

GENERAL INFORMATION

This document presents the main technical specifications of the dB4 4-channels data acquisition platform.

For more information, please contact your sales representative or send a request to the technical support department: support@acoemgroup.com.

ANALOG INPUT SUBSYSTEM SPECIFICATIONS

Features	Specifications
Number of analog input channels	4, single-ended, simultaneous
Resolution	24 bits
Ranges and gains	±10 V (gain of 1), ±1 V (gain of 10)
Gain error	<ul style="list-style-type: none"> Gain of 1: ±0.02% Gain of 10: ±0.5%
Zero Tempco (Temperature Coefficient)	(10 μV/°C x Gain) + 100 μV
Gain Tempco (Temperature Coefficient)	25 ppm/°C
A/D type	Delta-Sigma
Maximum sample rate	52.734 kHz
Minimum sample rate	195.3 Hz
Group delay	39/data rate, in s
ADC Sigma Delta Filter ^b <ul style="list-style-type: none"> Passband, -3 dB: Passband ripple, ±0.005 dB: Stopband, -100 dB: 	<ul style="list-style-type: none"> 0.49 x sample frequency, Hz 0.453 x sample frequency, Hz 0.547 x sample frequency, Hz
Analog Filter ^b <ul style="list-style-type: none"> Low pass cutoff, -3 dB: High pass cutoff, -3 dB (AC coupling): 	<ul style="list-style-type: none"> 400 kHz 0.5Hz
Signal/noise (typical)	106 dB
Total harmonic distortion (-0.5 dB) using 1 kHz sine wave, sampled at 50 kHz	-90 db typical
Spurious free dynamic range (SFDR) using a 1 kHz sine wave, sampled at 50 kHz <ul style="list-style-type: none"> 10 V full-scale signal (-0.5 dB): 1 V signal (-20 dB): 100 mV signal (-40 dB): 0 V signal: 	<ul style="list-style-type: none"> -90 dB typical -105 dB typical -115 dB typical -115 dB typical
Crosstalk (20V PP @ 10KHz) <ul style="list-style-type: none"> Channel 0: Channel 1: 	<ul style="list-style-type: none"> >-110dB with 50Ω termination -50dB open (Internal 1 M Ω) -105dB with 1k Ω termination
Data encoding	Offset binary
Maximum input voltage (without damage) <ul style="list-style-type: none"> Power on: Power off: 	<ul style="list-style-type: none"> ±30 V ±20 V
Input impedance	1 M Ω , 20 pF ^c
Overvoltage protection (power on/off)	±40 V
ESD protection <ul style="list-style-type: none"> Arc: Contact: 	<ul style="list-style-type: none"> 8 kV 4 kV
Current source	4 mA ±0.5% IEPE current
Compliance voltage	18 V
Current noise @ 1 kHz bandwidth	5 nA rms
Current source accuracy	±1.0%
DC offset	1.5 mV
AC coupling at -3 dB	0.5 Hz

a. The conversion rate = Sample rate * 512.

b. The total frequency response is the combined frequency response of the ADC Sigma Delta filter and the analog filter.

c. Cable capacitance of typically 30 pF per foot must be added.

ANALOG OUTPUT SUBSYSTEM SPECIFICATIONS

Features	Specifications
Number of analog output channels	1
Resolution	24 bits
Output range	±10 V
Data encoding	Offset binary
Output current	±1 mA maximum load (10 V across 10 K)
FIFO	8192 Samples, total
ESD protection <ul style="list-style-type: none"> • Arc: • Contact: 	<ul style="list-style-type: none"> • 8 kV • 4 kV
DC offset	1.5 mV
Gain error	±3.0%
Zero Tempco (Temperature Coefficient)	200 µV
Gain Tempco (Temperature Coefficient)	50 ppm/° C
Time delay (typical)	34/sample rate, in s
Power fault and reset	Goes to 0 V ±10 mV if the USB cable is removed or the power fails
Total harmonic distortion (typical at 1 kHz)	0.0015%
Internal clock	Output frequency x 256
Minimum sample rate	46.875 kHz
Maximum sample rate	46.875 Hz
DAC Sigma Delta Filter ^a <ul style="list-style-type: none"> • Passband, –3 dB: • Passband ripple, ±0.002 dB: • Stopband, –82 dB: 	<ul style="list-style-type: none"> • 0.49 x sample frequency, Hz • 0.454 x sample frequency, Hz • 0.546 x sample frequency, Hz
Analog Filter ^a	10 kHz, 2-pole, low-pass Butterworth

a. The total frequency response is the combined frequency response of the DAC Sigma Delta filter and the analog filter.

TACHOMETER INPUT SPECIFICATIONS

Features	Specifications
Number of channels	1
Resolution	31 bits per channel
Input voltage range	±30 V
Threshold voltage	+2 V with 0.5 V hysteresis
Maximum input frequency	380 kHz
Minimum pulse width high/low (minimum amount of time it takes a C/T to recognize an input pulse)	1.3 µs

POWER, PHYSICAL, AND ENVIRONMENTAL SPECIFICATIONS

Features	Specifications
Power, +5 V	±0.5 V @ 0.5 A
Physical <ul style="list-style-type: none"> Dimensions of enclosure: Weight: 	<ul style="list-style-type: none"> Width = 105.9 mm Length = 189 mm Height = 40 mm 490.7 g
Environmental <ul style="list-style-type: none"> Operating temperature range: Storage temperature range: Relative humidity: Altitude: 	<ul style="list-style-type: none"> 0° C to 55° C -25° C to 85° C to 95%, noncondensing up to 10,000 feet

REGULATORY SPECIFICATIONS

The table below lists the regulatory specifications for the DT9837 Series modules.

Features	Specifications
Emissions (EMI)	FCC Part 15, Class A EN55011:2007 (Based on CISPR-11, 2003/A2, 2006)
Immunity	EN61326-1:2006 Electrical Equipment for Measurement, Control, and Laboratory Use <u>EMC Requirements</u> EN61000-4-2:2009 Electrostatic Discharge (ESD) 4 kV contact discharge, 8 kV air discharge, 4 kV horizontal and vertical coupling planes EN61000-4-3:2006 Radiated electromagnetic fields, 3 V/m, 80 to 1000 MHz; 3 V/m, 1.4 GHz to 2 GHz; 1 V/m, 2 GHz to 2.7 GHz EN61000-4-4:2004 Electrical Fast Transient/Burst (EFT) 1 kV on data cables EN61000-4-6:2009 Conducted immunity requirements, 3 Vrms on data cables 150 kHz to 80 MHz
RoHS (EU Directive 2002/95/EG)	Compliant (as of July 1 st , 2006)
Safety	UL, CSA