

SL1800A Series

Scienlab Regenerative DC Emulator

High-Power Series – 90, 180, and 270 kW

SL1810A 90 kW Compact Version

SL1820A 90 kW Expandable Version (up to 270 kW)

SL1830A 180 kW Expandable Version (up to 270 kW)

SL1840A 270 kW



Parallel for up to 1.5 MW of DC output power

Scienlab Regenerative DC Emulator – High-Power Series

Systems with an output power range of 90 kW up to 270 kW, parallel up to 1.5 MW

Highly efficient test for high-power applications with a small footprint.

The Keysight's Scienlab Regenerative DC Emulator - High-Power Series with new silicon carbide (SiC) technology is a highly efficient system based on state-of-the-art technology. It allows the user to realistically emulate the electric vehicle battery in charging test applications, such as high-power DC fast charging, when paired with the SL1047A Scienlab Charging Discovery System – High-Power Series. Learn more about the SL1047A at www.keysight.com/find/SL1047A.

The switching frequency of silicon carbide transistors is greater than 10X when compared to IGBTs. This results in a significantly higher efficiency reducing costs by reducing heat dissipation (lower cooling costs), and lower energy consumption (lower electricity bill). Higher switching frequencies also enable the use of smaller components resulting in a system with a smaller footprint requiring less of your valuable floor space.

Highlights

- Smaller footprint compared to systems with similar power
- 1.5 MW power when paralleled
- Up to 1500 Vdc for emulating high voltage batteries
- Based on new HV-SiC technology
- Highly efficient with a recovery capability of 96%

| | SL1810A | SL1820A | SL1830A | | SL1840A | | |
|------------------------------|--|---------|---------|-------|---------|-------|-------|
| Power options | 90 kW | 90 kW | 180 kW | | 270 kW | | |
| Current options ¹ | 300 A | 300 A | 300 A | 600 A | 300 A | 600 A | 900 A |
| Voltage options | 50 to 1000 V 50 to 1200 V 50 to 1500 V | | | | | | |

¹ Parallel connection of several systems possible to achieve higher currents.

Output Characteristics and Data Acquisition

| Voltage | 1000 V | 1200 V | 1500 V |
|-------------------------------|--|--------|--------|
| Voltage accuracy ² | ±0.03% of measured value, ±150 mV (offset) | | |

| Voltage | 300 A | 600 A | 900 A |
|-----------------|--|--|-------|
| Voltage ripple | 300 mV _{eff} typ., 500 mV _{eff} max. at measuring range of 500 kHz | | |
| Output capacity | 1600 µF (800 µF optional ³) | 3200 µF (1600 µF optional ³) | TBD |
| Load stability | < 80 V (typ. < 40 V @ 400 V, 0 → 250 A < 1 ms, 400 µF) | < 80 V (typ. < 40 V @ 400 V, 0 → 500 A < 1 ms, 400 µF) | TBD |

Explanation of load stability

- @ 400 V → output voltage of 400 V
- 0 → 250 A, < 1 ms → current rise from 0 A to 250 A in less than 1 ms
- 400 µF → load capacity (typical DUT input capacity)
- Typically 40 V → average overvoltage of 40 V
- < 80 V → maximum 80 V overvoltage/undervoltage

| Current | 300 A | 600 A | 900 A |
|---------------------------------|---|---|---|
| Current accuracy ² | ±0.03% of measured value, ±150 mA (offset) | | |
| Ripple | < 0.2% FS _{eff} = 1.2 A _{eff} | < 0.2% FS _{eff} = 2.4 A _{eff} | < 0.2% FS _{eff} = 3.6 A _{eff} |
| Rise and fall time ⁴ | -90% → +90% < 1 ms @ 300 V | | |

| Data acquisition and re-calibration | |
|-------------------------------------|---------------------------------|
| Resolution | Single-Precision Floating-point |
| Sample rate | Maximum 100 kS/s |
| Recommended re-calibration period | 12 months |

² Measurement and programming accuracy.

³ For changing the output capacity, please refer to operation instructions.

⁴ No switching times within power stage or channel at transition from positive to negative current and vice versa

Paralleling Configurations

The following table displays compatible paralleling configuration. For example, you it is acceptable to parallel an SL1830A with the 600 A option with an SL1810A with the 300 A option to achieve a system capable of up to 900 A and up to 270 kW at 300 V.

If you prefer a configuration that is not shown as compatible, please contact your local Keysight representative to discuss the possibilities.

| Compatible Paralleling Configurations | | | | | | | |
|---------------------------------------|------------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|------------------------------|
| Models | SL1840A 900 A | SL1840A 600 A | SL1840A 300 A | SL1830A 600 A | SL1830A 300 A | SL1820A 300 A | SL1810A 300 A |
| SL1840A 900 A | 1800 A, 540 kW @ 300 V | | | | | 1200 A, 360 kW @ 300 V | 1200 A, 360 kW @ 300 V |
| SL1840A 600 A | | 1200 A, 540 kW @ 450 V | | | | | |
| SL1840A 300 A | | | 600 A, 540 kW @ 900 V | | | | |
| SL1830A 600 A | | | | 1200 A, 360 kW @ 300 V | | 900 A, 270 kW @ 300 V | 900 A, 270 kW @ 300 V |
| SL1830A 300 A | | | | | 600 A, 360 kW @ 600 V | | |
| SL1820A 300 A | 1200 A, 360 kW @ 300 V | | | 900 A, 270 kW @ 300 V | | 600 A, 180 kW @ 300 V | 600 A, 180 kW @ 300 V |
| SL1810A 300 A | 1200 A, 360 kW @ 300 V | | | 900 A, 270 kW @ 300 V | | 600 A, 180 kW @ 300 V | 600 A, 180 kW @ 300 V |



System Cabinet

| System | Weight | Height ⁵ x Width x Depth |
|---------|---------|-------------------------------------|
| SL1810A | 980 kg | 2150 x 1510 x 600 mm |
| SL1820A | 1350 kg | 2150 x 2410 x 600 mm |
| SL1830A | 1600 kg | |
| SL1840A | 1850 kg | |

Note: A magnetic signal lamp with a height of 35 cm can be mounted variably at the cabinet and therefore does not necessarily have an influence on the system height.

- Protection type IP 54
- Control cabinet color: RAL 7035
- Ambient temperature: 5 to 40 °C
- Air humidity: max. 80% relative humidity

Documentation

- Operating instructions in English
- CE Certificate of Conformity

System design and realization according to applicable safety and regulatory requirements (such as EU Directives). Please contact Keysight if you require conformance to specific standards.

| System AC power | | | | |
|-----------------|---|----------|----------|-----------|
| Efficiency | 96% | | | |
| Mains supply | 3-phase (3Φ), Protective Earth, 400/480 V, 50/60 Hz | | | |
| System cooling | SL1810A | SL1820A | SL1830A | SL1840A |
| Heat transfer | ≤ 3.6 kW | ≤ 3.6 kW | ≤ 7.2 kW | ≤ 10.8 kW |
| Cooling type | Water/air heat exchanger | | | |

| Pre-fuse on site | 90 kW | 180 kW | 270 kW |
|------------------|----------|----------|----------|
| 400/480 VAC | 160 A gG | 315 A gG | 500 A gG |

⁵ Rollers increase the height by 4 cm

System Cabinet (continued)

Safety

- Power contactors on the mains side ensure voltage-free operation
- Output contactors capable of disconnecting at full load current
- Emergency stop push button
- Discharge of all internal high-voltage sources with regard to service
- Integration into Test Bench Software (ESD) and Test Bench Guard (TBG)
- Insulation resistance: $\geq 30 \text{ M}\Omega$
- Intrinsically safe against overheating, overpower, short-circuit
- Reverse polarity protection
- Signal light with magnetic mounting
 - Red: Error; Yellow: Active, Green: Ready

System Options

Cabinet base option class

SL180XA-C01 Base stand

DCE is placed on top of base stand.

SL18X0A-C02 Rollers

DCE is placed on top of heavy-duty rollers and can be moved flexible.

Additional cabinet options

SL180XA-C03 Mirrored cabinet layout

To provide a higher flexibility for the lab design a mirrored cabinet layout is available.

SL18X0A-C04 Halogen-free cables

Cabling inside the system cabinet with halogen-free material.

SL18X0A-C05 Cabinet interior lighting

Illumination of the output terminals in the control cabinet.

Safety functions

SL180XA-T01 Insulation monitor

Insulation monitor Bender iso685 to supervise the isolation value of the connected DUTs.

SL18X0A-T02 Insulation monitor – key switch

Key switch for enable/disable the insulation monitor.

The following operation modes are available: 0: Auto, 1: Off, 2: On

Upgrade options

Power upgrades

Extension of the SL1820A or SL1830A system with additional 90 kW / 300 A power modules.

- SL1800AU-PU1 Power upgrade (90 kW to 180 kW)
- SL1800AU-PU2 Power upgrade (90 kW to 270 kW)
- SL1800AU-PU3 Power upgrade (180 kW to 270 kW)

Voltage upgrades

Extension of the voltage range to 1200 V or 1500 V.

- SL1800AU-VU1 Voltage upgrade (1000 V to 1200 V)
- SL1800AU-VU2 Voltage upgrade (1000 V to 1500 V)
- SL1800AU-VU3 Voltage upgrade (1200 V to 1500 V)

Current upgrades

Increase the output current of a system. If the maximum achievable current is already reached (see table on page 3), further increase is only possible with additional hardware (power upgrade or an additional system connected in parallel).

- SL1800AU-CU1 Current upgrade (300 A to 600 A)
- SL1800AU-CU2 Current upgrade (300 A to 900 A)
- SL1800AU-CU3 Current upgrade (600 A to 900 A)

Extend the Capabilities of your Test Solution

Keysight's Scienlab Charging Discovery System Series (CDS) is a breakthrough solution for holistic test of all AC and DC charging interfaces of electric vehicles (EV) and electric vehicle supply equipment (EVSE). You can get further information to the Scienlab Charging Test Solutions below.



From left to right: SL1040A CDS – EMC Series, SL1040A CDS – Portable Series and SL1047A CDS – High-Power Series

Meet the SL1040A Scienlab Charging Discovery System Series

The Scienlab Charging Discovery System Series from Keysight enables you to test charging interfaces of electric vehicles (EVs) and EV supply equipment (EVSE). Thanks to its modular and innovative design, you can configure the CDS to customers' specific needs and replace multiple real EV/EVSE with one test solution to ensure an optimal price-performance ratio.

- Automated functional, conformance, interoperability and quality testing for R&D, end-of-line (EOL) and Electromagnetic Compatibility (EMC) applications.
- Time synchronous measurement and decoding of communication and power signals.
- Scalable and futureproof hardware design according to CharIN e.V. CCS Test System.
- CE, UL and KC-Mark conformance certified by CSA Group.
- Extensive Test Case Library for automated conformance testing of CCS, CHAdeMO and GB/T standard.

Find out more about the [SL1040A Scienlab CDS Series](#).

Meet the SL1047A Scienlab Charging Discovery System – High-Power Series

The Scienlab Charging Discovery System – High-Power Series (CDS HP Series) from Keysight enables you to test charging interfaces of electric vehicles (EVs) and EV supply equipment (EVSE) during high-power charging up to 1,500 V DC and ± 600 A DC. With the CDS can perform all necessary conformance and interoperability tests according to worldwide charging standards. Our new solution, which features the separate Scienlab Cooling Unit with interchangeable liquid-cooled charging adapters, also enables a high-power upgrade of the SL1040A Scienlab Charging Discovery System – Portable Series.

- Automated functional, conformance, interoperability and quality testing for R&D and EOL applications.
- Time synchronous measurement and decoding of communication and power signals.
- Scalable and future-proof hardware design according to CharIN e. V. CCS Test System.
- CE, UL, and KC-mark conformance.
- Extensive Test Case Library for automated conformance testing of CCS, CHAdeMO, and GB/T standard.

Find out more about the [SL1047A Scienlab CDS HP Series](#).

Project Management, Consulting, and Installation Services

Service features depend on the facilities, customer expertise, and overall scope of the project. For that reason, it is not possible to give exact service efforts without knowing the customer's requirements and goals. Keysight offers the following services.

PS-XPM-100-SL Project management services

Keysight recommends Project management services for each test bench project. By ordering the Project management services, an experienced project manager is dedicated to your project and acts as a direct communication interface from Keysight to the customer's project management team.

The project manager takes over the responsibility:

- To develop and manage the project plan.
- To track project progress and milestones.
- Communication project status regularly and ensure any unscheduled project events or project deviations are communicated and promptly discussed with the customer project team.
- To provide complete and accurate project documentation to the customer.

PS-XINS-100-SL Project installation services

These services provide installation expertise to manage, deliver and coordinate local facilities installation for the test bench. Specific installation efforts depend on the customer's individual facility, the locally available power and cooling and the test bench being delivered.

PS-XENG-100-SL Project engineering services

Project engineering services provide specialized engineering services during project development and implementation. The customer's project team will have access to engineering expertise to aid in various tasks specific to their project including but not limited to – safety matrix and test bench guard, facilities and lab layout, special power requirements, etc.

PS-XCOM-100-SL Project commissioning services

Project commissioning services for the test solution provide an experienced test bench engineer to validate and complete the test bench setup in readiness for the customer's initial usage. It includes validating specific hardware and software configurations per the project requirements and any specific consulting agreed to beforehand, given the test bench's customer-specific usage.

KeysightCare Solutions

Service deliverables

| | KeysightCare Solution Basic | KeysightCare Solution Premium |
|---|------------------------------------|--|
| | Onsite R-55L-001-X ⁶ | Onsite R-55M-001-X ⁶ |
| Technical support (Application and solution specific for both hardware and software ¹⁾) | | |
| Self-service web portal & knowledge center, 24/7 | ✓ | ✓ |
| Technical support response times | 2 business days | 4 business hours ⁷ |
| Weekend support available on request ⁸ | X | ✓ |
| On-site technical support response time ⁸ | 7 business days ⁸ | 3 business days ⁸ |
| Software configuration support ⁹ | ✓ remote | ✓ remote or onsite ¹⁰ |
| Solution hardware support¹¹ | | |
| Repair service coverage | ✓ | ✓ |
| Repair service turnaround or onsite response time | 7 business days response | 3 business days response |
| Calibration service ¹⁰ | ✓ | ✓ |
| Calibration type | Keysight Calibration | Keysight Calibration + Measurement Uncertainty + Guard Banding |
| Calibration turnaround or onsite response time | mutually scheduled | priority scheduled |
| Preventive maintenance ¹² | X | ✓ |
| Preventive maintenance frequency | X | twice a year |
| Application of service notes ¹³ | ✓ mandatory notes only | ✓ mandatory and recommended notes |
| Customer care review twice a year on request | X | ✓ |

Find out more about KeysightCare Service and Support [here](#).

⁶ Service Product Number (SPN). When ordering, update with the relevant SPN based on the length of service required (e.g. -1, -2, -3, or -5 for 1 year, 2 years, 3 years or 5 years).

⁷ Technical support response times may vary for specific solutions

⁸ Onsite technical support is provided or at the discretion of Keysight. Weekend support is only available for existing tickets by prior arrangement.

⁹ KeysightCare Software Agreement required for software support including software updates and notifications. Onsite support at the discretion of Keysight.

¹⁰ Annual calibration service and calibration after repair if applicable is included for instruments that require calibration.

¹¹ Offering may be different by country. Certain solution configurations are not applicable for return to Keysight. Please contact regional representatives.

¹² 3rd party products are excluded for basic and premium packages

¹³ We perform application of service notes during scheduled service events.

KeysightCare Solutions (continued)

The KeysightCare Solutions provide comprehensive coverage for all support needs, including all hardware support and technical support. Two levels of post-delivery solution support are available:

- KeysightCare Premium Solution Support – Prioritized support designed to minimize down time with committed technical support response times and hardware support turnaround times.
- KeysightCare Basic Solution Support – complete solution coverage for installations where uptime is less critical. Includes technical support and hardware support with non-committed response times.
- Both Premium and Basic Solution support include on-site options. This is necessary for large installations and an option for smaller solutions (such as some portable solutions).

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

