



RF-Synthesizer HM8134-2

- Frequency range: 1Hz to 1200MHz
- Frequency accuracy $\pm 5 \times 10^{-7}$ (optional $\pm 5 \times 10^{-8}$)
- Frequency resolution 1Hz
- AM / FM / PM / GATE - Modulation
- Optional IEEE-488 and RS 232 - Interface

RF for Laboratory and Service

The **HM8134-2** is an exceptionally low-price 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 **HM8134-2** provides continuous frequency coverage from as low as 1Hz up to 1,2GHz. 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 is 1Hz.

The other propriety are a four modulation (AM/FM/ PM/ GATE), a modulation source internal may be varied between 10Hz and 100kHz, a modulation shape are (SIN / SQR / TRI / +RP / -RP). External input allow modulation between DC and 100kHz. The FM deviation may be varied up to ± 400 kHz and the PM deviation 10rad, the AM modulation depth is variable from 0 to 100% and the GATE on/off Ratio between 50dB and 80dB.

The **HM8134-2** have a fast response time of 10ms for frequency and amplitude changes (same range frequency

and without modulation) is another outstanding characteristic of this instrument.

The instrument parameters are all clearly displayed on two lines of 20 characters each on a backlight LCD.

The **HM8134-2** 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 center 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 **HM8134-2**, 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.

Technical specifications HM8134-2

Specifications

(Referency temperature :23°C ±2°C)

| Frequency | |
|---------------|---|
| Range: | 1Hz to 1200MHz |
| Resolution: | 1Hz |
| Setting time: | < 10ms (if same range) < 60ms (range to range) |

| Standard 10MHz | |
|-------------------------|---------------|
| Stability (10 to 40°C): | ≤ ± 0,5ppm |
| Aging: | ≤ ± 1ppm/year |

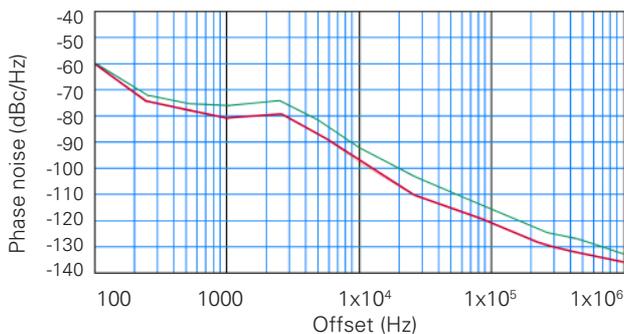
| Option OCXO 10MHz | |
|-------------------------|-----------------------------|
| Stability (10 to 40°C): | ≤ ± 5 10 ⁻⁸ |
| Aging: | ≤ ± 5 10 ⁻⁹ /day |

| | |
|----------------------------|---------------------------|
| Output referency internal: | (BNC jack in back panel) |
| Output voltage: | TTL |
| Input referency external: | (BNC jack in back panel) |
| Input frequency: | 10MHz ±5ppm |
| Input level: | > 0dBm |

| Spectral purity | |
|------------------------------------|---|
| without modulation, level ≤ +10dBm | |
| Harmonic: | 1Hz to 1200MHz ≤ -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)

| Range | Offset | | |
|---------------|--------|-------|--------|
| | 1kHz | 10kHz | 100kHz |
| <16MHz | -82 | -100 | -121 |
| 16 - 256MHz | -74 | -84 | -108 |
| 256 - 512MHz | -80 | -90 | -115 |
| 512 - 1024MHz | -74 | -84 | -108 |



| Output level | |
|---------------|--|
| Range: | -127dBm to +13dBm |
| Resolution: | 0,1dB |
| Accuracy: | ± 0,5dBm level ≥ -57dBm ±(1dBm+0,4dBm/10dB)level < -57dBm |
| Setting 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 in front panel) |

| | |
|--------------------------|--|
| Input impedance: | 10kΩ |
| Input voltage: | the modulation is calibrated with 2Vcc |
| Output source (int,ext): | (BNC jack in 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: | (to 1dB) 10Hz-50kHz AC coupled |
| Distorsion: | <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: | (to 1dB) DC coupled: DC- 30kHz(100kHz <16MHz) NUM AC coupled: 10Hz- 30kHz(100kHz <16MHz) NUM 30kHz-100kHz ANA |
| Distorsion: | < 3% for deviations ≥ 10kHz |

| Phase modulation | |
|---------------------------|--|
| Modulation source: | internal ,external |
| Deviation: | 0 to 3,14rad (<16MHz) 0 to 10rad (16 - 1200MHz) |
| Resolution: | 0,01rad |
| Accuracy (internal sine): | ±5% to 1kHz + residual-PM |
| Bandwidth ext: | (to 1dB) DC coupled: DC- 30kHz (100kHz <16MHz) NUM AC coupled: 10Hz- 30kHz (100kHz <16MHz) NUM 30kHz-100kHz ANA |
| Distorsion: | < 3% for Fmod=1kHz, Deviation=10rad |

| | |
|-------------|-------------------------------------|
| Distorsion: | < 3% for Fmod=1kHz, Deviation=10rad |
|-------------|-------------------------------------|

| Gate modulation | |
|--------------------|--|
| Modulation source: | external |
| on/off Ratio: | ≥ 65dB (<16MHz) ≥ 80dB (16MHz - 512MHz) ≥ 50dB (512MHz -1200MHz) |
| Rise/Fall time: | ≤ 1,5μs (<16MHz) ≤ 7,5μs (16MHz -1200MHz) |
| Delay time: | ≤ 1,5μs (<16MHz) ≤ 15μs (16MHz -1200MHz) |
| Input modulation: | (BNC jack in back panel) |
| Input level: | TTL: 0 OFF 1 ON or 1 OFF 0 ON |

| General | |
|--------------------------|--|
| Interfaces: | options bus 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: | classe I (IEC 1010-1/VDE 0411) |