

MSI PC/104 Embedded PC Series

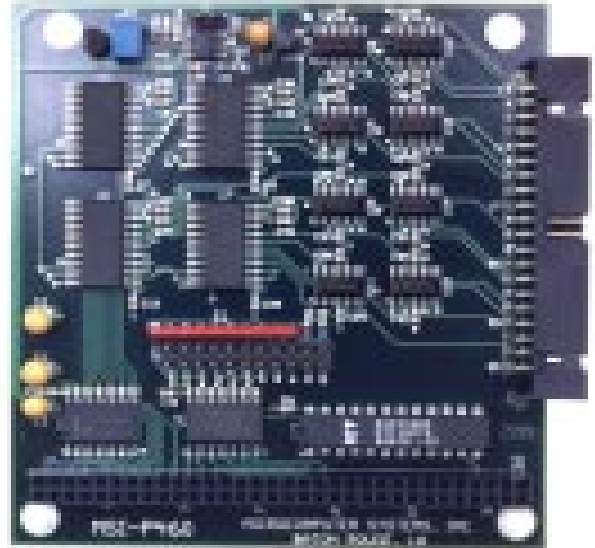
MSI-P460 ANALOG OUTPUT CARD

FEATURES

- ◆ Up to 32 analog output channels, low cost, high performance.
- ◆ 8-bit resolution, ± 1 LSB nonlinearity and relative accuracy.
- ◆ Jumper selectable output ranges of 0-5V and 0-10V.
- ◆ Output buffers with ± 10 mA drive capability.
- ◆ Voltage output settling time of $5 \mu\text{s}$ and a slew rate of $2 \text{ V}/\mu\text{s}$ minimum.
- ◆ 8-bit stackthrough PC/104 with I/O mapped 16-bit addressing.
- ◆ Jumper selectable I/O address.
- ◆ Complete hardware documentation with schematics.
- ◆ Operating temperature range -45°C to 85°C .
- ◆ Two-year warranty from date of shipment.

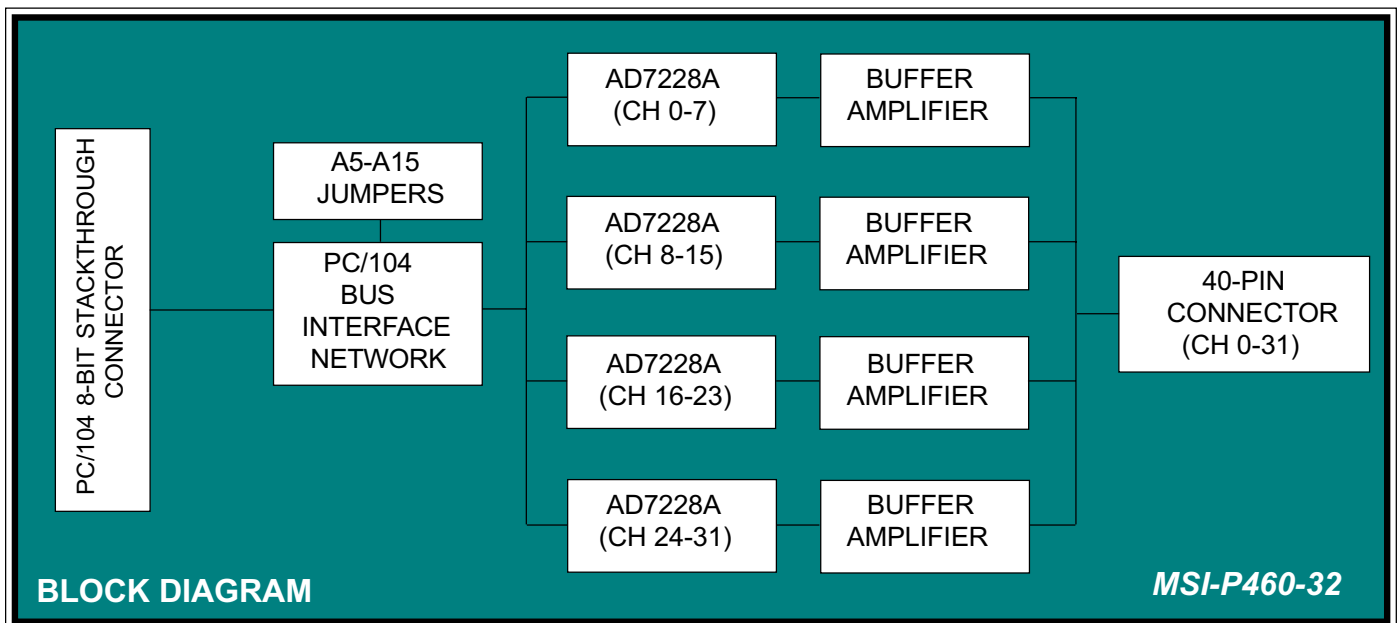
DESCRIPTION

The MSI-P460 is a low cost, high performance 8-bit analog output card designed for use with all PC/104 embedded systems. Four models provide output capacities of 8, 16, 24 or 32 channels. Output ranges are 0-5V and 0-10V with potentiometer adjustment of spans from 4 to 6V and 8 to 10V for each of these ranges, respectively.



D/A Converters and buffer amplifiers - The card employs up to four Analog Devices AD7228A eight-channel D/A converters. Output resolution is 8-bits with ± 1 LSB nonlinearity and relative accuracy. The voltage output settling time of $5 \mu\text{s}$ and a slew rate of $2 \text{ V}/\mu\text{s}$.

A precision reference source is provided by a LM336-5.0 based network which provides potentiometer adjustable voltages for the desired output range. Buffer amplifiers (LM224) on each channel provide output drives of ± 10 mA.



Card Addressing - The card is I/O mapped using 16-bit addressing to select the input channels and device status. Option jumpers are provided for specifying the card **base** address (A5 - A15). The address of the output channel is given by

$$\text{Channel Address} = \text{base} + \text{channel no.}$$

where the channel no. is in a range from 0 to 31 (0 to 1F in hexadecimal).

Programming - Performing output conversions is very simple. A data byte is written to the desired channel address. Data writes from 0 to 255 (FF hexadecimal) gives outputs from 0 to the maximum output range selected, respectively.

Models - The MSI-P460 comes in four models as shown.

MSI-P460-8	8 input channels
MSI-P460-16	16 input channels
MSI-P460-24	24 input channels
MSI-P460-32	32 input channels

SPECIFICATIONS

PC/104	8-bit, stackthrough
Analog Inputs	
Channels	8 to 32 in groups of 8
Converter	Analog Devices AD7228A
Output Ranges	0-5V, 0-10V
Span Adjustment	4 to 6V (0-5V range) 8 to 10V (0-10V range)
Resolution	8 bits
Non-linearity	±1 LSB
Relative Accuracy	±1 LSB
Settling Time	5 μs maximum
Slew Rate	2 V/μs minimum
Card Addressing	
16-Bit I/O Mapped	Base address set by option jumpers for A5 thru A15.
External Reference	
Ref Out Voltage 0-5V Range	Adjustable from 4 to 6V using a LM336-5.0
Ref Out Voltage 0-10V Range	Adjustable from 8 to 10V using a LM336-5.0
Connectors	
MSI-P460-8	One (1) AMP 103311-1 or eq. (10-pin)
MSI-P414-16	One (1) AMP 103311-5 or eq. (20-pin)
MSI-P460-24	One (1) AMP 103311-7 or eq. (34-pin)
MSI-P414-16	One (1) AMP 103311-8 or eq. (40-pin)
Option Jumpers	.025" square posts, 0.1" grid
Electrical & Environmental	
	+5V @ 15 mA typical
	+12V @ 20 mA typical for each group of 8 channels
	-12V @ 20 mA typical for each group of 8 channels
	Operating Temperature -45°C to 85°C



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