MODEL 8008AO

AUDIO OUTPUT CARD

The Model 8008AO Audio Output Card is a component of the IED 8000 Series™. It has eight outputs with balanced line drivers. The outputs can take audio from any of the four unbalanced audio buses.

Each output has a digitally controlled amplifier (DCA) which is controlled by the on-board microcontroller (MCU). These DCAs have an adjustment range of 127 dB in 0.5 dB steps, 31.5 dB gain through 95.5 dB attenuation.

All switching is done under software control. Four buses which run the length of the mother board make it possible to source audio to/from other cards.

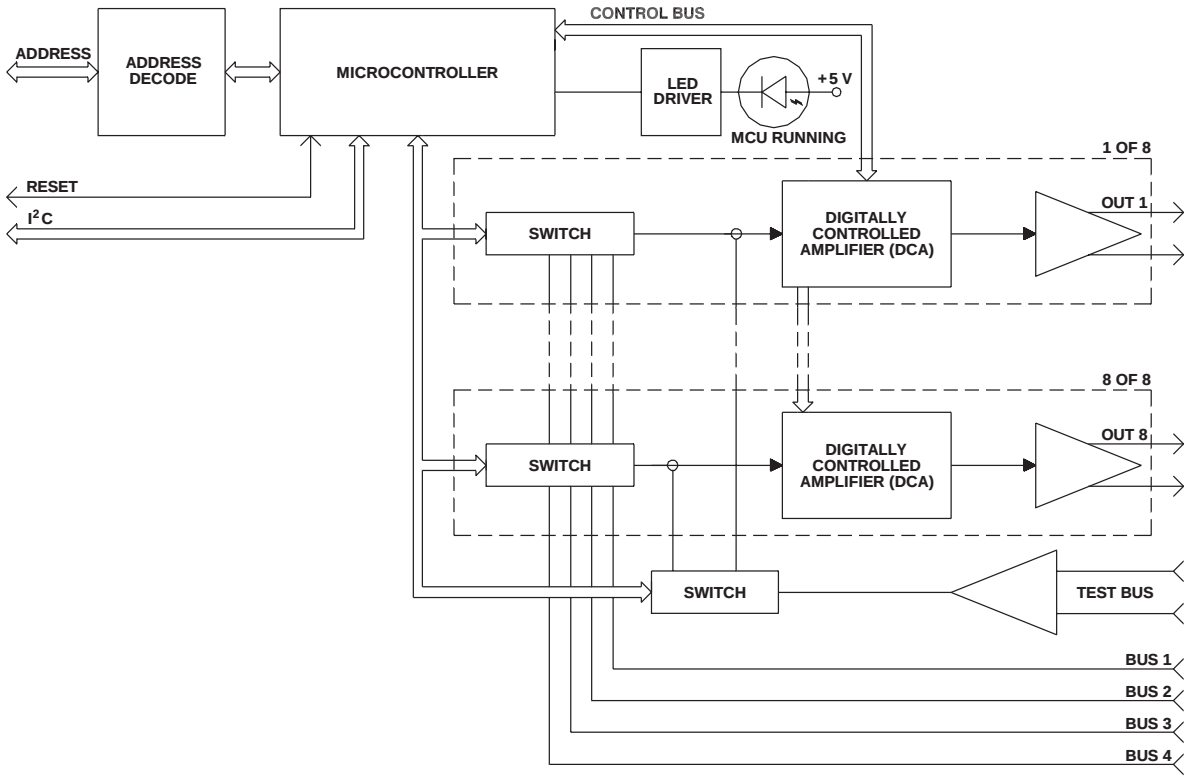

Figure 1 - 8044AO Audio Output Card Block Diagram

An Audio Test Signal Bus with a balanced input can be switched under software control to any output. The test tone will check the DCA, the output, and the MCU. This feature is used in conjunction with 8081MT cards and and the 8001SA card to test audio points in the system with the with the 8000 Monitor/Test System. This feature also allows test tones to be introduced into output zones for testing of amplifier and speaker lines down-stream of this card.

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Also included is an audio detector circuit for each channel with speech-band filters and a level detector circuit. The audio detector is used to trigger events in the 8000 System (for example, to switch this input to a specified output).

The on-board microcontroller communicates with the 8001CPU and the 8001SA through an I^2C bus on the mother board. A reset line from the mother board allows the MCU to be reset from the 8001CPU.

A green LED located on the front edge of the card is illuminated when the MCU is running.

SPECIFICATIONS

ELECTRICAL, ANALOG, V_S = +15 V, –15 V, DCA gain set to +6 dB

1. Frequency Response . . . . . +0, –0.1 dB
20 Hz - 20 kHz
2. Total Harmonic Distortion, THD . . . . . <0.01%
   20 Hz - 20 kHz, 10 Hz - 80kHz filters
3. Intermodulation Distortion, IMD . . . . . <0.03%
   60 Hz/7 kHz
4. Signal-to-Noise Ratio, S/N . . . . . > 90 dB
   Referenced to +4 dBu, 20 - 22 kHz filters
5. Crosstalk . . . . . < –70 dB
   Between any 2 audio paths, 20 Hz - 10 kHz
6. DCA Control
   - Range . . . . . 127 dB
   - Steps . . . . . 0.5 dB
   - Card Max. Gain . . . . . 25.5 dB
   - Card Max. Attenuation . . . . . 105.5 dB
7. Audio Detector Threshold . . . . . –22.5 dBu
   f = 4 kHz
8. Maximum Input Level . . . . . +24 dBu
9. Maximum Output Level . . . . . +24 dBu
   $R_L \int 600\ \tau$
10. Power Supply
    - Supply Voltage Range
      - +15 V Supply . . . . . +14.25 V to +15.75 V
      - – 15 V Supply . . . . . –14.25 V to –15.75 V
    - Supply current
      - V= +15 V
        - No audio input . . . . . 95 mA
        - Audio input = 18 dB, unity gain, R_L = 600 τ . . . . . 100 mA
      - V= –15 V
        - No audio input . . . . . 70 mA
        - Audio input = 18 dB, unity gain, R_L = 600 τ . . . . . 77 mA

INDICATORS

1. MCU running . . . . . Green LED

CONNECTORS

1. 32-pin Euro Connector, male, right-angle (2 each). . . Hirose PCN10-32P-2.54DS

MECHANICAL

1. Size (maximum overall dimensions as viewed from the front)
   - Height. . . . . (11.43 cm) 4.50"
   - Width . . . . . (2.03 cm) 0.80"
   - Depth . . . . . (20.42 cm) 8.04"
2. Weight . . . . . (162 gm) 0.358 lb

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ENVIRONMENTAL

1. Operating Temperature Range . . . . . (+32 °F - +104 °F) 0 °C - +40 °C
2. Storage Temperature Range . . . . . (–40 °F - +158 °F) –40 °C - +70 °C

PIN	FUNCTION	PIN	FUNCTION
1	No Connection	17	No Connection
2	No Connection	18	No Connection
3	No Connection	19	No Connection
4	No Connection	20	No Connection
5	No Connection	21	No Connection
6	Ground	22	Ground
7	+30 V External Supply In	23	+30 V External Supply In
8	Ground	24	Ground
9	Ground	25	Ground
10	Control 4 In +	26	Control 4 In –
11	Control 4 Shield	27	Control 3 Shield
12	Control 3 In +	28	Control 3 In –
13	Ground	29	Ground
14	Control 2 In +	30	Control 2 –
15	Control 2 Shield	31	Control 1 Shield
16	Control 1 +	32	Control 1 In –

Table 1 - Pin Connections, Upper Euro Connector

PIN	FUNCTION	PIN	FUNCTION
1	Address Line 4	17	Address Line 3
2	Address Line 2	18	Address Line 1
3	Address Line 0	19	I^2C Bus Interrupt Line (Inverted)
4	I^2C Serial Data	20	I^2C Serial Clock
5	+5 V	21	Master Reset Line
6	–15 V	22	–15 V
7	+15 V	23	+15 V
8	Spare 2	24	Spare 3
9	Ground	25	Ground
10	Ground	26	Ground
11	Ground	27	Ground
12	Audio Test Bus +	28	Audio Test Bus –
13	Audio Monitor Bus +	29	Audio Monitor Bus –
14	Audio Test Signal Bus +	30	Audio Test Signal Bus –
15	Internal Audio Routing Bus 2	31	Internal Audio Routing Bus 1
16	Internal Audio Routing Bus 3	32	Internal Audio Routing Bus 4

Table 2 - Pin Connections, Lower Euro Connector

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