

# Sorensen SL Series

75 W–14.4 kW

## DC and AC/DC Electronic Loads

60–500 V

1–720 A

- Flexible Product Line
  - Low power DC modules
  - Low power AC modules
  - High power DC,
- Remote: GPIB, RS-232, Analog
- DC Modes: CC, CR, CV, CP
- AC Modes: CR, CC with crest factor control
- Dynamic mode with slew rate control
- Flexible Data Feedback
- Current monitor output (SLM DC only)



~

100

115

230

GPIB RS232

The Sorensen SL series electronic loads offer the best value with the most flexible platform. A wide range of loads are available from 75-1800W with both DC and AC input in benchtop, modular and standalone form factors.

### SLM Mainframe

The SLM mainframe choices include a convenient single-bay configuration for benchtop/desktop applications or a four bay configuration for multichannel and ATE requirements. Either chassis is compatible with SLM- and SLD- loads. Each chassis contains non-volatile memory capable of storing up to 150 module setups and nine 16-step sequences for automated, standalone testing. Or for more complex test sequences, the chassis come with GPIB (optional on SLM-1) and RS-232 as standard interfaces.

### SLM Family

The SLM family includes nine models of fully programmable, single input AC or DC modular electronic loads. DC models are offered to test power supplies, battery chargers, battery discharge, power supply transient response and integration into ATE systems. AC models are ideal to test low power inverters.

The DC models support operation in Constant Current (CC), Constant Voltage (CV), Constant Resistance (CR) or Constant Power (CP) mode as well as a short simulation. Engineers have

ultimate control of current waveforms by using either the analog input or CC dynamic mode. An analog input (single input DC models) allows arbitrary current waveforms up to 20kHz with an external 0-10V signal. In dynamic mode, the pulse generator allows fast state switching between two programmed current levels with programmed slew rate and dwell times.

### SLD Family

The SLD family offers six models of fully programmable, dual input modular electronic loads. These DC modules are specifically designed for low power, high channel count testing and provide the highest channel density available.

### SLH Family

Fully programmable, high power AC or DC electronic loads. The 500V models are for PFC testing, power transformers and various other AC or DC power sources. The 300V models are used for testing of UPSs, automatic voltage regulators (AVR), and batteries.

- High current, 60V DC models for general purpose power supply testing
- High voltage, AC/DC models are intended for inverter test,
- Power Factor Correction (PFC) circuit testing (500V) and UPS testing (300V)

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Electronic Load Selection

Often the selection of programmable power supplies is based upon volts and amps capability. However when selecting an electronic load, it is important to account for volts, amps and power. The power limit is displayed on a constant power curve. A load must be selected so that the operating points are within the Power Curve (see Figure 1). For many applications in which different power sources are tested, there may be high voltage, low current requirements as well as low voltage, high current requirements. A single load may be able to handle both with good programming resolution. In cases where a single load may not work, the broad range of current, power and voltage available in the SL series allows optimum selection depending upon the voltage, current, power required.

Applications

**Low Voltage Operation**  
All SL series loads operate well below 1V. However in many applications, such as fuel cell research and microprocessor voltage regulator modules (VRM), the voltage at the load inputs can be 0.1 to 0.2V. This low voltage does not allow the load transistors to fully turn-on (bottom right corner of the power contour). To utilize the full rated current of an electronic load, a boost supply can be placed in series to increase the voltage. While a fixed voltage DC-DC converter can be used as the boost supply, a programmable power supply is preferred to keep the load voltage at the minimum to draw full current as the device under test ramps up in voltage.

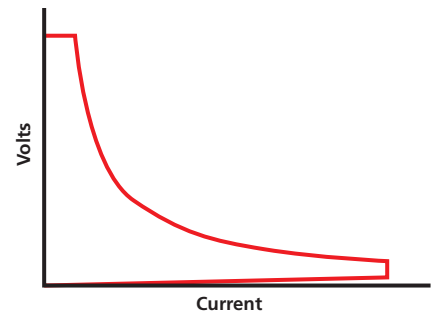
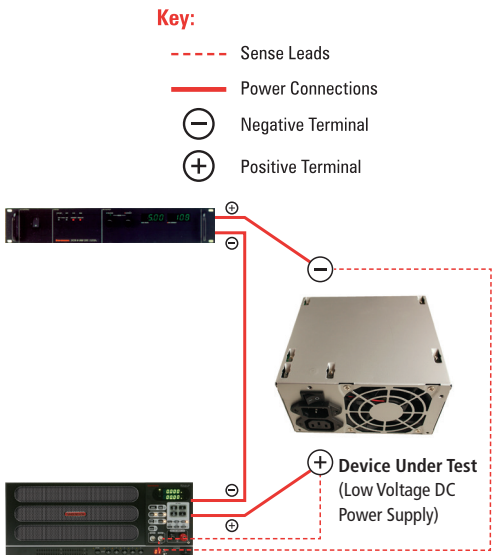


Figure 1 - Power Curve



SLM-4: Chassis



SLM: DC Module



SLM: AC Module



SLD: Dual Input DC Module



SLD: Dual Input DC Module



SLM-1 Chassis



SLH: DC Electronic Load



SLH: AC Electronic Load

# SL Series : Specifications

75 W–14.4 kW

| SLH - Standalone AC Loads   |                                                                         |                  |                 |                  |                 |
|-----------------------------|-------------------------------------------------------------------------|------------------|-----------------|------------------|-----------------|
| Model                       | SLH-500-4-1200                                                          | SLH-500-6-1800   | SLH-300-12-1200 | SLH-300-12-1800  | SLH-300-18-1800 |
| Input Ratings               |                                                                         |                  |                 |                  |                 |
| Power:                      | 1200VA                                                                  | 1800VA           | 1200VA          | 1800VA           | 1800VA          |
| Current:                    | 4Arms                                                                   | 6Arms            | 12Arms          | 12Arms           | 18Arms          |
| Voltage:                    | 300Vrms / 500Vdc                                                        | 300Vrms / 500Vdc | 300Vrms         | 300Vrms          | 300Vrms         |
| Frequency:                  | DC, 40 - 70Hz (CC Mode) ; DC - 70Hz (CR Mode)                           |                  |                 |                  |                 |
| CC Mode                     |                                                                         |                  |                 |                  |                 |
| Range:                      | 0-2 / 2-4A                                                              | 0-3 / 3-6A       | 0-6 / 6-12A     | 0-6 / 6-12A      | 0-9 / 9-18A     |
| Resolution:                 | 0.5 / 1mA                                                               | 0.75 / 1.5mA     | 1.5 / 3mA       | 1.5 / 3mA        | 2.25 / 4.5mA    |
| Accuracy:                   | ±0.5% of (setting + range)                                              |                  |                 |                  |                 |
| Low Current:                | 0 - 0.2A                                                                | 0 - 0.3A         | 0 - 0.6A        | 0 - 0.6A         | 0 - 0.9A        |
| Accuracy:                   | ±(0.5% of reading + 0.2% of range)                                      |                  |                 |                  |                 |
| Maximum Peak Current:       | 8A                                                                      | 12A              | 24A             | 24A              | 18A             |
| CR Mode                     |                                                                         |                  |                 |                  |                 |
| Range 1: (I>0.5% of rating) | 50 - 200,000Ω                                                           | 33.33 - 133,000Ω | 20 - 80,000Ω    | 20 - 80,000Ω     | 13.3 - 53,333Ω  |
| Range 2: (I>50% of rating)  | 12.5 - 50Ω                                                              | 8.33 - 33.33Ω    | 5 - 20Ω         | 5 - 20Ω          | 3.33 - 13.33Ω   |
| 4 1/2 DVM                   |                                                                         |                  |                 |                  |                 |
| Range:                      | 0-500V                                                                  | 0-500V           | 300V            | 300V             | 300V            |
| Resolution:                 | 0.1V                                                                    | 0.1V             | 0.1V            | 0.1V             | 0.1V            |
| Accuracy:                   | ±(0.5% of reading + 0.2% of range)                                      |                  |                 |                  |                 |
| 4 1/2 DAM                   |                                                                         |                  |                 |                  |                 |
| Range:                      | 0-4A                                                                    | 0-6A             | 0-12A           | 0-12A            | 0-18A           |
| Resolution:                 | 1mA                                                                     | 1mA              | 1mA             | 1mA              | 1mA             |
| Accuracy:                   | ±(0.5% of reading + 2% of range) ; ±0.5% of (reading + range) @ 50/60Hz |                  |                 |                  |                 |
| 4 1/2 Watt Meter            |                                                                         |                  |                 |                  |                 |
| Range:                      | 0-1200W                                                                 | 0-1800W          | 0-1200W         | 0-1800W          | 0-1800W         |
| Resolution:                 | 0.1W                                                                    |                  |                 |                  |                 |
| Accuracy:                   | ± (0.5% of reading)±3W                                                  |                  |                 |                  |                 |
| VA / Power Meter:           | Vrms × Arms                                                             |                  |                 |                  |                 |
| Weight                      | 18.5kgs/40.7lbs                                                         | 21.5kgs/47.3lbs  | 18.5kgs/40.7lbs | 21.5kgs/47.3lbs  | 21.5kgs/47.3lbs |
| SLM - AC Modules            |                                                                         |                  |                 |                  |                 |
| Model                       | SLM-60-20-300                                                           | SLM-150-8-300    | SLM-300-4-300   | SLM-500-1-300    |                 |
| Input Ratings               |                                                                         |                  |                 |                  |                 |
| Power:                      | 300VA                                                                   | 300VA            | 300VA           | 300VA            |                 |
| Current:                    | 20Arms                                                                  | 8Arms            | 4Arms           | 1Arms            |                 |
| Voltage:                    | 60Vrms                                                                  | 150Vrms          | 300Vrms         | 300Vrms / 500Vdc |                 |
| Frequency:                  | DC, 40 - 70Hz (CC Mode) ; DC - 70Hz (CR Mode)                           |                  |                 |                  |                 |
| CC Mode                     |                                                                         |                  |                 |                  |                 |
| Range:                      | 0-10 / 10-20A                                                           | 0-4 / 4-8A       | 0-2 / 2-4A      | 0-0.5 / 0.5-1A   |                 |
| Resolution:                 | 2.5 / 5mA                                                               | 1 / 2mA          | 0.5 / 1mA       | 0.125 / 0.25mA   |                 |
| Accuracy:                   | ±0.5% of (setting + range)                                              |                  |                 |                  |                 |
| Low Current:                | 0 - 1A                                                                  | 0 - 0.4A         | 0 - 0.2A        | 0 - 0.05A        |                 |
| Accuracy:                   | ±2% of (setting + range)                                                |                  |                 |                  |                 |
| Maxium Peak Current:        | 40A                                                                     | 16A              | 8A              | 2A               |                 |
| CR Mode (1)                 |                                                                         |                  |                 |                  |                 |
| Range 1: (I>0.5% of rating) | 1.2-4,800Ω                                                              | 7.5-30,000Ω      | 30 - 120,000Ω   | 200 - 800000Ω    |                 |
| Range 2: (I>50% of rating)  | 0.3 - 1.2Ω                                                              | 1.875 - 7.5Ω     | 7.5 - 30Ω       | 50 - 200Ω        |                 |
| 4 1/2 DVM                   |                                                                         |                  |                 |                  |                 |
| Range:                      | 60V                                                                     | 150V             | 300V            | 500V             |                 |
| Resolution:                 | 0.01V                                                                   | 0.01V            | 0.1V            | 0.1V             |                 |
| Accuracy:                   | ±(0.5% of reading + 0.2% of range)                                      |                  |                 |                  |                 |
| 4 1/2 DAM                   |                                                                         |                  |                 |                  |                 |
| Range:                      | 20A                                                                     | 8A               | 4A              | 1A               |                 |
| Resolution:                 | 0.01A                                                                   | 0.001A           | 0.001A          | 0.001A           |                 |
| Accuracy:                   | ±(0.5% of reading + 2% of range); ±0.5% of (reading + range) @ 50/60Hz  |                  |                 |                  |                 |
| 4 1/2 Watt Meter            |                                                                         |                  |                 |                  |                 |
| Range:                      | 300W                                                                    |                  |                 |                  |                 |
| Resolution:                 | 0.1W                                                                    |                  |                 |                  |                 |
| Accuracy:                   | ±(0.5% of reading)±3W                                                   |                  |                 |                  |                 |
| VA / Power Meter:           | Vrms × Arms                                                             |                  |                 |                  |                 |
| Weight                      | 3.5kas/7.7lbs                                                           |                  |                 |                  |                 |

# SL Series : Specifications

| SLM - DC Modules                   |                              |        |               |        |                |        |                    |        |                       |        |
|------------------------------------|------------------------------|--------|---------------|--------|----------------|--------|--------------------|--------|-----------------------|--------|
| Model                              | SLM-60-30-150                |        | SLM-60-60-300 |        | SLM-250-10-300 |        | SLM-500-10-300     |        | SLM-60-15-75          |        |
| Input Ratings                      |                              |        |               |        |                |        |                    |        |                       |        |
| Voltage:                           | 60V                          |        | 60V           |        | 250V           |        | 500V               |        | 60V                   |        |
| Current:                           | 30A                          |        | 60A           |        | 10A            |        | 10A                |        | 15A                   |        |
| Power:                             | 150W                         |        | 300W          |        | 300W           |        | 300W               |        | 75W                   |        |
| Minimum Voltage:<br>(Full Current) | 0.6V @ 30A                   |        | 0.5V @ 60A    |        | 0.8V @ 10A     |        | 4.5V @ 10A         |        | 0.3V @ 15A            |        |
| CC Mode                            |                              |        |               |        |                |        |                    |        |                       |        |
| Range 1:   Range 2:                | 0-3A                         | 0-30A  | 0-6A          | 0-60A  | 0-1A           | 0-10A  | 0-1A               | 0-10A  | 0-1.5A                | 0-15A  |
| Resolution:                        | 0.8mA                        | 8.0mA  | 1.6mA         | 16.0mA | 0.268mA        | 2.68mA | 0.268mA            | 2.68mA | 0.4mA                 | 4.0mA  |
| Accuracy:                          | ± 0.2% of (Setting + Range)  |        |               |        |                |        |                    |        |                       |        |
| CR Mode                            |                              |        |               |        |                |        |                    |        |                       |        |
| Range 1:<br>(I > 0.02% of RATING)  | 2-7.5KΩ                      |        | 1-3.75KΩ      |        | 25-18.75KΩ     |        | 50-18.75KΩ         |        | 4-15KΩ                |        |
| Range 2:<br>(I > 0.2% of RATING)   | 0.1067-2Ω                    |        | 0.0534-1Ω     |        | 1.333-25Ω      |        | 2.67-50Ω           |        | 0.213-4Ω              |        |
| CV Mode                            |                              |        |               |        |                |        |                    |        |                       |        |
| Range:                             | 0-60V                        |        | 0-60V         |        | 0-250V         |        | 0-500V             |        | 0-60V                 |        |
| Resolution:                        | 0.016V                       |        | 0.016V        |        | 0.067V         |        | 0.133V             |        | 0.016V                |        |
| Accuracy:                          | ± 0.1% of (Setting + Range)  |        |               |        |                |        |                    |        |                       |        |
| CP Mode                            |                              |        |               |        |                |        |                    |        |                       |        |
| Range:                             | 0-150W                       |        | 0-300W        |        | 0-300W         |        | 0-300W             |        | 0-75W                 |        |
| Resolution:                        | 0.04W                        |        | 0.08W         |        | 0.08W          |        | 0.08W              |        | 0.02W                 |        |
| Accuracy:                          | ± 0.5% of (Setting + Range)  |        |               |        |                |        |                    |        |                       |        |
| Short Mode:                        |                              |        |               |        |                |        |                    |        |                       |        |
| Resistance:                        | 0.02Ω                        |        | 8mΩ           |        | 0.08Ω          |        | 0.45Ω              |        | 0.02Ω                 |        |
| Current:                           | 30A                          |        | 60A           |        | 10A            |        | 10A                |        | 15A                   |        |
| Dynamic:                           |                              |        |               |        |                |        |                    |        |                       |        |
| T High & T Low:                    | 50μs to 9.999s               |        |               |        |                |        |                    |        |                       |        |
| Rise/Fall of Range 1:              | 2.0-125mA/μs                 |        | 4-250mA/μs    |        | 0.8-50mA/μs    |        | 0.8-50mA/μs        |        | 1.0-62.5mA/μs         |        |
| Rise/Fall of Range 2:              | 0.2-1.2A/μs                  |        | 0.04-2.5A/μs  |        | 8.0-500mA/μs   |        | 8.0-500mA/μs       |        | 10-625mA/μs           |        |
| Accuracy:                          | ± 10% of Setting             |        |               |        |                |        |                    |        |                       |        |
| 4 1/2 DVM:                         |                              |        |               |        |                |        |                    |        |                       |        |
| Range:                             | 15.0V                        | 60.0V  | 15.0V         | 60.0V  | 30.0V          | 250.0V | 199.99V            | 500.0V | 15.0V                 | 60.0V  |
| Resolution:                        | 0.001V                       | 0.002V | 0.001V        | 0.002V | 0.001V         | 0.01V  | 0.01V              | 0.1V   | 0.001V                | 0.002V |
| Accuracy:                          | ± 0.05% of (Reading + Range) |        |               |        |                |        |                    |        |                       |        |
| 4 1/2 DAM:                         |                              |        |               |        |                |        |                    |        |                       |        |
| Range:                             | 3.0A                         | 30.0A  | 6.0A          | 60.0A  | 1.0A           | 10.0A  |                    | 10.0A  | 1.5A                  | 15.0A  |
| Resolution:                        | 0.001A                       | 0.01A  | 0.001A        | 0.01A  | 0.0001A        | 0.001A |                    | 0.001A | 0.0001A               | 0.001A |
| Accuracy:                          | ± 0.2% of (Reading + Range)  |        |               |        |                |        |                    |        |                       |        |
| Current Monitor:                   | 3.0A/V                       |        | 6.0A/V        |        | N/A            |        | N/A                |        | 1.5A/V                |        |
| Load ON Volt:                      |                              |        |               |        |                |        |                    |        |                       |        |
| Range:                             | 0.1-25V                      |        |               |        | 0.2-50V        |        | 0.4-100V           |        | 0.1-25V               |        |
| Resolution:                        | 0.1V                         |        |               |        | 0.2V           |        | 0.4V               |        | 0.1V                  |        |
| Accuracy:                          | 1% of Setting + 0.25V        |        |               |        | 1% + 0.5V      |        | 1% of Setting + 1V |        | 1% of Setting + 0.25V |        |
| Load OFF Volt:                     |                              |        |               |        |                |        |                    |        |                       |        |
| Range:                             | 0-25V                        |        |               |        | 0-50V          |        | 0-100V             |        | 0-25V                 |        |
| Resolution:                        | 0.01V                        |        |               |        |                |        |                    |        |                       |        |
| Accuracy:                          | 1% of Setting + 0.25V        |        |               |        | 1% + 0.5V      |        | 1% of Setting + 1V |        | 1% of Setting + 0.25V |        |
| Weight:                            | 3.5kgs/7.7lbs                |        |               |        |                |        |                    |        |                       |        |

# SL Series : Specifications

75 W–14.4 kW

| SLD - Dual Input DC Modules      |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
|----------------------------------|-----------------------------|----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|-----------------|----------------|--|
| Model:                           | SLD-60-505-255              |                | SLD-61-505-255  |                | SLD-80-20-102   |                 | SLD-61-5-752   |                | SLD-62-5-752   |                | SLD-60-105-550  |                |  |
| Input Rating:                    |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Channel                          | A                           | B              | A               | B              | A               | B               | A              | B              | A              | B              | A               | B              |  |
| Voltage (Volt)                   | +60V                        | +60V           | +60V            | -60V           | +80V            | +80V            | +60V           | -60V           | -60V           | -60V           | +60V            | +60V           |  |
| Current (Ampere)                 | 50A                         | 5A             | 50A             | 5A             | 20A             | 20A             | 5A             | 5A             | 5A             | 5A             | 100A            | 5A             |  |
| Power (VA)                       | 250W                        | 50W            | 250W            | 50W            | 100W            | 100W            | 75W            | 75W            | 75W            | 75W            | 500W            | 50W            |  |
| Minimum Voltage (Full Current)   | 0.4V @ 50A                  | 0.4V @ 5A      | 0.4V @ 50A      | 0.9V @ 5A      | 0.4V @ 20A      | 0.4V @ 20A      | 0.4V @ 5A      | 0.4V @ 5A      | 0.4V @ 5A      | 0.4V @ 5A      | 0.4V @ 100A     | 0.4V @ 5A      |  |
| CC Mode:                         |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range                            | 0 - 5A / 50A                | 0 - 0.5A / 5A  | 0 - 5A / 50A    | 0 - 0.5A / 5A  | 0 - 2.0A / 20A  | 0 - 2.0A / 20A  | 0 - 0.5A / 5A  | 0 - 0.5A / 5A  | 0 - 0.5A / 5A  | 0 - 0.5A / 5A  | 0 - 10A / 100A  | 0 - 0.5A / 5A  |  |
| Resolution                       | 1.34 / 13.4mA               | 0.134 / 1.34mA | 1.34 / 13.4mA   | 0.134 / 1.34mA | 0.533 / 5.33mA  | 0.533 / 5.33mA  | 0.134 / 1.34mA | 0.134 / 1.34mA | 0.134 / 1.34mA | 0.134 / 1.34mA | 2.66 / 26.6mA   | 0.134 / 1.34mA |  |
| Accuracy                         | ±0.2% of (Setting + Range)  |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| CR Mode:                         |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range 1: (Ω) (I>0.02% of rating) | 1.2 - 4500                  | 12 - 45000     | 1.2 - 4500      | 12 - 45000     | 4 - 15000       | 4 - 15000       | 12 - 45000     | 12 - 45000     | 12 - 45000     | 12 - 45000     | 0.6 - 2250      | 12 - 45000     |  |
| Range 2: (Ω) (I>0.2% of rating)  | 0.04-1.2                    | 0.4-12         | 0.04-1.2        | 0.4-12         | 0.133-4         | 0.133-4         | 0.4-12         | 0.4-12         | 0.4-12         | 0.4-12         | 0.02-0.6        | 0.4-12         |  |
| CV Mode                          |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range                            | 0 – 60V                     |                |                 | 0 – (-60)V     |                 | 0 – 60V         |                |                | 0 – (-60)V     |                |                 | 0 – 60V        |  |
| Resolution                       | 16mV                        |                |                 |                | 21.3mV          |                 |                | 16mV           |                |                |                 |                |  |
| Accuracy                         | ±0.2% of (Setting + Range)  |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Short Mode                       |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Resistance                       | 8mΩ                         | 0.08Ω          | 8mΩ             | 0.18Ω          | 0.02Ω           | 0.02Ω           | 0.02Ω          | 0.06Ω          | 0.06Ω          | 0.06Ω          | 4mΩ             | 0.08Ω          |  |
| Current                          | 50A                         | 5A             | 50A             | 5A             | 20A             | 20A             | 5A             | 5A             | 5A             | 5A             | 100A            | 5A             |  |
| Dynamic Mode                     |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| T High / T Low                   | 50μs to 9.999s              |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Slew Rate (mA/μs)                | 4-200 / 40-2000             | 0.4-20 / 4-200 | 4-200 / 40-2000 | 0.4-20 / 4-200 | 1.6-80 / 16-800 | 1.6-80 / 16-800 | 0.4-20 / 4-200 | 0.4-20 / 4-200 | 0.4-20 / 4-200 | 0.4-20 / 4-200 | 8-400 / 80-4000 | 0.4-20 / 4-200 |  |
| Resolution (mA/μs)               | 0.8 / 8                     | 0.08 / 0.8     | 0.8 / 8         | 0.08 / 0.8     | 0.32 / 3.2      | 0.32 / 3.2      | 0.08 / 0.8     | 0.08 / 0.8     | 0.08 / 0.8     | 0.08 / 0.8     | 1.6 / 16        | 0.08 / 0.8     |  |
| Accuracy                         | ±(10% +10μs)                |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| 4 1/2 DVM:                       |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range                            | 15V / 60.00V                |                |                 |                | 20V / 80V       |                 |                | 15V / 60.00V   |                |                |                 |                |  |
| Resolution                       | 0.001 V / 0.01 V            |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Accuracy                         | ±0.05% of (Reading + Range) |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| 4 1/2 DAM:                       |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range                            | 15A / 50A                   | 1.5A / 5A      | 15A / 50A       | 1.5A / 5A      | 2.0A / 20A      | 2.0A / 20A      | 1.5A / 5A      | 1.5A / 5A      | 1.5A / 5A      | 1.5A / 5A      | 10 / 100A       | 1.5A / 5A      |  |
| Resolution                       | 1mA / 10mA                  | 0.1mA / 1mA    | 1mA / 10mA      | 0.1mA / 1mA    | 0.1mA / 1mA     | 0.1mA / 1mA     | 0.1mA / 1mA    | 0.1mA / 1mA    | 0.1mA / 1mA    | 0.1mA / 1mA    | 1 / 10mA        | 0.1mA / 1mA    |  |
| Accuracy                         | ±0.2% of (Reading + Range)  |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Load ON Voltage                  |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range                            | 0.1-25V                     |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Resolution                       | 0.1V                        |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Accuracy                         | 1% of Setting +0.25V        |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Load OFF Voltage                 |                             |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Range                            | 0-25V                       |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Resolution                       | 1mV                         |                |                 |                |                 |                 |                |                |                |                |                 |                |  |
| Accuracy                         | 1% of Setting +0.25V        |                |                 |                |                 |                 |                |                |                |                |                 |                |  |

# SL Series : Specifications

| SLH - Standalone DC Loads         |                             |                 |                 |                    |                 |                    |                      |
|-----------------------------------|-----------------------------|-----------------|-----------------|--------------------|-----------------|--------------------|----------------------|
| Model                             | SLH-60-120-600              | SLH-60-120-1200 | SLH-60-120-1800 | SLH-60-240-1200    | SLH-60-240-1800 | SLH-60-360-1800    | SLH-500-60-1800      |
| Input Ratings                     |                             |                 |                 |                    |                 |                    |                      |
| Voltage                           | 60V                         |                 |                 |                    |                 |                    | 500 V                |
| Current                           | 120A                        |                 |                 | 240A               |                 | 360A               | 60 A                 |
| Power                             | 600W                        | 1200W           | 1800W           | 1200W              | 1800W           | 1800W              | 1800 W               |
| Minimum Voltage<br>(Full Current) | 0.5V @ 120A                 | 0.4V @ 120A     | 0.3V @ 120A     | 0.5V @ 240A        | 0.5V @ 240A     | 0.4 @ 360A         | 6V @ 60A             |
| CC Mode                           |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0-12 / 0-120A               |                 |                 | 0-24 / 0-240A      |                 | 0 - 36 / 360A      | 0 - 6/60 A           |
| Resolution                        | 3.2 / 32mA                  |                 |                 | 6.4 / 64mA         |                 | 9.6 / 96mA         | 1.6/16 mA            |
| Accuracy                          | ±0.2% OF (SETTING + RANGE)  |                 |                 |                    |                 |                    |                      |
| CR Mode                           |                             |                 |                 |                    |                 |                    |                      |
| Range 1<br>(I>0.05% of rating)    | 0.5 - 1875Ω                 |                 |                 | 0.25 - 937.50Ω     |                 | 0.167 - 624.9Ω     | 8.33 - 18750Ω        |
| Range 2<br>(I>0.5% of rating)     | 0.027 - 0.5Ω                |                 |                 | 0.0133 - 0.25Ω     |                 | 8.3 - 167mΩ        | 0.444 - 8.33Ω        |
| CV Mode                           |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0 - 60V                     |                 |                 |                    |                 |                    | 0 - 500 V            |
| Resolution                        | 0.016V                      |                 |                 |                    |                 |                    | 0.133V               |
| Accuracy                          | ±0.1% OF (SETTING + RANGE)  |                 |                 |                    |                 |                    |                      |
| CP Mode                           |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0 - 600W                    | 0 - 1200W       | 0 - 1800W       | 0 - 1200W          | 0 - 1800W       | 0 - 1800W          | 0-1800W              |
| Resolution                        | 0.16W                       | 0.32W           | 0.48W           | 0.32W              | 0.48W           | 0.48W              | 0.48W                |
| Accuracy                          | ±0.5% OF (SETTING + RANGE)  |                 |                 |                    |                 |                    |                      |
| Short Mode                        |                             |                 |                 |                    |                 |                    |                      |
| Maximum Resistance                | 4.2mΩ                       | 3.3mΩ           | 2.5mΩ           | 2.1mΩ              |                 | 1.1mΩ              | 0.1 Ω                |
| Current                           | 120A                        |                 |                 | 240A               |                 | 360A               | 60A                  |
| Dynamic Mode                      |                             |                 |                 |                    |                 |                    |                      |
| T High / T Low                    | 50μs to 9.999s              |                 |                 |                    |                 |                    |                      |
| Slew Rate Low                     | 8mA - 500mA/μs              |                 |                 | 16mA - 1A/μs       |                 | 24mA - 1.5A/μs     | 4.8-300 mA/μs        |
| Slew Rate High                    | 80mA - 5A/μs                |                 |                 | 0.160A - 10A/μs    |                 | 0.24A - 15A/μs     | 0.048-3.0 A/μs       |
| Accuracy                          | ±(10% OF SETTING +10μs)     |                 |                 |                    |                 |                    |                      |
| 4 1/2 DVM                         |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0 - 20.00 / 60.00V          |                 |                 |                    |                 |                    | 0 - 60.00/600.0      |
| Resolution                        | 0.001 / 0.01V               |                 |                 |                    |                 |                    | 0.01/0.1V            |
| Accuracy                          | ±0.05% OF (READING + RANGE) |                 |                 |                    |                 |                    |                      |
| 4 1/2 DAM                         |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0 - 12A / 0 - 120A          |                 |                 | 0 - 24A / 0 - 240A |                 | 0 - 36A / 0 - 360A | 0 - 6/60 A           |
| Resolution                        | 1mA / 4mA                   |                 |                 | 1mA / 10mA         |                 | 1.2mA / 12mA       | 0.001A/0.01A         |
| Accuracy                          | ±0.5% OF (READING + RANGE)  |                 |                 |                    |                 |                    |                      |
| Current Monitor                   | 12A/V                       |                 |                 | 24A/V              |                 | 36A/V              | N/A                  |
| Load ON Volt                      |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0.1 - 25V                   |                 |                 |                    |                 |                    | 0.4 - 100V           |
| Resolution                        | 0.1V                        |                 |                 |                    |                 |                    | 0.4V                 |
| Accuracy                          | 1% of SETTING +0.25V        |                 |                 |                    |                 |                    |                      |
| Load OFF Volt                     |                             |                 |                 |                    |                 |                    |                      |
| Range                             | 0 - 25V                     |                 |                 |                    |                 |                    | 0 - 100V             |
| Resolution                        | 0.1V                        |                 |                 |                    |                 |                    |                      |
| Accuracy                          | 1% of SETTING +0.25V        |                 |                 |                    |                 |                    |                      |
| Weight                            | 15.2kgs./33.4lbs            | 19.4kgs/42.7lbs | 23.6kgs/51.9lbs | 19.4kgs/42.7lbs    | 23.6kgs/51.9lbs | 23.6kgs/51.9lbs    | 23.6 kgs. / 51.9 lbs |

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| Common                                     |                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software                                   | LabVIEW Driver can be downloaded at no cost: <a href="http://www.elgar.com/products/SL/SL_Downloads.htm">www.elgar.com/products/SL/SL_Downloads.htm</a>                                                        |
| Regulatory                                 | Certified to UL/CSA 61010 and IEC/EN 61010-1, CE Compliant (LVD and EMC Directives)                                                                                                                            |
| Environmental                              | Operating Temperature: 0° to 40°C<br>Storage Temperature: -10° to 65°C                                                                                                                                         |
| Cooling                                    | Front, Side, Top Air Inlets, Rear Exhaust, Units may be rackmounted without spacing.                                                                                                                           |
| SLH Memory                                 | 150 Settings for DC, 5 Settings for AC                                                                                                                                                                         |
| Readback                                   | Voltage, Current, Power: 16-bit resolution, VA: Vrms x Arms                                                                                                                                                    |
| Analog Input                               | SLM: DB9 connector, SLH: BNC connector. DC, Single Input (SLH or SLM), CC Mode: 0-10V = 0 – FS, Bandwidth: 20kHz, Sums Current with Programmed Value                                                           |
| AC (SLH or SLM)                            | Sync signal on zero crossing                                                                                                                                                                                   |
| Remote Programming                         | SLM-1: RS-232C, GPIB (Optional), SLM-4: RS-232C, GPIB, analog, SLH: RS-232C, GPIB, analog                                                                                                                      |
| Dynamic Mode (DC Models)<br>(see Figure 4) | Mode: CC, T-high, T-low: 50 $\mu$ s to 9.999 sec, Slew Rate: See Specification Tables, I high, I low: 0 to Rated Current                                                                                       |
| Options and Accessories                    | -1: GPIB, SLM-1 or SLM-4 only<br>-01: 100/200V AC input, SLM-1 only<br>-11: 100/200V AC input and GPIB<br>M12: Front panel bus bar, SLH DC only<br>M23: Front panel bus bar and 100/200V AC Input, SLH DC only |
| Input Power                                |                                                                                                                                                                                                                |
| Line:                                      | 115V / 230V $\pm$ 10%, switch selectable or 100V / 200V $\pm$ 10% switch selectable (optional)                                                                                                                 |
| Frequency:                                 | 50 / 60Hz                                                                                                                                                                                                      |
| Power Consumption                          | 100W Maximum                                                                                                                                                                                                   |
| Protection: AC input fuses                 |                                                                                                                                                                                                                |
| OVP, OCP, OPP:                             | ~5% above rated maximum                                                                                                                                                                                        |
| OTP:                                       | ~85°C Heat sink temperature                                                                                                                                                                                    |
| DC Loads:                                  | Reverse Polarity All protection modes turn off LOAD input                                                                                                                                                      |
| Hardware Input Voltage Limit:              | 60V Rated DC Input: 100V, 250V Rated DC Input: 400V, 500V Rated DC and all AC Input: 900V                                                                                                                      |
| SLM Chassis                                |                                                                                                                                                                                                                |
| Memory                                     | 150 memory settings for DC modules, 5 memory settings for AC modules, Memory settings store entire chassis condition                                                                                           |
| Sequencer (see Figure 2)                   |                                                                                                                                                                                                                |
| Control                                    | Front panel                                                                                                                                                                                                    |
| Timing                                     | 100ms-9.9 secs per step                                                                                                                                                                                        |
| Maximum Steps per Sequence                 | 16                                                                                                                                                                                                             |
| Number of Sequences                        | 9                                                                                                                                                                                                              |
| Programming                                |                                                                                                                                                                                                                |
| All Parameters                             | 12-bit resolution                                                                                                                                                                                              |
| AC Crest Factor (see Figure 3)             | Sinewave: $\sqrt{2}$ , 1.5-3.5, Resolution: 0.1<br>Squarewave: 1.0-3.4, Resolution: 0.1                                                                                                                        |
| DC                                         | $\sqrt{2}$ , 2.0-3.5, Resolution: 0.5                                                                                                                                                                          |
| Maximum Peak                               | Current = 2 x Rated Current                                                                                                                                                                                    |

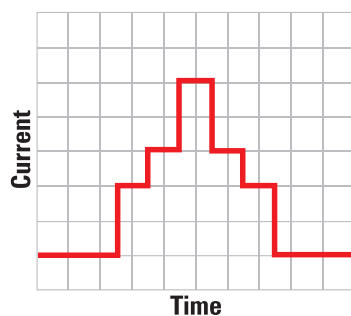


Fig.2 - Sequencer for Modules

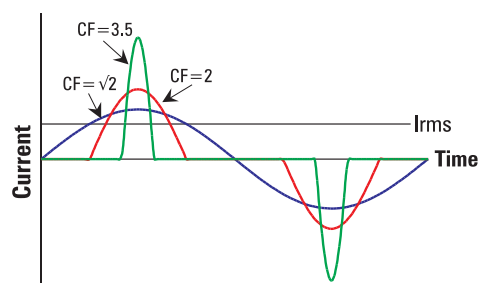


Fig.3 - Crest Factor for AC models

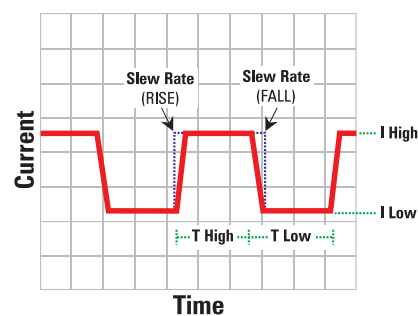
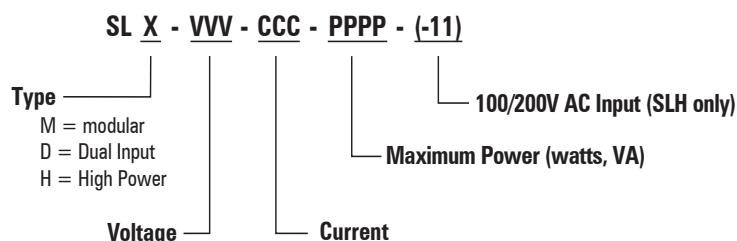
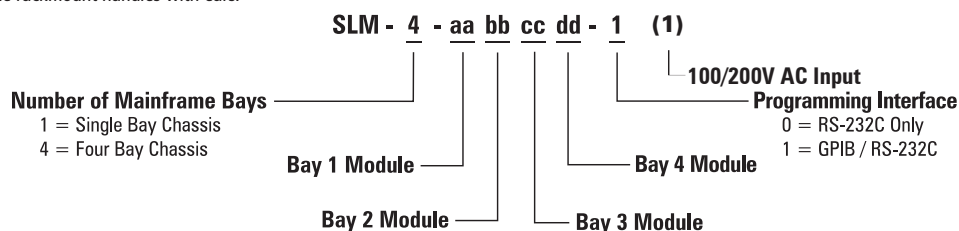


Fig.4 - Dynamic Mode for DC models

**SLH Stand Alone DC Loads**

| Model Number    | Description                                                       |
|-----------------|-------------------------------------------------------------------|
| SLH-60-120-600  | 60V / 120A / 600W rack mounted, programmable DC load              |
| SLH-60-120-1200 | 60V / 120A / 1200W rack mounted, programmable DC load             |
| SLH-60-120-1800 | 60V / 120A / 1800W rack mounted, programmable DC load             |
| SLH-60-240-1200 | 60V / 240A / 1200W rack mounted, programmable DC load             |
| SLH-60-240-1800 | 60V / 240A / 1800W rack mounted, programmable DC load             |
| SLH-60-360-1800 | 60V / 360A / 1800W rack mounted, programmable DC load             |
| SLH-500-60-1800 | 500V / 60A / 1800W rack mounted, programmable DC load             |
| SLH-500-4-1200  | 500Vdc/300Vrms / 4A / 1200W rack mounted, programmable DC load    |
| SLH-500-6-1800  | 500Vdc/300Vrms / 6A / 1800W rack mounted, programmable AC/DC load |
| SLH-300-12-1200 | 300Vrms / 12A / 1200W rack mounted, programmable AC/DC load       |
| SLH-300-12-1800 | 300Vrms / 12A / 1800W rack mounted, programmable AC/DC load       |
| SLH-300-18-1800 | 300Vrms / 18A / 1800W rack mounted, programmable AC/DC load       |

All SLH models include rackmount handles with ears.

**SLM & SLD Modular Loads**

| Code | Module / Chassis | Description                                                                      |
|------|------------------|----------------------------------------------------------------------------------|
| C    | SLM-4            | Mainframe Chassis, Four (4) Bay for SLM, SLD modular loads includes GPIB/RS-232C |
| C    | SLM-1            | Mainframe Chassis, Single bay for SLM, SLD modular loads                         |
| 10   | SLM-60-30-150    | DC Module, 60V / 30A / 150W                                                      |
| 11   | SLM-60-60-300    | DC Module, 60V / 60A / 300W                                                      |
| 12   | SLM-250-10-300   | DC Module, 250V / 10A / 300W                                                     |
| 14   | SLM-500-10-300   | DC Module, 500V / 10A / 300W                                                     |
| 15   | SLM-60-15-75     | DC Module, 60V / 15A / 75W                                                       |
| 32   | SLD-80-20-102    | DC dual input module, 80V / 20A / 100W x 2                                       |
| 30   | SLD-60-505-255   | DC dual input module, 60V / 50A / 250W, 60V / 5A / 50W                           |
| 31   | SLD-61-505-255   | DC dual input module, 60V / 50A / 250W, -60V / 5A / 50W                          |
| 33   | SLD-61-5-752     | DC dual input module, 60V / 5A / 75W, -60V / 5A / 75W                            |
| 34   | SLD-62-5-752     | DC dual input module, -60V / 5A / 75W x 2                                        |
| 35xx | SLD-60-105-550   | DC dual input module, 60V / 100A / 500W, 60V / 5A / 50W                          |
| 50   | SLM-60-20-300    | AC/DC Module, 60V / 20A / 300W                                                   |
| 51   | SLM-150-8-300    | AC/DC Module, 150V / 8A / 300W                                                   |
| 52   | SLM-300-4-300    | AC/DC Module, 300V / 4A / 300W                                                   |
| 53   | SLM-500-1-300    | AC/DC Module, 500Vdc/300Vrms / 1A / 300W                                         |
| BB   | SLM-BB           | Blank Panel                                                                      |