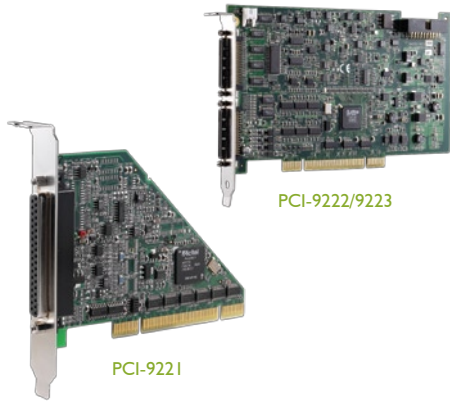


PCI-9221/9222/9223

16/32-CH 16-Bit 250/500 kS/s Multi-Function DAQ Cards with Encoder Input



PCI-9222/9223

PCI-9221

Introduction

The PCI-9221/9222/9223 are ADLINK's high performance DAQ cards. PCI-9221/9222/9223 are 16-bit, 16/32-CH, 250/500 kS/s multi-function DAQ cards with 4/8 different input ranges. They also feature 2-CH 16-bit simultaneous analog outputs and programmable function I/O. The software-programmable function I/O supports a variety of applications, including TTL digital I/O, high-speed DIO (PCI-9222/9223 only), general-purpose timer/counter, pulse generation, encoder input, and PWM output. Analog input, analog output, and function I/O can operate at full speed simultaneously.

For the PCI-9222/9223, multiple cards can be synchronized through the SSI (System Synchronization Interface) bus if more channels are needed. Ideal for mixed-signal tests, laboratory research, and factory automation, the PCI-9221/9222/9223 are the best single-board solutions on the market providing the best integration capability of multiple tasks with high performance and an affordable price.

Features

- Supports a 32-bit 3.3 V or 5 V PCI bus
- Programmable gains for analog input: 1, 2, 4, 5, 8, 10, 20, 40 (PCI-9222/9223) 1, 5, 10, 25 (PCI-9221)
- 2-CH 16-bit simultaneous analog outputs, up to 1 MS/s analog output update rate (PCI-9222/9223)
- Programmable function I/O, supporting modes:
 - TTL DI and TTL DO
 - 2 MHz High-Speed DIO (PCI-9222/9223 only)
 - General-purpose timer/counter
 - PWM outputs
 - Encoder inputs
- Dedicated 2-CH 4 MHz encoder inputs, supporting AB phase, and CW/CCW (PCI-9222/9223)
- Dedicated DMA channels for A/D, D/A, and high-speed DIO (PCI-9222/9223)
- External digital trigger for A/D, D/A, and high-speed DIO (PCI-9222/9223)
- Multiple card synchronization through SSI (System Synchronization Interface) bus (PCI-9222/9223)
- Auto-calibration

Operating Systems

- Windows 7/Vista/2000/XP/Server 2003
- Linux

Recommended Software

- AD-Logger
- VB.NET/VC.NET/VB/VC++/BCB
- DAQBench

Driver Support

- DAQPilot for LabVIEW™
- DAQ-MTLB for MATLAB®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Terminal Boards & Cables

DIN-68S-01 (for PCI-9222/9223)

Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)

TB-9221-01 (for PCI-9221)

General-purpose Terminal Board with One 37-pin D-Sub Connector. Supports Differential to Single-ended Encoder Signal Conversion of PCI-9221's Function I/O Through Jumper Switching. (Cables are not included.)

DIN-37D-01 (for PCI-9221)

Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included.)

ACL-10568-I (for PCI-9222/9223)

68-pin SCSI-VHDCI cable (mating with AMP-787082-7), 1 M

ACL-10137-IMM (for PCI-9221)

37-pin D-sub male/male cable, 1 M

* For more information on mating cables, please refer to P2-61/62.

SSI Bus Cables (for PCI-9222/9223) (for multiple cards synchronization)

ACL-SSI-2/3/4

SSI Bus cable for two, three, and four devices

Ordering Information

PCI-9221

16-Bit Multi-Function DAQ Card with 2-CH Encoder Input

PCI-9222

16-CH 16-Bit 250 kS/s Multi-Function DAQ Card with Encoder Input

PCI-9223

32-CH 16-Bit 500 kS/s Multi-Function DAQ Card with Encoder Input



SSI bus cable for multiple cards synchronization



Terminal board DIN-68S-01 & 68-Pin SCSI-VHDCI cable ACL-10568-I



TB-9221-01

Pin Assignment

CNI pin assignment for PCI-9223

| | | | |
|-----------|----|----|------------|
| A10(AI10) | 34 | 68 | A116(AI10) |
| A11(AI11) | 33 | 67 | A117(AI11) |
| A12(AI12) | 32 | 66 | A118(AI12) |
| A13(AI13) | 31 | 65 | A119(AI13) |
| A14(AI14) | 30 | 64 | A120(AI14) |
| A15(AI15) | 29 | 63 | A121(AI15) |
| A16(AI16) | 28 | 62 | A122(AI16) |
| A17(AI17) | 27 | 61 | A123(AI17) |
| AGND | 26 | 60 | AISENSE |
| A18(AI18) | 25 | 59 | A124(AI18) |
| A19(AI19) | 24 | 58 | A125(AI19) |
| A10(AI10) | 23 | 57 | A126(AI10) |
| A11(AI11) | 22 | 56 | A127(AI11) |
| A12(AI12) | 21 | 55 | A128(AI12) |
| A13(AI13) | 20 | 54 | A129(AI13) |
| A14(AI14) | 19 | 53 | A130(AI14) |
| A15(AI15) | 18 | 52 | A131(AI15) |
| AGND | 17 | 51 | AGND |
| A00 | 16 | 50 | AGND |
| A01 | 15 | 49 | AGND |
| NC | 14 | 48 | NC |
| NC | 13 | 47 | NC |
| NC | 12 | 46 | NC |
| NC | 11 | 45 | NC |
| NC | 10 | 44 | NC |
| NC | 9 | 43 | NC |
| NC | 8 | 42 | NC |
| NC | 7 | 41 | NC |
| NC | 6 | 40 | NC |
| NC | 5 | 39 | NC |
| NC | 4 | 38 | NC |
| NC | 3 | 37 | NC |
| NC | 2 | 36 | NC |
| NC | 1 | 35 | NC |

CNI pin assignment for PCI-9222

| | | | |
|-----------|----|----|-----------|
| A10(AI10) | 34 | 68 | A18(AI10) |
| A11(AI11) | 33 | 67 | A19(AI11) |
| A12(AI12) | 32 | 66 | A10(AI12) |
| A13(AI13) | 31 | 65 | A11(AI13) |
| A14(AI14) | 30 | 64 | A12(AI14) |
| A15(AI15) | 29 | 63 | A13(AI15) |
| A16(AI16) | 28 | 62 | A14(AI16) |
| A17(AI17) | 27 | 61 | A15(AI17) |
| AGND | 26 | 60 | AISENSE |
| NC | 25 | 59 | NC |
| NC | 24 | 58 | NC |
| NC | 23 | 57 | NC |
| NC | 22 | 56 | NC |
| NC | 21 | 55 | NC |
| NC | 20 | 54 | NC |
| NC | 19 | 53 | NC |
| NC | 18 | 52 | NC |
| AGND | 17 | 51 | AGND |
| A00 | 16 | 50 | AGND |
| A01 | 15 | 49 | AGND |
| NC | 14 | 48 | NC |
| NC | 13 | 47 | NC |
| NC | 12 | 46 | NC |
| NC | 11 | 45 | NC |
| NC | 10 | 44 | NC |
| NC | 9 | 43 | NC |
| NC | 8 | 42 | NC |
| NC | 7 | 41 | NC |
| NC | 6 | 40 | NC |
| NC | 5 | 39 | NC |
| NC | 4 | 38 | NC |
| NC | 3 | 37 | NC |
| NC | 2 | 36 | NC |
| NC | 1 | 35 | NC |

CNI pin assignment for PCI-9222/9223

| | | | |
|-------------------|----|----|-------------------|
| GP10(GP1C_CLK0) | 34 | 68 | GP16(GP1C_CLK2) |
| GP10(GP1C_LD0) | 33 | 67 | GP16(GP1C_LD2) |
| GP10(GP1C_GATE0) | 32 | 66 | GP16(GP1C_GATE2) |
| GP10(GP1C_CLK1) | 31 | 65 | GP16(GP1C_CLK1) |
| GP10(GP1C_LD1) | 30 | 64 | GP16(GP1C_LD1) |
| GP10(GP1C_GATE1) | 29 | 63 | GP16(GP1C_GATE1) |
| GP10(GP1C_CLK2) | 28 | 62 | GP16(GP1C_CLK3) |
| GP10(GP1C_LD2) | 27 | 61 | GP16(GP1C_LD3) |
| GP10(GP1C_GATE2) | 26 | 60 | GP16(GP1C_GATE3) |
| GP10(GP1C_CLK3) | 25 | 59 | GP16(GP1C_CLK4) |
| GP10(GP1C_LD3) | 24 | 58 | GP16(GP1C_LD4) |
| GP10(GP1C_GATE3) | 23 | 57 | GP16(GP1C_GATE4) |
| GP10(GP1C_CLK4) | 22 | 56 | GP16(GP1C_CLK5) |
| GP10(GP1C_LD4) | 21 | 55 | GP16(GP1C_LD5) |
| GP10(GP1C_GATE4) | 20 | 54 | GP16(GP1C_GATE5) |
| GP10(GP1C_CLK5) | 19 | 53 | GP16(GP1C_CLK6) |
| GP10(GP1C_LD5) | 18 | 52 | GP16(GP1C_LD6) |
| GP10(GP1C_GATE5) | 17 | 51 | GP16(GP1C_GATE6) |
| GP10(GP1C_CLK6) | 16 | 50 | GP16(GP1C_CLK7) |
| GP10(GP1C_LD6) | 15 | 49 | GP16(GP1C_LD7) |
| GP10(GP1C_GATE6) | 14 | 48 | GP16(GP1C_GATE7) |
| GP10(GP1C_CLK7) | 13 | 47 | GP16(GP1C_CLK8) |
| GP10(GP1C_LD7) | 12 | 46 | GP16(GP1C_LD8) |
| GP10(GP1C_GATE7) | 11 | 45 | GP16(GP1C_GATE8) |
| GP10(GP1C_CLK8) | 10 | 44 | GP16(GP1C_CLK9) |
| GP10(GP1C_LD8) | 9 | 43 | GP16(GP1C_LD9) |
| GP10(GP1C_GATE8) | 8 | 42 | GP16(GP1C_GATE9) |
| GP10(GP1C_CLK9) | 7 | 41 | GP16(GP1C_CLK10) |
| GP10(GP1C_LD9) | 6 | 40 | GP16(GP1C_LD10) |
| GP10(GP1C_GATE9) | 5 | 39 | GP16(GP1C_GATE10) |
| GP10(GP1C_CLK10) | 4 | 38 | GP16(GP1C_CLK11) |
| GP10(GP1C_LD10) | 3 | 37 | GP16(GP1C_LD11) |
| GP10(GP1C_GATE10) | 2 | 36 | GP16(GP1C_GATE11) |
| GP10(GP1C_CLK11) | 1 | 35 | GP16(GP1C_CLK12) |
| GP10(GP1C_LD11) | | | GP16(GP1C_LD12) |
| GP10(GP1C_GATE11) | | | GP16(GP1C_GATE12) |

CNI pin assignment for PCI-9221

| | | | |
|------------------|----|----|------------------|
| GP02 | 1 | 20 | GP01 |
| D0ND | 2 | 21 | GP10(GP1C_OUT1) |
| GP02(GP2C_OUT0) | 3 | 22 | GP10(GP1C_OUT1) |
| GP16(GP1C_GATE1) | 4 | 23 | D0ND |
| GP16(GP1C_GATE1) | 5 | 24 | GP16(GP1C_GATE1) |
| GP16(GP1C_GATE1) | 6 | 25 | GP16(GP1C_GATE1) |
| D0ND | 7 | 26 | GP16(GP1C_GATE1) |
| GP16(GP1C_GATE1) | 8 | 27 | A01 |
| AGND | 9 | 28 | A01 |
| AGND | 10 | 29 | A15(AI15) |
| A17(AI17) | 11 | 30 | A14(AI14) |
| A16(AI16) | 12 | 31 | A13(AI13) |
| A15(AI15) | 13 | 32 | A12(AI12) |
| A14(AI14) | 14 | 33 | A11(AI11) |
| AGND | 15 | 34 | A10(AI10) |
| A13(AI13) | 16 | 35 | A12(AI12) |
| A12(AI12) | 17 | 36 | A11(AI11) |
| A11(AI11) | 18 | 37 | A10(AI10) |
| A10(AI10) | 19 | | |
| NC | 13 | 47 | NC |
| NC | 12 | 46 | NC |
| NC | 11 | 45 | NC |
| NC | 10 | 44 | NC |
| E24V | 8 | 42 | NC |
| EGND | 8 | 42 | NC |
| EA0+ | 7 | 41 | EA+ |
| EA- | 6 | 40 | EA- |
| ES0+ | 5 | 39 | ES+ |
| ES- | 4 | 38 | ES- |
| E23+ | 3 | 37 | E23+ |
| E22+ | 2 | 36 | E22+ |
| ORG0 | 1 | 35 | ORG0 |

Specifications

| Model Name | PCI-9221 | PCI-9222 | PCI-9223 |
|--|---|---|---|
| Analog Input | | | |
| Resolution | 16 bits | | |
| Number of channels | 16 SE/ 8 DIFF | 16 SE/ 8 DIFF | 32 SE/ 16 DIFF |
| Maximum sampling rate (single channel) | 250 kS/s | 250 kS/s | 500 kS/s |
| Programmable gain | 1, 5, 10, 25 | 1, 2, 4, 5, 8, 10, 20, 40 | 1, 2, 4, 5, 8, 10, 20, 40 |
| Input range | ±5 V, ±1 V, ±500 mV, ±200 mV | ±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±500 mV, ±250 mV | ±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±500 mV, ±250 mV |
| Offset error | ±2.6 mV typical, before calibration, ±0.5 mV typical, after calibration | | |
| Gain error | ±0.2% of FSR, before calibration, ±0.015% of FSR, after calibration | | |
| -3 dB small signal bandwidth (gain=1) | 1.8 MHz | 1.5 MHz | 1.5 MHz |
| System noise (gain=1) | 0.1 mV _{RMS} | 0.5 mV _{RMS} | 0.5 mV _{RMS} |
| CMRR (gain=1) | 71 dB | 93.5 dB | 93.5 dB |
| SFDR (Spurious-free dynamic range, gain=1) | 95 dB | 95 dB | 88 dB |
| SINAD (Signal-to-noise and distortion ratio, gain=1) | 85 dB | 86 dB | 84 dB |
| THD (Total harmonic distortion, gain=1) | -93 dB | -94 dB | -90 dB |
| SNR (Signal-to-noise ratio, gain=1) | 86 dB | 87 dB | 86 dB |
| ENOB (gain=1) | 13.5 bits | 13.9 bits | 13.5 bits |
| FIFO buffer size | 1 k samples | | |
| Trigger sources | Software, external digital | Software, external digital, SSI | Software, external digital, SSI |
| Trigger mode | Post trigger | Post trigger, retrigger, gate trigger | Post trigger, retrigger, gate trigger |
| External conversion source | Yes (up to 250 kS/s) | Yes (up to 250 kS/s) | Yes (up to 500 kS/s) |
| Input coupling | DC | | |
| Overvoltage protection | ±10 V | Continuous ±30 V | Continuous ±30 V |
| Input impedance | High impedance > 1 GΩ | | |
| Data Transfer | Programmed I/O, Interrupt, Bus Mastering DMA | | |
| Analog Output | | | |
| Number of channels | 2 voltage outputs | | |
| Resolution | 16-bit | | |
| Maximum update rate | 1.25 kS/s (static) | 1 MHz (simultaneous update) | 1 MHz (simultaneous update) |
| FIFO | - | 512 | 512 |
| Output range | ±5 V | ±10 V | ±10 V |
| Output driving capacity | ±5 mA | | |
| Slew rate | 0.014 V/μs | 20 V/μs | 20 V/μs |
| Setting time (0.1% of full scale) | 1396 μs | 2.6 μs | 2.6 μs |
| Offset error | ±1 mV | ±0.1 mV | ±0.1 mV |
| Gain error | ±2 mV | ±0.1 mV | ±0.1 mV |
| Rising time | 390 μs | 0.67 μs | 0.67 μs |
| Falling time | 395 μs | 0.705 μs | 0.705 μs |
| Function I/O | | | |
| Mode | Digital I/O ⁽¹⁾ , General Timer/Counter ⁽¹⁾ , Pulse Generation ⁽¹⁾ | Digital I/O, General Timer/Counter, Pulse Generation | Digital I/O, General Timer/Counter, Pulse Generation |
| Digital I/O | 8 DI/4 DO (5 V TTL level) | 16 DO (3.3 V TTL Level) / 16 DI (3.3 V or 5 V TTL Level) | 16 DO (3.3 V TTL Level) / 16 DI (3.3 V or 5 V TTL Level) |
| General Timer/Counter | Two 32-bit, Base clock: 40 MHz, external to 10 MHz | Four 32-bit, Base clock: 80 MHz, external to 10 MHz | Four 32-bit, Base clock: 80 MHz, external to 10 MHz |
| Pulse generation | Two PWM outputs (Modulation frequency: 0.005 Hz to 5 MHz; Duty cycle: 1%-99%) | Four PWM outputs (Modulation frequency: 0.01 Hz to 5 MHz; Duty cycle: 1%-99%) | Four PWM outputs (Modulation frequency: 0.01 Hz to 5 MHz; Duty cycle: 1%-99%) |
| Encoder Input | | | |
| Number of channels | 2 ⁽²⁾ | | |
| Encoder type | CW/CCW encoder, x 1 AB phase encoder, x 2 AB phase encoder, x 4 AB phase encoder | | |
| General Specifications | | | |
| PCI Bus | 5 V and 3.3 V universal PCI bus | | |
| Auto-calibration | Yes | | |
| I/O Connector | One 37-pin D-Sub connector | Two 68-pin SCSI-VHDCI female | Two 68-pin SCSI-VHDCI female |
| Operation temperature | 0 to 45°C | 0 to 55°C | 0 to 55°C |
| Storage temperature | -20 to 80°C | -20 to 70°C | -20 to 70°C |
| Humidity | 5 to 95% non-condensing | | |
| Power requirements | +5 V 1A typical, +12 V 100mA typical, -12 V 100mA typical | +5 V 1.2 A typical, +12 V 760 mA typical, -12 V 50 mA typical | +5 V 1.2 A typical, +12 V 760 mA typical, -12 V 50 mA typical |
| Dimensions | 120 mm x 87 mm | 175 mm x 107 mm (not including connectors) | 175 mm x 107 mm (not including connectors) |

Note:

(1) The function I/O and encoder inputs share the same I/O pins of the PCI-9221. Only one of these modes can be selected.

(2) Dedicated

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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JONHON

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А