DATEL

HDAS-16, HDAS-8

12-Bit Microelectronic Data Acquisition Systems

T-51-07-01

FEATURES

- **Miniature 63-pin hermetic package**
- **12-Bit resolution, 50 KHz**
- **Full-scale gain range of 50 mV to 10V**
- **Three-state outputs**
- **16 Channels single-ended or 8 channels differential**
- **Auto-sequencing channel addressing**
- **MIL-STD-883 versions**
- **No missing codes**

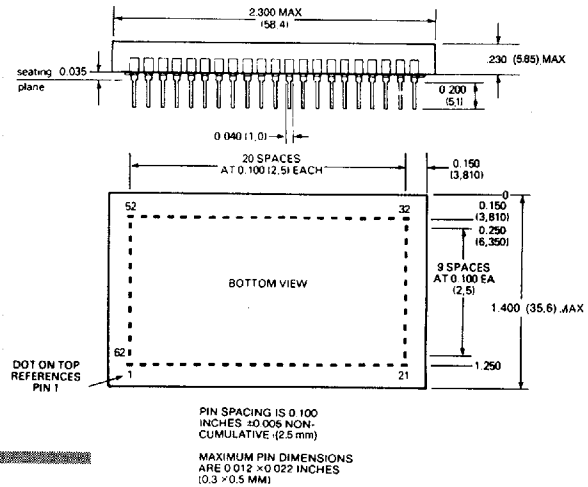
GENERAL DESCRIPTION

Using thin-and thick-film hybrid technology, DATEL offers complete low-cost data acquisition systems with superior performance and reliability.

The HDAS-8 (with 8 differential input channels), and the HDAS-16 (with 16 single-ended input channels), are complete high performance 12-bit data acquisition systems in 62-pin packages. Each HDAS may expand to 32 single-ended or 16 or more differential channels by adding external multiplexers.

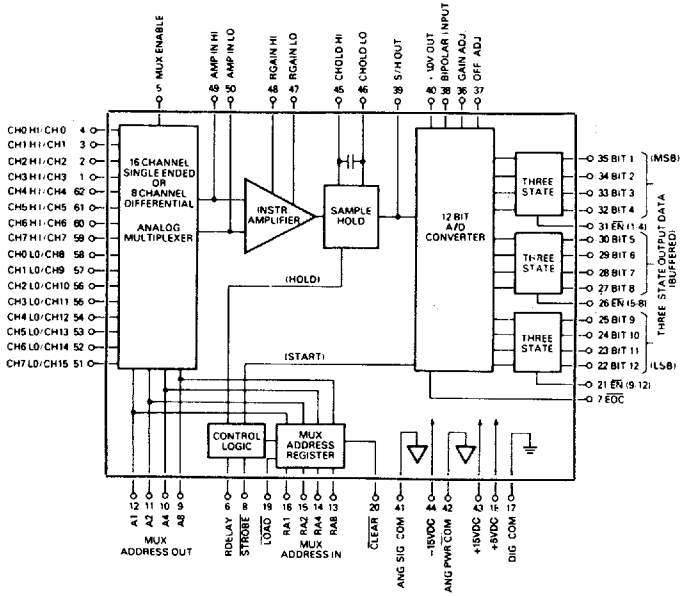
Internal channel address sequencing is automatic after each conversion, or the user may supply external channel addresses.

MECHANICAL DIMENSIONS — INCHES (MM)



PIN SPACING IS 0.100 INCHES ±0.005 NON-CUMULATIVE (2.5 mm)

MAXIMUM PIN DIMENSIONS ARE 0.012 ×0.022 INCHES (0.3 ×0.5 MM)



Internal HDAS circuitry includes:

- **Analog signal multiplexer**
- **Resistor programmable gain instrumentation amplifier**
- **A sample-and-hold-circuit, complete with MOS hold capacitor**
- **A 10 volt buffered reference**
- **A 12-bit A/D converter with three-state outputs and control logic**

ABSOLUTE MAXIMUM RATINGS			
Parameters	Min.	Max.	Units
+15V Supply (Pin 43)	−0.5	+18	Volts dc
−15V Supply (Pin 44)	+0.5	−18	Volts dc
+5V Supply (Pin 18)	−0.5	+7	Volts dc
Analog Inputs (Note 1)	−35	+35	Volts
Digital Inputs	−0.5	+7	Volts
Thermal Resistance			
Junction-Case		13	°C/Watt
Case-Ambient		17	°C/Watt
Junction-Ambient		30	°C/Watt
Power Dissipation		1.75	Watts
Lead Temp. (10 Sec.)		300	°C

FUNCTIONAL SPECIFICATIONS

The following specifications apply over the operating temperature range and power supply range unless otherwise indicated.

ANALOG INPUTS	MIN.	TYP.	MAX.	UNITS
Signal Range				
Unipolar				
Gain = 1	0	—	+10	Volts
Gain = 200	0	—	+50	mV
Bipolar				
Gain = 1	−10	—	+10	Volts
Gain = 200	−50	—	+50	mV
Input Gain Equation (Note 2)	Gain = 1 + (20K Ohm/RGAIN)			
Gain Equation Error	—	—	±0.1	%
Instrumentation Amp.				
Input Impedance	10^8	10^{12}	—	Ohms
Input Bias Current:				
0°C to +70°C	—	—	±250	pA
−55°C to +125°C	Doubles every 10°C above 70°C			
Input Offset Current:				
0°C to +70°C	—	—	±1	nA
−55°C to +125°C	Doubles every 10°C above 70°C			
Multiplexer				
Channel ON Resistance	—	—	2.0	K Ohms
Channel OFF Input Leakage	—	30	—	pA
Channel OFF Output Leakage	—	1.0	—	nA
Channel ON Leakage	—	100	—	pA
Input Capacitance				
HDAS-16, Channel On	—	100	—	pF
HDAS-8, Channel On	—	50	—	pF
+25°C, Channel Off	—	5	—	pF
Input Offset Voltage				
Gain = 1 to 200, +25°C	—	—	±2	mV
−55°C to +125°C	± (30ppm/°C × Gain) ppm/°C (max)		±20	
Common Mode Range	±11	—	—	Volts
CMRR, Gain = 1, at 60 Hz	−70	−82	—	dB
Input Voltage Noise (Referred to input)				
Gain = 1	—	150	200	µV RMS
Channel Crosstalk	−80	—	—	dB
PERFORMANCE				
Resolution	12	—	—	Bits
Integral Nonlinearity:				
+25°C	—	—	±¾	LSB
0°C to 70°C	—	—	±1	LSB
−55°C to +125°C	—	—	±1	LSB

PERFORMANCE (cont.)	MIN.	TYP.	MAX.	UNITS
Differential Nonlinearity:				
+25°C	—	—	±¾	LSB
0°C to 70°C	—	—	±1	LSB
−55°C to +125°C	—	—	±1	LSB
Differential Nonlinearity Tempco	—	—	±2	ppm/°C
Unipolar Zero Error				
+25°C (Note 3)	—	—	±0.1	%FSR
−55°C to +125°C	—	—	±0.3	%FSR
Unipolar Zero Tempco	—	—	±20	ppm/°C
Bipolar Zero Error				
±25°C (Note 3)	—	—	+0.1	%FSR
−55°C to +125°C	—	—	±0.3	%FSR
Bipolar Zero Tempco	—	—	±35	ppm/°C
Bipolar Offset Error				
+25°C (Note 3)	—	—	0.1	%FSR
−55°C to +125°C	—	—	0.3	%FSR
Bipolar Offset Tempco	—	—	±35	ppm/°C
Gain Error				
+25°C (Note 3)	—	—	±0.2	%FSR
−55°C to +125°C	—	—	±0.3	%FSR
Gain Error Tempco	—	—	±30	ppm/°C
No Missing Codes	Over the operating temperature range			
DYNAMIC CHARACTERISTICS				
Acquisition Time,				
At Gain = 1, +25°C	—	9	10	µSec.
−55°C to +125°C	—	—	15	µSec.
At Gain = 10, +25°C	—	9	—	µSec.
At Gain = 50, +25°C	—	16	—	µSec.
At Gain = 200, +25°C	—	60	—	µSec.
Aperture Delay Time	—	100	500	nSec.
Aperture Uncertainty	—	—	1	nSec.
S/H Droop Rate	—	—	800	mV/Sec.
Feedthrough Accuracy	—	—	±0.01	%
A/D Conversion Time:				
+25°C	—	9	10	µSec.
−55°C to +125°C	—	—	15	µSec.
Throughput Rate				
+25°C	50	55	—	KHz
−55°C to +125°C	33	—	—	KHz
DIGITAL INPUTS				
Logic Levels: (Pins 5, 8, 13, 14, 15, 16, 19, and 20)				
Logic 1	2.0	—	5.5	Volts
Logic 0	0	—	0.8	Volts
(Pins 21,26, 31)				
Logic 1	2.0	—	5.5	Volts
Logic 0	0	—	0.7	Volts
Logic Loading: (Pins 5, 8, 13, 14, 15, 16, 19, and 20)				
Logic 1	—	—	1	µA
Logic 0	—	—	−280	µA
(Pins 21, 26, 31)				
Logic 1	—	—	20	µA
Logic 0	—	—	−0.40	mA
Multiplexer Address Set-up Time	20	—	—	nSec.
Enable to Data Valid Delay	—	20	30	nSec.
$\overline{\text{STROBE}}$ (Note 4)	40	—	—	nSec.

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OUTPUTS	MIN.	TYP.	MAX.	UNITS
Logic Levels:				
(Pin 7 & Output Data)				
Logic 1	2.4	—	—	Volts
Logic 0	—	—	0.4	Volts
(Pins 9, 10, 11, and 12)				
Logic 1	4.4	—	—	Volts
Logic 0	—	—	0.1	Volts
Logic Loading:				
Logic 1	—	—	400	µA
Logic 0	—	—	4	mA
Internal Reference:				
Voltage, +25°C	+9.99	+10.00	+10.01	Volts dc
Drift	—	—	±20	ppm/°C
External current	—	—	1	mA
Data Output Coding	Straight binary (unipolar) or offset binary (bipolar)			
POWER REQUIREMENTS				
Power Supply Range:				
+15V dc Supply	+14.5	+15.0	+15.5	Volts dc
−15V dc Supply	−14.5	−15.0	−15.5	Volts dc
+5 dc Supply	+4.75	+5.0	+5.25	Volts dc
Supply Current:				
+15V Supply	—	—	+40	mA
−15V Supply	—	—	−45	mA
+5V Supply	—	—	+95	mA
Power Dissipation	—	1.45	1.75	Watts
PHYSICAL — ENVIRONMENTAL				
Operating Temperature Range:				
MC Models	0	—	+70	deg. C
MM/883B Models	−55	—	+125	deg. C
Storage Temperature Range:	−65	—	+150	deg. C
Weight		1.4(39.7)		oz. (gram)
Package Type	62-pin hermetically sealed Ceramic DIP			
Pin Type	0.010 x 0.018 in. Kovar			

SPECIFICATION NOTES

1. Analog inputs will withstand ±35 volts with power on. If the power is off, the maximum safe input (no damage) is ±20 volts.
2. The gain equation error is guaranteed before external trimming and applies at gains under 50. This error increases at gains over 50.
3. Adjustable to zero.
4. $\overline{\text{STROBE}}$ pulse width must be smaller than $\overline{\text{EOC}}$ period to achieve maximum throughput rate.

TECHNICAL NOTES

1. Input channels are protected to 20 volts beyond the power supplies. All digital output pins have one second short circuit protection; CHOLD has a ten second short circuit protection.
2. To retain high system throughput rate while digitizing low level signals, apply external high-gain amplifiers for each channel. Datel's AM-551 is suggested for such amplifier-per-channel applications.
3. The HDAS devices have self-starting circuits for free-running sequential operation. If, however, in a power-up condition the supply voltage slew rate is less than 3V per microsecond, the free running state might not be initialized. Apply a negative pulse to the $\overline{\text{STROBE}}$, to eliminate this condition.
4. For unipolar operation, connect BIPOLAR INPUT (pin 38) to S/H OUT (pin 39). For bipolar operation, connect BIPOLAR INPUT (pin 38) to +10V REFERENCE OUT (pin 40).
5. RDELAY may be a standard value 5% carbon composition or film type resistor.
6. RGAIN must be very accurate with low temperature coefficients. If necessary, fabricate the gain resistor from a precision metal film type in series with a low value trim resistor or potentiometer. The total resistor temperature coefficient must be no greater than ± 10 ppm/°C.

PIN CONNECTIONS

PIN NO.	HDAS-16	HDAS-8
1	CH3 IN	CH3 HIGH IN
2	CH2 IN	CH2 HIGH IN
3	CH1 IN	CH1 HIGH IN
4	CH0 IN	CH0 HIGH IN
5	MUX ENABLE	*
6	R DELAY	*
7	$\overline{\text{EOC}}$	*
8	$\overline{\text{STROBE}}$	*
9	A8 MULTIPLEXER	*
10	A4 ADDRESS	*
11	A2 OUT	*
12	A1	*
13	RA8 MULTIPLEXER	*
14	RA4 ADDRESS	*
15	RA2 IN	*
16	RA1	*
17	DIGITAL COMMON	*
18	+5V dc	*
19	$\overline{\text{LOAD ENABLE}}$	*
20	$\overline{\text{CLEAR ENABLE}}$	*
21	$\overline{\text{ENABLE}}$ (Bits 9–12)	*
22	BIT 12 OUT (LSB)	*
23	BIT 11 OUT	*
24	BIT 10 OUT	*
25	BIT 9 OUT	*
26	$\overline{\text{ENABLE}}$ (Bits 5–8)	*
27	BIT 8 OUT	*
28	BIT 7 OUT	*
29	BIT 6 OUT	*
30	BIT 5 OUT	*
31	$\overline{\text{ENABLE}}$ (Bits 1–4)	*
32	BIT 4 OUT	*
33	BIT 3 OUT	*
34	BIT 2 OUT	*
35	BIT 1 OUT (MSB)	*
36	GAIN ADJUST	*
37	OFFSET ADJUST	*
38	BIPOLAR INPUT	*
39	SAMPLE/HOLD OUT	*
40	+10V OUT	*
41	ANALOG SIGNAL COMMON	*
42	ANALOG POWER COMMON	*
43	+15V dc	*
44	−15V dc	*
45	C HOLD HIGH	*
46	C HOLD LOW	*
47	R GAIN LOW	*
48	R GAIN HIGH	*
49	AMP. IN HIGH[1]	*
50	AMP. IN LOW[1]	*
51	CH15 IN	CH7 LOW IN
52	CH14 IN	CH6 LOW IN
53	CH13 IN	CH5 LOW IN
54	CH12 IN	CH4 LOW IN
55	CH11 IN	CH3 LOW IN
56	CH10 IN	CH2 LOW IN
57	CH9 IN	CH1 LOW IN
58	CH8 IN	CH0 LOW IN
59	CH7 IN	CH7 HIGH IN
60	CH6 IN	CH6 HIGH IN
61	CH5 IN	CH5 HIGH IN
62	CH4 IN	CH4 HIGH IN

* Same as HDAS-16

1. Caution: pins 49 and 50 do not have overvoltage protection; therefore, protected multiplexers, such as DATEL's MX-1606 an MX-808 are recommended. See the General Operation description.

Table 1. Description of Pin Functions

FUNCTION	LOGIC STATE	DESCRIPTION
DIGITAL INPUTS		
$\overline{\text{STROBE}}$	1 to 0	Initiates acquisition and conversion of analog signal
$\overline{\text{LOAD}}$	0	Random Address Mode Initiated on falling edge of $\overline{\text{STROBE}}$
	1	Sequential Address Mode
$\overline{\text{CLEAR}}$	0	Allows next $\overline{\text{STROBE}}$ pulse to reset MULTIPLEXER ADDRESS to CH0 overriding $\overline{\text{LOAD}}$ COMMAND
MULTIPLEXER ENABLE	0	Disables internal MULTIPLEXER
	1	Enables internal MULTIPLEXER
MULTIPLEXER ADDRESS IN		Selects channel for Random Address Mode 8, 4, 2, and 1 natural binary coding
DIGITAL OUTPUTS		
$\overline{\text{EOC}}$		End of Conversion (STATUS)
	0	Conversion complete
	1	Conversion in process
$\overline{\text{ENABLE}}$ (1–4)	0	Enables three-state outputs bits 1–4
	1	Disables three-state outputs bits 1–4
$\overline{\text{ENABLE}}$ (5–8)	0	Enables three-state outputs bits 5–8
	1	Disables three-state outputs bits 5–8
$\overline{\text{ENABLE}}$ (9–12)	0	Enables three-state outputs bits 9–12
	1	Disables three-state outputs bits 9–12
MULTIPLEXER ADDRESS OUT		Output of MULTIPLEXER Address Register 8, 4, 2, 1 natural binary coding
ANALOG INPUTS		
Channel Inputs		Limit voltage to ±20V beyond power supplies.
Bipolar Input		For unipolar operation, connect to pin 39 (S/H OUT) For biploar operation, connect to pin 40 (+10V OUT)
AMP. IN HIGH AMP. IN LOW		These pins are direct inputs to the instrumentation amplifier for external channel expansion beyond 16SE or 8D channels.
ANALOG OUTPUTS		
S/H OUT		Sample/Hold Output
+10V OUT		Buffered +10V reference output
ADJUSTMENT PINS		
ANALOG SIGNAL COMMON		Low level analog signal return
GAIN ADJUSTMENT		External gain adjustment, see calibration instructions.
OFFSET ADJUSTMENT		External offset adjustment. See calibration instructions.
R GAIN		Optional gain selection point. Factory adjusted for G = 1 when left open.
C HOLD		Optional hold capacitor connection.
R DELAY		Optional acquisition time adjustment when connected to +5V, factory adjusted for 9 μSec. Must be connected to +5V either directly or through a resistor.

7. ANALOG SIGNAL COMMON, POWER COMMON, and DIGITAL COMMON are connected internally. Avoid ground-related problems by connecting the commons to one point . . . the ground plane beneath the converer when the above special grounding considerations do not apply.

8. For HDAS-16, tie pin 50 to a "signal source common" if possible. Otherwise tie pin 50 to pin 41 (ANA SIGN COM).

Table 2. Calibration Table

UNIPOLAR RANGE	ADJUST	INPUT VOLTAGE
0 TO +5V	ZERO	+0.6 mV
	GAIN	+4.9982V
0 TO +10V	ZERO	+1.2 mV
	GAIN	+9.9963V
BIPOLAR RANGE		
±2.5V	OFFSET	−2.4994V
	GAIN	+2.4982V
±5V	OFFSET	−4.9988V
	GAIN	+4.9963V
±10V	OFFSET	−9.9976V
	GAIN	+9.9927V

CALIBRATION PROCEDURES

1. Offset and gain adjustments are made by connecting two 20K trim potentiometers as shown in Figure 1.
2. Connect a precision voltage source to pin 4 (CH0 IN). If the HDAS-8 is used, connect pin 58 (CH0 LOW IN) to analog ground. Ground pin 20 ($\overline{\text{CLEAR}}$) and momentarily short pin 8 ($\overline{\text{STROBE}}$). Trigger the A/D by connecting pin 7 ($\overline{\text{EOC}}$) to pin 8 ($\overline{\text{STROBE}}$). Select proper value for RGAIN and RDELAY by referring to Table 3.
3. Adjust the precision voltage source to the value shown in Table 2 for the unipolar zero adjustment (ZERO + ½ LSB) or the bipolar offset adjustment (−FS + ½ LSB). Adjust the offset trim potentiometer so that the output code flickers equally between 0000 0000 0000 and 0000 0000 0001.
4. Change the output of the precision voltage source to the value shown in Table 2 for the unipolar or bipolar gain adjustment (+FS − 1½ LSB). Adjust the gain trim potentiometer so that the output flickers equally between 1111 1111 1110 and 1111 1111 1111.

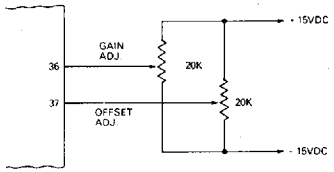

Figure 1. External Adjustment

GENERAL OPERATION

The HDAS devices accept either 16 single-ended or 8 differential input signals. For single-ended circuits, the AMP IN LOW (pin 50) input to the instrumentation amplifier must terminate at ANALOG SIGNAL COMMON (pin 41). For differential circuits, both the HIGH and LOW signal inputs must terminate externally for each channel. Tie unused channels to the ANALOG SIGNAL COMMON (pin 41). To obtain additional channels, connect external multiplexers to the AMP IN HIGH (pin 49) and AMP IN LOW (pin 50). Using this scheme, the HDAS-16 can provide 32 single-ended expansion channels while the HDAS-8 can provide up to 16 differential expansion channels. DATEL multiplexer MX-1606 is recommended.

The acquisition time is the amount of time the multiplexer, instrumentation amplifier, and Sample/Hold require to settle within a specified range of accuracy after $\overline{\text{STROBE}}$ (pin 8) goes low. The acquisition time period can be observed by measuring how long $\overline{\text{EOC}}$ is low after the falling edge of $\overline{\text{STROBE}}$ (see

Table 3. Input Range Parameters (Typical)

INPUT RANGE	GAIN	RGAIN (Ω)	ACQUISITION AND SETTLING DELAY	RDELAY (Ω)	THROUGHPUT	SYSTEM ACCURACY (%of FSR)
±10V	1	OPEN	9 μSec.	0 (SHORT)	55.5 KHz	0.009%
±5V	2	20.0K	9 μSec.	0 (SHORT)	55.5 KHz	0.009%
±2.5V	4	6.667K	9 μSec.	0 (SHORT)	55.5 KHz	0.009%
±1V	10	2.222K	9 μSec.	0 (SHORT)	55.5 KHz	0.009%
±200 mV	50	408.2	16 μSec.	7K	40.0 KHz	0.010%
±100 mV	100	202.0	30 μSec.	21K	25.6 KHz	0.011%
±50 mV	200	100.5	60 μSec.	51K	14.5 KHz	0.016%

NOTES

$$RGAIN\ (\Omega) = \frac{20{,}000}{(GAIN-1)} \qquad RDELAY\ (\Omega) = \frac{(Delay\ \mu sec. \times 1000)}{} - 9000$$

1. For gains between 1 and 10, RDELAY (pin 6) must be shorted to +5V (pin 18).
2. Throughput period equals Acquisition and Settling Delay, plus A/D conversion period (10 microseconds maximum).
3. The analog input range to the A/D converter is 0 to +10V for unipolar signals, and −10.0V to +10.0V for bipolar signals.
4. Full-scale can be accommodated for analog signal ranges of ±50mv to ±10V.

Figure 2). For higher gains increase the acquisition time. Do this by connecting a resistor from RDELAY (pin 6) to +5V (pin 18). An external resistor RGAIN, can be added to increase the gain value. The gain is equal to 1 without an RGAIN resistor. Table 3 refers to the appropriate RDELAY and RGAIN resistors required for various gains.

The HDAS devices enter the hold mode and are ready for conversion as soon as the one-shot (controlling acquisition time) times out. An internal clock is gated ON, and start-convert pulse is sent to the 12-bit A/D converter, driving the EOC output high.

The HDAS devices can be configured for either bipolar or unipolar operation (see Table 2). The conversion is complete within a maximum of 10 microseconds. The EOC now returns low, the data is valid and sent to the three-state output buffers. The sample/hold amplifier is now ready to acquire new data. The next falling edge of the STROBE pulse repeats the process for the next conversion.

Table 4. Output Coding

	UNIPOLAR		STRAIGHT BINARY
	0 to +10V	0 to +5V	
+FS − 1 LSB	+9.9976	+4.9988	1111 1111 1111
+½FS	+5.0000	+2.5000	1000 0000 0000
+1 LSB	+0.0024	+0.0012	0000 0000 0001
ZERO	0.0000	0.0000	0000 0000 0000

	BIPOLAR		OFFSET BINARY*
	±10 V	±5V	
+FS − 1 LSB	+9.9951	+4.9976	1111 1111 1111
+½FS	+5.0000	+2.5000	1100 0000 0000
+1 LSB	+0.0049	+0.0024	1000 0000 0001
ZERO	0.0000	0.0000	1000 0000 0000
−FS + 1 LSB	−9.9951	−4.9976	0000 0000 0001
−FS	−10.000	−5.0000	0000 0000 0000

*For 2's complement — add inverter to MSB line.

MULTIPLEXER ADDRESSING

The HDAS devices can be configured in either random or sequential addressing modes. Refer to Table 5 and the subsequent descriptions. The number of channels sequentially addressed can be truncated using the MUX ADDRESS OUT (pins 9, 10, 11 and 12) and appropriate decoding circuitry for the highest channel desired. The decoding circuit can drive the CLEAR (pin 20) function low to reset the addressing to channel 0.

RANDOM ADDRESS

Set pin 19 (LOAD) to logic 0. The next falling edge of STROBE will load the MUX CHANNEL ADDRESS present on pin 13 to pin 16. Digital address inputs must be stable 20 nanoseconds before and after falling edge of STROBE pulse.

FREE RUNNING SEQUENTIAL ADDRESS

Set pin 19 (LOAD) and pin 20 (CLEAR) to logic 1 or leave open. Connect pin 7 (EOC) to pin 8 (STROBE). The falling edge of EOC will increment channel address. This means that when the EOC is low, the digital output data is valid for the previous channel (CHn −1) than the channel indicated on MUX ADDRESS OUTPUT. The HDAS will continually scan all channels.

Example:

CH4 has been addressed and a conversion takes place. The EOC goes low. That channel's data becomes valid, but MUX ADDRESS CODE is now CH5.

TRIGGERED SEQUENTIAL ADDRESS

Set pin 19 (LOAD) and pin 20 (CLEAR) to logic 1 or leave open. Apply a falling edge trigger pulse to pin 8 (STROBE). This negative transition causes the contents of the address counter to be incremented by one, followed by an A/D conversion in 9 microseconds.

Table 5. Mux Channel Addressing

← MUX ADDRESS → PIN 9 RA8	10 RA4	11 RA2	12 RA1	5 MUX ENAB.	ON CHANNEL	
X	X	X	X	0	NONE	
0	0	0	0	1	0	
0	0	0	1	1	1	
0	0	1	0	1	2	
0	0	1	1	1	3	
0	1	0	0	1	4	
0	1	0	1	1	5	
0	1	1	0	1	6	HDAS-8 (3-BIT ADDRESS)
0	1	1	1	1	7	
1	0	0	0	1	8	
1	0	0	1	1	9	
1	0	1	0	1	10	
1	0	1	1	1	11	
1	1	0	0	1	12	
1	1	0	1	1	13	
1	1	1	0	1	14	HDAS-16 (4-BIT ADDRESS)
1	1	1	1	1	15	

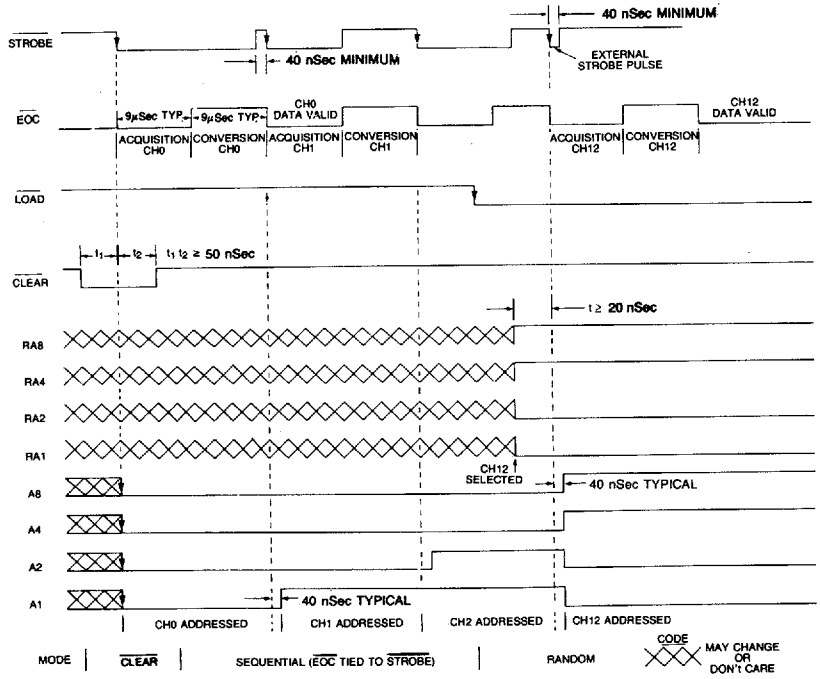

Figure 2. HDAS Timing Diagram

INPUT VOLTAGE PROTECTION

As shown in Figure 3, the multiplexer has reversed biased diodes which protect the input channels from being damaged by overvoltage signals. The HDAS input channels are protected up to 20V beyond the supplies and can be increased by adding series resistors (Ri) to each channel. The input resistor must limit the current flowing through the protection diodes to 10 mA.

The value of Ri for a specific voltage protection range (Vp) can be calculated by the following formula:

$$Vp = (R_{signal} + Ri + Ron)\ (10\ mA)$$

where $R_{ON} = 2K$

NOTE: Increased input series resistance will increase multiplexer settling time significantly.

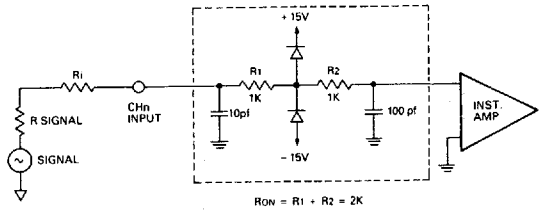

Figure 3. Multiplexer Equivalent Circuit

ORDERING INFORMATION

MODEL	OPERATING TEMP. RANGE
HDAS-16MC	0°C to + 70°C
HDAS-16MM	−55°C to + 125°C
HDAS-16/883B	−55°C to + 125°C
HDAS-8MC	0°C to + 70°C
HDAS-8MM	−55°C to + 125°C
HDAS-8/883B	−55°C to + 125°C

Receptacle for PC board mounting can be ordered through AMP Incorporated, #3-331272-4 (component lead spring socket) 62 required.

/883B Models are fully compliant to MIL-STD-883.