ROHDE & SCHWARZ

SMHU

The Rohde & Schwarz SMHU is a high-precision, low-noise RF signal generator covering the frequency range from 100 kHz to 4.32 GHz. Designed for demanding applications in laboratory research, development, and high-throughput production environments, it provides exceptional spectral purity, fast frequency switching, and versatile modulation capabilities including AM, FM, Phase, and high-performance Pulse modulation.

SPECIFICATIONS

Frequency

Minimum Frequency	100 kHz Hz
Maximum Frequency	4.32 GHz Hz
Frequency Resolution	0.1 Hz

Output

Maximum Output Power	+13 dBm dBm
Output Power Range	-140 dBm to +13 dBm (overrange up to +19 dBm)
Phase Noise	<-140 dBc/Hz (typical -143 dBc/Hz) at 20 kHz offset (1 GHz carrier)

Modulation

Modulation	AM, FM, Phase (M), Pulse
Sweep Modes	Frequency, Level, Modulation Frequency (linear/logarithmic)
External AM Frequency Range	DC to 50 kHz (3 dB bandwidth)
External FM Frequency Range	DC to 100 kHz (standard), DC to 1 MHz (broadband FM mode)
External Phase Modulation Frequency Range	20 Hz to 20 kHz
Internal Modulation Generators	2 independent synthesizers (standard)

General

Reference Oscillator	10 MHz OCXO
Interfaces	GPIB (IEEE-488)
Display	LCD
Memory Storage Locations	100 complete instrument setups
Warm-up Time	approx. 10 min

Physical

Power Supply	100 V / 115 V / 120 V / 200 V / 220 V / 240 V AC (±10%), 47 Hz to 440 Hz
Dimensions (W×H×D)	435 mm × 236 mm × 570 mm mm
Weight	31 kg kg
Rack Units	5 RU

Frequency Specifications

Frequency Settling Time	< 1 ms
Reference Frequency	10 MHz
Aging Rate	< 1 x 10^-9 / day (after warm-up)
Temperature Stability	< 2 x 10^-9 / °C

Level (Amplitude) Specifications

Output Impedance	50 Ω
Level Resolution	0.1 dB

Spectral Purity

Harmonics	<-30 dBc (for output levels < +10 dBm)
Non-Harmonic Spurious	<-100 dBc (for carrier frequencies f < 1 GHz, offset > 10 kHz)
Residual FM	< 1 Hz (at 1 GHz, 0.3 kHz to 3 kHz bandwidth)
Subharmonics (1000 to 2000 MHz)	<-76 dBc
Subharmonics (2000 to 4320 MHz)	<-70 dBc
Non-Harmonic Spurious (< 1000 MHz)	<-100 dBc (at > 10 kHz offset)
Non-Harmonic Spurious (1000 to 2000 MHz)	<-94 dBc (at > 10 kHz offset)
Non-Harmonic Spurious (2000 to 4320 MHz)	<-88 dBc (at > 10 kHz offset)

Amplitude Modulation (AM)

AM Modulation Depth Range	0% to 99%
AM Resolution	0.1%
AM Distortion	< 1% (at 30% AM, f_mod = 1 kHz)
AM Frequency Response	DC to 50 kHz (3 dB bandwidth)

Frequency Modulation (FM)

FM Frequency Response	DC to 100 kHz (3 dB bandwidth)

Pulse Modulation

Pulse Modulation On/Off Ratio	> 80 dB
Pulse Modulation Rise/Fall Time	< 20 ns

Internal Modulation Source

Internal Waveform Types	Sine, Square, Triangular, Sawtooth
Internal Modulation Frequency Range	0.1 Hz to 100 kHz
Internal Modulation Frequency Resolution	0.1 Hz

General and Environmental

AC Line Voltage Range	100 V to 240 V AC (±10%)
AC Line Frequency Range	47 Hz to 440 Hz
Power Consumption	230 VA
Operating Temperature Range	0 °C to 55 °C

Rear Panel and Auxiliary Interfaces

RF Output Connector	N female (front panel)

RF Output

Level Accuracy	±1 dB (for output levels > -127 dBm)

Reference Frequency

External Reference Input	5 MHz or 10 MHz
Reference Output	10 MHz

Overload Protection

Reverse Power Protection	50 W (up to 1000 MHz), 25 W (1000 to 4320 MHz) from 50 Ω source
Max. DC Overload Voltage	35 V

Modulation Options

I/Q Modulation Carrier Frequency Range	1.5 MHz to 4320 MHz (with Option SMHU-B1)
I/Q Modulation Bandwidth (3 dB)	DC to 5 MHz (with Option SMHU-B1)

TECHNOLOGY

Synthesized RF Signal Generator

APPLICATIONS

RF testing, local oscillator substitution, component and receiver testing