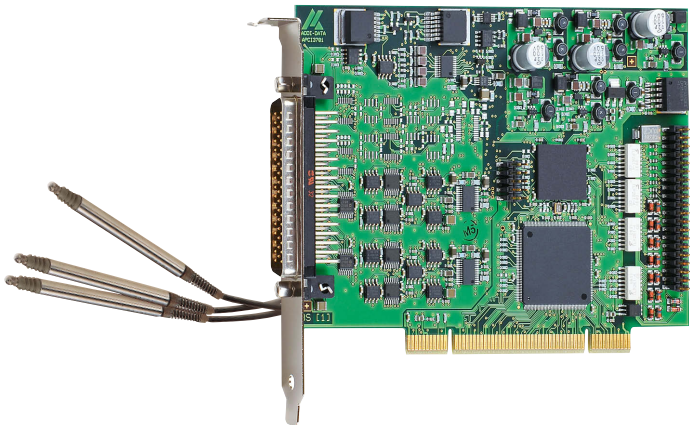


# Length measurement board, 16-bit, 16 or 8 inductive transducers, LVDT, half-bridge



PCI 32-bit



Windows  
64/32-bit drivers



LabVIEW™

With the length measurement board APCI-3701, you can connect directly and acquire up to 16 half-bridge or LVDT transducers. The calibration software "ConfigTools" guides you through each step of the installation, beginning with the selection of a transducer from a database including more than 50 pre-calibrated transducers up to testing each single channel.

## Features

- PCI interface to the 32-bit data bus, 3.3 V or 5 V
- Acquisition of 8 or 16 inductive transducers (half-bridge, LVDT, Knäbel)
- 16-bit resolution
- Sampling rate depending on the transducer: APCI-3701-8/-16: from 2 to 20 kHz
- Measuring frequency programmable through software: Standard version APCI-3701-8/-16: from 2 to 20 kHz (50 kHz on request)
- Conversion triggered through software, digital input or timer
- End of conversion through software and/or interrupt
- PCI-DMA access
- Onboard FIFO
- Sequence RAM
- 16 digital inputs and outputs, optically isolated, 24 V
- Connection of the transducer through an external box PX3701-8 or -16. The box type depends on the transducer, please order separately.
- Software operation
- Automatic setting of the input levels (gain and offset) acc. to the transducer sensitivity
- Tool for the individual calibration of the transducers with transducer database
- Database for connecting/calibrating a large range of industry-standard transducers (APCI-3701-8, or -16):
  - Solartron • Tesa • Marposs • Schlumberger
  - Peter & Hirt • Mahr • RDP • Schaevitz
  - SMPR Controle • Knäbel

## Safety features

- Input filters
- Diagnostic function in case of short-circuits or line break

## APCI-3701

Acquisition of 16 or 8 inductive transducers

Half-bridge, LVDT, Knäbel

16-bit resolution

16 digital inputs and outputs, optically isolated

Measurement of different transducer types with the same board!

## Applications

- Gear wheel control
- Gauge block
- Acquisition of sensor data
- Quality control
- Industrial process control
- Automatic parts control
- R&D Instrumentation

## Software

### ConfigTools (supplied with the board)

- Easy transducer calibration
- Step by step from the transducer selection up to testing each single channel.
- Database with more than 50 pre-calibrated transducers
- Update of the APCI-3701 firmware

### 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 for the following compilers and software packages:

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

### ADDIPACK functions:

Transducer • Timer • Digital input • Digital output

### On request:

Further operating systems, compilers and samples

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



Connection box for transducers

## Specifications

### Inputs for inductive transducers

<b>Channel features</b>	
Number	-4/-8/-16/ multiplexed
Input type	Single ended
Coupling	DC
Resolution	24-bit
Sampling rate $f_s$	On 1 channel At primary frequency $f_p$ of 4.883 kHz 6.975 kHz 9.768 kHz 13.951 kHz 19.531 kHz
	$f_s = f_p$
	Ab $n \geq 2$ channels $f_p =$ primary frequency SP . Settling period $5 \leq SP \leq 255$ $f_s = \frac{f_p}{SP \times n}$ $f_s$ here concerns all n channels
Example with TESA GT21	On one channel $f_s = f_p = 13.951$ kHz Ab $n \geq 2$ channels $f_s = \frac{13.951 \text{ kHz}}{5 \times 4} = 697.5$ Hz for 4 channels $f_s = \frac{13.951 \text{ kHz}}{5 \times 8} = 348.7$ Hz for 8 channels $f_s = \frac{13.951 \text{ kHz}}{5 \times 16} = 174.4$ Hz for 16 channels

### Input level

Input impedance	2 k $\Omega$ software-programmable 10 k $\Omega$ , 100 k $\Omega$ , 10 M $\Omega$
Input ranges	$\pm 3$ V single ended
<b>Sensor supply (sinus generator)</b>	
Type	Sinus differential (180° phase-shift)
Coupling	AC
Programmed signals:	
Output frequency $f_p$ (primary frequency)	2-20 kHz depending on the transducer (50 kHz Knäbel)
Output impedance	< 0.1 $\Omega$ typ., > 30 k $\Omega$ typ. in shutdown mode
Short-circuit current	0.7 A typ. at 25°C with thermal protection

### Digital I/O

Number of I/O channels:	8 dig. inputs, 8 dig. outputs, 24 V
Optical isolation:	1000 V through opto-couplers
Input current at 24 V:	3 mA typ.
Max. input frequency:	5 kHz
Max. switching current:	50 mA typ.
Input range:	0-30 V
Output range:	5-30 V

### 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:	140 x 99 mm
System bus:	PCI 32-bit 3.3/5 V acc. to spec. 2.2 (PCISIG)
Space required:	1 PCI slot for analog inputs, 1 slot opening for digital I/O with FB3701
Operating voltage:	+5 V, $\pm 5\%$ from the PC; 24 V external
Current consumption (+ 5 V from the PC):	APCI-3701-8: typ. 630 mA APCI-3701-16: typ. 800 mA
Front connector:	50-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)

### APCI-3701

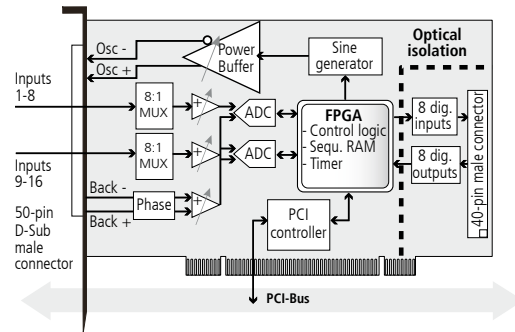
Length measurement board, 16-bit, 16 or 8 inductive transducers, LVDT, half-bridge, Knäbel.  
Incl. technical description and software drivers.

<b>APCI-3701-8:</b>	For 8 inductive transducers
<b>APCI-3701-16:</b>	For 16 inductive transducers
<b>APCI-3701-8-K:</b>	For 8 Knäbel inductive transducers
<b>APCI-3701-16-K:</b>	For 16 Knäbel inductive transducers

### Accessories:

<b>FB3702:</b>	Ribbon cable for digital I/O
<b>PX901-ZG:</b>	Screw terminal panel for digital I/O, for DIN rail
<b>ST010:</b>	Standard round cable, shielded, twisted pairs, 2 m

### Simplified block diagram



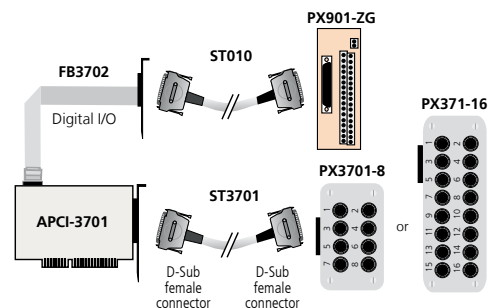
### Pin assignment

#### 50-pin D-Sub male connector (APCI-3701-16)

Pin	Pin	Pin	Pin
34	BACK+	18	BACK+
35	BACK-	19	BACK-
36	OSC+	20	OSC+
37	OSC+	21	OSC+
38	OSC-	22	OSC-
39	PWRGND	23	OSC-
40	CH0	24	PWRGND
41	PWRGND	25	CH2
42	CH3	26	PWRGND
43	PWRGND	27	CH5
44	CH6	28	PWRGND
45	PWRGND	29	CH8
46	CH9	30	PWRGND
47	PWRGND	31	CH11
48	CH12	32	PWRGND
49	PWRGND	33	CH14
50	CH15	33	CH14
		1	BACK+
		2	BACK-
		3	OSC+
		4	OSC+
		5	OSC-
		6	OSC-
		7	PWRGND
		8	CH1
		9	PWRGND
		10	CH4
		11	PWRGND
		12	CH7
		13	PWRGND
		14	CH10
		15	PWRGND
		16	CH13
		17	PWRGND

Osc+/-:	Phase-shifted supply signal of the inductive transducers
Back+/-:	Return lines of the supply voltage for measuring the amplitude. Actual value signal of the oscillator for the supply voltage.
CHx:	Transducer input and input number
PWRGND:	Ground

### ADDI-DATA connection



### Ordering information

#### Accessories for half-bridge and LVDT transducer:

<b>PX3701HB-8:</b>	Connection box of the APCI-3701-8, 8 x half-bridge
<b>PX3701HB-16:</b>	Connection box of the APCI-3701-16, 16 x half-bridge
<b>PX3701LVDT-8:</b>	Connection box of the APCI-3701-8, 8 x LVDT
<b>PX3701LVDT-16:</b>	Connection box of the APCI-3701-16, 16 x LVDT
<b>ST3701:</b>	Connection cable between APCI-3701 and Connection box PX3701