AFG-2000 Series

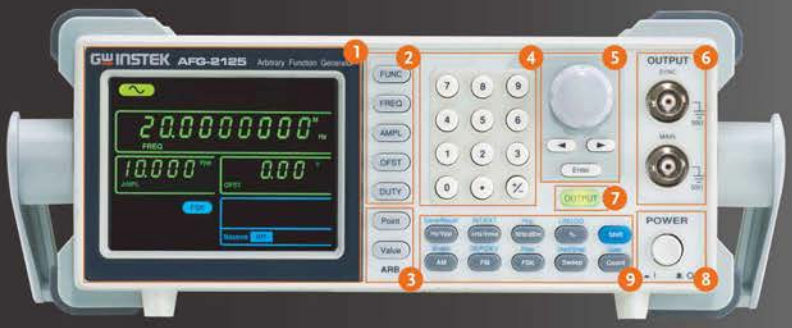
Arbitrary Function Generator

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

GW INSTEK
Simply Reliable

PANEL INTRODUCTION



CE USB PC Software

1. 3 Color LCD Panel
2. General Function Keys
3. Arbitrary Function Keys
4. Number Pad
5. Scroll Knob & Selection Key
6. Output Terminals
7. Main Output Switch
8. Power Switch
9. Operation Keys
10. Trigger, Modulation & Counter Input
11. Modulation Output
12. USB Device

Innovation and Value in Waveform Design

The AFG-2100/2000 Series Arbitrary Function Generator is a DDS (Direct Digital Synthesized) based signal generator designed to accommodate the Educational and Basic Industrial requirements for an accurate and affordable signal source covering the output of Sine, Square (Pulse), Ramp (Triangle), Noise and Arbitrary waveforms. The 20MSa/s sampling rate, 10 bit vertical resolution and 4k point memory of the AFG-2100/2000 Series provide user with a flexible environment for creating the specific waveform output as needed. The 0.1Hz resolution of Sine, Square and Triangle waveforms and the 1% ~ 99% adjustable duty cycle of Square (Pulse) waveform are the remarkable features to greatly extend its application range in various fields.

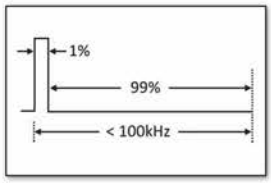
The AFG-2100/2000 Series includes 6 models in three frequency bands of 5MHz, 12MHz and 25MHz. Besides the basic features of the whole AFG-2100/2000 Series, AFG-2100 carries additional features of AM/FM/FSK Modulation, Sweep, and Frequency Counter.

The friendly human interface of AFG-2100/2000 Series allows user to set waveform parameters, including waveform type, frequency, amplitude, DC offset, modulation type, and duty cycle, through keypad entry and/or the knob selection, and display the set parameters on the 3.5" LCD screen. The AFG-2100/2000 Series is equipped with a USB Device interface for remote control and waveform editing through a PC. A waveform editing software is provided to facilitate the waveform creation on the PC. After the waveform editing is done, the user is able to download the waveform data from PC to the AFG-2100/2000 Series for signal output.

A. BUILT-IN ARBITRARY WAVEFORM FUNCTION

In addition to the high accuracy and high stability DDS Function Waveforms-Sine, Square and Ramp, the AFG-2100/2000 Series also provides the feature to generate Arbitrary Waveforms as what user wants. The 20MSa/s sampling rate, 10 bit vertical resolution and 4k point waveform memory allow user to create the needed waveform point by point through keypad entry on the front panel, or to do waveform editing on the PC and download the waveform data to the AFG-2100/2000 Series, for arbitrary waveform output.

B. 1% ADJUSTABLE DUTY CYCLE OF SQUARE WAVE



1% Duty Cycle of Square Wave Setting

For most conventional Function Generators, the adjustable duty cycle falls in a limited 20% ~ 80% range, which may not fit the demands of specific applications. The AFG-2100/2000 is able to provide a 1%~99% variable duty cycle for its Square waveform and 0%~100% variable symmetry for the Ramp. This allows the AFG-2100/2000 to be used as a Pulse Generator to create pulse waveform simulating a spike signal or a transient signal.

D. AMPLITUDE & DC OFFSET DISPLAY

Parameter Display

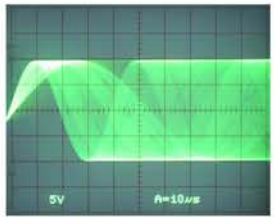
With the 3.5" LCD, the AFG-2100/2000 is able to show output waveform amplitude, DC offset and other key setting information simultaneously. This provides the convenience for user to know what signal is being sent out at the output terminal without the need to check the waveform through an oscilloscope.

C. FULLY DIGITAL ENTRY DESIGN

Fully Digital Keypad Operation

The conventional analog knob is not accurate enough for precision setting of waveform parameters, and may generate noise to interfere the system operation. The keypad entry design of AFG-2100/2000 improves the setting uncertainty and therefore significantly increases the accuracy of its waveform output. Besides, there is a Main Output switch which controls the main signal ON/OFF status. When a parameter, like output amplitude, is intended to be changed, user can turn off the output signal to avoid damaging the DUT.

E. AM/FM/FSK MODULATION, SWEEP & FREQUENCY COUNTER



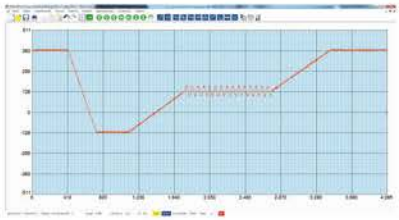
Sweep Waveform

All AFG-2100 models are equipped with additional AM/FM/FSK Modulation, Sweep & Frequency Counter functions. The AM/FM modulated signal provides a means for basic modulation circuit tests and experiments, and the FSK modulated signal offers the signal source of the most common digital modulation signal. The Sweep function adequately fits a lot of basic applications such as sweep-tone test for the speaker in audio frequency range. The built-in frequency counter is able to measure the frequency of an external signal up to 150MHz, which saves the cost of purchasing a frequency counter.

F. USB INTERFACE & ARBITRARY WAVEFORM EDITING PC SOFTWARE

USB Device Interface

The AFG-2100/2000 Series provides a USB Device Interface, which allows the programming of remote control or ATE of the product. An arbitrary waveform editing PC software can generate the waveform by hand drawing, recalling and tailoring waveforms including Rayleigh, Gaussian, Normal Noise, Pseudo Ternary, Bipolar AMI, Manchester, Differential Manchester, RS-232C, and NRZ etc. from the library.



Arbitrary Waveform Editing PC Software

Besides, this software can import CSV format file as waveform data which is created by the other tools. After the waveform editing is completed on the PC, the waveform data can be downloaded through USB Interface to the AFG-2100/2000 for arbitrary waveform output. The software fits for both AFG-2100/2000 and 3000 series and can be downloaded from GWInstek's website. (www.gwinstek.com)

SPECIFICATIONS

		AFG-2105	AFG-2112	AFG-2125	AFG-2005	AFG-2012	AFG-2025
WAVEFORMS		Sine, Square, Ramp, Noise(Normal Type), Arbitrary Waveform					
ARITRARY FUNCTION	**Sample Rate**	20MSa/s					
	Repetition Rate	10MHz					
	Waveform Length	4k point					
	Amplitude Resolution	10 bit					
FREQUENCY CHARACTERISTICS	**Range Sine / Square**	0.1Hz~5MHz	0.1Hz~12MHz	0.1Hz~25MHz	0.1Hz~5MHz	0.1Hz~12MHz	0.1Hz~25MHz
	Triangle, Ramp	1MHz					
	Resolution	0.1Hz					
	Stability	±20 ppm					
	Aging	±1 ppm, per 1 year					
	Tolerance	< 10 mHz					
OUTPUT CHARACTERISTICS	**Amplitude Range**	≤20MHz : 1mVpp~10Vpp (into 50Ω); 2mVpp~20Vpp (open-circuit) ≤25MHz : 1mVpp~5Vpp (into 50Ω); 2mVpp~10Vpp (open-circuit)					
	Accuracy	±1% of setting ±1 mVpp;(at 1 kHz,>10 mVpp)					
	Resolution	0.1mV or 3digits					
	Flatness	±1%(0.1dB)≤100kHz; ±3%(0.3dB)≤5MHz; ±5%(0.4dB)≤12MHz ±20%(2dB)≤20MHz; ±5% (0.4dB)≤25MHz; (sine wave relative to 1kHz)					
	Units	Vpp, Vrms, dBm					
	Offset Range	±5Vpk ac + dc (into 50Ω); ±10Vpk ac + dc (Open circuit)					
	Accuracy	1% of setting + 2mV+ 0.5% of amplitude					
	Waveform Output Impedance	50Ω typical (fixed); > 10MΩ (output disabled)					
	Protection	Short-circuit protected ; Overload relay auto-matically disables main output					
	SYNC Output Level	TTL-compatible into >1kΩ					
	Impedance	50Ω nominal					
	Rise or Fall Time	≤ 25ns					
SINEWAVE CHARACTERISTICS	**Harmonic Distortion**	-55dBc, DC~1MHz, Ampl>1Vpp ; -45dBc, 1MHz~5MHz, Ampl>1Vpp ; -30dBc, 5MHz~25MHz, Ampl>1Vpp					
SQUAREWAVE CHARACTERISTICS	**Rise/Fall Time**	≤ 25ns at maximum output (into 50Ωload)					
	Overshoot	< 5%					
	Asymmetry	1% of period+1 ns					
	Variable Duty Cycle	1%~99%≤ 100kHz; 10%~90%≤ 2MHz;20.0%~80.0%≤ 5MHz ; 40.0%~60.0%≤ 10MHz ; 50%≤ 25MHz ; (1% Resolution for full Frequency Range)					
RAMP CHARACTERISTICS	**Linearity**	< 0.1% of peak output					
	Variable Symmetry	0%~100%(0.1% Resolution)					
AM MODULATION	Carrier Waveforms	Sine, Square, Triangle			–		
	Modulating Waveforms	Sine, Square, Triangle					
	Modulating Frequency	2 mHz~20 kHz (Int); DC~20KHz (Ext)					
	Depth	0%~120.0%					
FM MODULATION	**Carrier Waveforms**	Sine, Square, Triangle			–		
	Modulating Waveforms	Sine, Square, Triangle					
	Modulating Frequency	2 mHz~20 kHz (Int); DC~20KHz (Ext)					
	Deviation	DC to Max Frequency					
FSK	**Carrier Waveforms**	Sine, Square, Triangle			–		
	Modulating Waveforms	50% duty cycle square					
	Internal Rate	2mHz~20kHz					
	Frequency Range	0.1Hz~Max Frequency					
SWEEP	**Waveforms**	Sine, Square, Triangle			–		
	Type	Linear or Logarithmic					
	Start/Stop Frequency	0.1Hz to Max Frequency					
	Sweep Time	1ms~500s					
FREQUENCY COUNTER	Range	5Hz~150MHz			–		
	Accuracy	Time Base accuracy ± 1count					
	Time base	±20ppm (23°C ± 5°C) after 30 minutes warm up					
	Resolution	The maximum resolution is:100nHz for 1Hz, 0.1Hz for 100MHz					
	Input Impedance	1MΩ/150pf					
	Sensitivity	≤35mVrms (5Hz~100MHz) ; ≤45mVrms(100MHz~150MHz)					
STORE/RECALL		10 Groups of Setting Memories					
INTERFACE		USB(Device)					
POWER SOURCE		AC100 ~ 240V , 50 ~ 60Hz					
POWER CONSUMPTION		65 VA					
DIMENSIONS & WEIGHT		266(W)×107(H)×293(D) mm ; Approx. 3.2 kg			266(W)×107(H)×293(D) mm ; Approx. 3.1 kg		

Specifications subject to change without notice. FG-2000GD1BH

ORDERING INFORMATION

AFG-2100 Series Arbitrary Waveform Function Generator
AFG-2000 Series Arbitrary Waveform Function Generator

ACCESSORIES

AFG-2100 Series - GTL-110 x 2, Instruction Manual x 1, Power cord x 1
AFG-2000 Series - GTL-110 x 1, Instruction Manual x 1, Power cord x 1

OPTIONAL ASSESSORIES

GTL-242 USB Cable, USB 2.0 Type A - Type B, 4P

FREE DOWNLOAD

PC Software FreeWave software
Driver USB driver

Contact:
Industrial Process Measurement, Inc.
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