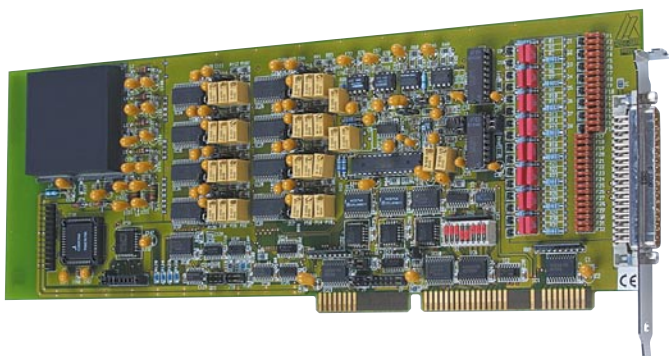


# Multifunction board, 16 SE or 8 diff. inputs, 8 analog outputs 16-bit



## PA 311-16-8

16 single-ended or  
8 differential inputs

8 analog outputs

16-bit resolution

100 kHz data transfer rate

DMA access

24 TTL I/O, 3 timers

Software trigger



LabVIEW™



LabWindows/CVI™



## Features

### Analog inputs

- 16 single-ended/8 differential inputs
- Resolution: 16-bit
- Conversion time: 10  $\mu$ s
- Overvoltage protection  $\pm 20$  V
- Input range: 0-10 V,  $\pm 10$  V software-programmable, 0-20 mA optional
- Low-pass filter and current inputs as option
- Gain: 1, 2, 10 freely programmable through software for each channel or freely through resistor
- DMA access for analog data acquisition
- 3 timers: timer 0 and timer 1 only for the analog acquisition, timer 2 programmable as cyclic-time counter

### Analog acquisition

- Acquisition of one single channel, several channels or 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 or timer
- Interrupt: end of single channel, end of multichannel, end of scan list

### Analog outputs

- 8 analog outputs
- Resolution: 16-bit
- Setting time: typ. 6  $\mu$ s (0-10 V)
- Simultaneous updating of the outputs
- Output voltage range: 0-10 V,  $\pm 10$  V
- Output current typ.  $\pm 5$  mA
- Driver for high capacitive loads (500 pF)
- Each output has its own ground line (without optical isolation)

### Timer/digital

- 3 timers (82C54), 16-bit
- Parallel TTL I/O port, 24 I/O, interruptible (82C55)

## Safety features

- Noise neutralization of the PC voltage supply

### EMC tested acc. to 89/336/EEC

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

## Applications

- Industrial process control • Industrial measurement
- Automatic test equipment
- Temperature monitoring and control
- Control of chemical processes
- Factory automation • Automated testing
- Voltage measurement • Laboratory instrumentation

## Software drivers

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

### Standard drivers for:

- Windows 2000 Windows NT/98/95, Windows 3.11, MS-DOS

### Real-time drivers for 2000/NT/98/95

### 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 • Visual Basic 1.0
- Turbo Pascal 7.0

### Drivers for the following application software:

- LabVIEW 5.01

### On request:

- DiaDem 6/7 • LabWindows/CVI 5.01
- Delphi 4.0

Current driver list on the web: [www.addi-data.com](http://www.addi-data.com)

Terminal panel PX 901-AG  
with cable ST010



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

PA 311-16-8

## Specifications

### Analog inputs

Number of inputs:	16 single-ended/8 differential
Resolution:	16-bit
Input range:	0-10 V, $\pm 10$ V, adjustable for each channel through software; 0-20 mA optional
Conversion time:	10 $\mu$ s
Gain:	Programmable gain (x1, x2, x10) or freely through resistor
Overvoltage protection:	$\pm 12$ V at power-on
Common mode rejection:	DC at 60 Hz, 90 dB Minimum
Input impedance:	$10^{12} \Omega/10$ nF single-ended, $10^{12} \Omega/20$ nF differential gegen GND
Trigger:	Through software or programmable timer
Interrupts:	IRQ 3, 5 for XT, IRQ 10, 11, 12, 14, 15 for AT
DMA-channels:	5, 6, 7

### Analog outputs

Outputs/resolution:	8 analog outputs, 16-bit
Output range:	0-10 V, $\pm 10$ V
Setting time at 2 k $\Omega$ , 1000 pF:	from 6 to 10 $\mu$ s, depending on voltage jumps and temperature range
Overvoltage protection:	$\pm 12$ V
Max. output current/load:	$\pm 5$ mA/500 pF, 2k $\Omega$
Short-circuit current:	$\pm 25$ mA (has to be limited externally)
Integral non-linearity (INL):	$\pm 1/2$ LSB max. at 25 $^{\circ}$ C, $\pm 1$ LSB through temperature range
Diff. non-linearity (DNL):	$\pm 1/2$ LSB max. at 25 $^{\circ}$ C, $\pm 1$ LSB through temperature range

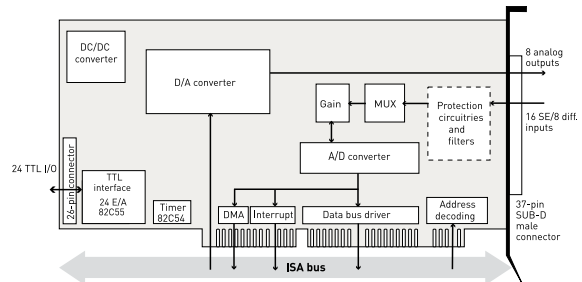
## EMC – Electromagnetic compatibility

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.

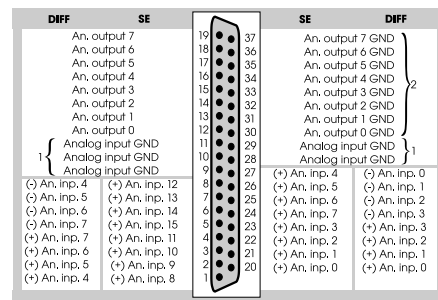
## Physical and environmental conditions

Dimensions:	337 x 114 mm
System bus:	ISA
Place required:	1 AT slot + 1 slot opening (TTL connection)
Operating voltage:	+5 V, $\pm 5$ %
Current consumption:	1270 mA typ.
Front connector:	37-pin SUB-D male connector
Additional connector:	For connecting the digital I/O: 26-pin SUB-D male connector for ribbon cable
Temperature range:	0 to 60 $^{\circ}$ C (with forced cooling)

## Simplified block diagram

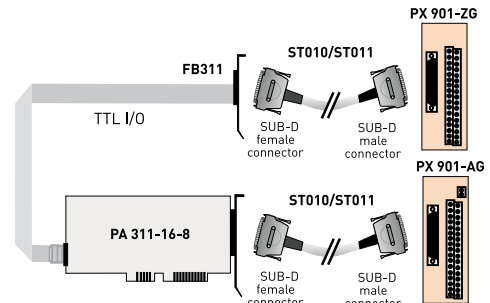


## Pin assignment – 37-pin SUB-D male connector



1: The analog inputs have a common ground line  
2: The analog outputs have separate ground lines

## ADDI-DATA connection



## Ordering information

### PA 311-16-8

Multifunction board, 16 SE or 8 diff. inputs, 8 analog outputs 16-bit incl. technical description and software drivers.

### Versions

**PA 311-16-8:** 16 SE/8 diff. inputs, 8 analog outputs

### Options

- Option SF:** Filter for 1 SE input
- Option DF:** Precision filter for 1 differential input
- Option PC:** Current inputs 0(4)-20 mA and precision resistor 250  $\Omega$ ; Tol. 0,01 %; TK 5;  $1/4 \Omega$ 
  - Option PC-SE:** for 1 single-ended input
  - Option PC-Diff:** for 1 differential input

### Connection

- PX 901-A:** Screw terminal panel with transorb diodes, for connecting the analog I/O
- PX 901-AG:** Screw terminal panel for DIN rail (analog I/O)
- ST010:** Standard round cable, shielded, twisted pairs, 2 m
- ST011:** Standard round cable, shielded, twisted pairs, 5 m
- FB311:** Ribbon cable for connecting the digital I/O
- PX 901-ZG:** Screw terminal panel for DIN rail (TTL I/O)