

ROHDE & SCHWARZ

FPH

The Rohde & Schwarz Spectrum Rider FPH is a versatile, handheld spectrum analyzer designed for laboratory and field applications. Known for its lightweight design, extensive battery life, and ruggedized housing, it offers excellent RF performance with upgradable frequency options spanning from 5 kHz up to 44 GHz.

SPECIFICATIONS

General

Interfaces	LAN, USB device (mini-B), USB host (Type A), microSD card slot, 3.5 mm audio jack
Display	7" WVGA color transfective capacitive touchscreen (800 x 480 pixels)
Recommended Calibration Interval	1 year

Physical

Power Supply	AC adapter input: 100 V to 240 V AC, 50 Hz to 60 Hz, 1.5 A; Output: 15 V DC, 5.3 A
Operating Temperature	-10 to +55 °C
Dimensions (W×H×D)	202 mm x 294 mm x 61 mm mm
Weight	2.5 kg

Frequency Specifications

Frequency Range	5 kHz to 2 / 6 / 13.6 / 26.5 / 36 GHz (base models, upgradable up to 3 / 4 / 8 / 20 / 31 / 44 GHz)
Frequency Resolution	1 Hz
Reference Frequency Aging per Year	1×10^{-6}
Reference Frequency Temperature Drift	1×10^{-6} (-10 °C to +55 °C)
Frequency Span Range	0 Hz, 10 Hz to max frequency of model
Spectral Purity Phase Noise (f = 500 MHz, 30 kHz offset)	<-88 dBc (1 Hz), typ. -95 dBc (1 Hz)
Spectral Purity Phase Noise (f = 500 MHz, 100 kHz offset)	<-98 dBc (1 Hz), typ. -105 dBc (1 Hz)
Spectral Purity Phase Noise (f = 500 MHz, 1 MHz offset)	<-118 dBc (1 Hz), typ. -125 dBc (1 Hz)

Amplitude and Sensitivity

Amplitude Measurement Range	DANL to +30 dBm
Maximum Safe RF Input Level	+30 dBm (1 W) RF continuous power
DC Input Voltage Limit	50 V
DANL without Preamplifier (1 GHz)	<-142 dBm (typ. -146 dBm) for Model .02/.06; <-138 dBm (typ. -142 dBm) for Model .13/.26/.36
DANL with Preamplifier (1 GHz)	<-158 dBm (typ. -163 dBm) for Model .02/.06; <-156 dBm (typ. -161 dBm) for Model .13/.26/.36
Level Measurement Uncertainty	< 1.25 dB (typ. 0.5 dB)
RF Attenuator Range	0 dB to 40 dB in 5 dB steps
Third-Order Intercept (TOI)	+10 dBm (typ., f = 1 GHz)
Second-Harmonic Distortion (SHD)	<-70 dBc (typ., input level -30 dBm, f = 1 GHz)

Bandwidths

Resolution Bandwidths (RBW) Range	1 Hz to 3 MHz in 1-3 sequence
Video Bandwidths (VBW) Range	1 Hz to 3 MHz in 1-3 sequence
RBW Shape Factor (60 dB / 3 dB)	< 4.6 (Gaussian-like profile)

Sweep and Trigger

Sweep Time (Zero Span)	1 ms to 100 s
Sweep Time (Span > 0 Hz)	20 ms to 1000 s
Sweep Modes	Continuous, Single
Trigger Sources	Free Run, Video, External (Rise/Fall)

Measurement Functions and Modes

Standard Detectors	Max Peak, Min Peak, Auto Peak, Sample, RMS
Trace Functions	Clear/Write, Max Hold, Min Hold, Average, View
Number of Markers	6 markers
Marker Readout Modes	Absolute Level/Frequency, Delta, Noise Marker, Frequency Counter
Standard Measurements	Channel Power, Occupied Bandwidth (OBW), Adjacent Channel Power (ACP), Spectrum Emission Mask (SEM), Harmonic Distortion

RF Input and Interface Ports

RF Input Connector Type	N female (50 ohm)
External Reference Input	BNC female, 10 MHz

Power and Battery Management

Battery Type	Lithium-Ion smart battery (R&S HA-Z306)
Battery Capacity	72 Wh
Battery Operating Time (Model .02)	up to 8 hours
Battery Operating Time (Model .06 / .13 / .26)	up to 6 hours
Battery Operating Time (Model .36)	up to 4.5 hours
Battery Charging Time	4 hours (instrument turned off)

Environmental and Mechanical

Storage Temperature Range	-40 °C to +70 °C
Relative Humidity Range	95% non-condensing
IP Protection Rating	IP51

Standards and Compliance

Mechanical Robustness Standards	MIL-PRF-28800F Class 2
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Hardware and Software Options

Preamplifier Option	R&S FPH-B22 / -B23 / -B24 / -B25 (hardware preamplifier dependent on model frequency range)
Vector Voltmeter Option	R&S FPH-K18
GPS Receiver Option	R&S HA-Z340 external GPS receiver

RF Input

Nominal RF Input Impedance	50 Ω
RF Input VSWR (3 GHz to 20 GHz)	< 2.0 (typically 1.5) for models with frequency range $\geq$ 13.6 GHz

Display & Audio

Display Resolution	800 $\times$ 480 pixels
Display Size	7 in (178 mm) diagonal
Display Type	Capacitive color touchscreen
Audio Output	Built-in speaker, 3.5 mm headphone jack

Storage & Interfaces

Internal Storage	approx. 100 MB (stores > 1000 instrument setups and traces)
External Storage Support	microSD card slot, supports up to 32 GB
USB Ports	1 $\times$ USB 2.0 Type-A host, 1 $\times$ USB 2.0 Mini-B client
LAN Interface Speed	10/100 Base-T (RJ-45)

Option FPH-B9 (Tracking Generator)

Tracking Generator Output Level Range (Option FPH-B9)	-40 dBm to 0 dBm (nominal)
Tracking Generator Output Level Step Size (Option FPH-B9)	1 dB

Spectral Purity	
Spectral Purity Phase Noise (f = 500 MHz, 10 kHz offset)	<-88 dBc (1 Hz), typ. -95 dBc (1 Hz)
Environmental & Compliance	
Maximum Operating Altitude	4600 m
Maximum Storage Altitude	12192 m
Environmental Shock Resistance	MIL-PRF-28800F Class 2 (also MIL-STD-810G, Method 516.6, Procedure I)
Environmental Vibration Resistance	MIL-PRF-28800F Class 2 (also MIL-STD-810G, Method 514.6, Procedure I)
EMC Compliance Standards	EN 61326-1, EN 61326-2-1, EN 55011 Class B (European EMC Directive 2014/30/EU)
Safety Standards	IEC 61010-1, EN 61010-1, CAN/CSA-C22.2 No. 61010-1, UL 61010-1
Instrument Warm-up Time	15 min
Power Supply	
AC Power Adapter Input Range	100 V to 240 V AC, 50 Hz to 60 Hz, 1.5 A
AC Power Adapter Output Rating	15 V DC, 5.3 A
Sweep	
Number of Sweep Points	711
Amplitude	
RF Attenuator Steps	5 dB
Interfaces & Connectivity	
USB Interface Ports	1 × USB 2.0 Type-A (Host), 1 × USB 2.0 Type Mini-B (Device)
Audio Output Jack	3.5 mm mini-jack
Built-in Speaker	Yes
Display	
Display Color Depth	262,144 colors
GPS Option	
GPS Position Accuracy (Horizontal)	< 2.5 m (CEP, 50% confidence, open sky)

Frequency Options

Frequency Upgrade Option FPH-B3	Extends frequency range of Model .02 from 2 GHz to 3 GHz
Frequency Upgrade Option FPH-B4	Extends frequency range of Model .02 from 3 GHz to 4 GHz (requires FPH-B3)
Frequency Upgrade Option FPH-B8	Extends frequency range of Model .06 from 6 GHz to 8 GHz
Frequency Upgrade Option FPH-B20	Extends frequency range of Model .13 from 13.6 GHz to 20 GHz
Frequency Upgrade Option FPH-B31	Extends frequency range of Model .26 from 26.5 GHz to 31 GHz
Frequency Upgrade Option FPH-B44	Extends frequency range of Model .36 from 36 GHz to 44 GHz

Physical Specifications

Weight (Model .02 with battery)	2.5 kg
Weight (Models .06/.13/.26/.36 with battery)	3.2 kg

TECHNOLOGY

Superheterodyne Spectrum Analysis

APPLICATIONS

Field RF Analysis, Interference Hunting, Installation & Maintenance, General Purpose Lab Use

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