RF**eye**System
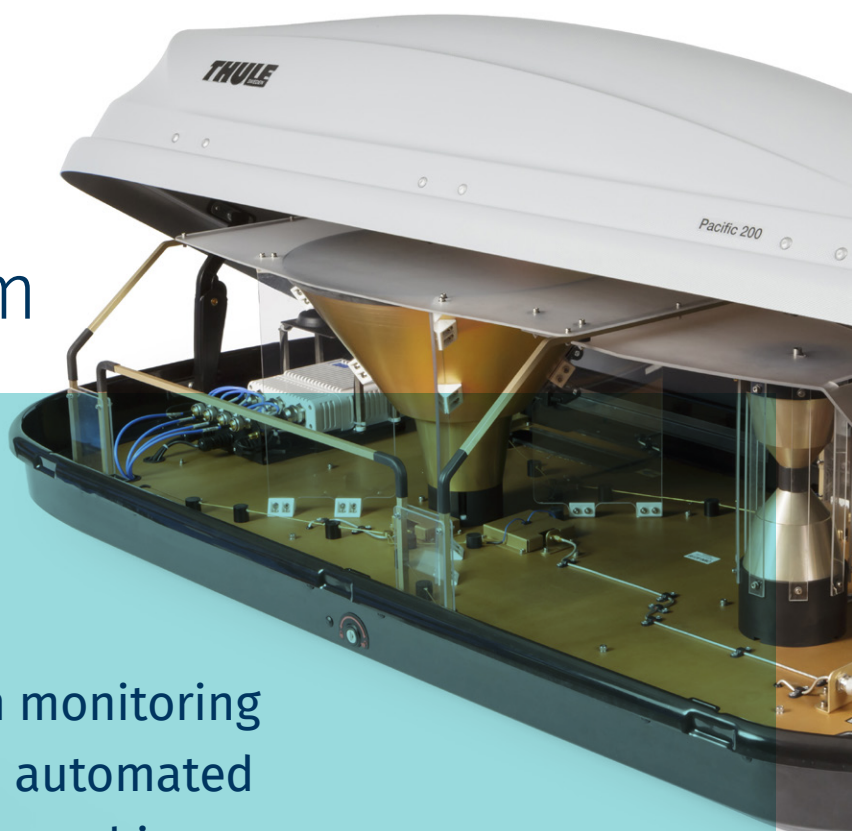
Roofbox 20-6

Mobile spectrum monitoring system

Vehicle-deployable spectrum monitoring and surveillance for discrete, automated data collection over wide geographic areas.

The RFeye Roofbox 20-6 is a complete solution for mobile wide area spectrum monitoring. The system combines the performance of the Node 20-6 with an array of high performance omnidirectional antennas. It can be powered via the vehicle 12 VDC supply or optionally via power over Ethernet for users running real-time RFeye software from within the vehicle.

The Roofbox system is targeted principally at spectrum regulatory, planning and enforcement teams who want to capture real-world data about spectrum usage and infringements across wide frequency bands. The aggregated data that emerges from mobile RFeye systems is used to monitor compliance, identify trends, and detect and localize suspicious or illegal activity.

Onboard intelligence and SSD data storage allow the Roofbox to be used flexibly as a real-time system via in-vehicle touchscreen software, or as a passive data collection system requiring no operator input, or concurrently in both modes.

RF**eye**System

Roofbox 20-6
Specifications

Receiver
Integrated receiver	1 x Node 20-6

Frequency
Range	10 MHz to 6 GHz

Noise figures at maximum sensitivity
10 MHz to 3 GHz	8 dB typical
3 GHz to 6 GHz	11 dB typical

Phase noise
Receiver input at 2 GHz	-91 dBc/Hz at 20 kHz offset, typ.

Signal analysis
Instantaneous bandwidth	20 MHz
Tuning resolution	1 Hz

Internal frequency reference (pre-calibration)
Initial accuracy	better than ±2 ppm typ.
Stability	better than ±1 ppm typ.
Ageing	better than ±2 ppm per year

Programmable sweep modes
Sweep speed - fast synth	45 GHz/s @ 1.2 MHz RBW
Sweep speed - high quality synth	15 GHz/s @ 1.2 MHz RBW
User programmable modes	free run continuous, single timed, user trigger and adaptive
Trigger-on-event modes	user defined masks, actions and alarms

Sampling
Resolution	14 bits per channel (I&Q)
Rate	40 MS/s I&Q

Third order intercept points with AGC
< 1 GHz	+21 dBm typical
1 GHz to 6 GHz	+22 dBm typical

Local oscillator
Re-radiation	-90 dBm typical

Frequency references
Selectable	Internal, GPS or external
External input	10 MHz ±1 kHz
Output	10 MHz

Processor sub-system
CPU	Marvell 88F6281 @ 1 GHz
Main memory	512 MB DDR2
System disk	512 MB

System software
Boot firmware	U-Boot
Operating system	Linux, kernel v 2.6
RFeye Node Control Protocol	NCP Server (NCPd)
Node Apps (optional)	Logger, Recorder, Threshold, Stations, Survey

Roofbox System

I/O
Antennas, Rx omnidirectional	20 MHz to 200 MHz 100 MHz to 700 MHz 500 MHz to 3 GHz 800 MHz to 6 GHz (connected via 4 x N-type 10 MHz-6 GHz ports)
Network	1 x 1 GigE, with POnE
Universal Serial Bus	1 x USB 2.0
1 x IEEE1394 expansion port	SyncLinc, trigger input, external peripheral control
GPS	Pre-integrated antenna
Cellular modem (internal)	LTE*/HSPA+/GSM
region variants, consult CRFS	*(MIMO not supported)*

Data storage
External flash disk	via USB interfaces
Internal storage	512 GB SSD

Size, weight and power
Dimensions (w, h, d)	1750 x 820 x 450 mm (29.5 x 32.3 x 17.7 inches)
Weight	35 kg (77.2 lbs)
Power	10-56 VDC via 12 VDC vehicle supply (adaptor included) or POnE via 56 VDC mains adaptor (in-vehicle inverter required)

Power consumption
Typical	15 W
Maximum	25 W

Environmental
Operating temperature	-30 to+55 °C (-22 to 131 °F)
Storage temperature	-40 to+70 °C (-40 to 158 °F)
Ingress protection	IP67 (RFeye Node)

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