

**Features**

- DDS(Direct Digital Synthesizer) Technology
- Function : Sine, Square, Triangle, Ramp, Noise and Arbitrary Waveform
- Frequency Range : 0.00000001 Hz to 31 MHz
- Frequency Resolution : 0.00000001 Hz
- Frequency Accuracy :  $\pm 3$  PPM
- Modulation : AM, FM, PM, Burst
- Arbitrary Waveform of 40M Sample/sec, up to 16K Sample Point
- RS232 Interface (Standard)
- GPIB Interface (Standard)
- Arbitrary Waveform Composer (Standard)



**Generator**

TEST & MEASURING INSTRUMENTS

Arbitrary & Function Generator

**Protek 9301/9302**

Main Function BNC(CH1/Ch2 output)



Sine, Square, Triangle, Ramp, Noise, Arbitrary

Function Keys



Sine, Square, Triangle, Ramp, Noise, Arbitrary

Step Keys



Sine, Square, Triangle, Ramp, Noise, Arbitrary

Sweep / Modulate Keys



Sine, Square, Triangle, Ramp, Noise, Arbitrary



**ARB Waveform Composer**  
Composing Arbitrary Waveform  
Composing Standard Waveform

Arbitrary Generator Outputs Waveforms From 2CH (Protek 9302)

**Protek 9302**  
Arbitrary & Function Generator 31MHz

Adopted In Various Fields



Audio Equipment

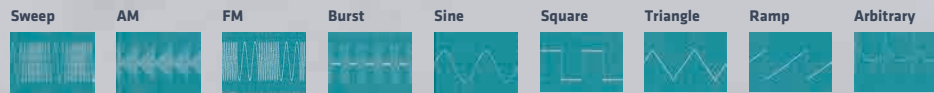


Communicating Equipment



Testing Electronic Equipment

**Protek 9301/9302 Various Waveforms**



**Specifications**

Waveform Specifications	Reception Frequency			
Standard Function	Sine, Square, Triangle, Ramp, Noise, Arbitrary			
AWC Software	Windows 95, 98, 2000, NT, ME			
AWC Function	Sine, Square, Triangle, Ramp, DC, Noise, Damped Sine, Exponential Rise, Exponential Fall, Free Hand, Line			
Waveform Length	16 to 16, 383 Points			
Amplitude Resolution	12 bits			
Sampling Rate	40 M Samples/sec			
Frequency Characteristics Specifications				
Sine, Square	0.01 $\mu$ Hz to 31 MHz			
Ramp, Triangle	0.01 $\mu$ Hz to 2 MHz			
Noise	10 MHz (64Bits M Type)			
Output Characteristics Specifications				
Output	Protek 9301(1Channel), Protek 9302(2Channel)			
Source Impedance	50 $\Omega$ Floating			
Output Units	Vpp, Vrms, dBm, %			
Sync Output	Front-Panel TTL Output For Each Channel			
Inter Channel Crosstalk	<0.05% (Protek 9302 Only)			
DC Offset				
Range	$\pm$ 5V (Limited Such That   Vac Peak   +   Vdc   <5V)			
Accuracy	$\pm$ 1.5% of Setting +0.5mV (DC Only)			
Amplitude Range	$\pm$ 80 mV Depending On AC And DC Settings 0.05Vp-p to 10Vp-p Into 50 $\Omega$			
1. Sine Wave Amplitude Accuracy ( 0 V DC Offset)				
	0.01 $\mu$ Hz ~100KHz	100kHz ~20MHz	20MHz ~25MHz	25MHz ~31MHz
5-10Vpp	$\pm$ 0.2dB	$\pm$ 0.3dB	$\pm$ 0.6dB	$\pm$ 0.9dB
0.05-5Vpp	$\pm$ 0.4dB	$\pm$ 0.4dB	$\pm$ 0.8dB	$\pm$ 0.8dB
2. Square Wave Amplitude Accuracy				
	0.01 $\mu$ Hz ~100KHz	100KHz ~20MHz	20MHz ~31MHz	
5-10Vpp	$\pm$ 3%	$\pm$ 6%	$\pm$ 15%	
0.05-5Vpp	$\pm$ 5%	$\pm$ 8%	$\pm$ 16%	
3. Triangle, Ramp, Arbitrary Amplitude Accuracy				
	0.01 $\mu$ Hz-100KHz	100KHz~2MHz		
5-10Vpp	$\pm$ 4%	$\pm$ 8%		
0.05-5Vpp	$\pm$ 5%	$\pm$ 9%		
Sine Wave Spectral Purity Specifications				
Spurious Components	DC to 2MHz : <-65dBc(Non-Harmonic) 2MHz to 31MHz : <-65dBc+6dBc/Octave(Non-Harmonic)			
Subharmonic	<-50dBc (Sine, 5Vpp)			
Harmonic Distortion	: Harmonically Related Signals Will Be Less Than DC to 1 MHz (Sine, 1Vpp) : <-45dBc 1 MHz to 31 MHz (Sine, 1Vpp) : <-32dBc			

Signal Characteristics Specifications		
Square Wave	Rise/Fall Time	<16ns(10% to 90%)
	Asymmetry	<1% of Period +4 ns
	Overshoot	<5%
Arbitrary Wave	Rise/Fall Time	35 ns
	Linearity	0.5% of Full Scale Output
Modulation Characteristics Specifications		
Amplitude Modulation	Source	Internal(Sine, Square, Triangle, Ramp or Arbitrary) or External
	Depth	0 to 100% AM or $\pm$ 100%DSBSC
	Rate	0.001 Hz to 10kHz Internal, 20kHz Max External
	Distortion	<-35dB at 1 kHz, 80% Depth
	DSB Carrier	<-35dB Typical at 1 kHz Modulation Rate(DSBSC)
External Input	$\pm$ 5V For 100% Modulation, 100K $\Omega$ Impedance	
Frequency Modulation	Source	Internal (Sine, Square, Triangle, Ramp or Arbitrary)
	Rate	0.001 Hz to 10 kHz
	Span	0.01 $\mu$ Hz to 31MHz(2MHz For Triangle, Ramp)
Phase Modulation	Source	Internal (Sine, Square, Triangle, Ramp or Arbitrary)
	Rate	0.001 Hz to 10 kHz
	Span	$\pm$ 9999.99 $^\circ$
Burst Modulation	Waveform	Sine, Square, Triangle, Ramp or Arbitrary
	Frequency	2 MHz to Sine, Square, Triangle, Ramp
	Count	1 to 65,000 Cycles/Burst
	Phase Shift	$\leq$ 100 kHz
Frequency Sweep	Type	Linear or Log
	Time	0.001 Hz to 10 kHz
	Span	0.01 $\mu$ Hz to 31 MHz (2MHz For Triangle, Ramp)
	Marker Output	Two Markers May Be Set At Any Sweep Point(TTL Output)
	Sweep Output	0-10 V Linear Ramp Signal, Synchronized to Sweep
Triggering	Source	CH1 : INT Rate, Single, POS EXT1, NEG EXT1, Line CH2 : INT Ch1, INT Rate, POS EXT2, NEG EXT2
	Rate	0.0001s ~ 999.99s
	External Input	$\pm$ Edge, TTL Input
	Output	TTL Output
Accuracy	$\pm$ 3 ppm(20 $^\circ$ C to 30 $^\circ$ C)	
Aging	$\pm$ 3 ppm/Year	
Input	10MHz/N $\pm$ 2ppm, N=1 to 8, 1Vp-p Minimum Input Level	
Output	10MHz, >1 Vp-p Sine Into 50 $\Omega$	
Operating Temperature	5 $^\circ$ C to 40 $^\circ$ C	
Operating Humidity	35% to 80%	
Weight	Protek 9301 : 8.2 kg, Protek 9302 : 8.7 kg	
Dimensions	363mm(W) x 109mm(H) x 386mm(D)	
Interfaces	RS-232 (2400 to 19,200 bps) and GPIB (Optional)	
Power Supply	100/ 120/ 220/ 230 VAC( $\pm$ 10%) 50/ 60 Hz	
Power Consumption	Protek 9301 : 46W, Protek 9302 : 80W	