Programmable DC Electronic Loads
8550 Series

The 8550 Series DC electronic loads provide many features and capabilities typically found in performance instruments, at a value price. Capable of sinking 350 W in a compact benchtop form factor, this series is well equipped for testing and evaluating power supplies, DC-DC converters, batteries, battery chargers, and photovoltaic arrays.

Static operating modes include constant current (CC), constant voltage (CV), constant resistance (CR), and constant power (CW). Configurable list, transient, and automatic test modes offer dynamically changing load conditions for evaluating a variety of DC sources. Additionally, the dedicated battery discharge mode simplifies battery testing with configurable stop conditions. Load behavior can be triggered internally, externally, or remotely.

Operating software and battery test software are provided for remote PC control and monitoring through the RS232 interface. The general-purpose handler interface offers pass/fail feedback and simplifies integration with PLC devices, commonly found in production and manufacturing environments. Measurement data and other parameters can be logged directly to a flash drive connected to the front panel USB host port.

Advanced power supply characterization

The 8550 Series offers several built-in functions for evaluating DC power supplies including:

- Sweep test
- Load regulation test
- Protection limit test

Model	8550	8551
Power	175 W	350 W
Rated Voltage	150 V	150 V
Rated Current	30 A	60 A

Features and benefits

- High power density, up to 350 W in compact 2U half-rack form factor
- Transient mode up to 20 kHz in CC mode
- CC/CV/CR/CW operating modes
- Front-panel remote sense terminals
- List mode programming
- Automatic test mode
- Overvoltage (OVP), overcurrent (OCP), Overpower (OPP) protection, remote reverse voltage (RRV), and key-lock function
- Thermostatically-controlled fans for quiet operation
- Short-circuit test
- CR-LED mode to simulate the loading behavior of typical LEDs
- Configurable battery discharge test
- Adjustable voltage/current slew rate
- Front panel USB host port for logging measurement data
- Save/recall instrument settings to internal memory
- Analog current monitoring BNC output
- Operating software and battery test software provided
- 4.3-inch LCD screen
- RS232 and Handler interfaces

Technical data subject to change
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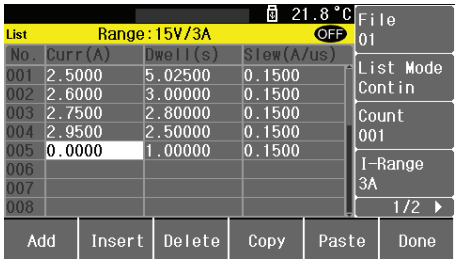
Operation highlights

List mode

The 8550 Series list mode is highly configurable for generating precise load sequences.

Each list mode program contains up to 100 user programmable steps. Save up to 10 list mode program files directly to internal memory for quick recall. Step parameters include current limit, step duration, and slew rate. This series supports extended list mode features with the ability to advance list steps upon receipt of an internal/external trigger. List mode programs can be configured and run from the front panel or remotely using the provided application software.



List mode configuration menu

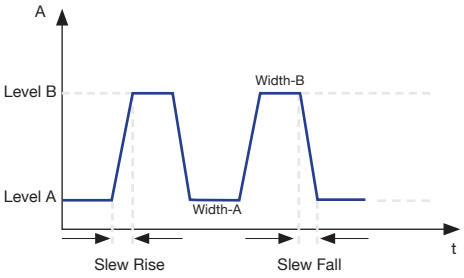
Direct data logging

Log voltage, current, and power measurement data with peak-to-peak statistics directly to a USB flash drive. Data is exported as a text file which can be transferred to a PC for further analysis. Data can be logged automatically every three seconds or manually with a key press.

Transient operation

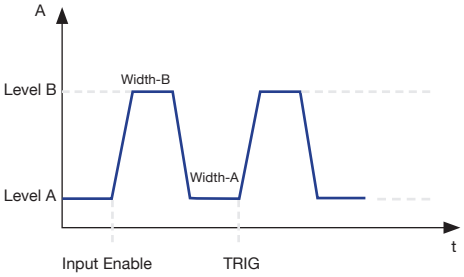
Transient operation enables the DC load to periodically switch between two load levels.

Transient – continuous



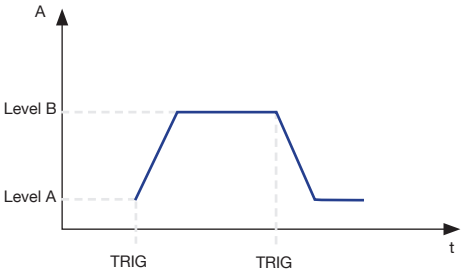
Switch continuously between A and B load current levels where rise/fall slew rates and level width can be adjusted.

Transient – pulse



Upon receipt of a trigger signal, the load executes one pulse cycle then returns to load current level A.

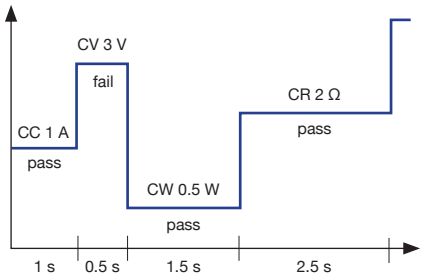
Transient – toggle



The DC load current will toggle between Level-A and Level-B following receipt of a trigger signal.

Automatic test mode

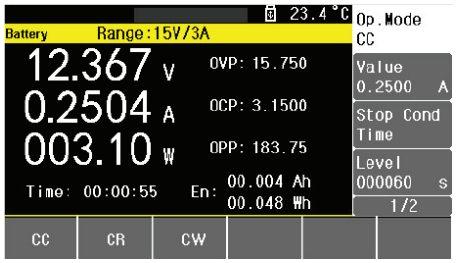
Automatic test mode enables these DC loads to execute multiple test sequences.



Up to 100 different sequences can be linked to run steps of various operating modes and loading conditions. Each step can be programmed with upper and lower pass/fail limits.

Battery discharge test

Safely discharge batteries with configurable stop conditions including voltage and time. Once a battery discharge test has started, elapsed time is displayed with Amp-hour (Ah) and Watt-hour (Wh) measurements. Battery discharge test can operate in CC, CR, or CW mode.



Low voltage operation

The 8550 Series can operate at low voltages for applications such as fuel cell and solar cell testing.

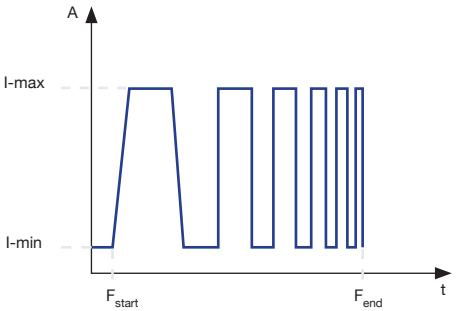
Typical minimum operating voltage at full scale current	
8550	8551
1.5 V	

The tools you need

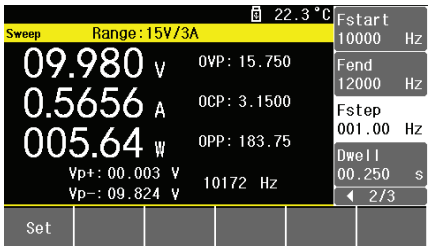
Advanced power supply characterization

The 8550 Series features three test modes specifically for evaluating the performance of DC power supplies.

- **Sweep mode** – Offers a simple way to capture overshoot and undershoot of a power supply by applying two configurable load levels at a swept frequency. The resulting maximum overshoot (Vp+) and maximum undershoot (Vp-) are displayed in real time at the frequencies of occurrence.

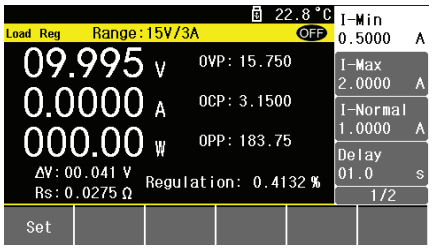


Sweep mode load profile



Sweep mode

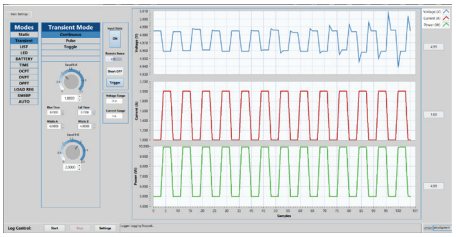
- **Load regulation test** – Calculates the load regulation (%) of a power supply under test by applying a sequence of minimum, normal, and maximum load conditions. The calculated internal resistance (Rs) of the connected power supply is also displayed.



Load regulation test

- **Protection test** – To evaluate the performance of common power supply protection features, the 8550 Series provides overcurrent, overvoltage, and overpower protection tests.

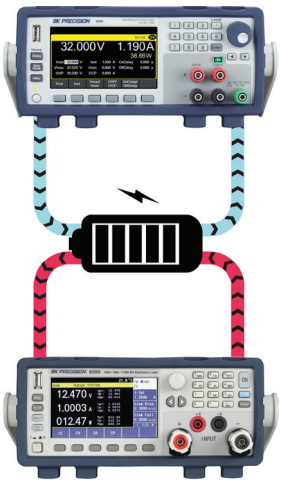
Application software



PC software is provided for generating and executing test sequences and measurement data logging without the need to write source code.

- Log voltage, current, power measurements and export data in spreadsheet format for further analysis
- Configure and run transient operation, list mode, and more

Battery Test Software



Supplementary PC software is available to simplify battery testing with the ability to create discharge sequences and log data. Couple the 8550 Series with a compatible external power supply, to perform battery charge/discharge cycle tests on batteries using the Battery Test Software.

CR-LED mode

Simulate the loading behavior of typical LEDs for testing LED drivers. Configure common LED characteristics including operating resistance, forward voltage and operating current.

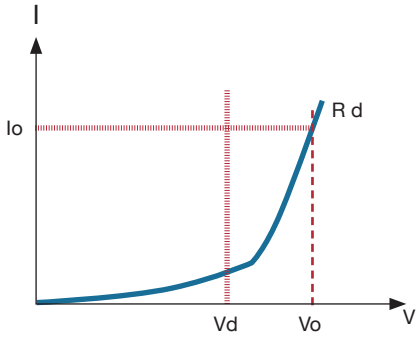


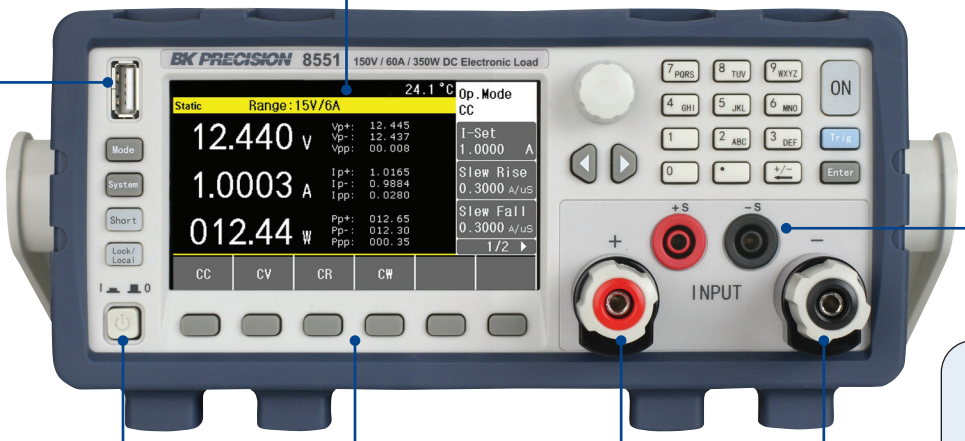
Figure - LED I-V Curve

- Vd = Forward voltage of the LED
- Rd Coeff = Ratio of the series equivalent resistance (RD) and total equivalent resistance of the LED (Vo/Io)
- Vo = Operating voltage across the LED
- Io = Operating current across the LED

Front panel

4.3-inch LCD
The bright display is easy to read and indicates peak-to-peak statistics

USB host
Save/Recall instrument settings and log measurement data directly to an external flash drive



Remote sense
Compensate for voltage drops due to resistance introduced from test leads

High current test lead accessory model TLPWRI

Mechanical power button
Gives tactical feel and prevents standby power draw

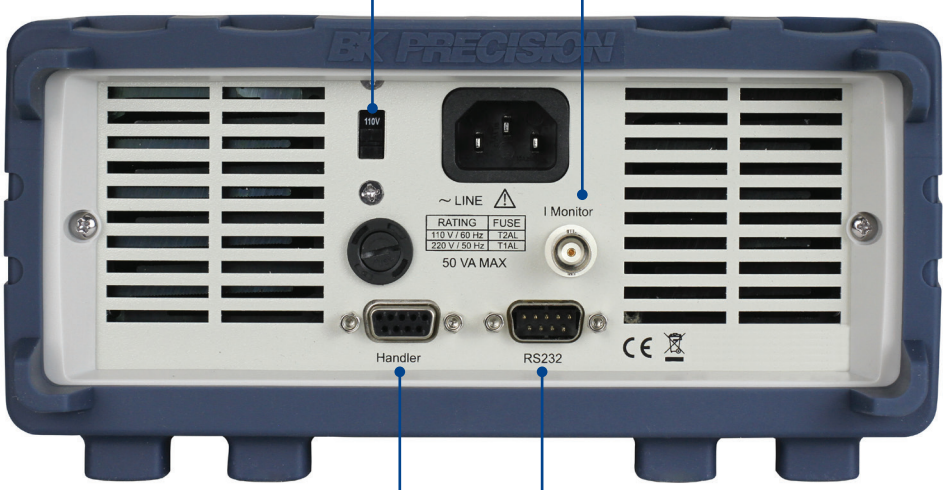
Function keys

Multi-type input terminals
Support both banana jack and spade lug type connectors with removable safety shields.

Rear panel

Line voltage switch
110 V / 220 V selectable

Current monitor BNC output
Connect voltmeter or oscilloscope to externally monitor input current



Handler interface
Simplifies integration with system controllers or component handlers in manufacturing environments

RS232 interface

Specifications

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

Model		8550	8551
Input Ratings			
Input voltage		0 to 150 V	0 to 150 V
Input current	Low	0 to 3 A	0 to 6 A
	High	0 to 30 A	0 to 60 A
Input power		175 W	350 W
Minimum operating voltage	Low	0.15 V at 3 A	0.15 V at 6 A
	High	1.5 V at 30 A	1.5 V at 60 A
CV Mode			
Range	Low	0 to 15 V	
	High	0 to 150 V	
Resolution	Low	0.2 mV	
	High	2 mV	
Accuracy		±(0.05% + 0.05% FS)	
CC Mode			
Range	Low	0 to 3 A	0 to 6 A
	High	0 to 30 A	0 to 60 A
Resolution	Low	0.05 mA	0.1 mA
	High	0.5 mA	1 mA
Accuracy		±(0.05% + 0.05% FS)	
CR Mode			
Range		0.05 Ω to 30 kΩ	0.03 Ω to 20 kΩ
Resolution		0.1 Ω	
Accuracy		1%	
CW Mode			
Range		0 to 175 W	0 to 350 W
Resolution		10 mW	
Accuracy		±(0.5% + 0.1% FS)	
Transient Mode (CC mode)			
T1 & T2 (1)		100 µs to 60 s	
Resolution		2 µs	
Accuracy		1 µs + 100 ppm	
Slew Rate (2)		0.6 A/ms to 1.5 A/µs	1.2 A/ms to 3 A/µs

(1) Fast pulse trains with large transitions may not be achievable.

(2) The slew rate specifications are not warranted but are descriptions of typical performance. The actual transition time is defined as the time for the input to change from 10% to 90%, or vice versa, of the programmed current values. In case of very large load changes, e.g. from no load to full load, the actual transition time will be larger than the expected time. The load will automatically adjust the slew rate to fit within the range (high or low) that is closest to the programmed value.

(3) Accuracy typical. Applies to supplementary V_{pp}, I_{pp}, and P_{pp} measurements.

Readback Voltage			
Range	Low	0 to 15 V	
	High	0 to 150 V	
Resolution	Low	1 mV	
	High	10 mV	
Accuracy		±(0.08% + 0.05% FS)	
Readback Current			
Range	Low	0 to 3 A	0 to 6 A
	High	0 to 30 A	0 to 60 A
Resolution	Low	0.1 mA	
	High	1 mA	
Accuracy		±(0.08% + 0.05% FS)	
Readback Ripple (3)			
Range	Low	0 to 15 V	
	High	0 to 150 V	
Bandwidth		250 kHz	
Accuracy		0.1%	
General			
Protection		Over voltage protection (OVP), Over current protection (OCP), Over power protection (OPP), and Remote reverse voltage (RRV)	
I/O Interfaces		RS232 and Handler	
AC Input		110 V/220 V ±10%, 50 Hz/60 Hz ±5%	
Maximum Rated Input Power		< 50 VA	
Temperature		32 °F to 104 °F (0 °C to 40 °C)	
Humidity		Indoor use, < 90% RH	
Safety		EN 61010-2010+A1:2019, Low Voltage Directive (LVD) 2014/35/EU	
Electromagnetic Compatibility		EN61326-1:2021, CISPR 11, EN61000-3-2:2019+A1:2021, EN61000-3-3:2013+A1:2019+A2:2021, EMC Directive 2014/30/EU	
Dimensions (W x H x D)		8.4" x 3.5" x 15.4" (213 x 88 x 390 mm)	
Weight		6.61 lb (3 kg)	10.58 lb (4.8 kg)
Warranty		3 Years	
Standard accessories		Power cord and certificate of calibration	
Optional accessories		TLPWR1 high current test leads	

Ordering Information

8550 Series Programmable DC Electronic Loads

Model	Description
8550	150 V / 30 A, 175 W
8551	150 V / 60 A, 350 W

About B&K Precision

For more than 70 years, B&K Precision has provided reliable and value-priced test and measurement instruments worldwide.

Our headquarters in Yorba Linda, California houses our administrative and executive functions as well as sales and marketing, design, service, and repair. Our European customers are most familiar with B&K through our French subsidiary, Sefram. Engineers in Asia know us through our B+K Precision Taiwan operation. The independent service centers in Singapore and Brasil service customers in Singapore, Malaysia, Vietnam, Indonesia and South America, respectively.

B&K Precision group member · Independent service center · Service center location

Quality Management System

B&K Precision Corporation is an ISO9001 registered company employing traceable quality management practices for all processes including product development, service, and calibration.

ISO9001:2015

Certification body NSF-ISR
Certificate number 6Z241-IS8

NSF-ISR
Registered to ISO 9001

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