



L.A.M.B.D.A.-II

Digital Audio and Metadata Monitor

User Guide





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Chapter 1: Introduction

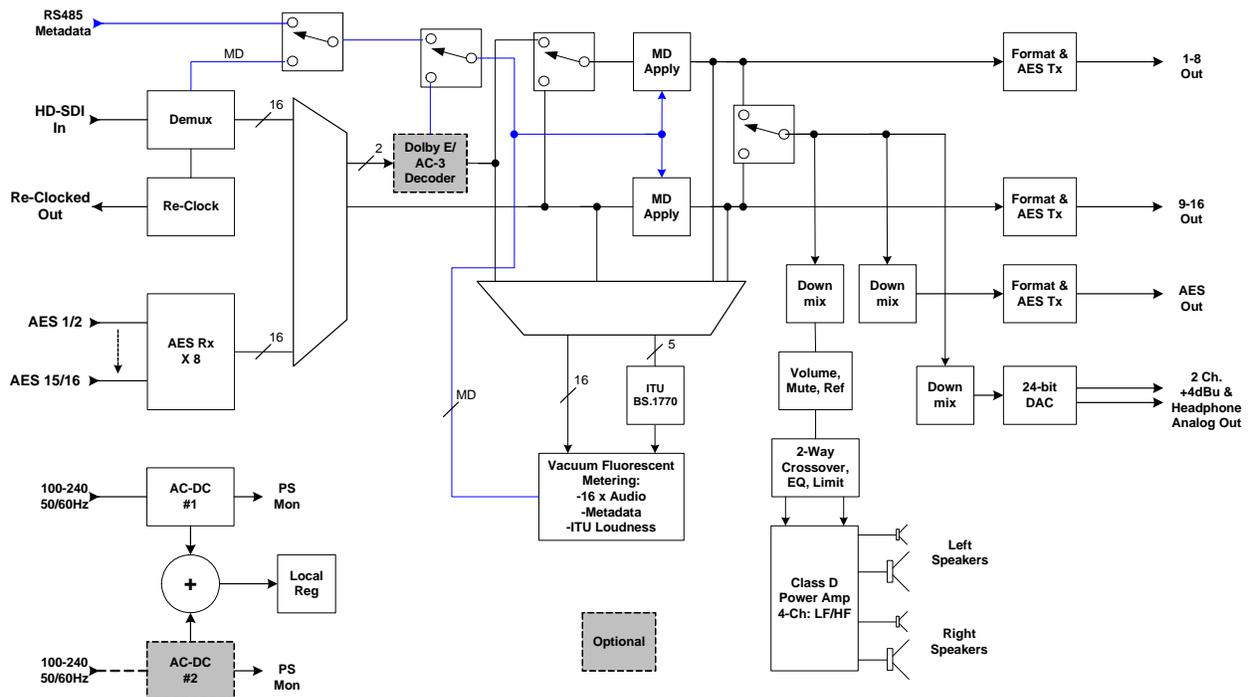
The second generation Linear Acoustic Monitor for Broadcast Digital Audio and metadata (LAMBDA) has been designed to enable fast and easy evaluation of complex multi-channel audio and metadata signals. The unit has the following features:

- Baseband PCM via AES and HD/SD-SDI audio can be arranged into logical groups. Baseband AES output of all 16 embedded audio channels when SDI input is selected or active loop-through outputs when AES input is selected.
- Display of serial or VANC SDI metadata applied alongside the audio meters and optionally applied to the audio signals to simulate its effects prior to transmission.
- Optional Dolby E/Dolby Digital (AC-3) or Linear Acoustic e-squared decoding can be provided for metering and output of discrete audio channels and metadata.
- Two-way audiophile grade speaker system driven by four digital power amplifiers, Linkwitz-Reilly crossovers provide exceptionally detailed local monitoring.
- Selected audio is also available from a powerful front panel headphone output, stereo AES and +4dBu balanced analog outputs.
- Simple control via dual menu clusters, function keys and a highly visible, durable, long-life vacuum fluorescent display
- Auto-ranging medical grade power supply, with option for dual redundancy
- Lightweight rigid aluminum construction for minimal weight impact
- **NEW:** Display of all 16 applied audio channels
- **NEW:** Front panel function keys for quick solo, downmix selection, and preset recall
- **NEW:** Downmix selectable between LoRo and True LtRt
- **NEW:** Utility delay provides up to 100 msec of delay to audio from speakers, headphones and analog/digital Monitor Outputs
- **NEW:** adjustable integration time of 3 seconds to 15 seconds for existing ITU-R BS.1770 loudness metering.
- **NEW:** GPO indication of programmable alarm conditions such as Loudness over/under threshold, Center channel under threshold, All channels under threshold, Any channel over threshold, Reference loss, and Metadata loss.

1.1 Principles of Operation

The LAMBDA is basically a multi-input router coupled with speakers and a display. Of course it is far more sophisticated than just that, combining measurement and audition of metadata, ITU loudness, and internal decoding of popular compressed audio formats such as Dolby E, Dolby Digital (AC-3), and Linear Acoustic e-squared. Sixteen baseband or compressed audio inputs are available via discrete AES3-ID (BNC) connectors, or by de-embedding from an applied HD-SDI signal. Audio outputs are active loop through of the inputs when in AES mode, and discrete decoded audio channels with compressed audio. In HD-SDI mode, the AES outputs are the de-embedded audio channels.

Figure 1-1 below is a high level block diagram showing general signal flow and currently available options. Exact operation will of course be more detailed and later chapters of this guide should be consulted for more information.



Linear Acoustic LAMBDA-II Broadcast Audio and Metadata Monitor

Figure 1-1 Audio Block Diagram

1.2 Location

The LAMBDA can be used anywhere audio and/or metadata need to be monitored. It is ideal for monitoring incoming audio, mid-plant quality control, checking audio at the point of transmission, and even providing visual and audible feedback right in master control. Each location could require some, all or none of the optional features, so the unit can be

scaled for specific applications.

1.3 Upgrades

Updates to the functionality of the LAMBDA unit will be installed via Ethernet and a provided update package. Customers are encouraged to fill out and mail the warranty registration card to enable timely notifications of updates and feature additions.

WARNING: Do not connect any devices to the Ethernet or USB connectors without specific instructions from the factory!

1.4 Warranty and Feedback

Please take a moment to fill out the postage-paid warranty card included with the unit and drop it in the mail. This will enable us to contact you if there are any software or documentation issues or updates. Also, we are very interested in your feedback. This unit was designed based on input gathered from many broadcast engineers and it will evolve further thanks to ongoing suggestions and comments from users. We look forward to hearing from you.

Chapter 2: Connections and Quick Setup

This chapter covers all required connections for the LAMBDA.

2.1 Unpacking and Inspection

Before unpacking the unit, inspect the outer carton for shipping damage. If the carton shows damage, inspect the unit in those areas. Please save the carefully designed shipping carton and packing materials. In the unlikely event that the unit needs to be returned to the factory, alternate cartons or packing materials may not be adequate and can cause damage not covered by warranty.

The following essential items are provided with the unit:

- Bag containing:
 - One power cord (style matches Country of order);
 - Spare fuses;
 - this manual
- Warranty information: Please fill out and return the warranty card to Linear Acoustic to ensure your software and documentation are kept up to date.

2.2 Installation

LAMBDA installation requires:

- two standard rack space units with ADEQUATE VENTILATION;
- standard 75-Ohm BNC cables for digital signal connections;

To connect to digital equipment with 110-Ohm XLR connectors, use impedance-matching transformers (available from Canare, Neutrik and other manufacturers).

2.3 Rear Panel

The rear panel of the LAMBDA contains its electrical I/O.

2.3.1 Connection Ports

All of the electrical I/O of the LAMBDA unit, with the exception of the front panel head-phone connector, is located on the rear panel. See Chapter 5: *Specifications* for specific pin-outs.

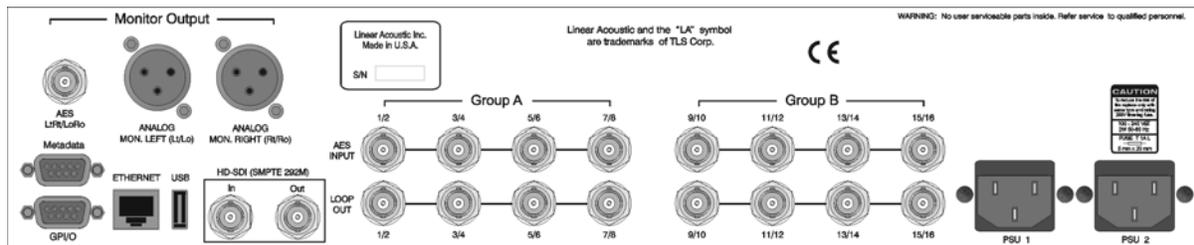


Figure 2-1 LAMBDA Rear Panel

- **AES LoRo Out:** PCM output of the audio selected to drive the speakers and headphones. Can be a downmix or individual channels, follows front panel control.
- **Analog Out Left/Right:** A +4dBu nominal analog version of the AES LoRo output.
- **AES In 1-16:** Apply baseband or compressed (optional) audio signals to these connectors. Internal routing allows for channel selection and grouping.

NOTE: LAMBDA uses AES 1/2 or the SDI input as a reference. All other source must be synchronized to the selected reference.

- **AES Out 1-16:** Active loop-through of AES inputs, AES outputs of de-embedded audio from applied HD-SDI signal, or discrete decoded audio outputs when an optional decoding module is installed.
- **Metadata:** Connect RS-485 serial audio metadata from any Dolby compatible metadata source using a pin-to-pin DB-9 cable for display and analysis.
- **GPI/O:** Four general purpose active low inputs, four general purpose TTL level outputs. GPI inputs can be used to select system presets. GPO outputs indicate alarm conditions such as loudness over or under threshold, loss of audio, missing reference and failed metadata. Thresholds and on/off times can be adjusted. See Chapter 4 for more details.

2.4 Quick Setup Notes

The LAMBDA audio monitor is very straightforward to use and configure. Spending just a few minutes with this manual and the unit will allow quick mastering of settings and controls. As shipped, the unit will have several presets to ease initial installation. Modifications can be made and new presets created that are specific to the facility, but basic audio can be monitored immediately.

As a general overview, it is helpful to think of the unit in several sections that are configured in “signal-flow” order:

- Source Mode - PCM vi BNC for discrete AES inputs, PCM via SDI for de-embedding audio from an applied SDI signal. For Dolby E or Dolby Digital (AC-3), select Dolby via BNC or Dolby via SDI.

NOTE: *Choosing PCM-16 PCM or SDI will automatically map input channels. Solo and downmix selection can then be done via front panel function keys. Please see Chapter 4 for detailed operational information.*

- Select Inputs - Configure how the applied channels should be grouped for monitoring. For example, if 8 audio channels are applied to the first four BNC connectors, they can be grouped into two programs: 5.1 and 2. This allows quick front panel selection of which program to monitor. For compressed formats such as Dolby E or Dolby Digital (AC-3), these fields are automatically assigned via metadata.
- Program Settings - Select whether to apply incoming metadata to the audio.

The following chapters will describe in detail how to set all of these parameters for custom monitoring configurations.

Chapter 3: Application Notes

The Linear Acoustic L.A.M.B.D.A. monitor can be thought of as a multi-format audio and metadata router followed by optional decoding, with outputs in the form of powered speakers, headphones, and baseband PCM. Metadata must be carefully checked prior to the final encoding process and this monitor also provides this necessary functionality.

In its simplest form, LAMBDA can be used to monitor baseband or embedded PCM audio signals grouped into pairs, and metadata can be selectively applied. For example, if 8 separate stereo programs are applied to the unit, each pair can be assigned to its own program (1-8), then easily cycled between using the Menu navigation cluster.

More complex configurations are also easily supported. Program one and program four are special in that they are able to support mono, stereo, or 5.1 channel programs. All other programs can support mono or stereo programs.

3.1 Inputs and Reference

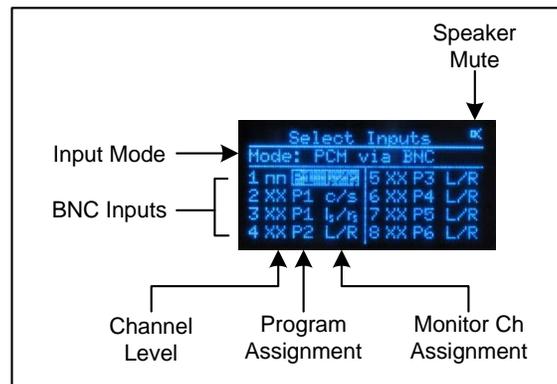
Audio can be applied as baseband or compressed via AES or HD-SDI. Metadata is via RS-485 to accompany AES signals, extracted from the vertical ancillary (VANC) space of an applied SDI signal, or provided by the optional Dolby E/Dolby Digital (AC-3) decoding module.

Reference for the LAMBDA is automatically changed when the input source is selected. For AES sources supplied via the discrete BNC connectors, the clock reference is derived from Input 1/2. For SDI sources, the reference is of course the SDI input. If no reference is connected, the unit will revert to an internal 48kHz oscillator.

3.2 Monitoring PCM Sources

The first step is to set the Source Mode to the desired PCM input format. If the input signal is baseband PCM over AES, the choices are PCM Via BNC or PCM Via BNC+MD for monitoring audio and RS-485 metadata.

The menu screen below shows how PCM inputs can be assigned to programs. Note the presence of audio on BNC 1 (assigned to Lf/Rf) and the absence of signal on other channels as indicated by “XX”:



In addition to allowing simple grouping of audio channels, setting programs also determines how audio channels are presented to the downmixer and the ITU loudness meter. It is thus critical that channels are properly assigned. For example, assigning an input with stereo audio to the c/s (Center/Subwoofer) channels will result in mono audio being reproduced and an incorrect loudness indication.

NOTE: For proper audio downmixing and loudness metering, channels must be properly assigned within a program.

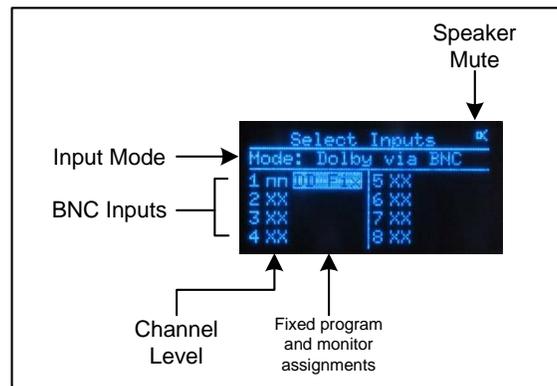
3.3 Monitoring In 16-Channel Mode

Selecting either of the PCM-16 modes (PCM or SDI) will automatically map the physical input channels 1:1 to the monitoring inputs of the LAMBDA. The Select Input screen is then fixed and no adjustments can be made. All channel selection and downmix settings are accomplished via the front panel function keys described in Chapter 4.

3.4 Monitoring Encoded Sources

Again, the first step is to set the Source Mode to the desired input format. If the input signal is Dolby E or Dolby Digital (AC-3) over AES, select Dolby via BNC, and if the input signal is supplied via HD-SDI, select Dolby via SDI. Metadata is automatically supplied by the optional decoder card.

For monitoring encoded signals, the input channel is chosen and the mapping is automatically dictated by metadata and the fixed channel layout of these formats. It can be seen below that an encoded signal is present on the first input and has been selected.



The outputs of the decoded signal (audio and metadata) are automatically mapped to the proper monitor channels. In the case of a Dolby Digital (AC-3) signal, a single program is created. In the case of a Dolby E signal, the number of programs created is driven by the Program Config metadata parameter. For example, a 5.1+2 program config is two programs, while 4x2 is four programs.

Chapter 4: Detailed Operation

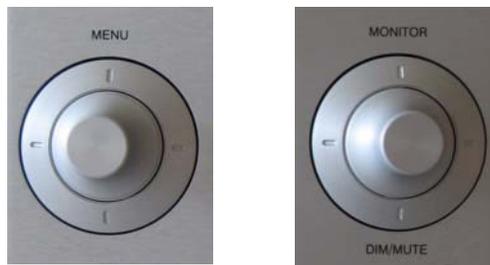
This chapter provides in depth information for setup and use of the LAMBDA unit.

4.1 Menu Navigation and System Control

The LAMBDA is unique in that the entire unit can be controlled by two simple navigation clusters. The left side controls menu functions, and the right side controls audio functions such as volume and mute. The second generation of the product brings four function keys to allow direct access to common features and preset recall.

Navigation Clusters

The Menu navigation cluster has four switches activated by pressing the left, right, top, or bottom of the navigation ring surrounding the center rotary encoder knob:



Press directly in the center of each side to avoid hitting two switches simultaneously.

Left and right advance through the menus, while up and down advance through settings within a menu. As with other Linear Acoustic products, when making a change that can be saved, an asterisk (*) will appear next to the changed value. To save it, press the Right or “Next” side of the navigation ring. To not save, press the Left or “Escape” side of the navigation ring.

NOTE: Pressing the Left button on the MENU navigation control will always return to the top menus.

The right navigation cluster controls just mute/un-mute via the top or bottom switches, and volume (via the center rotary encoder). Pressing the Right side of the Monitor navigation cluster allows instant recall of presets. Simply press Right, then turn the right rotary encoder to select the preset, then press Right again to “take” the preset and make it active.

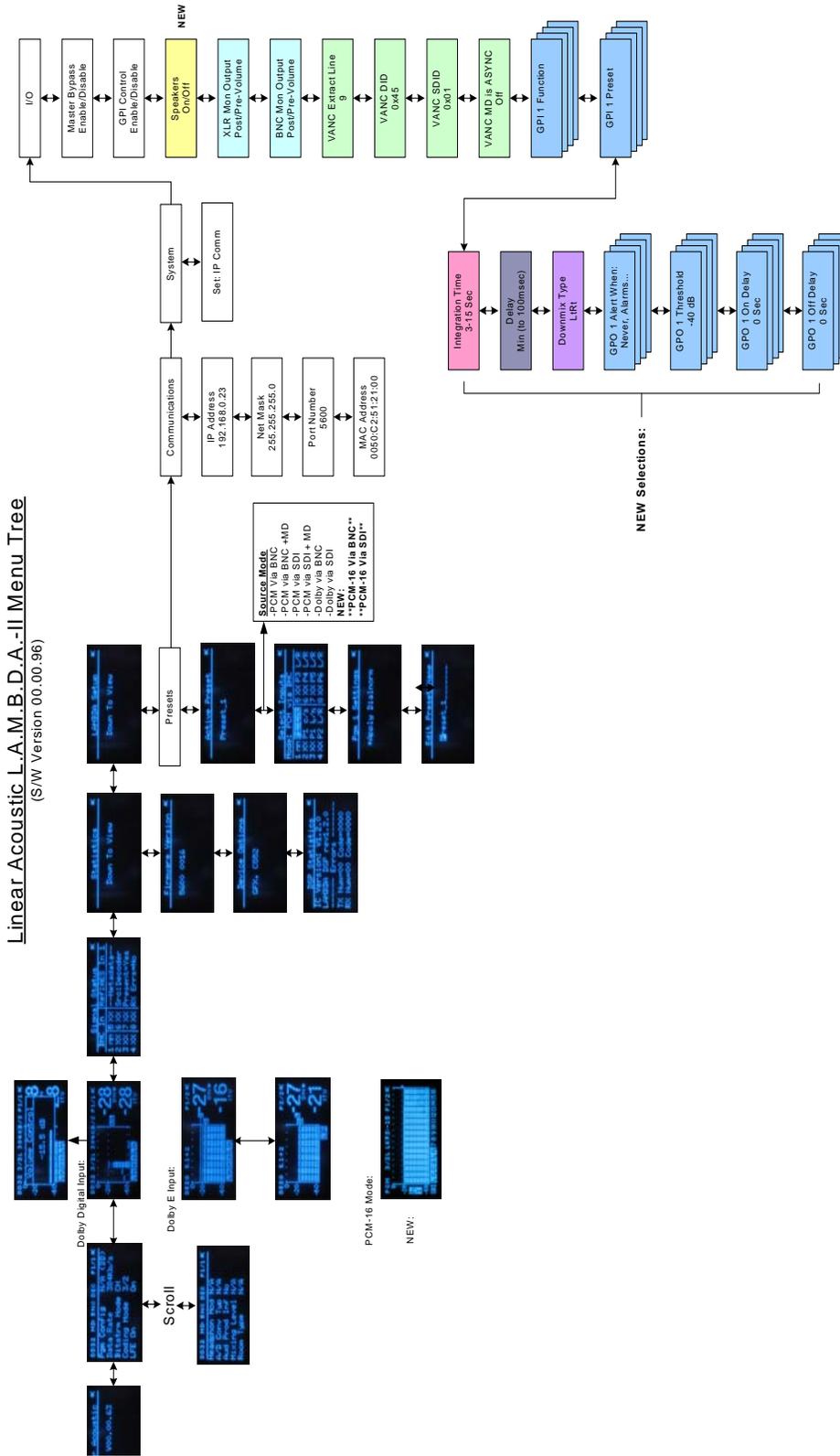
Function Keys

Four direct function keys are provided:



- **Solo Left** - Mutes the right speaker to solo audio being sent to the left speaker. Also used in PCM-16 mode when not in downmix (no light above the Downmix key) to select the channel to be reproduced by the Left speaker. Simply hold the Solo Left button until its blue light comes on, then turn the Menu (left) rotary encoder to move the “L” cursor to the desired channel. Solo can be used in any mode, but channel selection is only active in PCM-16 input modes.
- **Downmix** - Active only when in PCM-16 modes, pressing Downmix chooses 6 channels to downmix from 5.1 to two channels (LoRo or LtRt as set in the I/O menu). HOLD downmix and turn the Menu (left) rotary encoder to move the “downmix block” across channel pairs.
- **Preset** - Press to directly recall presets 1-4. Once pressed, the lights above the four buttons will blink indicating that by pressing any of them, the corresponding preset will be instantly recalled. If a key is not pressed for 5 seconds, the unit will revert to normal and no preset change will occur.
- **Solo Right** - Mutes the left speaker to solo audio being sent to the right speaker. Also used in PCM-16 mode when not in downmix (no light above the Downmix key) to select the channel to be reproduced by the Right speaker. Simply hold the Solo Right button until its blue light comes on, then turn the Menu (left) rotary encoder to move the “R” cursor to the desired channel. Solo can be used in any mode, but channel selection is only active in PCM-16 input modes.

The next page shows a detailed view of the current menu structure of the LAMBDA unit.



4.2 Detailed Menu Functions and Setup

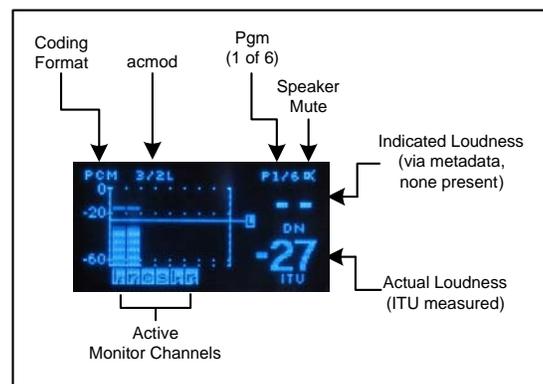
Below are in depth descriptions of each of the menu settings.

4.2.1 Menu Settings

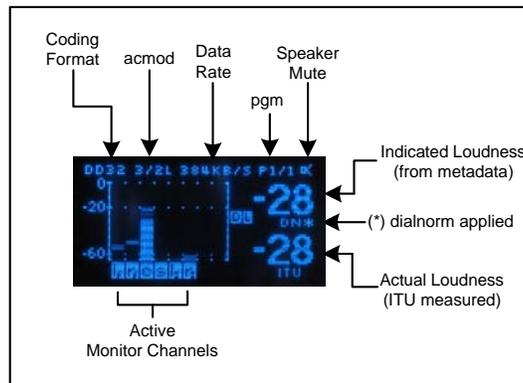
As with other Linear Acoustic products, the menus are structured so that top level menus provide current system status information, while setup is performed by accessing lower level menus. In other words, the deeper you navigate, the more detailed the status and set-up information becomes. In general, the most used information and setup parameters are kept towards the top level.

Top Level Menus:

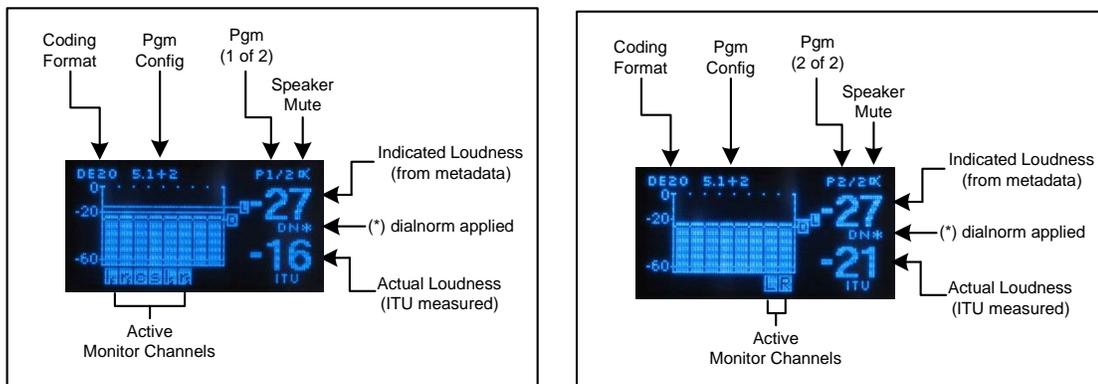
Main Screen - Displays metering and metadata information and is the default display. Below is the main screen for a PCM program. It can be see that this screen shows the first of six configured monitor programs. These programs can be cycled through by pressing down on the left Menu navigation cluster. Note that there is no metadata applied (as indicated by the --), however the ITU measurement is always active:



For a Dolby Digital (AC-3) signal, the Main screen will look like this:



For a Dolby E signal, there may be more than one program present, and this is indicated by the Program Config metadata parameter. For example, a 5.1+2 Program Config indicates two programs: a 5.1 channel program and a 2 channel program. Below are shown the two resulting screens automatically created by this metadata and they can be cycled through by simply pressing the down arrow of the navigation cluster. The left screen is Program 1 and the right screen is Program 2:



Metadata - Displays metadata information from any of three sources: Serial RS485, VANC from HD-SDI, or from an installed Dolby or Linear Acoustic decoder module.

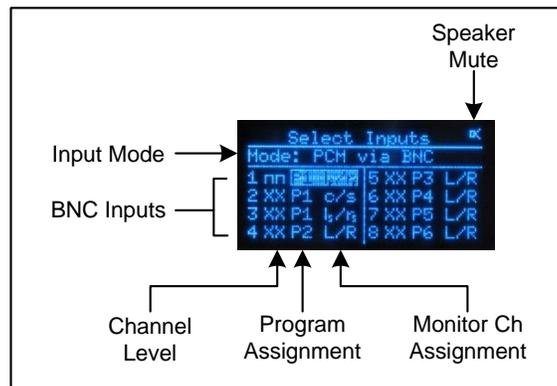
Signal Status - Shows summary of audio and metadata configuration and presence.

Statistics - Shows current installed firmware, options, and receive CRC errors for AES and metadata signals.

Setup - Menus for configuring the operation of the unit as follows:

LAMBDA Setup: Presets

- **User Preset** - Up to sixteen presets can be stored and recalled and this menu allows selection of the current preset for editing.
- **Source Mode** - Selects the type of input signals that will drive the rest of the unit:
 - PCM via BNC - Audio from any of the eight BNC inputs is used
 - PCM via BNC + MD - Audio from the BNC inputs plus metadata via RS485
 - PCM via SDI - Audio is de-embedded from applied HD-SDI signal
 - PCM via SDI + MD - Audio and metadata from applied HD-SDI signal
 - Dolby via BNC - Encoded audio is obtained from BNC inputs, then decoded (only present if Dolby decode option installed)
 - Dolby via SDI - Encoded audio is de-embedded from HD-SDI then decoded (only present if Dolby decode option installed)
 - PCM-16 via BNC - Audio from all eight BNC inputs is used, and Main Screen is set to display all 16 bar graph (bars)
 - PCM-16 via SDI- Audio from all sixteen embedded channels is used, and Main Screen is set to display all 16 bar graph (bars)
 - None - No audio inputs are selected
- **Select Inputs** - In non-16 channel modes, assigns each input BNC connector (1-8) to a specific program, and determines the channel type of each audio signal applied. For 16-channel modes (i.e. PCM-16 via BNC), the channels are mapped directly as applied to the input connectors or as they are embedded in the SDI signal. The picture below shows the function of each part of this menu screen:



NOTE: In PCM-16 via BNC or PCM-16 via SDI audio signals are mapped as applied to inputs. Front panel Solo and Downmix controls allow simple and quick selection of specific channels or groups for monitoring.

Each program can then be quickly switched between by using the up and down buttons on the Menu navigation cluster. Note that next to each of the eight BNC Inputs is a mini channel presence bargraph for easily determining if a channel pair has audio.

- **L/R** - Used for stereo or dual mono audio sources
- **lf/rf; c/s; ls/rs** - Used for setup of each pair within a 5.1 channel program: Left front/Right front, Center/Subwoofer, Left surround/Right Surround
- **C/C** - Used for 1+1 mono programs where the two channels contain different audio.
- **Pgm 1-8 Settings** - Selects whether to apply or not apply the dialnorm audio metadata parameter to the selected program.
- **Apply DRC (DD)** - Selects whether to apply or not apply the Dynamic Range Control words from an applied and decoded Dolby Digital (AC-3) signal. If present in the encoded bitstream, These control words apply dynamic cut and boost to the decoded audio. The actual gain words can be observed in the Metadata menu.
- **Edit Preset Name** - Change the name of the current preset.

LAMBDA Setup: I/O

This menu allows for general configuration of input and output signals. These settings are normally adjusted during installation and will normally not need to be changed.

- **Master Bypass** - Bypasses all audio, SDI, and metadata signals from input to output via relays. Same as powering the unit off, but audio will still be present from speakers/headphones and rear-panel Monitor Outputs.
- **GPI Control** - Enables GPI control of unit allowing for remote recall of up to four presets. See GPI setup below.
- **Speakers On/Off** - Mutes audio to internal speakers only. Does not affect headphone output or rear panel Monitor Outputs.
- **XLR Mon Output** - Pre-Volume/Post-Volume - Allows analog Monitor Output to be independent of front panel volume control. Default is Pre-Volume.
- **BNC Mon Output** - Pre-Volume/Post-Volume - Allows digital Monitor Output to be independent of front panel volume control. Default is Pre-Volume.
- **VANC Extrct Line** - Selects the video line for metadata extraction. Default is Line 9.
- **VANC DID:** - Sets the Data ID for metadata extraction. Default is 0x45.
- **VANC SDID:** - Sets the secondary Data ID for metadata extraction. Default is 0x01.
- **VANC MD is Async** - Enable for SMPTE 2020M “B” mode (i.e. CBS Metadata)
- **GPI X Function** - Configures each of the four general purpose inputs. Currently, the GPIs allow for recall of any stored preset.
- **GPI X Preset** - Allows selection of the preset that will be recalled by the GPI.
- **Integration Time** - Adjusts the storage length of the ITU integrator, where x number of seconds are stored and added to a rolling average to produce the loudness reading. Faster settings will produce more quickly moving readings and may result in a less accurate indication of average loudness. Adjustable from 3 seconds to 15 seconds, the recommended default is 10 seconds.
- **Delay** - Utility monitor audio delay between minimum (6msec in LoRo mode) to 100msec; default is Min. This is useful for matching the timing of an LCD video monitor. Thanks to our friends at ABC for the excellent suggestion!

NOTE: *Delay is only applied to the Monitor, headphone and speaker outputs, it is NOT applied to the Main AES outputs.*

- **Downmix Type** - Choose between a stereo LoRo or surround compatible LtRt downmix. Note that the LtRt contains the proper phase shift and latency is slightly longer.
- **GPO X Alert When-** Configures each of the four general purpose outputs:
 - Never - GPO does nothing.
 - Follow GPI - Each GPO will match the state of the corresponding GPI, so if GPI 1 is commanded Low, GPO1 will follow.
 - LKFS Over Thr - GPO will be active if the currently monitored input audio exceeds the adjustable threshold described below.
 - LKFS Under Threshold - GPO will be active if the currently monitored input audio is below the adjustable threshold described below.
 - Center Ch Under - GPO will be active if the Center channel of the input audio is not present, i.e. loss of Center.
 - All Ch Under - GPO will be active if the all channels of the input audio are not present, i.e. loss of audio.
 - Auto Ch Under - GPO will be active if the Center channel of the input audio is not present when program is indicated as being 5.1 via metadata, else GPO will be active if all channels are not present.
 - Any Chan Over - GPO will be active if any applied and monitored audio channel clips.
 - Reference Loss - GPO is active if reference signal is missing. If the unit is set to use PCM via BNC or Dolby via BNC, then Main In 1/2 is reference, and if the unit is set for PCM or Dolby via SDI then the SDI input is reference.
 - Metadata Loss - GPO is active if metadata fails. Metadata source can be RS485, VANC, or from an installed decoder card.
 - Buttons Locked - GPO active if the unit has been locked.
- **GPO X Threshold** - Adjustable from Mute to 0dB, default is -40dB.

- **GPO X On Delay** - Adjusts how long to wait before triggering the GPO. Default is 0 seconds, adjustable to 20 seconds. As an example, if set to 0 seconds, any event that would trigger GPO will do so instantly. If set to 20 seconds, the event must occur for 20 seconds for the GPO to change. This is useful when indicating loss of Center channel, where pauses are OK but loss for 20 seconds may not be.
- **GPO X Off Delay** - Adjusts how long to hold a GPO function once triggered. Think of it like a pulse stretcher. Allows for longer indications of quick events such as loss of metadata.

Chapter 5: Specifications

Table 5-1 Electrical Specifications

Sampling Rate	48 kHz ($\pm 0.1\%$)
Output Delay	PCM: > 6 msec; Dolby E: 33/40 msec (NTSC/PAL); Dolby Digital (AC-3): 32 msec; Delay can be padded up to an additional 100 msec.
Input Channels	Up to 16 channels via 8 AES inputs or via applied HD-SDI
Audio Word Length	24 bit
Digital Audio In	Eight BNC female connectors, AES-3ID-2001/SMPTE 276M
Digital Audio Out	Eight BNC female connectors, AES-3ID-2001/SMPTE 276M
Metadata Input/Output	RS-485, 9-pin female D-connector on rear panel
GPIO Port	TTL level, 9-pin female D-connector
Ethernet Port	RJ-45 female jack connector
HD-SDI (SMPTE 292-M)	Simultaneous extraction of sixteen channels (four groups) of audio plus VANC metadata per SMPTE RP-2020A/B.
Analog Outputs	
Frequency Response	20 Hz–20 kHz, ± 0.5 dB
Distortion	Less than 0.01% at 1 kHz Less than 0.02%, 20 Hz–20 kHz
Dynamic Range	Greater than 96 dB
Output Connectors	-Monitor/Subwoofer output via dual male XLR connectors; EMC filtered, +4dBu nominal, impedance: 25 Ohms -Headphone: 1/4 Inch (6.35mm) jack, +12dBu max
Digital I/O	
Digital Audio In/Out	Sixteen unbalanced female BNC connectors, signal levels and characteristics comply with AES-3ID-2001/SMPTE 276M. Inputs contain internal 75-Ohm termination.
HD/SD-SDI Input	75-Ohm BNC female. signals per SMPTE 292M/259M.
HD/SD-SDI Output	Active loop-through, signals per SMPTE 292M/259M

Table 5-2 Mechanical Specifications

Dimensions	3.5 × 19 × 15 in (89 × 483 × 381mm)
Net Weight	10 lb (4.54 kg) approx.
Shipping Weight	12 lb (5.44 kg) approx.
Power Requirements	100-240 VAC, autoranging, 50–60 Hz
Power Consumption	40 W maximum

Table 5-3 Environmental Specifications

Operating Temperature	0°C to 50°C, fan cooled
Non Operating Temperature (Storage)	-20°C to +70°C
Humidity	Up to 98% relative humidity, non-condensing
EMC Radiation Limits	FCC Part 15 Class A, ICES-003

Metadata Input/Output Port

9-pin female D-connector with full-duplex RS-485 protocol running at 115 kbps. Pinout is compatible with SMPTE 207M. Pin-for-pin compatible with Dolby metadata sources (i.e. straight-through cable should be used).

Table 5-4 Metadata Input Port Pinout

Pin	Connection
1	Shield
2	TX A asynchronous data out -
3	RX B asynchronous data in +
4	Ground
5	NC
6	Ground
7	TX B asynchronous data out +
8	RX A asynchronous data in -
9	Shield

GPIO Port

TTL level controls, active Low.

Table 5-5 GPIO Port Pinout

Pin	Connection
1	GPI 1
2	GPI 2
3	GPI 3
4	GPI 4
5	Ground
6	GPO 1
7	GPO 2
8	GPO 3
9	GPO 4

Ethernet Port

The Ethernet port is a standard RJ-45 female connector that supports 10 or 100BASE-T.

ITU Loudness Meter

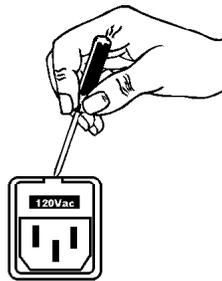
Implemented per ITU BS.1770 with an adjustable 3 second to 10 second integration time.

Chapter 6: Troubleshooting

The Linear Acoustic LAMBDA monitor is designed for years of trouble-free operation, but as with any sophisticated audio gear, there may be circumstances where some guidance would be helpful. Some practical issues and solutions are presented below.

6.1 Unit won't power on

The logo on the front panel is back-lit with blue LEDs that will illuminate when the power supply subsystem is functioning properly, so this should be the first place to check. If the logo is not lit, please check the mains fuse. This can be accomplished by removing power and the IEC connector, and using a small flat blade screwdriver to remove the fuse holder from the IEC inlet as shown below:



A spare fuse is included in the holder, and spare fuses were also included in the packing kit that shipped with the unit (Yes, that one. Now where did you put it...).

6.2 Output Audio Clicks and Pops

The LAMBDA uses either AES input 1/2 or the applied HD-SDI signal as a reference. All other inputs must be locked to the currently selected input mode (AES or SDI). Note that in AES mode, if no signal is applied to the 1/2 input, the unit will use an internal 48kHz reference so that signals applied to any of the remaining inputs will be reproduced.

NOTE: All AES input pairs must be locked to the same reference and must be applied to the unit synchronized or clicks and pops will be generated.

6.3 Meters Present, No Audio Reproduced

The most obvious reason for this would be that the unit is muted, as indicated by a “reverse-video M” in the top right corner of the display. If the unit is not muted, ensure that the volume control is turned up to a nominal level (such as -20dB). If the unit is not muted and is set to a sufficient volume, check to make sure that the bar graph meters that are showing signal presence have channels indicated below them. This determines which channels are routed to the monitoring system for reproduction over speakers, headphones, or analog outputs. If active bar graphs have no channels indicated, press the Up and Down sections of the Menu ring to cycle through the programs.

It is possible to invoke the protection circuitry in the power amplifiers. As we have found, this can be quickly accomplished by leaving the volume control set to +10 and applying a full-scale signal. While it might surprise you how loud this little box can get, imagine how the speakers must feel. Protection can be reset by powering off the unit and then powering it back on. Cleaning up the coffee you spilled on yourself can be fixed with a cloth.