2015
NEW PRODUCTS CATALOG

Power Supplies

Supports NI Data Dashboard for LabVIEW

The PVS Series delivers programmable output power up to 5.1 kW and is well suited for bench use, ATE systems integration, R&D, design verification, production test, and high voltage testing. The low-noise characteristic of the PVS Series makes these instruments particularly ideal for motor inverter testing. When operated with the optional SAS software, these power supplies can be used for solar array testing applications.

Features & Benefits

- Compact, high power density, 2U package
- Convenient single-phase AC input configuration
- Fast transient response time of ≤ 0.5 ms
- Standard USB (virtual COM), RS232, GPIB and LAN interfaces supporting SCPI commands
- External analog programming and monitoring interface
- Extensive protection features: OVP, OCP, OPP, OTP, foldback protection mode, and key-lock function

| Model		PVS60085	PVS60085MR	PVS10005
Output Ratings	Voltage	600 V		1000 V
	Current	8.5 A		5 A
	Power	5100 W	3000 W	5000 W
Load Regulation	Voltage	60 mV		100 mV
	Current	8.5 mA		5 mA
Ripple & Noise (20 Hz to 20 MHz)	Voltage	≤ 100 mVrms / ≤ 500 mVpp		≤ 100 mVrms / ≤ 600 mVpp
	Current	15 mA		10 mA
Programming Accuracy	Voltage	400 mV		700 mV
	Current	0.03% + 3.5 mA		0.03% + 2 mA
Dimensions (W x H x D)		420 mm x 88 mm x 532 mm		
Weight		14.6 kg		

Model PVS60085MR is a multi-ranging supply allowing any combination of the rated voltage and current up to the maximum output power of 3000 W.

Power supply guide

Introduction to different power supply types and the technology behind them, plus related terms, specifications and usage examples.

Power Supply Guide
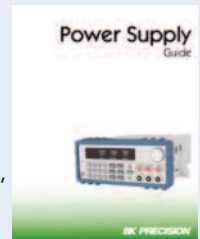
BK PRECISION

Visit "Applications" page at bkprecision.com

Solar Array Simulation (SAS) software option

Features

- Variety of input parameters (Voc/Isc/Vmp/Imp/FF/FFv/FFi)
- Monitors and logs real-time voltage, current, power, MPPT efficiency, and average MPPT efficiency
- Simulate I-V curve under different weather conditions during a day
- User-definable irradiance profile
- Generate a custom I-V curve with up to 1,024 data points
- Test to EN50530 and Sandia Labs standards
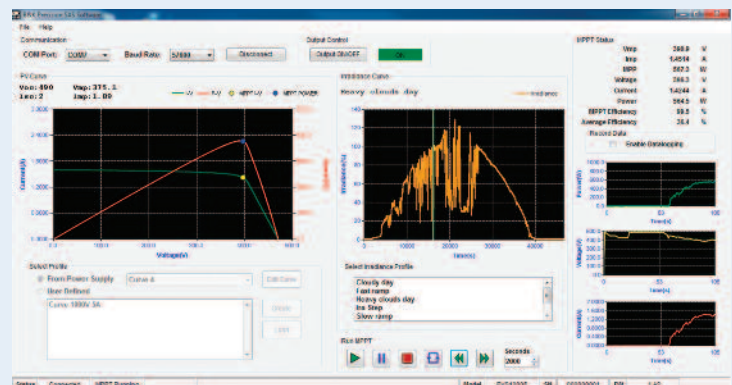
9115 Series - 1200 W Multi-Range DC Power Supplies

Any 9115 Series model can replace several supplies on your bench or in your rack. Unlike conventional supplies with fixed output ratings, these multi-range power supplies automatically recalculate voltage and current limits for each setting, providing full output power in any Volt/Amp combination within the rated voltage and current limits.

Model		9115	9115-AT	9116	9117
Output Ratings	Voltage	80 V		150 V	80 V
	Current	60 A		30 A	120 A
	Power	1200 W			3000 W
Load Regulation	Voltage	0.01 % + 5 mV		0.05 % + 30 mV	
	Current	0.1 % + 10 mA		0.1 % + 30 mA	
Ripple (20 Hz - 20 MHz)	Voltage	≤ 60 mVpp			≤ 80 mVpp
	Current	100 mArms		40 mArms	120 mArms
Progr./Readback Accuracy	Voltage	0.02 % + 30 mV		0.05 % + 30 mV	
	Current	0.1 % + 60 mA		0.2 % + 30 mA	0.2 % + 120 mA

Features & Benefits

- Multi-range operation
- Compact, high density, 1U rackmount form factor (2U for 9117)
- High programming and readback resolution
- Adjustable voltage slope (rise and fall times)
- Sequence programming (internal list mode for models 9115, 9115-AT, and 9116)
- Standard USB (USBTMC-compliant), RS-232, GPIB, RS-485, and LAN (9117 only) interfaces supporting SCPI commands for remote control
- Analog interface with control and monitoring functions
- Overvoltage protection (OVP), overpower protection (OPP), overtemperature protection (OTP), and key-lock function

Model 9115-AT automotive test functions

The 9115-AT provides automotive power test waveforms compliant to DIN 40839 and ISO 16750-2 standards that can simulate common test conditions for electrical and electronic devices installed in automobiles.
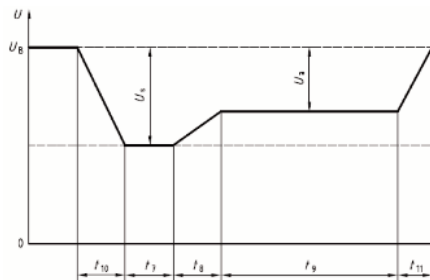
Motor startup curve test

B&K Precision's application software for selected power supplies integrate with National Instrument's NI Data Dashboard for LabVIEW, allowing you to remotely monitor your power supply on iOS, Android, or Windows 8 compatible tablets or smartphones. This app enables users to quickly develop a custom dashboard consisting of one or several indicators, charts, or gauges.

Supports NI Data Dashboard for LabVIEW

Power Supplies

9200 Series - Multi-Range Programmable DC Power Supplies

Supports NI Data Dashboard for LabVIEW

Features & Benefits

- Multi-range operation
- High programming and readback resolution
- List mode programming
- Standard USB, RS232, and GPIB interfaces for remote control
- Remote sense
- Built-in Digital Voltmeter (DVM)
- Store and recall up to 72 voltage/current presets
- Output timer function
- Overvoltage protection (OVP), overcurrent protection (OCP), and overtemperature protection (OTP)

Model		9201	9202	9205	9206
Output Ratings	Voltage	60 V	60 V	60 V	150 V
	Current	10 A	15 A	25 A	10 A
	Power	200 W	360 W	600 W	600 W
Load Regulation	Voltage	≤ 0.01%+5 mV	≤ 0.01%+8 mV	≤ 0.01%+15 mV	≤ 0.01%+15 mV
	Current	≤ 0.05%+4 mA	≤ 0.05%+6 mA	≤ 0.1%+10 mA	≤ 0.05%+10 mA
Ripple and Noise (20 Hz - 20 MHz)	Voltage	≤ 8 mVpp	≤ 15 mVpp	≤ 20 mVpp	≤ 50 mVpp
	Current	≤ 6 mArms	≤ 8 mArms	≤ 15 mArms	≤15 mArms
Programming/Readback Accuracy	Voltage	≤ 0.03%+5 mV	≤ 0.03%+5 mV	≤ 0.03%+5 mV	≤ 0.03%+20 mV
	Current	≤ 0.1%+10 mA	≤ 0.1%+15 mA	≤ 0.1%+25 mA	≤ 0.1%+25 mA

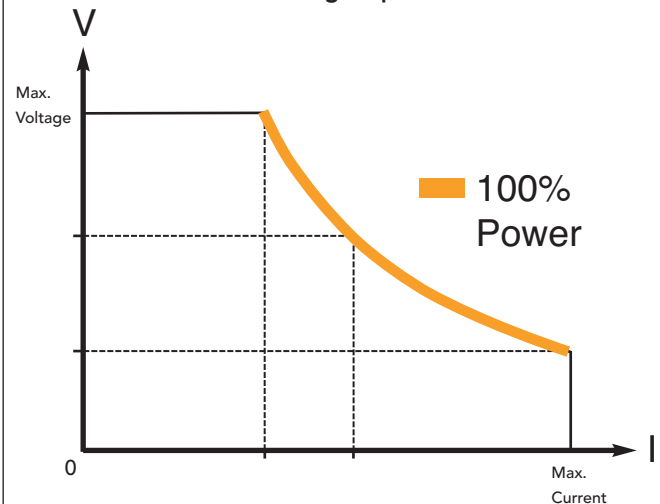## 9110 & 9111 - Multi-Range DC Power Supplies

Features & Benefits

- Multi-range operation
- 10 mV/1 mA resolution over the full range
- Store and Recall 4 x 100 groups of preset Volt/Amp values
- Temperature controlled, variable speed fan cooling
- Overvoltage protection (OVP), overcurrent protection (OCP), and overtemperature protection (OTP)

Multi-Range Operation

100% Power

The multi-ranging feature offers exceptional flexibility by providing any combination of the rated voltage and current up to the maximum output power of the supply.

Model		9110	9111
Output Ratings	Voltage	60 V	
	Current	5 A	8 A
	Power	100 W	180 W
Load Regulation	Voltage	≤ 0.01% + 3 mV	≤ 0.01% + 5 mV
	Current	≤ 0.01% + 3 mA	≤ 0.01% + 5 mA
Ripple and Noise (20 Hz - 20 MHz)	Voltage	≤ 2 mVrms	≤ 5 mVrms
	Current	≤ 5 mArms	≤ 8 mArms
Display/Setting Accuracy	Voltage	≤ 0.05% + 10 mV	
	Current	≤ 0.2% + 2 mA	≤ 0.3% + 5 mA
Dimensions (W x H x D)		88 mm x 175 mm x 282 mm	
Weight		2.65 kg	3.5 kg

9130B Series - Triple Output DC Power Supplies

Features & Benefits

- Three independent, fully programmable and electrically isolated outputs
- Tracking mode to adjust voltage and current settings for all channels simultaneously
- Connect any two or all three channels in series or parallel to produce higher voltages or currents
- 36 memory locations for instrument state storage & recall
- Standard USB (USBTMC-compliant), RS-232, & GPIB interfaces supporting SCPI commands for remote control
- Overvoltage protection (OVP) and overtemperature protection (OTP)

Model		9130B	9131B	9132B
Output Ratings	Ch1 & Ch2	30 V, 3 A	30 V, 6 A	60 V, 3 A
	Ch 3	5 V, 3 A	5 V, 3 A	5 V, 3 A
	Power	195 W	375 W	375 W
Load Regulation	Voltage	≤ 0.01%+3 mV	≤ 0.01%+3 mV	≤ 0.01%+3 mV
	Current	≤ 0.1%+3 mA	≤ 0.1%+3 mA	≤ 0.01%+3 mA
Ripple and Noise (20 Hz – 20 MHz)	Voltage	≤ 1 mVrms	≤ 1 mVrms	≤ 1 mVrms
	Current	≤ 3 mArms	≤ 5 mArms (ch1/ch2) ≤ 4 mArms (ch3)	≤ 4 mArms
Programming/Readback Accuracy	Voltage	≤ 0.03%+10 mV	≤ 0.03%+10 mV	≤ 0.03%+10 mV
	Current	≤ 0.1%+5 mA	≤ 0.1%+8 mA (ch1/ch2) ≤ 0.1%+5 mA (ch3)	≤ 0.1%+5 mA
Dimensions (W x H x D)		214.5 mm x 88.2 mm x 354.6 mm	214.5 mm x 88.2 mm x 445 mm	

9800 Series - AC Power Supplies

Features & Benefits

- Display Vrms, Irms, Ipeak, frequency, PF, apparent power, and active power simultaneously
- Dimmer function
- Power line disturbance simulation function
- Standard USB, RS232, and LAN interfaces supporting SCPI commands for remote control

| Model		9801	9803	9805
AC Output	Max Power	300 VA	750 VA	1500 VA
	Max Current (rms)	3 A (0-150 V), 1.5 A (0-300 V)	6 A (0-150 V), 3 A (0-300 V)	12 A (0-150 V), 6 A (0-300 V)
	Max Current (peak)	12 A (0-150 V), 6 A (0-300 V)	24 A (0-150 V), 12 A (0-300 V)	48 A (0-150 V), 24 A (0-300 V)
	Total Harmonic Distortion	≤ 0.5% at 45-500 Hz (resistive load)		
	Crest Factor	≥ 4		
	Line Regulation	0.1% max for a ±10% line change		
	Load Regulation	≤ 0.5% FS (resistive load)		
AC Input	Voltage	110/220 VAC ±10%		
	Max Current	8 A	15 A	30 A
Dimensions (W x H x D)		214.5 mm x 88.2 mm x 453.5 mm	439 mm × 131.4 mm × 535.7 mm	

DC Electronic Loads

Applications

The 8600 Series Programmable DC Electronic Loads can be used for testing and evaluating a variety of DC sources such as DC power supplies, DC-DC converters, batteries, battery chargers, and photovoltaic arrays.

Transient operation
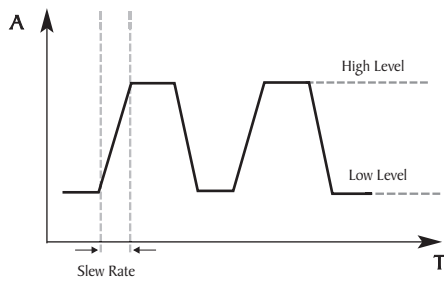
Transient operation enables the instrument to periodically switch between two load levels. A power supply's regulation and transient characteristics can be evaluated by monitoring the supply's output voltage under varying combinations of load levels, duty cycle, and slew rate.

List mode
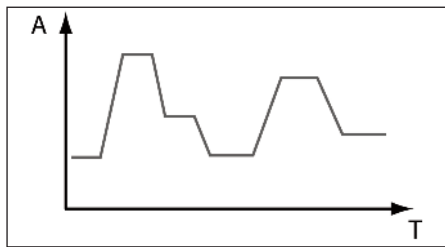
List mode lets you generate more complex sequences of input changes with several different levels. Up to 7 groups of list files can be saved. Each list can contain up to 84 steps with a minimum width time of 20 µs per step.

Features & Benefits

- CC/CV/CR/CW operating modes
- Measurement speed up to 50 kHz
- Remote sense function
- Built-in battery test function
- CR-LED mode to simulate the loading behavior of typical LEDs
- Adjustable slew rate in CC mode
- Store and recall up to 100 setups
- Standard RS232, USBTMC, and GPIB interfaces supporting SCPI commands for remote control
- Analog current control and monitoring
- OVP/OCP/OPP/OTP and reverse voltage protection

Model		8600	8601	8602	8610	8612	8614	8616
Input Ratings	Voltage (Hi)	120 V	120 V	500 V	120 V	500 V	120 V	500 V
	Current (Lo)	3 A	6 A	3 A	12 A	3 A	24 A	6 A
	Current (Hi)	30 A	60 A	15 A	120 A	30 A	240 A	60 A
	Power	150 W	250 W	200 W	750 W	750 W	1500 W	1200 W
CC Mode Accuracy	Low	± (0.05 % + 0.05 % FS)						
	High	± (0.05 % + 0.05 % FS)						
CC Mode Resolution	Low	0.1 mA			1 mA	0.1 mA	1 mA	0.1 mA
	High	1 mA			10 mA	1 mA	10 mA	1 mA
Transient Mode (CC mode)	T1 & T2	20 μs-3600 s / Resolution: 10 μs						
	Accuracy	5 μs + 100 ppm						
Dimensions (W x H x D)		218 x 90 x 387 mm			439 x 133.3 x 580 mm			

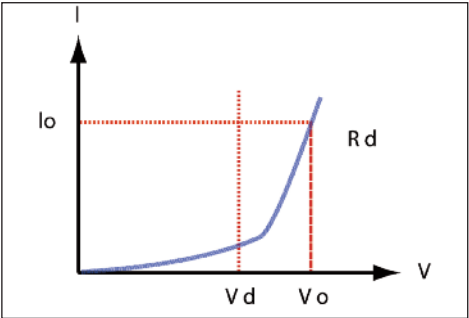## 8600 Series - Programmable DC Electronic Loads

CR-LED mode

Figure - LED I-V Curve

Vd = Forward voltage of the LED
Rd = LED's operating resistance
Vo = Operating voltage across the LED
Io = Operating current across the LED

Use the load's unique CR-LED operating mode to test LED drivers. This function allows users to configure the LED's operating resistance and forward voltage along with the voltage range (same as CR operation) to simulate the loading behavior of typical LEDs.

Models 8610 - 8616

Low voltage operation

The 8600 Series can operate at low voltages for applications such as fuel cell and solar cell testing.

High current test lead accessory
Model TLPWR1

- Length: 2 m
- Current: 60 A
- Gauge: 8 AWG
- Material: Flexible Silicon jacket
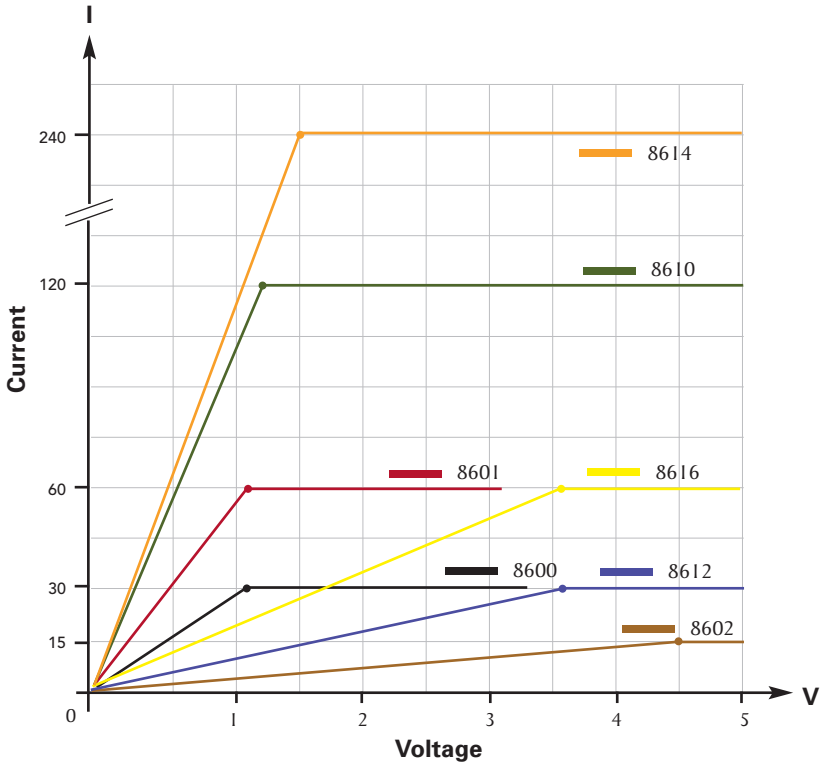
Typical minimum operating voltage at full scale current:

8600	8601	8602	8610	8612	8614	8616
1.1 V	1.1 V	4.5 V	1.2 V	3.6 V	1.5 V	3.6 V

LCR Meters & Multimeters

891 - Bench LCR Meter

LCR meter guide

Introduction to the benefits of LCR meters and the theory behind the measurements, plus related terms and example applications.
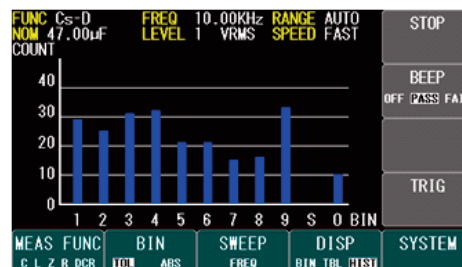
Visit applications page on bkprecision.com

The 891 is a compact, precise, and versatile LCR meter capable of measuring inductors, capacitors, and resistors at DC or from 20 Hz to 300 kHz, at both low and high impedance ranges. A large color display with all important parameters and measurements visible on one screen makes this meter easy to operate. A standard USB, GPIB and LAN interface enhances your productivity. The outstanding performance of the 891 makes it an invaluable tool in production, quality control and R&D.

Specifications		891
Measurement parameters		L, C, R, G, X, Z ,θ, Q, D, DCR
Basic accuracy		0.05%
Resistance measurement range		0.1 Ω – 20 MΩ
Test signal	Frequency range	20 Hz – 300 kHz
	Frequency accuracy	± 0.1%
	AC level range	0.5 Vrms, and 1 Vrms selectable
	AC level accuracy	5%
	Output impedance	100 Ω (typical)
Remote interfaces		USB (Virtual COM), GPIB, and LAN
Dimensions		218 x 90 x 387 mm
Weight		3.35 kg

392 & 393 - Handheld DMMs

Features	392 & 393
True RMS	√
Ranging	Auto/Manual
DCV Accuracy	0.08%
AC/DC Voltage and Current	√
Display Digits, Counts	4 5/6, 60000
Bar Graph	√
Capacitance Measurement	√
Transistor Test	-
Temperature Probe	√
Logic Probe	-
Relative Mode	√
Min/Max Hold	√
Peak Hold	√
Data Hold	√
USB	393 only
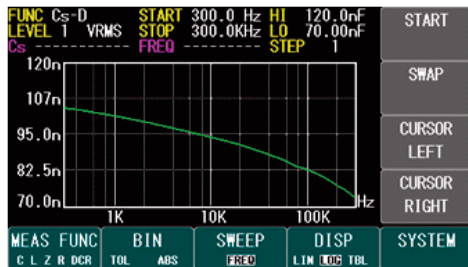
Linear and logarithmic sweep function to characterize components up to 300 kHz

Quickly sort components with 9 primary BINs, 1 secondary BIN, and 1 out BIN

Built-in web server and LAN interface

Configure and control basic instrument settings and take measurements from a remote computer using a web browser. The 891 can also be controlled with SCPI commands using a socket or Telnet connection via the LAN interface.

Function/Arbitrary Waveform Generators

## 4050 and 4060 Series - Dual Channel Function/Arbitrary Waveform Generators

4050 Series

4060 Series

WaveXpress™ Compatible

Series Comparison	4050 Series	4060 Series
Channels	2	2
Sine frequency range	Up to 50 MHz	Up to 160 MHz
Square frequency range	Up to 25 MHz	Up to 50 MHz
Frequency accuracy	± 100 ppm (1 year)	± 2 ppm (1 year)
Arbitrary waveform generator	14-bit, 125 MSa/s, 16 kpt	14-bit, 500 MSa/s, 16 kpt/512 kpt (ch2)
Display	3.5" color LCD	4.3" color LCD
Modulation	AM/FM/ASK/FSK/DSB-AM/PM/PWM	AM/FM/ASK/FSK/DSB-AM/PM/PWM
Linear/logarithmic sweep	√	√
Storage memory	10 instrument settings and 10 user-defined arbitrary waveforms	10 instrument settings and 32 user-defined arbitrary waveforms
Built-in counter	√	√
Front panel USB host port	√	√
USBTMC-compliant USB device port	√	√
External 10 MHz clock input	√	√
External 10 MHz clock output	-	√
Pulse width	16 ns minimum, 8 ns resolution	12 ns minimum, 100 ps resolution

Wide variety of modulation schemes
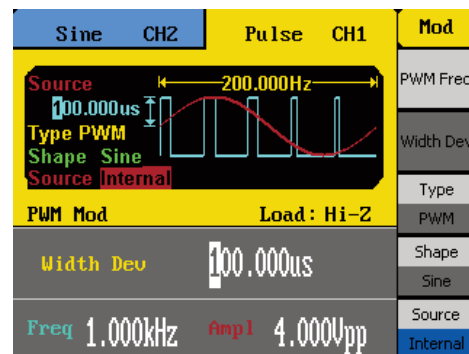
Modulate your waveforms with AM, DSB-AM, FM, PM, ASK, FSK, and PWM modulation schemes.

Synchronization and external triggering

Use the external 10 MHz clock input and output (4060 Series only) to synchronize your signals to a master time base.
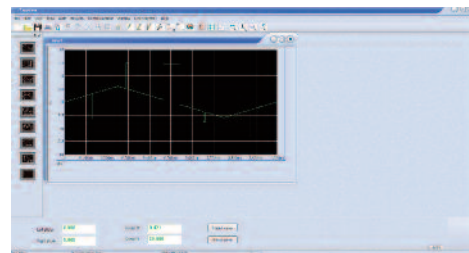

4060 Series

Advanced pulse generator

4060 Series adjustable rise/fall times

Typical DDS generator with limited rise/fall time ranges

The 4060 Series can generate pulses with minimum rise/fall times of 6 ns and maximum rise/fall times of 6 seconds.

Generate waveforms with ease

The provided waveform editing software can be used to create point-by-point arbitrary waveforms via freehand or waveform math functions.
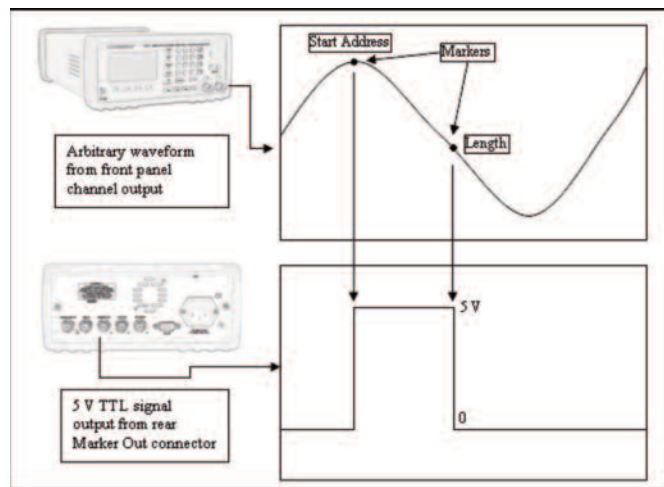
Arbitrary Waveform Generators

WaveXpress™ Compatible

Programmable markers
The 4075B Series provides fully programmable markers that allow you to generate a positive TTL level output signal at the points specified by address in memory and length up to 4000 points.


Features & Benefits

- 14-bit, 200 MSa/s, 16 Mpts arbitrary waveform generator
- Linear and logarithmic sweep
- AM/FM/FSK modulation
- Output ON/OFF button
- Gate and burst mode
- Store/recall up to 50 instrument settings
- USBTMC interface and SCPI-compliant command set
- Short circuit protection on output

Model		4075B	4078B	4076B	4079B	4077B	4080B
Channels		1	2	1	2	1	2
Frequency Characteristics	Sine	1 µHz - 30 MHz		1 µHz - 50 MHz		1 µHz - 80 MHz	
	Square	1 µHz - 30 MHz		1 µHz - 50 MHz		1 µHz - 60 MHz	
	Triangle, Ramp	1 µHz - 5 MHz					
	Pulse	1 mHz - 25 MHz					
Arbitrary Characteristics	Arbitrary Waveform Length	1 Mpts		4 Mpts		16 Mpts	
	Vertical Resolution	14 bits					
	Sampling Rate	200 MSa/s					

Dual architecture design
These generators provide the benefits of DDS and true point-by-point architectures without any limitations imposed by either technology. Standard waveforms such as sine and triangle are generated with a DDS chip, delivering great frequency resolution at a low cost. Generation of custom arbitrary waveforms is implemented with a true point-by-point design, offering improved signal integrity by producing significantly less jitter and distortion compared to a DDS-based architecture.
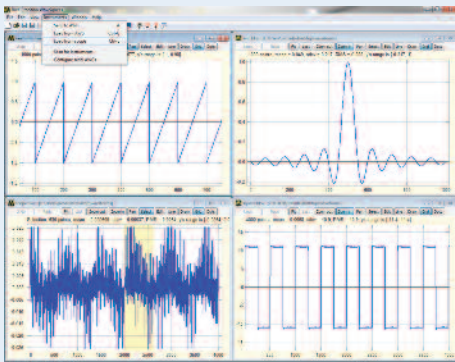
WaveXpress

WaveXpress is a comprehensive stand-alone application with several transformation options, allowing users to easily create complex waveforms. Quickly download them to your AWG and begin testing your circuits and systems moments later.

Available for download at:
bkprecision.com/WaveXpress.html

Features & Benefits
- Import waveforms from B&K scopes, AWGs, or load them from CSV or text files
- Autoscan function automatically detects instruments connected via RS232, USB, or GPIB
- Generate waveforms from scratch with drawing and editing tools. Insert commonly used waveforms and different types of noise
- Numerous transformations for changing a waveform. Add user-defined transformations in the python programming language

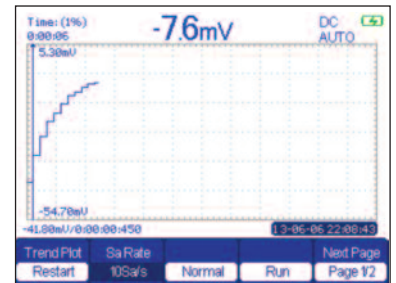## 2510 Series - 60 MHz & 100 MHz Handheld Digital Storage Oscilloscopes

Safety rated high bandwidth oscilloscope probes included

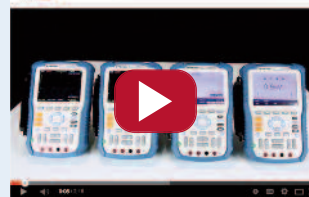Probe Model PR250SA for 2515/2516

Scope and meter trend plot functions

Capture intermittent errors in your system with the trend plot function to plot measurement values over time.
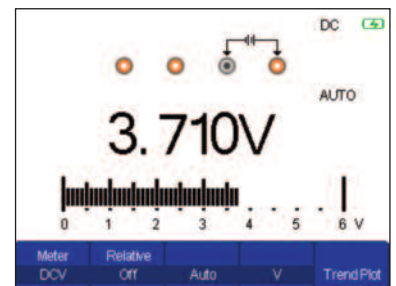
OVERVIEW VIDEO

Scan QR code to view video

Built-in 6000-count multimeter

Measurement functions include AC/DC voltage and current, resistance, capacitance, diode, and continuity test.

Model	2511	2512	2515	2516
Bandwidth	60 MHz	100 MHz	60 MHz	100 MHz
Sample Rate	1 GSa/s			
Memory	2 Mpts			
Display	5.7" color display			
Channels	2 non-isolated 300 V CAT II rated inputs		2 fully isolated 1,000 V CAT II, 600 V CAT III rated inputs	
Typical Applications	General electronics		Power electronics and industrial	

2190D - 100 MHz Digital Storage Oscilloscope

| Specifications	2190D
Bandwidth	100 MHz
Sample Rate	1 GSa/s
Memory	40 kpts
Display	7" widescreen color LCD
I/O	USB host port on front panel supports USB flash drives and optional USB-to-GPIB adapter, RS-232 and USB (USBTMC-compliant) device port for connection to PC, Pass/Fail output

EDU mode feature

Educators teaching oscilloscope fundamentals can benefit from the 2190D's EDU mode to disable the Auto set button, Measure menu, and Cursors menu.

About B&K Precision

For more than 60 years, B&K Precision Corporation has been building a reputation for excellence in the design and manufacture of reliable and cost-effective test and measurement instruments.

Our headquarters in Yorba Linda, California house most of our administrative and executive functions, including research and design, customer service and repair, and sales and marketing. Our European customers have become most familiar with B&K through our French subsidiary, Sefram. Engineers in Asia know us through our B+K Precision Taiwan operation as well as our ITECH brand. Our new B&K Precision Brasil office will support our expanding customer base in Brazil and other South American countries. The independent service center in Singapore services customers in Singapore, Malaysia, Vietnam, and Indonesia.
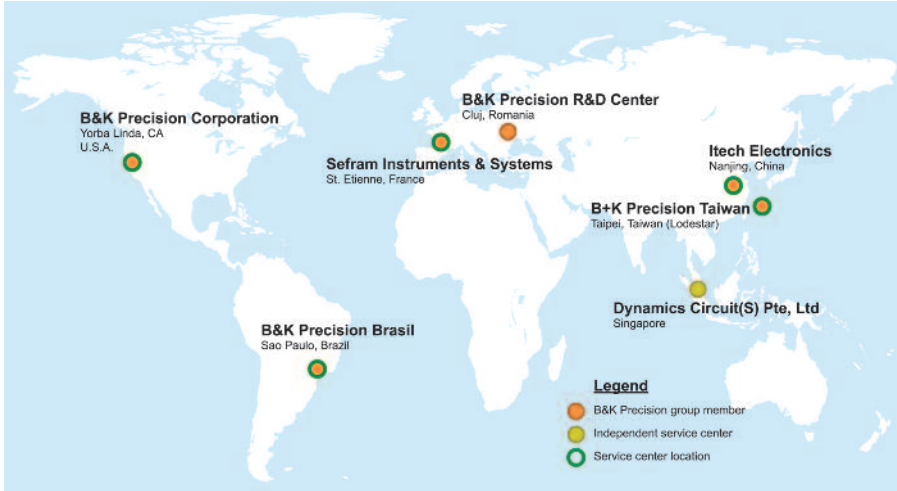
bkprecision.com

Detailed product information
Find all the information you need to quickly determine which instrument meets your requirements, including data sheets, user manuals, accessories, software and videos.

Applications
Here you will find a wealth of application notes, videos, product guides, and case studies addressing your measurement challenges.