



## TECHNICAL DETAILS (continued from page 3)

<b>Analog Audio Inputs/Outputs</b>	Stereo Nominal Input level: -10.0 to +4.0 dBu (VU) or -2 dBu to +21 dBu (PPM) Output level: +4dBu nominal; Clip level +18dBu unbalanced, +24dBu balanced
<b>Digital Audio Inputs/Outputs</b>	2 x Stereo input AES3 or S/PDIF, 24 bits resolution Input Reference Level: Variable within the range of -30 dBFS to -7 dBFS (VU) or -23 dBFS to 0dBFS (PPM) 2 x Stereo outputs AES3 or S/PDIF Output Level (100% peak modulation): -20.0 to 0.0 dBFS software controlled
<b>Input/Output Sample Rate</b>	For AES3 I/O: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, and 96 kHz, automatically detected (input) and user-selected (output). Input and output sample rates can be different. The hardware WAVE I/O sample rate appearing in the Window Sound Control panel is 48 kHz, which can be asynchronously sample rate converted by the Windows driver over a range of 8 – 96 kHz to accommodate requests from software driving the 1101e or receiving audio from it.
<b>Jitter</b>	Less than 10ns rms
<b>Windows PC Software</b>	Included in delivery; requires Microsoft Windows® 7 OS or higher; PC connection via TCP/IP protocol via direct cable connect, modem or Ethernet interface (RJ45) or serial RS232 interface
<b>GPI Interface</b>	8 x user-programmable inputs, floating on DB-25 male connector
<b>Tally Outputs</b>	2 x NPN open-collector
<b>Dimensions (W x H x D)</b>	PCI Standard Short Length – 6.6"/168mm x 4.2"/107mm x 0.75"/19mm

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The OPTIMOD-PC 1101e audio processing card is appropriate for all digital transmission media and channels. It tailors your audio signal to help you compete in audio netcasting, HD Radio, DAB, DAB+, DRM, and other dedicated digital radio services, FMExtra™ and other digital subcarriers, mastering,

audio production, and many others. Video-oriented presets use OPTIMOD-PC's built-in CBS Loudness Controller™ to make OPTIMOD-PC an unsurpassed choice for mono or stereo sound-for-picture applications, including HDTV, DVB-x digital television, and audio/video netcasting. OPTIMOD-PC is useful for users with multiple streams because you can load one computer with as many OPTIMOD-PC cards as you have free PCI slots, each card handling one stereo program.

### Key Features

**Quick Setup** provides a guided, systematic procedure for setting up the 1101e card.

Easy **LESS-MORE** adjustment of the dynamics processing lets anyone get excellent results, while processing experts can fine-tune to their exact preferences with Advanced Control.

**Factory Presets:** Each OPTIMOD comes with a variety of factory presets which you can use as basis to create your own signature sound. Orban is happy to help you find the perfect setup for your station.

**Two Processing Structures:** The OPTIMOD -PC 1101e offers two processing structure which are five-band for a spectrally consistent sound with good loudness control, and two-band for a transparent sound that preserves the frequency balance of the original program material while also effectively controlling subjective loudness.

**PreCode™ technology (in five-band structure):** This feature allows the OPTIMOD to manipulate several aspects of the audio to minimize artifacts caused by low bitrate codecs, ensuring consistent loudness and texture from one source to the next. PreCode™ includes special audio band detection algorithms that are energy and spectrum aware. This can improve codec performance on some codecs by reducing audio processing induced codec artifacts, even with program

material that has been preprocessed by other processing than OPTIMOD. There are several factory presets tuned specifically for low bitrate codecs.

**Speech and Music Detection:** The OPTIMOD automatically detect if voice or music is being processed and allow you to set up the processing individually for both.

**“True Peak” Control** for the digital radio processing with an accuracy of better than 0.5 dB. For typical program material, accuracy is 0.2 dB.

**ITU-R BS.1770-4 Loudness Control** is available for countries that enforce an ATSC A/85 or EBU R128 Program Loudness Level and allows U.S. television users to comply with the CALM Act. With this feature, the output's Integrated Loudness can be normalized to a selected Target Loudness (e.g. dialnorm metadata in Dolby Digital transmission systems), and will prevent your transmission from being too loud or quiet compared to other transmissions with the same Target Loudness.

**CBS Loudness Controller™:** The CBS algorithm has proven its effectiveness by processing millions of hours of on-air programming since the early 1980s. It smoothly limits subjectively perceived loudness to a broadcaster-set threshold, preventing audience irritation. The controller measures subjective loudness (as perceived by an average listener) and then closes a feedback loop to limit loudness to a



preset level. It effectively controls loud commercials, which are the primary irritant in sound-for-picture applications. Third generation improvements reduce annoyance more than simple loudness control alone, doing so without audible gain pumping.

**Digital mixing:** This feature is crucially important to a netcaster who needs to control commercial content and insertion. Unlike most sound cards, OPTIMOD-PC allows you to mix an analog source, two digital sources, and two WAVE sources. For example, you could run a playout system on your computer while using the three hardware inputs for a live microphone feed, commercial insert, and network insert. Alternatively, you could run the commercial insert playout software on the same computer as the main playout system, using OPTIMOD-PC's second WAVE input to separately route the outputs of the two playout systems to the card. An external mixer usually isn't needed, making OPTIMOD-PC a more economical system solution than a low-priced sound card combined with a bunch of external hardware.

**ClockLock™ Technology:** You can lock the 1101e's output sample rate to an external 10 MHz, word clock, or AES3/AES11 reference clock. Both AES3 outputs and WAV output can be locked, which prevents buffer underflows and overflows in the downstream software and hardware. ClockLock uses a phase-locked loop with crystal VFO to

ensure low jitter and will lock to 32, 44.1, 48, 88.2 and 96 kHz sample rates.

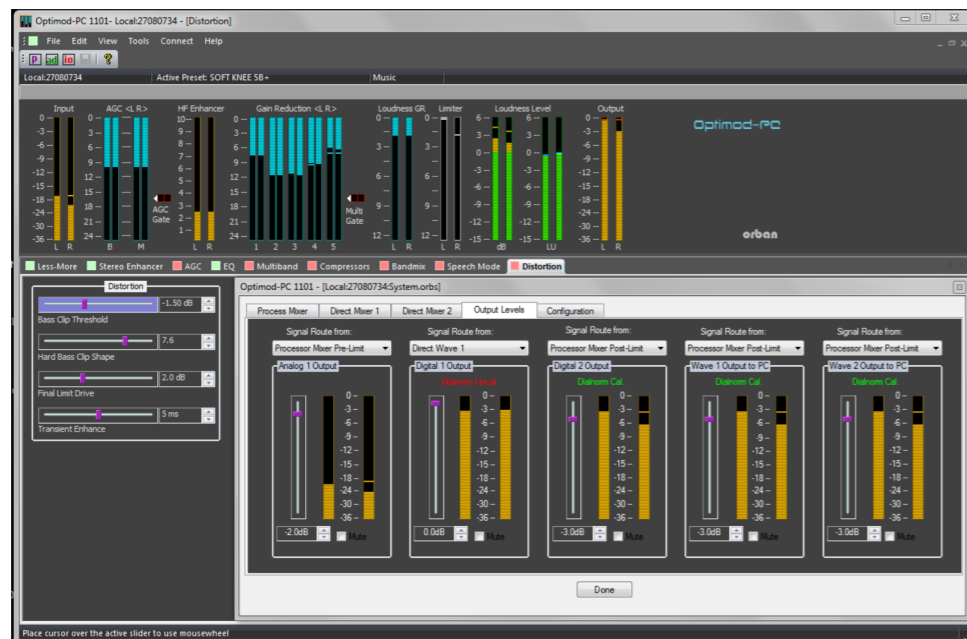
**Bypass Test Mode and Tone Generator:** A Bypass Test Mode can be invoked locally, by remote control or by automation to perform a broadcast system test or to compare easily original and processed sound. A built-in line-up tone generator facilitates quick and accurate level setting.

**Failsafe switching** detects loss of audio on the primary input, which you can assign to be the analog or digital input. If audio is lost on the primary input, the 1101e can switch automatically to the secondary input.

**SNMP Support:** The SNMP (Simple Network Management Protocol) features allow you to monitor your Optimod's status and to send alarm notifications via your Optimod's Ethernet connection to your network.

**Remote Control or front panel operation:** You can operate and configure the OPTIMOD-PC 1101e comfortably via the supplied Windows PC Software using your local network or the Internet.

**Chassis for rack mounting:** A chassis for up to 8 PC 1101e cards is available either with single or dual power supply.



## TECHNICAL DETAILS

### Number of Audio Processors

One stereo or two independent mono audio processors

### Number of channels

The 1101's audio driver allows it to appear as two standard sound devices to the computer operating system. Each of the two sound devices can handle one stereo channel or two mono channels. The channels can be mixed and routed via a three-bus mixer ("processed," "direct device 1," and "direct device 2"), but the 1101 can only apply stereo or dual-mono audio processing to the output of the "processed" bus.

The remaining two "direct" busses are applied to the output routing switcher but cannot be further processed.

### Total System Distortion (bypass mode, digital input to analog output @ +4 dBu)

<0.01% THD, 20 Hz–20 kHz. <0.002% THD @ -1 dBFS (digital input to digital output)

### Frequency Response

±0.10 dB, 2 Hz–20 kHz. Analog and digital output can be user-configured for flat or pre-emphasized output

### Internal Sample Rate

48 kHz to 192 kHz, depending on processing being performed

### L/R and R/L Crosstalk

> 50 dB, 20 Hz-20 kHz; >80 dB @ 1 kHz (analog input to output). Unmeasurable (digital input to digital output).

### Input/Output Delay

Adjustable from 25 ms to 62 ms in 1 ms steps. Presets available for one frame of: 30 fps (33.33ms), 29.97 fps (NTSC color video; 33.37ms), 25 fps (most PAL video; 40ms), and 24 fps (film; 41.67ms). "Minimum" delay is also available; this delay will vary according to the processing structure in use and crossover mode settings.

### Peak Overshoot

0.5 dB True Peak maximum; 0.2 dBTP typical

### Minimum Processing Delay

6 ms to 20 ms, processing structure dependent

### Wave Inputs/Outputs

Multiclient driver allows 1101e to appear as two standard sound devices to the computer operating system

2 x Wave input, Stereo

Input Level: Variable within the range of -20 to 0dBFS (Peak) in 0.5dB steps; software adjustable via OPTIMOD-PC Mixer Application and Windows Mixer API

2 x Wave output, Stereo

Output Level Control: Peak level is adjustable from -20 to 0dBFS in 0.1dB steps; software adjustable via OPTIMOD-PC Mixer Application and Windows Mixer API