-based VEHICLE ACCESS CONTROL SYSTEM

Automated vehicle access control system that prevents traffic congestion and time wastage at the gates

Accurate identification of authorized vehicles

Efficient verification and management of visitors' vehicles

Automated entry/exit logging and report generation

INSIDE:

TECHNOLOGY

Solution:
EPC Gen2 compliant access control and 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 Access Control 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

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Xtenna™ Integrated RFID Antenna/Reader

CASE STUDY

KEY REQUIREMENTS:

Chambal Fertilisers and Chemicals Limited has been using a manual system at its plant premises to manage vehicle access control. This requires security personnel at the gate to manually verify vehicle entry, note down the entry and exit timings and manually operate the boom barrier at the gates. This is a time-consuming process that causes vehicle queues and delays while entering and leaving the premises and is also a hindrance to regular employees' self-owned vehicles. The company therefore required an automated system of vehicle access control that would efficiently manage entry and exit traffic, automate verification of registered employee vehicles, manage verification of visitors' vehicles and prevent wastage of time and labour at the gates.

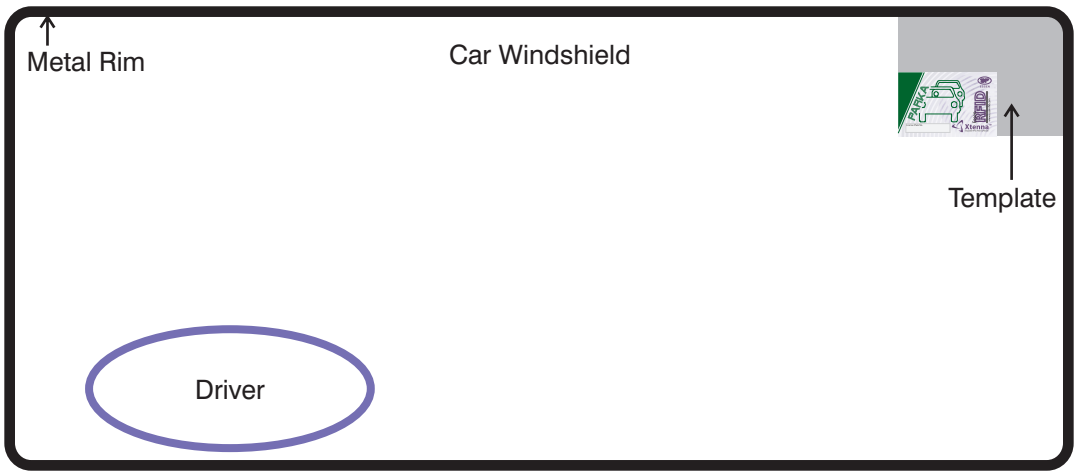
Main challenges:

- Unique identification of each vehicle entering the premises.
- Tracking and logging in the entry and exit of each vehicle through the gate.
- Automated operation of boom barrier at the gate for authorized vehicles without requiring human intervention.
- Automated report generation with details of vehicles, vehicle owners, visitors and entry/exit timings.

SOLUTION:

Essen RFID offered its Vehicle Access Control System (VACS) as an effective solution for efficiently tracking vehicles entering and exiting the plant premises. This system deploys RFID tags and readers to identify and authenticate vehicles entering and leaving the premises.

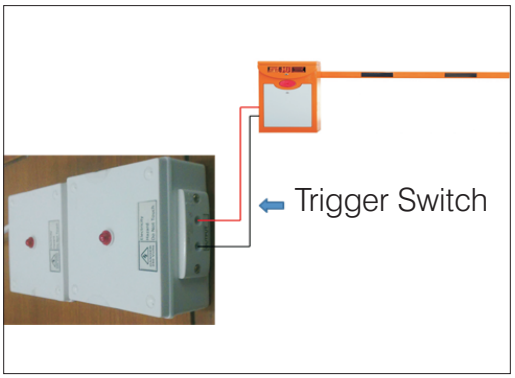
IMPLEMENTATION:



A PARKA™ RFID tag is issued to the authorized vehicle of each employee and permanently affixed to its windshield. Visitor's vehicles are issued the same tags temporarily. Each tag is registered into the database for the respective vehicle, using a Xtenna Proximity™ reader.

CASE STUDY

Xtenna™ integrated reader-antennas are mounted at the entry/exit gate. The boom-barrier at the gate is fitted with a trigger switch that is automatically

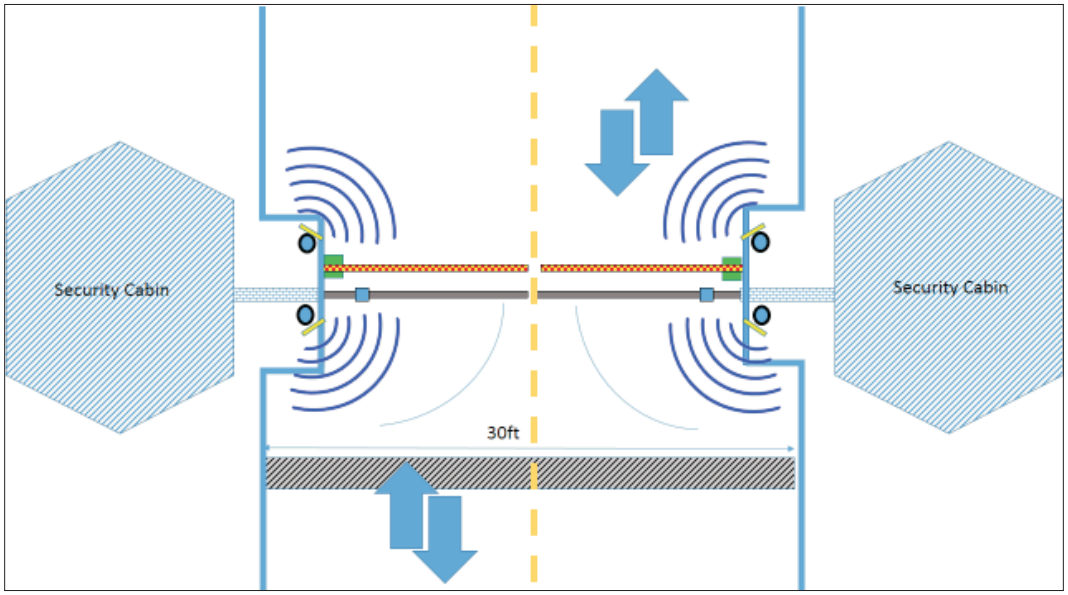


activated by the vehicle tracking system. The system uses SQL Server as the back-end database while the front-end application deploys .NET technology.

WORKING:

The company has a large main gate at its premises, that is divided into two halves – one half is used exclusively in the morning for both entry and exit of vehicles, whereas the other half is used exclusively in the evening for both entry and exit of vehicles.

Four Xtenna™ reader-antennas are thus deployed at the main gate, as shown in the diagram below. On each half of the gate, there is one Xtenna™ mounted outside the gate for tracking vehicles entering the premises and one Xtenna™ mounted inside the gate for tracking vehicles leaving the premises. Both halves of the gate have one boom barrier each. Each boom barrier is utilized only when its section of the gate is being used, i.e. one in the morning and the other in the evening.



CASE STUDY

When a vehicle enters the plant premises, it approaches the open section of the gate. The IN antenna-reader reads the PARKA™ tag of the vehicle and sends the tag details to the server. The VACS system checks if the vehicle is registered in the database. If the vehicle is registered, it sends a command to the trigger switch that controls the boom barrier. The boom barrier is lifted allowing the vehicle to enter and the vehicle IN time is logged into the system. Similarly a vehicle exiting the premises is read by the OUT reader-antenna and the system triggered to open the boom barrier while logging the vehicle OUT time.

When a visitor's vehicle arrives, it does not have a tag and so the boom barrier is not activated. The vehicle is issued a temporary PARKA™ tag and registered by security personnel in the Visitor Management module of the VACS. This assigns the tag to the vehicle in the database for the duration of the visit. The tag is temporarily mounted inside the vehicle and read by the IN antenna-reader. This will open the boom barrier and log the vehicle IN time into the system.

When the vehicle leaves the premises, the OUT antenna-reader reads the tag and opens the boom barrier while logging the vehicle OUT time. The temporary RFID tag de-assigned from the vehicle and is handed back to the security personnel at the gate. The same temporary tag can now be reissued to another visiting vehicle.

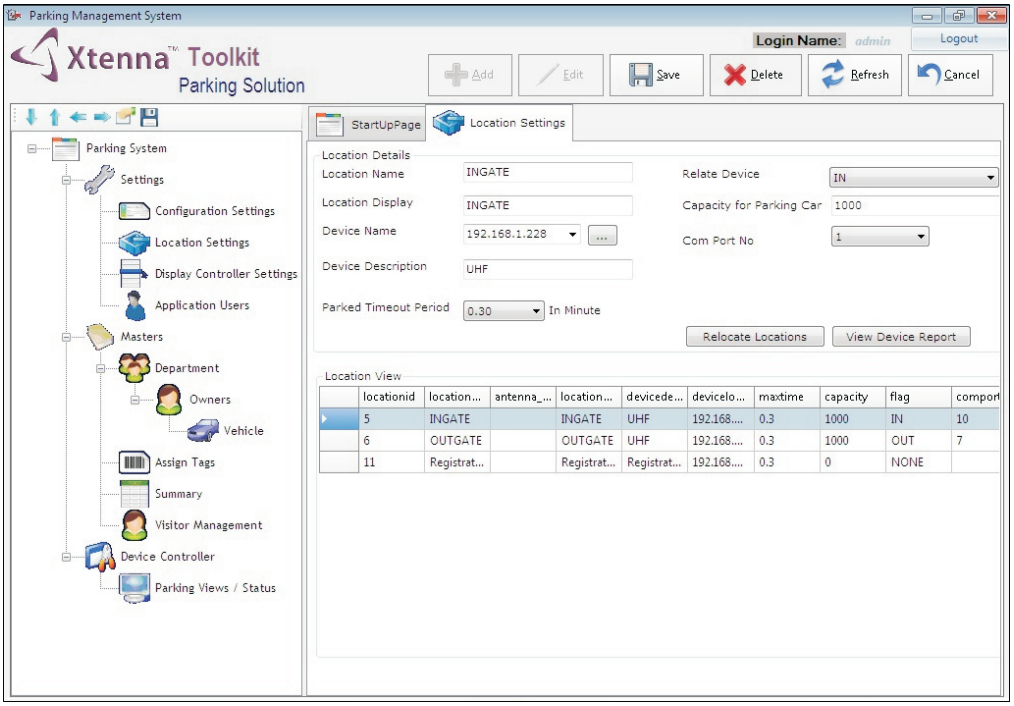
Application Process:

The main modules of the system are as follows:

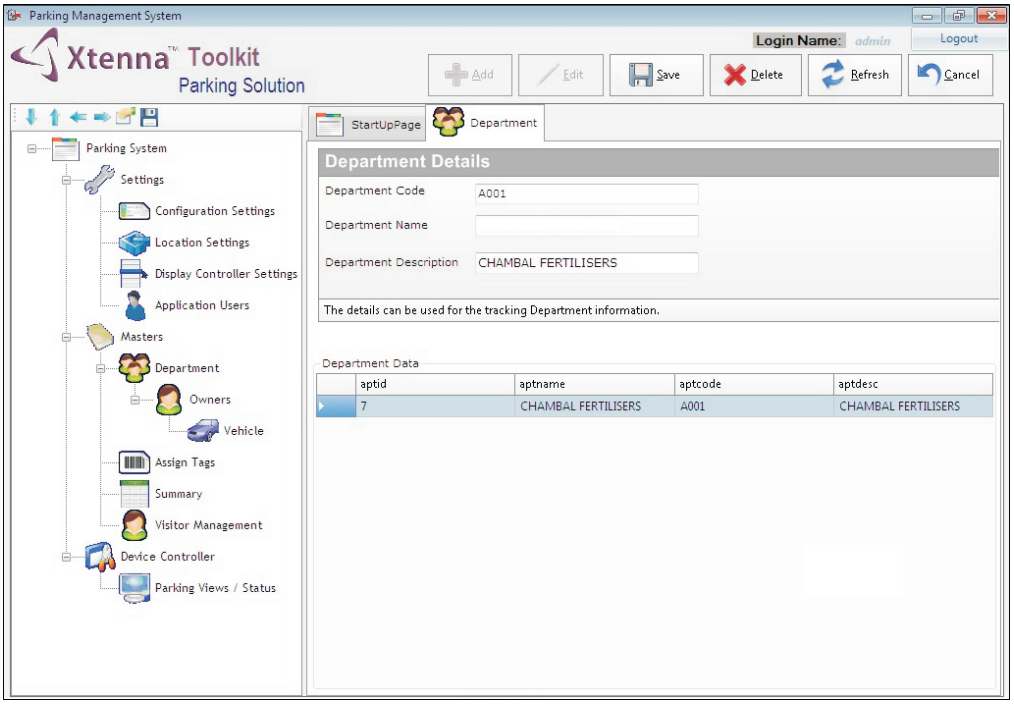
- Location Master
- Department Master
- Vehicle Owner Master
- Vehicle Master
- Assign Tags
- Summary
- Visitor Management
- Parking Status

1. **Location Master:** This registers each Xtenna™ antenna-reader's location and its IP address into the database. The administrator also enters each device's deployment location i.e. IN, OUT or for tag registration, in this module.

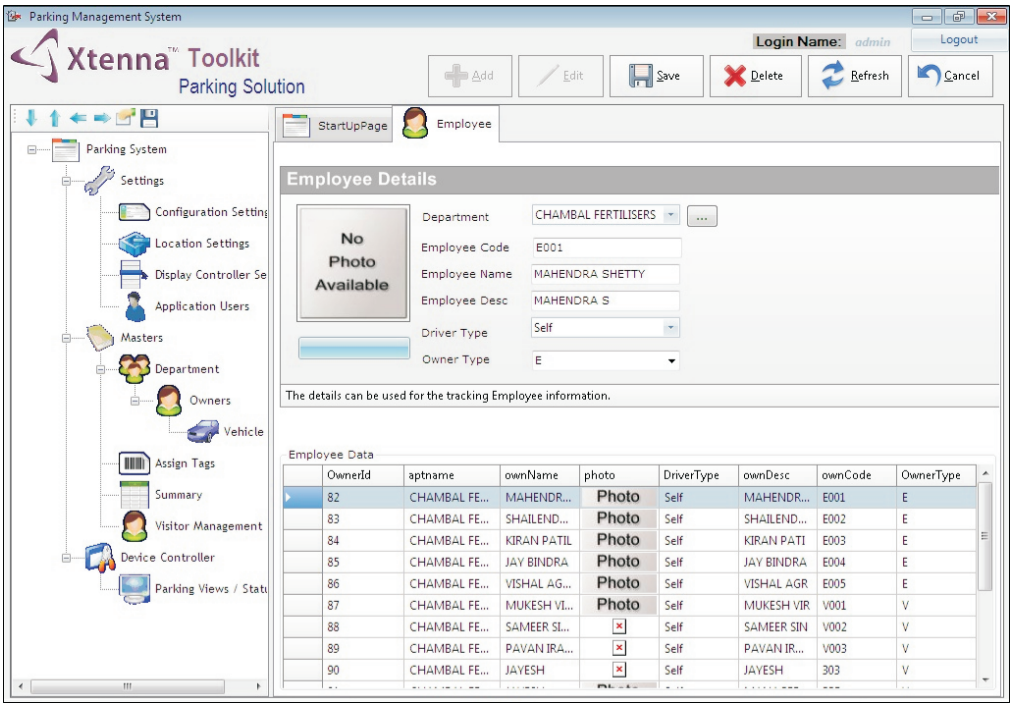
   The COM port of each of the trigger switches that control the respective boom barriers are also entered into the system.



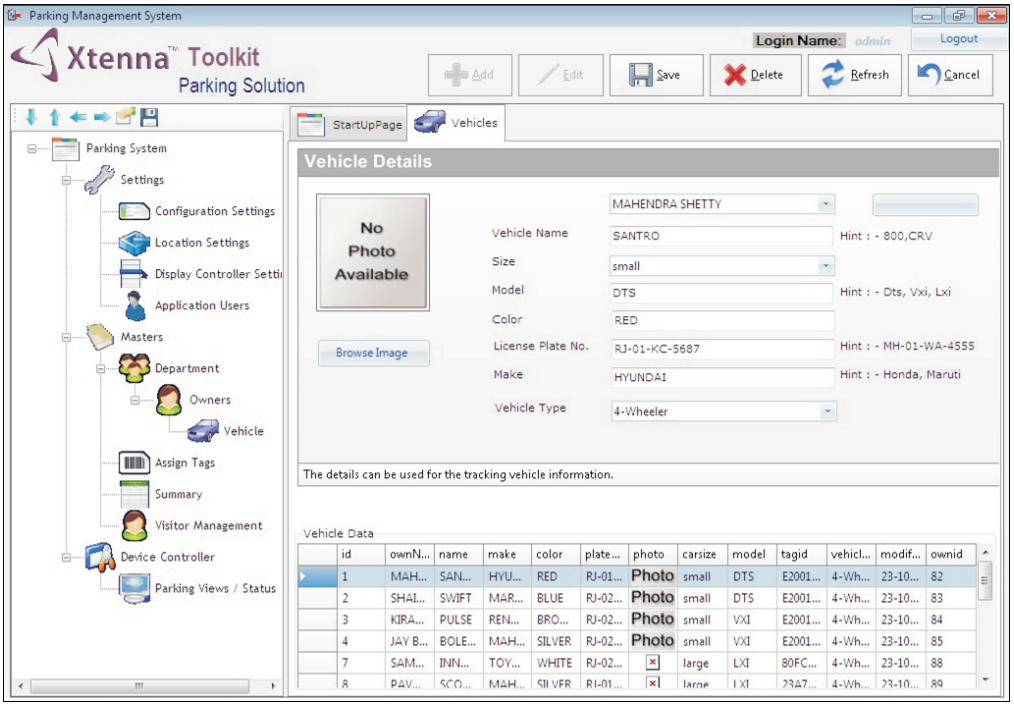
2. **Department Master:** The various departments within the company are entered into the system.



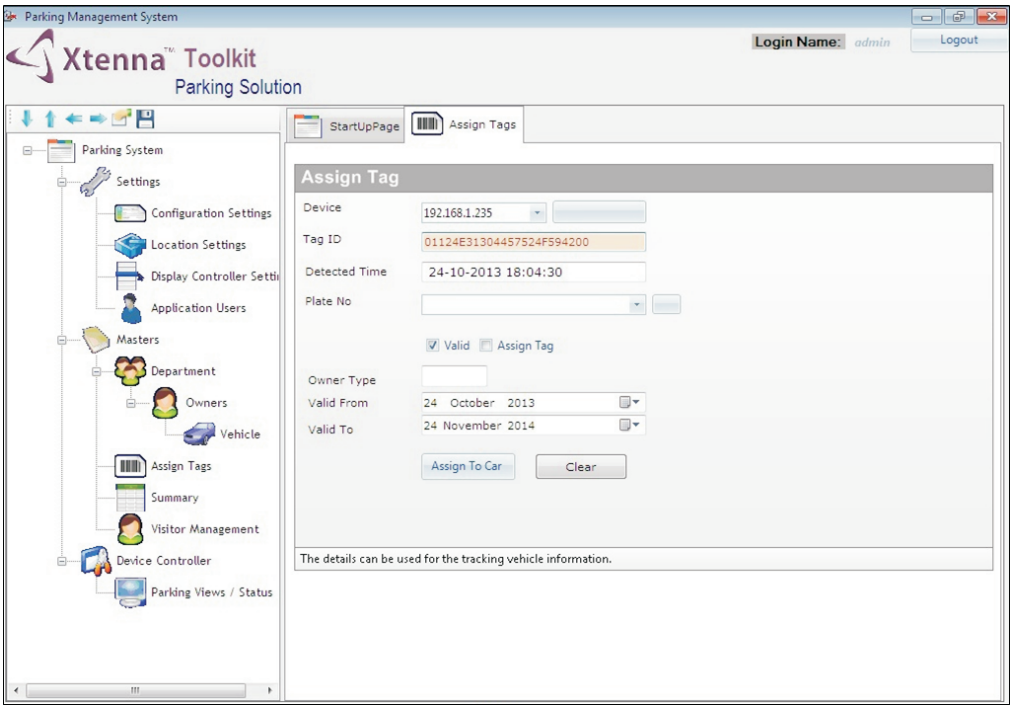
3. **Vehicle Owner Master:** This module contains all relevant details of vehicle-using employees such as employee name, employee code, department, etc. along with the person's photograph.



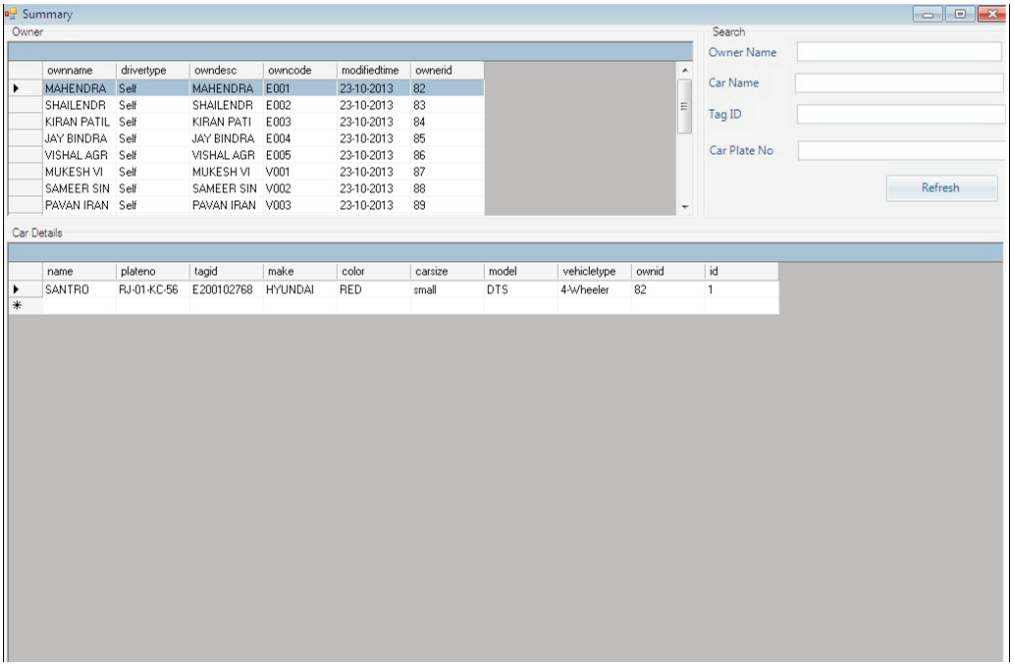
4. **Vehicle Master:** Here, the vehicle details are saved into the system and mapped to their respective owner's name. Vehicle details include vehicle name, model, manufacturer, license plate number and vehicle photograph.



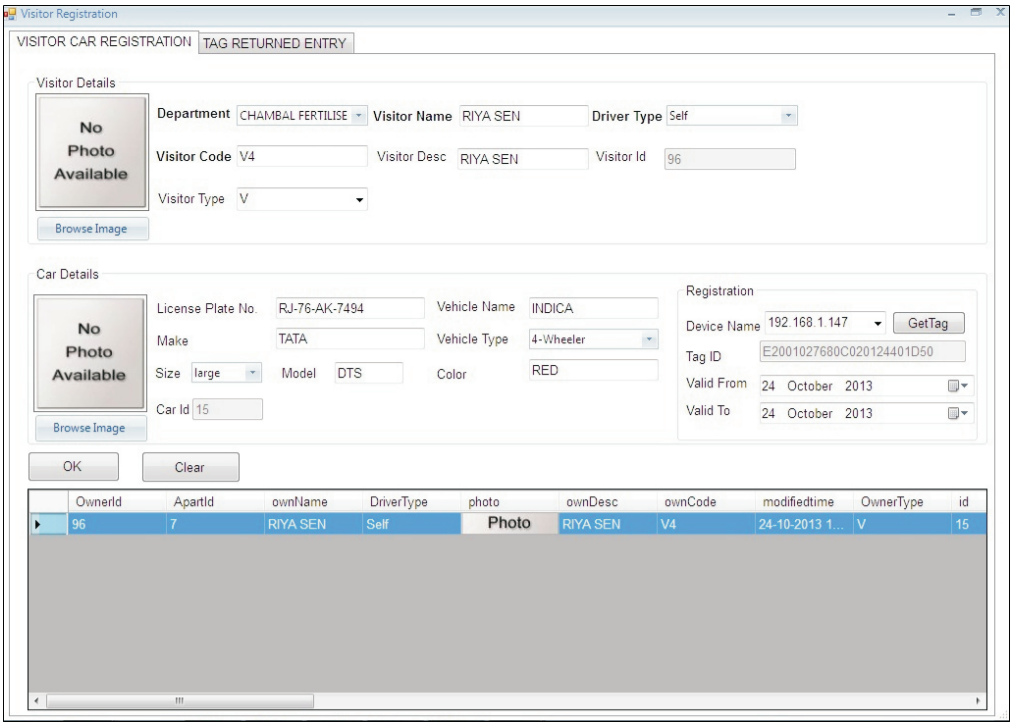
5. **Assign Tags:** A PARKA™ RFID vehicle tag is issued and assigned to each employee-owned vehicle that has already been registered in the database. The administrator selects the antenna-reader device, reads the tag using this device and selects the vehicle license plate number to assign the tag to that particular vehicle. Tag validity dates are also entered in this module.



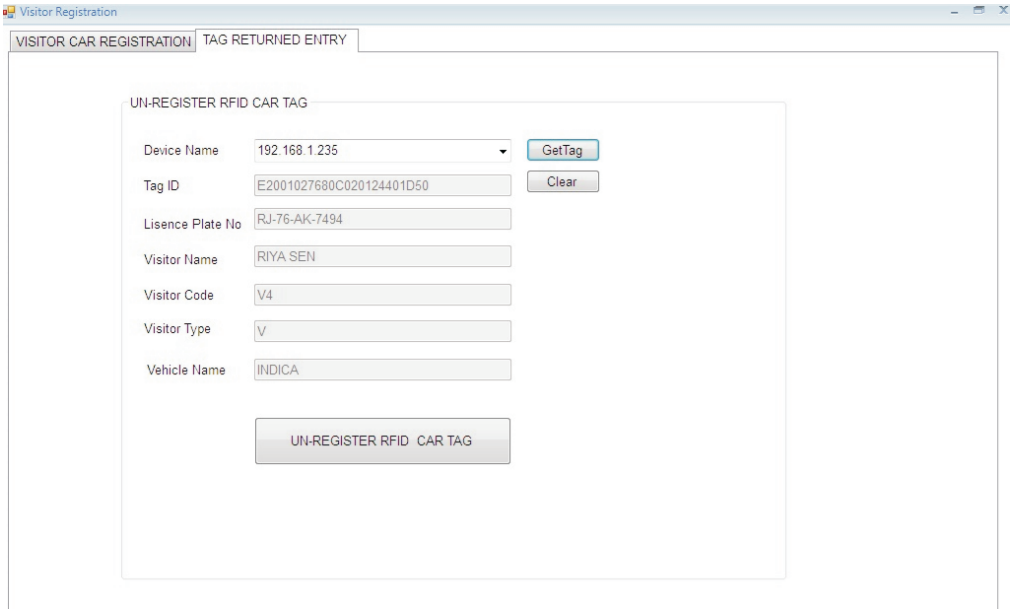
6. **Summary:** This screen allows the administrator to view owner-wise vehicle details. When a name is selected from the list, the corresponding vehicle details will be displayed.



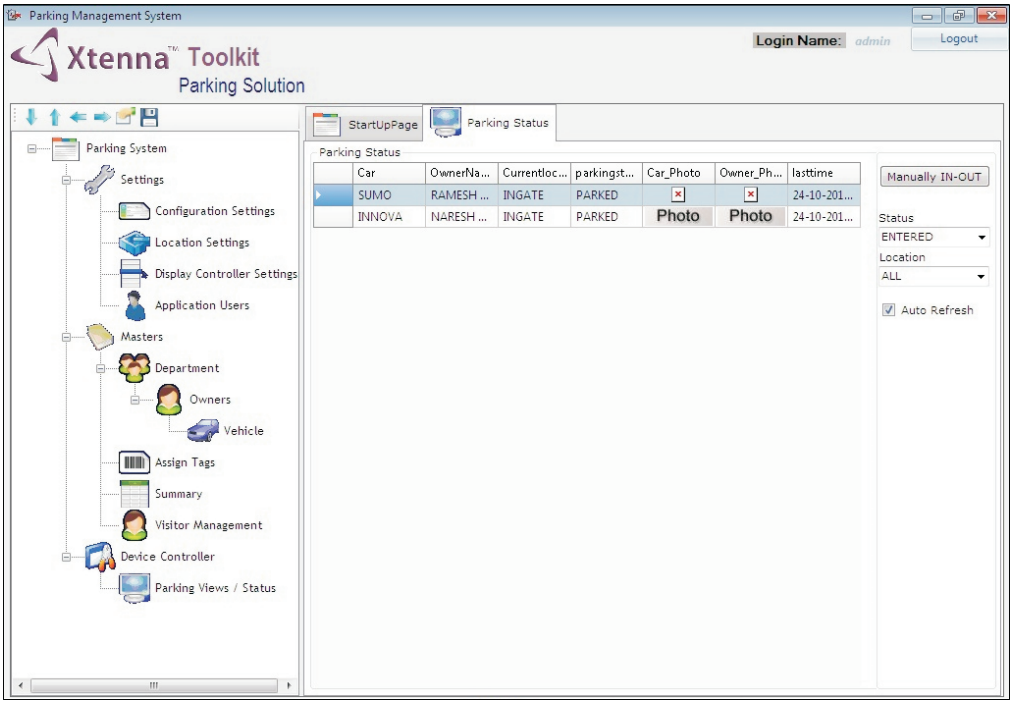
7. **Visitor Management - Visitor Car Registration:** This module is used to manage the access system for vehicles of visitors entering the plant premises. The details of each visitor and his vehicle are entered into the system and a tag is assigned to the vehicle along with its validity date for the duration of the visit.



8. **Visitor Management - Tag Returned Entry:** Since the visitor's RFID access tag is temporary, it is to be returned when the vehicle leaves the premises to the security personnel at the OUT gate. This module is used to de-assign and unregister the returned tag in the system database.



9. **Parking Status:** This module allows the administrator to view the list of vehicles currently parked within the plant premises.



10. **Reports:** The system has administrative reporting features that display details of all registered vehicles, vehicle owners, visitor details, date-wise entry/exit reports, etc.

BENEFITS:

- Secure, automated functioning with RFID technology.
- Accurate vehicle identification at entry and resultant access through boom barrier for authorized vehicles only.
- Automated boom barrier operation through server-controlled trigger switch without need for manual intervention or labour.
- Automated logging of IN and OUT entries into server enables quick vehicle movement, preventing stoppage, congestion and time wastage at the gates.
- Automated tallying of vehicle entry and exit prevents delays at the OUT gate.
- Minimization of manual entry work.
- Prevention of entry for untagged vehicles.
- Efficient verification and management of visitors' vehicles.
- Automated centralized report generation enables ready record reference for the administrator.

LINKS:

Hardware:

Xtenna™

Xtenna Proximity™

Tags:

PARKA™

Software:

Xtenna WebToolkit™

Xtenna Studio™

Reference Example:

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