EMTP Line Database

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1 Description

This device is used to explore, update and create EMTP Line database. A line database is composed of:

- Phase conductors
- Ground conductors
- Line configurations

Each database is stored in a XML-based format and can be updated manually using this device or through the provided JavaScript Interface or an XML editor.

2 Line Database

A default database is provided with EMTP. Data from various conductor manufacturers and typical line configurations are stored in this database.

A User-defined database can be created using the "*New...*" option shown in Figure 1. The User-defined database must be saved in the folder *UserDocument*\EMTP\Database where UserDocument designates the Documents folder in Windows, for example: C:\Users\XXXX\Documents\EMTP\Database.

The "*Delete Database*" option is available to delete the active database. This option deletes the actual database file. This action cannot be undone. By default, the "Default Line Database" is read-only and cannot be deleted or modified.

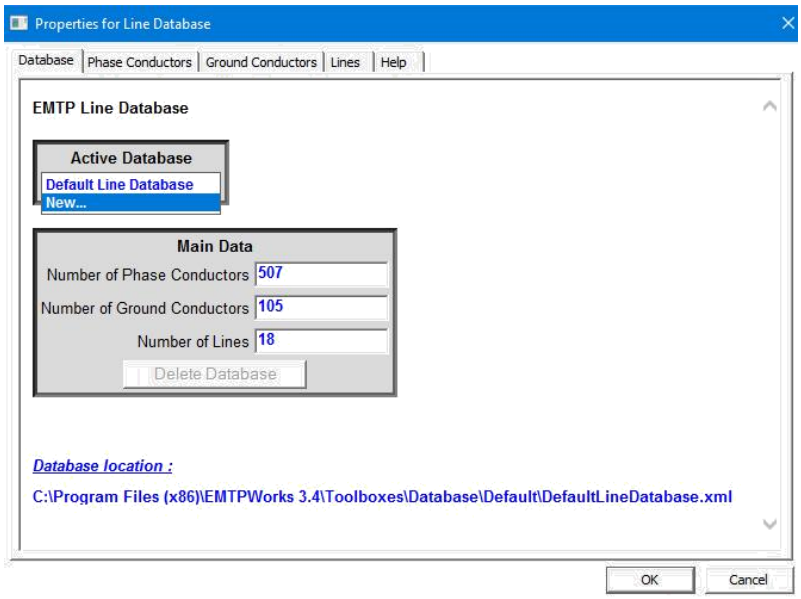
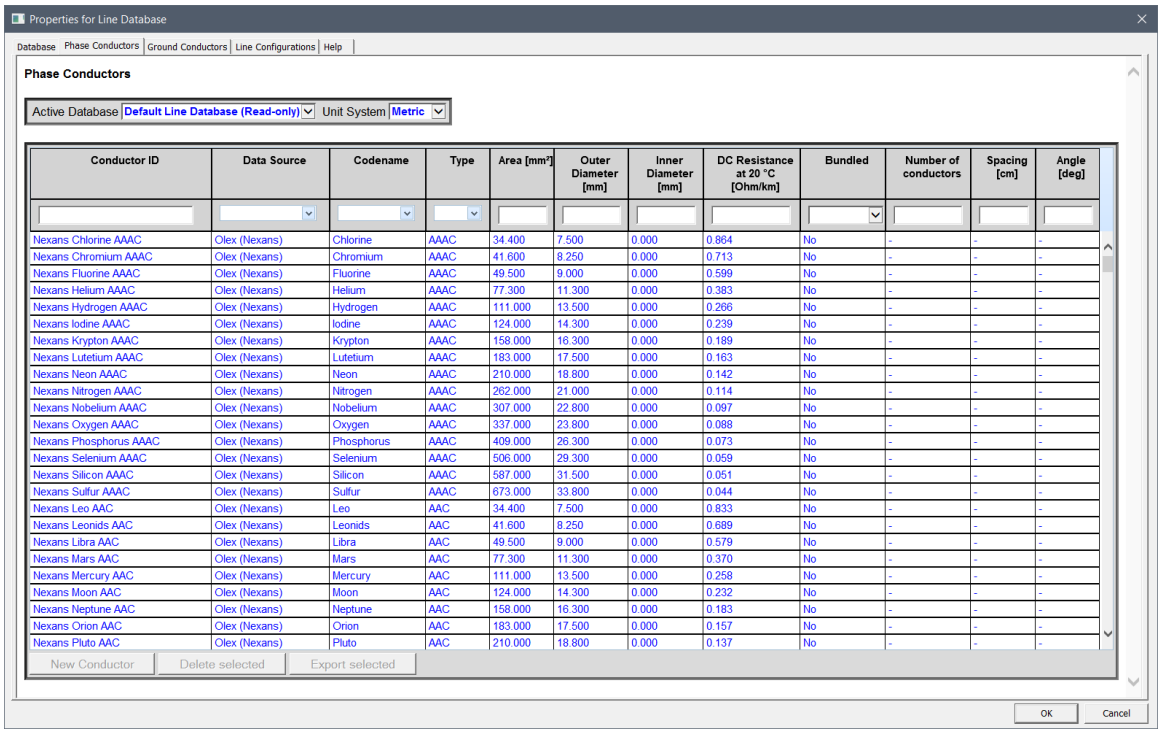


Figure 1: Database tab

3 Phase conductors

The “Phase Conductors” tab lists the phase conductors available in the active database.



Conductor ID	Data Source	Codename	Type	Area [mm²]	Outer Diameter [mm]	Inner Diameter [mm]	DC Resistance at 20 °C [Ohm/km]	Bundled	Number of conductors	Spacing [cm]	Angle [deg]
Nexans Chlorine AAAC	Olex (Nexans)	Chlorine	AAAC	34.400	7.500	0.000	0.864	No	-	-	-
Nexans Chromium AAAC	Olex (Nexans)	Chromium	AAAC	41.600	8.250	0.000	0.713	No	-	-	-
Nexans Fluorine AAAC	Olex (Nexans)	Fluorine	AAAC	49.500	9.000	0.000	0.599	No	-	-	-
Nexans Helium AAAC	Olex (Nexans)	Helium	AAAC	77.300	11.300	0.000	0.383	No	-	-	-
Nexans Hydrogen AAAC	Olex (Nexans)	Hydrogen	AAAC	111.000	13.500	0.000	0.266	No	-	-	-
Nexans Iodine AAAC	Olex (Nexans)	Iodine	AAAC	124.000	14.300	0.000	0.239	No	-	-	-
Nexans Krypton AAAC	Olex (Nexans)	Krypton	AAAC	158.000	16.300	0.000	0.189	No	-	-	-
Nexans Lutetium AAAC	Olex (Nexans)	Lutetium	AAAC	183.000	17.500	0.000	0.163	No	-	-	-
Nexans Neon AAAC	Olex (Nexans)	Neon	AAAC	210.000	18.800	0.000	0.142	No	-	-	-
Nexans Nitrogen AAAC	Olex (Nexans)	Nitrogen	AAAC	262.000	21.000	0.000	0.114	No	-	-	-
Nexans Nobelium AAAC	Olex (Nexans)	Nobelium	AAAC	307.000	22.800	0.000	0.097	No	-	-	-
Nexans Oxygen AAAC	Olex (Nexans)	Oxygen	AAAC	337.000	23.800	0.000	0.088	No	-	-	-
Nexans Phosphorus AAAC	Olex (Nexans)	Phosphorus	AAAC	409.000	26.300	0.000	0.073	No	-	-	-
Nexans Selenium AAAC	Olex (Nexans)	Selenium	AAAC	506.000	29.300	0.000	0.059	No	-	-	-
Nexans Silicon AAAC	Olex (Nexans)	Silicon	AAAC	587.000	31.500	0.000	0.051	No	-	-	-
Nexans Sulfur AAAC	Olex (Nexans)	Sulfur	AAAC	673.000	33.800	0.000	0.044	No	-	-	-
Nexans Leo AAC	Olex (Nexans)	Leo	AAC	34.400	7.500	0.000	0.833	No	-	-	-
Nexans Leonids AAC	Olex (Nexans)	Leonids	AAC	41.600	8.250	0.000	0.689	No	-	-	-
Nexans Libra AAC	Olex (Nexans)	Libra	AAC	49.500	9.000	0.000	0.579	No	-	-	-
Nexans Mars AAC	Olex (Nexans)	Mars	AAC	77.300	11.300	0.000	0.370	No	-	-	-
Nexans Mercury AAC	Olex (Nexans)	Mercury	AAC	111.000	13.500	0.000	0.258	No	-	-	-
Nexans Moon AAC	Olex (Nexans)	Moon	AAC	124.000	14.300	0.000	0.232	No	-	-	-
Nexans Neptune AAC	Olex (Nexans)	Neptune	AAC	158.000	16.300	0.000	0.183	No	-	-	-
Nexans Orion AAC	Olex (Nexans)	Orion	AAC	183.000	17.500	0.000	0.157	No	-	-	-
Nexans Pluto AAC	Olex (Nexans)	Pluto	AAC	210.000	18.800	0.000	0.137	No	-	-	-

Figure 2: Phase Conductors Tab data

Phase conductor data:

- **Conductor ID**: Unique ID used to specify conductors in the transmission line design (*required*).
- **Data Source**: Specify the origin of the conductor data (*optional*)

- **Codename**: Manufacturers usually assign codename or code words to conductors to identify the different types and sizes of available conductors (*optional*)
- **Type**: Specify the type of conductor (AAC, ACSR…) (*optional*)
- **Area**: Conductor cross sectional dimension *(optional)*
- **Outer Diameter**: Specify the overall conductor Diameter (*required*)
- **Inner Diameter**: Conductor inner diameter. Generally equal to 0 (*required*)
- **DC Resistance at 20°**: Conductor DC Resistance (*required*)
- **Bundled**: "Yes" specifies a symmetrical bundle
  - **Number of conductors**: numbers of conductors in the bundle (*required if a bundle is specified*)
  - **Spacing**: (SEPAR) Distance between adjacent conductors in the bundle (*required if a bundle is specified*)
  - **Angle**: (ALPHA) Angle of the first conductor (or any conductor) of the bundle. Positive angles are measured counter-clock wise (*required if a bundle is specified*)

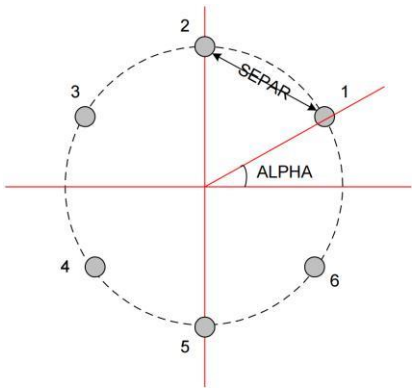


Figure 3: Bundle parameters

If the database is not read-only, it is possible to create and delete conductors. Multiple conductors can be deleted simultaneously. Conductors can be exported to other databases.

It is possible to filter and sort the conductor data using the options available in the table header. Multiple filtering options can be used simultaneously.

4 Ground conductors

Apart from the bundle options, Ground Conductor parameters are similar to Phase Conductor parameters.

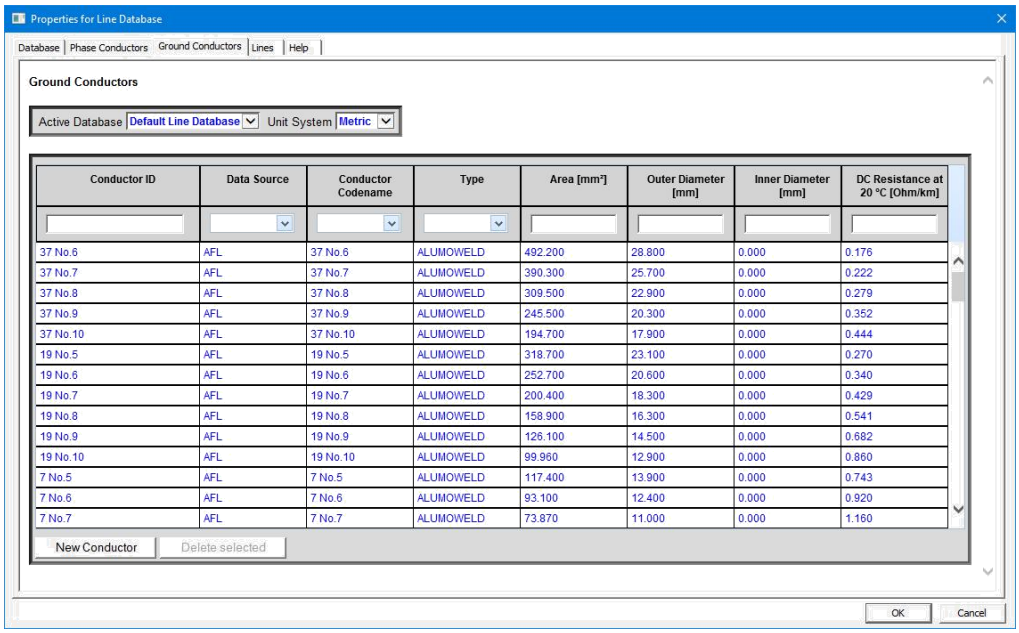


Figure 4: Ground Conductors tab

5 Line configurations

The Lines configurations tab lists the configurations available in the active Database. Each line is identified by its unique ID. Line parameters are:

- **Tower Structure**: Specify the type and shape of tower. When using a *generic* structure, the drawing is automatically updated. (*Required*)
- **Footprint:** Specify the tower footprint. Geometric dimensions of the footprint can be specified. (*Optional*)
- **Conductor Characteristics:** Options are available to add and delete conductors. Conductor parameters:
  - **Type:** "Phase" or "Ground". (Required)
  - **Index:** used to identify the conductor in the drawing. (*Calculated automatically*)
  - **Conductor ID:** ID of the conductor (phase or ground). (*Required*)
  - **Horizontal Distance:** Horizontal Distance of the conductor from the reference point. (Required)
  - **Vertical Distance:** Vertical Distance of the conductor hanging-point from the reference point. (Required)
  - **Insulation Chain Length:** Length of the Insulation Chain. Valid only for vertical insulators. If equal to 0, the conductor height at the tower is equal to the vertical distance. (Required)
  - **Conductor height above ground:** Vertical Distance of the conductor above the ground at the tower. (Calculated automatically)

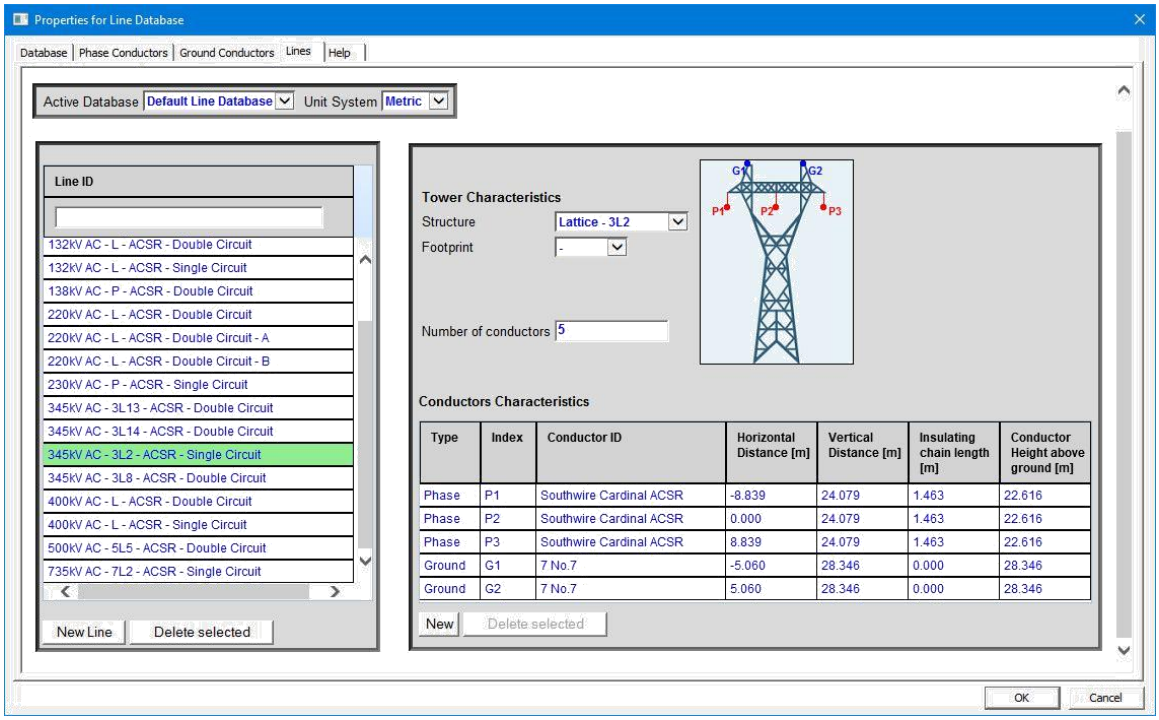


Figure 5: Lines Tab

6 Line Data Interface

The option “Load from Database” in the “Conductor Data” tab of the “Line Data” device is available to automatically calculate the conductor data parameters from a line available in the database.