Overview and Applications

National Instruments 6023E, NI 6024E and NI 6025E devices use E Series technology to deliver high performance, reliable data acquisition capabilities. These devices are used in a broad variety of applications including:

• Continuous high-speed data logging at up to 200 kS/s
• Externally timed and/or triggered data acquisition
• High-voltage and sensor measurements when used with NI signal conditioning (see page 244)
• High-channel-count system scalability with RTSI or PXI trigger bus

Features

NI 6023E, NI 6024E, and NI 6025E devices feature a highly precise voltage reference used during self-calibration. A simple software call initiates self-calibration, which minimizes errors caused by temperature drift and time. These devices feature the NI-PGIA, which is an instrumentation-class amplifier that guarantees settling times at all gains. Typical commercial off-the-shelf amplifier components might not meet the settling time requirements for high-gain measurement applications. Without the NI-PGIA, 12-bit devices with a 100X gain can have an effective resolution of only 10 bits. For a full description of NI accuracy advantages, see page 188. These devices offer several methods for connecting your signals including a differential mode for eight AI channels and maximum noise elimination, as well as referenced and nonreferenced single-ended mode for 16 AI channels.

NI 6023E, NI 6024E, and NI 6025E devices feature digital triggering, and two 24-bit 20 MHz counter/timers. NI 6023E and NI 6024E devices feature eight digital I/O lines compatible with both 5 V TTL and CMOS while NI 6025E devices feature 32 digital I/O lines. NI 6024E and NI 6025E devices feature two 12-bit analog outputs.

For a detailed list of differences between Performance E Series and Low-Cost E Series, see Table 1 on page 191.

Driver Software

NI-DAQ is the robust driver 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,
Low-Cost E Series Multifunction DAQ
12-Bit, 200 kS/s, 16 Analog Inputs

Table 2. NI 6023E, PCI-6024E, and NI 6025E Analog Input Accuracy Specifications

Table 3. DAQCard-6024E Analog Input Accuracy Specifications

Table 4. PCI-6024E, and NI 6025E Analog Output Accuracy Specifications

Table 5. DAQCard-6024E Analog Output Accuracy Specifications

LabWindows/CVI, and Measurement Studio for Visual Basic. High-performance features include multidevice synchronization, networked measurements, and DMA data management. Bundled with NI-DAQ, the Measurement & Automation Explorer utility simplifies the configuration of your measurement hardware with device test panels, interactive measurements, and scaled I/O channels. NI-DAQ also provides numerous example programs for LabVIEW and other application development environments to get you started with your application quickly.

Related Products
For related products, please refer to:
• SCXI Signal Conditioning – page 246
• SCC Signal Conditioning – page 320
• Analog Output Multifunction DAQ – page 365
• High-Speed Digital I/O – page 378

See page 221 for connector diagrams.
See page 233 for detailed specifications.

Ordering Information
NI PCI-6023E ........................................................777742-01
NI PCI-6024E ........................................................777743-01
NI DAQCard-6024E ..............................................778269-01
NI PCI-6025E ......................................................777744-01
NI PXI-6025E ......................................................777798-01

Includes NI-DAQ driver software.
1Windows only.
For information on extended warranty and value-added services, see page 20.

Recommended Configurations

For E Series accessory and cable information, see page 221.
Multifunction DAQ Overview

Diagram 1. S Series Diagram

Diagram 2. E Series Diagram