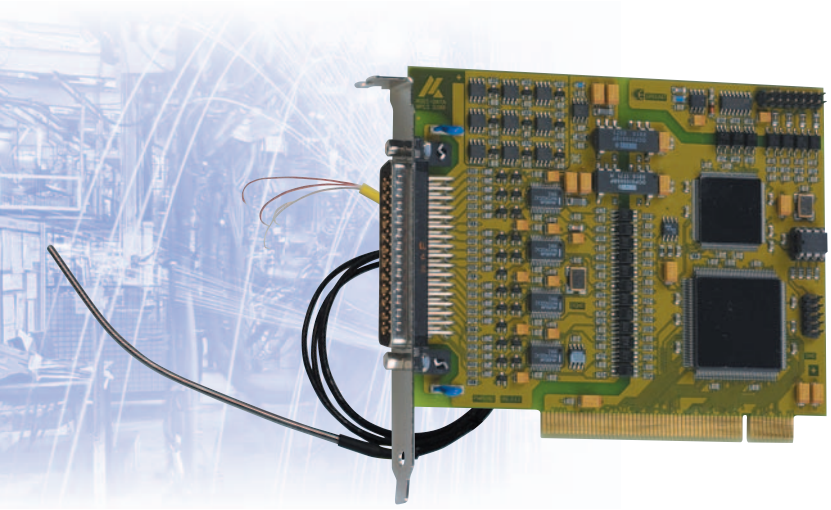
Acquisition of thermocouples/Pt100, isolated, 18-bit



APCI-3200

Up to 16 channels for thermocouples or 8 inputs for resistance temperature detectors (RTD)

Mixed configuration of the channels

18-bit resolution

Optical isolation 1000 V

Cold junction compensation on PX3200

Software linearisation

Graphical display of measured data

LabWindows/CVI™

DIAdem®

Features

- 18-bit resolution, 16-bit accuracy
- Each channel can be configured either for thermocouples/RTD or as an analog voltage input channel
  - 16 analog input channels for thermocouple types J, K, T, E, R, S, B, N
  - or 8 diff. analog input channels for the acquisition of resistance temperature detectors (Pt100)
  - or 16 SE/8 differential analog voltage input channels, ± 2.5 V
- 8 independent current sources for resistance temperature detectors (RTD) and one current source for cold junction compensation
- Cold junction compensation (on separate screw terminal board PX 3200)
- Gain and offset calibration
- Linearisation through table and calculation for the thermocouple types J, K, T, E, R, S, B, N and RTDs
- Programmable gain
- 16-bit accuracy with sample rates of 20, 40, 80 or 160 Hz (other rates on request)
- 4 digital input channels, 24 V and 3 digital output channels, open collector, isolated
- Base address and IRQ channels set through BIOS
- Monitoring program for testing/setting the board

Safety features

- Optical isolation 1000 V
- Creeping distance IEC 61010-1 (VDE411-1)
- Diagnostic functions: Short-circuit and line break detection depending on the type of sensor used.
- Protection against overvoltage (±30 V) and high-frequency EMI

EMC tested acc. to 89/336/EEC

- IEC 61326: electrical equipment for measurement, control and laboratory use

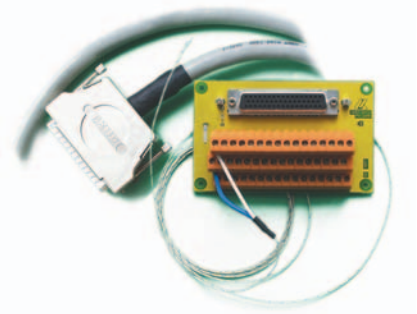
Software drivers for:

Linux kernel version 2.4.2, Windows XP/2000/NT/98
Real-time drivers for Windows XP/2000/NT/98.
The board is supplied with ADDIPACK (see Page 5).
Monitoring program ADDIMON
Drivers for the following application software:
LabVIEW 5.01 • Diadem 6/7. • LabWindows/CVI
Samples for the following compilers:
Microsoft VC++ 5.0 • Borland C++ 5.01
Visual Basic 5.0 • Delphi 4.0
ADDIPACK functions supported:
Interrupt • Analog input • Temperature • Resistance • Digital input • Digital output

Specifications

Analog inputs:	- 16 x thermocouples or - 8 x RTD with 2- or 4-wire connection or - 4 x RTD with 3-wire connection or 6 SE/8 diff. inputs, ±2.5 V
Resolution:	18-bit
Accuracy:	16-bit
Input amplifier:	1, 2, 4, 8, 16, 32, 64, 128
Conversion start:	through software or external trigger
Number of I/O channels:	4 digital inputs, 24 V, 3 digital outputs, 24 V, 125 mA typ., Open collector
Logical "0" level:	0-10 V
Logical "1" level:	19-30 V
Optical isolation:	1000 V through optical couplers for analog and digital channels
Noise immunity	
Test level:	- ESD: 4 kV - Fields: 10 V/m - Burst: 4 kV - Cond. radio interferences: 3 V
Physical and environmental conditions	
Dimensions:	131 x 99 mm
System bus:	PCI 5 V 32-bit
Place required:	1 PCI slot and 1 slot opening for the digital I/O
Operating voltage:	+5 V, ±5 % from PC
Current consumption (typ.):	550 to 600 mA depending on the board version
Front connector (analog):	50-pin SUB-D male connector
additional Connector :	16-pin male connector for connecting the digital I/O via a ribbon cable with a 37-pin SUB-D male connector
Operating temperature:	0 to 60 °C (with forced cooling)

Terminal board PX 3200
with cable ST3200 and cold junction compensation



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ADDI-DATA®

APCI-3200

Specifications

Thermocouple accuracy

Type	Range		Accuracy (+/-)
DIN EN 60584			
Type J	-200.0 °C	-0.1 °C	±0.6 °C
	0.0 °C	+599.9 °C	±0.2 °C
	+600.0 °C	+1200.0 °C	±0.6 °C
Type T	-200.0 °C	-80.0 °C	±0.7 °C
	-79.9 °C	+400.0 °C	±0.3 °C
Type K	-200.0 °C	-0.1 °C	±0.8 °C
	0.0 °C	+999.9 °C	±0.4 °C
	+1,000.0 °C	+1,300.0 °C	±0.6 °C
Type E	-200.0 °C	+1,000.0 °C	±0.5 °C
Type N	-200.0 °C	-0.1 °C	±1.0 °C
	0.0 °C	+799.9 °C	±0.2 °C
	+800.0 °C	+1,300.0 °C	±0.5 °C
Type S	0.0 °C	+399.9 °C	±1.6 °C
	+400.0 °C	+1,768.0 °C	±0.7 °C
Type R	0.0 °C	+399.9 °C	±1.6 °C
	+400.0 °C	+1,768.0 °C	±0.6 °C
Type B	+400.0 °C	+799.9 °C	±2.0 °C
	+800.0 °C	+1,820.0 °C	±1.0 °C

Reference junction temperature accuracy

Type	Range	Accuracy (+/-)
Pt1000	0° C +60° C	± (0.30 °C + 0.0050 x |T|) (T: Temperature in °C)

Resistance thermometer accuracy (RTD)

Type	Range		Accuracy (+/-)
DIN EN 60751			**Worst case (Gain=1 unipolar)**
Pt100	-200.0 °C	+850.0 °C	±0.4 °C
Pt200	-200.0 °C	+850.0 °C	±0.4 °C
Pt500	-200.0 °C	+850.0 °C	±0.3 °C
Pt1000	-200.0 °C	+499.9 °C	±0.2 °C
	+500.0 °C	+850.0 °C	±1.0 °C
Ni100	-60.0 °C	+250.0 °C	±0.3 °C

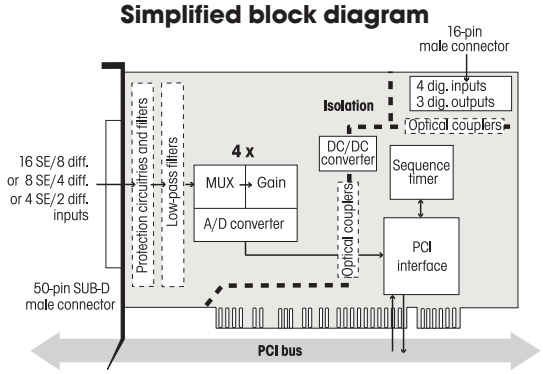
Accuracy in temperature range from -20 °C to +40 °C with Pt100

Gain	Accuracy
1	± 0.40 °C
2	± 0.20 °C
4	± 0.15 °C
8	± 0.10 °C
16	± 0.08 °C
32	± 0.08 °C
64	± 0.08 °C

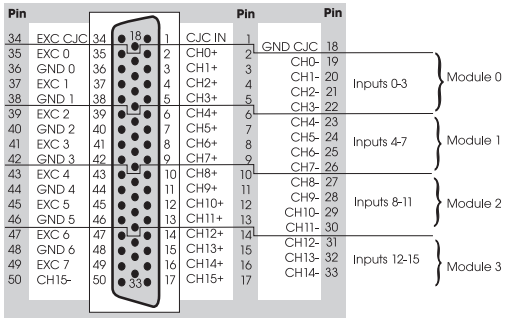
Sensor short-circuit/line break detection

Type	Short-circuit	Line break
Thermocouple (SE)	detection	no detection
Resistance thermometer (diff.)	detection	detection
Potentiometer (diff.)	detection	detection

Simplified block diagram



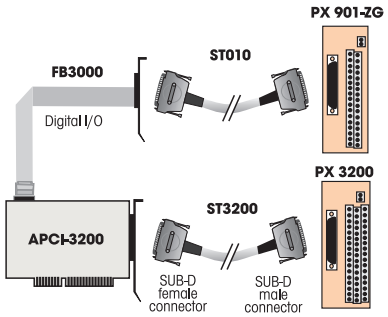
Pin assignment – 50-pin SUB-D male connector



Pin assignment – 16-pin male connector

24 V	1 ■ ■ 2	GND
Dig. output 0 (+)	3 ■ ■ 4	Dig. output 0 (-)
Dig. output 1 (+)	5 ■ ■ 6	Dig. output 1 (-)
Dig. output 2 (+)	7 ■ ■ 8	Dig. output 2 (-)
Dig. input 0 (+)	9 ■ ■ 10	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

ADDIALOG APCI-3200

Acquisition of thermocouples/Pt100, isolated. Incl. technical description, software drivers and monitoring program

Versions

APCI-3200-16: 16 analog inputs:
16 thermocouples
or 8 RTDs or 16 single-ended
or 8 diff. voltage inputs

APCI-3200-8: 8 analog inputs: 8 thermocouples
or 4 RTDs or 8 single-ended
or 4 diff. voltage inputs

APCI-3200-4: 4 analog inputs: 4 thermocouples
or 2 RTDs or 4 single-ended
or 2 diff. voltage inputs

Connection

PX 3200: Terminal board with cold junction compensation and housing for DIN rail.

ST3200: Standard round cable, shielded, twisted pairs, 2 m

FB3000: Ribbon cable for digital I/O on separate bracket

PX 901-ZG: Screw terminal board for DIN rail

ST010: Standard round cable, shielded, twisted pairs, 2 m

ST011: Standard round cable, shielded, twisted pairs, 5 m

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