

1.2 GHz RF-Synthesizer HM8134-3

HM8134-3



HZ42 19" Rackmount kit
2RU



H0880 IEEE-488
(GPIB) Interface (Option)



- ✓ Outstanding Frequency range 1 Hz...1.2 GHz
- ✓ Output power -127...+13dBm
- ✓ Frequency resolution 1 Hz (accuracy 0.5ppm)
- ✓ Input for external time base (10 MHz)
- ✓ Modulation modes: AM, FM, Pulse, Φ , FSK, PSK
- ✓ Rapid pulse modulation: typ. 200ns
- ✓ Internal modulator (sine wave, square wave, triangle, sawtooth) 10Hz...150kHz
- ✓ High spectral purity
- ✓ 10 configuration memories including turn-on configuration
- ✓ Standard: TCXO (temperature stability: $\pm 0.5 \times 10^{-6}$)
Optional: OCXO (temperature stability: $\pm 1 \times 10^{-8}$)
- ✓ Galvanically isolated USB/RS-232 Interface, optional IEEE-488

1.2 GHz HF Synthesizer HM8134-3

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

Frequency

Range:	1 Hz...1200 MHz
Resolution:	1 Hz
Settling time:	< 10 ms

Frequency Reference 10 MHz

Standard: TCXO	
Temperature stability (0...50°C):	≤ ±0.5 ppm
Aging:	≤ ±1 ppm/year

Option: OCXO (HO85)

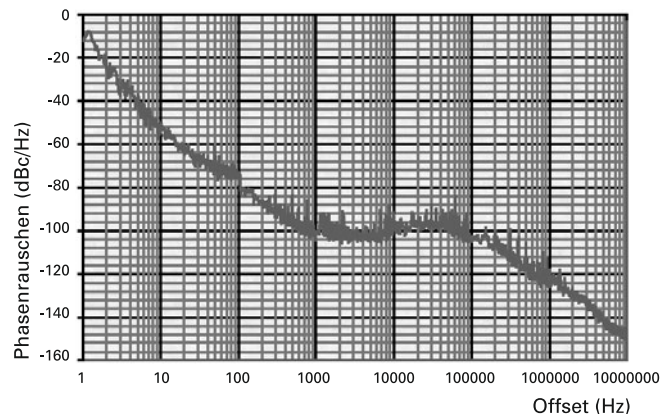
Temperature stability (0...50°C):	≤ ±1x10 ⁻⁸
Aging:	≤ ±1x10 ⁻⁹ /day

Internal reference output:

Level:	TTL
External reference input:	(rear panel)
Level:	> 0 dBm
Frequency:	10 MHz ± 20 ppm

Spectral purity (without modulation)

Harmonics:	≤ -35 dBc
Non-harmonics:	≤ -55 dBc (> 15 kHz from carrier)
Phase noise:	(at 20 kHz from carrier)
f < 16 MHz:	≤ -120 dBc/Hz
16 MHz ≤ f < 250 MHz:	≤ -94 dBc/Hz
250 MHz ≤ f < 500 MHz:	≤ -105 dBc/Hz
500 MHz ≤ f < 1000 MHz:	≤ -100 dBc/Hz
1000 MHz ≤ f < 1200 MHz:	≤ -95 dBc/Hz
Residual FM:	≤ 6.5 Hz (at 1 GHz in 300Hz...3 kHz bandwidth)
Residual AM:	typ. < 0.06 % (in 0.03...20 kHz bandwidth)



(Typical phase noise at 1 GHz)

Output level

Range:	-127...+13 dBm
Resolution:	0.1 dB
Precision:	for level > -57 dBm: ≤ ± 0.5 dB for level < -57 dBm: ≤ ± (0.5 dB + (0.2 x (-57 dBm - level)) / 10)
Impedance:	50 Ω
V.S.W.R.:	≤ 2

Modulation sources

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

Amplitude modulation (Level ≤ +7 dBm)

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

Frequency modulation

Source:	internal or external
Deviation:	± 200 Hz...400 kHz (depending on frequency band)
Resolution:	100 Hz
Accuracy:	± 3 % + res. FM (f _{mod} ≤ 5 kHz) ± 7 % + res. FM (5 kHz < f _{mod} < 100 kHz)
Ext. frequency response: (to -1 dB)	
DC coupling:	0...100 kHz
AC coupling:	10 Hz...100 kHz
Distortion:	< 1 % for deviation ≥ 50 kHz at 1 kHz < 3 % for deviation ≥ 10 kHz at 1 kHz

Phase modulation

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

FSK modulation

Range (F0 - F1):	16...1200 MHz
Mode:	2 FSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (F1 - F0):	0...10 MHz
Resolution:	100 Hz
Accuracy:	see under FM

PSK modulation

Mode:	2 PSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (Ph1 - Ph0):	< 16 MHz: 0...± 3.14 rad > 16 MHz: 0...± 10 rad
Resolution:	0.01 rad
Accuracy:	see under 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...1200 MHz
Depth:	500 Hz...1199 MHz
Sweep time:	20 ms...5 s
Trigger:	internal

Protective functions

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

Miscellaneous

Interface:	USB/RS-232 (HO820), IEEE-488 (optional)
Configuration memories:	10
Safety class:	Safety Class I (EN61010-1)
Power supply:	115...230 V ± 10 %, 50/60 Hz, CAT II
Power consumption:	approx. 40 VA
Operating temperature:	+5...+40°C
Storage temperature:	-20...+70°C
Rel. humidity:	5...80% (non condensing)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 5 kg

Accessories supplied: Line cord, Operating manual, USB/RS-232 Interface (HO820)

Optionales Zubehör:

HO85	OCXO temperature stability ± 1x10 ⁻⁸
HO880	IEEE-488 (GPIB) Interface (galvanically isolated)
HZ13	Interface cable (USB) 1,8m
HZ14	Interface cable (serial) 1:1
HZ20	Adapter, BNC to 4mm banana
HZ21	Adapter plug
HZ24	Attenuator Set 50Ω (3/6/10/20dB)
HZ33	Test Cable 50Ω (BNC-BNC) 0,5m
HZ34	Test Cable 50Ω (BNC-BNC) 1,0m
HZ42	19" Rackmount kit 2RU
HZ72	GPIB-Cable 2m