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Find the *National Instruments SCXI-1600* at our website: *Click HERE*

SCXI Data Acquisition Systems – 16-Bit, 200 kS/s USB Data Acquisition Module

NI SCXI-1600

- 200 kS/s for up to 352 channels
- 16-bit resolution
- Controller and digitizer for SCXI chassis
- ±10 V input range
- USB 2.0 connectivity to PC
- BNC connectors for:
  - Digital start trigger
  - External clock source
  - External calibration
- Internal calibration source
- NI-DAQmx 7.3 to simplify configuration and measurements

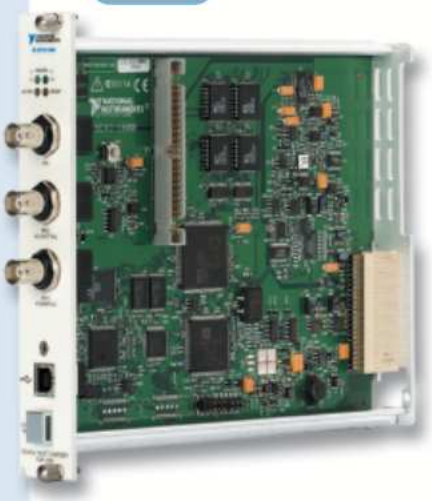
Operating Systems
- Windows 2000/NT/XP

Recommended Software
- LabVIEW
- LabWindows/CVI
- Measurement Studio

Measurement Services Software (included)
- NI-DAQmx

Calibration Certificate Included
- See page 21

NEW



Device	Connection to PC	Analog Inputs	Resolution	Sampling Rate	Input Range	Triggers
SCXI-1600	USB 2.0 full-speed compliant	Up to 352[1]	16 bits	200 kS/s	±0.05 to ±10 V	Digital (1)

[1]Multiplexed through a single channel analog-to-digital converter

Table 1. SCXI-1600 Channel, Speed, and Resolution Specifications

Overview and Applications

The National Instruments SCXI-1600 USB data acquisition module acquires data from and controls SCXI signal conditioning modules installed in the chassis in which it resides, making the chassis a complete data acquisition system. Conditioned output signals from other SCXI modules in the chassis are automatically routed to the NI SCXI-1600, digitized, and transferred to the PC via USB. You can connect the SCXI-1600 directly to any standard USB port (1.0, 1.1, or 2.0).

Features

The SCXI-1600 is a full-featured 16-bit digitizer and control module for SCXI analog input, analog output, digital I/O, and switching modules. A USB 2.0 full-speed compliant connection makes the SCXI-1600 ideal for remote applications up to 150 ft away from the PC. In addition, the SCXI-1600 features an internal calibration source and external calibration connection to ensure absolute measurement accuracy over time.

Software

NI-DAQmx is the robust measurement services software included with all National Instruments data acquisition and signal conditioning products. This easy-to-use software tightly integrates the full functionality of your DAQ hardware to LabVIEW, LabWindows/CVI, and Measurement Studio. High-performance features include multidevice synchronization, networked measurements, and DMA data management. Bundled with NI-DAQmx, the Measurement & Automation Explorer utility simplifies the configuration of your measurement hardware with device test panels, interactive measurements, and scaled I/O channels. NI-DAQmx also provides numerous example programs for LabVIEW and other application development environments to get you started with your application quickly.

Ordering Information

NI SCXI-1600 776572-1600
Includes NI-DAQmx software.

BUY ONLINE!
Visit ni.com/info and enter SCXI1600.

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SCXI Data Acquisition Systems – 16-Bit, 200 kS/s USB Data Acquisition Module

Specifications

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

Nominal Range at Full Scale (V)	Absolute Accuracy: Percentage of Reading 24 Hours	Absolute Accuracy: Percentage of Reading 1 Year	Absolute Accuracy: Offset (µV)	Absolute Accuracy: Noise + Quantizatio (µV) Single Point	Absolute Accuracy: Noise + Quantizatio (µV) Averaged	Temperature Drift (%/°C)	Absolute Accuracy at Full Scale (mV)	Relative Accuracy Resolution (µV) Single Point	Relative Accuracy Resolution (µV) Averaged
±10	0.0546	0.0588	±1601	±1029	±92	0.0010	7.57	1205	121
±5	0.0146	0.0188	±811	±515	±46	0.0005	1.80	603	60.3
±0.5	0.0546	0.0588	±100	±66	±6	0.0010	0.40	78.4	7.9
±0.05	0.0546	0.0588	±29	±31	±3.0	0.0010	0.061	39.8	4.0

Note: Accuracies are valid for measurements following an internal calibration. Averaged numbers assume dithering and averaging of 100 single-channel readings. Measurement accuracies are listed for operational temperatures within ±1 °C of internal calibration temperature and ±10 °C of external or factory calibration temperature.

Analog Input

Input Characteristics

Type of ADC ..... Successive approximation
Resolution ..... 16 bits, 1 in 65,536
Sampling rate ..... 200 kS/s

Device Gain	Range
0.5	±10 V
1	±5 V
10	±500 mV
100	±50 mV

Input coupling ..... DC
FIFO buffer size ..... 4,096 samples
Data transfers ..... USB
Configuration memory size ..... 512 words
Max working voltage
(signal + common mode) ..... Each input should remain within ±11 V of ground
External calibration overvoltage protection
Powered on ..... ±25 V
Powered off ..... ±15 V

Accuracy Information

Transfer Characteristics

Integral nonlinearity (INL) ..... ±1.5 LSB typ, ±2.0 LSB max
Differential nonlinearity (DNL) ..... ±0.5 LSB typ, ±3.0 LSB max
No missing codes ..... 16 bits
Offset error
  Pregain error after calibration ..... ±1.0 µV max
  Pregain error before calibration ..... ±28.8 mV max
  Postgain error after calibration ..... ±157 µV max
  Postgain error before calibration ..... ±40 mV max
Gain error (relative to calibration reference)
After calibration (gain = 1) ..... ±74 ppm of reading max
Before calibration ..... ±18,900 ppm reading max
Gain ≠ 1 with gain error
adjusted to 0 at gain = 1 ..... ±200 ppm of reading max

Amplifier Characteristics

Input impedance (normal) ..... 100 GΩ parallel with 100 pF
External calibration BNC input impedance
  Normal powered on ..... 100 GΩ parallel with 100 pF
  Powered off ..... 820 Ω
  Overload ..... 820 Ω
Input bias current ..... ±200 pA
Common-mode rejection ratio (CMRR), DC to 60 Hz

Gain	Bipolar
0.5, 1	85 dB
10, 100	96 dB

Dynamic Characteristics

Bandwidth

Signal	Bandwidth
Small (–3 dB)	413 kHz
Large (1% THD)	490 kHz

Settling time for full-scale step
Gain 100 ..... ±4 LSB, 5 µs typ

[1]This value is the input protection resistor in front of the analog input mux.

[2]The input bias current is taken from the AU829 op amp specification sheet. This value is much larger than the other op amps. Since the AU829 is used as a single-ended op amp, the input bias current is the same as the input offset current. Therefore, offset current is not listed.

Gain 10, 1, 0.5 ..... ±2 LSB, 5 µs max
System noise (LSB_{rms}, including quantization)

Gain	LSB_{rms}
0.5, 1.0	1.0
10.0	1.3
100	6.6

Stability

Recommended warm-up time ..... 15 min
Offset temperature coefficient
Pregain ..... ±20 µV/°C
Postgain ..... ±175 µV/°C
Gain temperature coefficient ..... ±20 ppm/°C

Triggers

AI triggers
  Input ..... AI START TRIG
AI REF TRIG
AI SAMP CLK
AI CONV CLK
AI GATE
SI SOURCE
  Output ..... AI Start Trigger,
AI Sample Clock
External sources ..... PFI <0, />
Compatibility ..... 5 V TTL
Response ..... Rising or falling edge
Pulse width ..... 10 ns min in edge-detect mode

Direction	Level	Min	Max
Input	Low voltage	0.0 V	0.8 V
	High voltage	2.0 V	5.0 V
Output	Low voltage (Iout = 5 mA)	—	0.4 V
	High voltage (Iout = 3.5 mA)	4.35 V	—

Calibration

Recommended warm-up time ..... 15 min
Interval ..... 1 year
External calibration reference ..... >6 and <10 V
Onboard calibration reference
  Level ..... 5.000 V (±3.5 mV)
(over full operating temperature,
actual value stored in EEPROM)
Temperature coefficient ..... ±5 ppm/°C max
Long-term stability ..... ±15 ppm/1,000 h

Power Requirements

+22 VDC ..... 115 mA max
–22 VDC ..... 135 mA max

Physical

Dimensions ..... 18.3 by 17.3 by 3.1 cm
depth by height by width (7.2 by 6.8 by 1.2 in.)
I/O connector ..... 3 BNC connectors, 1 USB front connector

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SCXI Data Acquisition Systems – 16-Bit, 200 kS/s USB Data Acquisition Module

Maximum Working Voltage

Maximum working voltage refers to the signal voltage plus the common-mode voltage.

Channel-to-earth	11 V, Installation Category I
Channel-to-channel	11 V, Installation Category I

Environmental

Operating temperature	0 to 50 °C
Storage temperature	–20 to 70 °C
Relative humidity	10 to 90%, noncondensing
Maximum altitude	2,000 m
Pollution Degree (indoor use only)	2

Safety

The SCXI-1600 is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

Note_ IEC 61010-1, EN 61010-1

Note_ UL 3111-1, UL61010B-1

Note_ CAN/CSA C22.2 No. 1010.1

For UL and other safety certifications, refer to the product label or visit ***ni.com/hardref.nsf***, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

Emissions	EN 55011 Class A at 10 m FCC Part 15A above 1 GHz
Immunity	EN 61326:1997 + A2:2001, Table 1
EMC/EMI	CE, C-Tick and FCC Part 15 (Class A) Compliant

For EMC compliance, operate this device with shielded cabling.

CE Compliance CE

The SCXI-1600 meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

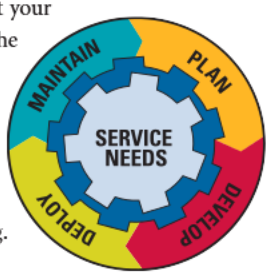
Low-Voltage Directive (safety)	73/23/EEC
Electromagnetic Compatibility Directive (EMC)	89/336/EEC

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

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Hardware Services

NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI™ combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with ni.com/pxiadvisor.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit ni.com/calibration.

Repair and Extended Warranty

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