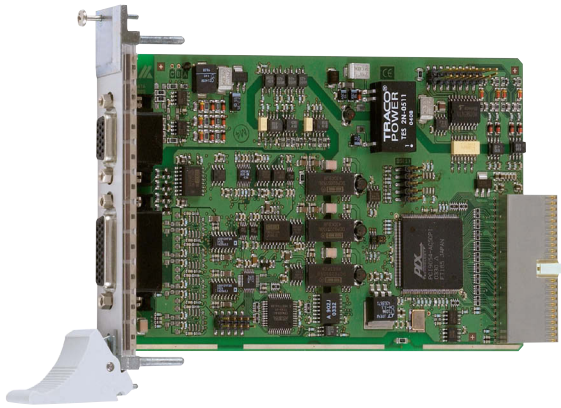


# Multifunction board, optically isolated, 16 SE or 8 diff. inputs, 4 analog outputs, 16-bit



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 SE or 8 diff. inputs, optically isolated 1000 V
- Resolution: 16-bit
- Throughput: 100 kHz
- Voltage inputs: 0-10 V,  $\pm 10$  V, 0-5 V,  $\pm 5$  V, 0-2 V,  $\pm 2$  V, 0-1 V,  $\pm 1$  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  $\mu$ 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:  $\pm 5$  mA
- Short-circuit current:  $\pm 20$  mA

## CPCI-3009

16 SE or 8 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 (82C54)
- 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  $\pm 40$  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
- 32-bit drivers for Windows 11 / 10 / 8 / 7 / Vista / XP / 2000
- Signed 64-bit drivers for Windows 11 / 10 / 8 / 7 / XP
- Real-time use with Linux and Windows on request

### On request:

Further operating systems, compilers and samples.  
Driver download: [www.addi-data.com/drivers](http://www.addi-data.com/drivers)

## Specifications

### Analog inputs

Number of inputs:	16 SE or 8 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, $\pm 10$ V, 0-5 V, $\pm 5$ V, 0-2 V, $\pm 2$ V, 0-1 V, $\pm 1$ 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
<b>Voltage outputs</b>	
Output range:	-10 V to +10 V (-1 LSB)
LSB:	4.8828 mV
Accuracy:	11-bit
Time to read:	typ. 5 $\mu$ s
Setup time:	typ. 15 $\mu$ s (at 10 V step)
Max. output current:	$\pm 5$ mA (each output)
Short-circuit current:	max. $\pm 20$ mA (temporary)
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
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### Digital I/O

Number of I/O channels:	4 digital inputs, 4 digital 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:	CompactPCI 32-bit
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, $\pm 5$ %, 3.3 V from CompactPCI system
Current consumption:	790 mA, $\pm 10$ %
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 °C up to +70 °C 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

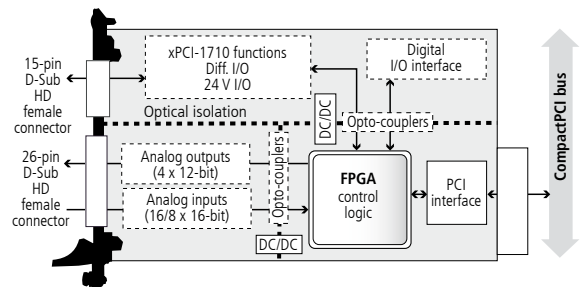
#### Options

**Please specify the number of channels when ordering**

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

**Option CAL3009:** Only for 32-bit operation system. On-site calibration of the CPCI-3009. Do the fine adjustment fast and reliably and then save the calibration report file.

### 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 data sheet of the board APCI-1710 on page 166**

## 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
- PX\_BNC:** BNC connection box for connecting the analog I/O
- 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