

## AFG-2100/2000 Series



### Innovation and Value in Waveform Design

The AFG-2100/2000 Series Arbitrary Function Generators are DDS based signal generators covering the output of Sine, Square, Ramp, Noise and 20MSa/s Arbitrary waveform. The 0.1Hz resolution and 1% ~ 99% adjustable duty cycle of Square(Pulse) waveform greatly extend its application range in various fields.

The AFG-2100/2000 Series includes 6 models in three frequency bands of 5MHz, 12MHz and 25MHz. Besides the features of AFG-2000, AFG-2100 also carries additional features of AM/FM/FSK Modulation, Sweep and Frequency Counter. The 3.5" color LCD will clearly display the digital waveform parameters set through front panel. The entire Series is equipped with USB Device interface for remote control and importing waveform data from PC.

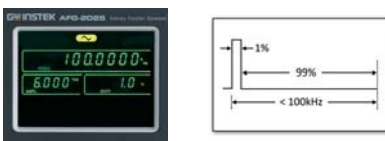
#### Built-In Arbitrary Waveform Function

20MSa/s sampling rate, 10 bit vertical resolution and 4k point memory equip AFG-2100/2000 the arbitrary waveform capacity. User can create waveform by mean of either point by point input from front panel or PC software.



#### 1% Adjustable Duty Cycle of Square Wave

The AFG-2100/ 2000 Series provides 1% ~ 99% variable duty cycle for its square waveform output. This feature allows generating the pulse waveform to simulate a spike signal or a transient signal.



#### Fully Digital Entry Design

The fully digital entry design of AFG-2100/2000 Series improves the setting uncertainty of conventional Function Generator and therefore significantly increases the accuracy of its waveform output. The 3.5" LCD screen allows user to see the parameter value change in detail when the adjustment is in progress.



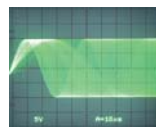
#### Amplitude and DC Offset Display

In addition to the setting parameters, the amplitude, DC offset values are also displayed on the LCD screen. Three amplitude units, Vpp, Vrms and dBm, can be selected and exchanged.



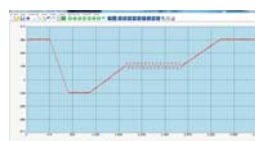
#### AM/FM/FSK, Sweep, Counter(AFG-2100 only)

AFG-2100 models are equipped with additional AM/FM/FSK Modulation, Sweep and Frequency Counter functions. The 150MHz frequency counter saves user the cost of purchasing a standalone frequency counter.



#### Arbitrary Waveform Editing Software

A free arbitrary waveform editing software is available which is used to edit the arbitrary waveform on PC. After completing the waveform editing, it can be downloaded to AFG through USB interface for waveform output.



### FEATURES

- 0.1Hz ~ 5/12/25 MHz with in 0.1Hz Resolution
- Sine, Square, Ramp, Noise and Arbitrary Waveform
- 20MSa/s Sampling Rate, 10 bit Vertical Resolution and 4k point Memory for Arbitrary Waveform
- 1% ~ 99% Adjustable Duty Cycle for Square Waveform
- Waveform Parameter Setting Through Numeric Keypad Entry & Knob Selection
- Amplitude, DC Offset and Other Key Setting Information Shown on the 3.5" LCD Screen Simultaneously
- AM/FM/FSK Modulation, Sweep, and Frequency Counter functions (AFG-2100 only)
- USB Device Interface for Remote Control and Waveform Editing
- PC Arbitrary Waveform Editing Software



AFG-2000 Series Front

### APPLICATIONS

- Audio Products Frequency Characteristics Measurement
- Pulse Signal as Trigger or Synchronization Signal for Electronic Product Testing
- Pulse Noise Simulation
- Reference Clock Signal of Electronic Device
- Vibration Signal Simulation
- Noise Simulation for Communication System Educational Lab

## SPECIFICATIONS

MODELS	AFG-2100 Series			AFG-2000 Series		
	AFG-2105	AFG-2112	AFG-2125	AFG-2005	AFG-2012	AFG-2025
WAVEFORMS	Sine, Square, Ramp, Noise, Arbitrary Waveform					
ARBITRARY FUNCTION	Sample Rate Repetition Rate Waveform Length Amplitude Resolution	20MSa/s 10MHz 4k point 10 bit				
FREQUENCY CHARACTERISTICS	Range	Sine/Square Ramp Sine, Square, Ramp Stability Aging Tolerance	0.1Hz~5MHz 0.1Hz~12MHz 0.1Hz~25MHz	0.1Hz~5MHz 0.1Hz~12MHz 0.1Hz~25MHz	0.1Hz~5MHz 0.1Hz~12MHz 0.1Hz~25MHz	0.1Hz~5MHz 0.1Hz~12MHz 0.1Hz~25MHz
OUTPUT CHARACTERISTICS	Resolution Accuracy		0.1Hz ~ 1MHz 0.1Hz ±20ppm ±1ppm, per 1 year ≤1mHz			
	Amplitude	Range	≤ 20MHz : 1mVpp~10Vpp(50Ω); 2mVpp~20Vpp (open-circuit) ≤ 25MHz : 1mVpp~5Vpp(50Ω); 2mVpp~10Vpp (open-circuit) ±2% of setting ±1mVpp; (at 1kHz, >10mVpp)			
		Accuracy Resolution Flatness	±1% (0.1dB) ≤ 100kHz; ±3% (0.3dB) ≤ 5MHz; ±4% (0.4dB) ≤ 12MHz; ±20% (2dB) ≤ 20MHz; ±5% (0.4dB) ≤ 25MHz; (sine wave relative to 1 kHz) Vpp, Vrms, dBm			
	Offset	Units Range	±5Vpk ac+dc (into 50Ω); ±10Vpk ac+dc (open circuit); ±2.5Vpk ac+dc (into 50Ω) for 20MHz~25MHz; ±5Vpk ac+dc (open circuit) for 20MHz~25MHz			
Waveform Output	Accuracy Impedance Protection (main output)	2% of setting + 5mV + 0.5% of amplitude 50Ω typical (fixed); >300kΩ (output disabled) Short-circuit protected; Overload relay automatically disables main output				
SYNC Output	Level Impedance Rise or Fall Time	TTL-compatible into >1kΩ 50Ω nominal ≤ 25ns				
SINE WAVE CHARACTERISTICS	Harmonic Distortion	-55 dBc DC ~ 200kHz, Ampl > 0.1Vpp; -50 dBc 200kHz ~ 1MHz, Ampl > 0.1Vpp -35 dBc 1MHz ~ 5MHz, Ampl > 0.1Vpp; -30 dBc 5MHz ~ 25MHz, Ampl > 0.1Vpp				
SQUAREWAVE CHARACTERISTICS	Rise/Fall Time Overshoot Asymmetry Variable Duty Cycle	≤ 25ns at maximum output (into 50Ω load) < 5% 1% of period + 1 ns 1%~99% ≤ 100kHz; 20.0%~80.0% ≤ 5MHz; 40.0%~60.0% ≤ 10MHz; 50% ≤ 25MHz (1% Resolution for full Frequency Range)				
RAMP CHARACTERISTICS	Linearity Variable Symmetry	< 0.1% of peak output 0%~100% (0.1% Resolution)				
AM MODULATION	Carrier Waveforms Modulating Waveforms Modulating Frequency Depth Source	Sine, Square, Triangle Sine, Square, Triangle 2 mHz~20 kHz (Int); DC~20kHz (Ext) 0%~120.0% Internal/External			-	
FM MODULATION	Carrier Waveforms Modulating Waveforms Modulating Frequency Deviation Source	Sine, Square, Triangle Sine, Square, Triangle 2 mHz~20 kHz (Int); DC~20kHz (Ext) DC to Max Frequency Internal/External			-	
SWEEP	Waveforms Type Start/Stop Frequency Sweep Time Source	Sine, Square, Triangle Linear or Logarithmic 0.1Hz to Max Frequency 1ms~500s Internal/External			-	
FSK	Carrier Waveforms Modulating Waveforms Modulation Rate Frequency Range Source	Sine, Square, Triangle 50% duty cycle square 2mHz~100kHz (Int); DC~100kHz (Ext) 0.1Hz~Max Frequency Internal/External			-	
FREQUENCY COUNTER	Range Accuracy Time base Resolution Input Impedance Sensitivity	5Hz~150MHz Time Base accuracy ± 1count ±20ppm (23°C±5°C) after 30minutes warm up 100nHz for 1Hz, 0.1Hz for 100MHz 1KΩ/1pF 35mVrms~30Vms (5Hz~150MHz)			-	
STORE/RECALL	10 Groups of Setting Memories					
INTERFACE	USB (Device)					
DISPLAY	LCD					
POWER SOURCE	AC100 ~ 240V, 50 ~ 60Hz					
POWER CONSUMPTION	25 VA					
OPERATING ENVIRONMENT	Temperature to satisfy the specification: 18~28°C; Operating temperature: 0~40°C Relative Humidity: ≤80%, 0~40°C; ≤70%, 35~40°C; Installation category: CAT II					
OPERATING ALTITUDE	2000 meters					
STORAGE TEMPERATURE	-10~70°C, Humidity: ≤70%					
DIMENSIONS & WEIGHT	266(W)×107(H)×293(D) mm; Approx. 2.5 kg					

Specifications subject to change without notice. FG-2000GD3DH

## ORDERING INFORMATION

AFG-2005	5MHz Arbitrary Waveform Function Generator
AFG-2105	5MHz Arbitrary Waveform Function Generator
AFG-2012	12MHz Arbitrary Waveform Function Generator
AFG-2112	12MHz Arbitrary Waveform Function Generator
AFG-2025	25MHz Arbitrary Waveform Function Generator
AFG-2125	25MHz Arbitrary Waveform Function Generator

## ACCESSORIES

CD (user manual + software) × 1, Quick Start Guide × 1, Power cord × 1  
AFG-2100 Series - GTL-101 Test Lead × 2, Instruction Manual × 1, Power cord × 1  
AFG-2000 Series - GTL-101 Test Lead × 1, Instruction Manual × 1, Power cord × 1

## OPTIONAL ACCESSORIES

**GTL-246** USB Cable, USB 2.0 Type A - Type B, 4P

## FREE DOWNLOAD

PC Software FreeWave software Driver USB driver

Global Headquarters  
**GOOD WILL INSTRUMENT CO., LTD.**  
T +886-2-2268-0389 F +886-2-2268-0639

China Subsidiary  
**GOOD WILL INSTRUMENT (SUZHOU) CO., LTD.**  
T +86-512-6661-7177 F +86-512-6661-7277

Malaysia Subsidiary  
**GOOD WILL INSTRUMENT (SEA) SDN. BHD.**  
T +604-6111122 F +604-6115225

Europe Subsidiary  
**GOOD WILL INSTRUMENT EURO B.V.**  
T +31(0)40-2557790 F +31(0)40-2541194

U.S.A. Subsidiary  
**INSTEK AMERICA CORP.**  
T +1-909-399-3535 F +1-909-399-0819

Japan Subsidiary  
**TEXIO TECHNOLOGY CORPORATION.**  
T +81-45-620-2305 F +81-45-534-7181

Korea Subsidiary  
**GOOD WILL INSTRUMENT KOREA CO., LTD.**  
T +82-2-3439-2205 F +82-2-3439-2207

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