MSI-P460

PC/104 32-CHANNEL ANALOG OUTPUT CARD

USER MANUAL

PC/104 Embedded
Industrial Analog I/O Series

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DESCRIPTION

The MSI-P460 Analog Output Card is an 8-bit stack-through PC/104 card which reqyuires +5V and ±12V from the PC/104 bus. It provides thirty-two analog output channels with an output resolution of 8 bits. The card uses four Analog Devices AD7228A analog-to-digital converters with unity gain buffer amplifiers for the outputs. The output ranges are selectable as either 0-5V or 0-10V with a single hardware jumper. The card uses 16-bit I/O mapped addressing which is jumper selectable. Outputs are provided via a 40-pin AMP type 103311-8 connector. The card outline is shown in Figure 1.

A. Card Addressing

The I/O-mapped card address is set by installing appropriate jumpers on JP1, pins 1 thru 22. An uninstalled jumper for a given address bit sets the bit to 1 (true) and

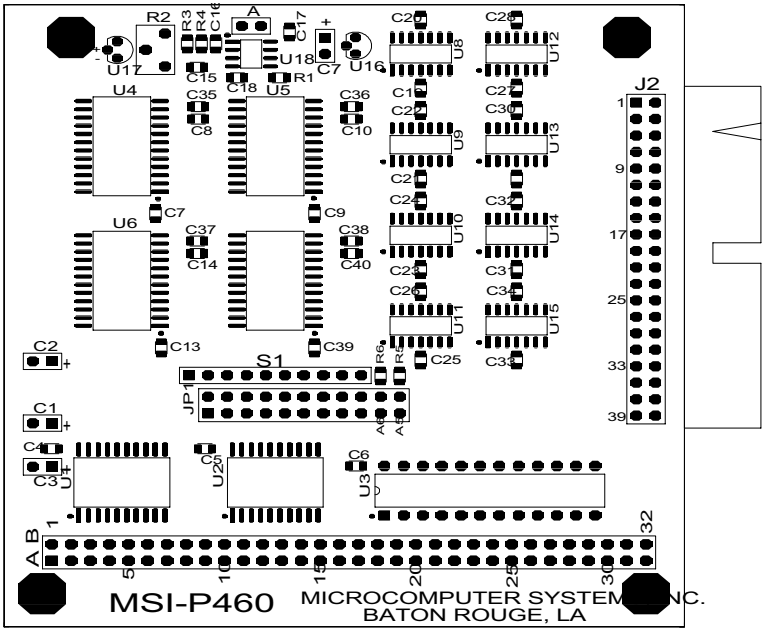

Figure 1. Outline of MSI-P460 Card.

an installed jumper sets the bit to 0 (false). Addresses A5 thru A15 are jumper selectable for defining the ***base address*** of the card from 0000H to FFE0H on integral 20H boundaries, where H denotes a hexadecimal number. To assign a base address of 300H, for example, install all jumpers except JP1-15,16 (A8) and JP1-13,14 (A9).

Individual channels have output addresses as given in Table 1.

Table 1. I/O Addresses of MSI-P460.

Channel	I/O Address *	Channel	I/O Address *
OUT 0	base address	OUT 16	base address + 10
OUT 1	base address+1	OUT 17	base address + 11
OUT 2	base address+2	OUT 18	base address + 12
OUT 3	base address+3	OUT 19	base address + 13
OUT 4	base address+4	OUT 20	base address + 14
OUT 5	base address+5	OUT 21	base address + 15
OUT 6	base address+6	OUT 22	base address + 16
OUT 7	base address+7	OUT 23	base address + 17
OUT 8	base address+8	OUT 24	base address + 18
OUT 9	base address+9	OUT 25	base address + 19
OUT 10	base address+A	OUT 26	base address + 1A
OUT 11	base address+B	OUT 27	base address + 1B
OUT 12	base address+C	OUT 28	base address + 1C
OUT 13	base address+D	OUT 29	base address + 1D
OUT 14	base address+E	OUT 30	base address + 1E
OUT 15	base address+F	OUT 31	base address + 1F

* Offsets from the base address are in hexadecimal notation.

B. Output Range Selection

The output range is selected is determined by Jumper A. An uninstalled jumper sets the output range for 4 to 6 V and an installed jumper sets the output range for 8 to 10V, respectively.

Potentiometer R2 must be adjusted to select the desired

output voltage for the range selected (e.g., for a value 5V in the range of 4 to 6V). This is performed by writing a FF to an output channel (see next section on Programming) and adjusting R2 for the desired output value. This sets the span or maximum output value of all channels.

C. Programming the Outputs

Output programming is very simple. An I/O write of a byte value to the channel address given in Table 1 will latch the value into the output of the selected channel. The output byte has a value from 0 to FF in hexadecimal. A value of 0 produces an output voltage of 0V. An output value of FF produces an output equal to the range or span value selected. In general, the output is

Output Value = (Output Data/256)*Span

D. Output Connector

The output connections to the output connector J2 are given in Table 2.

Table 2. Outputs of Connector J2.

Channel	J2 Pin No.*	Channel	J2 Pin No.*
OUT 0	1	OUT 16	21
OUT 1	2	OUT 17	22
OUT 2	3	OUT 18	23
OUT 3	4	OUT 19	24
OUT 4	5	OUT 20	25
OUT 5	6	OUT 21	26
OUT 6	7	OUT 22	27
OUT 7	8	OUT 23	28
OUT 8	11	OUT 24	31
OUT 9	12	OUT 25	32
OUT 10	13	OUT 26	33
OUT 11	14	OUT 27	34

OUT 12	15	OUT 28	35
OUT 13	16	OUT 26	36
OUT 14	17	OUT 27	37
OUT 15	18	OUT 28	38

Note: Pins 9, 10, 19, 20, 29, 30, 39 and 40 are commons for channels 0 thru 31.

E. Schematic Diagram