

DspMini is a signal processing and monitoring companion card for the X-Pod range of amplifiers. Processing includes crossover filtering, equalisation, delay and limiting, in addition to comprehensive monitoring features. DspMini is the cost-effective tamper-proof DSP solution for your X-Pod application. The card comes factory-fitted to your X-Pod amplifier.

- Two output channels
- High quality 96kHz audio processing
- Locked OEM settings
- Tamper-proof set-and-forget settings
- Temperature monitoring

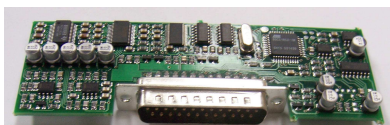
Introduction / Key Features

Linea's X-Pod range of amplifiers for use in active loudspeaker applications come factory-fitted with a DSP card of your choice. The DspMini card provides tamper-proof set-and-forget Digital Signal Processing, monitoring and control.

DspMini provides generous amounts of high quality signal processing capability, with access to a wide variety of crossover shapes.

A simple user-interface may consist of some essential indicators, and a switch arrangement which allows the user to select from a number of Voicings which you provide.

Your loudspeaker may be monitored by the PodWare Windows application, which will report levels and important status information.



Sonic Purity

DspMini uses 96kHz sampling rate, Burr-Brown analogue-to-digital converter, the renowned Wolfson multi-bit digital-to-analogue converter, and a Digital signal Processor (DSP) running audio processing algorithms borne of years of experience in high quality professional digital audio. All this adds up to deliver the ultimate in sonic transparency and a stunning open natural sound quality, fully living up to the very high sonic standards set in our amplifier products.

Branding

Each device is branded for the OEM customer so that PodWare reports the model name of your choice, with your colour scheme etc.

Crossover shapes

DspMini is capable of crossovers up to 8th order (48dB/Octave). In addition to the usual Butterworth, Linkwitz-Riley and Bessel filter shapes, DspMini provides access to Hardman crossover filtering, a technique we are proud to have introduced to the industry. Hardman filters produce much steeper cut-off slopes for a given order than conventional crossover alignments, without any additional group delay. This allows a lower order filter to be used without sacrificing cut-off characteristics, but with smoother group delay and less severe phase penalties, giving a more natural sound. Hardman filters also provide identical phase characteristics between adjacent bands (like Linkwitz-Riley), so the polar performance is rock steady.

We also employ phase matching on our Bessel filters, so adjacent bands are in-phase throughout the crossover region.

Our white-paper "Crossover Filter Shape Comparisons" provides more detail on this subject.

High-Pass Filtering

To avoid unnecessary inter-band phase shifts common in many competing products, we provide high-pass filtering on the inputs rather than forcing you to apply 'system' high-pass filtering on the low crossover bands.

Our white-paper "High-Pass Filtering in Two-Way Systems" explains why this is important.

Configuration

DspMini may be configured to provide processing for one input and up to two audio outputs.

Voices

DspMini allows four complete sets of parameters to be stored. Each set is called a *Voice*. Voices may be used, for example, to select an alternative tuning as may be required if a speaker is used with or without a separate sub-bass unit. Voice settings are stored permanently inside DspMini and so will always be available even if DspMini is not being used with PodWare.

The voice selected depends on the condition of two 'switch' lines. Normally two latching switches would be used to determine which voice is selected. If no connections are made to either of the two voice select terminals, voice 1 will always be activated at power-on.

Indicators and Switches

Up to two LED indicators and up to two Switches may be used on your loudspeaker and wired into DspMini. The LEDs show Limiter action and protection status. The switches would normally be used to select Factory/User Voice and Factory A/Factory B Voice.

Temperature Sensing

DspMini monitors the temperature of the X-Pod amplifier, which is shown on the PodWare panel as a temperature bargraph.

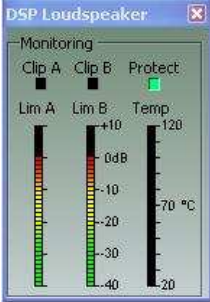
Protection

Working in close harmony with the protection systems in the X-Pod amplifier itself, DspMini protects the amplifier from damage in cases of abuse (thermal and load). It will not attempt any protection unless this is strictly necessary to preserve the longevity of the amplifier, the aim being to 'keep the show going' if at all possible, without the need for any user intervention.

In addition to this, the signal limiters aim to protect your drivers. The limiter in the LF output additionally features a two-band side-chain EQ so that the limiter threshold can be made more sensitive at some frequencies. This will be found useful to prevent excursion damage.

PodWare's MonIcon

The PodWare application uses a small panel called a *MonIcon* to display all the important status information about DspMini at a glance. From this small



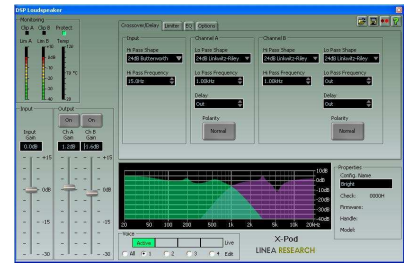
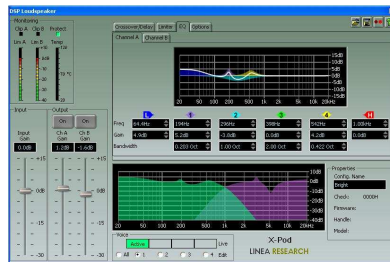
panel it is possible to see limiter activity, temperature, amplifier protection status, and amplifier clip indication. The user cannot tamper with the settings, so is not able to launch a full control panel.

OEM Settings

As the OEM, you have complete freedom to edit the crossover, driver equalisation and driver delay parameters. You can also apply a model name for the loudspeaker. Once a complete tuning has been prepared, PodWare allows you to save a Factory file which contains all these parameters. This file can then be used to load settings in production.

Should you wish to change the OEM settings in the field, modified Factory files can be distributed and loaded by the user, without the user being able to access the OEM settings.

In OEM mode, the full DspMini control panel in PodWare looks like this:



Hiding

Security of your settings is very simple: The user cannot access any of your settings. Only with the OEM password (agreed with Linea Research) can PodWare be unlocked to gain access to the OEM parameters.

Obcom

An all-new, clean messaging system developed by Linea Research, called Obcom is at the heart of our software. Obcom is used throughout our application software, and across all communications media. It is a thoroughly uniform standard that allows easy communication between different applications and different devices that support the Obcom standard. Obcom now has a large user base and is supported by many Pro Audio manufacturers.

Technical Specifications

Input impedance:	6.2k Ohm unbalanced 12.4k balanced
Max Input level:	+5.6dBu
Sample rate:	96kHz
Frequency Resp:	20Hz - 20kHz +/- 0.5dB 10Hz - 40kHz +/- 1dB
Dynamic range :	110dB A(20Hz - 20kHz)
THD (20Hz-20kHz):	<0.01%

E&OE

Signal Processing Block Diagram

