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Find the *National Instruments SCXI-1102* at our website: *Click HERE*

SCXI Thermocouple Input Modules

NI SCXI-1102, NI SCXI-1112

- Hardware scanning of cold-junction sensors
- 2 Hz lowpass filtering per channel
- Overvoltage protection to ±42 V
- 333 kS/s maximum sampling rate
- NI measurement services software that simplifies configuration and measurements

SCXI-1102

- Programmatic input range of ±100 mV or ±10 V per channel
- Thermocouple, millivolt, volt, and current input

SCXI-1112

- Instrumentation amplifier per channel
- Random scanning
- Onboard calibration reference
- Open-thermocouple detection LEDs
- Cold-junction compensation per channel

Operating Systems

- Windows 2000/NT/XP

Recommended Software

- LabVIEW
- LabWindows/CVI
- Measurement Studio

Measurement Services Software

- NI-DAQmx driver software
- VI Logger Lite data-logging software



Module	Channels	Thermocouple	RTD	±100 mV	±10 V	0 to 20 mA
SCXI-1102	32	✓	✓[1]	✓	✓	✓
SCXI-1112	8	✓	–	–	–	–

[1] With SCXI-1581

Table 1. Signal Compatibility

Overview

The National Instruments SCXI-1102 and SCXI-1112 are designed for high-accuracy thermocouple measurements. The SCXI-1102 also can acquire millivolt, volt, 0 to 20 mA, and 4 to 20 mA current input signals, as well as signals from RTDs when the SCXI-1581 provides excitation. Each input channel includes an instrumentation amplifier and a 2 Hz lowpass filter. The SCXI-1112 incorporates open-thermocouple detection circuitry on each input channel. LEDs on the front of the module indicate the presence of an open thermocouple.

Ordering Information

NI SCXI-1102 776572-02
NI SCXI-1112 776572-12

Accessories
SH96-96 shielded cable 1 m 183228-01
R96-96 ribbon cable 1 m 183425-01

For information on extended warranty and value-added services, go to **ni.com/signalconditioning**.

BUY NOW!

For complete product specifications, pricing, and accessory information, call (866) 265 9891 (U.S. only) or go to **ni.com/scxi**.

Terminal Block	Part Number	Type	CJ Sensor	Compatible Modules	Cabling	Special Functions
SCXI-1300	777687-00	Screw terminals Front-mounting	✔	SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1104C, SCXI-1100	_	IC sensor for CJC
SCXI-1303	777687-03	Screw terminals Front-mounting	✔	SCXI-1102B, SCXI-1102C, SCXI-1100	_	Isothermal construction Pluggable ground referencing
SCXI-1308	777687-08	Screw terminals Front-mounting	–	SCXI-1102B, SCXI-1102C, SCXI-1100	_	249 Ω precision shunt resistor for current measurements
TC-2095	777509-01	Thermocouple, plugs Rack-mounted	✔	SCXI-1100, SCXI-1102B, SCXI-1102C	SH96-96 or R96-96	Isothermal construction Prewired ground referencing
TBX-1303	777207-03	Screw terminals	✔	SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1104C, SCXI-1100	SH96-96 or R96-96	DIN-rail mount Isothermal construction Pluggable ground referencing 3 terminals per channel
TBX-96	777264-01	Screw terminals DIN-rail mount	–	SCXI-1100, SCXI-1102B, SCXI-1102C, SCXI-1104,	SH96-96 or R96-96	DIN-rail mount 3 terminals per channel
SCXI-1310	777687-10	Solder pins Front-mounting	–	SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1100	–	Low-cost connector and shell assembly

Table 2. Terminal Block Options for SCXI-1102

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SCXI Thermocouple Input Modules

Specifications

Complete Accuracy Table

			Percent of Reading[1]			System Noise (peak, 3 sigma)[1]				Temperature Drift	
						Single Point		Average			
Module	Nominal Range[1]	Overall Gain[1]	Typical	Maximum	Offset (µV)	4 Hz (µV)	10 kHz or FBW (µV)	4 Hz (µV)	10 kHz or FBW (µV)	Percent of Reading/°C	Offset (µV/°C)
SCXI-1100	±10 V	1	0.03	0.05	250	600	600	15.0	15.0	0.002	24.0
	±5 V	2	0.1	0.15	175	400	400	15.0	15.0	0.002	14.0
	±2 V	5	0.1	0.15	100	200	200	15.0	15.0	0.002	8.0
	±1 V	10	0.1	0.15	75	100	100	10.0	11.0	0.002	6.0
	±500 mV	20	0.1	0.15	65	50	50	10.0	11.0	0.002	5.0
	±200 mV	50	0.1	0.15	50	30	30	10.0	11.0	0.002	4.5
	±100 mV	100	0.1	0.15	50	10	10	5.0	6.0	0.002	4.5
	±50 mV	200	0.1	0.15	50	10	10	5.0	6.0	0.002	4.5
	±20 mV	500	0.1	0.15	45	10	10	5.0	6.0	0.002	4.0
	±10 mV	1000	0.1	0.15	45	1.5	1.5	0.5	1.5	0.002	4.0
	±5 mV	2000	0.1	0.15	45	1.5	1.5	0.5	1.5	0.002	4.0

[1]Absolute Accuracy (15 to 35 °C). To calculate the absolute accuracy for the SCXI-1100, 1102, 1102B, 1102C, 1104, 1104C, and/or 1112, visit **ni.com/accuracy**.

			Percent of Reading[1]			System Noise (peak, 3 sigma)[1]		Temperature Drift	
Module	Nominal Range[1]	Overall Gain[1]	Typical	Maximum	Offset (µV)	Single Point	Average (µV)	Percent of Reading/°C	Offset (µV/°C)
SCXI-1102	±10 V	1	0.025	0.035	500	600 µV	50	0.0010	20
	±100 mV	100	0.015	0.02	25	20 µV	5	0.0005	1
SCXI-1102B	±10 V	1	0.025	0.035	500	600 µV	50	0.0010	20
	±100 mV	100	0.015	0.02	25	20 µV	5	0.0005	1
SCXI-1102C	±10 V	1	0.025	0.035	500	600 µV	70	0.0010	20
	±100 mV	100	0.015	0.02	25	30 µV	10	0.0005	1
SCXI-1104	±60 VDC	0.1	0.035	0.05	800	900 µV	200	0.0020	50
SCXI-1104C	±42 VAC	0.1	0.035	0.05	800	1 mV	300	0.0020	50
SCXI-1112	±100 mV	100	0.015	0.02	25	20 µV	5	0.0005	1

[1]Absolute Accuracy (15 to 35 °C). To calculate the absolute accuracy for the SCXI-1100, 1102, 1102B, 1102C, 1104, 1104C, and/or 1112, visit **ni.com/accuracy**.

Input Characteristics

Module	Number of Channels
SCXI-1100, SCXI-1102, SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1104C	32 differential
SCXI-1112	8 differential

Input signal ranges..... See accuracy table
Input coupling..... DC

Maximum working voltage

Module	Maximum Working Voltage (Signal + Common Mode)
SCXI-1100, SCXI-1102, SCXI-1102B, SCXI-1102C	±10 V
SCXI-1104, SCXI-1104C	30 V_{rms} or ±42 VAC peak or 60 VDC
SCXI-1112	±10 V

Overvoltage protection

Module	Powered On	Powered Off
SCXI-1100	±25 V	±15 V
SCXI-1102, SCXI-1102B, SCXI-1102C	±42 V	±42 V
SCXI-1104, SCXI-1104C	30 V_{rms} or ±42 VAC peak or 60 VDC	
SCXI-1112	±42 V	±42 V

Inputs with Overvoltage Protection	
SCXI-1100, SCXI-1104, SCXI-1104C	CH0..CH31
SCXI-1102, SCXI-1102B, SCXI-1102C	CH0..CH31, CJ Sensor
SCXI-1112	CH0..CH7, CJ Sensor

Offset error..... See accuracy table
Gain error..... See accuracy table

Transfer Characteristics

Nonlinearity

Module	Percentage of Full Scale Range
SCXI-1100	±0.008
SCXI-1102, SCXI-1102B, SCXI-1102C	±0.005
SCXI-1104, SCXI-1104C	±0.01
SCXI-1112	±0.005

Amplifier Characteristics

Input impedance

Module	Normal Powered On	Powered Off/Overload
SCXI-1100	>1 GΩ	1.6 kΩ
SCXI-1102, SCXI-1102B, SCXI-1102C	>1 GΩ	10 kΩ
SCXI-1104, SCXI-1104C	1 MΩ	900 kΩ
SCXI-1112	>1 GΩ	10 kΩ

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SCXI Thermocouple Input Modules

Specifications

Input bias current

Module	Current
SCXI-1100	±350 pA
SCXI-1102, SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1104C, SCXI-1112	±0.5 nA

Input offset current

Module	Current
SCXI-1100	±350 pA
SCXI-1102, SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1104C, SCXI-1112	±1.0 nA

No MMR

CMRR (Common Mode Rejection Ratio) (DC to 60 Hz)

Module	Range	Filter	CMRR (dB)
SCXI-1100	±10 V to ±2 V	4 Hz	98
	±1 V to ±5 mV	4 Hz	78
	±10 V to ±2 V	10 kHz or full bandwidth	110
	±1 V to ±5 mV	10 kHz or full bandwidth	90
SCXI-1102	±10 V to ±100 mV	2 Hz	110
SCXI-1102B	±10 V to ±100 mV	200 Hz	90
SCXI-1102C	±10 V to ±100 mV	10 kHz	90
SCXI-1104	±42 VAC/±60 VDC	2 Hz	70
SCXI-1104C	±42 VAC/±60 VDC	10 kHz	70
SCXI-1112	±100 mV	2 Hz	110

Output range ..... See accuracy table

No output impendance

Dynamic Characteristics

Input signal bandwidth

Module	Bandwidth
SCXI-1100	4 Hz, 10 kHz, full bandwidth
SCXI-1102	2 Hz
SCXI-1102B	200 Hz
SCXI-1102C	10 kHz
SCXI-1104	2 Hz
SCXI-1104C	10 kHz
SCXI-1112	2 Hz

Step response (10 V step)

			Accuracy		
Module	Filter Setting	Range	±0.012%[1]	±0.006%[2]	±0.0015%[2]
SCXI-1100	Full bandwidth	±10 V to ±100 mV	6 µs	10 µs	32 µs
	(No filter)	±50 mV	7.5 µs	10 µs	33 µs
		±20 mV	12 µs	25 µs	40 µs
		±10 mV	20 µs	26 µs	76 µs
		±5 mV	25 µs	30 µs	195 µs
	10 kHz	All ranges	150 µs	160 µs	200 µs
	4 Hz	All ranges	350 ms	400 ms	500 ms

			Accuracy	
Module	Filter Setting	Range	±0.01%	±0.01%
SCXI-1102	2 Hz	±10 V, ±100 mV	1 s	10 s
SCXI-1102B	200 Hz	±10 V, ±100 mV	10 ms	100 ms
SCXI-1102C	10 kHz	±10 V, ±100 mV	200 µs	1 ms
SCXI-1112	2 Hz	±100 mV	1 s	10 s

			Accuracy	
Module	Filter Setting	Range	±0.01%	±0.01%
SCXI-1104	2 Hz	± 42 VAC/± 60 VDC	1 s	10 s
SCXI-1104C	10 kHz	± 42 VAC/± 60 VDC	200 µs	1 ms

Multiplexer performance

	Scan Interval	
Module	Settle to ±0.012%[1]	Settle to ±0.006%[2]
SCXI-1100	(See step response)	(See step response)
SCXI-1102, SCXI-1102B, SCXI-1102C, SCXI-1104, SCXI-1104C, SCXI-1112	3 µs	10 µs

Filter Characteristics

Module	Filter Setting	Range	Noise Related to Input (μV_{rms})
SCXI-1100	Full bandwidth	±10 V	15
	(No filter)	±10 mV	6
	4 Hz	±10 V	15
		±10 mV	0.2
	10 kHz	±10 V	15
		±10 mV	1.5
SCXI-1102	2 Hz	±100 mV	5
		±10 V	50
SCXI-1102B	200 Hz	±100 mV	5
		±10 V	50
SCXI-1102C	10 kHz	±10 V	70
SCXI-1104	2 Hz	±100 mV	10
		±42 VAC, ±60 VDC	200
SCXI-1104C	10 kHz	±42 VAC, ±60 VDC	300
SCXI-1112	2 Hz	±100 mV	5

Type ..... RC

Cutoff Frequency (-3 dB)

SCXI-1100 ..... 4 Hz, 10 kHz, full bandwidth (jumper-selectable)

SCXI-1102, 1104, 1112 ..... 2 Hz

SCXI-1102B ..... 200 Hz

SCXI-1102C, 1104C ..... 10 kHz

Stability

Module	Input Range	Gain Temperature Coefficient (ppm/°C)	Offset Temperature Coefficient (µV/°C()
SCXI-1100	All ranges	20	20
SCXI-1102	±10 V	10	20
SCXI-1102B SCXI-1102C	±100 mV	10	1
SCXI-1104 SCXI-1104C	±42 VAC, ±60 VDC	20	50
SCXI-1112	±100 mV	10	1

Recommended warm-up time ..... 20 minutes

Physical

Dimensions ..... 3.0 by 17.3 by 30.3 cm
1.2 by 6.8 by 8.0 in.

I/O Connector

Rear ..... 50-pin male ribbon cable rear connector

Front

SCXI-1112 ..... 8 uncompensated minithermocouple connectors

Others ..... 96-pin male DIN C front connector

Environment

Operating temperature ..... 0 to 50 °C

Storage temperature ..... -55 to 150 °C

Relative humidity ..... 5 to 90% noncondensing

Certification and Compliance

European Compliance

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

Safety ..... EN 61010-1

North American Compliance

EMC ..... FCC Part 15 Class A using CISPR

Australia and New Zealand Compliance

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

[1]Includes effects of NI 6052E with 1 or 2 m SCXI cable assembly.

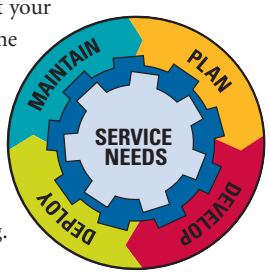
[2]Includes effects of NI 6030E with 1 or 2 m SCXI cable assembly.

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

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