



## LAMBDA™

### Professional Digital Audio and Metadata Monitor

Baseband and HD-SDI Audio and Metadata Monitor with ITU Loudness Measurement; Supports Dolby® Digital (AC-3), Dolby® E, and Linear Acoustic e<sup>2</sup> (e-squared®) Decoding

#### **Audio Monitors Are Not Created Equally.**

Broadcast audio has been taken a quantum leap forward in quality and complexity, and it is no longer sufficient to simply display metering information and play audio out of speakers.

Modern digital broadcast audio has grown beyond stereo and also supports 5.1 or more channels of surround sound. Audio is now accompanied by metadata, or data that describes the audio data which is used to configure downstream coding equipment and is passed along to consumers to automatically optimize their playback systems. This can work well assuming the audio and metadata are correct.

This means that in order to properly monitor audio inside a plant, an audio monitor must carefully take into account metadata and appropriately adjust metering and playback audio levels. If this is not done, operators will be unable to determine if the audio they are viewing and hearing is truly correct and could result in bad sounding decisions.

#### **Enter the Experts**

Introducing the Linear Acoustic Monitor for Broadcast Digital Audio, LAMBDA. This unit combines a unique understanding of audio and metadata through the entire broadcast chain from production to consumer.

LAMBDA can display and reproduce up to sixteen audio channels via AES or embedded HD-SDI input, and accepts industry standard professional audio metadata via 9-pin serial input or by extracting it from the vertical ancillary (VANC) space of an applied HD-SDI input. Audio and metadata can be displayed and properly combined to allow for accurate monitoring.

Any channel, channel pair, or downmix can be monitored through internal speakers, via the exceptionally dynamic front panel headphone output, or from the rear panel balanced analog stereo and AES digital output.

High-excursion full range drivers with aluminum cones are coupled with metal dome HF drivers in an acoustically tuned enclosure to optimize frequency response and power handling. Digital Linkwitz-Reilly style crossovers are combined with low distortion, high efficiency class-D power amplifiers for exceptional audio quality and loudness.

Optional Dolby Digital (AC-3) and Dolby E decoding and Linear Acoustic e-squared decoding can be applied to any of the discrete AES or embedded audio channels. Decoded discrete PCM audio outputs are provided, and decoded metadata is displayed and can be applied to the audio and metering signals.

Loudness metering per the new ITU BS.1770 standard is also included. In addition to a numerical readout, a thin line indicating measured loudness "floats" over audio metering to allow quick verification of program loudness.

A long-life and durable vacuum fluorescent display, plus two intuitive navigation clusters for menu and monitoring functions provide straightforward system navigation and audio adjustment.

All metering information is available via ETHERNET for remote monitoring and so-called "glass cockpit" applications (protocol on request). The unit supports a second optional power supply for redundancy.

## LAMBDA Specifications:

### Input Channels

Sixteen audio inputs via eight BNC connectors or optional HD-SDI (SMPTE 292M/299M) input; PCM audio and Linear Acoustic e-squared ( $e^2$ ) supported by default, optional decoding of audio formats such as Dolby E/Dolby Digital (AC-3) and others.

### Dolby Digital (AC-3) and Dolby E decoding (Available Option)

Decodes AC-3 and Dolby E signals, displays meters for all encoded channels, any pair of channels or downmix outputs for monitoring.

### Digital Audio Inputs and Outputs

1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 13/14, 15/16 AES inputs, with passive loop-through; 1/2, 3/4, 5/6, 7/8, 9/10 AES Out for e-squared and Option -01 decoding; AES Downmix Monitor output. All digital I/O via unbalanced female BNC connectors with signal levels per SMPTE 276/AES-3ID-2001.

### Audio Sample Rate

48kHz

### Frequency Response (Electrical Outputs)

20Hz – 20 kHz +/- 0.25 dB

### Speaker Outputs

98 dB SPL @ 1 meter, 160Hz - 20 kHz, 85 dB SPL @ 120 Hz

### Headphone and Monitor Outputs

Headphone via 6.3mm front panel connector, +12 dBu max into 600-Ohms, mutes speakers upon insertion; Analog Monitor out via electronically balanced 3-pin male XLR, output impedance 25-Ohms, 24-bit DAC, +4dBu @ -20dBFS.

### Latency

PCM Audio: <1 msec; Dolby Digital (AC-3): 33 msec; Dolby E (NTSC): 33 msec, Dolby E (PAL): 40 msec

### Metadata Input

9-pin female D connector, 115 kbps, pinout per SMPTE 207M (RS-485); Designed to directly interface with Dolby Metadata; alternately metadata can be extracted from VANC space of applied HD-SDI signals.

### Ethernet

10/100-BASE-T for available remote application with metering data and selectable audio (channel pairs or downmix) provided to soundcard of host PC. Remote protocol details will be provided upon request.

### Front Panel Controls and Indicators

Long-life, durable, reconfigurable vacuum fluorescent display provides visual indication of audio levels, metadata, and setup parameters. Independent navigation clusters with rotary encoder and switches for intuitive control of menus, monitor modes, volume, and mute.

### Power Requirements

High-reliability medical grade power supply rated at 100-264 VAC, auto-sensing, 45 W maximum; optional second supply for redundancy.

### Dimensions and Weight

3.50"H (2RU) x 19"W x 15"D; (89 x 483 x 381 mm).  
Net weight 13.4 lbs (6.1 kg), approximate.

### Environmental

Convection cooled. Operating: 0 to 50 degrees C, non-operating -20 to 70 degrees C. RoHS compliant design.

### Regulatory

North America: Designed to comply with the limits for a class A digital device pursuant to Part 15 of the FCC rules (CFR). Designed for U.S. and Canadian listing with UL.  
Europe: Designed to comply with the requirements of Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC. Designed for RoHS and WEEE compliance.

### Warranty

Two-years limited parts and labor

### Available Factory Installed Options

Option -01 - Dolby Digital (AC-3)/Dolby E decoding  
Option -03 - Dual power supply (second PSU)  
Option -04 - TCP/IP Remote

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