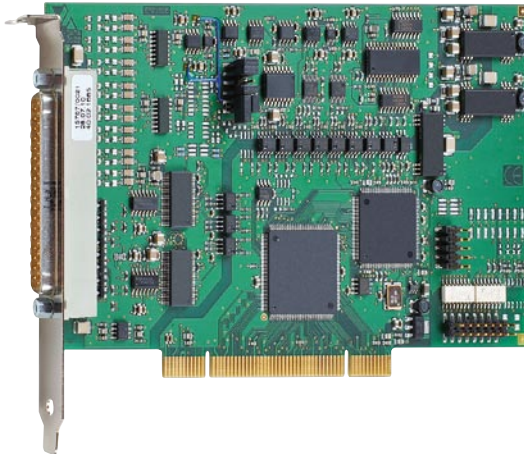


Multifunction board, optically isolated, 16/8 SE or 8/4 diff. inputs, 4/8 analog outputs, 16-bit



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

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 μ s 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

- Monitoring program for testing and setting the board functions (supplied with the board)
- 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 Kernel version 2.4.22 to 2.6.30, real-time drivers for Windows 7(32-bit)/Vista(32-bit)/XP/2000. Monitoring program ADDIMON

Drivers for the following software packages:

- LabVIEW up to 7.0
- LabWindows/CVI 5.01

Samples for the following compilers:

Microsoft VC++ 5.0 • Microsoft C 6.0
Borland C++ 5.01 • Borland C 3.1 • Visual Basic 5.0
Delphi 4 • Turbo Pascal 7.0
On request: RTX • VxWorks • DIAdem 6/7 • Embedded NT
• DASyLab 10 • .NET • LabVIEW from version 5.01

On request: ADDIPACK functions:

Limited write/read function on the I/O signals

Current driver list on the web: www.addi-data.com



PCI 32-bit

Also for **CompactPCI™**
See CPCI-3121
page 180

Also for **PCI EXPRESS®**
see APCLe-3121
page 82



LabVIEW™



LabWindows/CVI™

DASyLab 10
Data Acquisition System Laboratory



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.

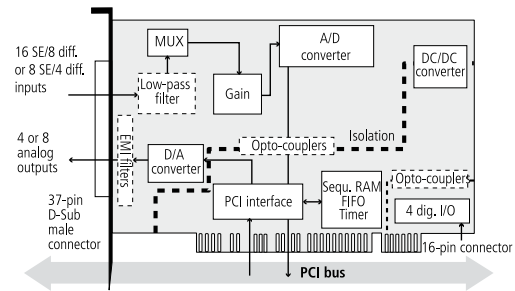
EMC – Electromagnetic compatibility

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:	175 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

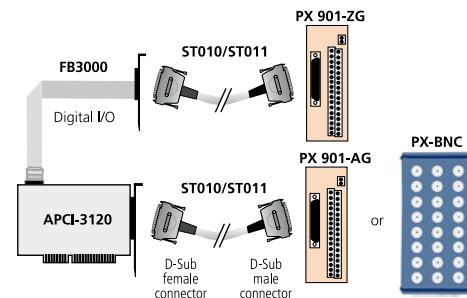
DIFF	SE	SE	DIFF
(+) An. input 0	(+) An. input 0	(+) An. input 8	(+) An. input 4
(+) An. input 1	(+) An. input 1	(+) An. input 9	(+) An. input 5
(+) An. input 2	(+) An. input 2	(+) An. input 10	(+) An. input 6
(+) An. input 3	(+) An. input 3	(+) An. input 11	(+) An. input 7
(-) An. input 3	(+) An. input 7	(+) An. input 15	(-) An. input 7
(-) An. input 2	(+) An. input 6	(+) An. input 14	(-) An. input 6
(-) An. input 1	(+) An. input 5	(+) An. input 13	(-) An. input 5
(-) An. input 0	(+) An. input 4	(+) An. input 12	(-) An. input 4
Analog input GND		Analog input GND	
Analog input GND		Analog input GND	
An. output 0 GND		An. output 0	
An. output 1 GND		An. output 1	
An. output 2 GND		An. output 2	
An. output 3 GND		An. output 3	
An. output 4 GND		An. output 4	
An. output 5 GND		An. output 5	
An. output 6 GND		An. output 6	
An. output 7 GND		An. output 7	

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

Pin assignment – 16-pin male connector

Dig. output 0 (+)	1 ■ 2	Dig. output 0 (-)
Dig. output 1 (+)	3 ■ 4	Dig. output 1 (-)
Dig. output 2 (+)	5 ■ 6	Dig. output 2 (-)
Dig. output 3 (+)	7 ■ 8	Dig. output 3 (-)
Trigger/dig. input 0 (+)	9 ■ 10	Trigger/dig. input 0 (-)
Dig. input 1 (+)	11 ■ 12	Dig. input 1 (-)
Dig. input 2 (+)	13 ■ 14	Dig. input 2 (-)
Dig. input 3 (+)	15 ■ 16	Dig. input 3 (-)

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: On-site calibration of the APCI-3120.

Do the fine adjustment fast and reliably and then save the calibration report file.

Accessories

PX 901-A: Screw terminal panel for connecting the analog I/O

PX 901-AG: Same as PX 901-A with housing for DIN rail

PX_BNC: BNC connection box for connecting the analog I/O

PX 901-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