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

\_\_\_\_<sup>\_</sup>\_\_\_\_<sup>\_</sup>\_\_\_\_

#### 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**

1	vetwork Da	atabase Ser	vers Refre	ish Help	
oni	nections [Vel	hicles Users	s Events F	Passthrough T	Text Callsigns Outgoing Message Queue Test1 Test2
	VehicleNu	VehicleReg	VehicleCall	VehiclePho	
	0	TEST	NULL	(null)	
	1	TEST2	VK2XSB-1	(null)	
	2	ACL52H	VK2TDS	0412 929 6	
	3	AFF434	VK2XSB	(null)	
	4	YAE148	M110-1	(null)	
	5	XLZ123	VK2XLZ	(null)	
	6	ISERV	ISERV	(null)	
	7	iuidsf	310917	(null)	
	8	dsffidi	DEST	(null)	
	9	EL-1	EL-1	(null)	
	10	123456	123456	(null)	
	11	311530	311530	(null)	
	12	IMSG	IMSG	(null)	
	13	ISERVD	ISERVD	(null)	
0.1	MSGNSERV	111@310917	MSG 2004	0123040436+	This is a message for non-fussy neonle

#### **Users List Screen**

	vetwork Da	atabase Se	rvers Refre	sh Help							
Con	nections   Vel	hicles User	s Events F	assthrough Tex	t Callsians	Outaoina N	/lessage Queu	e   Test1   1	Fest2		
	DriverNum	DriverNam	DriverPhon			1					
	0	TEST	1								
	1	TEST2	2								
	2	VK2TDS	1								
	3	ISERV	1								
	4	310917	1								
	5	EL-1	1								
	6	123456	1								
	7	311530	1								
	8	IMSG	1								
	9	ISERVD	1								

## Pass-through Text Screen

le Network Database Servers Refresh Help	
Vehicle User Events Feasthrough Text Callsigns Outgoing Message Queue Test2   Line:310017x15ERV-UIISISERV 310017 20040123050628 20040123050628 15052049E34007205000000 Line:MSG)ISERV/UIISISERV 310017 20040123050642 0040123050628 15052050E34007205000000   Line:310017x15ERV-UIISISERV 310017 20040123050642 0040123050645 15052050E34007215000000 Line:MSG)ISERV/UIISISERV JISI017 20040123050443 0040123050614 50001230500145 000000   Line:310017x15ERV-UIISISERV 310017 20040123050712 00001230507115052050E340072150000000 Line:310017x15ERV/UIISISERV JISI017 20040123060713 0040123050711 5052050E340072150000000   Line:MSG)SERV/UIISISERV 310017 20040123060734 0040123050711 505205E340071450000000 Line:MSG)SERV/UIISISERV JISI017 20040123050734 0040123050711 505205E34007145000000   Line:MSG)SERV/UIISISERV 310017 20040123050751 200401230507511 505205E34007145000000 Line:MSG)SERV/UIISISERV JISI017 200401230500750 20040123050075150205E340071450000000   Line:MSG)SERV/UIISISERV 310017 200401230500751 20040123050075150205E3400716520000000 Line:MSG)SERV/UIISISERV JISI017 20040123050082 000401230500875150205E3400716520000000   Line:MSG)SERV/UIISISERV JISI017 20040123050082 2004012305008241505205E3400715520000000 Line:MSG)SERV/UIISISERV JISI017 20040123050082 200401230500824150520554530071550000000 Line:MSG)SERV/UII	

#### **Callsign List Screen**

. 1		1 - 1			In a local		a far a	. 1		
onnections   Ve	hicles   Users	Events	Passthrough Te	ext Calisigns	Outgoing Mess	age Queue   Ti	est1   Testa	2		
HardwareA	Callsign									
871487389	VK2ABC									
787878834	VK3AH									
204160402	VK2TDS									
784375878	VK2XSB-1									
998910903	VK2XLZ-4									
777283499	VK2AAA									
909493878	VK4SX									
248498499	VK2SS									
998439800	VK8JS									
228439800	VK1SDF									
123489348	VK3SB									
410934900	NOCALL									
350030950	M110-1									
310917	310917									
123456	123456									
311539	311530									
IMSG	IMGS									
ISERVD	ISERVD									

#### **Outgoing Message Queue Screen**



iLog

Done Load Database	
22/01/2004 12:34:11 AM - Positior	n
22/01/2004 12:34:27 AM - Position	1 I
22/01/2004 12:34:42 AM - Position	1
22/01/2004 12:35:14 AM - Position	1 I
22/01/2004 12:35:30 AM - Positior	1 I
22/01/2004 12:35:45 AM - Positior	1
22/01/2004 12:36:17 AM - Positior	ı
22/01/2004 12:36:33 AM - Positior	ı
22/01/2004 12:36:48 AM - Positior	ı
22/01/2004 12:37:04 AM - Positior	1 IIII
22/01/2004 12:37:20 AM - Positior	1 IIII
22/01/2004 12:37:36 AM - Positior	ו
22/01/2004 12:37:52 AM - Positior	1

#### 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.

- 1	Even	Erem Lines	TaVahiala	Teller	Manager	Massage	Villen	Million Lat	Mare Lev	0.000	Antina	ManCan	Le le ID
1		From Oser	IMSG	TUOSEr		DE:This is a	23/01/2004 /	venere - Lau	where - Lon	Open r	Action	20040123040	107452800
	VK2TDS	1	IMSG		ADD JOB	BE:11111111	23/01/2004 4					20040123040	10745153
	VK2TDS		IMSG		ADD JOB	RE:This is a	23/01/2004 4					20040123040	10745152
-	VK2TDS	-	IMSG		ADD JOB	BE:This is a	23/01/2004 4					20040123040	10745149
	VK2TDS		IMSG		ADD JOB	aaaaaaaaaaa	23/01/2004 4					20040123040	10745105
	VK2TDS		IMSG		ADD JOB	TextBox6	23/01/2004 4					20040123040	10745105
	VK2TDS		IMSG		ADD JOB	Are You Ther	23/01/2004 4	6				20040123040	10743242
	VK2TDS		IMSG		ADD JOB	Are You Ther	23/01/2004 4	6				20040123040	10742856
	VK2TDS		IMSG		ADD JOB	DDDDDDDD	23/01/2004 4					20040123040	10742626
1	VK2TDS		IMSG		ADD JOB	cccccccc	23/01/2004 4	6				20040123040	10742626
6	VK2TDS		IMSG		ADD JOB	BBBBBBBBB	23/01/2004 4					20040123040	10742626
2	VK2TDS		IMSG		ADD JOB	АААААААА	23/01/2004 4					20040123040	10742626
3	VK2TDS		IMSG		ADD JOB	********	23/01/2004 4	:				20040123040	10742626
1	ISERV		IMSG		Add User	ISERVD	23/01/2004 4					20040123040	
5	ISERV		IMSG		Add User	IMGS	23/01/2004 4					20040123040	
5	ISERV		IMSG		Add User	311530	23/01/2004 4					20040123040	
,	ISERV		IMSG		Add User	123456	23/01/2004 4					20040123040	
3	ISERV		IMSG		Add User	310917	23/01/2004 4	1				20040123040	
3	ISERV		IMSG		Add User	M110-1	23/01/2004 4					20040123040	
)	ISERV		IMSG		Add User	NOCALL	23/01/2004 4					20040123040	

#### All Jobs List Screen

iM	essage Cli	ent										
File S	Setup											
Login	Live Data	Bin Lift All	Jobs My Job Q	ueue Users	Job Reque	st P2P	/ehicles All U	sers Outgoin	g Message	Queue		
	From	То	Message	ID	Expiry Date	ACK?	222	Reassign	???	Action		
1	VK2TDS	IMSG	RE:This is a	1074528092	NOT DONE	ADD JOB	222	Reassian	Delete	CLICK HERE		
2	VK2TDS	IMSG	RE:11111111	1074515352∨	NOT DONE	ADD JOB	???	Reassign	Delete	CLICK HERE		
3	VK2TDS	IMSG	RE:This is a	1074515203	NOT DONE	ADD JOB	???	Reassign	Delete	CLICK HERE		
4	VK2TDS	IMSG	RE:This is a	1074514915∨	NOT DONE	ADD JOB	???	Reassign	Delete	CLICK HERE		
5	VK2TDS	IMSG	ddddddddc	1074510597∨	NOT DONE	ADD JOB	777	Reassign	Delete	CLICK HERE		
6	VK2TDS	IMSG	TextBox6	1074510581∨	NOT DONE	ADD JOB	255	Reassign	Delete	CLICK HERE		
7	VK2TDS	IMSG	Are You Ther	1074324227∨	NOT DONE	ADD JOB	777	Reassign	Delete	CLICK HERE		
8	VK2TDS	IMSG	Are You Ther	1074285666	NOT DONE	ADD JOB	777	Reassign	Delete	CLICK HERE		
9	VK2TDS	IMSG	DDDDDDDC	1074262622	NOT DONE	ADD JOB	777	Reassign	Delete	CLICK HERE		
10	VK2TDS	IMSG	CCCCCCCCC.	1074262617∨	NOT DONE	ADD JOB	777	Reassign	Delete	CLICK HERE		
11	VK2TDS	IMSG	BBBBBBBBE	1074262612\/	NOT DONE	ADD JOB	???	Reassign	Delete	CLICK HERE		
12	VK2TDS	IMSG	AAAAAAAA	1074262607∨	NOT DONE	ADD JOB	???	Reassign	Delete	CLICK HERE		
13	VK2TDS	IMSG	*********	1074262601∨	NOT DONE	ADD JOB	225	Reassign	Delete	CLICK HERE		
•												• •
0	Connected	Clea	ar Live									

## My Jobs List Screen

1	From	То	Message	ID	Expiry Date	ACK?	Accept	Decline	Done	Action		
1	VK2TDS	IMSG	RE:This is a	1074528092	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
2	VK2TDS	IMSG	RE:11111111	1074515352	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
3	VK2TDS	IMSG	RE:This is a	1074515203	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
4	VK2TDS	IMSG	RE:This is a	1074514915\	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
5	VK2TDS	IMSG	qqqqqqqqqq	1074510597\/	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
6	VK2TDS	IMSG	TextBox6	1074510581∨	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
7	VK2TDS	IMSG	Are You Ther	1074324227	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
3	VK2TDS	IMSG	Are You Ther	1074285666V	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
}	VK2TDS	IMSG	DDDDDDDD	1074262622	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
0	VK2TDS	IMSG	00000000	1074262617	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
1	VK2TDS	IMSG	BBBBBBBBB	1074262612V	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
2	VK2TDS	IMSG	АААААААА	1074262607∨	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		
3	VK2TDS	IMSG	********	1074262601	NOT DONE	ADD JOB	Accept	Decline	Done	CLICK HERE		

## Job Request Screen

iMessage C	
File Setup	
Login   Live Dat	a Bin Lift All Jobs   My Job Queue   Users Job Pequest   P2P   Vehicles   All Users   Outgoing Message Queue   Job Request
Job Details	Job Request
For	V:2ABC Million   V:3AH Million   V:2XDS Villion   V:2XSB-1 Villion
Connected	IClear Live

#### P2P Message Entry Screen



#### **Outgoing Message Queue Screen**

🖶 Message Client	
File Setup	
Login Live Data Bin Lift All Jobs My Job Queue Users Job Request P2P Vehicles All Users Outgoing Message Queue	
FIG: TO Message ID Expiry Date ACK? DEL	<b>_</b>
I IMSG 310317 IMSG>ISERV2004012304010 Delete	
	_
Ormeted Department	

#### **Bin Lift Screen**



## **OziAPRS & OziExplorer**



## Database

#### Introduction

The database contains information on all th

#### **Database Tables**

Table DriverDetails HardwareCallsigns Jobs LatestPositions MessageMode Messages MessageType PhoneMode Positions VehicleDetails Description

List of IMEI's List of open Jobs List of current positions Type of message – P2P or to iServ List of all messages including Jobs Packet Types list Access levels on phone List of all positions

## **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 Port 8001 Port 80 iMessage and OziAPRS clients Net960 and M110 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