Digital synthetized arbitrary function generator

- Frequency range 1Hz ~ 80MHz (AFG3081) or 1Hz ~ 50MHz (AFG3051)
- Resolution 1µHz throughout full range
- Standard waveforms: sinus, square, pulse, ramp, noise
- Modulations: AM FM PWM FSK SWEEP BURST
- Vertical resolution 16 bits, Sample rate 200MSa/s
- Direct waveform construction capability
- Length of arbitrary waveform 1Mpoint
- Arbitrary waveform editing PC software
- 10 storage memories for setup and 1Mpoint waves
- 4.3" high resolution LCD display shows the wave and setup
- Using help on the screen
- 2 impedance outputs: 50Ω and high impedance
- USB, RS232, GPIB standard interfaces

ref. AFG3081 (80MHz)

ref. AFG3051 (50MHz)

Réf	AFG3081 (1µHz~80MHz) / AFG3051 (1µHz~50MHz)
STANDARD WAVEFORMS	Sinus, square, pulse, ramp,noise,DC, (sinx)/x, exponential rise and fall, negative ramp
ARBITRARY WAVEFORMS	
Sample rate	200 MSa/s
Repetition rate	100 MHz
Waveform length	1 Mpoint
Amplitude resolution	16 bits
FREQUENCY	
Sinus square	**1 µHz ~ 80 MHz / 1 µHz ~ 50 MHz**
Triangle ramp	1 MHz
Resolution / Accuracy	1 µHz / ±1 ppm de 0 à 50°C
AMPLITUDE	
Amplitude output	10mVpp ~ 10 Vcc into 50 , 20Vpp into 600
Accuracy	1% of setting + 1mVpp (10mVpp at f>1kHz)
Resolution	0,1 mV or 4 digits
Units	Vcc , Vrms, dBm
OFFSET	±5Vpk ac+dc into 50Ω
Accuracy	1% of setting + 2mV+0,5% of the amplitude
Protection	short circuit protected. Relay disables automatically the main output
Synchro output	TTL level into impedance > 1kW
SINUSWAVE CHARACTERISTICS	
Harmonic distorsion	60dBc DC~1MHz Ampl<3Vcc 30dBc 5MHz~80MHz Ampl>3Vcc
SQUAREWAVE CHARACTERISTICS	
Rise / Fall time	< 8ns
Duty cycle	20%~80%
Overshoot / Asymetry	% of period + 1ns
RAMP CHARACTERISTICS	
Linearity	<0,1% of the peak output
Variable symetry	0% ~ 100%
PULSE CHARACTERISTICS	
Period	20ns~2000s
Pulse width	8ns~1999,9s
AM MODULATION	
Carrier waveforms	sinus, square, pulse, ramp, arbitrary
Modulating waveforms	sinus, square, triangle, Up/down ramp
Modulating frequency	2mHz~20kHz
Depth	0% ~ 120%

Réf	AFG3081 (1µHz~80MHz) / AFG3051 (1µHz~50MHz)
FM MODULATION	
Carrier waveforms	sinus, square, pulse, ramp
Modulating waveforms	sinus, square, triangle, Up/down ramp
Modualting frequency	2mHz~20kHz
Peak deviation	**DC~80MHz / DC~50MHz**
PWM	
Carrier waveforms	square
Modulating waveforms	sinus, square, triangle, Up/down ramp
Modualting frequency	2mHz~20kHz
Deviation	0% ~ 100% of the pulse width
FSK	
Carrier waveforms	sinus, square, triangle, pulse, ramp
Modulating waveforms	50% duty cycle square
Internal rate	2mHz~100kHz
Frequency range	**DC~80MHz / DC~50MHz**
SWEEP	
Waveforms	sinus, square, triangle
Type	linéaire et logarithmique
Start / Stop frequency	**100µHz~80MHz / 100µHz~80MHz**
Sweep time	1ms à 500s
BURST	
Waveforms	sinus, square, triangle, ramp
Frequency	**10µHz~80MHz / 10µHz~50MHz**
Burst count	1~1000 000 or infinite
Start / Stop phase	-360° ~ +360°
Internal period	1ms~500s
Trigger delay	N cycles de 0s~85s
MARQUER OUTPUT	
Type	for Arbitrary, sweep
Level	TTL (fan out 4 loads) Compatible into 50Ω
OTHERS CHARACTERISTICS	
Impedance	50Ω typical
Store / Recall	10 groups of setting memories
Interfaces	USB-RS232-GPIB
Display	11cm TFT LCD resolution 480x272
Power source	100~240VAC 50~65Hz 65VA
DIMENSIONS / WEIGHT	265X107 depth 374mm / 4kg

2 GENERATORS WITH DIFFERENT BANDWIDTHS

AFG-3081 with 80 MHz and AFG-3051 with 50 MHz. AFG-3000 generators have sampling rate 200 M s/s, vertical resolution 16 bits
and curve length 1 M points.
Four ways of producing arbitrary signals make the AFG3000 a 'plug and play' tool:

- keyboard curve construction point by point or by assembling fragments of existing curves
- by loading files produced in a spreadsheet
- by loading curves from a digital oscilloscope
- by loading software constructed curves from a PC.

LCD TFT HIGH RESOLUTION 11CM SCREEN (4.3'')

It displays the waveform and the settings. The large screen is good for constructing an arbitrary wave on the front. The impedance of the AFG-3000 can be selected as 50 ohms or high impedance according to the load.

WIDE FREQUENCY RANGE 1 HZ TO 80/50 MHZ

AFG3000s use direct digital synthesis which ensures a stable and precise wave with resolution 1µHz on the DC/AC range 80/50 MHz.
Standard waveforms included: sine, square, triangle, ramp, pulse, noise, etc.

MODULATIONS, SWEEPING AND BURST FUNCTION

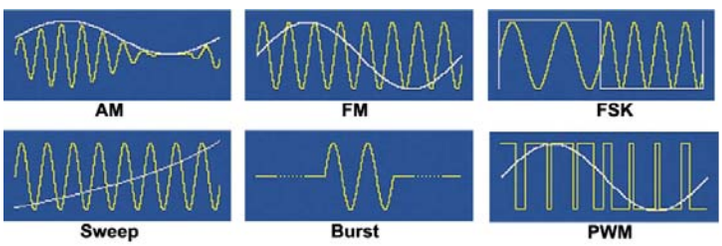
The modulations AM, FM, FSK and PWM by internal or external signal are available on a specific terminal.

- FSK is frequency modulation where digital information is transmitted by frequency variation of the signal. BFSK (binary FSK) uses two frequencies to represent 1 and 0 data in remote measurements.

- PWM is digital modulation used to adjust output power by controlling the pulse width of the command signal: e.g. motor speed.

- SWEEP is sawtooth frequency modulation, from f1 to f2, linear or logarithmic. Sweeping is triggered internally, externally or manually.

- BURST generates either N waves during a cycle (N cycle mode) or waves during a time period (Gate mode). Burst recurrence and duration have to be defined. In N mode the number of waves per burst have to be defined. In the two modes polarity and phase can be controlled.

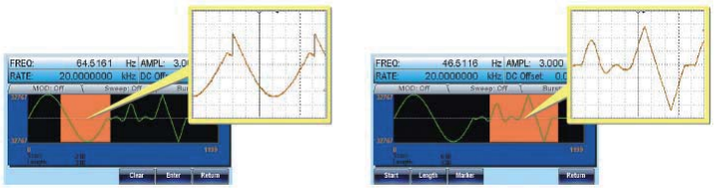


SAMPLING RATE 200 M Sa/s AND 16 BITS AMPLITUDE RESOLUTION

The frequency of an arbitrary wave = sampling rate / number of points in the waveform. So the higher the sampling rate, the higher the possible frequency of an arbitrary wave. AFG3000 generators have horizontal resolution 5 ns. 16 bits amplitude resolution produces a smooth wave, e.g. for 10 V amplitude, the voltage between two successive points is 0.15 mV.

1 M-POINT LENGTH WAVEFORMS

AFG3000 generators have 10 memories for saving a configuration or waveform up to length 1 M point.



ARBITRARY WAVE PRODUCTION

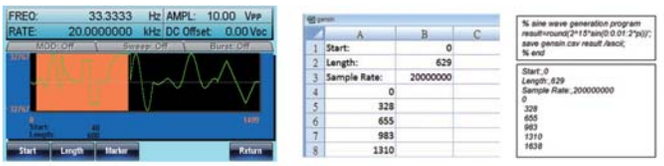
4 methods: on the front keyboard, from a PC with software, downloading of CSV files, loading of curve from GDS2000 or GDS3000 oscilloscopes.

KEYBOARD PRODUCTION

Construction and modification point by point of a downloaded wave.
Or construction by assembling sequences (parts of existing curves).
The wave shown on screen will be generated identically.

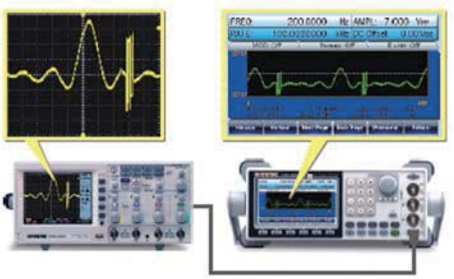
DOWNLOADING A CSV FILE

CSV files can be used by all spreadsheet programs, e.g. Excel. AFG3000 generators are compatible with all CSV files produced in a spreadsheet, calculation software, e.g. Octave, or by special software for producing arbitrary waves.



DOWNLOADING FROM AN OSCILLOSCOPE

The AFG3000 generator can use a USB cable to load a wave captured on GDS2000 or GDS3000 oscilloscopes.



ARBITRARY WAVE PRODUCING SOFTWARE

A PC program for producing arbitrary waves is supplied. As well as drawing tools it contains functions for producing waves using arithmetic operations. The most commonly used waveforms, including Rayleigh, Gaussian, normal noise, pseudoternary, AMI bipolar, Manchester, differential Manchester, RS-232, and NRZ, sine wave with Gaussian noise, etc., are available in the library.

SWITCHABLE OUTPUT IMPEDANCE

The user can select the output impedance best suited to the load: 50 ohms or high impedance. Help displayed at the screen top describes the functions of the various keys.

STANDARD INTERFACES

AFG-3000 generators have the following interfaces GPIB, RS-232.
AFG-3000 is compatible with remote control protocol IEEE 488.2