L-Acoustics DLL library for CATT-Acoustic

technical bulletin - version 2.0

Content description

The **L-ACOUSTICS_CATT_July_2016** zip is available from the Soundvision page on *www.l-acoustics.com* and contains:

L-ACOUSTICS_CATT_2016.dll	DLL file for: K1, K2, Kara, Kiva II, ARCS II, ARCS Wide, and ARCS Focus
L-Acoustics_CATT_TB_EN.pdf	instructions for use (this document)

CATT-Acoustic™ is a trademark of CATT.

Installling the DLL library

Procedure

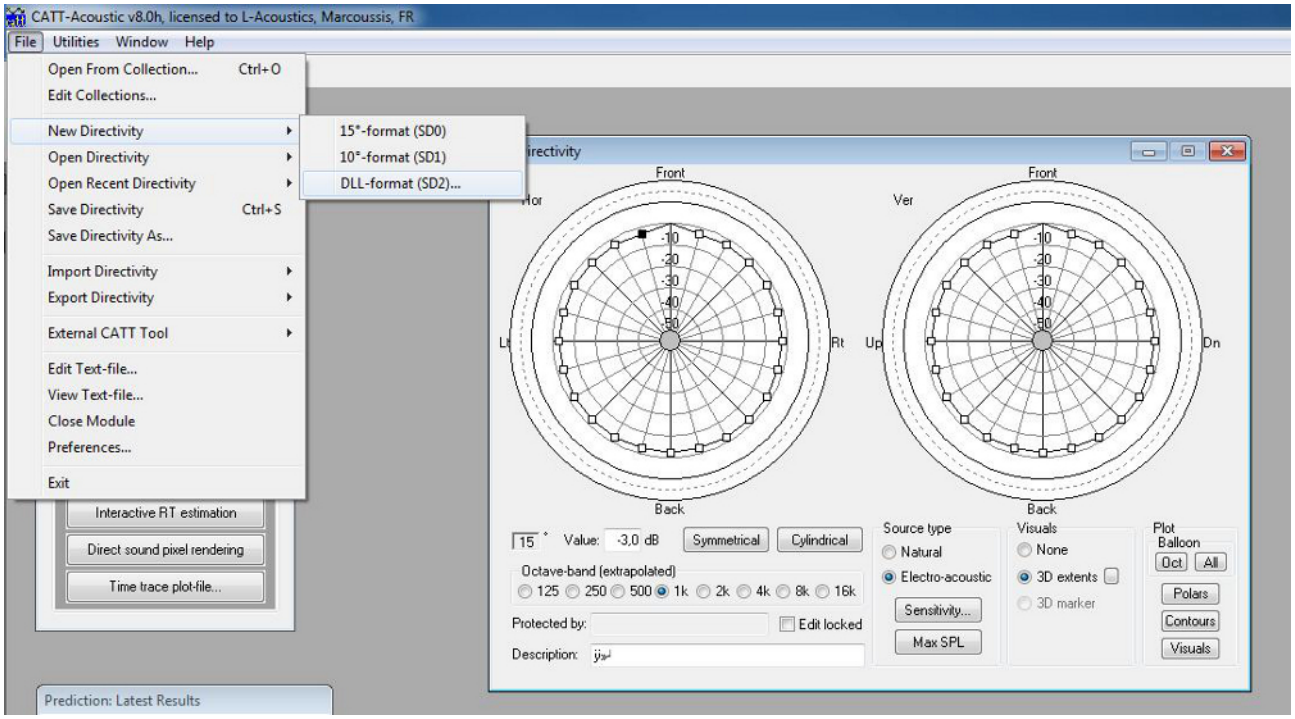
1. If necessary, define the folder for DLL libraries in CATT-Acoustic:
   a) Open CATT-Acoustic.
   b) Click **File** > **Preferences**.
   c) Select the folder.
   Typically the folder is C:/CATT_DATA
2. Copy the unzipped **L-ACOUSTICS_CATT_2016** folder in C:/CATT_DATA/SD2Data.

Creating a directivity file

How to create an array (type of enclosure and internal geometry).

Procedure

1. Open CATT-Acoustic.
2. In the main window, click **Window** > **Directivity**.
   The **Directivity** window is displayed.
3. In the main window, click **File** > **New Directivity** > **DLL-format (SD2)**.



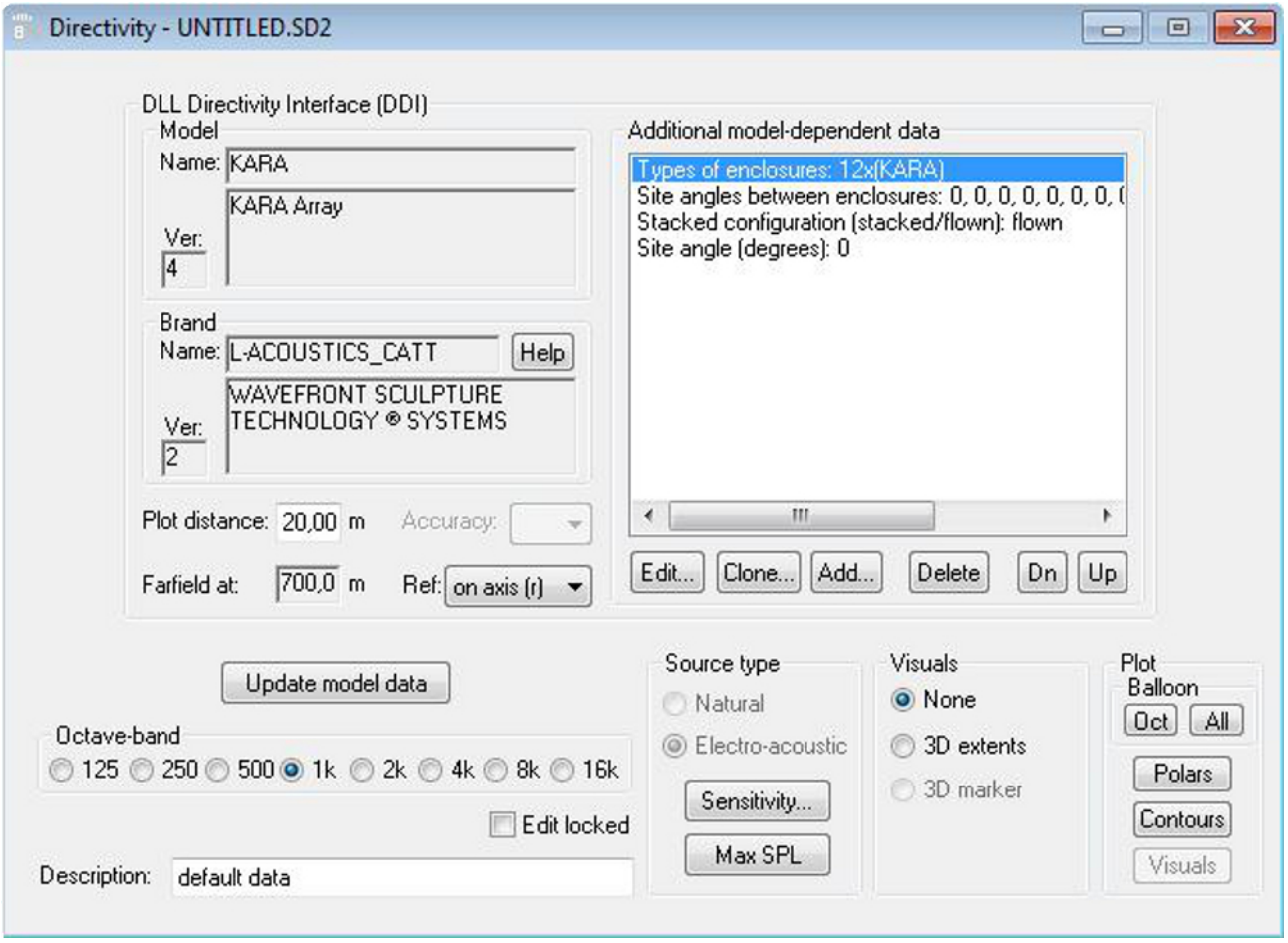
4. In the new window, select the L-ACOUSTICS_CATT_2016 folder, select an enclosure, and validate.

Risk of setting the wrong parameters

Enter data in accordance with the specifications of the system in use.

Refer to section *System specifications* (p.6).

5. In the **Directivity** window, set the array parameters:



a) Select **Types of Enclosures** and click **Edit** (or double-click **Types of Enclosures**).

b) In the new window, select the number of enclosures in the array and validate.

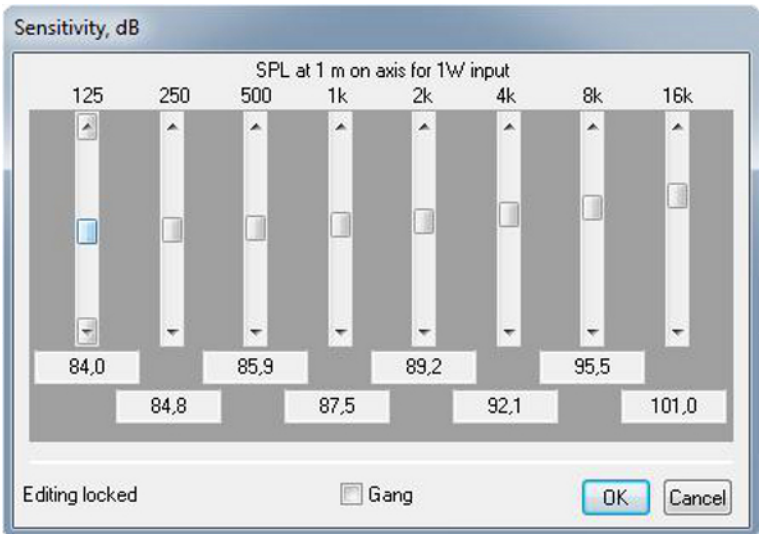
c) Repeat for **Site angles between enclosures**, **Stacked configuration (stacked/flown)** and **Site angle (degrees)**.

6. If necessary, verify the settings in the **Directivity** window:

a) Click **Sensitivity**.

The sensitivity is the SPL produced by a single enclosure at 1 m on axis with a 2.83 Vrms input signal.

It is calculated for each octave band from 125 Hz to 16 kHz.

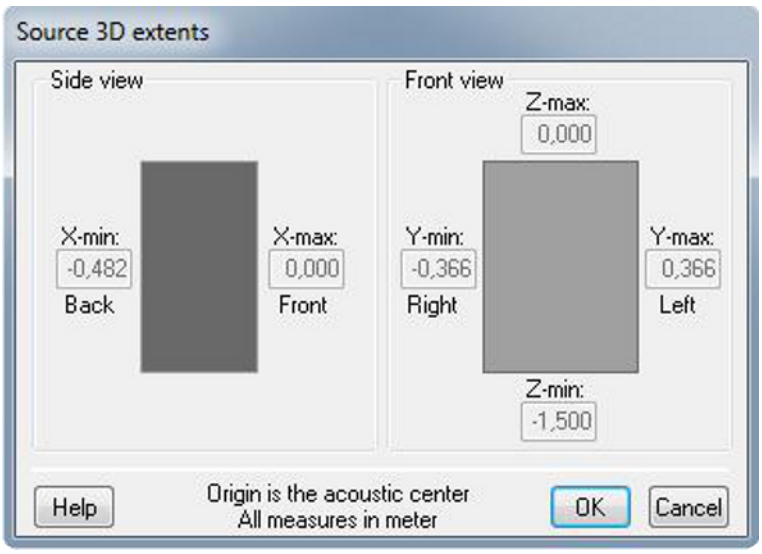


b) Click **Max SPL**.

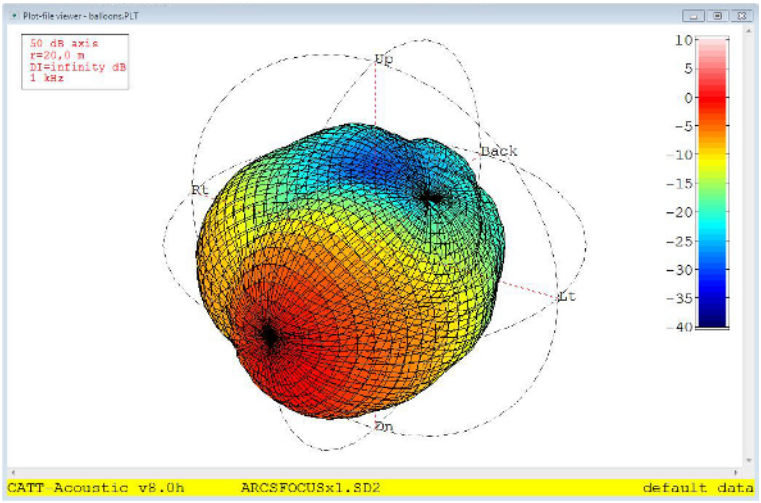
The maximum SPL is given for a single enclosure at 1 m on axis.

It is calculated for each octave band from 125 Hz to 16 kHz.

c) Select **3D extents** to display the external dimensions of the array.

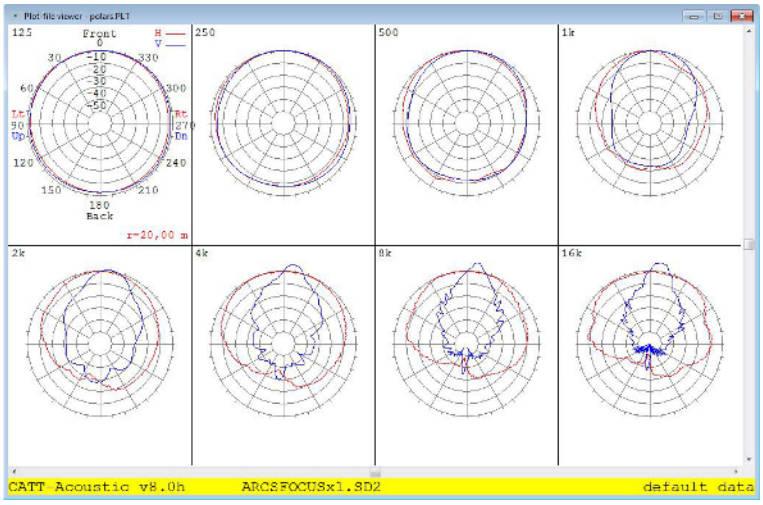


d) Select an **Octave-band** and click **Oct** to display the acoustic field (balloon) produced by the array at the selected octave-band.



e) Click **All** to display the acoustic field (balloon) produced by the array at each octave-band from 125 Hz to 16 kHz (toggle between screens).

f) Click **Polars** to display the horizontal and vertical polar plots of the array at each octave band between 125 Hz and 16 kHz.



7. From the main window, click **File** > **Save Directory As**, then enter a file name and validate to save as a .SD2 file.

Using a directivity file

How to place an array from a Directivity file (.SD2) in a venue and set gain and delay values.

Procedure

1. Click **File** > **Edit Text-file** to open the text file of the CATT-Acoustic project.
2. Add the array as a new source:

   Set the site angle in the Directivity file, then set the aim direction parallel to the xy plane (azimuth direction).

```
SOURCEDEFS
 a          b              c              d
A0        0.0 0.0 10.0    12xKARA.SD2    aim(0.0,0.0)
Lp1m_a = <0 0 0 0 0 0> e
Gain_a = <-9 -9 -9 -9 -9 -9> f
Delay_e = 0 g
```

   a) Source ID: single letter + single number
   b) Source position in the venue
   c) Directivity file (.SD2) containing the source
   d) Aiming point: (horizontal, vertical)
   e) Sensitivity values in dB at 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz respectively

      Set to 0 dB as these values are already contained in the Directivity file.

   f) Gain values in dB at 125 Hz, 250 Hz, 500 Hz , 1 kHz, 2 kHz and 4 kHz respectively

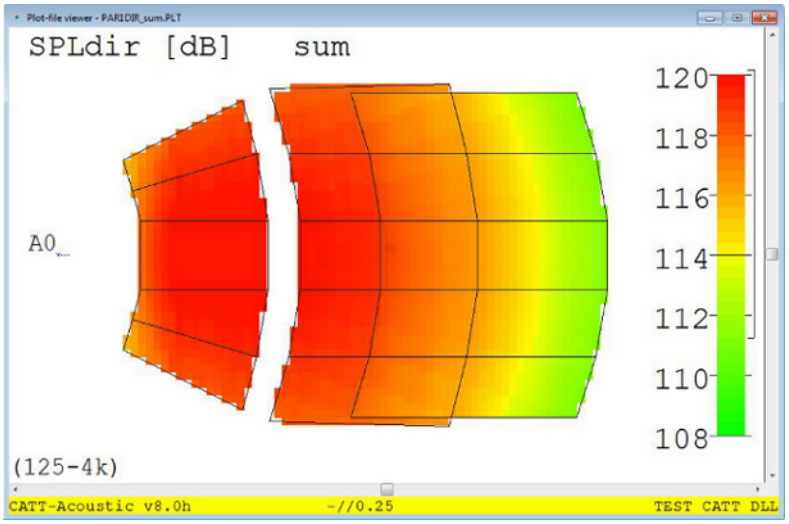
      Set to -9 dB to obtain the maximum RMS level (see information notice below)
      Add 10 dB to obtain the peak level on all enclosures (except Kiva II)
      Add 12 dB to obtain the peak level on Kiva II

   g) Delay value in ms
3. Save the Text-file and obtain the final mapping including the new array.

SPL increase in CATT-Acoustic compared to Soundvision

CATT-Acoustic calculates the SPL level over a wide frequency band by summing the levels of all octave bands contained in it (RTA convention), whereas Soundvision gives an average of all third-octave bands level values.

This leads to an SPL increase of 10.log(8) = 9 dB over the 6 octave bands from 125 Hz to 16 kHz in CATT-Acoustic.



System specifications

Specifications common to all systems

— For all arrays except the horizontal ARCS arrays, the **reference point** is the upper midpoint on the front face of the array (between the top enclosure and the rigging element).

Source position corresponds to this point.

Site angle corresponds to the vertical rotation of the array relative to this point.

— Follow this template to build an array containing a single type of enclosure: Nx(enclosure name)
  — N = number of enclosure
  — enclosure name = K1, K2, Kara, Kiva II, ARCS II, ARCS Wide, or ARCS Focus
  — The x sign and the parenthesis are mandatory
— In a flown array the enclosures and associated angles are sorted from top to bottom.
— In a stacked array all elements are reversed.

The enclosures and associated angles are sorted from bottom to top.

— For all systems except ARCS the acoustic axis of the top enclosure is parallel to the rigging element.

Specifications exclusive to each system

Risk of setting wrong inter-enclosure angles

The angle between the bumper and the top enclosure must **not** be entered in the Directivity file.

The first angle to be entered is the angle between the top enclosure and the enclosure below.

system	default configuration	possible configurations	possible inter-enclosure angles (°)
K1	12 K1 flown	vertical, flown or stacked	0 - 0.5 - 1 - 1.5 - 2 - 2.5 - 3 - 4 - 5
K2	12 K2 flown	vertical, flown or stacked	0.25 - 1 - 2 - 3 - 4 -5 - 7.5 - 10
Kara/Kara(i)	12 Kara flown	vertical, flown or stacked	0 - 1 - 2 - 3 - 4 - 5 - 7.5 - 10
Kiva II	8 Kiva II flown	vertical, flown or stacked	0 - 1 - 2 - 3 - 4 - 5 - 7.5 - 10 - 12.5 - 15
ARCS II	4 ARCS II flown horizontal	vertical, flown or stacked horizontal, flown or stacked	22.5
ARCS Wide	4 ARCS Wide flown horizontal	vertical, flown or stacked horizontal, flown or stacked	30
ARCS Focus	4 ARCS Focus flown vertical	vertical, flown or stacked horizontal, flown or stacked	15

— The **reference point** of a horizontal ARCS array (ARCS II, ARCS Wide, or ARCS Focus) is the upper midpoint on the front face of the array.
— In a vertical ARCS II, ARCS Wide, or ARCS Focus array the acoustic axis of the top enclosure and the rigging element make an angle of 11.25°, 15°, and 7.5° respectively.
— The ARCS II enclosure is acoustically asymmetric. The HF directivity pattern is -20°/+40°.

In a horizontal array: select the +40° side position as **up** or **down**.

In a vertical array: select the +40° side position as **left** or **right**.

— ARCS Wide and ARCS Focus enclosures can be mixed within the same array.

Follow this template to build an array containing several types of enclosure: N1x(ARCSFOCUS), N2x(ARCSWIDE), N3x(ARCSFOCUS), etc.