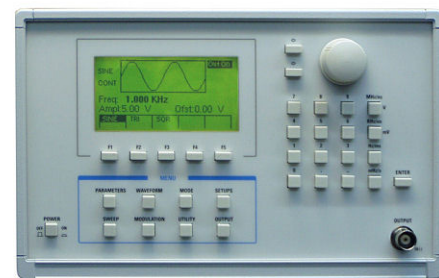


# GP1665HR

PRELIMINARY  
DATASHEET

## PROGRAMMABLE FUNCTION GENERATOR WITH RACK MOUNT. REPLACEMENT FOR HP8165A COMMAND SET.

- 100% Form-Fit-Function compatibility with Hewlett Packard 8165A Programmable Signal Source / Function Generator
- Generates sine, sawtooth, square, triangle, and DC waveforms
- Frequency range from 1 mHz to 50 MHz
- 4 digit frequency resolution



### DESCRIPTION

The GP1665H function generator is a programmable instrument capable of generating predefined sine, square, triangle, sawtooth, and DC waveforms. The firmware is customized for the HP 8165A GPIB command set. Software test procedures using the original HP8165A instrument require no code modification when upgrading to the GP1665H.

### FEATURES

The GP1665H offers phase-lock loop (PLL) for stability and accuracy up to 50 MHz as well as precision low-frequency waveform for trigger, gate, and burst modes. A selectable 20% - 50% - 80% duty cycle up to 20 MHz allows versatility in linear applications using sawtooth and rectangular waveforms.

The GP1665H provides internal storage of up to 10 complete sets of parameters and settings by using its internal non-volatile memory. This allows current settings to be saved in case of power failure.

Additionally, the GP1665H gives users the option of logarithmic sweeps over three decades as well as a VCO mode for sweeps going down to 1  $\mu$ Hz. Trigger and modulation modes are available for applications needing modulated bursts. Trigger modes can be used in conjunction with AM or FM from 1 mHz to 50 MHz.

### APPLICATIONS

- Automatic Test Equipment (ATE)
- Component Analysis
- Communication Signals
- Process Control
- Sonar

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## SPECIFICATIONS

OPERATING MODES	
Continuous	Continuous waveform is generated, phase locked to an internal 10 MHz crystal reference.
VCO	External voltage (1 kHz max) from 10 mV to 10 V lin-early sweeps 3 decades up to top of decade in which function generator is set. Twelve overlapping ranges cover 1 $\mu$ Hz to 50 MHz.
Trigger	Pos. ext. input pulse > 10 ns wide generates one output cycle. Upper level > +250 mV, lower level < 0 V.
Gate	Oscillator enabled when ext. input $\geq \pm 250$ mV, disabled when $\leq 0$ V. First and last output cycles are always complete.
Burst	A preprogrammed number of output cycles is generated. Minimum time between bursts 50 ns, burst length 0 to 9,999 cycles. Minimum trigger pulse width 10 ns
FM	0 to $\pm 1$ V modulates with $\pm 1\%$ deviation
AM	0 to 2.5 V <sub>pp</sub> modulates 0 to 100% modulation depth
Sweep	Provides logarithmic up / down sweep of up to three decades between limits set on the function generator. Eleven overlapping ranges cover 1 $\mu$ Hz to 50 MHz.
TIMING PARAMETERS	
Frequency	0.001 Hz - 50 MHz, sine and square
Resolution	4 digits
Accuracy	$\pm 0.001\%$
Jitter	0.1% for FRQ > 1 KHz, 0.02% for FRQ < 999 Hz
Stability	1 ppm
Duty Cycle	20% - 50% - 80%
AMPLITUDE CHARACTERISTICS	
Range	10 mV - 10 V <sub>pp</sub> into 50 $\Omega$
Resolution	3 digits
Accuracy	$\pm 3\%$ to 5 MHz, $\pm 8\%$ to 20 MHz, $\pm 5\%$ / -20% to 50 MHz for sine waveforms
OFFSET CHARACTERISTICS	
Range	0 to $\pm 5$ V into 50 $\Omega$
Resolution	3 digits
Accuracy	$\pm 1\%$ setting, $\pm 1\%$ AMP, $\pm 20$ mV

WAVEFORM PERFORMANCE	
Sine THD	< -40 dB to 5 MHz < -30 dB to > 5 MHz
Square Transition	< 5 ns, 10% to 90%
Square Aberrations	< $\pm 5\%$
Waveforms	Sine, square, triangle, sawtooth, and DC
VCO	
Band	3 decades (max)
Ranges	$\pm 1$ $\mu$ Hz - 50 MHz
Mod Bandwidth	DC - 100 kHz
MODULATION	
FM	1% maximum deviation for $\pm 1$ V input
Mod Bandwidth	DC - 20 kHz
AM Depth	100% for $\pm 2.5$ V input
AM Bandwidth	DC - 100 kHz
SWEEP MODE	
Log Sweep	Up-down, full frequency range available
Sweep Time	0.01 / 0.1 / 1 / 10 / 100 / 1,000 sec per decade selectable
Repetition	Continuous or triggered
Output	0 V - 2.99 V triangle, 50 $\Omega$ impedance
OUTPUT CHARACTERISTICS	
Output modes	Invert, disable, 50 $\Omega$ / 1 K selectable
Output Range	$\pm 10$ V into 50 $\Omega$ , $\pm 20$ V <sub>pp</sub> into 1 K or open
Source Impedance	50 $\Omega$ , $\pm 0.5\%$
INPUTS AND OUTPUTS	
Sync Output	1.5 V into 50 $\Omega$ , 50% duty cycle, 50 $\Omega$ impedance
External Trigger	High > 250 mV, positive slope 10 nx (min) pulse, 10 K IN impedance
VCO Input	10 mV - 10 V, 10 k $\Omega$ IN impedance
Modulation Input	Maximum $\pm 20$ V, 10 k $\Omega$ IN impedance

# GP1665HR

GENERAL	
Interface	Fully compatible with HP8165A
Memory	10 setups
Power Requirements	100 - 240 V selectable, 50 VA (max)
Weight	5 kg
Dimensions	13.0 cm H x 21.2 cm W x 40 cm L (5.25" x 8.3" x 15.75")
Operating Temperature	0 °C to +50 °C
Humidity	To 95% RH, 0 °C to +40 °C
Connectors	Rear panel connectors optional
Rack Mount	Optional

Note: Specifications are subject to change without notice

## ORDERING INFORMATION

GP1665HR	Programmable Function Generator with Rack Mount. Replacement for HP8165A command set.
ACCESSORY	
GP165X-EAR	Rack-Mount Kit for GP1650
GT90002	GPIB Cable, Double-shielded, 1 meter
GT90003	GPIB Cable, Double-shielded, 2 meters