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.
### Specifications

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

#### Analog Input

<table>
<thead>
<tr>
<th>Device Gain</th>
<th>Range</th>
<th>Offset (µV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>±10 V</td>
<td>±200 pV</td>
</tr>
<tr>
<td>1</td>
<td>±5 V</td>
<td>±200 pV</td>
</tr>
<tr>
<td>10</td>
<td>±50 mV</td>
<td>±200 pV</td>
</tr>
<tr>
<td>100</td>
<td>±5 V</td>
<td>±200 pV</td>
</tr>
</tbody>
</table>

#### Accuracy Information

<table>
<thead>
<tr>
<th>Transfer Characteristics</th>
<th>Offset (µV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset error (after calibration)</td>
<td>±1.0 pV max</td>
</tr>
<tr>
<td>Postgain error (after calibration)</td>
<td>±1.0 pV max</td>
</tr>
</tbody>
</table>

#### Amplifier Characteristics

<table>
<thead>
<tr>
<th>Gain</th>
<th>Bipolar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>86 dB</td>
</tr>
<tr>
<td>10</td>
<td>96 dB</td>
</tr>
</tbody>
</table>

#### Dynamic Characteristics

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>Signal Bandwidth</th>
<th>Noise Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>413 kHz</td>
<td>490 kHz</td>
</tr>
<tr>
<td>Large</td>
<td>6.6 kHz</td>
<td></td>
</tr>
</tbody>
</table>

#### Notes

- 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.

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### Analog Input

- Type of ADC: Successive approximation
- Resolution: 16 bits, 1 in 65,536
- Sampling rate: 200 kS/s
- Configuration memory size: 512 words
- FIFO buffer size: 4,096 samples

### Input Characteristics

- Analog Input
- Input coupling: DC
- 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 off: ±15 V
  - Powered on: ±25 V

### Gain Information

- Gain 10, 1, 0.5:
  - ±1600 ppm of reading max
- Gain 100:
  - ±4 LSB, 5 µs typ

### Power Requirements

- Voltage: 24 Hours: ±0.05 0.0546 0.0588 ±29 ±31 ±3.0 0.0010 0.061 39.8 4.0
  - Full Scale (V) 24 Hours: ±0.5 0.0546 0.0588 ±1029 ±1029 ±1029 0.0010 0.40 78.4 7.9
  - Full Scale (V) 1 Year: ±0.05 0.0546 0.0588 ±1029 ±1029 ±1029 0.0010 0.40 78.4 7.9

### System Noise

- Gain 10: ±20 µV/°C
- Gain 1: ±200 µV/°C
- Gain 0.5: ±1 mV/°C

### Physical

- Dimensions: 18.3 by 17.3 by 3.1 cm
- I/O connector: 3 BNC connectors, 1 USB front connector

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### Notes

- Offset error is not listed.
- The input bias current is taken from the AD829 op amp specification sheet. This value is much larger than the other op amps.
- Gain temperature coefficient: ±20 ppm/°C
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:

- IEC 61010-1
- UL 3111-1, UL61010B-1
- 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

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


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.
NI Services and Support

NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit ni.com/services.

Training and Certification
NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit ni.com/training.

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Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide NI Alliance Partner Program of more than 600 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

OEM Support
We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Local Sales and Technical Support
In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at ni.com/support.

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit ni.com/ssp.

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
NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit ni.com/services.