

## 15 MHz Arbitrary Function Generator HM8131-2



Frequency range from 100  $\mu$ Hz to 15 MHz

Direct Digital frequency Synthesis (DDS)

Input for external time base (10 MHz)

6 standard signal forms and arbitrary

Master-slave mode for up to 3 generators

SRAM memory card for signal storage (Option H0831)

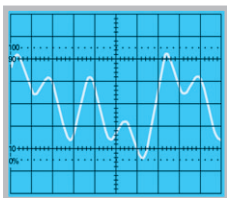
RS-232 Interface

optional: USB, IEEE-488

H0870 USB Interface



AF arbitrary signal



Option H0831  
SRAM Memory Card 1 xMB



# 15 MHz Arbitrary Function Generator HM8131-2

Valid at 23 °C after a 30 minute warm-up period

## Frequency specifications

Range:	100 µHz to 15 MHz
Resolution:	100 µHz; 100 mHz (sweep mode)
Display:	< 10 ms (without band change) < 60 ms (with band change)
Accuracy:	±(10 ppm x freq. + 30 µHz) HM8125 (ext. reference frequency): ±30 µHz
Temperature coefficient:	2 ppm/°C
Ageing:	10 ppm/year

## Waveforms

### Sine wave

Frequency range:	100 µHz to 15 MHz
Amplitude:	0 - 20 V <sub>pp</sub> (open circuit)
Distortion:	10 Hz to 20 kHz: < 0.1 % 20 kHz - 3 MHz: < 1 % 3 MHz - 15 MHz: < 3 %

Nonharmonic distortions:	100 µHz - 1 MHz: < -65 dBc 1 MHz - 15 MHz: < -(65 dBc + 6 dBc/Octave)
Phase noise:	< -90 dBc/√Hz (0 dBm, 1 kHz from carrier)

### Rectangle

Frequency range:	10 µHz to 15 MHz
Amplitude:	0 - 20 V <sub>pp</sub> (open circuit)
Rise/fall time:	< 10 ns
Overshoot:	< 5% (U <sub>out</sub> ≤ 200 mV)
Symmetry:	50% ±(5% + 10 ns)

### Ramp

Frequency range:	100 µHz to 100 kHz
Amplitude:	0 - 20 V <sub>pp</sub> (open circuit)
Linearity:	better than 1% (< 100 kHz)
Polarity:	positive/negative
Rise/fall time:	45 ns

### Triangle

Frequency range:	100 µHz to 1 MHz
Amplitude:	0 - 20 V <sub>pp</sub> (open circuit)
Linearity:	better than 1% (< 100 kHz)

### Noise

White noise:	Bandwidth 10 MHz
Pink noise:	Bandwidth 100 kHz

### Arbitrary

Frequency range:	100 µHz to 10 MHz
Amplitude:	max. 20 V <sub>pp</sub> (open circuit)
Output rate:	40 MSa/s
Resolution:	12 bit (amplitude)
Filter:	Bessel, 7 <sup>th</sup> order, b=10 MHz
Memories:	1x 4 K-words not volatile 1x 16 K-words volatile
Jitter:	< 25 ns

### Inputs

Gate/trigger	
Impedance:	5 kΩ    100 pF (protected to 30V)
Amplitude modulation	
Impedance:	1 kΩ (protected to ±30V)
External reference	
Frequency:	10 MHz ± 2 ppm
Input voltage:	1 V <sub>rms</sub>
Impedance:	500 Ω (protected to ±30V)

### Outputs

Signal output	BNC socket, short-circuit-proof ext. voltage max. ±15 V f. 30s.
Impedance:	50 Ω
Output voltage:	Range 1: 2.1 - 20 V <sub>pp</sub> (open circuit) Range 2: 0.21 - 2.0 V <sub>pp</sub> (open circuit) Range 3: 20 - 200 mV <sub>pp</sub> (open circuit)
Resolution:	3½ digit (100/10/1 mV) Display of V <sub>pp</sub> or RMS (except in arbitrary mode)
Setting accuracy:	Sine wave 1 kHz: ±(1% x amplitude + 5 digits) Rectangle 1 kHz: ±(3% x amplitude + 5 digits)

Frequency response:	< 100 kHz: ±0.2 dB 100 kHz - 1 MHz: ±0.3 dB 1 MHz - 15 MHz: ±0.5 dB
Temperature stability:	±0.1 %/°C
Trigger output	BNC socket, short-circuit proof
Level:	5V/TTL level
Ramp output	
Voltage progression:	0-5V; synchronous with sweep
Impedance:	1 kΩ

## DC offset

Output voltage:	Range 1: -5V... +5V (open circuit) Range 2: -0.5V... +0.5V (open circuit) Range 3: -50 mV + 50 mV (open circuit)
Resolution:	3 digit
Accuracy:	±(1 % x offset voltage + 5 digits)
Temperature stability:	±0.1 %/°C

## Phase

Range:	0 - 359.9°
Resolution:	0.1°
Reference:	declining slope of the synch. signal
Jitter:	< 25 ns
Accuracy:	except for rectangle: ±(0.1 + freq./Hz x 10 <sup>-6</sup> ) degrees for rectangle: ±(5 + freq./Hz x 30 x 10 <sup>-6</sup> ) degrees

## Sweep (internal)

Internal sweep:	all waveforms, linear or log.
Ranges:	100 mHz to max. signal frequency selectable beginning and end frequencies
Sweep time:	from 10 ms to 40 s, continuous or triggered (ext. signal, front panel keypad, interface)

## Modulation

FSK/PSK:	all signals
Frequency range:	100 µHz to max. frequency
Triggering:	by external signal
Minimum duration:	25 µs
Delay:	PSK: typ. 10 µs FSK: typ. 15 µs

## Amplitude modulation

Modulation source:	internal or external
Modulation depth:	0 to 100 %
Bandwidth:	DC - 20 kHz (-3 dB)
Carrier frequency:	100 µHz to max. signal frequency
Accuracy:	±(5 % of reading + 2 %)
Internal modulation:	1 kHz sine wave
External modulation:	20 Hz - 20 kHz
Gate:	(asynchronous)
Delay time:	< 150 ns
Input signal:	TTL
Trigger function:	(synchronous)
Frequency range:	< 500 kHz
Burst mode via ext. trigger or interface	

## Miscellaneous

Optional memory card:	PCMCIA II format up to 1 MB for storage of up to 16 ARB signals
Memories:	10 for device settings; 1 for ARB signal storage
Interface:	RS-232 (standard), IEEE-488 (optional), USB (optional)
Safety class:	Safety Class I (EN 61010-1)
Supply voltage:	115 / 230 V ± 10 %, 50 / 60 Hz
Power consumption:	approx. 30 VA
Operating temperature:	+10° C to +40° C
Max. relative humidity:	10 % - 90 % (without condensation)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 5 kg

Accessories supplied:	Operator's Manual and power cable
Optional accessories:	HZ33/HZ34 Test Cable 50 Ω (BNC-BNC), H0831 Memory Card 1 MB, HZ10S/R Silicone test lead, HZ20 Adapter plug, H0870 USB Interface, H0880 IEEE-488 interface