

Annexure – I

Technical Specifications

Item 1: PCI express high speed digitizer card

(Quantity: 2 Nos.)

PCI Express specification Rev. 2.0 compliant.

Analog input specifications

Number of channels: 2 (single-ended)

Input coupling: AC or DC, software selectable

AC coupling cutoff frequency: 11 Hz

-3 dB bandwidth: 90 MHz

Input impedance: 50 ohms or 1 Mohms, software selectable

Input signal range: ± 0.2 V, ± 2 V, or ± 10 V

Overvoltage protection:

- With 50 Ω : ± 10 V sine wave, 7 Vrms
- With 1M Ω : ± 10 V

ADC resolution: 14 bits

Sampling rate: up to 200 MS/s

Gain error: ± 0.65 % of input

Offset error: ± 1 mV

Crosstalk: < -80 dB

Trigger

Trigger sources: Software, External digital, Analog inputs, SSI

Trigger modes: Post-trigger, Pre-trigger, Middle-trigger, Delay-trigger

External digital input

- Source: Front panel SMA connector
- Compatibility: 3.3 V TTL, 5 V tolerance
- Trigger polarity: Rising or falling edge, software programmable

External digital trigger output

- Compatibility: 5 V TTL
- Trigger polarity: Positive or negative
- Driving capacity: Capable of driving 50 Ω load

Timebase

Timebase options

- Internal: onboard synthesizer
- External: Clock input (front panel)

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Sampling clock frequency

- Internal: 200 MHz
- External: 40 MHz to 200 MHz
- Timebase accuracy: $<\pm 25$ ppm

External reference clock source: Front panel, SSI

External reference clock: 10M Hz or 100M Hz

External reference clock input range: 500mVpp ~ 5Vpp (AC/DC compliant)

External sampling clock input range: 1Vpp ~ 5Vpp (AC/DC compliant)

Data storage and transfer

1 GB onboard memory, shared among the two analog inputs

Scatter-Gather DMA data transfer

Onboard reference

+5V and +2.5V onboard reference voltage

< 3.0 ppm/ $^{\circ}$ C reference temperature drift

General specifications

I/O Connectors

- SMA x 2 for analog inputs
- SMA x 1 for external trigger input
- SMA x 1 for external trigger output
- SMA x 1 for external clock input

Bus Interface: PCI Express Gen 2 x 4

Ambient Temperature (Operating): 0° C to 50° C

Ambient Temperature (Storage): -20° C to 80° C

Relative Humidity: 10% to 90%, non-condensing

Certifications

EMC/EMI: CE, FCC Class A

Supported operating system

Windows 7/8 x64/x86, Linux

Driver and SDK support

LabVIEW, MATLAB, C/C++, Visual Basic, Visual Studio.NET

Linux source code of the device driver must be provided along with the device.

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Item 2: 4-Channel, 16-bit, 40 MS/s PCI digitizer card

(Quantity: 2 Nos.)

PCI specification compliant
Support 32-bit/66 MHz PCI interface

Analog input specifications

Number of channels: 4 single-ended channels
Input connector: BNC
Input impedance: 50 Ω or 1 M Ω , software selectable
Input coupling: DC
Input range: ± 1 V, ± 5 V
Overvoltage protection: ± 15 V
ADC resolution: 16 bits
Sampling rate: Up to 40 MS/s
Crosstalk: < -80 dB from DC to 1 MHz, for both input ranges at 50 Ω input impedance
System noise, unit in LSB_{RMS} : better than or equal to 8.0 for ± 1 V input range and 5.0 for ± 5 V input range
Offset error: Better than or equal to ± 0.3 mV
Gain error: $\leq \pm 0.1\%$ for ± 1 V input range and $\leq \pm 0.06\%$ for ± 5 V input range
-3dB bandwidth: 20 MHz at 50 Ω input impedance, 90 kHz at 1 M Ω input impedance

Timebase

Sample clock sources
 Internal: on-board oscillator
 External: CLK IN (front panel SMB connector), SSI Bus
Timebase frequency range: 1 MHz - 40 MHz

Dedicated external clock input from panel

Connector type: SMB
Clock type: sine wave or square wave
Input impedance: 50 Ω
Input coupling: AC
Input range: 1 V_{pp} to 2 V_{pp}
Overvoltage protection: 2.5 V_{pp}

Triggering

Trigger sources:

- Software
- Trigger input (front panel SMB connector)
- Analog trigger from CH0 - CH3

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- SSI

Trigger modes: Pre-trigger, post-trigger, middle-trigger, delayed-trigger

Data storage and transfer

On-board memory: 512 MB, shared among the four AI channels

Data transfer: scatter-gather DMA

On-board reference

On-board reference voltage: +5 V

Temperature drift: < 3 ppm/°C

General specifications

I/O Connector

- BNC X4 for analog inputs
- SMB X2 for external digital trigger and external timebase input

PCI Bus Interface

- PCI signaling: support 3.3 V and 5 V signaling
- PCI interface: 32-bit, 33/66 MHz

Ambient temperature (Operational):

- 0°C to 50°C (32°F to 122°F)

Ambient temperature (Storage): -20°C to 80°C (-4°F to 176°F)

Relative humidity: 10% to 90% non-condensing

Power requirements: 3.3 V – 0.8 A, 5 V – 2 A, 12 V – 0.3 A

Certifications

EMC/EMI: CE, FCC Class A

Supported operating system

Windows 7/8 x64/x86, Linux

Driver and SDK support

LabVIEW, MATLAB, C/C++, Visual Basic, Visual Studio.NET

Linux source code of the device driver must be provided along with the device.

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Item 3: cPCI General Purpose Timer/Counter card

(Quantity: 3 Nos.)

CompactPCI backplane compliant
Form factor: 3U Eurocard, with 6U extension facia.

General-Purpose Timer/Counters

Number of channels: 10
Counter width: 16 Bit
Compatibility: 5 V/TTL
Base clock available: 8 MHz or external clock up to 10 MHz
Programmable clock sources

- Cascaded 32-Bit timer output
- External clock
- Timer/counter output of the last channel
- Onboard 8 MHz clock

Cascaded Timer

Number of channels: 1
Counter width: 32 Bits
Compatibility: 5 V/TTL
Base clock available: 8 MHz, fixed

Programmable De-bounce Filters for External Clocks

Number of channels: 11
Filtered inputs: external clock, external interrupt
Glitch rejection pulse width: 4 periods of the debounce clock
De-bounce clock: up to 2 MHz, programmable

Interrupt

Number of interrupt sources: 2
Sources: external interrupt input and output of counter #12

Digital I/O

Number of channels: 8 inputs and 8 outputs
Compatibility: 5 V/TTL
Data transfers: programmed I/O

General Specifications

I/O connector: One 100-pin SCSI-II female

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Operating temperature: 0°C to 60°C (32°F to 140°F)

Storage temperature: -20°C to 80°C (-4°F to 176°F)

Relative humidity: 5% to 95%, non-condensing

Power requirements: +5 V, 350 mA typical

Supported Operating System

Windows 7/8 x64/x86, Linux

Driver and SDK

LabVIEW, MATLAB, C/C++, Visual Basic, Visual Studio.NET

Linux source code of the device driver must be provided along with the device.

Item 4: Screw terminal block with cable (Quantity: 5 Nos.)

DIN rail mountable screw terminated terminal board, Connector – 100 pin SCSI-II (Female) with 2 m cable (Male-Male).

Item 5: SMA-SMA cable (Quantity: 10 Nos.)

Connector A Series: SMA

Connector A Gender: Plug (Male)

Connector A Body Style: Straight

Connector B Series: SMA

Connector B Gender: Plug (Male)

Connector B Body Style: Straight

Length: 1 m

Impedance: 50 Ohms

Frequency Range: ≥ 6 GHz

Cable Type: Flexible Coax

Item 6: SMA-BNC cable (Quantity: 10 Nos.)

Connector A Series: SMA

Connector A Gender: Plug (Male)

Connector A Body Style: Straight

Connector B Series: BNC

Connector B Gender: Plug (Male)

Connector B Body Style: Straight

Length: 1 m

Impedance: 50 Ohms

Frequency Range: Up to 4 GHz

Cable Type: Flexible Coax

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Item 7: SMB-BNC cable (Quantity: 10 Nos.)

Connector A Series: SMB

Connector A Gender: Plug (Male)

Connector A Body Style: Straight

Connector B Series: BNC

Connector B Gender: Plug (Male)

Connector B Body Style: Straight

Length: 1 m

Impedance: 50 Ohms

Frequency Range: Up to 4 GHz

Cable Type: Flexible Coax