ADC16
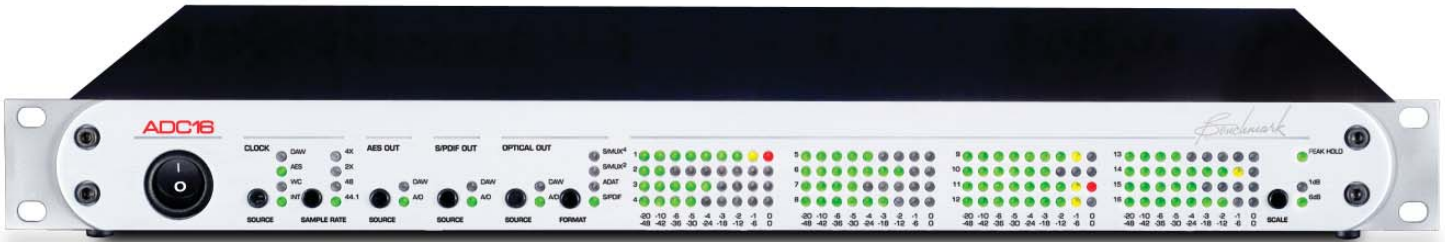## 16 Channel 24-bit 192kHz A/D Converter

Benchmark
...the measure of excellence!™

Music is a Beautiful thing…especially with the Benchmark ADC16

Benchmark's philosophy is very clear: digital converters should preserve all of the glorious nuances of the source so that the listener can simply engage with the music. Benchmark's converters are world-renowned for fulfilling this mandate.

Benchmark's ADC16 is, yet again, another successful actualization of this philosophy. With the ADC16, Benchmark's storied sonic purity can span across an entire multi-track recording session. This 16-channel A/D converter conquers the digital demons that plague so many converters on the market.

The ADC16 delivers the industry's 'Benchmark' for performance in a package that is simultaneously full-featured, functionally flexible, intuitive, aesthetically alluring, and surprisingly affordable.

Flexiblity at the I/O ports

The ADC16 features 16-channels of transformerless balanced analog inputs. The analog front-end continues Benchmark's tradition of exceptionally pristine, award-winning analog circuitry – a 27 year legacy.

Each channel of analog input has a gain control (via a trim-pot) that has a 20 dB range. At 0 dB of gain, it can accept 28 dBu at the input without clipping. At max-gain, an 8 dB input-signal will drive the converters to full-scale.

The ADC16 features very flexible I/O routing solutions. The control panel allows the user to dictate the source (A/D or DAW) for each of the AES, coaxial, and optical digital outputs. This is very useful when the ADC16 is used in a studio with an analog console. The digital audio from the A/D chips can be sent directly to the digital outputs to a multi-channel D/A to feed the console – completely bypassing the DAW. This reduces latency and DAW artifacts in real-time monitoring.

The eight optical outputs on the ADC16 can be operated in SPDIF or ADAT mode at sample-rates up to 192 kHz (ADAT has SMUX2 and SMUX4 functionality).

Flexibility across DAW's

The ADC16 is completely compatible with the digital I/O interfaces of the Avid Pro Tools interfaces and other interfaces with AES, coaxial, and/or optical inputs. Moreover, the ADC16 has an optional Firewire card that will allow the ADC16 to work directly with native DAW's.

Features

• **16 channels of analog-to-digital conversion**

• **Two DB25 connectors for transformerless balanced analog input**

• **Input gain trimpots for each channel provide high-performance over 20 dB range**

• **+8 dBu to +28 dBu input sensitivity range (at 0 dBFS)**

• **Benchmark's 9-segment dual-range digital LED meters with 'peak-hold'**

• **Conversion at standard sample-rates (44.1, 48, 88.2, 96, 176.4, and 192 kHz) and will also lock to non-standard rates (anything between 28 kHz and 200 kHz)**

• **Multifunction clock input with auto-recognition of AES, SPDIF, Word Clock, or Super Clock**

• **Word Clock output**

• **Total jitter-immunity with Benchmark's, phase-accurate UltraLockDDS™ technology**

• **Four sets of digital outputs (Balanced AES, coax, optical, Firewire [optional])**

• **Independently controlled sourcing (A/D or DAW) for each set of digital outputs**

• **AES/EBU, ADAT, and ADAT S/MUX2, and ADAT S/MUX4 optical output formats**

• **THD+N = -104 dB, 0.00063% @ -3 dBFS input, SNR 121 dB A-weighted**

• **Reliable and consistent performance under all operating conditions**

The ADAT mode of the optical outputs makes the ADC16 a perfect companion for Pro Tools LE interfaces, as well as other digital interfaces with ADAT and coaxial inputs, as it can fulfill the entire digital-input capability of the interface with state-of-the-art A/D performance.

UltraLock DDS™ - Jitter-immunity without a catch

The performance of the ADC16 never varies – another core philosophy of Benchmark products.

Benchmark's new UltraLockDDS™ clock system utilizes the latest low-jitter clock technology developed for high-frequency RF communications systems. The master oscillator is a low phase-noise, temperature-compensated, fixed-frequency crystal oscillator with a +/- 2 PPM frequency accuracy. This oscillator drives a 500 MHz Direct Digital Synthesis (DDS) system that generates a 3072 x WC system clock. This high-frequency clock is divided by 6 and distributed directly to the A/D converters using a high-speed PECL clock distribution chip. Each of the 8 converters are driven directly from a dedicated, matched-impedance transmission line.

Jitter attenuation is achieved with digital filters in a custom FPGA that controls the DDS system. All jitter-induced distortion artifacts are well below audibility under all operating conditions. Jitter-induced distortion is always at least 135 dB below the level of the music. The jitter-performance of UltralLockDDS™ meets or exceeds the performance of Benchmark's UltraLock™ system, but does not use asynchronous sample rate conversion (ASRC). The elimination of the ASRC processing significantly reduces system latency and provides the most direct path from the A/D to the digital interface.

Flexibility at the Core

Benchmark's UltraLockDDS™ system is frequency agile. It can lock to any sample rate between 28 kHz and 200 kHz, and it can do so in a few milliseconds. Special pull-up and pull-down sample rates for film to video transfers are no problem. Best of all, jitter is always attenuated to levels that are well below audibility. Jitter performance is identical in all modes of operation.

Precise, detailed metering

The ADC16 features 9-segment meters for each channel. These meters are single-sample accurate, so that even the shortest peaks are registered. The meters can be set to display in 6 dB increments (48 dB range) or 1 dB increments (20 dB range). In both cases, the meters can be put in 'peak-hold' mode, which will hold the highest-valued sample until the 'peak-hold' mode is reset.

• Internal 90-264 VAC, 47-63 Hz international power supply with very wide operating range

• Meets FCC Class B and CE emissions requirements

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