

SPECIFICATIONS

SLSC-12101

Prototyping Module

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

The following characteristic specifications describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- *Typical* specifications describe the performance met by a majority of models.
- *Nominal* specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are *Typical* unless otherwise noted.

Conditions

Specifications are valid under the following conditions unless otherwise noted.

- The SLSC-12101 module is mounted in an SLSC chassis with the recommended cooling clearances and using a power supply that meets the specifications provided in the chassis user guide.
- For the entire temperature range of the chassis.



Note These specifications only apply to the product as provided by NI. Modifications to the module may invalidate these. Be certain to verify the performance of modified modules.



Caution Observe all instructions and cautions in the user documentation. Using the model in a manner not specified can damage the model and compromise the built-in safety protection. Return damaged models to NI for repair.

Design Standards and Compatibility

Switch Load and Signal Conditioning Module Design Specifications Version	1.0
SLSC Compliance Level ¹	2
Rear I/O Compatibility Category	User-defined

DC and AC Characteristics

Parameter	Minimum	Typical	Maximum	Notes
CPLD Clock Frequency. U6	40 MHz – 100 ppm	40 MHz	40 MHz + 100 ppm	Using the SG-310 Oscillator.
24 V	20.4 V	24 V	27.6 V	Supplied by the SLSC chassis.
Bank 1 VCC	3.135 V	3.3 V	3.465 V	Supplied by the SLSC chassis.
Bank 2-4 VCC, configured for 1.2 V	1.17 V	1.2 V	1.23 V	—
Bank 2-4 VCC, configured for 1.5 V	1.463 V	1.5 V	1.538 V	—
Bank 2-4 VCC, configured for 1.8 V	1.755 V	1.8 V	1.845 V	—
Bank 2-4 VCC, configured for 2.5 V	2.438 V	2.5 V	2.563 V	—
Bank 2-4 VCC, configured for 3.3 V	3.218 V	3.3 V	3.383 V	—
Bank 1 Maximum I			400 mA	This is the maximum current that can be withdrawn from the backplane. You can use W6 to measure the current used by your design.
Bank 2-4 Maximum I			2 A	For all voltages.

¹ SLSC-12101 may be upgraded to Level 1 by implementing Fully Compatible Rear I/O.

Parameter	Minimum	Typical	Maximum	Notes
24 V Maximum I			2 A	This is the maximum current that can be withdrawn from the backplane. You can use W1 to measure the current used by your design.
XJ3 Maximum Current			8 A	Per blade.
XJ3 Maximum Voltage	-60 V		60 V	DC limit. Additional limitations are given in the <i>Switch Load and Signal Conditioning Module Design Specifications</i> document.
XJ2 Maximum Current			1 A	Per pin.
XJ2 Maximum Voltage	-32 V		32 V	DC limit. Additional limitations are given in the <i>Switch Load and Signal Conditioning Module Design Specifications</i> document.
J10, J11 Maximum Current			0.4 mA	Limit per pin. The limit is driven by trace width.
J10, J11 Maximum Voltage	-60 V		60 V	DC limit.
DIO V OH	2.4 V			Values for the default CPLD program using 3.3 V-LVTTL and -4 mA.
DIO V OL			0.45 V	Values for the default CPLD program using 3.3 V-LVTTL and 4 mA.
DIO V IH	1.7 V		4.0 V	Values for the default CPLD program using 3.3 V-LVTTL.

Parameter	Minimum	Typical	Maximum	Notes
DIO V IL	-0.5 V		0.8 V	Values for the default CPLD program using 3.3 V-LVTTL.
DIO Maximum Current			25 mA	Absolute maximum rating.

Power Requirements

If the SLSC-12101 is modified, you must ensure it meets all the power requirements in the *Switch Load and Signal Conditioning Module Design Specifications*.

Maximum current drawn from backplane, without module customization (Typical)

3.3 V	50 mA
24 V	30 mA
Power dissipation (Typical)	900 mW
Maximum allowed continuous power dissipation (Limited by specification)	50 W

Thermal Considerations

All components on the SLSC-12101 are rated for an ambient temperature of at least 85 °C. The components do not exceed 85 °C when the module is dissipating the maximum allowed power using resistors spread out over the prototyping areas. However, large components or grouped placement of very hot components may negatively affect airflow and heat dissipation, resulting in higher component temperatures.

Whenever possible, thorough thermal testing should be conducted in order to ensure the components remain within proper operational temperature ranges. Because chassis airflow characteristics may vary greatly from slot to slot, module testing should be repeated in a variety of slots.

Physical Characteristics

SLSC slots	1
Dimensions	175 mm × 31 mm × 336 mm (6.89 in × 1.19 in × 13.21 in)
Weight	283 g (10.0 oz)

Front I/O Connectors	2x high-density 44-position DSUB
Rear I/O Connectors	1x 110-pin Hard Metric Type A, 1x 8-blade Universal Power Module (UPM), capable of implementing Fully Compatible Rear I/O

Shock and Vibration

Operating shock	30 g peak, half-sine, 11 ms pulse
Operating vibration, random	5 to 500 Hz, 0.3 g RMS
Non-operating vibration, random	5 to 500 Hz, 2.4 g RMS

Safety Guidelines

Measurement Category	I
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Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as *MAINS* voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.



Caution Do not connect the SLSC-12101 to signals or use for measurements within Measurement Categories II, III, or IV.



Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1



Note For safety certifications, refer to the product label or the [Product Certifications and Declarations](#) section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.



Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

Environmental

Module operating temperature	0 °C to 85 °C ²
Storage temperature range	-40 °C to 85 °C
Relative humidity range, operating	10% to 90%, noncondensing
Relative humidity range, storage	5% to 95%, noncondensing
Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient)
Pollution Degree	2

Indoor use only.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

² The chassis internal ambient temperature may reach 85 °C with all slots at the maximum allowed power dissipation.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国 RoHS）



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CE Compliance

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

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