MSI IBM PC
Embedded PC Series

MSI-4020 ANALOG OUTPUT CARD

DESCRIPTION

The MSI-4020 is a 20-channel 12-bit analog output card designed for applications requiring large numbers of outputs for exciting analog output transducers in harsh industrial environments. The card is particularly useful in RTU, SCADA, and monitoring and control applications. The unit is implemented on a 4-layer card using low-power CMOS components for operating in a temperature range of -25° C to 85° C.

The card is jumper configurable for output current drives of either ±15 mA using the onboard ±15VDC power supply, or an output current capacity of ±50 mA using an external ±15VDC power supply for powering the output buffer op-amps. Output ranges are individually jumper selectable as 0-5V, 0-10V, ±5V or ±10V for each channel requiring no potentiometer adjustments. In addition, sites for ten optional resistor pairs are available for user supplied voltage divider networks on these outputs.

The card is I/O addressed using option jumpers for addresses A2-A9 for specifying the card base address. Up to thirty-one cards can be accessed in a PC/AT system at a single base address requiring a total space of only four I/O addresses. Output channels are indirectly addressed using a 16-bit command register to select the card and

FEATURES

♦ Provides up to 20 channels of 12-bit analog outputs for IBM PC/AT or compatible.

♦ Allows to 31 cards (620 channels) using only four I/O addresses in the I/O address space.

♦ Conversion accuracy of ± 1 LSB.

♦ Selectable output ranges of 0-5V, 0-10V, ±5V, and ±10V requiring no potentiometer adjustments. Resistor sites for output voltage dividers on ten channels.

♦ Output currents of ±15 mA from onboard supply. Output currents of ±50 mA using external supply for output buffer op-amps.

♦ Single +5V power supply operation.

♦ Operating temperature range -25°C to 85°C.

♦ Simple software sequences for data output.

♦ Complete hardware documentation with schematics supplied with MSI-4020 User Manual.

♦ Low power CMOS design using a 4-layer printed circuit board.

♦ 100% testing and 48-hour burn-in.

♦ One-year warranty from date of shipment.

channel number and an output register to set the 12-bit output value of the channel specified in the command register.

Card I/O Base Address - The I/O base address can be assigned in the hexadecimal range of 0 to 3FC. The card requires four contiguous bytes for operation from base address to base address+2. The base address is assigned by jumpers on JP1 for address bits A2 thru A9.

Card Select - Up to 31 cards can be accessed in a system by assigning a card select value using jumpers on JP2 to select N0 thru N4.

Command Register - The command register is a write-only register at base address. The format is:

        Channel Select - bits 0 thru 4
        Card Select   - bits 8 thru l2

Ex. - To enable channel 11 on card 21, one would write hexadecimal 150CH to the base address assigned to the cards in the system using JPl.

Output Register - The output register is a write-only register at base address+2. The format is:

        Output Value - bits 0 thru 11

Ex. - To set an output value of half the output range, write hexadecimal 7FF to base address+2.

Output Range Selection - Jumper blocks JP3 thru J22 are for setting the individual channels. The ranges are set on each JPn, n = 3 to 22, as follows:

    0-5V JPn-1/2   0-10V JPn-1/2, 5/6
    ±5V   JPn-3/4   ±10V   JPn-3/4, 5/6

Complete hardware documentation with schematics are supplied with the *MSI-4020 User Manual.*

Models - The MSI-4020 comes in four models as shown.

MSI-4020-8   8 output channels
MSI-4020-12   12 output channels
MSI-4020-16   16 output channels
MSI-4020-20   20 output channels

SPECIFICATIONS

Analog Outputs

Channels	8, 12, 16 or 20
Resolution	12 Bits
Accuracy	±1 LSB maximum
Nonlinearity	±0.9 LSB maximum
Output Offset	±0.006 % of Span
Output Slew Rate	2.0 V/us
Output Ranges	0-5V, 0-10V, ±5V, ±10V Resistor sites for voltage divider on 10 output channels.
Output Current	±15 mA minimum.
	±50 mA minimum with external supply.

Power Consumption

+5V @ 350 mA with outputs unloaded or external ±15VDC supply output op-amps.

+5V @ 3.5A with ±15 mA at each output.

Environmental

Operating Temperature -25° C to 85° C.

Physical Parameters

Size	Full-size PC/AT Card.
Output Connector	3M Type MHR50K

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