

thinkRF™ D4000

RF Downconverter/Tuner



Extend your existing RF test equipment to 40 GHz



COMPACT & LIGHT DESIGN

Smaller than a notebook!
19.3 cm x 19.3 cm x 4.1cm
(7.6" x 7.6" x 1.6")
1.7 kg (3.7 lbs)



SINGLE IF OUTPUT

Easy integration with
Spectrum Analyzers or
Receivers.



BUILT-IN LOCAL OSCILLATORS

No need for external
synthesizers.



OVERVIEW

D4000 RF Downconverter/Tuner

Small, powerful and cost-effective downconverter / tuner for the next generation RF environment

1

24-40 GHz RF In

2

1.536 GHz to the
Spectrum Analyzer

3

100 kHz tuning resolution

4

20 W @ 12V input power
consumption

5

Optional 10 MHz
clock synchronization

6

Control from the Spectrum
Analyzer or from a computer



Portable, High Performance, 5G Ready

Today's high-band signal standards are using higher frequencies and wider bandwidths than ever before. The thinkRF™ D4000 RF Downconverter /Tuner extends existing RF test equipment to 40 GHz to meet these new wireless standards. This portable, high performance, and plug-and-play platform based on thinkRF tuner technology enables purpose-built, 5G-ready

solutions and is the industry's first 40 GHz RF Downconverter/Tuner. Mobile operators and system integrators can retain existing field, lab, and manufacturing test equipment, extend the life of their investment, and reduce time to market and costs when measuring 5G signals in a variety of deployment scenarios and applications.

CAPABILITIES

D4000 RF Downconverter/Tuner

1 COMPACT FORM FACTOR

Smaller than a notebook! Measuring 19.3 cm x 19.3 cm x 4.1cm (7.6" x 7.6" x 1.6") and weighing 1.7 kg (3.7 lbs), the D4000 RF Downconverter/Tuner features a compact design that makes it portable, versatile, and easy to use for 5G analysis in any deployment scenario without adding significant size, weight, and power (SWaP) requirements.



2 OPEN PLATFORM

The D4000 works with third-party test equipment, RF Spectrum Analyzers, Software-Defined Radios and interfaces. The open platform works seamlessly with current spectrum analysis solutions through standard SCPI control over Ethernet, allowing control of the unit through the spectrum analyzer or any standard PC.



3 STANDARD CONFIGURATION INTERFACE

The D4000 supports open APIs for C/C++ and Python, and standard configuration protocols via SCPI commands over a Telnet connection, or configuration via spectrum analyzer software over a LAN connection.



4 MULTI-UNIT SYNCHRONIZATION CAPABILITY

The D4000 includes 10 MHz input and output clock references to support clock synchronization with external modules. This allows the ability to run multiple units in parallel to coordinate a compound signal monitoring system, particularly for wideband signal monitoring and capture.



KEY FEATURES

D4000 RF Downconverter/Tuner

1 WIDE BAND

The D4000 has 500 MHz of Analog Bandwidth - the widest on the market in this compact form factor. This is important because the maximum channel bandwidth for 5G is 400 MHz.

2 FREQUENCY COVERAGE

This covers the entire mm-Wave frequency range for 5G FR2 from 24 to 40 GHz.

3 PRE-SELECT FILTERING

The sophisticated RF filter technology of D4000 eliminates out-of-band signals and enables spurious mitigation. Without filtering these can result in interference within the analysis bands.

4 SINGLE IF OUTPUT

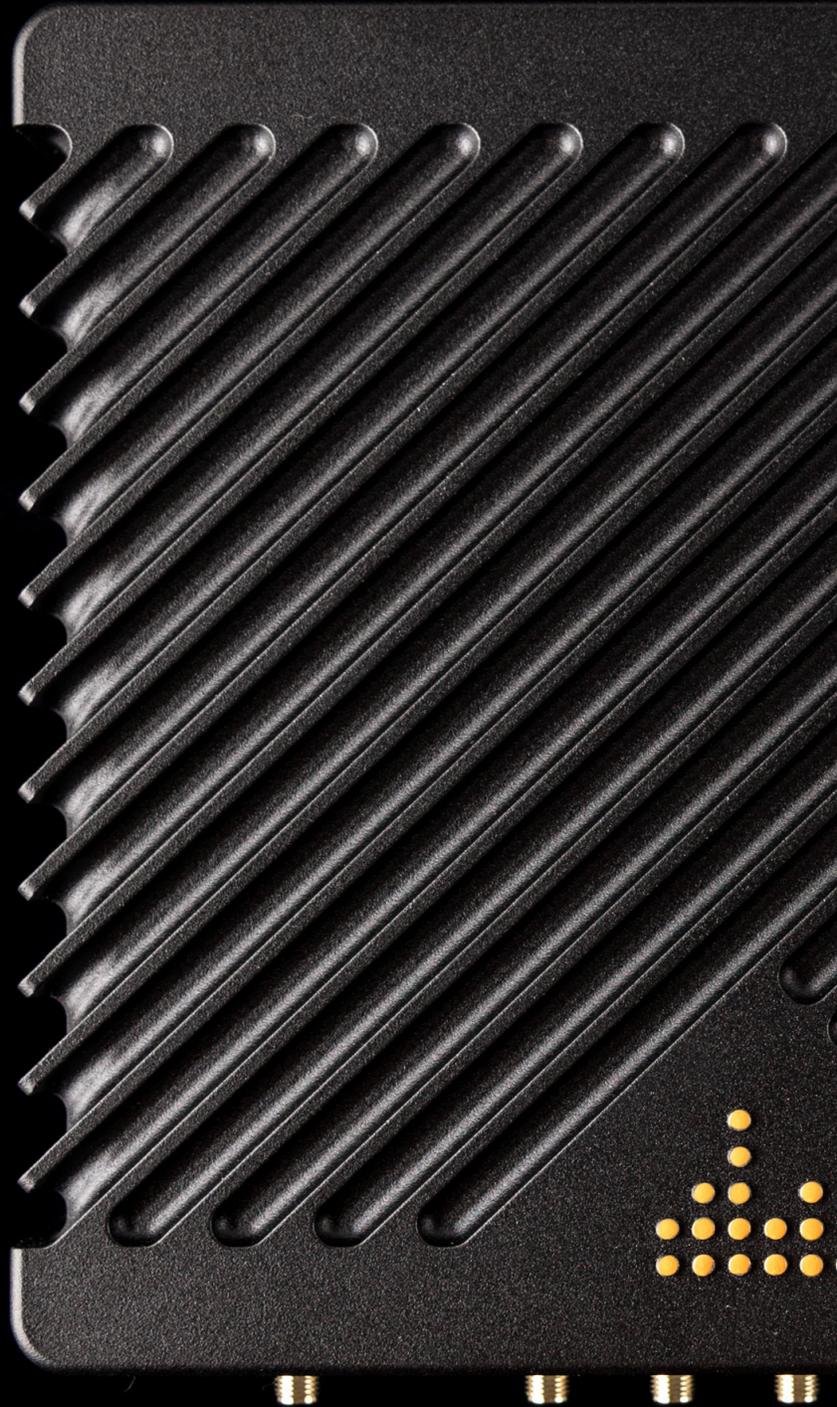
This makes it easier to integrate with Spectrum Analyzers or Receivers.

5 BUILT-IN LOCAL OSCILLATORS

This eliminates the requirement for external synthesizers.

6 EXTENSIBLE

The D4000 can be extended to cover lower 5G FR1 bands using other complementary ThinkRF receiver products.



RF Specifications

Frequency		
Frequency Range		
RF In	24 to 40 GHz	
IF Out	1.536 GHz	
Real-Time Bandwidth (RTBW)	500 MHz	
Tuning Resolution	100 kHz	
Amplitude Accuracy @ IF Output	±1.5 dB typical*	
Max. Safe RF Input Level	+10 dBm, 10Vdc	
Max. RF Input Operating Level	+10 dBm	
Noise Figure	< 12 dB typical**	
Phase Noise (@ 30 GHz)		
1 kHz	-83 dBc/Hz	
10 kHz	-88 dBc/Hz	
100 kHz	-92 dBc/Hz	
1MHz	-100 dBc/Hz	
Third Order Intercept (TOI)	> 15 dBm typical**	
Spurious performance		
Non-Input related (Residual)	-70 dBm typical***	
Spurious Free Dynamic Range (SFDR)	> 115 dBc	SFDR = 2/3 (IP3-DANL)
	Frequency Band (GHz)	Max Spur Level (dBm)
	24-28	-77
	28-32	-72
	32-36	-57
	36-40	-64
10 MHz Reference		
Output Level	+5 dBm min.	
Initial Tolerance	±1.5 ppm @ 25°C	
Stability over temp	±0.2 ppm (0 °C to 50 °C)	
Aging	±0.5 ppm/year	

General Specifications

Connectors	
RF In	2.92 mm female 50 Ω
IF Out	SMA female, 50 Ω
10 MHz Reference In and Out	SMA female, 50 Ω
10/100/1000 Ethernet	RJ45
Power	LEMO connector, 4 pin
Aux. GPIO	D-type, Female 15 pin

* Exceptions of +/- 2.5 db may be seen at 37.9 - 38.5 GHz

** thinkRF expects this performance by design in 90% of the units produced. Variability is possible from unit to unit.

*** Exceptions above -60 dBm may be seen at 32.3 - 39.8 GHz

General Specifications

Status Indicators

PLL Lock / 10 MHz reference clock status

Ethernet Link and Activity Status

CPU and Power Status

Power

Physical Power Supply	Use AC Wall Power Adaptor provided	Use AC Wall Power Adaptor provided
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Power Consumption	20 W @ 12V input
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Physical

Operating Temperature Range	-10°C to +55°C
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Storage Temperature Range	-51°C to +71°C
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Size (W x L x H)	193 x 193 x 41 mm (7.6 x 7.6 x 1.6 inches)	Approximately (including connectors)
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Weight	1.7 kg (3.7 lbs.)	Approximately
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Regulatory Compliance

RoHS Compliance	RoHS/RoHS 2 (European Union)
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REACH	Per Regulation (EC) No 1907/2006 of the European Parliament
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Marks	CE, CSA
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EMC Directive	IEC-003	Electromagnetic Compatibility
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Low Voltage Directive	IEC/EN 61010-1, CSA/UL 61010-1	Safety
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Software Specifications

Software Interface

Standard SCPI	Control over Ethernet
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Ordering Information

Base Units

Part Number

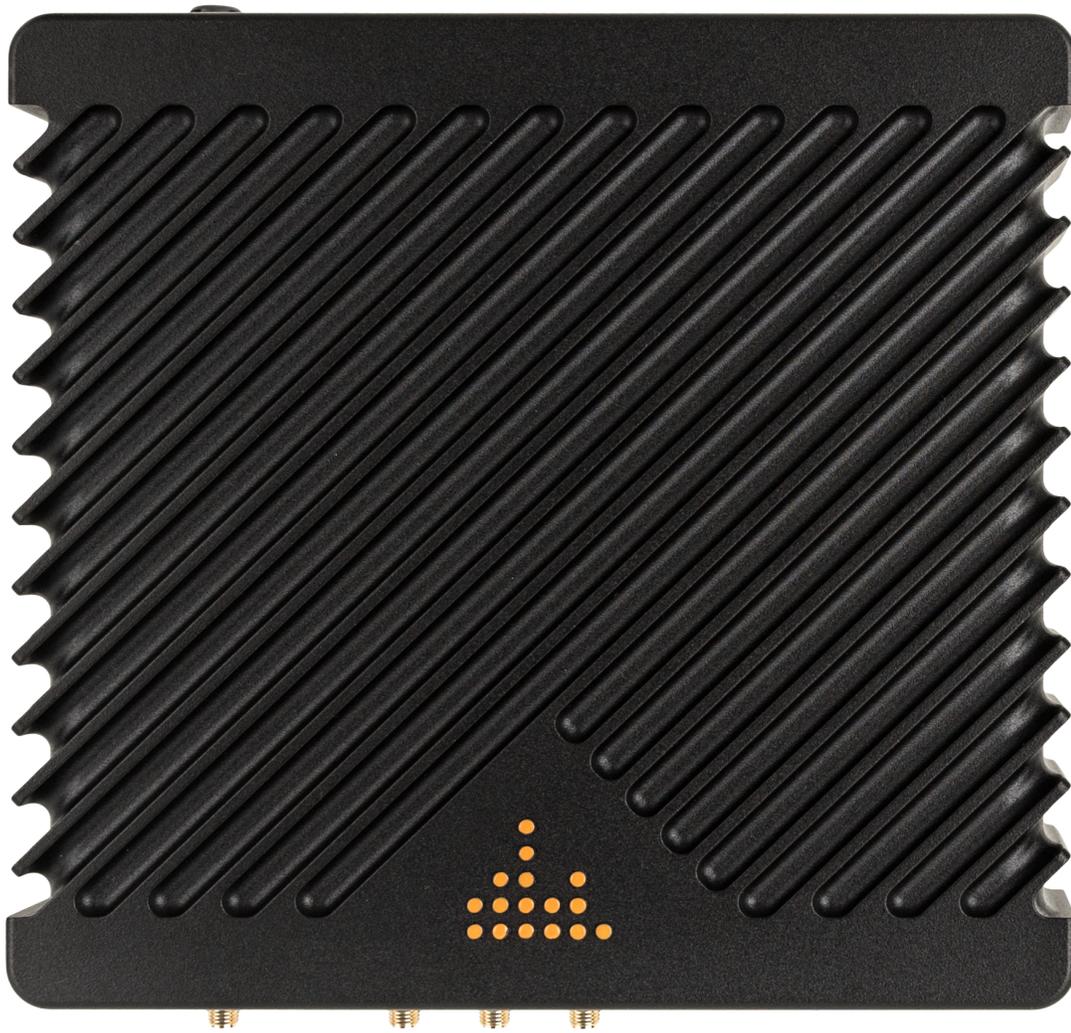
Description

24 to 40 GHz RF Downconverter/Tuner	D4000	24 - 40 GHz RF Downconverter/Tuner
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CONTACT US TODAY
FOR A FREE DEMO!

thinkRF™ D4000

RF Downconverter/Tuner



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Intellectual Property - Patents

The thinkRF D4000 product line are patent pending, (Patent Application No: 16/952,462) 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.

 **thinkRF™**
monitor. detect. analyze.