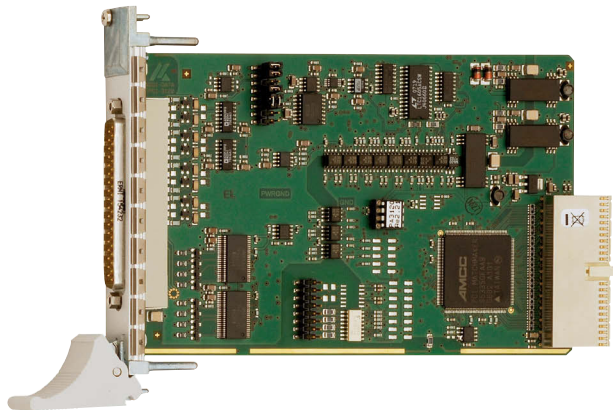


# Multifunction board, optically isolated, 16 SE or 8 diff. inputs, 8 analog outputs, 16-bit



## CPCI-3120

16/8 single-ended or

8/4 differential inputs, 16-bit

8/4 analog outputs, 14-bit

Optical isolation of the inputs and outputs, 500 V

Automatic analog acquisition

Output voltage after reset 0 V

MTBF: 75 867 hours at 45 °C

Timer, watchdog



CompactPCI™ 32-bit

Also for PCI-Express  
See APCLe-3121, page 134

Also for **PCI**  
See APCI-3120, page 180



**URS-3120-6U**  
6U bracket  
with FB3001



Windows  
64/32-bit drivers



LabVIEW™



LabWindows/CVI™

**DASYLab10**  
Data Acquisition System Laboratory

**DiAdem**

## Features

- Can be inserted in PXI systems, with restricted functionality

### Analog inputs

- 16 single-ended/8 differential inputs or 8 single-ended/4 differential inputs
- 16-bit resolution
- Optical isolation 500 V
- Throughput: 100 kHz
- Input voltage: 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
- PCI DMA for analog data acquisition
- Overvoltage protection
- Input filters: 159 kHz

### Analog acquisition

- Single channel, several channels, several channels through scan list
- Autom. analog acquisition through cyclic timer control
- Acquisition through scan list: up to 16 entries with gain, channel, unipolar/bipolar
- Acquisition triggered through software, timer, external event
- Trigger functions:
  - Software trigger or
  - external trigger: the analog acquisition (single or sequence) is started through signal switching from 0 V to 24 V at the digital input 0.
- Interrupt: End of single, End of multichannel, End of scan list

### Analog outputs

- 4 or 8 analog outputs, optically isolated 500 V
- Setup time 30 µs
- 14-bit resolution (13-bit for 0-10 V)
- Output voltage: ±10 V, 0-10 V (through software)
- Output voltage after reset: 0 V
- Each output has its own ground line (without optical isolation)
- Driver capacity: 5 mA/500 pF
- Short-circuit protection, EMI filters

### Digital

- 4 dig. inputs, 4 dig. outputs, 24 V, optically isolated

### Timer

- 24-bit; as cyclic time counter or watchdog

## Safety features

- Optical isolation 500 V min.
- Creeping distance IEC 61010-1
- Overvoltage protection ± 40 V (analog inputs)
- Protection against high-frequency EMI
- Input filters: 159 kHz
- Noise neutralisation of the PC supply

## Applications

- Industrial process control
- Industrial measurement and monitoring
- Multichannel data acquisition
- Control of chemical processes
- Factory automation
- Acquisition of sensor data, current measurement, pressure data
- Laboratory equipment, instrumentation

## Software

Calibration tool (**Option CAL3120**): Do the fine adjustment fast and reliably and save the generated calibration report file. All you need is a highly precise calibration source and a precise digital multimeter (not included in the delivery content).

A CD-ROM with the following software and programming samples is supplied with the board.

### Standard drivers for:

- Linux
- 32-bit drivers for Windows 8 / 7 / Vista / XP / 2000
- Signed 64-bit drivers for Windows 8 / 7 / XP
- Real-time use with Linux and Windows on request

### Drivers and samples for the following compilers and software packages:

- Microsoft VC++ • Microsoft C
- Borland C++ • Borland C
- Visual Basic • Delphi
- LabVIEW • LabWindows/CVI • DASYLab • DiAdem

### On request:

Further operating systems, compilers and samples.

Driver download: [www.addi-data.com/downloads](http://www.addi-data.com/downloads)

## Specifications

### Analog inputs

Number of inputs:	16 single-ended / 8 differential inputs or 8 single-ended / 4 differential inputs
Resolution:	16-bit resolution
Optical isolation:	500 V through opto-couplers from PC to peripheral
Input ranges:	Software-programmable for each channel 0-10 V, ± 10 V, 0-5 V, ± 5 V, 0-2 V, ± 2 V, 0-1 V, ± 1 V, 0-20 mA optional
Throughput:	100 kHz
Gain:	Software programmable (1, 2, 5, 10)
Common mode rejection:	DC at 10 Hz, 90 dB minimum
Relative precision (INL):	± 1 LSB (ADC)
Diff. Non-linearity (DNL):	± 0.5 LSB (ADC)
Input impedance (PDA):	10 <sup>12</sup> Ω/10 nF single-ended, 10 <sup>12</sup> Ω/20 nF differential against GND
Bandwidth (-3 dB):	Limited to 159 kHz with low-pass filter
Trigger:	Through software, timer, ext. event (24 V input)
Data transfer:	Data to the PC through FIFO memory, I/O commands, Interrupt at EOC (End Of Conversion) and EOS (End of Scan), DMA transfer at EOC
Interrupts:	End of conversion, End of timer, End of scan

### Timer

Time base of timer 2:	24-bit; 50 µs
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### Analog outputs

Number of outputs:	4 or 8
Resolution:	14-bit resolution
Optical isolation:	500 V through opto-couplers
Output range:	0-10 V, ± 10 V switchable through software
Setup time at 2 kΩ, 1000pF:	10 µs (10 V step)
Overvoltage protection:	± 12 V
Max. output current / load:	± 5 mA / 500 pF, 2 kΩ
Short-circuit current:	± 25 mA
Output voltage after reset:	0 V

### Digital I/O

Number of I/O channels:	4 dig. inputs, 4 dig. outputs, 24 V
Optical isolation:	1000 V through opto-couplers
Input current at 24 V:	3 mA typ.
Input range:	0-30 V
Output range:	5-30 V
Max. switching current:	10 mA typ.

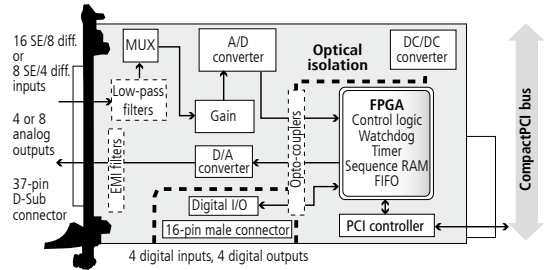
### EMC – Electromagnetic compatibility

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:	160 x 100 mm
System bus:	CompactPCI 32-bit (5 V signal voltage)
Space required:	1 PCI slot for analog I/O, 1 slot opening for digital I/O with FB3001
Operating voltage:	+5 V, ± 5 %, 3.3 V from CompactPCI system
Current consumption:	800 mA
Front connector:	37-pin D-Sub male connector
Additional connector :	16-pin male connector for connecting the dig. I/O
Temperature range:	0 to 60 °C (with forced cooling)
MTBF:	75867 hours at 45 °C

### Simplified block diagram



### Pin assignment – 37-pin D-Sub male connector

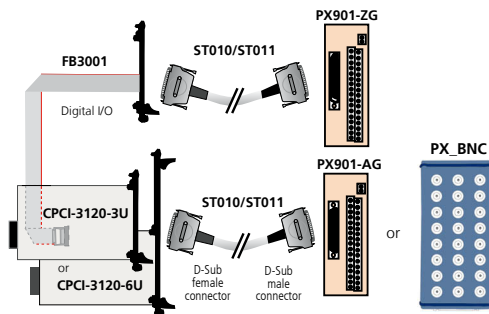
DIFF	SE	SE	DIFF
(+) An. input 0	(+) An. input 0	20	1
(+) An. input 1	(+) An. input 1	21	2
(+) An. input 2	(+) An. input 2	22	3
(+) An. input 3	(+) An. input 3	23	4
(-) An. input 3	(+) An. input 7	24	5
(-) An. input 2	(+) An. input 6	25	6
(-) An. input 1	(+) An. input 5	26	7
(-) An. input 0	(+) An. input 4	27	8
		28	9
		29	10
		30	11
		31	12
		32	13
		33	14
		34	15
		35	16
		36	17
		37	18
			19

1: The analog inputs have a common ground line  
2: Each analog output has its own ground line

### Pin assignment – 16-pin connector

Dig. output 0 (+)	1	Dig. output 0 (-)
Dig. output 1 (+)	3	Dig. output 1 (-)
Dig. output 2 (+)	5	Dig. output 2 (-)
Dig. output 3 (+)	7	Dig. output 3 (-)
Trigger/dig. input 0 (+)	9	Trigger/dig. input 0 (-)
Dig. input 1 (+)	11	Dig. input 1 (-)
Dig. input 2 (+)	13	Dig. input 2 (-)
Dig. input 3 (+)	15	Dig. input 3 (-)

### ADDI-DATA connection



### Ordering information

#### CPCI-3120

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

#### Versions

<b>CPCI-3120-16-4</b>	16 SE / 8 diff. inputs, 4 analog outputs
<b>CPCI-3120-16-8</b>	16 SE / 8 diff. inputs, 8 analog outputs

#### Options: Please specify the number of channels when ordering

<b>URS-3120-6U:</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 (30 Hz)
<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 CAL3120:** Only for 32-bit operation system. On-site calibration of the CPCI-3120. Do the fine adjustment fast and reliably and then save the calibration report file.

<b>CPCI-3120-8-4</b>	8 SE / 4 diff. inputs, 4 analog outputs
<b>CPCI-3120-8-8</b>	8 SE / 4 diff. inputs, 8 analog outputs

#### Accessories

<b>PX901-A:</b>	Screw terminal panel with transorb diodes, for connecting the analog I/O
<b>PX901-AG:</b>	Same as PX901-A with housing for DIN rail
<b>PX901-ZG:</b>	Screw terminal panel for connecting the digital I/O, for DIN rail
<b>PX_BNC:</b>	BNC connection box for connecting the analog I/O
<b>ST010:</b>	Standard round cable, shielded, twisted pairs, 2 m
<b>ST011:</b>	Standard round cable, shielded, twisted pairs, 5 m
<b>FB3001:</b>	Ribbon cable for digital I/O, with 37-pin D-Sub male connector on 3U bracket