



## RF-Synthesizer HM8134

- Programmable RF Signal Generator
- Frequency Range 1Hz to 1024MHz
- Frequency Accuracy  $\pm 0.5 \times 10^{-6}$
- Resolution 1Hz; AM/FM-Modulation
- Optional IEEE-488- or RS 232-Interface

The **HM8134** is an exceptionally low-priced RF-Synthesizer combining high performance with fast and easy operation. It has excellent basic specifications, including such characteristics as high frequency stability, fast frequency change response time, spectral purity, and repeatable signal output levels.

The **HM8134** provides continuous frequency selectable from as low as **1Hz** up to **1.024GHz**, with optional gated mode. This wide range covers the most commonly needed spectrum of audio, video, and IF frequencies, as well as the RF frequencies used by receivers and transmitters in a wide variety of communication systems. The frequency resolution of 1Hz allows convenient incremental settings in narrow band systems.

The instrument offers amplitude, frequency, phase and gated modulation. Internally generated sine, square, triangle and ramp signals are available for internal **AM**, **FM** and **PM** modes over a wide frequency range. External inputs allow modulation between **10Hz** and **50kHz**. The FM deviation may be varied up to  $\pm 400\text{kHz}$ .

Amplitude modulation depth is variable from 0 to 100%. The fast response time of **10ms** for frequency

## RF for Laboratory and Service

and amplitude changes is another outstanding characteristic of this instrument.

The generator frequency, output level, and modulation parameters are all clearly displayed on a **LCD** providing all relevant information at a glance. The **HM8134** was designed with the thought of operational ease and productivity in mind. **Menu driven** operation gives clear, up front information at every stage. Parameters are either set via the **rotary dial** or by the front panel keypad. A maximum of **ten** frequently used instrument settings can be stored in a non volatile memory.

Full programmability for use in automated measuring systems is provided by the optional **IEEE-488** (HO88) or **RS232** (HO89) interfaces. Either one of these options can be factory-installed at the time of purchase, or can easily be added by the user.

With the **HM8134**, **HAMEG** offers a price/performance ratio unsurpassed in today's market. As already successfully demonstrated in its oscilloscope and Modular System HM8000 series, **HAMEG** has again reached its goal of cost-effective, high-quality instrumentation by concentrating on essentials, keeping operation simple without omitting important functions.



**Specifications** (Referency temperature :23°C ±2°C)**Frequency**

Range: 1Hz to 1024MHz  
 Resolution: 1Hz  
 Settling time: < 10ms (if same range)  
 < 60ms (range to range)

**Standard 10MHz**

Stability (10 to 40°C): ≤ ± 0.5ppm  
 Aging: ≤ ± 1ppm/year

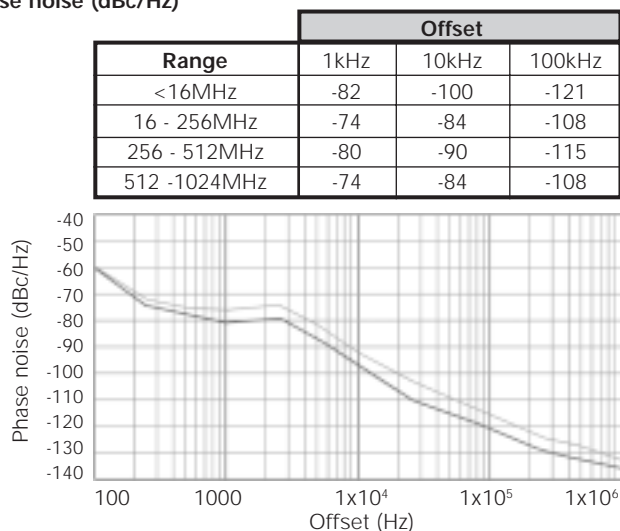
**Option OCXO 10MHz**

Stability (10 to 40°C): ≤ ± 5 10-8  
 Aging: ≤ ± 5 10-9/day  
 Output reference internal: (BNC jack on back panel)  
 Output voltage: TTL  
 Input reference external: (BNC jack on back panel)  
 Input frequency: 10MHz ±5ppm  
 Input level: > 0dBm

**Spectral purity**

without modulation, level ≤ +10dBm

Harmonic: 1Hz to 1024MHz ≤ -30dBc  
 Non harmonic: 16MHz to 500MHz ≤ -55dBc  
 (> 15kHz offset)  
 Residual FM: < 50Hz RMS to 1GHz (0,3-3kHz BW)  
 Residual PM: < 0,06rad RMS to 1GHz (0,3-3kHz BW)  
 Residual AM: < 0,1% (50Hz to 10kHz)

**Phase noise (dBc/Hz)****Output level**

Range: -127dBm to +13dBm  
 Resolution: 0,1dB  
 Accuracy: ± 0,5dB level ≥ -57dBm  
 ±(1dBm+0,4dBm/10dB)level < -57dBm  
 Settling time: < 10ms (with modulation)  
 < 60ms (without modulation)  
 Impedance: 50Ω  
 V.S.W.R.: <1,5

**Modulation source**

Modulation source int: 10Hz to 100kHz (40kHz in AM ) Sine  
 10Hz to 20kHz Sqr, Tri, Rmp+, Rmp-  
 Resolution: 10Hz  
 Input modulation ext: (BNC jack on front panel)  
 Input impedance: 10kΩ  
 Input voltage: the modulation is calibrated with 2Vpp  
 Output source (int,ext): (BNC jack on front panel)  
 Output voltage: ≤ ± 2V

**Amplitude modulation**

Level: ≤ +7dBm  
 Modulation source: internal, external  
 AM-depth: 0 to 100%  
 Resolution: 0,1%  
 Accuracy (internal sine): ±4% of reading ±0,5% of value

(AM-depth ≤ 80% , Fmod ≤ 1kHz)  
 ±7% of reading ±0,5% of value  
 (AM-depth ≤ 80% , Fmod > 1kHz)

Bandwidth ext (1dB):  
 coupled 10Hz-50kHz, AC

Distortion: <2% (AM-depth ≤ 60% to 1kHz)  
 <6% (AM-depth ≤ 80% , level = +7dBm 10Hz to 20kHz)

**Frequency modulation**

Modulation source: internal, external  
 Deviation: ±200Hz to ±150kHz (<16MHz )  
 ± 2kHz to ±400kHz ( 16 -256MHz)  
 ± 1kHz to ±200kHz ( 256 -512MHz)  
 ± 2kHz to ±400kHz ( 512 -1024MHz)  
 Resolution: 100Hz  
 Accuracy (internal sine): ±2% Fmod ≤ 1kHz + residual FM  
 ±5% Fmod > 1kHz + residual FM

Bandwidth ext (1dB):

DC coupled: DC- 30kHz (100kHz <16MHz)  
 AC coupled: 10Hz- 30kHz (100kHz <16MHz)  
 30kHz-100kHz

Distortion: < 3% for deviations ≥ 10kHz

**Phase modulation**

Modulation source: internal, external  
 Deviation: 0 to 3,14rad (<16MHz )  
 0 to 10rad ( 16 - 1024MHz )  
 Resolution: 0,01rad  
 Accuracy (internal sine): ±5% to 1kHz + residual-PM

Bandwidth ext (1dB):

DC coupled: DC- 30kHz (100kHz <16MHz)  
 AC coupled: 10Hz- 30kHz (100kHz <16MHz)  
 30kHz-100kHz

Distortion: < 3% for Fmod=1kHz, Deviation=10rad

**Gated mode**

Gate source: external  
 on/off Ratio: ≥ 65dB (<16MHz)  
 ≥ 80dB (16MHz - 512MHz)  
 ≥ 50dB (512MHz -1024MHz)  
 Rise/Fall time: ≤ 1,5μs (<16MHz )  
 ≤ 7,5μs (16MHz -1024MHz )  
 Delay time: ≤ 1,5μs (<16MHz )  
 ≤ 15μs (16MHz -1024MHz )  
 Input modulation: (BNC jack on back panel)  
 Input level: TTL: 0 OFF 1 ON or 1 OFF 0 ON

**General**

Interfaces: optional IEEE-488 (HO88) or RS232 (HO89)  
 IEEE-488 functions: (T6),(L4) SH1, AH1, RL1, DC1, DT0 and R0  
 (HO80)  
 Set-up memory locations: 10  
 Dimensions: 285 x 75 x 365 (W x H x D)  
 Weight: approx. 10kg  
 Power consumption: approx. 70VA  
 Operating conditions: +0°C to +40°C  
 Humidity: 10% - 90% no condensation  
 Warm up time: typ. 60min. for the specifications  
 Supply voltages: 115/230V ±10%, 50-60Hz  
 Safety: class I (IEC 1010-1/VDE 0411)

Subject to change without notice

05/99

**Optional accessories:**

HZ33, HZ34: 50Ω Coaxial cable BNC-BNC; HZ24: BNC 50Ω attenuators (3 / 6 / 10 / 20 dB); HZ42: 19" rack mount kit;  
 HZ72-S/L: Double shielded IEEE-488-Bus cable, 1m/1.5m. HO88: IEEE-488 Interface; HO89: RS232 Interface.