Hardware Specifications

Front Panel

Rear Panel

Input Characteristics

Number of channels: 2

Type: Differential, with 500 ohms low side to ground. This may be changed by the user.

Impedance: 1 Meg Ω || < 50 pF

CMRR: > 60 dB from dc to 4 kHz
> 60 - 20 • log(f/4 kHz) dB from 4 to 50 kHz

Noise floor: < -140 dBVrms/$\sqrt{Hz}$ from 500 Hz to 50 kHz
< -140-20 • log(f/500 Hz) dbVrms/$\sqrt{Hz}$ from 1.25 Hz to 500 Hz

Input bias current: < 4 nA at 25°C

Protection: 30 Vrms (differential)

Voltage ranges: 10 ranges: ±20 mV to ±10 V full scale in 6 dB steps

Coupling: dc/ac (0.25 Hz ac -3 dB point)

User dc offset: ± 8 V on 10 V and 5 V input ranges, otherwise ±2.5 V

Residual dc offset: dc coupled: ±1 mV ± .02% of range + offset drift
ac coupled: ±2 mV ± .03% of range + offset drift

Offset drift: ± 200 μV/°C on 5 V and 10 V input ranges
± 50 μV/°C on all other ranges (after calibration)

Absolute accuracy: ± 0.0025% of full scale range ± [0.03 + 0.04 • (f/50 kHz)] dB

Data converter: 16-bit sigma delta A/D

Signal conditioning: Interface for optional circuit board for customization

Bandwidths: 5 Hz to 50 kHz in a 1, 2, 5 sequence

Sampling rate: 2.56 times selected bandwidth

Alias protection: 90 dB on all frequency ranges for f <100 kHz
80 dB on all frequency ranges for f >100 kHz

Digital filters: Real-time decimating and frequency translating digital filters Frequency translation center frequency resolution < 500 μHz, 50 kHz max center frequency on ±5 Hz to ±2000 Hz bands. 40 kHz max on ± 10 kHz and ± 5kHz bands

Filter efficiency: The alias filters provide full 90 dB protection over 78% of the Nyquist bandwidth (equivalent filter roll off: >142 dB/octave)

Digital filter ripple: < ± 0.02 dB (includes internal A/D digital filter)

Analog filter ripple: < ± [0.01 + 0.04 • (f/50 kHz)] dB

Gain match: < [0.01 + 0.04 • (f/50 kHz)] dB

Phase match: Between channels 1 and 2, same gain range:
< [0.1 + 0.9 • (f/50 kHz)]°
Otherwise: < [0.2 + 3.0 • (f/50 kHz)]°

Dynamic range: All harmonic, intermodulation, and spurious signals will be:
> 90 dB below full scale on 20, and 40 mV ranges
> 95 dB below full scale on all other input ranges

Transfer function dynamic range: > 110dB, dc-20 kHz
> 105dB, 20-50 kHz

Overload detectors: On both low and high side of inputs and at the A/D input

Trigger sources: Input channels, output channels, external TTL

Trigger threshold: 17 steps from -71% to 71% of full scale (9% steps)

Trigger slope: Positive or negative

Trigger hysteresis: Selectable, 9% or 18% of full scale

Transient response: Overshoot/preshoot < 15% on 50 kHz bandwidth or with digital filters off. Otherwise < 22%

Sampling rate: 128 kHz max per channel (simultaneous sampling)

Frequency accuracy: ± 0.01% with internal timebase

Output Characteristics

Number of channels: 1

Type: Single ended

Impedance: 51 Ω , ±1%

Noise floor: < -115 dBVrms/$\sqrt{Hz}$ from 500 Hz to 50 kHz
< -115 - 10 • log (f/500Hz) dBVrms/$\sqrt{Hz}$ from 5 Hz to 500 Hz

Drive current: 20 mA rms

Protection: 15 Vrms

Maximum level: ± 10 V (including dc offset), maximum p-p arb output 10 V

Level control: 20 mV to 10 V with better than 1 mV resolution

User dc offset: ± 10 V with < 1 mV resolution

Residual dc offset ± 4 mV + offset drift

Offset drift: ± 200 μV/°C (after calibration)

Amplitude accuracy: ± 2 mVrms ± [0.1 + 0.7 • (f/50 kHz)] dB

Data converter: 16-bit D/A, ninth-order elliptic smoothing filter

Filter ripple: < [0.1 + 0.7 • (f/50 kHz)] dB

Spectral purity: Harmonics, subharmonics, intermodulation products and spurious signals are below the selected output level (in Vrms) by the lesser of: -90 dBc for f<=5 kHz or -90+(f-5 kHz/45 kHz) dBc for 5 kHz<f<50 kHz. The table below gives some examples. (For low level outputs, the noise floor must be considered.)

Frequency in kHz:	2	5	10	20	30	40	50
Spectral Purity:	-90	-90	-88	-85	-81	-78	-75

Host interface: SCSI with selectable active terminator, high density connectors

Power requirements: 12 Vdc (15 max), less than 1.5 Amps

ac adapter: Input: 95-240 Vac, Output: 12 Vdc

Internal battery: 7.2 V, 1500 mAh

Data memory: 4 MB standard. 8, 16, and 32 MB options

Size: Aluminum case, 8.5" x 11" x 2" (21.6 cm x 27.9 cm x 5.1 cm)

Weight: 4.5 lbs. (2 kg) including internal battery

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