

Multifunction board, optically isolated, 16 SE or 8 diff. inputs, 4 analog outputs, 16-bit

New!*



CompactPCI™ 32-bit



The board CPCI-3009 is a fast multifunction and counter board for the CompactPCI bus. It is characterised by flexible applications, high accuracy, speed and reliability in severe industrial environments.

With this board you can put into practice a large range of applications on the same hardware basis thanks to FPGA technology. The board is supplied with a pool of functions allowing a high efficiency on just one board. The functions are programmed using the supplied software. You can adapt the functions of the board to the requirements of your application and change them as required. On request, further counter applications can be adapted per software thanks to the the FPGA. Contact us!

Features

- CompactPCI 3.3 V or 5 V
- Can be inserted in PXI systems, with restricted functionalities

Analog inputs

- 16 diff. inputs, optically isolated 1000 V
- Resolution: 16-bit
- Throughput: 100 kHz
- Voltage inputs: 0-10 V, ± 10 V, 0-5 V, ± 5 V, 0-2 V, ± 2 V, 0-1 V, ± 1 V, 0-20 mA (option) freely programmable through software for each channel
- Gain PGA x1, x2, x5, x10 freely programmable through software for each channel
- Version with input range 0-30 V (only SE inputs)

Analog acquisition

- Different input modes for the analog acquisition:
 - 1) Simple mode
 - 2) Scan modes
 - 3) Sequence modes
 - 4) Auto Refresh mode
- Onboard FIFO
- PCI-DMA for analog data acquisition

Analog outputs

- 4 analog outputs, optically isolated
- 12-bit resolution, setup time 15 μ s typ
- Output voltage after reset: 0 V
- Each output has its own ground line (without optical isolation)
- Output voltage range: - 10 V to + 10 V
- Output current: ± 5 mA
- Short-circuit current: ± 20 mA

CPCI-3009

16/8/4 SE or 8/4/2 diff. inputs

16-bit resolution, 100 kHz

Voltage and current inputs (optional)

4 analog outputs, 12-bit

Reprogrammable counter function module

8 optically isolated digital I/O, 24 V

24 V digital I/O

- 4 digital inputs, 24 V, optically isolated
- 4 digital outputs, 24 V, optically isolated

Reprogrammable counter function module

- 32-bit data access
- Counter component with 32-bit width and 5 MHz counting frequency, signals in RS422 mode

Functions:

- Incremental counter for the acquisition of incremental encoders (90° phase-shifted signals)
- Chronos for frequency, pulse width and period duration measurement
- Digital inputs and outputs, 24 V, TTL, RS422

Further functions on request:

- SSI synchronous serial interfaces. The SSI function is an interface for systems which allow an absolute position information via serial data transfer.
- Counter/timer (82x54)
- Pulse acquisition
- Velocity measurement
- PWM (Pulse Width Modulation)
- Customised functions

Timer/Counter/Watchdog

- 3 / 3 / 2, 16-bit

Safety features

- Optical isolation 1000 V min.
- Creeping distance IEC 61010-1
- Circuit part of the analog acquisition is separated from the circuit part of the digital function
- Overvoltage protection ± 40 V
- Protection against high-frequency EMI
- Input filters
- Noise neutralisation of the PC supply
- Connection of the I/O-signals via robust industry-standard D-Sub connector

Software

Standard drivers for:

- Linux (real-time)
- 32-bit drivers for Windows XP (real-time)

On request:

Further operating systems, compilers and samples.

Driver download: www.addi-data.com, download menu

*Preliminary
product information

Phone: +49 7229 1847-0
Fax: +49 7229 1847-222

info@addi-data.com
www.addi-data.com

ADDI-DATA®
SPIRIT OF EXCELLENCE

Specifications*

Analog inputs

Number of inputs:	16 differential inputs, 16-bit resolution
Optical isolation:	1000 V through opto-couplers from PC to peripheral
Voltage inputs:	software-programmable for each channel CPCI-3009: 0-10 V, ± 10 V, 0-5 V, ± 5 V, 0-2 V, ± 2 V, 0-1 V, ± 1 V, 0-20 mA optional CPCI-3009_30V: 0-30V
Gain:	software programmable (x1, x2, x5, x10)
Throughput:	100 kHz
Trigger:	through software, timer, ext. event (24 V input)
Data transfer:	data to the PC through FIFO memory, Interrupt at EOC (End Of Conversion), DMA transfer at EOC
Interrupts:	End of conversion, End of timer, End of scan

Analog outputs

Number of outputs:	4, 12-bit resolution
Optical isolation:	1000 V through opto-couplers
Voltage outputs	
Output range:	- 10 V to + 10 V (- 1 LSB)
LSB:	4.8828 mV
Accuracy:	11-bit
Time to Ready:	typ. 4.5 μ s
Setup time:	typ 15 μ s (at 10 V step)
Max. output current:	± 5 mA
Short-circuit current:	± 20 mA
Output voltage after reset:	0 V

Counter components

Counting depth:	32-bit, counting frequency: up to 5 MHz
Optical isolation:	1000 V

Free programming of the functions

For programming your function module select one function from the list on the right.

Signals	Digital I/O, 24 V signals, TTL or RS422
---------	---

Digital I/O

Number of I/O channels:	4 dig. inputs, 4 dig. outputs (50 mA), 24 V
Logical "0" level:	0-14 V
Logical "1" level:	19-30 V
Optical isolation:	1000 V through opto-couplers from PC to peripheral

EMC – Electromagnetic compatibility

The product complies with the European EMC directive. The tests were carried out by a certified EMC laboratory in accordance with the norm from the EN 61326 series (IEC 61326). The limit values as set out by the European EMC directive for an industrial environment are complied with. The respective EMC test report is available on request.

Physical and environmental conditions

Dimensions:	3U/4TE
System bus:	PCI 32-bit acc. to CompactPCI specification 2.1
Space required:	1 x CompactPCI slot for analog I/O, counter 1 x slot opening for digital I/O with FB3001
Operating voltage:	+5 V, ± 5 %
Current consumption:	790 mA, ± 10 %
Front connector:	26-pin D-Sub female connector (analog I/O) 15-pin D-Sub female connector (counter module) Separ. 37-pin D-Sub connector for 8 dig. I/O via FB3001
Temperature range:	0 to 60 °C (with forced cooling) -30° up to +70° in preparation

CPCI-3009

Multifunction board, optically isolated, 16 SE or 8 diff. inputs, 4 analog outputs, 16-bit. Incl. technical description and software drivers.

Versions

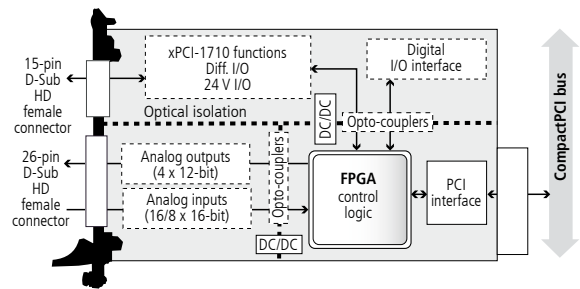
CPCI-3009_30V: Same as CPCI-3009, only SE inputs, unipolar, 0-30 V input range

Options

Please specify the number of channels when ordering

URS-3009-6U:	6U bracket for mounting in 6U housing
Option SF:	Precision filter for 1 single-ended channel
Option DF:	Precision filter for 1 diff. channel (30Hz)
Option PC:	Current input 0(4)-20 mA for 1 channel
PC-SE:	For 1 single-ended channel
PC-Diff:	For 1 diff. channel (30 Hz)

Simplified block diagram



Reprogrammable function module allows many different applications

The function module has numerous functions which can be programmed quickly and easily. For the programming of your function module, choose one of the following functions. If your application changes, just reprogram the function module and use another function from the list below.

Select one of the following functions:

- 1 x 32-bit acquisition of incremental encoders
- 2 x 16-bit acquisition of incremental encoders
- 1 x Chronos/TOR for frequency measurement
- 1 x Chronos for pulse width modulation
- 1 x Chronos for period duration measurement
- 8 digital I/O, 24 V, TTL, RS422

Further functions on request:

- 3 x acquisition of absolute encoders/SSI
- 3 x counter/timer
- 4 x pulse acquisition
- 2 x TOR for velocity measurement
- 2 x PWM
- 2 x ETM
- 1 x SSI monitor

For a detailed description of the functions, please see the datasheet of the board APCI-1710 on page 124

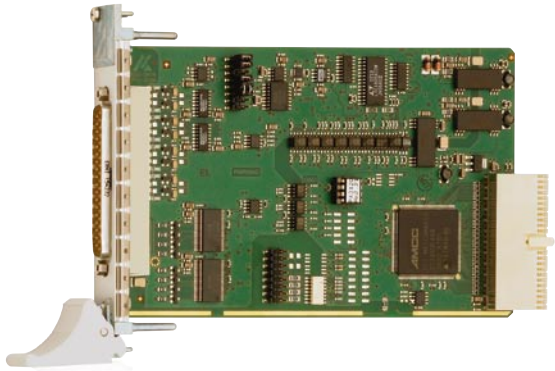
Ordering information

Accessories

PX901-A:	Screw terminal panel with transorb diodes for connecting the analog I/O
PX901-AG:	Same as PX901-A with housing for DIN rail
PX901-ZG:	Screw terminal panel for connecting the digital I/O, for DIN rail
ST3009-DZ:	15-pin HD D-Sub female to 37-pin D-Sub male connector
ST3009-A:	26-pin HD D-Sub female to 37-pin D-Sub male connector
FB3001:	Ribbon cable for dig. I/O, with 37-pin D-Sub male connector on 3U bracket
ST010:	Standard round cable, shielded, twisted pairs, 2 m

*Preliminary product information

COMPACT PCI BOARDS



CompactPCI™

Faster through FPGA

A FPGA component has a programmable logic on which you can save your own algorithms in order to adapt the functionality of the PC board to your requirements. This adaptation makes your PC board unique and improves the performance of your applications. The onboard algorithms reduce the cycle time of signal acquisition and regulation tasks. Most ADDI-DATA CompactPCI boards are equipped with a FPGA component. Use the full potential of your PC board hardware and software resources and thus accelerate your processes.

HIGH PROTECTION

- Optical isolation from 500 V to 1000 V
- Separation of analog and digital signals
- Protection against short-circuits, overtemperature, overvoltage
- Filters for the inputs and outputs
- Industry-standard D-Sub connectors



**READY FOR
HARSH INDUSTRIAL
ENVIRONMENT**

Reliable and available in the long term!

The CompactPCI bus is used particularly in applications with vibrations and shocks. To assure the reliability and longevity of a CompactPCI system it is important to use interference-free CompactPCI boards which are available in the long term – like the CompactPCI boards by ADDI-DATA.

High interference resistance

The key to the high interference resistance of the ADDI-DATA CompactPCI boards is the well thought-out concept of design and protective circuits. Therefore our boards are predestined for tasks in harsh industrial environments. They are resistant to vibrations, accelerations or dirt and provide reliable and accurate data.

3 U version

ADDI-DATA CompactPCI boards are available in 3 U version. 6 U brackets enable an installation in a 6 U rack. The 3 U version has been chosen because it is much more stable than longer boards. Thus the CompactPCI boards are more resistant to shocks and vibrations.

Complete real-time system



- Combination of the PAC-system MSX-Box-CPCI and CompactPCI boards
- Compact and flexible
- Stand-alone system (own CPU)
- Long-term availability

Information about the MSX-Box-CPCI on page 32



New!

New!

	Digital		Counter	Analog			Serial interfaces (base board)	Motion control
	CPCI-1500	CPCI-1564	CPCI-1710	CPCI-3009	CPCI-3120	CPCI-3001	CPCI-7500	CPCI-8004
32-bit CompactPCI bus	5 V	3,3 V / 5 V	5 V	3,3 V / 5 V	3,3 V / 5 V	3,3 V / 5 V	5 V	3,3 V / 5 V
FPGA		✓	✓	✓	✓	✓		
Filters and protective circuits	✓	✓	✓	✓	✓	✓	✓	✓
Optical isolation 1000 V	✓	✓	✓	✓	✓	✓	optional	✓
Digital, 24 V								
Input channels, 24 V	16	32	12 (depending on function)	4	4	4		24
Output channels, 24 V	16	32	4	4	4	4		12
Output current per output	500 mA (typ.)	500 mA (typ.)	500 mA (typ.)					
Watchdog / Timer / Counter	2 x 12-bit timer, incl. 1 which can be used as a watchdog	Timer (12-Bit)/ Watchdog (8-Bit)		16-bit 3/3/2	1 x 24-bit timer which can be used as a watchdog	1 x 24-bit timer which can be used as a watchdog		
Counter								
Function modules			4	1				
Functions Incremental counter, SSI synchronous serial interface, counter/timer, pulse acquisition, frequency, pulse width, Period duration, velocity measurement, PWM, BiSS master, digital inputs and outputs, ...			reprogrammable	reprogrammable				4 incremental counters or SSI
Input frequency			up to 5 MHz	up to 5 MHz				
Signals			TTL, RS422, 24 V	TTL, RS422, 24 V				
Analog								
Analog inputs, 16-bit				16 SE / 8 diff.	16 SE / 8 diff.	16 SE / 8 diff.		
Throughput (kHz)				100	100	100		
Voltage range				0-10 V ± 10 V	0-10 V ± 10 V	0-10 V ± 10 V		
Gain 1, 2, 5, 10				✓	✓	✓		
FIFO (value)								
Trigger (software or 24 V)				✓	✓	✓		
Sequence RAM				✓	✓	✓		
Analog outputs				4, 12-bit	8 or 4, 14-bit			4, 16-bit
0-10 V ± 10 V				✓	✓			
Settling time				15 µs	30 µs			
Serial interfaces (base board)							4-port	
Configuration of the operation mode through MX modules							RS232, RS422, RS485, RS485, 20 mA CL	
Motion Control								1 to 4 servo or stepper motors
Software	Current driver list on the web: www.addi-data.com							
Page	184	186	188	190	192	194	196	198