



# Scope of Performance

**CadnaB** is the software to calculate airborne and impact sound transmission between rooms for an entire building including airborne sound transmission from and to the exterior via the façade walls according to the calculation methods ISO 12354 and DIN 4109. Furthermore, it is the link between CadnaA and CadnaR and does interface with both products. The integrated software system CadnaA/B/R is currently the only system which can calculate sound from an outside source, through the construction, inside a building and through various rooms (and vice versa).

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# 1 Overview CadnaB Base-Module and CadnaB Options

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## CadnaB Base-Module

**Precondition for the usage** of all CadnaB options. Efficient model creation based on layout plans (bitmap, pdf), handling and report generation for the whole building. Possibility to create user defined databases containing constructions and sound sources as well as user defined requirements. User interface in English, German, French, Spanish, Portuguese, Italian.

- ✓ Includes calculation standard ISO 12354 parts 1 to 3
- ✓ Includes database No.1 CadnaB specific data

## Option DIN 4109

Additional calculation standard DIN 4109 (2018).

- ✓ Includes database No.2: DIN 4109
- ✓ Includes predefined requirements in the requirement browser DIN 4109-1 and DIN 4109-5 (2018)

## Option PRO

- ✓ Auralization of spectral calculations according to ISO 12354: renders the calculated sound insulation audible in dependence of the sound absorption characteristics of the receiving room.
- ✓ It also includes many predefined requirements in the requirement browser according to national regulations.
- ✓ Import of construction data from INSUL.

## Option DB (Additional databases)

- ✓ Additional databases suitable for calculations according to ISO 12354

## 2 Technical Spezifikation of CadnaB

### 2.1 Calculation and Standards

Feature	CadnaB Base-Module	Options		
		DIN 4109	PRO	DB
<b>Calculation of airborne and impact sound insulation for pairs of rooms with a common separating surface within a building</b> acc. to ISO 12354-1 (2017)   ISO 12354-2 (2017)	<input checked="" type="checkbox"/>			
<b>Calculation of the airborne sound insulation of exterior walls</b> acc. to ISO 12354-3 (2017)	<input checked="" type="checkbox"/>			
<b>Compatibility mode with ISO 12354 - 2000</b>	<input checked="" type="checkbox"/>			
<b>Calculation of airborne and impact sound insulation for pairs of rooms with a common separating surface within a building</b> acc. to DIN 4109-2 (2018)		<input checked="" type="checkbox"/>		
<b>Calculation of the airborne sound insulation of exterior walls</b> acc. to DIN 4109-2 (2018)		<input checked="" type="checkbox"/>		
<b>Structural reverberation time</b> Simplified model	<input checked="" type="checkbox"/>			
<b>Structural reverberation time</b> acc. to CRAIK	<input checked="" type="checkbox"/>			
<b>Structural reverberation time</b> acc. to Fischer et al.	<input checked="" type="checkbox"/>			
<b>Structural reverberation time</b> acc. to ISO 12354-1:2017-11 Annex C	<input checked="" type="checkbox"/>			
<b>Impact noise transmission bottom-up</b> Solution outside the ISO 12354-2	<input checked="" type="checkbox"/>			
<b>Automatic detection of junctions</b> Based on geometry and construction used	<input checked="" type="checkbox"/>			
<b>Input option of user defined vibration reduction indexes Kij</b>	<input checked="" type="checkbox"/>			
<b>Requirement browser</b> Allows the entry of user-defined requirements	<input checked="" type="checkbox"/>			
<b>DIN 4109 Pre-defined requirements</b> Includes pre-defined requirements for DIN 4109-1 (2018) and DIN 4109-5 (2019)		<input checked="" type="checkbox"/>		
<b>DIN 4109 automatic requirements selection</b> CadnaB will predict the most likely requirement based on your model		<input checked="" type="checkbox"/>		
<b>Pre-defined requirements</b> Includes pre-defined requirements for DIN 4109-1 (2018)   DIN 4109-5 (2019)   VDI 4100 (2007)   VDI 4100 (2012)   ISO 19488 (2020)   UNI 11367 (2010)   DEGA 103 (2018)   BS 8233 (2014)   BS 93 (215)   DB HR (2019)   NBR 15575 (2013)			<input checked="" type="checkbox"/>	
<b>Auralization of spectral calculations according to ISO 12354</b>			<input checked="" type="checkbox"/>	
<b>Interoperability with CadnaA</b> Requires CadnaA 2021 or later	<input checked="" type="checkbox"/>			
<b>Interoperability with CadnaR</b> Requires CadnaR 2021 or later	<input checked="" type="checkbox"/>			
<b>CadnaR project manager</b>	<input checked="" type="checkbox"/>			

## 2.2 Import and Modelling tools

Feature	CadnaB Base-Module	Options		
		DIN 4109	PRO	DB
<b>New project wizard</b> Allows the creation of a new project for a new horizontal / vertical room pair, a new building or a new CadnaR Interop project	<input checked="" type="checkbox"/>			
<b>Object: Building</b>	<input checked="" type="checkbox"/>			
<b>Object: Wall</b>	<input checked="" type="checkbox"/>			
<b>Add wall as polyline</b>	<input checked="" type="checkbox"/>			
<b>Object: Vertical junction</b>	<input checked="" type="checkbox"/>			
<b>Object: Small element (window, door, etc.)</b>	<input checked="" type="checkbox"/>			
<b>Geometry edition via drag and drop</b>	<input checked="" type="checkbox"/>			
<b>Creation of storeys</b> With or without rooms inside	<input checked="" type="checkbox"/>			
<b>Automatic detection of room pairs</b> Model what you see and CadnaB will do the rest for you	<input checked="" type="checkbox"/>			
<b>Import of BASTIAN files (*.bap)</b>	<input checked="" type="checkbox"/>			
<b>Import of CadnaA files (*.cna)</b>	<input checked="" type="checkbox"/>			
<b>Import of CadnaR files (*.cni)</b>	<input checked="" type="checkbox"/>			
<b>Import of INSUL XML files</b> Requires INSUL 9.0.24 or later			<input checked="" type="checkbox"/>	
<b>Import and calibration of floor plans as bitmap files</b> PNG, BMP, JPG, GIF, TIFF, JPEG, PDF	<input checked="" type="checkbox"/>			
<b>Import of KS files (Germany)</b>		<input checked="" type="checkbox"/>		
<b>Room / Habitation assignment</b>	<input checked="" type="checkbox"/>			

## 2.3 Material databases

Feature	CadnaB Base-Module	Options		
		DIN 4109	PRO	DB
<b>Database No.1: CadnaB specific data</b> Specific database of calculated spectra for monolithic walls and floors, and for heavy double walls. 1.629 constructions, 46 sound sources, 1.834 (R, Ln) spectra. Suitable for calculations according to ISO 12354 and DIN 4109.	<input checked="" type="checkbox"/>			
<b>Database No. 2: DIN 4109</b> The Supplement 1 for DIN 4109 (edition 1989) includes data from sections 6, 7, 8 (wooden framework and concrete pillar buildings) and 10 (exterior elements). 284 constructions are suitable for calculations according to ISO 12354, of which 131 (Rw, Ln,w) + 287 (Dn,f,w) are single number values. Additionally, 531 constructions are suitable for calculations according to DIN 4109 (parts 33, 34, 35, 35/A1).		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Database No.3: UBA-text 11.1985</b> UBA-text 11.1985, "Combining sound and thermal insulating measures at exterior elements". 96 constructions, 96 (R) spectra				<input checked="" type="checkbox"/>
<b>Database No.4: Saint-Gobain Isover</b> Measured data from Saint-Gobain Isover. 287 constructions, 302 (R, Ln) + 23 (Dn,f) spectra.				<input checked="" type="checkbox"/>
<b>Database No. 5: Rigips GmbH</b> Measured data from Rigips GmbH. 41 constructions, 41 (R) spectra.				<input checked="" type="checkbox"/>
<b>Database No.6: Geluidwering in de Woningbouw</b> PE Braat-Eggen; LJ. van Luxemburg: Geluidwering in de Woningbouw. 333 constructions, 350 (R, Ln) spectra.				<input checked="" type="checkbox"/>
<b>Database No.7: Fasold/Sonntag/Winkler</b> Fasold/Sonntag/Winkler: Bauphysikalische Entwurfslehre, Raum- und Bauakustik. 314 constructions, 314 (R, ΔL, ΔR) spectra.				<input checked="" type="checkbox"/>
<b>Database No.8: ON V 32</b> ON V 32 "Katalog für schallschutztechnische Kennwerte von Bauteilen". 186 constructions, 186 (R) spectra.				<input checked="" type="checkbox"/>
<b>Database No.9: Saint-Gobain glass</b> Measured data from Saint-Gobain Glass. 83 constructions, 83 (R) spectra.				<input checked="" type="checkbox"/>
<b>Database No.10: SIA D 0189</b> SIA-documentation D 0189 "Sound insulation in buildings - Collection of measured element data". 420 constructions, 500 (R, Ln, ΔL) spectra.				<input checked="" type="checkbox"/>
<b>Database No.14: PTB-Report</b> Building element data based on measured data (for walls, floors and roofs of wooden structure) listed in the report "Integration of wooden and framework buildings into the revised DIN 4109" (report available in German only), final report, Braunschweig 2005. 146 constructions, 173 (Rw, Ln,w, Dn,f,w) single number ratings.				<input checked="" type="checkbox"/>
<b>Database No.15: US &amp; Canadian data</b> Building element data from various sources, e.g. NRC-test reports, manufacturer's test reports, literature data (compiled by: The Peabody Institute of the Johns Hopkins University, Baltimore MD, U.S.A.), 408 constructions, 408 (R/TL, ΔR, Dn,e) spectra.				<input checked="" type="checkbox"/>
<b>Database No.16: CTE (Spain)</b> Catálogo de Elementos Constructivos del CTE, Redacción: Instituto Eduardo Torroja de ciencias de la construcción con la colaboración de CEPCO y AICIA (May 2008), 385 constructions, 487 (Rw+C, ΔRw+C, Ln,w, ΔLw) single number ratings.				<input checked="" type="checkbox"/>
<b>Import of SOAB database</b> Contact Sonusoft AB separately	<input checked="" type="checkbox"/>			
<b>Construction browser</b> Allows direct entry of new constructions and import of databases from Bastian (*.bap) and CadnaB (*.cnb, *.CadnaB DB)	<input checked="" type="checkbox"/>			
<b>Construction catalogue DIN 4109-2016/2019</b> Allows you to easily create constructions based on DIN 4109-2016 parts 31-35		<input checked="" type="checkbox"/>		

## 2.4 Calculation results and export

Feature	CadnaB Base-Module	Options		
		DIN 4109	PRO	DB
<b>Open GL 3D View</b> Modelling and results view	<input checked="" type="checkbox"/>			
<b>Airborne and impact sound transmission results</b> Single and 1/3 octave bands	<input checked="" type="checkbox"/>			
<b>Partial results for separating elements and flanks</b> Single and 1/3 octave bands	<input checked="" type="checkbox"/>			
<b>Verification of compliance with requirements based on calculation results</b> Works for ISO 12354 and DIN 4109	<input checked="" type="checkbox"/>			
<b>Interior level results</b> According ISO 12354-3	<input checked="" type="checkbox"/>			
<b>Information about junctions</b>	<input checked="" type="checkbox"/>			
<b>Export of graphics to the clipboard</b>	<input checked="" type="checkbox"/>			
<b>Export of result values to the clipboard and as (*.csv)</b>	<input checked="" type="checkbox"/>			
<b>Export of construction data and full reports to WORD (*.docx)</b> Layout depends on the chosen calculation standard	<input checked="" type="checkbox"/>			
<b>Export of the complete results report to WORD (*.docx)</b> Layout depends on the chosen calculation standard	<input checked="" type="checkbox"/>			
<b>Export of protocol files to EXCEL (*.xlsx)</b> Layout depends on the chosen calculation standard	<input checked="" type="checkbox"/>			
<b>Export of object tables (*.csv)</b>	<input checked="" type="checkbox"/>			
<b>Result table and calculation presets</b>	<input checked="" type="checkbox"/>			

### 3 System requirements

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CadnaB can be installed on any system which fulfils the following requirements:

- Multi-core processor from Intel (Core i series, 6th generation, „Skylake“ architecture or newer) or from AMD (Ryzen series, starting from the 1<sup>st</sup> generation, „Zen“ architecture or newer) with at least 4 cores, instruction set extensions SSE 4.2 and AVX as well as 64-bit extensions (Intel 64 or AMD64)
- 8 GB RAM
- OpenGL 3.3 graphics card with minimum 1 GB real graphic memory to use the hardware accelerated 3D-view. Using processor graphics or graphics card with no dedicated graphics memory ("shared memory") may result in display errors.
- Windows 64-bit operating system
  - Microsoft Windows 10 (Version 22H2)
  - Microsoft Windows 11 (Version 22H2 or newer)