



8 Channel, 12 Bit Data Acquisition System With μ P Interface

HS9410 Series

Data Converter Line

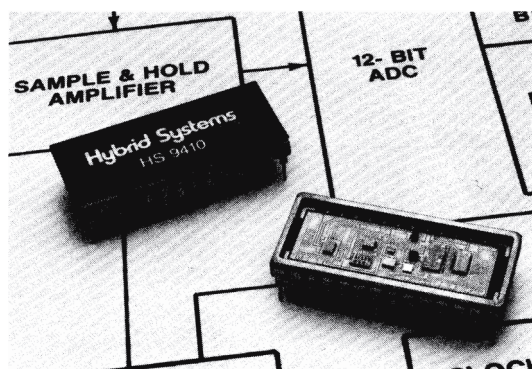
FEATURES

Complete 8 channel, 12-bit data acquisition system with MUX, S/H, REF, clock and three-state outputs
Full 8- or 16-bit microprocessor bus interface
Guaranteed linearity over temperature
High throughput rate: 25kHz
Hermetic 28-pin
Low Power: 400mW

DESCRIPTION

The HS9410 Series is a complete 8-channel, microprocessor-compatible, 12-bit data acquisition system with all the interface logic to connect directly to 8- or 16-bit microprocessor buses. It is contained in a 28-pin DIP and includes an 8-channel multiplexer, a sample-and-hold amplifier, and a 12-bit A/D converter along with the control logic needed to perform a complete data acquisition function. System throughput rate is 25kHz for full rated accuracy.

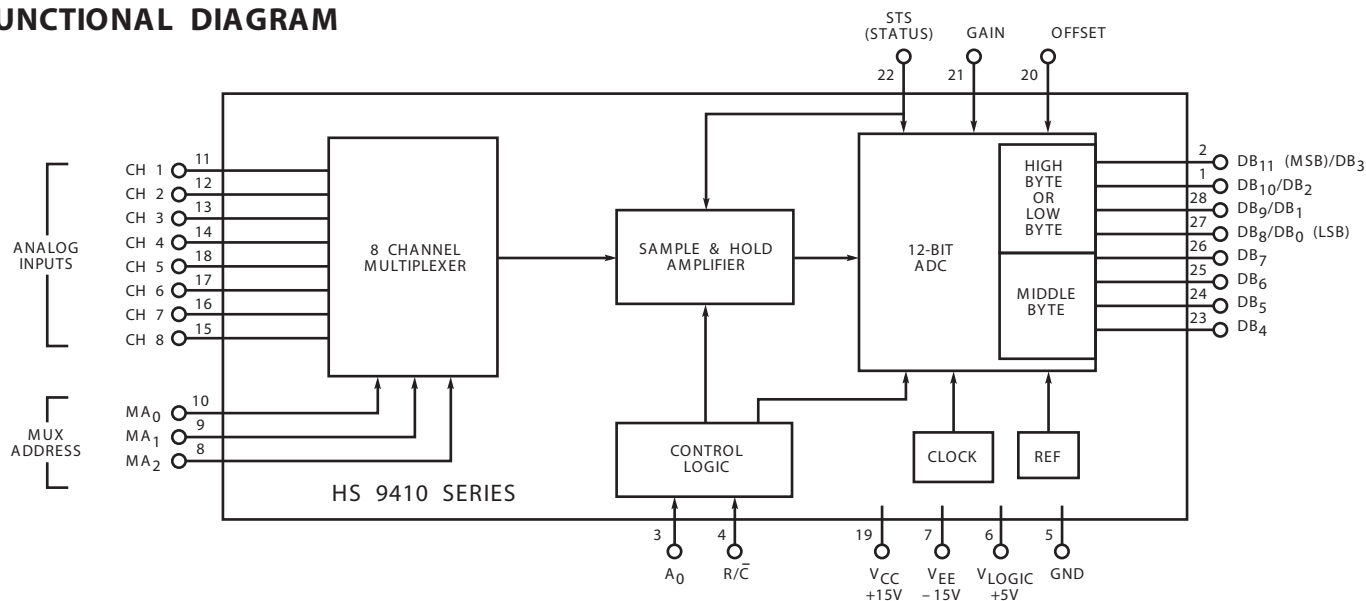
The analog-to-digital converter section contains the HS574 12-bit ADC. The HS9410 Series is offered in a hermetically sealed package for use over a wide temperature range and for MIL-STD-883 requirements.



The HS9410 Series operates from $\pm 15V^*$ and +5V with a total power consumption of 400mW. To take advantage of the 28-pin package, the user must specify an input range of 0 to +10V, $\pm 5V$ or $\pm 10V$ when ordering. Four basic product grades are available; J and K models are specified over a temperature range of $0^\circ C$ to $+70^\circ C$ while the S and T models are specified over an extended temperature range of $-55^\circ C$ to $+125^\circ C$. Full screening to MIL-STD-883C and processing in accordance with Method 5008.1 is available with models specified as "B."

* $\pm 12V$ operation possible; consult factory for further information.

FUNCTIONAL DIAGRAM



HS9410 SERIES

SPECIFICATIONS

(Typical@ +25°C with $V_{CC} = +V_{EE} = -15V$, $V_{LOGIC} = +5V$, unless otherwise specified)

MODEL	HS 941XJ	HS 941XK	HS 941XS	HS941XT
TRANSFER CHARACTERISTICS				
Resolution	12-Bits			
Number of Channels	8 Single-Ended			
Throughput Rate	25 kHz			
ANALOG INPUTS				
Input Ranges ¹ (Specified as a suffix in the model number. See Ordering Guide.)				
HS9410	0 to +10V			
HS9411	±5V			
HS9412	±10V			
Input Bias Current per Channel				
I _B 25°C	±10 nA typ			
-55°Cto +125°C	± 250nA max			
Input Impedance				
ON Channel	10 ¹⁰ 100pf			
OFF Channel	10 ¹⁰ 10pf			
DIGITAL INPUTS				
Logic Inputs				
R/C.A ₀				
V _{IH} min	+2.4V			
V _{IH} max	+5.5V			
V _{IL} max	+0.8V			
V _{IL} min	-0.5V			
I _{IL} max	±5μA max			
I _{IL} max	±5μA max			
Multiplexer inputs				
V max	+0.8V			
V ^{IL} min	+4.0V			
	+4.0V ²			
Input Capacitance (All Digital Inputs)	5pF typ			
Minimum Start Pulse				
R/C-Negative	50ns			
SIGNAL DYNAMICS				
Conversion Time				
12-Bit Conversion	25μs max			
8-Bit Conversion	9μs max			
DIGITAL OUTPUTS				
Logic Outputs				
DB ₁₁ -DB ₀ . STS				
Logic 0	+0.4V max. I _{OL} 1.6mA			
Logic 1	+2.4V min. I _{OH} 0.5mA			
Leakage (High 2 Slate)	±5μA typ (DB ₁₁ DB ₀ only)			
Capacitance	5pF typ			
Output Code Configuration				
Unipolar	Positive True Binary			
Bipolar	Positive True Offset Binary			
POWER SUPPLY				
V _{LOGIC}	+4.5 to +5.5 Volts@11mA max			
V _{CC}	+13.5 to +16.5 Volts@35mA max			
V _{EE}	-13.5 to -16.5 Volts@15mA max			
Power Dissipation	700mW typ.,1W max.			
Rejection ³	700mW typ.,1W max.			
V _{LOGIC}	0.002% /% typ. 0 005% /% max			
V _{CC}	0.002% /% typ. 0 005% /% max			
V _{EE}	0.002% /% typ. 0 005% /% max			
ACCURACY				
Linearity Error (% of F.S.R. max)	±0.025	±0.012	±0.025	±0.012
Offset ⁴				
Unpolar (% of F.S.R. max)	±0.05			
Bipolar (% of F.S.R. max)	±0.25	±0.01	±0.25	±0.01
Gain ⁴ (% of F.S.R. max)	±0.3			

Continued on next page.

HS9410 SERIES

STABILITY

Linearity (ppm/°C max)	±0.5	±0.5	±0.25	±0.25
Unipolar Offset (ppm/°C max)	±10	±5	±25	±20
Bipolar Offset (ppm/°C max)	±25	±20	±25	±20
Gain (Scale Factor)(ppm/°C max)				

TEMPERATURE RANGE

Operating	0° to +70°C	-55°C to +125°C	-55°C to +125°C
Storage	-25°C to +85°C	-65°C to +150°C	-55°C to +125°C

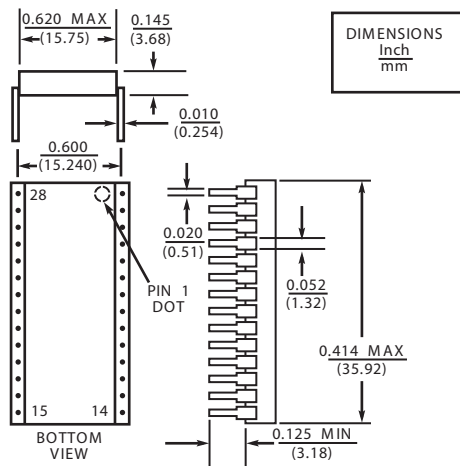
NOTES

1 For J and K models, positive analog input voltage should not exceed V_{CC} -4 volts. Exceeding V_{CC} -4 volts can cause an OFF channel to be turned ON. Negative input voltages and input voltages for S and T models may go to supply voltages. Input voltages exceeding these values will not result in permanent damage as long as the absolute maximum ratings are not exceeded. 2. 1 K pullup to +5V recommended for MA_0 - MA_2 when driven by TTL 3.Maximum change over rated supply voltage. 4. Externally adjustable to zero. See Applications Information.

*Specifications same as HS 9410J

PACKAGE OUTLINE

Dimensions shown in inches and (mm)



PIN ASSIGNMENTS

PIN	FUNCTION	PIN	FUNCTION
1	D8,o/DB2	28	DB ₉ /DB ₁
2	DB _n (MSB)/DB3	27	DB ₈ /DB ₀
3	A _o	26	DB ₇
4	R/C	25	DB ₆
5	GROUND	24	DB ₅
6	VLOGIC	23	08 ₄
7	VEE	22	STS(STATUS)
8	MUX ADDRESS A ₂	21	GAIN
9	MUX ADDRESS A ₁	20	OFFSET
10	MUX ADDRESS A ₀	19	V _{cc}
11	INPUT CH 1	18	INPUT CH 5
12	INPUT CH 2	17	INPUT CH 6
13	INPUT CH 3	16	INPUT CH 7
14	INPUT CH 4	15	INPUT CH 8

ORDERING INFORMATION

Model Number1	Input Range	System Accuracy (% FSR)	Full Scale T.C. (ppm/°C)	Temp. Range	MIL Screening
HS 94XXJ	SEE NOTE1	±0.025	50.0	0°C to +70°C	—
HS 94XXK		±0.012	20.0	0°C to +70°C	—
HS 94XXS		±0.025	50.0	-55°C to +125°C	—
HS 94XXT		±0.012	25.0	-55°C to +125°C	—
HS 94XXS/B		±0.025	50.0	-55°C to +125°C	883C
HS 94XXT/B		±0.012	25.0	-55°C to +125°C	883C

NOTES

1.

HS 94XX

MODEL SUFFIX	INPUT RANGE
10	0 to +10V
11	±5V
12	±10V

Add letter suffix as required above

ABSOLUTE MAXIMUM RATINGS

V_{CC} to Common GND.....0 to +16.5V

V_{EE} to Common GND.....0 to -16.5V

V_{LOGIC} Common GND.....0 to +7V

Control Inputs (A_0 + R/C) to

Common GND-0.5Vto V_{LOGIC} +0.5V

Power Dissipation.....1.3W

Lead Temperature, Soldering..... 300°C, 10Sec

Maximum Input Voltage..... V_{CC} +20V

Minimum Input Voltage..... V_{EE} -20V

Analog Input Maximum Current..... 25mA

