

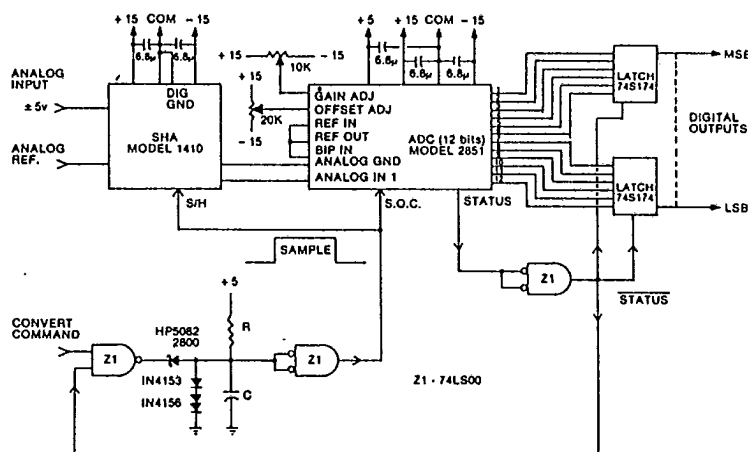
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Models	Resolution	Max. Total Conversion Time	Min. Throughput Rate	Bipolar Input Ranges	Unipolar Input Ranges	Input Resistance	Models
2850	12 bits	1.7us	0.588MHz	$\pm 5V$	0 to +10V	$1K \Omega \pm 0.5\%$	2850
2851	12 bits	1.7us	0.588MHz	$\pm 5V$ $\pm 10V$	0 to -10V 0 to -20V	$1K \Omega \pm 0.5\%$ $2K \Omega \pm 0.5\%$	2851
2852	10 bits	850ns	1.176MHz	$\pm 5V$	0 to +10V	$1K \Omega \pm 0.5\%$	2852
2853	10 bits	850ns	1.176MHz		0 to -5V	$0.5K \Omega \pm 3 \Omega$	2853
2854					0 to -10V	$1K \Omega \pm 5 \Omega$	2854
2855				$\pm 5V$		$1K \Omega \pm 5 \Omega$	2855
2856				$\pm 10V$		$2K \Omega \pm 10 \Omega$	2856
2857	8 bits	650ns	1.538MHz	$\pm 5V$	0 to +10V	$1K \Omega \pm 0.5\%$	2857
2858	8 bits	650ns	1.538MHz		0 to -5V	$0.5K \Omega \pm 3 \Omega$	2858
2859					0 to -10V	$1K \Omega \pm 5 \Omega$	2859
2860				$\pm 5V$		$1K \Omega \pm 5 \Omega$	2860
2861				$\pm 10V$		$2K \Omega \pm 10 \Omega$	2861

12-BIT - 500 KHZ DATA ACQUISITION SYSTEM

The schematic diagram to the right demonstrates the ease with which a 12-Bit Data Acquisition System operating at 500 KHz can be implemented using the DMC 1410 (SHA) and DMC 2851 (ADC).

The positive pulse generated by the one-shot determines the length of time over which data is to be sampled. For .01% accuracy, pulse duration should be a minimum of 350 ns. The data is then held while the ADC makes its conversion. This technique takes maximal advantage of the ADC's internal logic which insures that the (SHA) has settled before making its first decision. Even faster data rates can be achieved, if less bit resolution is acceptable. Please consult DMC for details.

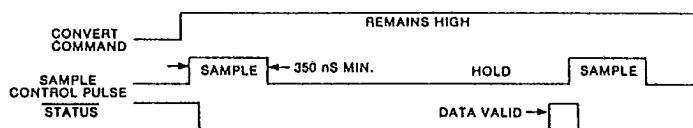


CONTINUOUS CONVERT OR RANDOM CONVERT MODE

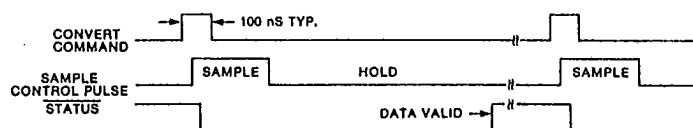
Two modes of operation governed by a single control line can be employed without additional circuitry. In the "Continuous Convert" mode, the Convert Command Input is held at a logic "1" state...enabling the Status Signal to retrigger the one-shot and regenerate a conversion. When employing the "Random Convert" mode, the Status Signal is used to enable a "Convert Command" input pulse...which determines when a conversion is to be performed. The timing diagram shows the relationship of the appropriate signals for the respective modes of operation.

TIMING DIAGRAMS

(CONTINUOUS CONVERT MODE)



(RANDOM CONVERT MODE)



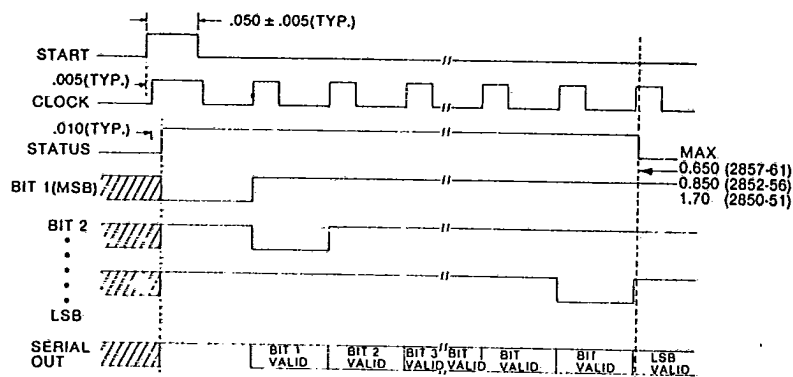
OPERATING SPECIFICATIONS
 Typical and nominal at +25°C, unless otherwise noted
 Minimum warmup time 15 minutes

Group	Item	12 Bit Models 2850-51	10 Bit Models 2852-56	8 Bit Models 2857-61
INPUTS	Digital Inputs	TTL Positive Pulse		
	Initiate Conversion	100ns±50ns		
	Pulse Width	1 TTL Load		
	Maximum Input Loading	-10V, 4KΩ		
	Reference Input			
	Input Power	+15V±0.5V @ 50mA max. -15V±0.5V @ 30mA max. +5V±0.25V @ 325mA max.	+15V±0.5V @ 40mA max. -15V±0.5V @ 30mA max. +5V±0.25V @ 325mA max.	+15V±0.5V @ 40mA max. -15V±0.5V @ 30mA max. +5V±0.25V @ 325mA max.
CHARACTERISTICS	Accuracy	±½ LSB max.		
	Nonlinearity	±½ LSB max.		
	Differential Nonlinearity			
	Zero Offset Error ①	±10mV	±10mV	±25mV
	Gain Error ①	±0.1% max.	±0.06% typ., ±0.1% max.	±0.2% typ., ±0.3% max.
	Stability vs. Temperature			
	Nonlinearity	±5ppm/°C max.	±10ppm/°C max.	±10ppm/°C max.
	Differential Nonlinearity	±3ppm/°C typ., ±5ppm/°C max.	±5ppm/°C typ., ±10ppm/°C max.	±5ppm/°C typ., ±10ppm/°C max.
	Zero Offset Error			
	Unipolar	±5ppm/°C max.	±15ppm/°C max.	±15ppm/°C max.
	Bipolar	±10ppm/°C max.	±15ppm/°C max.	±15ppm/°C max.
	Gain Error	±10ppm/°C max.	±10ppm/°C max.	±20ppm/°C max.
	Conversion Time	+2.8ns/°C max.	+2ns/°C max.	+2ns/°C max.
	Vref out	±3ppm/°C typ., ±10ppm/°C max.		
	Long-Term Stability	0.007%/month	0.01%/month	0.02%/month
	3σ Noise, P-P	0.01% FS	0.02% FS	0.02% FS
	PSRR (Ref to Input)	0.002%/%		
OUTPUTS	Reference Output (-5mA)	-10V±0.1%	-10V±0.1%	-10V±1.0%
	Digital Outputs			
	Logic Codes			
	Parallel Unipolar	BIN		
	Parallel Bipolar	OBIN, 2's C		
	Serial Unipolar	BIN		
	Serial Bipolar	OBIN		
	Format	NRZ		
	Output Drive, Min.	8 TTL Loads		
	Switching Levels			
	"0" State	≤0.5V		
	"1" State	≥2.4V		
	Status			
	"1" State			
	Output Drive, Min.	5 TTL Loads	During Conversion 5 TTL Loads	4 TTL Loads
	Clock Out			
	Logic			
	Output Drive, Min.			
	Pulse Width	TTL Positive Pulse 8 TTL Loads 40ns		
ENVIRONMENTAL	Temperature Ranges			
	Operating, Full Ratings	0°C to +70°C		
	Operating, 50% Derated	-25°C to +85°C		
	Storage	-55°C to +125°C		
	Relative Humidity	95% Non-condensing		
	Shielding	RFI and EMI, on five sides		
RATINGS	Absolute Maximum Ratings			
	Supply Voltage to Ground			
	±15V Input	±18V		
	+5V Input	+6V		
	Digital Input Voltage	+5V		
	Analog Input Voltage			
	R _{in} = 250Ω	±8V		
	R _{in} = 500Ω			
	R _{in} = 1KΩ	±11V		
	R _{in} = 2KΩ	±16V		
		±22V		

Notes: ① Adjustable to Zero

In the U.S.A. call DMC toll-free (800) 225-1151

DYMEC INC 26 DE 3004926 0000431 0



- NOTES
1. VALUES ARE IN MICROSECONDS.
 2. INDICATED BIT STATES ASSUME DIGITAL OUTPUTS ARE ALL "1"s.
 3.  INDICATES UNKNOWN STATES.

DIGITAL CODES

Analog Input		UNIPOLAR	BIPOLAR	
2850, 52, 57	2851 2853-56, 2858-61	Binary	Offset Binary	2's Complement
-FS	+FS		000 000	100 000
-FS + 1 LSB	+FS - 1 LSB		000 001	100 001
- $\frac{1}{4}$ Scale	+ $\frac{1}{4}$ Scale		001 000	101 000
- $\frac{1}{2}$ Scale	+ $\frac{1}{2}$ Scale		010 000	110 000
0 - 1 LSB	0 + 1 LSB		011 111	111 111
0	0	000 000	100 000	000 000
0 + 1 LSB	0 - 1 LSB	000 001	100 001	000 001
+ $\frac{1}{2}$ Scale	- $\frac{1}{2}$ Scale	100 000	110 000	010 000
+ $\frac{1}{4}$ Scale	- $\frac{1}{4}$ Scale	110 000	111 000	011 000
+FS - 1 LSB	-FS + 1 LSB	111 111	111 111	011 111

GAIN TRIMMING

All models are gain-trimmed by DMC to within $\frac{1}{2}$ LSB of specified full scale input voltage. For optional gain trimming, apply $-FS + 1\frac{1}{2}$ LSB of voltage to ANALOG INPUT*. With the gain trim potentiometer, set the digital output exactly on the threshold of changing from 111...110 to 111...111.

OFFSET TRIMMING

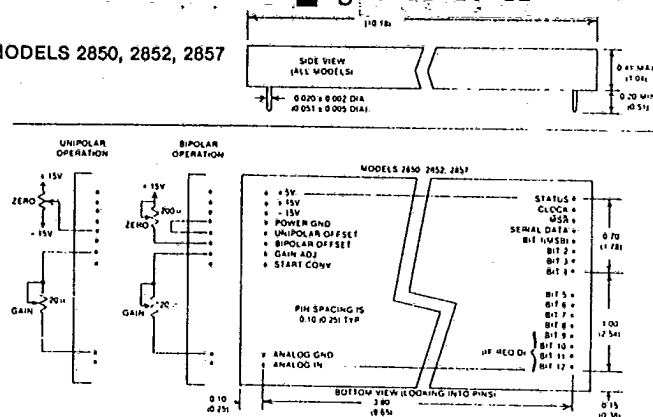
Apply $-1/2$ LSB (for unipolar mode) or $+FS - 1/2$ LSB (for bipolar mode) of voltage to ANALOG INPUT*. With the offset trim potentiometer, set the digital output exactly on the threshold of changing from all 0's to 000 . . . 001.

* Model 2851 has two ANALOG INPUTS. Trimming either one will automatically trim the other.

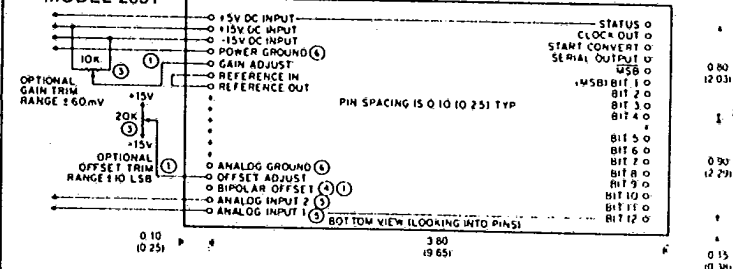
POWER AND GROUNDING CONSIDERATIONS IN HIGH SPEED SYSTEMS

For maximum accuracy and speed, high speed systems require added care in power distribution. To minimize RF contamination, supply voltages should be bussed. For optimum performance, it is good practice to bypass each power supply input with a 1uF tantalum capacitor and a 0.01uF disc capacitor.

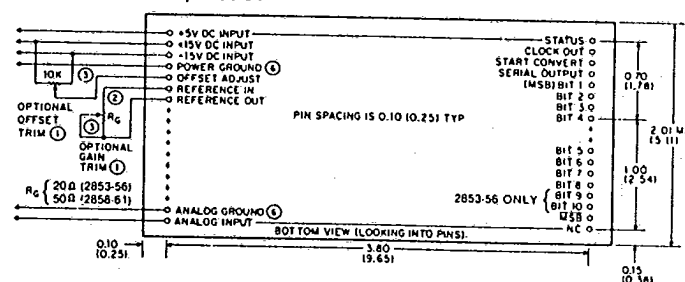
To guard against ground loop errors, the system power ground must be at very low impedance . . . since ANALOG GROUND is internally connected to POWER GROUND.



MODEL 2851



MODELS 2853-56, 2858-61



CONNECTION NOTES:

- 1 Pins are left unconnected when optional trim circuits are not used. Please see Note 2.
- 2 On eight and ten bit models (2853-56, 2858-61) when optional gain trim is not used, please connect REFERENCE OUT to REFERENCE IN, unless an external reference is used.
- 3 Potentiometers should be Cermet ($\leq 100\text{ppm}/^\circ\text{C}$).
- 4 For bipolar operation of twelve bit model 2851, please connect BIPOLAR OFFSET to REFERENCE OUT.
- 5 To select input voltage ranges on Model 2851, please use ANALOG INPUT 1 for $-10\text{V} \pm 5\text{V}$ ranges and ANALOG INPUT 2 for $-20\text{V} \pm 10\text{V}$ ranges.
- 6 POWER GROUND and ANALOG GROUND are internally connected.

MECHANICAL NOTES:

7. Dimensions in parentheses are in Centimeters.
8. Dimensional tolerance between pins is ± 0.01 (± 0.025), non-cumulative. Dimensional tolerance from case edge to center of pins is ± 0.02 (± 0.51).
9. DMC Mating Socket is Model 6524 (2 req'd.)

In the U.S.A. call DMC toll-free (800) 225-1151



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6 Lowell Avenue Winchester Mass 01890 (617) 729-7870 TWX (710) 348-6596