

# SCXI 32-Channel Current Excitation Module

## NI SCXI-1581

- Use with SCXI-1102 module for high-channel-count RTD and thermistor measurements
- 32 channels of 100  $\mu$ A current excitation sources
- $\pm 0.05\%$  accuracy per channel current source
- $\pm 5$  ppm/ $^{\circ}$ C maximum temperature drift
- Screw terminal, BNC connector, and solder pin connectivity options
- NI-DAQ driver simplifies configuration and measurement

### Operating Systems

- Windows 2000/NT/XP

### Recommended Software

- LabVIEW
- LabWindows/CVI
- Measurement Studio
- VI Logger

### Driver Software

- NI-DAQ 7



## Overview

The National Instruments SCXI-1581 provides 32 channels of 100  $\mu$ A current excitation. The high accuracy and stability of these current sources make them especially well suited for measuring resistance with a high degree of accuracy. The module is ideal in any application that requires a 100  $\mu$ A fixed current excitation, such as RTDs and thermistors. You can combine the NI SCXI-1581 with the SCXI-1102 to create a high-channel-count RTD measurement system.

## Description

The 32 current sources on the SCXI-1581 are activated whenever the SCXI chassis is powered-on. The current sources on the SCXI-1581 are designed for  $\pm 0.05\%$  accuracy of the specified value, with a maximum  $\pm 5$  ppm/ $^{\circ}$ C temperature drift.

Terminal Block	Part Number	Type	Cable	Special Functions	Info Code*	Page
SCXI-1300	777687-00	Screw terminals Front-mount	–	–	scxi1300	328
BNC-2095	777508-01	BNC connectors Rack-mount	–	Prewired ground referencing	bnc2095	330
TBX-96	777264-01	Screw terminals DIN-rail mount	SH96-96 or R96-96	3 terminals per channel	tbx96	331
SCXI-1310	777687-10	Solder pins Front-mount	–	–	scxi1310	328

\*For more information about any of these products, please visit [ni.com/info](http://ni.com/info) and enter the info code provided.

Table 1. Terminal Block Options for SCXI-1581

## Signal Connection

Signals from each channel of the SCXI-1581 connect to screw terminals located in the SCXI-1300 terminal block. The SCXI-1300 plugs directly into the front of the module. Alternatively, you can use the TBX-96, a DIN-rail mountable terminal block that you connect to the SCXI-1581 with the SH96-96 cable. A general-purpose 96-pin connector and shell, the SCXI-1310, is available as a low-cost alternative for custom cabling. Finally, you can select the BNC-2095, a rack-mounted accessory, for BNC applications.

## Ordering Information

NI SCXI-1581 .....777966-81

For information on extended warranty and value-added services, see page 20.

### BUY ONLINE!

Visit [ni.com/info](http://ni.com/info) and enter *scxi1581*.

See page 276 to configure your complete SCXI system.

# SCXI 32-Channel Isolated Analog Output and Current Excitation Specifications

## Specifications

These specifications are typical for 25 °C unless otherwise noted.

### SCXI-1124

#### Analog Output – Output Characteristics

Number of channels.....	6 voltage or current
Resolution.....	12 bits, 1 in 4,096
Common-mode isolation.....	250 V <sub>rms</sub> between channels and channel to earth ground
Maximum update rate <sup>1</sup>	
Single channel.....	555 S/s
All six channels.....	125 S/s (per channel rate)

#### Transfer Characteristics

Relative accuracy (INL).....	±0.5 LSB maximum
Absolute accuracy	
Voltage outputs.....	±0.05% FSR maximum
Current output.....	±0.1% FSR maximum
DNL.....	±1 LSB maximum
Monotonicity.....	Guaranteed over temperature

#### Voltage Output

Ranges.....	0-1 V, 0-5 V, 0-10 V, ±1 V, ±5 V, ±10 V, software selectable
Output coupling.....	DC
Output impedance.....	0.1 maximum
Current drive.....	±5 mA maximum
Load impedance.....	10,000 pf maximum
Protection.....	Short-circuit to ground
Power-on state.....	-10 mV

#### Current Output

Range.....	0 to 20 mA
Type, (external power not required).....	Current sink with internal loop supply,
Output impedance.....	1 G minimum
Current loop supply	
Internal.....	15 to 21 V <sup>2</sup>
External.....	3 to 42 V <sup>2</sup>
Protection.....	Short-circuit and open-circuit
Power-on state.....	0 µA

#### Dynamic Characteristics

	Output Range					
	0 to 1 V	0 to 5 V	0 to 10 V	±1 V	±5 V	±10 V
Settling time <sup>3</sup>	270 µs	115 µs	100 µs	135 µs	65 µs	85 µs
Slew rate	0.015 V/µs	0.075 V/µs	0.15 V/µs	0.03 V/µs	0.15 V/µs	0.15 V/µs

Slew rate (current outputs).....	0.3 mA/µs
Noise	
Voltage outputs.....	1 mV <sup>2</sup> , 0 to 20 MHz
Current outputs.....	10 µA <sub>rms</sub> , 0 to 20 MHz

#### Stability

Offset temperature coefficient	
Unipolar range.....	±1 ppm/°C
Bipolar range.....	±6 ppm/°C
Gain temperature coefficient.....	±20 ppm/°C

<sup>1</sup>Update rate depends largely on the computer and software. These tests were made using a PCI-6032E installed in a 500 MHz PIII computer running NI LabVIEW and Windows NT; Not for Waveform Generation.

<sup>2</sup>Refer to the SCXI-1124 User Manual for more information.

<sup>3</sup>Setting time is to ±0.012% (±0.5 LSB) accuracy for a full scale step.

### SCXI-1581

#### Excitation

Number of channels.....	32 single-ended outputs
Current output.....	100 µA
Accuracy.....	±0.05%
Temperature drift.....	±5 ppm/°C
Maximum resistive load.....	100 k
Overvoltage protection.....	±40 V
Power-on state.....	100 µA (nonprogrammable)

#### Certification and Compliance

SCXI-1124.....	250 V, Cat II working voltage
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#### European Compliance

EMC.....	EN 61326 Group I Class A, 10 m,
Table Immunity	
Safety.....	EN 61010-1

#### North American Compliance

EMC.....	FCC Part 15 Class A using CISPR ICSE5003 via harmonization to FCC Part 15
Safety.....	UL Listed to UL 3111-1 CAN/CSA C22.2 No. 1010.1

#### Australian and New Zealand Compliance

EMC.....	AS/NZS 2064.1/2 (CISPR-11)
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