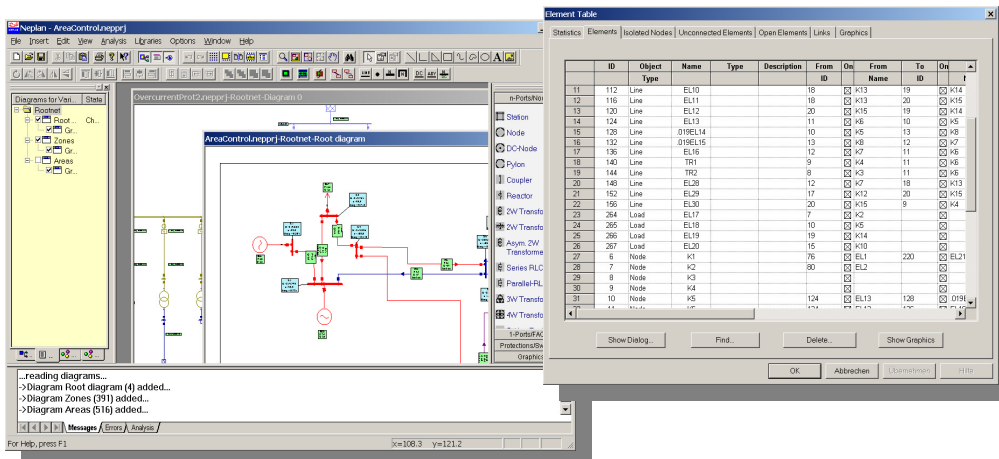


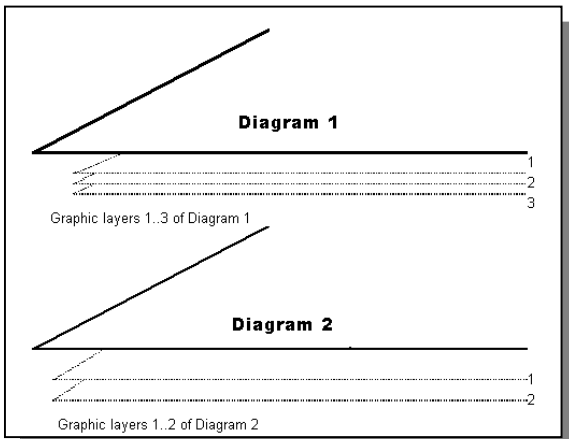
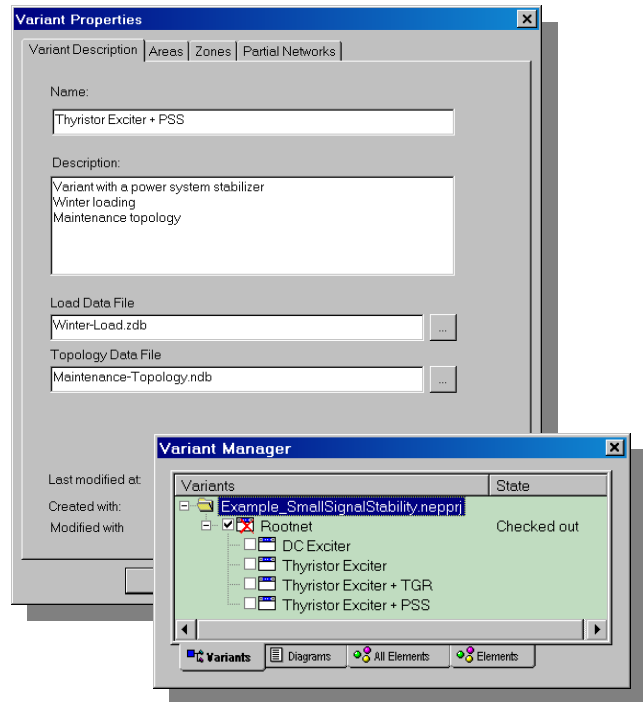
Data management

- Most intuitive Graphical User Interface
- Multi-document and multi-window system
- All equipment can be entered graphically and/or table oriented (like in a excel sheet)
- There is no restriction on drawing sizes and number of nodes and elements.
- Extensive editing functions like undo, redo, delete, copy, move and zoom for processing the network diagram are available. An element can be moved from one node to an other node without deleting the element.
- OLE functionality: Data and graphic can be moved to and from third party software (like MS-Excel, MS-Word). Project documentation was never easier.
- The equipment data are entered in dialogs, with plausibility checks provided. A coloring tool helps to show which data is needed for which analysis (e.g. short circuit, transient stability etc.)
- Integrated Variant Manager (insert, delete, append, compare variants, compare results, etc.).
- ASCII file or SQL database oriented import/export functions for exchanging network data, topology data and load data are available.
- Interfaces to external programs (e.g. measured data) can be implemented.
- Import of a geographic map as a background graphic, for easier schematic capturing.
- Import of almost any raster and vector graphic files (e.g. PCX and DXF files).
- Graphics can be exported as raster files (e.g. JPG, which can be used in any internet web browser).
- Option for combining and separating networks. Any number of independent network areas and zones are possible. Each element and node can belong to any independent area and zone.
- Extensive functions for network statistics and network documentations are available.
- A state of the art library manager with extensive libraries for each element type facilitates data entry.
- All computation modules access a shared database.
- Integrated chart manager allows to analyze and compare all results from all variants.
- Multi-lingual Graphical User Interface.



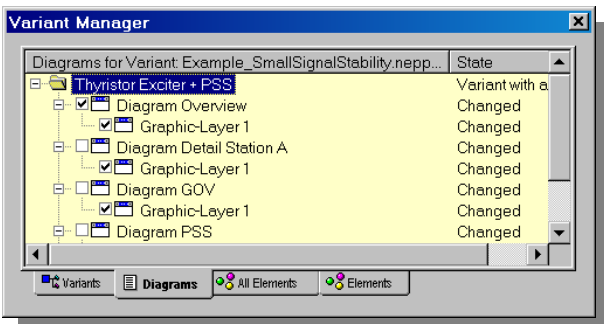
Variant Management

- Non-redundant storage and management of variants.
- For each network, you can select
 - * any desired switch states (topology file)
 - * any desired loading states (loading file)
- For each network you can define and store any desired number of variants and subvariants (variant tree). In the variant data, only the differences from the parent variant are saved.
- Variants can be compared, merged and deleted.
- The diagrams of different projects and variants can be displayed at the same time
- Results from two different variants can be displayed on the diagram in one result label.
- Results of two variants can be compared in the chart manager.



Multi-Diagram and Multi-Layer-Technique

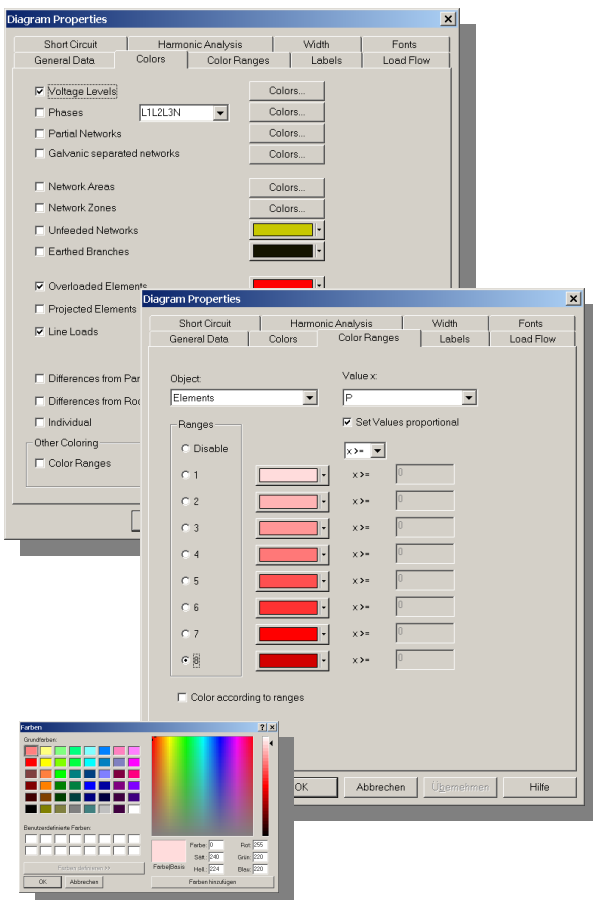
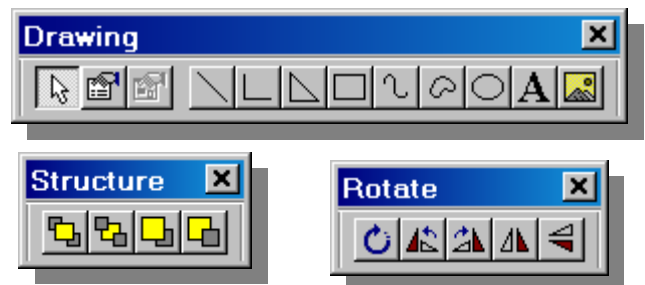
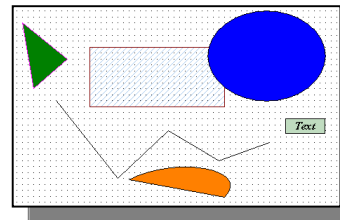
- A network can be entered in several different diagrams, so that the HV network, for instance, is in one diagram, and the MV network in one or more other diagrams.
- Each diagram can have any number of graphic layers. These layers can be colored, locked, hidden or shown.
- Zooming into stations: in the overview diagram, a station is shown as a black box, while in another diagram it is depicted in detail, with all its breakers, protective devices and instruments.
- Topological linkage of elements over more than one diagram.
- All diagrams will be considered for various analysis (e.g. load flow).
- One element can have more than one graphical representation in the same diagram or in different diagrams.



- OLE copy/paste graphic data from and to MS-Word

Auxiliary Graphics

- Auxiliary graphics can be used for documenting the diagram.
- Input of lines, rectangles, ellipses, arcs, ellipse sections, polygons, polylines, any kind of bitmap graphics.
- Input of user text with selectable character set.
- Color for background, foreground, line, outlines and fill patterns is user-selectable.
- Functions available for rendering overlapped symbol elements, rendering, alignment and rotation

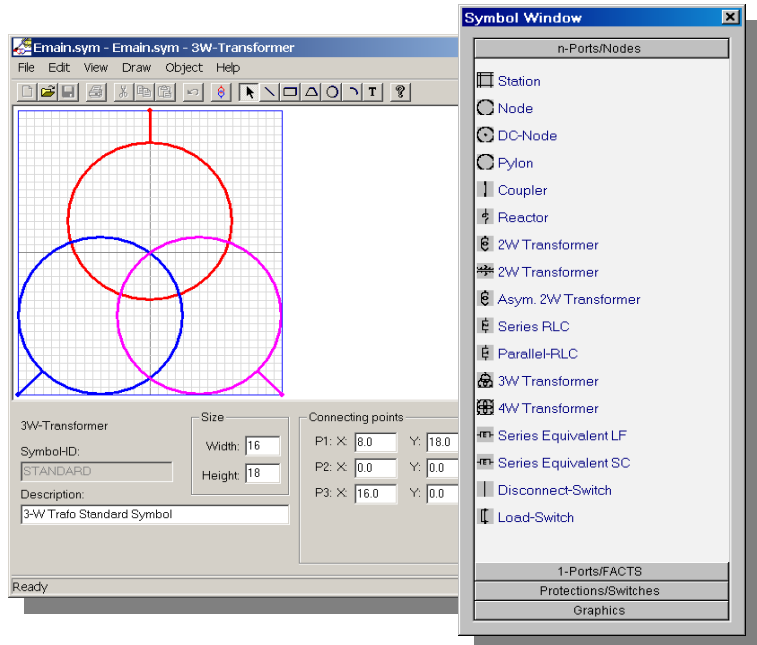


Network Diagram Coloring

- Colors and line types can be freely selected.
- Elements overloaded after a load flow or short-circuit-current analysis are color-highlighted.
- Isolated elements can be highlighted.
- Coloring options to distinguish user-selectable network areas, zones, feeders, voltage levels, earthed or un-supplied networks and galvanic separated networks.
- Differences to the parent variant or the root net can be colored.
- Each element can be colored individually.
- User defined graphic layers can be colored.
- Coloring according to ranges. Many calculated variables can be colored according to their values (e.g. according to element losses or according to voltage drops)
- Results in tables and graphic charts, flow animation, background visualization, gauges, pie charts

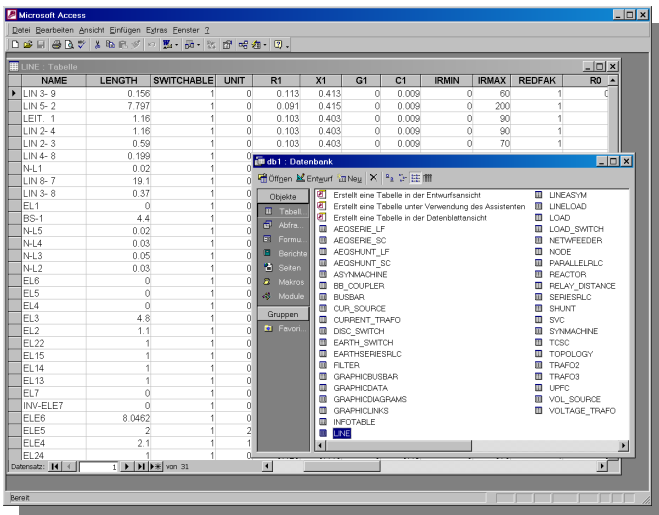
Symbol-Editor

- The user can create and define for each element type and node his own symbols.
- Any number of different symbols per element type or node can be defined.
- All symbols will be displayed while entering the diagram. Just drag and drop the desired symbol to the diagram
- On the diagram the symbols can be flipped, rotated and resized.



SQL Database Connection

- All element data can be imported and exported to any SQL database (like Oracle, MS-Access, etc.)
- SQL database includes all network equipment (HVDC, FACTS, protection devices, user defined data, etc.).
- The network topology can be stored.
- Graphic of the elements and nodes can be exported and imported.
- All data of all libraries can be imported and exported.
- Can be used as interface to existing GIS and NIS or DMS/SCADA systems.
- Very flexible storing and import features, like full import or only updating, storing only variant differences, network zones or areas, voltage levels, etc.
- Handles very large networks
- Partial reading of data fields (e.g. read only the line length but do not read the R and X values)



Library Manager

- The comprehensive library manager is fully integrated.
- NEPLAN offers an extensive element library for lines, synchronous and asynchronous machines, transformers, harmonic current sources and motor characteristics.
- The user can create complementary libraries.
- While entering network data the data in the library can be accessed. Further more the data entered in the network, can be exported to the library.
- All network data can be updated with changed library data.
- The data can be entered through excel like table sheets.
- Import/export to MS-Excel with drag and drop.
- Import/export to any SQL database. Update functionality from/ to database is provided.
- Part of diagrams with all technical data can be stored in the library (e.g. used for IEEE control circuits).

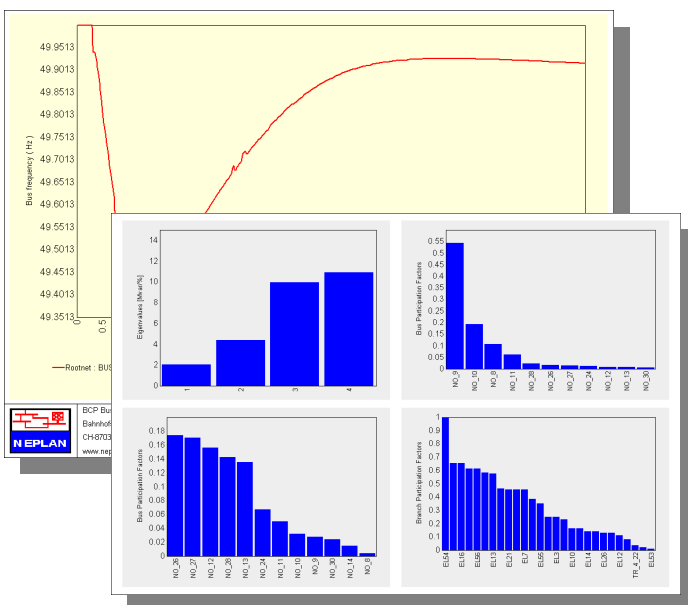
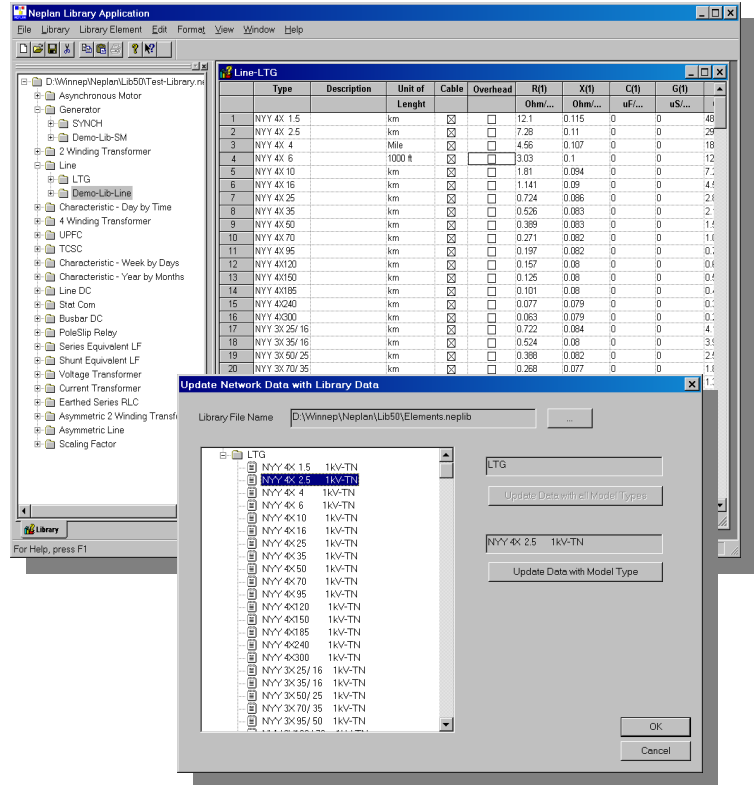


Chart Manager

- The chart manager allows to display the results in different charts (e.g. line, bar, etc.).
- Any number of sub charts can be displayed in one chart.
- A user defined logo (as bitmap) can be added to the header for documentation purposes
- Results from different variants can be compared and displayed in the same chart.
- Export the chart to *.JPG file for any internet browser.
- Copy/paste to the clipboard for documentation (e.g. MS-Words).

Data storing and Interfaces

NEPLAN stores all the network data, such as single line diagram, protection devices, controllers, calculation parameters and results in an internal database in order to handle in an easier and faster way the data.

NEVERTHELESS represents NEPLAN a very open system. All NEPLAN data are accessible from external system. Principally there several ways to transfer data from or to NEPLAN:

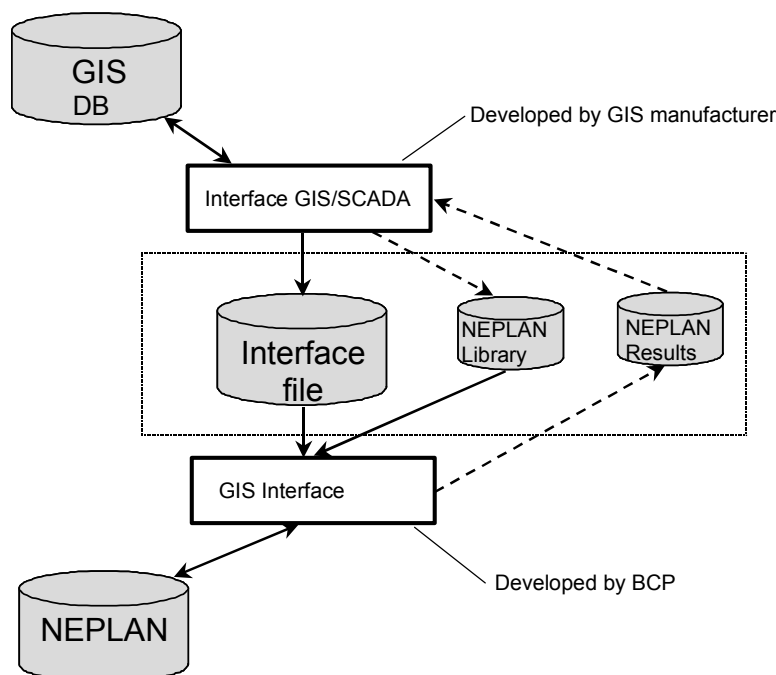
- NEPLAN Programming Library (NPL)
- ASCII files (Excel)
- GIS/SCADA interface
- SQL database

NPL is a C/C++ API library, which includes functions to access NEPLAN data and calculation algorithms through a C/C++ user written program. More information could be found in a separate document.

The ASCII files allows to import/export all the

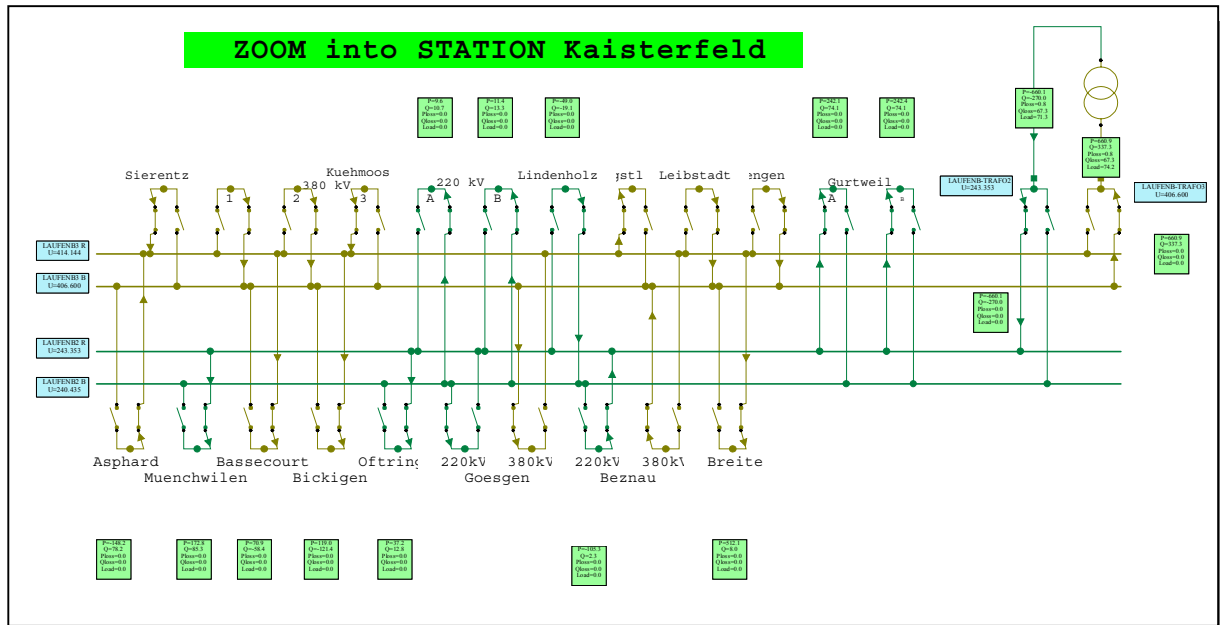
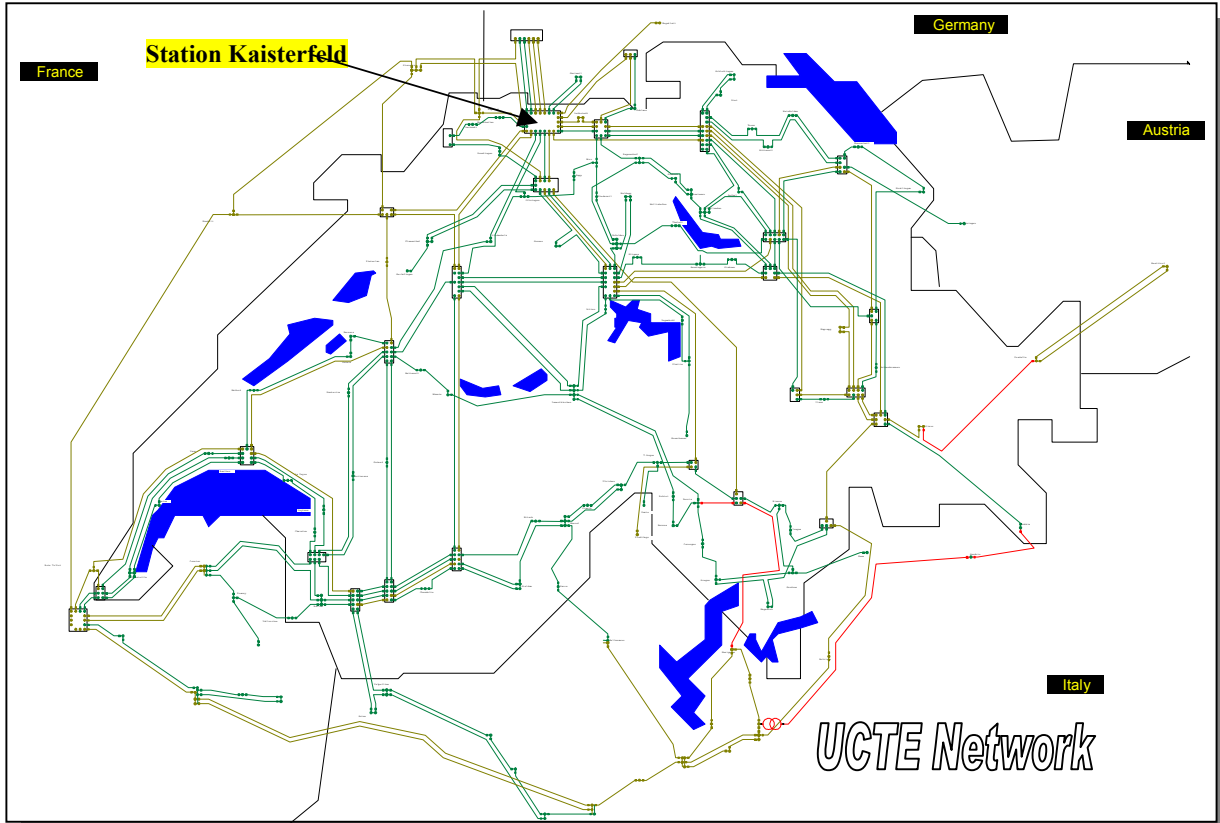
- electrical parameters of the primary elements, like lines, transformers, generators, motors, etc.
- load and measurement data as well as pre-defined load profiles
- protection device types and settings
- Harmonic currents and voltages
- Control circuit data (function blocks)

The GIS/SCADA interface is supported by many GIS manufacturers and is an ASCII file, which includes only the most essential information, such as graphic information, interconnection of elements, state of switches, type of elements and the line length. The electrical data are taken from the NEPLAN library.



Graphical User Interface and Data Management

Application: Transmission – Distribution – Industrial - Generation



Graphical User Interface and Data Management

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