



# PMC-4108

## Wide-Range Fast 8-Channel 16-Bit PMC Analog Input Card

With  $\pm 2.5$  to  $\pm 200$ V Ranges and 500 KSPS Conversion Rate

### FEATURES

- ◆ EIGHT 16-BIT DIFFERENTIAL INPUT CHANNELS
- ◆ WIDE INPUT RANGE SPAN:  $\pm 2.5$ V TO  $\pm 200$ V
- ◆ HIGH COMMON MODE VOLTAGES TO  $\pm 200$ V
- ◆ BROAD DYNAMIC RANGE; 134dB
- ◆ 500 KSPS/CHANNEL, ANY SINGLE CHANNEL
- ◆ 360 KSPS AGGREGATE; MULTICHANNEL SCAN
- ◆ DEEP-FIFO INPUT BUFFER; 64K SAMPLES
- ◆ 32-BIT INTERNAL RATE GENERATOR: 0.006 SPS TO 500 KSPS
- ◆ SCAN TABLE FOR SEQUENCE CONTROL
- ◆ BURST AND CONTINUOUS TRIGGERING MODES
- ◆ EXTERNAL CLOCK AND SYNC I/O
- ◆  $\pm 300$ -VOLT INPUT PROTECTION
- ◆ MASTERING DMA ENGINE
- ◆ 8-BIT BIDIRECTIONAL DIGITAL I/O PORT
- ◆ INTERNAL AUTOCALIBRATION
- ◆ COMPLIES WITH IEEE-1386 AND PCI LOCAL BUS SPECIFICATION 2.2

### APPLICATIONS

- HIGH AND LOW LEVEL VOLTAGE MEASUREMENT
- FAST PRECISION ANALOG SAMPLING
- HIGH COMMON-MODE SENSORS
- ALTERNATIVE TO ISOLATION AMPLIFIERS
- VEHICLE AUTOMATIC TEST EQUIPMENT (ATE)
- ACOUSTIC AND AUDIO SAMPLING
- POWER SYSTEM MONITORING
- FAULT-TOLERANT ACQUISITION SYSTEMS

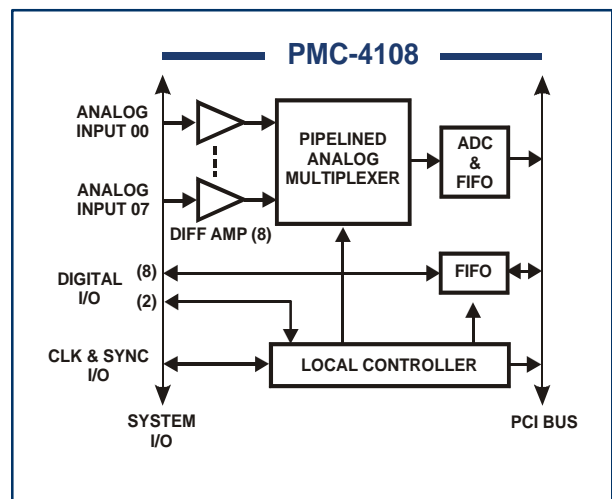
With fast sampling of up to eight wide-range inputs, the PMC-4108 provides high-rate 16-Bit performance previously available only in low-level analog input products.

The input range is software-selectable from  $\pm 2.5$ V to  $\pm 200$ V in two major ranges and three subranges, and can be controlled through a scan table. Accuracy is ensured by internal autocalibration, which can be initiated on-demand by the host.

Conversion rates can be adjusted internally from 0.006 SPS to 500 KSPS, and a scan table controls the scanning sequence. Timing also can be controlled by external hardware or through a local control register.

Acquired data is buffered through a 64 K-sample FIFO, and is accessible with both mastered DMA and single-read transactions.

An 8-bit bidirectional I/O port can be controlled either directly or through a 256-Byte FIFO, and is supported by two auxiliary I/O lines.



# Performance Specifications <sup>1</sup>

## Analog Inputs

Inputs:	Eight or (optional) four differential input pairs. Single-ended operation is obtained by connecting the LO input of each channel to input return.
Resolution:	16 Bits; 0.0015 percent of FSR
Voltage Ranges:	HIGH Range: Subranges are $\pm 200$ , 100, 50 Volts LOW Range: Subranges are $\pm 10$ , 5, or 2.5 Volts. HIGH/LOW ranges are selected independently for Odd/Even channel groups. Subranges are assigned through the scan table.
Conversion Rate:	Zero to 500,000 conversions (samples) per second if any single channel is selected in the scan table. Zero to 360,000 per second aggregate rate if multiple channels are selected.
Scan Size:	1-256 channels. Determined by the scan table.
Scanning Modes:	Single-Scan (Burst): A trigger initiates a single scan of the channel or channels defined in the scan table. Continuous: The sequence of channels defined by the scan table is scanned continuously at the selected conversion rate. Triggering is ignored in this mode.
Scan Table:	256-Channel table determines the position and subrange for each input channel in a scanning sequence..
Rate Generators:	20-Bit sample-rate and scan rate dividers provide timing rates from 31 Hz to 500,000 Hz.
External Sync I/O: (TTL, asserted LOW)	Trigger Input: Initiates one scan. Trigger Output: Pulse out at scan start Clock Input: Ext ADC clock. Clock Output: ADC clock output
Input Data Buffer:	64K-Sample or (optional) 16K-Sample FIFO with adjustable threshold and DMA access.
DC Accuracy, RTI	$\pm 0.05$ % Reading $\pm 0.02$ % FSR $\pm 2.4$ mV; E.g.: $\pm 6.4$ mV when reading +4 Volts on the $\pm 5$ V input range.
Nonlinearity:	$\pm 0.002$ percent INL; $\pm 0.0015$ percent DNL, maximum
Input Noise:	2.0, 3.0, 5.0 LSB-RMS on high, mid, low subranges respectively; typical.
Input Impedance:	800 k $\Omega$ typical
Input Bandwidth, -3dB:	Small-Signal: DC to 150 kHz nominal Full-Power: 30 kHz on $\pm 200$ V and $\pm 10$ V ranges; 60 kHz on other ranges
Common Mode:	CMRR 80 dB typical, DC-60 Hz. CMV = $\pm 200$ V.
Crosstalk Rejection:	85dB, DC-100 Hz; 70 dB to 40kHz
Overvoltage Protection:	$\pm 300$ Volts line-line and line-common, sustained, power ON or OFF.

Note 1: At +25°C, with specified environmental conditions.

## Digital I/O Port

Configuration:	Bidirectional 8-Bit port with a 256-Byte buffer and two auxiliary I/O lines.
Logic Levels:	Standard TTL
Loading:	Outputs: 20 ma, source and sink. Inputs: 1.0 ma sink, 0.1 ma source
Access Modes:	Direct-Read/Write or Mastered DMA. Buffer orients automatically to support assigned port direction.
Buffer:	256-Byte FIFO buffer. Supports periodic pattern generation.
Buffer Clocking Rate:	500 Hz to 16 MHz, controlled by internal rate generator.

## Compatibility

Compliance:	Conforms to the electrical requirements of PCI Local Bus Specification Revision 2.2, and to the IEEE 1386 standard for Common Mezzanine Cards (CMC).
Access Modes::	Read/Write D32; Single transaction as slave, or DMA as master; Multifunction interrupt on INT-A.

## Environmental Characteristics

Dimensions:	HxWxD: 13.5 mm (0.53 in) x 74.0 mm (2.91 in) x 149.0 mm (5.87 in)	
Mass:	150 grams maximum	
Ambient Temperature:	Operating: 0 to +60 degrees Celsius;	Storage: -40 to +85 degrees
Humidity: (Noncondensing)	Operating: 0 to 85% RH;	Storage: 0 to 95% RH
Cooling:	Conventional 150 LFPM air flow	
Altitude:	10,000 Feet (3000 Meters)	
Power Requirements:	+5 ±0.25 VDC at 1.1 Amps maximum	

## Ordering Information

Specify base model number plus applicable option suffix as shown below:  
For example; PMC-4108-0864 specifies eight channels and a 64K buffer.:

### PMC-4108 - C B

↑  
Base Model

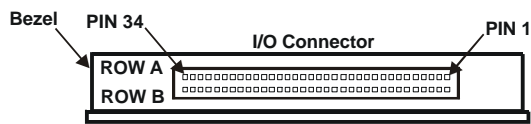
↑ ↑  
Input/Output Buffer Size:

16 = 16 Kwords  
64 = 64 Kwords

↑ ↑  
Number of Input Channels:

04 = 4 Input channels  
08 = 8 input channels

## System I/O Connections



### Cable Mating Connector:

68-Pin 2-row 0.050" dual ribbon-cable socket connector:  
Robinson Nugent # P50E-068-S-TG

PIN	FUNCTION
1A	DIG RTN
2A	TRIG INPUT
3A	DIG RTN
4A	CLOCK INPUT
5A	ANA AUX HI
6A	ANA AUX LO
7A	INPUT RTN
8A	INPUT RTN
9A	ANA INP 00 LO
10A	ANA INP 00 HI
11A	ANA INP 01 LO
12A	ANA INP 01 HI
13A	ANA INP 02 LO
14A	ANA INP 02 HI
15A	ANA INP 03 LO
16A	ANA INP 03 HI
17A	ANA INP 04 LO
18A	ANA INP 04 HI
19A	ANA INP 05 LO
20A	ANA INP 05 HI
21A	ANA INP 06 LO
22A	ANA INP 06 HI
23A	ANA INP 07 LO
24A	ANA INP 07 HI
25A	INPUT RTN
26-34A	INPUT RTN

PIN	FUNCTION
1B	DIG RTN
2B	TRIG OUTPUT
3B	DIG RTN
4B	CLOCK OUTPUT
5B	DIG RTN
6B	DIG 00
7B	DIG RTN
8B	DIG 01
9B	DIG RTN
10B	DIG 02
11B	DIG RTN
12B	DIG 03
13B	DIG RTN
14B	DIG 04
15B	DIG RTN
16B	DIG 05
17B	DIG RTN
18B	DIG 06
19B	DIG RTN
20B	DIG 07
21B	DIG RTN
22B	DIG AUX 00 (Input)
23B	DIG RTN
24B	DIG AUX 01 (Output)
25B	DIG RTN
26-34B	DIG RTN

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