SCXI 6-Channel Isolated Analog Output

NI SCXI-1124

- 6 isolated channels, per channel configurable for voltage or current output
- 250 V_{rms} working isolation per channel
- Software programmable ranges
- 12-bit resolution
- Combine channels for output voltages of up to ±60 V per module
- Software calibration using onboard calibration EEPROM
- 0-1, 0-5, 0-10, ±1, ±5, ±10 V voltage output ranges
- 0-20 mA current outputs
- 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

Calibration Certificate Included
See page 21

Module	Frequency Input Range (±1 to ±10 V)	Input Signal Range (0-20 mA)
SCXI-1124	✓	✓

Table 1. Module Compatibility

Overview

The National Instruments SCXI-1124 is a 6-channel isolated source for static DC (low bandwidth) voltage or current signals. The NI SCXI-1124 includes six independently isolated, 12-bit digital-to-analog-converter (DAC) channels. You can configure each channel for voltage or current output. For voltage, choose any of the available three unipolar or three bipolar ranges. For current, each channel outputs 0 to 20 mA. The module is software configurable, and includes an onboard EEPROM for storing calibration constants. The SCXI-1124 is ideal for applications requiring isolated voltage or current outputs to control a process. For more channels, you can use several SCXI-1124 modules in an SCXI system along with other signal conditioning I/O modules. The SCXI-1124 is controlled digitally over the SCXIbus, so a single DAQ device can control several SCXI-1124 modules.

Description

Figure 1 is a block diagram of the SCXI-1124. Its major functions are described in the following paragraphs.

Analog Output

The SCXI module has six independently isolated analog output channels. You can software program each channel for voltage output ranges such as 0 to 1, 0 to 5, 0 to 10, ±1, ±5, or ±10 V. Within a single module, you can successively connect channels together to create output signals up to 60 VDC per module. Each voltage channel includes a low impedance output buffer that can drive up to 5 mA.

Alternatively, you can configure any channel as a programmable 0 to 20 mA sink. Each current output channel includes a 15 V loop supply, eliminating the need for external supplies. With this 15 V loop supply, a current output channel can drive loads of up to 600 You can also use an external loop supply for higher loads.

Each output channel of the SCXI-1124 is optically isolated. You can operate the module with up to 250 V_{rms} of common-mode voltage between any two channels or between any channel and earth ground.

Multiplexed Mode Operation

In multiplexed serial mode, a single DAQ device controls one or more SCXI-1124 modules through the SCXIbus using a serial digital data protocol. This mode of operation uses a maximum of five digital I/O lines of the plug-in DAQ device. With multiplexed-mode operation, you can control several SCXI modules in one or more chassis using a single DAQ device.

Calibration EEPROM

An onboard calibration EEPROM stores calibration constants measured at the factory. A set of calibration constants is stored in the EEPROM for each output range for each channel. Although the factory calibration constants are permanent and cannot be modified, an additional user section of the EEPROM stores user-modifiable constants for calibration under your exact operating conditions. NI-DAQ transparently uses the calibration constants to correct for gain and offset errors.

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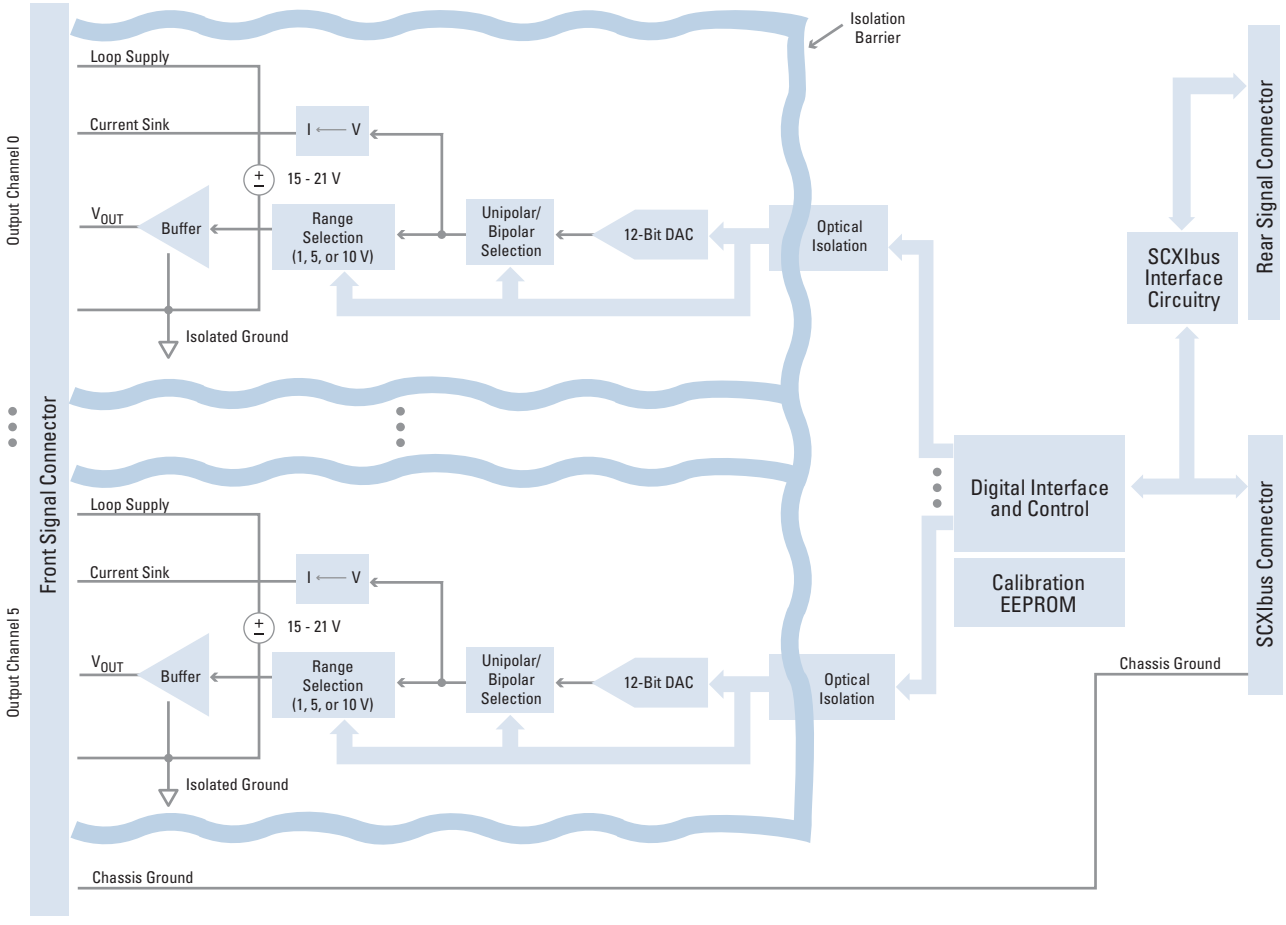

Figure 1. SCXI-1124 Block Diagram

Terminal Block	Part Number	Type	Cable	Page
SCXI-1325	777687-25	Screw terminals front-mounting	–	329
TBX-1325	777207-25	Screw terminals DIN-rail mount	SH48-48-A (183229-01)	331

Figure 2. Terminal Block Options for SCXI-1124

Ordering Information

NI SCXI-1124.....776572-24

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

BUY ONLINE!

Visit ni.com/info and enter scxi1124.

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_{rms} between channels and channel to earth ground
Maximum update rate[1]
  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[2]
  External ..... 3 to 42 V[2]
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[3]	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°, 0 to 20 MHz
  Current outputs ..... 10 μA_{rms}, 0 to 20 MHz

Stability

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

[1]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.
[2]Refer to the SCXI-1124 User Manual for more information.
[3]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 (nonprogrammble)

Certification and Compliance

SCXI-1124 ..... 250 V, Cat II working voltage
European Compliance CE
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 ICSES003 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)

For a definition of specific terms, please visit *ni.com/glossary*