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RAPTOR RXi
Ultra-fast scanning Countersurveillance Receiver

Features

- Scans 26GHz in less than 4 seconds at 3kHz resolution (approx. 100,000,000 samples per second)
- Full span spectrum analyzer display – 6GHz, 10GHz & 26GHz models available
- High resolution 15" touch screen display with multiple windows
- Sophisticated signal logging tools easily identify new signals
- Active pinpoint direction finding with "optional" probe antenna
- Full span waterfall display for analysis of signals over time
- Dedicated ultra wideband (UWB) receiver detects signals impossible to find with conventional receiver (optional)
- Rectrix software for long-term waterfall analysis + historic waveform recall (optional)
- Rostrum software delivers retrospective standalone analysis and reporting (optional)
- Remote operation by means of Ethernet
- Built-in auto switching antenna system

Applications

- Technical surveillance countermeasures (TSCM)
- Spectrum monitoring and interference mitigation
- Government sweep teams for internal and external security
- Radio monitoring and enforcement by regulatory government authorities
- Monitoring all signals from military and government bases
- Signal acquisition and analysis in a compact portable package
- In-conference and VIP monitoring

Overview

The Raptor RXi is an ultra-fast-scanning counter-surveillance receiver for quickly detecting surveillance transmitters.

The Raptor scans from 10kHz to 26GHz in under 4s, detecting even the briefest pulsed transmissions. Featuring a fast Core 2 Duo processor, its multiple software tools and demodulators detect frequency-hopping, burst mode and spread spectrum devices as well as analogue audio and video signals.

Two spectrum analyser windows allow the user to simultaneously view the whole spectrum and zoom in on individual frequencies. The 'Waterfall' display mode gives an intuitive display of signals over time.

The Raptor is designed to allow 24hr continuous monitoring of the radio spectrum to detect remote-controlled devices. Using its built-in Ethernet port, the Raptor can be operated remotely, allowing sites to be continuously monitored without the need for a site visit.

Modern ultra wideband (UWB) spread spectrum devices are challenging for a conventional receiver to detect. Its optional integrated, dedicated UWB receiver allows the Raptor to detect such devices easily.

The Raptor is a portable device, allowing reference scans to be easily run in different areas of a building, operating either from an internal rechargeable battery or an external supply. Its integrated antenna system provides excellent wideband performance from 10kHz to 26GHz.

The Raptor can also be supplied with an external passive omni-directional antenna which has amazing coverage from below 20 MHz to 26GHz. With nominal gains of 0 dBi or higher over 99.5% of the frequency range.

Technology

The system contains a full-feature Core 2 Duo PC running Windows 7 and a state-of-the-art receiver (designed by Winkelmann). The receiver uses an analogue front end, combined with software filtering and demodulation to provide the best combination of fast scan speed and receiver performance.
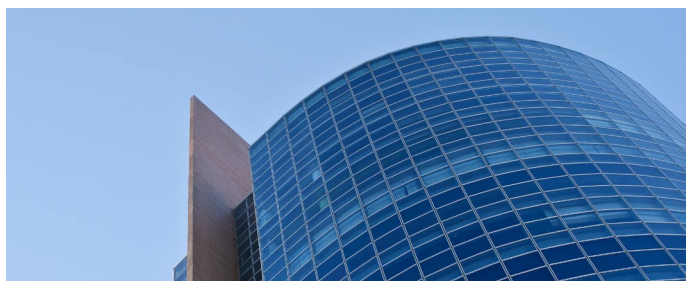
This design enables the system to sweep extremely fast; the software provides a wide range of analysis tools for the detection and location of bugging devices.

The user interface has been carefully designed to be simple and intuitive; the spectrum analyzer display shows the entire spectrum in one graphical window with the facility to zoom in on areas of interest. A separate zoom window allows the user to simultaneously look at areas of the spectrum in high-resolution mode. Displays spectrum as a list or graphically. Facility to compare lists or graphs sampled in different locations, plus allows user to zoom over the spectrum without any interruption at even 20MHz.
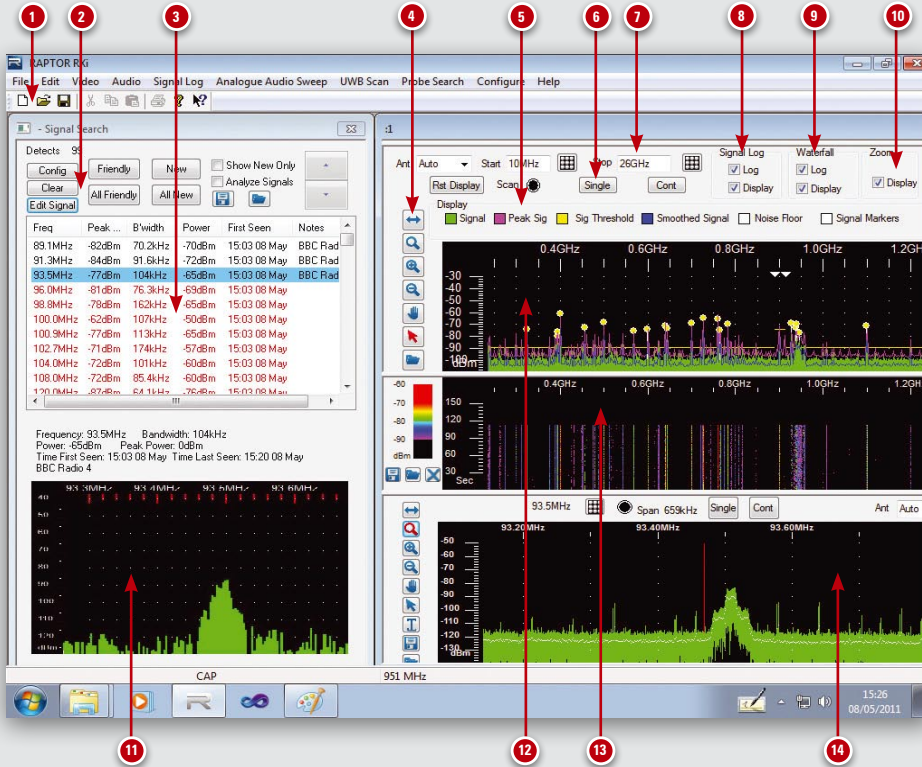
Software

The software package includes :
- Spectrum analyzer window
- Spectrum zoom window
- User definable start and stop frequencies
- Signal log window
- Waterfall display
- Automatic sweep for analogue bugs
- Video display (PAL/NTSC/SECAM)
- Audio receiver (analog demodulation)
- Automatic frequency control (graphical fine tune interface)
- Probe search window
- Ultra-wideband receiver (optional)
- Save spectrum displays or 'snapshot' of brief signals
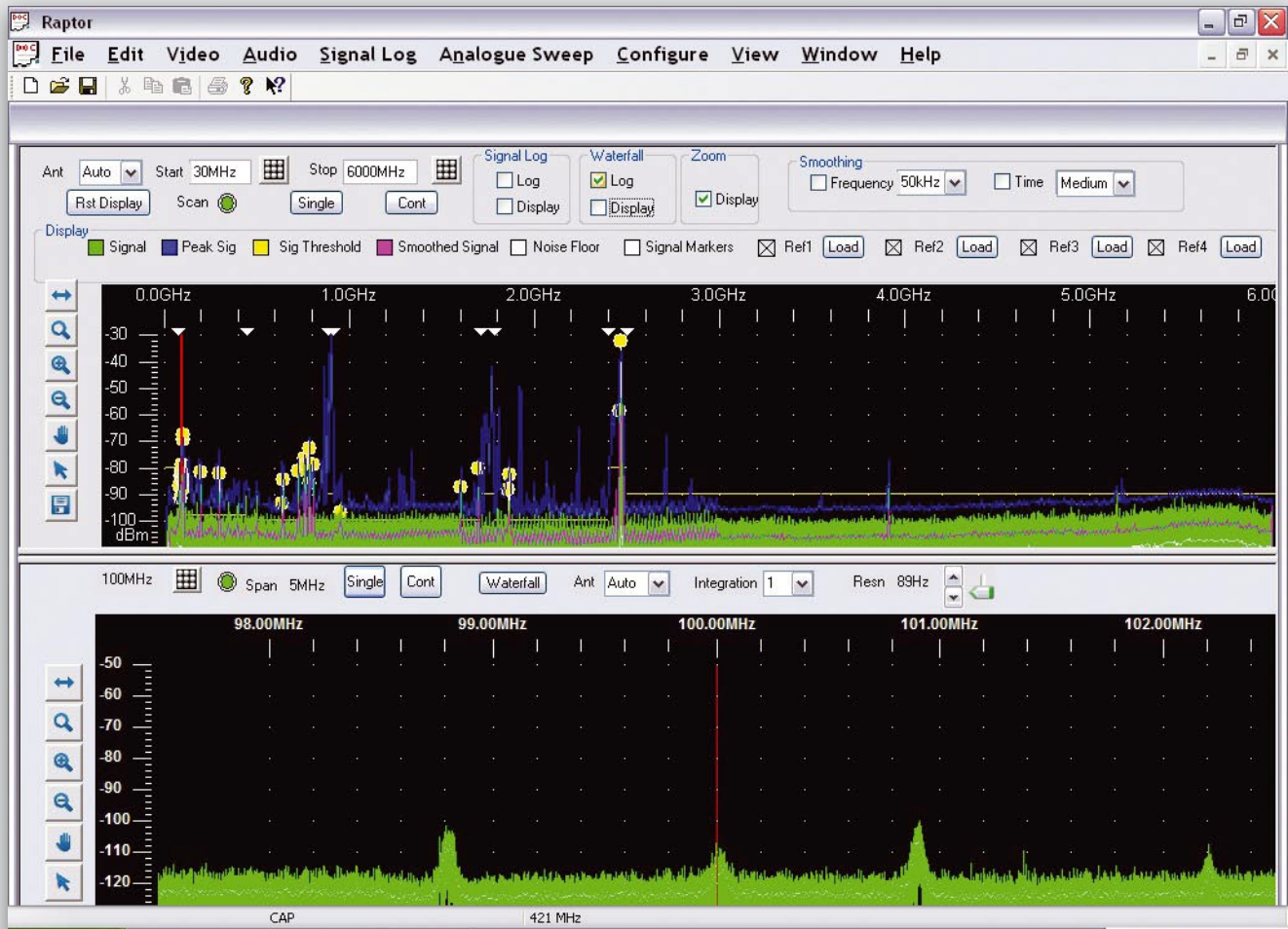- Save application configurations and user-defined parameters to disk
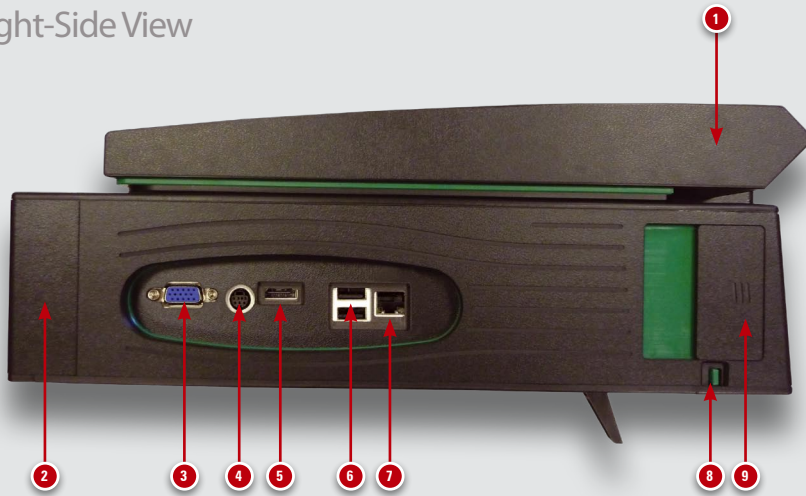
Screenshots

Legend:

1: Main frame menu
2: Signal log controls
3: Signal log window
4: Spectrum analyzer toolbar
5: Trace display colour controls
6: Start/Stop scan controls
7: Scan frequency controls
8: Activate/Display signal log
9: Activate/Display waterfall display
10: Display spectrum zoom window
11: Signal log signal snapshot
12: Spectrum analyzer window
13: Waterfall window
14: Spectrum zoom window

Clear Graphical display of full spectrum analyzer bandwidth, 6GHz, 10GHz or 26GHz (depending on model)
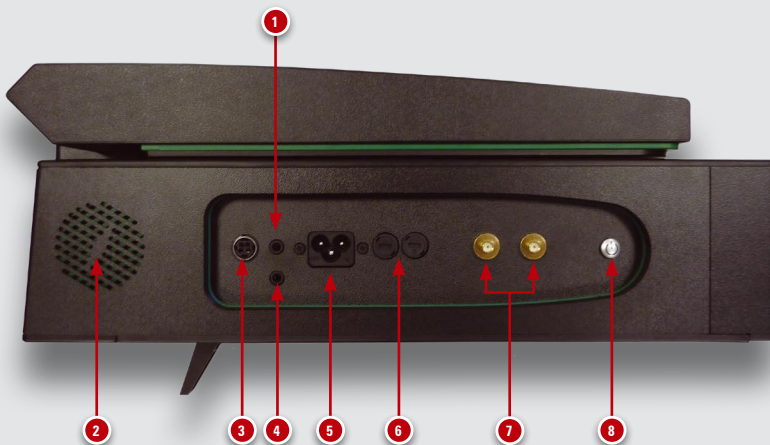
Profiles

Right-Side View

Legend:

1: Antenna
2: Base unit
3: VGA monitor output*
4: Video monitor output*
5: HDMI*
6: 2 x USB connectors*
7: Gigabit Ethernet connector*
8: Stylus
9: Battery compartment

* Layout and availability of these connectors are subject to change.

Left-Side View

Legend:

1: Speaker output connector
2: Speaker
3: DC supply input connector
4: Mic input connector
5: Mains interface connector
6: Mains interface fuses
7: 2 x external RF in connector
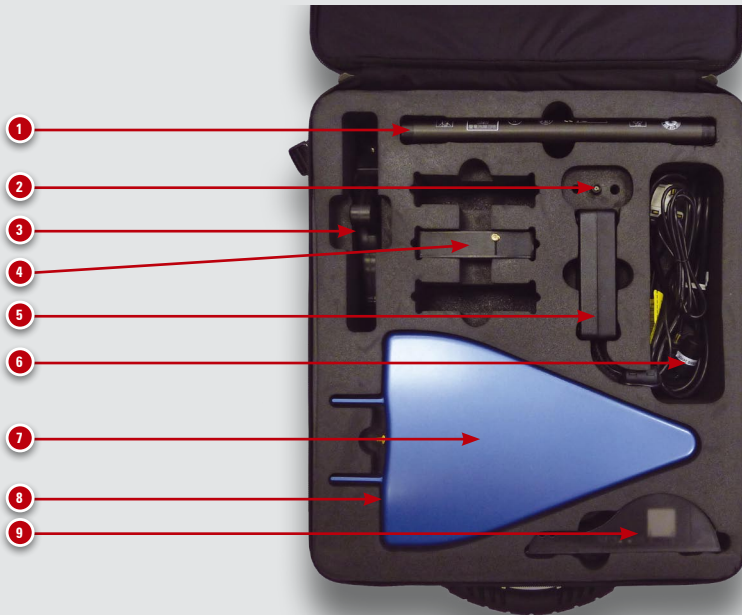**8:** Power On/Off button

Transport Case

Legend:

1: Accessory case
2: Raptor carry case

The Raptor RXi comes in a soft carry case. The optional Accessory Case can be attached to the main Raptor RXi carry case using the four snap-on clips.

Accessory Case (optional)

Legend:

1: Spare battery
2: Tone box antenna
3: Handle / Tripod
4: Tone box
5: Battery charger power adaptor
6: DC power cable and mains supply lead
7: Directional Probe Antenna
8: Probe cable (underneath the antenna)
9: Stand-alone battery charger

The Directional Probe Antenna can be used as a probe antenna when performing a probe search and as a desktop directional antenna.

Probe Search Window

External antenna, omni wide-band passive, 20MHz - 26GHz supplied with tabletop tripod and roof rack mount

The probe search window can be used with a Probe Antenna to find the location of a suspect transmission.

The probe search gives a visual (and audible if required) reading of the strength of a signal. Using an external directional antenna, this can be used to locate the physical location of a transmitter. The Raptor RXi optional accessory case contains a Directional Probe Antenna (right) which can be used for this purpose. This Directional Probe Antenna is officially rated from 700MHz to 6GHz. In practice the probe antenna performs below 700MHz and above 6GHz. (Other frequencies are available upon request – see Product Codes on back page.)

Directional Log Periodic Probe Antenna for locating digital transmissions

Technical Specifications

Receiver	
Frequency range	10kHz – 6GHz 10kHz – 10GHz 10kHz – 26GHz
Tuning resolution	1Hz
Demodulation bandwidth	6kHz, 15kHz, 30kHz 110kHz, 220kHz
Demodulation modes	AM, FM
Sensitivity	-110dBm
DANL	-100dBm
System phase noise	-90dBc at 10kHz
Attenuation	0dB to -31.5dB in 0.5dB steps
Dynamic range	90dB (SFDR: 80dB)
Aux RF in	10kHz – 26GHz
RF input	2x 50 ohms (1x 10kHz - 6GHz & 1x 10kHz - 26GHz)
Maximum RF input	+10 dBm (10kHz - 6GHz) -6 dBm (6GHz - 26GHz)
Power (overall system)	19 VDC (150 Watts max.)

Spectrum Analyzer	
Frequency range	10kHz – 6GHz 10kHz – 10GHz 10kHz – 26GHz
Sampling resolution	3kHz
IF display bandwidth	20MHz
Sensitivity	-110dBm at 3kHz Sampling Resolution
Scan time	>6GHz/sec

Video Demodulation	
Formats	PAL, NTSC, SECAM
Modulation types	AM, AM inverted FM, FM inverted

Processing	
Processor	Intel Core 2 Duo
Display	15" Colour LCD with Touchscreen
Operating system	Windows 7
Hard drive capacity	1TB

Display Modes

Full Bandwidth Spectrum Analyzer, Full Bandwidth Waterfall Spectrum Zoom, Signal Logging, Video, Probe Search UWB Receiver (optional)

Inputs/Outputs

2 x Aux RF, 2 x USB ports as standard, Monitor Output, HDMI, Ethernet

Dimensions & Weights	
Dimensions	375mm x 360mm x 130mm
Weight	Approx 8Kg
Operating Temperature	0° C to + 50° C

Power Supply	
Universal power supply	90-264V AC, 47-63Hz
Size	65mm (D) x 37.5mm (H) x 169mm (W)

Battery	
Slot-in rechargeable Lithium-ion smart battery	
Size	22.3mm (H) x 285mm (L) x 58.9mm (W)
Weight	700g
Battery life	Approx. 90 minutes

Charger (supplied with optional Accy Case)	
Desktop smart charger	90-260V AC,
Output	12V, 2.5A DC
Size	58.0mm (H) x 180mm (L) x 92.0mm (W)
Weight	235g (excluding power supply)

Product Codes

RAPTOR RXi Countersurveillance Receiver – Full Systems

3-299-020 — RAPTOR RXi 6GHz- Full system and accessories with signal processing software, video demodulation, built-in auto switching antenna system, high resolution 15" touch screen display with 'drag' & 'move' controls, internal Li-ion rechargeable battery, universal power supply 90-264V AC, power cable, protective soft carry case & guidance manual

3-299-021 — RAPTOR RXi 10GHz- Full system and accessories with signal processing software, video demodulation, built-in auto switching antenna system, high resolution 15" touch screen display with 'drag' & 'move' controls, internal Li-ion rechargeable battery, universal power supply 90-264V AC, power cable, protective soft carry case & guidance manual

3-299-022 — RAPTOR RXi 26GHz- Full system and accessories with signal processing software, video demodulation, built-in auto switching antenna system, high resolution 15" touch screen display with 'drag' & 'move' controls, internal Li-ion rechargeable battery, universal power supply 90-264V AC, power cable, protective soft carry case & guidance manual

RAPTOR RXi Receiver – Accessories & Upgrades

3-299-023 — Ultra Wideband Receiver Module (built-in) designed specifically for detecting ultra wideband transmission based on multiband OFDM

3-299-024 — Accessory case including Directional Log Periodic Probe Antenna with SMA connector, 8m cable, tone box (1), tone box antenna, spare Li-ion rechargeable battery, smart battery charger 90/260V all housed in protective soft pouch including machined foam insert (Accy Pouch can be attached to the side of main Raptor case)

3-299-025 — Spare slot-in rechargeable Lithium-ion smart battery

3-299-026 — Desktop smart charger: 90-260V AC, output: 12V, 2.5A DC

3-299-027 — Directional Log Periodic Probe Antenna 680MHz to 18GHz with 8m cable

3-299-028 — Directional Log Periodic Probe Antenna 100MHz to 26GHz with 8m cable

3-299-029 — External antenna, omni wide-band passive, 20MHz - 26GHz supplied with tabletop tripod and roof rack mount

3-299-030 — Rectrix software long-term waterfall analysis with historic waveform recall (per license)

3-299-031 — Rostrum software view raptor files on any windows PC (per license)

3-299-048 — Tone Box with antennae

3-299-995 — GSM196 Cellular Detector can detect both 2G (GSM900/1800) and 3G (WCDMA /UMTS 2100) with cadenced vibration alert and latched alarm, omni-directional antenna and guidance manual

3-299-993 — GSM196A Cellular Detector can detect both 2G (GSM850/1900) and 3G (WCDMA /UMTS 2100) with cadenced vibration alert and latched alarm, omni-directional antenna and guidance manual