E Series Multifunction I/O – 100 kS/s, 12-Bit, 16 Analog Inputs

602xE Families (E-10)

6020E Family (MIO-16E-10)
DAQPad-6020E for USB*
AT-MIO-16E-10

6021E Family (MIO-16DE-10)
AT-MIO-16DE-10

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

Analog Output
2 channels, 12-bit resolution

Digital I/O
8 (5V/TTL) lines (6020E)
32 (5V/TTL) lines (6021E)

Counter/Timers
2 up/down, 24-bit resolution

Triggering
Digital

NI-DAQ Software
Windows NT/98/95
* Windows 98 only for USB
(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
6020E	16 SE/8 DI	12 bits	100 kS/s	±0.05 to ± 10 V	2	12 bits	100 kS/s	up to ± 10 V	8	2, 24-bit	Digital
6021E	16 SE/8 DI	12 bits	100 kS/s	±0.05 to ± 10 V	2	12 bits	100 kS/s	up to ± 10 V	32	2, 24-bit	Digital

Table 1. 602xE Family Channels, Speed, and Resolution Specifications (refer to page 313 for more detailed specifications)

Overview

The 6020E (MIO-16E-10) and 6021E (MIO-16DE-10) families use E Series technology to deliver high performance and reliable data acquisition capabilities to meet a wide range of application requirements. You get up to 100 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 100 kS/s.

These E Series boards feature digital triggering capability, as well as two 12-bit analog outputs; two 24-bit, 20 MHz counter/timers; and 8 or 32 digital I/O lines.

The DAQPad-6020E for USB is available in three different configurations.

The 15 cm enclosure is ideal for desktop or portable applications and features a 68-pin shielded connector.

The 30 cm enclosure with mass termination offers a low-profile package that fits right under your laptop. It features a 68-pin shielded connector to connect signals from our SCC Series modular signal conditioning products or from our CA-1000 custom connectivity enclosure.

The 30 cm enclosure with BNC connectivity is ideal for applications where portability and quick connectivity is needed such as in-vehicle automotive or aircraft testing.

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

USB Connectors

The DAQPad-6020E are cabled to your USB-equipped computer via a standard USB cable (included). The USB cable uses a USB B-type connector for the device and a USB A-type connector for the computer.

DAQPad-6020E Power

The DAQPad-6020E is powered by an included AC to DC adapter unit. With this unit, you can power the DAQPad-6020E from any standard AC source. An optional BP-1 rechargeable battery pack, or any 9 to 30 VDC supply can also power the DAQPad-6020E for up to 40 minutes between charges.

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E Series Multifunction I/O – 100 kS/s, 12-Bit, 16 Analog Inputs

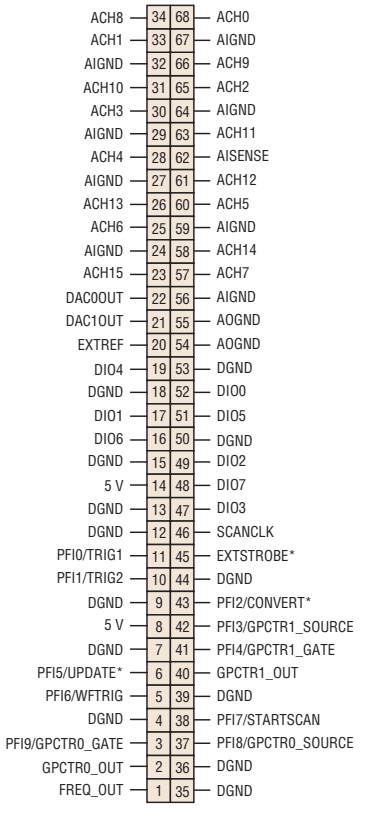

Figure 1. 6020E Family I/O Connector

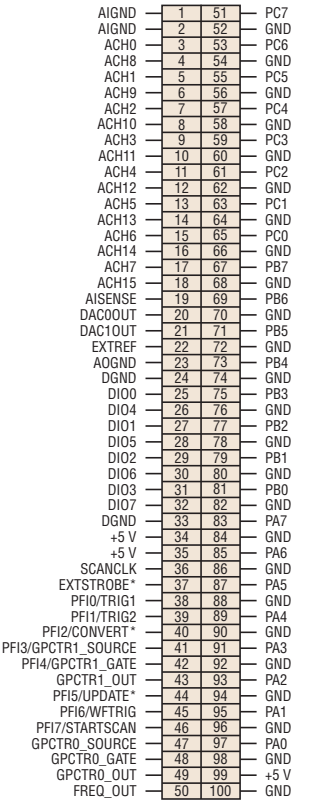

Figure 2. 6021E Family I/O Connector

Ordering Information

6020E Family

DAQPad-6020E for USB in

15 cm enclosure with AC adapter and USB cable

U.S. 120 VAC 777474-01
Universal Euro 240 VAC 777474-04
United Kingdom 240 VAC.....777474-06
Japan 120 VAC 777474-07

30 cm enclosure with mass termination, AC Adapter, and USB cable

U.S. 120 VAC 777704-01
Universal Euro 240 VAC 777704-04
United Kingdom 240 VAC.....777704-06
Japan 120 VAC 777704-07

BNC termination, AC Adapter, and USB cable

U.S. 120 VAC 777703-01
Universal Euro 240 VAC 777703-04
United Kingdom 240 VAC.....777703-06
Japan 120 VAC 777703-07

AT-MIO-16E-10 777521-01

6021E Family

AT-MIO-16DE-10 777640-01

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

All DAQPad kits include 1 meter USB cable.

BP-1 Rechargeable battery pack

120 VAC charger 776896-01
230 VAC charger 776896-31

Example Configurations

Family	DAQ Board	Cable (page 305-309)	Accessory (page 295-304)
6020E	DAQPad-6020E (15 cm enclosure)	SH6868-EP (184749-01)	SCB-68 (776844-01)
	DAQPad-6020E (30 cm enclosure, mass termination)	SH6868-EP (184749-01)	CA-1000 (777664-01)
	DAQPad-6020E (30 cm enclosure, BNC termination)	None	None
	AT-MIO-16E-10	SH6868-EP (184749-01)	SCB-68 (776844-01)
6021E	AT-MIO-16DE-10	SH100100 (182853-01)	SCB-100 (776990-01)

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

E Series Multifunction I/O – 100 kS/s, 12-Bit, 16 Analog Inputs

	Absolute Accuracy							Relative Accuracy	
	% of Reading				Noise + Quantization (mV)		Temp	Resolution (mV)	
Nominal Range (V)	24 Hrs	90 Days	1 Year	Offset (mV)	Single Pt.	Averaged	Drift (%/°C)	Single Pt.	Averaged
±10	0.072%	0.074%	0.076%	6.380	3.467	0.846	0.0010	5.729	1.114
±5	0.019%	0.019%	0.021%	3.198	1.733	0.423	0.0005	2.865	0.557
±2.5	0.072%	0.074%	0.076%	1.608	0.867	0.211	0.0010	1.432	0.278
±1	0.072%	0.074%	0.076%	0.653	0.347	0.085	0.0010	0.573	0.111
±0.5	0.072%	0.074%	0.076%	0.335	0.173	0.042	0.0010	0.286	0.056
±0.25	0.072%	0.074%	0.076%	0.176	0.105	0.021	0.0010	0.151	0.028
±0.1	0.072%	0.074%	0.076%	0.081	0.061	0.008	0.0010	0.074	0.011
±0.05	0.072%	0.074%	0.076%	0.049	0.049	0.004	0.0010	0.056	0.006
0 to 10	0.019%	0.019%	0.021%	3.198	1.733	0.423	0.0005	2.865	0.557
0 to 5	0.072%	0.074%	0.076%	1.608	0.867	0.211	0.0010	1.432	0.278
0 to 2	0.072%	0.074%	0.076%	0.653	0.347	0.085	0.0010	0.573	0.111
0 to 1	0.072%	0.074%	0.076%	0.335	0.173	0.042	0.0010	0.286	0.056
0 to 0.5	0.072%	0.074%	0.076%	0.176	0.105	0.021	0.0010	0.151	0.028
0 to 0.2	0.072%	0.074%	0.076%	0.081	0.061	0.008	0.0010	0.074	0.011
0 to 0.1	0.072%	0.074%	0.076%	0.049	0.049	0.004	0.0010	0.056	0.006

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

	Absolute Accuracy				
	% of Reading				Temp
Nominal Range (V)	24 Hrs	90 Days	1 Year	Offset (mV)	Drift (%/°C)
±10	0.018%	0.020%	0.022%	5.93	0.0005
0 to 10	0.018%	0.020%	0.022%	3.49	0.0005

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

Table 3. 602xE Family Analog Output Accuracy Specifications

Refer to page 313 for more detailed specifications.

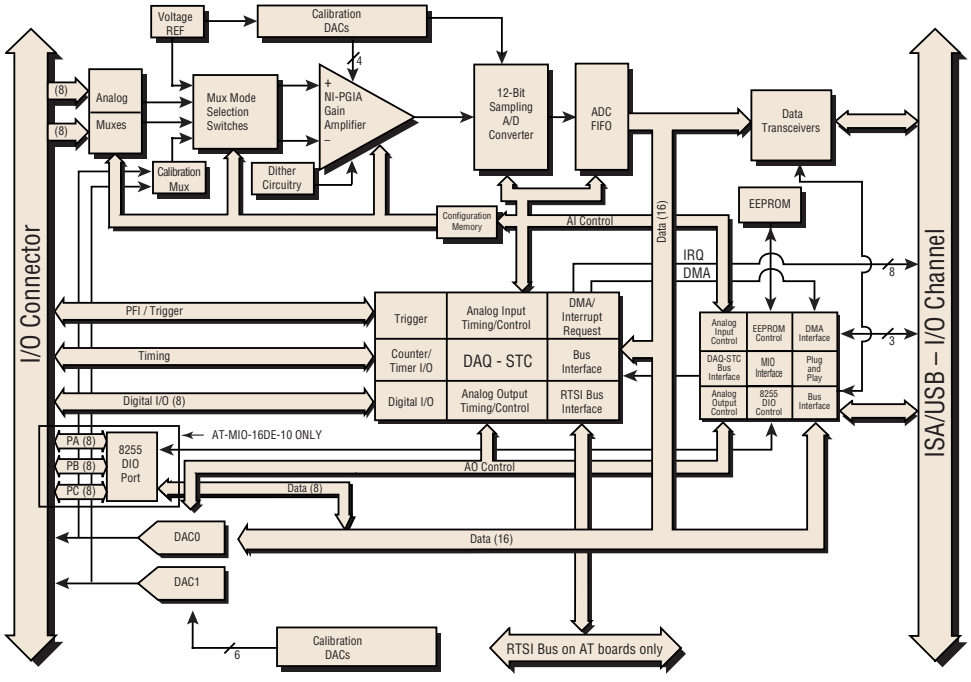

Figure 3. 602xE Family Hardware Block Diagram

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

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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 6024E 6025E	500 kHz	225 kHz
6021E	150 kHz	120 kHz

Settling time to full-scale step

Board	Range	Accuracy ±0.012% (±0.5 LSB)	Accuracy ±0.024% (±1 LSB)	Accuracy ±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_{rms}, not including quantization)

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

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

Crosstalk

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

Analog Output

Output Characteristics

Number of channels

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

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

Maximum update rate

Board	Waveform Generation: FIFO Mode: Internally Timed	FIFO Mode: Externally Timed	Non-FIFO Mode: 1 Channel	Non-FIFO Mode: 2 Channels
607xE 606xE 604xE	1 MS/s	950 kS/s	800 kS/s, system dependent	400 kS/s, system dependent
6023E 6024E 6025E	N/A	N/A	10 kHz with DMA 1 kHz with interrupts system dependent	10 kHz with DMA 1 kHz with interrupts system dependent
6020E; except DAQPad 6021E	N/A	N/A	100 kS/s, system dependent	100 kS/s, system dependent
DAQPad-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 606xE	2,048 samples
604xE	512 samples
602xE	None

Data transfers

- PCI, PXI, AT, VXI ..... DMA, interrupts, programmed I/O
- DAQPad ..... 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 606xE 604xE 6020E 6021E	±10 V, 0 to 10 V, ±EXTREF, 0 to EXTREF; software selectable
6023E 6024E 6025E	±10 V

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)

12-Bit E Series (continued)

External reference input (not available on 6024E or 6025E)
- Range ..... ±11 V
- Overvoltage protection

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

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

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

Dynamic Characteristics

Settling time and slew rate

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

Noise ..... 200 μV_{rms}, DC to 1 MHz

Glitch energy (at mid-scale transition)
- Magnitude

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

- Duration

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

Stability

Gain temperature coefficient
- External reference ..... ±25 ppm/°C

Digital I/O

Number of channels

6021E 6025E	32 input/output
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_{out} = 24 mA)	–	0.4 V
Output high voltage (I_{out} = 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_{out} = 2.5 mA)	–	0.4 V
Output high voltage (I_{out} = 2.5 mA)	3.9 V	–

Data transfers

6021E 6025E	Interrupts, programmed I/O
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_{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 ..... PFI0..PFI9, RTSI0..RTSI6, Analog trigger; software selectable
External gate selections ..... PFI0..PFI9, RTSI0..RTSI6, 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_{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

607xE 606xE 604xE	1
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 6060E 604xE 602xE	ACH<0..15>, PFI0/TRIG1
6071E 6061E	ACH<0..63>, PFI0/TRIG1

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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/$\sqrt{1000\ h}$; (±6 ppm/$\sqrt{1000\ h}$ for VXI)

RTSI (PCI, and AT only)
Trigger lines 7

PXI Trigger Bus (PXI only)
Trigger lines 6
Star trigger 1

VXI Trigger Bus (VXI only)
Trigger lines ..... 5 (5V/TTL), 2 ECL

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

Power Requirements*

Board	+5 VDC (±5%)[1]	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
[1]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*