



**Features**

- Simultaneous sampling
- 16-bit 80 dB dynamic range
- Input anti-aliasing and output smoothing filters
- Software programmable attenuation, gain, compression and sampling rate
- Ideal for digital audio

**Ordering Information**

Model	Description
4252	16-Ch 16-bit A/D & D/A MIX module
<b>Option:</b>	
-003	16 ksample FIFO

**General Information**

Although effective in a variety of applications, Model 4252 is specifically designed for digital audio use, providing sixteen individual analog inputs and outputs with 16-bit resolution.

**Preset Standard Sampling Rates**

Preset sampling rates can be chosen under program control for the common digital audio applications, including 44.1 kHz for CD, 48 kHz for DAT and 8 kHz for digital telecommunications.

Any other sampling rate from 4 kHz to 50 kHz can be derived from the internal clock or provided externally. Due to the sigma-delta conversion technique employed, all channels are sampled simultaneously with virtually zero phase delay between channels. Provisions are included for synchronizing the sampling clocks of multiple modules.

**Precision Data Conversion**

The data converters provide greater than 80 dB dynamic range at both input and output. For telecommunications applications built-in  $\mu$ -law and A-law companding can be selected at input and output.

**Signal Conditioning Built in**

The sigma-delta converters include digital low pass filtering of all A/D inputs to prevent aliasing. These linear-phase filters track the sampling rate and exhibit extremely sharp rolloffs and flat passband response. Matching filters are provided at each D/A output to remove sampling components. Input gain and output attenuation are included. Gain and attenuation

changes are timed at zero crossings to prevent switching noise.

**Specifications**

**Input:** single-ended,  $\pm 2.8$  V full scale, 100 kohm impedance,  $\pm 0.5$  dB frequency response; optional differential input adapter available, Model 9101

**Input gain:** programmable from 0.0 dB to +22.5 dB in 1.5 dB steps

**Output:**  $\pm 2.8$  V full scale, 50 ohm impedance,  $\pm 0.5$  dB frequency response; optional differential output adapter available, Model 9101

**Output attenuation:** programmable from 0.0 to 94.5 dB in 1.5 dB steps

**Input and output filters:** digital, track at 45% of sampling rate; -74 dB stopband at  $\geq 55\%$  of sampling rate;  $\pm 0.1$  dB ripple, 0  $\mu$ s group delay variance

**A/D and D/A conversion:** 16 bits, 80 dB dynamic range;  $\pm 0.9$  LSB differential non-linearity; 74 dB SINAD

**Compression/decompression:** software programmable 8-bit A-law or  $\mu$ -law

**FIFO:** 1 ksample expandable to 16 ksample between A/D and MIX bus; 1 ksample expandable to 16 ksample between the MIX bus and D/A

**Sampling rates:** 4 kHz to 50 kHz from internal or ext. clock; preset rates of 8, 16, 24, 32, 44.1, 48 kHz and others

**MIX interface:** memory mapped; FIFO data input; FIFO data output; gain/attenuation registers; status/control and interrupt mask registers; sample clock control; interrupts on FIFO full, half-full, empty

**Power:** 1.0 A at +5 V; 0.2 A at +12 V, 0.2 A at -12 V from the MIX bus

**Block Diagram, Model 4252**

