# ADC-001 – 31kSPS, 2 channel A/D converter for Beaglebone Black

The ADC-001 is an analog-to-digital converter designed as a shield for the Beaglebone Black. The converter is optimized for use with electret microphones. Features of the ADC-001 include:

- High quality Analog Devices A/D converter: AD7172.

- 24 bit sampling. ENOB may be lower, depends upon sample rate and filtering in AD7172.

- Configurable sample rate; sampling up to 31kSPS.

- Two input channels.

- Two-pin 0.100" header input connector.

- Audio frequency range: 50Hz – 15kHz. (Good quality NPO DC blocking cap at input.)

- Input signal conditioning using low-noise Analog Devices op-amps.

- Open-source driver and data-acquisition software to run the board is available for free download at GitHub under https://github.com/brorson/ADC-001_basic_code. The code is written in C. All support files are also included.
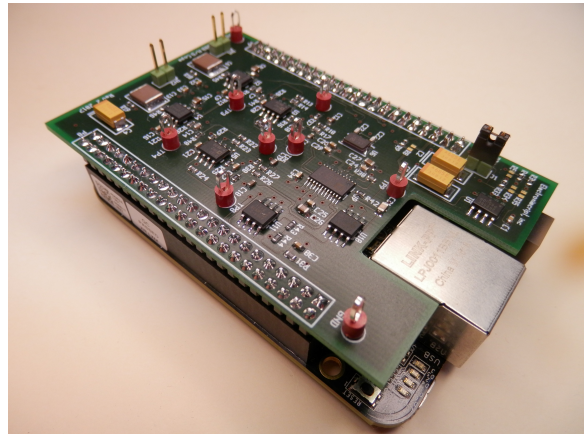
ADC-001 shown mounted on Beaglebone Black.

Example applications

The Beaglebone Black is a widely known single-board computer ideal for embedded computing applications. Its CPU is a powerful 32-bit ARM microprocessor manufactured by TI, the AM3559. The AM3559 supports hardware floating point operations.   The ADC-001 interfaces with the Beaglebone Black via SPI link over the expansion headers. The wide frequency range of the ADC-001 and the processing power of the AM3559 make the combination a powerful system for signal processing applications in the audio range. Target applications include:

- Audio signal processing.

- Data acquisition.

- Embedded sensors and controllers.

- DSP algorithm prototyping and development.

- Education, research, and development.

Open-source flexibility

Some applications may require hardware changes (i.e. to enable frequency response down to DC). A full schematic diagram of the ADC-001 is available at the GitHub site to facilitate circuit modifications. All code required to build and use the shield is also available on GitHub under so that the circuit and the software may be tailored for your individual application.

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