Radioactive Networks

iServ System Manual
Version 0.0.1

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Introduction

Welcome to Radioactive Networks and our iServ product. This product is a new software package designed for tracking vehicles, and job management. Using in-vehicle terminals and GPRS modems, we are able to provide a unique set of capabilities.

The product allows remote messaging and position monitoring over an network, and storing all data into a database for future reference, and billing as required.

System Requirements

The system has a number of dependencies. Some are mandatory, and some are optional.

Server	PC running Windows 2000 or Windows XP	Mandatory
	512 Mbytes RAM	Mandatory
	Internet Access with Permanent IP address	Mandatory
	Microsoft Access	Optional
Messaging and Reporting Station	PC running Microsoft Windows 2000 or Windows XP	Mandatory
	256 Mbytes RAM	Mandatory
	Microsoft Access	Recommended
Position Monitoring Station	PC running Microsoft Windows 98 or better	Mandatory
	128 Mbytes RAM	Mandatory

Copyright

The iServ system is protected by copyright and should not be copied without our expressed written permission. Certain components are licensed from other parties and are only distributed in accordance with their license conditions.

Other Documents

This manual should be read in reference to a number of other documents.

Acknowledgements

Radioactive Networks would like to acknowledge the support of our contract programmer, Kevin Dawson. Without his work, we would have been unable to complete this project. His professionalism has made this product what it is today.

Software Architecture

The iServ system is made up with a number of separate components that are brought together to create a full application. These components can be combined to suite specific requirements.

The components include

- iServ
- iLog
- iMessage
- OziAPRS – APRS for OziExplorer
- Embedded GPRS Modem
- Mobile Data Terminal

iServ

The central part of the system is the iServ application. iServ is a server for the other applications, logs messages coming in and routes messages. The server will accept data from iMessage, M110 GPRS Tracking Units, Net960 Mobile Data Terminals and NetGPS PDA's.

The application logs messages and jobs using XML for database logging by XML.

iLog

iLog is a database logging component. It takes XML files exported from iServ, and writes them into the database. iLog is a separate component to simplify issues in case of problems with the database. The XML files can be imported at a later date to reconstruct a corrupted database. Alternately, the XML files can be easily imported into different databases of different platforms.

iMessage

The message and job entry application is known as iMessage. It is where operators are able to assign work requests, and monitor messages.

OziAPRS – APRS for OziExplorer and MapPoint

OziAPRS is a vehicle position monitoring system for OziExplorer and Microsoft MapPoint.

Embedded GPRS Modem

The embedded GPRS modem acts as an interface between the GPRS Radio Network, and the Mobile Data Terminal. It contains an entire TCP stack, and reduces the complexity of the mobile data terminal software.

Mobile Data Terminal

The mobile data terminal is a 386ex computer with 8 line 40 character display, flash memory and an internal modem for voice communications. The Mobile Data Terminal acts as the interface for the user.

The Mobile Data Terminal contains proprietary software developed by Radioactive Networks.

Setup

Installing the software

The software package is based on the Microsoft .NET architecture. The first step in installing the software is to install the .NET runtime libraries. This may lead to needing to reboot the machine several times.

Installing iServ

iServ should be installed c:\program files\iServ\iSev

Installing iLog

iServ should be installed c:\program files\iServ\iLog

Installing iMessage

iMessage should be installed to c:\program files\iServ\iMessage

Installing OziAPRS

OziAPRS should be installed to c:\program files\OziAPRS. Unlike the previous three products, OziAPRS does not use the .NET runtimes and can be installed on a wider range of computers

Installing OziExplorer

OziExplorer should be installed into C:\Program files\OziExplorer.

Configuring Directories

iServ needs to be configured with three directories that XML files will reside for uploading into the database. These directories will need to be created, and the settings changed in iServ.

We recommend that the following directories are created and used

C:\Program Files\iServ\XML\Upload
C:\Program Files\iServ\XML\Error
C:\Program Files\iServ\XML\Done

Once the directories are created, the directories will need to be changed in iServ. They can be entered in the DataBase menu. Once the three directories have been entered, iMessage and iLog will need to be restarted.

Database

iServ and iLog need access to the iServ Database. We recommend that this database is copied to

C:\Program Files\iServ\Database\[ClientName].MDB

Once this file is copied to the desired location with the correct filename, it needs to be entered into iServ, under the Databases menu. Once it has been entered, you will need to restart iServ and iMessage.

Application License Files

Various programs supplied use license files of one type or another to restrict unauthorized usage. We suggest that you record the license file details on the lines bellow.

OziExplorer

The OziExplorer software comes with two numbers of the form

1234-5678-9012
$00001111

These numbers will need to be entered into OziExplorer as per the instructions that are included with the software.

__ __ __ __ - __ __ __ __ - __ __ __ __

$ __ __ __ __ __ __ __ __

OziAPRS

The OziExplorer software required you to enter two pieces of information in the Register area under the Help menu. These are an EMAIL address and registration key. The numbers are of the form

test@radio-active.net.au
123456789ABC

_____

__ __ __ __ __ __ __ __ __ __ __ __

iServ, iMessage, iLog

The OziExplorer software required you to enter two pieces of information in the Register area under the Help menu. These are an EMAIL address and registration key. The numbers are of the form

test@radio-active.net.au
123456789ABC

Email _____

iServ __ __ __ __ __ __ __ __ __ __ __ __

iMessage __ __ __ __ __ __ __ __ __ __ __ __

iLog __ __ __ __ __ __ __ __ __ __ __ __

Software Operations

In order to use this software, the iServ and iLog applications MUST be running.

Should iServ not be running, field units will be unable to contact the database or connect to the receive jobs and messages. As a result it is vitally important that iServ is running at all times.

iLog is not as critical. Its job is to write entries into the database storing where vehicles were at a particular point in time, and which jobs were worked on. The iLog application reads XML files and moves them when finished with them. If it is not running, the database will not reflect the current status of the system.

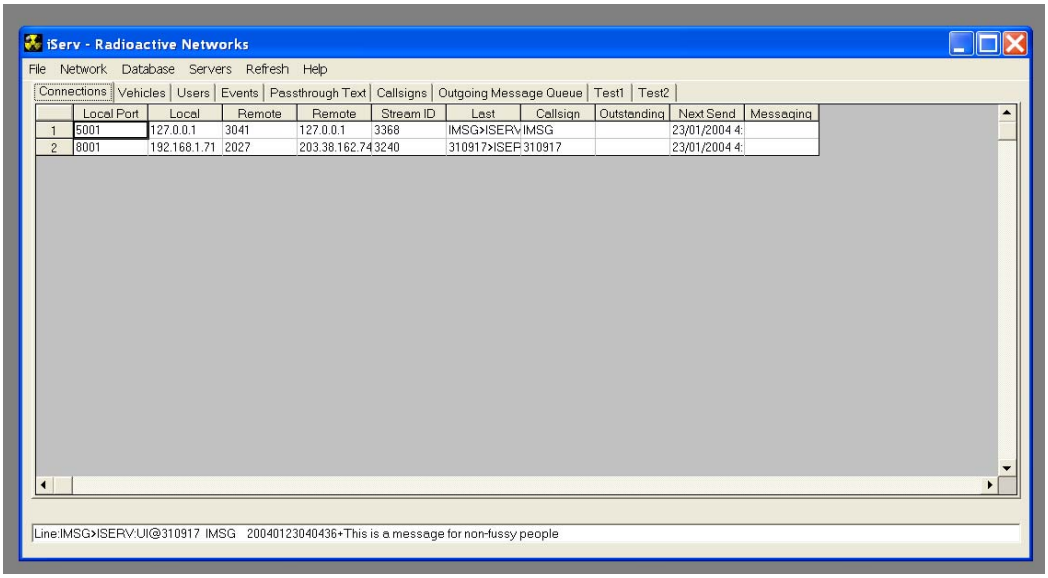
Software Components

iServ

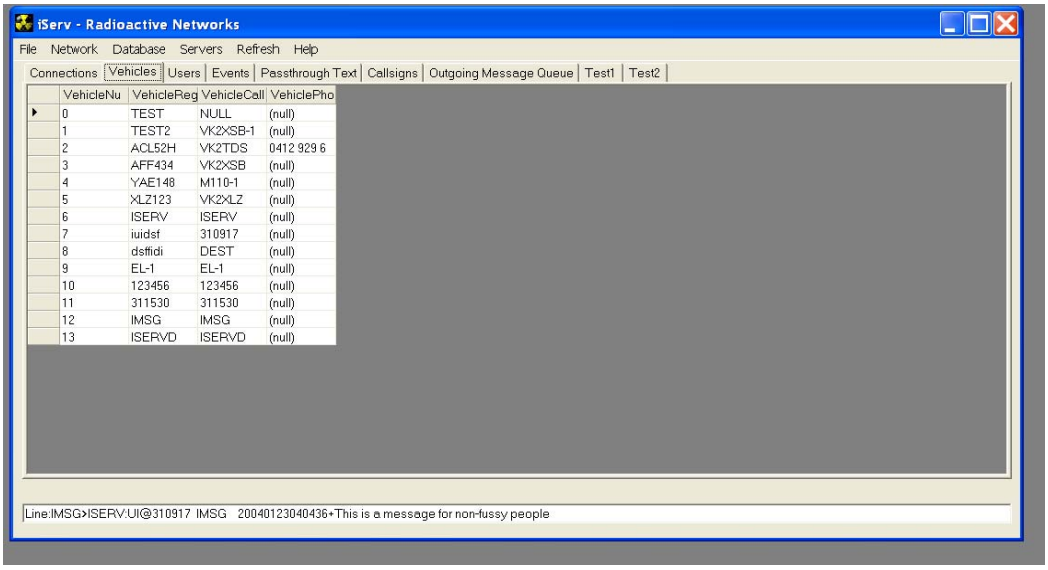
Connections Screen

The connections screen contains one line for every connection to the server. Connections can be manually killed by clicking on the button at the end of the line corresponding to the connection.

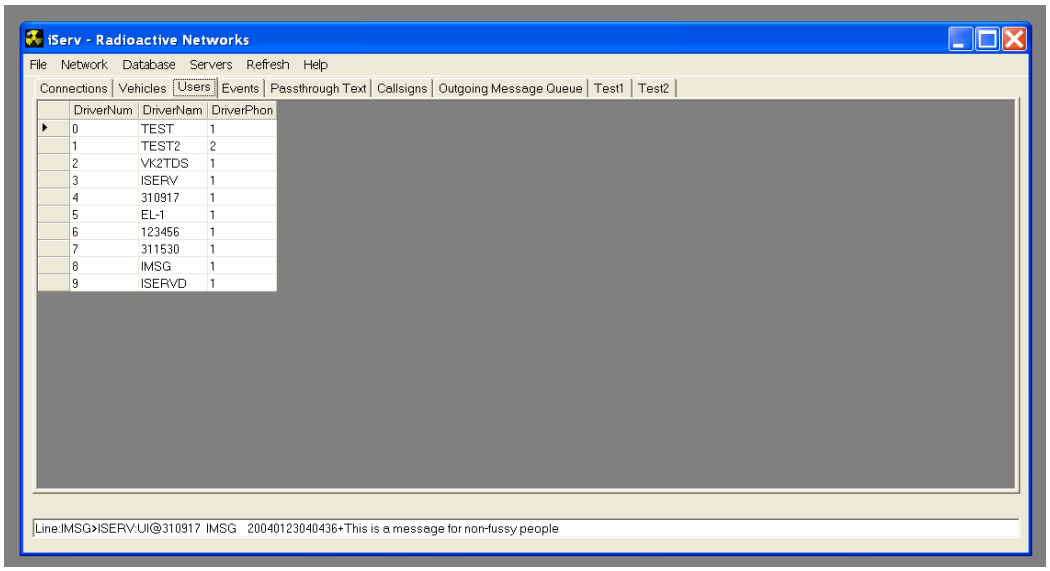
Just because a connection appears on this table does not mean that the connection is working. With a GPRS connection, there will often be cases where zombie connections exist.



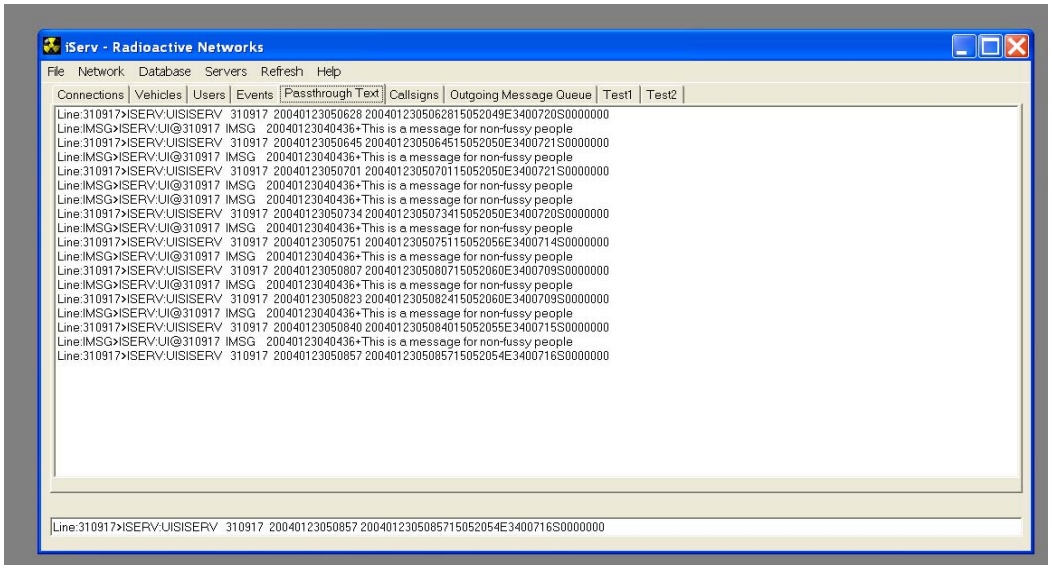
Vehicles List Screen



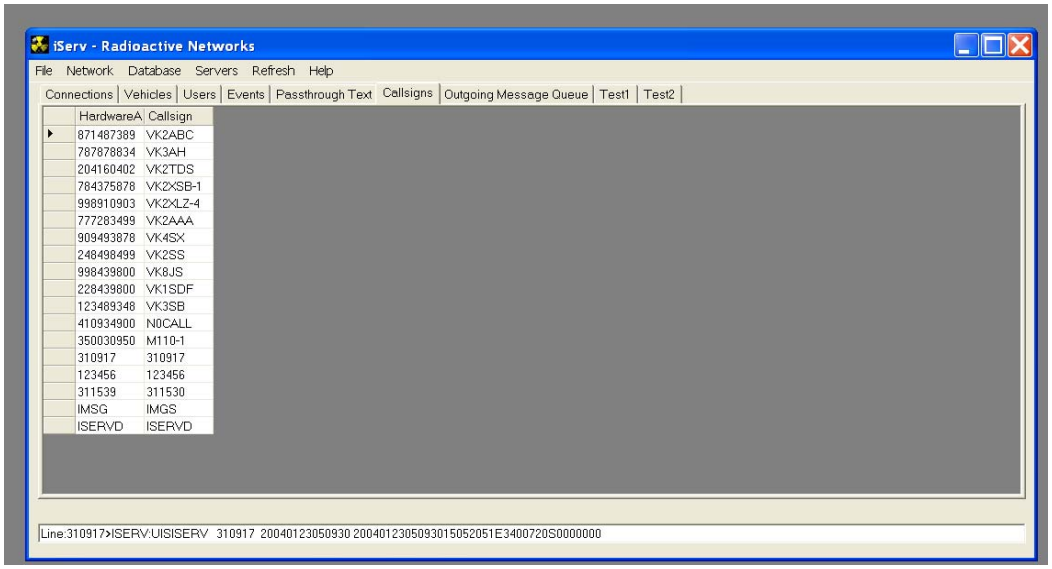
Users List Screen



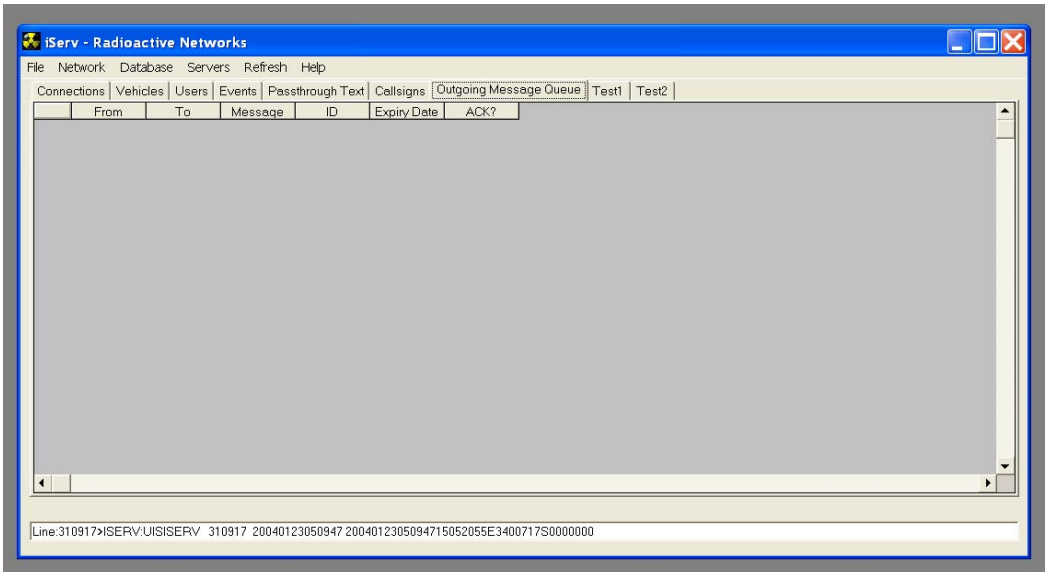
Pass-through Text Screen


iServ - Radioactive Networks
File Network Database Servers Refresh Help
Connections Vehicles Users Events Passthrough Text Callsigns Outgoing Message Queue Test1 Test2
Line:310917>ISERV:UISISERV 310917 20040123050628 2004012305062815052049E3400720S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050645 2004012305064515052050E3400721S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050701 2004012305070115052050E3400721S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050734 2004012305073415052050E3400720S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050751 2004012305075115052056E3400714S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050807 2004012305080715052060E3400709S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050823 2004012305082415052060E3400709S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050840 2004012305084015052055E3400715S0000000
Line:IMSG>ISERV:UI@310917 IMSG 20040123040436+This is a message for non-fussy people
Line:310917>ISERV:UISISERV 310917 20040123050857 2004012305085715052054E3400716S0000000
Line:310917>ISERV:UISISERV 310917 20040123050857 2004012305085715052054E3400716S0000000

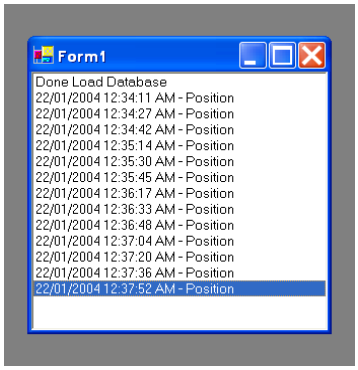
Callsign List Screen



Outgoing Message Queue Screen



iLog

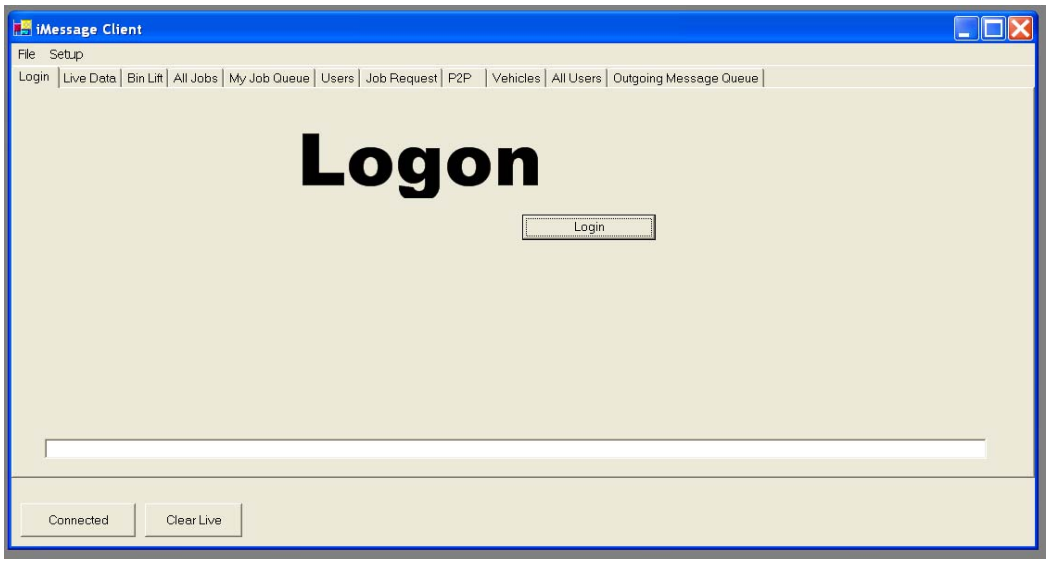

Form1
Done Load Database
22/01/2004 12:34:11 AM - Position
22/01/2004 12:34:27 AM - Position
22/01/2004 12:34:42 AM - Position
22/01/2004 12:35:14 AM - Position
22/01/2004 12:35:30 AM - Position
22/01/2004 12:35:45 AM - Position
22/01/2004 12:36:17 AM - Position
22/01/2004 12:36:33 AM - Position
22/01/2004 12:36:48 AM - Position
22/01/2004 12:37:04 AM - Position
22/01/2004 12:37:20 AM - Position
22/01/2004 12:37:36 AM - Position
22/01/2004 12:37:52 AM - Position

iMessage

Logon Screen

On opening the iMessage application, the user is presented with the Logon Screen. In the future this screen will have the ability for the user to enter a username and password. At the current time, all the user can do is click the 'Logon' button.

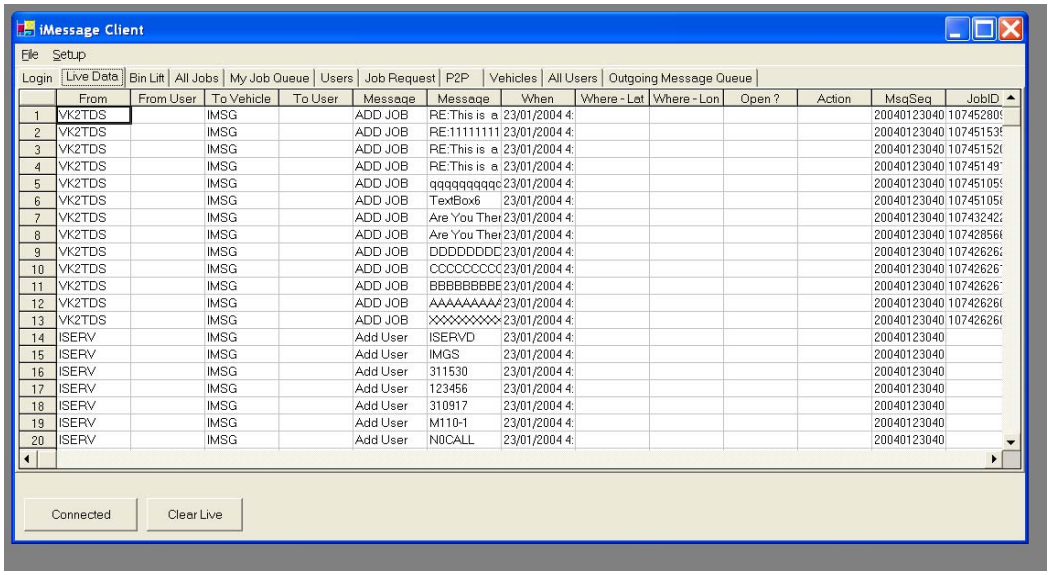
Pressing the button sends a message to the server informing it that the user has just logged on. It also then requests an update on all open messages from the database, and a list of all the users of the system.



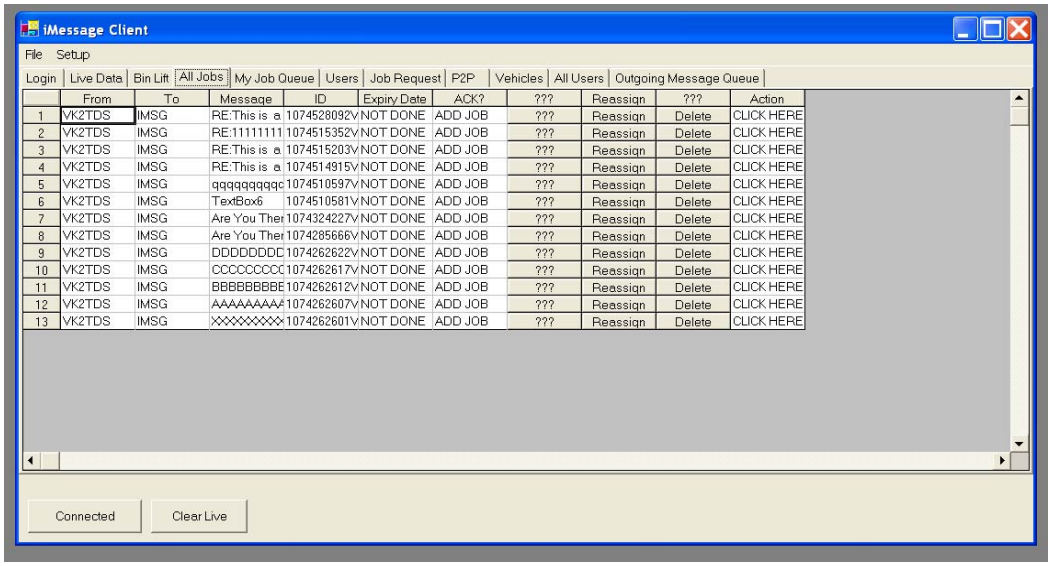
Live Data Screen

The Live Data screen is an overview screen that shows what has been happening on the network. It monitors all traffic between stations and from the server to the station. The data on this screen is updated in real time.

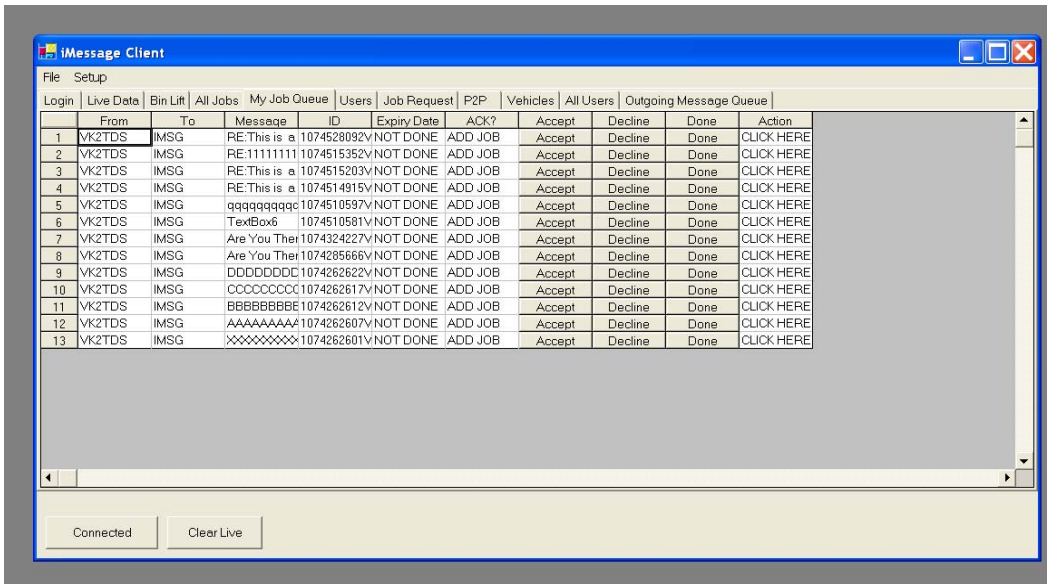
The data can be cleared with the ‘Clear Live’ button. The data is not saved when the program is shut down and restarted.



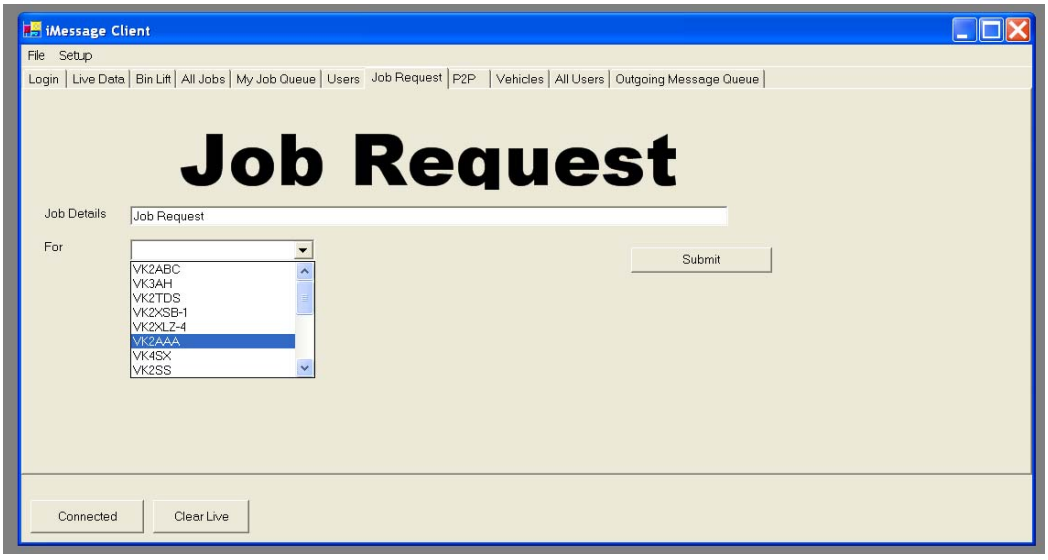
All Jobs List Screen



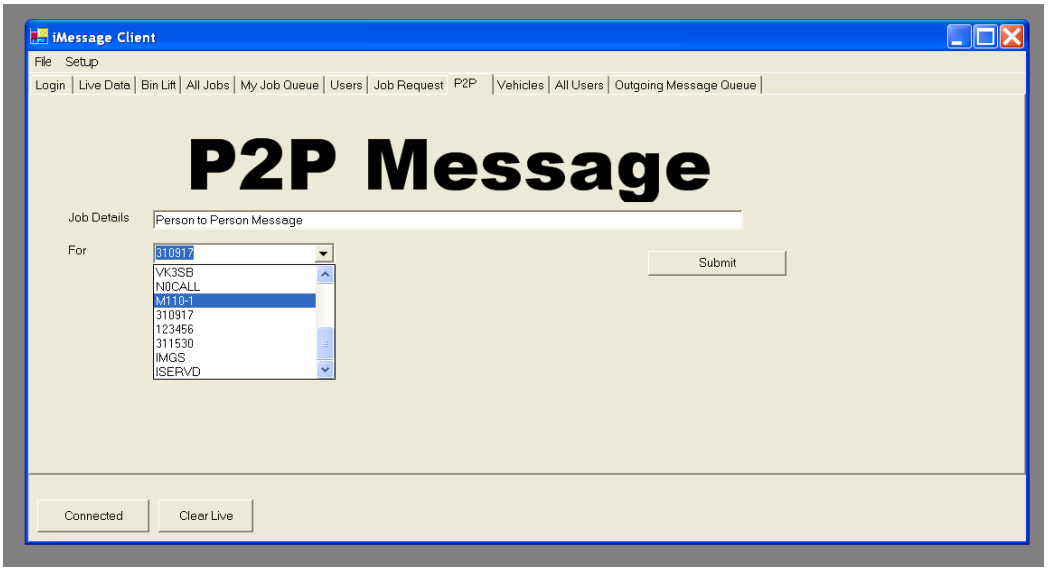
My Jobs List Screen



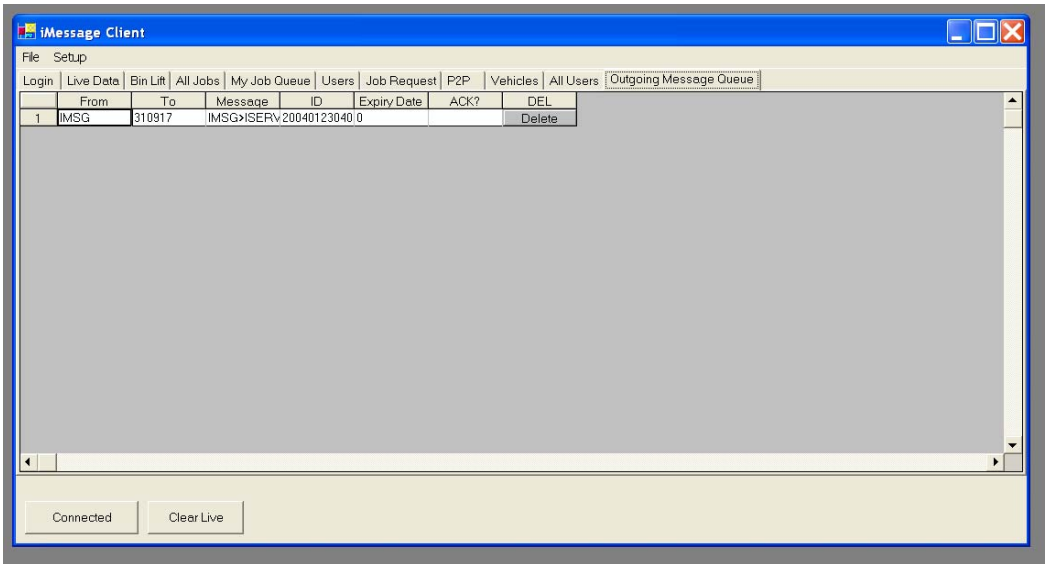
Job Request Screen



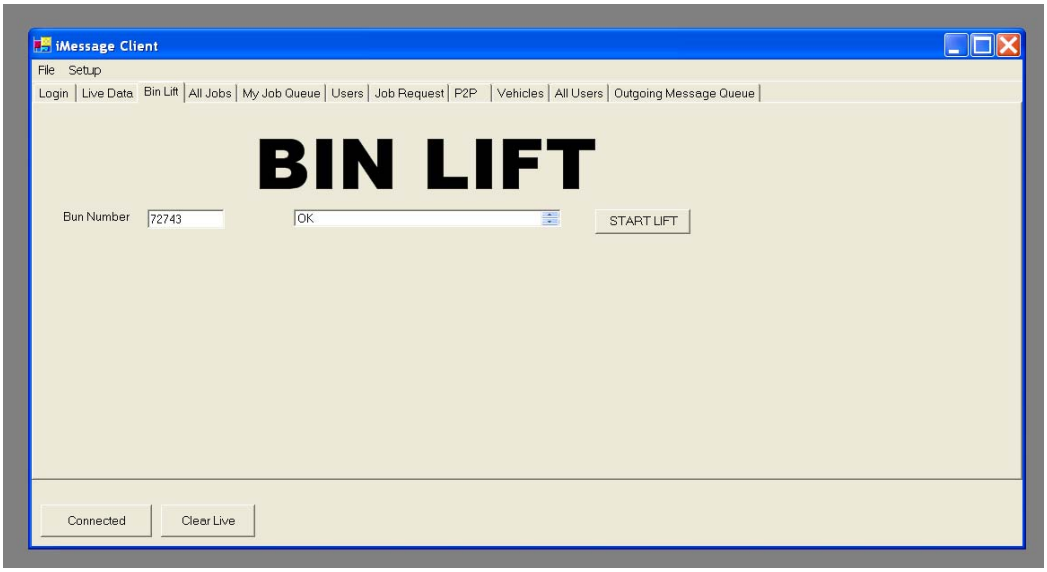
P2P Message Entry Screen



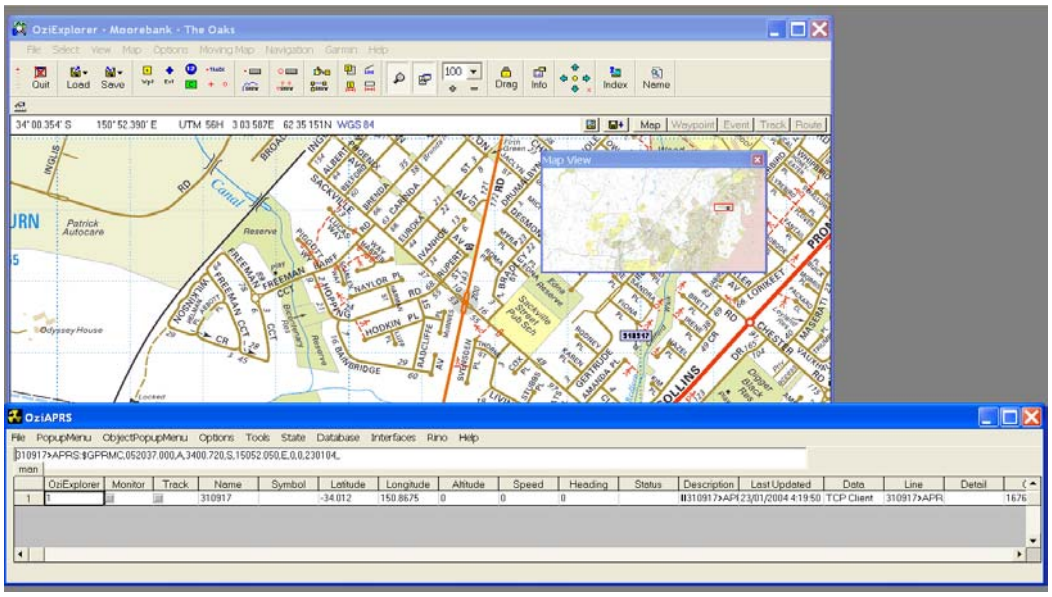
Outgoing Message Queue Screen



Bin Lift Screen



OziAPRS & OziExplorer



Database

Introduction

The database contains information on all th

Database Tables

Table	Description
DriverDetails	
HardwareCallsigns	List of IMEI's
Jobs	List of open Jobs
LatestPositions	List of current positions
MessageMode	Type of message – P2P or to iServ
Messages	List of all messages including Jobs
MessageType	Packet Types list
PhoneMode	Access levels on phone
Positions	List of all positions
VehicleDetails	

Network Architecture

The iServ product suite operates using TCP/IP, Windows File Sharing and Microsoft Access. The exact interface depends on the particular operation being performed.

TCP/IP Ports

A number of TCP/IP ports are used for this application, depending on the type of device connecting to the application. The ports include

Port 5001	iMessage and OziAPRS clients
Port 8001	Net960 and M110
Port 80	NetGPS

Port 5001 for iMessage and OziAPRS Clients

Port 5001 is used for communications between iServ and the iMessage and OziAPRS client software. The iMessage and OziAPRS client software connects to the iServ server on this port in order to exchange messages of various types.

On connecting, iServ sends a series of messages to the client with the last recorded positions of all the mobile stations.

Port 5001 is designed to be used on a high bandwidth link (modem, Ethernet, broadband). Several of the messages could potentially overload a low bandwidth radio link.

Clients connected to port 5001 should see all data sent or received on this port by other clients, as well as all data on port 8001.

Port 8001 for Net960 and M110 units

Port 8001 is designed to operate with GPRS units in the field. Incoming data is massaged into a format that is common to other parts of the iServ system. The incoming data has a Callsign added if it does not have one already.

An important feature of port 8001 is that upon connection, any connections to this port from other clients using the same Callsign are immediately disconnected. This is to remove the possibility of a ‘Denial Of Service’ attach on this port, from connections to this port without a resulting session.

These type of connections are common on the GPRS network as a way to handle the mobile IP environment.

Port 80 for NetGPS

The iServ software is able to add a small HTTP server on Port 80 for the specific purpose of allowing connections from the NetGPS PC and PDA software. NetGPS allows uploading GPS data in real time from a PDA in the field using the HTTP protocol.

Protocol

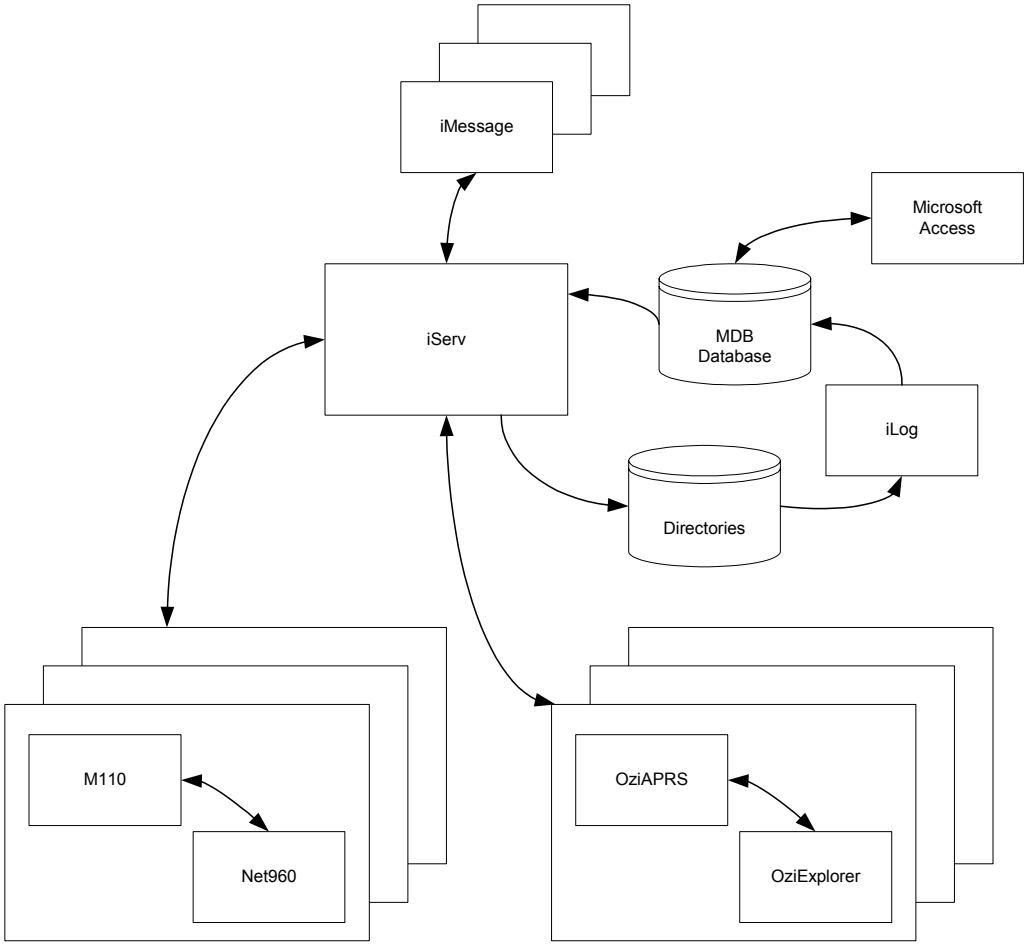
The iServ protocol is a modified version of the APRS protocol developed by Bob Bruninga in the USA. The iServ, iMessage and OziAPRS software support most of the position reporting formats in APRS.

Radioactive Networks have extended the APRS protocol to allow highly robust messaging formats, by implementing a sub-class in the User-Defined area of the protocol.

Within this User-Defined area, a number of message types have been defined.

#INCLUDE PROTOCOL DETAILS HERE

iServ Component Interactions



Backups of Data

In an application like this, reliable backups are vitally important. The backups should be done daily or weekly depending on business needs.

Backup of XML Files

The XML files contain the same data that can be found in the database. As such they provide a backup in case the entire database gets corrupted.

1. Shut down iServ
2. Move any files from C:\Program Files\iServ\XML\Errors to C:\Program Files\iServ\XML\Upload
3. Once the files have been processed, close iLog
4. Backup all the files in C:\Program Files\iServ\XML\Done
5. Optionally, ZIP all the files in C:\Program Files\iServ\XML\Done and move them to CD-ROM
6. Optionally, ZIP the files in C:\Program Files\iServ\XML\Errors if there are any and sent them to Radioactive Networks for Analysis
7. Restart iLog and iServ

Backup of Database File

The database file should be backed up periodically to ensure system availability.

1. Shut down iServ and iLog
2. Backup any files in C:\Program Files\iServ\Database
3. Restart iServ and iLog