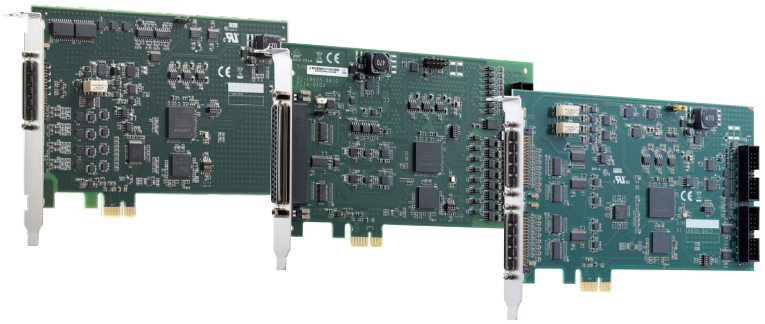
PCIe-9100 Series

Multiplexer/Simultaneous Multi-Function Data Acquisition Card



Features

- PCI Express bus
- High-density design to integrate AI/AO/DI/DO functions in one card
- High accuracy with up to 16-bit resolution A/D and D/A
- Supports a wide, programmable voltage input range of ±10V, ±5V, ±2.5V, ±1.25V, ±0.625V, ±0.3125V
- Up to 2-channel encoder for simple motion control, supporting CW/CCW, x1/x2/x4 AB phase encoder
- Direct memory access channels offload CPU utilization
- Fully automated calibration
- Board ID switch
- Easy to use utility/SDK simplifies design effort
- PM (Pattern Match) function realtime reflective actions by comparing pattern of digital input or encoder

Introduction

The PCIe-9100 series are multi-function data acquisition cards with a PCI Express interface for industrial applications. Their high sample rate, high resolution, and high-density I/O design allow customers easily integrate multiple functions in one card for various applications, such as data logging, process control, and condition monitoring.

Software Support

- **Operating Systems**
  Windows 7/10/11 x86/x64 or later, Linux
- **Driver and SDK**
  LabVIEW, C/C++, Visual Basic, Visual Studio.NET, Python
- **Software Utility**
  ACE, Soft-Front Panel

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Ordering Information

Multiplexer DAQ

- **PCIe-9101**
  16-ch 16-bit 250KS/s Multifunction DAQ
- **PCIe-9121**
  16-ch 14-bit 800KS/s Multifunction DAQ
- **PCIe-9141**
  16-ch 16-bit 1MS/s Multifunction DAQ
- **PCIe-9103**
  32-ch 16-bit 500KS/s Multifunction DAQ
- **PCIe-9161**
  16-ch 16-bit 4MS/s multifunction DAQ
- **PCIe-9163**
  32-ch 16-bit 4MS/s multifunction DAQ
- **PCIe-9164**
  64-ch 16-bit 4MS/s multifunction DAQ

Terminal Boards & Cables

- **DIN-37D-01**
  Terminal board with one 37-pin D-sub connector and DIN-rail mounting (cables not included)
- **DIN-68S-01**
  68-pin SCSI-II Termination board with DIN-Rail Mounting (Cables are not included.)
- **ACL-10137-1MM**
  37-pin D-sub male/male cable, 1M
- **ACL-10120-1**
  20-pin flat cable, 1 M
- **ACL-10568-1**
  SCSI 68P(M) to VHDCI 68P cable, 1M

Simultaneous DAQ

- **PCIe-9146**
  4-ch 16-bit 1MS/s simultaneous multifunction DAQ
- **PCIe-9147**
  8-ch 16-bit 1MS/s simultaneous multifunction DAQ

Terminal Boards & Cables

- **DIN-68S-01**
  68-pin SCSI-II terminal board with DIN-rail mounting (cables not included)
- **ACL-10568-1**
  SCSI 68P(M) to VHDCI 68P cable, 1M

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Specifications

Model		PCIe-9101/9121/9141	PCIe-9103	PCIe-9161/63/64	PCIe-9146/47
Analog Input					
Simultaneous/Scanning		Scanning			Simultaneous
Number of Channels		16-ch single-ended (SE) or 8-ch differential input (DI)	32-ch single-ended (SE) or 16-ch differential input (DI)	PCIe-9161: 16-ch PCIe-9163: 32-ch PCIe-9164: 64-ch single-ended (SE) or PCIe-9161: 8-ch PCIe-9163: 16-ch PCIe-9164: 32-ch differential input (DI)	PCIe-9146: 4-ch PCIe-9147: 8-ch differential input (DI)
Resolution		PCIe-9101/9141: 16-bit PCIe-9121: 14-bit	16-bit	16-bit	16-bit
Sampling Rate	Single-channel	PCIe-9101: 250 KS/s PCIe-9121: 800 KS/s PCIe-9121: 1 MS/s	500 KS/s	4M S/s	1M S/s
	Scanning	PCIe-9101: 100kS/s PCIe-9121: 400 KS/s PCIe-9141: 500 KS/s		1M S/s *1	
FIFO Buffer Size		Onboard 4K samples		Onboard 8K samples	Onboard 4K samples
Input Range		± 10 V, ± 5 V, ± 2.5 V, ± 1.25V, ± 0.625V,± 0.3125V			
Input Impedance		10MΩ			1GΩ
Input Coupling		DC			
Overvoltage Protection		Continuous ± 20 V	Continuous ± 15 V		Continuous ± 30 V
Trigger Source		Software, digital, analog			
Data Transfer		Polling, DMA			
SNR		90 dB	90 dB	84 dB	80 dB
ENOB		14.5-bit	14.5-bit	14-bit	13-bit
Analog Output					
Number of Channels		2	N/A	PCIe-9161: 2-ch PCIe-9163: 4-ch PCIe-9164: 4-ch	2
Resolution		16-bit		16-bit	16-bit
Output Range		± 10 V		± 10 V	± 10 V
FIFO Buffer Size		Onboard 1K samples (2-channel share)		Onboard 4K samples (2/4-channel share)	Onboard 1K samples (2-channel share)
Output Driving Capacity		± 20 mA max.		± 20 mA max.	± 20 mA max.
Slew Rate		10 V/μs		10 V/μs	10 V/μs
Settling Time (0.1% of Full scale)		2 μs		2 μs	2 μs
Output Coupling		DC		DC	DC
Output Impedance		< 0.1 ohm		< 0.1 ohm	< 0.1 ohm
Trigger Source		Software, digital		Software, digital	Software, digital
Data Transfers		Polling, DMA		Polling, DMA	Polling, DMA
Digital Input					
Number of Channels		16	16	16	16
Compatibility		TTL	Isolation	TTL	TTL
Input Impedance		pull-low 100Kohm	2.4Kohm/0.5W	pull-low 100Kohm	pull-low 100Kohm
Input Frequency Range		0.01Hz to 1M Hz	-	0.01Hz to 1M Hz	0.01Hz to 1M Hz
FIFO Buffer Size		Onboard 512 samples	-	Onboard 1024 samples	Onboard 512 samples
Isolation		No	Yes	No	No
Trigger Source		Software, digital	N/A	Software, digital	Software, digital
Data Transfer		Polling, DMA	Polling	Polling, DMA	Polling, DMA

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Specifications

Digital Output				
Number of Channels	16	16	16	16
Compatibility	TTL	Isolation	TTL	TTL
Output Impedance	pull-low 100Kohm	No, default Open	pull-low 100Kohm	pull-low 100Kohm
Output Frequency Range	0.01Hz to 1M Hz	-	0.01Hz to 1M Hz	0.01Hz to 1M Hz
FIFO Buffer Size	Onboard 512 samples	-	Onboard 1024 samples	Onboard 512 samples
Isolation	No	Yes	No	No
Trigger Source	Software, digital	N/A	Software, digital	Software, digital
Data Transfer	Polling, DMA	Polling	Polling, DMA	Polling, DMA
General Purpose Timer Counter				
Number of Channels	2	1	4	2
Resolution	32-bit			
Compatibility	TTL			
Clock Source	Internal clock fix 33M Hz. External clock 0.01Hz to 8M Max. Selected by software	Internal clock fix 33M Hz. External clock 0.01Hz to 2M Max. Selected by software	Internal clock fix 33M Hz. External clock 0.01Hz to 8M Max. Selected by software	Internal clock fix 33M Hz. External clock 0.01Hz to 8M Max. Selected by software
Output Frequency	By internal clock: 16.5MHz By external clock: 32MHz Max	By internal clock: 16.5MHz By external clock: 32MHz Max	By internal clock: 16.5MHz By external clock: 32MHz Max	By internal clock: 16.5MHz By external clock: 32MHz Max
Encoder				
Number of Channels	N/A		2	
Encoder Type	N/A		CW/CCW encoder, x 1 AB phase encoder, x 2 AB phase encoder, x 4 AB phase encoder	
General Specification				
Bus Type	PCI Express 1.0			
Bus Width	x1 lane			
Dimension (L x W x H)	169.55 mm (L) x 16.15 mm (W) x 98.4 mm (H)		181.05mm (L) x 21.1mm (W) x 126.29mm (H)	181.05mm (L) x 19.4mm (W) x 126.72mm (H)
Connector	37-pin D-type connector		68-pin VHDCI female	68-pin VHDCI female
Operating Temperature	0°C to 60°C			
Storage Temperature	-40 to 85 °C			
Power Consumption	PCIe-9101: Typical: 71.6 mA@3.3V 261.5 mA@12V Max: 257.8 mA@3.3V 556.24 mA@12V PCIe-9121/9141: Typical: 60.3 mA@3.3V 358.2 mA@12V Max: 246.5 mA@3.3V 652.94 mA@12V	Typical: 113 mA@3.3V/292.1 mA@12V Max: 140 mA@3.3V/656.2 mA@12V	Typical: 34 mA@3.3V 490 mA@12V Max: 55 mA@3.3V 885 mA@12V	Typical: 30 mA@3.3V 650 mA@12V Max: 45 mA@3.3V 770 mA@12V

*1: The PCIe-9161/9163 is a 16/32-ch multiplexer DAQ with a 1MSps sampling rate. It can also function as a 2-ch simultaneous DAQ with a 4MSps sampling rate.
The PCIe-9164 is a 64-ch multiplexer DAQ with a 1MSps sampling rate. It can also function as a 4-ch simultaneous DAQ with a 4MSps sampling rate.

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