

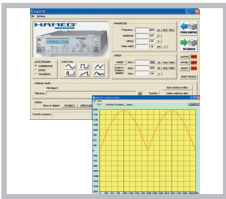
## Arbitrary Function Generator 12.5MHz HM8150



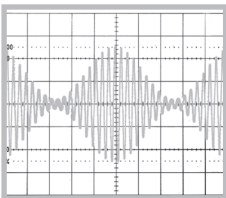
HM8150



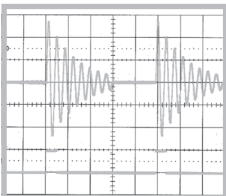
Gated Sine Wave,  
PC-Software included



Amplitude-modulated  
Sine Wave



Triggered Arbitrary Signal



- Frequency range: 10mHz to 12.5MHz
- Triangle waveforms up to 250 kHz
- Output voltages: 10 mV<sub>pp</sub> to 10 V<sub>pp</sub> (at 50 Ω)
- Total Harmonic Distortion: 0.05 % (f ≤ 100 kHz)
- Waveform modes: sine, square, triangle/ramp, pulse and arbitrary waveforms
- External amplitude modulation up to 20 kHz
- External connectors: GATE (I), TRIGGER (I/O), SWEEP (O), MODULATION (I)
- Arbitrary waveform generator: 40 MSa/s, 12 bit, 4096 Pts
- PC software (free of charge) to easily create user-defined waveforms
- RS-232/USB dual interface, IEEE-488 (GPIB) optional

# Arbitrary Function Generator 12.5 MHz HM8150

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

## Frequency

Range:	10 mHz to 12.5 MHz
Resolution:	5 digit, max. 10 mHz
Accuracy:	±(1 digit + 5 mHz)
Temperature coefficient:	0.5 ppm/°C
Aging:	2 ppm/year

## Waveforms

### Sine wave

Frequency range:	10 mHz to 12.5 MHz
Amplitude:	20 mV <sub>pp</sub> to 20 V <sub>pp</sub> (open circuit)
Harmonic Distortion @ 1 V <sub>pp</sub> :	
f < 500 kHz	-65 dBc
500 kHz ≤ f < 5 MHz	-50 dBc
5 MHz ≤ f ≤ 12.5 MHz	-40 dBc
Total Harmonic Distortion @ 1 V <sub>pp</sub> :	
f < 100 kHz	typ. 0.05%
Spurious (Non-Harmonic) @ 1 V <sub>pp</sub> :	
f < 500 kHz	-65 dBc
500 kHz ≤ f ≤ 12.5 MHz	-65 dBc + 6 dBc/octave

### Square wave

Frequency range:	10 mHz to 12.5 MHz
Amplitude:	20 mV <sub>pp</sub> to 20 V <sub>pp</sub> (open circuit)
Rise/fall time:	< 10 ns
Overshoot:	< 5% (V <sub>out</sub> ≤ 200 mV)
Symmetry:	50% ±(5% + 10 ns)

### Pulse

Frequency range:	10 mHz to 5 MHz
Amplitude:	10 mV <sub>pp</sub> to +10 V <sub>pp</sub> or -10 mV <sub>pp</sub> to -10 V <sub>pp</sub>
Rise/fall time:	< 10 ns
Pulse width:	100 ns to 80 s
Duty cycle:	max. 90%

### Sawtooth

Frequency range:	10 mHz to 25 kHz
Amplitude:	20 mV <sub>pp</sub> to 20 V <sub>pp</sub> (open circuit)
Linearity:	better than 1%

### Triangle

Frequency range:	10 mHz to 250 kHz
Amplitude:	20 mV <sub>pp</sub> to 20 V <sub>pp</sub> (open circuit)
Linearity:	better than 1%

### Arbitrary generator

Frequency range:	10 mHz to 250 kHz
Amplitude:	20 mV <sub>pp</sub> to 20 V <sub>pp</sub> (open circuit)
Output rate:	40 MSa/s
Resolution:	X: 1,024 (10 bit), Y: 1,024 (10 bit) or X: 4,096 (12 bit), Y: 4,096 (12 bit)

### Inputs

Gate/Trigger:	BNC connector
Impedance	5 kΩ    100 pF
Max. input voltage	±30 V
Modulation Input:	BNC connector
Impedance	10 kΩ
Max. input voltage	±30 V

### Outputs

Signal output:	BNC connector, short circuit proof, ext. voltage up to ±15 V
Impedance	50 Ω
Output voltage	Range 1: 2.1 V <sub>pp</sub> to 20 V <sub>pp</sub> (open circuit) Range 2: 0.21 V <sub>pp</sub> to 2.0 V <sub>pp</sub> (open circuit) Range 3: 20 mV <sub>pp</sub> to 200 mV <sub>pp</sub> (open circuit)
Resolution	Range 1: 100 mV Range 2: 10 mV Range 3: 1 mV
Setting accuracy (1 kHz)	Range 1: ±2% Range 2: ±3% Range 3: ±4% 3% additional for pulse and square wave
Frequency response	< 100 kHz ±0.2 dB 0.1 MHz to 12.5 MHz: ±0.5 dB
Offset error	Range 3: ±50 mV
Display	2½ digits (LCD)

Trigger output:	BNC connector
Level	5V/TTL
Impedance	50 Ω
Sawtooth output:	BNC connector
Output voltage	0V to 5V, synchronous to sweep
Impedance	1 kΩ

### DC offset

Output voltage:	Range 1: -7.5V to +7.5V (open circuit) Range 2: -0.75V to +0.75V (open circuit) Range 3: -75 mV to +75 mV (open circuit) V <sub>acrange</sub> + 2 x V <sub>offsetrange</sub> ≤ V <sub>range max.</sub>
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### Sweep (internal)

Setting of start and stop frequencies:	all waveforms
Internal sweep:	linear, 20 ms to 100 s continuous or triggered (ext. signal, interface)

### Amplitude Modulation

Modulation via external signal:	
Modulations depth:	0% to 100%
Bandwidth:	DC to 20 kHz (-3 dB)

### Gate (asynchronous)

Modulation on/off via external TTL signal:	
Delay time:	< 150 ns
Input signal:	TTL

### Trigger Function (synchronous)

Burst mode via ext. trigger input or interface:	
Frequency range:	< 500 kHz

### Miscellaneous

Interface:	Dual-Interface USB/RS-232 (H0820), IEEE-488 (GPIB) (optional)
Display:	16 characters, LCD with backlight
Memory:	for the last device settings and for 1 arbitrary signal
Safety Class:	Safety Class I (EN61010-1)
Power supply:	115V to 230V ±10%; 50 Hz to 60 Hz, CAT II
Power consumption:	approx. 20 W
Operating temperature:	+5 °C to +40 °C
Storage temperature:	-20 °C to +70 °C
Rel. humidity:	5% to 80% (non condensing)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 5 kg

**Accessories supplied:** Line cord, printed operating manual, CD, Software

### Recommended accessories:

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
HZ24	Attenuators 50 Ω (3/6/10/20 dB)
HZ33	Test cable 50 Ω, BNC/BNC, 0.5 m
HZ34	Test cable 50 Ω, BNC/BNC, 1.0 m
HZ42	19" Rackmount kit 2RU
HZ72	GPIB-Cable 2 m