**Data Sheet**

# Programmable AC Power Sources
## 9800 Series


* 9803 and 9805 only

The 9800 Series is both a programmable AC source and measurement tool. These fully programmable linear AC sources deliver a maximum of 1500 VA through the universal line output terminals on the front and the output connector on the rear. The output can be varied from 0 to 300 V with 0.1 V programming resolution. The output frequency can also be adjusted from 45 Hz to 500 Hz with start and stop phase angle from 0 to 360 degrees. The bright VFD display shows Vrms, Irms, Ipeak, frequency, power factor (PF), apparent power, true power, and elapsed output time.

These AC sources provide 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, LAN and GPIB* 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 9800 Series AC power sources are suitable for evaluating transformers, TRIACs, SCRs and passive components as well as production, R&D, service, and pre-compliance testing.

| Model | 9801 | 9803 | 9805 |
|---|---|---|---|
| Voltage (rms) | 0 - 300 V | | |
| Max. Power | 300 VA | 750 VA | 1500 VA |

### Features

- 0 to 300 V, low distortion AC power source with models delivering a maximum of 1500 VA, 12 Arms / 36 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, LAN and GPIB* interfaces
- OVP/OCP/OPP/OTP protection modes and key lock function
- 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

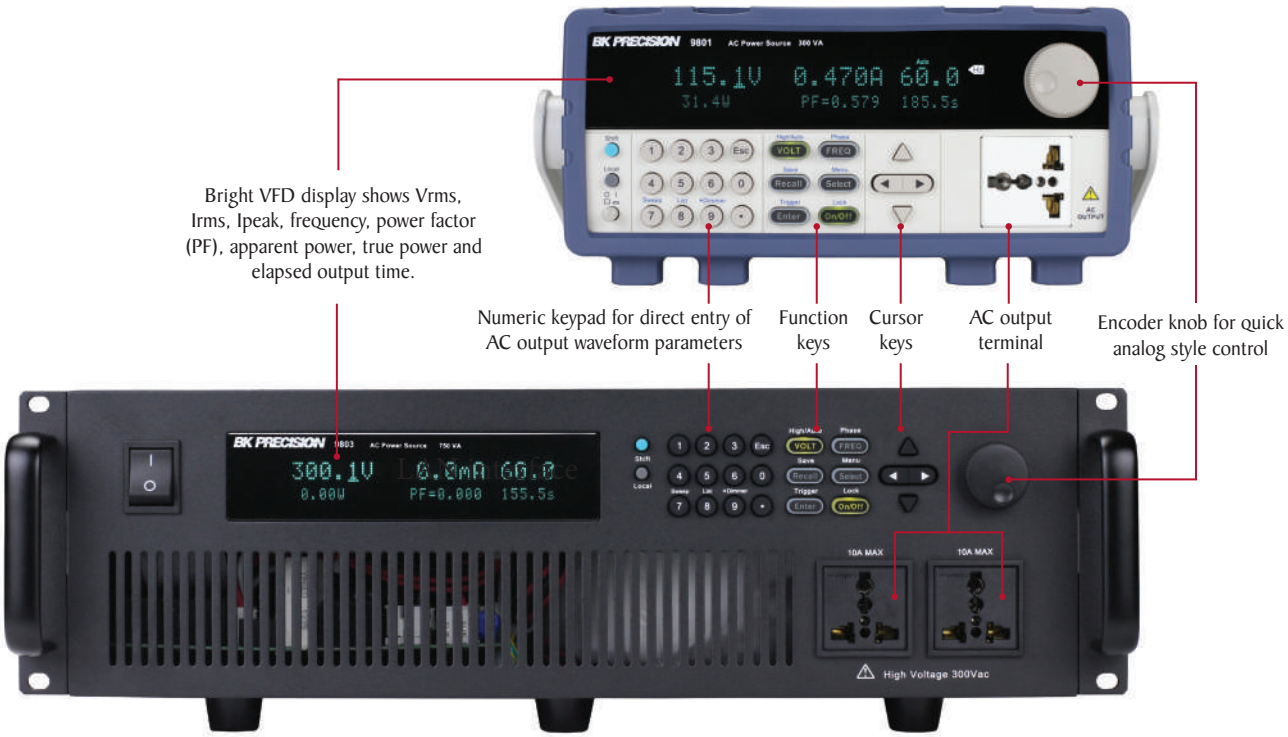




B&K PRECISION
ELECTRONIC TEST INSTRUMENTS

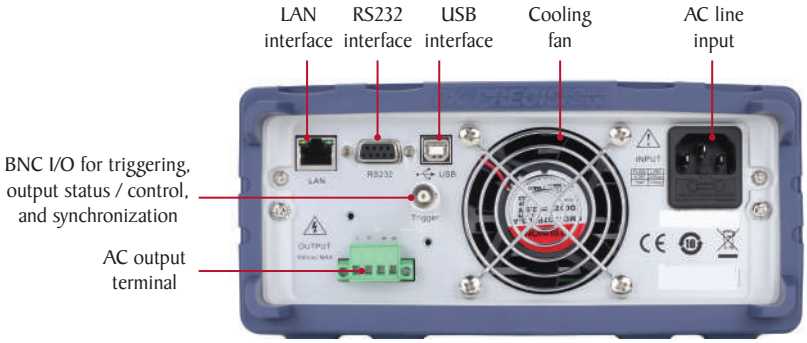
## Front panel

**Model 9801**

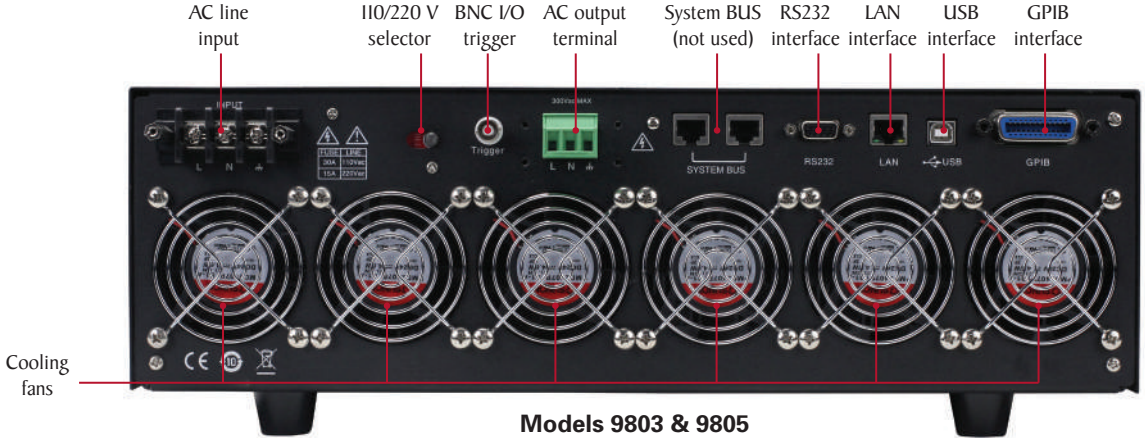



**Models 9803 & 9805**

## Rear panel




**Model 9801**

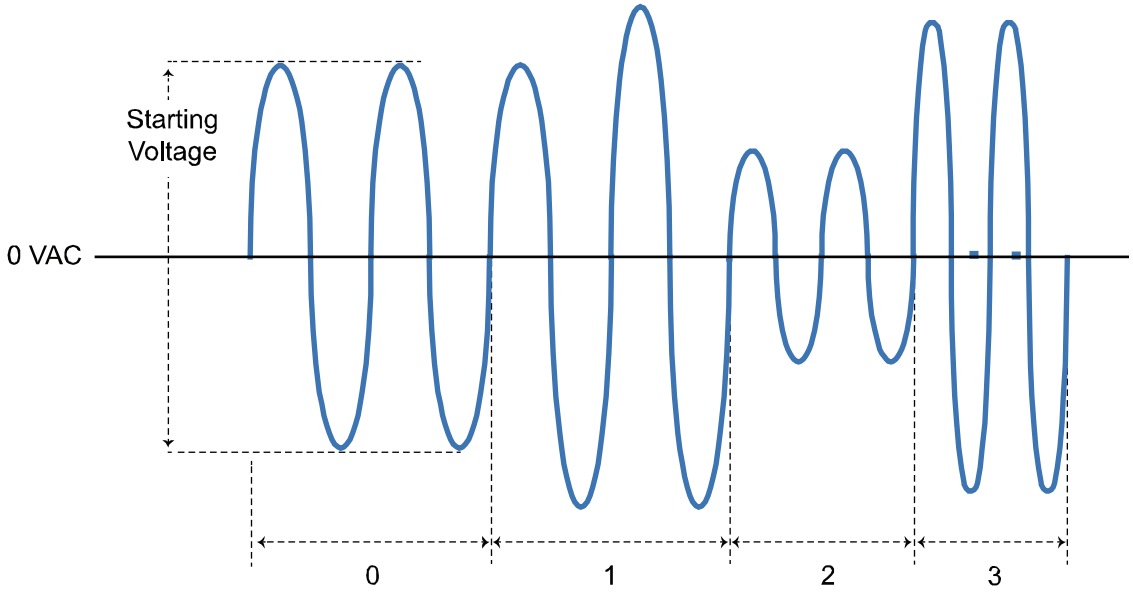



**Models 9803 & 9805**

# Flexible operation

### List mode

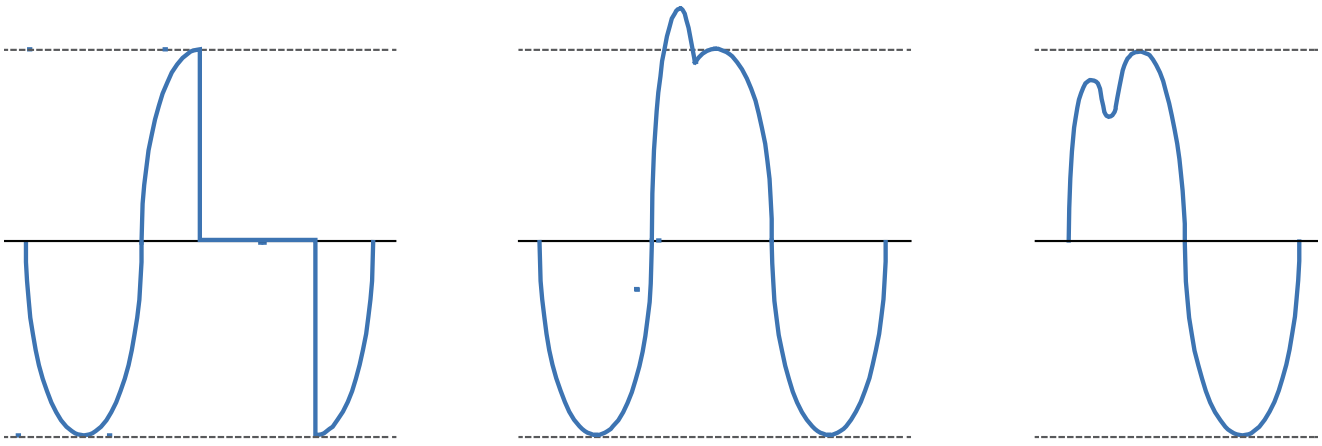
List mode supports the generation of more complex sequences with varying times, amplitudes, and frequencies. Up to 100 steps in 10 groups can be saved and executed. This allows the user to build a wide range of waveforms in a sequence to simulate grid faults and disturbances. The programmed list can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




List Mode Steps

### Power line disturbance (PLD) simulator

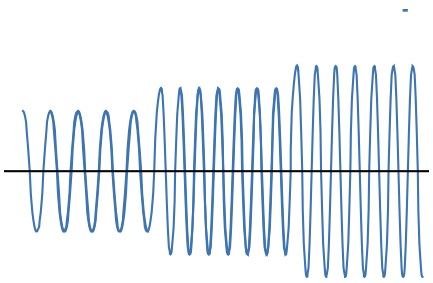
The PLD simulator is an extended feature of list mode that provides the user with more control over the disturbance insertion into the waveform. This can be useful for evaluating a product's immunity performance. For instance, a user could produce common waveform disturbances like surge, sag, spikes,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



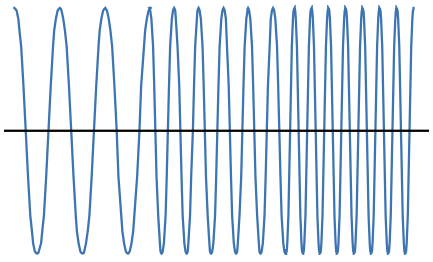
PLD Waveforms

## Sweep mode

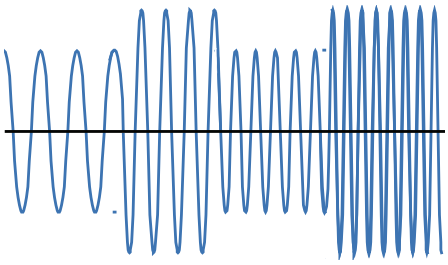
The sweep function is ideal for testing the efficiency of switching power supplies or capturing the maximum operating power requirements of the device under test. User-defined voltage and frequency sweeps can be created independently or combined. Up to 10 sweep profiles can be stored and recalled.



Voltage Sweep



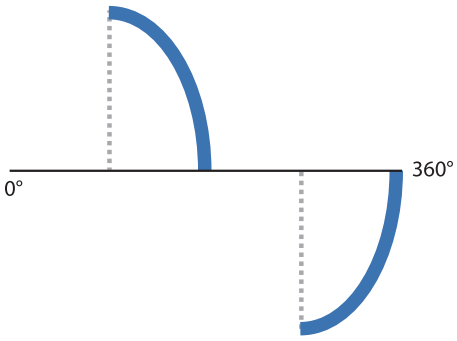
Frequency Sweep



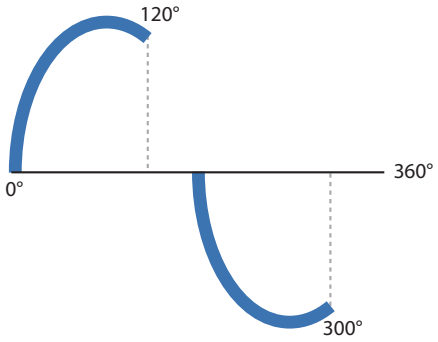
Voltage plus Frequency Sweep

## 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 | 9803 | 9805 |
|---|---|---|---|---|
| **AC Input** | | | | |
| Phase | | Single | | |
| Voltage | | 110 / 220 VAC ± 10% | | |
| Frequency | | 47 - 63 Hz | | |
| Max. Current | | 8 A max. | 15 A max. | 30 A max. |
| Power Factor | | 0.5 (typical) | 0.7 (typical) | 0.7 (typical) |
| **AC Output** | | | | |
| Max. Power | | 300 VA | 750 VA | 1500 VA |
| Max. Current (rms) | 0 - 150 V | 3.0 A | 6 A | 12 A |
| | 0 - 300 V | 1.5 A | 3 A | 6 A |
| Max. Current (peak) | 0 - 150 V | 9 A | 18 A | 36 A |
| | 0 - 300 V | 6 A | 12 A | 24 A |
| Crest Factor | | ≥4 | | |
| Phase | | Single | | |
| Total Harmonic Distortion (THD) | | ≤0.5% at 45 - 500 Hz (Resistive load) | | |
| Line Regulation | | 0.1% max for a ±10% line change | | |
| Load Regulation | | ≤0.5% FS (Resistive load) | | |
| Response Time | | <100 µs | | |
| **Programming** | | | | |
| Voltage (rms) | Range | 0 -300 V, 150 V / 300 V (Auto) | | |
| | Resolution | 0.1 V | | |
| | Accuracy | ±(0.2% + 0.6 V) | | |
| Frequency | Range | 45 - 500 Hz | | |
| | Resolution | 0.1 Hz at 45 - 99.9 Hz<br>1 Hz at 100 - 500 Hz | | |
| | Accuracy | ±0.1 Hz (100 Hz)<br>±1 Hz (100 - 500 Hz) | | |
| Phase Angle | Range | 0 - 360° | | |
| | Resolution | 0.1° | | |
| | Accuracy | ±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 ± 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.

**9803 & 9805 Standard Accessories**

Unterminated power cord

Rackmount ears with handles

| **Measurements** | | | | |
|---|---|---|---|---|
| Voltage (rms) | Range | 0 - 300 V | | |
| | Resolution | 0.1 V | | |
| | Accuracy | ±(0.2% + 0.6 V) | | |
| Current (rms) | Range* | Low: 120.0 mA / Mid: 1.200 A / High: 3.00 A | Low: 120.0 mA / Mid: 1.200 A / High: 6.00 A | Low: 120.0 mA / Mid: 1.200 A / High: 12.00 A |
| | Resolution | Low: 0.1 mA / Mid:1 mA / High: 10 mA | | |
| | Accuracy | Low: ±(0.2% + 0.4 mA) / Mid: ±(0.2% + 4 mA) / High: ±(0.2% + 20 mA) | | |
| Current (peak) | Range | 0 - 9 A | 0 - 18 A | 0 - 36 A |
| | Resolution | 0.01 A | | |
| | Accuracy | ±(1% + 120 mA) | | |
| True Power (watts) | Resolution | Low: 0.01 W / Mid:0.1 W / High: 1 W | | |
| | Accuracy (47 - 65 Hz) | Low: ±(0.2% + 0.05 W) / Mid: ±(0.2% + 0.5 W) / High: ±(0.2% + 2 W) | | |
| Frequency | Range | 45 - 500 Hz | | |
| | Resolution | ±0.1 Hz (45 - 99.9 Hz), ±1 Hz (100 - 500 Hz) | | |
| | Accuracy | ±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) | | ±0.04% per °C | | |
| **General** | | | | |
| Memory | | 10 Locations | | |
| External BNC I/O | | Trigger input, sync output, output status, output indicator / control | | |
| Interface | | LAN, USB, RS232 | LAN, USB, RS232, & GPIB | |
| 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) ≤ 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) | 17.3" x 5.2" x 21.1" (439 x 131.4 x 535.7 mm) | |
| Weight | | 20.94 lb (9.5 kg) | 88.2 lb (40 kg) | 115 lb (52.16 kg) |
| ***Two-Year Warranty*** | | | | |
| Standard Accessories | | AC Power cord (9801 only), unterminated power cord with input connector (9803 & 9805 only), rackmount ears & handles (9803 & 9805 only), instruction manual, test report & certificate of calibration | | |
| Optional Accessories | | IT-E151 rack mount kit (9801 only) | | |