thinkRF™ R6000

Real-Time Spectrum Analyzer

9 kHz to 8 GHz RTSA in smaller size

COMPACT & LOW FOOTPRINT

184 x 165 x 60 mm
(7.2” x 6.5” x 2.4“)
2.2 kg (4.8 lbs)

HIGH PERFORMANCE

Super-heterodyne
radio design

HIGH SPEED NETWORKING CAPABILITY

USB 3.0, ethernet,
PCIe interfaces

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OVERVIEW

R6000
Real-Time Spectrum
Analyzer
in smaller size

Compact, fanless, networked and remote deployable real-time spectrum analyzers with GNSS

1

Wi-Fi 6E ready, 9 kHz to 8 GHz

2

100 MHz
Instantaneous Bandwidth (IBW)

3

65 GHz/s @ 10 kHz RBW
Sweep Rate

4

23 W @ 12V input power consumption

5

184 x 165 x 60 mm
(7.2" x 6.5" x 2.4")
Compact

6

2.2 kg (4.8 lbs)
Light

The performance of traditional lab-grade spectrum analyzers at a fraction of the cost, size, weight and power consumption.

thinkRF™ makes the cost-effective testing and monitoring of billions of wireless devices possible. Using innovative software-defined radio technologies, the thinkRF R6000 Real-Time Spectrum Analyzer with GNSS has the performance of traditional lab-grade spectrum analyzers at a fraction of the cost, size, weight and power consumption.

The sleek, lightweight, and fanless thinkRF R6000 analyzer provides the benefits of a high-performance software-defined RF receiver, digitizer and analyzer along with integrated GNSS technology offering location and time information.

The R6000 Real-Time Spectrum Analyzer is based on an optimized software-defined radio receiver architecture coupled with real-time digitization and digital signal processing. This enables wide bandwidth, deep dynamic range and 8 GHz frequency range in a small, one-box, stylish platform. Designed for stand-alone, outdoor, mobile, remote and/or distributed wireless signal analysis, the R6000 analyzer can be deployed as a single unit or a network of radio sensors, making it ideal for monitoring, management and surveillance of transmitters, whether they are in-building or spread across a geographic area. The Low SWaP (size weight and power) - designed for easy integration into a wide range of applications including:

- Spectrum Monitoring
- Signals Intelligence
- Test Equipment
- RF Scanners

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APPLICATIONS

R6000 Real-Time Spectrum Analyzer (RTSA)

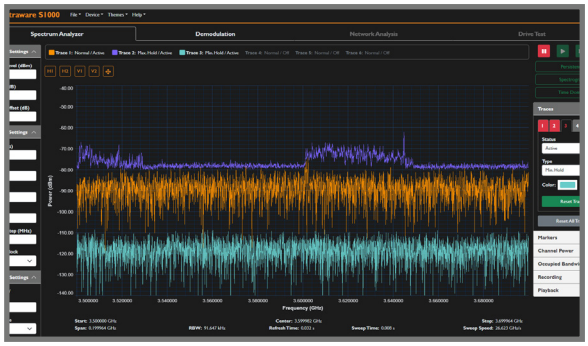
S1000 Spectraware Real-Time Spectrum Analysis Application Software

The thinkRF™ S1000 Spectraware software harnesses the power of the thinkRF Real-Time Spectrum Analyzers to provide all the visualization capabilities you'd expect, while still being cost-effective and easy to use. The intuitive graphical user interface (GUI) has been designed with the end-user in mind, focusing on center, span, start and stop coupled mode rather than on RFE mode as its primary control model, simplifying the user experience and keeping the view of the spectrum front and center.

AUTOMATIC MEASUREMENTS

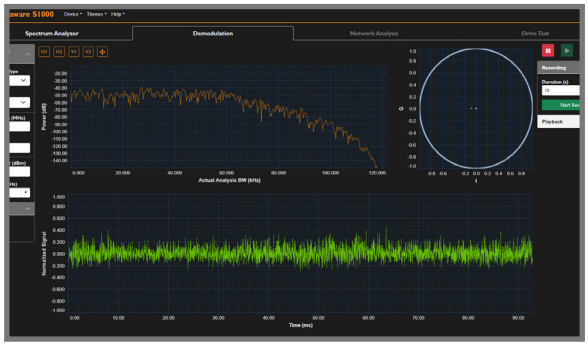
The S1000 supports two standard measurements that are critically important for users analyzing modern devices and signals such as Wi-Fi, Bluetooth, and cellular standards such as 3G/4G/5G/LTE.

The Channel Power measurement determines the power contained within a channel bandwidth. The Occupied Bandwidth measurement determines the bandwidth which contains a percentage of the total integrated power of the signal, centered on the assigned channel frequency.



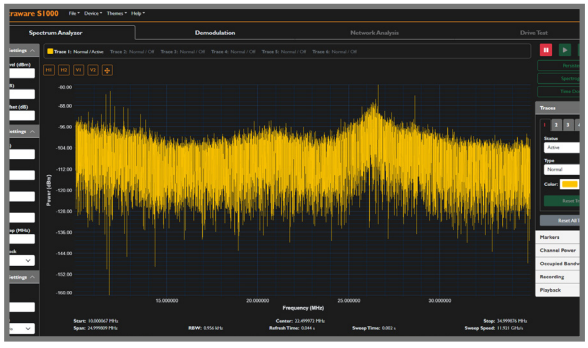
DEMODULATION FOR DEEPER SIGNAL ANALYSIS

Conduct both spectrum and signal analysis and extract the original information-bearing signal from the carrier wave with demodulation capabilities. Gapless streaming allows seamless playback of demodulated audio which can be amplified from 0% - 300%. View Constellation, Frequency Domain, and Time Domain graphs in the clean, professional interface and record and play back streams with full demodulation and graphing support.



PERFORMANCE YOU NEED

All functions have been made easily accessible in an intuitive soft menu on the right-hand side of the display. Commonly used settings including Amplitude, Frequency and Bandwidth, are presented on the left and are always available to the user.



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APIS - PROGRAMMING ENVIRONMENTS

Unlock the Power of Real-Time Spectrum Analysis with thinkRF LibTRF API

The thinkRF LibTRF API is your gateway to seamless integration with the world's most advanced real-time spectrum analyzers. Designed for the thinkRF R6000 and R5xx0 series, including the cutting-edge R5750, this multi-platform API library empowers developers to harness the full potential of thinkRF's spectrum analysis capabilities. Whether you are working on Windows or Linux, for x86_64 or ARM architectures, the LibTRF API provides robust and flexible tools to streamline your development process and elevate your signal analysis applications.

With the LibTRF API, you gain access to a suite of sophisticated signal processing features that can be effortlessly integrated into your end-user applications. Imagine the possibilities with real-time AM and FM demodulators, IQ to Spectrum conversion, and advanced spectrum characterization capabilities such as Peak-hold and Min-hold spectra. The API also supports finite-duration spectrum capture, allowing you to specify time-duration or frame-count, ensuring you capture exactly what you need.

Key Benefits

- Cross-Platform Compatibility: Supports both Windows and Linux, across x86_64 and ARM architectures.
- Advanced Signal Processing: Includes AM/FM demodulators, IQ to Spectrum conversion, and comprehensive spectrum characterization tools.
- User-Friendly Integration: Designed to be easily integrated into your applications, enhancing development efficiency and capability.

Experience the future of spectrum analysis with thinkRF's LibTRF API, and transform the way you handle complex signal processing tasks.

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RF and Digitization Specifications

Frequency		
Frequency Ranges	9 kHz to 8 GHz	
Frequency Reference	±1.5 ppm ±0.2 ppm 0°C to 55°C ±0.2 ppm per year	@20°C +/- 5°C temperature Stability over operating temp Aging
Frequency Resolution	1 Hz	
Instantaneous Bandwidth (IBW)	100 MHz	
Spurious Free Dynamic Range (SFDR) Non-input-related spurs (residual responses) level	100 dBc < -100 dBm	
Amplitude		
Amplitude Accuracy (25 °C ± 5 °C)	± 0.9 dB typical	50 MHz to 8 GHz
Amplitude Flatness		
IBW amplitude flatness	+ 1 dB p-p	
IBW noise floor flatness	+ 1 dB p-p	
Full freq range noise floor flatness	1 dB/GHz max deviation monotonic across 9 kHz to 8 GHz	
Maximum Safe RF Input Level	+20 dBm, Max DC: 10V	
Displayed Average Noise Level (DANL | at 25 °C ± 5 °C, typical)		
Preamplifier ON	< - 160 dBm/Hz	
Preamplifier OFF	< - 150 dBm/Hz	
Third Order Intercept Point (IP3)		
Preamplifier ON	+ 12 dBm	
Preamplifier OFF	+ 19 dBm	
Spectral Purity		
Phase Noise	Offset	
25°C ± 5°C at 1GHz	10 kHz	-130 dBc/Hz (OCXO Option)
Digitization		
Data Sampling Rate Digital IQ Output Sample Rate	491.52 MSa/s 122.88 MSa/s	Resolution 14 bit
Ethernet I/F Sweep Rate Data Transfer Rate	 65 GHz/s @ 10 kHz RBW 695 Mb/s (Max)	 100 MHz IBW
USB I/F Sweep Rate Data Transfer Rate	 100 GHz/s @ 10KHz RBW 1.2Gb/s Max	 100MHz IBW

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Global Navigation Satellite System (GNSS)

Global Positioning System (Concurrent reception of up to 2 GNSS)					
GNSS Types supported	GPS, GLONASS, BeiDou				
GNSS Antenna Power	3.3 V, 50 mA				
Time to first fix, maximum	From 2 sec (hot) to 36 sec (cold start), -130 dBm input signal power				
Horizontal positional accuracy (CEP, 50%, 24 hours Static, -130 dBm, >6 SVs)	GPS & GLONASS	GPS & BeiDou	GPS	GLONASS	BeiDou
	2.5 m	2.5 m	2.5 m	4.0 m	3.0 m
Data Timestamp Resolution	+/- 5 ns				

General Specifications

Connectors		
RF In	SMA female, 50 Ω	
10 MHz Reference In and Out	SMA female, 50 Ω	
Ethernet	RJ45	
USB Port	3	
GPIO	15-pin female D-Subminiature	
GNSS Antenna Port	SMA female, 50 Ω (Active 3.3VDC)	
Power	LEMO Connector, 4 pin female	
Status Indicators		
10 MHz reference clock status		
Ethernet Link		
Power Status		
Power		
Physical Power Supply	Use AC Wall Power Adaptor provided	Input AC 120V-240V / Output +12V
Power Consumption	18W with Power Adaptor provided	At room temperature
Physical		
Operating Temperature Range	-10°C to +55°C	
Storage Temperature Range	-51°C to +85°C	
Relative Humidity*	5 to 95±5 %	
Dimensions	184 x 165 x 60 mm (7.2” x 6.5” x 2.4“)	
Weight	2.2 kg (4.8 lbs)	

*available with optional MIL-PRF-28800 F complaint case

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CONTACT US TODAY

thinkRF™ R6000

Real-Time Spectrum Analyzer

sales@thinkrf.com | +1-613-271-5451

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Intellectual Property - Patents
The thinkRF R6000 product line is protected by patents, (US8,675,781, US9,197,260, US9,350,404, US8,886,794) in the United States. This information is provided to satisfy the patent marking provisions including, but not limited to, the patent marking provisions of the America Invents Act (AIA) and is intended to serve as notice under 35 U.S.C. § 287(a), as amended by Section 16 of the AIA. Additional patents may be pending in the United States and/or elsewhere.

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