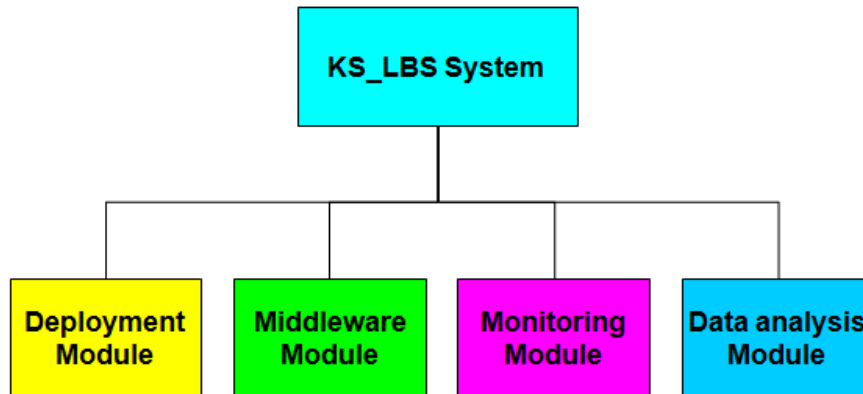


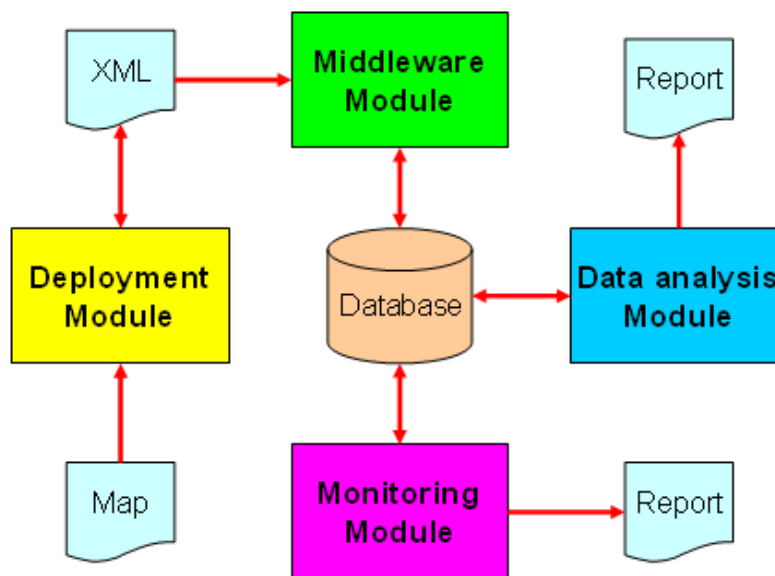
KS_LBS 1500

1. System Function Description

The KS_LBS system provides the functions to support the indoor real time locating. It includes Deployment, Middleware, Monitoring and Data analysis modules as the structure diagram below.



The whole system running through Database & Input/Output file interface to connect these four module in collaborative operation as the diagram below:



1.1 Deployment Module

The deployment module can provide a graphic user interface to load the 2-D map and deploy reader on the map. It also can draw the location area on the map and to set the parameter of: the area name, the relating reader ID or exciter ID, RSSI range and the option to have a record and/or alarm when entering this location area. The monitoring module display the personal location is depend on the RSSI value received by the middleware module and compare to the RSSI range which is set on the location area by the deployment module. All the deployment setting can be saved as a .xml file.

1.2 Middleware Module

The middleware module provides resident service to query deployed readers to get the communication packet from tag. The communication packet contains tag_ID, reader_ID, exciter_ID, RSSI, emergent button pushed, battery life, etc. The middleware can disassemble the communication packet send from tag and save to database. If the deployment information changed, we must load the deployment file and save to database before start the middleware.

1.3 Monitoring Module

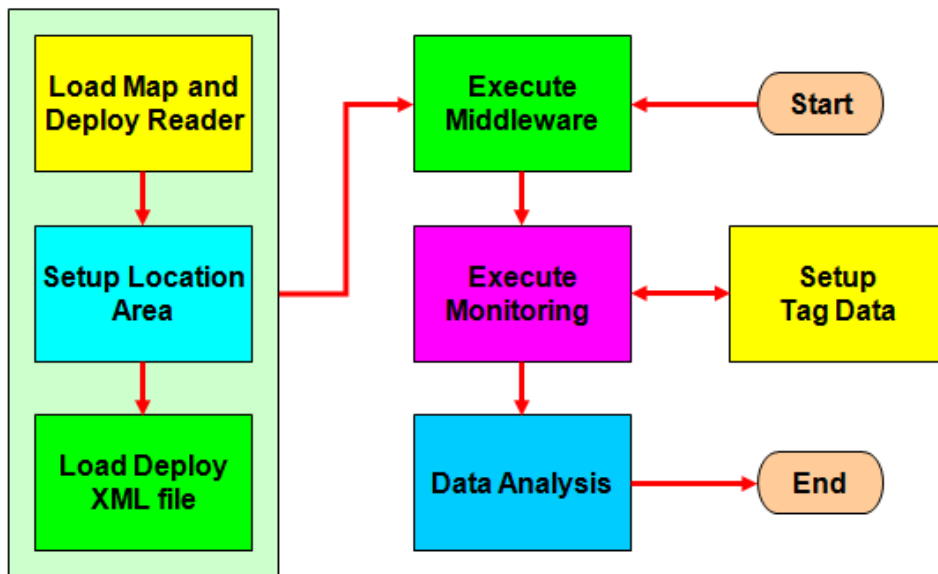
The monitoring module provides the graphic user interface to present the personal location and to monitor the status. It retrieves the tag information from database to refresh the monitoring screen. If the emergent button is pushed or entering alarm area is happened, the top screen will pop up the warning image and alarm voice is started. Also, the monitoring module provides the function to maintain the tag data and setup the system parameter.

1.4 Data analysis Module

The data analysis module provides the function to query history data and analyze the history data to find some specific behavior. The history data records who pushes the emergent button and when to push it. Also, the history records who and when enters each location area and when to leave it. By the cross-analysis, we can find the specific personal activities trajectory. By the way, we can also try to understand the personal most common activities in the region and time and with whom.

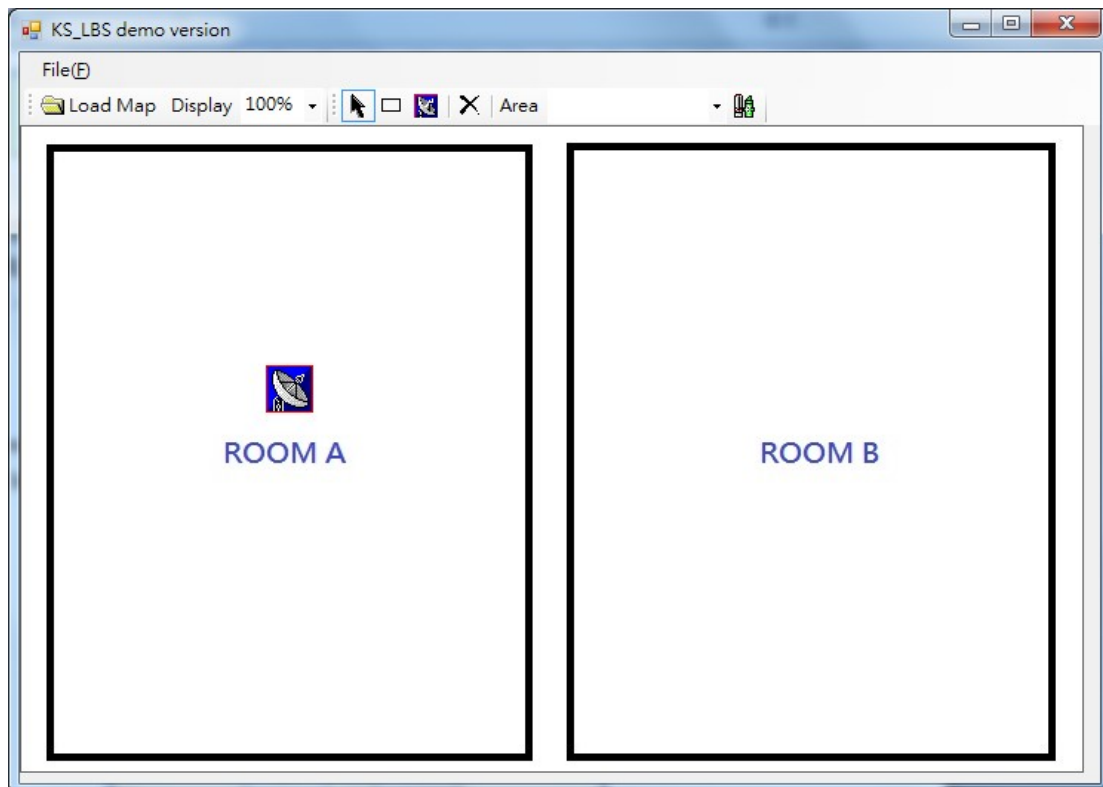
2. System Operation Description

The system operation flowchart as below:

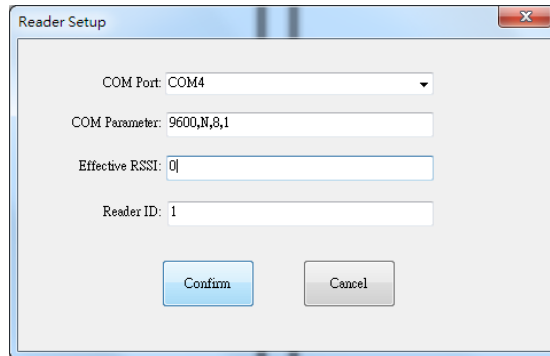


2.1 Deployment

Execute the deployment program to load the map and deploy the reader. The example as below:



Setup the reader parameter as below:

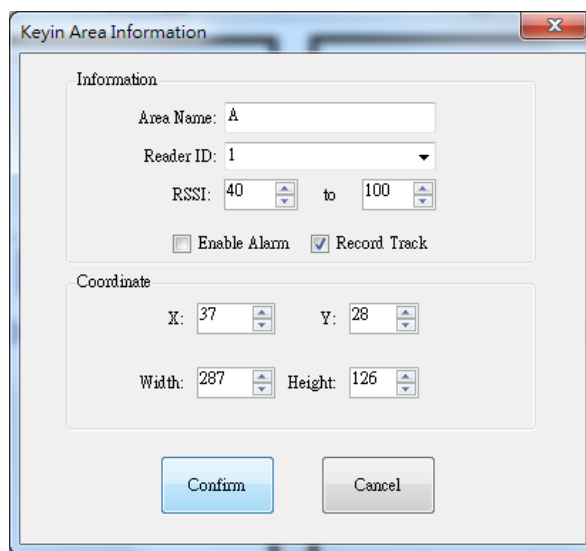


Reader Setup dialog box with the following fields:

- COM Port: COM4
- COM Parameter: 9600,N,8,1
- Effective RSSI: 0
- Reader ID: 1

Buttons: Confirm, Cancel

We can draw the area range in the map and setup the area parameter as below:



Keyin Area Information dialog box with the following fields:

Information

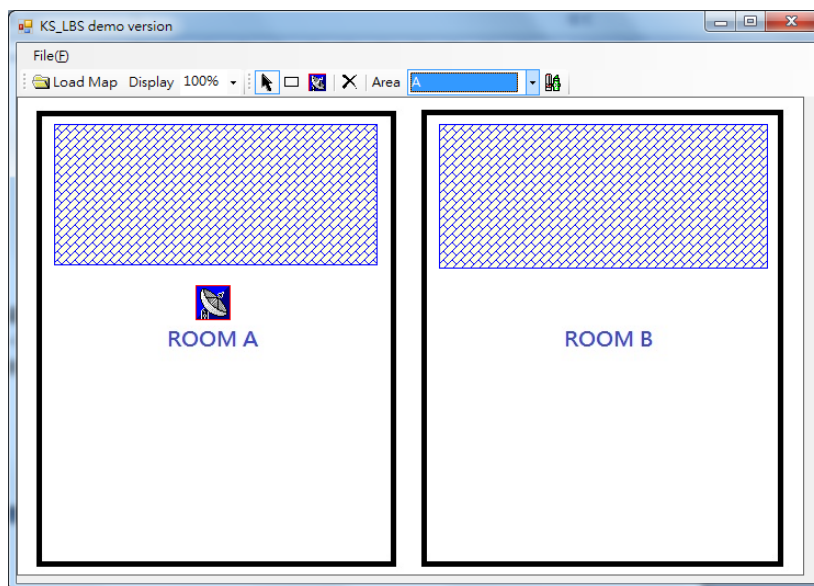
- Area Name: A
- Reader ID: 1
- RSSI: 40 to 100
- Enable Alarm Record Track

Coordinate


- X: 37 Y: 28
- Width: 287 Height: 126

Buttons: Confirm, Cancel

Finish the deployment and save to an XML file.

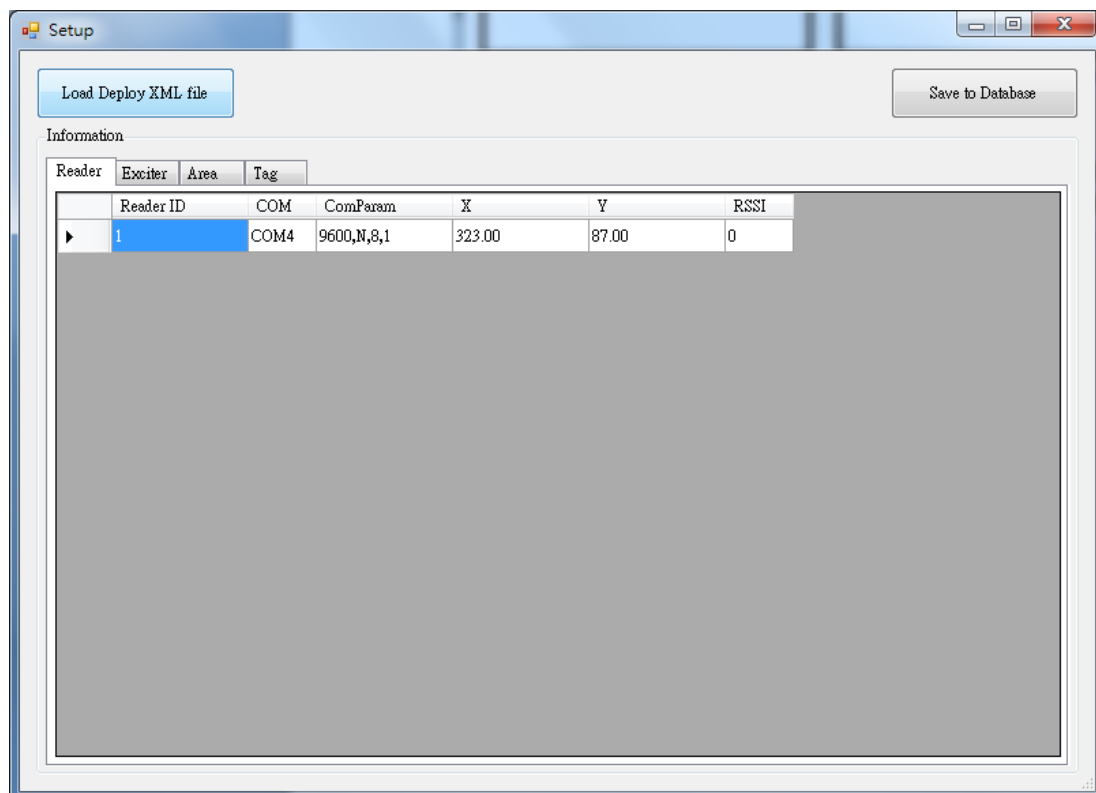


2.2 Middleware

Execute the middleware will show  icon in the status bar. Press this icon and right-click the mouse will show the function window. Press "Load Deploy XML file" at the first time to run the middleware, or every time update the deployment.



Press "Load Deploy XML file" button to load the deployment information. Confirm and press "Save to Database" button to save the deployment information to database.

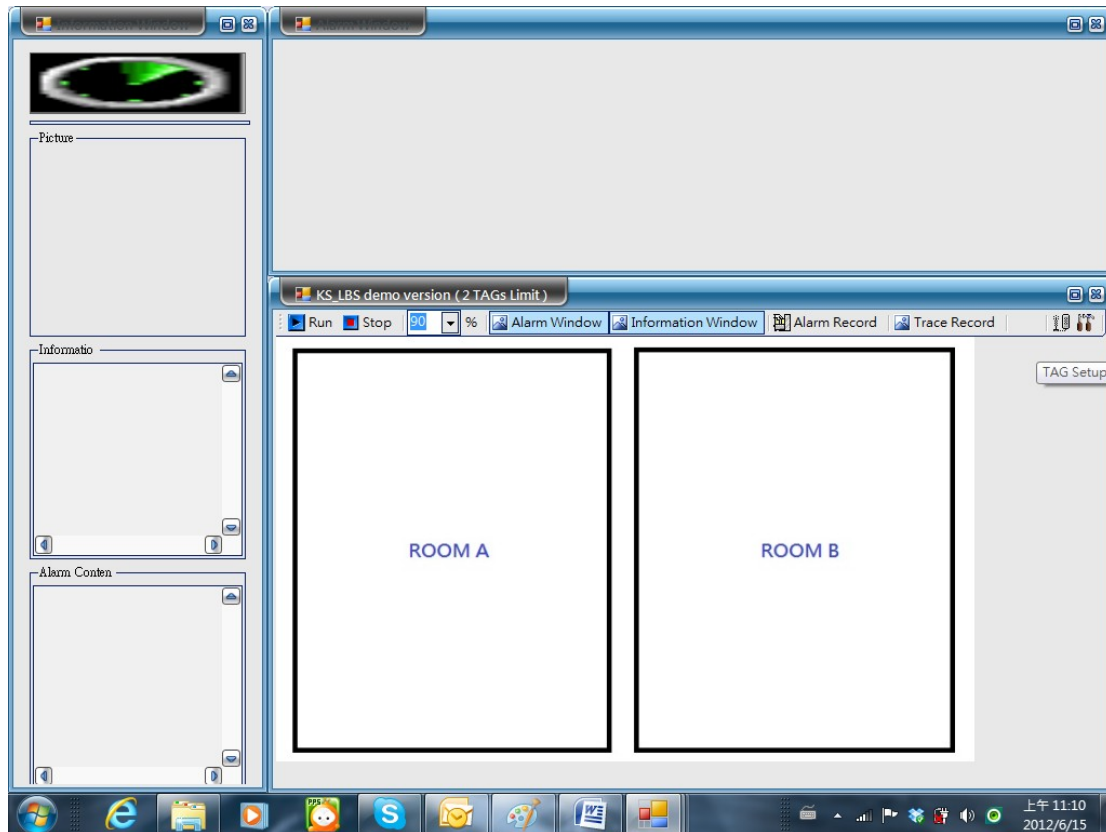


Press “Start” to start the middleware.

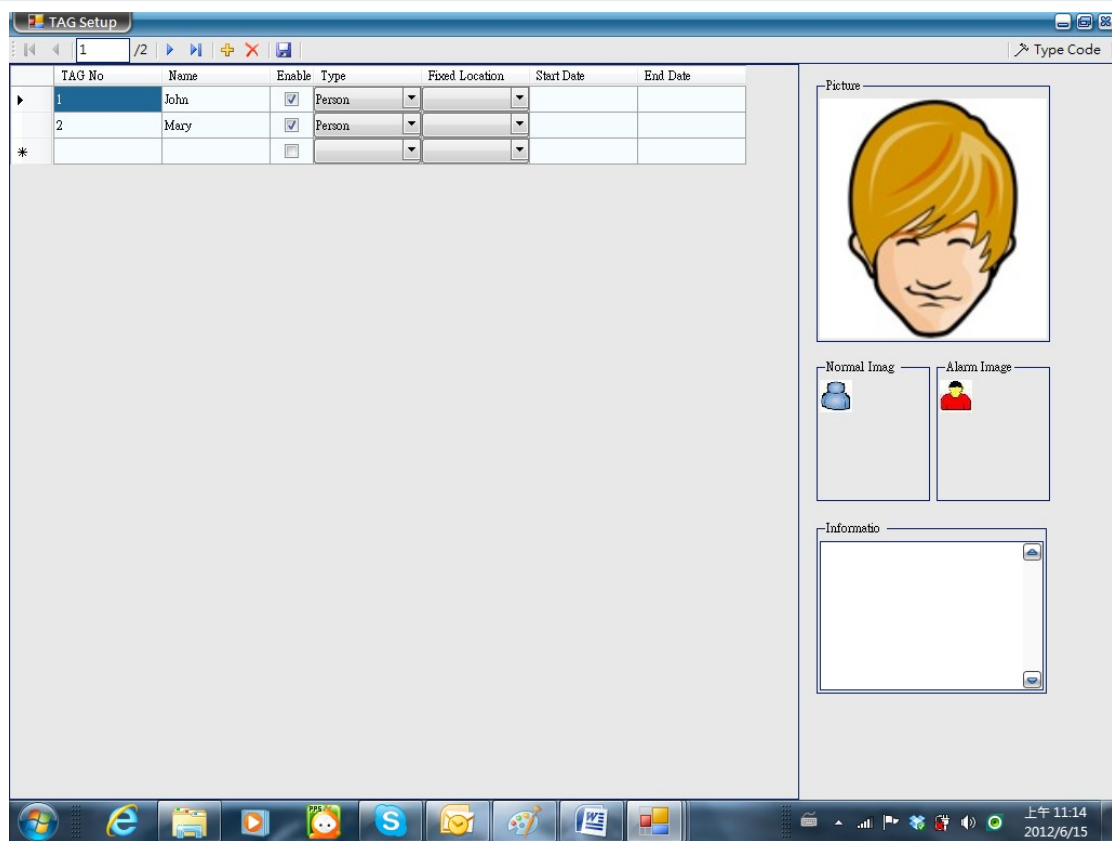


2.3 Monitoring

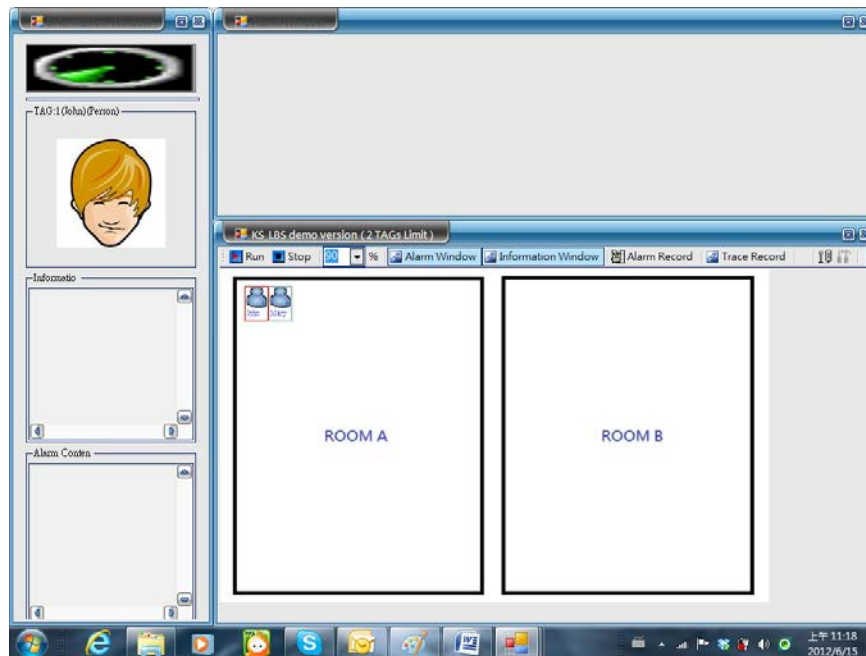
Execute the monitoring program will show the screen as below. We can press “Alarm Windows” and “Information Window” button to enable/disable this two windows.



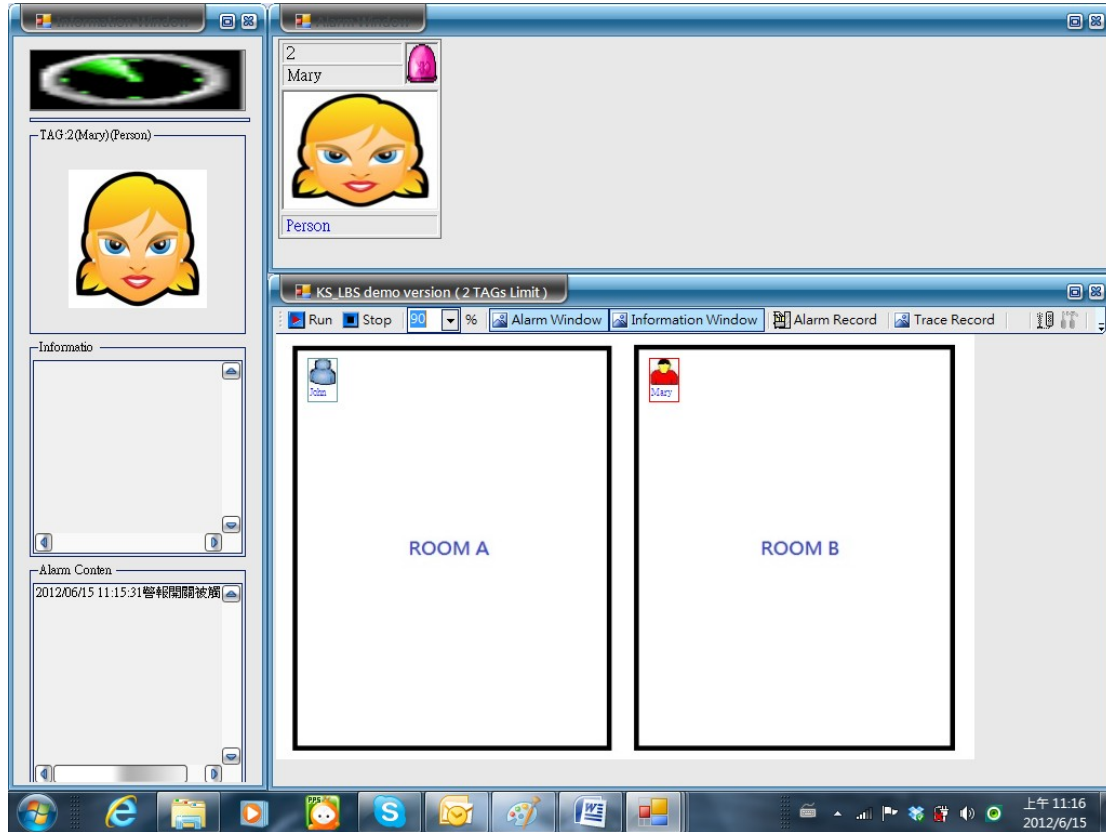
Press “TAG setup” button will show the screen as below. We can setup the tag information and press “Save” button to store tag information into database. Double click the picture or image to change the picture or image.



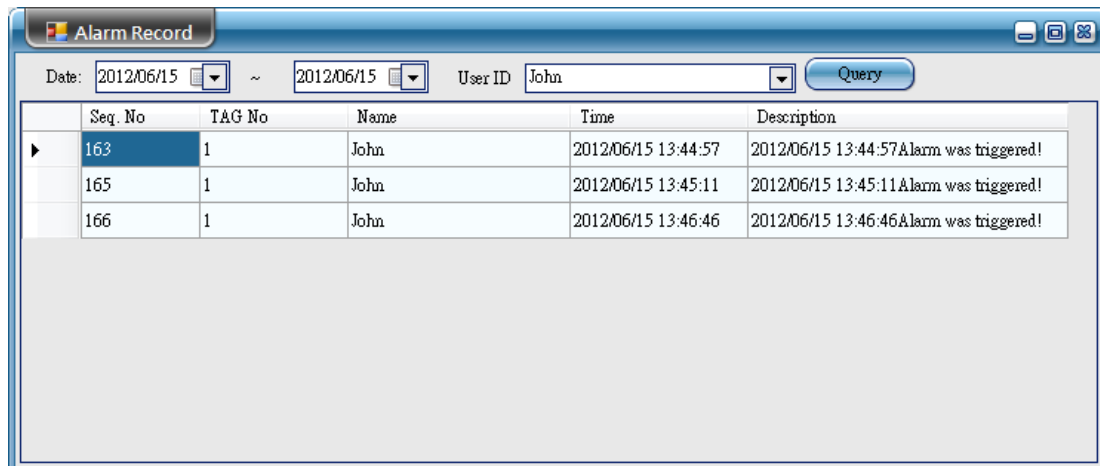
Press “Run” button to start monitoring. The screen will show the real time location of tags.



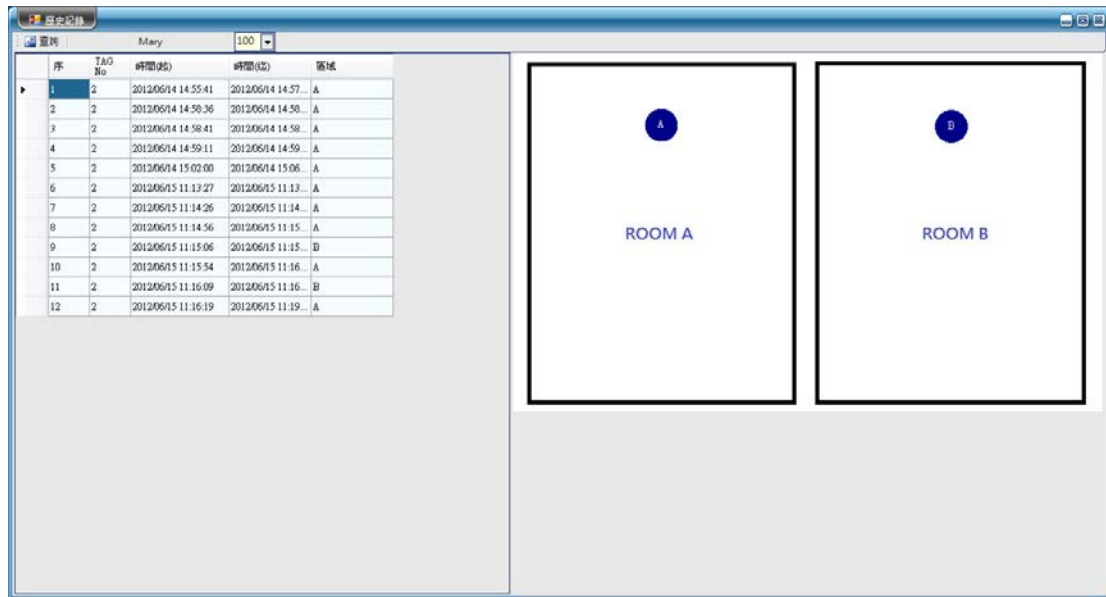
If the tag's alarm button is pressed, the monitoring screen will show as below. The tag press the alarm button will appear in the alarm window. We can disappear this alarm by double click the red light in the right-top of this tag.



Press "Alarm Record" button to query the alarm history records as below.



Press "Trace Record" button to query the trace data as below.



The screenshot displays the 'Trace Record' interface. On the left, a table lists 12 trace records with columns for '序' (No.), 'TAG No.', '時間(起)' (Time Start), '時間(迄)' (Time End), and '區域' (Area). The first record is highlighted. On the right, a diagram shows two rooms, 'ROOM A' and 'ROOM B', each with a blue circular marker labeled 'A' and 'B' respectively, indicating the location of the tracked device.

序	TAG No.	時間(起)	時間(迄)	區域
1	2	2012/06/14 14:55:41	2012/06/14 14:57...	A
2	2	2012/06/14 14:58:36	2012/06/14 14:58...	A
3	2	2012/06/14 14:58:41	2012/06/14 14:58...	A
4	2	2012/06/14 14:59:11	2012/06/14 14:59...	A
5	2	2012/06/14 15:02:00	2012/06/14 15:06...	A
6	2	2012/06/15 11:13:27	2012/06/15 11:13...	A
7	2	2012/06/15 11:14:26	2012/06/15 11:14...	A
8	2	2012/06/15 11:14:56	2012/06/15 11:15...	A
9	2	2012/06/15 11:15:06	2012/06/15 11:15...	B
10	2	2012/06/15 11:15:54	2012/06/15 11:16...	A
11	2	2012/06/15 11:16:09	2012/06/15 11:16...	B
12	2	2012/06/15 11:16:19	2012/06/15 11:19...	A