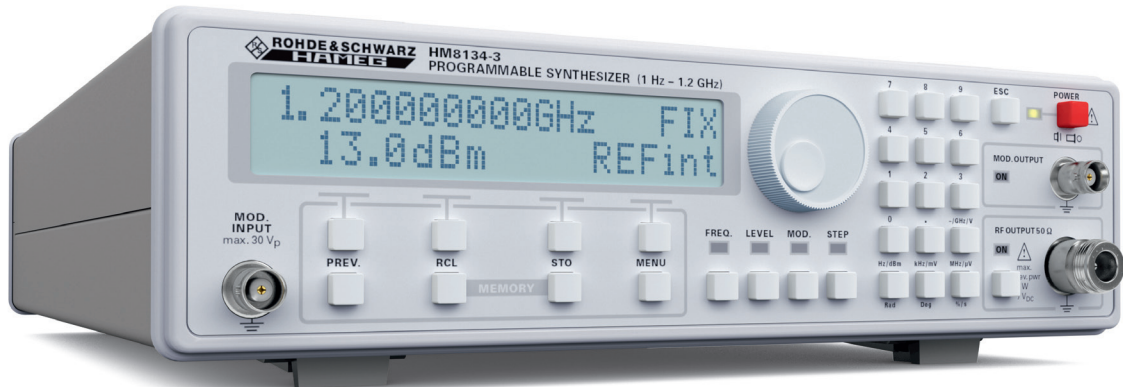


1.2GHz RF-Synthesizer HM8134-3 | HM8134-3X



HZ42
19" Rackmount Kit 2RU



H0880 IEEE-488 (GPIB)
Interface (option)



- ✓ Frequency range: 1 Hz to 1.2 GHz
- ✓ High dynamic output power: -127 dBm to +13 dBm
- ✓ Frequency resolution: 1 Hz
- ✓ High spectral purity, excellent SWEEP mode
- ✓ Modulation modes: AM, FM, pulse, phase, FSK, PSK
- ✓ Internal modulation (10 Hz to 150 kHz): sine, square, triangle, ramp
- ✓ External Ref.-Input/Output (10 MHz) via BNC-connector
- ✓ HM8134-3: TCXO (temperature stability: $\pm 0.5 \times 10^{-6}$)
HM8134-3X: OCXO (temperature stability: $\pm 1.0 \times 10^{-8}$)
- ✓ RS-232/USB dual interface, IEEE-488 (GPIB) optional

1.2 GHz RF-Synthesizer HM8134 | HM8134-3X

All data valid at 23 °C after 30 minutes warm-up.

Frequency

Range:	1 Hz to 1.2 GHz
Resolution:	1 Hz
Settling time:	<10 ms

Frequency reference 10 MHz

HM8134-3 (TCXO):	
Temperature stability (0 to 50 °C)	$\leq \pm 0.5 \times 10^{-6}$
Aging	$\leq \pm 1.0 \times 10^{-6}/\text{year}$

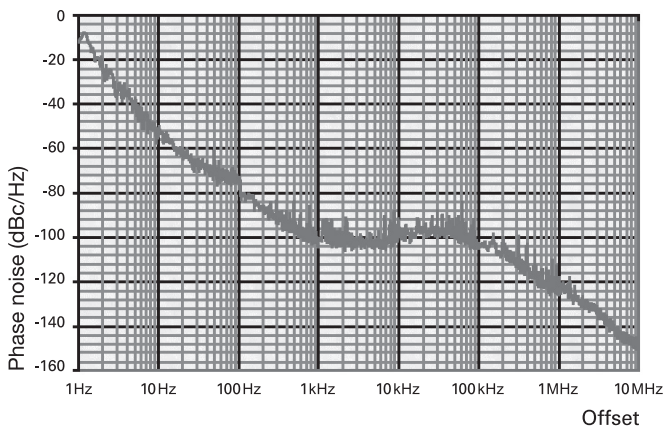
HM8134-3X (OCXO):	
Temperature stability (0 to 50 °C)	$\leq \pm 1.0 \times 10^{-8}$
Aging	$\leq \pm 1.0 \times 10^{-9}/\text{day}$

Internal reference output:	(rear panel)
Level	TTL

External reference input:	(rear panel)
Level	>0 dBm
Frequency	10 MHz $\pm 20 \times 10^{-6}$

Spectral purity (without modulation)

Harmonics:	$\leq -35 \text{ dBc}$
Non-harmonics:	$\leq -55 \text{ dBc}$ (>15 kHz from carrier)
Phase noise:	(at 20 kHz from carrier)
f < 16 MHz	$\leq -120 \text{ dBc/Hz}$
16 MHz $\leq$ f < 250 MHz	$\leq -94 \text{ dBc/Hz}$
250 MHz $\leq$ f < 500 MHz	$\leq -105 \text{ dBc/Hz}$
500 MHz $\leq$ f < 1 GHz	$\leq -100 \text{ dBc/Hz}$
1 GHz $\leq$ f < 1.2 GHz	$\leq -95 \text{ dBc/Hz}$
Residual FM:	$\leq 6.5 \text{ Hz}$ (at 1 GHz in 0.3 to 3 kHz bandwidth)
Residual AM:	typ. <0.06 % (in 0.03 to 20 kHz bandwidth)



(Typical phase noise at 1 GHz)

Output level

Range:	-127 to +13 dBm
Resolution:	0.1 dB
Display-offset for ext. attn.:	0.0 to 30.0 dB in 0.1 dB steps
Precision:	
for level > -57 dBm	$\leq \pm 0.5 \text{ dB}$
for level < -57 dBm	$\leq \pm [0.5 \text{ dB} + (0.2 \times (-57 \text{ dBm} - \text{level}))/10]$
Impedance:	50 Ω
V.S.W.R.:	≤ 2

Modulation sources

Internal:	10 Hz to 150 kHz sine wave, 10 Hz to 20 kHz square wave, triangle, ramp
Resolution	10 Hz
External:	(input on front panel)
Impedance	10 k Ω 50 pF
Input level	2V _{pp} for full scale
Coupling	AC or DC
Output:	(on front panel)
Level	2V _{pp}
Impedance	1 k Ω

Amplitude modulation (Level $\leq +7 \text{ dBm}$)

Source:	internal or external
Modulation depth:	0 to 100 %
Resolution:	0.1 %
Accuracy:	$\pm 4 \%$ of reading $\pm 0.5 \%$ (AM-depth $\leq 80 \%$, $f_{\text{mod}} \leq 40 \text{ kHz}$)
Ext. frequency resp. (to -1 dB):	10 Hz to 50 kHz for AC
Distortion:	<2 % (AM-depth $\leq 60 \%$, $f_{\text{mod}} \leq 1 \text{ kHz}$) <6 % (AM-depth $\leq 80 \%$, $f_{\text{mod}} < 20 \text{ kHz}$)

Frequency modulation

Source:	internal or external
Deviation:	$\pm 200 \text{ Hz}$ to 400 kHz (depending on frequency band)
Resolution:	100 Hz
Accuracy:	$\pm 3 \%$ + res. FM ($f_{\text{mod}} \leq 5 \text{ kHz}$) $\pm 7 \%$ + res. FM (5 kHz < $f_{\text{mod}} < 100 \text{ kHz}$)
Ext. frequency response (to -1 dB):	
DC coupling	0 to 100 kHz
AC coupling	10 Hz to 100 kHz
Distortion:	<1 % for deviation $\geq 50 \text{ kHz}$ at 1 kHz <3 % for deviation $\geq 10 \text{ kHz}$ at 1 kHz

Phase modulation

Source:	internal or external
Deviation:	
<16 MHz	0 to 3.14 rad
>16 MHz	0 to 10 rad
Resolution:	0.01 rad
Accuracy:	$\pm 5 \%$ up to 1 kHz + residual PM
Ext. frequency response (to -1 dB):	
DC coupling	0 to 100 kHz
AC coupling	10 Hz to 100 kHz
Distortion:	<3 % for $f_{\text{mod}} = 1 \text{ kHz}$ and deviation = 10 rad

FSK modulation

Range (F0 to F1):	16 MHz to 1.2 GHz
Mode:	2 FSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (F1 to F0):	0 to 10 MHz
Resolution:	100 Hz
Accuracy:	$\pm 3 \%$ + residual FM ($f_{\text{mod}} \leq 5 \text{ kHz}$) $\pm 7 \%$ + residual FM (5 kHz < $f_{\text{mod}} < 100 \text{ kHz}$)

PSK modulation

Mode:	2 PSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (Ph1 to Ph0):	
<16 MHz	0 to $\pm 3.14 \text{ rad}$
>16 MHz	0 to $\pm 10 \text{ rad}$
Resolution:	0.01 rad
Accuracy:	$\pm 5 \%$ up to 1 kHz + residual PM

Pulse modulation

Source:	external (rear panel)
Dynamic range:	>80 dB
Rise/fall times:	<50 ns
Delay:	<100 ns
Max. frequency:	2.5 MHz
Input level:	TTL

Sweep mode

Range:	1 MHz to 1.2 GHz
Depth:	500 Hz to 1.199 GHz
Sweep time:	20 ms to 5 s
Trigger:	internal

Protective functions

The synthesizer is protected against reverse power applied to the RF output up to 1 W for a 50 Ω source and against any DC source up to $\pm 7 \text{ V}$. The protection disconnects the output until manually reset by operator.

Miscellaneous	
Interface:	Dual interface USB/RS-232 (H0820), IEEE-488 (GPIB) (optional)
Configuration memories:	10
Safety class:	Safety Class I (EN61010-1)
Power supply:	115/230 V $\pm 10\%$, 50 to 60 Hz, CAT II
Power consumption:	approx. 40 VA
Operating temperature:	+5 to +40 °C
Storage temperature:	-20 to +70 °C
Rel. humidity:	5 to 80 % (non condensing)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 5 kg

Accessories supplied: Line cord, printed Operating manual, CD

Recommended accessories:

H0880	Interface IEEE-488 (GPIB), galvanically isolated
HZ13	Interface cable (USB) 1.8 m
HZ14	Interface cable (serial) 1:1
HZ20	Adapter, BNC to 4 mm banana
HZ21	Adapter, N male to BNC female
HZ24	Attenuators 50 Ω (3/6/10/20 dB)
HZ33	Test cable 50 Ω , BNC/BNC, 0.5 m
HZ34	Test cable 50 Ω , BNC/BNC, 1.0 m
HZ42	19" rackmount kit 2RU
HZ72	GPIB-cable 2 m

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