



## ***RavTrack PC SQL Server Edition***

### ***User's Guide***

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Real-time GPS Tracking Software

PC Compatible Version 5.2.4

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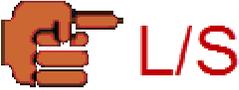
# Documentation and Conventions

Section1

## General

This manual uses the following conventions to present information:

Convention (TypeFace)	Description
<i>bold italic</i>	Menu commands and button names
<i><u>bold italic sans serif</u></i>	Web GUI page links
terminal	Computer display text
<b>bold terminal</b>	User-entered text
<i>italic</i>	Italic type indicates the titles.

Icon	Description
	Requests that you pay particular attention to a specified procedure or piece of information in the text. The NOTE message has a regular type style.
	Information shown here describes a difference between the Lite version of the program and the Standard version of the program. .
	<b>CAUTION Icon: Suggest you review the referenced details and heed the instructions offered. The CAUTION message has a bold type style.</b>
	<b><i>WARNING Icon: Demands that you observe the actions given in the text. The WARNING message has a bold italic type style.</i></b>
	COMPASS Icon: Points the user to additional information concerning the topic under discussion. The COMPASS message has a regular type style.

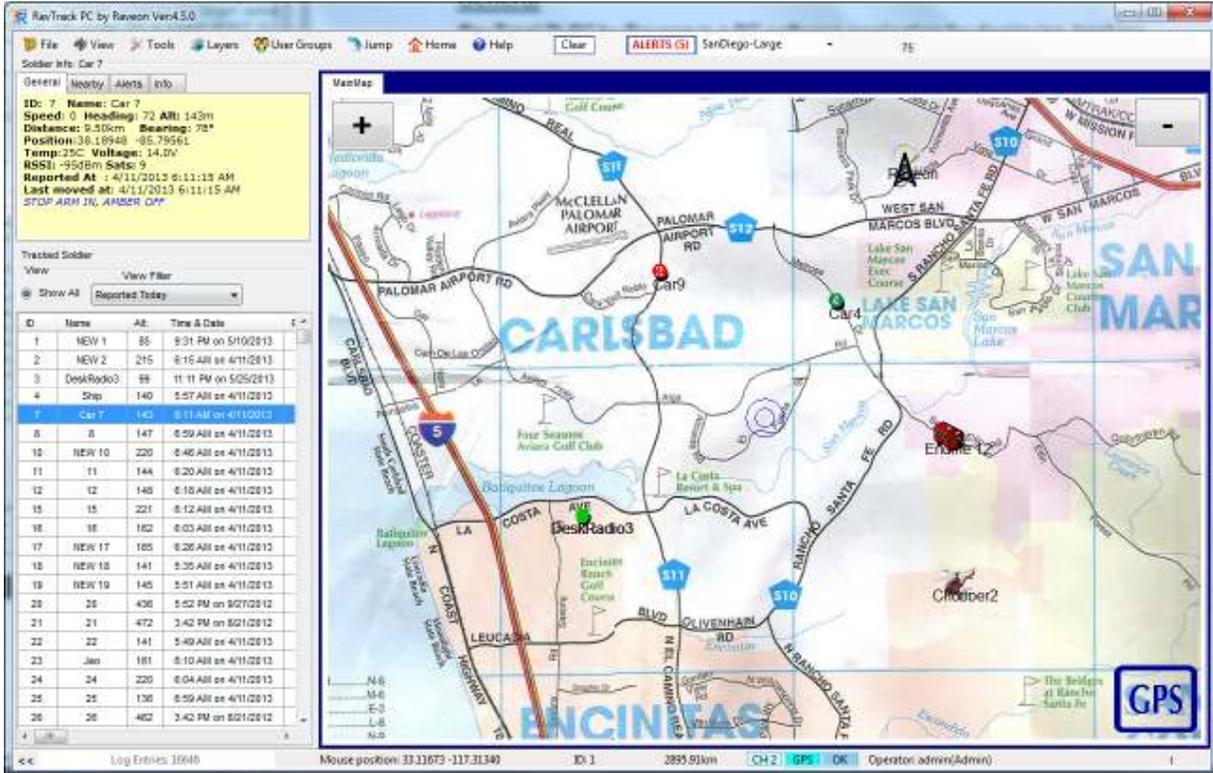


# Overview of Major Capabilities

## Section2

### General

RavTrack™ PC by Raveon is a PC software application for displaying, tracking, alarming, and logging the activity of RavTrack Transponders.



This easy-to-use PC application graphically shows the location and status of cars, trucks, people, or anything equipped with RavTrack Transponders. The displayed map may be any graphic image, bitmap, or .jpg. Additional graphics such as lines, shapes, and icons may be added by the user.



### L/S RavTrack PC Versions

Information shown here describes a difference between the *Trial, Limited* and the *Unlimited* license for the *RavTrack PC* program. The software activation key purchased from Raveon determines the level of functionality. The table below outlines the differences between the various versions of the *RavTrack PC*.

Version	Duration operation	Number of common channels	Multi-user operation	Maximum number of tracked objects	TCP/IP comms	Logging location and status to disk	Microsoft SQL Server Updating
Trial	30 days	6	Yes	10	Yes	Yes	No

Lite	unlimited	1	No	Not limited	No	No	No
Standard	unlimited	6	Yes	Not limited	Yes	No	No
Server	unlimited	6	Yes	Not limited	Yes	Yes	Yes

The **Trial** license of the RavTrack PC is strictly for short-term evaluation of the program to determine its suitability for a particular use. All features of the software are enabled, but only a maximum of 10 transponders may be tracked and the trial version will not store to Microsoft SQL server databases.

The **Lite** license of *RavTrack PC* is for use on a stand-alone computer or tablet that does not share position/tracking information with other computers in its network. Typically the **Lite** version is used for in-vehicle display or simple position visualization. It does not log to disk, print reports, or receive position reports over a network interface.

The **Standard** license is suitable for workstations at dispatch, control centers, and anywhere that the computer running *RavTrack PC Server* will be sharing its position/status information with other users. Standard can read data from SQL databases, but it does not store GPS position data from GPS transponders to a SQL database.

The **Server** version has all features of the Standard version, plus it can update and manage the database on a Microsoft SQL server. It stores the GPS position and status information from GPS transponders to a SQL database (Microsoft Access or Microsoft SQL Server).

Regardless of the type of license acquired from Raveon, one license may only be used on one PC. Multi-user systems must purchase one license per computer.

### Legal Notice

GPS tracking may be illegal in certain states and in certain circumstances. Raveon's tracking devices may not be used to violate the privacy rights of others, or in violation of local, county, state or federal statutes. In no way will Raveon Technologies Corporation, dealers or partners be held responsible for inappropriate use of these products.

IT IS THE SOLE RESPONSIBILITY OF THE BUYER TO CONSULT LEGAL COUNSEL FOR THE INTERPRETATION OF ANY LAWS APPLICABLE TO THE AREA OF INTENDED USE OF THESE PRODUCTS.



## Installation

### Section 3

#### Recommended System requirements

*RavTrack PC* is a Windows application. For small or stand-alone systems, it uses a Microsoft Access database to store its information in. For larger system, deep logging, or multi-user applications, we recommend using a Microsoft SQL server to store the primary database. This manual describes the features, installation, and configuration of the SQL Server version of *RavTrack PC*.

If your server will LOG tables with more than 300,000 log entries at a time or your refresh rate in a multi-user environment will be faster than 10 seconds, we recommend you use a business-grade server to hold the LOG and TrackedObject database. Typical minimum requirements are:

Intel® Xeon® E55xx processor or faster  
6GB of RAM

Server-grade hard-drives

Supported Databases:

1. Microsoft SQL Server 2005
2. Microsoft SQL Server 2005 express (10GB database limit)
3. Microsoft SQL Server 2008
4. Microsoft SQL Server 2008
5. Microsoft SQL Server 2012

#### Program Dependencies



*RavTrack PC* is built using Microsoft's .NET foundation. The computer *RavTrack PC* is installed on must have Microsoft's .NET version 4.0 or higher. If .NET is not on the computer, the *RavTrack PC* install program will initiate a download of it first, before installing *RavTrack PC*.



*RavTrack PC* uses *Crystal Reports 10* to create and view reports.



#### L/S SQL Server Version Installation Steps

1. Visit [www.ravtrack.com](http://www.ravtrack.com) and go to the "Downloads" section of the website.
2. Log into the website. If you are a new user, create a user account.
3. Click on the *RavTrack PC* software program link to download it to your computer.
4. A ZIP file containing an executable program called *Setup5.zip* will download to your computer. It is a fairly large download, typically 100-130MB, so it will take some time to download.
5. Once the download is complete, open the .ZIP file and double-click on the file *RavTrackPC.exe* contained in the .ZIP file.
6. Run the downloaded *setup.exe* file, and follow the setup instructions.

7. RavTrack PC is now installed on the computer. Proceed with the first-time setup instructions. *RavTrack PC* by default uses a locally stored Microsoft Access database to hold its information. Once installed, you can modify this default to utilize a SQL server if you wish.
8. If you will be using Microsoft SQL Server as your database, install the SQL Server software first and create a “**RavTrack**” database, before running *RavTrack PC*.
9. The first computer to start *RavTrack PC* will create the tables in the **RavTrack** database, so that computer must have full administration rights to the database. For Microsoft ACCESS databases, this should not be an issue. For SQL databases, you may need to temporarily allow the client full rights to the **RavTrack** database.

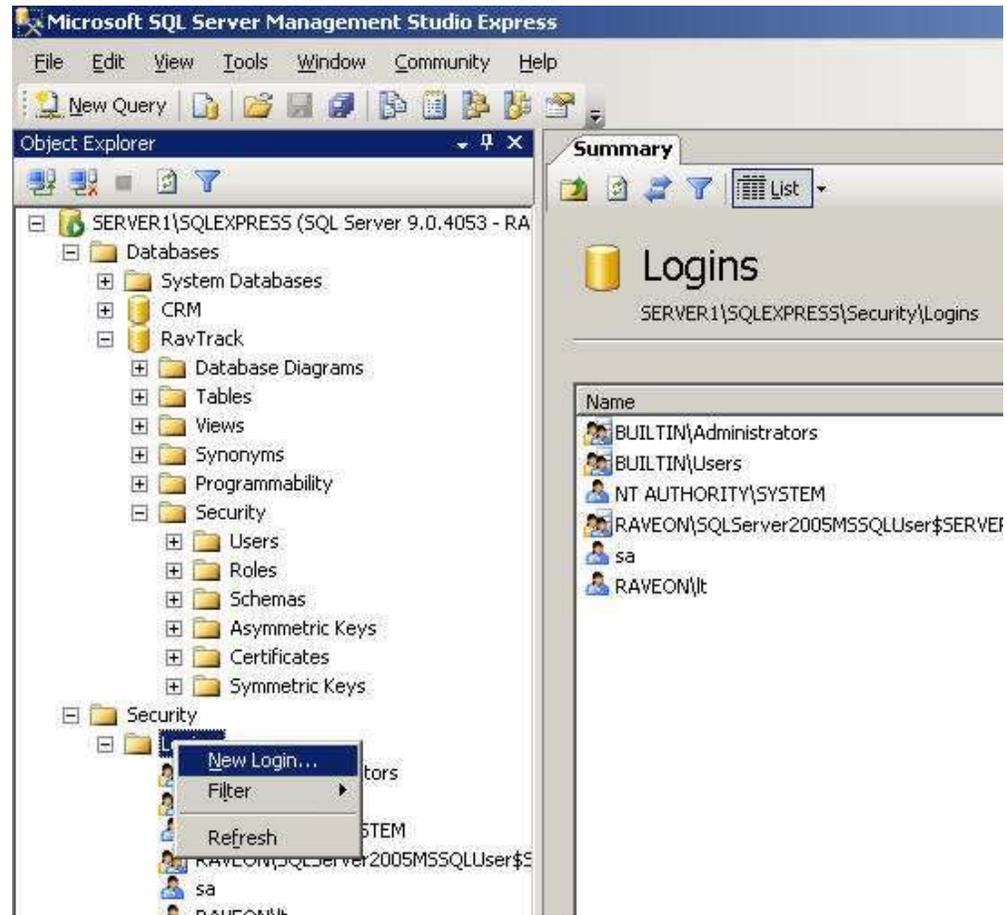
### Databases

When you choose to use Microsoft SQL Server for your *RavTrack PC* database, all of the location information of the GPS tracked vehicles will be stored in the SQL database called “RavTrack”. You must create this database manually using Microsoft’s Management Studio software program, and then assign the user login rights to the database. *RavTrack PC* will create the tables within the database.

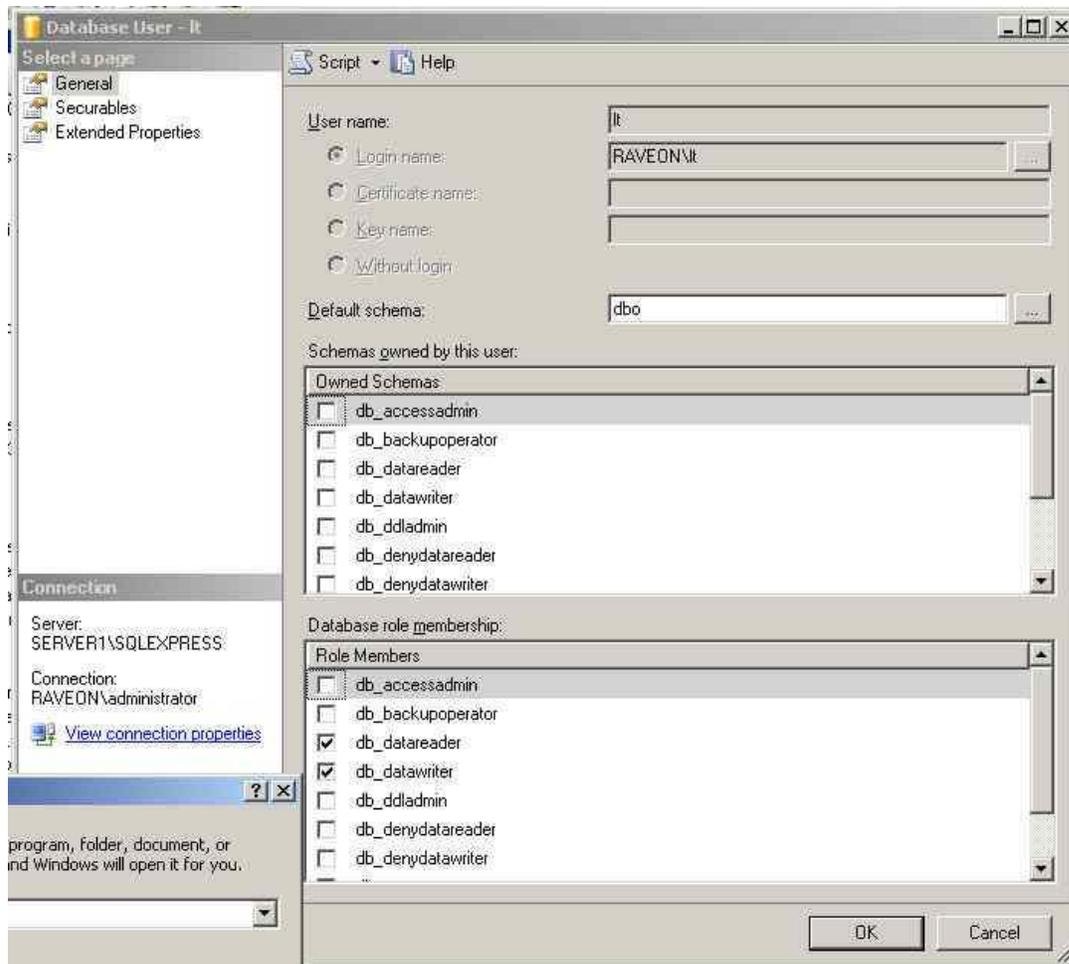
The steps to take to setup the *RavTrack* SQL database in SQL Server 2005 or 2008 are as follows:

- i. Using the Management studio, create a database with the name “**RavTrack**”. You do not need to create any tables in the database, as *RavTrack PC* will create them the first time it connects to this database.
- ii. Using *Management Studio*, create security login accounts for the users that will be using *RavTrack PC* on the network. Right click on Databases > Security > Logins > New Login... to create a new login

account for each user. Set the Server Role to “serveradmin”.



- iii. Using Management Studio, assign the new user login to the RavTrack database. Right click on Databases > RavTrack > Security > Users . Add User... to add the new user to the database.
- iv. Set the Role Members” to db\_datawriter and b\_datareader.



V.

Management Studio is a very good tool to use not only for configuring SQL Server, but also to verify that connections to the RavTrack database are OK. On any workstation that you feel there is a login problem with the database, login to that workstation with the user name and password, run Management Studio, and try to access the RavTrack database. If you can access it and list the tables, then the user name and password has the proper rights configured on the server.

There is a version of Microsoft SQL Management Studio for every version of their SQL Server program

### **Microsoft SQL Server Configuration**

If you are going to use a Microsoft SQL Server 2005, 2008, 2012, or 2014, database with *RavTrack PC*, then you will need to prepare the SQL Server first, before running *RavTrack PC*. Microsoft SQL Server requires expertise in database installation and administration. Microsoft SQL Server does not have to be installed on a computer running a server operating system. It may be run on a Windows XP, Vista, 7 or 8 computer.



SQL Server installation is often very challenging for personnel not trained in Microsoft SQL Server management. Raveon highly recommends that professional IT consultants with proper experience and training setup and configure the SQL Server software and computer.

If your network has a domain controller, then all computers, clients, and servers should be part of that domain, or a member of a domain with a mutual trust between the domains. Setting up mutual trust is a complicated procedure and should be done with a great deal of care and due security considerations.

Client computers running *RavTrack PC Standard* that remotely connect via a network to the SQL Server computer will need to be “Authenticated”. Authentication ensures that the client computers have the right to access the SQL Data. There are two ways a client computer will be authenticated by SQL Server.

**Windows Authentication.** The user name and password that the person logged onto Windows on the client computer is used by SQL Server to authenticate the user.

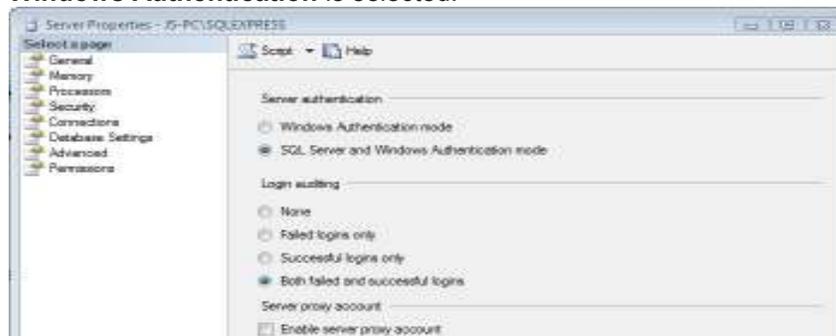
**SQL Server Authentication.** With this method, *RavTrack PC* must be configured with a password and login name. The same login name and password will be configured at the SQL Server. By default Raveon configures SQL Server authentication login name as “RavTrackUser” and the password is “password”. You may configure it to a name and password that you would like.

Here are some suggested steps when installing MS SQL Server. Your installation may vary:

1. If you are using *Windows Authentication* to connect and authenticate your computers, make sure that all client computers have
  - A) A login name
  - B) A passwordthat matches the EXACT login name and password on the server. Windows Login will not work if the account names and passwords are not the exact same on the server that runs SQL Server and any client machine that wants to connect to it.
2. Install Microsoft SQL Server or SQL Server Express. *SQL Server Express* is available from Microsoft at no charge.
3. Use the “*SQL Server Configuration Manager*” software program that is installed with MS SQL Server to configure the server. Be sure to enable the TCP/IP Client Protocol (*SQL Server Configuration Manager > SQL Native Client Configuration > Client Protocols > TCP/IP*).
4. Also download and install the “*Management Studio*” for SQL Server. The Express version may be downloaded at the same website as the SQL Server Express is downloaded from. To run Management Studio as an administrator, right-click on it when you start it, and say “*Run As...*” and then select the administration account to run as.

## 5. Configure the SQL Server Settings using *Management Studio*

- a. Set the default transaction time-out to 600 seconds (Tools> Options> Designers> Transaction Timeout)
- b. Set the “*Server Authentication*” method to both Windows and SQL Server. (right click on the **Server** in Object Explorer, select **Properties**, **Security** page) Check the correct button.
- c. Right click on your SQL database server, and select **Properties**. Enable the type of user authentication you wish to use. We also recommend enabling “Login Auditing” of all login attempts to help trouble shoot authorization issues. Make sure if you use SQL Authentication, that the **SQL Server and Windows Authentication** is selected.



- d. Using Management Studio, create a database with the name “**RavTrack**”. You do not need to create any tables in the database, as *RavTrack PC* will add them to the database the first time it connects to this database. Set the Server Role for the users to “serveradmin”.
  - e. Add Logins to the SQL Server for any user ID that will be using the database. (**Security > Logins** then right-click Logins and select “**New Login...**”) Add your user account and password here.
  - f. Add the Logins or users that will use *RavTrack PC* software to the **RavTrack** database. To add Logins, expand the **RavTrack** database tab, **Security, Users**. Then right-click **Users** to add new users to the database. Set the new Login’s “Default Database” to **RavTrack**.  
Very Important: Set the “**Database Role Membership**” for the Login to db\_datawriter, db\_owner, and db\_datareader.
  - g. Verify the “SQL Server Browser” service is running on the computer. To verify or start the server, go to Control Panel > Administrative Tools > Services, and scroll down to find the **SQL Server Browser**. Make sure the service is Started. If it is not running, other computers cannot discover the sever when they scan for SQL servers on the network.
6. If SQL Server was installed on a Windows XP computer, make sure the “*Simple File Sharing*” is turned off. To do this, open Windows Explorer, select **Tools > Folder Options > View**, and verify the **Use Simple File Sharing** box is not checked.
  7. On the computer running *MS SQL Server*, make sure the directory services are running so that *RavTrack PC* workstations can discover the SQL Server. To see if the services are running on the SQL server computer, go to **Start > Control Panel > Administrative tools >**

**Services.** The SQL “*Server Browser service*”, “*SQL Server*”, and “*SQL Server Active Directory Helper*” services should all be started. If they are not running, enable and start them.

### **Troubleshooting:**

If you are having trouble connecting *RavTrack PC* to your SQL server installation, check the following items:

- i. Shut down *RavTrack PC* using File > Exit, and restart it. Whenever the database type is changed in *RavTrack PC*, you should restart the application.
- ii. Install Microsoft’s *Management Studio* application on the computer running *RavTrack PC*. Use Management Studio to connect to the server to verify that the SQL Server is running properly and accessible from the workstation.
- iii. Make sure the the TCP/IP Client Protocol is enabled on the SQL Server.
- iv. Make sure you are logged into *RavTrack PC* as an administrator with the ADMIN account.
- v. Make sure you have purchased and installed an “*Unlimited*” license on *RavTrack PC*. The “*Limited*” version will not connect to an SQL Server.
- vi. Make sure you created a database on the SQL server named “*RavTrack*”. The *RavTrack* database needs to be on the server before running the *RavTrack PC* program. Use the Management Studio to create the “*RavTrack*” database on the server.
- vii. You should have an account on the SQL Server computer with the same name and password as the name/password that you used to log onto Windows on the *RavTrack PC* computer. If you have not done this, create a Windows user account and password on the SQL Server computer to match the Windows user/password on the *RavTrack PC* Windows login account.
- viii. Make sure the rights assigned to the login account are at least db\_reader, db\_writer, and db\_admin.

### **RavTrack PC First-Time Setup**

Once the *RavTrack PC* software is loaded on the computer, you must configure a number of settings and add your tracked objects to the database.

Begin by running the *RavTrack PC* application. Select the ***Start Menu*** and then under All Programs, select ***Raveon***, and then ***RavTrack PC***.

This will start-up the *RavTrack PC* software. The first time the software is run, you will see a pop-up window showing the message:

RavTrack PC Trial Software License. Contact Raveon sales to purchase a license to use this product.

Click OK, and let the program begin normally. Once it begins, enter your license information. *RavTrack PC* will run for 30 days with the Evaluation license key that is automatically installed with the product.



The first computer to start *RavTrack PC* will create the tables in the **RavTrack** database, so that computer must have full administration rights to the database. For Microsoft ACCESS databases, this should not be an issue. For SQL databases, you may need to temporarily allow the user on the *RavTrack PC* computer to have full rights to administer the **RavTrack** database.

### Entering the License Key

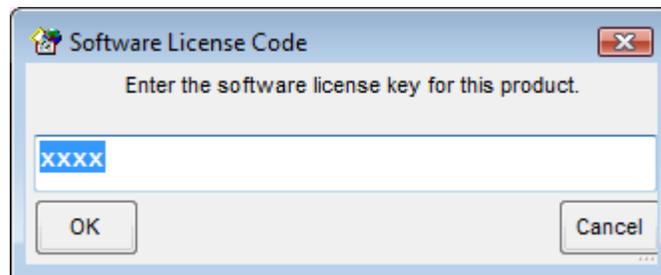
To use *RavTrack PC*, you must purchase a license for each copy you will be using. Contact Raveon sales ([sales@raveon.com](mailto:sales@raveon.com)) to purchase a license. Your license key will be emailed to you.

To enter the license key into *RavTrack PC*, start up the software and select **Help > About Ravtrack**.

On the *About RavTrack PC* help window, there is a button labeled “**Modify License**”.



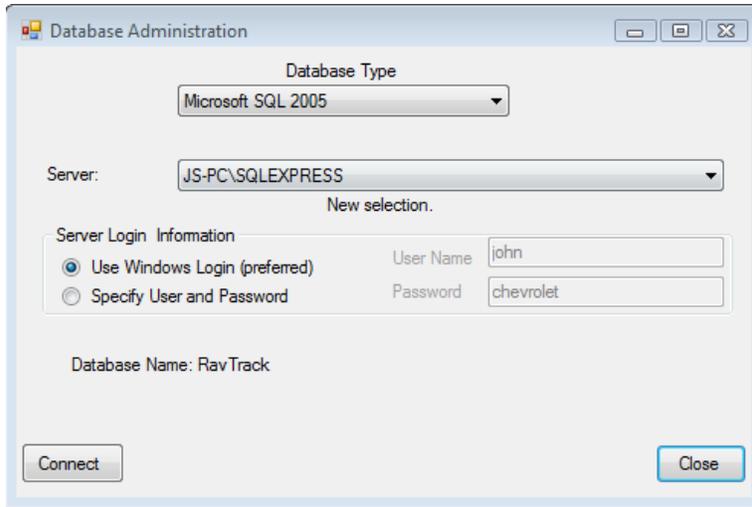
Click on the **Modify License** button. When the pop-up box appears asking for your license key, enter the license key that was emailed to you from Raveon.



Enter your license and press the OK button.

### Changing to the SQL Server Database

By default, *RavTrack PC* will run using the built-in Microsoft Access database. To reconfigure *RavTrack PC* to use a Microsoft SQL Server database, select **Tools > Database Administration** from the main *RavTrack PC* screen.



Set the Database Type to “*Microsoft SQL*”, and choose your server computer from the list of servers in the drop-down list. Then click ***Connect***.

Once *RavTrack PC* successfully connects to the SQL server, click ***Close***. If this is the first time that *RavTrack PC* has connected to the particular SQL database, you will get two warning messages. Click **YES** on both. The two warning messages are:

1. *Warning. Missing TrackedObject table. Do you want to re-create it?*  
Click **Yes** to create you new TrackedObject table in the RavTrack SQL database.
2. *Warning. Missing LOG table. Do you want to re-create it?*  
Click **Yes** to create you new LOG table in the RavTrack SQL database.

At this point, is it suggested you restart *RavTrack PC* by selecting ***File > Exit***. This will save the settings and exit the program. Then restart *RavTrack PC*.

### **Admin User**

Upon installation, the default *RavTrack PC* user is “admin” and the password for this user is “admin” (all lower case letters).

### **Crystal Reports**

*Crystal Reports* from SAP is a report generation and viewing program used by *RavTrack PC* to view and print various reports. To view the *Crystal Reports* included with *RavTrack PC 5.x*, you must install SAP’s *Crystal Reports*, version for Visual Studio 2010. It is a free download available from SAP here: <http://scn.sap.com/community/crystal-reports-for-visual-studio> In most installations, there is a link to the *Crystal Reports* installer setup on the computer where *RavTrack PC* was installed. From the Start Menu, open the ***RAVEON > RavTRACK PC*** folder. Click on the install *Crystal Reports* link in this menu. Or, follow the steps below to download the *Crystal Reports* runtime file from SAP.

Download the current “Support Pack” for SAP Crystal reports, and install it on the computer. This will install Crystal Report runtime module on the computer.

**Please note.** To integrate “SAP Crystal Reports, developer version for Microsoft Visual Studio” into VS 2010 or 2012, you must run the Install Executable. Running the MSI will not fully integrate Crystal Reports into VS. **MSI files by definition are for runtime distribution only.**



Install Executable	Fixed Issues	MSI 32 Bit	MSI 64 Bit	MSM 32 Bit	ClickOnce
Support Pack 5 (v. 13.0.5.x)	SP 5 Fixed Issues Wiki	32bit_13_0_5.msi	64bit_13_0_5.msi	13_0_5.msm	clickonce_13_0_5

If RavTrack PC is not installed on the C:\ drive of the computer, you will need to modify a registry setting for Crystal Reports. Perform these steps on the registry.

- a) Using *Regedit*, find the registry sub-key that holds the **ConnectionDirectoryPath** in it. This will usually have a value of C:\
- b) Do not changed the **ConnectionDirectoryPath** value.
- c) Add a new entry in the same sub-key that holds the **ConnectionDirectoryPath**. The new entry you must create is called **ReportDirectoryPath**.
- d) Set the **ReportDirectoryPath** value to the drive letter where *RavTrack PC* resides. For example, if *RavTrack PC* is on the E: drive, set the value of **ReportDirectoryPath** to **E:\**.

## RavTrack PC Main Screen Overview

The screenshot shows the RavTrack PC software interface. The main window is titled "RavTrack PC by Raveon Ver4.5.0" and displays a map of San Diego with several tracked transponders. The interface includes a menu bar (File, View, Tools, Layers, User Groups, Amp, Home, Help), a toolbar, and a status bar at the bottom. The status bar shows "Log Entries: 1666", "Mouse position: 33.11673 -117.32340", "Id: 1", "2895.91km", "CH.2", "GPS", "OK", and "Operator: admin(Admin)".

Callouts point to various features:

- Tracked Object Information Shows the selected object's**: Points to the information panel on the left.
- Select Groups to View**: Points to the "User Groups" menu item.
- Quickly Re-center Map to Home**: Points to the "Home" button in the toolbar.
- Zoom In/Out with pg up/down or Touch Buttons**: Points to the zoom controls on the map.
- Customizable Information Fields**: Points to the "General" tab in the information panel.
- Name, ID, Location, Status, Speed, Heading, Input status, and Alerts of selected transponder**: Points to the detailed information for the selected transponder (Car 7).
- Database of all tracked objects this user is allowed to view. One click to select and view details.**: Points to the "Tracked Sotbler" table.
- Location of nearest transponder to the last point clicked on the map**: Points to the "Car 9" icon on the map.
- Communications and Database Status**: Points to the "GPS" and "OK" buttons in the status bar.

The information panel on the left shows the following details for "Car 7":

ID: 7 Name: Car 7  
 Speed: 0 Heading: 72 Alt: 143m  
 Distance: 9.30km Bearing: 78°  
 Position: 36.18948 -85.79561  
 Temp: 23C Voltage: 14.0V  
 RSSI: -95dBm Sats: 9  
 Reported At : 4/11/2013 6:11:15 AM  
 Last moved at: 4/11/2013 6:11:15 AM  
 STOP ARR IN, AMBER OFF

The "Tracked Sotbler" table shows a list of tracked objects:

ID	Name	Alt	Time & Date
1	NEW 1	65	9:31 PM on 5/10/2013
2	NEW 2	215	6:15 AM on 4/11/2013
3	Desfiladeo3	99	11:11 PM on 5/25/2013
4	Shp	140	5:57 AM on 4/11/2013
7	Car 7	143	6:11 AM on 4/11/2013
8	8	147	6:58 AM on 4/11/2013
10	NEW 10	220	6:48 AM on 4/11/2013
11	11	144	6:20 AM on 4/11/2013
12	12	148	6:18 AM on 4/11/2013
15	15	221	6:12 AM on 4/11/2013
16	16	182	6:03 AM on 4/11/2013
17	NEW 17	165	6:28 AM on 4/11/2013
18	NEW 18	141	6:35 AM on 4/11/2013
19	NEW 19	145	5:51 AM on 4/11/2013
20	20	436	5:52 PM on 8/27/2012
21	21	472	3:42 PM on 8/21/2012
22	22	141	5:49 AM on 4/11/2013
23	J40	181	6:10 AM on 4/11/2013
24	24	220	6:04 AM on 4/11/2013
25	25	138	6:58 AM on 4/11/2013
26	26	462	3:42 PM on 8/21/2012

This is the main user-window for the *RavTrack PC* software program. You will note in the lower-right corner are buttons showing the status of the communications from the radio and GPS. When they show red, there is a problem with the radio communications set-up.

### Configure your Communications settings

See the *RavTrack PC* User Manual for information on configuring communication channels and all other parameters.

### Directory Structure on the PC

When *RavTrack PC* is installed, a number of directories are created on the computer. There are data directories for maps, sounds, log files, and data. These directories are all located under one `\Ravtrack PC\` sub-directory. Normally this directory is in the `C:\RAVEON\...` subdirectory. Previous version of *RavTrack PC* (3.X and 4.X) stored their data in `C:\Program Data\RAVEON\...` Currently, version 5.x stores *RavTrack PC* data here:

***C:\Raveon\RavTrack PC\...***

**...\\RavTrack PC\\Data\\** This directory will hold all of the data files for the program if the program is configured to use the MS Access database. The database with for the tracked objects, the log file, the system databases are all stored in this directory.

**...\\RavTrack PC\\Maps\\** This directory hold the maps used the the program. RavTrack PC installs with a world-map. Custom maps created by the program's user are stored in this directory.

**...\\RavTrack PC\\Icons\\** This directory has various icons that the user may edit and merge into their custom maps.

**...\\RavTrack PC\\Logfiles\\** This directory holds the weekly program operation log file. This is not a database, but a text file describing general program operation, events, and errors. It holds the event logs for RavTrack PC, not the log file for vehicle movements.

**...\\RavTrack PC\\Reports\\** This directory hold the Crystal Report files used by RavTrack PC.

**...\\RavTrack PC\\Sounds\\** This directory holds sound files (.wav) that can be played when an alert is triggered.

## System Database

### **RTsystem.mdb**

The RTsystem.mdb database holds configuration information about the RavTrack system.

It has these tables in it:

- |                        |   |
|------------------------|---|
| <i>Fences</i>          | The records in this table hold information about the geofences that have been established, as well as points of interest and all user-created graphics and shapes on the map.   |
| <i>AlarmRules</i>      | As the table name implies, each entry in this table holds an individual alarm/alert rule. Alarm/alert rules specify the conditions that trigger alerts as well as the action to take if an alert is triggered. The rules processor in the RavTrack PC monitors the objects and verifies every position report against these rules, and generates alerts based upon the rules. |
| <i>RouteData</i>       | As the table name implies, each this table holds the waypoints for routes. At this time, this table is unused.  |
| <i>AlertingObjects</i> | Used by RavTrack PC to manage the list of alerting objects.   |

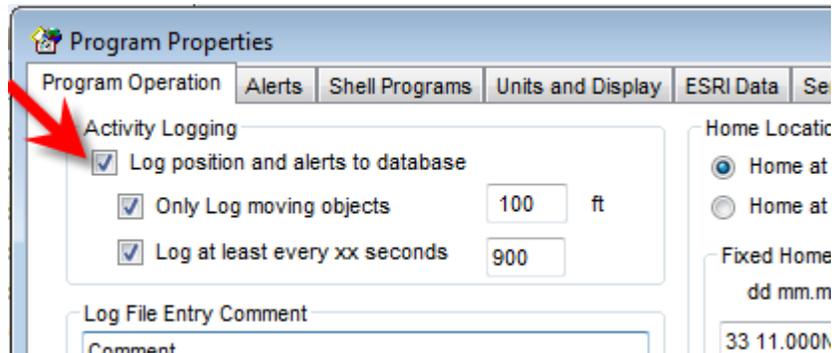
## Microsoft SQL Server Database

If the program is configured to use the Microsoft SQL Server database, then the activity log is stored in one table, and the tracked object information in a second table. A third table will hold the street-address location information for the tracked objects. All three tables are held in one SQL database called "RavTrack". There may also be numerous backup copies of the LOG table.

<i>ObjectData</i>	Records for each tracked object. Any object such as a car, bike, truck, that has a GPS radio transponder on it will have an entry in this table, which maintains the current information about the object (location, speed, heading...) as well as a user-friendly name.
<i>LocationInfo</i>	If reverse geo-coded address information is available, this table will hold the street, city, state, country and zip code of the location of each tracked object.
<i>GroupMembers</i>	The list of groups and the IDs that belong to the groups.
<i>Groups</i>	The list of all groups defined in the system.
<i>ObjectInfo</i>	The free-format table containing user-defined fields with information about the IDs in the system.
<i>UserRestrictions</i>	The list of restrictions applied to the various users.
<i>Users</i>	The list of all of the user names in the system.
<i>LanufageText</i>	A table with columns for various languages. The translation text for much of the text in RavTrack PC is stored in this file, and users may add new language columns as needed.
<i>Log</i>	Records for each position/status received by the RavTrack PC program. The RavTrack PC program may be configured to store every reception in the log, store only data from moving objects in the log, or store nothing in the log.
<i>LOG_-xxxxx</i>	Backup-copies of the LOG table. The date of the backup is in the table name. For example, the table LOG_2009_10_27 was created October 27, 2009. .

## System Log Database

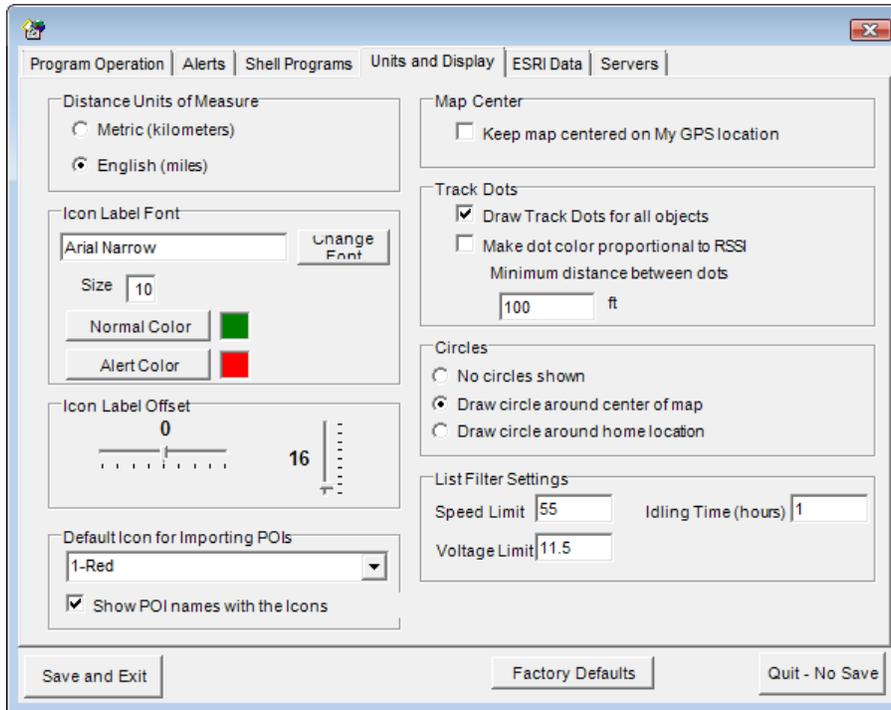
On the **Program Operation** tab, the user may enable the Track Log. The Activity Log is a database table that holds position and status information about the objects that have reported their position and it holds each Alert Event if the alert was configured to be logged. Select **Log position and alerts to database** to enable saving position/status reports to the Log table.



On busy systems, the Log table in the database may grow quite large, so there is an option to limit the logging of position/status report from object to only those from moving objects. Click on **Only Log moving object** and enter the distance they must move if only position/status information about moving objects is to be saved to the log.

## Units and Display Options

The Units and Display tab allow the operator to select how some aspects of the RavTrack PC display information. The data stored on the SQL server is also stored in the same format as configured here.



### **Metric or English Units**

The program can display speed and distance in either Metric or English format. Log entries in the Log database as well as status entries in the tracked objects database are stored using the selected format.



Use caution when changing the units or measure and later analyzing the data. If the system of measurement was set to one type and then data was stored in the database, when it is changed to another format, the databases still holds the old data in the old units of measure, and thus data recalled from them may be displayed incorrectly. For example, if the program is set to metric, and an object was recorded going 100km/hour, the speed is saved in the LOG table as 100. This simplifies the reporting for anyone using the log file, because the unit of measurement in the log is the same as set in the program. But if the program is later changed to English units and the log file is retrieved, it will show the speed as 100 *miles per hour* for the previous entry.

to this fence. Fence names used in geo-fencing are not case sensitive. Carlsbad and CARLSABD will be treated as the same fence name.



## Section 9

A LOG table is a table stored in a database that holds historical information about the location and status of the tracked objects. The log table in the RAVTRACK SQL database file is named LOG.

Following is a list of the fields stored in the log file for each position/status reception from a tracked object.

Field Name	Data Type	Description
EntryNum	Number	Sequential entry number in the log
ID	Number	Object ID number. 0000 - 9999
Name	Text	The Name of this Object at the time this record is stored
EntryType	Text	The reason for this LOG entry.
Status	Text	Status Code. Also the rule ID if this entry is due to a rule trigger.
EntryTime	Date/Time	The PC's time of the last updated position received from this object
Longitude	Number	The longitude of the last position received
Latitude	Number	The latitude of the last position received from this object
Alerts	Text	Warnings and alerts based upon Rules. BLANK = none.
Speed	Number	The object's estimated speed, based upon last two reported positions
Altitude	Number	The objects altitude
Direction	Number	The object's estimate direction, based upon the last two GPS reports
Satellites	Number	Number of satellites in view
UTCtime	Number	The UTC time received over the air
Voltage	Number	The device's DC voltage
Temperature	Number	Temperature of the device
RSSI	Number	Signal strength of the transmission
Inputs	Number	The digital Inputs
RuleNumber	Number	The Rule ID/number if this is an alert entry
Description	Text	A description field for this entry
Spare1	Text	A spare data field
Spare2	Text	Another Spare field

The LOG table holds the data for the log entries. The field in the LOG table named "EntryType" identifies the type of entry in this log file. The valid types are:

- Update** A position/status update was received over the radio from a tracked object, and this is the log entry for that event.
- Alert** A rule was triggered and this is the log entry for the alert.
- Clear** A tracked object had been triggering a rule alert, but the event has cleared.

### System Log

Additionally, a text file is created and various system activities related to the *RavTrack PC* operation and its actions are recorded in it. The system log file is called RT-w-yyyy.txt where w is the current week number, and yyyy is the current year. Every week a new system log file is created.

The RT- system log files are stored in a subdirectory under the ...\\RavTrack PC\\Logfiles directory.

Any text viewing program may be used to review the system log file. These are provided for system and installation debugging purposes.

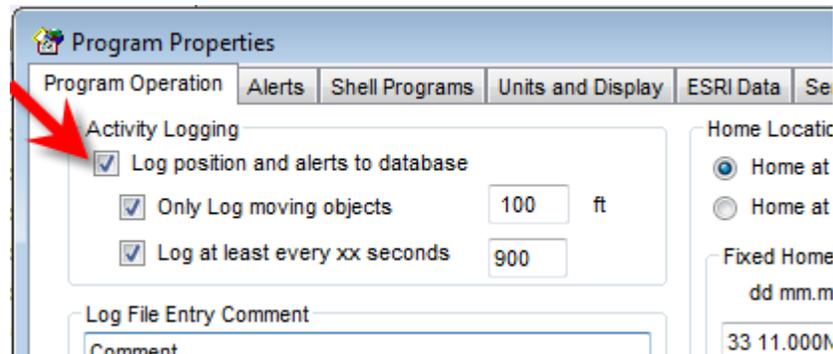
## **Enabling Activity Logging of Tracking Objects**

Logging the position, status, and alerts received by *RavTrack PC* to the LOG table is a two-step process.

1. Enable the activity logging feature in *RavTrack PC*.
2. Enable logging for the individual tracked object

To enable *RavTrack PC* to store GPS position data, status, and alerts in the LOG table, select ***File, Program Properties*** from the main screen. From the Properties screen, check ***Log position and alerts to database***.

If you only wish to log objects that are moving(recommended), also check ***Only Log moving objects***, and specify the minimum distance an object must move before its location and status are stored to the LOG table.



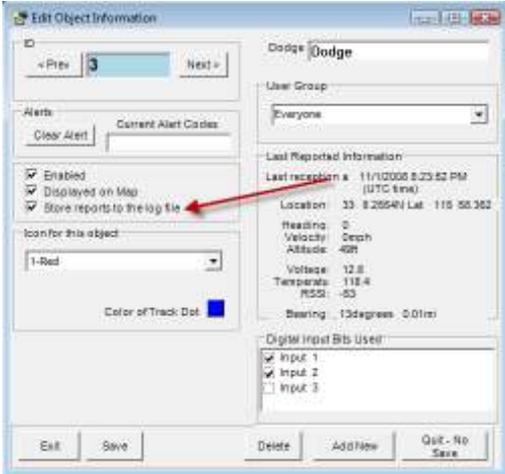
If you only store information to the Log table when an object is moving, you may also want to also periodically store an update to the Log table. To for a periodic entry in the log table for stationary objects, check the ***Log at least every xx seconds box***, and enter the maximum number of seconds you wish to have between Log table entries for any particular vehicle.

For example: In the configuration above, *RavTrack PC* will store every position report received from any vehicle that moves more than 100 feet. If the vehicle does not move in 15 minutes (900 seconds), then it will store an entry in the Log table anyway, and continue to do so every 15 minutes seconds until the object begins moving. Each time the object moves more than 100ft between position reports, a log entry will be made. This configuration is recommend so that the Log table does not grow excessively large.

Once logging is enabled, it still must be enabled for the individual tracked objects. When a tracked object is first defined, by default, activity logging for the object is enabled.

To enable/disable logging of individual tracked objects, first double-clicking on the object in the database window, or select ***Tools, Add/edit tracked objects***.

Locate the object in question, and check ***Store reports to the log file*** to enable logging for this object. If checked, every time the object transmits a position/status, the specifics of the transmission are stored in the LOG table.



**Log Table Size Limitation**

All databases have size limitations, and because the LOG table can grow over time to be quite large, the user must be aware of the size of the LOG table, and manage it properly by “Pruning” it to remove old data, and periodically backing it up.

For Microsoft SQL Server the LOG table should be kept to 400,000 entries. These are not “Hard” limits, and the actual limit will greatly depend upon the performance of the computers running the database software. A high-performance business-class server should have no trouble processing 1,000,000 LOG table entries.

Below is a table to help you estimate the number of LOG table entries that *RavTrack PC* will make per day, week, and month. This will help you configure how often *RavTrack PC* should prune the records in the LOG table.

Number of Tracked Objects	Update Rate (seconds)	Usage per day	Log Only Moving?	Log Entries per day	Log Entries per week	Log Entries per month
10	10	24	no	86,400	604,800	4,233,600
10	10	24	Yes	8,640	60,480	423,360
10	30	8	Yes	960	6,720	47,040
50	10	24	no	432,000	3,024,000	21,168,000
50	30	24	Yes	14,400	100,800	705,600
50	60	8	Yes	2,400	16,800	117,600
200	30	24	no	576,000	4,032,000	28,224,000
200	60	24	Yes	28,800	201,600	1,411,200
200	120	8	Yes	4,800	33,600	235,200

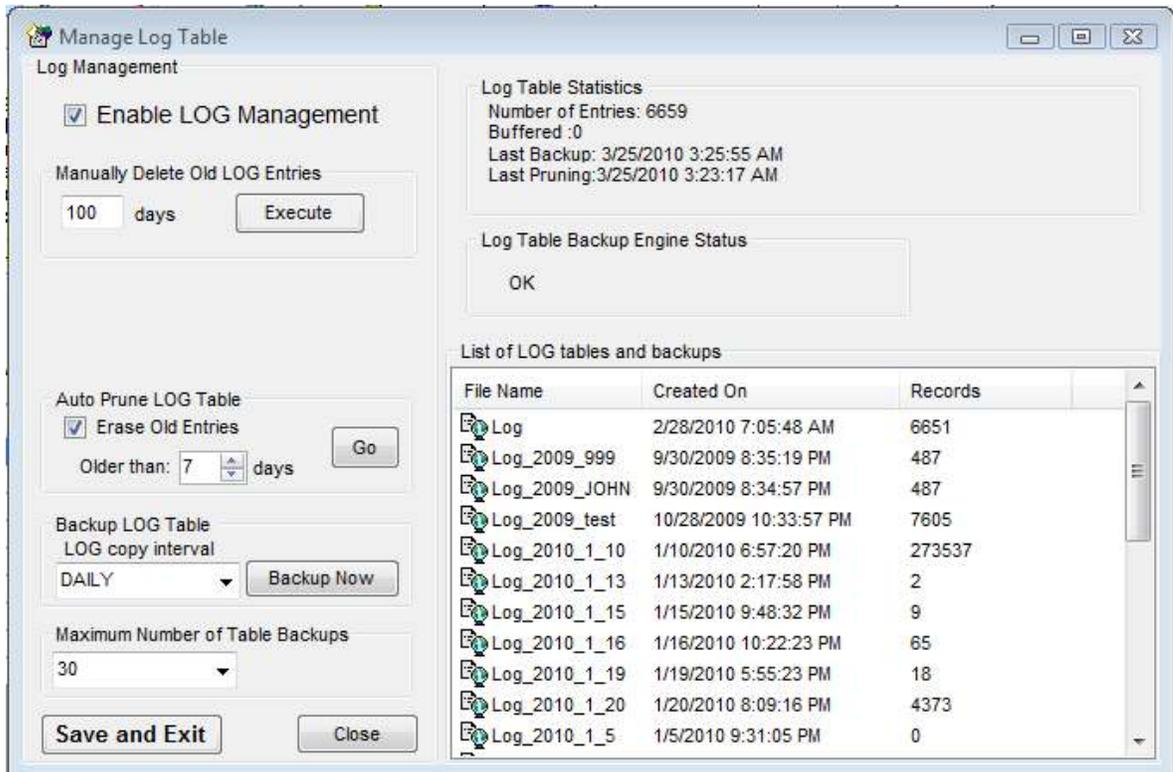
**Log Table Management**

Position reports and alert events may be stored in a database table called the LOG. Each individual tracked object may be configured to store its position/status reports to

the LOG table, as well as rules may be configured to store events to the LOG table if the rule is triggered.

All entries in the LOG table are sequentially numbered and dated. This facilitates management and reporting. To erase some or all of the entries in the LOG table, select ***File, Manage Log Database*** from the main screen. When you start this Log Table Management utility, a window will pop-up allowing you to review and configure how the LOG table is managed.

A *RavTrack PC* user must be either an Administrator or have the rights to “Manage the LOG table” assigned to the user to open this Log Table Management window.



To enable a computer to manage the LOG table and its backups, check the ***Enable LOG Management*** checkbox on the top left of the window.

The window “*List of LOG tables and backups*” will show you the LOG table which has the table name “LOG” and the number of records in it, as well as a list of backup-copies of the LOG table. The backup copies have the date they were created in their name, such as Log\_2010\_1\_13. This table was created January 13<sup>st</sup>, 2010.

The main LOG table that holds the current log information in it is simply called “LOG”.

Use the ***Manually Delete Old LOG Entries*** selection to erase old log entries and reduce the size of the log database.

To erase all entries in the log file, select ***Clear All***.

To delete an old log table, right-click on it, and select ***Delete***.

Note, each entry in the log file uses approximately 1000 bytes in a MS SQL Server database.

### **Pruning the LOG table**

For optimum performance, the main LOG table should not grow excessively large, so it periodically should be “Pruned”. Pruning removes old entries. Use the *Auto Prune* feature to automatically have RavTrack PC remove old log entries from the LOG table.

Check the *Erase Old Entries* checkbox to enable the LOG table *Auto Prune* feature. The select the maximum age for LOG table entries by setting the *Older Than XX* days value. For example, if it is set to *Older Than 10 days*, RavTrack PC will automatically remove log entries that were placed in the LOG table more than 10 days ago. T



The date of an individual record in the LOG table is dependent upon the date set on the computer that stored the LOG entry. Care should be taken to ensure that computers which store LOG entries have their date and time properly set.

### **Backing Up the LOG Table**



Only one computer on a *RavTrack PC* system should be configured to automatically backup the LOG table. All others should have their backup option set to “Manual”.

Configure automatic backups using the “*Backup Log Table*” drop-down list on the Mange Lot Table window. *Daily, Weekly, Monthly, or Manual* may be selected. At the interval you select, RavTrack PC will copy the LOG table to another table named LOG\_XXXX where XXXX is the date of the copy.

### **Third-Party SQL Table backups Software**

On *RavTrack PC* systems with a large number of vehicles or vehicles that report very quickly, the LOG table may get large quickly. In this case, Raveon recommends that a third-party table backup program be used so that the SQL database does not get excessively large.

Configure your backup software to periodically backup the LOG tables, and once they are backed up, delete the old ones from the SQL database so they do not consume resources. Then, if the historical log data is ever needed, you can restore the appropriate log table back to the database so it can be reviewed or replayed.

The following is a list of possible third-party SQL backup software vendors.

#### **Quest Software**

<http://www.quest.com/sql-server/backup-and-recovery.aspx>

#### **SteeleEye Technologies**

<http://www.steeleye.com/>

#### **Red-Gate**

<http://www.red-gate.com/index.htm>





## Multi-User Operation

### Section 11

*RavTrack PC* may be run on multiple computers, all monitoring, tracking, alerting, logging, and reporting on the activity of the system. If a *RavTrack PC* is configured as a “*Client*” it will get the information it displays on the map and in the Tracked Object database window from a remote Database Server.

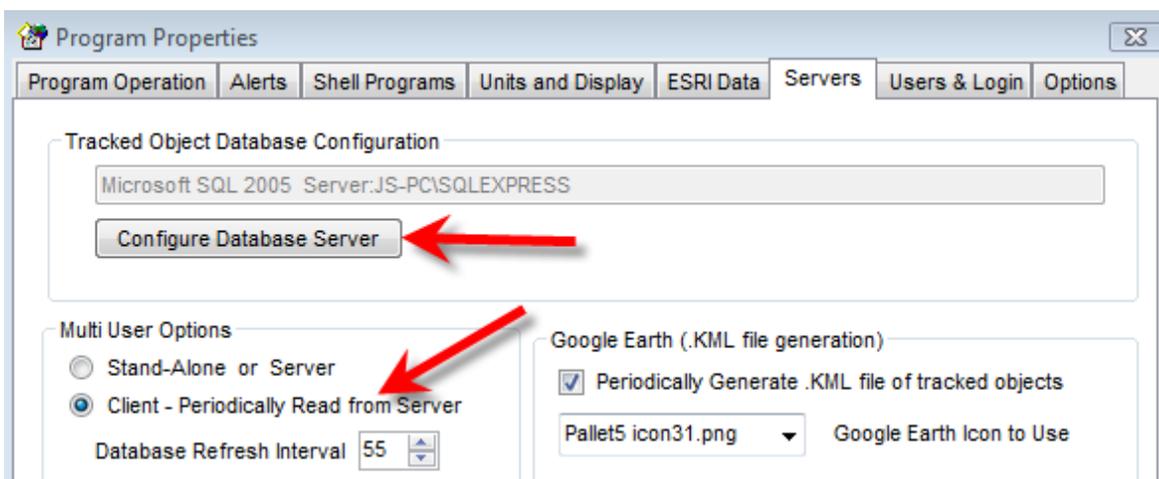


*RavTrack PC* uses a time/date field in the database to synchronize the various workstations running *RavTrack PC*. It is very important that the time and the date on all of the PCs in the system be correct, to within 20 seconds of each other.

When *Microsoft SQL Server* is used, the shared database name is ***RAVTRACK*** and the table that holds the location/status information for all tracked objects is called ***ObjectData***.

To configure a PC for multi-user operation:

1. Setup the *RavTrack* database on an SQL server, accessible on your network.
2. Select ***File > Program Properties > Servers*** tab to configure access to the Tracked Object database.
3. Click on ***Configure Database Server***. Change the “*Tracked Object Database File Location*” to the common shared directory where the “*TheTrackedObjects*” database is stored. In the example below, it was stored on a server’s *P:* drive in the *RavTrackPC* subdirectory.  
Click on ***Configure Database Server***. Set the Database Type to *Microsoft SQL Server*. In the Server: drop-down list, choose the server that you installed the ***RavTrack*** database on.
4. On the ***Servers*** tab of the ***Program Properties*** window check the ***Client – Periodically Read from Server*** radio button.



Client computers on a multi-user *RavTrack PC* systems will periodically synchronize the Tracked Objects that are displayed on the map with the data in the shared database table. How often this refresh is done may be set in with the “***Database Refresh Interval***”. During refresh, the PC may respond a bit slower, so it is best to do this as infrequently as possible. Raveon suggests every 60 seconds.

When ***Multi-User Operation*** is configured as a Client, *RavTrack PC* will periodically send a query to the SQL Database Server asking for a list of all new position information. When new position/status information is returned from the Database Server, this new information will be processed as new position/status reports, checked against the rules, and logged to the LOG table as appropriate.

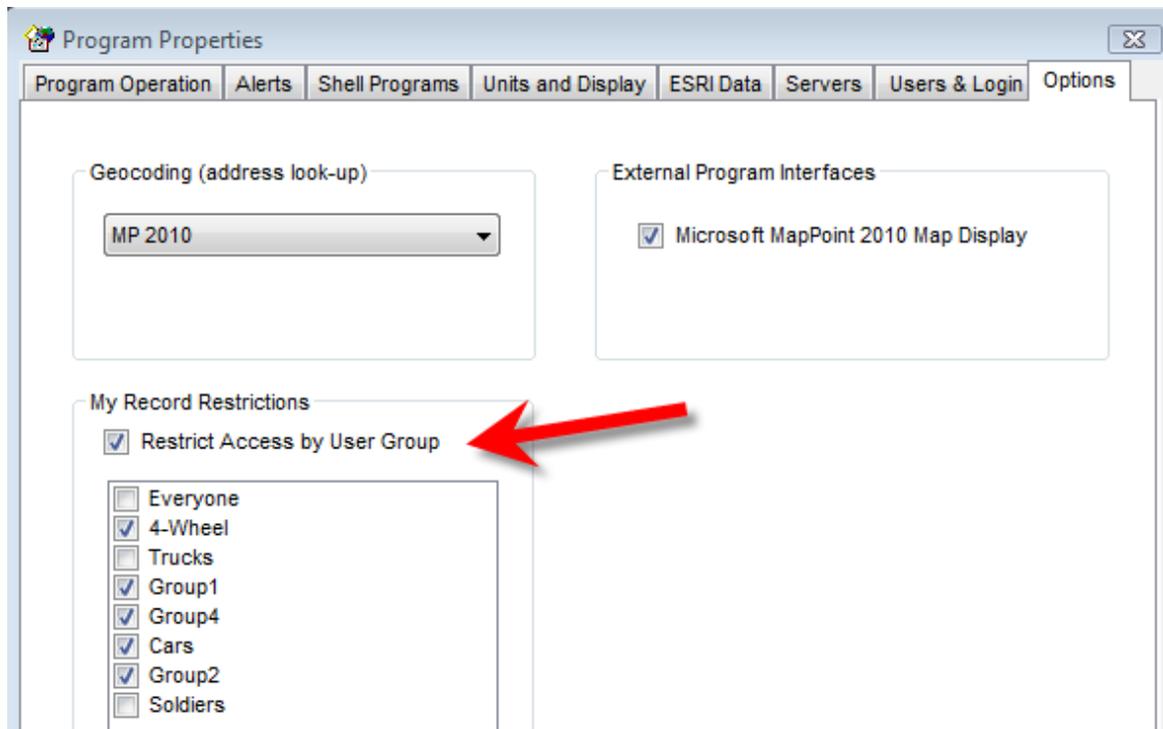
On a multi-user system, one *RavTrack PC* computer updates the SQL database **Server**, and will update the database tables with the Tracked Object information and event Log table.

The *RavTrack PC* computer that updates the SQL database in a multi-user system is connected to the Raveon GPS transponder and receives position information over-the-air from the vehicles being tracked. This computer may be configured as a **Stand-Alone** because it does not have to retrieve position information from the server. It already knows the position of all objects because it is receiving them over-the-air and storing them to the database.

### **Restricting Access by User Group**

When an installation of *RavTrack PC* is configured for Multi-User, it retrieves information about the location and status of all vehicles from an SQL database. It periodically retrieves the location/status records from the database.

You may restrict which vehicles the *RavTrack PC* program displays. The restriction is based upon the **User Group** that the vehicle is assigned to. For example, you may have a *RavTrack* system tracking trucks and cars, but would like to have a workstation that only shows the location of the trucks. Enabling the ***Restrict Access by User Group*** feature will block viewing of all vehicles unless the User Group is enabled for viewing.



To enable the Restriction by User Group, from the main screen, select **File > Program Properties** and click on the **Options** tab. Check the **Restrict Access by User Group** checkbox. In the **My Record Restrictions** frame, you will see a list of all of the groups on your system. Check the groups that this computer should be able to see.

Like most all *RavTrack PC* configuration options, you must be signed into *RavTrack PC* with administrator privileges to modify the Record Restrictions. Once a workstation is configured for **Restricted Access by User Group**, you may want to login to *RavTrack PC* with a user name that has limited rights to modify the configuration. This will stop the *RavTrack PC* user from modifying the restriction and viewing the location of vehicles that he/she is restricted from viewing.

 **Note:** When the **Restricted Access by User Group** feature is enabled, the “Auto-Add” feature will not work. “Auto-Add” is a feature that will automatically add new vehicles to the list of tracked objects if the GPS data from a new previously unheard-from vehicle is received. Because *RavTrack PC* assumes that a computer with restricted group access is only supposed to view and track certain groups, the location and status information from new vehicles which are not already a member of one of the allowed groups will be ignored.



## Software License

### Section19

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THE WARRANTY AND REMEDY PROVIDED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE END-USER ASSUMES ALL RISK AS TO THE SUITABILITY, QUALITY, AND PERFORMANCE OF THE SOFTWARE. IN NO EVENT WILL LICENSOR, OR ITS DIRECTORS, OFFICERS, EMPLOYEES OR AFFILIATES, BE LIABLE TO THE END-USER FOR ANY CONSEQUENTIAL INCIDENTAL, INDIRECT, SPECIAL OR EXEMPLARY DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF DATA OR BUSINESS INFORMATION, AND THE LIKE) ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE OR ACCOMPANYING WRITTEN MATERIALS,

EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

LICENSOR'S LIABILITY TO THE END-USER (IF ANY) FOR ACTUAL DIRECT DAMAGES FOR ANY CAUSE WHATSOEVER, AND REGARDLESS OF THE FORM OF THE ACTION, WILL BE LIMITED TO, AND IN NO EVENT SHALL EXCEED, THE AMOUNT ORIGINALLY PAID TO LICENSOR FOR THE LICENSE OF THE SOFTWARE.

## **6. Enhancements**

From time to time Licensor may, in its sole discretion, advise the End-User of updates, upgrades, enhancements or improvements to the Software and/or new releases of the Software (collectively, "Enhancements"), and may license the End-User to use such Enhancements upon payment of prices as may be established by Licensor from time to time. All such Enhancements to the Software provided to the End-User shall also be governed by the terms of this License. IN ORDER FOR THE END-USER TO BE ASSURED THAT IT WILL BE ADVISED OF AND LICENSED TO USE ANY ENHANCEMENTS TO THE SOFTWARE, THE END-USER MUST COMPLETE, SIGN AND RETURN TO LICENSOR THE ATTACHED END-USER REGISTRATION FORM.

Generally, licensed end-users may obtain minor upgrades at no charge. Major updates of *RavTrack PC* may be obtained for an upgrade fee. Please contact Raveon for upgrade fees. Minor upgrades are designated by version numbers where the integer portion does not change. For example, version 2.3 to 2.7 is a minor upgrade. Major upgrades are where the integer portion of the version number changes. Version 2.7 to 3.0 is major upgrade and will require the purchase of a license for the upgraded version of the software.

## **7. Disputes**

This license agreement shall be governed by, construed and enforced in accordance with the laws of the California, as it is applied to agreements entered into and to be performed entirely within such jurisdiction.

To the extent you have in any manner violated or threatened to violate Raveon Technologies Corporation and/or its affiliates' intellectual property rights, Raveon Technologies Corporation and/or its affiliates may seek injunctive or other appropriate relief in any state or federal court in the State of California, and you consent to exclusive jurisdiction and venue in such courts.

Any other disputes will be resolved as follows:

If a dispute arises under this agreement, we agree to first try to resolve it with the help of a mutually agreed-upon mediator in the following location: San Diego County, USA. Any costs and fees other than attorney fees associated with the mediation will be shared equally by each of us.

If it proves impossible to arrive at a mutually satisfactory solution through mediation, we agree to submit the dispute to binding arbitration at the following location: San Diego County, under the rules of the American Arbitration Association. Judgment upon the award rendered by the arbitration may be entered in any court with jurisdiction to do so.

## **8. General**

If any provision of this License is held by a court of competent jurisdiction to be invalid or unenforceable to any extent under applicable law, that provision will be enforced to the maximum extent permissible and the remaining provisions of this License will remain in full force and effect. Any notices or other communications to be sent to Licensor must be mailed first class, postage prepaid, to the following address: Raveon Technologies Corporation, 2460 Impala Drive, Carlsbad, CA 92010 – USA.

This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof, and all prior proposals, agreements, representations, statements and undertakings are hereby expressly cancelled and superseded.

This Agreement may not be changed or amended except by a written instrument executed by a duly authorized officer of Licensor.

## **9. Acknowledgment**

BY INSTALLING THIS SOFTWARE PROGRAM, THE END-USER ACKNOWLEDGES THAT IT HAS READ THIS LICENSE, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS.

If you have any questions concerning this License, contact Licensor at the address set forth below.

### ***Raveon Technologies Corporation***

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Phone +1-760-444-5995



# End User Registration Form

## Section20

To be eligible for upgrades and notices of improvements to *RavTrack PC*, please register your software with Raveon by mailing or emailing in the following information.

Your Name: \_\_\_\_\_

Company Name \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

License Code: \_\_\_\_\_

Current RavTrack PC Version: \_\_\_\_\_

Send the above to:

### *Raveon Technologies Corporation*

2461 Impala Drive  
 Carlsbad, CA 92010  
 Phone: +1-760-444-5995  
 Fax: +1-760-444-5997

Or Email it to your account manager at Raveon.

Raveon also appreciates any suggestions you may have for improvements to this product. Please let us know about any ideas or suggestions you have.

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**For More Information**

For more information about this or any other Raveon product, call in the U.S.A. 1-760-444-5995 or visit us a [www.ravtrack.com](http://www.ravtrack.com).

***Raveon Technologies Corporation***

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