



UPM-1

Stereo to 5.1 Converter



The UPM-1 is an all digital stereo-to-5.1 upmix processor, aimed at broadcast applications. The progression from standard definition (SD) to high definition (HD) broadcasting brings with it the requirement for a digital 5.1 audio stream. In many working environments broadcasters find themselves in situations where they need to introduce previously recorded stereo material into an HD 5.1 audio stream. A typical example would be in the coverage of major sporting tournaments where short extracts of archived material from previous years' winning performances need to be inserted. Folding the audio back down to stereo momentarily is unacceptable - the UPM-1 will take any digital stereo input signal and create a natural sounding 5.1 mix.

Software and hardware upmixing tools have existed for some time, but most of these devices employ effects such as reverb and phase-shifts to create the extra channels required for 5.1. Instead, the UPM-1 uses a unique algorithm to perform detailed real-time analysis of the stereo source material, identifying and separating the ambience from the direct sound. Mono sources (dialogue, commentary, etc) are extracted from the stereo signal and fed to the centre channel and a good frontal stereo image is maintained by keeping the direct sound sources at the front. The UPM-1 then feeds the extracted natural ambience to the rear surround channels.



There are three controls central to the UPM-1's operation: Front Direct Sound, Front Ambient Sound and Rear Ambient Sound. By adjusting these three controls the user can create a desired balance between direct and ambient sound within the 5.1 surround. Two further controls, Width and Centre Divergence, provide the opportunity for further fine adjustment to imaging and centre channel content. Output level controls are provided for the Front, Rear, Centre and LFE channels.

The UPM-1 has two main modes of operation - Upmix mode and Matrix Decode mode. Matrix Decode mode should be selected when processing stereo matrix encoded material (Dolby® Pro Logic® etc) and any direct sound intended by the encoding process for the rear surround will be sent there.

The UPM-1 can be either internally or externally clocked - the on-board sample rate converters will synchronise the incoming AES-3 streams to either the internal clock or an external word clock. All digital input/output connections are on BNC connectors.