

Professional audio development kit

Solution optimized for professional audio applications

The Professional audio development kit (PADK) is a stand-alone, audio digital signal processing development board, designed around the low-cost TMS320C6727 floating-point DSP from Texas Instruments. The PADK is extremely flexible and benefits from more capabilities than needed by most professional audio applications. Working with such a capable platform accelerates overall design efficiency and gives developers the liberty to create exactly the type of products they need.



AT A GLANCE

- TMS320C6727 DSP from TI
- Spartan-IIIE FPGA
- Multiple I/Os
- Onboard memory

The PADK is also designed to serve as a production-quality reference design. Developers can use it as a base design, and then customize it to create a final board. Because of the flexibility of the components used on the PADK, its cost can easily be reduced and

brought to production. Lyrtech offers engineering services to help in customizing final design boards. The PADK's flexibility thus contributes in simplifying initial application development and final production design through straightforward component replacements.

Features

The PADK offers the following features:

- High-quality, 24-bit, four-channel ADCs (x2) and DACs (x2) capable of sampling rates of up to 192 kHz for multichannel coding, processing, and sound generation.
- Coaxial and optical, 24-bit digital I/O ports capable of sampling rates of up to 192 kHz—ideal for direct digital professional audio application development.
- USB port ideal for high-speed communications with a host computer, enabling real-time audio streaming, downloading large sound banks, and handling other high-bandwidth applications.
- MIDI input, output, and through ports to directly interface with external musical instruments and controllers.
- Analog port for external controls such as pedals and switches.
- The high-resolution sampling rate converter of the PADK offers the possibility to simultaneously operate at different input and output sampling rates, and to lock to various audio and word clock input sources.
- The TMS320C6727 DSP offers powerful processing and is designed for applications where audio quality and performance are critical:
 - The 64 internal registers improve automatic compiler optimizations, increase tight-loop performance, and reduce the overall number of necessary accesses to the memory.
 - The four enhanced floating-point add instructions while boosting FFT processing by 20%.
 - The dMAX DMA engine offloads the processor for specialized off-chip memory accesses, commonly used in effects processing.
 - 32 x 64-bit operations improve the efficiency of high-precision audio processing of high-sampling-rate, low-frequency applications. 32-bit, fixed-point operations are also supported to ease the porting of existing legacy code.
 - The PADK's DSP is capable of processing up to 128 simultaneous polyphonic voices of sound synthesis and up to 15 simultaneous MP3 decodes with full capabilities of mixing matrix and audio effects processing (through the optional Audio Streaming and Wavetable Solution software. See below).

Developers take advantage of all these features to deliver the most realistic audio experience and incorporate unique capabilities such as automatic room correction, speaker virtualization, audio and voice enhancements, music synthesis, and more into their professional audio and mass-market products.

