

# Features of the Network Optimization System

The Network Optimizer is a powerful customizable tool for:

- gas pipeline network modeling
- simulation and
- optimization.

The Network Optimizer determines optimal parameters for a new network, as well as operational parameters for an existing one.

It provides an easy integration with external programs and legacy systems, runs on Windows 2000, XP, Vista with MS Office and can use MS Access, MS SQL Server or Oracle as a database engine

## Key Features

### Symbol Designer

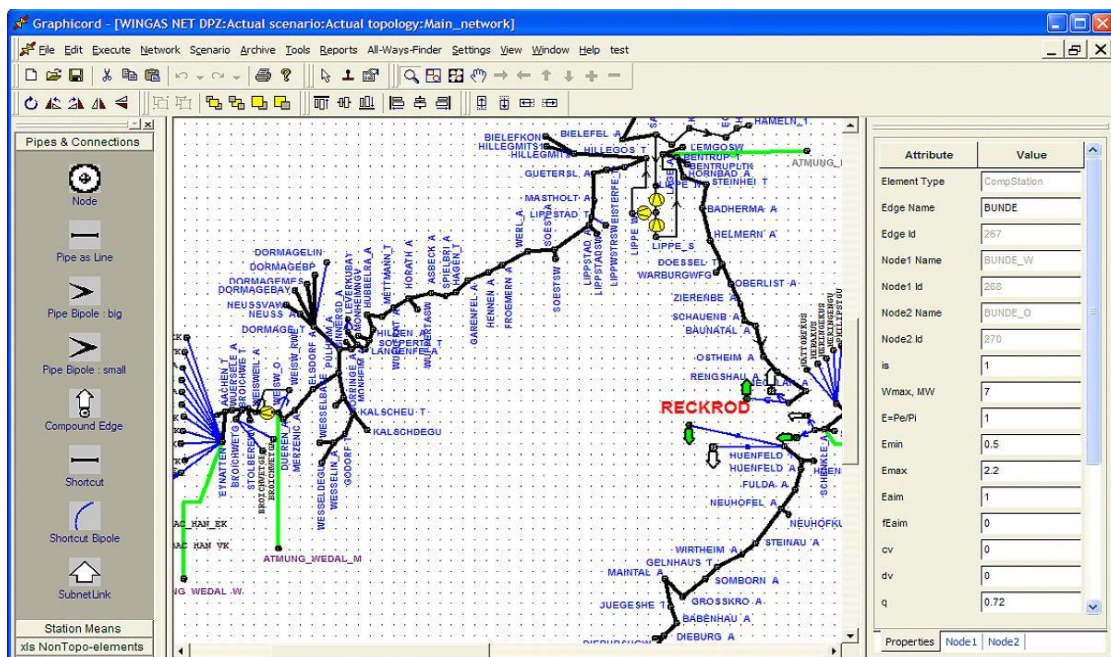
The Symbol Designer helps to create and save symbol objects for use in The Network Optimizer. With the Symbol Designer, a user can define the visual characteristics of a symbol and determine where other symbols can connect to it.

### Net-Element Editor

Net-Element Editor allows creation and modification of basic network elements: nodes, edges, and non-topological elements. Using Net-Element Editor, a user can define new elements or extend and modify existing ones. Each Net-element is defined with a graphical symbol and a collection of properties. From the definition of element properties, a database table schema is derived, allowing subsequent storage of element instances in the database. Net-elements are grouped into Net-element libraries that are later used by the Topo-editor.

### Topo-editor

Topo-editor is used to create or modify gas pipeline networks. A network consists of one or more sub network, each shown in its own window. Topo-editor provides an easy and intuitive WYSIWIG way of creation and editing of sub networks.



A sub network (here without map background) designed by Topo-editor

## Organization of versions, scenarios and states of networks

The Network Optimizer provides a hierarchical organization of versions, scenarios and states of networks. The hierarchy consists of 3 levels: Networks, Scenarios, and Archive Points. Each network consists of a set of Scenarios. A Scenario represents a variant state of the network. Scenarios in turn contain a set of Archive Points. Each Archive Point represents a state of a particular network at particular point in time. An Archive Point consists of a set of sub networks and Scenarios, Archives and Sub networks can be cloned providing an easy way to perform experiments with network topology and changes of network parameters in time.

## Graphical Interface (GIS)

The Network Optimizer is integrated with MapPoint GIS. The Geographical maps provided by MapPoint are displayed on the background of a network. By request additional GIS systems could be integrated with The Network Optimizer

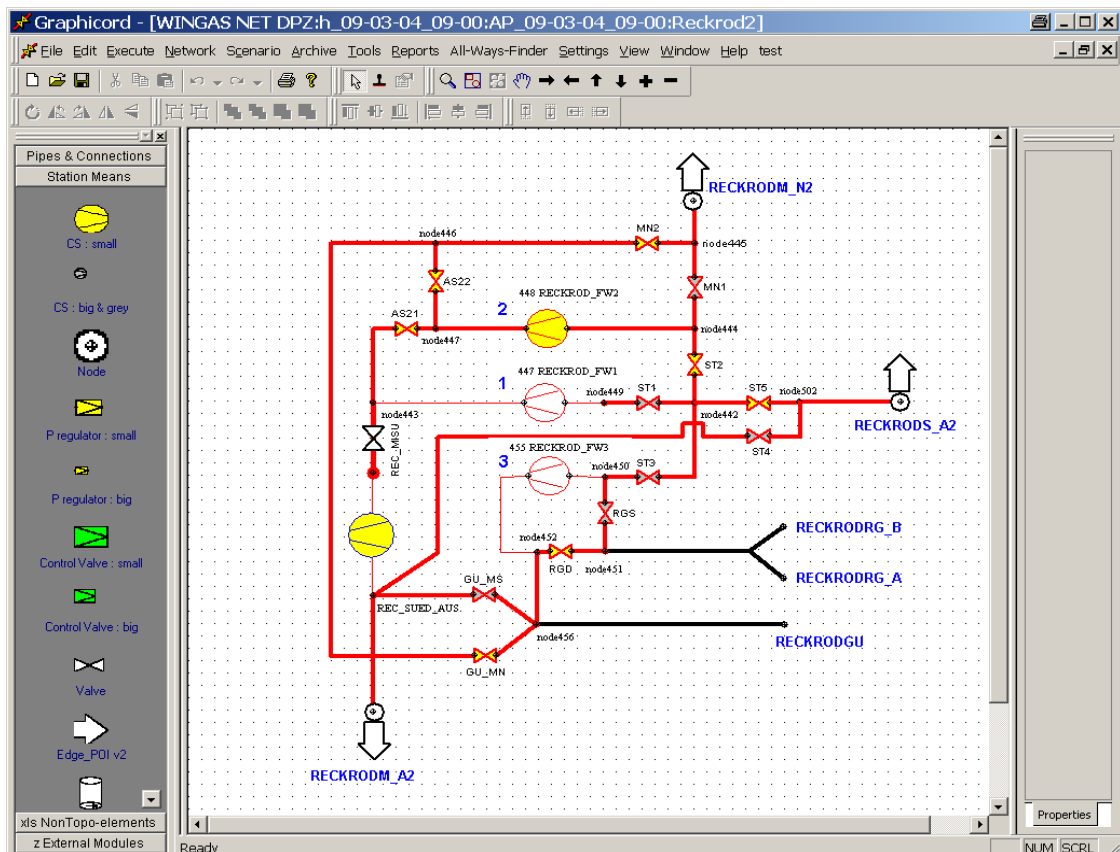
## Integration with external applications

The automation interface of The Network Optimizer provides essential integration features. Most The Network Optimizer functions and features are exposed and can be invoked from an external application. The database structure allows direct data-level integration. VB Script can be generated by (and executed within) The Network Optimizer allowing tight integration with MS Office applications.

On the other hand, the 3-rd party exe-modules and applications can be added to be called from The Network Optimizer. Both manual and programming call of the 3-rd party applications from the The Network Optimizer environment are available.

## Path Finder

The Network Optimizer provides a simple interface for finding paths on the networks based on specified criteria. Found paths can be iteratively displayed by highlighting the set of elements from which the path is composed.



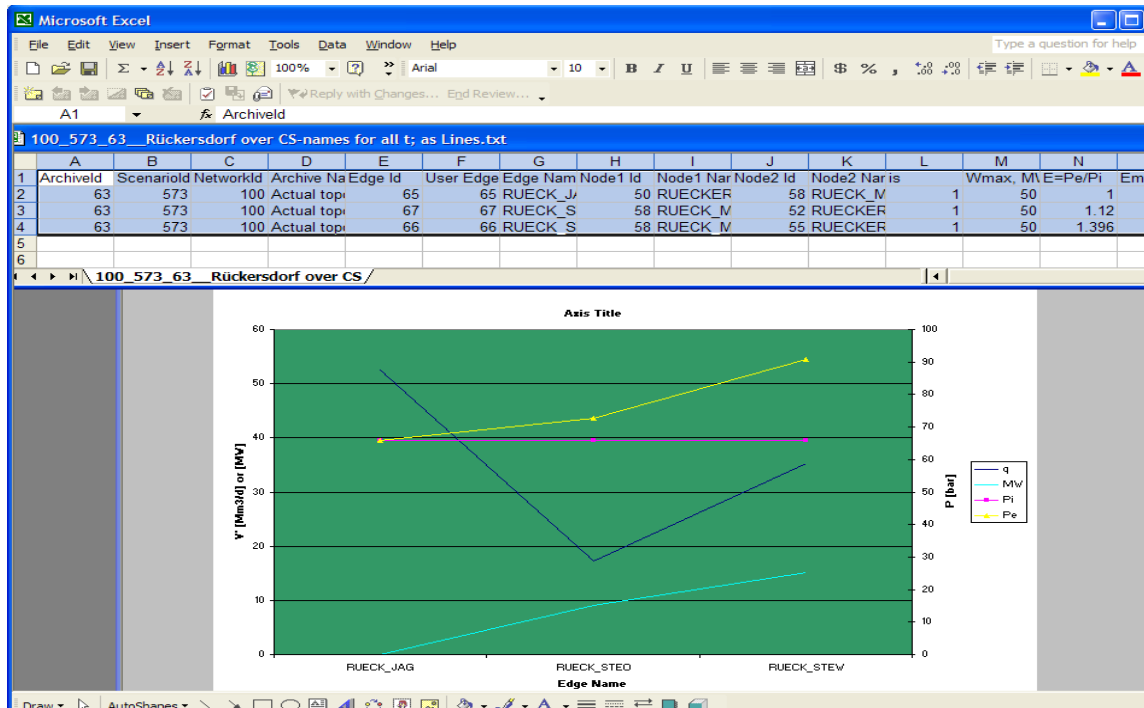
Results of Path Finder

## Support of embedded spreadsheet format

The Network Optimizer supports spreadsheet format in particularly for tabular processing of input, plain and Excel files.

## Reports putting by Generator of tables and diagrams

The Network Optimizer integrates transparently with Excel. Graphs and charts can be defined through a user-friendly interface, creating complex queries. VBA script that executes the query is generated then and creates complex tables, graphs and charts at the run time in Excel. The results can be saved to use again.



Simple example of generated tables and diagrams.

## 1. Graphical Format Rules

One of the important visualization features of The Network Optimizer is a graphical format rules. A user can define conditional visual formatting of net-elements. Graphical properties that can be conditionally modified include net-element fill color, line color, line width and element rotational orientation.

By request the rules can be applied and visual representation of the network will be modified based on the conditional rules and properties of particular net-elements belonging to the network.

## 2. Flexible user definable export and import

The Network Optimizer allows a user to define a custom export data formats of data transfer files, using as interface to the 3-rd party applications. At run-time, data is extracted from the database and a data transfer file created according to selected format. As a third party application may modify the data or provide calculation results, a user-defined format is used to import the data from a user file back into The Network Optimizer database.