

## Automated Vehicle-based Spectrum Surveillance

- **Complete self-contained system for mobile spectrum surveys**
- **Ruggedised, pre-integrated solution**
- **Single (power) connection to vehicle**
- **Ruggedised**
- **Support for AOA and TDOA direction finding**
- **Designed for use by unskilled personnel if required**
- **Optional RFeyeView data mapping software**
- **Easy integration with RFeye Spectrum Management Systems**
- **Optional connection to local PC for live monitoring**

The RFeye Roof Box System is a complete pre-integrated vehicle-mounted solution designed to allow discreet spectrum surveillance over wide areas.

Built into a standard commercial roof box, the system includes an RFeye node, internally-mounted broadband omnidirectional antenna (with optional additional antennas, including antenna arrays for AOA [angle of arrival] direction finding), power controller and back-up battery, and high-capacity USB memory stick for local storage.

The system may be pre-programmed with the required measurement profile (frequency range(s), measurement interval(s), resolution bandwidth(s), statistical processing required, etc.) prior to the start of the survey, allowing use by non-technical personnel where required. The built-in high accuracy GPS receiver is used to tag the data received to map data against location, and data is also time-stamped using the precision GPS-derived clock, allowing later TDOA (time difference of arrival) analysis against data from other nodes for signal location purposes. Data is normally logged to a USB memory stick for easy transfer of data after each survey, but may also be transmitted over the built-in GPRS/HSPA modem.

The powerful Linux PC built into the RFeye node allows for conditional data acquisition (inc. if-then-else constructs) and statistical analysis as the data is collected to maximise the usefulness of the survey. In addition, an external PC may be connected for monitoring signals received whilst the survey is underway.

Features	
<ul style="list-style-type: none"> <li>• <b>System Includes:</b></li> <li>• RFeye Node</li> <li>• Power controller and backup battery</li> <li>• Broadband omnidirectional antenna</li> <li>• GPS and GPRS/HSPA antennas</li> <li>• USB memory stick for data storage</li> <li>• <b>Alternative Antenna Configurations:</b></li> <li>• Omnidirectional antenna or directional (DF) antenna arrays</li> </ul>	<ul style="list-style-type: none"> <li>• <b>RFeye Node Capability:</b></li> <li>• Wide frequency range: 10 MHz to 6 GHz</li> <li>• Fast digital sweep captures transient signals more effectively than swept analysers</li> <li>• Designed for unattended operation</li> <li>• <b>Option:</b></li> <li>• RFeyeView data mapping software</li> </ul>

## Three easy steps to discreet spectrum surveillance:

### 1): Define acquisition scenario

```
[config]
# Define maximum file size in bytes for data files:
max_file_size = 10000000

# Define unit or campaign information:
unit_info = "Town Survey 050709"

# Describe the scans the unit will perform and onboard data processing required:

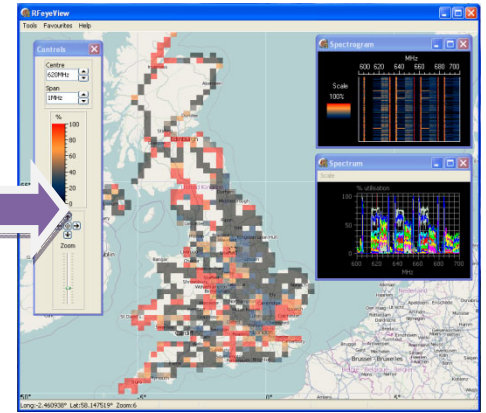
[scan1]
# First scan: 800 - 2000 MHz, 0.1sec between scans, narrow RBW
scan = 0.1,1,800,2000,1024,8
#
# Define statistics to be collected for scan1:
peak = 11.4,-1,"Peak capture for scan1"
mean = 12.4,-1,"Mean capture for scan1"
cpeak = 13.1,-1,"Compressed peak",-110
occl = 16.1,-1,"Occupancy -100 threshold 5mins",300,-115.8

[scan2]
# Second scan: 100 - 5000 MHz, 5 sec between scans, wider RBW
scan = 5.0,1,100,5000,256,16
#
# Define statistics to be collected for scan2:
cpeak = 17.1,-1,"Compressed peak from 100MHz to 5GHz",-100
```

### 2): Perform survey



### 3): Analyse data using RFeyeView software



## Technical specification

### Frequency

Range	10 MHz to 6 GHz
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### Sensitivity (equivalent noise figures at maximum sensitivity)

10 MHz - 4 GHz	8 dB typical
4 GHz - 6 GHz	11 dB typical

### Signal Input

Maximum input level	+15 dBm; 15 VDC
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### Internal Frequency Reference

Initial accuracy	better than $\pm 2$ ppm at 20°C
Stability	better than $\pm 1$ ppm (10°C to 30°C)
Ageing	better than $\pm 2$ ppm per year

### Sweep and Triggering

Sweep time	10 MHz - 6 GHz: less than 100ms*
Sweep mode	Fully programmable: Free run continuous, single, timed, delay timed, user trigger, adaptive (if-then-else)
Trigger on event	Fully programmable: user-definable masks, user-definable action when mask exceeded

### Signal Analysis

Real-time analysis bandwidth	20 MHz maximum
Equivalent resolution bandwidth	20 kHz min. (max. analysis b/w)
	2 kHz min. (reduced analysis b/w)

### Operating System and Software Development Options

Linux OS version	2.6
Python version	2.6
Development environments	Full SDK C and Python development environment available

\*: Fast sweep mode

## For more information

### Antennas

Measurement (Omnidirectional)	700 MHz - 5 GHz (usable to 100 MHz)
Measurement (Directional - DF array)	6 x 600 MHz - 6 GHz (Circular polarisation)
Measurement (Other)	Other antennas may be accommodated - please contact CRFS for further details
GPS	Built-in
GPRS/HSPA	Built-in

### Interfaces

100 Base T Ethernet	For external monitoring
USB	2, for memory sticks (system programming and/or bulk result storage)

### Power Supplies

Ext DC input	12 VDC vehicle supply
Power consumption	12 - 18 W, radio operational 6 W typical, radio idle

### Mechanical

Roof box	Thule Karrite PB310 or equivalent
Dimensions	130 cm x 85 cm x 39 cm
Weight	21.0 kg

### Environmental

Operating temperature	-30 to +55°C
Storage temperature	-40 to +50°C