DATEL® Data Acquisition Solutions

Since being established in 1970, the DATEL Data Acquisition product offering has grown to become one of the industry's broadest, designed to meet the ever-changing requirements of military, HI-REL, medical, scientific and industrial applications. Today, our leadership status in high-performance data acquisition components is unchallenged, driven in large part by our engineering expertise to develop solutions with outstanding electrical performance, small packaging, low power consumption and ease of use.

These products employ five basic technologies: monolithic CMOS, monolithic bipolar, thin-film hybrid, thick-film hybrid and discrete component circuit. Many products utilize a combination of these technologies to achieve higher levels of performance.

Whether you require a standard, off-the-shelf solution or a custom product of data acquisition, analog, linear and/or integrated power, we welcome the opportunity to work with you on your designs.

Contents

CCD Signal Processor/Imaging Converters

The ADCDS family are application-specific video signal processors designed for electronic-imaging applications that employ CCDs (Charge Coupled Devices) as their photodetector.

They incorporate a "user configurable" input amplifier, a CDS (correlated double sampler) and a sampling A/D converter in a single package. Functionally complete, these imaging converters provide the user with a high-performance, low-cost, low-power integrated solution.

The key to the ADCDS family's performance is a unique, high-speed, high-accuracy CDS circuit, which eliminates the effects of charge injection and "kT/C" noise on the CCD's output floating capacitor, producing a "pixel data" output signal. The ADCDS family digitizes this resultant "pixel data" signal using a high-speed, low-noise sampling A/D converter.

If you cannot find the CCD/imaging converter solution you need in the tables below, contact us, and we'll modify or develop one for you.

Sampling A/Ds with Integrated Correlated Double Samplers (CDS)

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	DC RMS Noise	Input Ranges	Power Supplies	Power	Temperature	Package	Process	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	LSB	Volts	Volts	Watts	°C				
12	40	0.5	1.5	1	0.68	+3.3, ±5, +12	TBD	0 to +70	44-pin TDIP/SMT	SMT	ADCDS-1240	9
14	3	0.5	2.5	1	0.35 - 2.8	±5, +12	0.500	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1403	3
	3	0.6	2.5	1.25	0.35 - 2.8	±5, +12	0.500	-55 to +125	40-pin TDIP/SMT	SMT	ADCDS-1403EX	3
	5	0.5	2.5	1	0.35 - 2.8	±5, +12	0.700	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1405	3
	5	0.6	2.5	1.25	0.35 - 2.8	±5, +12	0.700	-55 to +100	40-pin TDIP/SMT	SMT	ADCDS-1405EX	3
	10	0.5	2.5	1	0.35 - 2.8	±5, +12	0.700	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1410	3
	10	0.6	2.5	1.25	0.35 - 2.8	±5, +12	0.700	-55 to +100	40-pin TDIP/SMT	SMT	ADCDS-1410EX	3
16	2.3	0.5	1	2	0.342 -2.048	±5	0.635	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1603	1
	2.3	0.6	2	2	0.342 -2.048	±5	0.635	-40 to +125	40-pin TDIP/SMT	SMT	ADCDS-1603EX	1
	10	0.5	1.5	2	0.342 -2.8	±5	TBD	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1610	7

Stand-alone Correlated Double Samplers (CDS)

Accuracy	Pixel Rate	Acquisition Time	Aperture Delay	Input Range	Hold Mode Droop	Power Supplies	Power	Temperature	Package	Model Number
%	MSPS	µsec	nsec	±Volts	µV/µsec	Volts	Watts	°C		
0.01	5	0.1	10	±2.5	5000	±5	0.35	0 to +70	24-Pin DDIP/SMT	CDS-1402MC
	5	0.1	10	±2.5	5000	±5	0.35	-55 to +125	24-Pin DDIP/SMT	CDS-1402MM
0.003	1.25	0.4	10	10	4	+5, ±15	0.7	0 to +70	24-Pin DDIP/SMT	CDS-1401MC
	1.25	0.4	10	10	4	+5, ±15	0.7	-55 to +125	24-Pin DDIP/SMT	CDS-1401MM
0.001	5	TBD	TBD	±2.5	TBD	±5	TBD	0 to +70	24-Pin DDIP/SMT	CDS-1605
	5	TBD	TBD	±2.5	TBD	±5	TBD	-55 to +125	24-Pin DDIP/SMT	CDS-1605MM

Sampling A/Ds optimized for imaging applications

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	DC RMS Noise	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	LSB	-dB	Volts	Volts	Watts	°C			
12	1	0.25	0.5	0.25	73	0 to +10	+5, ±15/12	1.7	0 to +70	24-pin DDIP/SMT	ADS-CCD1201MC	0
	1	0.25	0.5	0.25	73	0 to +10	+5, ±15/12	1.7	-55 to +125	24-pin DDIP/SMT	ADS-CCD1201MM	0
	2	0.25	0.5	0.30	72	0 to +10	+5, ±15/12	1.75	0 to +70	24-pin DDIP/SMT	ADS-CCD1202MC	0
	2	0.25	0.5	0.30	72	0 to +10	+5, ±15/12	1.75	-55 to +125	24-pin DDIP/SMT	ADS-CCD1202MM	0
14	10	0.30	1.0	0.5	78	0 to +5	+5, ±15/12	1.25	0 to 70	40-pin DDIP/SMT	ADS-CCD1410MC	7
	10	0.30	1.0	0.5	78	0 to +5	+5, ±15/12	1.25	-55 to +125	40-pin DDIP/SMT	ADS-CCD1410MM	7

Contact DATEL about high-reliability and/or surface mount version(s) of these products.

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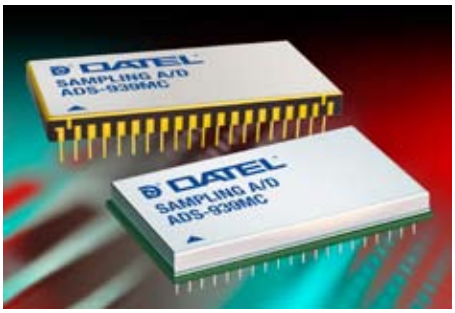
Sampling A/D Converters



The ADS family of Sampling A/Ds combine a sample-hold and analog-to-digital converter with support circuitry, in a single-packaged device.

As such, these sampling A/Ds provide a functionally complete (no additional external components are required) and fully static and dynamic tested device – with guaranteed performance. Active laser trimming ensures the final performance has been optimized based upon the internal component interactions and layout management – aspects not readily achieved in discrete designs. These products do not require a minimum sampling rate. The sampling speed can be varied from a minimum clock of zero Hertz all the way to the maximum sampling rate. Extended temperature range and high-reliability devices (DESC and/or MIL-STD-883 screened and qualified units) are available for many of these devices.

12-bit Resolution Sampling A/Ds

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
12	0.06	0.75	0.75	74	70	+5, +10, ±2.5, ±5, ±10	+5, ±15	0.9	0 to +70	32-pin TDIP/SMT	ADC-HS12BMC	0
	0.06	0.75	0.75	74	70	+5, +10, ±2.5, ±5, ±10	+5, ±15	1.7	-55 to +125	32-pin TDIP/SMT	ADC-HS12BMM	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.3	0 to +70	24-pin DDIP/SMT	ADS-112MC	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.3	-55 to +125	24-pin DDIP/SMT	ADS-112MM	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.6	0 to +70	24-pin DDIP/SMT	ADS-117MC	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.6	-55 to +125	24-pin DDIP/SMT	ADS-117MM	0
	5	0.5	0.75	72	69	±1	±5	1.8	0 to +70	24-pin DDIP/SMT	ADS-118MC	0
	5	0.5	0.75	72	69	±1	±5	1.8	-55 to +125	24-pin DDIP/SMT	ADS-118MM	0
	10	0.5	0.75	72	69	±1.5	±5	1.8	0 to +70	24-pin DDIP/SMT	ADS-119MC	1
	10	0.5	0.75	72	69	±1.5	±5	1.8	-55 to +125	24-pin DDIP/SMT	ADS-119MM	1

14-bit Resolution Sampling A/Ds, Part 1

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
14	0.5	0.5	0.5	90	81	0 to +10	+5, ±15	1.6	0 to +70	24-pin DDIP/SMT	ADS-916MC	0
	0.5	0.5	0.5	90	81	0 to +10	+5, ±15	1.6	-55 to +125	24-pin DDIP/SMT	ADS-916MM	0
	0.5	0.5	0.5	90	81	±5	+5, ±15	1.3	0 to +70	24-pin DDIP/SMT	ADS-926MC	0
	0.5	0.5	0.5	90	81	±5	+5, ±15	1.3	-55 to +125	24-pin DDIP/SMT	ADS-926MM	0
	1	0.5	0.5	90	81	0 to +10	+5, ±15/12	1.7	0 to +70	24-pin DDIP/SMT	ADS-917MC	0
	1	0.5	0.5	90	81	0 to +10	+5, ±15/12	1.7	-55 to +125	24-pin DDIP/SMT	ADS-917MM	0
	1	0.5	0.5	90	81	±5	+5, ±15/12	1.6	0 to +70	24-pin DDIP/SMT	ADS-927MC	0
	1	0.5	0.5	90	81	±5	+5, ±15/12	1.6	-55 to +125	24-pin DDIP/SMT	ADS-927MM	0
	2	0.5	0.75	79	78	±5	+5, ±15/12	1.4	0 to +70	24-pin DDIP/SMT	ADS-929MC	0
	2	0.5	0.75	79	78	±5	+5, ±15/12	1.4	-55 to +125	24-pin DDIP/SMT	ADS-929MM	0

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Sampling A/D Converters

The 14-bit high-resolution ADS family of Sampling A/Ds are designed utilizing SMT-based or hybrid manufacturing technology.

Both manufacturing technologies offer commercial 0 to +70°C and extended -55 to +125°C temperature range versions.

The SMT-based products serve the industrial/COTs markets with the lowest possbible price/performance ratios. The hybrid-based products also deliver outstanding technical performance, and have the ability to be screened and qualified for applications demanding high reliablility (MIL-STD-883 versions).

14-bit Resolution Sampling A/Ds, Part 2

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
14	3	0.5	0.75	83	79	±2	±5	1.8	0 to +70	24-pin DDIP/SMT	ADS-943MC	0
	3	0.5	0.75	83	79	±2	±5	1.8	-55 to +125	24-pin DDIP/SMT	ADS-943MM	0
	5	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	2.95	0 to +70	32-pin TDIP/SMT	ADS-944MC	0
	5	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	2.95	-55 to +125	32-pin TDIP/SMT	ADS-944MM	0
	10	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	4.2	0 to +70	Custom DIP	ADS-945MC	1
	10	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	4.2	-55 to +125	Custom DIP	ADS-945.-EX	1
	8	0.5	0.75	80	78	±2	±5	1.9	0 to +70	24-pin DDIP/SMT	ADS-946MC	0
	8	0.5	0.75	80	78	±2	±5	1.9	-55 to +125	24-pin DDIP/SMT	ADS-946MM	0
	10	0.5	0.75	76	76	±2	+5, -5.2	2	0 to +70	24-pin DDIP/SMT	ADS-947MC	1
	10	0.5	0.75	76	76	±2	+5, -5.2	2	-55 to +100	24-pin DDIP/SMT	ADS-947MM	1
	12.8	0.5	0.75	81	78	0 to+5, ±2.5	±5, +15	2	0 to +70	32-pin TDIP/SMT	ADS-949MC	3
	12.8	0.5	0.75	81	78	0 to +5, ±2.5	±5, +15	2	-55 to +125	32-pin TDIP/SMT	ADS-949MM	3

14-bit Resolution, Dual Sampling A/Ds, Part 3

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Process	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C				
14	2	0.5	1	79	79	±5	±5	0.6	0 to +70	40-pin TDIP/SMT	SMT	ADSD-1402S	0
	2	0.5	1	79	79	±5	±5	0.6	-55 to +125	40-pin TDIP/SMT	SMT	ADSD-1402S-EX	0
	2	0.5	1	79	79	±5	±5	0.6	0 to +70	40-pin TDIP/SMT	HYBRID	ADSD-1402MC	0
	2	0.5	1	79	79	±5	±5	0.6	-55 to +125	40-pin TDIP/SMT	HYBRID	ADSD-1402MM	0
	5	0.5	1	80	78	±2	±5, +15	1.6	0 to +70	28-pin DDIP/SMT	HYBRID	ADSD-1405MC	3
	5	0.5	1	80	78	±2	±5, +15	1.6	-55 to +125	28-pin DDIP/SMT	HYBRID	ADSD-1405MM	3
	10	0.5	1	84	75	±2.5	±5	1.7	0 to +70	28-pin DDIP/SMT	HYBRID	ADSD-1410S	3
	10	0.5	1	84	75	±2.5	±5	1.7	-55 to +125	28-pin DDIP/SMT	HYBRID	ADSD-1410S-EX	3
	10	0.5	1	83	76	±2.5	±5	1.7	0 to +70	40-pin TDIP/SMT	SMT	ADSD-1410MC	5
	10	0.75	2	83	76	±2.5	±5	1.7	-55 to +125	40-pin TDIP/SMT	SMT	ADSD-1410MM	5
	20	0.5	1	80	75	±2.5	±5	1.7	0 to +70	40-pin TDIP/SMT	SMT	ADSD-1420S	5
	20	0.75	2	80	75	±2.5	±5	1.7	-55 to +125	40-pin TDIP/SMT	SMT	ADSD-1420S-EX	5

14-bit Resolution, Quad Sampling A/Ds, Part 4

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Process	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C				
14	10	0.5	1	82	79	±2.5	±5	3.1	0 to +70	66-pin TDIP/SMT	SMT	ADSQ-1410S	3
	10	0.5	1	82	79	±2.5	±5	3.1	0 to +70	66-pin TDIP/SMT	SMT	ADSQ-1410S-EX	3

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Sampling A/D Converters

The 16 and 18-bit high-resolution ADS family of Sampling A/Ds achieve superior noise performance by managing sensitive analog grounding, local decoupling and innovative architectures.

Some new models have been added after further optimization for signal-to-noise ratio – or perhaps peak harmonic performance, based upon customer requests/ feedback. These devices have been fully characterized and tested as a single unit, and allow the end user to focus on their system application, and not how twenty to thirty components may interact with each other over time, temperature and various production lots.

16 and 18-bit Resolution Sampling A/Ds

Resolution	Sampling Rate	Differential Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
16	0.5	0.5	1	89	83	0 to -10, ±5	±5, ±15	3.5	0 to +70	40-pin TDIP/SMT	ADS-930MC	0
	0.5	0.5	1	89	83	0 to -10, ±5	±5, ±15	3.5	-55 to +125	40-pin TDIP/SMT	ADS-930MM	0
	1	0.5	0.75	89	87	0 to -5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP/SMT	ADS-931MC	3
	1	0.5	0.75	89	87	0 to -5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP/SMT	ADS-931MM	3
	1	0.5	0.75	87	88	0 to -10, ±5	+5, ±15	1.25	0 to +70	40-pin TDIP/SMT	ADS-937MC	1
	1	0.5	0.75	87	88	0 to -10, ±5	+5, ±15	1.25	-55 to +125	40-pin TDIP/SMT	ADS-937MM	1
	2	0.5	0.75	88	86	0 to -5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP/SMT	ADS-932MC	3
	2	0.5	0.75	88	86	0 to -5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP/SMT	ADS-932MM	3
	3	0.5	1.5	86	85	0 to -5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP/SMT	ADS-933MC	3
	3	0.5	1.5	86	85	0 to -5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP/SMT	ADS-933MM	3
	5	0.5	1.5	84	84	0 to -5.5, ±2.75	±5, ±12/±15	2.85	0 to +70	40-pin TDIP/SMT	ADS-935MC	3
	5	0.5	1.5	84	84	0 to -5.5, ±2.75	±5, ±12/±15	2.85	-55 to +125	40-pin TDIP/SMT	ADS-935MM	3
	10	0.5	1.5	81	85	0 to -5.5, ±2.75	±5, ±12/±15	1.5	0 to +70	40-pin TDIP/SMT	ADS-939MC	7
	10	0.5	2	77	82	0 to -5.5, ±2.75	±5, ±12/±15	1.5	-55 to +125	40-pin TDIP/SMT	ADS-939MM	7
18	1	0.5	10	89	89	±5	+5, ±15	1.45	0 to +70	32-pin TDIP/SMT	ADS-951MC	1
	1	0.5	10	89	89	±5	+5, ±15	1.45	-40 to +110	32-pin TDIP/SMT	ADS-951MM	1
	1	0.5	10	85	93	±5	+5, ±15	1.45	0 to +70	32-pin TDIP/SMT	ADS-953MC	1
	1	0.5	10	85	93	±5	+5, ±15	1.45	-40 to +110	32-pin TDIP/SMT	ADS-953ME	1

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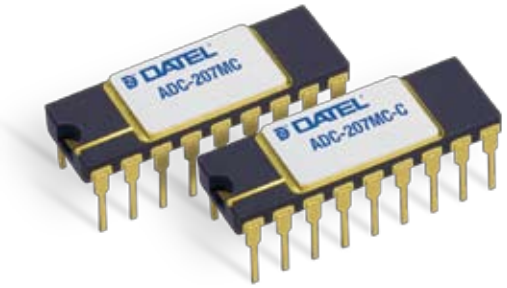
Military 883 Screening

Our manufacturing line is audited and certified by DSCC as conforming to MIL-PRF-38534 and MIL-STD-883 military standards. Many different screening levels can be provided (from commercial to full MIL-883 screened), and all of the assembly and screening processes are performed on the same lines and in a state-of-the-art clean room facility.

A/D Converters (stand-alone)



The stand-alone A/D Converters include 7 & 8-bit resolution Flash A/Ds – and then some industry standard pin-out legacy A/D converters.

Both A/D converter families offer commercial 0 to +70°C and extended -55 to +125°C temperature range versions. The Flash family of A/D converters have wide-bandwidth inputs that often digitize the input pulse and/or steady-state signal directly. The legacy A/Ds without internal sample-holds often use external sample-hold devices or are part of a larger multi-channel data acquisition system, handling multiple channels with various low-bandwidth input signal types/demands that may not require sample-holds.

7 and 8-bit Flash and Stand-alone 12-bit A/D Converters

Resolution	Conversion Rate/Time	Differential Linearity Error	Integral Linearity Error	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS/µsec	±LSB	±LSB	Volts	Volts	Watts	°C			
7	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin LCC	ADC-207LC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin LCC	ADC-207LM	0
	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	18-Pin DIP	ADC-207MC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	18-Pin DIP	ADC-207MM	0
8	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin LCC	ADC-208ALC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin LCC	ADC-208ALM	0
	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin DIP	ADC-208AMC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin DIP	ADC-208AMM	0
	20 MSPS	0.5	0.5	+5	+5, ±15	0.7	0 to +70	24-Pin DDIP/SMT	ADC-228AMC	0
	20 MSPS	0.5	0.5	+5	+5, ±15	0.7	-55 to +125	24-Pin DDIP/SMT	ADC-228AMM	0
12	2 µsec	0.75	0.75	0 to +10/20, ±5/±10	+5, ±15	2.5	0 to +70	32-pin TDIP/SMT	ADC-810MC	0
	2 µsec	0.75	0.75	0 to +10/20, ±5/±10	+5, ±15	2.5	-55 to +125	32-pin TDIP/SMT	ADC-810MM	0
	20 µsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HX12BGC	0
	20 µsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HX12BMC	0
	20 µsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	-55 to +125	32-pin TDIP/SMT	ADC-HX12BMM	0
	8 µsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HZ12BGC	0
	8 µsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HZ12BMC	0
	8 µsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	-55 to +125	32-pin TDIP/SMT	ADC-HZ12BMM	0

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Dedicated Solutions

With our broad process capability and design knowledge, we can create a product that meets your needs, allowing you to focus on other aspects of your design and shorten your time to market.

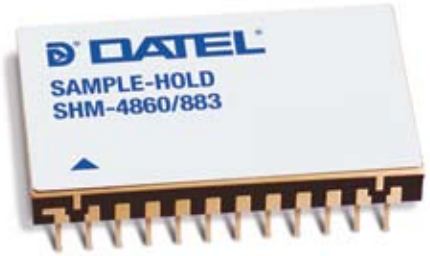
Typical modifications include:

- Modified input range
- Tighter DC specifications
- Modified dynamic specifications
- Custom tests or temperature ranges

We can also work with you to modify a product further to suit your specific application. For example:

- Incorporating some of your on-board circuitry into one of our existing modules, allowing you to source a single, fully screened building block tailored to meet your needs
- Increasing the speed of an existing product
- Modifying a package or pinout to accommodate your specific needs
- Converting a standard/custom product into a SMT solution (where a high reliability package is not required)

Sample-Hold Amplifiers



Sample-Hold Amplifiers shorten the aperture time for A/D converters by rapidly sampling the input signal and then holding its value until the conversion is completed.

Many A/D converters now include the sample-hold with the A/D converter in a single package (appropriately named sampling A/Ds). There are still many pulse, wide-bandwidth and multi-channel applications that can benefit from stand-alone Sample-Holds. Products from 0.1% to 0.001% accuracy (10 to 16-bit equivalent resolutions) with acquisition speeds from microseconds to the low tens of nanoseconds are offered.

Accuracy	Acquisition Time	Aperture Delay	Input Range	Small Signal Bandwidth	Hold Mode Droop	Power Supplies	Temperature	Power	Package	Model Number
(%)	µsec	nsec	±Volts	MHz	µV/µsec	Volts	°C	Watts		
0.1	40	3	2.5	25	20	±15	0 to +70	1.8	24-Pin DDIP/SMT	SHM-40MC
	40	3	2.5	25	20	±15	-55 to +125	1.8	24-Pin DDIP/SMT	SHM-40MM
0.01	6	100	11.5	1	0.2	±5 to ±18	0 to +70	0.18	TO-99	SHM-LM-2
	0.16	10	11.5	16	0.5	+5, ±15	0 to +70	0.365	8-Pin DIP/SMT	SHM-49MC
	0.16	10	11.5	16	0.5	+5, ±15	-55 to +125	0.365	8-Pin DIP/SMT	SHM-49MM
	0.16	6	10	16	0.5	+5, ±15	0 to +70	0.73	24-Pin DDIP/SMT	SHM-45MC
	0.16	6	10	16	0.5	+5, ±15	-55 to +125	0.73	24-Pin DDIP/SMT	SHM-45MM
	0.16	6	11.5	16	0.5	+5, ±15	0 to +70	0.73	24-Pin DDIP/SMT	SHM-4860MC
	0.16	6	11.5	16	0.5	+5, ±15	-55 to +125	0.73	24-Pin DDIP/SMT	SHM-4860MM
	0.025	5	2	150	1	±5, +15	0 to +70	0.545	14-Pin DIP/SMT	SHM-43MC
	0.025	5	2	150	1	±5, +15	-55 to +125	0.545	14-Pin DIP/SMT	SHM-43MM
0.005	0.05	5	2.5	70	3	±5	0 to +70	0.225	8-Pin DIP/SMT	SHM-50MC
	0.01	2	2.5	250	1	±5	0 to +70	0.5	16-pin CLCC	SHM-14S
	0.01	2	2.5	250	1	±5	-55 to +125	0.5	16-pin CLCC	SHM-14SM
0.001	0.8	10	10	16	15	+5, ±15	0 to +70	0.36	8-Pin DIP/SMT	SHM-950MC
	0.8	10	10	16	15	+5, ±15	-55 to +85	0.36	8-Pin DIP/SMT	SHM-950MM
0.0008	0.4	5	10.5	16	0.5	+5, ±15	0 to +70	0.305	24-Pin DDIP/SMT	SHM-945MC
	0.4	5	10.5	16	0.5	+5, ±15	-55 to +125	0.305	24-Pin DDIP/SMT	SHM-945MM

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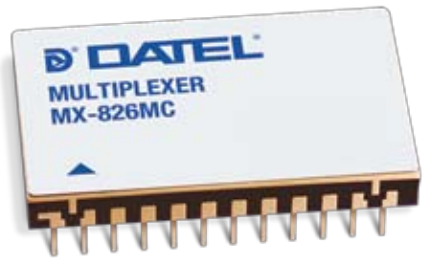
Multiplexers



Analog Multiplexers are used for time sharing of A/D converters between a number of analog information channels.

Our four and eight-channel multiplexers are characterized from 0.1% to 0.001% accuracy (10 to 16-bit equivalent resolutions), with fast settling time speeds in the low tens of nanoseconds.

Channels	Settling Time to 0.01% (µsec)	Access Time (nsec)	On Resistance (Ohms)	Input Ranges (±Volts)	Power Supplies (Volts)	Power (mW)	Temperature	Package	Model
4 S.E.	.05	20	18 to 70	±10	+5, ±15	207	0 to +70	14-Pin DIP	MX-850MC
	.05	20	18 to 70	±10	+5, ±15	207	-55 to +125	14-Pin DIP	MX-850MM
8 S.E.	0.225	60	5	±10	+5, ±15	395	0 to +70	24-Pin DDIP	MX-826MC
	0.225	60	5	±10	+5, ±15	395	0 to +70	24-Pin DDIP	MX-826MM

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Digital-to-Analog Converters (D/As)

Digital to Analog converters convert digital binary codes into analog currents or voltages. Our D/A family of products provide a functionally complete tested device that incorporates internally a high precision voltage reference. Among the many and varied application usages of these devices are wireless communication, instrumentation, data acquisition systems, automated test and process control equipment.

Products from 8-bit to 16-bit resolutions are offered, in either current and/or voltage output products. Settling times range from microseconds to tens of nanoseconds, and some units provide input latching capability too.

Accuracy	Settling Time	Differential Linearity Error	Integral Linearity Error	Output	Power Supplies	Power	Temperature	Package	Model Number
(%)	µsec	±LSB	±LSB	mA-or-Volts	Volts	Watts	°C		
8	0.025	0.5	0.75	+5, ±2.5 mA	±15	0.7	0 to +70	24-Pin DDIP	DAC-HF8BMC
	0.025	0.5	0.75	+5, ±2.5 mA	±15	0.7	-55 to +125	24-Pin DDIP	DAC-HF8BMM
	1	0.75	0.5	+1, ±1 mA	+5 to +15	0.03	0 to +70	20-Pin DIP	DAC-608C
10	0.004	0.5	1	-1	-5.2	0.45	0 to +70	28-Pin DDIP	DAC-330
	0.012	0.5	2	+2	5	0.15	0 to +70	32-Pin QFP	DAC-341
	0.025	0.5	0.5	+5, ±2.5 mA	±15	0.8	0 to +70	24-Pin DDIP	DAC-HF10BMC
	0.025	0.5	0.5	+5, ±2.5 mA	±15	0.8	-55 to +125	24-Pin DDIP	DAC-HF10BMM
12	0.02	0.5	0.75	-20.48mA	+5, -5.2	0.65	0 to +70	28-Pin CLCC	DAC-SC
	0.02	0.5	0.75	-20.48mA	+5, -5.2	0.65	-55 to +125	28-Pin CLCC	DAC-S
	0.05	0.5	0.5	+5, ±2.5 mA	±15	0.85	0 to +70	24-Pin DDIP	DAC-HF12BMC
	0.05	0.5	0.5	+5, ±2.5 mA	±15	0.85	0 to +70	24-Pin DDIP	DAC-HF12BMM
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BGC
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BMC
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	-55 to +125	24-Pin DDIP	DAC-HK12BMM
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BGC-2
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BMC-2
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	-55 to +125	24-Pin DDIP	DAC-HK12BMM-2
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12BGC
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12BMC
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	-55 to +125	24-Pin DDIP	DAC-HZ12BMM
3-Digit	3	0.25	0.25	+2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12DGC
	3	0.25	0.25	+2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12DMC
	3	0.25	0.25	+2.5/5/10	±15	0.39	-55 to +125	24-Pin DDIP	DAC-HZ12DMM
16	15	1	2	±5/10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BGC
	15	1	2	±5/10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BMC
	15	1	2	±5/10	±15	0.65	-55 to +125	24-Pin DDIP	DAC-HP16BMM
	15	1	2	±10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BGC-1
	15	1	2	±10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BMC-1
	15	1	2	±10	±15	0.65	-55 to +125	24-Pin DDIP	DAC-HP16BMM-1

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Data Acquisition Systems

Functionally complete Data Acquisition Systems can combine an input multiplexer, instrumentation amplifier, sample-hold, A/D converter and various interface logic in a single package device.

In addition to the size reduction realized, users receive functionally complete tested and guaranteed devices. Should high-reliability screening or qualification be required, economy is realized by only performing these quality assurance steps on a single device.

Resolution	Input Channels	Differential Linearity Error	Integral Linearity Error	Throughput Rate	Full-Scale Input Ranges	Power Supplies	Power	Temperature	Package	Model
Bits		± LSB	± LSB	kHz.	Volts	Volts	Watts	°C		
12	16 S.E.	1	1	50	50mV to 10	+5, ±15	1.25	0 to +70	62-Pin QDIP	HDAS-16MC
	16 S.E.	1	1	50	50mV to 10	+5, ±15	1.25	-55 to +125	62-Pin QDIP	HDAS-16MM
	8D	1	1	50	50mV to 10	+5, ±15	1.25	0 to +70	62-Pin QDIP	HDAS-8MC
	8D	1	1	50	50mV to 10	+5, ±15	1.25	-55 to +125	62-Pin QDIP	HDAS-8MM
	8 S.E.	0.75	0.75	75	100mV to 10	±15, +5	0.7	0 to +70	40-Pin DDIP	HDAS-75MC
	8 S.E.	1	1.5	75	100mV to 10	±15, +5	0.7	-55 to +125	40-Pin DDIP	HDAS-75MM
	4D	0.75	0.75	75	100mV to 10	±15, +5	0.7	0 to +70	40-Pin DDIP	HDAS-76MC
	4D	1	1.5	75	100mV to 10	±15, +5	0.7	-55 to +125	40-Pin DDIP	HDAS-76MM
	8 S.E.	0.75	0.75	400	100mV to 10	+5, ±15	2.6	0 to +70	40-Pin DDIP	HDAS-528MC
	8 S.E.	0.75	0.75	400	100mV to 10	+5, ±15	2.6	-55 to +125	40-Pin DDIP	HDAS-528MM
	4D	0.75	0.75	400	100mV to 10	+5, ±15	2.6	0 to +70	40-Pin DDIP	HDAS-524MC
	4D	0.75	0.75	400	100mV to 10	+5, ±15	2.6	-55 to +125	40-Pin DDIP	HDAS-524MM

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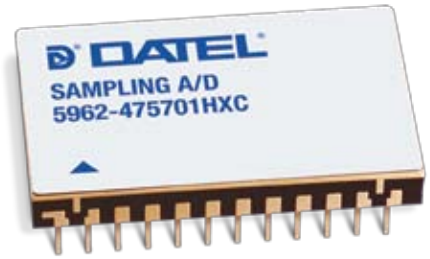
High-Reliability Models (DESC/MIL-STD-883 Versions)



The Defense Electronics Supply Center (DESC) has created industry standard Source Control Drawings for popular data acquisition products.

Much as an individual MIL-PRF-38534 manufacturer may certify their own products to MIL-STD-883 processed parts, a DESC product provides a common set of specifications, agreed to by manufacturers who supply parts that meet these requirements.

Generic Model	Package	DESC Model (Gold Pins)	DESC Model (Solder-Dipped Pins)
ADC-HX	32-Pin TDIP	5962-8850801XC	5962-8850801XA
ADC-HZ	32-Pin TDIP	5962-8850802XC	5962-8850802XA
HDAS-8	62-Pin Hybrid	5962-8851403XC	5962-8851403XA
HDAS-16	62-Pin Hybrid	5962-8851404XC	5962-8851404XA
DAC-HK	24-Pin DDIP	5962-8952801XC	5962-8952801XA
DAC-HK-2	24-Pin DDIP	5962-8952802XC	5962-8952802XA
DAC-HP	24-Pin DDIP	5962-8953101HXC	5962-8953101HXA
DAC-HP1	24-Pin DDIP	5962-8953102HXC	5962-8953102HXA
ADS-944	32-Pin TDIP	5962-9319801HXC	5962-9319801HXA
MX-826	24-Pin DDIP	5962-9450601HXC	5962-9450601HXA
ADS-927	24-Pin DDIP	5962-9475701HXC	5962-9475701HXA

Application Notes

Application Note	Description
DACAN-01	High-speed A/D converter designs: Layout and interfacing pitfalls
DACAN-02	Picking the right sample-and-hold amp for various data-acquisition needs
DACAN-03	Data converters: Getting to know dynamic specs
DACAN-04	Understanding data converter frequency domain specifications
DACAN-05	Subranging ADCs operate at high-speed with high resolution
DACAN-06	Seeing is believing! A/D converters make a difference in imaging applications
DACAN-07	Modifying start convert pulses using commercially available devices
DACAN-08	Heat sinks for data converters
DACAN-09	Performance considerations for high-end PC A/D boards

Other products from DATEL

Digital Panel Meters

From standard, off-the-shelf products to application specific designs, our DATEL digital panel meters are a versatile and cost-effective solution for a number of applications.

■ Multifunction AC Power Meters

Displays Volts, Amps, Watts, and Power Factor or Hertz. Built-in 10A, 32A or 100A current transformers.

■ 2-Wire Meters

Power your measuring instrument with the signal you're measuring! Measure the voltage at a standard USA-style wall outlet simply by "plugging in" an AC line monitor.

■ Process Monitors

4/20mA and 0-10V process control monitors

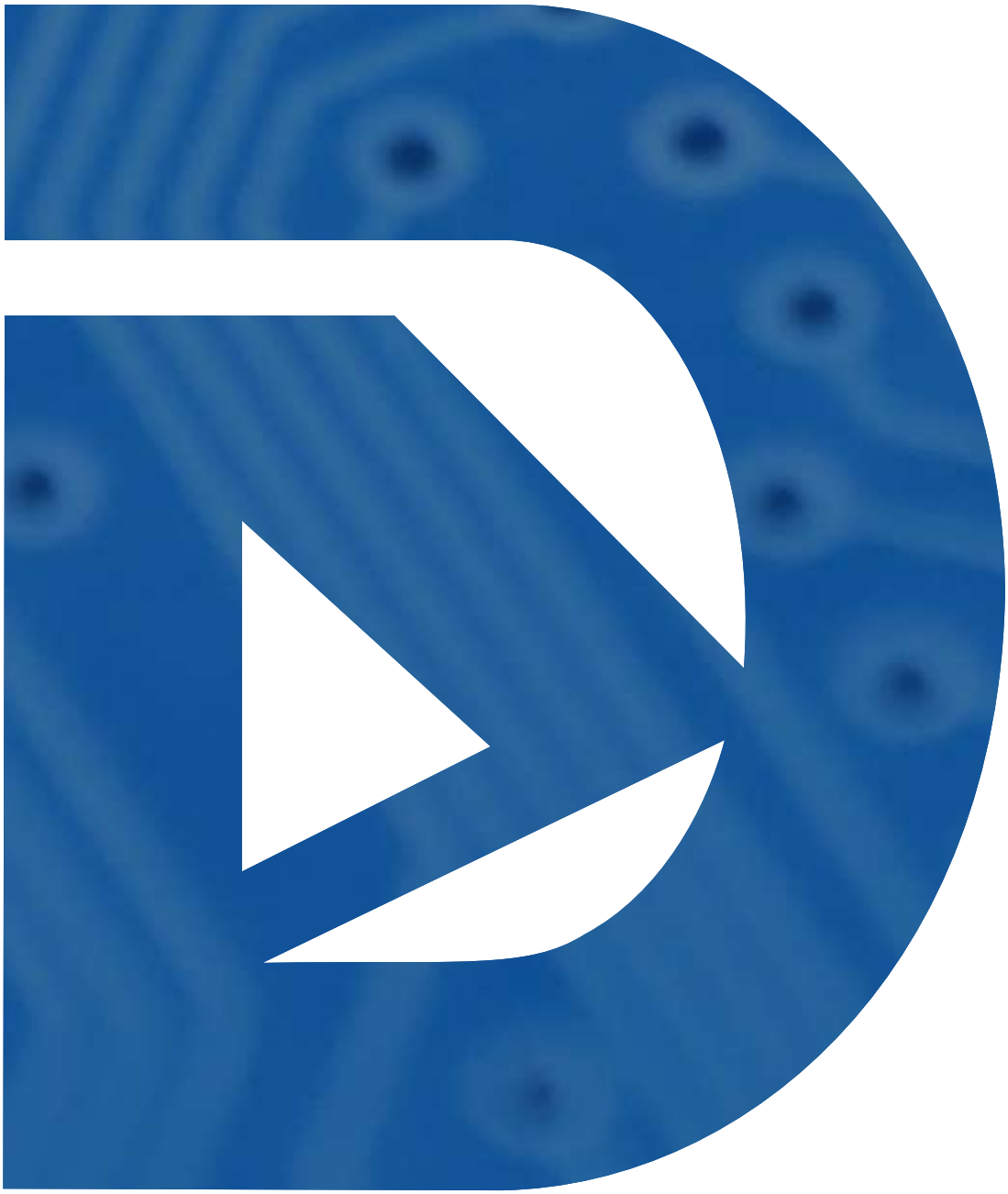
■ AC Ammeters

Directly measure AC currents from 0-2A to 0-100A

■ DC Ammeters

Include built-in shunts, reverse-polarity protection, and connections for all supply and load wiring

1 Safety Critical Component means any component whose failure to perform could cause the failure of, or affect the operation of a Life Support Device.
2 Life Support Device means any device, system or ancillary equipment intended for implant into the body or used in relation to supporting or sustaining life.



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