

BK8500B SERIES

Programmable DC Electronic Loads



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BK PRECISION
ELECTRONIC TEST INSTRUMENTS

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Applications

- Performance verification of photovoltaic solar panel
- Simulation loading behavior and test LED drivers
- Fuel and solar cell market
- High voltage applications
- Battery test industries cell-phone, automotive, aerospace
- Power supply manufactures
- Benchtop and production line



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Overview

- Voltage range to 500 V
- Current range to 120 A
- Power range to 600 W
- CC/CV/CR/CW operating modes
- 16-bit voltage and current measurement system providing 0.1 mV / 0.1 mA resolution
- Transient mode up to 10 kHz in CC mode
- List mode function
- Rack-mountable
- TTL (DB9) interface
- 3 years warranty

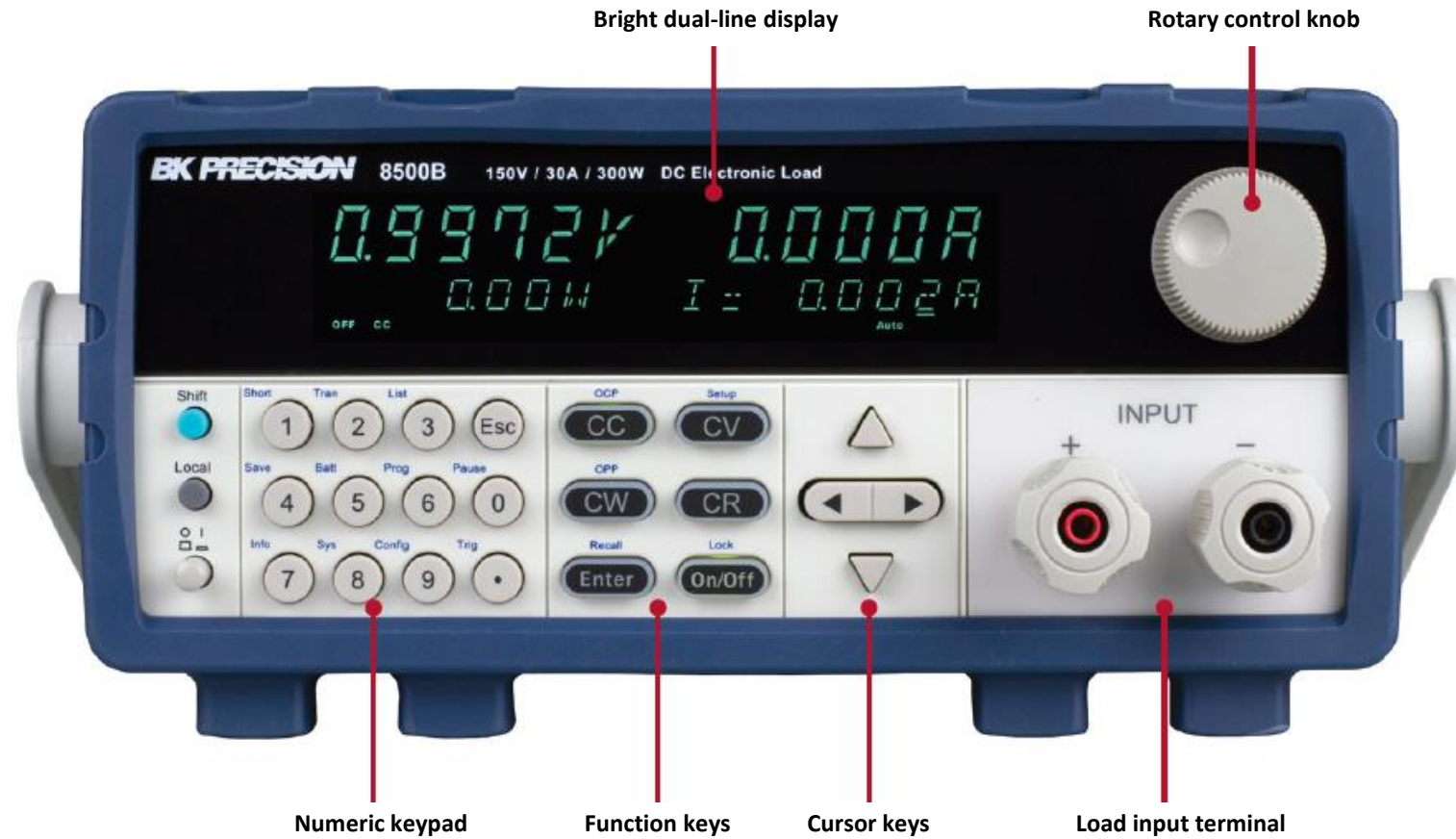


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Front panel

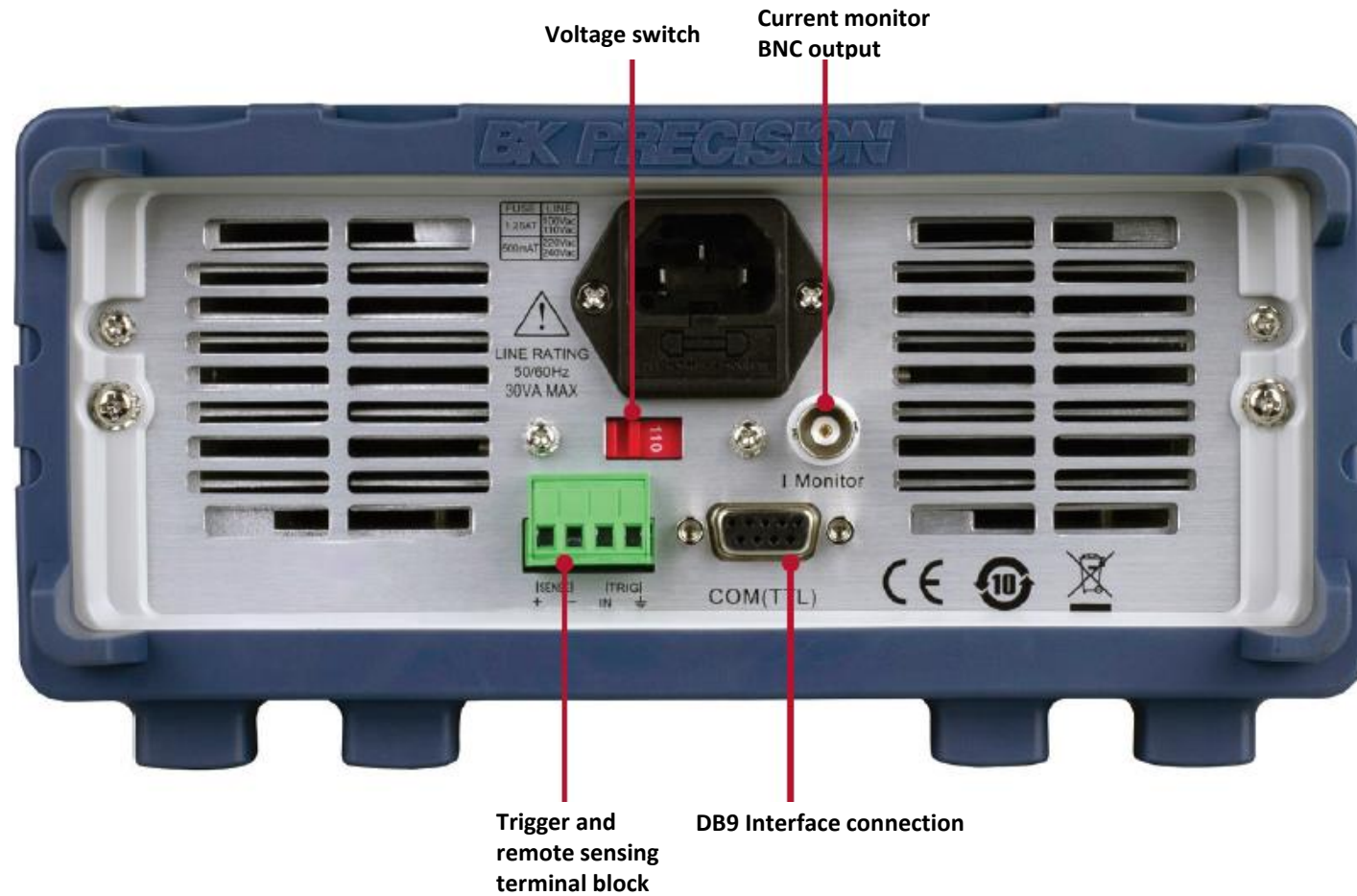


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Rear panel



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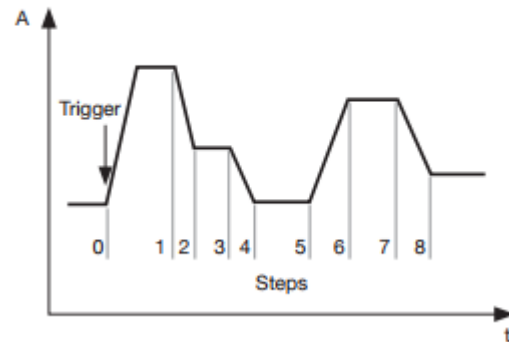
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Flexible operation

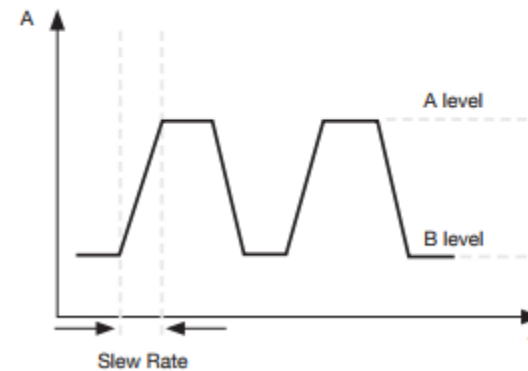
list mode, Transient operation, Automatic test mode

List mode



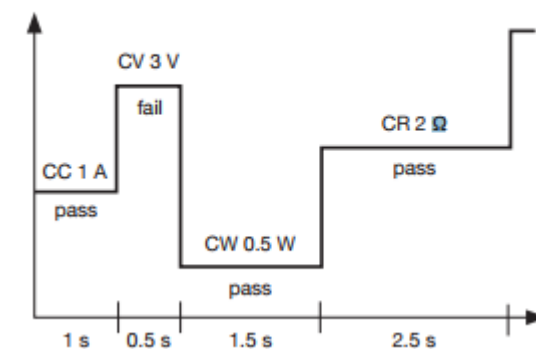
List mode lets you generate more complex sequences of input changes with several different levels. Save up to 7 groups of list files to internal memory for recall and set parameters including step counts (range 2 - 84), width time of a single step (minimum 20 μ s), step value, and slope.

Transient operation



Transient operation to periodically switch between two load levels. A power supply's regulation and transient characteristic can be evaluated by monitoring the supply's output voltage under varying combinations of load levels, frequency, duty cycle, and slew rate. These combinations are all controllable in the continuous, pulse, and toggled modes.

Automatic test mode



Execute multiple test sequences in automatic test mode. Up to 100 different sequences can be linked to run steps of various operating modes and load conditions.

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Flexible operation

Low voltage operation

CR-LED mode

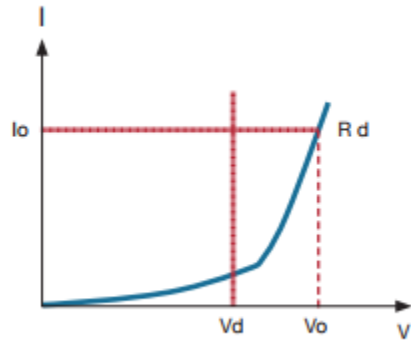


Figure - LED I-V Curve

V_d = Forward voltage of the LED

R_d = LED's operating resistance

V_o = Operating voltage across the LED

I_o = Operating current across the LED

Use the load's unique CR-LED operating mode to test LED drivers.

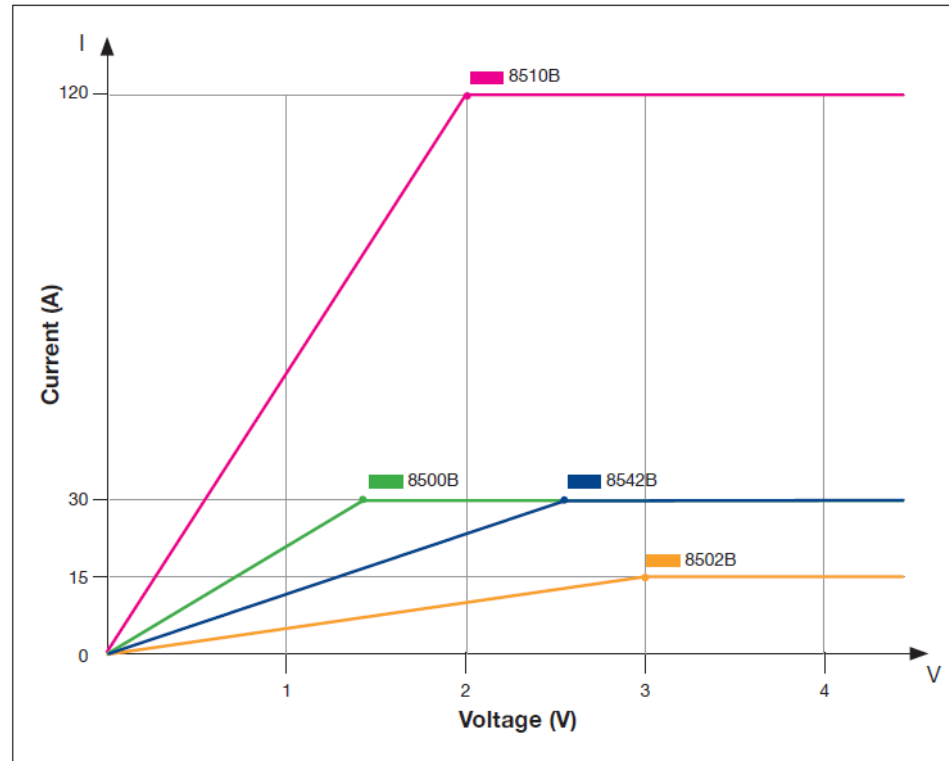
This function allows users to configure the LED's operating resistance and forward voltage along with the voltage range (same as CR operation) to simulate the loading behavior of typical LEDs

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Low voltage operation

The 8500B Series can operate at low voltages for applications in fuel cell and solar cell testing.

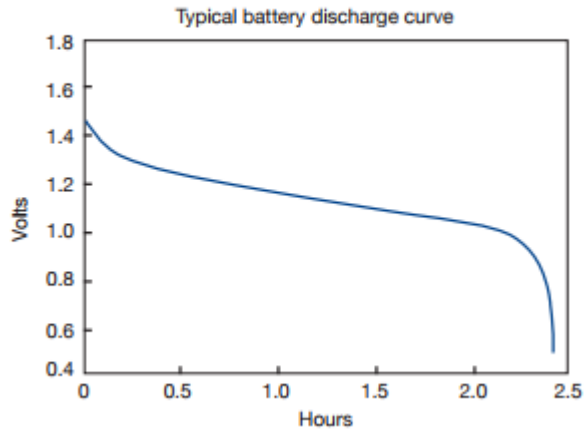


Typical minimum operating voltage at full scale current

8542B	8500B	8502B	8510B
2.5 V	1.4 V	3 V	2 V

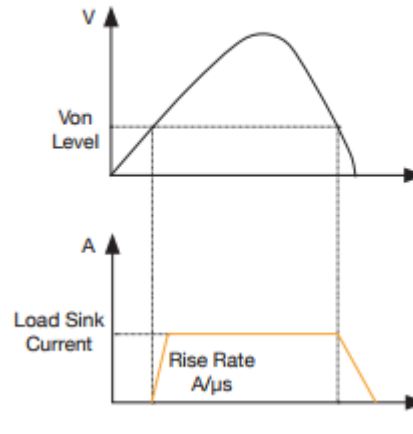
Battery test function, Voltage-on latch operation, Adjustable slew rate

Battery test function



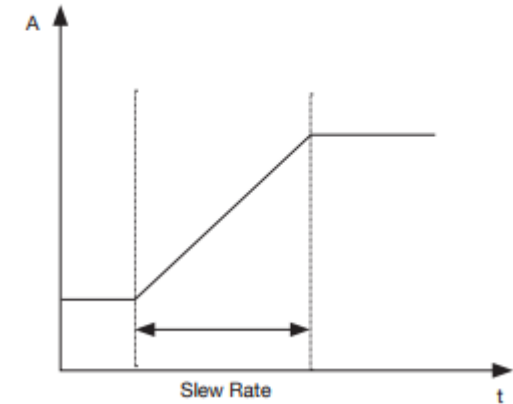
The built-in battery test function uses CC mode to calculate the battery capacity using a fixed current load discharge. Users can specify cut-off voltage level, capacity level, and time stop conditions.

Voltage-on (Von) latch operation



Control the input turn on state for the DC electronic load by configuring the Von latch function. This can be used to start and stop discharging of a battery or other power source at a specified voltage level.

Adjustable slew rate



In CC mode, users can control the rate or slope of the change in current in a transient response test. Set the slew rate to as low as $0.0001 A/\mu s$ or as fast as $1.5 A/\mu s$ depending on the model and selected current range.

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Remote control and programming

Software

PC software is provided for front panel emulation, generating and executing test sequences, or logging measurement data without the need to write source code. Additionally, this application software integrates with NI Data Dashboard for LabVIEW apps, allowing users to create a custom dashboard on a tablet computer or smart phone to remotely monitor 8500B Series DC loads.

- Remote monitoring on iOS, Android or Windows 10 compatible tablets or smart phones
- Log voltage, current, and power values with time stamp.
- Run transient operation and list mode programs remotely.
- Create an unlimited number of external list files to be executed from PC memory

The screenshot displays the software interface for remote control and programming. The top section, titled 'Communication', shows the selected communication port as 'USB0::0xFF:0x8800' and the baud rate as 4800. Real-time measurements are displayed as Voltage: 0.8907 V, Current: 1.4376 A, and Power: 1.281 W. On the right, there are status indicators for Over current, Reverse voltage, Over voltage, Remote sense reverse voltage, Over power, Remote sense, and Over temperature, all of which are currently inactive.

The main interface is divided into several tabs: Main, Waveform Recording, Transient Operation, Buffer Operation, List Program, and External Program. The 'List Program' tab is active, showing a table of test steps and various configuration options.

Step #	Level (A)	Width (s)	Slew Rate (A/us)
1	1.6540	1.5	1.0000
2	2.7850	2.6	1.0000
3	3.4530	5.7	1.0000
4	4.1440	9	1.0000
5	5.7800	10	1.0000
6	3.0000	10	1.0000
7	1.0000	1.45	1.0000
8	1.2350	1	1.0000
9	1.0000	1	1.0000
10	1.0000	1	1.0000
11	1.0000	1	1.0000
12	1.0000	1	1.0000
13	1.0000	1	1.0000
14	1.0000	1	1.0000
15	1.0000	1	1.0000

Configuration options include Range (20.00), Total Steps (2), List Count (1), List Number (1), and various logging and timestamp settings. The 'Run List' button is highlighted, and the status bar at the bottom shows 'State: Idle', 'Model: 8600', 'FW Ver.: 1.32-1.37', and 'SN: 602197010697010001'.

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Selection guide




Model	Power	Rated voltage	Rated Current	Form Factor	Price
BK8542B	150 W	0 – 150 V	0 – 30 A	2U half-rack	870 €
BK8500B	300 W	0 – 150 V	0 – 30 A	2U half-rack	1170 €
BK8502B	300 W	0 – 500 V	0 – 15 A	2U half-rack	1290 €
BK8510B	600 W	0 – 120 V	0 – 120 A	2U half-rack	2185 €

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Comparative

Stand-alone DC Electronic Load Series Comparison Guide			
	8500 Series	8500B Series	8600 Series
			
Starting list price	1 200 €	870 €	1 150 €
Operating modes	CC/CV/CR/CW		
Transient mode	1 kHz fixed	adjustable up to 10 kHz	adjustable up to 25 kHz
Max CC mode accuracy	Low range: 0.1% (rdg) + 0.1% F.S.	Low range: 0.05% (rdg) + 0.05% F.S.	
Max CC/CV mode resolution	0.1 mA / 1 mV	0.1 mA / 1 mV	0.1 mA / 0.1 mV
Max measurement resolution	1 mV / 0.1 mA	0.1 mV / 0.1 mA (16-bit)	
communication protocol	proprietary (26 byte) protocol	SCPI and (26 byte) protocol, backward compatible with 8500	SCPI
PC interface	DB9 (TTL) interface with USB adapter		USBTMC, RS232, GPIB
Front panel	Single row VFD: To display power values and other settings, up and down keys must be used.	Dual row VFD (multi-segment): Display voltage, current and setting values at the same time.	Dual row VFD (dot-matrix): Display voltage, current and setting values at the same time.
	Spade type input terminals only	Multi-type spade or banana plug input terminals	
	Only up and down cursor	Up down and left and right cursor, more convenient menu navigation and value editing	
Additional functions	OVP/OCP/OPP/OTP Recall 25 instrument settings.	CR-LED mode. Comprehensive protection features: OVP/OCP/OPP/OTP, LRV/RRV (local and remote reverse voltage protection). Recall 100 instrument settings.	
Software	Application software for front panel emulation, battery discharge profiling and basic	Application software for front panel emulation and data logging. Battery test software for battery charge/discharge testing.	
Power Range	300 W - 2400 W	150 W - 600 W	150 W - 6000 W
Warranty	1 year	3 years	3 years

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