

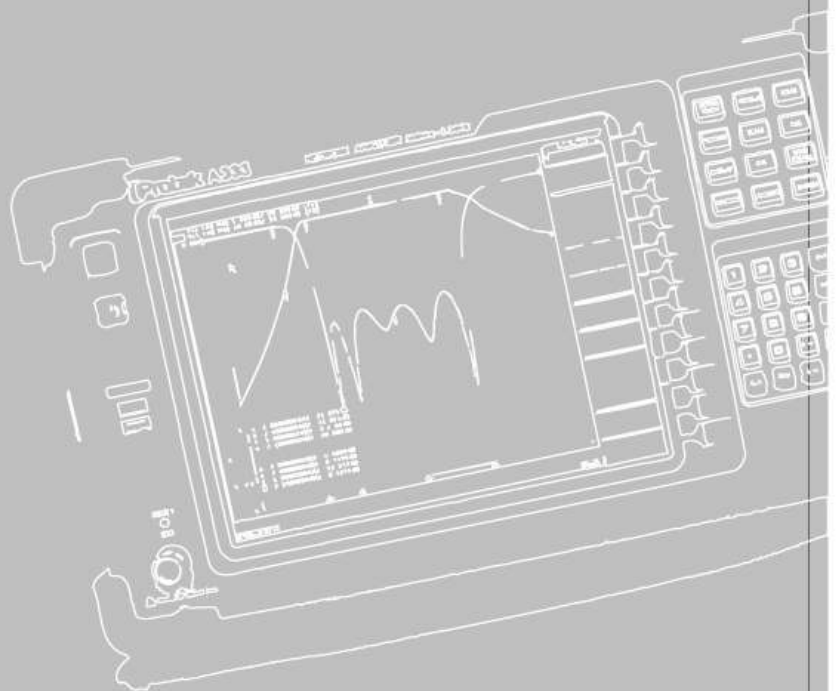
**PRODUCT
CATALOG**



Protek

Test & Measuring
Instruments

www.gsinstrument.com



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History

- 2010 A333 has been certified Excellent Quality Product by Korean Public Procurement Service (PPS)
- 2009 A333 selected as NEP(New Excellent Product) by Korea Agency for Technology and Standards.
Signed contract with Korea Airports Corporation for development and supply SKY MARU 910
Field Test Set Instrument Landing System (ILS)
- 2008 A333 Network Analyzer won Ministry of Knowledge Economy Korea Technology Award
A333 Network Analyzer won Good Design Award
Completed development WiMAX Femtocell, Small BTS, 4G technology for wireless telecommunication.
- 2007 Completed development of Tracking Generator G632 for 7830
Acquired GS Teletech Telecommunication department
- 2006 Completed development Handheld Spectrum Analyzer Protek 7830
Completed development WiMAX 5W AMP for ZTE
Completed development DUO-LIF PAM
- 2005 Completed development WiBro 60W AMP first in the world
Completed development AMP SF-C20, C60, W20 for SKT repeater
Completed development Nortel WiBro 35W AMP for ZTE
Completed development WCDMA 10W AMP for ZTE
- 2004 Changed Company Name from Heung Chang to GSInstrument
Inauguration of CEO An Chang-don
- 2003 Completed development of LPA for IMT-2000 Base Station
- 2001 Developed and started producing LPA for CDMA 1X Base Station
- 1998 Developed Voice Over FLEX System
Developed GSM LPA and Digital Satellite Receiver
Developed and started producing CDMA Fiber Optic Repeater
- 1997 Established China subsidiary factory
- 1990 Completed development 1GHz Spectrum Analyzer
- 1989 Signed contract with Netherland-based Phillips for Oscilloscope OEM
Developed Digital Storage Oscilloscope
- 1986 Signed contract with Japanese AARON for developing and producing Oscilloscope
- 1972 Company Established

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Protek Series

protek

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Protek



New Product

8GHz Network Analyzer
Digital Multimeter

Protek

**New
Product**



New Product

8GHz Network Analyzer

Protek A338

Protek A338

Protek A338 is vector network analyzer supporting from 300kHz to 8GHz and designed to analyze the properties of electrical networks, especially those properties associated with the reflection and transmission of electrical signals known as S-parameters.



Frequency Range
Measurement Level

- 300KHz ~ 8GHz
- -60dbm ~ +10dbm (300KHz~6GHz)
- -60dbm ~ +5dbm (6GHz~8GHz)

Display

- 10.4 inch TFT Color LCD
- Touch Screen

Interface

- USB(2)/LAN/Print/Video/Keyboard/Mouse
- GPIB (Option)

Operating System

- Windows XP

Specifications

Frequency range	300 kHz to 8 GHz	
CW frequency accuracy	$\pm 5 \times 10^{-6}$	
Harmonic distortion	-25 dBc	
Non harmonic spurious	-30 dBc	
Output power level	300 kHz to 6.0 GHz 6.0 GHz to 8.0 GHz	-60 dBm to +10 dBm -60 dBm to +5 dBm
Output power level accuracy	± 1.0 dB	
Magnitude transmission measurement accuracy, if $ S_{11} $ and $ S_{22} $ of the DUT are less than -32 dB, and $ S_{12} $ and $ S_{21} $ values are as follows:	+5 dB to +15 dB	0.2 dB
	-50 dB to +5 dB	0.1 dB
	-70 dB to -50 dB	0.2 dB
	-90 dB to -70 dB	1.0 dB
Phase transmission measurement accuracy, if $ S_{11} $ and $ S_{22} $ of the DUT are less than -32 dB, and $ S_{12} $ and $ S_{21} $ values are as follows:	+5 dB to +15 dB	2°
	-50 dB to +5 dB	1°
	-70 dB to -50 dB	2°
	-90 dB to -70 dB	6°
Magnitude reflection measurement accuracy, if $ S_{11} $ and $ S_{22} $ values are as follows:	-15 dB to 0 dB	0.4 dB
	-25 dB to -15 dB	1.0 dB
	-35 dB to -25 dB	3.0 dB
Phase reflection measurement accuracy, if $ S_{11} $ and $ S_{22} $ values are as follows:	-15 dB to 0 dB	3°
	-25 dB to -15 dB	6°
	-35 dB to -25 dB	20°
Receiver noise floor (IF bandwidth 10 Hz)	-125 dBm	
Trace noise (IF bandwidth 3 kHz)	0.001 dB rms	
Uncorrected directivity	-18 dB	
Uncorrected source match	-18 dB	
Uncorrected load match	-18 dB	
AC mains power	100 to 240 VAC 50/60Hz	
Power consumption	110W	
Dimensions LxWxH	320 x 439 x 280 mm	
Weight	20 kg	
Operating conditions :		
- Temperature	5 °C to 40 °C	
- Humidity at 25 °C	90%	
- Atmospheric pressure	84 to 106.7 kPa	

**New
Product**



New Product

Digital Multimeter

Protek D705

Protek D705

Compact true-rms meter for field service technicians.

The Protek D705 is the solution for a wide variety of electrical and electronic testing applications.

It has to set with a combination of precision, ease-of-use, safety and reliability.

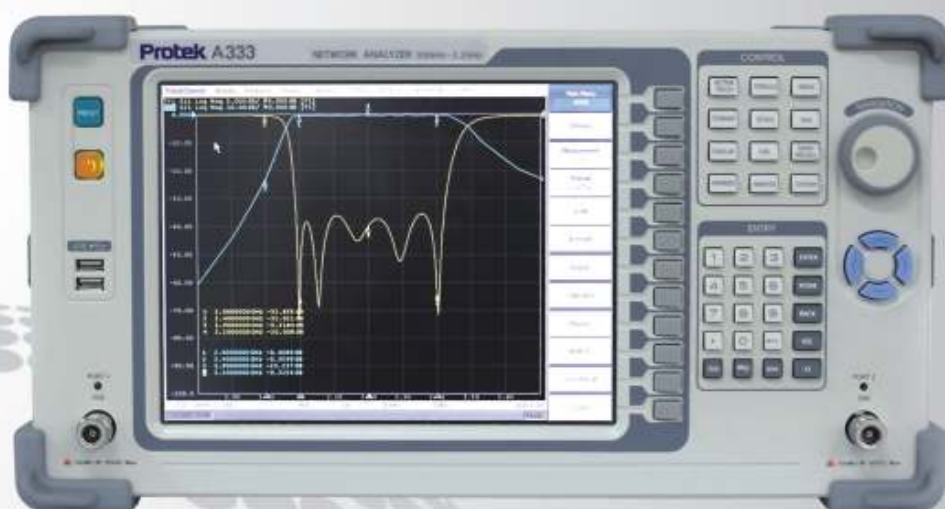
Features

- True RMS
- 25 segments bar graph
- Back-lit display (White LED)
- AC/DC μ A measurements
- Capacitance measurements
- Data Hold and Range Hold
- Auto Power Off function (30min)
- Diode and Continuity Beeper tests
- Frequency and Duty cycle measurements
- MAX/MIN/AVG mode (Sampling rate : 100ms)
- 5000 count LCD display (Black & White STN)
- IEC 1010-2-032, CATIII 1000V Safety protection
- K-Type thermocouple temperature measurements
- Measures DC Voltage to 1000V, AC Voltage to 1000V and Resistance to 40M Ω



Specifications

DC Voltage	Range	500mV	5V	50V	500V	1000V	
	Resolution	0.1mV	0.001mV	0.01V	0.1V	1V	
	Accuracy	±(0.09%+2d) ±(0.09%+5d) ±(0.09%+2d) ±(0.09%+2d) ±(0.09%+2d)					
AC Voltage	Range	500mV	5V	50V	500V	1000V	
	Resolution	0.1mV	0.001mV	0.01V	0.1V	1V	
	Accuracy	(45Hz ~ 500Hz) (500Hz ~ 1KHz)	±(0.8% + 5d) True RMS ±(1.0% + 5d) True RMS				
DC Current	Range	500µA	5000µA	50mA	400mA	5A	10A
	Resolution	0.1µA	1µA	10µA	100µA	1mA	10mA
	Accuracy	±(1.0% + 3d)					
AC Current	Range	500µA	5000µA	50mA	400mA	5A	10A
	Resolution	0.1µA	1µA	10µA	100µA	1mA	10mA
	Accuracy	(45Hz ~ 500Hz) (500Hz ~ 1KHz)	±(0.8% + 5d) True RMS ±(2.0% + 5d) True RMS				±(1.5%+10d) True RMS ±(2.0%+10d) True RMS
Resistance	Range	500Ω	5kΩ	50kΩ	500kΩ	5MΩ	50MΩ
	Resolution	0.1Ω	0.001kΩ	0.01kΩ	0.1kΩ	0.001MΩ	0.01MΩ
	Accuracy	±(1.0% + 5d)					
Diode Test	Range	2V					
	Resolution	0.001V					
	Accuracy	±(2.0% + 5d)					
Temperature	Range	-40°C ~ 400°C					-40°F ~ 752°F
	Resolution	0.1°C					0.1°F
	Accuracy	±(3.0% + 3.0°C)					±(3.0% + 5.4°F)
Frequency	Range	9.999Hz	99.99Hz	999.9Hz	9.999kHz	99.99kHz	999.9kHz
	Resolution	0.001Hz	0.01Hz	0.1Hz	1Hz	10Hz	100Hz
	Accuracy	±(0.1% + 3d)					
Sensitivity	Vpp = ±300mV (Square wave input)						
Duty	Range	1.0% ~ 99.0%					
	Resolution	0.1%					
	Accuracy	0.5Hz to 300KHz (Pulse width > 3µs)					(0.1% + 0.05% per kHz + 1count) for ±600mVp-p Square wave input
Capacitance	Range	40nF	400nF	4µF	40µF	400µF	4000µF
	Resolution	0.01nF	0.1nF	0.001µF	0.01µF	0.1µF	1µF
	Accuracy	±(3.0% + 10d)					±(3.5% + 30d)
Continuity Test	Range	500Ω	Threshold	Response time			
	Resolution	0.1Ω					
	Accuracy	±(1.0% + 5d)	Approx. 25Ω	1msec			



Analyzer

RF analyzers are designed to measure & analyze radio frequency characteristics. They are widely used in many industries such as wireless telecommunication, RF component manufacturing, antenna installation, on-site maintenance, etc. Protek can offer complete ranges of equipment by adding RF analyzers.



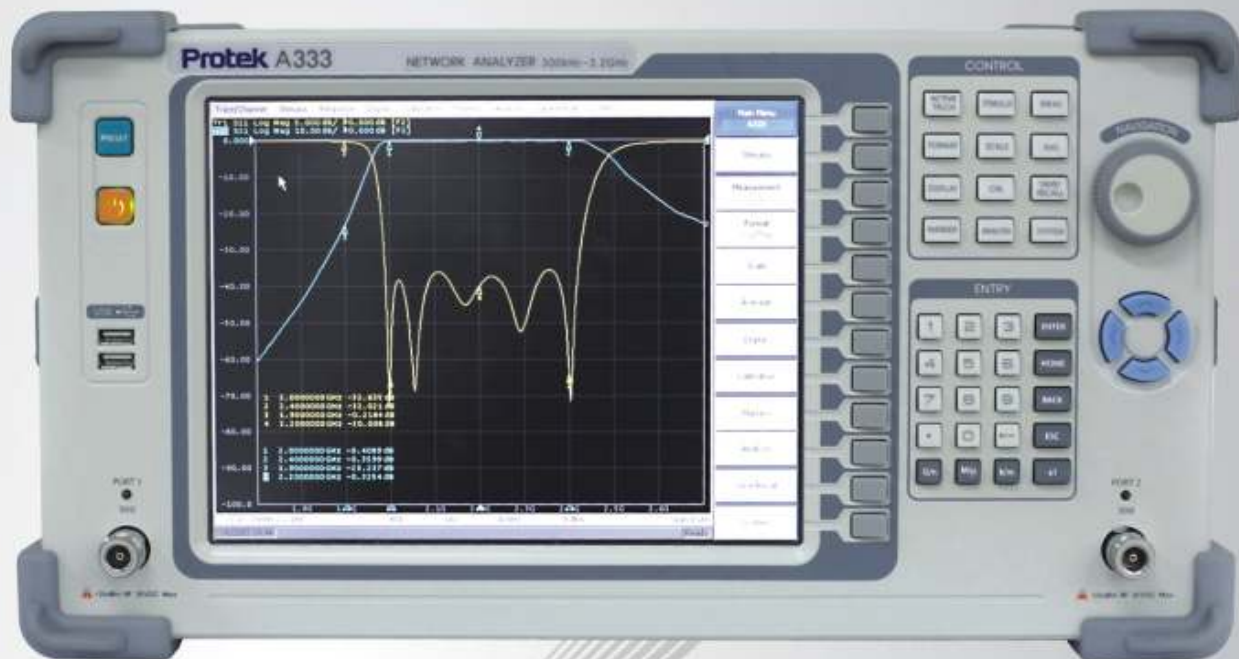
3.2GHz Network Analyzer

RF Master

Handheld Spectrum Analyzer

RF Field Strength Analyzer

Analyzer



Analyzer

3.2GHz Network Analyzer

Protek A333

Protek A333 (3.2GHz)

Protek A333 has been designed to ensure and evaluate successful development, testing and manufacturing of various electronic devices in telecommunication, medical, automotive and RF component industries. The A333 provides accurate and fast measurement, user friendly remote control interface.

Features

- Frequency Range : 300kHz~3.2GHz
- Measurement Range : -55~+10dbm
- LCD : 10.4 Inch TFT Color(Touch Screen)
- Interface : RS-232/USB(2)/LAN/Printer/Video/Keyboard/Mouse
- Size(WXHxD) : 426 X 266 X 300(mm)



Specifications

MODEL	A333	
Measurement Range	Impedance	50Ω (75 Ω)
	Test Port Connectors	N-type Female
	Number of Test Ports	2
	Frequency Range	0.3 to 3200MHz
	Frequency Accuracy	±5 ppm
	Frequency Resolution	1mHz
	Number of Test Points User-Selectable	2 to 10001
	IF bandwidth settings 1/1.5/2/3/5/7/10 steps	1Hz to 30kHz
Measurement Speed	Dynamic Range IF Bandwidth 10Hz	3 to 3200MHz > 125dB Typ. 130dB
	Measurement time per a point measurement bandwidth (30kHz)	120μs
Measurement Accuracy	Accuracy of Transmission Measurement (magnitude) Specifications are based on a matched DUT, a measurement bandwidth of 10 Hz, and a nominal source power of -10dBm	+15 to +5dB 0.2dB +5 to -50dB 0.1dB -50 to -70dB 0.2dB -70 to -90dB 1.0dB
	Accuracy of Transmission Measurement (phase) Specifications are based on a matched DUT, a measurement bandwidth of 10 Hz, and a nominal source power of -10dBm	+15 to +5dB 2.0° +5 to -50dB 1.0° -50 to -70dB 2.0° -70 to -90dB 6.0°
	Accuracy of reflection measurement (magnitude) Specifications are based on a matched DUT, a measurement bandwidth of 10 Hz, and a nominal source power of -10dBm	0 to -5dB 0.2dB -5 to -15dB 0.4dB -15 to -25dB 1.5dB -25 to -35dB 4dB
	Accuracy of reflection measurement (phase) Specifications are based on a matched DUT, a measurement bandwidth of 10 Hz, and a nominal source power of -10dBm	0 to -15dB 4.0° -15 to -25dB 7.0° -25 to -35dB 22.0°
Trace Stability	Temperature Dependence Per one degree of the temperature variation	0.02dB
	Trace Noise Magnitude IF bandwidth 3kHz	1mdBrms
Test Port Output	Power range	-55 to ~+10dBm
	Power accuracy	< 1.0dB
	Power resolution	0.05dB
	Harmonic distortion	-30dBc
External Reference Signal Input/Output	Frequency	10MHz
Operating Environment	Temperature	+5 to +40°C
	Dimensions	425 x 266 x 427 mm
	Weight	12kg
	Power supply	90 to 264VAC / 47 to 63 Hz
	Power consumption	150W

Analyzer



Analyzer

RF Master

Protek A434

Protek A434 (4GHz)

Protek A434 is antenna and cable analyzer offering measurement capabilities such as VSWR, cable loss and DTF.

It helps field engineers perform field verification and is leading choice for installation, maintenance and troubleshooting of microwave cables and communication systems in cellular and broadcast industries.

RF Master Protek A434

Features

- Handheld operation
- 7 inch TFT color display (viewable in daylight)
- Easy front panel touch operation
- Up to 1001 data points to locate long range problems
- External USB memory
- 6 markers
- Save up to 20 users setup
- Application software for data management
- Save up to 400 traces and 100 screens
- Rechargeable lithium-ion battery



Specifications

General Specification	Max Input Power	$\pm 25\text{dBm}$	
	Frequency Accuracy	$< \pm 75\text{ppm}$	
	Frequency Resolution	100kHz	
	Impedance	50 Ω	
	Test Port	N Female	
	Test Curve Storage	Up to 400	
	Screen Storage	Up to 100	
	Setup Storage	Up to 20	
VSWR Specification	Frequency Range	25MHz ~ 4GHz	
	Number of data points	126, 251, 501, 1001	
	Return Loss	Range : 0 ~ 60dB	
	VSWR : Range	1 ~ 65	
	Scan Speed	1, 2, 3.5, 7sec for each data points	
Cable Loss Specification	Frequency Range	25MHz ~ 4GHz	
	Cable Loss : Range	0 ~ 30dB	
DTF Specification	Distance	Range : 0 ~ 1250m (4125ft)	
	Resolution	distance/450 (m/ft)	
	Return Loss	Range : 0 to 60 dB	
	VSWR	Range : 1 ~ 65	
Immunity to Interfering Signals	On Frequency	$\pm 10\text{dBm}$	
	On Channel	$\pm 20\text{dBm}$	
RF Power Meter (Option)	Sensor Type	Peak	
	Peak Power	Frequency Range	20MHz ~ 4GHz
	Sensor	Dynamic Range	0dB ~ -40dB
	Accuracy	$\pm 10\%$	
Miscellaneous	Test Port	Precision N Female	
	Dimension	260x190x60mm (10.2"x7.5"x2.4")	
	Weight	$< 2.5\text{kg}$ (5.5lbs) includes battery	
	Battery	Li-Ion (3hr operating time after full charging)	
Environmental Condition	Operating Temperature	0 $^{\circ}\text{C}$ ~ +50 $^{\circ}\text{C}$ (+32 $^{\circ}\text{F}$ ~ +122 $^{\circ}\text{F}$)	
	Storage Temperature	-40 $^{\circ}\text{C}$ ~ 80 $^{\circ}\text{C}$ (-40 $^{\circ}\text{F}$ ~ +176 $^{\circ}\text{F}$)	
	Humidity	95% NO Condensation	

Analyzer



Analyzer

Handheld Spectrum Analyzer / Tracking Generator

Prottek 7830+G632

Prottek 7830 + G632(2.9GHz)

Prottek 7830 Handheld Spectrum Analyzer is the compact, Lightweight, Portable, and cost-effective equipment with various measurement functions such as Marker, Delta Marker, Peak Search, Channel Power measurement etc.

So, it is ideal for RF field technicians to test, install and maintain Wireless Mobile Telecommunication Systems, Cable Systems, Satellite Antennas, RFID and Jammer Systems etc.



Handheld Spectrum Analyzer
Protek 7830



Tracking Generator
Protek G632



Protek 7830+G632



Various Waveforms

Channel Power



The Channel power Measurement Function is for determining the power in a transmission channel specified by the user. In the case of CDMA with 849.98MHz channel width at 1.25MHz from the carrier.

Continuous Wave



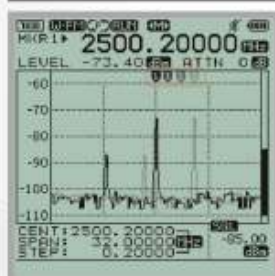
Protek 7830 has a CW Measurement in the range from 100kHz to 2.9GHz. It helps to test signal strength and density including the signal level.

Peak Search



This function detects a peak for each sweep, and always moves the marker to that peak. The marker is always displayed on the peak.

Marker to Center



This function sets the marker at peak within the search range, and the marker frequency (at the peak point) is then set to center frequency.

Delta Marker



The Delta Marker is displayed on the same position as that of the normal marker. The frequency and level value of this marker are relative to those of the normal marker.

Noise Level



Protek 7830 supports -110dBm of low displayed average noise level. Noise is extremely important for measurements on frequency-processing equipment or when searching for interference signals.

Mobile Phone Signal



Protek 7830 enhances to measure wireless communication signals such as CDMA, GSM, Cellular phone and cordless phone.

Dynamic Range



The Dynamic Range can be set automatically when the frequencies are measured. And also user can set the ranges from -20dBm to -110dBm.

Features

- 100kHz to 2.9GHz measurement range
- Measures and demodulates W-FM / N-FM / AM / SSB signals
- Sweep modes (Free Run, Single Run, Squelch Run)
- 100 Saves and loads for waveforms and settings
- Marker / Delta Marker / Squelch Adjustment Functions
- Peak Search Function
- Marker to Center Function
- Channel Power Measurement Function
- RS-232 Interface

Applications

- Field wireless Equipment installation and Maintenance
- General field use for Communications installation and Maintenance
- Cable installation and Maintenance
- RFID Tag RF Strength Measurement
- Jammer(for hospital,theater and military)
- Performance Test
- Satellite Antenna installation and Maintenance
- Tapping,Hidden Camera Detection

Specifications

MODEL		7830	G632(7830)
Frequency	Range	100kHz to 2900MHz	30MHz to 2.9GHz
	Resolution	Min. 3.125kHz	
	Accuracy	TXO : ± 3 PPM Display : ± 1.5 PPM	
	Modulation Bandwidth	Wide FM : Apprx. 180kHz (-6dB) Narrow FM : Apprx 12.5kHz / AM / SSB: Appex 2.4kHz (-6dB)	
	Step Range	6.25kHz, 12.5kHz	
Amplitude	Frequency Selection	Center, Start/Stop, Span	
	Measurement Range	-20dBm to -110dBm	-55dBm to -65dBm / 5dB steps
	Average Noise Level	Wide FM / AM / SSB : -100dBm Narrow FM : -110dBm	
	Amplitude Units	dBm, dBmV, dBuV	dBm
	Reference Level Accuracy	Wide FM Typical ± 1.5 dB(20°C ~ 30°C) Narrow FM/AM/SSB Typical ± 1.5 dB(25°C)	± 2.0 dB (Typical-95%) (@20°C to 30°C)
	Reference Level Ranges	0dBm to -80dBm	
	Log Scale	0.2dB/div Min. In 0.25dB Steps (5 Display Division)	
	Internal Atten	10dB, 20dB, 30dB, 35dB	
	Speed	Min. 500msec	
	Trigger Source	Narrow FM / Wide FM / AM / SSB	
Sweep	Trigger Mode	Free Run / Single Run / Continuous Wave / Squelch Run	
	Trigger Level	TTL Level	
	Marker Modes	Marker / Delta Marker / Peak Search / Marker to Center / Channel Power	
Memory	Trace Storage/Setup Storage	Max 100 Waveforms and 100 States	
Display	Type	Mono STN LCD	
	Display Resolution	192 X 192 pixels	
	LCD Backlight	ON / OFF	
Input	RF Input Connector	N Type Female, 50ohms	N Type Connector
	Maximum Input Power	Max +10dBm, 5V RMS	
Frequency	Range	35MHz to 2900MHz	
	RF Input Connector	BNC Type Female, 50ohms (Standard)	
General Specification	Operation Temperature	0°C to 40°C	0°C to 40°C
	Humidity	35RH to 85RH	35RH to 85RH
	Storage Temperature	10°C to 50°C	
Power	Power Source	AA Type Ni-MH Rechargeable Battery X 6pcs	
	Power Adaptor	SMP5 Type AC Adaptor DC 12V Car-adaptor DC 12V	7830 RS232C Port
	Auto Power	OFF / 5min / 10min / 20min / 30min	
Dimension & Weight	Size	102(W) X 229(H) X 45(D)mm	60 X 135 X 40mm
	Weight	Aprx. 2.2 lmb / 700grams (Except Antenna)	about 200g
Other	Speaker	0.5W into 8 ohms Speaker	
	Antenna	Dipole Antenna (Receive Only)	
	RS-232C Interface	9600bps, 19200bps, 38400bps, 57600bps, and 115200bps 8-pin MINI-DIN Connector	Power + Interface

Analyzer



Cable TV
Paging System
Satellite TV Receiver
Hidden Camera
Tele-tapping Detection

Analyzer

RF Field Strength Analyzer

Protek 3290N / 3201N

Protek 3290N(2.9GHz) / 3201N(2GHz)

RF Field Strength Analyzer - With frequency range of 100kHz to 2GHz(3201N) and 2.9GHz(3290N), our RF analyzers offer great application in the fields for installation, repair and maintenance of Mobile Telecommunication Systems, Cable Systems, Antenna Systems etc. It measures and demodulates W-FM/N-FM/AM/SSB signals with built-in frequency counter and speaker.

Features

- 100kHz to 2,900MHz measurement range(3290N only)
- Measures and demodulates W-FM / N-FM / AM / SSB signals
- PLL tuning system for precise frequency tuning
- Built-in Frequency Counter and speaker
- LED Backlight LCD (192X192 dots)
- RS-232C for PC interface and printer(8 pin mini Din)
- Menu driven for various function
- 3 Types of Sweep modes
(Free run/Single run/Squelch run)
- Save and recall:100 Waveforms and 100 states
- dBm/dBμ/dBmV/Display

Standard Accessories

- Antenna(Receive Only)
- Coaxial Cable
- RS-232 Cable
- Software for PC Application
- AA Type Ni-MH Rechargeable Batteries
(1.2V 2,700mAH)
- Carrying Strap
- Carrying Case
- Earphone
- Manual

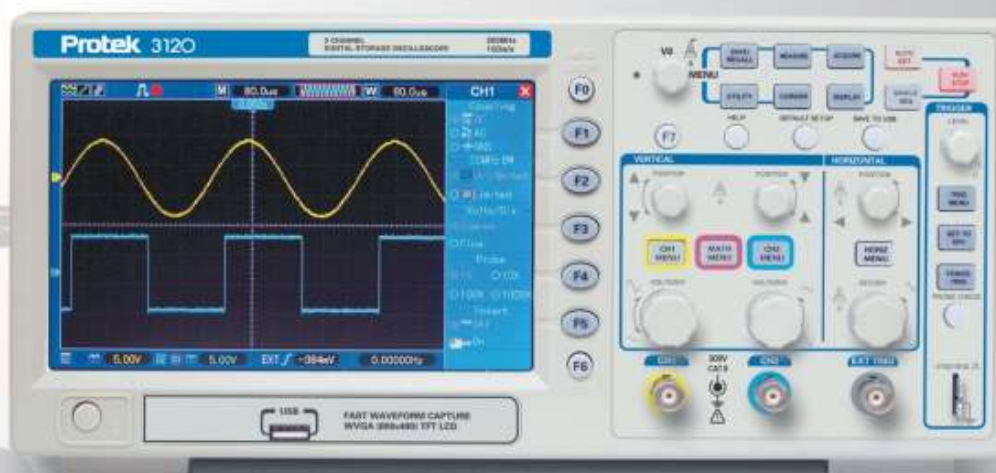
Optional Accessories

- Matching Pad(75 to 50)
- F-BNC Adaptor

Specifications

MODEL		3290N	3201N
Frequency	Range	100kHz to 2900MHz	100kHz to 2000MHz
	Resolution	6.25kHz(Multiple of 6.25kHz)	
	Accuracy	TXO : ±3PPM Display : ±1.5PPM	
	Modulation Bandwidth	Wide FM : Apprx. 180kHz(-6dB) Narrow FM : Apprx 12.5kHz(-6dB)	AM/SSB : Appex 2.4kHz(-6dB)
	Step Range	6.25kHz, 12.5kHz	
Amplitude	Frequency Selection	Start, Stop, Center span setup	
	Measurement Range	-45dBm to -110dBm	
	Average Noise Level	Wide FM/AM/SSB : -100dBm Narrow FM : -110dBm	
	Amplitude Units	DBm, dBmV, dBuV	
	Reference Level Accuracy	Wide FM Typocal ±2.0dB(20°C ~ 30°C), Narrow FM Typocal ±2.0dB(25°C)	
Sweep	Reference Level Ranges	0dBm ~ -80dBm	
	Log Scale	0.2dB/div Min, in 0.25dB Steps(5 Display Division)	
	Internal Atten	10dB	
	Speed	Min, 500msec	
	Trigger Source	Narrow FM/ Wide FM/AM/SSB	
Memory	Trigger Mode	Free Run/ Single Run/ Continuous Wave/ Squelch Run	
	Trigger Level	TTL Level	
	Marker Modes	Marker/ Delta Marker/ Squelch Marker	
Display	Trace Storage	Max 100 Waveforms and 100 States	
	Setup Storage		
	Type	Mono STN LCD	
Input	Display Resolution	192 X 192 pixels	
	LCD Backlight	ON/OFF	
	RF Input Connector	N Type Female, 50ohms	
Frequency	Maximum Input Power	Max +10dBm, 5V RMS	
	Range	35MHz ~ 2900MHz	35MHz to 2000MHz
	RF Input Connector	BNC Type Female, 50ohms(Standard)	
General Specification	Operation Temperature	0°C to 40°C	
	Humidity	35RH to 85RH	
	Storage Temperature	10°C to 50°C	
Power	Power Source	AA Type Ni-MH Rechargeable Battery X 6pcs	
	Power Adaptor	SMPS Type AC Adaptor DC 12V Car-adaptor DC 12V	
	Auto Power	OFF/ 5min/ 10min/ 20min/ 30min	
Dimension & Weight	Size	102(W) X 229(H) X 45(D)mm	
	Weight	Aprx. 2.2 lmb/ 700grams(Except Antenna)	
	Speaker	0.5W into 8 ohms Speaker	
Other	Antenna	Dipole Antenna(Receive Only)	
	RS-232C Interface	9600bps, 19200bps, 38400bps, 57600bps, and 115200bps 8-pin MINI-DIN Connector	

Protek



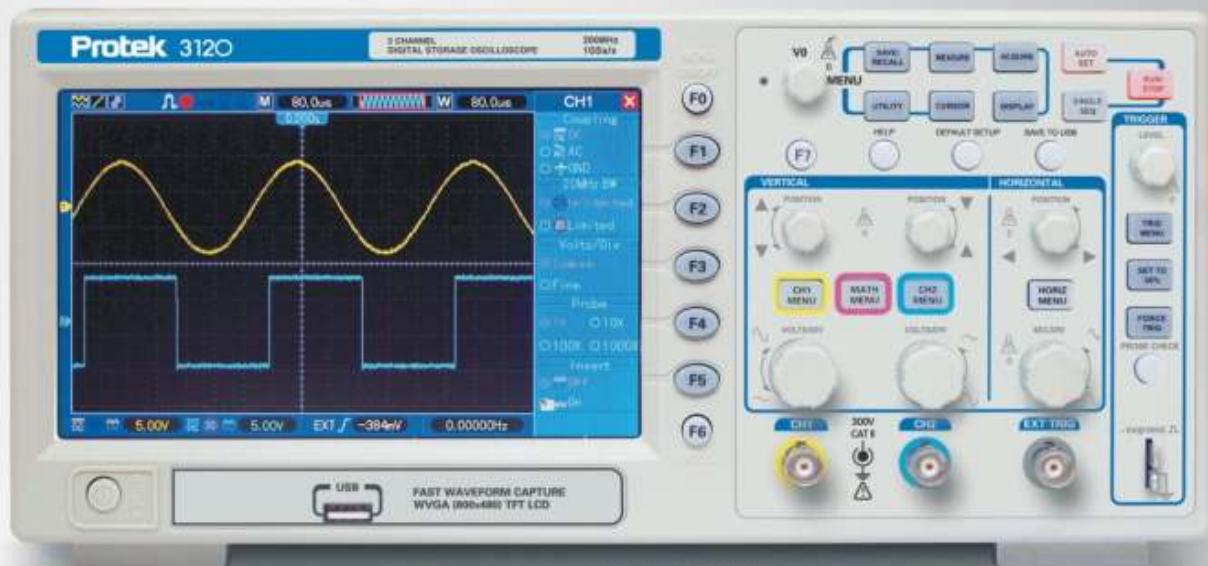
Oscilloscope

Oscilloscopes are one of the most widely used electronic equipment that allows the user to observe the exact waveforms of an electrical signal. Digital storage oscilloscopes use analogue-to-digital converters to process the analogue signal and display it on screen, and uses digital memory to store data without degradation



Analog Oscilloscope
Digital Storage Oscilloscope
Handheld Scope Meter
PC Based DSO

Oscilloscope



Oscilloscope

Digital Storage Oscilloscope

Protek 3000 Series

Protek 3000 Series

Protek 3000 series are new Digital Storage Oscilloscopes. They display waveforms truthfully and capture less-frequently-occurred signals. The 8 inch LCD provides an ample and wider display to accommodate multiple waveform signals and measurement information.

Digital Storage Oscilloscope

Protek 3000 Series

Features

- 60/100/200MHz Bandwidth with 2 Channels
- 500MSa/s and 1GSa/s Real-Time Sampling Rate
- 25GSa/s Equivalent-Time Sampling Rate
- Large 7 inch Color LCD Display
- Record Length upto 1M
- 4 Math Functions Plus FFT
- Multi-Languages Support
- USB Host and Device Connections



Specifications

Specifications	Protek 3006	Protek 3010	Protek 3110	Protek 3120
Bandwidth	60MHz	100MHz	100MHz	200MHz
Channels	2	2	2	2
Real-Time Sampling Rate	500MSa/s	500MSa/s	1GSa/s	1GSa/s
Equivalent-Time Sampling Rate		14GSa/s		
Horizontal				
Range	40s/div~4ns/div	40s/div~4ns/div		40s/div~2ns/div
Step		2, 4, 8 Increments		
Mode		Main Sweep, Main Sweep+Delay Expansion Sweep, X-Y		
Bandwidth Limit		20MHz +/- 40% Typical		
Vertical				
Rise Time	5.8ns	3.5ns	3.5ns	1.8ns
Maximum Input		400V(DC+AC peak)		
Input Impedance		Resistance : 1M +/- 2% ; Capacitance : (20+3) pF		
Polarity		Normal & Invert		
Probe		X1, X10, X100, X1000		
Trigger				
Source		CH1, CH2, EXT, EXT/5		
Trigger Sensitivity		DC : CH1/CH2 (Typical) 1div from DC to 10MHz : 1.5div from 10MHz to full EXT (Typical) : 200mV from DC to 100M EXT/5 (Typical) : 1V from DC to 100M AC : Attenuates signals below 10Hz HF Reject : Attenuates signals below 80KHz LF Reject : Attenuates signals below 150KHz Noise Reject : Reduces trigger sensitivity		
Mode		AUTO, Normal, Single		
Type		Edge, Pulse Wide, Videon, Slope, Overtime, Alternative		
Other				
Voltage Measurement		Vpp, Vrms, Vmax, Vmin, Mean		
Time Measurement		Frequency, Period, Rise Time, Fall Time, Positive Width, Negative Width		
Cursors Measurement		Voltage difference between cursors ΔV , Time difference between cursors ΔT Frequency difference between cursors $1/\Delta T$		
Waveform Signal Process		CH1+/-CH2, CH1xCH2, CH2, -CH1, FFT		
Interface		USB Host / USB Device		
Display		7.0 Inch TFT LCD type display		
Display Resolution		800 x 480 Dots		
Power Source		AC 100V ~ 240V $\pm 10\%$, 45Hz ~ 440Hz, Auto Selection		
Dimension / Weight		313(L) x 108(W) x 142(H) mm / 2.08Kg (Exclusive of packing and accessories)		

Protek 6502A / 6510



Protek 6502A



Protek 6510

Features

- 2 Channels 4 Traces
- 20MHz Bandwidth
- X5 Magnifier
- ALT Trigger

Features

- 2 Channels 4 Traces
- X-Y Operation
- 12KV CRT / A, B Sweep Time Delay
- 100MHz Bandwidth
- X10 Magnifier

Specifications

MODEL	6502A			6510		
Vertical Deflection						
Operation Mode	CH A, CH B, ALT, CHOP, ADD			CH A, CH B, DUAL, ADD		
Sensitivity	5mV~5V/div			5mV~5V/div, 1mV~1V/div (X5 MAG)		
Bandwidth	DC:DC~20MHz AC:10Hz~20MHz			DC:DC~100MHz AC:10Hz~100MHz		
Input Impedance	1MΩ ±2%, 25pF±3pF			1M ±2%, 25pF±3pF		
Rise Time	17.5ns			3.5ns		
Chop Frequency	250kHz			250kHz		
Max. Input Voltage	300V (DC+AC peak)			300V (DC+AC peak)		
Horizontal Deflection						
Sweep Mode	A,XY,ALT,MAG, X5 MAG			A, B, B TRIG'D, XY, A ALT B		
Sweep Time	0.1μs~0.2s/div			0.05μs/div~0.2s/div		
Trigger Source	INT, ALT, LINE, EXT			INT, CM2, LINE, EXT		
Trigger Coupling	AC, TV-V, TV-H			AUTO, NORM TV-V, TV-H		
Trigger Sensitivity						
Norm	Frequency	EXT	INT	Frequency	EXT	INT
	DC~2MHz	200mV	3div	DC~10MHz	0.48div	200mV
Fix	2MHz~20MHz	300mV	3div	10MHz~100MHz	1.5div	500mV
	20Hz~2MHz	200mV	3div	TV Sync.	Min. 1div	Min. 1Vp-p
	2MHz~20MHz	300mV	3div			
X-Y Operation						
Frequency Bandwidth	DC ~ 500kHz			DC~2MHz		
Phase Difference	Less Than 3° (DC~50kHz)			Less Than 3° (DC~100kHz)		
General						
CRT	6" (8 X 10div), 1.9KV			6" (8 X 10div), 12KV		
Power Requirement	AC 100V / 120V / 220V / 230V ± 10%					
Dimensio	335(W) X 140(H) X 375(D)mm					
Weight	Approx. 7.3Kg			Approx. 7.5Kg		
Probe	x1, x10					

Protek 1000 Series

Features

- 600/200/60 MHz Bandwidth with 2 Channels
- 2Gsa/s, 1Gsa/s, 500Msa/s, 150Msa/s Real-Time Sampling Rate
- 50Gsa/s Equivalent-Time Sampling Rate
- 6,000-Count DMM resolution with AC/DC at 600V, 10A
- Large 5.7 inch TFT Color LCD Display
- USB Host / Device 2.0 full-speed interface connectivity
- Multi-Languages Support
- Battery Power Operation (Installed)



Specifications

MODEL		Protek 1006	Protek 1020
VERTICAL	Channels	2	2
	Bandwidth	60MHz	200MHz
	Rise Time	5.8ns	1.7ns
	Input Impedance	Resistance: 1M ; Capacitance: 15 pF	
	Input Sensitivity	10mV/div to 5V/div	2mV/div to 10V/div
	Input Coupling	AC, DC with Groud Level Indicator	
	Vertical Resolution	8 bits	
	Memory Depth	32k at Singal Channel, 16k at Dual Channel	
HORIZONTAL	Maximum Input	300V (DC+AC Peak)	
	Sampling	150MSa/s	500MSa/s
		Equivalent Max. Sampling Rate is 50Gsa/S for all items	
TRIGGER	Time Base Range	5ns/div~1000s/div	2ns/div~1000s/div
	Time Base Precision	±50ppm	
X-Y MODE	Source	CH1, CH2	
	Mode	Edge, Pulse Width, Alternative	Edge, Vedio, Pulse Width, Alternative
CURSORS AND MEASUREMENT	X-Axis Input	Channel 1	
	Y-Axis Input	Channel 2	
METER MODE	Phase Shift	Max.3 degree	
	Voltage Measurement	Vpp, Vamp, Vmax, Vmin, Vtop, Vmid, Vbase, Vavg, Vrms, Vcrms, Preshoot, Overshoot	
	Time Measurement	Frequency, Rise Time, Fall Time, Positive Width, Negative Width, Duty Cycle	
	Delay Measurement	Delay 1->2, Dealy 1->2	
	Curcors Measurement	Manual, Track, Auto Measure Modes	
	Waveform Signal Process	CH1+/- CH2, CH1xCH2, CH1/CH2, FFT, Invert	
	Storage	15 Waveforms and Setups	
	Maximum Resolution	6,000 Counts	
DISPLAY	DMM Testing Modes	Voltage, Current, Resistance, Capacitance, Diode & Continuity	
	Maximum Input Voltage	AC: 600V, DC: 600V	
	Maximum Input Current	AC: 10A, DC: 10A	
	Input Impedance	10 MΩ	
INTERFACE	TFT LCD Type	5.7 Inch with LED Backlight Display	
	Display Resolution	240 (Vertical) x 320 (Horizontal) Dots	
POWER SOURCE	USB	USB Host / Device 2.0 Full Speed Supported	
	Optional	RS232, LAN	
MECHANICS	Line Voltage Range	AC 100V ~ 240V, 50Hz ~ 60Hz; DC Input: 8.5VDC, 1500mA	
	Battery Power (Installed)	6 Hours (Li-ion Battery)	
Other	Dimension	245 x 163 x 52 (mm)	
	Weight	1.2Kgs	
GND Reference		Oscilloscope and Multimeter Independence	



Pc Based DSO

Protek 2090 / 2150 / 2250

- Features**
- USB interface provides high
 - performance for most usages

Specifications

MODEL	DSO-2090	DSO-2150	DSO-2250
Realtime Sampling	100MS/s	150MS/s	250MS/s
Bandwidth	40MHz(-3dB)	60MHz(-3dB)	100MHz(-3dB)
Single Shot bandwidth	40MHz	60MHz	100MHz
Buffer Size	32K samples		10k to 512k samples
Channels		2 Channels	
Voltage Range		10mV to 5V/div @ x1 probe 100mV to 50V/div @ x10 probe 1V to 500V/div @ x100 probe 10V to 5000V/div @ x1000 probe	
Accuracy		±3%	
Timebase Range		4ns/div to 1h/div(1-2-4 sequences)	
Offset Level		±4 divisions	
Coupling		AC, DC, GND	
Impedance		1M ohm	
Input Protection		35Vpk(DC + peak AC, without external attenuation)	
Roll Mode		1s/div to 1h/div	
Range		10 divisions	
Pre/Post Trigger		0% to 100%	
Trigger TYPE		Edge trigger: Rising edge, falling edge	
Trigger Mode		Auto, Normal and Single	
Autoset			
Settability		0.03 div increments	
Trigger Level		±4 divisions	
Measurements		Vp-p, Vmax, Vmin, Vmean, Vrms, Vamp, Vhigh, Vlow, positive overshoot, negative overshoot, cycle mean, cycle rms, period, frequency, positive pluse width, negative pulse width, rise time(10% to 90%), fall time(10% to 90%), positive duty cycle, negative duty cycle	
Cursor		Time / frequency difference, voltage difference	
Math		Addition, subtraction, multiplication, division	
FFT		Rectangular, Hanning, Hamming, Blackman Window	
Interface		Universal Serial Bus(USB)	
Power		No external power source required. Bus-powered from USB1.7W)	
Calibration Signal Ouput		2V, 1kHz, Square Wave	
Trace Display		Point / Line	
Vertical Position Variable		Yes	
Grid		On / Off	
File Management		Image save: BMP, JPG Data save: dso	
Print		OLE(Object Linking and Embedding) automation: Data generation for Microsoft Excel Setting save / load Print in color / mono	

Generator

Protek product line includes a wide selection of generators from Sweep Function Generator to Arbitrary function Generator.

Protek generators are providing precision and suitable performance with over past 20 years on the global market.



Arbitrary & Function Generator
Digital Synthesis Arbitrary Function Generator
DDS Function Generator
Sweep Function Generator

Arbitrary & Function Generator

Generator

Protek 9301 / 9302

Protek 9301/
Protek 9302
Various
Waveforms



SWEEP



AM



FM



BURST



SINE



Main function BNC
(CH1/CH2 Output)

- This output has an impedance of 50Ω
- If it is terminated into an impedance other than 50Ω, the output amplitude will be incorrect, and it may cause increased distortion



Function Keys

- These keys select the main waveform output. The FUNCTION up/down arrow keys select the output waveform.
- If the output frequency is set beyond the allowable range of the waveform, (>2MHz for triangle and ramp) a message will be displayed and the frequency will be set to the maximum allowed for that function.



Step Keys

- The step keys permit the operator to increase or decrease the displayed parameter value.
- Every parameter key has an associated step size, pressing the STEP UP arrow

Key adds the step size to the current value. While pressing the STEP DOWN arrow key subtracts the step size from the current value.

- Pressing [STEP SIZE] key again returns the display to the previous parameter.



Sweep / Modulate Keys

- These keys control the Protek 9302's modulation and sweep capabilities. The left hand up/down arrow keys select the type of modulation or sweep.
- The Right hand up/down arrow keys

select the modulating or sweep waveform.

- The [SWEEP MOD] key selects modulation ON and OFF. When the modulation is turned on the SWEEP MOD LED will light.
- If the modulation parameters are not permitted for the selected output function, an error message will be displayed and modulation will not be turned on.

Features

- DDS(Direct Digital Synthesizer) technology
- Function : Sine, Square, Triangle, Ramp, Noise and Arbitrary waveform
- Frequency Range : 0.00000001Hz to 31MHz
- Frequency Resolution : 0.00000001Hz
- Frequency Accuracy : ± 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)

Applications

- Test of sounds, images, communication equipments and electronic parts
- Test of construction, civil engineering, machines and materials
- Standard generator of communication facilities
- Test of electronic equipments and measuring instruments
- Automotive, Industrial, Biomedical, Sensor simulation
- Manufacturing test

Protek 9301/ Protek 9302 Various Waveforms

SQUARE



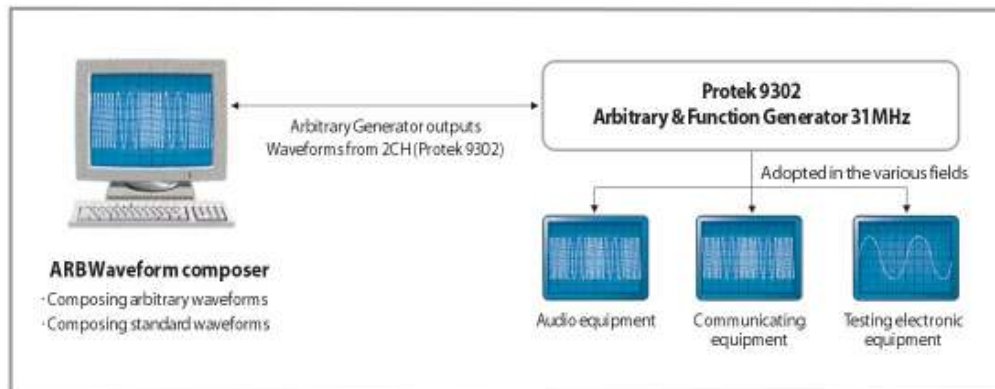
TRIANGLE



RAMP



ARBITRARY



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, Freehand, Line
Waveform Length	16 to 16,383 points
Amplitude Resolution	12 bits
Sampling Rate	40 M samples/sec
Frequency Characteristics Specifications	
Sine, Square	0.01μHz to 31MHz
Ramp, Triangle	0.01μHz to 2MHz
Noise	10MHz (64BITS M type)
Output Characteristics Specifications	
Output	Protek9301 [1 Channel], Protek9302 [2 Channel]
Source Impedance	50Ω Floating
Output Units	Vpp, Vrms, dBm, %
Sync Output	Front - Panel TTL Output for each channel
Inter Channel Crosstalk	< 0.05% [Protek9302 only]
DC Offset	
Range	±5V (limited such that Vac peak < Vdc (KSV))
Accuracy	±2% of setting + 1 mV (DC only)
Amplitude Range	±80mV depending on AC and DC settings 0.05Vp-p to 10Vp-p into 50Ω
1. Sine Wave Amplitude Accuracy (0 V DC Offset)	
	0.01μHz ~ 100kHz 100kHz ~ 20MHz 20MHz ~ 25MHz 25MHz ~ 31MHz
5-10Vpp	±0.2dB ±0.3dB ±0.6dB ±0.9dB
0.05-5Vpp	±0.4dB ±0.4dB ±0.8dB ±0.8dB
2. Square Wave Amplitude Accuracy	
	0.01μHz ~ 100kHz 100kHz ~ 20MHz 20MHz ~ 31MHz
5-10Vpp	±3% ±6% ±15%
0.05-5Vpp	±5% ±8% ±16%
3. Triangle, Ramp, Arbitrary Amplitude Accuracy	
	0.01μHz ~ 100kHz 100kHz ~ 2MHz
5-10Vpp	±4% ±8%
0.05-5Vpp	±5% ±9%
Sine Wave Spectral Purity Specifications	
Spurious Components	DC to 2MHz : < -65dBc [non-harmonic] 2MHz to 31MHz : < -65dBc + 6dB/octave [non-harmonic]
Subharmonic	< -50 dBc [Sine, 5Vpp]
Harmonic Distortion	: Harmonically related signals will be less than : DC to 1MHz [Sine, 1Vpp] : < -45 dBc 1MHz to 31MHz [Sine, 1Vpp] : < -32 dBc

Signal Characteristics Specifications

Rise / Fall Time	< 16 ns (10% to 90%)
Asymmetry	< 1% of period + 4 ns
Overshoot	< 5%
Rise / Fall Time	35 ns
Linearity	0.5% of full scale output

Modulation Characteristics Specifications

Source	Internal (sine, square, triangle, ramp or arbitrary) or External
Depth	0 to 100% AM or ±100% DSBSC
Rate	0.001Hz to 10kHz internal, 20kHz max external
Distortion	< -35dB at 1kHz, 80% depth
DSB Carrier	< -35dB typical at 1 kHz modulation rate (DSBSC)
External Input	±5 V for 100% modulation, 100kΩ impedance
Source	Internal (sine, square, triangle, ramp or arbitrary)
Rate	0.001 Hz to 10 kHz
Span	0.01 μHz to 31 MHz (2 MHz for triangle, ramp)
Source	Internal (sine, square, triangle, ramp or arbitrary)
Rate	0.001 Hz to 10 kHz
Span	9999.99
Waveform	sine, square, triangle, ramp or arbitrary
Frequency	2 MHz to sine, square, triangle, ramp, ARB
Count	1 to 65,000 cycles / burst
Phase Shift	≤ 100 kHz
Type	Linear or Log
Time	0.001 Hz to 10 kHz
Span	0.01 μHz to 31 MHz (2 MHz 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
Source	CH1 : INT RATE, Single, POS EXT1, NEG EXT1, Line CH1 : INT CH1, INT RATE, POS EXT2, NEG EXT2
Rate	0.0001s ~ 999.99s
External Input	±edge, TTL Output
Output	TTL Output
Accuracy	±3 ppm (20°C to 30°C)
Aging	±3 ppm/year
Input	10MHz/N ±2 ppm, N=1 to 8, 1Vp-p minimum input level
Output	10MHz, >1 Vp-p sine into 50Ω
Operating Temperature	5°C to 40°C
Operating Humidity	35% to 80%
Weight	Protek9301 : 8.2kg, Protek9302 : 8.7kg
Dimensions	363mm [W] × 109mm [H] × 386mm [D]
Interfaces	RS-232 (2400 to 19,200 bps) and GPIB (Optional)
Power Supply	100 / 120 / 220 / 230 VAC [±10%] 50 / 60 Hz
Power Consumption	Protek9301 : 46W, Protek9302 : 80W

Protek 9300 Series



Protek 93120

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 9380: 80MHz
- Protek 9340: 40MHz
- Protek 9320: 20MHz
- Protek 9310: 10MHz
- Protek 9305: 5MHz

Features

- Using Direct Digital Synthesis Technology
- 100μHz 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)

Accessories

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

Specifications

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	With Internal Attenuation	Cut off frequency about 100kHz
	With External Attenuation	≤-3dB
Gate Time		10ms~10s
Operation Characteristics		
Power		220V±10%, 50~60Hz, Max. 35W
Temperature/Humidity		0℃~40℃, 35%~80%
Dimension		255mm×370mm×100mm

Function Generator			9305	9310	9320	9340	9380	93120
Subject								
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					
	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)					
Frequency	Square Waveform Rising/Falling Time		Less than 25ns					
	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-fu, Commut-tr, Sine-tra, Sine-ver, Sine-pm, Log, Exp, Round-har, sin%, Squ-root, Argent, 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					
	Carrier Waveform		Sine, Square					
AM	Modulation Mode		INT, EXT					
	Modulation signal	Waveform	Sine, Square, Triangle, Up-lamp, Down-lamp					
		Frequency	10μHz~20kHz					
	Relative Modulation Error		±(5%+0.2) 100 Hz < Freq≤10kHz, ±(10%+0.5) (10kHz < Freq ≤ 20kHz)					
	Modulation Depth		1%~120%					
FM	Amplitude of External Input Signal		3Vpp (+1.5V~1.5V)					
	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 2Vp-p (+1.5V~1.5V)					
	FSK Modulation	Input Signal	either Frequency 1 or Frequency 2					
PM		Control Mode	INT, EXT (TTL level, Low level F1, High level F2)					
		Alternation Rate	0.1ms~800s					
	Waveform		Sine, Square					
	PSK Modulation	PSK	Phase 1 (P1), Phase 2 (P2)					
		Range	0.1°~360.0°					
Burst		Resolution	0.1°					
		Alternation Time Interval	0.1ms~800s					
		Control Mode	INT, EXT (TTL level, Low level P1, High level P2)					
	Waveform		Sine, Square					
	Burst Counting		1~10000 period					
Sweep	Alternation Time Interval		0.1ms~800s					
	Control Mode		INT, EXT					
	Waveform		Sine, Square					
	Time		1ms~800s (linear), 100ms~800s (log)					
	Mode		Linear, Log					
Output of Modulation Signal	External Trigger Signal Frequency		DC~1kHz (linear), DC~10kHz (log)					
	Control Mode		INT, EXT					
	Waveform		Sine, Square, Triangle, Up-lamp, Down-lamp					
	Frequency		100μHz ~ 20kHz					
	Amplitude		5Vpp±2%					
Storage	Output Impedance		620Ω					
	Storage Parameter		Single frequency, amplitude, waveform, DC offset values and Function state					
	Storage capacity		10 signal					

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 100μHz ~ 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 100μHz ~ 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 100μHz ~ 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 100μHz ~ 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 100μHz ~ Max 100kHz
2. Input the signal on DSO and press the auto key a time
3. Check the output signal of 9300

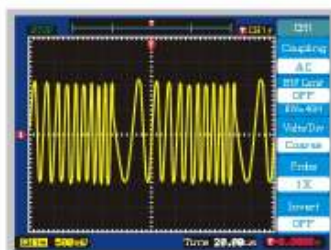
Output Waveform-6 (ARBITRARY)



ARBITRARY WAVE : 2.7, 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 (DEVI, FREQ, WAVE, SOURCE)
3. Check output signal of 9300 through DSO display

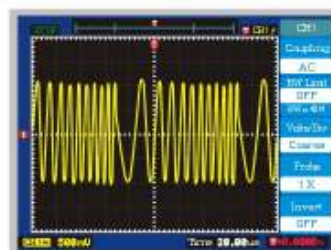
Waveform Modulation-8 (AM)



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

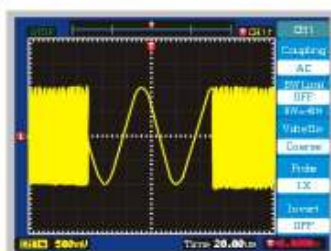
Waveform Modulation



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

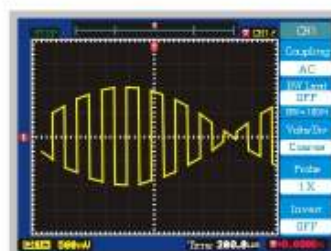
Waveform Modulation-11 (FSK)



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



Protek

GD-0000N Series

Features

- Direct digital synthetic technology and abundant programmable logic components with high integration and good reliability
- Built-in SCM digital control, rolling menu indication
- Back light LCD with abundant information
- Operation keypad combined hand wheel, full digital control
- RS-232C interface with PC has the whole set of dictate collection
- 9 function wave, high resolution
- Linearity/log sweep, FSK, ASK, PSK, AM, FM, PM



Specifications

MODEL NO.		Protek GD-0005N	Protek GD-0010N	Protek GD-0020N
WAVEFORM		Sine, Triangle, Square, Rising Slope, Declining Slope, Random noise, SIN(X) / X, rising / drop exponent, pulse waveform		
Frequency	Sine	1μHz-5MHz	1μHz-10MHz	1μHz-20MHz
	Square	1μHz-5MHz		1μHz-10MHz
	Other Wave	1μHz-1MHz		
	Resolution	8 bits or 0.1μHz		
Signal	Square Rising / Falling Time	≤15ns (50Ω Load, 1Vpp)		
	Square Overshoot	≤5%		
	Disymmetry (1kHz)	≤1% + 20ns		
	Duty Modulus	0.1%~99.9% (<10kHz) / 1%~99% (10kHz~100kHz) / 3%~97% (<1MHz)		
	Triangle, Ramp Linearity (1kHz)	Better than 0.1%		
Output	Amplitude Setting	1mVpp-20Vpp (High impedance) 0.5mVpp-10Vpp (50Ω)		
	Offset Ratio (Within 5Vpp)	-100% ~ 100%		
	Impedance	50Ω		
Sweep	Type	Linearity / Logarithm		
	Direction	Positive / Negative		
	Early / Final Freq.	1Hz ~ 5MHz	1Hz ~ 10MHz	1Hz ~ 20MHz
AM	Waveform Modulation	Any inner function waveform		
	Freq. Modulation	100mHz ~ 20kHz		
	AM Depth	0% ~ 100%		
	Source	Inner / external		
FM	Waveform Modulation	Any inner function waveform		
	Freq. Modulation	100mHz ~ 20kHz		
	Freq. Offset	1Hz ~ 5MHz	1Hz ~ 10MHz	1Hz ~ 20MHz
	Source	Inner		
PM	Waveform Modulation	Any inner function waveform		
	Freq. Modulation	100mHz ~ 20kHz		
	Phase Offset	360 degree		
	Source	Inner		
Frequency Counter	Range	1Hz ~ 100MHz		
	Input Signal	100mV		
MECHANICS	Power	AC 220V±10%, 50Hz±5%		
	Dimension	95H * 245W * 340D (mm)		
	Weight	About 2KGS		

Protek 9205A / 9205C



Protek 9205A



Protek 9205C

Features

- Sine, Triangle, Square, Pulse,
- Ramp Waveform
- Sync. Out (TTL Square Waveform)
- Sweep Function
- VCG Input
- DC Offset
- AM Modulation
- Frequency Counter

Features

- Sine, Triangle, Square, Pulse,
- Ramp Waveform
- Sync. Out (TTL Square Waveform)
- Sweep Function
- VCG Input
- DC Offset
- Frequency Counter

Specifications

MODEL	9205C	9205A
Output		
Frequency Range	0.02Hz to 2MHz (7 Ranges)	0.03Hz to 3MHz (7 Ranges)
Accuracy	±5% of Full Scale to 200kHz, ±8% of Full Scale from 200kHz to 2MHz	Over 1Hz ± 1 Count ± Time Base Error
Amplitude	10Vp-p in 50Ω Load	1Vp to 20Vp (Open Circuit), 0.5Vp to 5Vp (50Ω)
Attenuation	Fixed 20dB ±1dB, 20dB Continuity Variable	
Impedance	50Ω ±5%	
Sine Wave		
Flatness	Better than ±3dB ~ 2MHz at Max. Output AMP	±3dB ~ 3MHz
Distortion	2% (10Hz ~ 100kHz)	
Square Wave		
Rise / Fall Time	100ns or Less	
Triangle Wave		
Linearity	99% or More ~ 100kHz	
Symmetry Variation	1:1 ~ 4:1	1:1 ~ 4:1 (1MHz) / 1:1 ~ 2:1 (2.5MHz)
VCF Input	0V ~ 10VDC	
Sweep Function		
Mode	Linear	
Width	1:1 ~ 100:1	
Time	20ms ~ 2s	
Frequency Counter		
Range	10Hz ~ 2MHz	10Hz ~ 3MHz
Accuracy	0.01% ± 1 Count	
Max. Input Voltage	70Vp-p	
Input Impedance	1MΩ	
AM Modulation		0 ~ 100%, 10V Max. Input
General		
Power	100/120/220/230VAC ±10%, 50 / 60Hz	
Dimension	250(W)×267(D)×76(H)mm	
Weight	Approx. 2.5Kg	

Sweep Function Generator

Generator

Protek G305

Features

- Sine, Triangle, Square, Ramp, Pulse Waveform
- Gate & Trigger Output
- Burst Waveform Output
- Sweep Function (Linear/Logarithmic)
- VCG Input
- GCV Function
- AM Modulation
- Variable Symmetry
- Output Attenuator
- DC Offset
- Frequency Counter



Specifications

Output	
Frequency Range	0.01Hz to 10MHz (9 Ranges)
Accuracy	Counter Accuracy
Amplitude	10Vp-p in 50Ω Load
Attenuation	0 / 20 / 40 / 60dB Fixed, Variable
Impedance	50Ω ±10%
Sine Wave	
Flatness	±0.2dB (0.01Hz ~ 100KHz), ±2dB (100KHz ~ 10MHz)
Distortion	5% (10Hz ~ 50KHz)
Square Wave	
Rise / Fall Time	25ns or Less
Triangle Wave	
Linearity	99% or More ~ 100KHz
Symmetry Variation	20:80 ~ 80:20
VCF Input	0V ~ 5V DC
Sweep Function	
Mode	Linear and Logarithmic
Width	100:1 Continuity Variable
Time	1ms ~ 10s
Frequency Counter	
Range	1Hz ~ 10MHz
Accuracy	0.01 / 0.1 / 1 / 10s
Max. Input Voltage	± 1 Count / ± Time Base Error
AM Modulation	0 ~ 100%, 5V Max. Input
Time Base Error	
Frequency	10MHz
Aging rate	± 3 × 10 ⁻⁵ / Month
Temperature	± 1 × 10 ⁻⁵ (0°C ~ 40°C)
Burst	1ms to 10s Gate Time
Trigger Mode	One Cycle Oscillation Triggered by Input Signal
Gate Mode	Oscillation only When Input is High
General	
Power	100/120/220/230VAC ±10%, 50 ~ 60Hz
Dimension	300(W)×300(D)×98(H)mm
Weight	Approx. 4Kg

Meter

Protek is well known for its multi-meters with over past 30 years of Protek meters are widely spread in the educational and industrial markets globally.



LCR Meter
RF Power Meter
Multi Meter

Protek 9216A

Protek 9216A

Protek 9216A is a useful tool measuring a device characteristics with various functions. It has more than 13 orders of magnitude, basic accuracy of 0.05% and 5 test frequencies.



Features

- Basic accuracy of 0.05%
- 5 Test frequencies
- Store up to 9 setups in the memory
- Remote over RS-232C

Optional Accessories

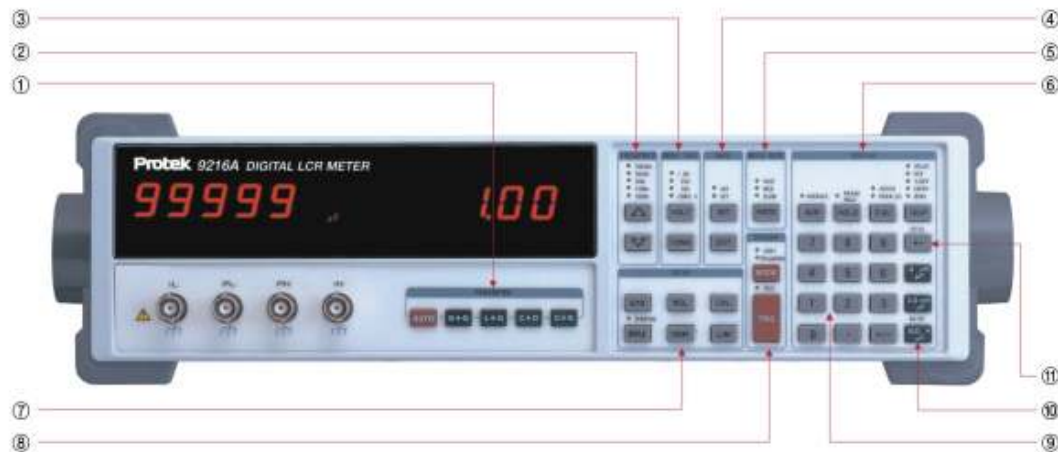
- Kelvin Clips : Provides connection of devices that are not easily accommodated in the fixture. Polarity is indicated for biased measurements.
- SMD Tweezers : Provides connection to Surface Mount Device Parts. Polarity is indicated for biased measurements.
- GUI Software

Standard Accessories

- Radial Fixture : For measuring simply Radial or Axial type's parts, use it after connected in front of LCR Meter.
- the interface. DB25 male connector provides output lines to indicate binning information and instrument status and an input trigger line. The trigger input is negative edge triggered TTL and is protected to +/- 15 Volts.

Specifications

Measurement Modes	Auto, R+Q, L+Q, C+D, C+R
Equivalent Circuit	Series or Parallel
Parameters Displayed	Value, Deviation, % Deviation or Bin Number. Deviation and % deviation are calculated from a stored relative value.
Averaging	2 ~ 10 Measurement
Measurement Range	R+Q R 0.0001 Ω ~ 2000 Ω Q 0.00001 ~ 50 L+Q L 0.0001 μ H ~ 99999H Q 0.00001 ~ 50 C+D C 0.0001pF ~ 99999 μ F D 0.00001 ~ 10 C+R C 0.0001pF ~ 99999 μ F R 0.00001 ~ 99999K Ω
Test Frequency	100Hz, 120Hz, 1kHz, 10kHz, 100kHz
Frequency accuracy	± 100 ppm
Drive Voltage	0.1V, 0.25V, 1Vrms
Drive levels accuracy	$\pm 2\%$
Measurement Rate	Slow, Medium, Fast : 2, 10 or 20 measurements per second at test frequencies of 1KHz and above and about 0.6, 2.4, or 6 measurements per second at 100Hz and 120Hz.
Ranging	Auto or Manual
Triggering	Through External Trigger, Continuous, Manual or Remote over RS232 Interface
Bias Voltage	Internal $\rightarrow$ 2.0VDC $\pm 2\%$ External $\rightarrow$ 0 to +40 VDC (fused @ 0.25A)
Conditions	At least 30 minute warm up, 23 $^{\circ}$ C $\pm$ 5 $^{\circ}$ C
Basic Accuracy	0.05%



① PARAMETER

AUTO : This switch causes the most appropriate parameter to be selected and measured automatically.

R+Q : $QI < +0.125$

L+Q : $Q > +0.125$

C+Q : $Q < -0.125$ at Series mode

C+D : $Q < -0.125$ at Parallel mode

(**R+Q** = Resistance + Quality Factor

L+Q = Inductance + Quality Factor

C+D = Capacitance + 1/Q

C+R = Capacitance + Resistance)

② FREQUENCY

△ ▽ : The output frequency is one of five fixed frequencies (100Hz, 120Hz, 1kHz, 10kHz, 100kHz) and is accurate to 100ppm (0.01 %).

③ DRIVE VOLT

VOLT : The VOLT key cycles through the three preset output drive voltage options.

CONS : This button can set the meter in the constant voltage mode.

④ BIAS

This bias mode is used only for capacitance measurements. If you press these buttons incorrectly,

the error message "bias for c" is displayed.

INT : Internal button selects a 2.0VDC internal bias.

EXT : It can select an external bias mode (0V-40V)

⑤ MEAS RATE

RATE : Selects slow, medium, or fast measurement rates (2, 10, or 20 Measurements per second at measurement frequency 1kHz or higher).

⑥ DISPLAY

AVR : User can choose to average from 2 to 10 measurements with this button.

HOLD : This button holds the meter in its current measurement range.

EQU : This button toggles equivalent circuit between a series or parallel.

DISP : This button selects the parameter on the display. You can select following display types.

VALUE : Display the value of the measurement.

DEV : The deviation of the value from an entered value.

%DEV : The percent deviation from the nominal.

ENTRY : for entering parameter values,

BINS : selects the bin number when binning is enabled.

⑦ SETUP

STO, RCL : These button 3 can store and recall up to 9 setups in the memory.

CAL : This button acts as a calibrate mode and special Configurable parameter.

BIN#, NOM, LIM : These buttons are used to enter binning parameters.

⑧ TRIGGER

MODE : This button selects between continuous (CONT) or triggered (TRIGGERED) measurement.

TRIG : Under the Trigger mode, when it presses, it measures one at a time.

⑨ [0], ... [9]

These numeric buttons enter parameters and are only active when the meter is in the 'ENTRY' mode.

⑩ ENTER

These three buttons are used when entering numeric parameters in the entry mode, & acts as a general purpose ENTER button.

⑪

Correcting mistakes when entering numeric data, and also serves as the 'LOCAL' function.

Standard Accessory



Ridial Fixture

Optional Accessories



Kelvin Clips



SMD Tweezers

Meter



Meter

RF Power Meter

Protek M733

Protek M733

With a frequency range of 10MHz to 2.9GHz, Protek M733 measures average watts of RF signals from 2mW to 500mW. Overpower alarming system to protect itself, and LCD display screen with auto-scale and unit selecting functions.

Protek M733

Features

- Lightweight hand-held instrument
- Frequency range : 10MHz to 2.9GHz
- Hold / Run Modes
- Meter zero, Auto range functions
- 3 1/2 Digits LCD
- CW Power 0.1mW to 500mW (limited duration up to 1W)
- Full-scale ranges : 1.999mW, 19.99mW, 199.9mW, 1999mW
- Rugged design
- Low Battery detect and display
- Unit display : dBmV, mV, dBm, mW

Applications

- IF and RF system test
- RF amplifier test
- CATV testing and troubleshooting
- Wireless consumer product test
- Base station testing and troubleshooting
- Two-way radio
- Field Service
- Trunk radio
- Cellular and PCS phones



Specifications

MODEL	M733
Frequency Range	10MHz to 2.9GHz
RF Signal Input Power Range	2mW to 500mW Max.
Accuracy	+20°C to +30°C ±10% [mW] @10MHz to 1GHz ±15% [mW] @1GHz to 2.9GHz +10°C to +20°C, +30°C to +40°C ±15% [mW] @10MHz to 1GHz ±20% [mW] @1GHz to 2.9GHz
Meter Buttons Function	Power Switch Button : Meter Power ON/OFF ZERO Button : Meter Value Zero Point Function HOLD Button : Meter Value Holding Function UNIT Button : Unit Selection (mW, dBm, mV, and dBmV)
Extra Functions	Auto-scale Function 'Lo BAT' Message Output Function (Low Battery) 'HPI' Message Output Function (High Power Input) 'LPI' Message Output Function (Low Power Input)
LCD Type	Mono, FSTN LCD
Input Connection	N-Type Female, 50 Ohms, Return Loss < -18dBRL N-Type to SMA Female Adaptor (Option)
Battery	9V Battery X 2pcs, 6F22UT(006PUT)
Operating Temperature	+10°C to +40°C
Operating Humidity	35RH to 85RH (RF : Relative Humidity)
Storage Temperature	-20°C to 70°C
Dimension	89mm (W) X 160mm (H) X 45.7mm (D)
Weight	Max. 900g (2 Pounds)

Protek 4000



Features

- Display : 4 $\frac{4}{5}$ Digits, Dual Display, 50,000Counts
- Resolution : 0.01mV, 0.01 Ω
- Accuracy : 0.05% (DC Volt)
- Measurement Function of True RMS (AC+DC)
- Measurement Function of Frequency, Capacitance
- Pulse Width, Duty, Temperature
- Measurement Function of Peak to Peak
- Measurement Function of Wide-Band : 5000 μ A to 10A
- Measurement Function of Low Voltage : Min. 2500mV
- Measurement Function of Zener-Diode : 20V
- Memory Location Function
- Go-NoGo Function
- Auto Back Light
- Interface : RS-232C

Accessories

- | | |
|-----------------|-----|
| • Test Leads | 1EA |
| • User Manual | 1EA |
| • RS-232C Cable | 1EA |
| • GUI Software | 1EA |
| • Power Cable | 1EA |

Option Accessories

- | | |
|-----------------------|-----|
| • Temperature Adapter | 1EA |
| • Tempe Prode | 1EA |



Multi Meter

Protek 4000



Specifications

DC/V	Range	500.00mV, 2500.0mV				5.0000V, 50.000V, 500.00V, 1000.0V			
	Accuracy					±0.05%+5d			
AC/V	Range	500.00mV				5.0000V, 50.000V, 500.00V, 750.0V			
	Accuracy					±0.75%+20d			
AC+DC/V	Range	500.00mV				5.0000V, 50.000V, 500.00V, 750.0V			
	Accuracy	1.5%+50d				2.0%±50d			
DC/A	Range	5000.0μA				500.00mA		10.000A	
	Accuracy					0.2%+5d		0.5%+5d	
	SHUNT	100ohm				1ohm		10Mohm	
AC/A	Range	5000.0μA				500.00mA		10.000A	
	Frequency					50Hz to 1kHz			
AC+DC/A	Accuracy					0.75%±20d for <40000count 1% for> 40000count			
	Range	5000.0μA				500.00mA		10.000A	
	Frequency					DC to 1kHz			
Ohm	Accuracy					1.5%+50d for <30000count 2% for> 30000count			
	Range	50.00ohm				5.0000k, 50.000k, 500.00k, 5.0000M		50.000M	
	Resolution	0.01ohm				0.1ohm, 1ohm, 10ohm, 100ohm		1k	
LV Ohm	Accuracy	1.0%+20d				0.2%+5d		1.0%+10d	
	Range					5.0000k, 50.000k, 500.00k, 5.0000M		50.000M	
	Resolution					1ohm, 10ohm, 100ohm, 1kohm		10k	
nS	Accuracy					0.5%+5d		2.5%+10d	
	Range					500.0nS			
	Resolution					0.1nS			
Continuity	Accuracy					3.0%+5d			
	Range	5kohm		50kohm		500kohm		5Mohm	
	Input	SHORT	OPEN	SHORT	OPEN	SHORT	OPEN	SHORT	OPEN
	Resolution	BUZZ	BUZZ	BUZZ	BUZZ	BUZZ	BUZZ	BUZZ	BUZZ
	Accuracy	On	OFF	On	OFF	On	OFF	On	OFF
Zener Diode	Accuracy	< 5ohm	> 15ohm	< 50ohm	> 100ohm	< 500ohm	> 1kohm	< 5kohm	> 10kohm
	Range					15.000V			
	Accuracy					5%+10d			
	Current					1mA			
Capacitance	Open Volt					15 to 22V			
	Range	5.000nF	50.00nF	500.0nF	5.000μF	50.00μF	500.0μF	5.000mF	-
	Resolution	1pF	10pF	100pF	1nF	10nF	100nF	1μF	-
	Accuracy	5%+10d	2%+10d		2%+5d		3%+10d		-
Frequency	Range	50.00Hz		500.0Hz		50.000kHz		500.00kHz	5.0000kHz
	Resolution	0.01Hz		0.1Hz		1Hz		10Hz	100Hz
	Accuracy					0.01%+5d			
Pulse Width	Range					200.00ms			
	Resolution					10μSec			
	Accuracy					0.1%+5d			
Duty Cycle	Range					100.00%			
	Resolution					0.01%			
	Accuracy					0.1%+5d			
Temperature	Range	-20~0℃		0~150℃	150~1200℃	°F		K	
	Resolution			0.1℃					
	Accuracy	±3℃		±2℃	±2℃	°F = °C×9/5+32		K = °C+273.1	
Peak ±Detection	Range	DCmV, DCV, DμA, DmA, DCA							
	Accuracy	Less than 10% for peak with > 5ms of duration and with < 10% of full scale of each range							

Protek 9902A



Features

- AC / DC Voltage, AC / DC Current, Resistance Measurement
- 4 1/2 Digits Display, 20,000 counts
- Over Range Indication
- 6 Functions
- Data Hold Function

Accessories

- Test Leads 1EA
- Power Code 1EA
- User's Manual 1EA

Specifications

DC Voltage	Range	200mV	2V	20V	200V	1000V
	Resolution	10μV	100μV	1mV	10mV	100mV
	Accuracy	±(0.05%rdg + 2d)				±(0.075%rdg + 2d)
AC Voltage	Range	200mV	2V	20V	200V	750V
	Resolution	10μV	100μV	1mV	10mV	100mV
	Accuracy	±(0.05%rdg + 10d)				±(0.075%rdg + 10d)
DC Current	Range	200μA	2mA	20mA	200mA	2000mA
	Resolution	10μA	0.1μA	1μA	10μA	100μA
	Accuracy	±(0.3%rdg + 3d)				±(1%rdg + 3d)
AC Current	Range	200μA	2mA	20mA	200mA	2000mA
	Resolution	10μA	0.1μA	1μA	10μA	100μA
	Accuracy	±(0.75%rdg + 10d)				±(1%rdg + 10d)
Resistance	Range	200Ω	2KΩ	20KΩ	200KΩ	2MΩ
	Resolution	10mΩ	100mΩ	1Ω	10Ω	100Ω
	Accuracy	±(0.5%rdg + 10d)				±(0.75%rdg + 10d)
General	Power Requirement	115V / 230V ±10%, 50/60Hz				
Dimension		250(W) × 267(D) × 76(H) mm				
Weight		Approx. 2.5Kg				

Protek 506

Features

- True RMS
- Dual Display for Frequency, AC Voltage and Temperature
- RS232C Interface
- 10 Location Memories
- Min., Max., Avg. and Relative Mode
- Decibel Measurement
- Capacitance and Inductance Measurement
- Temperature Mode (°C/°F)
- Pulse Signal Injection Function for Logic and Audible Test etc.
- Continuity and Diode Test
- Logic Test
- Auto Power Off and "Keep On" Mode
- Fused 20A Input with Warning
- Beeper
- Back Light
- Date Hold and Run Mode
- Low Battery Indication Mode



Specifications

DC Voltage	Range	400mV	4V, 40V, 400V, 1000V
	Resolution	0.1mV	1mV, 10mV, 100mV, 1V
	Accuracy	0.3% + 2d	0.5% + 2d
AC Voltage	Range	400mV	4V, 40V, 400V, 750V
	Resolution	0.1mV	1mV, 10mV, 100mV, 1V
	Accuracy	1% + 3d	1.5% + 5d
DC Current	Range	400μA, 400mA, 20A	
	Resolution	0.1μA, 0.1mA, 0.01A	
	Accuracy	1% + 2d	
AC Current	Range	400μA, 400mA, 20A	
	Resolution	0.1μA, 0.1mA, 0.01A	
	Accuracy	1.5% + 3d	
Resistance	Range	400Ω, 4KΩ, 40KΩ, 400KΩ	4MΩ, 40MΩ
	Resolution	0.1Ω, 1Ω, 10Ω, 100Ω	1KΩ, 10KΩ
	Accuracy	0.5% + 2d	1% + 2d
Frequency	Range	10kHz, 100kHz, 1MHz, 10MHz	
	Resolution	1Hz, 10Hz, 100Hz, 1kHz	
	Accuracy	0.01% ± 2d	
Capacitance	Range	100μF	
	Resolution	0.01μF	
	Accuracy	3% + 5d	
Temperature	Range	-20°C ~ 1200°C / 0°F ~ 2000°F	
	Resolution	1°C / °F = 32 + (9/5 x °C)	
	Accuracy	3% + 5d (-20 ~ 10°C), 3% + 3d (10 ~ 350°C), 5% + 3d (350°C ~ 1200°C)	
dBm	Range	-25dBm ~ +59dBm	
	Resolution	0.01dBm	
	Accuracy	±0.5dBm	
Logic Test	Logic	0.8V ~ 2.0V	
Diode Test		Test Volt 3.3V Max.	
Continuity		Less Than 100Ω	
Signal Out		2048Hz, 4096Hz, 8192Hz (4.5V Square Wave)	
Basic Accessories	Carrying Case, Manual, Test Leads, Gift Box, Battery, RS232C Cable		
Optional Accessories	Holster, Temp Probe (TP35, "K" Type), Temp Adaptor (TA35)		

Protek 608

Features

- 4 $\frac{4}{5}$ Digits, Dual Display, 50,000 Counts
- Accuracy : 0.05% (DC Volt)
- True RMS for AC or AC+DC
- RS232C PC Interface
- CAT II 1000V DC, 750V AC

Special Functions

- New Style of Bar Graph Display Based on Binary Bit Expression Method
- $\pm$ Peak Detection Mode for High Speed Signal Captuer
- Easy Determination on with GO / NoGo Mode

Basic Accessory: Test Leads, User Manual, Gift Box, Holster, Software Win98 & WinNT RS232C Cable, Temp Adaptor (TA60) Temp. Probe (TP35, "K" Type)

Low Battery Detect: Battery Indicator on LCD Appears at Below 6 $\pm$ 1V

Physical Size (H x W x D): Main Unit (Net): 203.5 x 94.0 x 43.2mm
With Holster: 216.5 x 104.5 x 58.0mm

Physical Weight: Main Unit (Net): 417g (14.7oz)
With Holster: 557g (1 lb 3.6oz)



Protek 608



Specifications

DCmV&V					NS					
Function	Range	Accuracy			Range	Resolution	Accuracy	Open/Short	Protection	
DCmV	500.00mV 2500.0mV		> 1GΩ	MAX. 250V AC or DC (5KΩ PTC)	500 ns	0.1 ns	3.0% + 5d	2.5V / 25nA	250V AC or DC	
DCV	5.0000V 50.000V 500.00V 1000.0V	0.05% + 5d	About 10.5MΩ About 10MΩ About 10MΩ About 10MΩ	MAX. 1000V DC or 750 V AC (10MΩ)	Continuity					
					Range	Input	Response	Accuracy	Protection	
					5KΩ	Short Open	Buzz On Buzz Off	< 5Ω > 15Ω	250V AC or DC (500Ω PTC)	
					50KΩ	Short Open	Buzz On Buzz Off	< 50Ω > 100 Ω		
					500KΩ	Short Open	Buzz On Buzz Off	< 500Ω > 1KΩ		
					5MΩ	Short Open	Buzz On Buzz Off	< 5KΩ > 10K		
ACmV&V					Zener Diode					
Function	Range	Accuracy for Each Frequency Band			Range	Accuracy	Test Current	Open Circuit V		Protection
ACmV	500.00mV	50~500Hz 0.75% + 20d for < 400mV 1% for > 400mV	UP~1kHz 1.5% for > 50mV	Up ~ 5kHz 2% for > 50mV	Up ~ 10kHz 2% for ACV > 10% of Full Scale	Up ~ 20kHz 3% for > 50mV				
ACV	5.0000V 50.000V 500.00V 750.0V	0.75% + 20d	1% for ACV Level more than 10% of Full Scale Reading	2% for ACV > 10% of Full Scale	Not Specified					
AC+DCmV&V					Capacitance					
Function	Range	Accuracy for Each Frequency Band			Range	Input	Response	Accuracy	Protection	
AC+DC mV	500.00mV	50~500Hz 1.5% + 50d for < 300mV 2% for > 300mV	UP~1kHz 2.5% for > 50mV	Up ~ 5kHz 3.5% for > 50mV	Up ~ 10kHz 3.5% for AC+DCV > 10% of Full Scale	Up ~ 20kHz 4.5% for > 50mV				
AC+DC V	5.0000V 50.000V 500.00V 750.0V	2.0% + 50d	2.5% for ACV + DCV Level more than 10% of Full Scale Reading	3.5% for AC+DCV > 10% of Full Scale	Not Specified					
DC Current					Frequency					
Function	Shunt	Range	Accuracy	Protection	Range	Resolution	Accuracy	Open/Short	Protection	
DCμA	100Ω	5000.0 μA	0.2% + 5d	1A/600V Fast Fuse & 22V M. O. Varistor	50.00 Hz	0.01 Hz	0.01% + 5d	10MΩ // 1nF	500V AC or DC (1KV 1nF Capacitor parallel with 10M 1/2W Resistor)	
DC mA	1Ω	500.00mA			500.0 Hz	0.1 Hz				
DCA	10MΩ	10.000A	0.5% + 5d	15A/600V Fast Fuse	50.000 kHz	1 Hz				
					500.00 kHz	10 Hz				
AC Current					Resistance					
Function	Range	Frequency	Accuracy	Protection	Range	Resolution	Accuracy	Open/Short	Protection	
AC μA	5000.0 μA	50Hz~1kHz	0.75% + 20d for < 40000 Count 1% for > 40000 Count	1A/600V Fast Fuse & 22V M. O. Varistor	50.00Ω	0.01Ω	1.0% + 20d	2.5V / 1.7mA	250V AC or DC (500Ω PTC)	
AC mA	500.00mA				5.0000KΩ	0.1Ω	0.2% + 5d	2.5V / 1.7mA		
ACA	10.000A				50.000KΩ	1Ω		2.5V / 240μA		
					500.00KΩ	10Ω		2.5V / 25μA		
AC+DC Current					Temperature					
Function	Shunt	Frequency	Accuracy	Protection	Range	Resolution	Range	Accuracy		Protection
AC+DC μA	5000.0μA	DC ~ 1kHz	1.5% + 50d for < 30000 Count 2% for > 30000 Count	1A/600V Fast Fuse & 22V M. O. Varistor	°C	0.1°C	-20 ~ 0°C 0 ~ 150°C 150 ~ 1200°C	±3°C ±2°C ±2°C	Max. 500V AC or DC for V Terminal, 1A 600V Fast Fuse for mA Terminal	
AC+DC mA	500.00mA				°F	0.1°F	F = 32 + (9/5 x C)			
AC+DC A	10.000A				K	0.1°K	K = C + 273.1			
Pulse Width					Peak +/- Detection					
Range	Resolution	Accuracy	Input Impedance	Protection	Function	Accuracy		Remark		
200.00ms	10μ sec.	0.1% + 5d	10MΩ // 1nF	500V AC or DC	DC mA	Less Than 10% for Peak with > 5ms of Duration and with > 10% of Full Scale of Each Range				
Duty Cycle										
Range	Resolution	Accuracy	Puls Width	Protection						
100.00%	0.01%	0.1% + 5d	0.1ms~200ms	500V AC or DC						
LV ohm (Low Voltage OHM)										
Range	Resolution	Accuracy	Open / Short	Protection	DCV	Less Than 10% for Peak with > 5ms of Duration and with > 10% of Full Scale of Each Range				
5.000Ω	1Ω	0.5% + 5d	0.25V / 170μA	250V AC or DC (500Ω PTC)						
50.00KΩ	10Ω		0.25V / 24μA							
500.00KΩ	100Ω		0.25V / 2.5μA							
5.0000MΩ	1KΩ		0.25V / 250μA							
50.000MΩ	10KΩ	2.5% + 10d	0.25V / 25nA							

Meter

Multi Meter

Protek 305/307



Protek 305

Features (305)

- 4,000 Counts
- 40 Segments Bargraph
- AC / DC 1000A
- True RMS

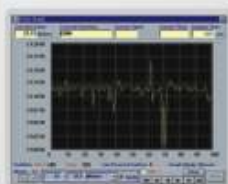
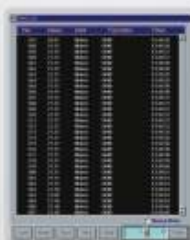


Protek 307



Features (307)

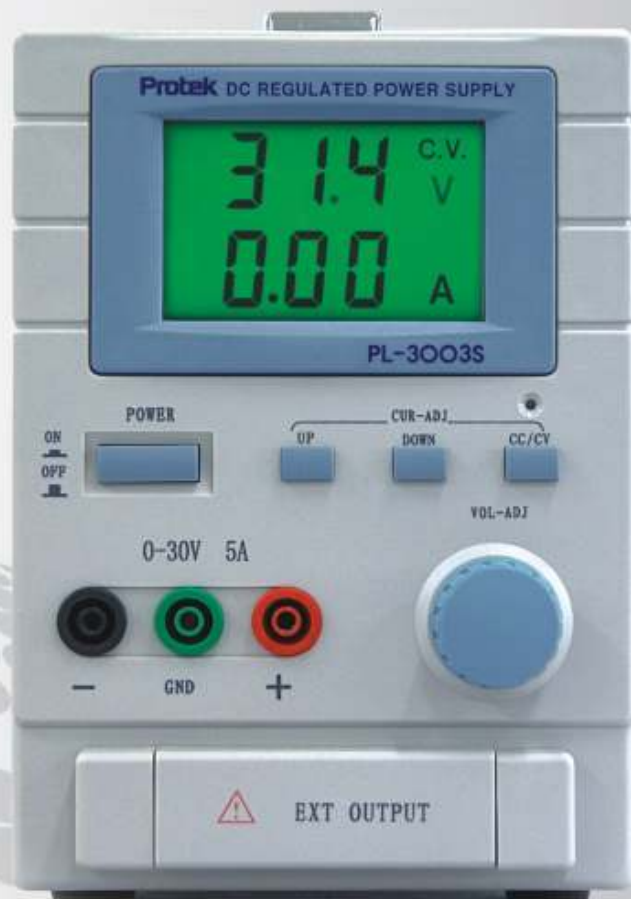
- 4,000 Counts
- 40 Segments Bargraph
- AC / DC 1000A
- True RMS
- Power, Apparent Power Factor



Specifications

Model		305/307					
DC Voltage	Range	400mV		4V		40V, 400V, 600V	
	Accuracy	±(0.5% rdg + 3d)					
	Input Impedance	100M		11M		10M	
	Max. Input	1,000V DC and AC Peak					
AC Voltage	Range	4V, 40V, 400V, 600V					
	Accuracy	±(1.5% rdg + 5d)					
	Input Impedance	10M					
	Max. Input	750V DC and AC Peak 50Hz ~ 500Hz					
DC Current	Range	400A		1000A			
	Accuracy	±(2.0% rdg + 5d)					
	Resolution	0.1A		1A			
	Overload Port	1000A (Within 1 Minute)					
AC Current	Range	400A		1000A			
	Accuracy	±(2.0% rdg + 5d)					
	Resolution	0.1A		1A			
	Overload Port	1000A (Within 1 Minute)					
Resistance	Range	400K	4K	40K	400K	4M	10M
	Accuracy	±(2.0% rdg + 5d)					
	Resolution	100mΩ	1Ω	10Ω	100Ω	1KΩ	10KΩ
	Max. Input	600Vrms					
Frequency	Range	100Hz	1KHz	10KHz	100KHz	1MHz	
	Accuracy	±(2.0% rdg + 2d)					
	Resolution	0.01Hz	0.1Hz	1Hz	10Hz	100Hz	
	Max. Input	250V DC or rms					
Model		307 Only					
Power	Range	600KW					
	Accuracy	±(2.0% rdg + 3d)					
	Resolution	100W					
	Max. Input	1000V / 1000A					
Apparent Power	Range	600VA					
	Accuracy	±(2.0% rdg + 3d)					
	Resolution	1VA					
	Max. Input	1000V / 1000A					
Power Factor	Range	0.03 ~ 1					
	Accuracy	±(2.0% rdg + 3d)					
	Resolution	0.01					
	Max. Input	1000V / 1000A					
General							
Measuring Method		Dual Integration Mode					
Display		3 3/4 Digits LCD, Max. Reading of 3999					
Bar Graph Display		40 Segments					
Range		Auto or Manual Range					
Polarity		Automatic No Indication for Positive					
Sampling		Polarity Minus (-) Sign for Negative Polarity					
Low Battery Indication		Digital 2 Times / sec Bargraph 20 Times / sec.					
Operating Temperature		*BAT* Light 2.4 ± 0.3V					
Temp. Coefficient		0℃ ~ 40℃ (Below 80 R.H) Non-condensing					
Storage Temperature		(0℃ ~ 18℃), (28℃ ~ 40℃) Accuracy x 0.1					
Power Supply		-20℃ ~ 60℃ (Below 70 R.H) Non-condensing					
Auto Power Off		1.5V Battery(AAA) x 2pcs (305), 9V Battery x 1pcs (307)					
		30 Minutes					

Protek



Power Supply

Power Supplies are devices that supply electrical energy to another electrical device or a system of electrical devices. Protek power supplies are reliable and robust, providing the industry with quality products for over decades.



Power Supply

Protek

3003 / 3005 S.D.T Series

Features (3003/3005 S Series)

- It adopts SMD adhesive sheet element technology
- Liquid crystal displayed voltage and current
- Stable voltage and current displayed by liquid crystal screen
- Wanton choice of green, yellow liquid crystal back light
- Automatic conversion of stable voltage and current
- Multi-loop type high precision voltage regulation
- Progressive current regulation
- With expansion outlet terminal

Model	PL-3003S	PL-3005S	PL-5003S
Voltage	0 to 30V	0 to 30V	0 to 50V
Current	0 to 3A	0 to 5A	0 to 3A
Display			100mV to 1mA



Features (3003/3005 D Series)

- It adopts SMD adhesive sheet element technology
- Liquid crystal displayed voltage and current
- Liquid crystal displayed voltage and current regulation
- Wanton choice of green, yellow liquid crystal back light
- Automatic conversion of stable voltage and current
- Multi-loop type high precision voltage regulation
- Stepped current regulation
- Automatic work tracking by series or parallel connection means
- Can be full-load continuous operation
- With expansion outlet terminal

Model	PL-3003D	PL-3005D
Voltage	0 to 30V (two-way)	0 to 30V (two-way)
Current	2×3A	2×5A



Features (3003/3005 T Series)

- It adopts SMD adhesive sheet element technology
- Liquid crystal displayed voltage and current
- Liquid crystal displayed voltage and current regulation
- Wanton choice of green, yellow liquid crystal back light
- Automatic conversion of stable voltage and current
- Multi-loop type high precision voltage regulation
- Stepped current regulation
- Automatic work tracking by series or parallel connection means
- Can be full-load continuous operation
- With expansion outlet terminal

Model	PL-3003T	PL-3005T
Dual Output	Voltage 0 to 30V	0 to 30V
	Current 0 to 3A	0 to 5A
Fixed Output	Voltage 5V	5V
	Current 3A	3A

PL-3003T Series





Protek

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