

PMC66-24DSI6LN4AO

10-Channel Analog I/O PMC

***Six Simultaneous, 24-Bit Delta Sigma, Input Channels,
With Four 16-Bit Output Channels, and Byte-Wide Digital I/O Port***

Features Include:

- ***Advanced component upgrade***, with original ADADIO functionality and I/O connector pinout.
- 6 Analog input channels; 24-Bit ADC per channel; Delta-Sigma converter.
- 4 Analog output channels; 16-Bit DAC per channel.
- 8-Bit Bi-directional Digital Port with two auxiliary control lines.
- Simultaneous analog input sampling; with Linear Phase Antialias filtering.
- Analog input sample rates adjustable up to 100ksps. (200ksps option available.)
- 256K-Sample analog input FIFO buffer.
- Supports Continuous and Triggered-Burst input modes.
- Analog outputs disconnect from system under software control.
- Simultaneous updating of outputs with hardware or software strobe.
- Analog output aggregate data rates to 250K Samples per second, host dependent.
- 33MHz/66 MHz, 32-Bit PCI support, with universal 5V/3.3 signaling.
- Single-width PMC form factor.
- Extended temperature range available.
- VxWorks™ Driver available.

Applications:

- ✓ Supervisory Control Systems
- ✓ Data Acquisition Systems
- ✓ Research Instrumentation
- ✓ Automatic Test Equipment
- ✓ Simulators and Trainers
- ✓ Process Control

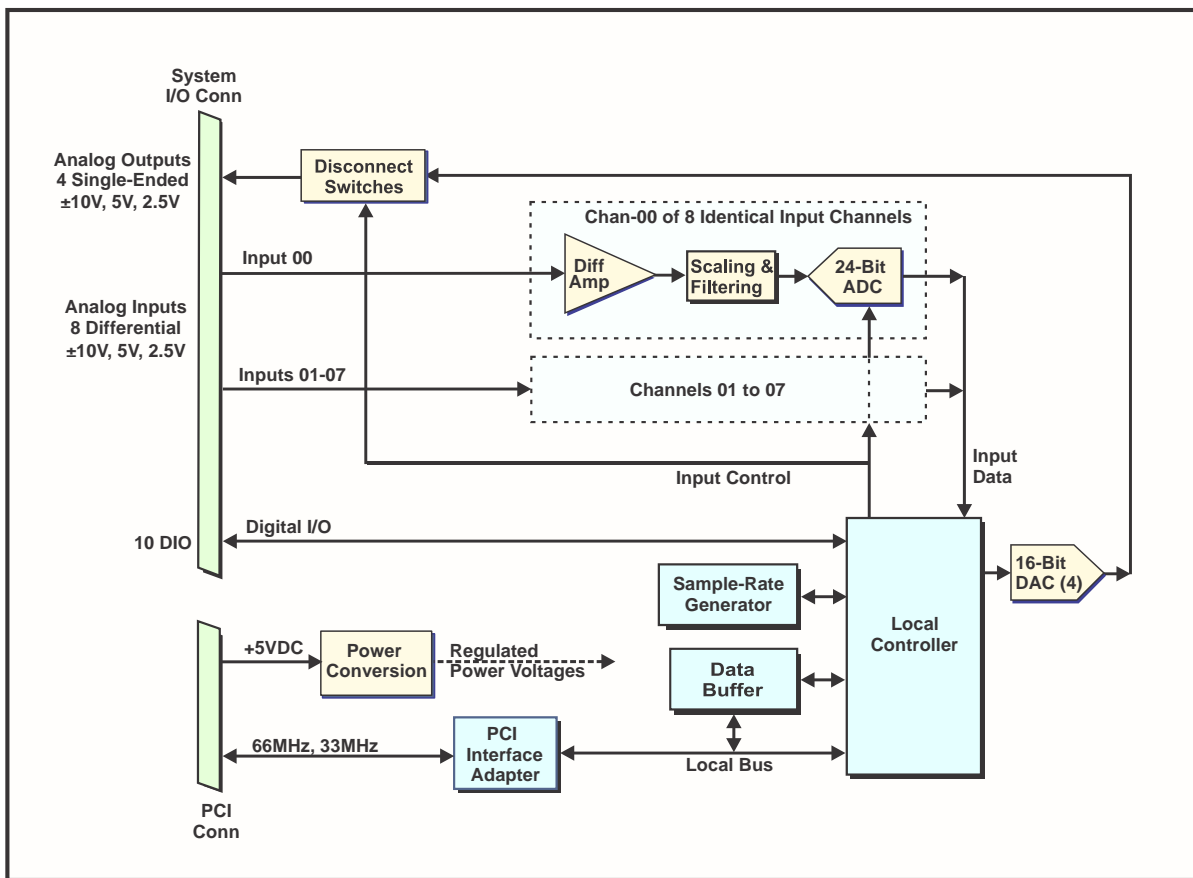
Rev: 110820

Overview:

The PMC66-24DSI6LN4AO is a single-width PMC module which contains six 24-Bit A/D converters, four 16-bit D/A converters, and all supporting functions necessary for adding flexible analog I/O capability to a PMC host. All analog input and output system connections are made through a single 68-pin subminiature-D front-access I/O connector. The analog outputs can be internally disconnected from the system I/O connector under software control.

Each analog output channel is accessed through an independent 16-bit data register in PCI memory space. ADC conversion data are read by the bus through an analog input FIFO buffer. An auxiliary digital port contains eight bits of bi-directional data and two control lines, and is controlled through a single register.

Communication with the host PCI bus is provided by a PCI Interface Adapter which furnishes a 32-bit local bus for exchanging information between the FIFO buffers, the adapter, and the Local Controller. All internal operations are managed by the Local Controller.



This product is functionally compatible with the IEEE PCI local bus specification Revision 2.3. System input/output connections are made at the front panel through a high-density 68-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 air cooling.

ELECTRICAL SPECIFICATIONS

At +25 °C, with specified operating conditions

ANALOG INPUT CHANNELS

□ **Input Characteristics:**

Configuration: 6 analog input channels; software-selected as differential or single-ended.
 Voltage Ranges: Factory configured as ± 10 , ± 5 , or ± 2.5 Volts.
 Input Impedance: 1.0 Megohms in parallel with 20 pF; 2.0 Megohms line-to-line
 Input Coupling: Selectable as either AC-coupled or DC-coupled. AC coupling provides lower noise.
 Common Mode Rejection: 60dB to 50 Hz typical
 Common Mode Range: ± 11.0 Volts; with zero input signal level
 Remote Ground Sensing: All single-ended inputs are measured relative to the external return, which is isolated from the internal analog return by approximately 200 Ohms.
 Overvoltage Protection: ± 30 Volts with power applied; ± 15 Volts with power removed
 External Trigger Input: TTL level, active LOW

□ **Transfer Characteristics:**

Resolution: 24 Bits
 Sample Rate: 2,000 to 200,000 samples per second per channel
 Oversampling Factor: 2-50ksps: x128; 50-100ksps: x64; 100-200ksps: x32
 DC Offset: ± 50 mV max; Inputs connected to input return.
 Gain Accuracy: ± 2 dB within passband
 Passband (0.2dB):
 Sample Rate: Typical, DC Coupling*
 2-50ksps: DC to 0.47 Fsamp
 50-100ksps: DC to 0.46 Fsamp
 100-200ksps: DC to 0.24 Fsamp
 *-0.13dB low end of passband is Fsamp/2400 in AC-coupled mode.
 E.g.: 20Hz if Fsamp=48KSPS.

Passband Ripple: ± 0.06 dB maximum

Stopband:	Sample Rate:	Threshold	Rejection
	2-50ksps:	0.58 Fsamp	100dB
	50-100ksps:	0.68 Fsamp	95dB
	100-200ksps:	0.78 Fsamp	100dB

Phase Skew: Typically less than 55ns (0.1-Degree for Fsig = 5kHz), with Fsig/Fsamp <0.35; channel-channel (board-board for multiboard configurations), excluding noise, with high-frequency image filter.

Antialias Filtering: Each ADC provides linear-phase digital antialias filtering as indicated for Passband and Stopband. A 270kHz lowpass analog image filter in each channel suppresses images from the digital filter. Optional alternative image filter frequencies are available, and should be selected to be well above the expected passband.

Dynamic Range: 112dB to 50KSPS, typical with AC coupling; 100dB with DC coupling. Dynamic range degrades above 50KSPS to 78dB at 200KSPS; AC or DC coupled.

SINAD: 98dB typical to Fsig=20kHz and sample rates to 50KSPS.

Interchannel Crosstalk: -100dB typical to 50kHz

Analog Input Operating Modes and Controls

Input Sampling Mode:	<u>Continuous Conversion Mode</u> (Default): Analog inputs are converted continuously at the selected conversion rate. Inputs are selected as differential. <u>Burst Scan Mode</u> : A single conversion of selected channels is initiated by an external hardware trigger or by a software trigger.
Sample Rate Generator:	An internal PLL rate generator provides sample rates from 2.0 KSPS to 200 KSPS. The frequency of the generator is controlled by the ratio of two 10-Bit integers, and has a setting accuracy is 25 PPM.
Active Channels:	Software selected from 1 to 6 channels. Conversion data from active channels appear in the analog input buffer. Active channels are contiguous, beginning with Channel-0 and proceeding upward to the highest active channel number.
Data Buffer:	FIFO buffer with a capacity of 256K samples.
Buffer Flags:	Buffer threshold flag.
Data Format:	Software selected as offset binary or two's complement format
Multiboard Synchronization:	A single initiator card can be used to trigger synchronized conversions in up to three target cards through a TTL interface.

ANALOG OUTPUT CHANNELS

□ Output Characteristics:

Configuration:	Four single-ended output channels
Voltage Ranges:	Factory configured as ± 10 , ± 5 , or ± 2.5 Volts. (Same range as inputs)
Output Resistance:	1.0 Ohm, maximum if outputs are enabled; 22 kOhms to ground if outputs are disabled
Output protection:	Withstands sustained short-circuiting to ground. Also withstands overvoltage transients to ± 40 Volts through 80 Ohms for 10 milliseconds.
Load Current:	± 5 mA maximum; ± 2 mA recommended for minimum crosstalk and line loss
Load Capacitance:	Stable with zero to 2000 pF shunt capacitance
Noise:	1.4 mVrms, 10Hz-10MHz

□ Transfer Characteristics:

Resolution:	16 Bits (0.0015 percent of FSR)												
Maximum Sample Rate:	250K channels per second, typical aggregate rate. Useable rate is host-dependent.												
DC Accuracy, Line-Line: (No-load)	<table border="1"> <thead> <tr> <th>Range</th> <th>Midscale Accuracy</th> <th>\pmFullscale Accuracy</th> </tr> </thead> <tbody> <tr> <td>± 10V</td> <td>± 4.1mv</td> <td>± 6.3mv</td> </tr> <tr> <td>± 5V</td> <td>± 3.2mv</td> <td>± 4.9mv</td> </tr> <tr> <td>± 2.5V</td> <td>± 2.0mv</td> <td>± 3.5mv</td> </tr> </tbody> </table>	Range	Midscale Accuracy	\pm Fullscale Accuracy	± 10 V	± 4.1 mv	± 6.3 mv	± 5 V	± 3.2 mv	± 4.9 mv	± 2.5 V	± 2.0 mv	± 3.5 mv
Range	Midscale Accuracy	\pm Fullscale Accuracy											
± 10 V	± 4.1 mv	± 6.3 mv											
± 5 V	± 3.2 mv	± 4.9 mv											
± 2.5 V	± 2.0 mv	± 3.5 mv											
Settling Time (0.01%):	No output filter: 25 us												
Crosstalk Rejection:	75 dB minimum, DC-1000Hz												
Integral Nonlinearity:	± 0.007 percent of FSR, maximum												
Differential Nonlinearity:	± 0.003 percent of FSR, maximum												
External Strobe Input:	TTL level, active LOW												

Table 1. System Connector Pin Functions

P5A		P5B	
PIN	SIGNAL	PIN	SIGNAL
1	OUTPUT RETURN	1	DIGITAL RETURN
2	OUTPUT CHANNEL 00	2	INPUT TRIGGER
3	OUTPUT RETURN	3	DIGITAL RETURN
4	OUTPUT CHANNEL 01	4	INPUT TRIGGER READY
5	OUTPUT RETURN	5	DIGITAL RETURN
6	OUTPUT CHANNEL 02	6	OUTPUT STROBE
7	OUTPUT RETURN	7	DIGITAL RETURN
8	OUTPUT CHANNEL 03	8	OUTPUT STROBE READY
9	INPUT RETURN	9	DIGITAL RETURN
10	INPUT RETURN	10	I/O DATA 00
11	INPUT CHANNEL 00 LO (-)	11	DIGITAL RETURN
12	INPUT CHANNEL 00 HI (+)	12	I/O DATA 01
13	INPUT CHANNEL 01 LO (-)	13	DIGITAL RETURN
14	INPUT CHANNEL 01 HI (+)	14	I/O DATA 02
15	INPUT CHANNEL 02 LO (-)	15	DIGITAL RETURN
16	INPUT CHANNEL 02 HI (+)	16	I/O DATA 03
17	INPUT CHANNEL 03 LO (-)	17	DIGITAL RETURN
18	INPUT CHANNEL 03 HI (+)	18	I/O DATA 04
19	INPUT CHANNEL 04 LO (-)	19	DIGITAL RETURN
20	INPUT CHANNEL 04 HI (+)	20	I/O DATA 05
21	INPUT CHANNEL 05 LO (-)	21	DIGITAL RETURN
22	INPUT CHANNEL 05 HI (+)	22	I/O DATA 06
23	NO CONN*	23	DIGITAL RETURN
24	NO CONN*	24	I/O DATA 07
25	NO CONN*	25	DIGITAL RETURN
26	NO CONN*	26	I/O CONTROL INPUT
27	VREF RETURN	27	DIGITAL RETURN
28	VREF ADJUST REFERENCE	28	I/O CONTROL OUTPUT
29	VREF RETURN	29	DIGITAL RETURN
30	VREF REMOTE ADJUST	30	DIGITAL RETURN
31	VREF RETURN	31	DIGITAL RETURN
32	RANGE VREF	32	DIGITAL RETURN
33	VREF RETURN	33	DIGITAL RETURN
34	VREF RETURN	34	DIGITAL RETURN

* Open circuit. No internal connection.

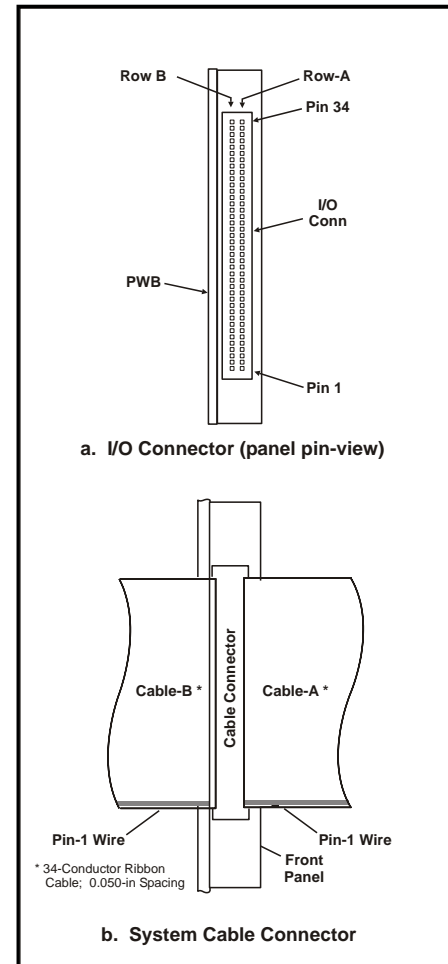


Figure 2. System I/O Connector

System Cable Mating Connector:
 68-pin 0.050" Subminiature connector: with metal shield:
 AMP #749621-7 or equivalent.

I/O Connector Installed on Board
 (Ref): Amp # 787170-7

General Standards Corporation assumes no responsibility for the use of any circuits in this product. No circuit patent licenses are implied. Information included herein supersedes previously published specifications on this product and is subject to change without notice.