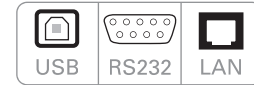


## Data Sheet

# Programmable AC Power Source Model 9801



The 9801 is both a programmable AC power source and measurement tool in a compact benchtop package. This fully programmable linear AC source delivers up to 300 VA through its universal line output terminal on the front and output connector on the rear. The output can be varied from 0 to 300 V with 0.1 V resolution, with adjustable start and stop phase angles from 0 to 360 degrees and maximum current of 3 A. The output frequency can be adjusted from 45 Hz to 500 Hz. The bright VFD display shows Vrms, Irms, Ipeak, frequency, power factor (PF), apparent power, true power and elapsed output time.

The AC source provides a power line disturbance (PLD) simulator, list mode, and sweep mode for simulation of common power grid faults and disturbances. A built-in dimmer function is also available for testing motors and LEDs.

List mode can be used to generate sequences of waveforms such as surges, sags, and frequency disturbances. The programmed list can be triggered from the front panel or via BNC connector on the rear.

Standard USB, RS232, and LAN interfaces can be used to remotely control the source via a PC. Free application software and LabVIEW driver are available to reduce programming time and increase productivity.

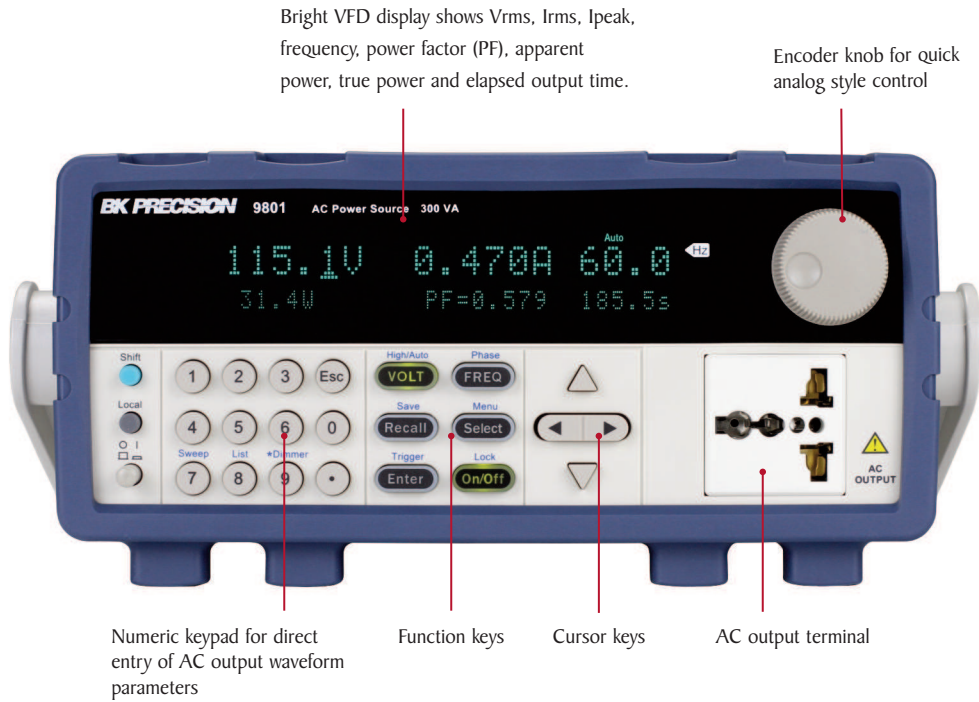
### Common applications

The 9801 AC power source is suitable for evaluating transformers, TRIACs, SCRs and passive components as well as production, R&D, service, and pre-compliance testing.

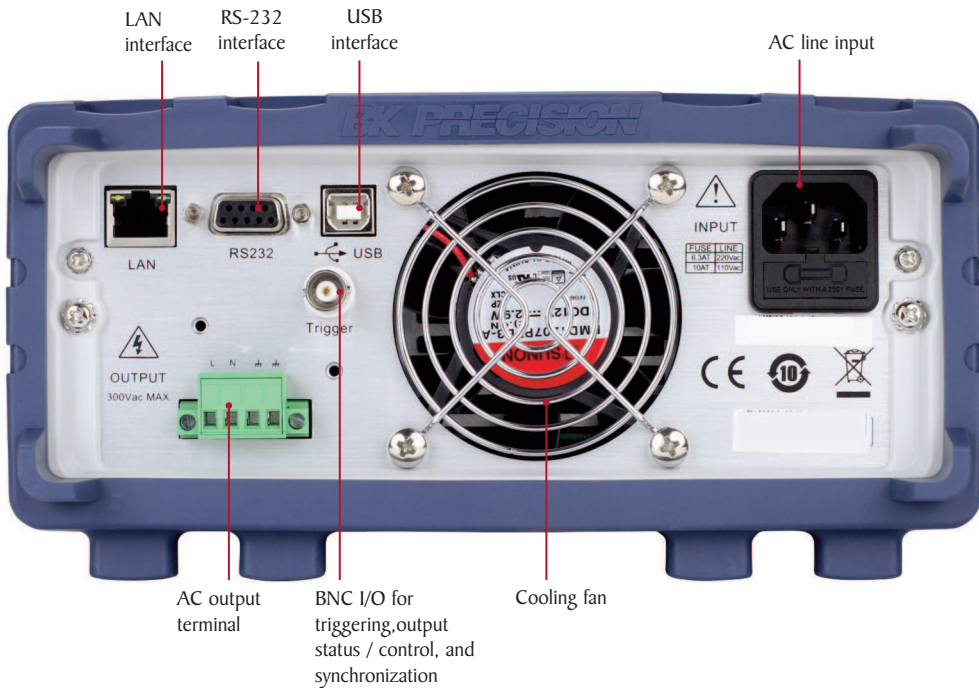
### Features

- 300 VA, 300 V, low distortion, single phase, AC power source delivering a maximum of 3 Arms / 12 Apeak
- Output frequency adjustable from 45 Hz – 500 Hz
- Select 150 V / 300 V autoranging or 300 V range operation for continuous sweep from 0 - 300 V
- Displays Vrms, Irms, Ipeak, frequency, PF, apparent power, true power, and elapsed output time
- Adjustable phase angle control
- Programmable voltage and frequency limit settings
- Built-in PLD and dimmer simulation
- Voltage and frequency sweep mode
- List mode: 10 user-defined programs with up to 100 programmable steps each
- BNC I/O for external triggering, output status indication/control, and synchronization
- Save and recall up to 100 instrument settings
- Standard USB (USBTMC-compliant), RS232, and LAN interfaces
- OVP/OCP/OPP/OTP protection modes and key lock function
- Compact 19" half-rack form factor allows for side-by-side rack mounting of two units
- Pre-compliance testing for voltage dips and frequency simulations according to IEC61000-4-11 / 4-14 / 4-28
- LabVIEW driver and softpanel for remote control available

## Front panel



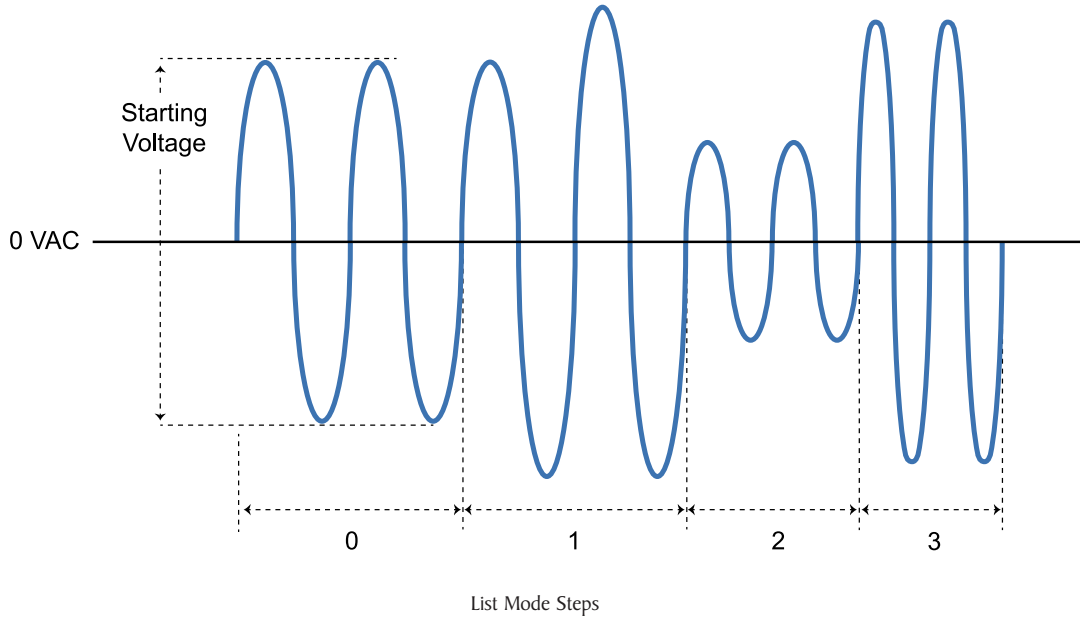
## Rear panel



## Flexible operation

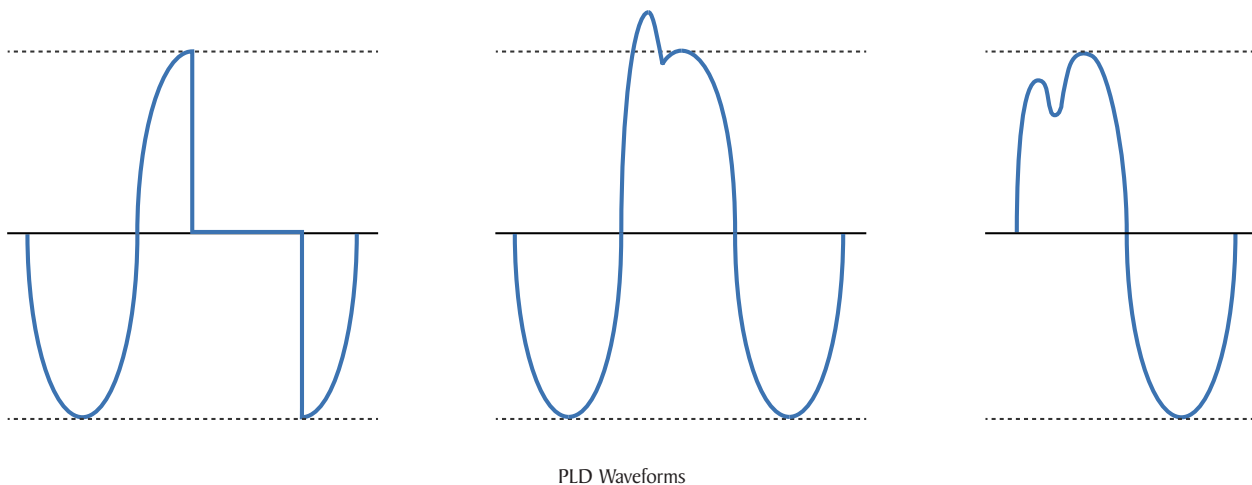
### List mode

List mode supports the generation of more complex sequences with varying times, amplitudes, and frequencies. Up to 100 steps in 10 groups can be saved and executed. This allows the user to build a wide range of waveforms in a sequence to simulate grid faults and disturbances. The programmed list can be triggered from the front panel or via BNC connector on the rear.



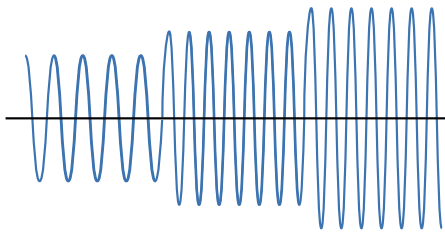
### Power line disturbance (PLD) simulator

The PLD simulator is an extended feature of list mode that provides the user with more control over the disturbance insertion into the waveform. This can be useful for evaluating a product's immunity performance. For instance, a user could produce common waveform disturbances like surge, sag, spikes, and dropouts at user-defined locations on the waveform.

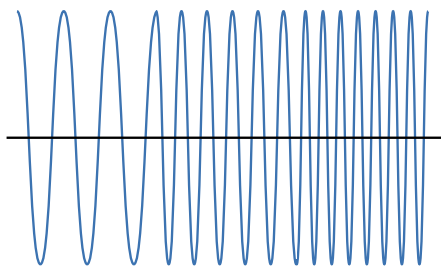


### Sweep mode

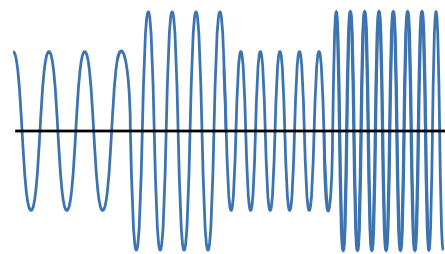
The sweep function is ideal for testing the efficiency of switching power supplies or capturing the maximum operating power requirements of the device under test. User-defined voltage and frequency sweeps can be created independently or combined. Up to 10 sweep profiles can be stored and recalled.



Voltage Sweep



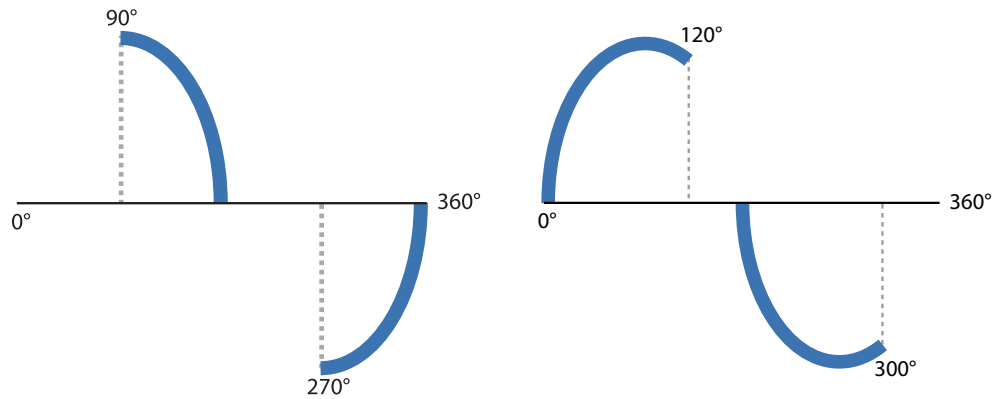
Frequency Sweep



Voltage plus Frequency Sweep

### Dimmer simulation

The dimmer feature can be used for many test applications such as motor control and lighting. By controlling the phase cut-off of the AC sine wave's leading or trailing edge, the dimmer simulation varies the RMS voltage supplied to the load under test. The phase cut-off can be adjusted for leading or trailing edge dimming between 0 – 180 degrees.



Leading Edge Dimmer at 90°

Trailing Edge Dimmer at 60°

### Application software

PC software is provided for front panel emulation, generating and executing list, PLD, and sweep profiles, or logging measurement data without the need to write source code.



Supports NI Data  
Dashboard for  
LabVIEW

## Specifications

Model		9801
<b>AC Input</b>		
Phase	Single	
Voltage	110 / 220 VAC $\pm$ 10%	
Frequency	47 - 63 Hz	
Max. Current	8 A max.	
Power Factor	0.5 (typical)	
<b>AC Output</b>		
Max. Power	300 VA	
Max. Current (rms)	0 - 150 V	3.0 A
	0 - 300 V	1.5 A
Max. Current (peak)	0 - 150 V	12 A
	0 - 300 V	6 A
Crest Factor	$\geq$ 4	
Phase	Single	
Total Harmonic Distortion (THD)	$\leq$ 0.5% at 45 - 500 Hz (Resistive load)	
Line Regulation	0.1% max for a $\pm$ 10% line change	
Load Regulation	$\leq$ 0.5% FS (Resistive load)	
Response Time	<100 $\mu$ s	
<b>Programming</b>		
Voltage (rms)	Range	0 -300 V, 150 V / 300 V (Auto)
	Resolution	0.1 V
	Accuracy	$\pm$ (0.2% + 0.6 V)
Frequency	Range	45 - 500 Hz
	Resolution	0.1 Hz at 45 - 99.9 Hz 1 Hz at 100 - 500 Hz
	Accuracy	$\pm$ 0.1 Hz (100 Hz) $\pm$ 1 Hz (100 - 500 Hz)
Phase Angle	Range	0 - 360°
	Resolution	0.1°
	Accuracy	$\pm$ 1° (45 - 65 Hz)

Note: All specifications apply to the unit after a temperature stabilization time of 15 minutes over an ambient temperature range of 23 °C  $\pm$  5 °C.

\* The current range switches from low to mid range or mid to high range when Ipeak > 300 % of the present range.

When Ipeak is <80 % of the high range, the current range switches from high to mid range.  
When Ipeak is <20 % of the mid range, the current range switches from mid to low range.

Measurements		
Voltage (rms)	Range	0 - 300 V
	Resolution	0.1 V
	Accuracy	$\pm$ (0.2% + 0.6 V)
Current (rms)	Range*	Low: 120.0 mA / Mid: 1.200 A / High: 3.00 A
	Resolution	Low: 0.1 mA / Mid: 1 mA / High: 10 mA
	Accuracy	Low: $\pm$ (0.2% + 0.4 mA) / Mid: $\pm$ (0.2% + 4 mA) / High: $\pm$ (0.2% + 20 mA)
Current (peak)	Range	0 - 12 A
	Resolution	0.01 A
	Accuracy	$\pm$ (1% + 120 mA)
True Power (watts)	Resolution	Low: 0.01 W / Mid: 0.1 W / High: 1 W
	Accuracy (47 - 65 Hz)	Low: $\pm$ (0.2% + 0.05 W) / Mid: $\pm$ (0.2% + 0.5 W) / High: $\pm$ (0.2% + 2 W)
Frequency	Range	45 - 500 Hz
	Resolution	0.1 Hz (45 - 99.9 Hz), 1 Hz (100 - 500 Hz)
	Accuracy	$\pm$ 0.1 Hz
Power Factor	Range	0.000 - 1.000
	Resolution	0.001
	Accuracy	True Power (w) / Apparent Power (VA)
Apparent Power (VA)	Resolution	Low: 0.01 VA / Mid: 0.1 VA / High: 1 VA
	Accuracy	Voltage (rms) x Current (rms)
Temperature Coefficient (typical)	$\pm$ 0.04% per °C	
<b>General</b>		
Memory	10 Locations	
External BNC I/O	Trigger input, sync output, output status, output indicator / control	
Interface	LAN, USB, RS232	
Operating Temperature	32 °F to 104 °F (0 °C to 40 °C) 20 - 80% R.H.	
Storage Temperature	-4 °F to 158 °F (-20 °C to 70 °C) $\leq$ 85% R.H.	
Environmental conditions	For indoor use only, max humidity 80%, no condensation	
Dimensions (W x H x D)	8.45" x 3.47" x 17.83" (214.5 x 88.2 x 453.5 mm)	
Weight	9.5 kg (20.94 lb.)	
<b>Two-Year Warranty</b>		
Standard Accessories	Power cord, instruction manual, test report & certificate of calibration	
Optional Accessories	IT-E151 rack mount kit	