

## New Features of CadnaA 4.0

The list of new features in **CadnaA**, release 4.0, is subdivided into the following sections<sup>1</sup>:

- calculation/configuration
- **CadnaA**-objects
- further new features/miscellaneous
- import
- export
- **CadnaA**-options
- bug fixing

Links to the text section of the corresponding **CadnaA**-manual offer a quick overview about the details of the new features.

- Austria: industrial sources calculated with ISO 9613 with limitation of Dz to 20/20 dB with single and double barriers (see section „Dz with limit 20/20“ in chapter 6.3.10 Industry Tab). **Calculation| Configuration**
- Austria: new road surfaces for RVS 4.02 implemented (see chapter 1.7 Literature , Nr. /28/)
- Harmonoise: now with averaging, turbulence, sigma source-height (see chapter 6.3.2 Implemented Calculation Methods)
- Nordic Prediction Method, Railway: Option "Use non-standard reference time D/E/N" is deactivated automatically upon calculation of maximum levels (see section „Country Scandinavia“ in chapter 6.3.1 Country Tab).
- Aircraft Noise: new calculation methodes AzB 08 and ÖAL 24 implemented (see 1.7 Literature, No.s /60/ and /81/)
- Aircraft Noise: sigma-statistics for levels and NATs („Number above Threshold“) editable
- Aircraft Noise: NATs and SigmaNATs as new evaluation parameters

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1. The list contains the new features of releases 3.71 and 3.72 as well.

- Aircraft Noise: NATs and maximum levels also available for calculations according to AzB 08, ECAC, DIN, and OEAL 24
- Errors in a formula of an evaluation parameter (type "f(x)", dialog **ConfigurationEval. Param.**) will be displayed as -88 as result (see section „Expression Field“ in chapter 6.3.6 Evaluation Parameter Tab).
- tab „General“: Propagation Coefficient Uncertainty via formula (see chapter 6.3.3 General Tab)
- CRTN (UK): new option „Use Non-Standard Reference Time D/E/N“ to be used in conjunction with diurnal patterns (see chapter 6.3.11 Road Tab)
- CRTN (UK): calculation considers now Low-Traffic-Correction K (see chapter 6.3.11 Road Tab)

#### CadnaA-Objects, All Objects

- Object Table can be accessed via ALT+click on the object symbol in the toolbox
- action „Transformation“ (dialog **Modify Objects**): new type of transformation „interactive“ to move/duplicate objects using the mouse (see section „Interactive Transformation“ in chapter 7.3.4 Coordinate Transformation)
- maximum ID-length extended to 23 characters (see section „ID“ in chapter 4.4.2 Dialog Options Name, ID, INFO, ObjectTree in the manual „Introduction to **CadnaA**“)
- ObjectTree: On dialog "Definition" and PWL-table, activated objects are highlighted on the graphics (see section „Synchronisation Object-Tree - Graphics“ in chapter 14.4 ObjectTree).
- ObjectTree-sources on tables **Power Level** and **Partial Level** (menu **Tables|ObjectTree**) can be toggled (see section „Display Objects On/Off“ in chapter 14.4 ObjectTree).
- ObjectTree: change ID via dialog **Modify Objects/Modify Attribute** selectable from ObjectTree (see section „Automatic Assignment of Objects“ in chapter 14.4 ObjectTree)

- Action "Break Lines/Areas" breaks non-deactivated objects only (see chapter 12.5 Break Lines in the manual „Introduction to **CadnaA**“).
- Action "Break Lines" breaks also at polygon points (see chapter 12.5 Break Lines & chapter 12.6 Break Areas in the manual „Introduction to **CadnaA**“).
- Action "Delete Duplicates" (dialog **Modify Objects**) offers weighting function and option "2D only" (see chapter 11.22 Delete Duplicates in the manual „Introduction to **CadnaA**“).
- Action "Modify Order of Points" (dialog **Modify Objects** and on the context menu) enables to modify point 1 with weight function (see chapter 11.7 Modify Order of Points in the manual „Introduction to **CadnaA**“).
- new attribute PO\_CLOCK for polygones: PO\_CLOCK=1 when sequence is clock-wise, else PO\_CLOCK=0 (see chapter 2.2 Object Attributes in the **CadnaA**-manual „Attributes, Variables, and Keywords“)

- point/line/area sources: LwA-point source also addressable per "pq" for attribute LWTYP (see chapter 2.2 Object Attributes in the **CadnaA**-manual „Attributes, Variables, and Keywords“)
- point/line/area sources & parking lot, tennis: toggling the operating time with attribute TEINW\_OK=0/1 (see chapter 2.2 Object Attributes in the **CadnaA**-manual „Attributes, Variables, and Keywords“)
- ISO 9613-2: no further limitation of the sum Agr+Afol+Ahous to 15 dB (see chapter 3.9 Built-Up Areas and Foliage)
- copying of directivities via the clipboard accepts comma as decimal separator (see section „Paste“ in chapter 2.7.3 Frequency-dependent Directivity, General).
- dialog **Long Straight Road** (RLS90): some modifications (see chapter 2.11 Long Straight Road)

**Industrial Sources**

**Road**

- dialog **Long Straight Road**: button to select template file (in folder „templates“ in the installation directory, see chapter 2.11 Long Straight Road)
- self-screening road: editable station range for parapets (see chapter 2.9 Roads)
- grid arithmetics (CRTN): new evaluation function `crtn_de()`, converts L10-grids into Leq-grids (see section „Evaluation for CRTN“ in chapter 5.5.4 Grid Arithmetic)

#### Railway

- self-screening railway: editable station range for parapets (see section „Station from/up to“ in chapter 2.12 Railways)
- new action: "Generate Rails" (dialog **Modify Objects** and on the context menu, see chapter 11.14 Generate Rails in the manual „Introduction to **CadnaA**“)
- ONR 305011 and Nordic Prediction Method (Railway) with self-screening option (see chapter 2.12 Railways)

#### Receivers

- suppress "empty" lines in SPL-partial levels table (see section „Suppress Display of empty Table Lines“ in chapter 5.2.5 Partial Levels)

#### Building Noise Map & Facade Points

- dialog **ObjectScan**: Source=Facade Point, Target=Building Evaluation Symbol is summed up per appropriate building and not per geometry (see section „Summation of Facade Points into Building Evaluation Symbols“ in chapter 5.7.5 Object-Scan).

#### Obstacles

- barrier with cantilever: cantilever shows screening effect for sources outside and below the cantilever (see chapter 3.5.2 Barrier with special Crowning)

- embankment: When converting an embankment into a barrier the relative height HREL is converted to the barrier's height attribute HA automatically (see section „Conversion into barrier“ in chapter 3.7 Embankment).
- supporting multiple monitors
- multithreading: "Use all available processors" is default (see chapter 14.7 Multithreading)
- Receiver points are calculated with multithreading as long as "Protocol" is deactivated (see above).
- Vertical grids are calculated with multithreading (see above).
- "auxiliary lines" at Building Evaluation Symbols and text boxes are now transformed (see chapter 5.6 Building Evaluation and chapter 9.12.1 Text Box).
- translation transformation of bitmaps possible (see section „Transforming Bitmaps“ in chapter 10.2.1 Bitmap Size and Position)
- **Libraries|Sound Levels**: weighting can be switched via „!A“, „!B“, „!C“, „!D“ and „!“ without changing the values themselves (see section „Switch weighting without changing the values“ in chapter 12.3.3 Sound Level Spectra).
- new attributes for text box: UNDERLINED, STRIKEOUT, BOLD, ITALICS (see chapter 2.2 Object Attributes in the **CadnaA**-manual „Attributes, Variables, and Keywords“)
- new attributes for level box (VAL, PREC, AUTOVAL) and station box (AUTOWINKEL, (see chapter 2.2 Object Attributes in the **CadnaA**-manual „Attributes, Variables, and Keywords“)
- menu **Tables|Miscellaneous**: new command Link **Buildings to Building Evaluations** (see section „Importing Building Evaluation Symbols“ in chapter 5.6 Building Evaluation)
- background color ("sky") on dialog **3D-Special** specifiable (see section „Change sky color“ in chapter 9.15 3D-Special View)

#### Further new features

**Miscellaneous**

- For object-tables the position and size of the dialog is stored (for each object group separately).
- textbox & objects can be rotated around mass-centre by ALT+click, with SHIFT+ALT+click in steps (see chapter 4.3.5 Rotating Objects in in the manual „Introduction to **CadnaA**“)
- Plot-Designer: copy-button to copy graphics to clipboard (see chapter 13.2.4 Plot-Designer)
- PCSP-menu now also available on **Calculation** menu (besides **Tables/Misc.** menu)

**Import**

- new import formats: AutoCAD-DWG, MicroStation-DGN (see chapter 7.4.3 AutoCad-DWG and chapter 7.4.4 MicroStation-DGN)
- CityGML-format (German format for noise mapping, see chapter 7.4.9 GML and CityGML)
- import ASCII-Objects: **CadnaA**-objects being closed objects are imported as such (see chapter 7.4.17 ASCII-Objects).
- Import ASCII-Objects: address/save/delete of user-defined settings per button „Defaults“ (see chapter 7.4.17 ASCII-Objects)
- import DXF: with new option 3DFACE imported as polylines (see section „Import 3D-Faces as Polys“ in chapter 7.4.2 AutoCad-DXF)
- import ESRI-ASCII-Grid via menu **Grid|Open** available (see section „Grid Formats“ in chapter 5.5 Grid of Receiver Points)
- import DXF: Layer descriptions with lengths > 23 characters are copied to the string variable ORG\_LAYER (see chapter 7.4.2 AutoCad-DXF).
- MITHRA: When importing railroads the option "Railways are absorbing (G==1)" is deactivated (dialog **Configuration/Ground Absorption**, see also chapter 7.4.14 Special Formats).
- 16-bit greyscale-bitmap can be converted into height point-cluster (see chapter 4.7.2 Generate Cluster of Heights Points from a Bitmap)
- option FLG: new import format „QSI AzB“ available

- ArcView-Export also for object "Cylinder" Export
- export ASCII-grid: with designation of evaluation parameter, instead of numbering 1,2,3,4 (see chapter 13.3.1 Export Formats).
- Export LGS („Long Straight Road“) and QSI: pre-defined template files now installed in directory **templates**
- option FLG: export AzB-Lmax time period selectable on INI-file: [ImpExp]AzBLmax=den (instead of "den", also "de", "dn", "d" can be used)
- option FLG: export of maximum levels with evening
- option FLG: new export format „QSI AzB“ available
- option FLG: new export format AzB-DES exports into XML or PDF/HTML
  
- 64-Bit-version available as separate option (see chapter 13.8 Option 64-Bit in the manual „Introduction to **CadnaA**“) CadnaA-Options
- option BMP: further formats available (e.g. DWF, WMZ, GIF, PSP, WPG, VWPG, ECW, SCT, SGI, SFF, WBMP, XWD, XBM, XPM)
- option BMP: new option „Convert to monochrome (for PDF)“ (see chapter 10.2.1 Bitmap Size and Position)
- option XL, dialog **ObjectScan**: Source=Fassade Point, Target=Building Evaluation Symbol is summed up per appropriate building and not per geometry (see section „Summation of Facade Points into Building Evaluation Symbols“ in chapter 5.7.5 Object-Scan)
- option XL: User-defined evaluation expressions on dialog **ObjectScan** can be deleted (see section „Predefined“ in chapter 5.7.5 Object-Scan).
- option FLG: With calculations according to AzB08 in batch-mode the airport will be automatically „transferred“ to each individual file.
- option FLG: program-supported generation of protection zones
- option FLG: display flight corridors (dialog **Options/Appearance**)

- option APL: new AUSTAL-version 2.4.7 implemented (now offering up to 20 monitor points, and with text output in English)
- option APL: particles with "particle size" (-1..-4, -u) available
- option APL: nested grids available (per string variable NESTING=<nesting level>)
- option APL: emission parameters selectable on dialog **Air Pollution|Configuration**
- option APL: deactivated buildings/barriers are not considered as obstacles in AUSTAL-calculations
- option APL: vertical area sources are now considered

**Bug Fixing**

- correction of screening calculation with British guidelines CRTN and CRN