

ADC-HX, ADC-HZ Series

12-Bit, 8 and 20µsec Analog-to-Digital Converters

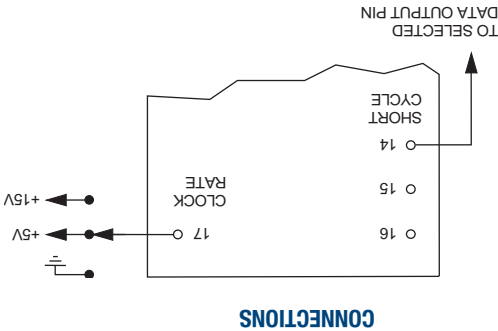
CODING TABLES

UNIPOLAR OPERATION		
INPUT RANGE		COMP. BINARY CODING
0 TO +10V	0 TO +5V	MSB
		LSB
+9.9976V	+4.9988V	0000 0000 0000
+8.7500	+4.3750	0001 1111 1111
+7.5000	+3.7500	0011 1111 1111
+5.0000	+2.5000	0111 1111 1111
+2.5000	+1.2500	1011 1111 1111
+1.2500	+0.6250	1101 1111 1111
+0.0024	+0.0012	1111 1111 1110
0.0000	0.0000	1111 1111 1111

BIPOLAR OPERATION					
INPUT VOLTAGE RANGE			COMP. OFFSET BINARY		
+10V	+5V	+2.5V	MSB	LSB	COMP. TWO'S COMPLEMENT
+9.9951V	+4.9976V	+2.4988V	0000 0000 0000	1000 0000 0000	
+7.5000	+3.7500	+1.8750	0001 1111 1111	1001 1111 1111	
+5.0000	+2.5000	+1.2500	0011 1111 1111	1011 1111 1111	
0.0000	0.0000	0.0000	0111 1111 1111	1111 1111 1111	
-5.0000	-2.5000	-1.2500	1011 1111 1111	0011 1111 1111	
-7.5000	-3.7500	-1.8750	1101 1111 1111	0101 1111 1111	
-9.9951	-4.9976	-2.4988	1111 1111 1110	0111 1111 1110	
-10.0000	-5.0000	-2.5000	1111 1111 1111	0111 1111 1111	

Refer to Technical Note 4 for methods of reducing the ADC-HX or ADC-HZ conversion times.

SHORT CYCLE OPERATION



CLOCK RATE VS. VOLTAGE		
PIN 17 VOLTAGE	ADC-HX	ADC-HZ
	CLOCK RATE	CLOCK RATE
0V	600KHZ	1.5MHZ
+5V	720KHZ	1.8MHZ
+15V	880KHZ	2.2MHZ

PIN 14 CONNECTION			
RES. (BITS)	PIN 14 TO	RES. (BITS)	PIN 14 TO
1	PIN 11	7	PIN 5
2	PIN 10	8	PIN 4
3	PIN 9	9	PIN 3
4	PIN 8	10	PIN 2
5	PIN 7	11	PIN 1
6	PIN 6	12	PIN 16

8, 10 & 12-BIT CONVERSION TIMES			
RESOLUTION	12 BITS	10 BITS	8 BITS
ADC-HX Conversion Time	20µs	15µs	10µs
ADC-HZ Conversion Time	8µs	6µs	4µs
Connect These Pins Together		14 & 16	14 & 4
		17 & 15	17 & 28

INPUT CONNECTIONS							
WITHOUT BUFFER				WITH BUFFER			
INPUT VOLTAGE RANGE	INPUT PIN	CONNECT THESE PINS TOGETHER		INPUT PIN	CONNECT THESE PINS TOGETHER		
0 to +5V	24	22 & 25	23 & 26	30	22 & 25	23 & 26	29 & 24
0 to +10V	24	—	23 & 26	30	—	23 & 26	29 & 24
±2.5V	24	22 & 25	23 & 22	30	22 & 25	23 & 22	29 & 24
±5V	24	—	23 & 22	30	—	23 & 22	29 & 24
±10V	25	—	23 & 22	30	—	23 & 22	29 & 25

Figure 3. Bipolar Operation, -5 to +5V

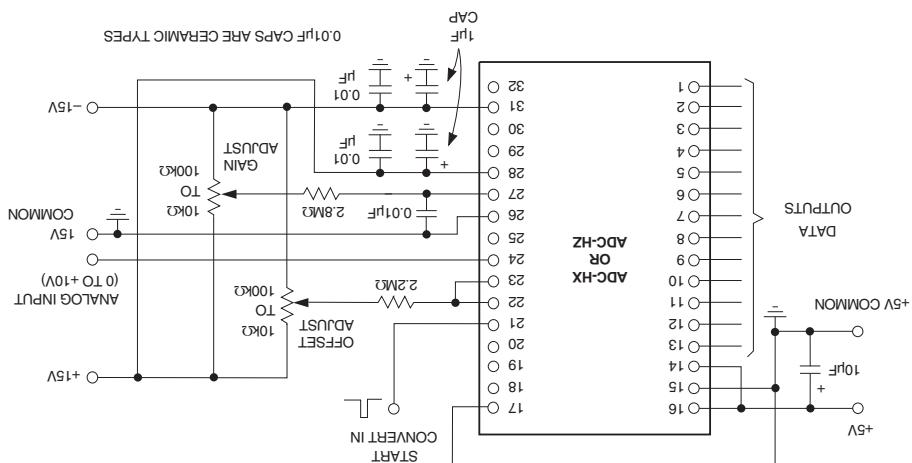
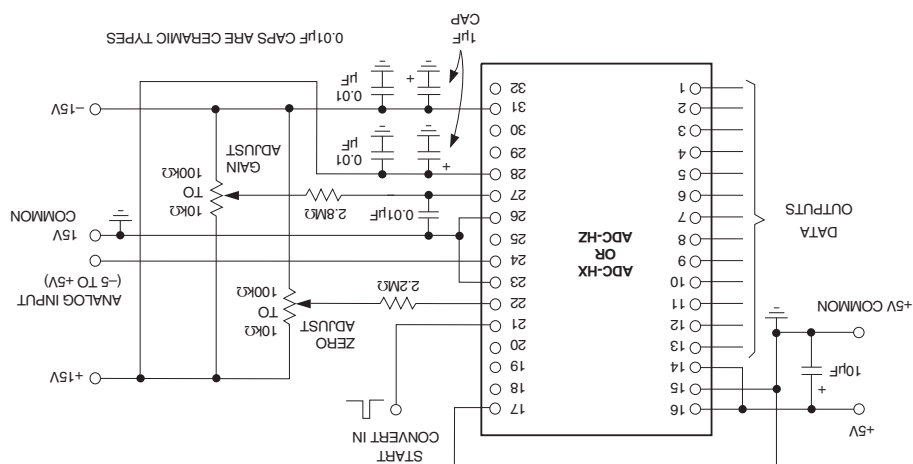


Figure 2. Unipolar Operation, 0 to +10V



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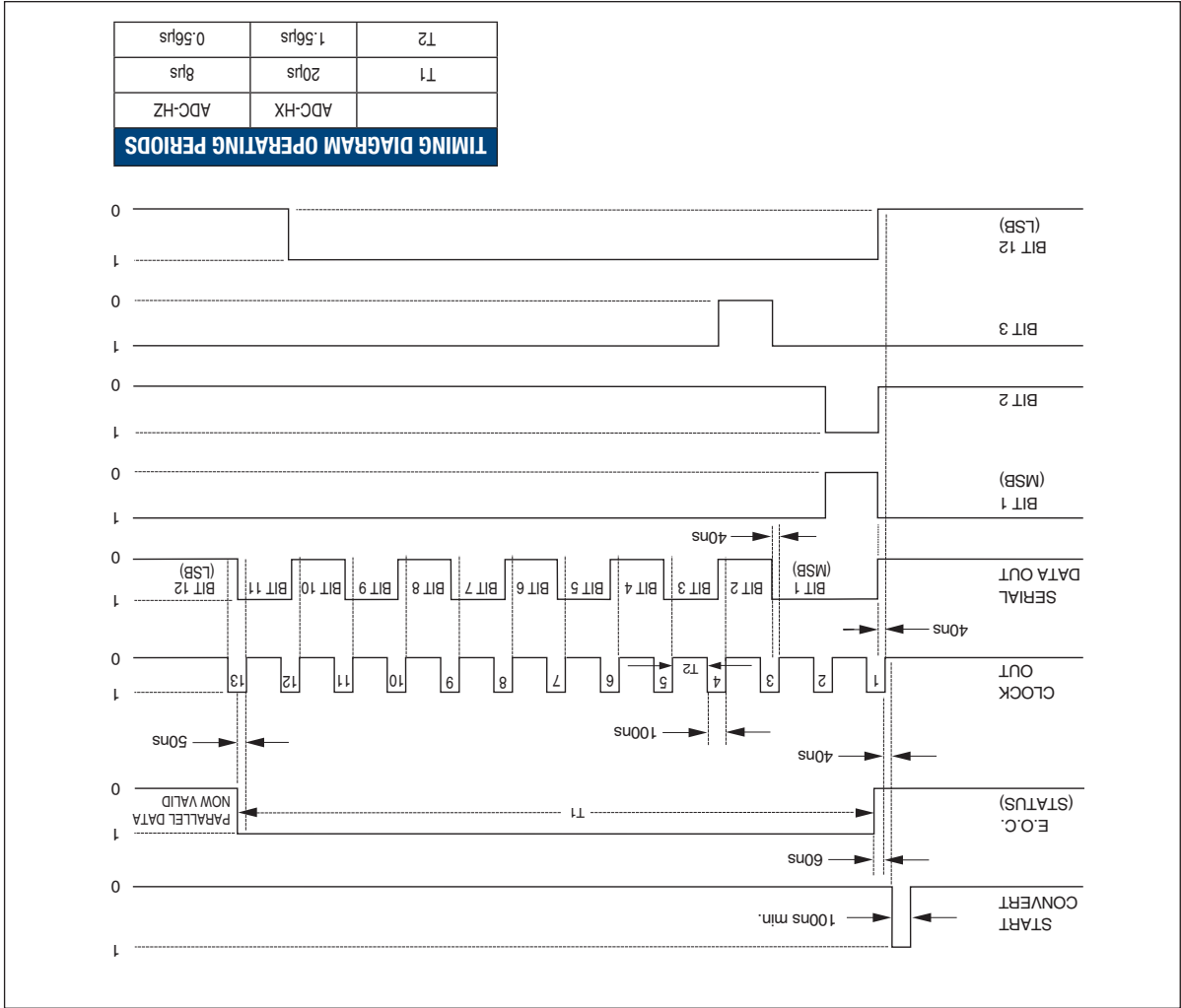
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CALIBRATION PROCEDURE

1. Connect the converter for bipolar or unipolar operation.
Use the input connection table for the desired input voltage range and input impedance. Apply START CONVERT pulses of 100 nanoseconds minimum duration to pin 21. The spacing of the pulses should be no less than the maximum conversion time.
2. Zero and Offset Adjustments
Apply a precision voltage reference source between the selected analog input and ground. Adjust the output of the reference source to the value shown in the Calibration Table for the unipolar zero adjustment (zero + 1/2LSB) or the bipolar offset adjustment (–FS + 1/2LSB). Adjust the trimming potentiometer so that the output code flickers equally between 1111 1111 1111 and 1111 1111 1110.
3. Full Scale Adjustment
Change the output of the precision voltage reference source to the value shown in the Calibration Table for the unipolar or bipolar gain adjustment (+FS – 1.5LSB). Adjust the gain trimming potentiometer so that the output code flickers equally between 0000 0000 0000 and 0000 0000 0000.

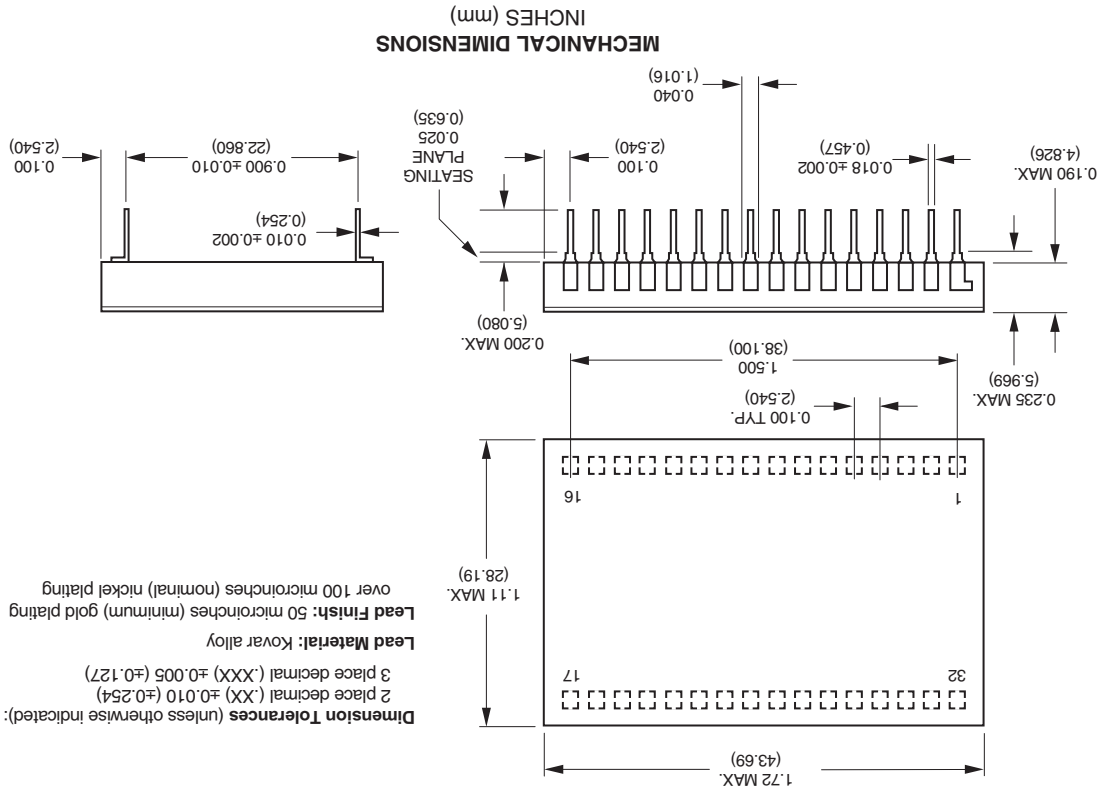
CALIBRATION TABLE		
UNIPOLAR RANGE	ADJUST.	INPUT VOLTAGE
0 to + 5V	ZERO	+ 0.6 mV
0 to + 10V	ZERO	+ 4.982V
	ZERO	+ 1.2 mV
BIPOLAR RANGE		
± 2.5V	OFFSET	-2.494V
	GAIN	+ 2.4982V
± 5V	OFFSET	-4.9988V
	GAIN	+ 4.9963V
± 10V	OFFSET	-9.9976V
	GAIN	+ 9.9927V

**TIMING DIAGRAM FOR
ADC-HX, ADC-HZ OUTPUT: 101010101010**



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ORDERING GUIDE SUMMARY

MODEL	TEMP. RANGE
ADC-HX12BGC	0 to +70°C
ADC-HX12BMC	0 to +70°C
ADC-HX12BMM	-55 to +125°C
ADC-HX12BMM-QL	-55 to +125°C
ADC-HX/883	-55 to +125°C
ADC-HZ12BGC	0 to +70°C
ADC-HZ12BMC	0 to +70°C
ADC-HZ12BMM	-55 to +125°C
ADC-HZ12BMM-QL	-55 to +125°C
ADC-HZ/883	-55 to +125°C

MIL-STD-883B units are available under DESC Drawing Number 5962-88508. Contact DATel for 883 product specification.

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