

# DC ELECTRONIC LOADS

Keithley DC electronic loads are stand-alone, high accuracy instruments for testing and for performance characterization of power conversion devices such as power supplies, battery chargers, solar cells, DC/DC converters, and other power components. Keithley electronic loads offer high resolution as low as 0.1mV and 0.01mA to enable detection of subtle changes in power devices. The loads also have high bandwidth dynamic cycling and slew rates as fast as 2.5A/ $\mu$ s to thoroughly test the transient performance of power conversion devices.



	2380 SERIES
Channels	1
Maximum power	200W, 250W, 750W
Maximum Voltage/Current	500V/15A, 120V/60A, 500V/30A
Operation Modes	Constant Current (CC), Constant Voltage (CV), Constant Resistance (CR), and Constant Power (CP), Battery Test, LED Simulation
Connectivity	GPIB, USB, RS232

## CHOOSING YOUR DC ELECTRONIC LOAD

DC electronic loads have a wide range of performance to enable testing both static and dynamic performance of power devices. Key capabilities to consider when selecting DC electronic loads are presented below.

### 1 Output Power, Output Voltage, and Output Current

Ensure that the electronic load can dissipate the output power that your devices can generate. Also make sure that the load is rated for the maximum voltage and maximum current that your devices or components can supply. It is essential that all three parameters are factored in to your selection decision on the dissipation requirements for your DC electronic load.

### 2 Electronic Load Operating Modes

All electronic loads offer a constant current (CC) operating mode. Most also offer constant voltage (CV) and constant power (CP) operating modes. Some also provide constant resistance (CR) loading. More advanced electronic loads offer battery discharge loading to test battery life characteristics and LED simulation loading to test LED driver modules. Make sure the electronic load you select has the operating modes that you will need.

### 3 Dynamic Load Testing

If you need to test how your device performs with load changes, ensure that the load you select has a dynamic mode with a transition speed that is fast enough to test the specified transient response of your device. Dynamic modes are typically specified as the range of times that the load will be at each of two current levels. The inverse of twice the shortest time interval determines maximum cycling rate. Shorter time intervals, with fast transitions between loading, stress the power source and provide insight into its stability.

In addition to testing response to fast load changes, it can also be important to determine whether your device can respond at the rate that the load is changing. Ensure electronic load slew rates, often specified in A/ $\mu$ s, are high enough to test your device to its slew rate specifications. Ensure these rates are programmable so the electronic load's range of slew rates meets your application needs.

### 4 Safety Testing

Verifying that your power source does not fail under fault conditions is of critical importance. This is particularly true for a short circuit load condition. Electronic loads can be set for short circuits conditions with the load operating near 0V with milliohm load impedance. Make sure the electronic load you select has short circuit test features.



## 2380 Series

Series 2380 programmable DC Electronic Loads are single output, standalone loads with 200 W, 250 W and 750 W models. Multiple operating modes with up to 25 kHz of dynamic cycling, superior voltage/current resolution and readback accuracy together with multiple interface choices make the Series 2380 ideal for testing a power source in your bench.

MODEL	2380-500-15	2380-120-60	2380-500-30
Number of Output	1	1	1
Maximum Power	200 W	250 W	750 W
Maximum Voltage	500 V	120 V	500 V
Maximum Current	15 A	60 A	30 A
Operating Modes	CV, CC, CR, CP, Battery Test, LED Simulation		
Connectivity	GPIB, USB, RS232	GPIB, USB, RS232	GPIB, USB, RS232

- Multiple operating modes: CV, CC, CR, CP, Battery Test, and LED Simulation
- 0.1 mV / 0.01 mA V/I readback resolution and 0.025%/0.05% V/I readback accuracy
- Up to 25 kHz dynamic cycling mode with adjustable slew rates up to 2.5 A/μs
- Helpful features include voltage rise and fall time measurement, a current monitor output, and list mode load profiles
- Built-in GPIB, USB, RS232 interfaces
- 0.1 mV / 0.01 mA voltage/current readback resolution give you more confidence in the reading when testing your device.
- Dynamic Mode up to 25 kHz for faster transient validation of DC power sources.



### SHIPS WITH PRODUCT

Quick Start Guide  
User Documentation  
Power Cords  
9-Pin Rear Mating Connector

### RECOMMENDED ACCESSORIES

2380-001: 9-pin Rear Panel Mating Connector  
2380-002: DUT Connection Protective Cover  
7007-2: Double-Shielded Premium IEEE-488 Interface Cable, 2 m (6.5 ft)  
KPCI-488LPA: IEEE-488.2 Interface Board for the PCI Bus  
USB-B-1: USB Cable, Type A Connector to Type B Connector, 1 m (3.3 ft)  
4299-7: Universal Fixed Rack Mount Kit for 2380-500-15 and 2380-120-60  
RMU2U: Fixed Rack Mount Kit for 2380-500-15 and 2380-120-60  
386759800: RMU2U Rack Mount Cosmetic Filler Panel for 2380-500-15 and 2380-120-60  
2380-RM: Full-Rack-Width Instrument Fixed Rack Mount Kit for 2380-500-30

### RECOMMENDED SERVICE

Model\*-1-EW: 3-year factory warranty from date of shipment extended 1 additional year  
Model\*-5Y-EW: 3-year factory warranty from date of shipment extended to 5 years  
C/Model\*-3Y-STD: KeithleyCare 3 YR STD Calibration Plan  
C/Model\*-3Y-DAT: KeithleyCare 3 YR Calibration w/Data Plan  
C/Model\*-5Y-STD: KeithleyCare 5 YR STD Calibration Plan  
C/Model\*-5Y-DAT: KeithleyCare 5 YR Calibration w/Data Plan

\*Replace the specific power supply model number in place of Model Number to generate the appropriate model number for a service item. Example for a 2380-500-15, a 1-year extended warranty model number would be 2380-500-15-EW.

**LEARN MORE** with the "AC-DC Power Supply Efficiency Testing for Regulatory Standards" Application Note.

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