

## 1.2GHz RF-Synthesizer HM8134-3



HM8134-3



HZ42  
19" Rackmount Kit 2RU



H0880 IEEE-488 (GPIB)  
Interface (Option)



- Frequency Range 1Hz...1.2GHz
- Output Power -127...+13dBm
- Frequency Resolution 1Hz (Accuracy 0.5ppm)
- Input for external Time Base (10MHz)
- Modulation Modes: AM, FM, Pulse,  $\Phi$ , 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 Dual-Interface,  
optional IEEE-488 (GPIB)

## 1.2 GHz RF-Synthesizer HM8134-3

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

### Frequency

Range:	1 Hz...1,200 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 (H085)

Temperature stability (0...50 °C)	≤±1 × 10 <sup>-8</sup>
Aging	≤±1 × 10 <sup>-9</sup> /day

Internal reference output: (rear panel)

Level: TTL

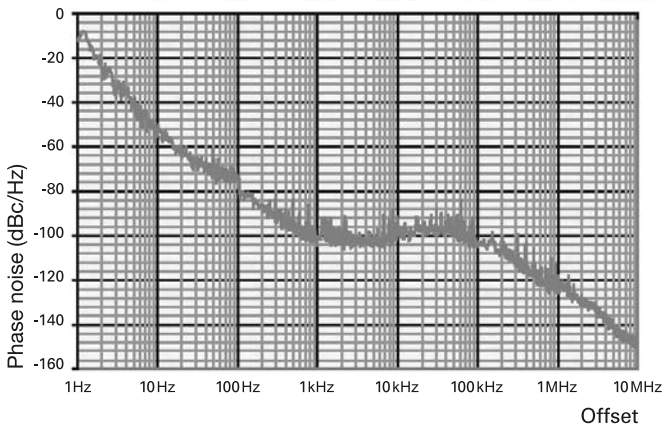
External reference input: (rear panel)

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 < 1,000 MHz	≤-100 dBc/Hz
1,000 MHz ≤ f < 1,200 MHz	≤-95 dBc/Hz
Residual FM:	≤6.5 Hz (at 1 GHz in 0.3...3 kHz bandwidth)
Residual AM:	typ. <0.06 % (in 0.03...20 kHz bandwidth)



### Output level

Range:	-127...+13 dBm
Resolution:	0.1 dB
Display-Offset for ext. Attn.:	0.0...30.0 dB in 0.1 dB steps
Precision:	
for level > -57 dBm	≤±0.5 dB
for level < -57 dBm	≤±(0.5 dB + (0.2 × (-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	2V <sub>pp</sub> for full scale
Coupling	AC or DC
Output:	(on front panel)
Level	2V <sub>pp</sub>
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 <sub>mod</sub> ≤40 kHz)

Ext. frequency resp.

(to -1 dB):	10 Hz...50 kHz for AC
Distortion:	<2 % (AM-depth ≤60 %, f <sub>mod</sub> ≤1 kHz) <6 % (AM-depth ≤80 %, f <sub>mod</sub> <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 <sub>mod</sub> ≤5 kHz) ±7 % + res. FM (5 kHz < f <sub>mod</sub> < 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 % up 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 <sub>mod</sub> = 1 kHz and deviation = 10 rad

### FSK modulation

Range (F0...F1):	16...1,200 MHz
Mode:	2 FSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (F1...F0):	0...10 MHz
Resolution:	100 Hz
Accuracy:	±3 % + residual FM (f <sub>mod</sub> ≤5 kHz) ±7 % + residual FM (5 kHz < f <sub>mod</sub> < 100 kHz)

### 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:	±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...1200 MHz
Depth:	500 Hz...1,199 MHz
Sweep time:	20 ms...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 ±7 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 ±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, CD

### Recommended accessories:

H085	OCXO, temperature stability ±1 × 10 <sup>-8</sup> (Installation only ex factory)
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 $\Omega$ (3/6/10/20 dB)
HZ33	Test cable 50 $\Omega$ , BNC/BNC, 0.5 m
HZ34	Test cable 50 $\Omega$ , BNC/BNC, 1.0 m
HZ42	19" Rackmount kit 2RU
HZ72	GPIB-Cable 2 m