

Digital Synthesis Arbitrary Function Generator/Counter Protek 9300 Series

Protek 9300 Series is a precise test instrument that designed by Direct Digital Synthesis system and can be output standard waveforms (sine, square, triangle, ramp & pulse) and Arbitrary Waveform. These models used to output function signal and AM, FM, FSK, PSK, Sweep, and Burst, Frequency sweep signal. It is widely used by electronic engineers in electronic laboratory, production lines, education and scientific research.



Protek 93120 : 120MHz

Protek 9340 : 40MHz

Protek 9310 : 10MHz

Protek 9380 : 80MHz

Protek 9320 : 20MHz

Protek 9305 : 5MHz

■ Features

- Using Direct Digital Synthesis Technology
- 100 μ Hz to 120MHz frequency range for main waveforms
- 1mV output amplitude for small signal
- High resolution of pulse Duty Rate up to 1/1000
- High resolution and accuracy of digital FM
- Continuous phase adjustment function in burst mode
- Arbitrary setting of start and stop for frequency sweep output
- 0.1° resolution of phase adjustment
- Arbitrary setting of AM modulation (1% to 120%)
- 10 Channel signal save, recall setting
- More than 30 kinds of output waveforms (included arbitrary waveform)
- Wide measurement range of frequency counter(1 to 100MHz)
- RS232C Built-in : GUI Software (option)
- GPIB (option)



Specifications

Function Generator

Subject			9305	9310	9320	9340	9380	93120	
Waveform	Frequency Range	Main Waveform	100μHz to 5MHz	100μHz to 10MHz	100μHz to 20MHz	100μHz to 40MHz	100μHz to 80MHz	100μHz to 120MHz	
		Stored Waveform	100μHz~100kHz						
	Resolution	1μHz							
	Accuracy	5 0,000001							
Stability			1 0,000001						
Frequency	Main Waveform		Sine, Square, TTL						
	Level Resolution		12Bits						
	Sampling Rate		200MS/s						
	Sine Waveform Distortion Harmonic		-50dBc (Freq≤5MHz), -45dBc (Freq≤10MHz), -40dBc (Freq≤20MHz), -35dBc(Freq≤40MHz)						
	Sine Waveform Distortion		0,1% (20MHz~100kHz)						
	Square Waveform Rising/Falling Time		Less than 25ns			Less than 15ns			
	Stored Waveform	Waveforms		27 Waveforms (Sine, Square, Triangle, Up-lamp, Down-lamp, Noise, Pulse, P-pulse, N-pulse, P-dc, N-dc, Stair, c-pulse, Commut-lu, Commut-hr, Sine-tra, Sine-ver, Sine-pm, Log, Exp, Round-har, sin%, Squ-root, Angent, Cardio, Quake, Combin)					
		Waveform Length		4096Dots					
Amplitude Resolution		10Bits							
Duty Factor of Pulse Wave		0,1%~99,9%(Less than 10kHz), 1% ~ 99%(10kHz~100kHz)							
Amplitude	Amplitude Range		2mV ~ 20Vp-p(high impedance), 1mV ~ 10Vp-p(50Ω)						
	Max. Resolution		2μVp-p(high impedance), 1μVp-p(50Ω)						
	Amplitude Accuracy(at 1kHz)		(1%+0,2mV)						
	Amplitude Stability		5% / 3hours						
	Flatness	Amplitude ≤ 2V	3% (Freq≤5MHz), 10% (5MHz<Freq≤40MHz)						
		Amplitude > 2V	5%(Freq≤5MHz), 10% (5MHz<Freq≤20MHz), 20% (20MHz<Freq≤40MHz)						
Output Impedance		50Ω							
Offset	Offset Range		10V(high impedance), 5V(50Ω)						
	Resolution		2μV(high impedance), 1μV(50Ω)						
	Error		1%+10mV						
AM	Carrier Waveform		Sine, Square						
	Modulation Mode		INT, EXT						
	Modulation signal	Waveform	Sine, Square, Triangle, Up-lamp, Down-lamp						
		Frequency	10μHz~20kHz						
	Relative Modulation Error		(5%+0,2)100μHz<Freq≤10kHz, (10%+0,5)(10kHz<Freq≤20kHz)						
Modulation Depth		1%~120%							
Amplitude of External Input Signal		3Vpp (+1,5V~-1,5V)							
FM	Carrier Waveform		Sine, Square						
	Modulation Mode		INT, EXT						
	Modulation signal	Waveform	Sine, Square, Triangle, Up-lamp, Down-lamp						
		Frequency	100μHz~10kHz						
	Frequency Offset		Max. 50% of carrier frequency for internal FM; Max. 10% of Carrier frequency for external FM; input signal voltage 3Vp-p (+1,5V~-1,5V)						
	FSK Modulation	Input Signal	either Frequency 1 or Frequency 2						
Control Mode		INT, EXT (TTL level, Low level F1, High level F2)							
Alternation Rate		0,1ms~800s							
PM	Waveform		Sine, Square						
	PSK Modulation	PSK	Phase 1(P1), Phase 2(P2)						
		Range	0,1° ~ 360,0°						
		Resolution	0,1°						
		Alternation Time Interval	0,1ms~800s						
Control Mode		INT, EXT (TTL level, Low level P1, High level P2)							
Burst	Waveform		Sine, Square						
	Burst Counting		1~10000 period						
	Alternation Time Interval		0,1ms~800s						
	Control Mode		INT, EXT						
Sweep	Waveform		Sine, Square						
	Time		1ms~800s(linear), 100ms~800s(log)						
	Mode		Linear, Log						
	External Trigger Signal Frequency		DC~1kHz(linear), DC~10kHz(log)						
	Control Mode		INT, EXT						
Output of Modulation Signal	Waveform		Sine, Square, Triangle, Up-lamp, Down-lamp						
	Frequency		100μHz~20kHz						
	Amplitude		5Vpp 2%						
	Output Impedance		620Ω						
Storage	Storage Parameter		Single frequency, amplitude, waveform, DC offset values and Function state						
	Storage capacity		10 signal						

Frequency Measurement

Frequency Range		1Hz~100MHz	
Min. Input Voltage	ATT Open	50mV (Freq 10Hz~50MHz), 100mV (Freq 1Hz~100MHz)	
	ATT Close	0,5V (Freq 10Hz~50MHz), 1V (Freq 1Hz~100MHz)	
Max. Input Voltage		100Vpp (Freq≤100kHz), 20Vpp (1Hz~100MHz)	
Low pass Filter		Cut off frequency about 100kHz	
		With Internal Attenuation	≤-3dB
		With External Attenuation	≥-3dB (Freq>1MHz)
Gate Time		10ms~10s	

Operation Characteristics

Power	220V 10%, 50~60Hz, Max. 35W
Temperature/Humidity	0°C~40°C, 35%~80%
Dimension	255mm 370mm 100mm

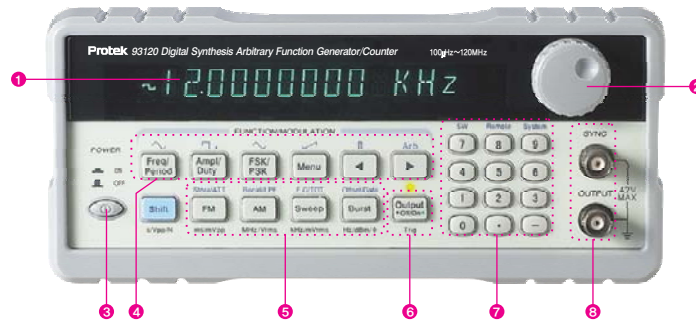
Accessories

- BNC to BNC Cable 1EA
- Power Cord 1EA
- User's Manual 1EA

Digital Synthesis Arbitrary Function Generator/Counter Protek 9300 Series

■ Each Part Names

- 1 Output Display
- 2 Variable Knob
- 3 Power On/Off S/W
- 4 Waveforms selective S/W
(Sine, Square, Triangle, Ramp, Pulse)
- 5 Modulation signal selective S/W
(AM, FM, FSK, PSK, Sweep, Burst)
- 6 Output On/Off S/W
- 7 Output value manual input S/W
- 8 Output Terminal



■ Various Waveforms

Output Waveform-1 (SINE)

SINE WAVE : 2V, 10KHz

1. Set the sine wave output of 9300
Power Voltage : Min 1mV~ Max 20V
Frequency : Min 100 μ Hz~ Max 120MHz
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

Output Waveform-2 (SQUARE)

SQUARE WAVE : 2V, 10KHz

1. Set the square wave output of 9300
Power Voltage : Min 1mV~ Max 20V
Frequency : Min 100 μ Hz~ Max 120MHz
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

Output Waveform-3 (TRIANGLE)

TRIANGLE WAVE : 2V, 10KHz

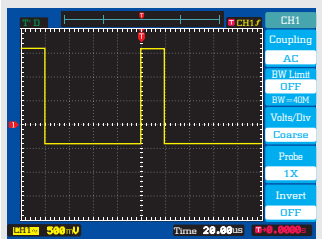
1. Set the triangle wave output of 9300
Power Voltage : Min 1mV~ Max 20V
Frequency : Min 100 μ Hz~ Max 100kHz
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

Output Waveform-4 (RAMP)

LAMP WAVE : 2V, 10KHz

1. Set the ramp wave output of 9300
Power Voltage : Min 1mV~ Max 20V
Frequency : Min 100 μ Hz~ Max 100kHz
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

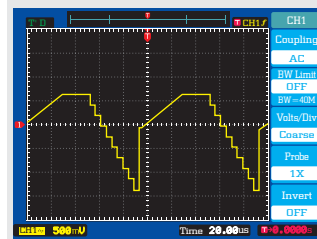
Output Waveform-5 (PULSE)



PULSE WAVE : 2V, 10KHz

1. Set the pulse wave output of 9300
Power Voltage : Min 1mV~ Max 20V Frequency : Min 100Hz~ Max 100kHz
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

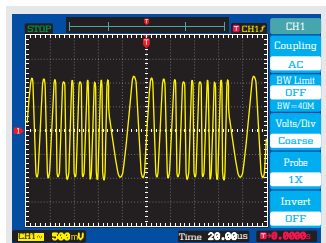
Output Waveform-6 (ARBITRARY)



ARBITRARY WAVE : 27, STAIR

1. Set the arbitrary wave output of 9300 (1~27)
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

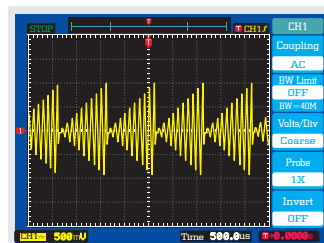
Waveform Modulation-7 (FM)



FM Modulation used by sine WAVE

1. Set the sine wave output of 9300
2. Set the FM modulation function (DEVIR, FREQ, WAVE, SOURCE)
3. Check output signal of 9300 through DSO display

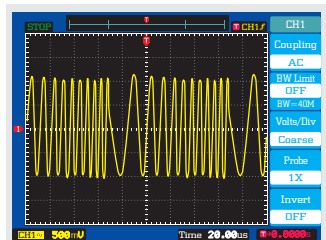
Waveform Modulation-8 (AM)



AM Modulation used by sine WAVE

1. Set the sine wave output of 9300
2. Set the AM modulation function (LEVEL, FREQ, WAVE, SOURCE)
3. Check output signal of 9300 through DSO display

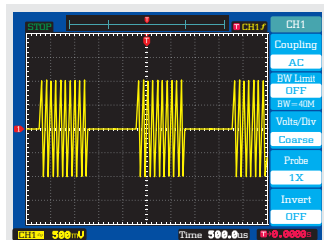
Waveform Modulation-9 (SWEEP)



Sweep Modulation used by sine WAVE

1. Set the sine wave output of 9300
2. Set the sweep modulation function (MODE, START-F, STOP-F, TIME, TRIG)
3. Check output signal of 9300 through DSO display

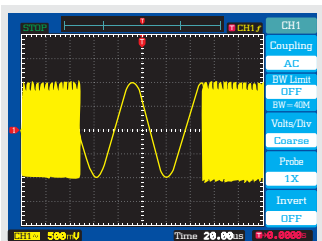
Waveform Modulation



Burst Modulation used by sine WAVE

1. Set the sine wave output of 9300
2. Set the burst modulation function (TRIG, COUNT, SPACE-T, PHASE)
3. Check output signal of 9300 through DSO display

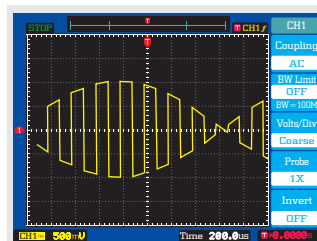
Waveform Modulation-11 (FSK)



FSK Modulation used by sine WAVE

1. Set the sine wave output of 9300
2. Set the FSK modulation function (START-F, STOP-F, SPACE-T, TRIG)
3. Check output signal of 9300 through DSO display

Waveform Modulation-12 (PSK)



PSK Modulation used by sine WAVE

1. Set the sine wave output of 9300
2. Set the PSK modulation function (P1, P2, SPACE-T, TRIG)
3. Check output signal of 9300 through DSO display