GENESIS S.A.

LOUDNESS TOOLBOX
Users guide

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1 Document purpose

This document details the installation and using procedure relative to the Loudness Toolbox provided by Genesis.

2 Matlab

This chapter is dedicated to the use of the Matlab version of the Loudness Toolbox.

2.1 Requirements

The Matlab version of the loudness toolbox requires the following software applications and components to work correctly:

- Matlab® version 7.2 R2006a or later
- Signal Processing Toolbox for Matlab®

The Loudness toolbox has been tested and validated on the following platforms:

- Windows XP SP2 and Matlab R2006
- Windows XP SP3 and Matlab R2007b
- Windows Vista SP2 and Matlab R2009b

Nota bene: Matlab® versions prior to 7.2 R2006a have not been tested but compatibility is highly probable.

2.2 Installation and configuration

The loudness toolbox for Matlab is made of a directory (named "LoudnessToolbox" by default) that contains a set of .m files and a folder named WAV that contains several test sounds in WAV format.

The user may locate this directory in any place he wishes. The only requirement is to preserve the original content and tree of the original folder.

In order to execute the loudness calculation functions provided in the toolbox, two methods are possible:

- call the wanted function in Matlab from the directory where the toolbox is located,
- add the toolbox directory to the Matlab path. This can be done as follows:
  - via the menu File > Set Path > Add folder : add here the folder where the user choosed to locate the toolbox,
  - via the command line: `addpath( DIRECTORYNAMEOFTHETOOLBOX )`

2.3 Usage

Loudness calculation is simply done by calling the wanted function. The available functions are described further in this document.

Remind that the toolbox provides several functions of loudness calculation, each one having its own validity domain in terms of acoustic signal type. For more details concerning these models, please refer to the description document provided with the toolbox.

The following table gives the correspondences between the function names, the associated model and the type of sounds for which the model is applicable.

Matlab function name	Model / standard	Stationary sound	Time-varying sound	Impulsive sound
Loudness_ISO532B	ISO 532B DIN 45631	x		
Loudness_ANSI_S34_2007	ANSI S3.4-2007	x		
Loudness_NonStationnary_Zwicker	Fastl and Zwicker loudness model for time-varying sounds		x	
Loudness_NonStationnary_Moore	Moore and Glasberg loudness model for time-varying sounds		x	
Loudness_LMIS	Impulsive sounds loudness model from Boullet et al			x

In order to know how to call the functions presented in the table, just type the following command into the Matlab console:

```
help [Function_Name]
```

where `[Function_Name]` is the name of the wanted function.

All functions and subfunctions provided in the toolbox are fully documented into the code according to the Matlab syntax.