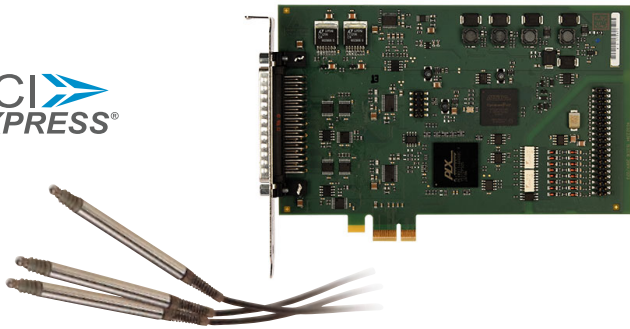


Length measurement board, 16-bit, 16 or 8 inductive transducers, LVDT, half-bridge

PCI
EXPRESS®



Also for **PCI**
See APCI-3701



64/32-bit drivers



With the length measurement board APCle-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

Inputs for inductive transducers

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

Digital

- 16 digital inputs and outputs, optically isolated, 24 V
- On separate ribbon cable, please order separately!

Safety features

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

APCle-3701

PCI Express interface

Acquisition of 16 or 8 inductive transducers

Half-bridge, LVDT

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 APCle-3701 firmware

Standard drivers for:

- Linux
- 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, download menu



Connection box
for transducers

*Preliminary
product information

Specifications

Inputs for inductive transducers

| | |
|------------------------|--|
| Channel features | |
| 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 |
| | $f_s = \frac{f_p}{SP \times n}$ SP . Settling period $5 \leq SP \leq 255$ |
| | 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 Ω software-programmable |
| | 10 k Ω , 100 k Ω , 10 M Ω |
| Input ranges | ± 3 V single ended |
| Sensor supply (sinus generator) | |
| Type | Sinus differential (180° phase-shift) |
| Coupling | AC |
| Programmed signals: | |
| Output frequency f_p | 2-20 kHz depending on the transducer |
| (primary frequency) | |
| Output impedance | < 0.1 Ω typ., > 30 k Ω 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: | Acc. to PCI Express base specification, Revision 1.0a (PCI Express 1.0a) |
| Space required: | 1-/4-/8-/16-lane PCI Express slot |
| Operating voltage: | +5 V, $\pm 5\%$ from the PC; 24 V external |
| Current consumption | APCLe-3701-8: typ. 630 mA |
| (+ 5 V from the PC): | APCLe-3701-16: typ. 800 mA |
| Front connector: | 50-pin D-Sub male connector |
| Additional connector: | 40-pin male connector for connecting the dig. I/O |
| Temperature range: | 0 to 60 °C (with forced cooling) |

APCLe-3701

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

| | |
|-----------------------|------------------------------|
| APCLe-3701-8: | For 8 inductive transducers |
| APCLe-3701-16: | For 16 inductive transducers |

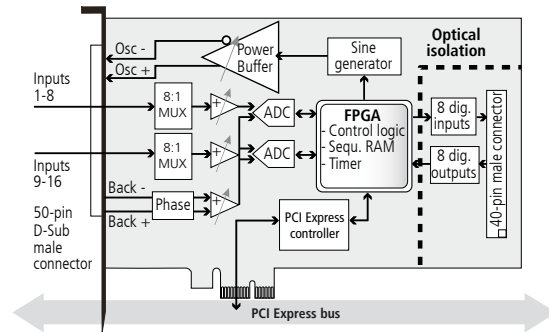
Accessories:

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

Accessories for half-bridge and LVDT transducer:

| | |
|--------------------|---|
| PX3701HB-8: | Connection box of the APCLe-3701-8, 8 x half-bridge |
|--------------------|---|

Simplified block diagram

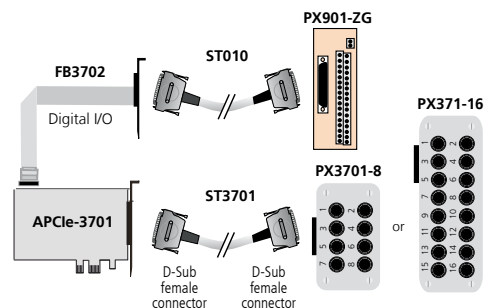


Pin assignment 50-pin D-Sub male connector

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

| | |
|----------|---|
| 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

| | |
|-----------------------|---|
| PX3701HB-16: | Connection box of the APCLe-3701-16, 16 x half-bridge |
| PX3701LVDT-8: | Connection box of the APCLe-3701-8, 8 x LVDT |
| PX3701LVDT-16: | Connection box of the APCLe-3701-16, 16 x LVDT |
| ST3701: | Connection cable between APCLe-3701 and Connection box PX3701 |

*Preliminary product information