C&D TECHNOLOGIES

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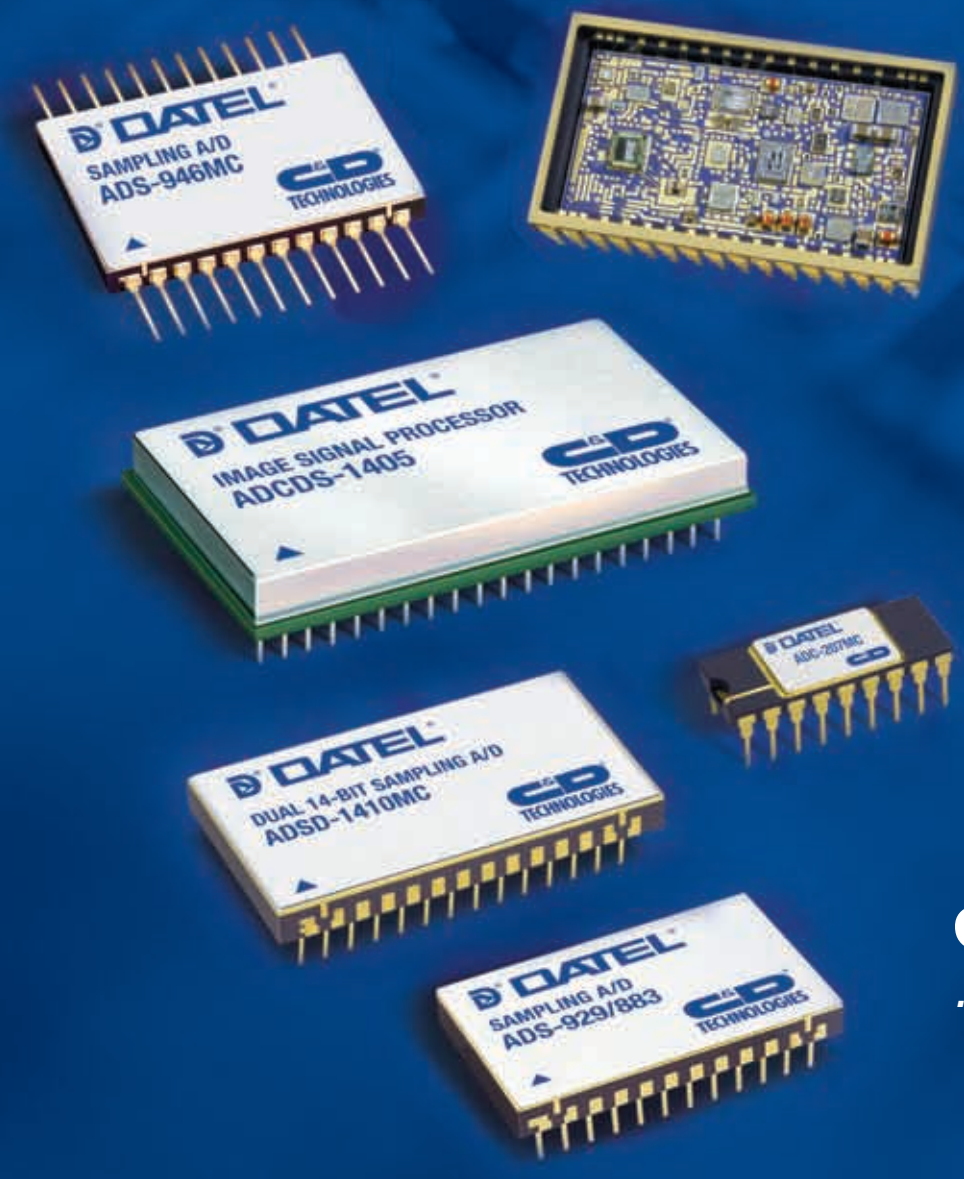
Product Data Book

Data Acquisition Products



C&D TECHNOLOGIES

...POWERING INNOVATION

Powering Innovation...

Power Electronics Division

C&D Technologies was founded on innovation - when Frank Carlyle and Leon Dougherty began a career converting gas lighting to electricity in the early 1900s.

Since then the organization has grown into a global force in power conversion and storage and is now a world-leading manufacturer, listed on the New York Stock Exchange (NYSE:CHP).

As we have changed, so have the demands of our customers. Where a simple light bulb would have amazed Carlyle and Dougherty's first customers, today's electronic design engineers need innovative solutions for their ever more complex power needs. We aim not only to meet these needs, but to design the solutions that provide the power to drive the innovations of the future.

With half a million square feet of manufacturing in six facilities on three continents, eight development labs and 12 sales offices around the world, C&D Technologies' Power Electronics Division boasts some of the best resources in the power electronics industry.

Our product range is the widest available today and is constantly being updated to keep pace with the many markets we serve.

Value, quality, reliability and innovation go hand-in-hand with total customer support to ensure that our products and services are second to none.

www.cd4power.com

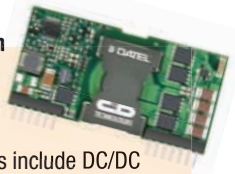
Full data on over 3,400 products are available online now.

The site offers an interactive resource for engineers sourcing all our product ranges and features:

- Intelligent product search
- Technical support details
- RoHS information
- Online purchasing
- Product datasheets
- Application notes
- Sample requests
- Custom parts requests

C&D Technologies, Inc.

C&D Technologies, Inc. is a technology company that produces and markets systems for the power conversion and storage of electrical power, including industrial batteries and electronics. The organization comprises three operating divisions:



Power Electronics Division designs, manufactures and markets products for the conversion of power within electronic systems. Products include DC/DC & AC/DC converters, support magnetics, digital panel meters and data acquisition products.

Standby Division designs, manufactures and markets batteries for standby power in telecommunications, uninterruptable power systems (UPS), broadband, CATV and mobility traction applications.

Motive Power Division develops, manufactures and markets the world's leading motive power batteries, advanced chargers, electronic monitoring modules, maintenance tools and computerized management systems.

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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France Tel: +33 (0)1-34-60-01-01 email: france@cdtechno.com
Japan Tel: +81 3-3779-1031 email: tokyo@cdtechno.com

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 "valid video" output signal. The ADCDS family digitizes this resultant "valid video" signal using a high-speed, low-noise sampling A/D converter.

If you can not find the 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	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
14	3	0.5	2.5	75	75	0.35 - 2.8	±5, +12	0.500	0 to +70	40-pin TDIP	ADCDS-1403	adcds1403.pdf
	3	0.5	2.5	75	75	0.35 - 2.8	±5, +12	0.500	-55 to +125	40-pin TDIP	ADCDS-1403EX	adcds1403.pdf
	5	0.5	2.5	74	74	0.35 - 2.8	±5, +12	0.700	0 to +70	40-pin TDIP	ADCDS-1405	adcds1405.pdf
	5	0.5	2.5	74	74	0.35 - 2.8	±5, +12	0.700	-55 to +125	40-pin TDIP	ADCDS-1405EX	adcds1405.pdf
	10	0.5	2.5	75	75	0.35 - 2.8	±5, +12	0.700	0 to +70	40-pin TDIP	ADCDS-1410	adcds1410.pdf
	10	0.5	2.5	75	75	0.35 - 2.8	±5, +12	0.700	-55 to +125	40-pin TDIP	ADCDS-1410EX	adcds1410.pdf

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	Datasheet at www.cd4power.com
%	MSPS	µsec	nsec	±Volts	µV/µsec	Volts	Watts	°C			
0.003	1.25	0.4	10	10	4	+5, ±15	0.7	0 to +70	24-Pin DDIP	CDS-1401MC	cds1401.pdf
	1.25	0.4	10	10	4	+5, ±15	0.7	-55 to +125	24-Pin DDIP	CDS-1401MM	cds1401.pdf
0.01	5	0.1	10	10	5000	±5	0.35	0 to +70	24-Pin DDIP	CDS-1402MC	cds1402.pdf
	5	0.1	10	10	5000	±5	0.35	-55 to +125	24-Pin DDIP	CDS-1402MM	cds1402.pdf

Sampling A/Ds optimized for imaging applications

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
12	1	0.25	0.5	84	73	+10	+5,±15/12	1.7	0 to +70	24-pin DDIP	ADS-CCD1201MC	ccd1201.pdf
	1	0.25	0.5	84	73	+10	+5,±15/12	1.7	-55 to +125	24-pin DDIP	ADS-CCD1201MM	ccd1201.pdf
	2	0.25	0.5	76	72	+10	+5,±15/12	1.75	0 to +70	24-pin DDIP	ADS-CCD1202MC	ccd1202.pdf
	2	0.25	0.5	76	72	+10	+5,±15/12	1.75	-55 to +125	24-pin DDIP	ADS-CCD1202MM	ccd1202.pdf

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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 and fully static and dynamic tested device...with guaranteed performance. Active laser trimming insures the final performance has been optimized based upon the internal component interactions and layout management... aspects not readily achieved in discrete designs. 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	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
12	0.06	0.75	0.75			+5, +10, ±2.5, ±5, ±10	+5, ±15	0.9	0 to +70	32-pin TDIP	ADC-HS12BMC	adchs-12.pdf
	0.06	0.75	0.75			+5, +10, ±2.5, ±5, ±10	+5, ±15	1.7	-55 to +125	32-pin TDIP	ADC-HS12BMM	adchs-12.pdf
	2	0.5	0.5	78	72	+10, ±5	+5, ±15	1.3	0 to +70	24-pin DDIP	ADS-112MC	ads112.pdf
	2	0.5	0.5	78	72	+10, ±5	+5, ±15	1.3	-55 to +125	24-pin DDIP	ADS-112MM	ads112.pdf
	2	0.5	0.5	78	72	+10, ±5	+5, ±15	1.6	0 to +70	24-pin DDIP	ADS-117MC	ads117.pdf
	2	0.5	0.5	78	72	+10, ±5	+5, ±15	1.6	-55 to +125	24-pin DDIP	ADS-117MM	ads117.pdf
	5	0.5	0.75	72	69	±1	±5	1.8	0 to +70	24-pin DDIP	ADS-118AMC	ads118.pdf
	5	0.5	0.75	72	69	±1	±5	1.8	-55 to +125	24-pin DDIP	ADS-118AMM	ads118.pdf
	10	0.5	0.75	72	69	±1.5	±5	1.8	0 to +70	24-pin DDIP	ADS-119AMC	ads119.pdf
	10	0.5	0.75	72	69	±1.5	±5	1.8	-55 to +125	24-pin DDIP	ADS-119AMM	ads119.pdf

14-bit Resolution Sampling A/Ds, Part 1

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
14	0.5	0.5	0.5	90	81	+10, ±5	+5, ±15	1.6	0 to +70	24-pin DDIP	ADS-916MC	ads916.pdf
	0.5	0.5	0.5	90	81	+10, ±5	+5, ±15	1.6	-55 to +125	24-pin DDIP	ADS-916MM	ads916.pdf
	0.5	0.5	0.5	90	81	+10, ±5	+5, ±15	1.3	0 to +70	24-pin DDIP	ADS-926MC	ads926.pdf
	0.5	0.5	0.5	90	81	+10, ±5	+5, ±15	1.3	-55 to +125	24-pin DDIP	ADS-926MM	ads926.pdf
	1	0.5	0.5	90	81	+10, ±5	+5, ±15/12	1.7	0 to +70	24-pin DDIP	ADS-917MC	ads917.pdf
	1	0.5	0.5	90	81	+10, ±5	+5, ±15/12	1.7	-55 to +125	24-pin DDIP	ADS-917MM	ads917.pdf
	1	0.5	0.5	90	81	+10, ±5	+5, ±15/12	1.6	0 to +70	24-pin DDIP	ADS-927MC	ads927.pdf
	1	0.5	0.5	90	81	+10, ±5	+5, ±15/12	1.6	-55 to +125	24-pin DDIP	ADS-927MM	ads927.pdf
	2	0.5	0.75	79	78	+10, ±5	+5, ±15/12	1.4	0 to +70	24-pin DDIP	ADS-929MC	ads929.pdf
	2	0.5	0.75	79	78	+10, ±5	+5, ±15/12	1.4	-55 to +125	24-pin DDIP	ADS-929MM	ads929.pdf

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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	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
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	ADS-943MC	ads943.pdf
	3	0.5	0.75	83	79	±2	±5	1.8	-55 to +125	24-pin DDIP	ADS-943MM	ads943.pdf
	5	0.5	0.75	80	78	±1.25	+5, -5.2	2.95	0 to +70	32-pin TDIP	ADS-944MC	ads944.pdf
	5	0.5	0.75	80	78	±1.25	+5, -5.2	2.95	-55 to +125	32-pin TDIP	ADS-944MM	ads944.pdf
	10	0.5	0.75	80	78	±1.25	+5, -5.2	4.2	0 to +70	Custom DIP	ADS-945MC	ads945.pdf
	10	0.5	0.75	80	78	±1.25	+5, -5.2	4.2	-55 to +125	Custom DIP	ADS-945.-EX	ads945.pdf
	8	0.5	0.75	80	78	±2	±5	1.9	0 to +70	24-pin DDIP	ADS-946MC	ads946.pdf
	8	0.5	0.75	80	78	±2	±5	1.9	-55 to +125	24-pin DDIP	ADS-946MM	ads946.pdf
	10	0.5	0.75	76	76	±2	+5, -5.2	2	0 to +70	24-pin DDIP	ADS-947MC	ads947.pdf
	10	0.5	0.75	76	76	±2	+5, -5.2	2	-55 to +125	24-pin DDIP	ADS-947MM	ads947.pdf
	12.8	0.5	0.75	81	78	+5, ±2.5	±5, +15	2	0 to +70	32-pin TDIP	ADS-949MC	ads949.pdf
	12.8	0.5	0.75	81	78	+5, ±2.5	±5, +15	2	-55 to +125	32-pin TDIP	ADS-949MM	ads949.pdf

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

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
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	ADSD-1402S	adsd1402s.pdf
	2	0.5	1	79	79	±5	±5	0.6	-55 to +125	40-pin TDIP	ADSD-1402S-EX	adsd1402s.pdf
	2	0.5	1	79	79	±5	±5	0.6	0 to +70	40-pin TDIP	ADSD-1402MC	adsd1402.pdf
	2	0.5	1	79	79	±5	±5	0.6	-55 to +125	40-pin TDIP	ADSD-1402MM	adsd1402..pdf
	5	0.5	1	80	78	±2	±5, +15	1.6	0 to +70	28-pin DDIP	ADSD-1405MC	adsd1405.pdf
	5	0.5	1	80	78	±2	±5, +15	1.6	-55 to +125	28-pin DDIP	ADSD-1405MM	adsd1405.pdf
	10	0.5	1	84	75	±2.5	±5	1.7	0 to +70	28-pin DDIP	ADSD-1410S	adsd1410s.pdf
	10	0.5	1	84	75	±2.5	±5	1.7	-55 to +125	28-pin DDIP	ADSD-1410S-EX	adsd1410s.pdf
	10	0.5	1	80	78	±2	±5, +15	1.7	0 to +70	28-pin DDIP	ADSD-1410MC	adsd1410.pdf
	10	0.5	1	80	78	±2	±5, +15	1.7	-55 to +125	28-pin DDIP	ADSD-1410MM	adsd1410.pdf

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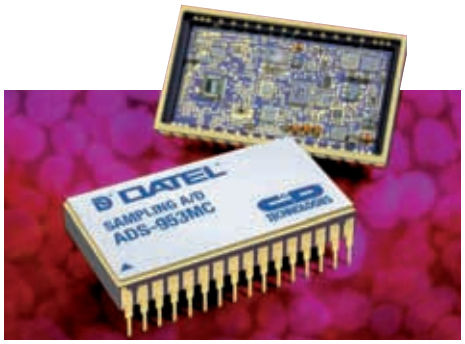
Sampling A/D Converters

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	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
16	0.5	0.5	1	89	83	-10, ±5	±5, +15	3.5	0 to +70	40-pin TDIP	ADS-930MC	ads930.pdf
	0.5	0.5	1	89	83	-10, ±5	±5, +15	3.5	-55 to +125	40-pin TDIP	ADS-930MM	ads930.pdf
	1	0.5	0.75	89	87	-5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP	ADS-931MC	ads931.pdf
	1	0.5	0.75	89	87	-5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP	ADS-931MM	ads931.pdf
	1	0.5	0.75	87	88	-10, ±5	+5, ±15	1.25	0 to +70	40-pin TDIP	ADS-937MC	ads937.pdf
	1	0.5	0.75	87	88	-10, ±5	+5, ±15	1.25	-55 to +125	40-pin TDIP	ADS-937MM	ads937.pdf
	2	0.5	0.75	88	86	-5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP	ADS-932MC	ads932.pdf
	2	0.5	0.75	88	86	-5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP	ADS-932MM	ads932.pdf
	3	0.5	1.5	86	85	-5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP	ADS-933MC	ads933.pdf
	3	0.5	1.5	86	85	-5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP	ADS-933MM	ads933.pdf
	5	0.5	1.5	84	84	±2.75	±5	2	0 to +70	40-pin TDIP	ADS-935MC	ads935.pdf
	5	0.5	1.5	84	84	±2.75	±5	2	-55 to +125	40-pin TDIP	ADS-935MM	ads935.pdf
18	1	0.5	10	89	89	±5	+5, ±15	1.45	0 to +70	32-pin TDIP	ADS-951MC	ads951.pdf
	1	0.5	10	89	89	±5	+5, ±15	1.45	-40 to +110	32-pin TDIP	ADS-951MM	ads951.pdf
	1	0.5	10	85	93	±5	+5, ±15	1.45	0 to +70	32-pin TDIP	ADS-953MC	ads953.pdf
	1	0.5	10	85	93	±5	+5, ±15	1.45	-40 to +110	32-pin TDIP	ADS-953ME	ads953.pdf

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Quality Assurance, Testing & Custom Designs

Monolithic data acquisition components may need ten to twenty plus support components, that must interact consistently with each other over temperature and over various production lots.

We use our 35 years of data acquisition/analog design and layout-decoupling expertise that keeps the noise levels to a minimum, to provide multi-chip hybrid and/or SMT-based data acquisition products in a single package. Combined with interactive laser trimming to obtain the best possible static and dynamic performance, we then 100% test and guarantee our data converters performance, over temperature to deliver consistent production lots to you over time. We get you to market quickly, letting you focus on you system-level design needs... and we lower your total cost-of-ownership, by having you screen and/or qualify only a single device.

Hybrid and/or SMT manufacturing technology is leveraged in manufacturing our Data Acquisition component products (some legacy monolithic in our product offering too!). Many of our standard products, that push the resolution or speed spectrums of our industry, may have their initial intellectual property developed on behalf of a specific need and/or application. Should you have a need for some custom and/or special product development of data acquisition, analog, linear and/or integrated power products, we'd be interested to hear from you!

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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	Converstion Rate/Time	Diff. Linearity Error	Integral Linearity Error	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Datasheet at www.cd4power.com
Bits	MSPS/µsec	±LSB	±LSB	Volts	Volts	Watts	°C			
7	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	18-Pin DIP	ADC-207MC	ADC-207.pdf
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	18-Pin DIP	ADC-207MM	ADC-207.pdf
8	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin DDIP	ADC-208AMC	ADC-208A.pdf
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin DDIP	ADC-208AMM	ADC-208A.pdf
	20 MSPS	0.5	0.5	+5	+5, ±15	0.7	0 to +70	24-Pin DDIP	ADC-228AMC	ADC-228A.pdf
	20 MSPS	0.5	0.5	+5	+5, ±15	0.7	-55 to +125	24-Pin DDIP	ADC-228AMM	ADC-228A.pdf
	20 MSPS	0.5	0.5	+0.5 to +2.5	+5	0.06	0 to +70	24-Pin DIP	ADC-305	ADC-305.pdf
	50 MSPS	0.5	0.5	+0.5 to +2.5	+5	0.125	0 to +70	32-Pin PQFP	ADC-321	ADC-321.pdf
12	20 µsec	0.5	0.75	+5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP	ADC-HX12BGC	ADC-HXHZ.pdf
	20 µsec	0.5	0.75	+5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP	ADC-HX12BMC	ADC-HXHZ.pdf
	20 µsec	0.5	0.75	+5/10, ±2.5/5/10	+5, ±15	1.2	-55 to +125	32-pin TDIP	ADC-HX12BMM	ADC-HXHZ.pdf
	8 µsec	0.5	0.75	+5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP	ADC-HZ12BGC	ADC-HXHZ.pdf
	8 µsec	0.5	0.75	+5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP	ADC-HZ12BMC	ADC-HXHZ.pdf
	8 µsec	0.5	0.75	+5/10, ±2.5/5/10	+5, ±15	1.2	-55 to +125	32-pin TDIP	ADC-HZ12BMM	ADC-HXHZ.pdf

Contact C&D Technologies about high-reliability and/or surface mount version(s) availability of these products

Application Notes

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

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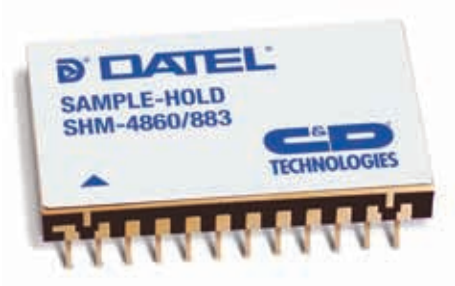
Japan Tel: +81 3-3779-1031 email: tokyo@cdtechno.com

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.

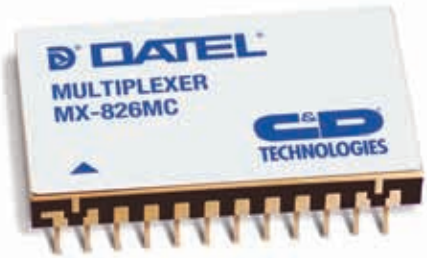
Accuracy	Acquisition Time	Aperture Delay	Input Range	Small Signal Bandwidth	Hold Mode Droop	Power Supplies	Temperature	Power	Package	Model Number	Datasheet at www.cd4power.com
(%)	µsec	nsec	±Volts	MHz	µV/µsec	Volts	°C	Watts			
0.1	40	3	2.5	25	20	±15	0 to +70	1.8	24-Pin DDIP	SHM-40MC	SHM-40.pdf
	40	3	2.5	25	20	±15	-55 to +125	1.8	24-Pin DDIP	SHM-40MM	SHM-40.pdf
0.01	6	100	11.5	1	0.2	±5 to ±18	0 to +70	0.18	TO-99	SHM-LM-2	SHM-LM-2.pdf
	0.16	10	11.5	16	0.5	+5, ±15	0 to +70	0.365	8-Pin DIP	SHM-49MC	SHM-49.pdf
	0.16	10	11.5	16	0.5	+5, ±15	-55 to +125	0.365	8-Pin DIP	SHM-49MM	SHM-49.pdf
	0.16	6	10	16	0.5	+5, ±15	0 to +70	0.73	24-Pin DDIP	SHM-45MC	SHM-45.pdf
	0.16	6	10	16	0.5	+5, ±15	-55 to +125	0.73	24-Pin DDIP	SHM-45MM	SHM-45.pdf
	0.16	6	11.5	16	0.5	+5, ±15	0 to +70	0.73	24-Pin DDIP	SHM-4860MC	SHM-4860.pdf
	0.16	6	11.5	16	0.5	+5, ±15	-55 to +125	0.73	24-Pin DDIP	SHM-4860MM	SHM-4860.pdf
	0.025	5	2	150	1	±5, +15	0 to +70	0.545	14-Pin DIP	SHM-43MC	SHM-43.pdf
	0.025	5	2	150	1	±5, +15	-55 to +125	0.545	14-Pin DIP	SHM-43MM	SHM-43.pdf
0.005	0.05	5	2.5	70	3	±5	0 to +70	0.225	8-Pin DIP	SHM-50MC	SHM-50.pdf
	0.05	5	2.5	70	3	±5	-55 to +125	0.225	8-Pin DIP	SHM-50MM	SHM-50.pdf
0.001	0.8	10	10	16	15	+5, ±15	0 to +70	0.36	8-Pin DIP	SHM-950MC	SHM-950.pdf
	0.8	10	10	16	15	+5, ±15	-55 to +125	0.36	8-Pin DIP	SHM-950MM	SHM-950.pdf
0.0008	0.4	5	10.5	16	0.5	+5, ±15	0 to +70	0.305	24-Pin DDIP	SHM-945MC	SHM-945.pdf
	0.4	5	10.5	16	0.5	+5, ±15	-55 to +125	0.305	24-Pin DDIP	SHM-945MM	SHM-945.pdf

Contact C&D Technologies about high-reliability version(s) availability of these products

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 nanonseconds.



Channels	Settling Time to 0.01% (µsec)	Access Time (nsec)	On Resistance (Ohms)	Input Ranges (±Volts)	Power Supplies (Volts)	Power (mW)	Temperature	Package	Model	Datasheet at www.cd4power.com
4SE	.05	20	18 to 70	10+5	±15	207	0 to +70	14-Pin DIP	MX-850MC	MX-850.pdf
	.05	20	18 to 70	10+5	±15	207	-55 to +125	14-Pin DIP	MX-850MM	MX-850.pdf
8SE	0.225	-4	2500	10+5	±15	395	0 to +70	24-Pin DDIP	MX-826MC	MX-826.pdf
	0.225	-4	2500	10+5	±15	395	0 to +70	24-Pin DDIP	MX-826MM	MX-826.pdf

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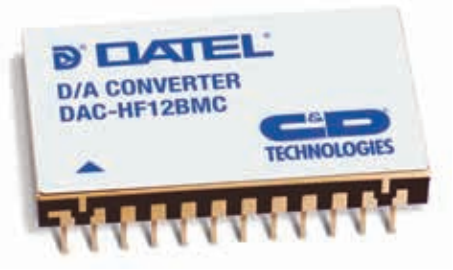
Digital-to-Analog Converters (D/As)



The Digital-to-Analog Converters count digital generation of waveforms and digital control of automated process control systems as quick examples...amongst the many and varied application usages for these devices.

Products from 8-bits 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 µsec	Differential Linearity Error ±LSB	Integral Linearity Error ±LSB	Output mA-or-Volts	Power Supplies Volts	Power Watts	Temperature °C	Package	Model Number	Datasheet at 0www.cd4power.com
8	0.025	0.5	0.75	+5, ±2.5 mA	±15	0.7	0 to +70	24-Pin DDIP	DAC-HF8BMC	DAC-HF.pdf
	0.025	0.5	0.75	+5, ±2.5 mA	±15	0.7	-55 to +125	24-Pin DDIP	DAC-HF8BMM	DAC-HF.pdf
	1	0.75	0.5	+1, ±1 mA	+5 to +15	0.03	0 to +70	20-Pin DIP	DAC-608C	DAC-608C.pdf
10	0.004	0.5	1	-1	-5.2	0.45	0 to +70	28-Pin DDIP	DAC-330	DAC-330.pdf
	0.012	0.5	2	+2	5	0.15	0 to +70	32-Pin QFP	DAC-341	DAC-341.pdf
	0.025	0.5	0.5	+5, ±2.5 mA	±15	0.8	0 to +70	24-Pin DDIP	DAC-HF10BMC	DAC-HF.pdf
	0.025	0.5	0.5	+5, ±2.5 mA	±15	0.8	-55 to +125	24-Pin DDIP	DAC-HF10BMM	DAC-HF.pdf
12	0.02	0.5	0.75	-20.48mA	+5, -5.2	0.65	0 to +70	28-Pin CLCC	DAC-SC	DAC-S.pdf
	0.02	0.5	0.75	-20.48mA	+5, -5.2	0.65	-55 to +125	28-Pin CLCC	DAC-S	DAC-S.pdf
	0.05	0.5	0.5	+5, ±2.5 mA	±15	0.85	0 to +70	24-Pin DDIP	DAC-HF12BMC	DAC-HF.pdf
	0.05	0.5	0.5	+5, ±2.5 mA	±15	0.85	0 to +70	24-Pin DDIP	DAC-HF12BMM	DAC-HF.pdf
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BGC	DAC-HK.pdf
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BMC	DAC-HK.pdf
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	-55 to +125	24-Pin DDIP	DAC-HK12BMM	DAC-HK.pdf
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BGC-2	DAC-HK.pdf
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BMC-2	DAC-HK.pdf
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	-55 to +125	24-Pin DDIP	DAC-HK12BMM-2	DAC-HK.pdf
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12BGC	DAC-HZ.pdf
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12BMC	DAC-HZ.pdf
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	-55 to +125	24-Pin DDIP	DAC-HZ12BMM	DAC-HZ.pdf
3-Digit	3	0.25	0.25	+2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12DGC	DAC-HZ.pdf
	3	0.25	0.25	+2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12DMC	DAC-HZ.pdf
	3	0.25	0.25	+2.5/5/10	±15	0.39	-55 to +125	24-Pin DDIP	DAC-HZ12DMM	DAC-HZ.pdf
16	15	1	2	±5/10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BGC	DAC-HP.pdf
	15	1	2	±5/10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BMC	DAC-HP.pdf
	15	1	2	±5/10	±15	0.65	-55 to +125	24-Pin DDIP	DAC-HP16BMM	DAC-HP.pdf
	15	1	2	±10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BGC-1	DAC-HP.pdf
	15	1	2	±10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BMC-1	DAC-HP.pdf
	15	1	2	±10	±15	0.65	-55 to +125	24-Pin DDIP	DAC-HP16BMM-1	DAC-HP.pdf

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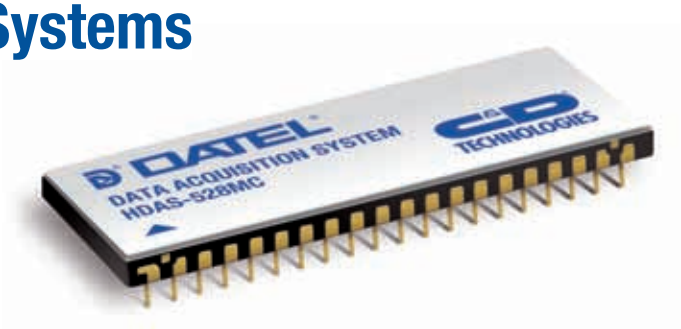
Data Acquisition Systems

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.

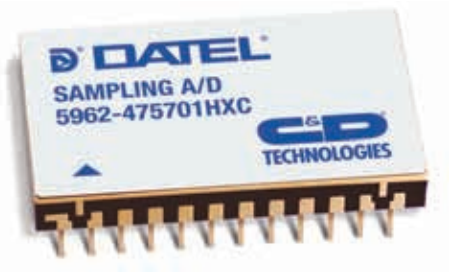
In addition to the size reduction realized, users receive functionally complete tested and guaranteed devices. Should high-reliability screening or qualification be required, economy is realized by only performing these quality assurance steps on a single device.



Resolution	Input Channels	Differential Linearity Error	Integral Linearity Error	Throughput Rate	Total Harmonic Distortion	Power Supplies	Power	Temperature	Package	Model	Datasheet at www.cd4power.com
Bits		± LSB	± LSB	kHz, Min.	-dB	Volts	Watts	°C			
12	16SE	1	1	50	-	±15	1.25	0 to +70	62-Pin QDIP	HDAS-16MC	HDAS8-16.pdf
	16SE	1	1	50	-	±15	1.25	-55 to +125	62-Pin QDIP	HDAS-16MM	HDAS8-16.pdf
	8DE	1	1	50	-	±15	1.25	0 to +70	62-Pin QDIP	HDAS-8MC	HDAS8-16.pdf
	8DE	1	1	50	-	±15	1.25	-55 to +125	62-Pin QDIP	HDAS-8MM	HDAS8-16.pdf
	8SE	0.75	0.75	400	73	±15	2.6	0 to +70	40-Pin DDIP	HDAS-528MC	HDAS524-528.pdf
	8SE	0.75	0.75	400	73	±15	2.6	-55 to +125	40-Pin DDIP	HDAS-528MM	HDAS524-528.pdf
	4D	0.75	0.75	400	73	±15	2.6	0 to +70	40-Pin DDIP	HDAS-524MC	HDAS524-528.pdf
	4D	0.75	0.75	400	73	±15	2.6	-55 to +125	40-Pin DDIP	HDAS-524MM	HDAS524-528.pdf

Contact C&D Technologies about high-reliability version(s) availability of these products

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)	Datasheet at www.cd4power.com
ADC-HX	32-Pin TDIP	5962-8850801XC	5962-8850801XA	ADC-HXHZ.pdf
ADC-HZ	32-Pin TDIP	5962-8850802XC	5962-8850802XA	ADC-HXHZ.pdf
HDAS-8	62-Pin Hybrid	5962-8851403XC	5962-8851403XA	HDAS8-16.pdf
HDAS-16	62-Pin Hybrid	5962-8851404XC	5962-8851404XA	HDAS8-16.pdf
DAC-HK	24-Pin DDIP	5962-8952801XC	5962-8952801XA	DAC-HK.pdf
DAC-HK-2	24-Pin DDIP	5962-8952801XC	5962-8952801XA	DAC-HK.pdf
DAC-HP	24-Pin DDIP	5962-8953101HXC	5962-8953101HXA	DAC-HP.pdf
DAC-HP1	24-Pin DDIP	5962-8953102HXC	5962-8953102HXA	DAC-HP.pdf
ADS-944	32-Pin TDIP	5962-9319801HXC	5962-9319801HXA	ADS-944.pdf
ADS-944	32-Pin TDIP	5962-9319803HXC	5962-9319803HXC	ADS-944.pdf
MX-826	24-Pin DDIP	5962-9450601HXC	5962-9450601HXA	MX-826.pdf
ADS-927	24-Pin DDIP	5962-9475701HXC	5962-9475701HXA	ADS-927.pdf

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Other Products from C&D

DC/DC Converters

C&D Technologies are proud to offer the largest range of DC/DC Converters available from a single manufacturer. Our ever increasing product portfolio includes all the options you'll ever need, including:

- **Isolated DC/DC Converters**
  Single, dual, triple and quad output from 0.25 to 340 Watts.

- **Point-of-Load Converters**
  From 0.75 to 5V outputs (including user-selectable versions) at current levels from 0.5 to 50A.

- **Processor & Memory Support**
  Support for 64 & 32-bit processors and DDR1 & DDR2 memory.

- **Bus Converters**
  Designed to take advantage of the high-efficiency and cost savings of intermediate bus architectures.

- **Digital Power**
  Digital IBA - a multi-source open architecture power solution that utilizes and industry-standard 1^2C interface to allow you to configure your power system (up to 32 PoLs) in less than 1 hour.

- **Factorized Power**
  V•I Chips delivering up to 300W available in 'in-board' BGA configuration or as 'on-board' J-lead SMDs.

AC/DC Power Supplies

C&D Technologies has AC/DC power supplies to meet every possible application requirement in terms of power, performance, efficiency, protection, size, approvals compliance, and cooling requirements.

- **Military**
  Our military specialists at Celab have over 30 years' experience designing and producing power supplies for Avionic, Naval, Tracked, Land and Portable.

- **CATV / Telco**
  Ultra-reliable, ruggedized power supplies for harsh CATV and Telecomunications

- **PCI & cPCI**
  From 200-500W, many with IPMI functionality in packages as small as 3U x 4HP
- **Configurable**
  400-1000W, up to 12 Output, general & medical configurations

- **Front End Modules for DPAs**
  AC to 48VDC ultra compact front end supplies for distributed power architectures with active power factor correction

- **Custom Power Supplies**
  Our design teams have the engineering expertise, experience, tools, processes and manufacturing capabilities to meet your needs

Magnetics

Two essential elements of the vast majority of power electronics applications are filtering and isolation. Whether you need to reduce noise or protect vital components, C&D can offer a wide range of products to suit your requirements.

- **Inductors & Transformers**
  Over 400 highly advanced and optimized inductor and transformer solutions with the emphasis on miniaturization, reliability and ease of handling. These power oriented designs are available in a variety of styles including:
  - bobbin
  - radial
  - axial
  - surface mount
  - through-hole
  - Tape and reel packaging is available for surface mount devices making them ideal for pick and place assembly lines

- **Filters**
  Differential common-mode
- **Databus Isolators**
  Dual and Quad

Digital Panel Meters

Over 25 years of designing and manufacturing digital panel meters has not dulled our spirit of innovation. Today we are focusing on specific applications of 2-wire meters, process monitors and AC or DC ammeters that are the easiest-to-use, most affordable meters available.

- **General Purpose Voltmeters**
  Versatile, 12-pin, dual-in-line package offering component like "plug-in" convenience for pc-board mounting as well as a built-in bezel for easy panel mounting.

- **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. Monitor the 400MHz frequency of an aircraft power generator without worrying about "proper" grounding.

- **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

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