

# Low-Cost PCI E Series Multifunction I/O – 200 kS/s, 12-Bit, 16 Analog Inputs

602xE Families (E-5)

## 602xE Families (E-5)

**6023E Family (AI-16E-5)**  
PCI-6023E

**6024E Family (MIO-16E-5)**  
PCI-6024E

**6025E Family (MIO-16DE-5)**  
PCI-6025E

### Analog Inputs

16 single-ended, 8 differential channels  
200 kS/s sampling rate  
200 kS/s stream-to-disk rate  
12-bit resolution

### Analog Output (6024E and 6025E only)

2 channels, 12-bit resolution

### Digital I/O

8 (5V/TTL) lines (6023E and 6024E)  
32 (5V/TTL) lines (6025E)

### Counter/Timers

2 up/down, 24-bit resolution

### Triggering

Digital

### NI-DAQ Software

Windows NT/98/95  
(refer to page 200 for other operating systems)

### Application Software

LabVIEW  
LabWindows/CVI  
ComponentWorks  
VirtualBench  
Measure  
BridgeVIEW  
Lookout

**Calibration Certificate Included!**



Family	Analog Inputs	Resolution	Sampling Rate	Input Range	Analog Outputs	Resolution	Output Rate	Output Range	Digital I/O	Counter/Timers	Triggers
6023E	16 SE/8 DI	12 bits	200 kS/s	±0.05 to ±10 V	-	-	-	-	8	2, 24-bit	Digital
6024E	16 SE/8 DI	12 bits	200 kS/s	±0.05 to ±10 V	2	12 bits	10 kS/s <sup>1</sup>	±10 V	8	2, 24-bit	Digital
6025E	16 SE/8 DI	12 bits	200 kS/s	±0.05 to ±10 V	2	12 bits	10 kS/s <sup>1</sup>	±10 V	32	2, 24-bit	Digital

<sup>1</sup> 10 kS/s when using DMA for analog output. 1 kS/s when using interrupts for analog output.

**Table 1. 604xE Family Channels, Speed, and Resolution Specifications** (refer to page 313 for more detailed specifications)

## Overview

The 6023E (AI-16E-5), 6024E (MIO-16E-5), and 6025E (MIO-16DE-5) are our lowest cost families of boards that use E Series technology to deliver high performance and reliable data acquisition capabilities in a wide range of applications. You get up to 200 kS/s, 12-bit performance on 16 single-ended analog inputs. Depending on your type of hard drive, these boards can stream to disk at rates up to 200 kS/s.

These E Series boards feature digital triggering capability, as well as two 24-bit, 20 MHz counter/timers; and 8 digital I/O lines. The 6024E and 6025E also feature two 12-bit analog outputs. An additional 24 lines of 5V/TTL I/O makes the 6025E family the best value of any PCI data acquisition board available.

For a more detailed hardware overview, refer to the E Series Multifunction I/O Overview on page 231.

## Ordering Information

### 6023E Family

PCI-6023E.....777742-01

### 6024E Family

PCI-6024E.....777743-01

### 6025E Family

PCI-6025E.....777744-01

Includes NI-DAQ for Windows NT/98/95 on CD unless otherwise noted. See page 228 for more details.

## Example Configurations

Family	DAQ Board	Cable (page 305-309)	Accessory (page 295-304)
6023E	PCI-6023E	R6868 (182482-01)	CB-68LP (777145-01)
6024E	PCI-6024E	R6868 (182482-01)	CB-68LP (777145-01)
6025E	PCI-6025E	R1005050 (182762-01)	Two CB-50LPs (777101-01)

For more detailed cable and accessory options, refer to page 205.

Data Acquisition

# Low-Cost PCI E Series Multifunction I/O – 200 kS/s, 12-Bit, 16 Analog Inputs

602xE Families (E-5)

Nominal Range (V)	Absolute Accuracy						Relative Accuracy		
	% of Reading			Offset (mV)	Noise + Quantization (mV)		Temp Drift (%/°C)	Resolution (mV)	
	24 Hrs	90 Days	1 Year		Single Pt.	Averaged		Single Pt.	Averaged
±10	0.072%	0.074%	0.076%	6.385	3.906	0.975	0.0010	5.892	1.284
±5	0.027%	0.029%	0.031%	3.203	1.953	0.488	0.0005	2.946	0.642
±0.5	0.072%	0.074%	0.076%	0.340	0.195	0.049	0.0010	0.295	0.064
±0.05	0.072%	0.074%	0.076%	0.054	0.063	0.006	0.0010	0.073	0.008

Note: Accuracies are valid for measurements following an internal E Series 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. One year calibration interval recommended. See page 310 for example accuracy calculations.

Table 2. 602xE Family Analog Input Accuracy Specifications

Nominal Range (V)	Absolute Accuracy				
	% of Reading			Offset (mV)	Temp Drift (%/°C)
	24 Hrs	90 Days	1 Year		
±10	0.018%	0.020%	0.022%	5.93	0.0005

Note: Temp Drift applies only if ambient is greater than ±10 °C of previous external calibration. See page 310 for example calculations.



Refer to page 313 for more detailed specifications.

Table 3. 6024E and 6025E Family Analog Output Accuracy Specifications

ACH8	34	68	ACH0
ACH1	33	67	AIGND
AIGND	32	66	ACH9
ACH10	31	65	ACH2
ACH3	30	64	AIGND
AIGND	29	63	ACH11
ACH4	28	62	AISENSE
AIGND	27	61	ACH12
ACH13	26	60	ACH5
ACH6	25	59	AIGND
AIGND	24	58	ACH14
ACH15	23	57	ACH7
DAC0OUT <sup>1</sup>	22	56	AIGND
DAC1OUT <sup>1</sup>	21	55	AOGND <sup>1</sup>
RESERVED	20	54	AOGND <sup>1</sup>
DIO4	19	53	DGND
DGND	18	52	DIO0
DIO1	17	51	DIO5
DIO6	16	50	DGND
DGND	15	49	DIO2
5 V	14	48	DIO7
DGND	13	47	DIO3
DGND	12	46	SCANCLK
PF10/TRIG1	11	45	EXTSTROBE*
PF11/TRIG2	10	44	DGND
DGND	9	43	PF12/CONVERT*
5 V	8	42	PF13/GPCTR1_SOURCE
DGND	7	41	PF14/GPCTR1_GATE
PF15/UPDATE*	6	40	GPCTR1_OUT
PF16/WFTRIG	5	39	DGND
DGND	4	38	PF17/STARTSCAN
PF19/GPCTR0_GATE	3	37	PF18/GPCTR0_SOURCE
GPCTR0_OUT	2	36	DGND
FREQ_OUT	1	35	DGND

AIGND	1	51	PC7
AIGND	2	52	GND
ACH0	3	53	PC6
ACH8	4	54	GND
ACH1	5	55	PC5
ACH9	6	56	GND
ACH2	7	57	PC4
ACH10	8	58	GND
ACH3	9	59	PC3
ACH11	10	60	GND
ACH4	11	61	PC2
ACH12	12	62	GND
ACH5	13	63	PC1
ACH13	14	64	GND
ACH6	15	65	PC0
ACH14	16	66	GND
ACH7	17	67	PB7
ACH15	18	68	GND
AISENSE	19	69	PB6
AIGND	20	70	GND
DAC1OUT <sup>1</sup>	21	71	PB5
RESERVED	22	72	GND
DIO4	23	73	PB4
DGND	24	74	GND
DIO0	25	75	PB3
DIO6	26	76	GND
DIO1	27	77	PB2
DIO5	28	78	GND
DIO2	29	79	PB1
DIO6	30	80	GND
DIO3	31	81	PB0
DIO7	32	82	GND
DGND	33	83	PA7
+5 V	34	84	GND
+5 V	35	85	PA6
SCANCLK	36	86	GND
EXTSTROBE*	37	87	PA5
PF10/TRIG1	38	88	GND
PF11/TRIG2	39	89	PA4
PF12/CONVERT*	40	90	GND
PF13/GPCTR1_SOURCE	41	91	PA3
PF14/GPCTR1_GATE	42	92	GND
GPCTR1_OUT	43	93	PA2
PF15/UPDATE*	44	94	GND
PF16/WFTRIG	45	95	PA1
PF17/STARTSCAN	46	96	GND
GPCTR0_SOURCE	47	97	PA0
GPCTR0_GATE	48	98	GND
GPCTR0_OUT	49	99	+5 V
FREQ_OUT	50	100	GND

<sup>1</sup>Not Available on 6023E

Figure 1. 6023E and 6024E Family I/O Connector

Figure 2. 6025E Family I/O Connector

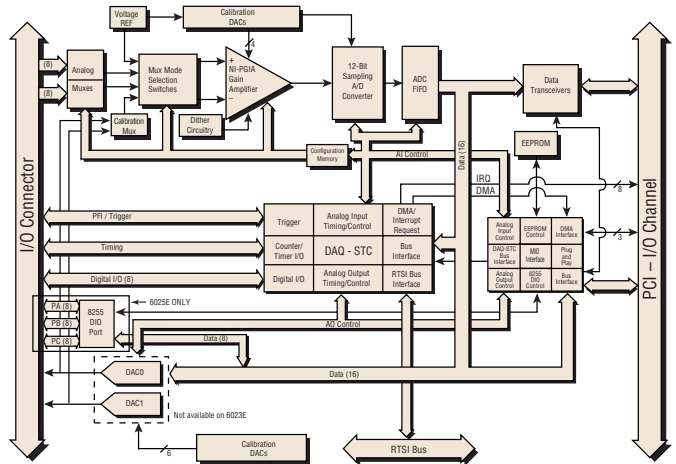


Figure 3. 602xE Family Hardware Block Diagram

Data Acquisition

# Specifications

## 12-Bit E Series (607xE, 606xE, 604xE, and 602xE Families)

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

### Analog Input

Accuracy specifications ..... See product pages

#### Input Characteristics

Number of channels

6070E 6060E 604xE 602xE	16 single-ended or 8 differential (software selectable per channel)
6071E 6061E	64 single-ended or 32 differential (software selectable per channel)

Type of ADC ..... Successive approximation

Resolution ..... 12 bits, 1 in 4,096

Maximum sampling rate

607xE	1.25 MS/s
6060E	500 kS/s
604xE	500 kS/s single channel scanning 250 kS/s multichannel scanning
6061E	500 kS/s single channel scanning 333 kS/s multichannel
6023E 6024E 6025E	200 kS/s
6020E 6021E	100 kS/s

Streaming-to-disk rate (system dependent)

607xE	1.25 MS/s
606xE	500 kS/s
604xE	250 kS/s (except for DAQCard)
6023E 6024E 6025E	200 kS/s
6020E 6021E	100 kS/s (except for DAQPad)

Input signal ranges

Range (Software Selectable)	Gain	Input Range	
		Bipolar	Unipolar*
20 V	0.5	±10 V	–
10 V	1	±5 V	0 to 10 V
5 V*	2	±2.5 V	0 to 5 V
2 V*	5	±1	0 to 2 V
1 V	10	±500 mV	0 to 1 V
500 mV*	20	±250 mV	0 to 500 mV
200 mV*	50	±100 mV	0 to 200 mV
100 mV	100	±50	0 to 100 mV

\* not available on 6023E, 6024E, or 6025E

Input coupling ..... DC

Maximum working voltage

(signal + common mode) ..... Input should remain within  
±11 V of ground

Overvoltage protection

Board	Powered On	Powered Off
607xE 606xE 604xE	±25 V	±15 V
6023E 6024E 6025E	±40 V	±25 V
6020E 6021E	±35 V	±25 V

Inputs protected

6070E 6060E 604xE 602xE	ACH<0..15>, AISENSE
6071E 6061E	ACH<0..63>, AISENSE, AISENSE2

FIFO buffer size

AT-MIO-16E-1	8,192 Samples
DAQPad-6020E	4,096 Samples
606xE	2,048 Samples
6041E	1,024 Samples
PCI-MIO-16E-1 PXI-6070E 6071E 6040E 602xE; except DAQPad	512 Samples

Data transfers

PCI, PXI, AT, VXI ..... DMA, interrupts, programmed I/O

DAQCard, DAQPad ..... Interrupts, programmed I/O

DMA modes

PCI, PXI, VXI ..... Scatter-gather (single-transfer, demand transfer)

AT ..... Single transfer, demand transfer

Configuration memory size ..... 512 words

#### Transfer Characteristics

Relative accuracy

Board	Typical Dithered	Maximum Undithered
607xE 606xE 604xE 6023E 6024E 6025E	±0.5 LSB	±1.5 LSB
6020E 6021E	±0.2 LSB	±1.5 LSB

DNL

Board	Typical	Maximum
607xE 606xE 604xE 6023E 6024E 6025E	±0.5 LSB	±1.0 LSB
6020E 6021E	±0.2 LSB	±1.0 LSB

#### Amplifier Characteristics

Input impedance

Board	Normal Powered On	Powered Off	Overload
6070E 606xE 6040E PCI-6071E PXI-6071E	100 GΩ in parallel with 100 pF	820 Ω minimum	820 Ω minimum
VXI-MIO-64E-1 6041E	100 GΩ in parallel with 100 pF	1 kΩ minimum	1 kΩ minimum
6023E 6024E 6025E	100 GΩ in parallel with 100 pF	4 kΩ minimum	4 kΩ minimum
6020E 6021E	100 GΩ in parallel with 100 pF	3 kΩ minimum	3 kΩ minimum

Input bias current ..... ±200 pA

Input offset current ..... ±100 pA

CMRR, DC to 60 Hz

Board	Range	CMRR
607xE	20 V	95 dB
606xE	10 V	100 dB
	100 mV to 5 V	106 dB
604xE	10 to 20 V	85 dB
	5 V	95 dB
	100 mV to 2 V	100 dB
6023E	10 to 20 V	85 dB
6024E	100 mV to 1 V	90 dB
6025E		
6020E	100 mV to 20 V	90 dB
6021E		

# Specifications

## 12-Bit E Series (continued)

### Dynamic Characteristics

Bandwidth

Board	Small Signal (-3 dB)	Large Signal (1% THD)
607xE	1.6 MHz	1 MHz
606xE	1 MHz	300 kHz
6041E	800 kHz	400 kHz
6040E	600 kHz	350 kHz
6023E	500 kHz	225 kHz
6024E		
6025E		
6021E	150 kHz	120 kHz

Settling time to full-scale step

Board	Range	Accuracy		
		±0.012% (±0.5 LSB)	±0.024% (±1 LSB)	±0.098% (±4 LSB)
6070E	20 V	2 µs typical 3 µs max	1.5 µs typical 2 µs max	1.5 µs typical 2 µs max
	10 V	2 µs typical 3 µs max	1.5 µs typical 2 µs max	1.3 µs typical 1.5 µs max
	200 mV to 5 V	2 µs typical 3 µs max	1.5 µs typical 2 µs max	0.9 µs typical 1 µs max
	100 mV	2 µs typical 3 µs max	1.5 µs typical 2 µs max	1 µs typical 1.5 µs max
PCI-6071E PXI-6071E	20 V	3 µs typical 5 µs max	1.9 µs typical 2.5 µs max	1.9 µs typical 2 µs max
	10 V	3 µs typical 5 µs max	1.9 µs typical 2.5 µs max	1.2 µs typical 1.5 µs max
	200 mV to 5 V	3 µs typical 5 µs max	1.9 µs typical 2.5 µs max	1.2 µs typical 1.3 µs max
	100 mV	3 µs typical 5 µs max	1.9 µs typical 2.5 µs max	1.2 µs typical 1.5 µs max
6060E	All	2 µs typical 4 µs max	1.9 µs typical 2 µs max	1.8 µs typical 2 µs max
6061E VXI-MIO-64E-1	All	3 µs typical 5 µs max	2 µs typical 3 µs max	1.8 µs typical 2 µs max
604xE	All	4 µs typical 8 µs max	4 µs max	4 µs max
6023E 6024E 6025E	All	5 µs typical	5 µs max	5 µs max
6020E 6021E	All	10 µs max	10 µs max	10 µs max

System noise (LSB<sub>rms</sub>, not including quantization)

Board	Range	Dither Off	Dither On
6070E	1 V to 20 V	0.25	0.5
PCI-6071E	500 mV	0.4	0.6
PXI-6071E	200 mV	0.5	0.7
	100 mV	0.8	0.9
VXI-MIO-64E-1	500 mV to 20 V	0.15	0.5
606xE	200 mV	0.3	0.6
	100 mV	0.5	0.7
604xE	1 V to 20 V	0.2	0.5
	500 mV	0.25	0.5
	200 mV	0.5	0.7
	100 mV	0.9	1.0
6023E	1 to 20 V	0.1	0.6
6024E	100 mV	0.7	0.8
6025E			
6020E	1 V to 20 V	0.07	0.5
6021E	500 mV	0.12	0.5
	200 mV	0.25	0.6
	100 mV	0.5	0.7

Dynamic Range..... 91.7 dB, 10 V input with 1 to 10 V ranges

Crosstalk

607xE	-80 dB, DC to 100 kHz
606xE	
604xE	
602xE	-60 dB, DC to 100 kHz

### Analog Output Output Characteristics

Number of channels

607xE	2 voltage outputs
606xE	
6040E	
6020E	
6021E	
6024E	
6025E	
6021E	
6041E	None
6023E	

Resolution..... 12 bits, 1 in 4096

Maximum update rate

Board	Waveform Generation			
	FIFO Mode		Non-FIFO Mode	
	Internally Timed	Externally Timed	1 Channel	2 Channels
607xE	1 MS/s	950 kS/s	800 kS/s, system dependent	400 kS/s, system dependent
606xE				
604xE				
6023E	N/A	N/A	10 kHz with DMA	10 kHz with DMA
6024E			1 kHz with interrupts	1 kHz with interrupts
6025E			system dependent	system dependent
6020E; except DAOPad	N/A	N/A	100 kS/s, system dependent	100 kS/s, system dependent
6021E				
DAOPad-6020E	N/A	N/A	20 S/s, system dependent	20 S/s, system dependent

Type of DAC..... Double buffered, multiplying

FIFO buffer size

607xE	2,048 samples
606xE	
604xE	512 samples
602xE	None

Data transfers

PCI, PXI, AT, VXI ..... DMA, interrupts, programmed I/O

DAOPad ..... Interrupts, programmed I/O

DMA modes

PCI, PXI, VXI ..... Scatter-gather (single transfer, demand transfer)

AT ..... Single transfer, demand transfer

### Transfer Characteristics

Relative accuracy

After calibration ..... ±0.3 LSB typical, ±0.5 LSB max

Before calibration ..... ±4 LSB max

DNL

After calibration ..... ±0.3 LSB typical, ±1.0 LSB max

Before calibration ..... ±3 LSB max

Monotonicity ..... 12 bits, guaranteed after calibration

Gain error (relative to external reference) ..... 0% to +0.67% of output max, not adjustable

### Voltage Output

Ranges

607xE	±10 V, 0 to 10 V, ±EXTREF, 0 to EXTREF; software selectable
606xE	
604xE	
6020E	
6021E	
6023E	±10 V
6024E	
6025E	

Output coupling ..... DC

Output impedance ..... 0.1 Ω max

Current drive ..... ±5 mA max

Protection ..... Short-circuit to ground

Power-on state ..... 0 V (±200 mV)

# Specifications

## 12-Bit E Series (continued)

External reference input (not available on 6024E or 6025E)

Range ..... ±11 V  
Overvoltage protection

607xE	±25 V powered on, ±15 V powered off
606xE	
604xE	
602xE	±35 V powered on, ±25 V powered off

Input impedance ..... 10 kΩ  
Bandwidth (-3dB)

607xE	1 MHz
606xE	
604xE	
602xE	300 kHz

### Dynamic Characteristics

Settling time and slew rate

Board	Settling Time for Full-Scale Step	Slew Rate
607xE	3 μs to ±0.5 LSB accuracy	20 V/μs
606xE		
604xE		
602xE	10 μs to ±0.5 LSB accuracy	10 V/μs

Noise ..... 200 μV<sub>rms</sub>, DC to 1 MHz

Glitch energy (at mid-scale transition)

Board	Reglitching Disabled	Reglitching Enabled
PCI-MIO-16E-1	±20 mV	±4 mV
PCI-6071E		
PXI-6070E		
PXI-6071E		
AT-MIO-16E-1	±200 mV	±30 mV
606xE		
604xE		
VXI-MIO-64E-1	±70 mV	±40 mV
6023E	±12 mV	N/A
6024E		
6025E		
6020E	±100 mV	N/A
6021E		

Duration

607xE	1.5 μs
606xE	
604xE	
6023E	2 μs
6024E	
6025E	
6020E	3 μs
6021E	

### Stability

Gain temperature coefficient

External reference ..... ±25 ppm/°C

### Digital I/O

Number of channels

6021E	32 input/output
6025E	
All others	8 input/output

Compatibility ..... 5V/TTL

Power-on state ..... Input: High impedance

Digital logic levels

DIO<0..7> on all boards

Level	Minimum	Maximum
Input low voltage	0 V	0.8 V
Input high voltage	2 V	5 V
Output low voltage (I <sub>out</sub> = 24 mA)	–	0.4 V
Output high voltage (I <sub>out</sub> = 13 mA)	4.35 V	–

PA<0..7>, PB<0..7>, PC<0..7> on remaining 24 lines of 6021E and 6025E

Level	Minimum	Maximum
Input low voltage	0 V	0.8 V
Input high voltage	2 V	5 V
Output low voltage (I <sub>out</sub> = 2.5 mA)	–	0.4 V
Output high voltage (I <sub>out</sub> = 2.5 mA)	3.9 V	–

Data transfers

6021E	Interrupts, programmed I/O
6025E	
All others	Programmed I/O

Handshaking (6021E and 6025E only)

Direction ..... Input or output  
Modes ..... 2-wire

Transfer rate (1 word = 8 bits)

Maximum with NI-DAQ software ..... 50 kwords/s  
Constant sustainable rate ..... 1 to 10 kwords/s, typical

### Timing I/O

#### General-purpose Up/Down Counter/Timers

Number of channels ..... 2

Resolution ..... 24 bits

Compatibility ..... 5V/TTL

Digital logic levels

Level	Minimum	Maximum
Input low voltage	0 V	0.8 V
Input high voltage	2 V	5 V
Output low voltage (I <sub>out</sub> = 5 mA)	–	0.4 V
Output high voltage (I <sub>out</sub> = 3.5 mA)	4.35 V	–

Base clocks available ..... 20 MHz and 100 kHz

Base clock accuracy ..... ±0.01%

Maximum source frequency ..... 20 MHz

External source selections ..... PFIO..PF19, RTSIO..RTS16, Analog trigger; software selectable

External gate selections ..... PFIO..PF19, RTSIO..RTS16, Analog trigger; software selectable

Minimum source pulse duration ..... 10 ns

Minimum gate pulse duration ..... 10 ns, edge-detect mode

Data transfers

PCI, PXI, AT, VXI ..... DMA, interrupts, programmed I/O  
DAQCard, DAQPad ..... Interrupts, programmed I/O

DMA modes

PCI, PXI, VXI ..... Scatter-gather (single transfer, demand transfer)

AT ..... Single transfer, demand transfer

### Frequency Scaler

Number of channels ..... 1

Resolution ..... 4 bits

Compatibility ..... 5V/TTL

Digital logic levels

Level	Minimum	Maximum
Input low voltage	0 V	0.8 V
Input high voltage	2 V	5 V
Output low voltage (I <sub>out</sub> = 5 mA)	–	0.4 V
Output high voltage (I <sub>out</sub> = 3.5 mA)	4.35 V	–

Base clocks available ..... 10 MHz, 100 kHz

Base clock accuracy ..... ±0.01%

Data transfers ..... Programmed I/O

### Triggers

#### Analog Triggers

Number of triggers

607xE	1
606xE	
604xE	
602xE	None

Purpose

Analog input ..... Start and stop trigger, gate, clock

Analog output ..... Start trigger, gate, clock

General purpose counter/timers ..... Source, gate

Source

6070E	ACH<0..15>, PFIO/TRIG1
6060E	
604xE	
602xE	
6071E	ACH<0..63>, PFIO/TRIG1
6061E	

# Specifications

## 12-Bit E Series (continued)

Level	Internal source, ACH<0..15/63>.....	±Full-scale
	External source, PFI0/TRIG1 .....	±10 V
Slope.....	Positive or negative; software selectable	
Resolution .....	8 bits, 1 in 256	

Board	Internal Source	External Source
607xE	2 MHz	7 MHz
606xE	1 MHz	7 MHz
604xE	2 MHz	3 MHz

Hysteresis.....	Programmable
Bandwidth (-3dB)	
Accuracy .....	±5% of full-scale range

### Digital Triggers (all boards)

Number of triggers.....	2
Purpose	
Analog input.....	Start and stop trigger, gate, clock
Analog output.....	Start trigger, gate, clock
General purpose counter/timers .....	Source, gate
Source .....	PFI0..PFI9, RTSI0..RTSI6
Slope.....	Positive or negative; software selectable
Compatibility .....	5V/TTL
Response.....	Rising or falling edge
Pulse width.....	10 ns minimum

### External input for digital or analog trigger (PFI0/TRIG1)

Impedance.....	10 kΩ
Coupling .....	DC
Protection	
Digital trigger .....	-0.5 to Vcc + 0.5 V
Analog trigger	
On/Off/Disabled .....	±35 V

### Calibration

Recommended warm-up time.....	15 minutes; 30 minutes for DAQCard
Calibration interval.....	1 year
Onboard calibration reference	
DC Level .....	5.000 V (±3.5 mV); (±0.5 mV for VXI) actual value stored in EEPROM
Temperature coefficient .....	±5 ppm/°C max; (±0.6 ppm/°C max for VXI)
Long-term stability .....	±15 ppm/√1000 h; (±6 ppm/√1000 h for VXI)

### RTSI (PCI, and AT only)

Trigger lines .....	7
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### PXI Trigger Bus (PXI only)

Trigger lines .....	6
Star trigger.....	1

### VXI Trigger Bus (vXI only)

Trigger lines .....	5 (5V/TTL), 2 ECL
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### Bus Interface

PCI, PXI .....	Master, slave
AT, DAQCard, DAQPad, VXI.....	Slave

### Power Requirements\*

Board	+5 VDC (±5%) <sup>1</sup>	Power available at I/O connector
607xE	1.1 A	+4.65 to +5.25 VDC, 1 A
606xE 6040E	1.0 A	+4.65 to +5.25 VDC, 1 A
602xE, (except DAQPAD)	0.7 A	+4.65 to +5.25 VDC, 1 A
DAQCard-AI-16E-4	280 mA typical 400 mA maximum	+4.65 to +5.25 VDC, 250 mA

<sup>1</sup>Excludes power consumed through I/O connector.

Board	+9 to +30 VDC	Power available at I/O connector
DAQPad-6020E	15 W	+4.65 to +5.25 VDC, 1 A

### Physical\*

Dimensions (not including connectors)\*

PCI .....	17.5 by 9.9 cm (6.9 by 3.9 in)
PXI.....	16.0 by 10.0 cm (6.3 by 3.9 in)
AT (long).....	33.8 by 9.9 cm (13.3 by 3.9 in)
AT (short).....	17.5 by 9.9 cm (6.9 by 4.2 in)
DAQPad.....	14.6 by 21.3 by 3.8 cm (5.8 by 8.4 by 1.5 in)
DAQCard .....	Type II PC Card
Weight (DAQPad only) .....	0.83 kg (1.8 lb)

I/O connector\*

6070E 6060E 6040E 6020E 6023E 6024E	68-pin male SCSI-II type
6071E 6061E 6021E 6025E	100-pin female 0.050 D-type
DAQCard-AI-16E-4	68-pin female PCMCIA

### Environment

Operating temperature.....	0 to 55 °C; DAQCard case temperature should not exceed 55 °C while in PCMCIA slot
Storage temperature.....	-20 to 70 °C
Relative humidity .....	10 to 90%, noncondensing

\* For VXI power requirements, dimensions, and I/O connections, refer to the *VXI Solutions Product Guide*.