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EFC-400 Release 2017 – new for Windows 10

Overview of the new Features:

- ❑ Cable libraries of DIN EN 50182 rope types with Al/St cross sections and diameters
- ❑ Audible Noise default settings according to DIN Spec 8987
- ❑ Extended block library with portals for substations
- ❑ New and revised limit library
- ❑ Open *.log protocol files directly from the software
- ❑ Significantly faster calculation of surface field strengths according to EPRI
- ❑ PDF manual accessible directly via Help
- ❑ Help, Assistant and Manual available in different languages after one installation
- ❑ Object list in geometry window with new table grid for better clarity
- ❑ Individual names for towers and mouse-over-display in the construction window
- ❑ Possibility of re-adding towers from the geometry to the library
- ❑ Transfer of tower and building positions into the coordinate list

Improved User Interface:

- The previous cursors (four-arrow plus sign) to move objects in the construction and 3D windows were replaced by the system's hand cursor. Due to a higher system speed this doesn't cause any flickering during movement of geometry objects anymore.

- In the toolbar there are now hints on the buttons %, LF, HF, S and the setting of units and scaling.

- It's now possible to draw additional boundary lines on the transition area of two color steps in the 2D view - in other words grey ISO lines. This produces a sharper contrast in the figures.
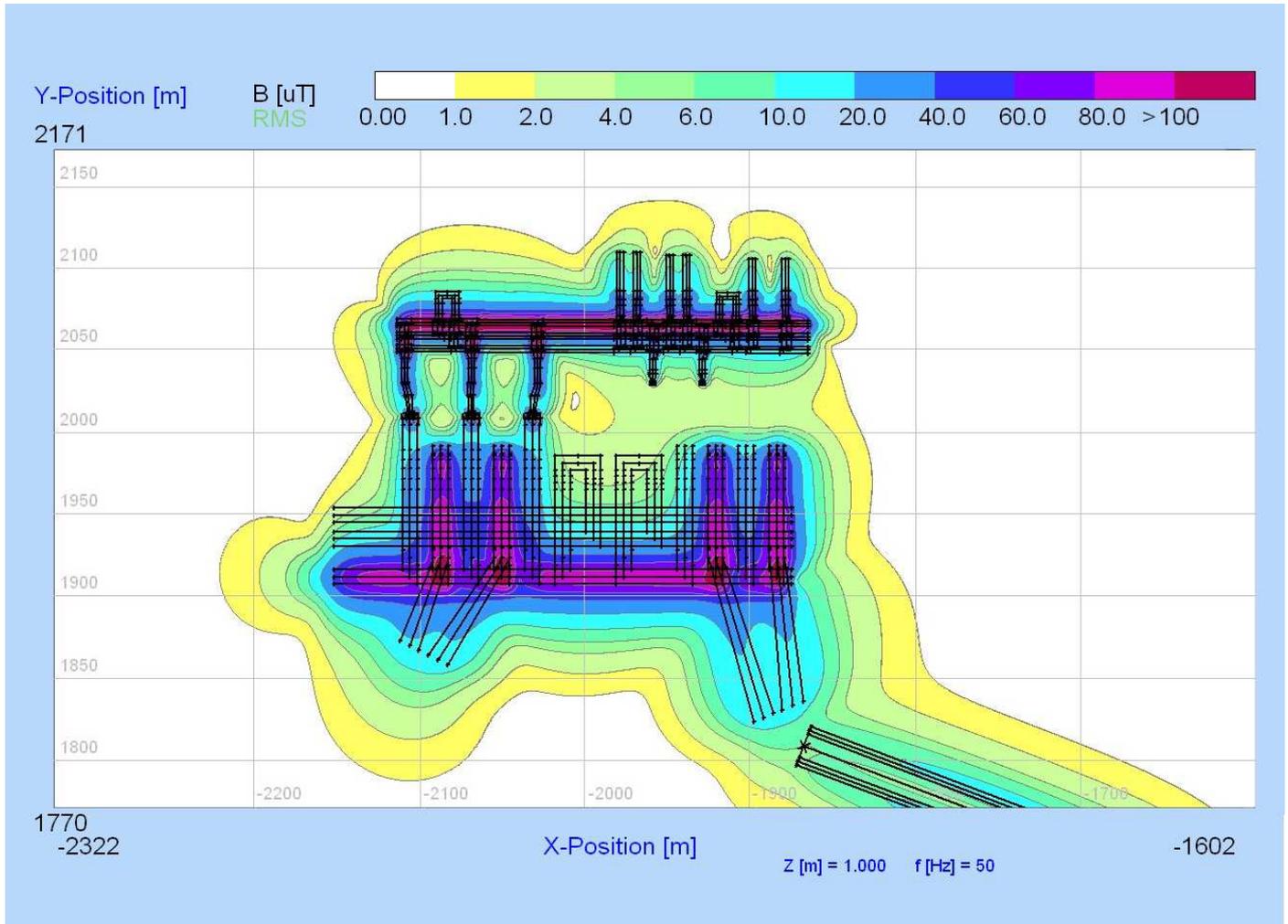
- The name of every tower, for both extended and standard towers, can be given an individual title. This name will be shown in the mouse-over-display in the construction window.
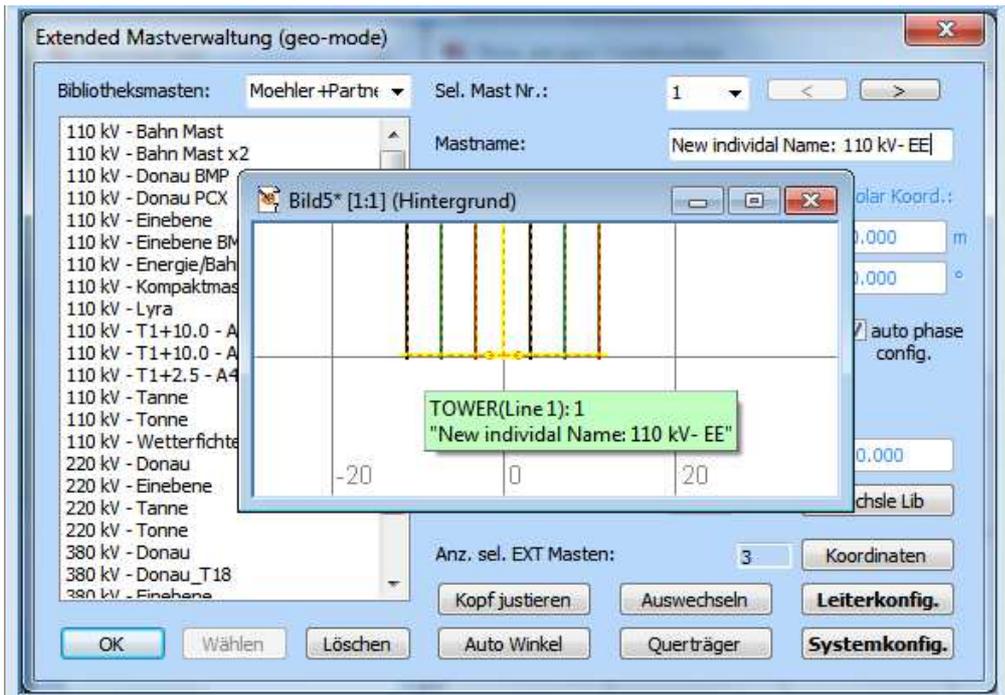

Fig.: Mouse-over-display in the construction window with individual tower names

- The buttons 'straight' with 'all/system' now have the same function when using 'shift' and 'adjust' in the conductor configuration dialog.

- When it comes to audible noise calculations for DC there will be a hint in the dialog that shows a surcharge for summer and winter.

Fig.: Hint for summer and winter surcharges

- Automatical scaling in the x-axis-window now uses a range of 1-11 (previously 1-10), that is to say the steps after 100 will be 110 and then 200.

- The status line containing the progress bar to display the calculation progress was corrected in order to be accurate even with calculation times exceeding 24 hours.

- The selection button for the cable library is no longer only available in the system configuration of transmission lines but also generally in the conductor dialog for specification of geometry settings.

- The label in the 'height at midspan' dialog is now 'XY-Position' instead of 'X-Position'.

- The accuracy of the drawing position of very long conductors, i.e. 100 m and longer was improved in the construction and data windows such as 2D and ISO. Due to the drawing speed, some conductors were placed up to two or three pixels away from their actual position so that a selection of conductors by mouse was confusing. This problem was fixed. The conductors are now drawn exactly where they are supposed to be and can be selected by mouse on exactly this position.

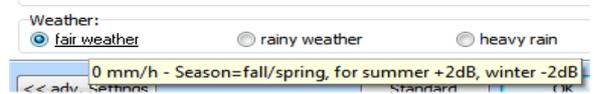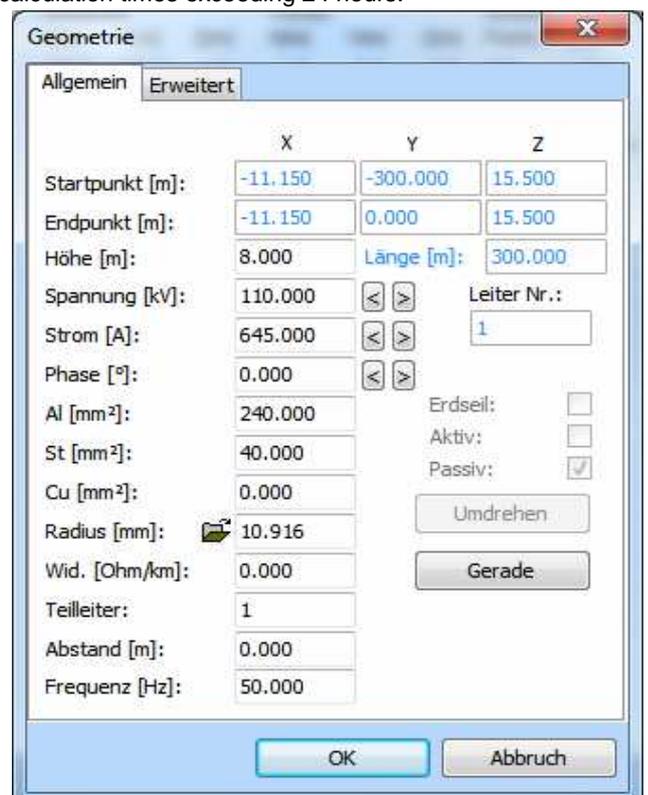- The dialogs for acoustic settings were revised ergonomically.

Fig.: Conductor dialog with selection button for the cable library

- For better clarity the geometry window now contains a table grid which can be up to the size of 24 Mio. lines and 14 columns.

Para. No.	Number Cond.	Segments p.Cond.	Startpoint X[m]	Y[m]	Z[m]	Vector X[m]	Y[m]	Z[m]	Number Points	Y-Shift [m]	Z-Shift [m]	Number of Rows
0	14	1	-100.0	-400.0	1.0	1.0	0.0	0.0	201	25.0	0.0	33

No. Cond.		Startcoordinates X[m]	Y[m]	Z[m]	Endcoordinates X[m]	Y[m]	Z[m]	Height [m]	Voltage [kV]	Current [A]	Phase [°]	Cond. Radius [mm]	No. Subr.	Dist. Subr. [m]	Frequency [Hz]
1	X	-11.1	-300.0	15.5	-11.1	0.0	15.5	8.0	110.0	645.0	0.0	10.9	1	0.0	50
2	X	-7.2	-300.0	15.5	-7.2	0.0	15.5	8.0	110.0	645.0	120.0	10.9	1	0.0	50
3	X	-3.2	-300.0	15.5	-3.2	0.0	15.5	8.0	110.0	645.0	240.0	10.9	1	0.0	50
4	X	3.2	-300.0	15.5	3.2	0.0	15.5	8.0	110.0	645.0	0.0	10.9	1	0.0	50
5	X	7.2	-300.0	15.5	7.2	0.0	15.5	8.0	110.0	645.0	120.0	10.9	1	0.0	50
6	X	11.1	-300.0	15.5	11.1	0.0	15.5	8.0	110.0	645.0	240.0	10.9	1	0.0	50
7	GX	0.0	-300.0	27.5	0.0	0.0	27.5	15.0	0.0	1.4	330.9	5.7	1	0.0	50
8	X	-11.1	0.0	15.5	-11.1	300.0	15.5	8.0	110.0	645.0	0.0	10.9	1	0.0	50
9	X	-7.2	0.0	15.5	-7.2	300.0	15.5	8.0	110.0	645.0	120.0	10.9	1	0.0	50
10	X	-3.2	0.0	15.5	-3.2	300.0	15.5	8.0	110.0	645.0	240.0	10.9	1	0.0	50
11	X	3.2	0.0	15.5	3.2	300.0	15.5	8.0	110.0	645.0	0.0	10.9	1	0.0	50
12	X	7.2	0.0	15.5	7.2	300.0	15.5	8.0	110.0	645.0	120.0	10.9	1	0.0	50
13	X	11.1	0.0	15.5	11.1	300.0	15.5	8.0	110.0	645.0	240.0	10.9	1	0.0	50
14	GX	0.0	0.0	27.5	0.0	300.0	27.5	15.0	0.0	1.4	330.9	5.7	1	0.0	50

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Fig.: Geometry window with grid for better clarity

Cartographic Data:
- The resolution of numbers during data export was set to at least three decimals.
- The maximum number of coordinates was raised to 1000.

New Construction Functions:
- The settings made by the checkbox 'Auto Phase Config' in the extended tower manager can now be saved together with the geometry. This prevents geometries which for example contain crossing ropes from getting destroyed accidentally (that is to say the crossing ropes get replaced by parallel ones).
- Extended and standard tower from the geometry can now be (re-)added into the library via right click menu in the tower manager.
- The positions of towers in the geometry can now be saved in the coordinate list using the right click menu in the tower manager. The position of standard tower can also be copied via standard tower manager. Using the building manager coordinates of buildings can be added to the coordinate list as well.
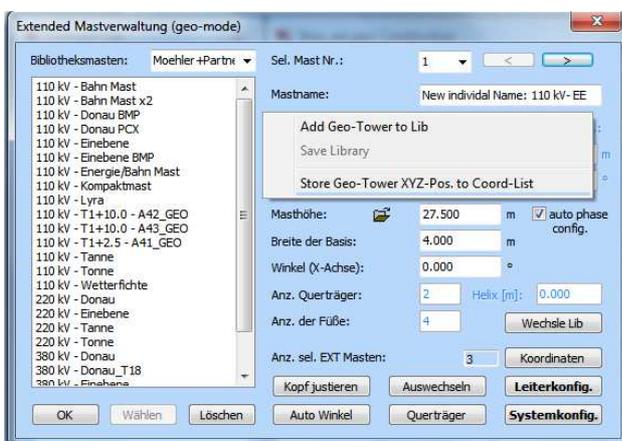

Fig.: Extended Tower Manager with right click menu

Fig.: Building Manager with right click menu

- The depiction of cross sections of rectangular conductors was improved. They remain unchanged while zooming in and don't disappear anymore as they did previously.
- The input of cross sections for Al/St of conductor ropes now allows the use of decimal places. For better clarity only the actual used resolution is displayed.

- The maximum number of transmission lines was raised from 101 to 301 because it was necessary in some projects.

General Improvements:

- When a user receives a new version and the path settings were changed individually before, so that a server update would be necessary, the software now automatically detects whether or not the work path and the library path are the same. The software runs an update for both paths in order to avoid repeating requests for 'server updates'.

- In audible noise calculation projects the rain intensity is now saved with the project.

- A new button named 'Open internal Error Log-Files' was added to Advanced Settings│Calculation. It opens a dialog which is aimed on the work directory and lists all the log-files in this directory. The user can open the files without searching them with the explorer on his drive.
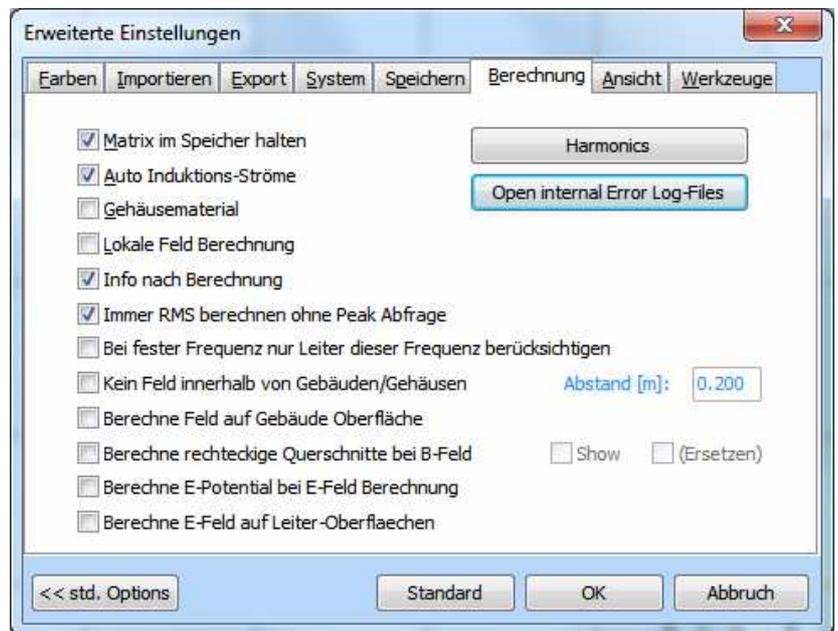
- When you work on a system with a German operating system, the standard message-dialogs get the label 'Ja' and 'Abbrechen'. This usually happens as well when EFC-400's language is switched to English, Italian, etc. Windows offers the opportunity to install language packages as a complete alternative, so that the whole system can be switched to that language, e.g. English. If this is done, the label of all standard message-dialogs are 'Okay' and 'Cancel'.
EFC-400 is now designed for multilingual support. Even when your operating system is set to German and you switch to e.g. Italian in EFC-400 and the software detects that there is an Italian language package for Windows installed on the computer, then EFC-400 uses the Italian spelling for all standard message-dialogs.

Fig.: Open internal Error Log-Files button in Advanced Settings

- The dialog which is used to determine the directory paths now contains a menu named 'Extra'. It can be used to export libraries and to create a new work path.
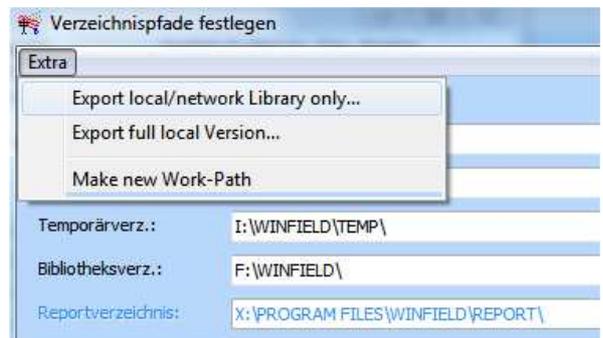
- The distance table containing the audible noise overview from 0 to 200 m was removed from the noise.log file. The table could lead to misinterpretations as it was only valid when the transmission line had its center in the coordinate origin and was parallel to the y-axis.

- The noise.log file with output of the surface field strengths and sound level is only available in the Sound and Enterprise Versions. The Standard Version doesn't contain this feature anymore.

- The dialog to determine the directory paths was improved. Missing backslashes ('\') in file names between drive letters and path get filled in automatically.

Fig.: Extra menu in the directory dialog

- The QSI examples for export audible noise calculations were revised.

- A right-hand click on the tabulators in the main window now offers the possibility of two new commands: 'close page' and 'page to clipboard'.
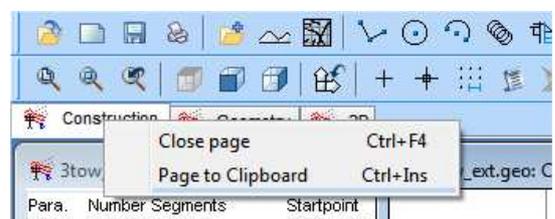
- The manual can now be opened using the menu 'Help'. Help, assistant, manual and videos can all be used in the language set in the software. All available language are implemented during the installation, except for the videos. Due to their large data size they can separately be installed later.
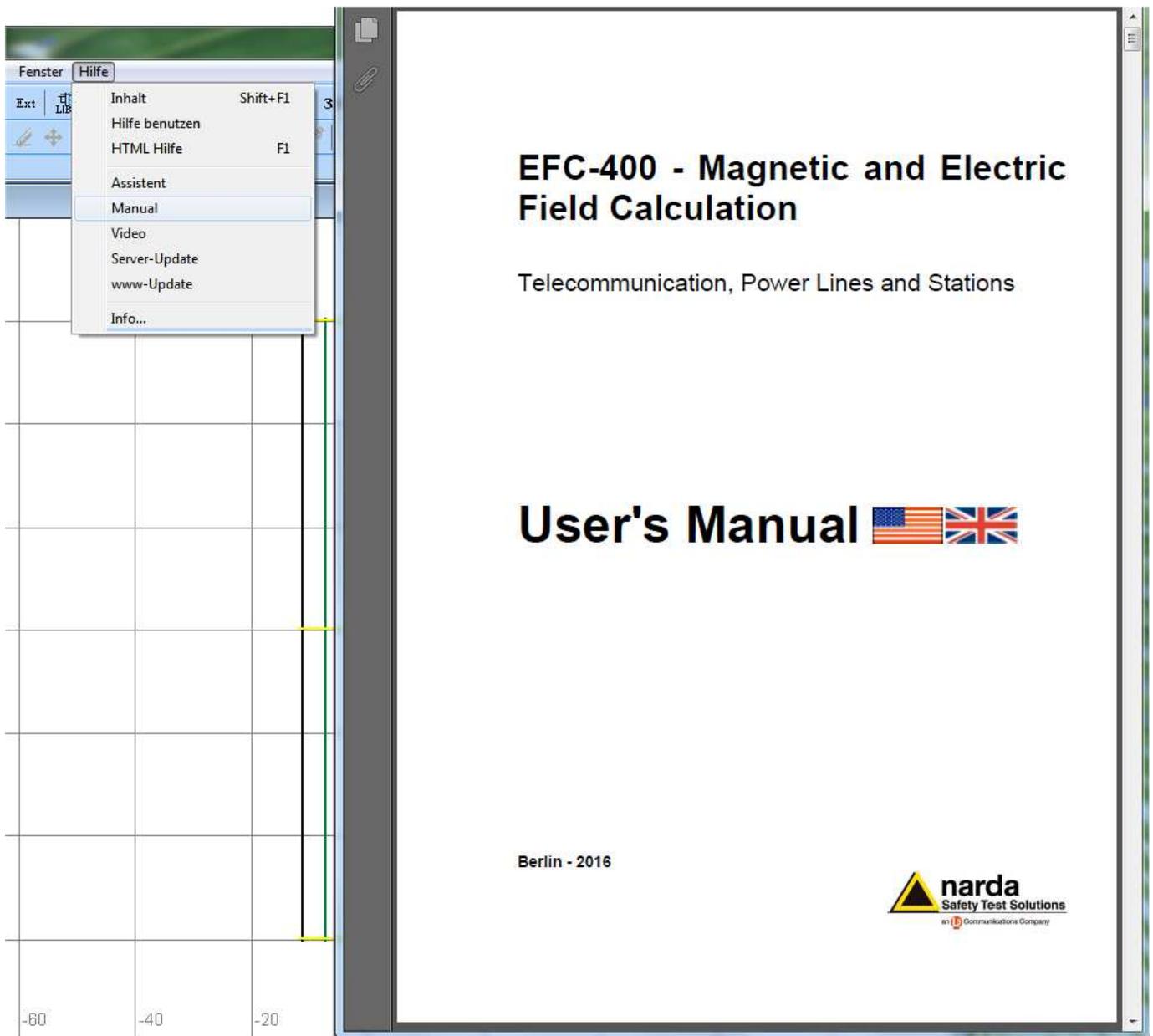

Fig.: right click menu on the tabulators

Fig.: Manual entry in the Help menu and the user's manual opened with that button

Extension of libraries:

- In the cable library all 780 DIN EN 50182 rope types are implemented with the corresponding Al/St cross sections. Previously, the radius had an accuracy of only 1 mm. It was refined to the actual amount of decimals used by DIN.

- The block library for switchgears was extended among other things by components of the company Schneider Electric.

- File names for library elements can now contain special characters such as '110wf dd%. #. .eee'.

- The block library was extended by 'portals' for the construction of substations. They can be found in the library 'Terminal'.

- The limit libraries were revised.

- The 'fence objects' from the block library for LF and HF have been replaced. There had been graphical problems in the 3D-view which have been fixed now.

- Insulators for the construction of substations which are contained in the libraries have been replaced and improved as well in order to reduce boundary effects on them.

- The block libraries with street components have been revised. In order to avoid calculational misinterpretations concerning material factors, the minimum thickness is now set to 10 cm.
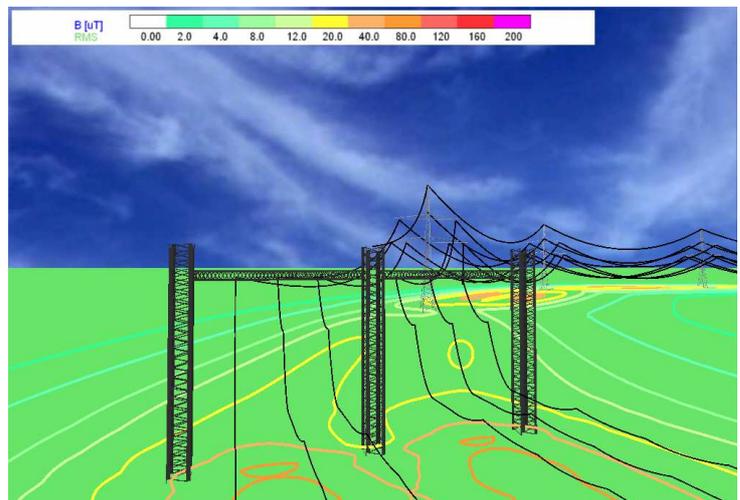

Fig.: Geometry with newly created portal for substations

New Calculation Functions:

- For audible noise calculations of corona sounds emitted by transmission lines, the procedure F9 'DIN ISO 9613' and the subprocedure 'EPRI (Transmission Line Reference Book - 345 kV and above)' are preset as default according to the new DIN Spec 8987.

- The calculation of the electrical surface field strengths used for audible noise calculations can now be determined by different procedures. Right-click on the list of procedures and chose the right method in the local menu to set a procedure.

- The calculation for the surface field strength derived from the electric charge is now significantly faster then the previous integration over the conductor surface.

- In the rare case of three ground wires, 'Auto induction currents' is automatically activated, so that the ground wire currents are correct for the example.

- The acoustical calculation procedure via 'Auto Segments' as in ISO 9613-2 has been sped up.

- In audible noise calculations, the segments of metal plates for shielding don't get exported during data export anymore. They wouldn't have contributed to the sound level at all.

Fig.: List of procedures for electrical surface field strength calculation

- Using the QSI export of audible noise data, every object is now given a name including the value of its voltage, AC or DC and the size of its cross section.

- The determination method for L'W-values during audible noise calculation according to the degree-of-regression procedure was updated (see: error limits according to DIN Spec 8987).

Fig.: Example QSI export with additional information

- The export of audible noise data is now limited to a minimum value for the noise level of -99.9 dB. This value is exactly the one used in the QSI definition of DIN 45687.
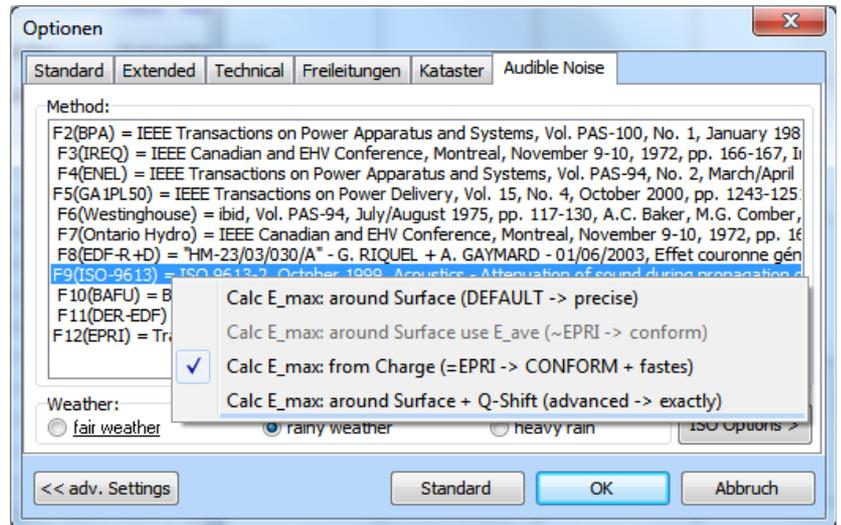
Virtual Reality Interface:

- Two new light sources have been added to the 3D window under an angle of +/- 45°, so that surfaces of switchgears never become completely black because this looks like an error. The surfaces are dark grey now because the light sources are have a very low intensity.

- The multiple insertion of blocks while the 3D window is opened has been corrected.

- A display error concerning fences in 3D under an angle of exactly - 45° was corrected.

- The illumination of the ground profile in the 3D window has been optimized.

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