PMC66-16AI32SSC

32-Channel, Differential, 16-Bit Simultaneous Sampling; PMC Analog Input Board

With 200 KSPS Sample Rate per Channel and 66 MHz PCI Support

ADVANCE INFORMATION

Features

- **32 Differential Analog Inputs with Dedicated 200KSPS 16-Bit ADC per Channel**
- **Sampling Rates to 200 KSPS per Channel (6.4 MSPS Aggregate Rate)**
- **Simultaneous Sampling of all Inputs; Minimum Data Skew**
- **D32; 66MHz, 33MHz PCI Compatibility, with Universal 5V/3.3V Signaling**
- **Input Ranges: ±2.5V, ±1.25, ±0.625V; Software-Selectable**
- **Sync and Clock I/O Support External Control and Multiboard Configrations**
- Increased Throughput Capacity with Local Data Packing
- Continuous, Burst and Single-Sample Clocking Modes
- Hardware Sync I/O for Multiboard Operation
- 1 MByte FIFO Data Buffer; 512 K-Samples in packed-data mode.
- 2-Channel DMA Engine
- Sampling Controlled by Internal Rate Generator, by Software Trigger, or Externally
- On-Demand Internal Autocalibration of all Channels
- Single-width PMC Form Factor

Typical Applications

✓ High-Density Analog Inputs	✓ Industrial Robotics	✓ Acoustic Sensor Arrays
✓ Analog Event Capture	✓ Biometric Signal Analysis	✓ Dynamic Test Systems

Rev: 022608AP

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Functional Description

The 16-Bit PMC66-16AI32SSC analog input board samples and digitizes up to 32 input channels simultaneously at rates up to 200,000 samples per second for each channel. Each input channel contains a dedicated 16-Bit sampling ADC, and the resulting sampled data is available to the PCI bus through a 1-MByte FIFO buffer. The 32-Bit local data path supports full D32 local-bus data packing. Throughput capacity is further enhanced with 66MHz PCI support. All operational parameters are software configurable.

Inputs can be sampled in groups of 2, 4, 16 or 32 channels; or any contiguous channel group can be selected for sampling. The sample clock can be generated from an internal rate generator, or by software or external hardware. Input ranges are software-selectable as ±2.5V, ±1.25V or ±0.625V.

An on-demand autocalibration feature determines offset and gain correction values for each input channel, and applies the corrections subsequently during acquisition. A selftest switching network routes calibration reference signals to each channel through internal selftest switches, and permits board integrity to be verified by the host..

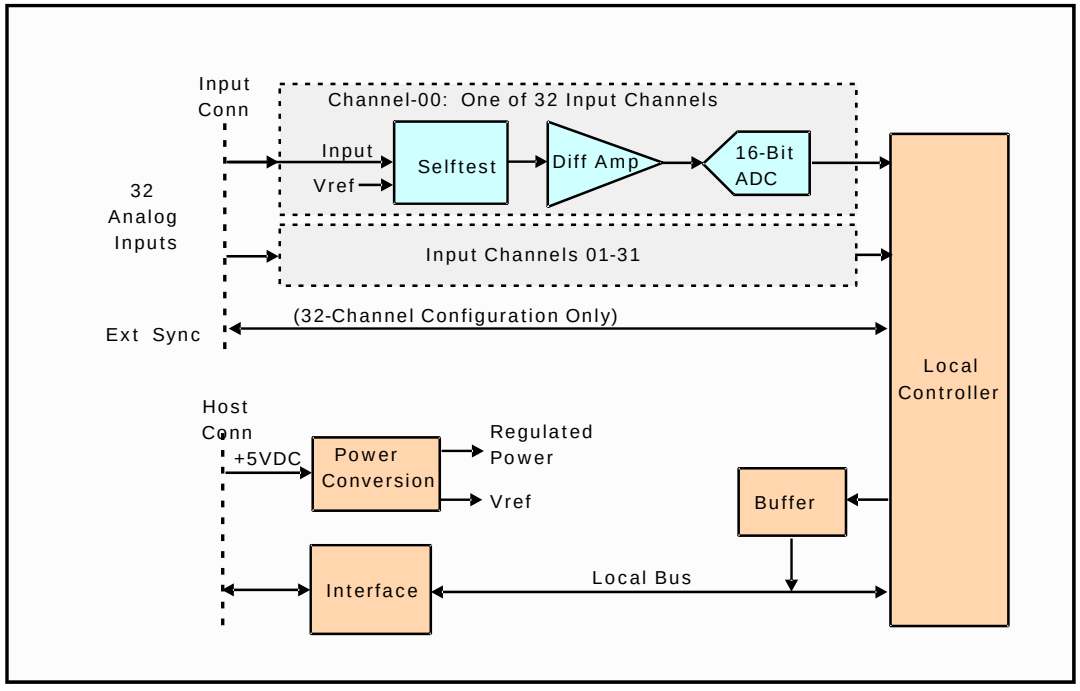

Figure 1. PMC66-16AI32SSC; Functional Organization

This product is functionally compatible with the IEEE PCI local bus specification Revision 2.3, and supports the "plug-n-play" initialization concept. System connections are made at the front panel through an 80-pin I/O connector. Power requirements consist of +5 VDC in compliance with the PCI specification, and operation over the specified temperature range is achieved with conventional convection cooling.

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Performance Specifications

At +25 ^{O}C, with specified operating conditions, and with differential processing deselected

Input Characteristics:

Configuration:	32 differential analog input channels. 16-Channel version also available.
Voltage Ranges:	Software configurable as ±2.5V, ±1.25V or ±0.625V fullscale
Input Impedance:	800KOhms typical, line-line. 400Kohms line-ground..
Bias Current:	3 ua maximum with inputs shorted to common ground.
Common Mode Rejection:	60dB typical, DC-50kHz
Min/Max Input Levels for rated performance:	LO input: -5V to +11V. HI input: -2.5V to +8.5V.
Crosstalk Rejection:	85dB typical, DC-50kHz
Input Noise:	0.15 mVRMS; typical on all ranges
Overvoltage Protection:	±40 Volts with power removed; ±25V with power applied.

Transfer Characteristics:

Conversion Resolution:	16 Bits (0.0015 percent of FSR)
Maximum Sample Rate:	200 KSPS per channel
Input Bandwidth (-3dB):	DC to 100 kHz typical..
Channels per Sample:	1-32.

DC Accuracy: (Maximum composite error after autocalibration)

Range	Zero-Input	Fullscale
±2.5V	± 1.0mV	± 2.0mV
±1.25V	± 0.9mV	± 1.5mV
±0.625V	± 0.8mV	± 1.0mV

Integral Nonlinearity:	±0.008 percent of FSR, maximum
Differential Nonlinearity:	±0.004 percent of FSR, maximum

Analog Input Operating Modes and Controls

Input Data Buffer:	1 Megabyte in packed-data mode.
Sample Clock Sources:	Internal rate generator; External Hardware Sync I/O, Software clock. Continuous, Burst and Single-Sample Clocking Modes.
Rate Generator:	Programmable from 0.01-200,000 sample clocks per second. Divides the local master clock to the sample rate. (The standard master clock frequency is 40.000MHz. See ordering information for custom frequencies.)
External TTL Sync, Clock:	Bidirectional TTL lines; available through the I/O connector, or through a 6-pin connector located on the back of the board.
Input Data Format:	Nonpacked Mode: 16-Bit data word plus single-bit Channel-00 tag. Packed Mode: Lword sync code followed by packed channel data. Even-numbered channels occupy lower word (D00-15), odd channels occupy upper word (D16-31).
Data Format:	Selectable as offset binary or two's complement.

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PCI Compatibility:

Conforms to PCI Specification 2.3, with 66MHz/33MHz, D32 and universal signaling (5/3.3 Volt).
Single multifunction interrupt.
DMA transfers as bus master with two DMA channels.

Power Requirements

+5VDC ±0.2 VDC at 1.0 Amp maximum, 0.8 Amp typical.

Maximum Power Dissipation: Side-1: 4.0 Watts. Side 2: 1.0 Watt.

Physical Parameters

Mechanical Characteristics

Height:	13.5 mm (0.53 in)
Depth:	149.0 mm (5.87 in)
Width:	74.0 mm (2.91 in)
Shield:	Side-1 is protected by an EMI shield.

Environmental Specifications

Ambient Temperature Range:	Operating: 0 to +65 Degrees Celsius inlet air Storage: -40 to +85 Degrees Celsius
Relative Humidity:	Operating: 0 to 80%, non-condensing Storage: 0 to 95%, non-condensing
Altitude:	Operation to 10,000 ft.
Cooling:	Conventional convection cooling; 150 LFPM

Ordering Information

Specify the basic product model number followed by an option suffix "-A-B-C", as indicated below. For extended-temperature operation to +80 Deg-C, add the suffix "I" to the base model number.

For example, model number PMC66-16AI32SSC-32-40M-0 describes an extended-temperature board with 32 input channels, a standard 40.0000MHz master clock frequency, and no custom features.

Optional Parameter	Value	Specify Option As:
Number of Input Channels	32 Channels	A = 32
	16 Channels	A = 16
Master Clock Frequency: (Standard frequency is 40.000MHz)	40.000 MHz	B = 40M
	(Specify custom frequency; 38-42 MHz)	B = (Custom frequency)M
Custom Feature	No custom features	C = 0

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Table 1. System Input/Output Connector

ROW-A	
PIN	SIGNAL
1	INPUT RTN
2	INP00 HI
3	INP00 LO
4	INP01 HI
5	INP01 LO
6	INPUT RTN
7	INP02 HI
8	INP02 LO
9	INP03 HI
10	INP03 LO
11	INPUT RTN
12	INP04 HI
13	INP04 LO
14	INP05 HI
15	INP05 LO
16	INPUT RTN
17	INP06 HI
18	INP06 LO
19	INP07 HI
20	INP07LO
21	INPUT RTN
22	INP08 HI
23	INP08 LO
24	INP09 HI
25	INP09 LO
26	INPUT RTN
27	INP10 HI
28	INP10 LO
29	INP11 HI
30	INP11 LO
31	INPUT RTN
32	INP12 HI
33	INP12 LO
34	INP13 HI
35	INP13 LO
36	INPUT RTN
37	INP14 HI
38	INP14 LO
39	INP15 HI
40	INP15 LO

ROW-B	
PIN	SIGNAL
1	INP16 HI
2	INP16 LO
3	INP17 HI
4	INP17 LO
5	INP18 HI
6	INP18 LO
7	INP19 HI
8	INP19 LO
9	INPUT RTN
10	INP20 HI
11	INP20 LO
12	INP21 HI
13	INP21 LO
14	INP22 HI
15	INP22 LO
16	INP23 HI
17	INP23LO
18	INPUT RTN
19	INP24 HI
20	INP24 LO
21	INP25 HI
22	INP25 LO
23	INP26 HI
24	INP26 LO
25	INP27 HI
26	INP27 LO
27	INPUT RTN
28	INP28 HI
29	INP28 LO
30	INP29 HI
31	INP29 LO
32	INP30 HI
33	INP30 LO
34	INP31 HI
35	INP31 LO
36	INPUT RTN
37	CLOCK I/O RTN
38	CLOCK I/O
39	SYNC I/O RTN
40	SYNC I/O

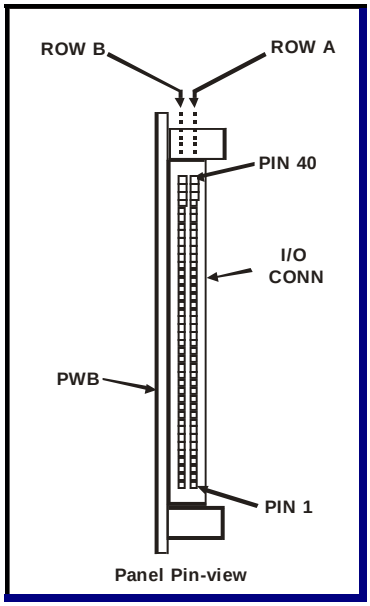

Figure 2. System Input Connector

System Mating Connector:

Standard 80-pin 0.050" dual-ribbon socket connector:

Robinson Nugent **P50E-080S-TG,** or equivalent.

Table 2. Sync-I/O Connector

PIN	SIGNAL
1	DIG RTN
2	AUX 00
3	DIG RTN
4	AUX 01
5	DIG RTN
6	Reserved. Ground or leave disconnected.

Recommended Sync-I/O mating cable connector is:

Molex# 51146-0600.

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