

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

6034E/6035E Families

6034E Family
PCI-6034E

Triggering
Digital

6035E Family
PCI-6035E

Driver Software
NI-DAQ
Windows 2000/NT/9x
Mac OS

Analog Inputs

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

Application Software

LabVIEW
LabWindows/CVI
ComponentWorks
VirtualBench
Measure
BridgeVIEW
Lookout

Analog Output (6035E only)

2 channels, 12-bit resolution

Digital I/O

8 (5 V/TTL) lines

Counter/Timers

2 up/down, 24-bit resolution

Calibration Certificate Included!

(refer to page 216)



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Family	Bus	Analog Inputs	Resolution	Sampling Rate	Input Range	Analog Outputs	Resolution	Output Rate	Output Range	Digital I/O	Counter/Timers	Triggers
6034E	PCI	16 SE/8 DI	16 bits	200 kS/s	± 0.05 to ± 10 V	—	—	—	—	8	2, 24-bit	Digital
6035E	PCI	16 SE/8 DI	16 bits	200 kS/s	± 0.05 to ± 10 V	2	12 bits	10 kS/s ¹	± 10 V	8	2, 24-bit	Digital

¹ 10 kS/s system dependent when using the single DMA channel for analog output. 1 kS/s system dependent when using the single DMA channel for either analog input or counter/timer operations.

Table 1. 6034E/6035E Families Channel, Speed, and Resolution Specifications (refer to page 308 for more detailed specifications)

Overview

The 6034E, and 6035E are our lowest cost families of devices that use E Series technology to deliver reliable, 16-bit acquisition in a wide range of applications. You get up to 200 kS/s, 16-bit performance on 16 single-ended analog inputs. Depending on your type of hard drive, these devices can stream to disk at rates up to 200 kS/s.

These E Series devices feature digital triggering capability, as well as two 24-bit, 20 MHz counter/timers; and eight digital I/O lines. The 6035E also features two 12-bit analog outputs.

For a more detailed hardware overview, refer to the E Series Multifunction I/O Overview on page 220.

Ordering Information

6034E Family

PCI-6034E and NI-DAQ for

Windows 2000/NT/9x.....778075-01

Mac OS778075-02

6035E Family

PCI-6035E and NI-DAQ for

Windows 2000/NT/9x.....778026-01

Mac OS778026-02

Includes NI-DAQ on CD unless otherwise noted. See pages 192 and 210 for more details.

Example Configurations

Family	DAQ Board	Cable (page 296)	Accessory (page 292)
6034E	PCI-6034E	R6868 (182482-01)	CB-68LP (777145-01)
6035E	PCI-6035E	R6868 (182482-01)	CB-68LP (777145-01)

For more detailed cable and accessory options, refer to page 286-299.

6034E/6035E Families

Data Acquisition

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

Nominal Range (V)	Absolute Accuracy						Relative Accuracy		
	% of Reading			Offset (μV)	Noise + Quantization (μV)		Temp Drift (%/°C)	Resolution (μV)	
	24 Hrs	90 Days	1 Year		Single Pt.	Averaged		Single Pt.	Averaged
±10	0.0496%	0.0516%	0.0538%	± 1591	± 885	± 77.9	0.0010	1025.0	102.5
±5	0.0146%	0.0166%	0.0188%	± 806	± 443	± 38.9	0.0005	512.6	51.26
±0.5	0.0496%	0.0516%	0.0538%	± 99.5	± 53.4	± 4.76	0.0010	62.73	6.273
±0.05	0.0496%	0.0516%	0.0538%	± 28.9	± 26.4	± 2.57	0.0010	33.80	3.380

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 a ±1 °C of internal calibration temperature and ±10 °C of external or factory calibration temperature. See page 300 for example calculations.

Table 2. 6034E/6035E Families 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 300 for example calculations.



Refer to page 308 for more detailed specifications.

Table 3. 6035E Family Analog Output Accuracy Specifications

Family	Analog Input			Analog Output				Available	PCI
	Sampling Rate	Polarity	Range Selections	Update Rate	Polarity Rate	Resolution	FIFO Size	DMA Channels	Bus Master
6010E	20 kS/s	Unipolar or Bipolar	20 V, 10 V, 5 V, 2 V, 1 V, 200 mV, 100 mV	20 kS/s	Bipolar	12-bit	-	3	✓
6030E/6031E 6032E/6033E	100 kS/s	Unipolar or Bipolar	20 V, 10 V, 5 V, 4 V, 2 V, 1 V, 500 mV, 400 mV, 200 mV, 100 mV	100 kS/s	Unipolar or Bipolar	16-bit	2048 Samples	3	✓
6034E/6035E	200 kS/s	Bipolar	20 V, 10 V, 1 V, 100 mV	10 kS/s ¹	Bipolar	12-bit	-	1	✓
6052E	333 kS/s	Unipolar or Bipolar	20 V, 10 V, 5 V, 2 V, 1 V, 500 mV, 200 mV, 100 mV	333 kS/s	Unipolar or Bipolar	16-bit	2048 Samples	3	✓

¹ 10 kS/s system dependent when using the single DMA channel for analog output, 1 kS/s system dependent when using the single DMA channel for either analog input or counter/timer operations.

Table 4. How To Choose Between the 6010E, 6030E, and 6052E Families The table above highlights the differences between these four families of products. Use the table to determine which device has the features your application requires.

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 ¹	22	56	AIGND
DAC1OUT ¹	21	55	AOGND ¹
RESERVED	20	54	AOGND ¹
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
PF18/GPCTR0_GATE	3	37	PF18/GPCTR0_SOURCE
GPCTR0_OUT	2	36	DGND
FREQ_OUT	1	35	DGND

¹Not Available on 6023E

Figure 1. 6034E/6035E Families I/O Connector

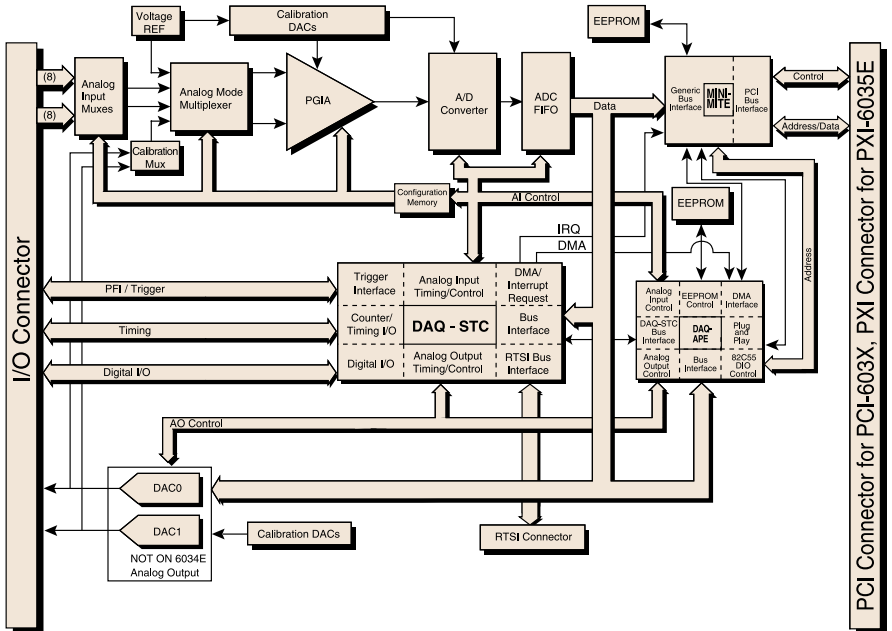


Figure 2. 6034E/6035E Families Block Diagram

Specifications

16-Bit E Series (6052E, 6030E and 6010E Families)

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

Analog Input

Accuracy specifications See related product pages

Input Characteristics

Number of channels

6052E 6030E 6032E 6034E 6035E 601xE	16 single-ended or 8 differential (software selectable per channel)
6031E 6033E	64 single-ended or 32 differential (software selectable per channel)

Type of ADC Successive approximation

Resolution 16 bits, 1 in 65,536

Maximum sampling rate

6052E	333 kS/s
6034E	200 kS/s
6035E	
6030E 6031E 6032E 6033E	100 kS/s
601xE	20 kS/s; 200 kS/s single-channel sampling with the DAQCard-AI-16XE-50

Streaming-to-disk rate (system dependent)*

6052E	333 kS/s
6034E	200 kS/s
6035E	
6030E 6031E 6032E 6033E	100 kS/s
601xE	20 kS/s

*Streaming-to-disk rates do not apply to RT Series devices

Input signal ranges

Device	Range Software Selectable	Bipolar Input Range	Unipolar Input Range
6052E	20 V	±10 V	—
	10 V	±5 V	0 to 10 V
	5 V	±2.5 V	0 to 5 V
	2 V	±1 V	0 to 2 V
	1 V	±500 mV	0 to 1 V
	500 mV	±250 mV	0 to 500 mV
	200 mV	±100 mV	0 to 200 mV
	100 mV	±50 mV	0 to 100 mV
	20 V	±10 V	—
	10 V	±5 V	0 to 10 V
6030E 6031E 6032E 6033E	5 V	—	0 to 5 V
	4 V	±2 V	—
	2 V	±1 V	0 to 2 V
	1 V	±500 mV	0 to 1 V
	500 mV	—	0 to 500 mV
	400 mV	±200 mV	—
	200 mV	±100 mV	0 to 200 mV
6034E 6035E	100 mV	—	0 to 100 mV
	20 V	±10 V	—
	10 V	±5 V	—
	1 V	±500 mV	—
	100 mV	±50 mV	—
601xE	20 V	±10 V	—
	10 V	±5 V	0 to 10 V
	5 V	—	0 to 5 V
	2 V	±1 V	—
	1 V	—	0 to 1 V
	200 mV	±100 mV	—
	100 mV	—	0 to 100 mV

Input coupling DC

Maximum working voltage
(signal + common mode) Each input should remain within ±11 V of ground

Overvoltage protection

Powered on ±25 V

Powered off ±15 V

Inputs protected

6052E 6030E 6032E 6034E 6035E 601xE	ACH<0..15>, AISENSE
6031E 6033E	ACH<0..63>, AISENSE, AISENSE2

FIFO buffer size 512 samples; 1024 samples for DAQCard;
2048 for PCI-MIO-16XE-50

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 (dithered)

Device	Typical	Maximum
6052E 6034E 6035E	±1.5 LSB	±3 LSB
6030E 6031E 6032E 6033E	±0.75 LSB	±1 LSB
6011E	±0.5 LSB	±1 LSB
6012E	±1.5 LSB	±2 LSB

DNL

Device	Typical	Maximum
6052E 603xE 6011E	±0.5 LSB	±1 LSB
6012E	+1.5 to -0.75 LSB	+2.25 to -1.0 LSB

No missing codes 16 bits, guaranteed

Amplifier Characteristics

Input impedance

Device	Normal Powered On	Powered Off	Overload
6052E	100 GΩ in parallel	820 Ω;	820 Ω;
603xE	with 100 pF	1 kΩ for VXI	1 kΩ for VXI
601xE	7 GΩ in parallel with 100 pF	820 Ω;	820 Ω;
		1 kΩ for DAQCard	1 kΩ for DAQCard

Input bias and offset current

Device	Bias Current	Offset Current
6052E 6034E 6035E	±200 pA	±100 pA
6030E 6031E 6032E 6033E	±1 nA	±2 nA
6011E except DAQPad	±10 nA	±20 nA
DAQPad-MIO-16XE-50	±3.5 nA for ACH<0,8> ±3 nA for ACH<1..7,9..15>	±4 nA
6012E	±10 nA	±14 nA

16-Bit E Series (continued)

CMRR, DC to 60 Hz

Device	Range	CMRR	
		Bipolar	Unipolar
6052E	20 V	92 dB	—
	10 V	97 dB	97 dB
	5 V	101 dB	101 dB
	2 V	104 dB	104 dB
	100 mV to 1 V	105 dB	105 dB
6030E	20 V	92 dB	—
6031E	10 V	97 dB	92 dB
6032E	5 V	—	97 dB
6033E	4 V	101 dB	—
	2 V	104 dB	101 dB
	1 V	105 dB	104 dB
	100 mV to 500 mV	105 dB	105 dB
6034E	20 V	85 dB	—
6035E	10 V	85 dB	—
	1 V	96 dB	—
	100 mV	96 dB	—
	100 mV	96 dB	—
601xE	20 V	80 dB	—
	10 V	86 dB	80 dB
	5 V	—	86 dB
	2 V	100 dB	—
	1 V	—	100 dB
	200 mV	120 dB	—
	100 mV	—	120 dB

Dynamic Characteristics

Bandwidth

Device	Range	Small Signal (-3 dB)
6052E	All ranges	480 kHz
6030E	All ranges	255 kHz
6031E		
6032E		
6033E		
6034E	All ranges	413 kHz
6035E		
6011E, except DAQPad	5 to 20 V	63 kHz
	1 to 2 V	57 kHz
	100 to 200 mV	33 kHz
	100 to 200 mV	33 kHz
DAQPad-MIO-16XE-50	5 to 20 V	63 kHz
	1 to 2 V	60 kHz
	100 to 200 mV	42 kHz
	100 to 200 mV	42 kHz
6012E	5 to 20 V	69 kHz
	1 to 2 V	66 kHz
	100 to 200 mV	39 kHz
	100 to 200 mV	39 kHz

System Noise (LSB_{rms}, including quantization)

Device	Range	Bipolar	Unipolar
6052E	2 to 20 V	0.95	0.95
	1 V	1.1	1.1
	500 mV	1.3	1.3
	200 mV	2.3	2.3
	100 mV	4.2	4.2
	100 mV	4.2	4.2
6030E	2 to 20 V	0.6	0.8
6031E	1 V	0.7	0.8
6032E	400 to 500 mV	1.1	1.1
6033E	200 mV	2.0	2.0
	100 mV	—	3.8
	100 mV	—	3.8
6034E	10 to 20 V	0.8	—
6035E	1 V	1.0	—
	100 mV	5.6	—
	100 mV	5.6	—
6010E	1 to 20 V	0.5	0.5
	100 to 200 mV	0.8	1.4
6011E	1 to 20 V	1.0	1.0
	100 to 200 mV	1.2	1.6

Settling time to full-scale step

Board	Range	Accuracy				
		±0.00076% (±0.5 LSB)	±0.0015% (±1 LSB)	±0.0031% (±2 LSB)	±0.0061% (±4 LSB)	±0.024% (±16 LSB)
6052E	2 to 20 V	20 μ s typical	10 μ s max	5 μ s max	4 μ s max	3 μ s typical
	1 V	20 μ s typical	15 μ s max	5 μ s max	4 μ s max	3 μ s typical
	200 to 500 mV	20 μ s typical	15 μ s max	8 μ s max	4 μ s max	3 μ s typical
	100 mV	20 μ s typical	15 μ s max	10 μ s max	4 μ s max	3 μ s typical
	100 mV	20 μ s typical	15 μ s max	10 μ s max	4 μ s max	3 μ s typical
6030E	All	40 μ s max	20 μ s max	—	10 μ s max	—
6032E	All	—	—	—	—	—
6031E, except VXI	All	50 μ s max	25 μ s max	—	10 μ s max	—
6033E	All	—	—	—	—	—
6034E	1 to 20 V	—	—	5 μ s max	—	—
6035E	100 mV	—	—	—	5 μ s typical	—
	100 mV	—	—	—	—	—
VXI-MIO-64XE-10	All	50 μ s typical	25 μ s typical	—	10 μ s typical	—
6011E	1 to 20 V	—	50 μ s max	—	50 μ s max	—
	200 mV (bipolar),	—	75 μ s max	—	50 μ s max	—
	100 mV (unipolar)	—	75 μ s max	—	50 μ s max	—
	100 mV (unipolar)	—	—	—	50 μ s max	—
6012E	1 to 20 V	—	—	50 μ s max	50 μ s max	—
	200 mV (bipolar),	—	—	60 μ s max	50 μ s typical	—
	100 mV (unipolar)	—	—	60 μ s max	50 μ s typical	—
	100 mV (unipolar)	—	—	60 μ s max	50 μ s typical	—

Crosstalk

	Adjacent Channels	All Other Channels
6052E	-75 dB	-90 dB
603xE		
601xE	-85 dB	-100 dB

Analog Output

Output Characteristics

Number of channels

6052E	2 voltage outputs
6030E	
6031E	
6035E	
6011E	
6032E	None
6033E	
6034E	
6012E	

Resolution

6052E	16 bits, 1 in 65,536
6030E	
6031E	
6035E	12 bits, 1 in 4,096
6011E	

Maximum update rate

6052E	333 kS/s
6035E	10 kS/s, system dependent
6030E	100 kS/s
6031E	
6011E, except DAQPad	20 kS/s
DAQPad-MIO-16XE-50	400 S/s, system dependent

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

FIFO buffer size

6052E	2,048 samples
6030E	
6031E	
6035E	None
6011E	

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

Specifications

16-Bit E Series (continued)

Transfer Characteristics

<i>Relative accuracy</i>	
6052E	±0.35 LSB typical, ±1 LSB max
6030E	±0.5 LSB typical, ±1 LSB max
6031E	
6035E	±0.3 LSB typical, ±0.5 LSB max
6011E	±0.5 LSB max

DNL ±1.0 LSB max

Monotonicity

6052E	16 bits, guaranteed
6030E	
6031E	
6035E	12 bits, guaranteed
6011E	

Voltage Output

<i>Ranges</i>	
6052E	±10 V, 0 to 10 V, ±EXTREF, 0 to EXTREF; software selectable
6030E	±10 V, 0 to 10 V; software selectable
6031E	
6035E	±10 V
6011E	

Output coupling DC
Output impedance 0.1 Ω max
Current drive ±5 mA max
Protection Short-circuit to ground

Power-on state

6052E	0 V (±20 mV)
6030E	
6031E	
6035E	0 V (±200 mV)
6011E	0 V (±85 mV)

External reference input (6052E only)

Range ±11 V
Overvoltage protection ±25 V powered on, ±15 V powered off
Input impedance 10 kΩ
Bandwidth (-3 dB) 3 kHz
Slew rate 0.3 V/μs

Dynamic Characteristics

Settling time and slew rate

Device	Settling Time for Full-Scale Step	Slew Rate
6052E	3.5 μs to ±1 LSB accuracy	15 V/μs
6030E	10 μs to ±1 LSB accuracy	5 V/μs
6031E		
6035E	10 μs to ±0.5 LSB accuracy	10 V/μs
6011E	50 μs to ±0.5 LSB accuracy	2 V/μs

Noise

6052E	60 μV _{rms} ; DC to 1 MHz
6030E	
6031E	
6035E	200 μV _{rms} ; DC to 1 MHz
6011E	40 μV _{rms} ; DC to 1 MHz

Glitch energy (at mid-scale transition)

Device	Magnitude	Duration
6052E	±10 mV	1 μs
6030E	N/A	N/A
6031E		
6035E	±12 mV	2 μs
6011E	±30 mV	10 μs

Digital I/O

Number of channels 8 input/output
Compatibility 5 V/TTL
Power-on state Input (high impedance)
Data transfers Programmed I/O

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 _{out} = 24 mA)	–	0.4 V
Output high voltage (I _{out} = 13 mA)	4.35 V	–

Timing I/O

General-Purpose Up/Down Counter/Timers

Number of channels 2
Resolution 24 bits
Compatibility 5 V/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 _{out} = 5 mA)	–	0.4 V
Output high voltage (I _{out} = 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 5 V/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 _{out} = 5 mA)	–	0.4 V
Output high voltage (I _{out} = 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

6052E	1
6030E	
6031E	
6032E	
6033E	None
6034E	
6035E	
601xE	

Purpose

Analog input Start and stop trigger, gate, clock
Analog output Start trigger, gate, clock
General-purpose counter/timers Source, gate

Source

6052E	ACH<0..15>, PF10/TRIG1
6030E	
6032E	
6031E	ACH<0..63>, PF10/TRIG1
6033E	

Level

Internal source, ACH<0..15/63> ±Full-scale

External source, PFIO/TRIG1 ±10 V

Slope Positive or negative; software selectable

Resolution 12 bits, 1 in 4,096

Hysteresis Programmable

Bandwidth (-3 dB)

Board	Internal source ACH<0..15/63>	External Source PFIO/TRIG1
6052E	700 kHz	700 kHz
603xE	255 kHz	4 MHz

Accuracy ±1% of full-scale range max

16-Bit E Series (continued)

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.....	5 V/TTL
Response.....	Rising or falling edge
Pulse width	10 ns minimum

External Input for Digital or Analog Trigger (PFI0/TRIG1)

Impedance	10 k Ω
Coupling	DC
Protection	
Digital trigger	-0.5 to (V _{cc} + 0.5) V
Analog trigger	
On/Off/Disabled	± 35 V

Excitation and Cold-Junction Compensation (DAQPad only)

Excitation

Type	Current output
Channels	1
Level	100 μ A ± 50 nA
Maximum load resistance	80 k Ω
Temperature coefficient.....	± 20 ppm/ $^{\circ}$ C
Long term stability	$\pm 2,530$ ppm/ $\sqrt{1000}$ h

Cold-Junction Temperature Sensor

Absolute accuracy.....	2.0 $^{\circ}$ C
Relative accuracy	0.5 $^{\circ}$ C
Output	0.15 V (at 55 $^{\circ}$ C) to 1.63 V (at 0 $^{\circ}$ C)
Connection.....	Independent analog input channel (does not reserve any ACH inputs)

Calibration

Recommended warm-up time.....	15 minutes; 30 minutes for DAQCard
Calibration interval.....	1 year

Onboard calibration reference

DC Level

6052E	5.000 V (± 1.0 mV)	Over full operating temperature, actual value stored in EEPROM
6030E		
6031E		
6032E		
6033E		
6012E		
6034E	5.000 V (± 3.5 mV)	
6035E		
6011E	5.000 V (± 3.0 mV)	

Temperature coefficient

6052E	± 0.6 ppm/ $^{\circ}$ C max
6030E	
6031E	
6032E	
6033E	
6012E	± 5 ppm/ $^{\circ}$ C max
6034E	
6035E	
6011E	± 2 ppm/ $^{\circ}$ C max

Long-term stability

6052E	± 6 ppm/ $\sqrt{1000}$ h
6030E	
6031E	
6032E	
6033E	
6034E	± 15 ppm/ $\sqrt{1000}$ h
6035E	
601xE	

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 V/TTL
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Bus Interface

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

Power Requirements^{1,2}

Device	+5 VDC ($\pm 5\%$)	Power Available at I/O Connector
6052E	1.3 A	+4.65 to +5.25 VAC, 1 A
603xE (PCI, PXI); except 6034E/6035E	1.5 A	+4.65 to +5.25 VDC, 1 A
6034E	0.9 A	+4.65 to +5.25 VDC, 1 A
6035E		
603xE (AT)	1.2 A	+4.65 to +5.25 VDC, 1 A
PCI-MIO-16XE-50	1.1 A	+4.65 to +5.25 VDC, 1 A
DAQCard-A1-16XE-50	230 mA	+4.65 to +5.25 VDC, 250 mA
AT-MIO-16XE-50	750 mA	+4.65 to +5.25 VDC, 1 A

Device	9 to 42 VDC	Power Available at I/O Connector
DAQPad-MIO-16XE-50	325 mA at 12 VDC	+4.65 to +5.25 VDC, 250 mA

DAQPad discharge time with BP-1 battery pack.....	9 hours, typical
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Physical

Dimensions (not including connectors)³

PCI	17.5 by 10.6 cm (6.9 by 4.2 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 (15 cm enclosure)	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)

0.8 kg (1.7 lb)	
Parallel port connectors (DAQPad only)	Two 36-pin MDR 1284-C female connectors
I/O connector ⁴	

6052E	68-pin male SCSI-II type
6030E	
6032E	
6034E	
6035E	
6011E	
6031E	100-pin female 0.050 D-type
6033E	
6012E	68-pin female PCMCIA

DAQPad-TB-52 Screw Terminal Block

I/O connections.....	52 labeled screw terminals, with strain relief
Field wire gauge.....	26-16 AWG
Fuse on +5 V screw terminal	250 mA, 125 V, Pico II, fast-acting from Littelfuse

Environment

Operating temperature.....	0 to 55 $^{\circ}$ C; DAQCards should not exceed 55 $^{\circ}$ C while in PCMCIA slot; 0 to 50 $^{\circ}$ C for DAQPads
Storage temperature.....	-20 to 70 $^{\circ}$ C
Relative humidity	10 to 90%, noncondensing

Certifications and Compliances

CE Mark Compliance

¹For VXI power requirements, dimensions, and I/O connections, refer to the VXI Solutions Product Guide

²For RT Series devices power requirements and dimensions, refer to page 247.