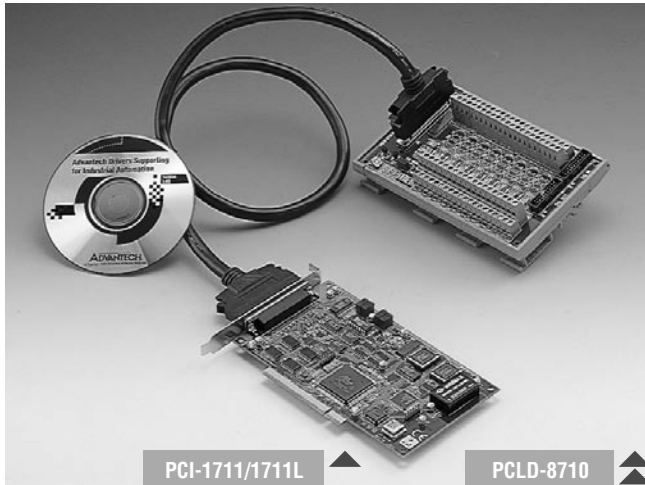


# PCI-1711 PCI-1711L

100 kS/s, 12-bit, 16-ch S.E. Inputs Low-cost  
Multifunction Card

100 kS/s, 12-bit, 16-ch S.E. Inputs Low-cost  
Multifunction Card w/o AO



PCI-1711/1711L

PCLD-8710



## Features

- 16 single-ended analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain for each input channel
- Automatic channel/gain scanning
- On-board 1K samples FIFO buffer
- Two 12-bit analog output channels (Only for PCI-1711)
- 16 digital inputs and 16 digital outputs
- Programmable pacer/counter

## Introduction

PCI-1711 and PCI-1711L are powerful, but low-cost multifunction cards for the PCI bus. PCI-1711 comes with 2 analog output channels, while the PCI-1711L doesn't. Thus, PCI-1711L represents a cost saver for those that do not need analog output.

## Specifications

### Analog Input

- Channels** 16 Single-Ended
- Resolution** 12-bit
- FIFO Size** 1K samples
- Sampling Rate\*** 100 kS/s max.

Input range and Gain List	Gain	1	2	4	8	16
	Input	$\pm 10\text{ V}$	$\pm 5\text{ V}$	$\pm 2.5\text{ V}$	$\pm 1.25\text{ V}$	$\pm 0.625\text{ V}$
Drift (ppm/°C)	Gain	1	2	4	8	16
	Zero	15	15	15	15	15
Small Signal Bandwidth for PGA	Gain	25	25	25	30	40
	Bandwidth	4.0 MHz	2.0 MHz	1.5 MHz	0.65 MHz	0.35 MHz

- Max. Input Overvoltage** 20 V
- Input Protect** 30 Vp-p
- Input Impedance** 2 M $\Omega$ /5 pF
- Trigger Mode** Software, On-board Programmable Pacer or external

Accuracy	DC	INLE: $\pm 0.5$ LSB
		Monotonicity: 12 bits
AC	Offset error: Adjustable to zero	
	Gain error: 0.005% FSR (Gain=1)	
AC	SNR: 68 dB	
	ENOB: 11 bits	

### Programmable Counter / Timer

- Channels** 1
- Resolution** 16-bit
- Compatibility** TTL level
- Base Clock** 10 MHz
- Max. Input Frequency** 10 MHz

### Note:

The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and so on.

### Analog Output (only for PCI-1711)

- Channels** 2
- Resolution** 12-bit

Output Range (Internal & External Reference)	Internal Reference	0 ~ +5 V, 0 ~ +10 V
	External Reference	0 ~ +x V @ -x V (-10 $\leq$ x $\leq$ 10)
Accuracy	Relative	$\pm 1/2$ LSB
	Differential Non-linearity	$\pm 1/2$ LSB

- Gain Error** Adjustable to zero
- Slew Rate** 11 V/ $\mu$ s
- Drift** 40 ppm/°C
- Driving Capability** 3 mA
- Throughput** PC dependent, Software update (direct AO)
- Output Impedance** 0.81  $\Omega$
- Settling Time** 26  $\mu$ s (to  $\pm 1/2$  LSB of FSR)
- Reference Voltage** Internal -5 or -10 V  
External -10 or +10 V

### Digital Input / Output

Input Channels	16	
Input Voltage	Low	0.8 V max.
	High	2.0 V max.
Output Channels	16	
Output Voltage	Low	0.8 V max. @ 8.0 mA (sink)
	High	2.0 V min. @ -0.4 mA (source)

### General

I/O Connector Type	68-pin SCSI-II female		
Dimensions	175 x 100 mm (6.9" x 3.9")		
Power Consumption	Typical	PCI-1711	PCI-1711L
		+5 V @ 850 mA	+5 V @ 700 mA
Temperature	Max.	+5 V @ 1.0 A	
		Operation	0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
Relative Humidity	Storage	-20 ~ 70° C (-4 ~ 158° F)	
	5% ~ 95% RH non-condensing (refer to IEC 68-2-3)		

## Ordering Information

- **PCI-1711** 100 kS/s, 12-bit, 16-ch S.E. inputs Low-cost Multifunction Card, user's manual and driver CD-ROM. (cable not included)
- **PCI-1711L** 100 kS/s, 12-bit, 16-ch S.E. inputs Low-cost Multifunction Card w/o analog output, user's manual and driver CD-ROM. (cable not included)
- **PCLD-8710** Industrial Wiring Terminal Board with CJC circuit for DIN-rail mounting (cable not included)
- **PCL-10168** 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- **ADAM-3968** 68-pin SCSI-II Wiring Terminal Board for DIN-rail Mounting

## Pin Assignments

AI0	68	34	AI1
AI2	67	33	AI3
AI4	66	32	AI5
AI6	65	31	AI7
AI8	64	30	AI9
AI10	63	29	AI11
AI12	62	28	AI13
AI14	61	27	AI15
AIGND	60	26	AIGND
*AO0_REF	59	25	AOI_REF*
*AO0_OUT	58	24	AOI_OUT*
*AOGND	57	23	AOGND*
DI0	56	22	DI1
DI2	55	21	DI3
DI4	54	20	DI5
DI6	53	19	DI7
DI8	52	18	DI9
DI10	51	17	DI11
DI12	50	16	DI13
DI14	49	15	DI15
DGND	48	14	DGND
DO0	47	13	DO1
DO2	46	12	DO3
DO4	45	11	DO5
DO6	44	10	DO7
DO8	43	9	DO9
DO10	42	8	DO11
DO12	41	7	DO13
DO14	40	6	DO15
DGND	39	5	DGND
CNT0 CLK	38	4	PACER OUT
CNT0 OUT	37	3	TRG GATE
CNT0 GATE	36	2	EXT TRG
+12V	35	1	+5V

\*: Pins 23~25 and pins 57~59 are not defined for PCI-1711L

## Feature Details

### Plug & Play Function

PCI-1711 and PCI-1711L fully comply with the PCI Specification Rev 2.1. and thus are Plug & Play devices. During card installation, it is virtually unnecessary to set any jumpers or DIP switches. Instead, all bus-related configurations such as base I/O address and interrupts are conveniently taken care of by the Plug & Play function.

### Flexible Input Types and Range Settings

PCI-1711 and PCI-1711L feature an automatic channel/gain scanning circuit. This circuit design controls multiplexer switching during sampling. You can set different gain values for each channel according to your needs for the corresponding range of input voltages. The gain values thus selected are stored in the SRAM. This flexible design enables multi-channel and high-speed sampling for high-performance data acquisition (up to 100 kS/s).

### On-board FIFO Memory

PCI-1711 and PCI-1711L provide an onboard FIFO (First In First Out) memory buffer, storing up to 1 K A/D samplings. You can either enable or disable the interrupt request feature of the FIFO buffer. While the interrupt request for FIFO is enabled, you can further specify whether the interrupt request will be sent whenever one sampling takes place or when the FIFO buffer is half saturated. This feature enables a continuous high-speed data transfer with more predictable performance on Windows systems.

### Onboard Programmable Counter

PCI-1711 and PCI-1711L are equipped with a programmable counter, which can serve as a pacer trigger for A/D conversions. The counter chip is an 82C54 or equivalent, which incorporates three 16-bit counters on a 10 MHz clock. One of the three counters is used as an event counter for input channels. The other two are cascaded into a 32-bit timer for pacer triggering.

## Applications

- Process monitoring and control
- Transducer and sensor measurement
- Multi-channel DC voltage measurement