Livestock Tagging Management System
Application Quick Guide

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1.0 Project Overview

- Cattle Tagging Management System is a system to manage the cattle farm using RFID UHF technology to monitor the daily activities of the cattle in a farm.
- Each cattle on the farm is being tagged with a RFID UHF cattle tag which represent the specific cattle using the Tag ID.
- The RFID UHF tag will be pierce onto the cattle's ear as an identity tag for the cattle. The Tag ID will be act as the cattle's identity to retrieves information and monitor the activities of the cattle.

1.1 Project Introduction

- The Cattle Tagging Management System will equipped with the features such as :
  - Store and retrieve the full information of the cattle from the database based on the Tag ID read.
  - Monitor the movement at entrance and exit of the farm.
  - Store the vaccination, medication and family history of the cattle.
  - Set and show alert of the necessary action to be taken on the specific cattle.
  - Synchronize the database with the RFID UHF handheld device to get the latest and updated information.

HARDWARE : CSL-461 4-Port UHF RFID Fixed Reader

Figure 1.1-1 CSL461 Hardware

Hardware Overview & Structure

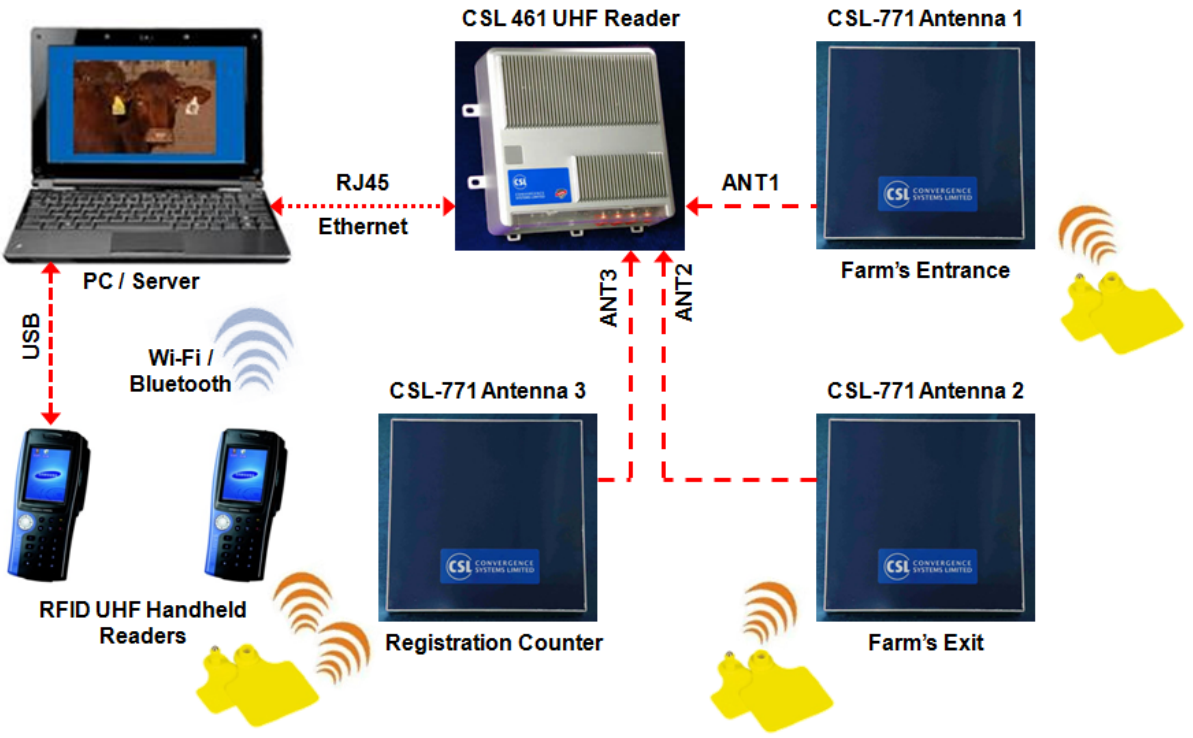

Figure 1.1-2 Overview of the System Hardware and Connection

- A RFID UHF reader is used to read the tag and retrieve the full information of the cattle from the database to be display on the PC screen.
- The CSL-461 RFID UHF Reader with 4-channel antennas will be used to cater for the requirement of the cattle tagging management system.
- For initial stage, one of the antenna (Antenna1) will be placed at the farm entrance and another antenna (Antenna2) will be placed at the farm exit to monitor the in/out movement of the cattle.
- The third antenna (Antenna3) will be placed at the registration counter for tag registration. Antenna4 will be reserved for future use.
- On the other hand, reading a tag from a fix station is not convenient for the farmer since the cow will the scattered around the farm.
- In order to solve this, a handheld device with UHF RFID reader is being used to read and retrieve the information from the database. (Future Development)
- The handheld reader will be synchronize with the server database before it is being used and will be again synchronize with the server to update the latest information to the database after it is being used. (Future Development)

2.0 Software Overview

- Database is used to store the information of a registered tag and to display the information upon request of the user.
- A special user interface will act as the front end of the software to trigger the action requested by the user.
- The PC user interface is consist of the following features :
    - Tag Management – A tab to read/register/remove or edit a tag.
    - Entrance and Exit Logger – A tab to monitor and log the time of cattle movement when it enters or exits the gate.
    - Database Viewer – A tab to view the database by using filter and query.
    - Alert Viewer – A tab to view the alerts set for cattle's activities.
    - Sync Handheld – A tab to initiate the synchronization between the PC and the Handheld reader. (Future Development)
    - General Setting – A setting panel for general parameter. (Future Development)

2.1 Information Database

- The Information Database will mainly consist of :
    - Cattle's Tag ID
    - Cattle's Breed
    - Cattle's Sex
    - Cattle's Date of Birth
    - Cattle's Origin and Location
    - Cattle's Owner
    - Cattle's Last In and Last Out Time, Purchase Date, Selling Date, etc…
    - Cattle's 3 Level Pedigree & Generation
    - Cattle's Medical History such as Vaccination and Medication History with Date, Purpose, Remarks and Veterinarian Information
    - Cattle's Next Alert Time & Alert Remarks
    - Cattle's Financial Remarks & Slaughter Remarks

3.0 Hardware Layout and Installation

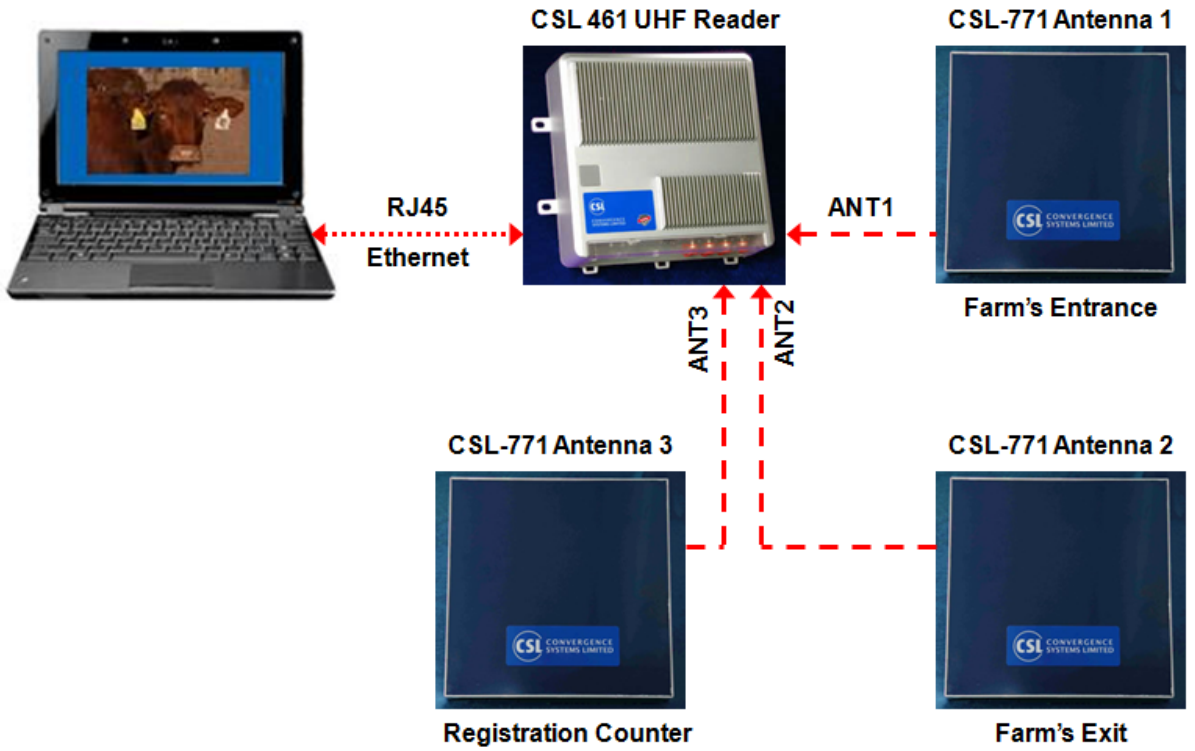

Figure 3-1 The System Hardware Connection

1. Connect the CSL 461 UHF Reader to the PC via the RJ45 Ethernet interface.
2. Connect the Antenna placed on the farm's entrance to the ANT1 port of the reader.
3. Connect the Antenna placed on the farm's exit to the ANT2 port of the reader.
4. Connect the Antenna placed on the registration counter to the ANT3 port of the reader.
5. Recognize the preset IP address of the reader and open the reader configuration panel via an internet browser by keying in its IP address at the address bar.
6. Log in into the reader configuration panel. (default username: root, password: csl2006)
7. Set the reader access mode to low level and save the configuration.
8. Exit the configuration by logout and close the browser.
9. Install the application software by executing setup.exe on the setup CD.
10. Follow the steps to complete the installation.

4.0 PC User Interface

4.1 Overview

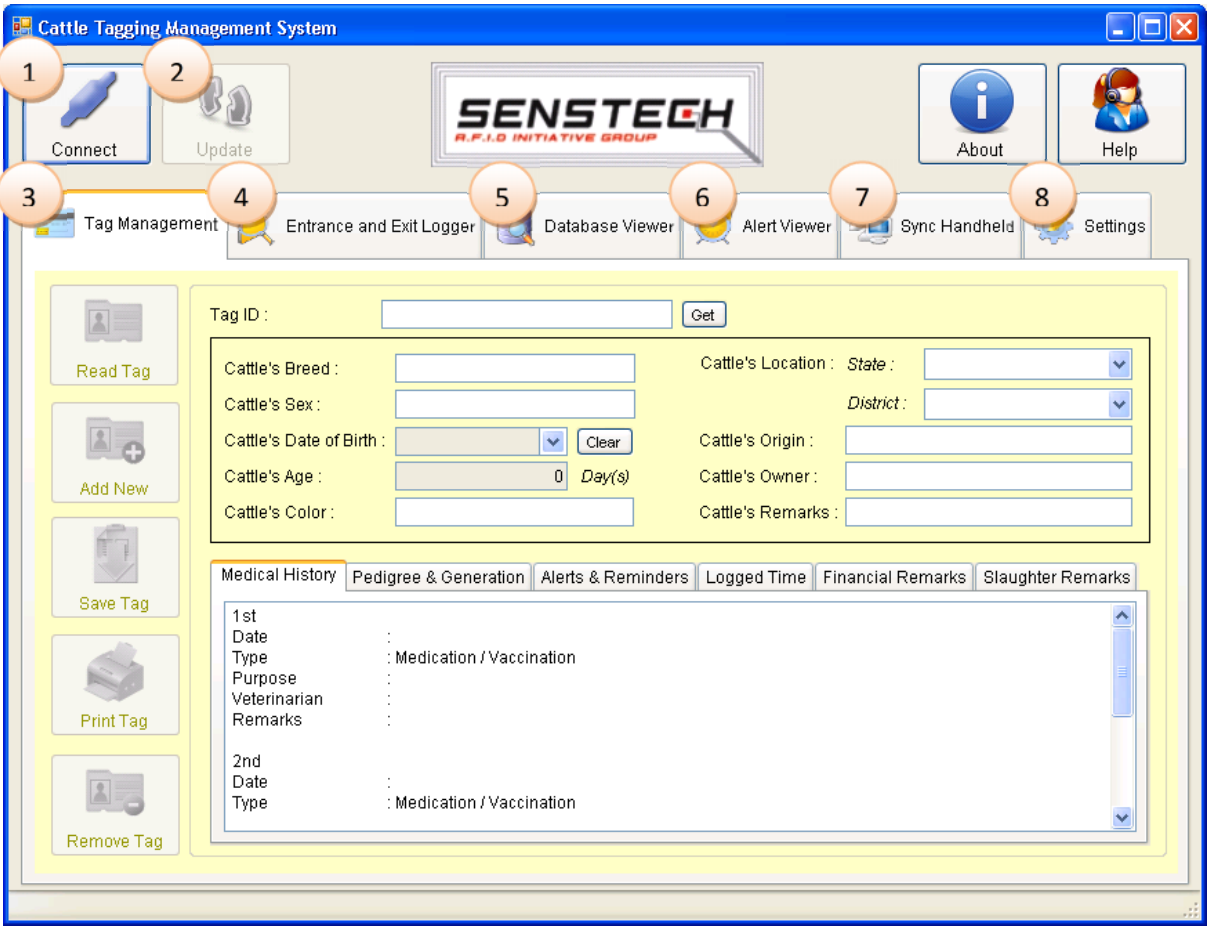

Figure 4.1-1 Overview of the Application Software

1. Connect Button
2. Update Button
3. Tag Management Panel
4. Entrance and Exit Logger Panel
5. Database Viewer Panel
6. Alert Viewer Panel
7. Sync Handheld Panel (For Future Development)
8. Settings Panel (For Future Development)

4.2 Get Connected to the Reader

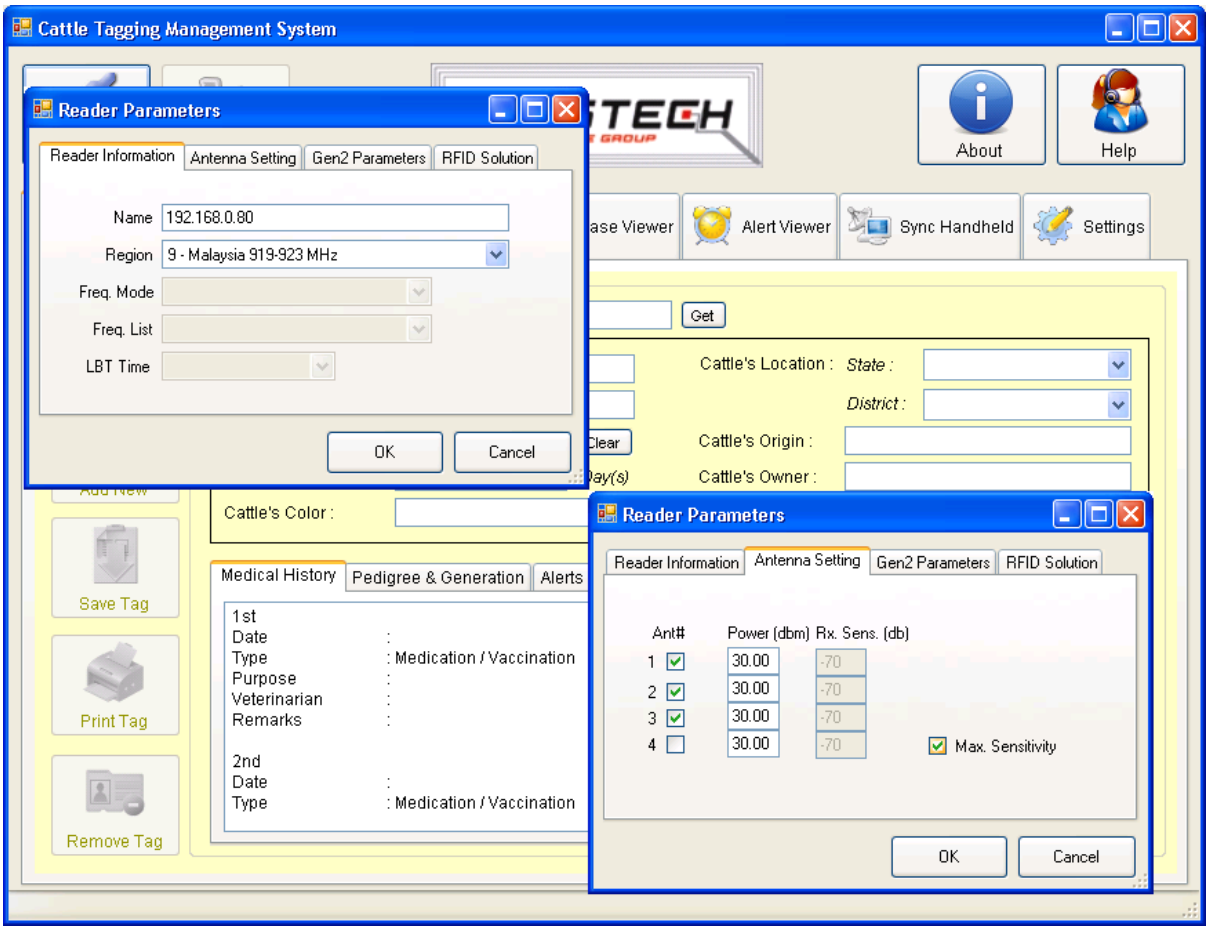

Figure 4.2-1 The Reader Connection Panel

1. Press once on the Connect button.
2. Select the connection parameter (reader information and antenna setting…) and press ok.
3. If the connection to the reader is successful, the Connect button will change its stated to Disconnect and the Update button will be enabled.
4. The Update button is use to make a reconnection to the reader with the update changes to the reader parameters.

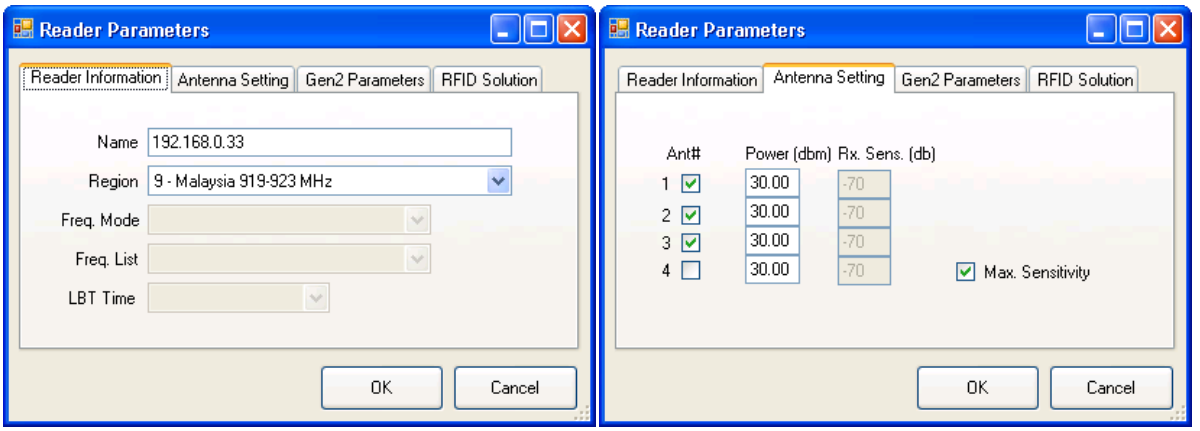

Figure 4.2-2 The Reader Parameters

4.3 Tag Management Panel

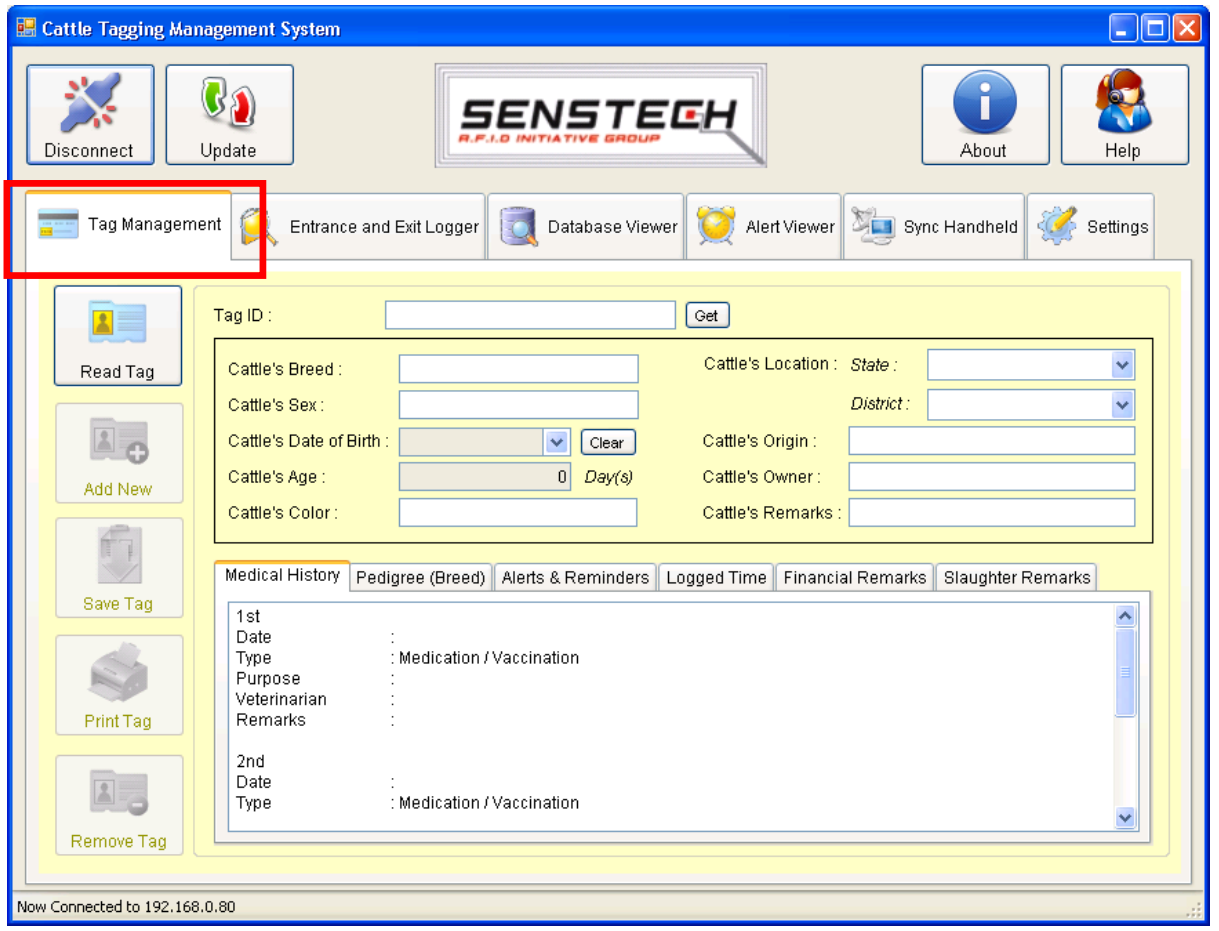

Figure 4.3-1 Tag Management Panel

1. Tag Management Panel is a panel use to manage tags such as reading tags, register a new tag, edit or remove tags.
2. In order to read a tag, please use the antenna that connected to the port 3 of the reader.
3. Press once on the Read Tag button, it is ready to read a tag detected by the antenna 3.

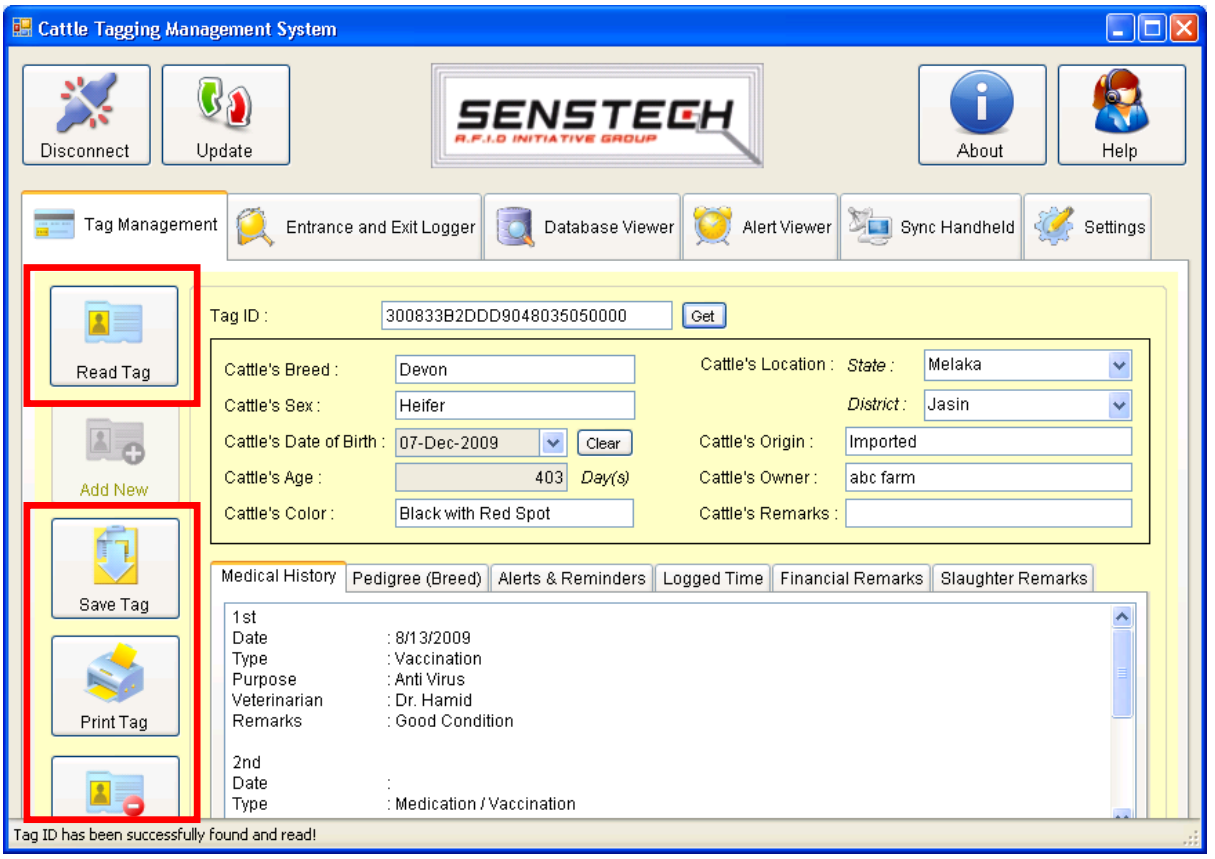

Figure 4.3-2 A Tag is Successfully Read and Info Retrieved from the Database

4. While reading for tag, the Read Tag button will grey out for about 5 seconds to allow the system to scan for tags. If there is no any tag detected within 5 seconds, the system will dropped the read tag request and back to normal condition.
5. When a registered tag is read, the system will automatically grab all the information of the tag from the database to be displayed on the screen.
6. At this point, some functions to manage the tag will be enabled (eg. Edit Tag, Save Tag, Print Tag and Delete Tag)

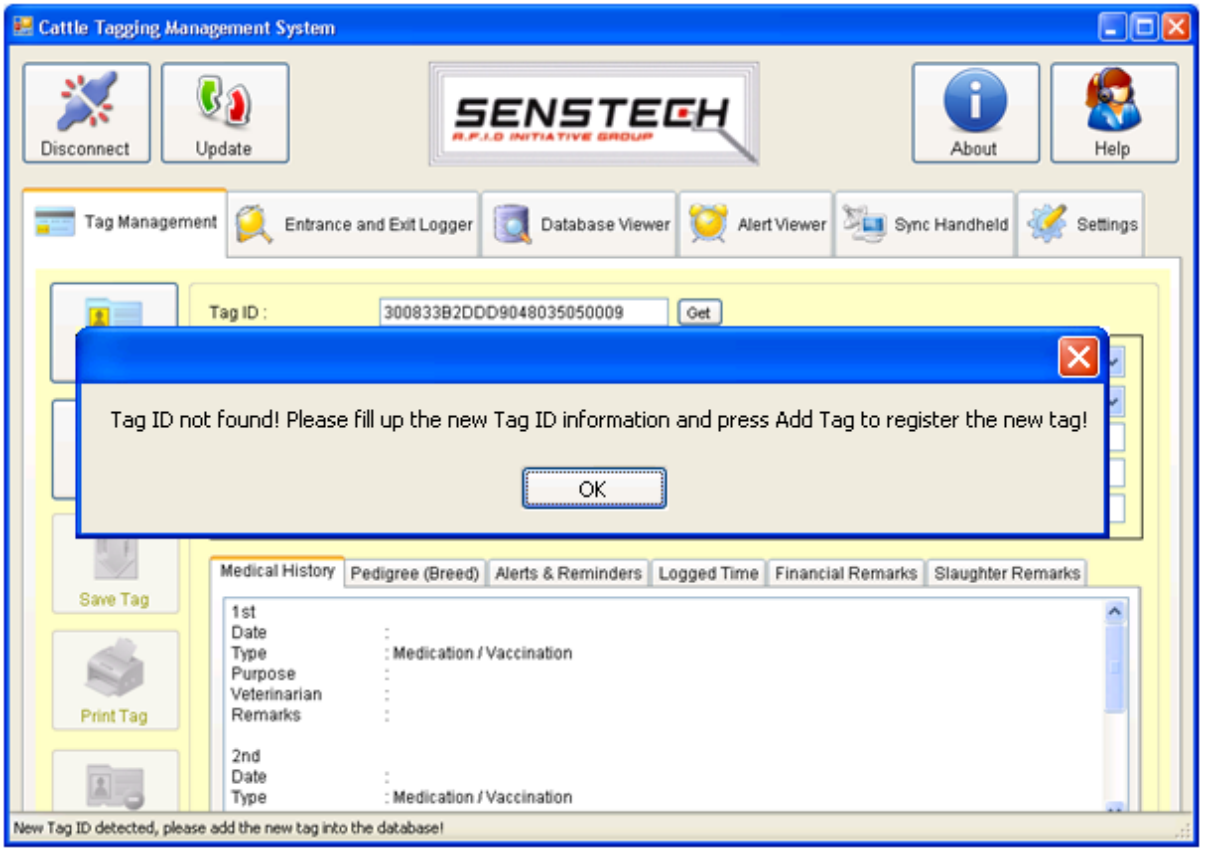

Figure 4.3-3 System Read a New or Unregistered Tag

7. If an unregistered tag is read, the system will pop up a message saying that the Tag ID not found. At this point, user is allowed to register the new found tag by fill up the information of the tag and press Add New button.

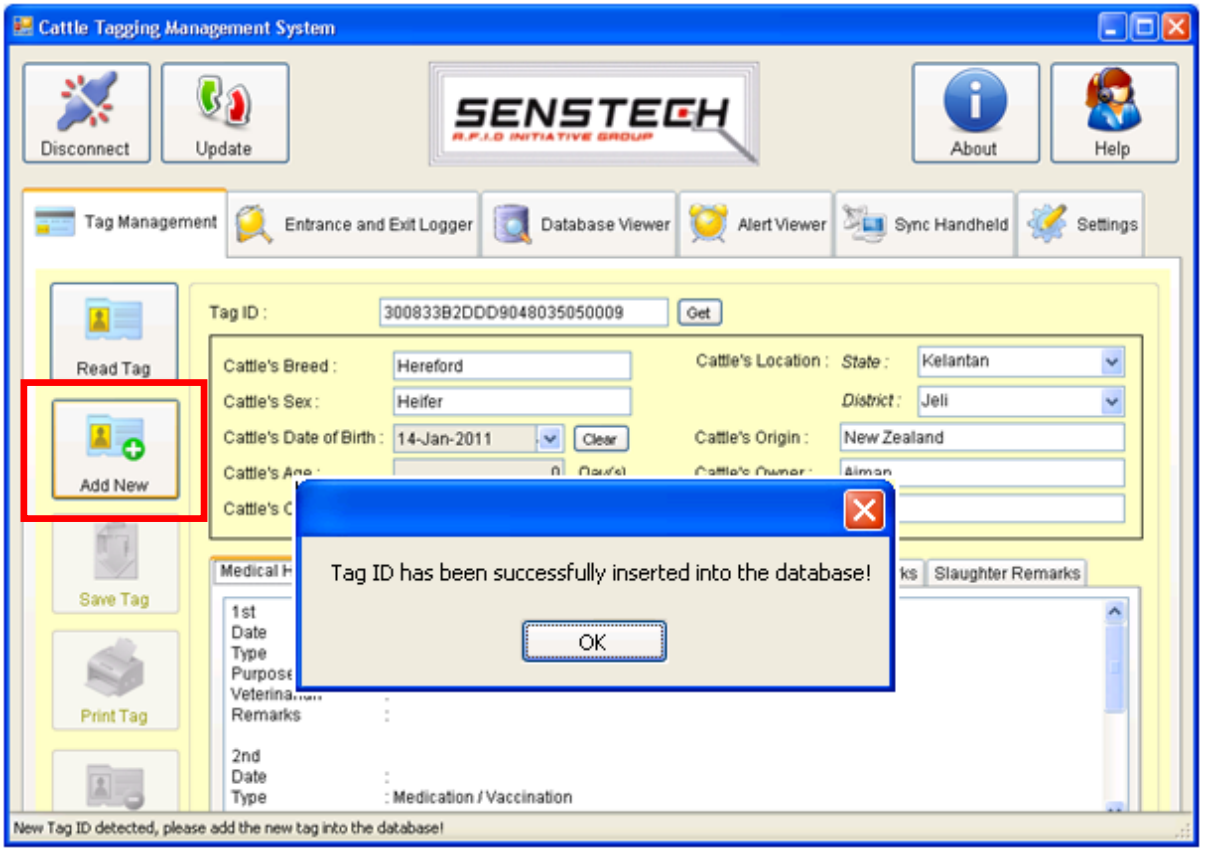

Figure 4.3-4 A New Tag is Successfully Registered and Added to Database

8. To edit a registered tag information, user will need to read the tag to retrieve all the information on the screen, from the screen, edit and make the necessary changes and press Save Tag.
9. To print a tag information, read the tag and press Print Tag.
10. To delete a tag, read the tag and press the Delete Tag button.

4.4 Entrance and Exit Logger

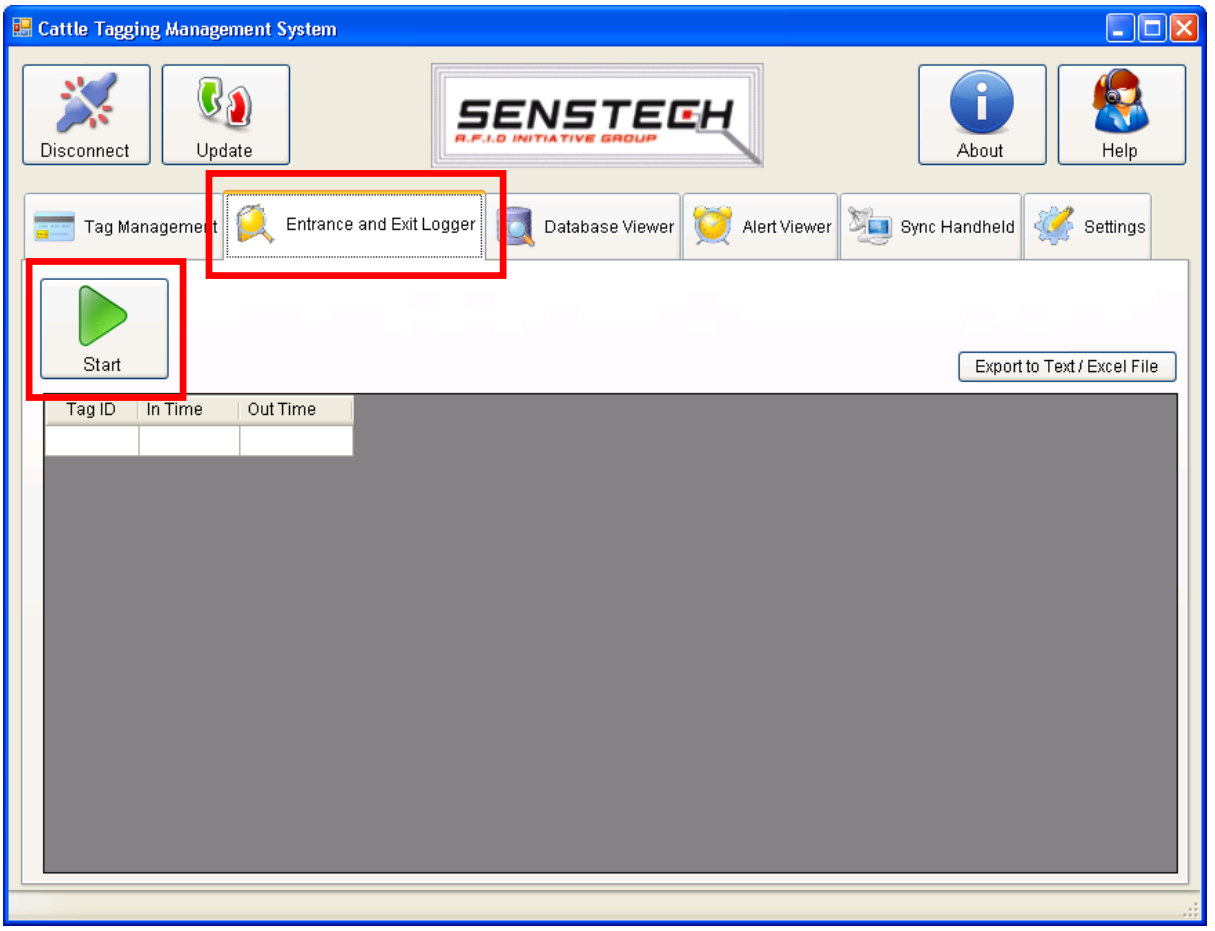

Figure 4.4-1 Entrance and Exit Logger Panel

1. Entrance and Exit Logger is a panel use to monitor and show the log of the cattle movement where the logger will show a list of tag detected by the antenna at the entrance and antenna at the exit. These activities will show the user which cattle going in and out the farm at the time detected.
2. In order to use the logger, please connect the antenna at the entrance to the port 1 of the reader and connect the antenna at the exit to the port 2 of the reader.

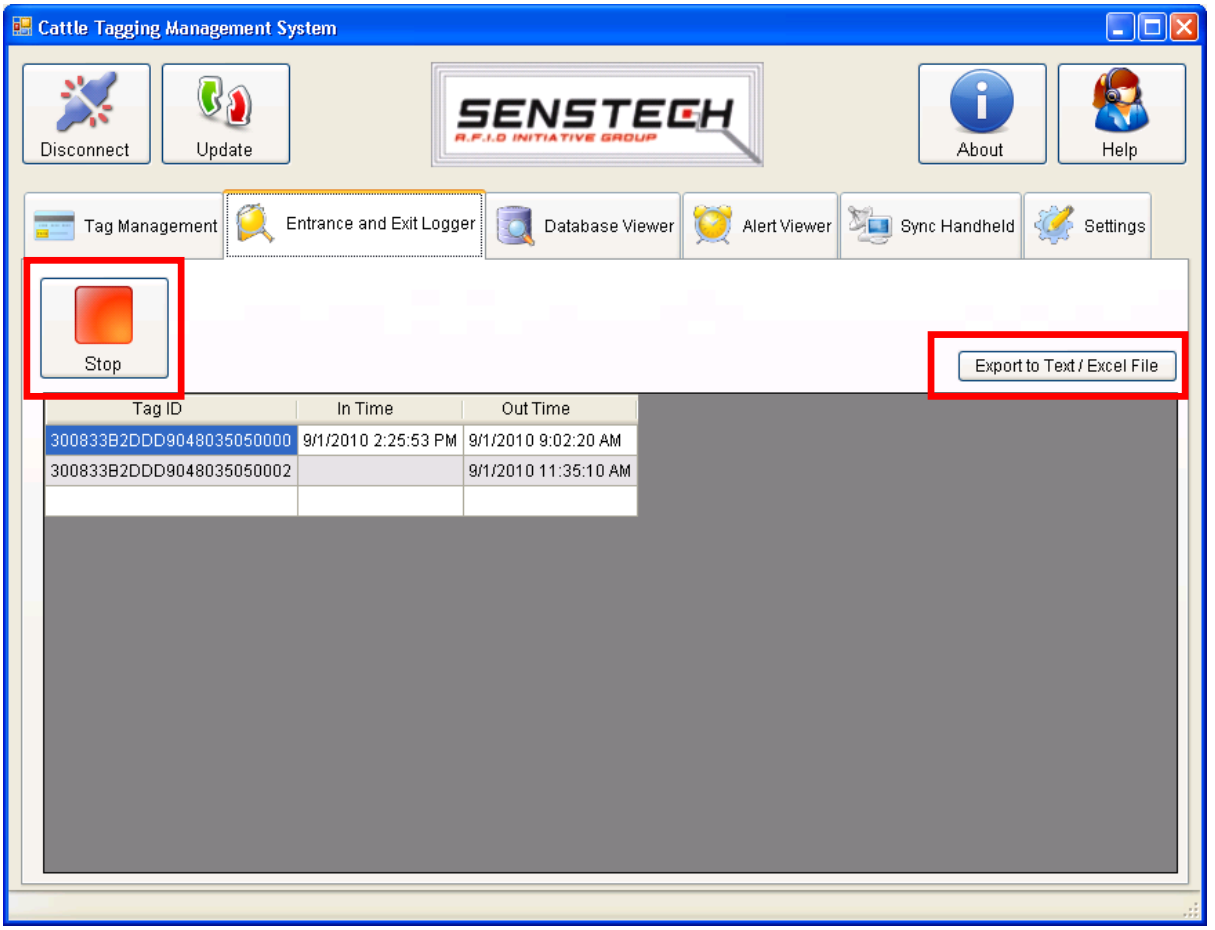

Figure 4.4-2 Entrance and Exit Logger Result Display

3. After the reader connected to the PC, Press once on the Entrance and Exit Logger tab, Press the Start button to start the monitoring process. The Start button will change to a Stop button when the monitoring process started.
4. During the monitoring, any registered tag that being detected by the Antenna 1 (Entrance) will appear on the screen and the date and time of the detection will be displayed in the Entrance column of the tag row. Similarly, tags that being detected by the Antenna 2 (Exit) will be recorded under the Exit column.
5. Note that, the time displayed on the screen will be update to the latest date and time if the tag is being redetect by the antenna.
6. Only registered tags will be monitored and recorded into the system. Any unregistered tag that being read by the reader will be discarded by the system instantly.
7. The monitoring process can be pause or stop by pressing the Stop button.
8. The log on the screen can be easily export to a file (eg. txt, xls) for further analysis by pressing on the Export button.

4.5 Database Viewer

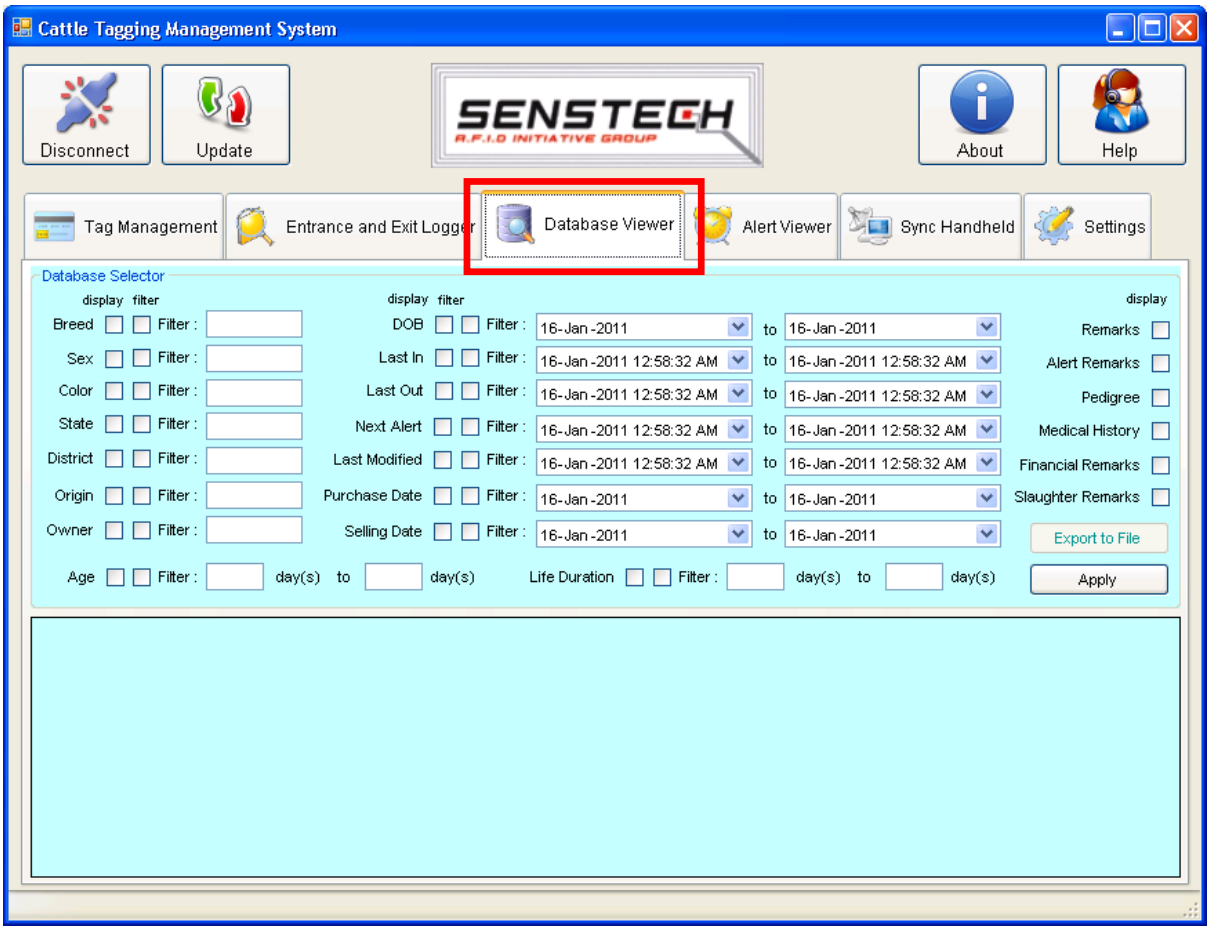

Figure 4.5-1 Database Viewer Panel

1. Database Viewer is use to retrieve all the information from the database.
2. User can also specific filter needed to refine the search from the entire database.

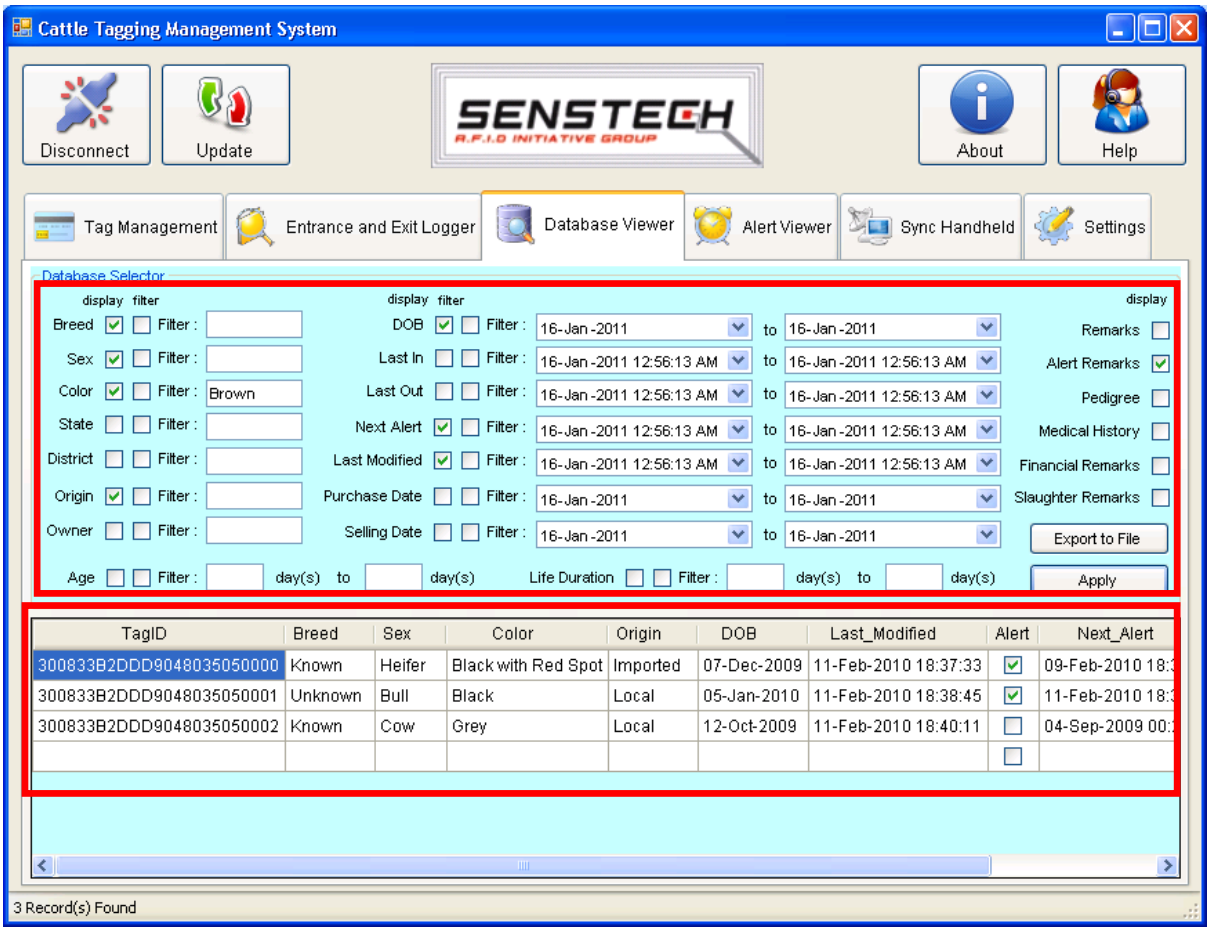

Figure 4.5-2 Database Viewer with Filtered Result

3. Just fill up the necessary filter criteria needed and press Apply.
4. The result of the search will appear in the panel below the form.
5. The result of the search can also be export to a text or excel file for further analysis.

4.6 Alert Viewer

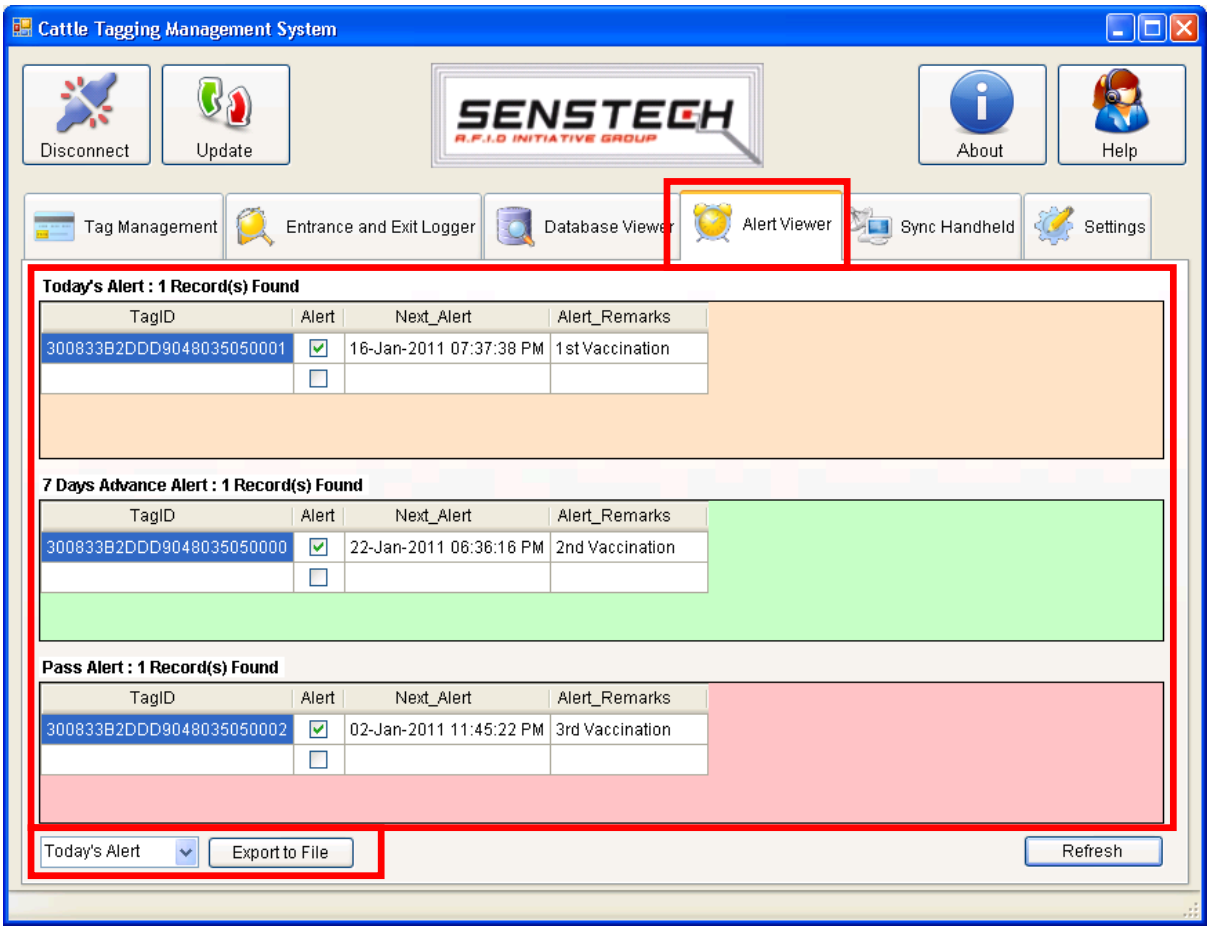

Figure 4.6-1 Alert Viewer Panel

1. Alert Viewer is use to monitor the alert triggered by the system at the specific date set.
2. An alert can be set to a specific tag from the tag management panel. It can be an alert for next vaccination, next action to be taken on the specific cattle or etc…
3. In the Alert Viewer panel, there are 3 kinds of alerts which are Today's Alert panel to show the alerts for today, Advanced Alert to show the alerts for 7 days in advance and Pass Alert to show the previous alerts that has been missed or delayed.
4. User will have to clear the alert once the action is taken to avoid the alert to be appear in the pass alert.
5. User can also keep updating the alert for next coming alert once the current action has been performed.
6. All the alert result can also be export to a file by choosing the right alert to be export from the drop down list.

4.7 Disconnect from Reader

1. To disconnect the reader from the system, just press on the Disconnect button.
2. Only the Database Viewer and Alert Viewer can be operated under offline mode.
3. Tag Management Panel can also be operated under offline mode by manually key in the Tag ID and press Get.