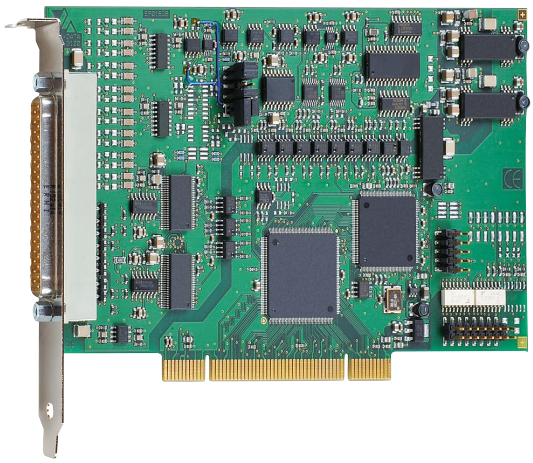
Multifunction board, optically isolated, 16/8 SE or 8/4 diff. inputs, 4/8 analog outputs,16-bit



APCI-3120

16 Single-ended/8 differential inputs, 16-bit

8/4 analog outputs, 14-bit

Optical isolation of inputs and outputs, 500 V

PCI DMA, programmable gain

Trigger functions

8 digital I/O, 24 V, optically isolated, timer

On-site calibration with the CAL3120 option

RoHS 2002/95/EC

PCI 32-bit

Also for *CompactPCI™*
See CPCI-3121, page 250

Also for PCI EXPRESS
see APCIe-3121, page 146

Windows 64/32-bit drivers

LabVIEW™

LabWindows/CVI™

DASYLab10

DIAdem®

Features

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

- One single channel, several channels, several channels through scan list
- Automatic 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 channel, end of multichannel, end of scan list

Analog outputs

- 4 or 8 analog outputs, optically isolated 500 V
- Setup time 10 µs typ.
- 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

- As cyclic time counter or as watchdog

Safety features

- Optical isolation 500 V min.
- Creeping distance IEC 61010-1
- Overvoltage protection ± 40 V
- Protection against high-frequency EMI
- Input filters: 160 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
- 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).

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:

- .NET on request
- 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, download menu

Phone: +49 7229 1847-0 info@addi-data.com
Fax: +49 7229 1847-222 www.addi-data.com

ADDI-DATA® SPIRIT OF EXCELLENCE

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 (PGA):	10^{12} Ω / 10 nF single-ended, 10^{12} Ω / 20 nF differential against GND
Bandwidth (- 3 dB):	Limited to 159 kHz with low-pass filter
Trigger:	Through software, timer, external 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, at timer overrun, End of scan

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, 1000 pF:	10 µs at 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.

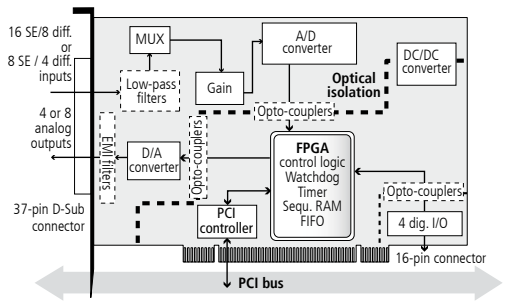
EMC – Electromagnetic compatibility

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.

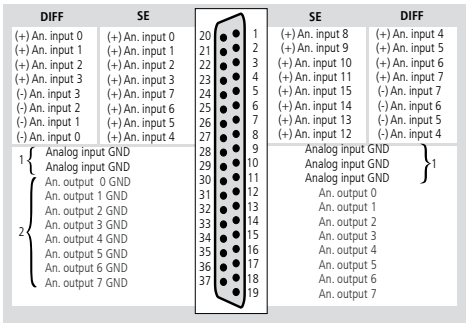
PC system requirements and environmental conditions

Dimensions:	169 x 99 mm
System bus:	PCI 32-bit 3.3/5 V acc. to specification 2.1 (PCISIG)
Space required:	1 PCI slot for analog I/O, 1 slot opening for digital I/O with FB3000
Operating voltage:	+5 V, ±5 % from the PC
Current consumption:	From 710 to 790 mA typ. depending on the board version
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)

Simplified block diagram

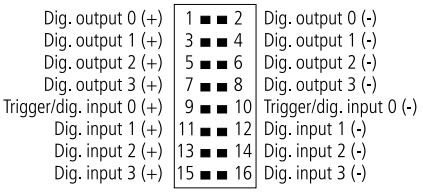


Pin assignment – 37-pin D-Sub male connector

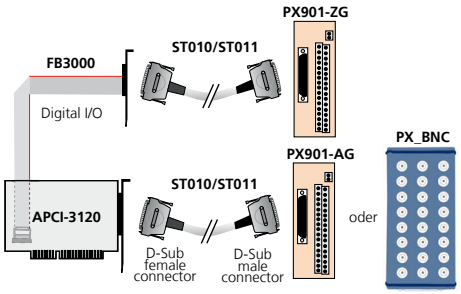


1: The analog inputs have a common ground line
2: Each analog output has its own ground line

Pin assignment – 16-pin male connector



ADDI-DATA connection



Ordering information

APCI-3120

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

Versions

APCI-3120-16-8 Version with 16 SE/8 diff. inputs, 8 analog outputs
APCI-3120-16-4 Version with 16 SE/8 diff. inputs, 4 analog outputs
APCI-3120-8-8 Version with 8 SE/4 diff. inputs, 8 analog outputs
APCI-3120-8-4 Version with 8 SE/4 diff. inputs, 4 analog outputs

Options

Please indicate the number of channels
Option SF: Precision filter for 1 single-ended channel
Option DF: Precision filter for 1 diff. channel
Option PC: Current input 0(4)-20 mA for 1 channel
PC-SE: for single-ended **PC-Diff:** for differential

Option CAL3120: Only for 32-bit operation system. On-site calibration of the APCI-3120. Do the fine adjustment fast and reliably and then save the calibration report file.

Accessories

PX901-A: Screw terminal panel for connecting the analog I/O
PX901-AG: Same as PX901-A with housing for DIN rail
PX_BNC: BNC connection box for connecting the analog I/O
PX901-ZG: Screw terminal panel for connecting the dig. I/O
ST010: Standard round cable, shielded, twisted pairs, 2 m
ST011: Standard round cable, shielded, twisted pairs, 5 m
FB3000: Ribbon cable for digital I/O