TopoDesk

Modular Time Series Information System

toposoft

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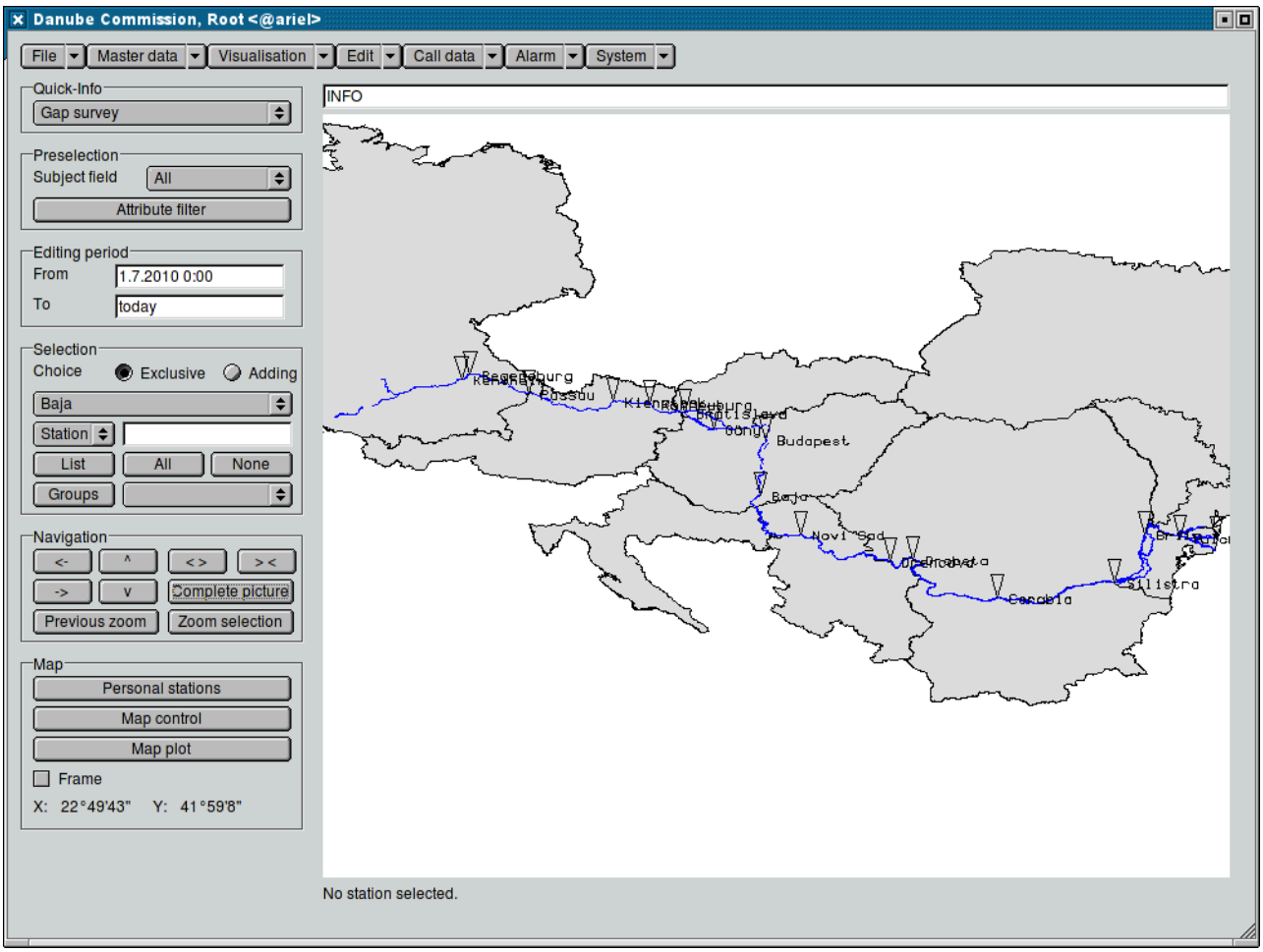

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Chapter 1

Introduction

TopoDesk serves the management, maintenance, visualisation, calculation and analysis of time-oriented observations within hydrology. Data of the subject fields rainfall, hydrometry, groundwater and climate are edited by **one** program system.

TopoDesk can be run locally or over a network. It allows several users to work at the same time. This way data management, analysis and data import can occur simultaneously. The data is located in a central data pool which is linked to all workstations by an LAN (local area network). By means of a user management with login, the administrator can allocate subject-oriented access.

This is an easy to use interactive system. TopoDesk has two essential components that help you to get to the requested application quickly.

- The map
  Here, the geometries of the observation area are visualised together with all existing measuring sites (stations). By mouse click selection you premark several stations for further processing. You are also able here to access short information on several stations directly.

- The axboxes
  The results of temporal analyses are displayed in interactive axis graphs (which we will call **axboxes** from now on).

For further assistance, tooltips will appear when the mouse icon hovers over specific boxes.

Therefore, as a user, you move quickly and confidently within space (the map) and time (the axboxes) and can follow and control all operations visually. This benefits the data quality and secures comprehensive and skilled information.

The system provides many auxiliary means to support you at your work. This becomes evident, for instance, through the increased accessibility of sub-functions. Everything you select and enter in the map is forwarded to these.
A pragmatic, effective and thorough test of the data is particularly guaranteed by the simple handling, the short response time and the small but important functionalities in detail. Furthermore, all analyses and tests can generally be produced as reports.

TopoDesk is based on the toposoft time series database, on the toposoft machine for the graphical interactive user interface and on Azur for operating with time series.

Summary of functions

The essential functions of TopoDesk are named in the following enumeration.

- **Main window**
  This possesses an interactive, topographic map which visualises measuring sites (stations) and several other geographical layers retaining the geographical reference. At the same time, it provides operating equipment with which you are able to navigate and select. Here, you also have the possibility to make presets which are forwarded to the subprograms (editing period, parameters). You can print the selected section of the topographic map with all displayed elements.

- **Map control**
  This offers you the possibility of modifying the map display by loading and removing layers and scenarios or by changing the presentation of layers and texts. You can also load station layers of other subject fields.

- **System tools**
  Here you decide on general settings and define the appearance of TopoDeskŸou determine, for instance, whether the map shall be displayed and make the presets for the printer. From here, you can generate the station survey of the measuring sites from the master data. The possibility to define and file station groups (also from different subject fields) is also very helpful. Once defined, you can easily select these in the map and use them for further processing. Additionaly, version information can be requested.

- **Master data**
  This is where master data can be gathered, modified and deleted. Certain stations can be selected and prepared for editing by means of filtering functions. Consequently, your selection serves as a basis for analyses, reports and graphics.

- **Code-relations**
  These involve key lists with the aid of which you define the entries of all shortlists.

- **Time series**
  In TopoDesk, time series are assigned to the stations and are clearly defined by their attributes. Via the stations you can invoke these series in the system either by means of the map, the station name or by a specific time series filter. The attributes of existing series can be edited without big effort. You can also query the availability of time series of selected stations within a certain time period.
  With the editing functions for time series sequences, any periods of different time series can be combined and also modified by means of formulas (for example, time series sequence Runoff calculated from basic series Water level). The time series sequence stores the construction rule defining which basic time series to access in which time period. This is why changes within the basic series are always immediately available in the time series sequences.

- **Import**
  After a prior visual check and supplementation of the missing attributes you can import time series from external or exchange formats. At present, there are about 50 formats

implemented that are automatically recognised and read.
The system independently checks if the time period to be imported already exists in the receiving time series and warns the user of overlaps. Before the import, the existing series is plotted together with the series you want to import.
Master data can be imported fieldwise from DBF and CSV data.

- **Export**
  All time series can be exported from here into the toposoft-pack-format and the DBF format. All master data or extracted master data attributes can be exported into DBF format either for further processing (for instance in Excel) or for data exchange.

- **Single value entry**
  Entry and editing of interval and momentary time series as well as longtime values in a table.

- **Hydrograph visualisation with TopoVit** Continuous time series can be superimposed on any combinable stations and parameters. All graphics are zoomable and scrollable. Additionally, you can edit and print these graphically and tabularly. The layout can be configured interactively.

- **Hydrograph editing**
  - Check and correct hydrographs
    In consideration of a time lag, the connection between continuous time series (W und Q) can be appointed by means of linear regression calculation. This way, substitute series can be generated and filled into observation gaps. These kind of modifications are commented as reconstructed and can be undone. However, the series can also be independently edited graphically, calibrated or sychronised.
  - Check and correct precipitation (rainfall)
    TopoDesk allows you to search gaps, to trace deviations between analyser and plotter items, to examine processed precipitations as well as to make a thorough checkup of heavy rain occurances and other noticeable problems. Subsequently, you correct and reconstruct the values by aligning plotter data to analyser data, filling gaps and by inserting and aligning data from substitute plotters.
  - Edit rating curves
    You can express, visualise and edit rating curves in a W-Q diagram and print them graphically and tabularly. They can be calculated from stream gauging either as a power or as an exponential function but they can also be constructed from the hydraulic boundary conditions according to Poleni or Weisbach. A Spline interpolation along compulsory points is available.
  - Runoffs and reduction values
    This is where reduction values (eta, reduction) can be edited extensively in alignment with the runoffs. Stream gaugings can also be presented in the time together with the gaugings of W und Q and with the corresponding continuous time series. Runoffs can be calculated by means of the water level rating curves.

- **Analyse hydrographs**

- Isolines
  You can calculate and display isolines for the following data: interval sums (also of circular definition) from pluviograph and pluviometer data as well as heavy rain evaluations of selected annuality and duration level. The display and calculation of the data are possible for any station combinations and time periods.
- Rainfall annuality
  TopoDesk allows you to calculate the annuality of any rainfall occurences.
- Volume
  You can determine the runoff volume for a certain time interval with interactive display. The volume is calculable absolutely, over a connecting line of runoff ordinates within a selected time interval or as difference to a comparative series. This application gives you a quick idea of the volume which has run off between two gauges or which is being induced or extracted.
- Frequency and duration
  Frequencies and duration lines of the selected parameter of one or more stations can be displayed graphically as well as opposed for comparison. Means, minimums, maximums or loads for selected intervals are examined. Any interval widths can be calculated for continuous data.
- Correlation and regression
  This examination is executed for analyses of discrete time intervals which are calculated directly from the continuous time series. Among others, analyses can be mean values or freights. All statistical parameters and the regression equations are documented. These methods are very good for plausibility checks and applicable for the fathoming of coherences. A temporal displacement (lag) of the series towards (against) each other is also possible.
- Threshold exceedances
  W as well as Q series can be examined for exceedances of thresholds with interactive display. The results can be documented graphically and tabularly with a listing of all events, their duration, peak values with point in time specification as well as with the statistical evaluation.

- **Reports**
  All evaluations are calculated directly from the continuous time series during the generation of the report. Reports of the following topics are at your disposal.
  - Data report
    * Time series survey with graphical display of the data availability
    * Gap survey showing the gap proportion per half-year, year and whole period
    * Half-year gap-table
    * Chronological output of all comments in a time series for an arbitrary time interval.
    * Sequel listing of the processing levels (qualities), gaps and comments
    * Monthly list for minima, totals/loads, means and maxima
    * Half-yearly and yearly page with display of continuous time series as well as evaluations of minima, means, maxima, loads, mass curves of loads, frequencies and duration curves.

    * Tables of primary values for minima, totals/loads, means or maxima
    * Main values with an output of minima, mean and flood (high water) values.
    * Yearbook page for water level and runoff, selectable water year or calendar year
  - Tables/graphics
    * Monthly list for minima, totals/loads, means and maxima
    * Half-yearly and yearly page with display of the continuous time series as well as evaluations of minima, means, maxima, loads, mass curves of loads, frequencies and duration curves
    * Tables of primary values for minima, totals/loads, means and maxima
  - Longtime behaviour
    * Daily total values
    * monthly total values
    * Mass curves
    * Annual hydrograph
  - Reports according to German hydrographic regulations
    * Monthly list for the combined edition of water level, runoff and reduction (reduction and eta values)
    * Annual list
    * Table of primary values (monthly maxima)
    * Table of primary values for water years or calendar years with combined display of the **L**owest, **M**ean and **H**ighest waterlevel as well as the 10 yearly series.
  - Hydrological description
    → according to the guidelines of the German hydrological yearbook
  - Yearbook
    * Yearbook: day, month, duration (graphical output of daily and monthly means as well as duration curves
    * Duration curve/duration table
    * Yearbook page with 14 columns for the common presentation of water year and calendar year

- **Statistics**
  There are a complete flood peak statistic, a drought analysis, a flow volume statistic as well as a heavy rain analysis ready for interactive use embedded in the system.

All these functions can be comfortably and interactively operated. Due to the fact that you can invoke all modules at the same time, they are easy to control.
You orientate yourself in the system intuitively since spacial phenomenons are presented in the interactive map and temporal phenomenons can be searched for and displayed in interactive axboxes.

Chapter 2

Login and user administration

All toposoft program systems can be provided either with or without login and user administration. This chapter will only concern you if you own a login.

2.1 Login

Figure 2.1: Login-window

Enter the name of the user in the User input field. Then enter the pass word (this will not be echoed) in the Password input field. Press the Tab-key or use the mouse in order to get from one

input field to the next. After you have filled out both fields, you start the login with the Return key or the OK button.
When you click the [Quit] button, the login window will be closed and the whole program will not be started.

On execution of the login, the program will be activated according to the existing access rights of the logged in user. The SuperUser who manages all users specifies the access rights for each user. Control elements which are not accessible for a user are either displayed in grey or hidden.

> HINT:
> You can also have the login executed automatically. Which presets have to be made can be read in chapter 13.3.4.

2.2 User administration

Der SuperUser verwaltet alle Benutzer, d. h. er legt fest, welche Zugriffsrechte jeder einzelne User hat.

2.2.1 Zugriffsrechte

Generell gilt:

- SuperUser: Als „root“ eingeloggter Benutzer. Hat uneingeschränkte Zugriffsrechte auf alle Funktionen. Ist damit automatisch Administrator.
- Administrator: Wird im Benutzerprofil eingestellt (☑ Administrator). Hat spezielle Administratorrechte. Kann alle Sachgebiete bearbeiten. Hat automatisch alle im Rahmen Speziell aufgeführten Rechte.
- Benutzer: Rechte werden im Benutzerprofil eingestellt (↪ Kap. 2.2).

Bedienelemente in TopoDesk, auf die ein Benutzer keinen Zugriff hat, werden grau dargestellt oder ausgeblendet.

2.2.2 Manage users

Only the SuperUser has the possibility to activate the window Manage users (↪ fig. 2.2). In order to carry out modifications described in the following, you must thus have the essential access rights. In case you are not a SuperUser, you can skip this subchapter. If you want to log in as a SuperUser, you do this with the user name root and the according password. You get to the window to Manage users via the menu [▽ File] (↪ chapt. 5).

By means of the buttons

[New user]

Delete

Save

Manage profiles

you assign, modify and delete access rights.

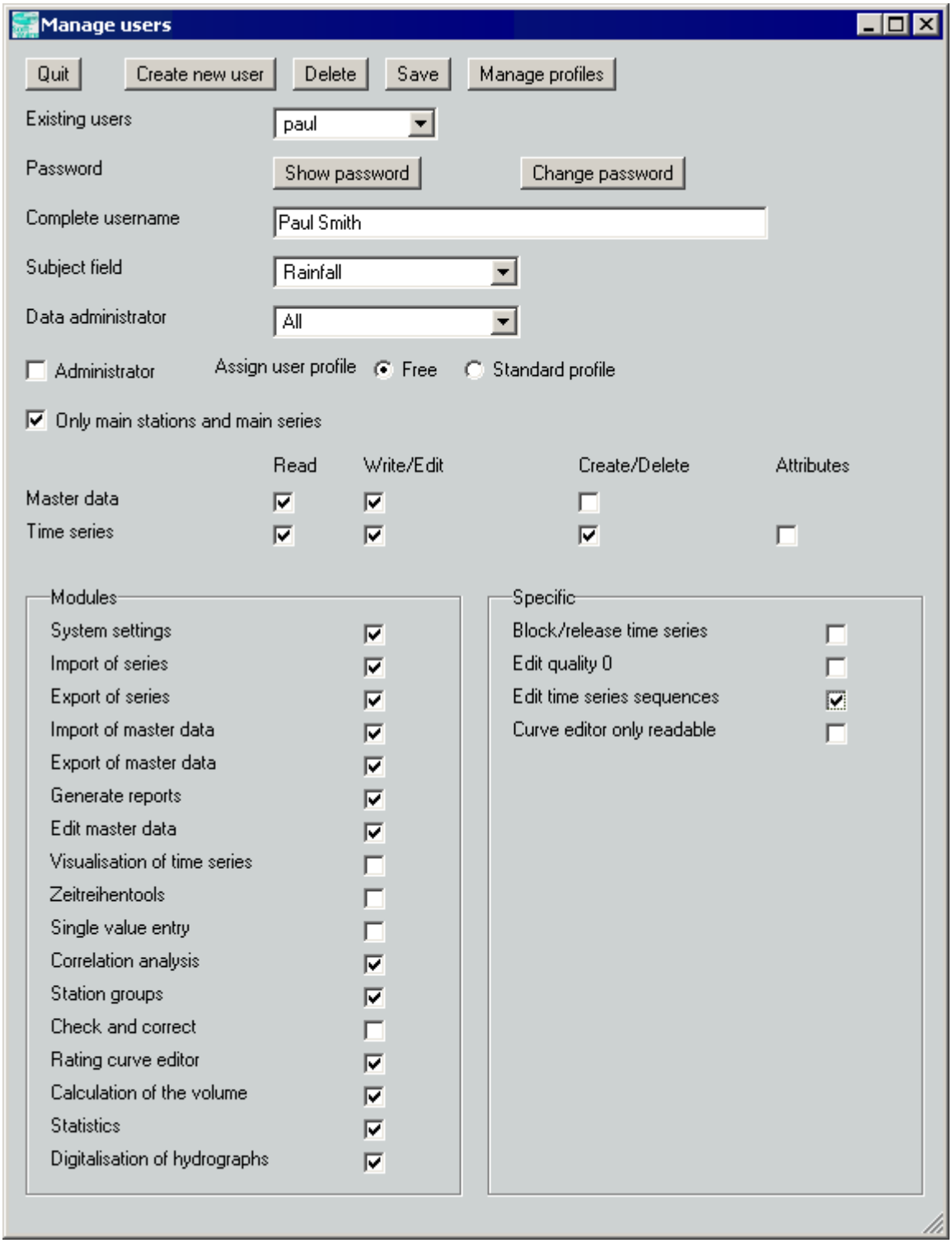


Figure 2.2: Manage users

Wer Administratorrechte bekommen soll, legen Sie über das Kästchen ☑ Administrator fest.

TopoDesk bietet darüber hinaus die Möglichkeit, Hauptstationen und Hauptreihen zu definieren (Hauptstationen ↪ Kap. 6.2, Hauptreihen ↪ Kap. ??). Mit dem Kästchen ☑ Nur Hauptstationen und Hauptreihen wird je Benutzer festgelegt, ob er die gesamte Datenmenge zur Verfügung gestellt bekommt oder nur ausgewählte Stationen und Zeitreihen. Dieses Prinzip dient in erster Linie der Vereinfachung und der besseren Übersichtlichkeit bei großen Datenmengen.

As **root** you can differentiate the access rights with respect to Read, Write/Edit and Create/Delete for master data and time series. Für Zeitreihen können Sie darüber hinaus bestimmen, ob Zeitreihenattribute bearbeitet werden dürfen (↪ Kap. ??).

All other modules or functions can be released or refused within the frame Specific. The functions marked with a tick are released. A user cannot use a module when it is not marked, i. e. refused (↪ fig. 2.2).

2.2.3 Set up and delete users

In order to set up a new user click on [New user]. An input window will appear (↪ fig. 2.3), asking you to enter a user name. After you have done this, click on [OK].

Figure 2.3: Set up a new user

Now, another input window will appear in which you must enter the password. After you have clicked on [OK] you will be asked to enter the password once more. Now the program will adopt the data. The new user will appear in the list of existing users.

> HINT:
> A subdirectory is set up in the user directory for every new user. Therefore, the SuperUser must have access rights at his disposal which allow him to set up these subdirectories.

After the set-up of the new user, enter its complete name in the input field. This name will then appear in reports, for instance: (written by...) or in the export journal (exported by...). You can also assign a subject field to the user and determine whether it shall have the rights of an administrator. The users without administration rights are assigned with the specific access rights. Please read chapter 2.2.4 for further informtion.

> HINT:
> The SuperUser is automatically the administrator.
> The administrator automatically has all rights indicated in the frame Specific.

ADVICE:
Do not give administrator rights to any other but the SuperUser.

In order to delete an existing user, select it in the shortlist beside Existing users and then click [Delete].

2.2.4 Change access rights

The access rights of the selected user in the user list can either be defined ⦿Free by the checkboxes in the frame Specific or by assignment of a ⦿Standard profile (↪ chapt. 2.2.5) to the user.

Once the access rights are set, click [Save].

2.2.5 Create profiles

When managing many users who hold the same access rights you may be advised to set up a user profile. For this purpose, click the button [Manage profiles]. The window Manage users changes to the window Manage profiles (↪ fig. 2.4), the button [Manage profiles] changes to the button [Manage users] and brings you back to the window for managing users.
In the top section of the profile management you will find the list of the existing profiles. Underneath, you select the subject field for a profile as well as the individual rights.

By means of the button [Create profile], you can generate a new profile. When you click on this button, an input window appears in which you enter the name of the new profile. After confirming with [OK], this profile is immediately available in the profiles list. Now select it and assign the requested rights via the subject field list and the checkboxes. Then click [Save].

If you want to assign a profile to a user, go back to the user management with the register button [Manage users]. Here you first select the user and then the ⦿Standard profile under Assign user profile. Now, instead of the checkboxes, the profiles list appears within the frame Specific. This is where you select the desired and then click [Save].

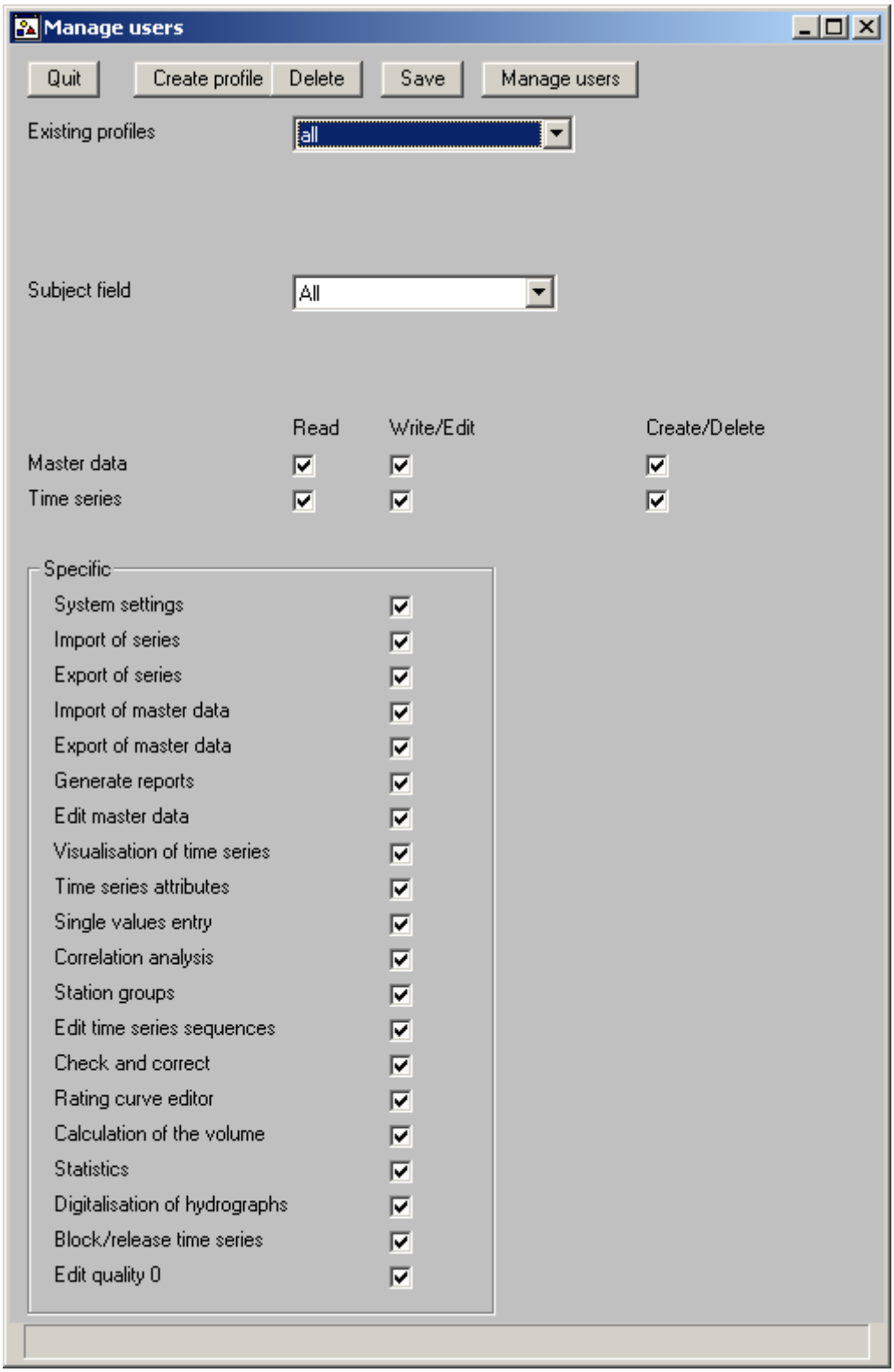


Figure 2.4: Manage users: Manage profiles

Chapter 3

First steps

In the following sections you will find basic information on the time series information system TopoDesk. Read chapter 4.1 to learn about the structure of the main window. In chapter 3.3 you find out how to simplify your work by means of presets and the chapter 13.4 explains the assignment of the mouse buttons for dealing with the map and the axboxes. The chapters 3.5, 3.6 and 5.3.1 describe how to suit the appearance and the presented functions of the individual windows in TopoDesk to your special needs and work methods. Chapter 5.3.2 explains how to print under TopoDesk.

3.1 Stations and time series

In TopoDesk time series are assigned to the stations and are clearly defined by their attributes (↪ chapt. 7). The origin of the series is clearly determined by the distinction of the attributes. Several series of different origin can be managed for one station.

3.2 Maps and axboxes

Central elements of all toposoft program systems are the map in the main window (↪ fig. 4.1) and the axes of coordinates (axboxes) in which time and real series are plotted. The map gives you an overview of the locations of the stations and allows you to preselect stations for further process. You will come accross axboxes all the time in the program, be it in TopoVit (↪ chapt. **??**), with which you can take a quick and easy look at hydrographs or be it in the visualisation or also in all sorts of editing windows (Import, Check and correct continuous time series, Statistics etc.).
The map functions are explained in chapter 4.2.2, general information on the axboxes is available in chapter 13.5.17.

3.3 Feeding back information to the subprograms

In all toposoft program systems you have the possibility to make presets in the main window which will then be fed back ("bequeathed") to the sub functions.
This way, you can predetermine ("select") the stations here to be processed, preselect attributes and determine the time period for the process. The chapters 4.2.3.2, 4.2.3.3 and 4.2.3.4 will tell you how to proceed.

> HINT:
> This preselection is not a "must", the subprograms, also, offer the appropriate input possibilities.
> However, if you are carrying out several evaluations for one station or a station group, it simplifies your work because you only have to enter these standard settings once.

3.4 Assignment of mouse buttons

For working with the map (↪ chapt. 4.2.2) and the axboxes (↪ chapt. 13.5.17) as well as with the Preview window (↪ chapt. 13.8.1), there are special mouse button functions. These are precisely explained in chapter 13.4.

3.5 Options

There are several functions in TopoDesk that the editors will need in different frequency or possibly not at all. These are gathered as options in frames or seperated by parting lines and can be switched on or off on demand in the respective right corner with [x]. This way, you can set up certain windows which suit your individual needs. These settings are saved individually for each user (↪ chapt. 3.6).

> HINT:
> The System settings (↪ chapt. 5.3.1) offer arrangement possibilities for the main window. Read in chapter 13.3.1 how to change the whole appearance of TopoDesk.

3.6 The "memory" of TopoDesk

When you exit a window properly (via [x] or [Quit]), the most important settings are saved up to the next invocation. This applies, for example, to

- the displayed map section and the loaded scenario,
- the window position and window size,
- the activation and deactivation of options (↪ chapt. 3.5),

- selected list entries and
- alternative selections.

The saving of these settings occurs user-specifically. This way, TopoDesk shows each user the "face" which he/she is accustomed to.

> HINT:
> When you exit a window via [Cancel], modifications of the appearance are **not** saved.

Chapter 4

Main window and map

Once you enter TopoDesk you attain the **main window** (↪ fig. 4.1). This is the basis from which you start the individual operations. In the following text, we will call this the TopoDesk window or main window.

The main window offers the interactive map as well as the control elements for invoking all service and subprograms. From this window, all settings and inputs are fed back to the subprograms.

> HINT:
> This handover of information is only possible from the main window to the subprograms, not the other way around.

4.1 The structure of the main window

The main window is subdivided into the following function units:

1. The menu bar in the upper section:
   → All subfuntions of TopoDesk are entered from here.

2. The map:
   → This is where the stations (measuring sites) and several other geographical layers are displayed together with their locations.

3. The basic tools:
   → These are the functions (which can be switched on and off) for quick query, for navigating and for the presets. They help you to get a quick overview of time series and master data information, they support you when zooming and scrolling in the map and allow you to predetermine the editing period, the station type as well as to predefine individual stations for further process. (↪ chapt. 3.3).

4. The status line:
   → The bottom window section outputs editing hints, warnings and error messages.

Chapter 4.2 will tell you how to work with the function units of the main window.

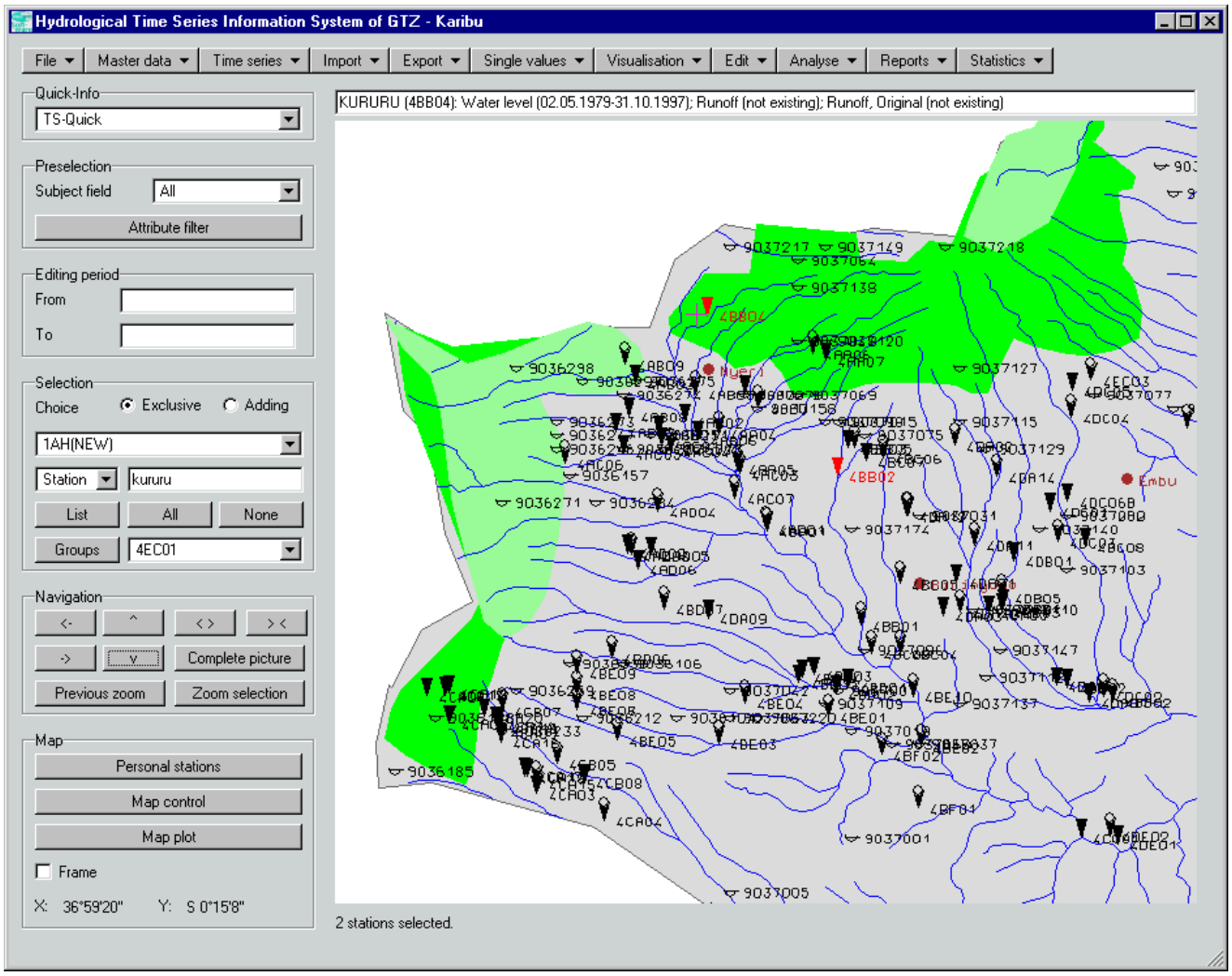


Figure 4.1: Main window of TopoDesk

4.2 The functions of the main window

4.2.1 Menu bar

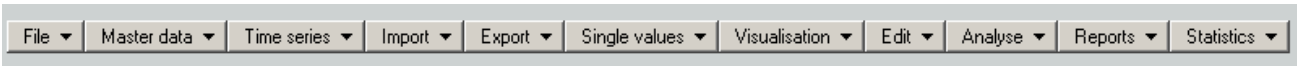


Figure 4.2: Menu bar in the main window of TopoDesk

By means of the individual menus in the upper section you invoke the subfunctions of TopoDesk.

The number of available menus and subfunctions is limited by the access rights in the user profile and can be controlled arbitrarily in the system settings (↪ chap. 5.3.1)

4.2.2 Map

The map in TopoDesk has three essential functions:

1. It displays an overview of the station locations and their spacial references.
2. Individual stations can be marked and selected for further process (↪ chapt. 4.2.3.4).
3. You can make instant queries about the stations and map elements with the mouse (↪ chapt. 4.2.3.1).

Station symbols
The station symbols in the map are displayed according to the German DIN standard 2425. The details needed are taken from the master data (Sensor details ↪ chapt. 6.8 and from the checkbox ☑ With runoff ↪ fig. 6.3). This way, the distinctive symbols give infomation about in which way which parameters are measured at a station (for instance, whether, at gauge stations, the runoff and the water temperature are measured in addition to the water level or whether, at rainfall measuring sites, the meter readings take place daily and/or the rainfall is recorded continuously.

Information about the number of selected stations as well as the current position of the mouse pointer (Gauss-Krueger-coordinates) is displayed underneath the map.

The selected section of the topographic map can be printed together with all displayed elements (↪ chapt. 4.2.3.6).

The map can be closed on request (menu ▽ File → Close map). This, for example, may be required at workstations for sheer single value entry.

HINT:
Read in chapter 4.2.3.5 how to navigate within the map.
Chapter 13.4 offers a brief and clear explanation for the assignment of the mouse buttons when working with the map.

4.2.3 Basic tools

The basic tools are located in the left section of the main window. They are sectored as options in individual function fields and combined by frames. Since not every editor uses all functions in equal measure, each function field can be switched on or off in the system settings (↪ chapt. 5.3.1) when desired.

How to deal with the individual basic tools is explained in the following chapters 4.2.3.1 to 4.2.3.6.

4.2.3.1 Quick-Info

Information about the map, time series availability, main data and measured values can be invoked via the stations in the map.

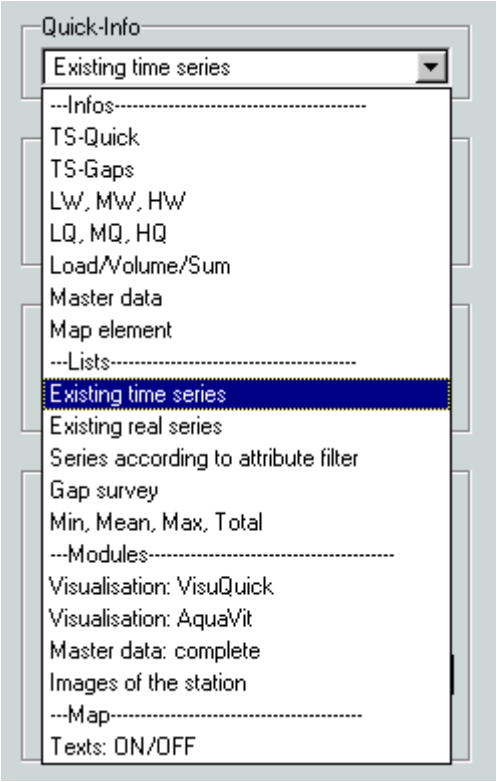


Figure 4.3: Shortlist Quick-Info

For this purpose, first select the program for quick-info (↪ fig. 4.3) in the shortlist TS-Quick ▽ .

Then use the middle mouse button to click the station symbol in the map or a map element and the selected program will be executed.

The shortlist is devided into four sections:

1. *Info*
   All information is output via the info line above the map.

2. *Lists*
   All information is output via a table window (↪ fig. 4.4). This information is more comprehensive than that under *Infos*. The content of the tables can be exported as a `dbf` table relation with DBF-Export.

3. *Modules*
   By using the middle mouse button, you invoke the corresponding subfunction of TopoDesk with preallocation of the clicked station (an example ↪ fig. ??).

4. *Map*
   The display of individual stations in the map will be modified.

The following entries can be selected:

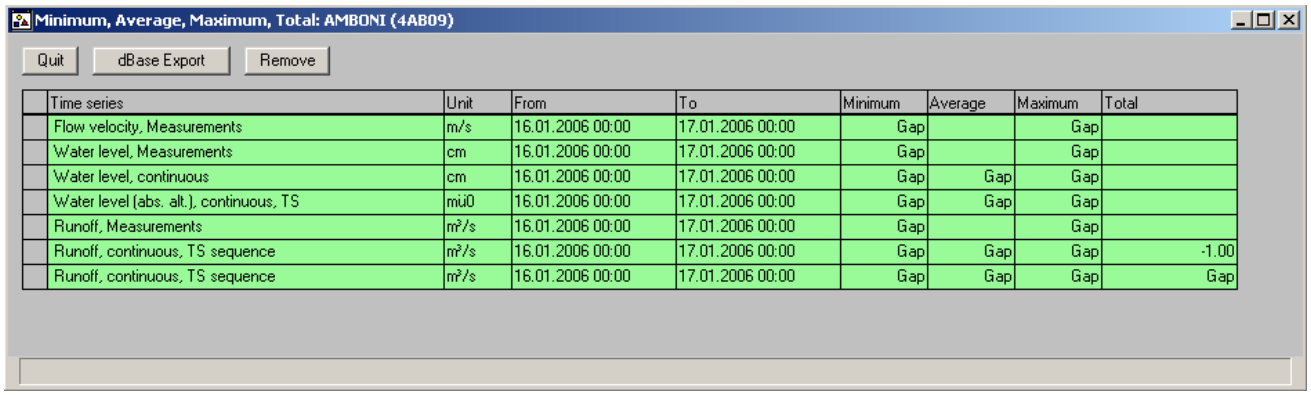
- *—Infos———*
  - *TS-Quick*
    MaxFocus of the existing time series
  - *TS-Gaps*
    Information about gaps
  - *LW,MW,HW*
    Information about floods
  - *LQ,MQ,HQ*
    Information about runoff
  - *Load,Volume,Sum*
    Information about loads and volume
  - *Master data (Extract)*
    Information about master data
  - *Element of map*
    Information about individual map elements
  - *Coordinates of the mouse position*
    Indication of the coordinates of the clicked point in the map
- *—Lists———*
  - *Existing time series*
    Output of all existing time series
  - *Existing real series*
    Output of all existing rating curves
  - *Series according to attribute filter*
    Output of comprehensive time series information about the series defined by aid of the attribute filter
  - *Gap survey*
    Output of all existing gaps and blocked periods
  - *Min, Mean, Max, total*
    Output of minimum, mean, maximum and total/load, Example ↪ fig. 4.4
- *—Modules———*
  - *Visualisation: TopoVit*
    Invocation of TopoVit, ↪ chapt. 9.1
  - *Master data*
    Invocation of the master data window, ↪ chapt. 6.2
  - *Edit TS*
    Invocation of the time series, ↪ chapt. 7.2

- *Station pictures*
  Display of images found in the system for the clicked station, ↪ chapt. **??**, Example ↪ fig. 4.5

- *—Map———*

  - *Texts ON/OFF*
    On or off switch for texts of indidual stations

Figure 4.4 shows an example of a table invoked through quick-info.
Figure 4.5 shows an example for a station picture.



Time series	Unit	From	To	Minimum	Average	Maximum	Total
Flow velocity, Measurements	m/s	16.01.2006 00:00	17.01.2006 00:00	Gap		Gap	
Water level, Measurements	cm	16.01.2006 00:00	17.01.2006 00:00	Gap		Gap	
Water level, continuous	cm	16.01.2006 00:00	17.01.2006 00:00	Gap	Gap	Gap	
Water level (abs. alt.), continuous, TS	miü0	16.01.2006 00:00	17.01.2006 00:00	Gap	Gap	Gap	
Runoff, Measurements	m³/s	16.01.2006 00:00	17.01.2006 00:00	Gap		Gap	
Runoff, continuous, TS sequence	m³/s	16.01.2006 00:00	17.01.2006 00:00	Gap	Gap	Gap	-1.00
Runoff, continuous, TS sequence	m³/s	16.01.2006 00:00	17.01.2006 00:00	Gap	Gap	Gap	Gap

Figure 4.4: Example of quick-info (Lists): Min, Mean, Max, Total

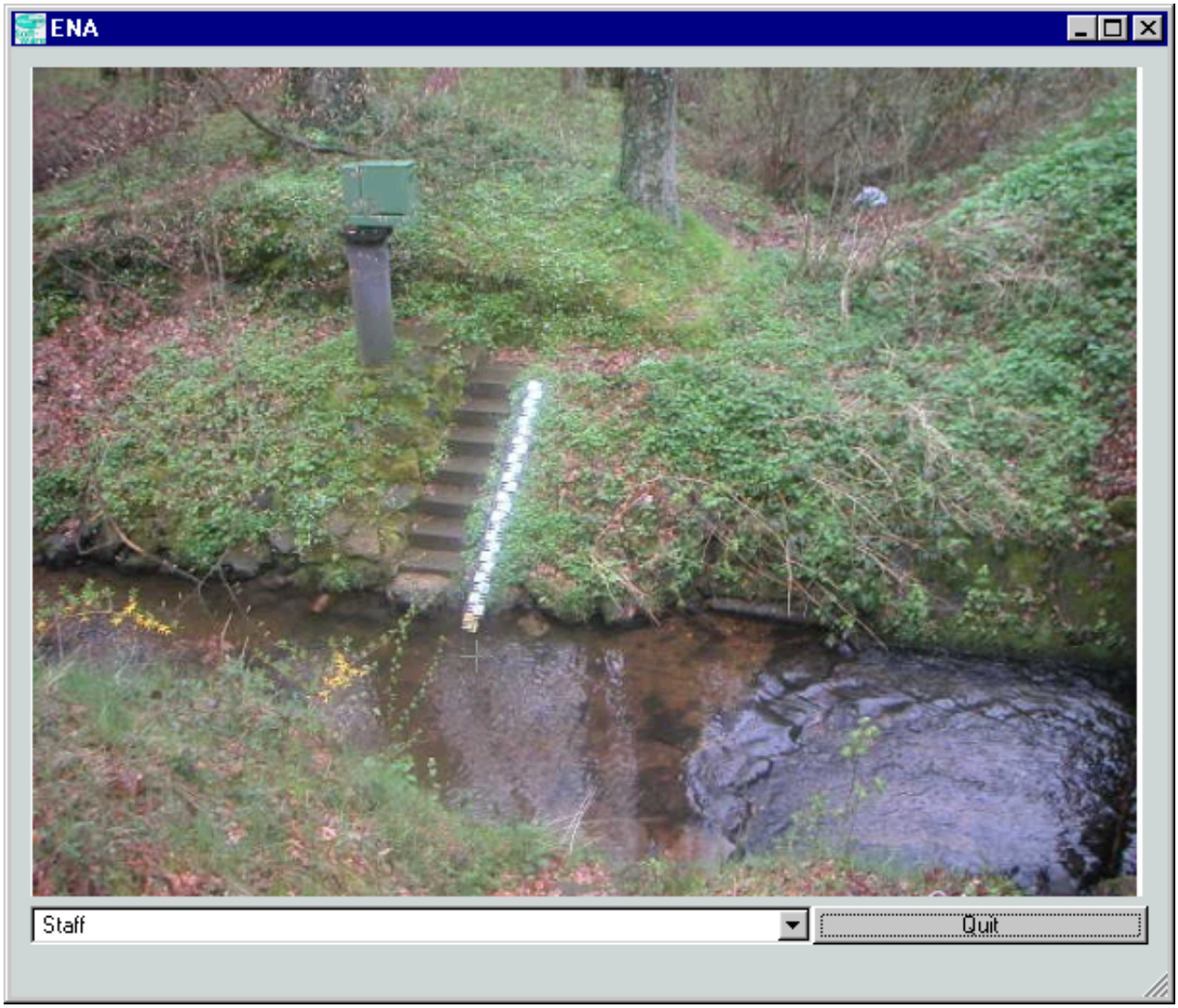


Figure 4.5: Example of a quick-info (Modules): Station pictures

4.2.3.2 Preselection

In the frame Preselection you can define a certain subject field and optionally define the station type for the further editing. Here, you can also switch between the the attribute filter or the parameter list. Which one of these options you want to utilise can be determined in the system settings (↪ chapt. 5.3.1).
When the checkbox ☑ Hide blocked periods is ticked, all blocked hydrograph segments will be hidden. The checkbox ☑ Only main stations and main series limits the selection of all stations and series to main stations and main series. The system treats all others as non-existent.

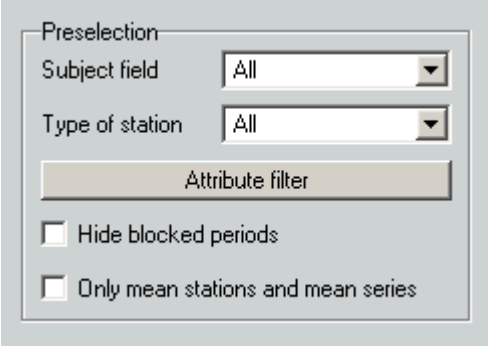


Figure 4.6: Frame Preselection

Subject field

Under Subject field, you can limit the further editing process to one subject field. When, for instance, you have chosen 20,Surface water hydrology ▽ , the map as well as all lists will indicate only hydrology stations. The attribute filter (see below) will also indicate only the selected subject field.

The preselection of a subject field effects the displayed stations in the map in the following way:

- From the displayed layer, only the stations of the selected subject field will be displayed.
- When the groups are selected, only the stations of the selected subject field will be considered.
- When searching for individual stations, a selected subject field will work as a filter.

HINT:
An already existing selection will get lost on preselection of another subject field since the preselection is used for the displayed layer, not for stations displayed in the map.

If you want to select stations from different groups for a subject field, you first select the subject field and then the groups one after another.Only the stations of the preselected subject field will be selected from all groups.

Type of station

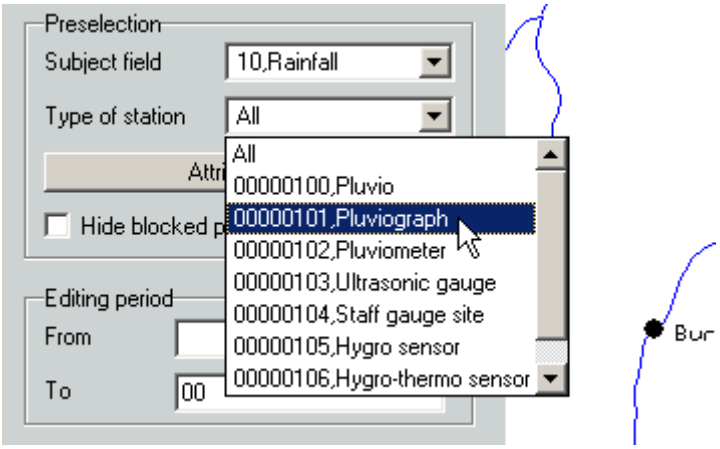


Figure 4.7: List Type of station

Besides the distinction >subject field<, measuring stations can be distinguished by freely defined station types. Whether this distinguishing possibility is to be offered, can be defined in the system settings (↪ chapt. 5.3.1). The entries offered in the list are defined via key lists (↪ chapt. 6.3).

The selection of a station type limits the station list to the according subject field and switches the attribute filter to this subject field.

Attribute filter

In the **toposoft** time series management, the time series are filed and addressed according to their attributes. With assistance of the attribute filter (↪ fig. 4.8) you have the possibility of preselecting the time series attributes in the requested way. When invoking subfunctions, the system then will search for the corresponding time series that are available for the selected stations. This limitation facilitates the search for time series.

The following time series, for example, can be assigned to a station:

- continuous data from data loggers or from digitised gauge registration cards
- daily mean values from manually evaluated analog gauge registration cards
- staff readings on certain dates (the value is only valid for this point of time), etc.

  HINT:
  The series in TopoDesk is clearly determined by the distinction of the 9 identification attributes.

This has no influence on the output possibilities. Among others, interval mean values within any bandwidth (e. g. 1 min, 15 min, 1 day, etc.) can be evolved from continuous time series.

In order to filter attributes, first select the subject field for which the appropriate presets shall be made (only possible when the preselection Subject field in the main window is set to *All*. On the first invocation of the attribute filter, the lists of each attribute are set to *All*. Use these lists in order to localise your search. All settings will be considered immediately when invoking the subfunctions.

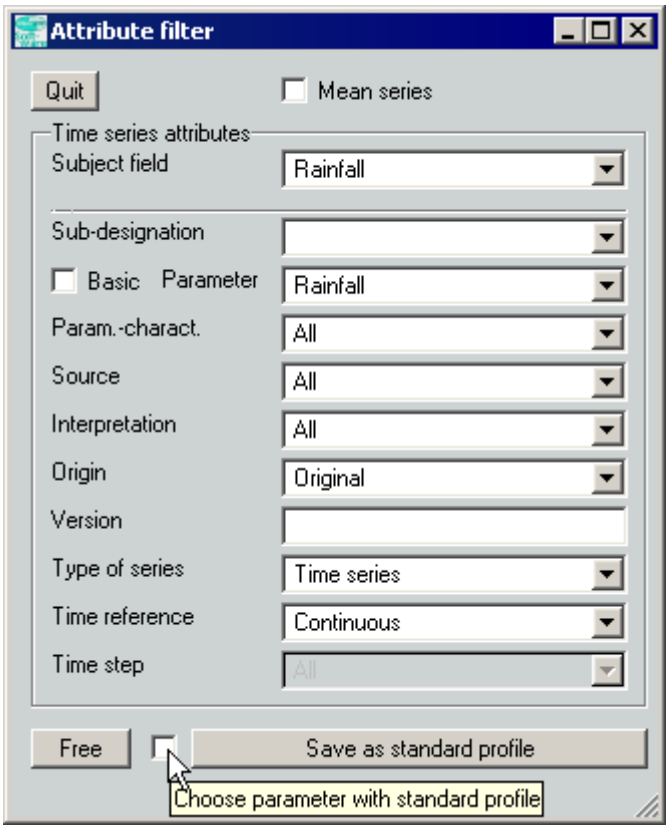


Figure 4.8: Attribute filter

ATTENTION:
Within the attribute filter, all settings of each subject field are saved seperately and used for the filtering.

HINT:
On invocation, all subfunctions of TopoDesk (visualisation, reports etc.) will be displayed with the here defined series.

The checkbox ☑ Main series limits the series selection lists to main series. Which series is a main series, is defined in Time series information and attributes (↪ chapt. ??). Hint: This checkbox does not appear when the checkbox ☑ Only main stations and main series is ticked in the main window.

The checkbox ☑ Basic (Parameter) limits the entries in the parameter list to the basic parameters (↪ chapt. 5.3.3). When the checkbox is deactivated, the list contains all parameters.

The button [Free] sets all lists below the parameter list back to the entry *All*.

You can save the attribute settings which you have carried out for a parameter as a standard profile with [Save as standard profile]. This standard profile is invoked by activating the accompanying checkbox **before** selecting the parameter in the list.When the checkbox is deactivated, the adjusted attributes will be retained should the parameter vary.

Parameter list

A slightly easier way for the preselection is using the parameter list. Here, you exclusively preselect the parameter, there is no further limitation for searching the time series. The checkbox ☑ Basic limits (as in the attribute filter) the entries in the parameter list to basic parameters.

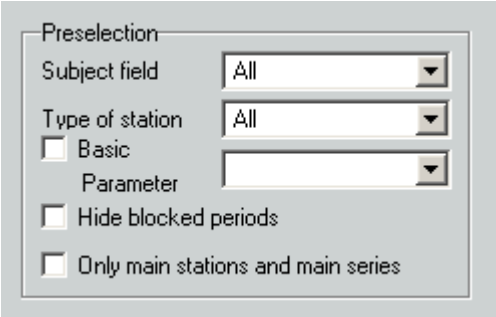


Figure 4.9: Frame Preselection: Parameter list

Hide blocked periods

By means of the checkbox ☑ Hide blocked periods, all blocked periods of all time series will be hidden in the same way as done for users without the right to see these (↪ chapt. 12.2). The activation of this checkbox is recommended for the export, for example, when blocked periods should not be exported along.

> HINT:
> The user „root“ cannot hide the blocked periods.

Only main stations and main series

On one hand, when you tick the checkbox ☑ Only main stations and main series, only the defined main stations in part 1 of the master data (↪ chapt. 6.2) are displayed in the map, and, on the other hand, only the main series defined in Time series information and attributes (↪ chapt. ??) are listed in all time series lists.

4.2.3.3 Editing period

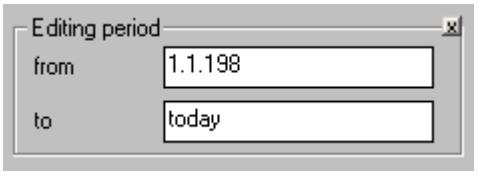


Figure 4.10: Entry of the editing period

The editing period is entered in the input fields as shown in figure 4.10. It will automatically be forwarded to all subfunctions.

> HINT:
> Read about the possibilities you have for the input of the time period and about what are significant point of time entries in chapter 13.5.11.

4.2.3.4 Selection

The stations you want to work with are „prebooked“ by selection. This facilitates the further editing of these stations.

Following this, the text and also the station symbol will be marked red in the map (↪ fig. 4.11).

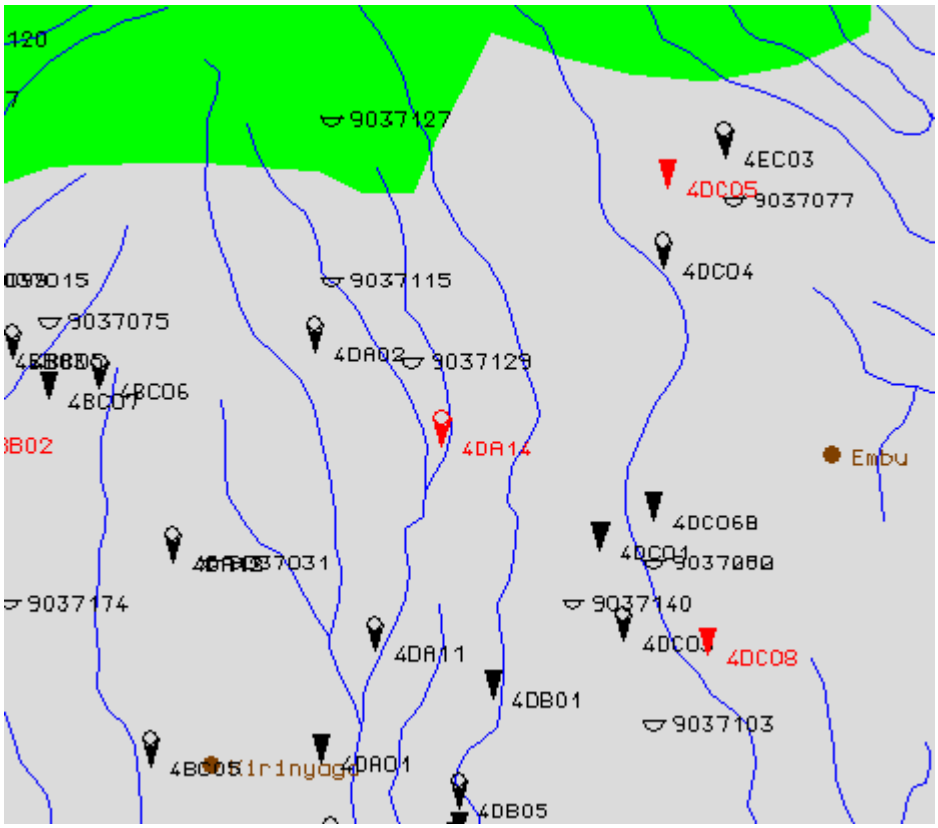


Figure 4.11: Selected and unselected stations

The selection can be carried out in four different ways:

1. **Selection with the left mouse button**
   You can select and deselect stations with the left mouse button in the map (↪ chapt. 13.4).

2. **Selection via the functions in the main window**

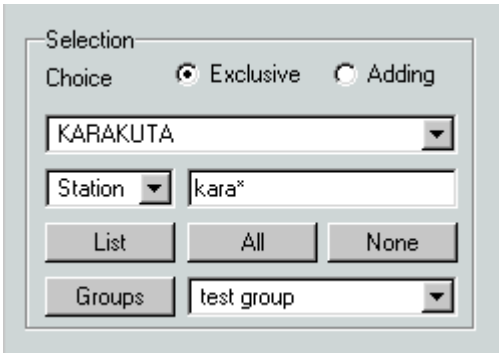


Figure 4.12: Functions for selecting in the main window

The elements displayed in figure 4.12 have the following functions:

By means of ◉ Exclusive ◯ Adding, you determine whether, when selecting in several steps, the existing selection should be dismissed or the new selection should be added to the previous one.

By means of the list below, all existing stations from which you can choose individual ones for the selection will be provided (whether the station list should be displayed here, is specified in the system settings).

By means of the input field, you can select a station or a map element (depending on the preselection in the adjacent list) according to a defined search pattern (also via the Wild Cards „*“ and „?“). In the example in figure 4.12, stations that start with „Tana“ will be selected when the Return button is clicked.

By means of [List], you invoke a table in which the currently selected stations will appear (↪ fig. 7.3).

By means of [All], all existing stations will be selected. The preselection under Subject field will be considered hereby.

By means of [None], all selected stations will be deselected.

3. **Selection of defined groups** (see below, “Station groups“)

4. **Selection via the master data filter** (↪ chapt. 6.1.3)

Station groups

It often occurs, that information of certain stations is needed simultaneously. It is useful to gather these stations to one group. These station groups can then be selected any time in the main window.
The creation and administration of groups takes place in the window Station groups (↪ fig. 4.13). You obtain this window via the button [Groups] in the main window.

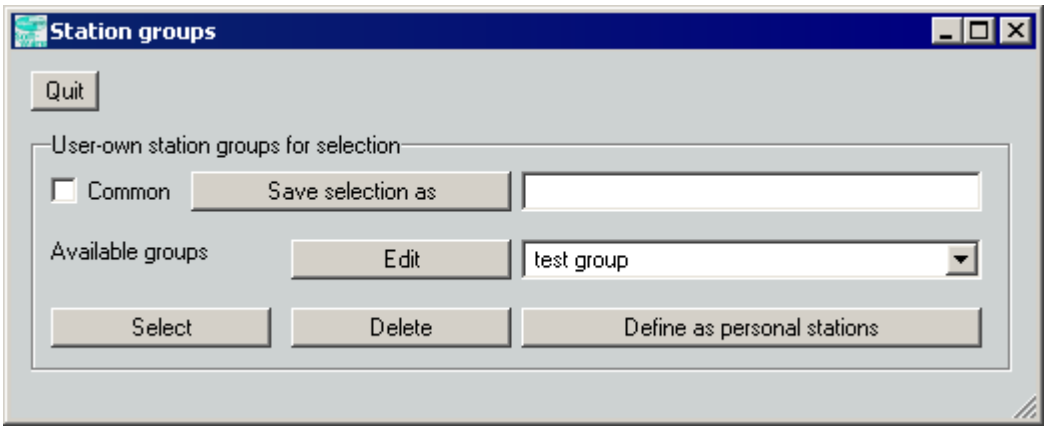


Figure 4.13: Window for the creation of station groups for the selection

Set up groups Select the according stations in the map and combine them with a definite name in the input field (any special characters can be used here). When you click Save selection as, this selection will be filed in your user-directory (sub-directory selection). At the same time, it will appear as an entry in the list of the available groups as well as in the group list in the frame Selection.

Edit groups You can Edit the group selected in the list by aid of a table window (↪ fig. 4.14). Here, you can Insert further stations seperately or Delete the selected station or all marked stations. The buttons /\ and \/ are used to shift the selected station one row up or down.

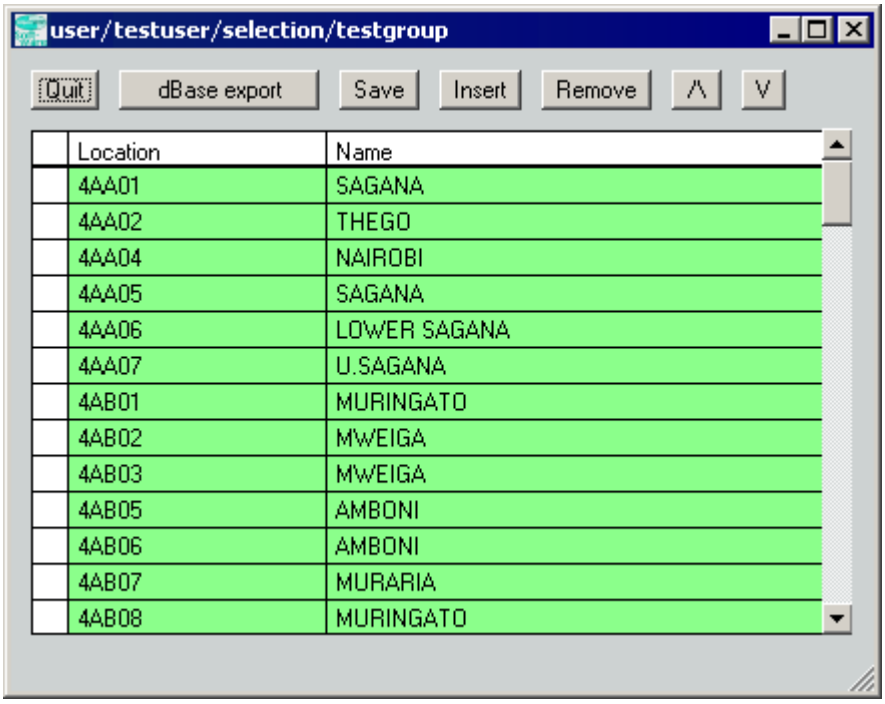


Figure 4.14: Table window to edit a group

Select groups You can now [Select] the so combined stations by their groupname in this window as well as via the main window.

Delete groups The button [Delete] removes the unneeded group selected in the list.

Central groups Central station groups are available for all users. They can only be installed, edited or deleted by users with administrator rights. In order to install a central group, click the checkbox ☑ Central before saving the selection. After the saving step, the group will appear to all users with the addition "Central:", both in the list of the available groups in the 'station groups' window and in the 'group list' in the main window. Central station groups are filed in the subdirectory selection of the TopoDesk start directory.

HINT:
Station groups can also be used as a compilation of defined stations in many other places (↪ chapt. 13.7.1).

By the way:
The button [Define as personal stations] enables you to choose a group from the list of the available groups and define this as "personal stations". Within the frame Map, you determine whether you just want these personal stations or all stations to be displayed (↪ chapt. 4.2.3.6).

Hidden stations Generally, all stations can be selected even if they are (temporarily) not displayed in the map. This can occur, for example, when the personal station layer (↪ chapt. 4.2.3.6) is displayed and you select a group that contains stations not belonging to this layer. In this case, you can display the hidden stations with the button appearing below the map. Additionally, you have the possibility to output the hidden stations in an info window (↪ fig. 4.16). However, this option must be defined in the system settings (↪ chapt. 5.3.5).

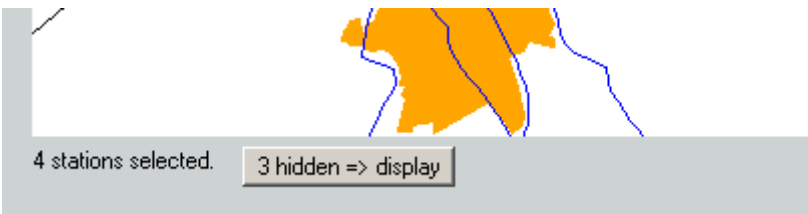


Figure 4.15: Fade in selected hidden stations

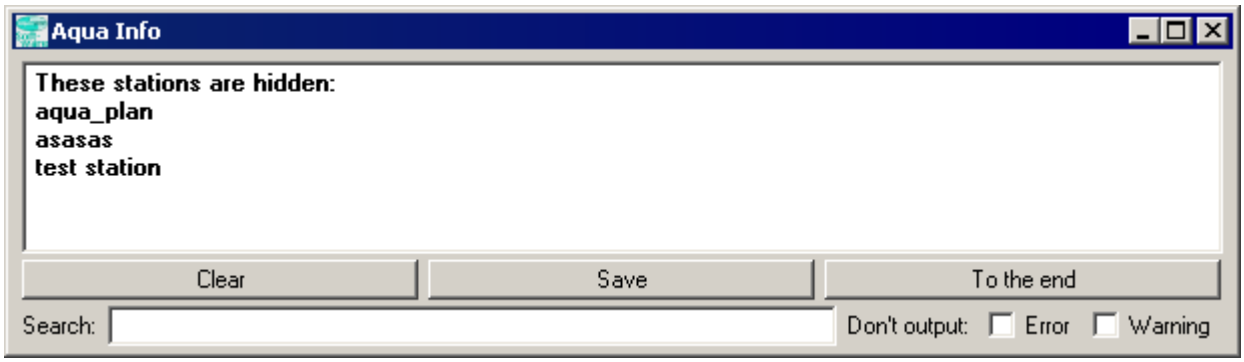


Figure 4.16: List of the selected hidden stations

4.2.3.5 Navigation

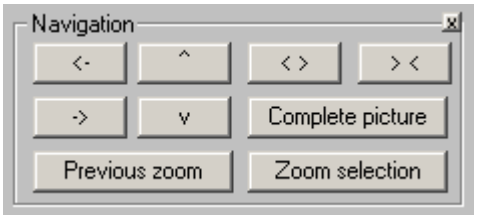


Figure 4.17: Navigating buttons in the TopoDesk-window

For navigating in the map, you have the following possibilities at your disposal:

1. Zooming with the right mouse button
   You can zoom in an area by drawing a rubberband (↪ chapt. 13.4). When you hold the Shift key at the same time, the displayed section will be magnified.

2. Zooming and scrolling with the navigation buttons
   To move quickly and easily, use these buttons in the frame Navigation (↪ fig. 4.17) in the left section of the window.

   The buttons have the following functions:

< –	scrolls to the left
– >	scrolls to the right
∧	scrolls upwards
∨	scrolls downwards
<>	zooms in
><	zooms out

Complete picture displays all loaded layers in full expansion

Previous zoom displays the previous map section

Zoom selection focuses the display on the current selection

4.2.3.6 Map

The top button in the frame Map will show you predefined Personal stations. You define these in the window Station groups (↪ fig. 4.13). First you select a group from the list of the available groups which you then Define as personal stations. The stations of this group are saved as a user's own layer. The definition of the personal stations can be changed any time by selecting and saving a different group. Optionally, now either these personal stations or all stations can be displayed in the map. This can be defined in the frame Map in the main window ↪ chapt. 4.2.3.6 and fig. 4.18).

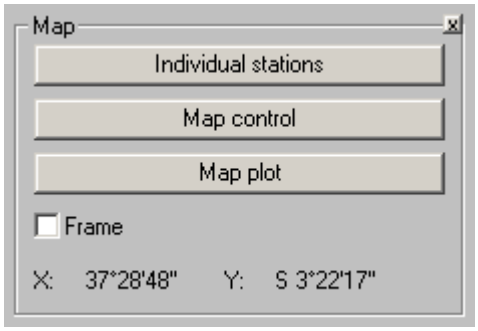


Figure 4.18: Frame Map

> HINT:
> Once you have selected the personal stations, all other stations will be hidden. However, it is possible to select the hidden stations also (e. g. via the button All in the main window). In this case, you can fade in the hidden selected stations by aid of a new button appearing below the map (↪ fig. 4.15).

With the two other buttons, you invoke the Map control and the Map plot. The checkbox ☑ Frame will open up a frame with the Gauss-Krueger coordinates.

> HINT:
> This setting **exclusively** effects the main window; it is adopted for the report but it can be selected divergently.

The current position of the mouse pointer in the map (X and Y coordinates) is indicated in the line below the map.

Map control

The map control serves displaying and loading layers and scenarios.

HINT:
When introducing to TopoDesk, it is not necessary to make settings in the map control. All layers and scenarios required for your work are already loaded in the delivery status.

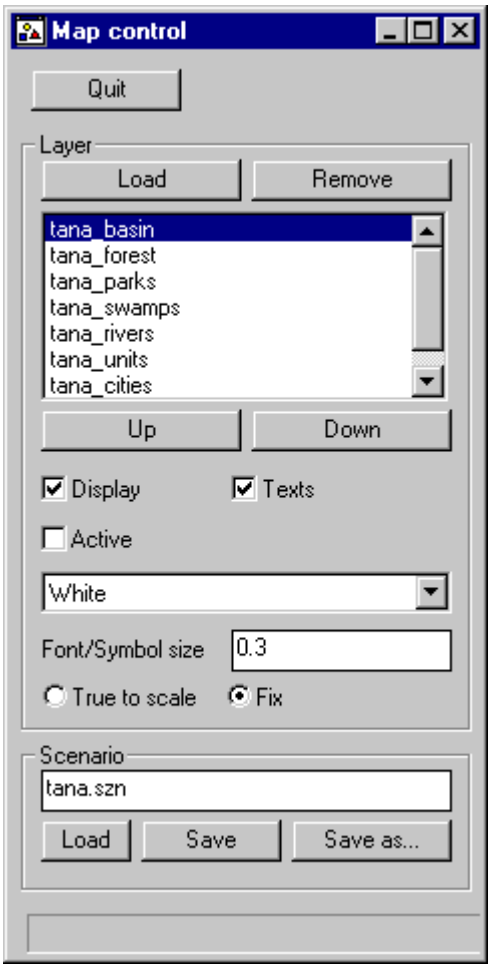


Figure 4.19: Map control

Layers

Via [Load] → Choose layer you can add a layer file to the map display (↪ chapt. 13.7.4, file selector). At the same time, the layer name appears in the list.

The layer marked blue in the list can be

- cleared from the layer list with the button [Remove],
- can be rotated into another display position by means of the buttons [Up] or [Down] (upper layers cover the lower ones)
- adopted in the map with ☑ Display
  (HINT: The last displayed layer will place itself over the ones already existing in the graphic.),

- completed with ☑ Texts in the map,
- set to the mode for enabling the polygon selection with the checkbox ☑ Active,
- displayed in the desired colour by selection in the shortlist,
- labelled in the desired Font/Symbolsize (Confirm your entry with Return).

When you click ◉ True to scale, the map elements and texts will be displayed according to scale. When you click ◉ Fix, all texts and station symbols will be displayed without reference to the enlargement factor of the map display. The size you enter in the input field above will be used.

> HINT:
> The settings for the font/symbolsize influence the map plot.

Scenario

The upper area shows the file of the current map display. You [Load] another scenario with the file selector. Scenarios are usually to be found in the `geo`-directory.
The loaded scenario will be stored user-specific when exiting the system.

When you have modified the current scenario, you can either [Save] it under your name in the `geo`-directory (the existing file will be clobbered without a callback first) or [Save as...] in the `geo`-directory under a new name.

> HINT:
> Since scenarios are not saved user-specific but centrally, an over-writing should be well considered. This particularly applies for the modification of `topodesk.szn` as this is the scenario which is usually used.

Map plot

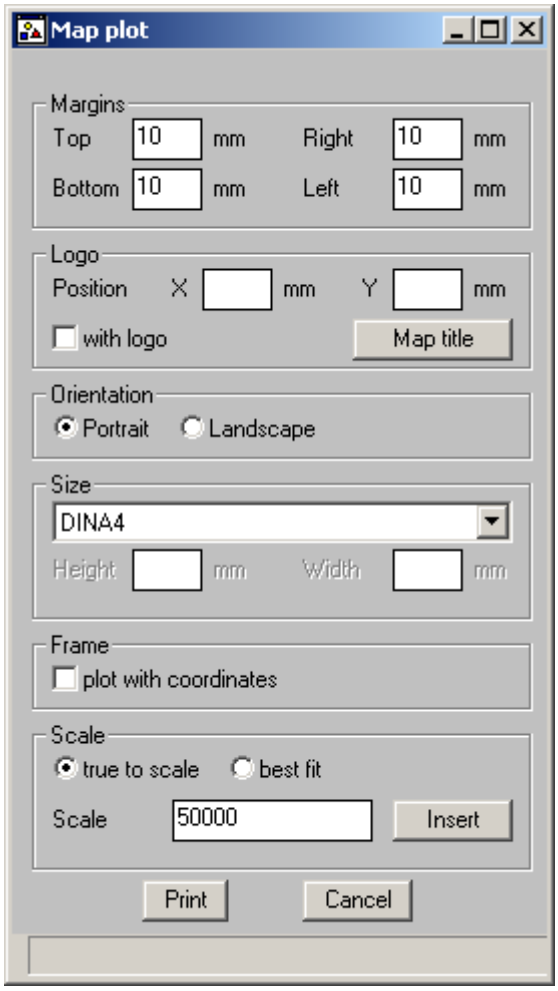
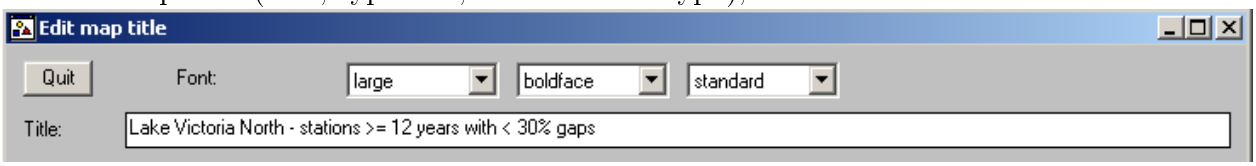


Figure 4.20: Map plot

The presets for plotting the map are made in the individual frames in the window Map plot (↪ fig. 4.20). Here you can

- change the size of the margins (enter at least 10 mm),
- determine whether and in which position (relative to the left bottom corner) the logo should be output in the report,
- edit the map title (text, type size, font and font type),



- determine, whether the map should be displayed in portrait or in landscape format,

- determine the size of the plot (*DINA5* to *DINA0* or *user-defined*),
- determine, whether the Gauss-Krueger-axes shall be plotted as well and
- fix the scale and text size for the plot:

  ☑ True to scale → prints according to the set scale → after clicking [Print], a green section frame showing the section size will appear on the cursor (the size of this frame results from the selected output sheet size, the selected scale and from the preset map section in the window) → a mouse click in the desired area will start the print,

  ☑ Best fit → prints the current displayed section and, if necessary, scales the width or the height to the size of the sheet.

After you have made all settings needed for the output, start the process with [Print].

> HINT:
> In order to assign the general printing parameters (e. g.: output medium, paper format etc.), invoke the printing control (menu [▽ File] → System settings → Printing control, ↪ chapt. 5.6).

Figure 4.21 and figure 4.22 show two possibilities for map plotting.

4.2.4 Status line

The status line is located in the bottom area of the main window. This is where editing hints, warnings and error messages are indicated.

> TIP:
> Should one of your processing steps not come up with the desired result, first take a look at the status line. Here, you often receive information to help you proceed.

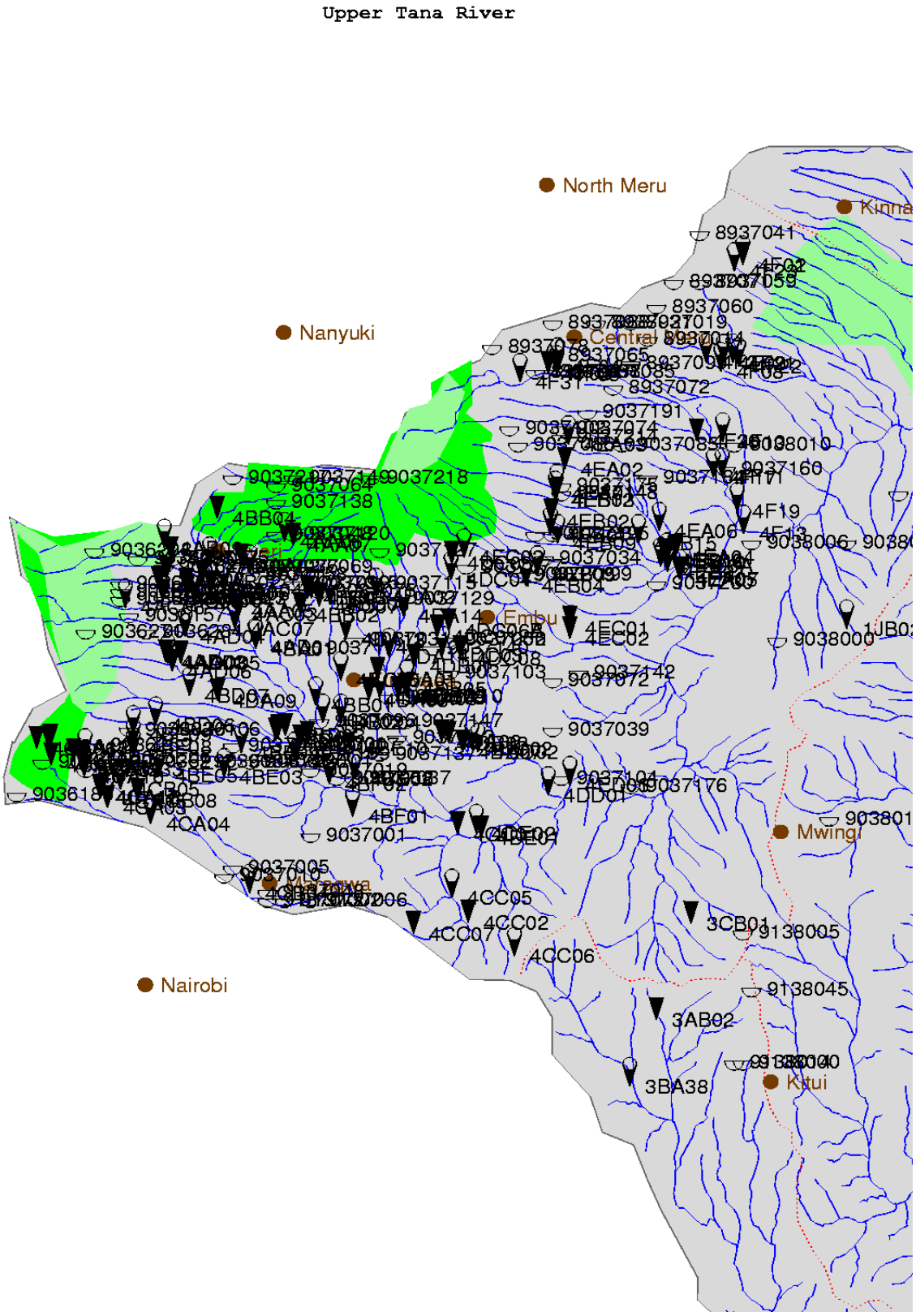


Figure 4.21: Map plot under TopoDesk (Portrait format without frame and with title)

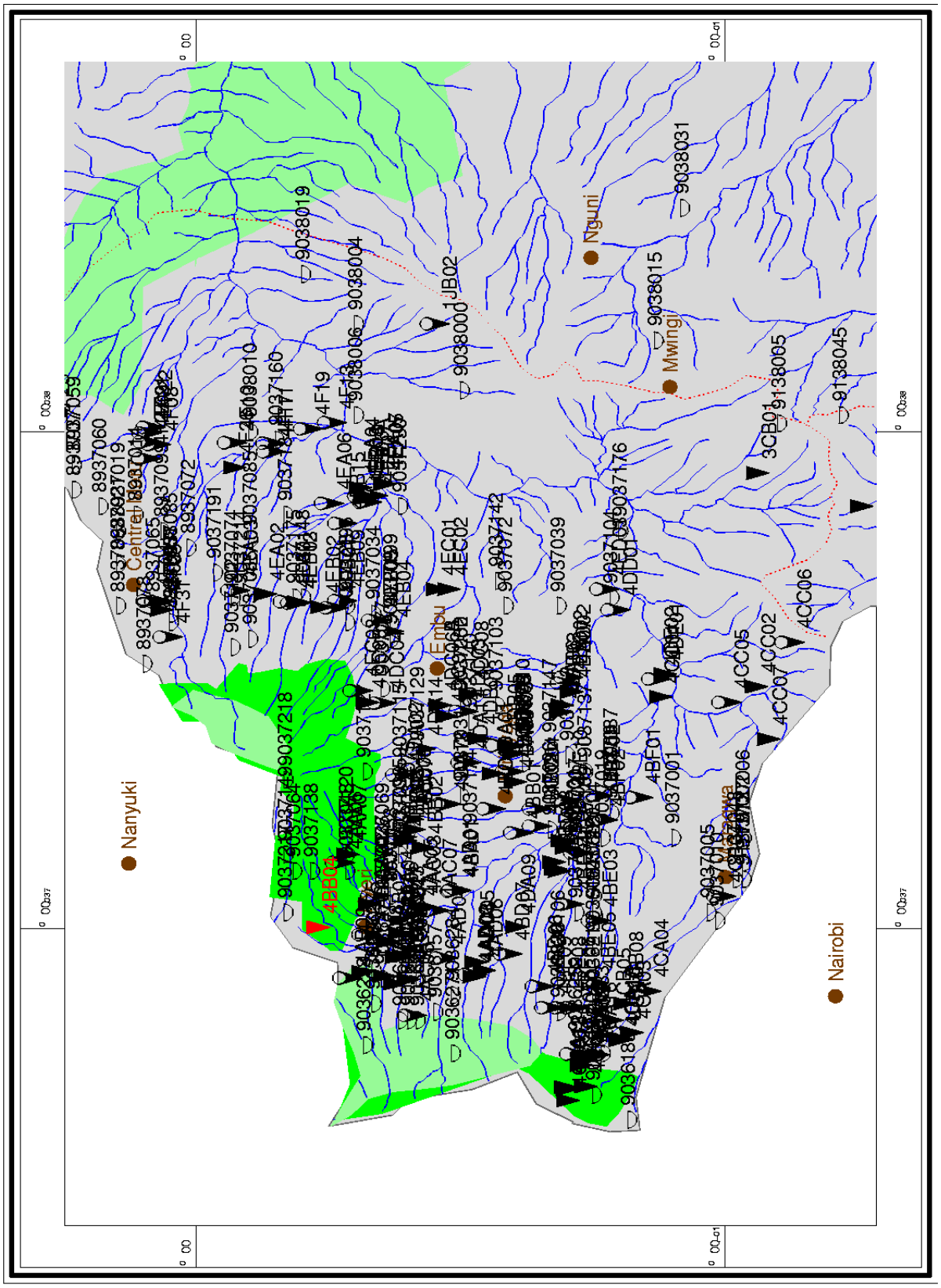


Figure 4.22: Map plot under TopoDesk (Landscape format with Gauss-Krueger-coordinates)

Chapter 5

File

In the menu ▽ File in the main window, you will find general applications such as, for instance, the functions for setting up new users or changing the password, the printing control, the system settings, information about the version etc. To exit the program in the proper manner, click Quit.

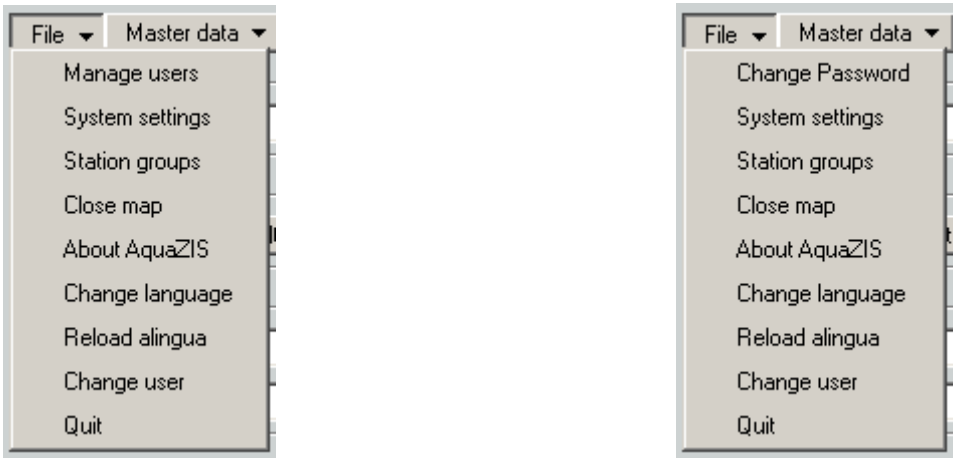


Figure 5.1: Menu File in the main window

5.1 Manage users/Change password

The function Manage users is only available for the users logged in as SuperUsers (root) (↪ chapt. 2.2). The menu function Change password appears for all other users.

When the function Change password is selected, the window in figure 5.2 appears and allows the current logged in user to change the password (two password entries).

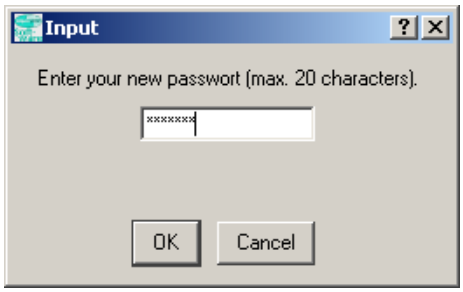


Figure 5.2: Window for changing the password

5.2 Change user

topodesk allows you to login as another user. On selection of the according menu entry, the program is shut down immediately and a login window appears (↪ fig. 2.1). On entry of username and password, topodesk will be started once again.

5.3 System settings

You can make several basic settings in the system settings of topodesk (change the appearance of the main window, set up the printer, modify lists and windows etc.).
The tabs in the top section open the desired page.

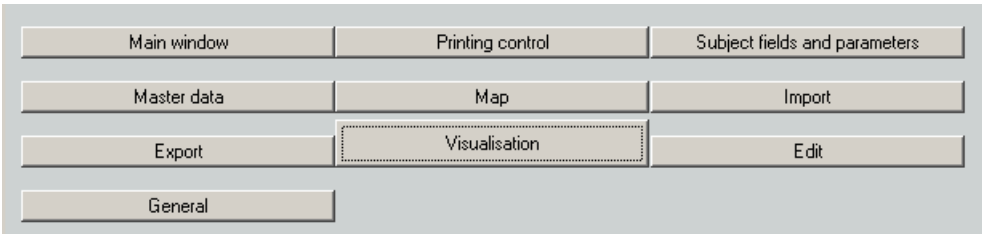


Figure 5.3: Tab buttons in the system settings

5.3.1 Tab: Main window

The appearance of the main window in topodesk can be suited to the operation method of the logged in user by means of the functions of this register page.

5.3.1.1 Basic tools

Within the frame Basic tools you can choose which basic tool frames you want to have in the main window by marking the according checkboxes and clicking Apply. Also, the application of the elements Info field (set above the map), Selection info (set below the map) as well as Station list (set within the frame Selection) is executed here. You can preselect whether the parameter list or the attribute filter shall be indicated.

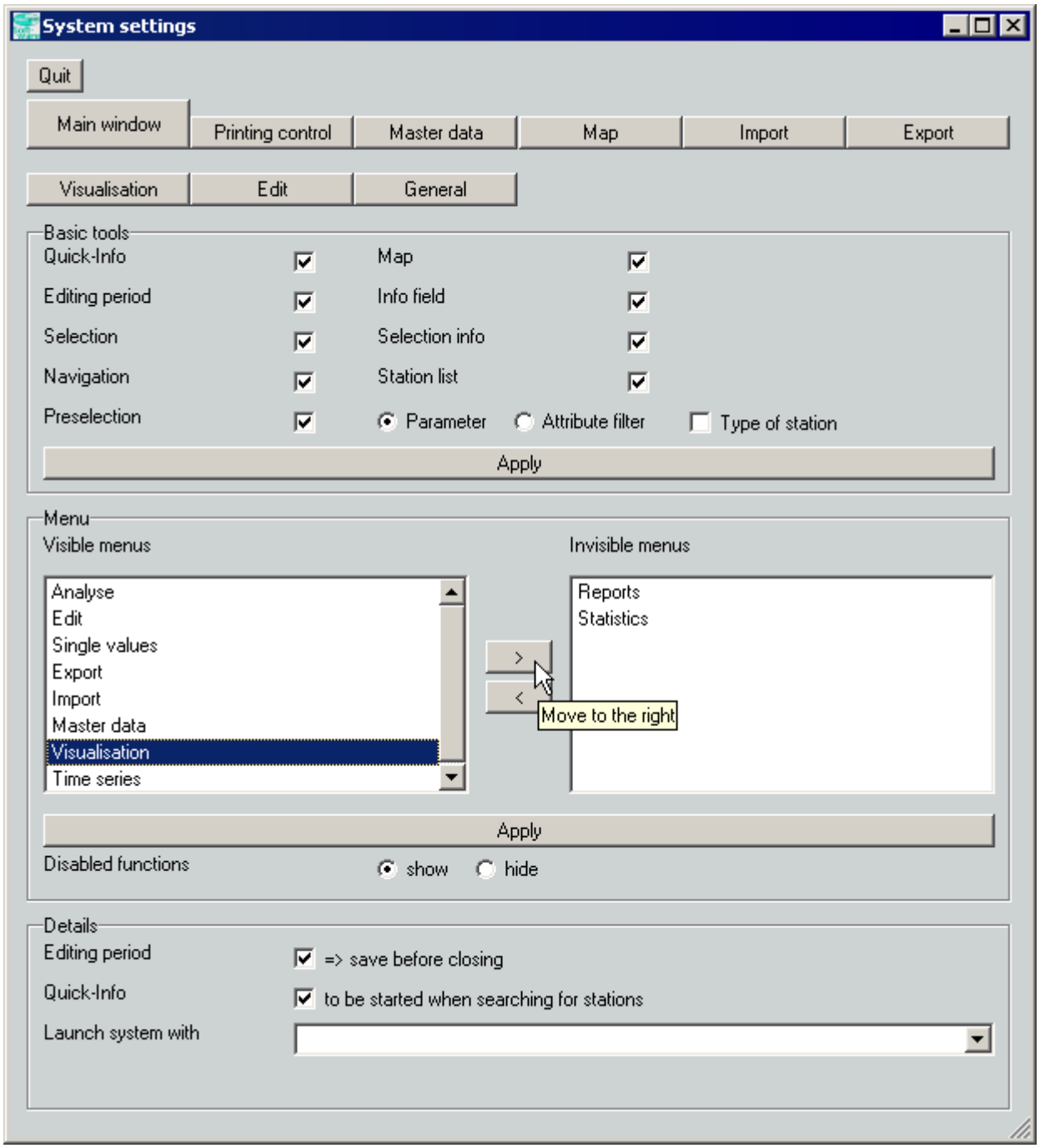


Figure 5.4: System settings: Main window

5.3.1.2 Menu

In the frame Menu you have the possibility of switching off complete menus of the main window when not required. This is simply carried out by the buttons [>] and [<]. In order to remove a menu, select this in the list Visible menus and click [>]. The menu then appears in the list Invisible menus. The opposite execution order reverses this action. Click [Apply] in order to transform these entries immediately to the main window.

You can also principally determine whether blocked functions shall be indicated in grey or hidden completely ◉ show ◯ hide).

5.3.1.3 Details

In the frame Details you choose, by means of the according checkboxes, whether or not you want to save the Editing period before closing and whether or not the Quick-Info shall be started when searching for stations. Also, you can determine whether, besides the main window, the system is to be activated directly with an additional module from a range of 5 options.

These are additional functions for the user logged in as „root“:

- ☑ Hide blocked periods
- ☑ Choose restriction for main stations and series

When the checkboxes are ticked, the according functions appear in the frame Preselection (↪ chapt. 4.2.3.2) of the main window.

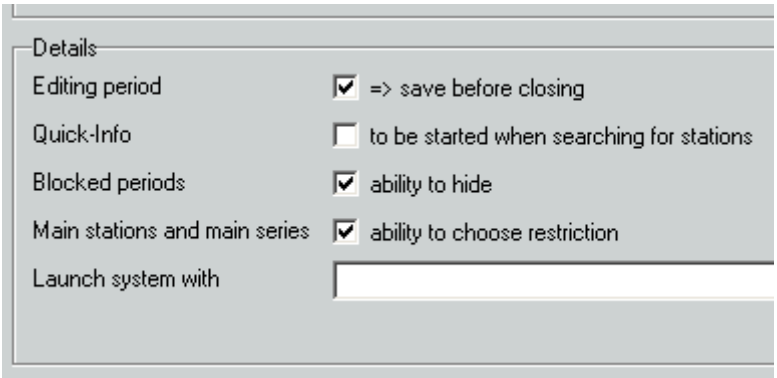


Figure 5.5: Main window: Additional functions for „root“

5.3.2 Tab: Printing control

In order to make the printing presets, activate the tab Printing control (↪ fig. 5.6). These presets will affect all prints made within topodesk.

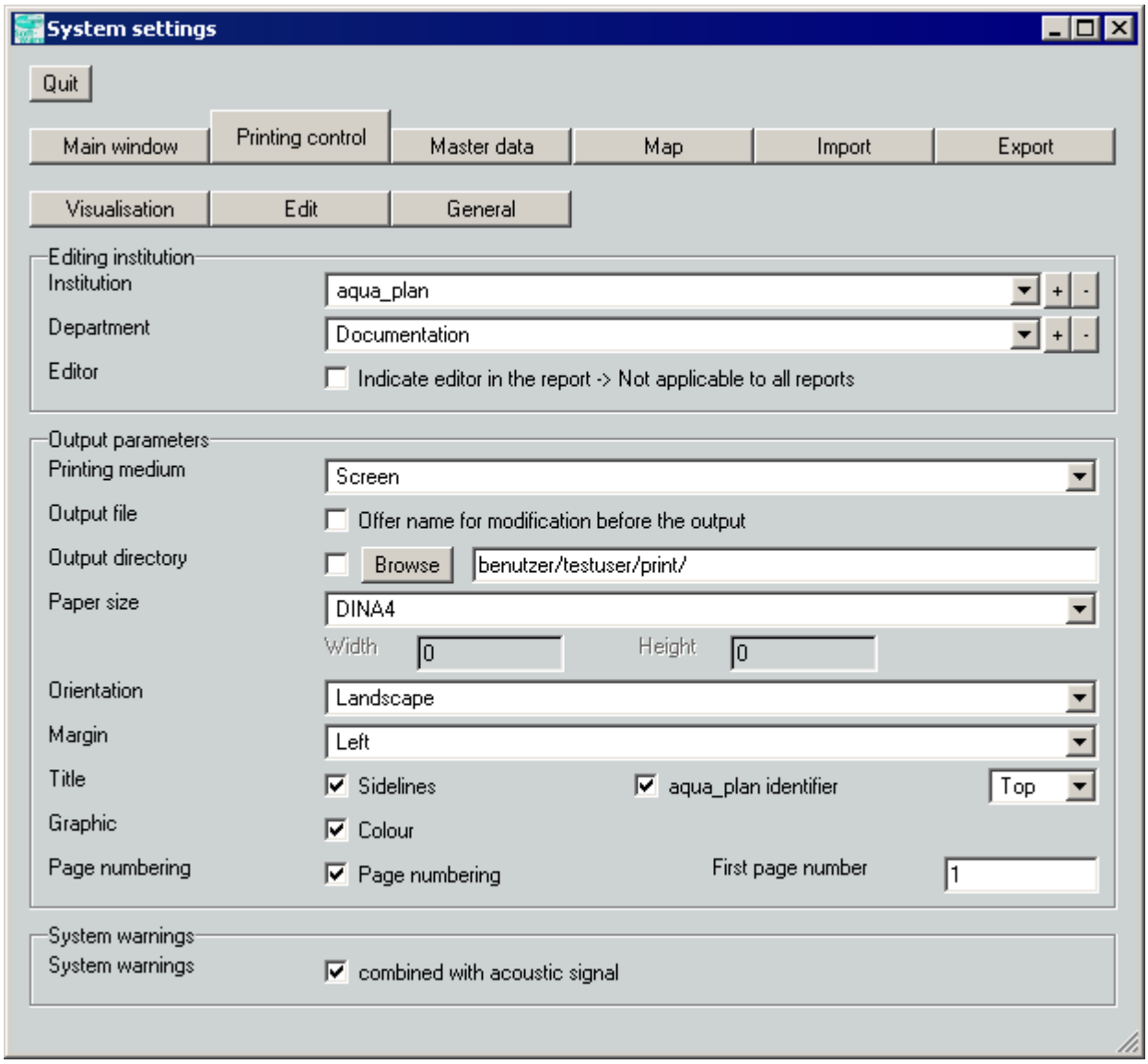


Figure 5.6: System settings: Printing control

You can print, for example:

- the map
- all reports
- all time series accessed via the visualisation TopoVit)
- all time series displays, also during the editing process.

5.3.2.1 Editing institution

By using the lists in this frame, you can indicate the organisation and department for those reports in which these should be output as well. In case no institution shall show up in the report, click [*None*] .
With [+] and [–], the lists can either be extended or reduced by individual entries .
All users have access to these lists.

The editor's name can be indicated in the reports by using the checkbox. This is the name entered in the field Complete username in the "Manage users" window (↪ fig. 2.2).

5.3.2.2 Output parameters

Basic presets which count for all outputs are made in the frame Output parameters

You can determine the following here:

- which medium the output shall be directed to (↪ fig. 5.7)

  Specific features:

  → when *Printer* is selected, a new button [Select printer] will appear on the left with which you can choose the desired printer:

  → when *Screen* is selected, the output will be directed to the window Preview (↪ chapt. 13.8.1)

  → when *PNG* or *JPG* are selected, you can change the resolution (default: 70 dpi)

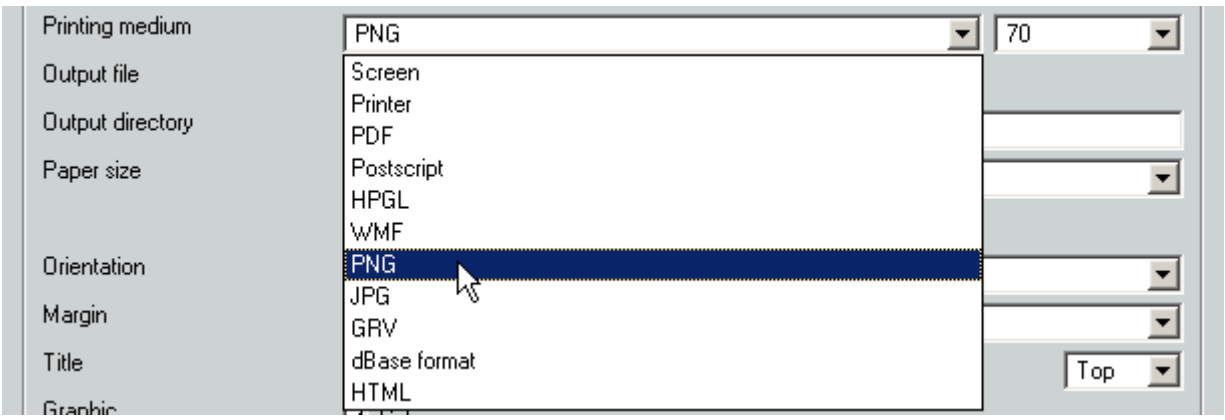


Figure 5.7: List Output medium

- whether the name of the output file is to be chosen freely
  - → if the checkbox is activated, you will be asked for a file name before each output
  - → if the checkbox is deactivated, the output file will be named by the system
- the output directory
  - → when the checkbox is activated, the path entered in the input field will be used for the output (you open the file selector via which you can enter the desired directory with the button Browse.
- the paper size:
  - → when *User-defined* is selected, enter the width and height in cm,
- the orientation (portrait or landscape format),
- whether the margin shall be on the left or on the right of the paper or whether there shall be no margin at all,
- how the title should be displayed (only possible for some reports)
  - → with boundary lines
  - → with toposoft-label
  - → in the top or in the bottom of the report
- whether the Graphic is to be displayed in ☑ Colour and
- how the page numbering is to be handled (for multilateral reports)
  - → whether the pages are to be numbered
  - → with which page number to begin with

5.3.2.3 System warnings

The checkbox ☑ combined with an acoustic signal in the frame System warnings determines whether or not topodesk shall initiate an alert for objections and important hints.

5.3.3 Tab: Subject fields and parameters

This tab manages the subject fields and their accompanying parameters. Here you can create and delete parameters as well as make further settings for the individual parameters. Above all, the standard day and year changes of all subject fields and their parameters are specified here. This has effects on data capture, calculations, graphic displays, report outputs etc.

> HINT:
> The settings in this tab can only be made by a user with administrator rights. He would normally adjust the day and year changes once in the beginning according to what is conventional in your institution.

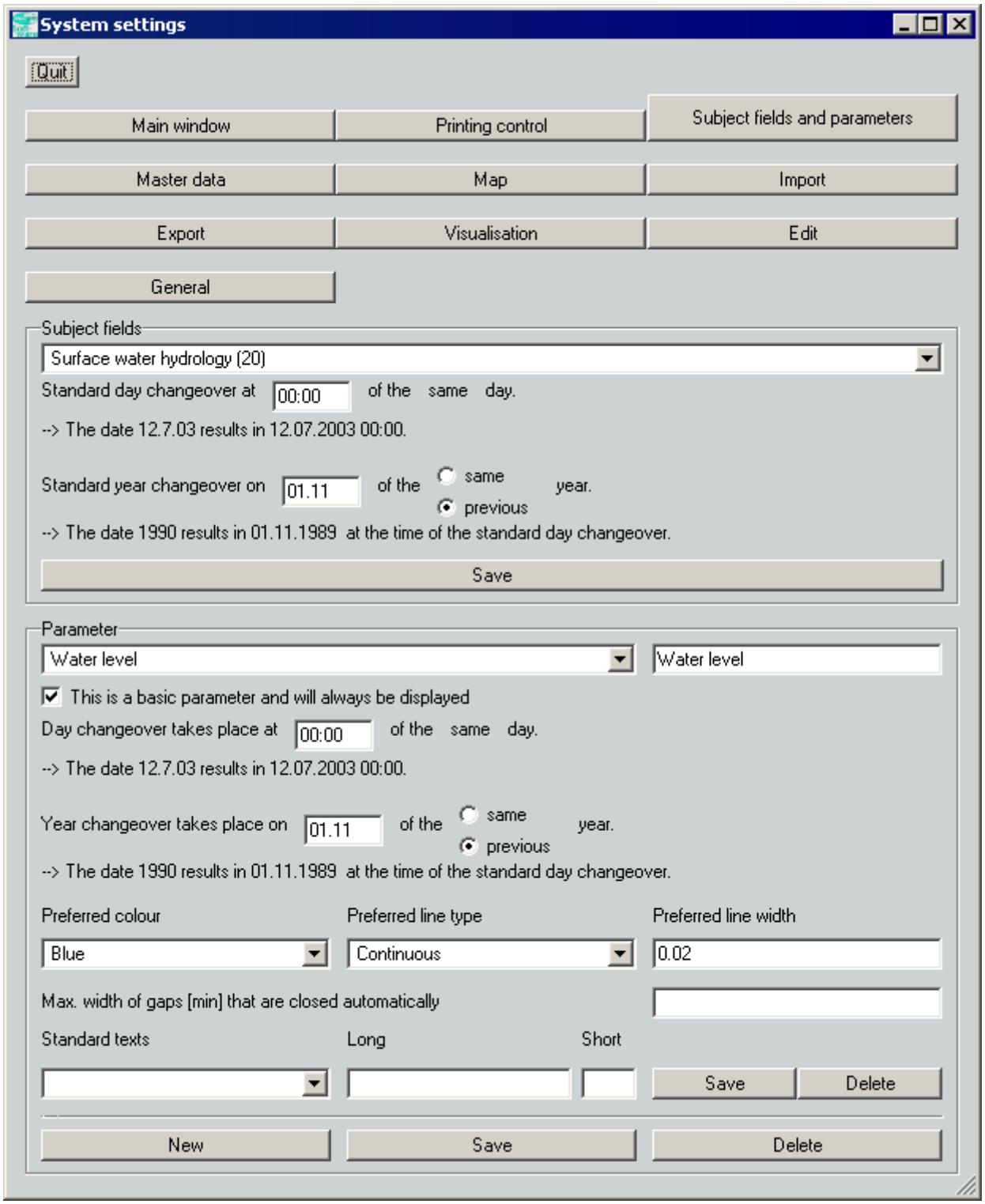


Figure 5.8: System settings: Subject fields and parameters

Specify the standard day and year change:

- Select the subject field or parameter

- Make the according entries for the day/year change
- [Save] the entries with the accompanying button

  ATTENTION:
  The once adjusted day and year changes should preferably not be modified.

Create a new parameter:

- Select the subject field for the parameter to be created.
- Write the name of the parameter into the input field in the top right of the Parameter frame
- Click [New] → the new parameter will be adopted in the list
- Make the desired settings for the day and year change, colours etc. for the new parameter (see below)
- [Save] the settings with the according button in the bottom section

One parameter for several subject fields:

Should there be just one parameter for several subject fields, it must be created individually for each subject field. To logout single subject fields, delete the parameter for the selected one.

Additional settings in the frame Parameter**:**

- Determine the basic parameter: Select the parameter and click the checkbox, then [Save] → only the basic parameters will appear in all parameter lists
- Allocate a colour as well as a line type and a line width to a parameter: make the according selection or entry, then click [Save] → the series of the respective parameter will preferably be displayed with these display options
- Determine a maximum gap width up to which gaps will automatically be closed : Enter in minutes in the input field, then click [Save]
- Create standard texts (for the selected parameter): enter the desired comment in the input field under Long, a short form under Short (optional), then click the adjacent button [Save] → the comment will now be available in the list and can be modified or deleted later; in the windows Single value entry (↪ chapt. 8.1.3) and Check and correct continuous time series (↪ chapt. **??**), the standard comments can be used (the long form will be saved in the time series; the short form will appear in the reports in which also remarks are output)

5.3.4 Tab: Master data

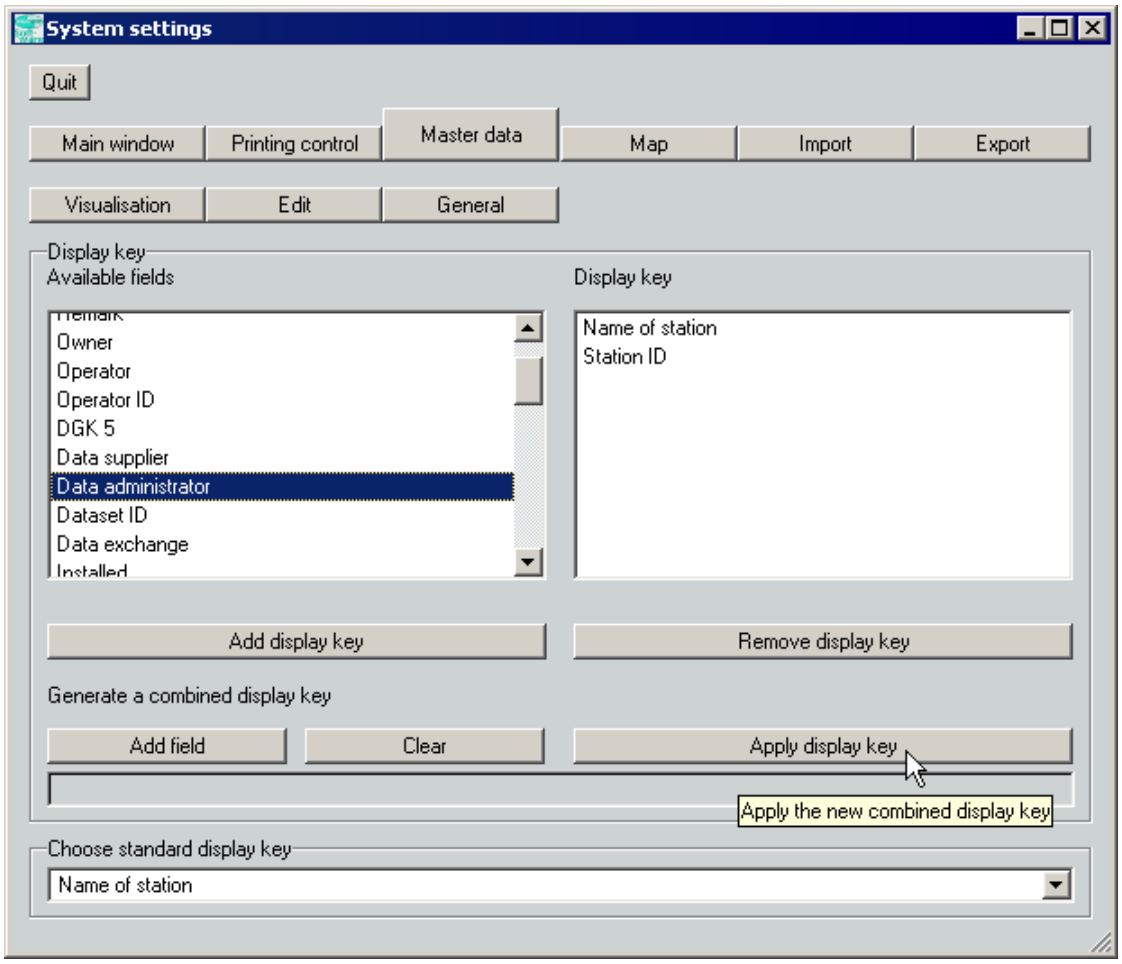


Figure 5.9: System settings: Master data

The tab Master data allows you to complement the listings in the "display key list" (stations) in the **Master data window** (↪ fig. 6.3) and the **Master data filter** (↪ fig. 6.2). Furthermore, this tab contains additional functions which are only accessible to the user „root".

5.3.4.1 Display key

The listings in the "display key list" indicate under which display key (master data entry/entries) the stations are to appear in the station list. Figure 5.10 (left) shows the standard entries, on the right-hand side the list has been complemented by three entries.

There are two lists in the system settings → Master data for modifying the display keys (↪ fig. 5.9). Available fields provides the possible entries for the "display key list" in the master data window, in Display key, you compile the desired entries.

You can transfer individual entries from the list of the Available fields to the Display key with the button Add display key.

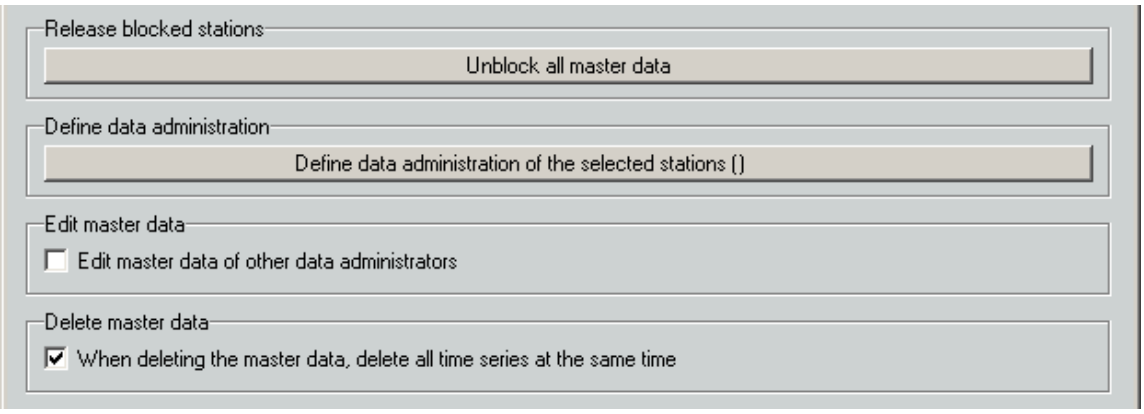
Figure 5.10: Definition list in the main window

The display key can also contain combinations of master data entries.
In order to create a combined display key, proceed as follows:

1. mark the desired entry in the left list
2. click [Add field] to make it appear in the bottom input field
3. repeat point 1 and 2 until all desired entries are in the bottom section
4. use [Clear] to delete all entries in the bottom field in case you have selected a wrong entry
5. click [Apply display key] to forward the row from the bottom field to the right-hand list
6. repeat the whole procedure to create another list entry

In order to delete an entry in the display selection, mark this in the list Display key and then click the button [Remove display key].
You can now select one of the display key entries as the Standard-display key. This default value will be used in all station lists of topodesk , i. e. all these entries will be listed for each station in the selected order and separated by commas. (This function is currently in process; it may not be provided in all lists yet.)

5.3.4.2 Additional functions for "root"



The user logged in as "root" obtains further frames in the bottom part.

- Release blocked stations
  [Unblock all master data] may be necessary when a user has announced a change request in the main window and a system crash occurs.
  Before the SuperUser unblocks the master data, he should make sure that no other user is editing master data at the same time because unsaved modifications can get lost during the unblocking procedure.

- Define data administration
  [Define data administration of the selected sections (...)] defines the own institution as data administration for the selected stations. Find more information about the data administration in chapter 6.2.5.

- Edit Master data
  By means of the button ☑ Edit master data of other data administrators rootcan allow master data of external data administrators to be modified (default is NO). If this is activated, the master data modification rights that are defined in the user administration apply to the individual users. However, it is not possible to export stations of external data administrators.

- Delete Master data
  The button ☑ When deleting the master data, delete all time series at the same time can be deactivated, in case the series should furthermore be accessed with other programs.

5.3.5 Tab: Map

By use of this tab function, you make basic presets for the map.

5.3.5.1 Map selection

- ☑ List hidden stations on selection
  When the checkbox is activated, an Info window like in figure 4.16 will additionally appear with the button in figure 4.15, each time a selection does not display all stations in the map.

- Save the selection when exiting:
  You have the possibility to determine whether the existing selection is to be saved when exiting the program. On a new opening of topodesk the same stations will then be selected automatically.

- Map section:
  By means of this list, you arrange the performance of the map section via buttons or lists. Available are:
  - *follows the selection*, i.e. the map section always adapts to the modified selection
  - *extends to selection*, i.e. the map section only changes when stations which lie outside the displayed map section are selected
  - *will be maintained*, i.e. the map section does not change on selection

- For the first two possibilities in the list Map section, the distance between the selection and the map boundary can be determined.

5.3.5.2 Define complete picture for navigation

By means of the button [Current map section], you can define the current zoomed in map section as a complete picture for navigation. The button [Complete picture] in the frame Navigation of the main window will then produce exactly this zoomed in section.
By means of the button [Calculate from geometry], you arrange the section zoomed in with [Complete picture] to comprise all displayed map elements.

5.3.5.3 Individual station layer (Station layer for user...)

By using the list next to Station labelling in the map, you determine under which identifier the stations of your individual station layer are labelled in the map (the texts of the according layer must be switched on for this purpose). To change the station identifier, first choose the corresponding entry in the shortlist and subsequently click on the [Regenerate stations in the map]-button. This setting will now apply only for you and your individual stations.

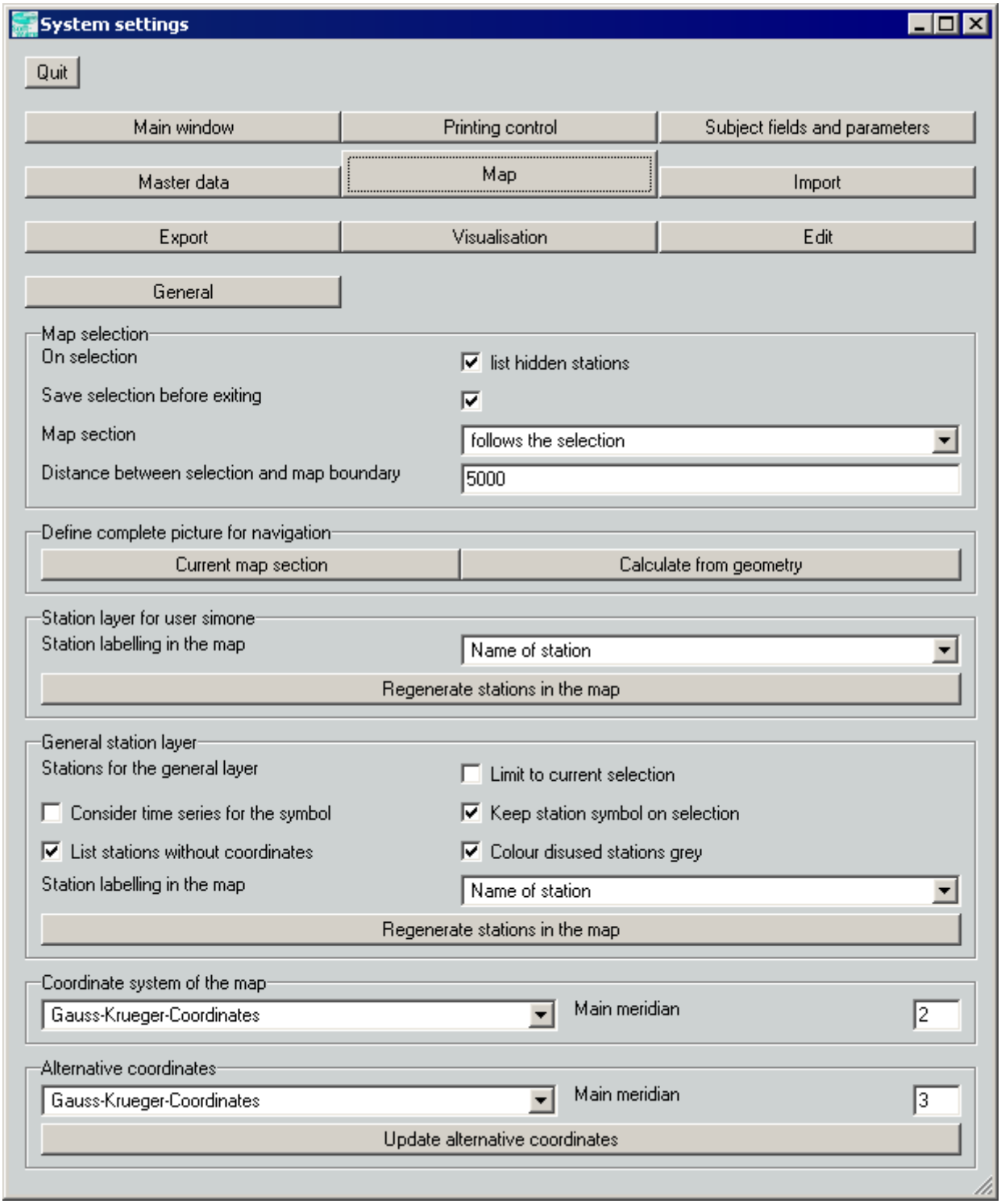


Figure 5.11: System settings: Map

5.3.5.4 General station layer

Normally, the general station layer contains all stations existing in the master data. With the functions in this frame, you can make presets which will be considered in a readjustment of the general station layer via the button [Regenerate stations in the map].

- The button ☑ Limit to current selection narrows the Stations for the general station layer to the selection
  On request, this layer can be limited to part of these stations. For this purpose, select the stations that should continue to be contained and then activate the checkbox ☑ Limit to current selection. The button [Regenerate stations in the map] changes the layer.

- ☑ Consider time series for the symbol makes sure that, when newly creating the station layer, also the relevant information from the time series can be drawn on for the display of the station symbol besides already the entries in the master data.
  WARNING: Since all existing time series will be checked for this action, the creation of the station layer will take a lot of time.

- You can determine to ☑ Keep station symbol on selection for the display of the selected stations. When the checkbox is deactivated, the selected stations will be displayed with a small star.

- ☑ List stations without coordinates outputs the stations that are found during the regeneration of the station layer and which don't have coordinates in an info window (↪ fig. 5.12).

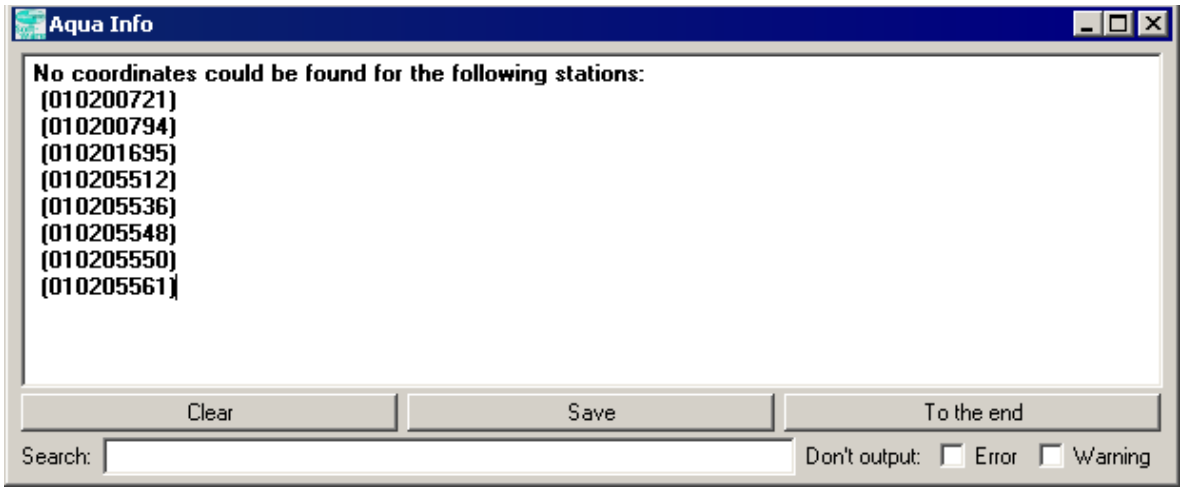


Figure 5.12: Info window for stations without coordinates

- You can ☑ Colour disused stations grey when regenerating the layer. The information about the disused stations will be taken from the basic data of the master data. The Station labelling in the map occurs analogous to the Station layer for user... in the general station layer.

  HINT:
  The settings in the general station layer can only be modified by an administrator. However, they then apply to all users.

Regenerate stations in the map

The display of the stations in the map is defined by the following master data:

- name of the station
- easting and northing
- symbol angle
- types of the existing sensors (parameters, registering)
- checkbox ☑ With runoff

If you change one of these entries, this will cause an immediate modification of the display of this station in the map.

Normally, you will not need the function for regenerating all stations in the map after such a modification. Solely on a system crash, it can occur that the display in the map will not correspond to the current master data anymore.

> HINT:
> Please note that when you [Regenerate stations in the map], the settings you have made in the corresponding frame will be respected.

5.3.5.5 Coordinate system of the map

In the bottom section, you choose the coordinate system of the map and – for Gauss-Krueger-coordinates – the main meridian, provided that you have administrator rights in topodesk.

5.3.5.6 Alternative coordinates

The coordinates which are allocated to the individual stations will be converted to alternative coordinates for any another coordinate system or – with Gauss-Krueger-coordinates – for another meridian. [Update alternative coordinates] starts the calculation; the alternative coordinates will be filed in the master data (Relation: Location). This function is also only available for administrators. HINT: UTM coordinates may still be afflicted with slight inaccuracies and are not yet saved as alternative coordinates but are filed in the start directory of topodesk as a dbase relation.

5.3.6 Tab: Import

Here you can make presets for the import functions in topodesk.

- Station search fields
  Here the administrator defines, which master data fields are to be used for the allocation of the stations during the time series import and the master data exchange. The station number (station ID) is always a fixed search field, all other fields indicated here can be chosen additionally.

- Standard import mode
  Here the administrator can centrally define a standard import mode for all users. For non-administrators, this is now not selectable anymore in the import window. When the entry *Left up to the user* is selected, the individual user decides in which mode the import should take place.

- Search for sensors
  According to the format, an identifier for the station and the sensor will be withdrawn from each dataset of an import file. The station identifier will find a station via the agreed station search fields. When the station has been found, a sensor according to the indications in the dataset will be searched for. When no sensor has been found, it is also possible to search for one via the time series attributes defined in the sensor details. In this case, the button ☑ via time series attributes must be activated.
  By activating the checkbox ☑ via logger number, the sensor and also the station can be found via the logger number. This only makes sense if the logger number is well-defined in the sensor details.

- Save dataset ID
  Here you determine whether, when saving the sensor via the import window, the Station ID of the dataset should be saved as [Dataset ID in the basic data | ▽] or as a [Logger number in sensor details | ▽].
  HINT: In contrary to the dataset ID which is written in the masterdata of the station, the logger number applies only to this concrete sensor (and therefore also has no history). When data collectors are exchanged, it is mandatory to select the logger number in order to guarantee a clear allocation.

- Consistent attributes
  Consistent attributes ☑ as an import preset open the possibility of having Origin, Version and Source as presets in the import window after selection of the import choice (↪ chapt. ??, fig. ??). When an attribute is made a consistent setting, it will overload the information in the sensor details.

- Unified templates
  With this checkbox, you can determine whether unified templates are to be made for the import. Optionally, the ☑ Station and sensors or ☑ Attribute acc. to preselection can be offered as templates after the selection of the import file in the import window (↪ chapt. ??, fig. ??). When an attribute is standardised and predefined, it takes precedence over the indication from the sensor details.

- Extreme values
  By means of this checkbox, you can define whether or not the daily extreme values should be imported along and merged in on the data-logging import.

- Rainfall
  Additionally, you can select whether topodesk should automatically convert Rainfall into intensities on the import (default setting: convert).

- Rainfall impulses
  When tipping bucket rain gauges are used as data collectors where no information is given about the rainfall beginning time, the maximum width for individual rainfall impulses can be determined here (default: 4 minutes). Generally, you activate or deactivate this function with the adjacent checkbox.

- Plausibility
  On activation of this checkbox, implausible values will automatically be transcribed with a gap in the quality *Purged* during the import (implausible values: exceedances of the measuring range defined in the sensor details; non-identified interfering signals during pluvio data measuring, e. g., ground motion). This function is only provided for users with administrator rights.

- Block raw data
  Here you define whether continuous time series with the origin "Original" should be blocked automatically during the import. This function is only provided for users with administrator rights.

- toposoft pack format
  For the import from the toposoft pack format, you can define whether lock flags existing in the import file should be adopted or removed. This function is only provided for users with administrator rights.

- CSV files
  For CSV files, you can determine whether the queried station and the sensor should be saved in the CSV file. The data entered in the fields Station(s) and Sensors in figure ?? will be written in the CSV file when you click [OK]. ATTENTION: The file is now not accessible via the window mentioned above since station and sensor can be allocated immediately. In case you would like to correct the entries, this must be done via an external editor.

- File datasets
  In case the datasets should be forwarded to the archive after the import, you can choose here whether the filename should be kept or whether it should be created automatically from the short-ID, the time period end and the format.

- System series
  With the list, you choose the colour of the system series for the comparison to the time series to be imported. Also, you can define whether you want to ☑ Display texts.

- Rainfall mass curve
  Determines which type of mass curve should be displayed in the import graphic.

5.3.7 Tab: Export

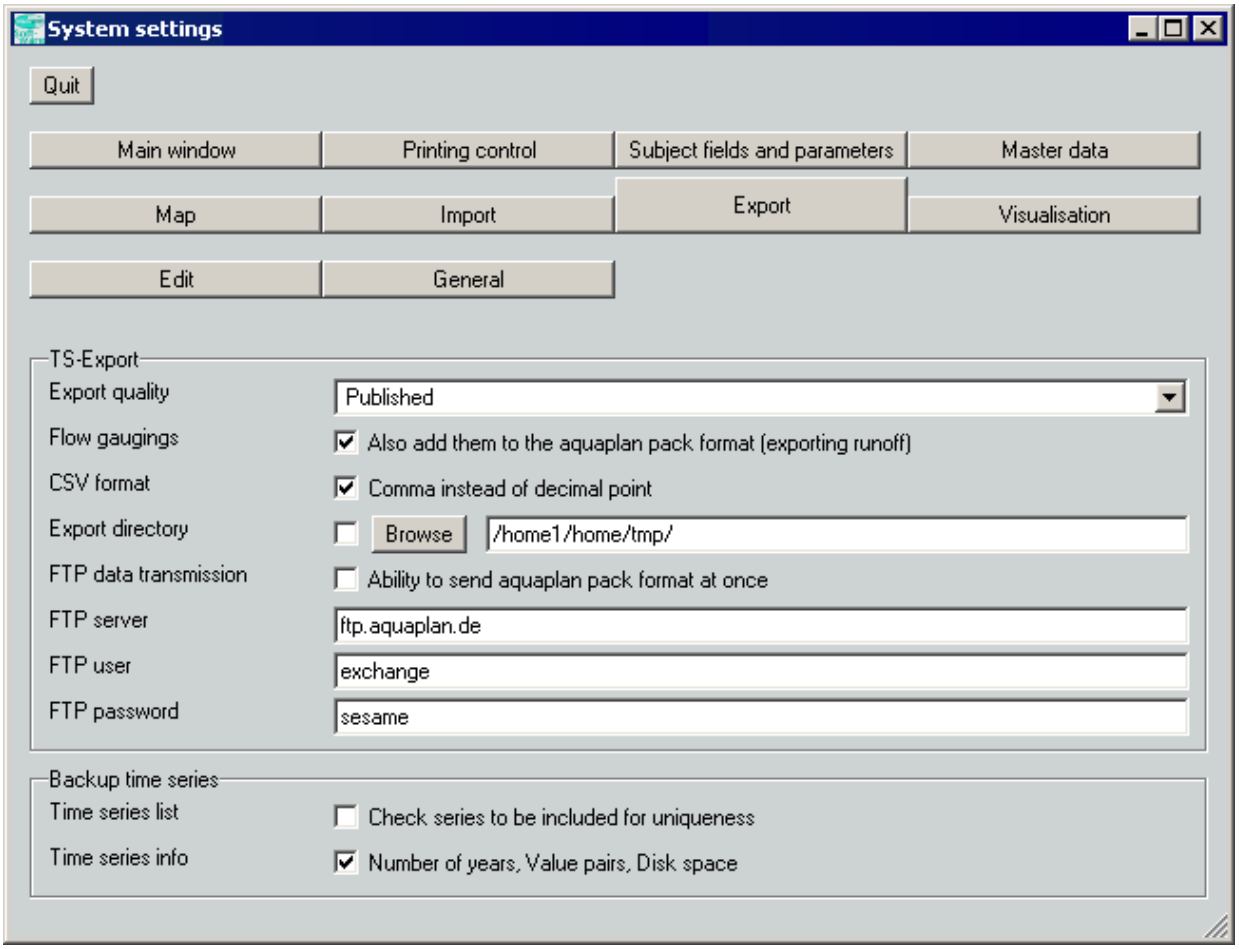


Figure 5.13: System settings: Export

In the frame TS-Export you make presets for the export functions in topodesk:

- By means of the list Export quality, you choose from which quality the data should be exported.
- The Flow gaugings can be added additionally to the toposoft pack format when exporting runoff.
- You determine for the CSV format whether to output ☑ Comma instead of decimal point.
- The Export directory can be selected freely by entering it directly in the input field or via [Browse] by aid of the file selector (↪ chapt. 13.7.4). By means of the checkbox, you define whether the entered path or – when deactivated – the default user/*user name*/export should be used.
- FTP data transmission: When the checkbox is activated, the frame Automatic data transmission per FTP (↪ chapt. ??) will be added to the export window (↪ fig. ??).

- FTP server: Entry of the IP address of the FTP server and the desired path
- FTP user: Entry of the FTP user
- FTP password: Entry of the FTP password

Under Save time series, you can make the presets for the saving of time series in a .tar file:

- By deselection of the checkbox ☑ Check series to be included for uniqueness, you make sure that series will only be included once in the time series list. Under certain circumstances, this can save a lot of editing time and is non-critical upon the saving procedure (however, in this case, it may be that one series turns up twice in the series list; once as original time series and once as initial series of a time series sequence, ↪ fig. 5.14.)
- ☑ Number of years, Value pairs, Storage space ensures that the time series infos will be output in the bottom line before saving (↪ fig. 5.14).

	Series	From	To	Years	Value pairs	Disk space [MB]
■	aqua_plan Aquaplan: Rainfall, continuous, TS sequence (free) [mm/h]	31.10.1980	01.04.2008	27.4	0	0.002
■	aqua_plan Aquaplan: Rainfall, continuous [mm/h]	14.03.2001	02.01.2009	7.8	78848	0.636
■	aqua_plan Aquaplan: Rainfall, continuous [mm/h]	14.03.2001	02.01.2009	7.8	78848	0.636
	Summation			35.2	78848	0.638

Figure 5.14: Example of a series list for the storage of time series

5.3.8 Tab: Visualisation

On this register page, you make presets for the visualisation.

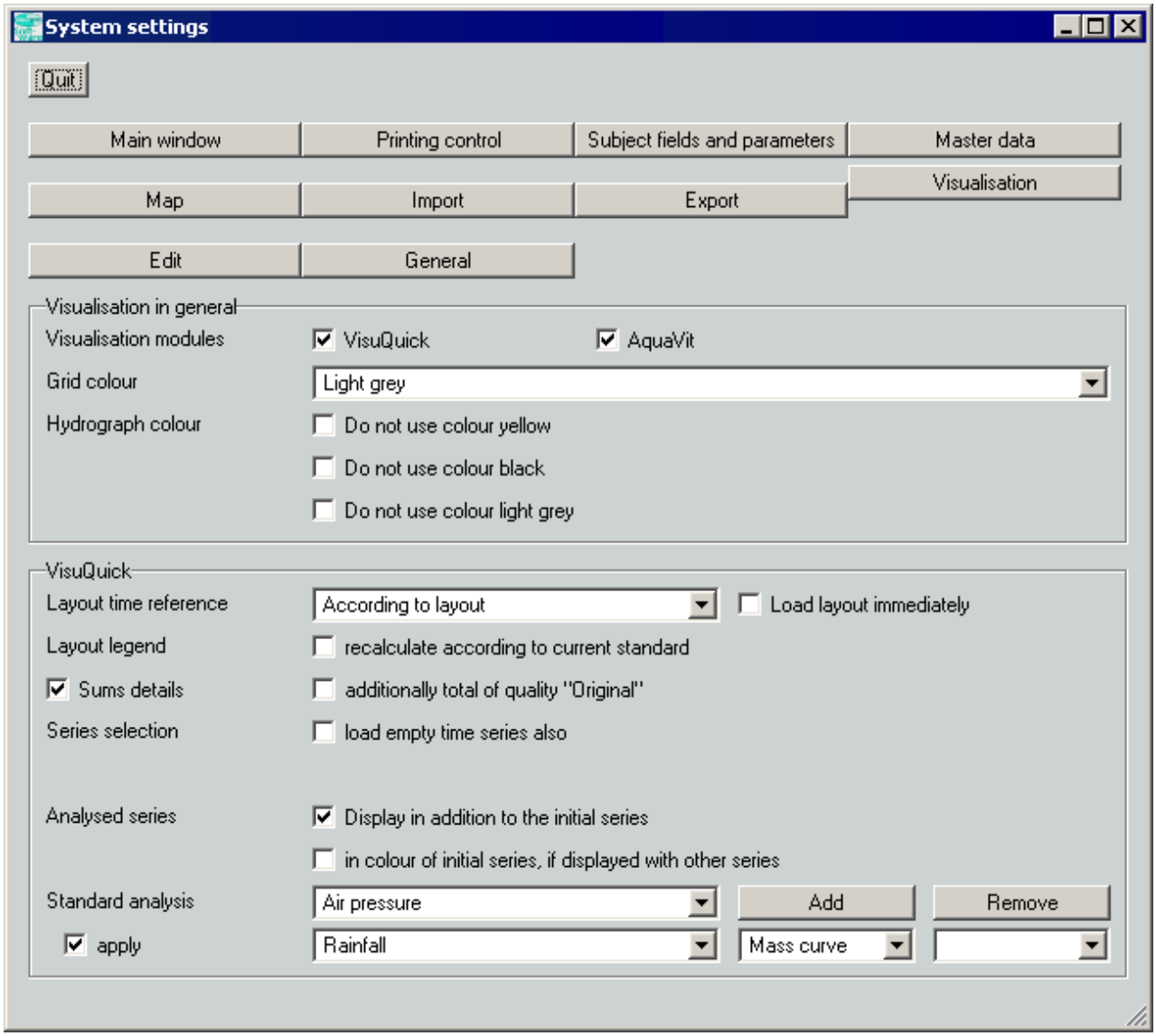


Figure 5.15: System settings: Visualisation

5.3.8.1 Visualisation in general

- Grid colour
  Here you can define the colour of the grid lines in all axboxes.
- Hydrograph colour
  Here you can appoint the colour yellow not to be used for displaying the time series.

5.3.9 Tab: Edit

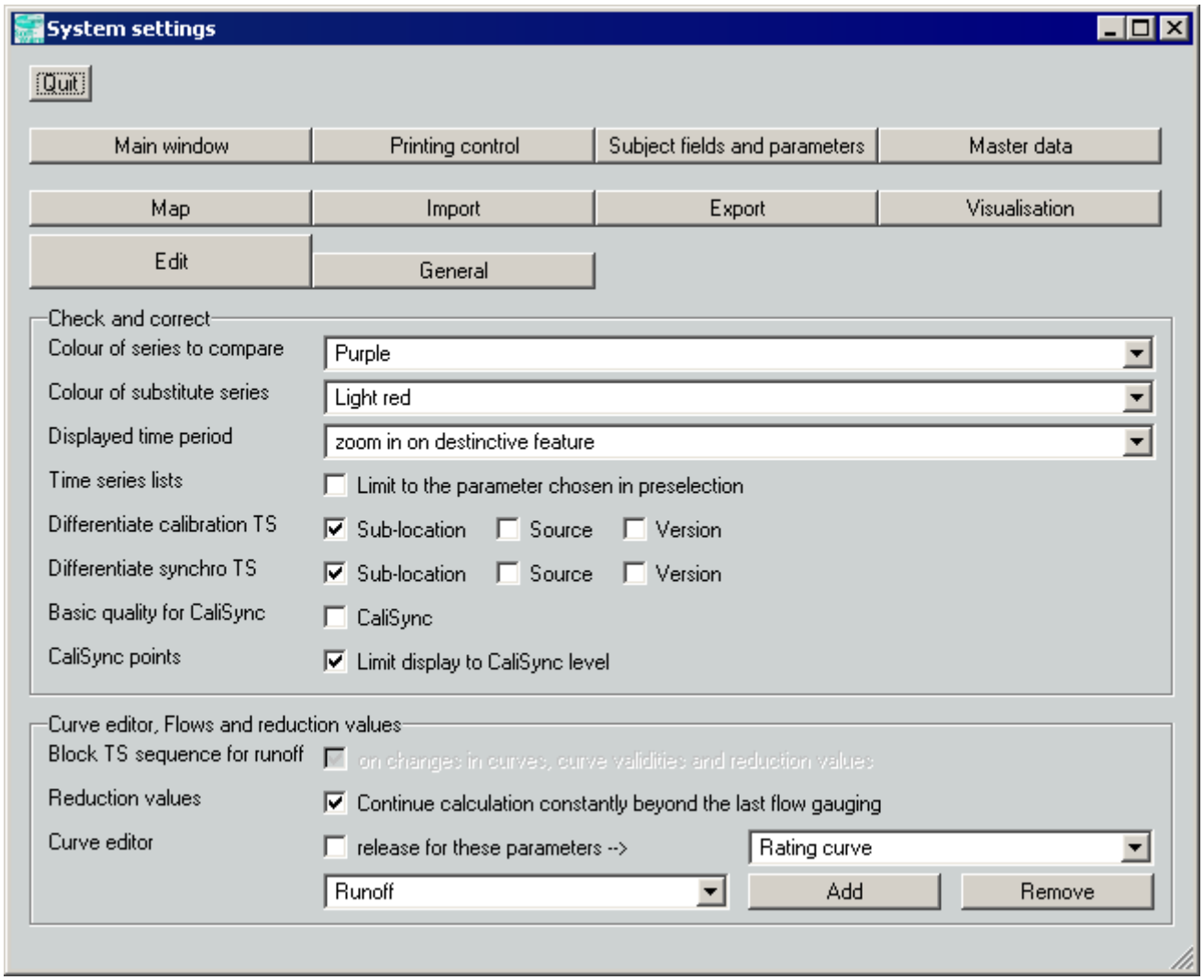


Figure 5.16: System settings: Edit

Here you make presets for all subprograms that you can approach via the menu ▽ Edit .

5.3.9.1 Check and correct

- Colour of comparative series/Colour of substitute series:
  Here you can select a colour for the display of the comparative series as well as the substitute series in the hydrograph editor

- Displayed time period:
  for searching the next distinctive feature, you can choose on which period you want to focus the display on.

- Time series lists:
  the entries in the time series lists can be limited by means of the checkbox ☑ Limit to the

parameter chosen in preselection (Preselection: Attribute filter or parameter list).

- Differentiate calibration TS:
  users with administrator rights additionally have checkboxes in the bottom section of this frame in order to define by which attributes the calibration time series should or should not be differentiated. (When all checkboxes are deactivated, only **one** calibration series can be generated per station).

- Differentiate synchro TS:
  users with administrator rights additionally have checkboxes in the bottom section of this frame in order to define by which attributes the synchronisation time series should or should not be differentiated. (When all checkboxes are deactivated, only **one** synchronisation series can be generated per station).

- Basic quality for CaliSync: Here, by means of the according checkbox, the basic quality for CaliSync can be set to ☑ CaliSync. In the case of a switched-off condition, which is the norm, the data will be read from one quality level below. Should, however, e. g. time periods first be synchronised and then calibrated, the checkbox must be activated. Then the calibration will occur on the basis of the synchronised data.

- CaliSync Points:
  Each user can select in the system settings whether the display of the calibrating and synchro points should be limited to the CaliSync level or not.

5.3.9.2 Curve editor, Flows and reduction values

- Block TS sequence for Runoff: The user „root“ can specify whether, when changes are made in curves, curve validities and reduction values, the Runoff TS sequence as well as the Reduction value series should be blocked in the relevant time period.

- Reduction values
  By using the checkbox, you define whether the calculation of the reduction values should be carried on constantly after the last runoff measurement.

- Curve editor
  The administrator can select whether the curve editor should be released for other parameters as a [Rating Curve | ▽] and if so, then for which ones. Thereby, you work as follows: Select a parameter from the parameter list below the checkbox and adopt this in the second list ([Rating Curve | ▽]) with [Add]. Repeat this step until all desired parameters have been adopted. To remove, select the according parameter from the second list and click [Remove].

5.3.10 Tab: General

By means of this tab you control the appearance of individual windows, for instance, the size or the number of the offered functions.

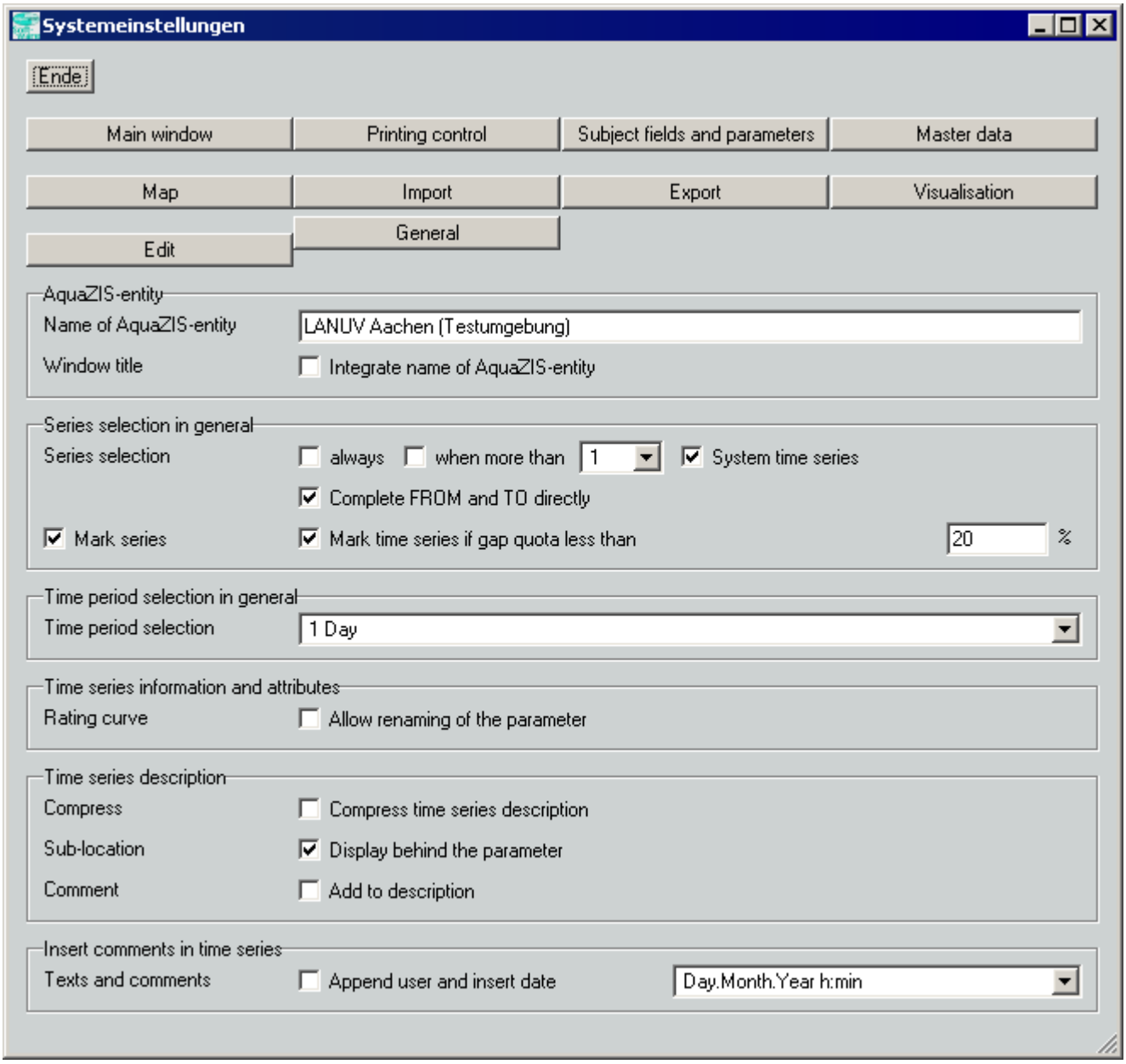


Figure 5.17: System settings: General

5.3.10.1 TopoDesk-entity

- Name of TopoDesk-entity
  Via the entry field, you define the name of the entity – as long as you have administrator rights.

- Window title
  The checkbox ☑ Integrate name of TopoDesk-entity determines, whether this will be listed in the individual window titles as well.

5.3.10.2 Series selection in general

- When the checkbox ☑ when more than is ticked, the series selection will be interposed if the number of *...found series* exceeds the number you have selected in the accompanying list [... | ▽] . You can then choose the desired series.
  When both checkboxes are deactivated, the visualisation opens immediately without the series selection. This is helpful and time saving when you have already made a preselection by choosing the stations and predefining the series in the attribute filter. When you tick the checkbox ☑ System time series, certain time series such as calibration value series will also be offered in the series selection.

- ☑ Complete FROM and TO directly lists all series in the series selection directly with an indication of the MaxFocus (HINT: When this checkbox is selected, it will take a little while for the series selection to open .).

- Via the checkbox ☑ Mark series you determine whether, when opening the series selection, all series should be marked automatically. Via the checkbox ☑ Mark time series if gap quota less than [... | ▽] % you can limit the marking on **continuous and interval time series** with a gap quota below a certain defined limit. (HINT: The function ☑ Mark series takes up less time since it doesn't have to check the gap quota of each series.)

  Combination possibilities of the two checkboxes:
  ☑ ☑ → Momentary and real series as well as the continuous and intervaltimeseries- und Realreihen sowie die kontinuierlichen und Intervallzeitreihen, die die Bedingungen für den Lückenanteil erfüllen, werden markiert
  ☑ ☑ → all Series will be marked
  ☐ ☑ → solely continuous and interval time series that fulfil the conditions for the gap quota will be marked
  ☐ ☐ → nothing will be marked

5.3.10.3 Time period selection in general

Via the list, you make presets for the time period. They will function on the opening of modules (except Export), when no time period has been entered in the main window or only one of the fields has been filled out, as well as on a renewed display, when at least one of the time entry fields stays blank.

- *x Days* leads to a display of x days. When no time period has been entered, these will be the last x days of the row. When a beginning point of time has been entered, x days will be displayed from this time onwards. On entry of the ending point of time in the main window, x days up to this date will be indicated.

- *Standard* this will – when no time indication has been made – display the current day. If only **one** time input field is filled out, this will be considered and nothing added.
- *MaxFocus* displays the whole series or complements your entries with the beginnning and ending of the time series.

5.3.10.4 Time series information and attributes

By means of the checkbox, you can ☑ Allow renaming of the parameter Rating curve (for security reasons, this is normally not possible).

5.3.10.5 Time series description

Here you can influence the description of the time series:

- the sub-designation ☑ Display behind the parameter:
  The description of the time series in lists, legends etc. usually occurs in the order: Standard display key (↪ chapt. 5.3.4.1, Sub-designation, Parameter. By clicking the checkbox, the order of sub-designation and parameter will be inverted.
- attach a Comment by using the checkbox ☑ add to description
  (the time series comment is meant here ↪ fig. **??**)

5.3.10.6 Insert comments in the series

Here you can define for the manual insert of comments whether the username and insert date should be appended. The format for the date is selectable via the list.
This control counts for all users and is therefore reserved to the administrator.

5.4 Save settings

With the selection of this menu point, certain settings, which you have made in the main window will be saved. These are those settings that are described in chapter 3.6 („Memory“). By aid of this function, your settings remain in tact even after a system crash or a power failure.

5.5 Distribution system

There is an own documentation for the distribution system.

5.6 Geolayer tools

Via the Geolayer tools, you can export map elements from topodesk in order to display them, for instance, in *Google Earth* (↪ chapt. 5.6.1). Additionally, you can read in external formats (*Shape* files) (↪ chapt. 5.6.2).

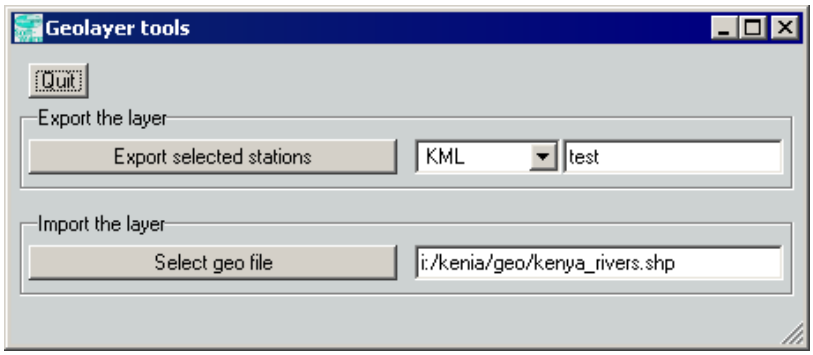


Figure 5.18: The window Geolayer tools on the entry

5.6.1 Export the layer

1. Select the desired measuring stations

2. Choose the format in the list

   - *ai format* → toposoft-specific readable ASCII format
   - *Binary* → toposoft-specific binary format (storage saving, quickly readable)
   - *KML* → format for the presentation of geographic data in *Google Earth*
   - *Shape* → `shp` format, to be read in in *ArcView*

3. Enter the name for the export file

4. Click [Export selection] → the export file will be created (path will be shown in the status line)

5. Load the export file in the desired program (↪ fig. 5.19)

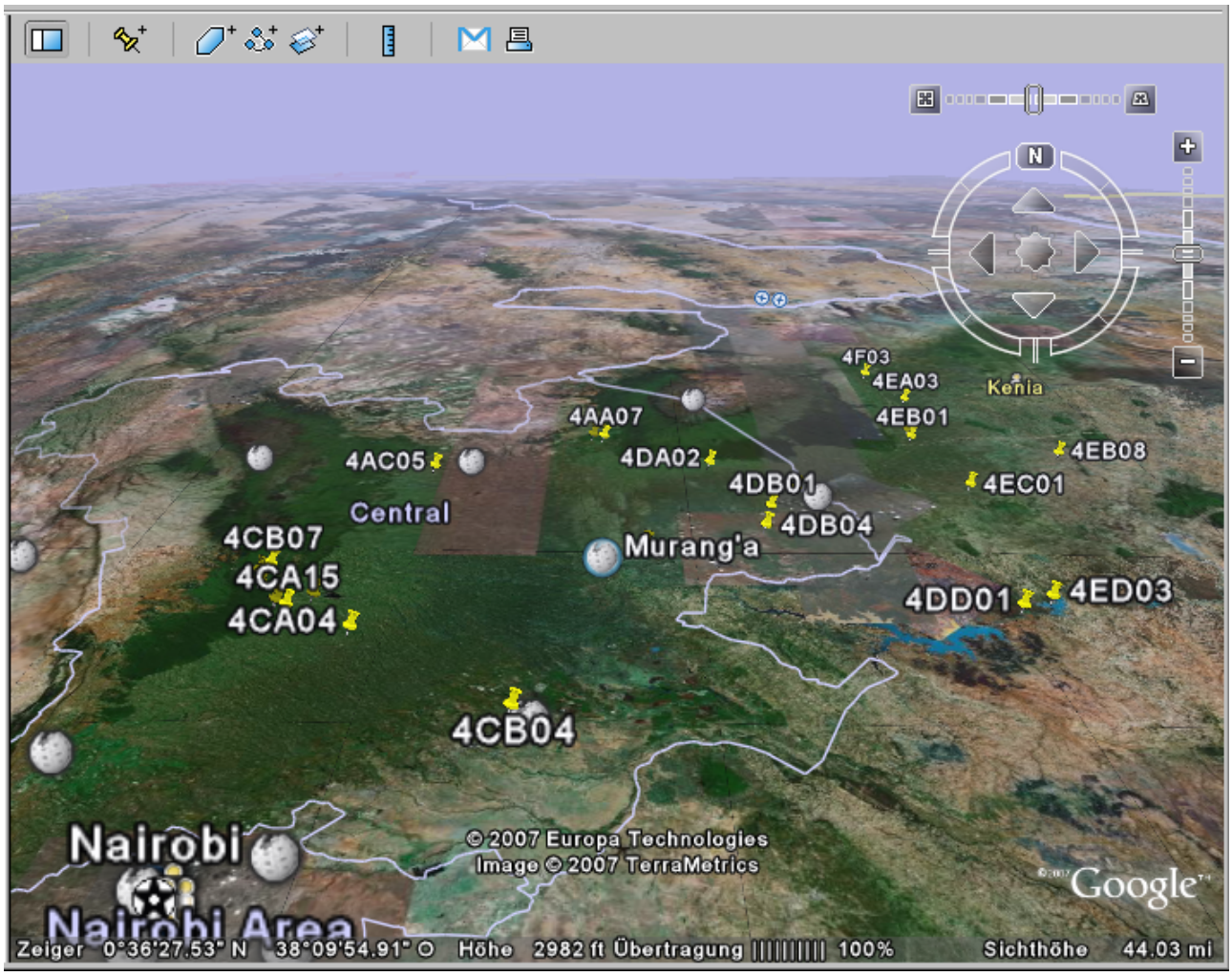


Figure 5.19: topodesk measuring sites in *Google Earth*

5.6.2 Import the layer

1. Select geo file opens the free file selection (↪ chapt. 13.7.4)
2. Choose the geo file

   → if the selected layer is a Shape file (ending: „.shp"!), the window will expand after the analysis of the layer file as shown in figure 5.20

   → if the selected layer is not a Shape file, click the button Convert layer to the TopoGeo format

   - Number of polygons serves the information needs
   - Existing attributes lists the attributes → via the shortlist, you select which one should be allocated to the polygons.
   - ☑ Fill closed polygons → fills out the surface area of a closed polygon with the colour of the layer
   - ☑ Label polygons → determines whether the texts of the polygons should be indicated, 3 determines the labelling space (in cm)

- ☑ Longitude/Latitude -> Gauss-Krueger → converts geographical coordinates to Gauss-Krueger, [2] → indicates the according meridian
- ☑ Gauss-Krueger -> Longitude/Latitude → converts Gauss-Krueger to geographical coordinates, [2] → indicates the according meridian
- ☑ Lambert -> Longitude/Latitude → converts Lambert to geographical coordinates, [2] → indicates the according meridian
- [Convert polygons with the chosen attribute to the TopoGeo format] → converts the existing layer into the TopoGeo format under consideration of the selected attributes

3. Resulting layer will be generated and filed in the topodesk-geo directory (the path of the resulting layer will be indicated in the statusline)

4. Resulting layer can now be loaded via the map control in topodesk .

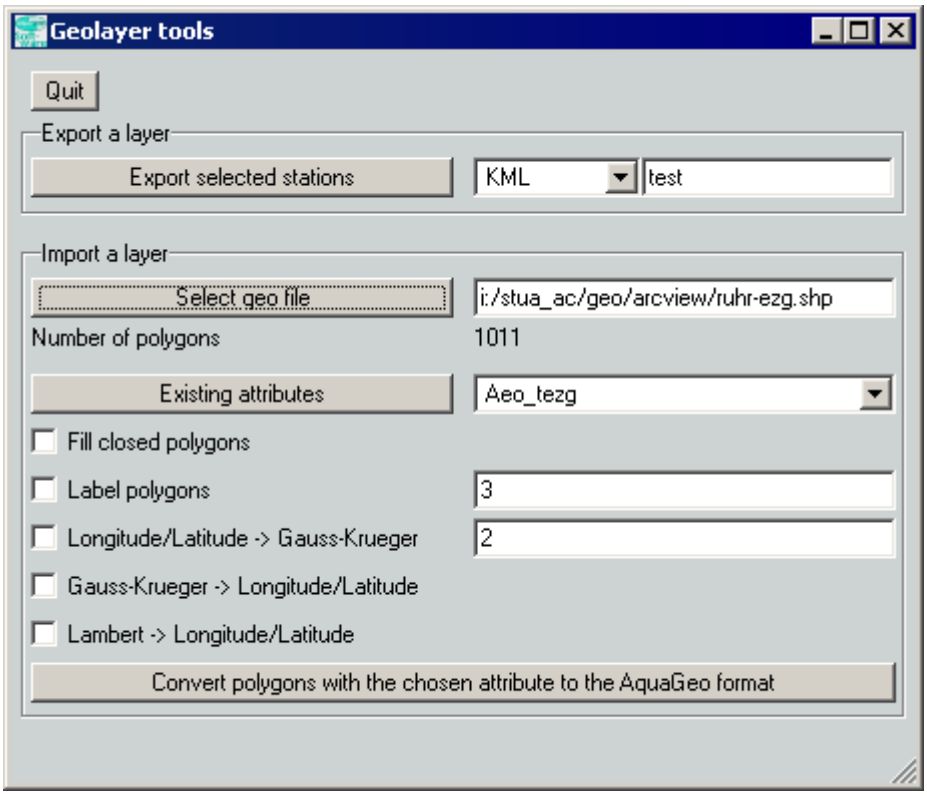


Figure 5.20: Geolayer Tools – expanded

5.7 Open table

Via this tab, you can find dBase and XLS files. The dBase files that are not in the stammdir directory can also be edited and saved. This function is primarily for looking at tables.

When you click Open table, the file selector will open (↪ chapt. 13.7.4) via which you look for the table to be opened. After you have selected a file, click on OK. The file will be opened in a table window (DBGrid). Read in chapter 13.6.1 how to work with DBGrids.

i:/testumgebung/stua_ac/bla.dbf

Quit Save Add Delete Search

	Parameter	Location	Defart	Interpreta	XDistanc	XFactor	Origin	Type of se	Version
	Runoff	2741500000100	K		E	1	F	Z	0
	Water level	2741500000100	K		E	1	F	Z	0
	Water level	2741500000100	K		E	1	0	Z	0
	Rating curves	2741500000100	K			0	0	Z	0
	Reduction	2741500000100	K			0	0	Z	0
	Rating curve	2741500000100	K	Mean		0	0	R	14
	Rating curve	2741500000100	K	Mean		0	0	R	15
	Rating curve	2741500000100	K	Mean		0	0	R	16
	Rating curve	2741500000100	K	Mean		0	0	R	17
	Rating curve	2741500000100	K	Mean		0	0	R	18
	Rating curve	2741500000100	K	Mean		0	0	R	19
	Rating curve	2741500000100	K	Mean		0	0	R	20
	Rating curve	2741500000100	K	Mean		0	0	R	21
	Rating curve	2741500000100	K	Mean		0	0	R	22
	Rating curve	2741500000100	K	Mean		0	0	R	23
	Water level	2741500000100	M	Mes	E	1	0	Z	0
	Runoff	2741500000100	M	Mes	E	1	0	Z	0
	Flow velocity	2741500000100	M	Mes	E	1	0	Z	0
	Flow cross-section	2741500000100	M	Mes	E	1	0	Z	0
	Width	2741500000100	M	Mes	E	1	0	Z	0
	Profile coefficient	2741500000100	M	Mes	E	1	0	Z	0
	Wetted perimeter	2741500000100	M	Mes	E	1	0	Z	0
	Delta W	2741500000100	M	Mes	E	1	0	Z	0
	Surface velocity.	2741500000100	M	Mes	E	1	0	Z	0
	Water depth	2741500000100	M	Mes	E	1	0	Z	0

Figure 5.21: Table window

5.8 Close map/Open map

When required, the map can be closed. All functions not concerning the map will stay maintained. Once the map is closed, the entry in the menu ▽ File changes to Open map.

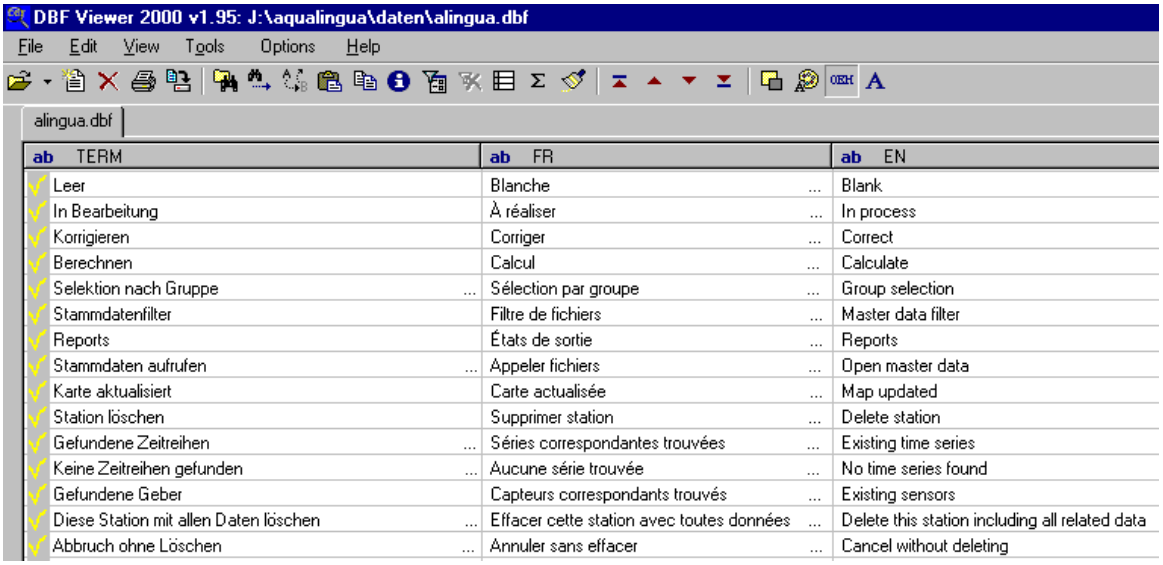
> HINT:
> Normally, you will keep the map open since it supports your work usefully. A closed map could possibly be interesting at workplaces for the sheer single value entry.

5.9 Choose language

Via ▽ File → Choose language, you enter the window in figure 5.22.

Figure 5.22: Choose language

Here you can switch between the different languages. By clicking on one of the buttons, all texts in topodesk will be translated according to the entries of the file `alingua.dbf` (↪ fig. 5.23). This table relation lies in the startup directory of topodesk, i.e. in the directory from which you start topodesk .



ab TERM	ab FR	ab EN
Leer	Blanche	Blank
In Bearbeitung	À réaliser	In process
Korrigieren	Corriger	Correct
Berechnen	Calcul	Calculate
Selektion nach Gruppe	Sélection par groupe	Group selection
Stammdatenfilter	Filtre de fichiers	Master data filter
Reports	États de sortie	Reports
Stammdaten aufrufen	Appeler fichiers	Open master data
Karte aktualisiert	Carte actualisée	Map updated
Station löschen	Supprimer station	Delete station
Gefundene Zeitreihen	Séries correspondantes trouvées	Existing time series
Keine Zeitreihen gefunden	Aucune série trouvée	No time series found
Gefundene Geber	Capteurs correspondants trouvés	Existing sensors
Diese Station mit allen Daten löschen	Effacer cette station avec toutes données	Delete this station including all related data
Abbruch ohne Löschen	Annuler sans effacer	Cancel without deleting

Figure 5.23: The file `alingua.dbf`

5.10 About topodesk

The menu entry About TopoDesk opens a window which contains information on the current invoked version of topodesk (↪ fig. 5.24).

Figure 5.24: Window Information

The frame ag.exe gives information about ag, the basic version for all **toposoft** programs.

The frame topodesk.ao contains data concerning the version of topodesk.

The frame below displays the startup directory of topodesk.

The next frame will tell you the local data administrator in topodesk and whether he is connected to the distribution system.

The frame Users online lists all users currently working with topodesk – provided you possess administrator rights. If not, you will be informed as which user you are logged in.

5.11 Exit

With Exit in the menu [File ▽] you duly quit topodesk .
You can also quit the program in the title bar of the main window via [x] (top right).

Chapter 6

Master data

From the TopoDesk-window and via the menu ▽ Master data , you reach the master data window in different ways (↪ chapt. 6.2) and also some further functions:

- All stations
  for displaying and maintaining the master data of all stations (↪ chapt. 6.1.1)
- Selected stations
  for displaying and maintaining the master data of all stations selected in the map (↪ chapt. 6.1.2)
- Master data filter
  for filtering stations according to a certain pattern → for entering the master data window and for further editing (↪ chapt. 6.1.3)
- Manage code relations
  for defining list entries (of the master data window) (↪ chapt. 6.3)
- Master data fields
  for the export and report of free to choose master data attributes (↪ chapt. 6.4)
- Define main stations
  for the determination of main stations (↪ chapt. 6.5)
- Define subdesignations
  for assigning subdesignations (↪ chapt. 6.6)

Master data have a central role in TopoDesk : Stations are applied in the system via the master data. The system then places them in the map.

6.1 Invocation of the master data window

You attain the master data window (↪ fig. 6.3) via the menu entries All stations, Selected stations and Master data filter.

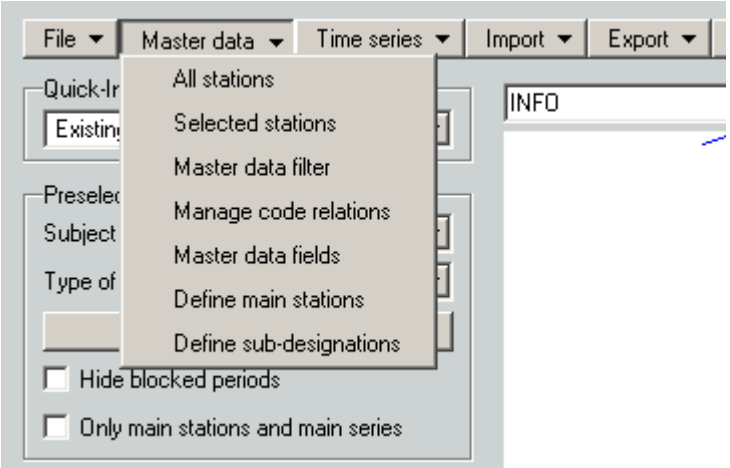


Figure 6.1: Menu Master data in the main window

6.1.1 Master data of all stations

When the master data window is entered via All stations, all stations existing in the system are presented in the station list.
If, on entry of the master data window, a station has already been selected in the map, it will automatically be selected in the station list and its master data will be displayed.

6.1.2 Master data of selected stations

Should you want to use the master data window for the presentation and editing of stations selected in the map, you need to invoke the window via Selected stations.
In contrary to the invocation via All stations, now only the pre-selected stations are presented in the station list of the master data window.

6.1.3 How to filter stations via certain features

By aid of the features in figure 6.2, you can filter the stations before entering the master data window which will then only provide these filtered stations.

The filtering orders can be started multiple times after one other. How the results of the search orders are jointed is determined by the selection in the menu ▽ Filter .

6.1.3.1 Structure of the master data filter

In the left section of the window there is the station list in which the filtered stations are indicated. All stations listed here are also selected in the map. When you modify the selection in the map, this station list will be updated at the same time and vice versa.
By means of the list above, you can choose with which master data entry the stations shall be listed (you determine in the system settings which entries this list shall include ↪ chapt. 5.3.4).

The current number (quantity) of the scheduled stations and respectively the stations selected in the map is indicated in the top section.

The filtering functions are located on the right hand side of the master data filter window. These are the master data entries via which you can filter the stations, then the menu ▽ Filter and the checkbox ☑ Inverse.
The two other buttons Master data and Groups lead you to the according subfunctions.

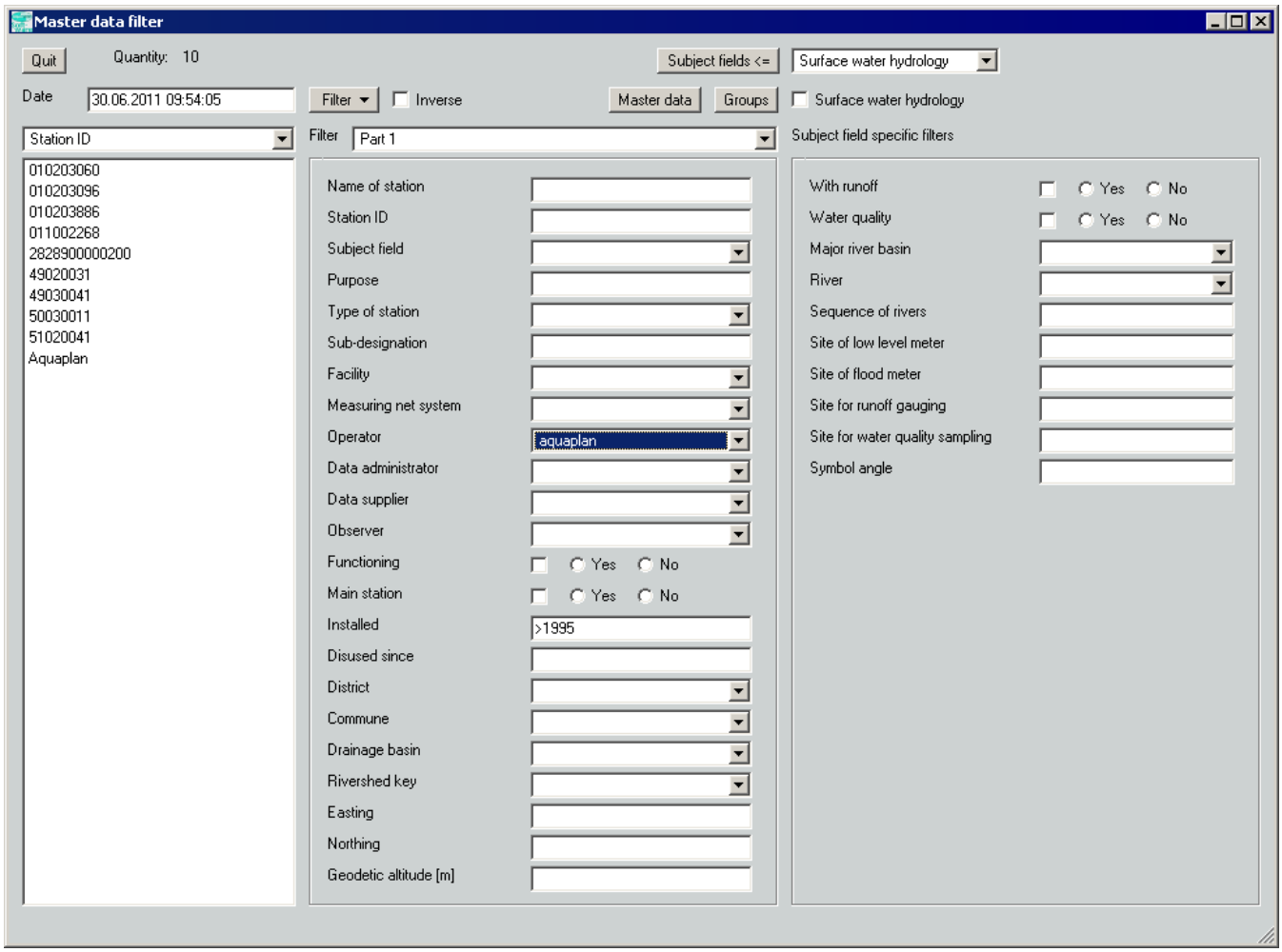


Figure 6.2: Master data filter

6.1.3.2 Filtration procedure

When you enter the filter, the stations selected in the map will automatically appear in the station list in the left section. When no stations are selected, the list stays blank.

In order to change the selection or to select stations, fill in the fields of the three-parted filter according to your search.
For this purpose, you can

- enter an upper or a lower limit in the number and date fields (Installed, Disused since...) by

preceding your input with „>“ or „<“ (> signifies greater-or-equal and < signifies smaller-or-equal).

- limit an area „from-to“
  → this usually occurs via the „–“-character, e. g. when entering dates
  → Exception: Text fields, here hyphens can already appear in the text, e. g. in the station name; to make the entry clear, you enter a double- hyphen „––“ here for„to“

- use WildCards (↪ chapt. 13.5.15) in character fields.

On activation of the checkbox ☑ Inverse, the filtration acts inversely which means that all entries not according to the search request will be searched for.

For the subject-field specific filters you define by means of the checkbox in the upper section whether entries for the according subject field should be regarded during the filtration. When, for example, you have made an entry for the subject field Groundwater ▽, this entry will remain also when you subsequently prioritise the page of another subject field. When the checkbox ☑ Groundwater has been selected, the filtration principles of the groundwater page are adapted regardless of which page is visible.

After you have filled out one or more fields for the filtration, you define with the menu ▽ Filter, whether

- the selection out of all available stations should occur as a New selection (thereby all the already selected stations will first be deselected),

- the existing selection should be retained, plus the new stations found by the filtering procedure (Extend selection) or

- the new selection should result from the already existing selection (Limit selection).

The filtering function will be started in the menu immediately on selection via the menu. The number of selected stations is indicated in the top section of the window.

Once you have completed the filtration process, click Master data in order to open the master data window (↪ fig. 6.3) with the filtered stations.
The button Groups leads you to the window for the set-up and editing of selection groups (↪ chapt. 4.2.3.4). Here you can save the existing selection for later access.

EXAMPLES:

1. **Filter all stations of a subject field**
   → Select in the list Subject field and start the filtration process

2. **Filter all stations of a district**
   → Select in the list District and start the filtration process

3. **Filter all stations which have been installed before a certain date**
   → Enter the *<(date)* in the input field Installed and start the filtration process

4. **Filter all stations of an operator which lie above a certain height**
   → Select in the list Operator and enter the >*(height)* in the input field Geodetic altitude[m], then start the filtration process

5. **Filter all stations whose station-IDs start with „012“**
   → Enter *012** in the input field Station ID and start the filtration process

6. **Filter all gauges of a certain water which were installed within the 1.5.1990 and the 31.12.2005**
   → Select the Water in a subject field specific filter for [Hydrometry ▽], click the checkbox ☑ Hydrometry, Enter *1.5.1990-31.12.2005* in the field Installed and start the filtration process.

6.2 Functions of the master data window

Via the master data window (↪ fig. 6.3) you can modify master data and create or delete stations.

In the left section you find the station list in which you select the station to be edited.
The middle section indicates the characteristics of each station. These are divided into four parts which you can recall in the list above Part ... ▽ .
The section for the specific subject field data and the sensors is located on the right.

The window always presents itself with the same functions, without reference to the filtration via which it is invoked. The only difference is to be found in the entries of the station list. Therefore this module can be used for the presentation of selected master data.

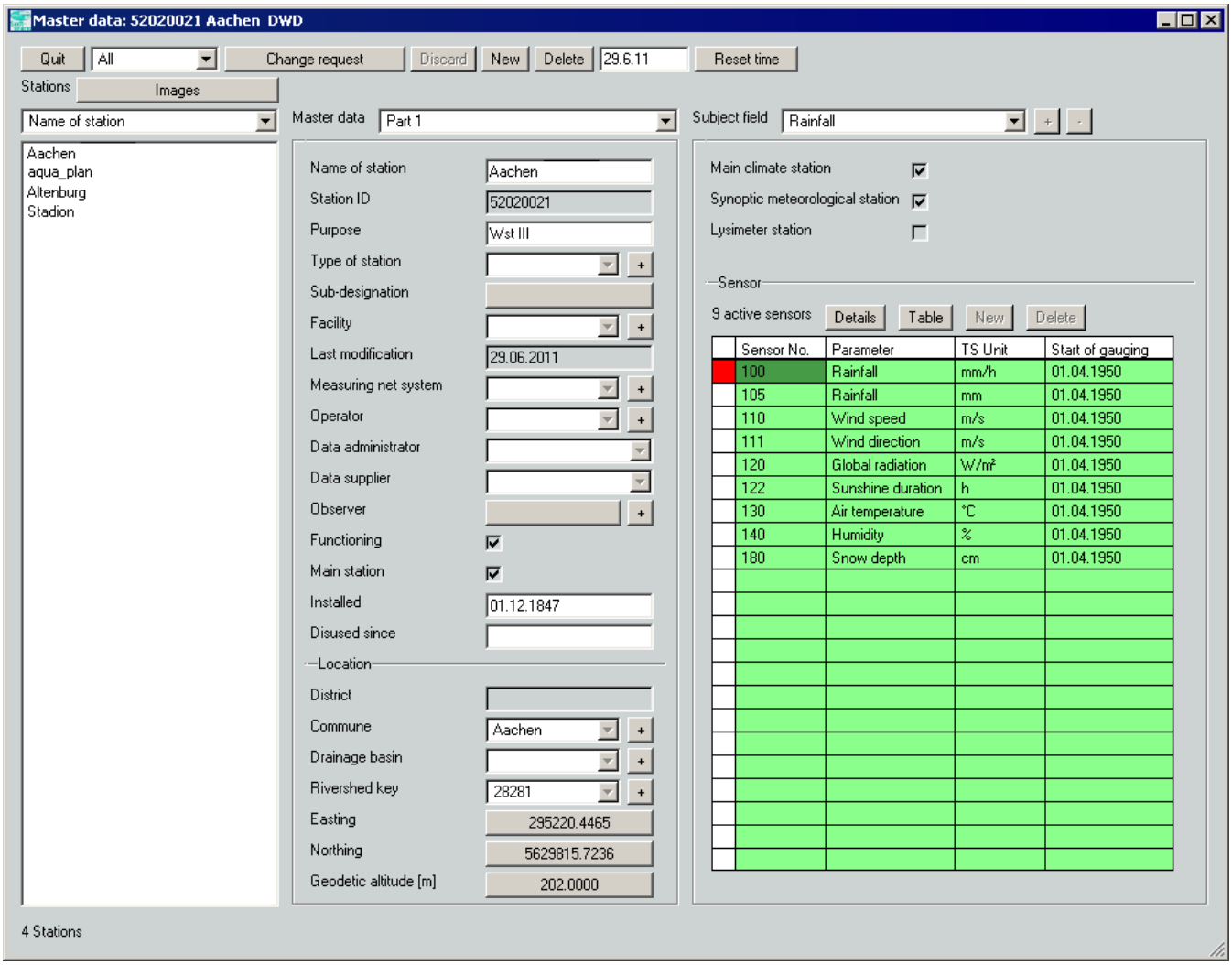


Figure 6.3: Window Master data

Master data is saved according to a clearly defined key, the station-ID. The station will be filed under this designation.

6.2.1 Select stations and display images

6.2.1.1 Station list

In the station list on the left you select the station for which you want to edit the master data. The alphanumeric listing facilitates a fast locating of the desired station.

> TIP:
> Use the keypad to enter the first digit or letter of a station. The marker will then skip to the first entry which starts with this letter or number. (↪ chapt. 13.5.3).

Once a station is marked, all associated master data entries will appear automatically. These can now be completed (↪ chapt. 6.2.2), modified (↪ chapt. 6.2.3) or deleted (↪ chapt. 6.2.4). Read in chapter 6.2.6 how to administrate sensors. The button [Reset time] and its adjacent input field are explained in chapter 6.2.7.

6.2.1.2 Display selection

When you enter the master data window you will find all (or all selected) Stations in the station list. You determine in the list above (the „display selection“) under which master data entry the stations should appear in the list. By default, you choose between the (*Station ID*) and the (*Station*). However, you can also list the stations under any other arbitrary master data entry or combinations therefrom by adding these to the display key in the system settings (↪ chapt. 5.3.4).
The menu [▽ All] in the top section enables you to invoke the stations via subject fields (*Rainfall*, *Water quality*, *Hydrometry*, *Groundwater* etc.).

6.2.1.3 Station images

Click on [Images] to look at images filed in TopoDesk (↪ fig. 4.5).
In order to deposit the images here, you generate a subdirectory pictures in the directory in which TopoDesk is started. This is where you save the images you want to file away with your stations. Thereby, the following conditions must be fulfilled:

1. Images must be in jpg format.

2. The name of each image file must start with the station ID of the respective station (optionally with an added hyphen), e. g. `1AE01station_image1.jpg` or `ENA-map.jpg`. This guarantees the allocation of the images to the according stations.

HINT:
In case you want to rename the directory pictures, enter the following assignment in the file topodesk.ini:
PICTUREDIR=*desired directory name.*
Should the directory be named "images", the entry must read:
PICTUREDIR=images.

Images opens the window in figure 4.5. You choose the desired image with the list in the bottom section (here, the image names are listed without the station ID and hyphen). By using the right mouse button, you can draw a rubberband (↪ chapt. 13.4) to zoom in image details. To zoom out, use the Shift button + right mouse button.

6.2.2 Create new stations

Click the button New in order to set up a new station. The window Create a new station will appear (↪ fig. 6.4).

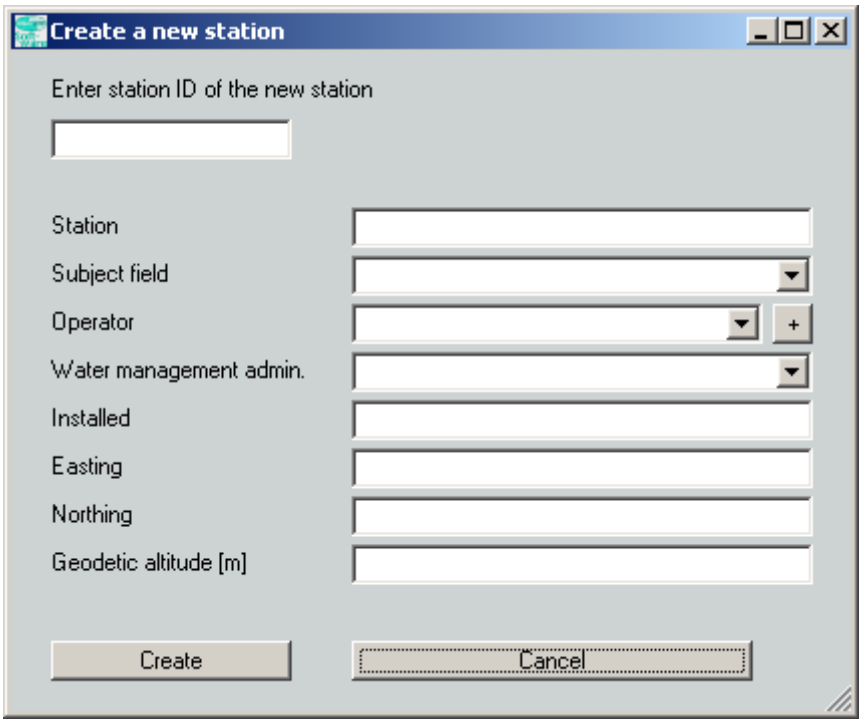


Figure 6.4: Window Create a new station

This input window requires the following details which are compulsory for the creation of a new station:

- Station number (Station ID),
- Station (Name of the station),
- Subject field,

- Operator,
- Water management admin. (Supervisory authority),
- Installed,
- Easting and
- Northing.

The entry of the Geodetic altitude is optional.

> HINT:
> For simple acquisition of the position coordinates, click the according point in the map with the middle mouse button (the more you zoom into the map, the more exact you can click). The easting and northing will then automatically be adapted in the input fields.

Once you have entered all these details, the new station will be included in the list and the entries will be indicated in the master data window. Here, you can now make additions (↪ chapt. 6.2.3). The new station will automatically appear in the map after creation.

6.2.3 Modify master data entries

Any master data entry can be modified as long as you have the required access rights.
In order to avoid simultaneous editing in a multi-user environment, it is necessary to submit a [Change request]. Thereupon, the station is inaccessible for all other users. The button [Change request] changes to [Save], where you can file your modifications in the system. You can, however, also [Discard] your entries.
The modifications are immediately available in all applications after saving.

6.2.4 Delete stations

Stations with all their series can be removed from the system with the button [Delete]. Before the deletion is carried out, a window will appear showing an exact listing of the stations with their time series and sensors to be deleted (↪ fig. 6.5). This way you can either confirm or cancel the deletion.

Since this can be a decision with consequences, a safety query will appear when you click the button [Delete] asking whether you really want to delete this station.

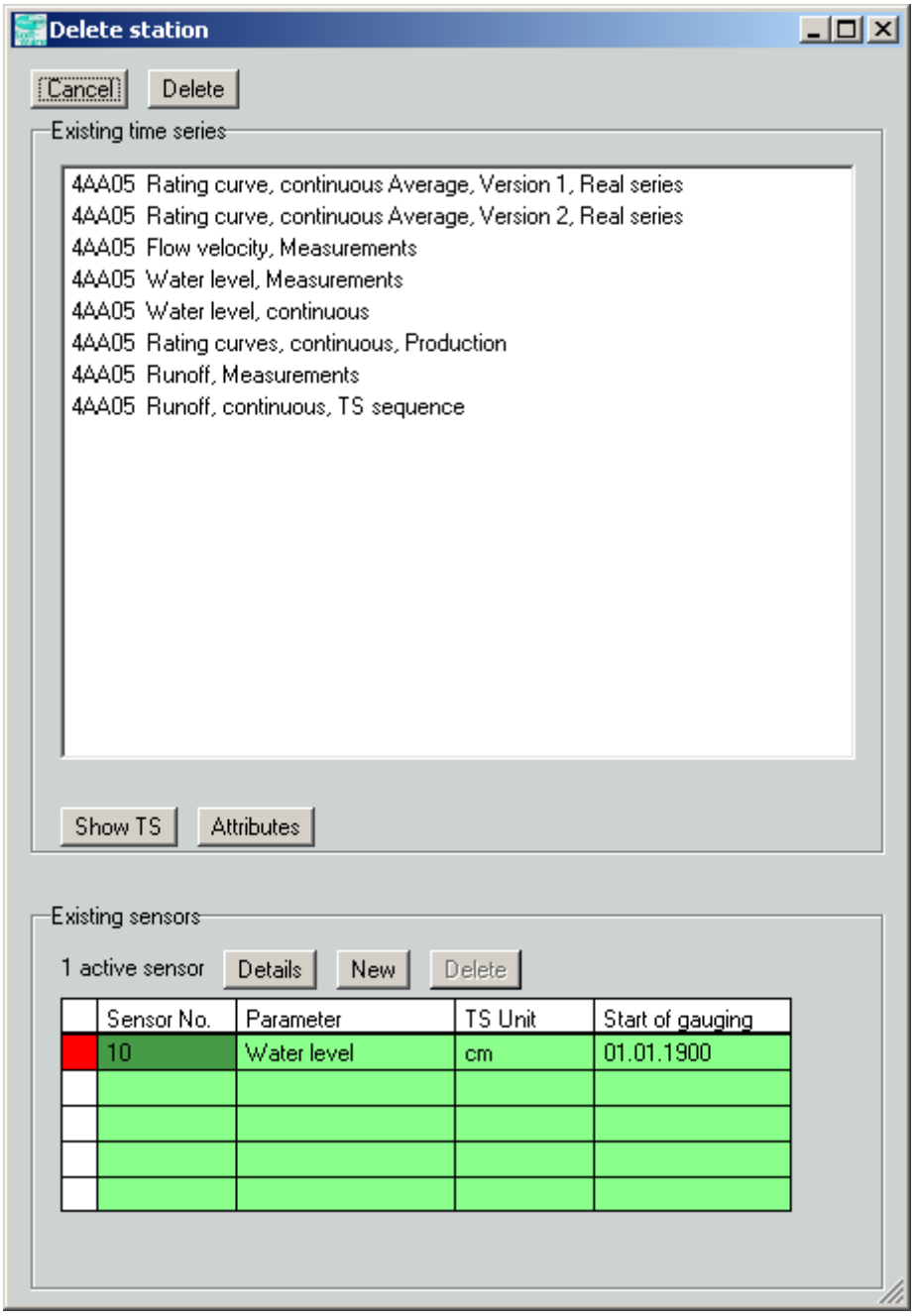


Figure 6.5: Window for the deletion of a station

6.2.5 Data authority

> HINT:
> This chapter is relevant for you only if you operate TopoDesk with different data authorities.

The data administrating institution is determined in the list Data authority. You can only edit stations whose data authority matches your user profile. For all other stations, a change request will not be allowed and all lists will be displayed as blocked entries.
For master data exchange, only those stations can be fed back that are subject to your own data administration.
Also in code-relations, only the own entries can be administrated. New codes are given an according endowment of the administrating location.

> HINT:
> The data administrating location must not necessarily simultaneously be the Operator or Possessor, but the one that is responsible for the station under TopoDesk.

Introduction of a data authority at the own instance

The first declaration of the data authority can be carried out easily:

1. Log in as root
2. Select stations, e. g. by master data filtration according to the operator
3. [▽ File] System settings → Master data → [Define data authority of the selected stations (...)]

> HINT:
> A master data exchange is safe after the introduction of the data authority. The code relations do not clash anymore.

Data authorities for the creation of new stations

When a station is first created, the allocation of the data authority accords to the user profile:

- SuperUser → Main data authority
- User responsible for all data authorities → Main data authority
- User responsible for one data authority → this (his) data authority
- User without responsibility for a data authority → no data authority

6.2.6 Create and edit sensors

With TopoDesk one or more sensors which you administrate in the master data window can be assigned to a station
In case no sensors have been assigned to a station yet, the section Sensor in the master data window will look like in figure 6.6.

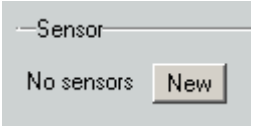


Figure 6.6: Section Sensor in the master data window, when no sensors exist yet

The active sensors are listed in a table in the master data window (↪ fig. 6.7). This table indicates the Sensor No., Parameter, TS Unit and the version. All entries are edited in the Sensor details window (↪ fig. 6.8).

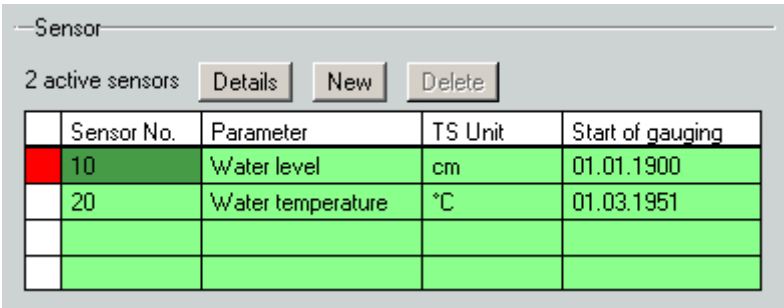


Figure 6.7: Existing sensors listed in the master data window

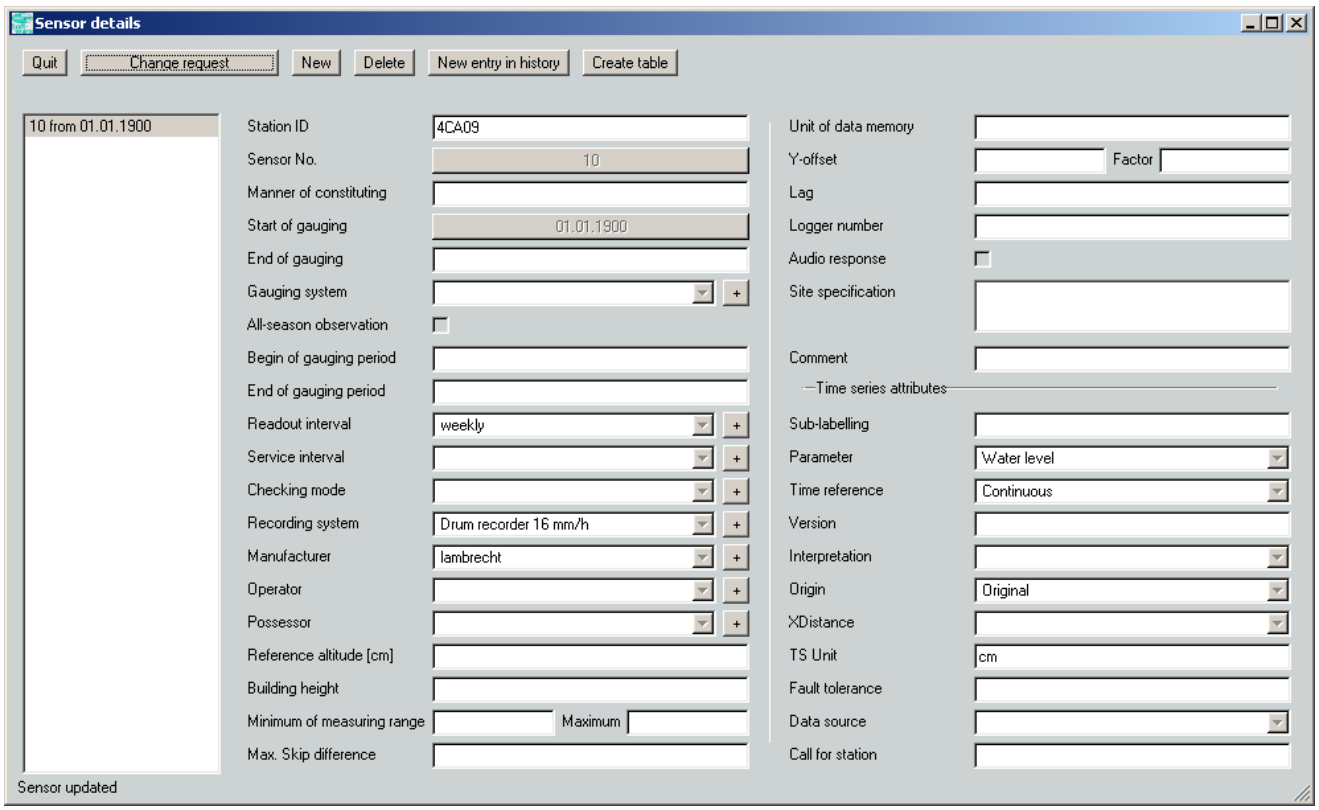


Figure 6.8: Window Sensor details

6.2.6.1 Create new sensor

In order to create a sensor for the selected station, click Create Sensor or New. Before the window Sensor details opens, you will be asked to allocate a number to the new sensor (↪ fig. 6.9).

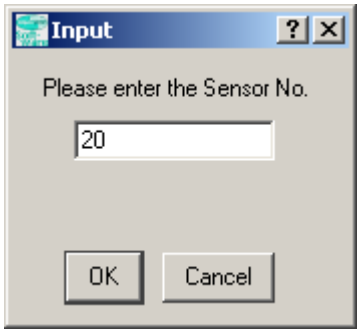


Figure 6.9: Entry of Sensor No.

The system automatically assigns the parameter to the allocated Sensor No. In this connection, the German guidelines for hydrology are respected.

The following list shows the alternative sensor numbers with the associated parameters:

Sensor No.	Parameter
1 - 19:	water level
20 - 29:	water temperature
30 - 39:	oxygen, dissolved
40 - 49:	ph-value
50 - 59:	conductivity
60 - 69:	turbidity
70 - 79:	rH-value
80 - 89:	chloride
100 - 109	rainfall
110 - 119:	wind speed
120 - 129:	global radiation
130 - 139:	temperature
140 - 149:	air humidity
200 - 209:	runoff
210 - 219:	flow velocity
220 - 229:	pressure

In this example (↪ fig. 6.9), the sensor receives the number 20. The parameter "water temperature" is automatically assigned to the sensor and, in the window Sensor details, the fields Station ID, Sensor No., Parameter and TS Unit are occupied.

6.2.6.2 Edit existing sensor

The same window can be invoked for editing an existing sensor. To do this, select the sensor in the table and click Details. The window Sensor details will indicate the attributes of the sensor

which can be edited here directly.
There is a list in the left section in which all existing sensors – with history, if applicable (see below) – are listed and can be selected.
In addition, you can create a new sensor in this window with New (↪ chapt. 6.2.6.1).

Before editing a sensor, it is necessary to submit a Change request.

By means of the button New entry in history you can create and update a history for the sensor. The window in figure 6.10 will appear in which you enter the new date that should apply for the sensor. You will find the respective beginning dates provided in the left list. The sensor data always changes according to the date selected in the list.

Figure 6.10: Changing date for sensor data

Delete deletes the temporal entity of the transducer marked in the list.

Create table creates a transformation directive for data retrieval with CALLISTO.

6.2.6.3 Delete existing sensor

Click Delete in the section Sensor of the master data window in order to remove the red-marked sensor from the system after a safety query.

6.2.7 Time-dependent attributes

Certain attributes are saved time-dependent. These are:

- Sensor,
- Staff,
- Observer,
- Catchment area,
- Easting,
- Northing,
- Geodetic altitude,
- Kilometre marking and
- Cable way installation.

Once information has been given to one of these attributes in the master data window, a time reference must be specified as well. This occurs via a window Relations (↪ fig. 6.11), which opens automatically when you click the button of the corresponding attribute in the master data window. This button can also be unlabelled ([_____]), as long as no entries have been made yet.

When you enter a date in the input field beside [Reset time] and then click the button, all time-dependent data at this stage will be shown in the master data window.

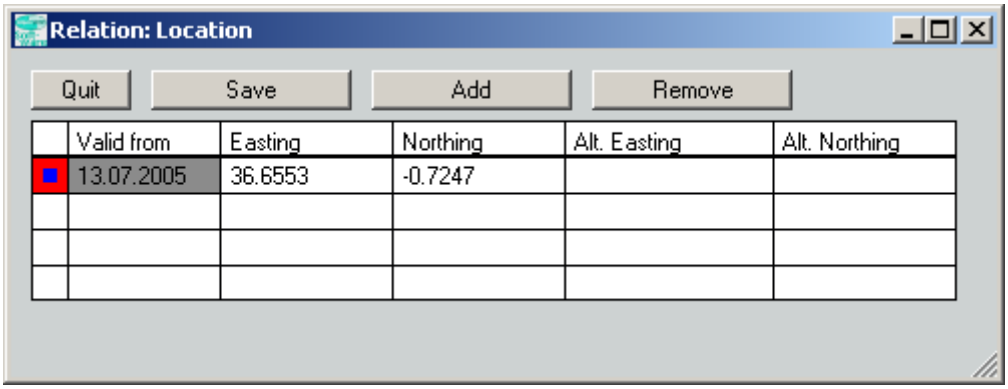
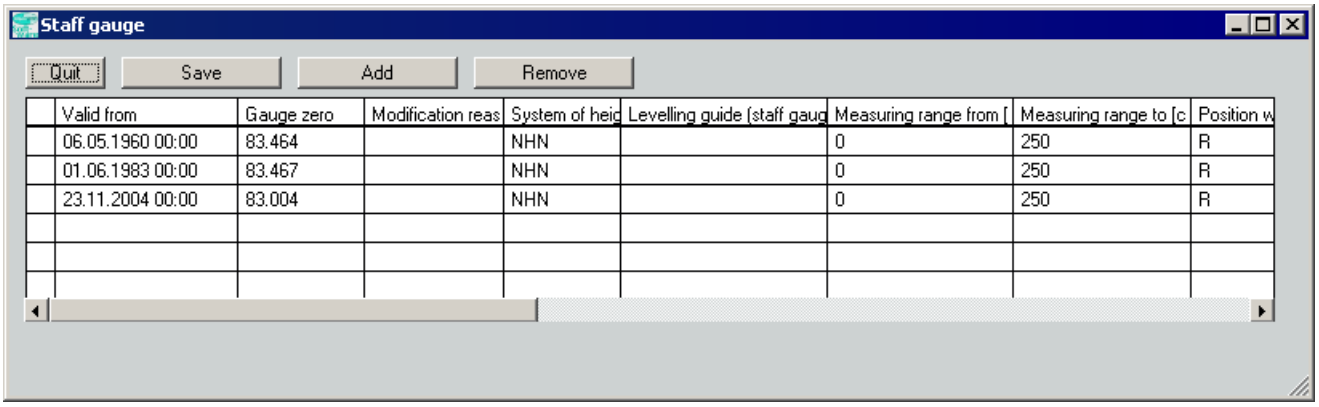


Figure 6.11: Table for editing the coordinates

Characteristic for staff gauge

In the column Modification reason of the relation Staff gauge (↪ fig. 6.12) the following entries are possible:

- G: set
  The gauge was newly set (actually only on new setup, for eigentlich nur bei Neueinrichtung, wirkt aber auch im laufenden Betrieb).
- B: Reference measurement Adjustment of the gauge, the transition from the last height entry is gradual.
- V: Modification
  The modification is abrupt, there is no gradual transition from the previous value to here (like G, but during the operation).
- *no entry*
  Works like B.



Valid from	Gauge zero	Modification reas	System of heig	Levelling guide (staff gaug	Measuring range from [	Measuring range to [c	Position w
06.05.1960 00:00	83.464		NHN		0	250	R
01.06.1983 00:00	83.467		NHN		0	250	R
23.11.2004 00:00	83.004		NHN		0	250	R

Figure 6.12: Relation Staff gauge

6.3 Manage code relations

Code relations are keylists with which you can define list entries.
Thus, all lists of the master data window can be defined freely.

> HINT:
> The list entries can only be changed by users who have the appropriate access rights (↪ chapt. 2.2).

Via the menu item Manage code relations, you access the window in figure 6.13.

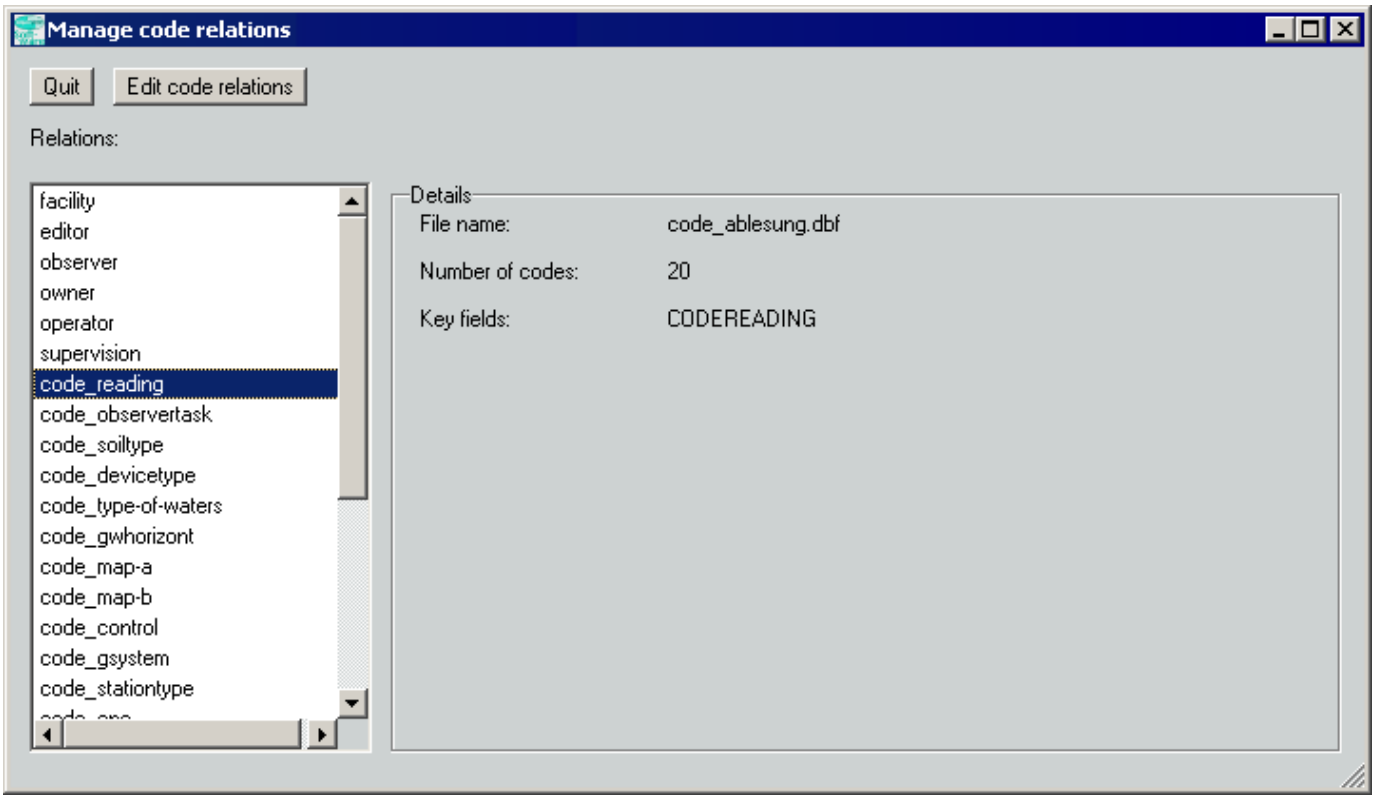


Figure 6.13: Window Manage code relations

Now choose the attribute in the list for which you want to edit the code relations. Details for this attribute will appear in the right section. When you click the button Edit code relations, the according code relation will open as a table. In order to edit this table, you must first submit your change request in the master data window. You will find closer information for editing in tables in chapter 13.6.2.

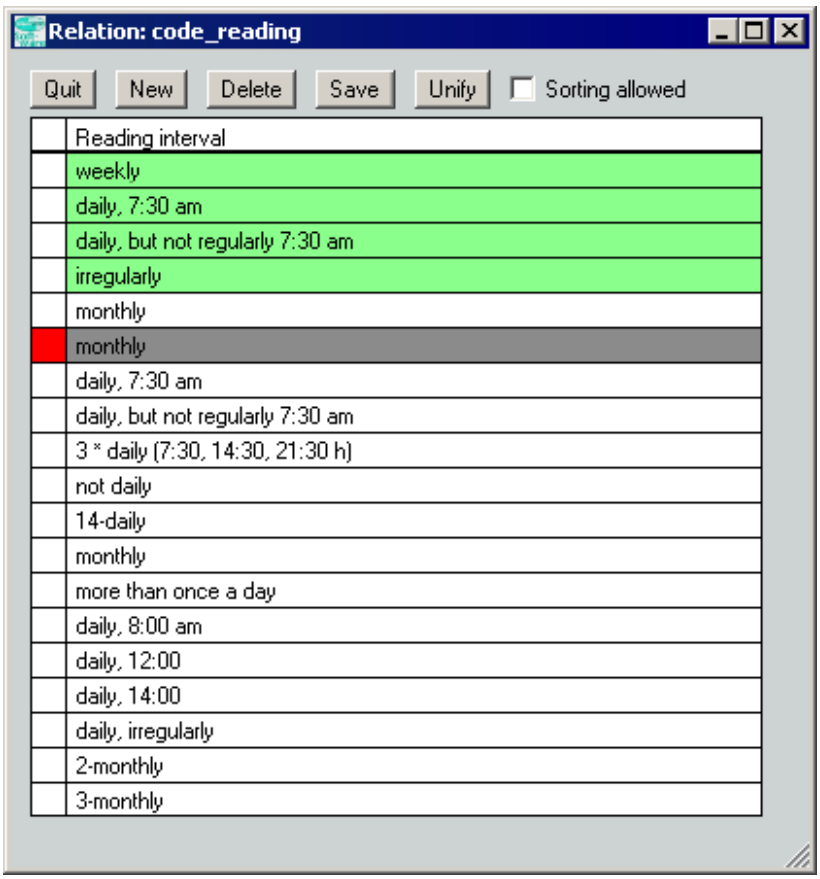


Figure 6.14: Table for editing code relations (River)

6.4 Master data fields

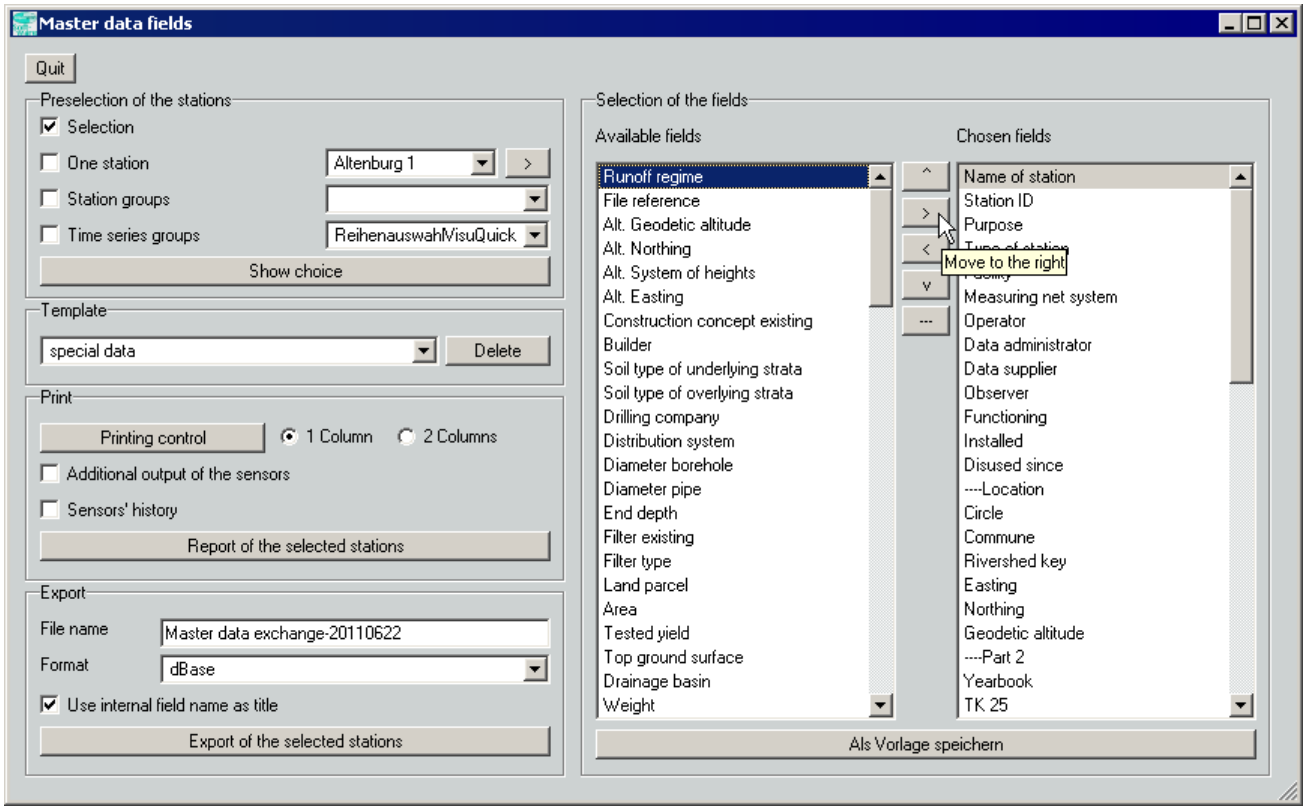


Figure 6.15: Window Report: Master data fields

With TopoDesk you have the possibility to output master data fields in arbitrary compilation in a report and to export these to the dBase or CSV format. This function is available via ▽ Master data → Master data fields.

6.4.1 Preselection Stations

Via Preselection Stations (↪ chapt. 13.7.1) you provide those stations for which you wish to output the master data. An own report is output for each station. For the export, all stations are written in one file.

6.4.2 Field selection

In the frame Field selection you compile the master data fields to be output. In the list Available fields you will find all existing master data fields, in the list Selected fields all fields to be output. The compilation of the fields occurs via the following functions:

- By using the buttons > and < you transport individual fields from left to right or back from right to left.

- The buttons [∧] and [∨] are used for sorting the entries in the list Selected fields for the output. The selected entry is shifted up or down by one position.
- [—] inserts a separator. Via the input window appearing after the click, a text can be entered for the separator (↪ fig. 6.16). The separator will be labelled with this text. When no text is entered, a separator will be generated without a text. To delete a separator, click [<].

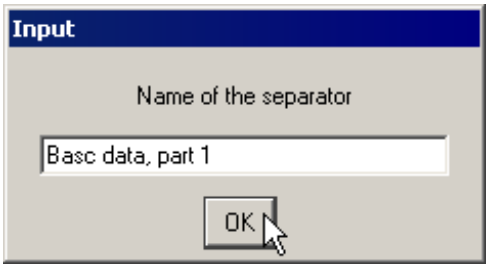


Figure 6.16: Entry of the text for the separator

To prevent your entries from going lost when you are making a different composition, you have the possibility to save entries. Click the button [Save as template] and enter a name for the template in the input field (↪ fig. 6.17).

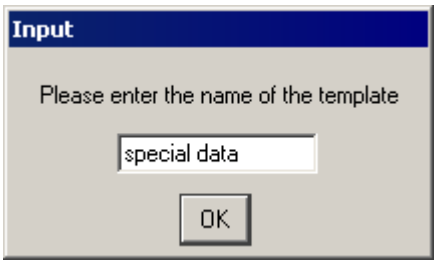


Figure 6.17: Entry of a name for the template

6.4.3 Template

After saving a template, this will be included in the list in the frame Template. Via this list you define according to which template the export or report should be generated. The button [Delete] removes the template selected in the list.

Each user can define an unlimited number of templates for master data attributes. The templates are saved in the user directory.

6.4.4 Print

With the functions in the frame Print you can

- access the output control to make general settings (e. g the portrait or landscape format, output medium etc.) for the report,

- indicate whether the report should be output in one or two columns ,
- define whether you want to ☑ Output the sensor as well as
- the ☑ History of the sensor,
- start the report for the selected stations.

Figure 6.18 shows an example report.

Master data fields

aquaplan

Page 1

Surface Water Hydrology

Altenburg 1

Station ID: 2823900000200

22.06.2011 12:22

Name of station	:	Altenburg 1
Station ID	:	2823900000200
Purpose	:	
Type of station	:	
Facility	:	
Measuring net system	:	
Operator	:	StUA Herten
Data administrator	:	LANUV, Aachen
Data supplier	:	DFÜ-Datenbeschaffer
Observer	:	000290
Functioning	:	yes
Installed	:	06.05.1960
Disused since	:	
Location		
Circle	:	Düren
Commune	:	Inden
Rivershed key	:	28239
Easting	:	315360.5446
Northing	:	5641832.1958
Geodetic altitude	:	
Part 2		
Yearbook	:	Rheingebiet , Teil III
TK 25	:	00000109
DGK 5	:	
Predecessor	:	
Successor	:	
Owner	:	000033
Short ID	:	
Operator ID	:	24004501
Water management ID	:	
State ID	:	2823900000200
External ID	:	
Dataset ID	:	
Water management admin.	:	StUA Aachen
Association	:	
Storage of originals	:	StUA Aachen
Data exchange	:	
Part 3		
Comment	:	Basic measuring site
Location description	:	
Address	:	Inden
Project	:	
Further equipment	:	Cable way installation
Remark	:	01.06.1983: PNP 01.06.1983 = 83,423 mMSL

Figure 6.18: Report Master data fields

6.4.5 Export

In the frame Export you have the functions for the export of the master data fields into the dBase and CSV format.

In the field File name, you can determine a file name. In case the field stays empty, the system proposal will be used.

Since the field names are not allowed to be longer than 10 characters in the dBase format, the internal field names (e. g. BETRID instead of USER-ID) will always be used for the column name

instead of the clear-text names which you see in the two lists Available fields and Selected fields. For the CSV format, the checkbox must be activated if you want to ☑ Use internal field names as headline.

Export of the selected stations operates the export according to the default settings. Then the output path is indicated in the statusline.

> HINT: When the field „Comment“ is output in the dBase export, a dbt file will emerge alongside with the dBase file

6.5 Define main stations

The access of the window for defining main stations (↪ fig. 6.19) occurs via the menu ▽ Master data
.

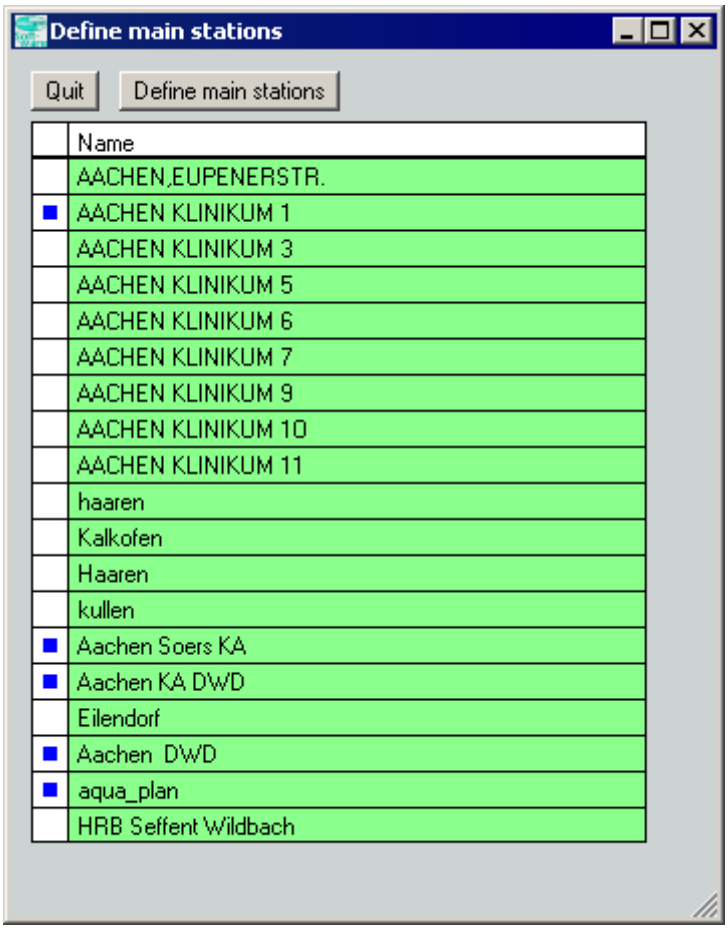


Figure 6.19: Define main stations

All selected stations are listed in the table. To define main stations, mark the desired stations in the first column with the right mouse button (a blue square will appear) and the click on Define main stations.
On renewed access of this window, these main stations are marked and will also be labelled in the master data window (Basic data Part 1) as ☑ Main station.

HINT:
This function is only available for users with administrator rights.

6.6 Define sub-designations

The window for defining sub-designations (↪ fig. 6.20) is also accessed via the menu ▽ Master data .

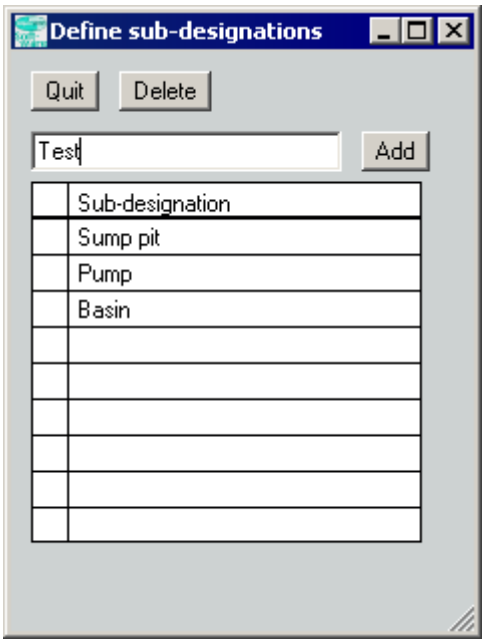


Figure 6.20: Define sub-designations

This window serves the purpose of defining stipulated sub-designations for your TopoDesk-Entity. Enter the desired sub-designation in the input field and then click Add or the Return button. The new sub-designation appears in the table and is now available in all combo-lists for the sub-designation.

HINT:
This function is only available for users with administrator rights.

Chapter 7

Time series

Via the menu ▽ Time series , you reach the functions for the administration and deletion of time series.

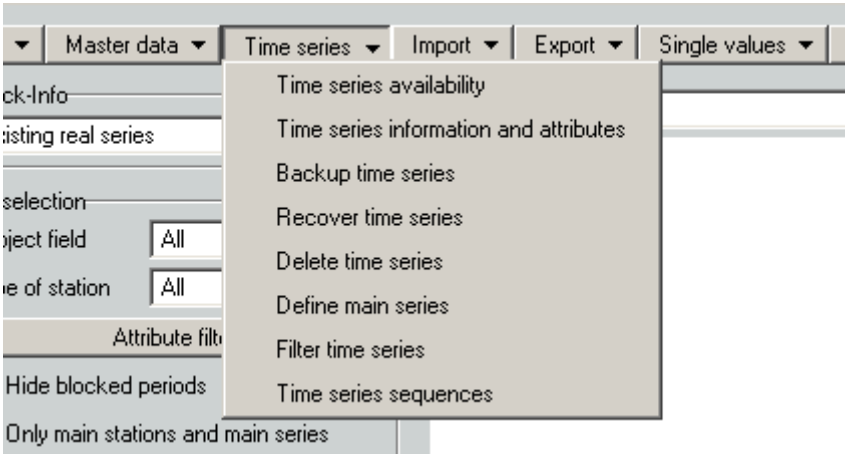


Figure 7.1: Menu Time series in the main window

In topodesk, time series are assigned to the measuring sites. For one measuring site, several series can be distinguished on the basis of their identification attributes. Via these identification attributes, the series are accessible.
Once an identification attribute of a series is changed, another series comes into existence.

> HINT:
> A time series is clearly defined by its identification attributes.

The identification attributes of a series are:

1. Station (location)
2. Sub-location
3. Parameter

4. Parameter-characteristic
5. Source
6. Interpretation
7. Origin
8. Version
9. Type of series
10. Time reference
11. Time step (X Distance + X Factor)

Beside the identification attributes, each series possesses interpretation attributes (unit and fault tolerance). Interpretation attributes determine how the series is interpreted by the system.
By means of the unit, all time series values can be processed due to their dimension. In the first place, the fault tolerance serves the removal of collinear, superfluous supporting points (nodes) in continuous time series. In addition, it is used in many applications in order to determine the number of decimal places when displayed as figures.

7.1 Time series availability

By means of the window Time series availability, you can check the existence of series for all or for selected stations without spending too much time. The search for series can be bound to a time period by clicking on the checkbox ☑ Maximum gap quota [%] 10 in period [ ] [ ].

For the search of time series, proceed as follows:

1. Select the stations in the map for which the time series availability should be inquired
2. If necessary, make the appropriate presets in the Attribute filter (↪ chapt. 4.2.3.2 and fig. 4.8) or choose the desired parameter in the ParameterList (↪ fig. 4.9).
3. Choose the subject field for which series should be searched (you can also select *All* here)
4. Activate the checkbox and enter the corresponding percentage if a maximum gap should be set (for this purpose, a time period must be entered)
   → when the checkbox stays deactivated, the general existence of series will be examined
5. Click the button [Filter stations]

Only those stations that fulfill the stated preconditions stay selected after the search. The map section focusses on these stations, if required.

By means of the button [Show stations] you enter a table in which all found stations are listed (↪ fig. 7.3).

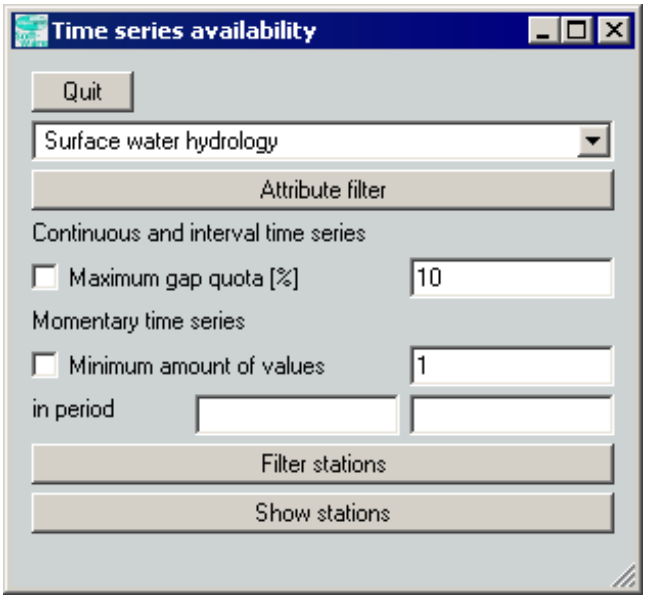


Figure 7.2: Time series availability

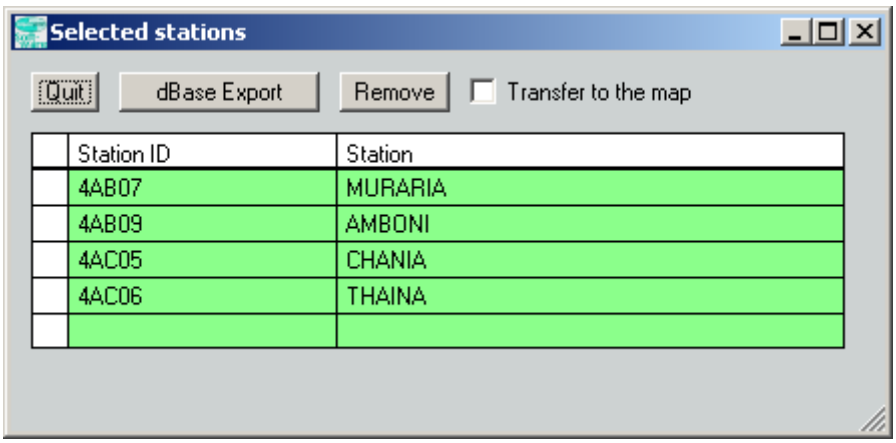


Figure 7.3: Listing of the found stations

7.2 Time series sequences

The window Edit TS sequences (↪ fig. 7.6) can be approached via ▽ Time series → Time series sequences.

Any sort of time series periods of different time series can be combined with this module. These periods can originate from different stations. Also parameter, interpretation, x-type, origin and version can differ. Solely the unit must be compatible.
By means of a vast number of conversion functions, all sections of a time series sequence can be edited. Most of the time series sequences in topodesk consist of only one or two sections. Runoff-, gauge datum- and oxygen saturation time series sequences always consist of one section only.

The result is a time series which does not store values but a regulation defining which section of which initial time series should be accessed. The time series sequences are thus not filed as copies of their assigned time series but as a construction regulation. The great advantage of this is that modifications in the assigned time series are always immediately on hand in the time series sequences. This is why the time series sequences need not and cannot be edited themselves. Accordingly, the system prohibits their editing.

> HINT:
> By means of the functions for editing time series sequences, it is also possible to link the predecessor and the successor of a station together.

7.2.1 Attributes of a time series sequence

The resulting time series always has the origin **F** and the series type **Z**.
Time series sequences are thus available as an additional source area of time series and so can be selected in all relevant menus (for instance in the time series selection (↪ chapt. 13.7.3) or in the attribute filter). Figure 7.4 exemplary shows the shortlist Origin of the attribute filter (↪ fig. 4.8).

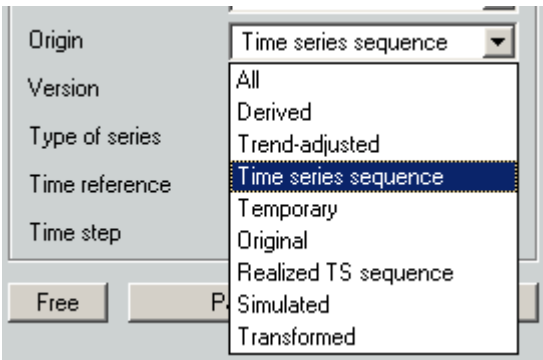


Figure 7.4: Selection of a time series sequence in the attribute filter

7.2.2 Texts of a time series sequence

There are two possibilities for the texts of a time series sequence:

1. **Texts of the initial series**
   A time series sequence generally adopts the texts of its initial time series. These can be made visible or switched off in the individual modules.

2. **Own texts**
   Alternatively, own texts can be generated for time series sequences. This occurs via the usual modules (e. g. TopoVit). On creation of the first text of a time series sequence, an acompanying time series will be generated which exclusively contains the texts of this TS sequence. When an accompanying time series exists for one of the time series sequences, it is not possible anymore to transfer the texts of an initial series (s. Point replaced by1).

7.2.3 Create and delete time series sequences

In order to create a time series sequence, select the corresponding station in the station list. Possibly already existing time series sequences will now be displayed in the window. When no time series sequences exist yet, the tables stay empty.

For the creation of a new time series sequence, click the button [Create]. The window in figure 7.5 will open where you define the time series sequence.

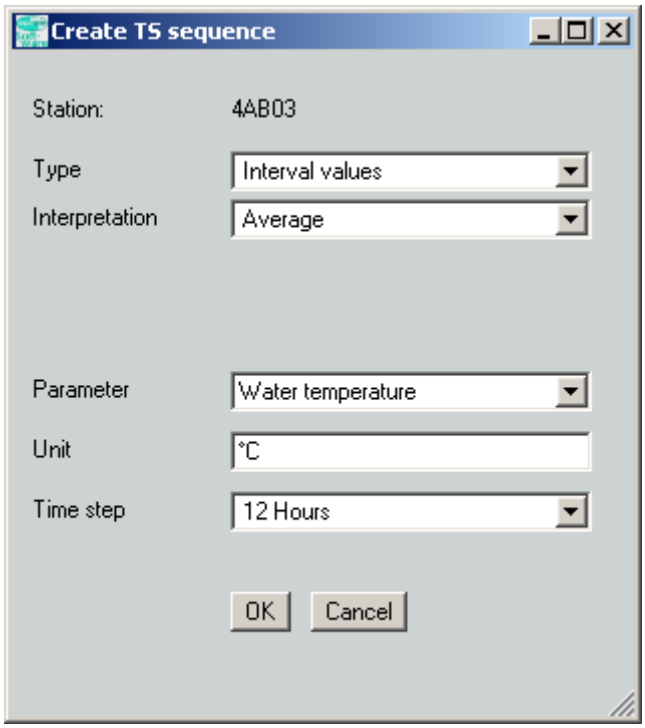


Figure 7.5: Window for the creation of a new time series sequence

Once you have made the desired settings and confirmed these with [OK], the new time series sequence will be created and absorbed in the table TS-sequence, but will not contain any data yet.

In the second step, you assign one or more time series to the new sequence. This occurs with the button [Insert] under Assigned series. The window Time series selector opens (↪ chapt. 13.7.3, fig. 13.10). With its help you filter those series needed for the sequence out of the existing time series.

In case you want to insert one of the here listed series into your time series sequence, mark the according series and click OK. (A double-click here leads to the same result.)
The window subsequently closes and the series is indicated in the table Assigned series.

In order to construct a time series sequence, the beginning of each validity period of the individual periods must be specified. Click Insert to enter the beginning of the period in the column From (Date) in the table **Formulas:**.
A period ends when a new one begins. The column Formula need not necessarily contain an entry.

The according button Delete removes either one of the assigned series or one of the formulas.

You can Delete the red-marked time series sequence any time.

7.2.4 Formulas of a time series sequence

When you create a time series sequence, the relevant series according to the sequence type will automatically be assigned and combined in a formula.

The formula for

Type: *Interval values - Minima*
Parameter: *Water level*
Time step: *Day*

for example, reads as follows:

$$IMIN(ZR1, 1d)$$

and will so automatically be indicated in the column Formula.

Note: ZR stands for TS = Time Series, d for day.

HINT:
The formula and the assignment are not generated automatically when you select *continuous (free)* under Type for the creation.

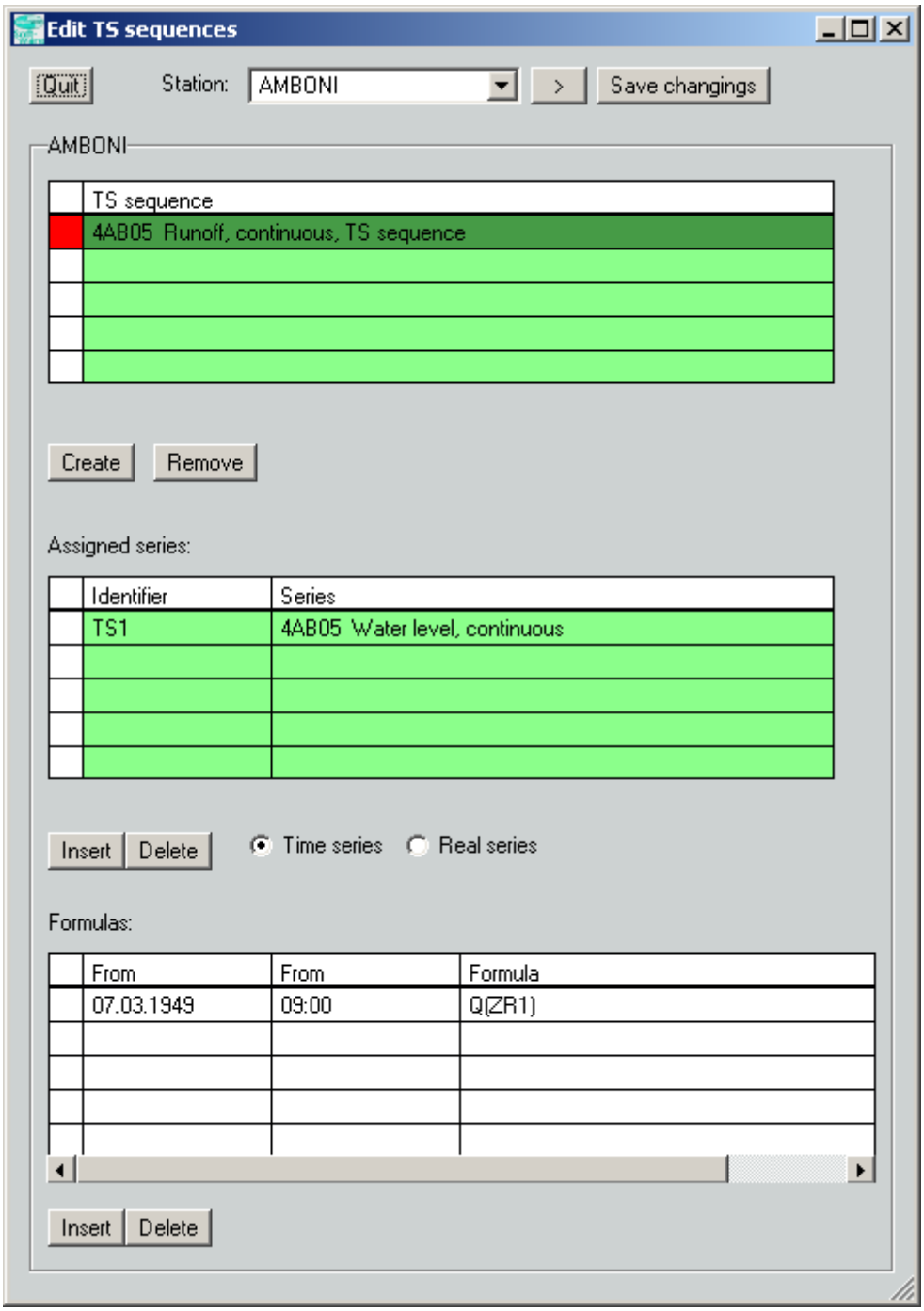


Figure 7.6: Window for editing time series sequences

7.2.4.1 Structure of a formula

A formula can consist of any arbitrary number of terms connected by +. Each term consists of a time series identifier or a time series evaluation with an optimal factor or a constant.

Examples:

- $zr1 * 10 + 1490$

- $IMit(zr2, 1d) + zr1$
- $ZR1 * ZR2$
  usable, for instance, for water quality:
  Ammonia transport $[g/s]$ = *Runoff* $[m^3/s]$ * *Ammonia concentration* $[mg/l]$
  or runoff calculation:
  Flow cross-section time series $*$ *Velocity time series*

7.2.4.2 Possible operations

- $IMit(zr, breite[, maxlueckproz])$
  calculates interval averages (width: arbitrary distance, for instance T or M). By means of *maxlueckproz* (optional) you can generate gap intervals when you have too many gaps in the initial series.
- $IMax$ (same as $IMit$)
  calculates interval maxima.
- $IMin$ (same as $IMit$)
  calculates interval minima.
- $ISum$ (same as $IMit$)
  calculates interval sums.
- $ILck$ (same as $IMit$)
  calculates gap quantum per interval.
- $MMax(zr, breite)$
  calculates maxima as instantaneous values (with point in time).
- $MMin$ (same as $MMax$)
  calculates minima.
- $GMit(zr, breite)$
  calculates moving average values. The calculation is very time-consuming for wide distances (>1 day).
- $GMin$ (same as $GMit$)
  calculates moving minima.
- $GMax$ (same as $GMit$)
  calculates moving maxima.
- $Q(zr)$ or $Q(zr, quelle)$
  calculates the runoff out of the water level time series.

  The parameter Runoff can generally be a test or a production version. Should this distinction be made possible, this must be declared in the file `topodesk.ini` using the following entry:
  `ABFLUSSPRODUKTIONTEST=TRUE`
  The test version serves the creation of examined and tested rating curves, curve validities

and reduction values. It can be developed and edited freely and parallely to the production data. The production data serves the publication. Once the test data has been stored satisfactorily, it can be adopted in the production version. The distinction into test and production version occurs for curve validities, reduction values and runoff.
The system either allows **one** runoff time series sequence without specifiction of the source (e. g. $Q(zr1)$) or **two** parallely existing runoff sequences requiring a source specification (e. g. $Q(zr1, P)$ or $Q(zr1, T)$).

- $QvonV(vzr, wzr, FvonW[, kvonW \text{ or } k])$
  calculates the runoff from the flow velocity v and the water level w. $FvonW$ is the curve which calculates the cross-sectional flow area via the water level. If v is not the mean flow velocity but only an approximation (e. g. an acoustic discharge measurement), a second curve can be indicated with $kvonW$ which indicates the connection between the measured v and the mean v or a factor k which does not depend on W.

- $O2Sat(o2zr, tmpzr)$
  calculates the oxygen saturation out of the oxygen concentration and the water temperature. The calculation needs to take into account the altitude of the gauge which is found in the attribute Altitude() of the O_2-time series.

- $I2K(zr)$
  converts interval time series into continuous time series. Here, the discretisation gets lost and it may appear as though the series shows a higher information density as actually existing. Thus, this operation is to be chosen with caution.

- $M\ddot{U}0(zr)$
  does not access the time series, but only its location. Calculates a continuous gauge zero time series according to the associated master data.

- $SCHWELLE(zr, > wert \text{ or } < wert)$
  calculates a time series which filters out all values below or above a threshold value („wert“). Time periods which do not fulfil the criterion are set as gap.

- $VH(zr)$
  calculates the evaporation according to Haude. ts is the temperature time series. The air humidity time series is accessed as well with same location (if this ts is not present, the vapour pressure time series is accessed). The involved time series can be of arbitrary DefType, it is always the maximum between 12 and 3 pm per day that is accessed. The result is a daily averages time series.

- $PRIO(zr1, zr2, ...)$
  generates a time series which contains the data of $ts1$, or, in case $zr1$ presents a gap, the data of $ts2$ etc.

- $Func(zr1, kurve)$
  converts the values in $zr1$ by means of the function which is defined by $kurve$. $kurve$ must be a real series.

- $Kalib(zr1, kzr)$
  calibrates $zr1$ by means of the time series kzr, which contains calibration values (check measurements). kzr should be an instantaneous time series.

- $MPH(zr1[, zr2])$
  calculates the time series of the measuring point height (upper pipe edge) of a groundwater measuring station. The heights are taken from the master data (Location from $zr1$). The reason for the height entry (reference measurement or change) either leads to a sliding transition from measurement to measurement or to an abrupt change. The data of $zr1$ will not be used. When not only $zr1$, but also $zr2$ is indicated, it is a matter of reductions (quarter values), that devide up sliding transitions.

- $GOK(zr1[, zr2])$
  works analog to MPH. However, instead of the measuring point height, the time series of the ground level is calculated. There are no abrupt changes.

- $GWStand(zr1[, zr2])$
  calculates the difference zr1-zr2, whwereupon, however, only the inflexion points from $zr2$ will appear. The texts are adopted from $zr2$.

- $Ueberfall(b, wktyp, \mu, h|hZR, W_{oben}[, W_{unten}])$
  This formula calculates the runoff above a weir hydraulically. b is the weir width, $wktyp$ the type of the weir crest (1=broad-crested, 2=roof-shaped weir, 3=standard profile (1), 4=standard profile (0.42), 5=sharp-crested) and μ is the overfall coefficient. Optionally, a weir height h or a weir height time series hZR can be indicated. This is followed by the headwater level time series and possibly the tailwater level time series (by means of which a free overfall and a submerged overfall are defined and calculated). The coefficient σ_{uv} is calculated according to the type of weir crest $wktyp$.

  The entries for b, $wktyp$, μ and h can also alternatively be field names from the master data which contain the values. The tupel is automatically informed about the location of the TS sequence.

- $Mul(zr1, zr2)$
  calculates the product of $zr1$ and $zr2$. The units are checked and the values are adjusted, if necessary.

- $Div(zr1, zr2)$
  calculates the quotient of $zr1$ and $zr2$. The units are checked and the values are adjusted, if necessary.

- $Mittel(zr1, zr2, ...)$
  calculates the mean value of all time series. The gaps in a time series will not be considered, i. e. from area to area the mean is only composed of those time series which contain values in these periods.

- $Abl(zr1)$
  calculates the derivation of $zr1$.

- $QSpende(zr1)$
  calculates the discharge rate for zr. zr must be a runoff time series. The size of the area is adopted from the master data.
- $AEO(zr1)$
  generates the time series of the catchment area in km^2 for $zr1$.
- *Luecke*
  inserts a gap.

7.2.4.3 Abbreviations in the formulas

zr = ts (time series)

I = interval

Mit = mean

Max = maximum

Min = minimum

Sum = sum

Lck = gap

quelle = source

Chapter 8

Single values

The menu Single values in the main window provides the functions for gathering single values.

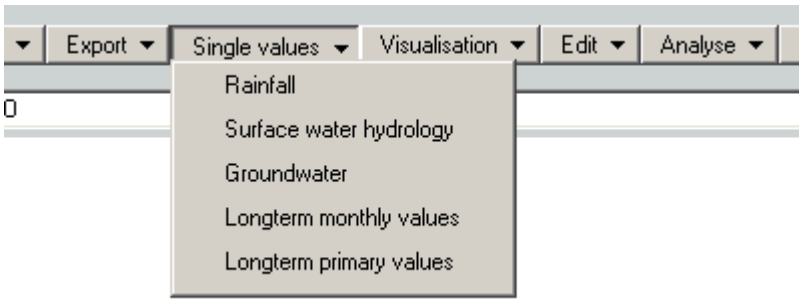


Figure 8.1: Menu Single values in the main window

Single values of the following subject fields can be fed:

- Rainfall,
- Surface water hydrology and
- Groundwater

as well as the statistical parameters

- longterm monthly values and
- longterm primary values.

8.1 Single value entry

By means of the Single value entry you can enter values such as daily values, comments etc.

Single values are gathered in a special table (↪ fig. 8.2 and 8.5). Principally, the codes of practice for table editing apply here as well (↪ chapt. 13.6.2).

> HINT:
> The structure of the window for single value entry is always the same, no matter which subject field you have chosen.

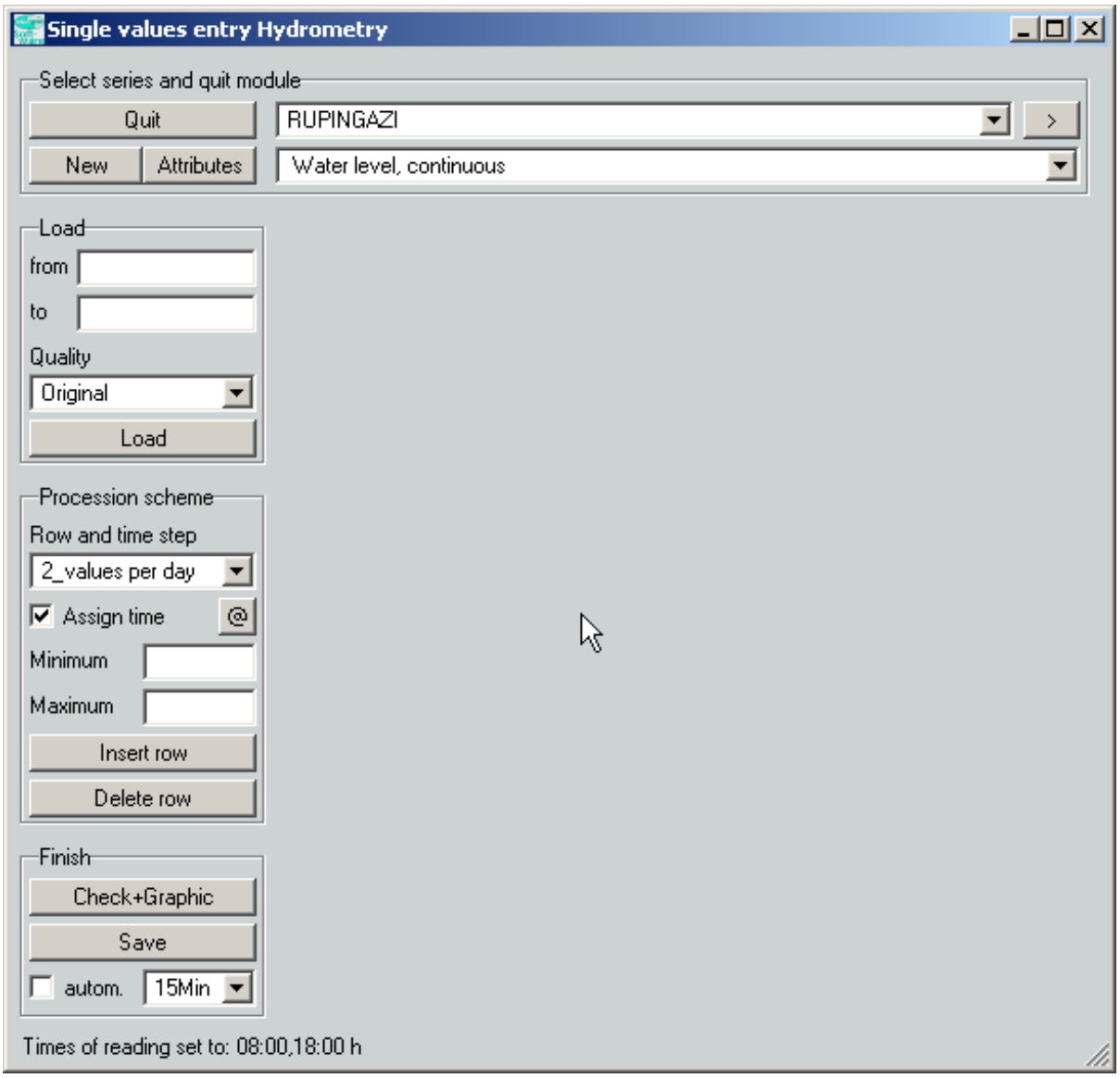


Figure 8.2: Window Single value entry on invocation

The several functions of the window are clarified on the basis of the Single value entry Rainfall.

8.1.1 Select/create/edit series

8.1.1.1 Select series

You can select the station you want to edit in the station list (↪ chapt. 13.5.4) in the top section of the window. On selection of a station, a further list appears automatically which holds all series existing for the station and the subject field (↪ fig. 8.3). All further editing steps refer exclusively to the series selected with this list.

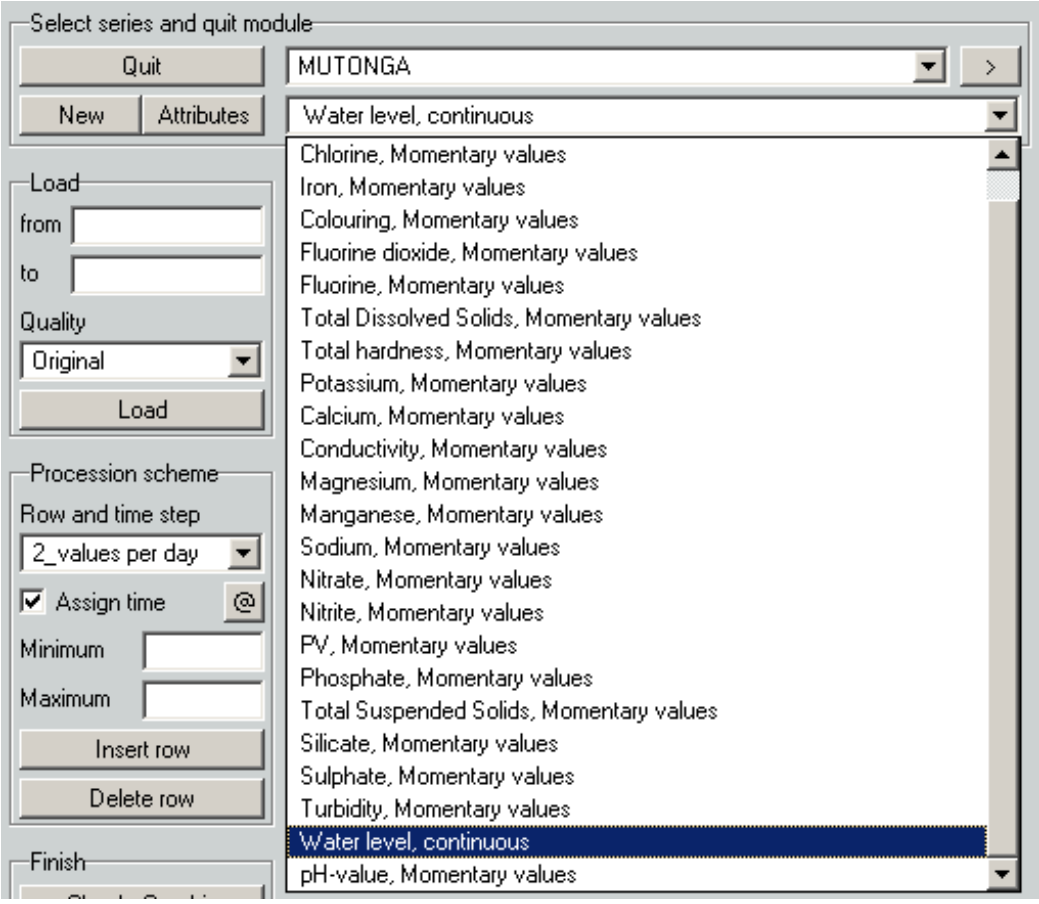


Figure 8.3: List for selection of the series

8.1.1.2 Create series

When you click New, you open the window Create series (↪ fig. ??). How to create a new series is described in chapter ?? .

8.1.1.3 Edit the attributes of the series

In order to edit an already existing series, click [Attributes] to open the window Time series information and attributes (↪ chapt. ??, fig. ??). Here you can check and, if necessary, modify the attributes.

8.1.2 Load

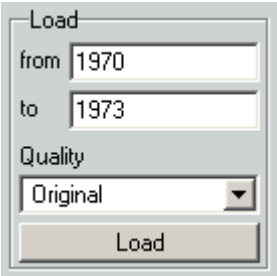


Figure 8.4: Frame Load in the window Single value entry

In order to load a series in the table, specify the editing period. TopoDesk either inherits this from the main window or you enter it in the fields from and to. When both fields are skipped, the time period from the last value pair up to the present date is opened (when there are no values yet, TopoDesk automatically loads the last month up to the current date). When you skip the field to and when the beginning date lies beyond the existing series, the connexion value is indicated on the left as well. And vice versa: when from is skipped and the terminal date does not lie in the existing time series, the connexion value appears on the right of the table.

The quality layer to be edited can be modified with the list [original ▽] .

When you click [Load] or Return while the curser is in one of the time input fields, the series will be loaded in tabular form (↪ fig. 8.5).

> HINT:
> The editing period cannot be modified during the capture process.

8.1.3 Procession scheme

For the capture of new data, enter the date, the time and the measured value in the table. In addition you can assign a text to each date in the column Comment.

New dates can be inserted at the beginning, the end, or between already existing rows. Even if you don't keep the chronological order, the entry is accepted and sorted to the right location.

The cursor automatically jumps to the next field when you click Return. By means of the checkbox ☑ active above the table, you can define in advance whether you want to initialize the cursor with just the value, just the comment or both (in any case, one of either column must be completed since the entry only makes sense when a value or/and a comment has/have been assigned to a date). For the navigation within the table, it is advisable to use the Tab-key or the cursor keys (← ↑ ↓ →).

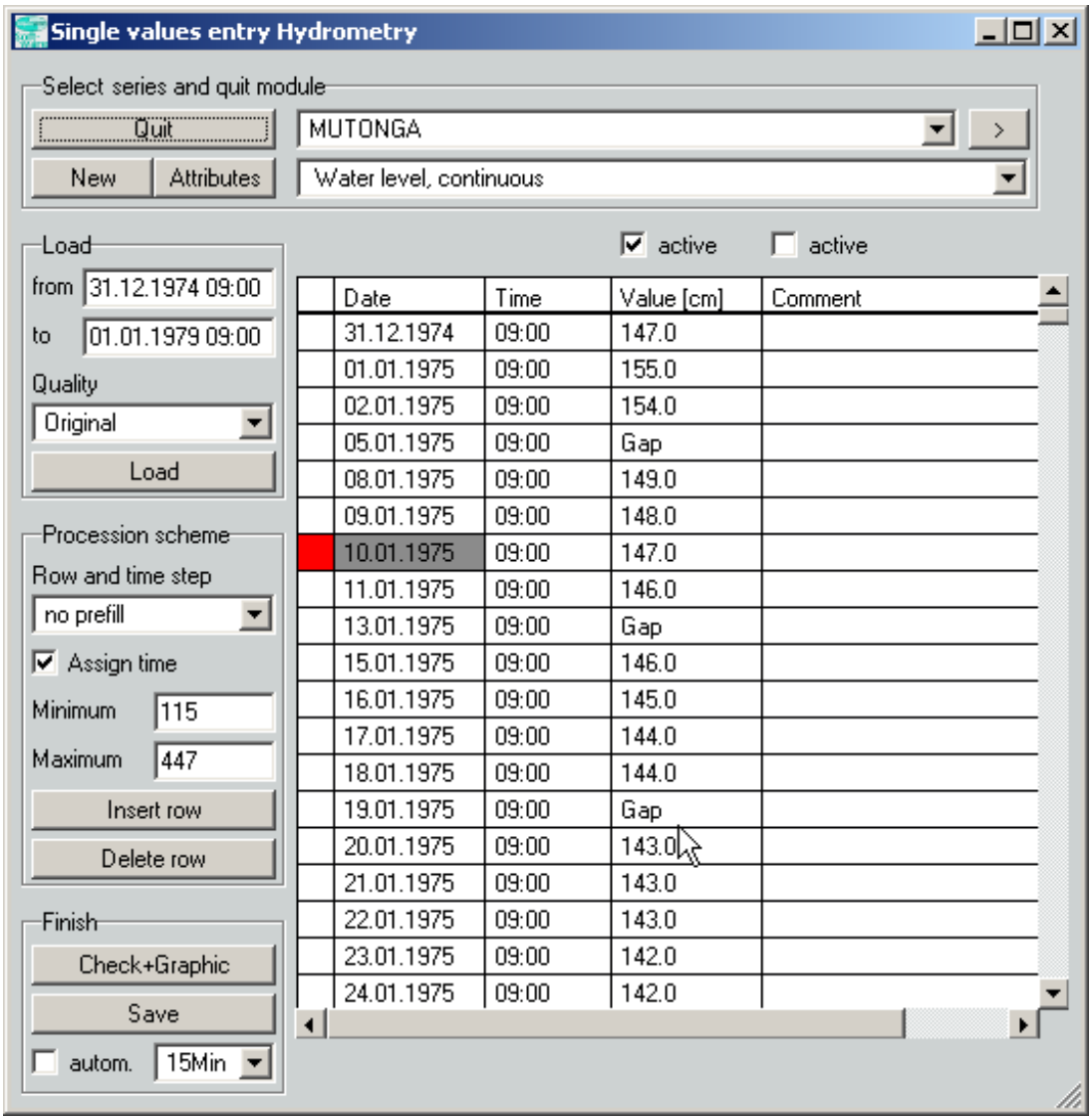


Figure 8.5: Window Single value entry Rainfall

In the frame Procession scheme (↪ fig. 8.6) you find additional functions to ease your work with capturing larger amounts of data.

You can narrow down the choice by using the list Row and time step to select in which time lag you wish to record the data.
After entry of the last row and completion with Return, a new row is attached and directly initialized with the according time.
Thereby the time intervals of the gathered sums must not necessarily stretch from 7:30 to 7:30 as the German common practice would be (for the example Rainfall) but can correspond with the actual times of the liquid output gauging. A sum value always stretches chronologically from the time in the previous row up to the current time. Thus, in the table you gather a pluviometer sum value with the time of the discharge metering.

Available for the preallocation are:

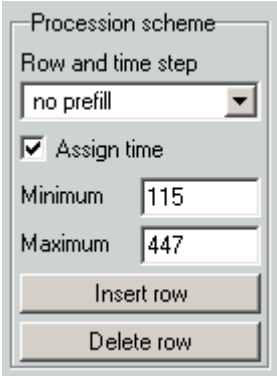


Figure 8.6: Frame Procession scheme in the window Single value entry

- No auto-newrow → no new row is added after the last one
- No prefill → a new row is added whose columns stay blank (e. g. when the data was sent in irregular intervals)
- 2 values per day → allocates the succeeding rows so that two values can be gathered per day; you can define the times of reading by using the button [@]
- 3 values per day → allocates the succeeding rows so that three values can be gathered per day; you can define the times of reading by using the button [@]
- 30 Minutes → the next row is preallocated with the point of time 30 minutes later
- 1 Hour → the next row is preallocated with the point of time 1 hour later
- 2 Hours → the next row is preallocated with the point of time 2 hours later
- Day → the next row is preallocated with the next day
- Week → the date exactly one week later is preallocated
- Month → the day exactly one month later is preallocated
- Year → the day exactly one year later is preallocated

In case the measuring times are always identical, you can set the time for the succeeding row with the checkbox ☑ Assign time. The time of the previous row or the time preselected with [@] is registered automatically (the date must be preallocated for this function).

You define the range outside of which no values are accepted with the input fields Minimum and Maximum. This way, plausibility limits which are useful for the series to be edited, are set. The system automatically suggests a minimum and a maximum. These correspond with the existing minimum and maximum values of the last year. However, you can also modify these values. Once you enter a value in the table which falls below or exceeds these limits, a selection window as in picture 8.7 appears. When the entered value is correct, even though it lies outside, you can now adjust the limits.

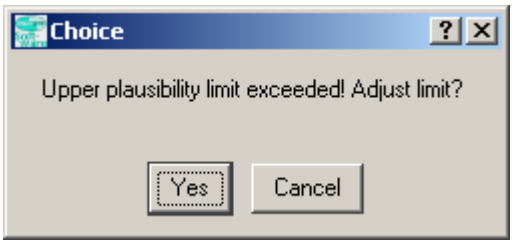


Figure 8.7: Query for plausibility limit

The list below allows the entry of a standard text in the comment line. The entry mode is determined by using the adjacent checkbox: when the checkbox is ticked, the text is attached to an already existing comment, when the checkbox is not ticked, the standard text will replace the comment. In order to enter a comment, select the desired line with the mouse (red mark in the first column) and then choose the desired comment in the list.

> HINT:
> A non-measurable rainfall is expressed by the value 0 and the comment *unverifiable*. In a later generated tabular report, the value will appear as '0.0' on the contrary to '•' (for no rainfall).

By means of the button Insert row, you open a new table row below the one marked with a red field.
With Delete row(s) the red-marked row is deleted (↪ chapt. 13.6.2).

8.1.4 Finish

Figure 8.8: Frame Finish in the window Single value entry

With Check and Graphic you have the possibility of checking the entries before saving. A window appears with the axbox (↪ fig. 8.9) in which you can check your work once more visually. At the same time, the system checks the entries for plausibility. Possible objections are indicated in the status line.

> Characteristic of the graphical check:
> When you click a row in the table once the axbox is open, an arrow appears indicating this date in the axbox.
> Contrariwise, a date can be marked in the table by using the trigger Tab.? and by clicking a date in the axbox. (↪ Abb. 8.10)

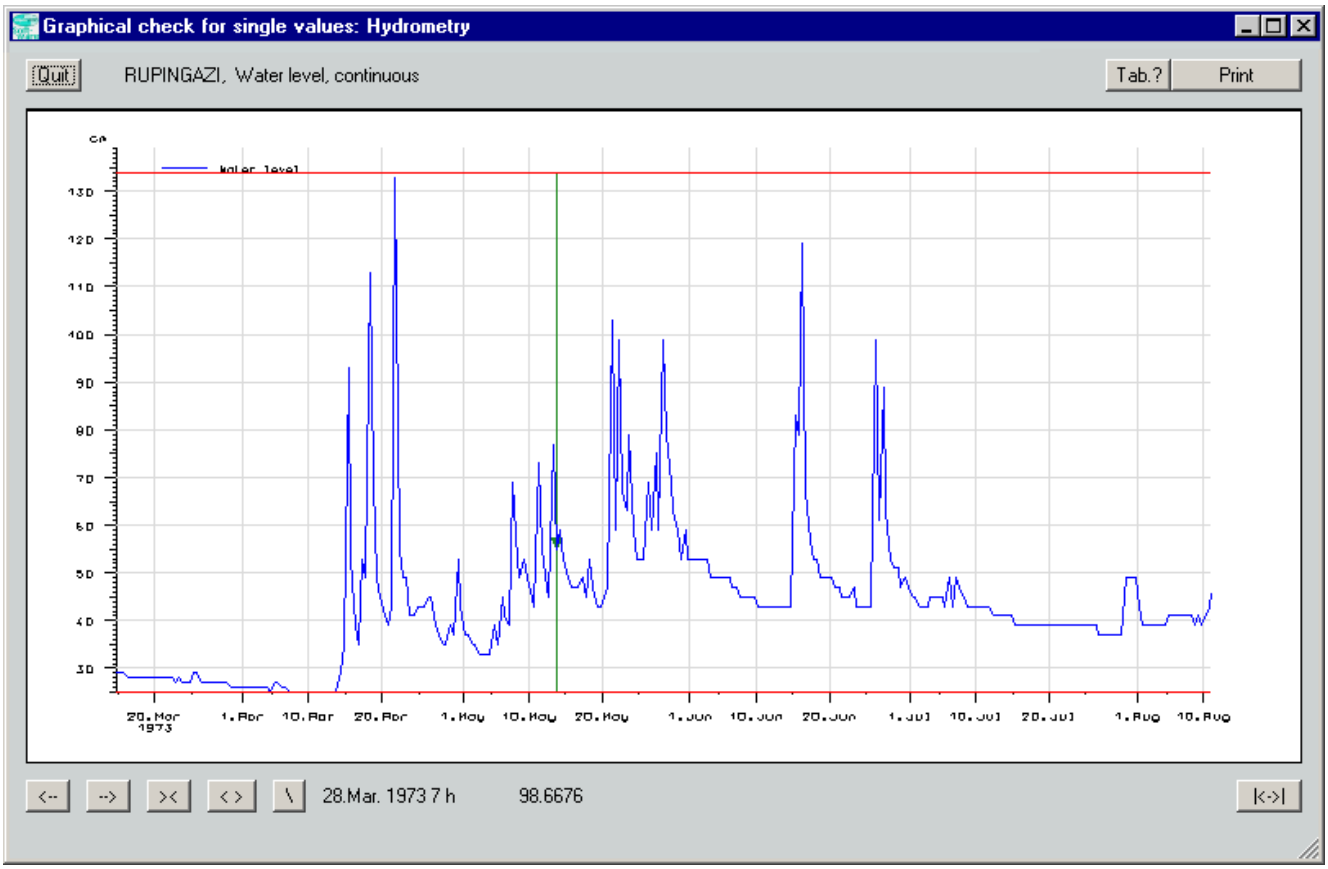


Figure 8.9: Axbox-check single value entry

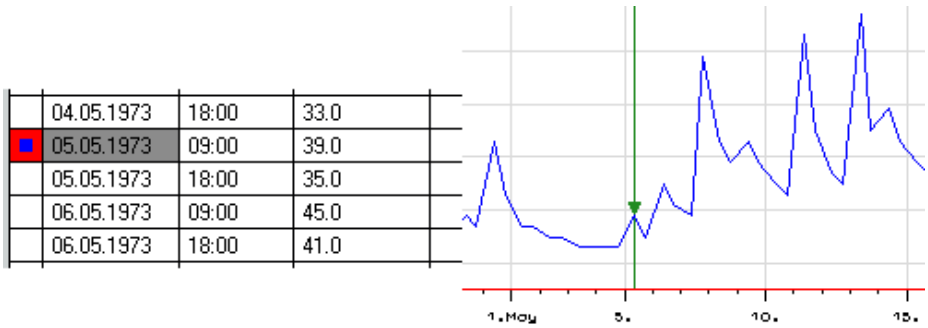


Figure 8.10: Marked date in table and axbox

Click [Save] to store your entries. When you exit the window after the editing process without having saved beforehand, a query will appear asking if your entries shall be saved (↪ fig. 8.11).

With the functions in the bottom section you can also have your entries saved automatically. Choose the time interval in the list and activate the automatic saving by aid of the checkbox ☑ autom..

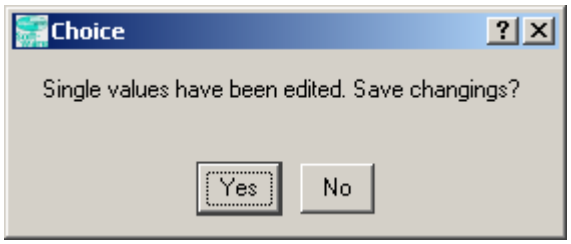


Figure 8.11: Query for saving on exit of the single value entry

8.2 Gathering of statistical characteristic magnitudes

The menu entries Longterm monthly values and Longterm primary values open up two entry windows for saving the average performance of monthly values deriving from a longterm monitoring (↪ fig. 8.12) and the primary values (↪ fig. 8.13).
The station to be edited must be selected before the invocation. Select the parameter in the parameter list or via the attribute filter in the main window.

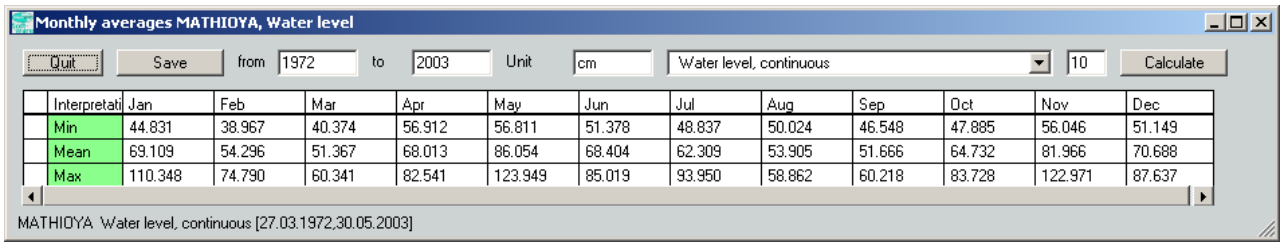
Longterm values can be entered for each existing series. These are subsequently used for certain evaluations (reports, graphics).

How to work with tables is explained in detail in chapter 13.6.2.

The values of the longterm behaviour gathered in both tables are opposed to the values of a selected water year in the reports for longterm behaviour (↪ chapt. **??**).

> HINT:
> It will soon be possible to calculate the statistical characteristic magnitudes from the data existing in the system by means of this window. The actual purpose of these entry windows, however, is the arrangement of longterm values exceeding the existing digital data in the system.

8.2.1 Longterm monthly values

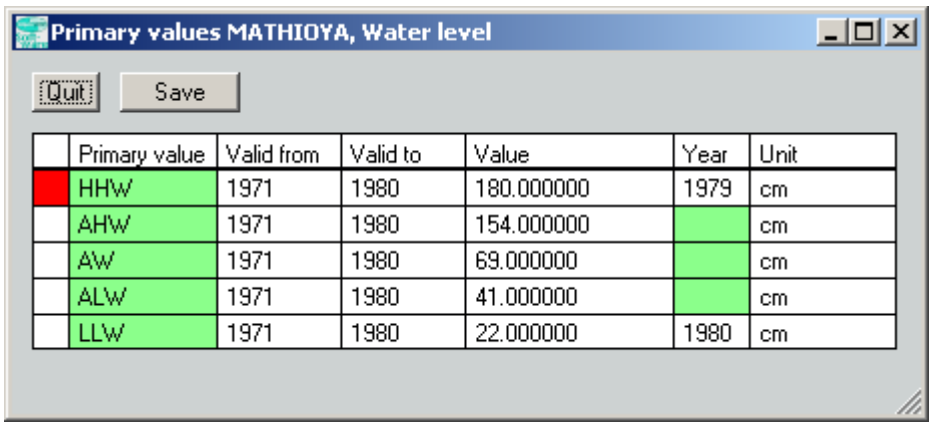


Interpretati	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min	44.831	38.967	40.374	56.912	56.811	51.378	48.837	50.024	46.548	47.885	56.046	51.149
Mean	69.109	54.296	51.367	68.013	86.054	68.404	62.309	53.905	51.666	64.732	81.966	70.688
Max	110.348	74.790	60.341	82.541	123.949	85.019	93.950	58.862	60.218	83.728	122.971	87.637

Figure 8.12: Table for the entry of longterm monthly sums

This table stores solely the lowest, mean and highest monthly **sums**. The parameter rainfall is an exception. In the case of all other parameters you enter monthly **means**.

8.2.2 Longterm primary values



	Primary value	Valid from	Valid to	Value	Year	Unit
	HHW	1971	1980	180.000000	1979	cm
	AHW	1971	1980	154.000000		cm
	AW	1971	1980	69.000000		cm
	ALW	1971	1980	41.000000		cm
	LLW	1971	1980	22.000000	1980	cm

Figure 8.13: Table for the entry of primary values

Primary values can only be edited for the parameters *Waterlevel* or *Runoff*. The table stores the values for LLW, ALW, AW, AHW, HHW and LLQ, MLQ, MQ, MHQ, respectively, with reference period.

Chapter 9

Visualisation

When you enter the menu ▽ Visualisation in the main window you approach the applications for the display of series with TopoVit.

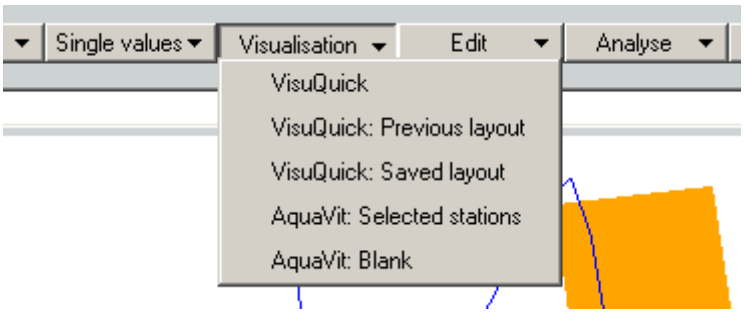


Figure 9.1: Menu Visualisation in the main window

TopoVit serves the visualisation and editing of time series. You can have up to fifty selected stations displayed in the map immediately after opening.

9.1 Visualisation and editing (TopoVit)

9.1.1 Introduction

The menu ▽ Visualisation leads you to TopoVit.

By aid of TopoVit you can visualise time and real series and edit them graphically and tabularly. The series can originate from different subject fields. Three axboxes are at your disposal in order to display and edit the series.

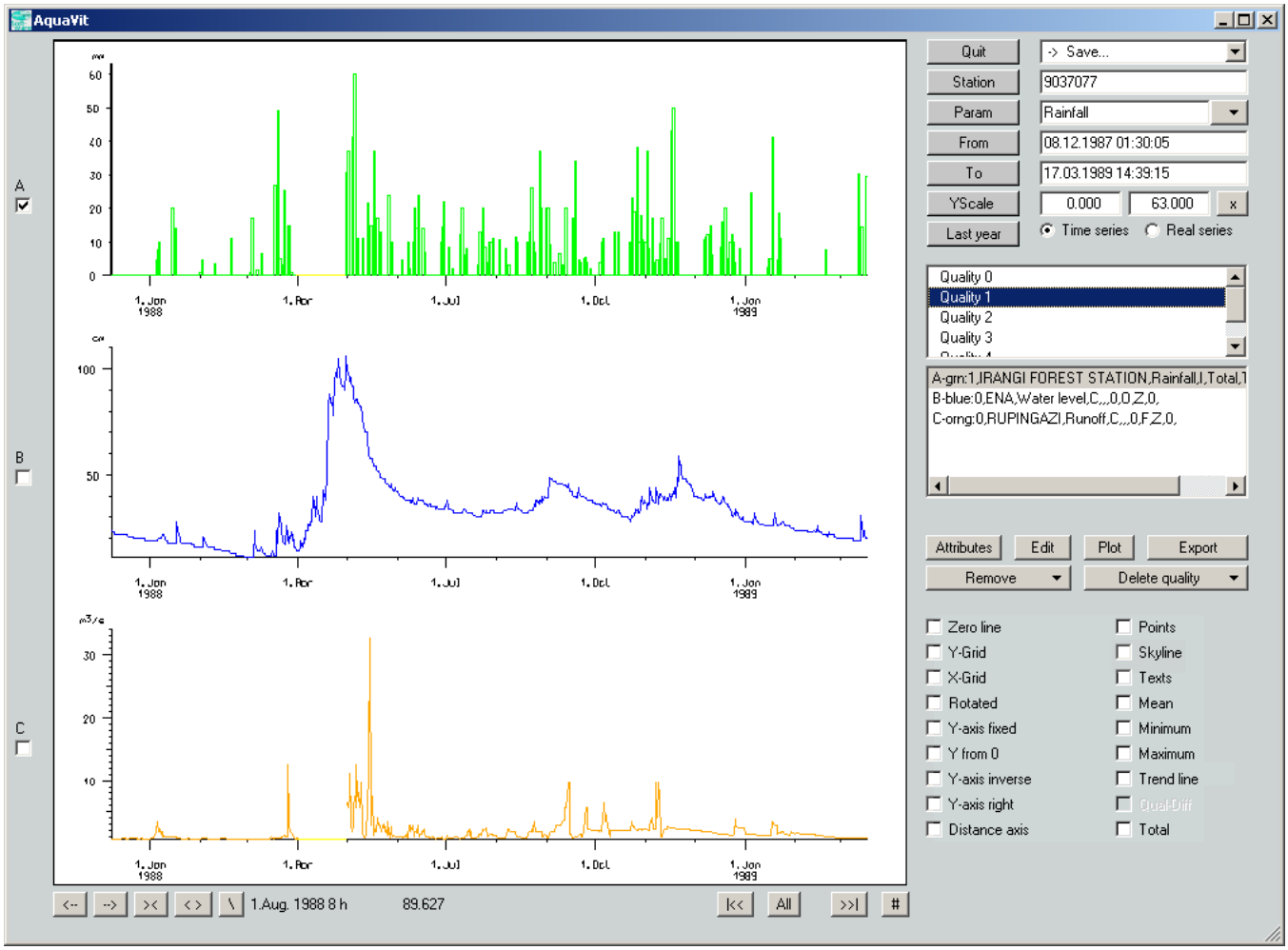


Figure 9.2: TopoVit-window

9.1.2 Axboxes

In the following, the axboxes of the TopoVit-window are specified. The general use of axboxes is described in chapter 13.5.17.

The graphical section offers space for up to three axboxes (↪ fig. 9.3).
In order to display a graphic, specifications must be made for station and parameter. Read in chapter 9.1.3.1 how to proceed.

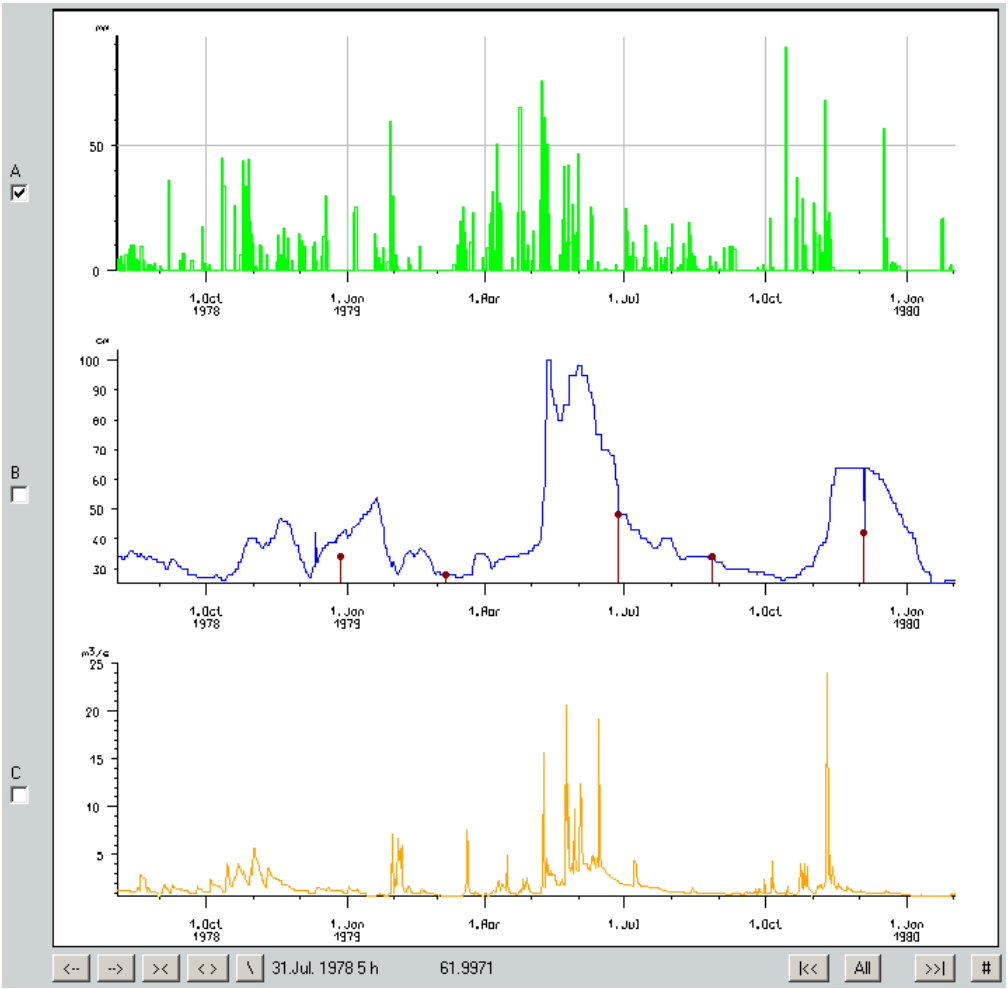


Figure 9.3: The graphical display with three axboxes

9.1.2.1 Navigation in the axboxes

You have two possibilities to select axboxes:

1. Choose the desired axbox with the three checkboxes on the left ☑ A, ☑ B or ☑ C.

2. Single-click the according axbox with the left mouse button.
   In order to see an axbox in full-size view, click it again. As shown in figure 9.4 it now fills in the whole graphical section. The other axboxes are hidden. Each further mouse click switches between full-size and normal view.

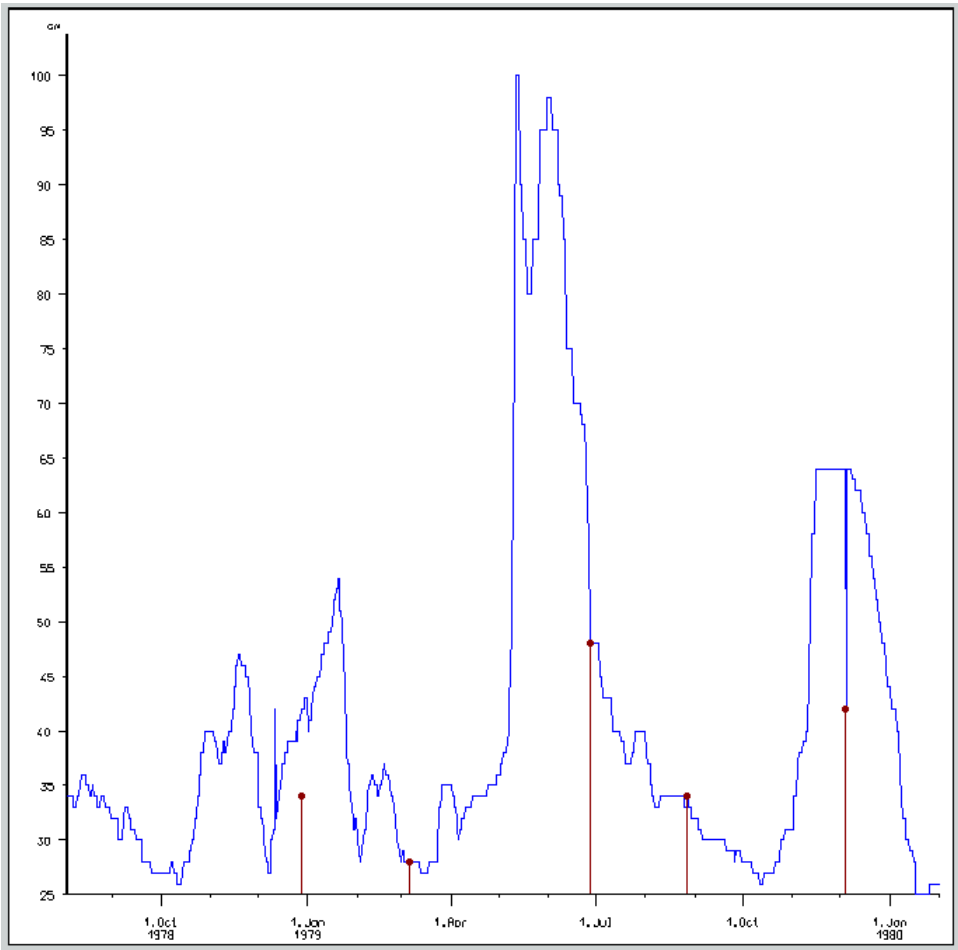


Figure 9.4: Axbox in full-size view

In order to enlarge a section in an axbox, draw a rubberband around this section by clicking and holding the right mouse button. The frame you have drawn fixes the new time interval and the Y-scaling for the display.

9.1.2.2 Edit axboxes

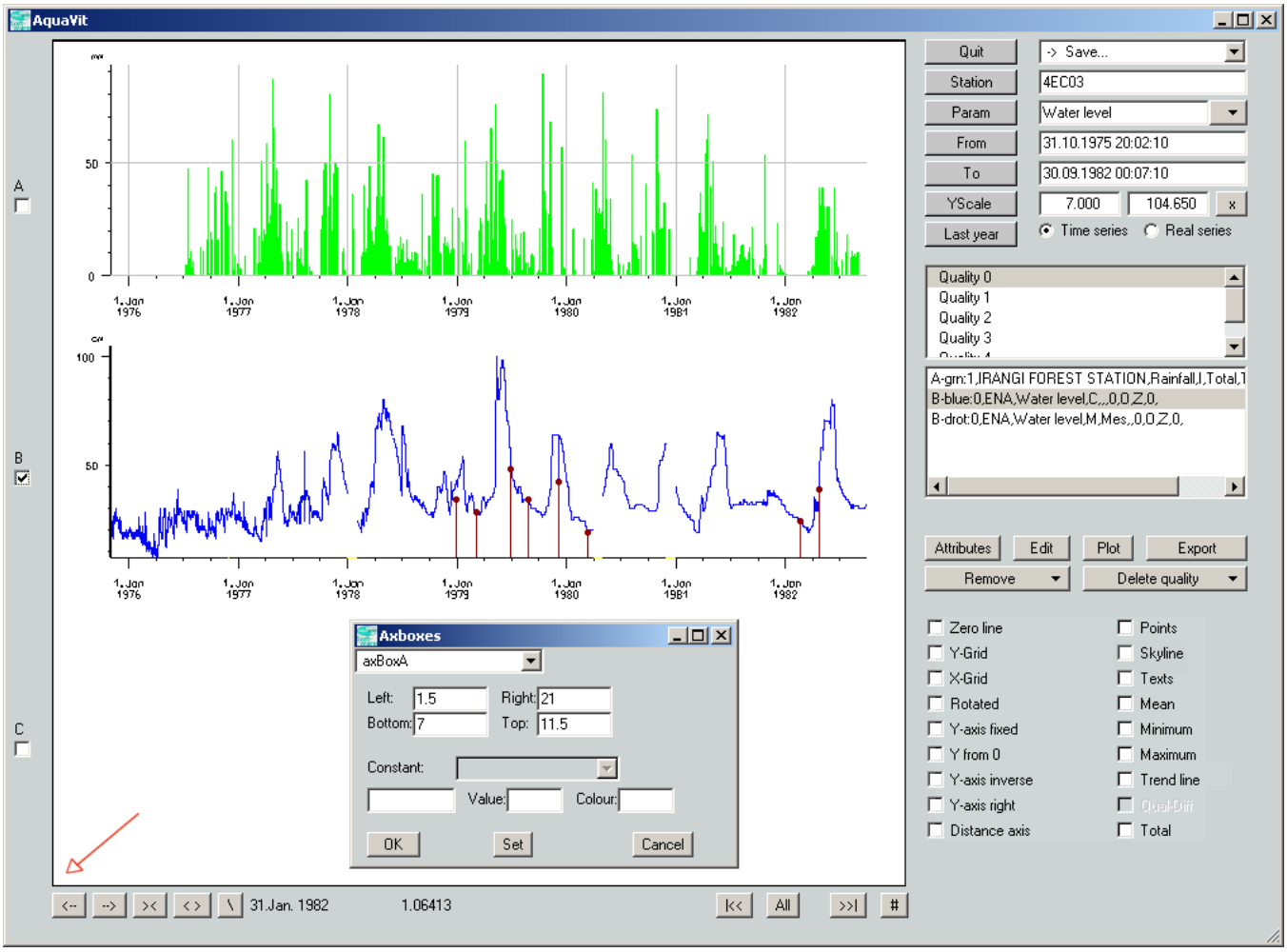


Figure 9.5: Two axboxes - “AxboxB“ is selected

In order to modify position and size of the axboxes, click [#] on the right below the graphical display. The window in figure 9.6 appears.

In the top of the window Axboxes you will find a shortlist in which the axboxes of the TopoVit-window are listed. In order to edit an axbox, choose this in the list. On opening of the window, the axbox checkmarked in the TopoVit-window is always selected.

The specifications for Left:, Right:, Bottom: and Top: are made in centimetres, whereas the zero point lies in the left bottom part of the graphic (see red arrow in fig. 9.5).
The values in the input fields Left: and Right: state the distance between the left and right side of the axbox to the left side of the graphical display displayhow far the left and right side of the axbox. The values in Bottom: and Top: state the distance of the bottom an top of the axbox to the bottom of the graphical display.

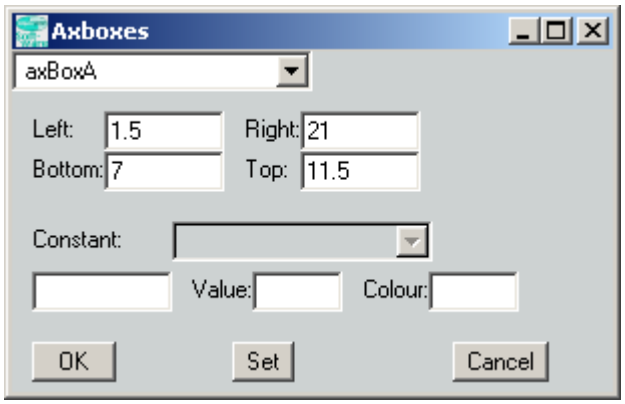


Figure 9.6: Setting position and size of axboxes

HINT:
In order to edit the coordinates of an axbox, choose the according axbox in the list.

When, for instance, you want to compare two hydrographs, you can layer them easily with the window Axboxes as shown in figure 9.7.

- For this purpose, enter the same values for Top: and Bottom: for the according axboxes. This would mean Bottom: 7 and Top: 17.5 for the example in figure 9.7.
- Confirm your entries each with Set so that TopoVit adopts your modifications and converts them graphically.

You can also draw constants in the axboxes with the window Axboxes. To do this, three attributes must be allocated to the constant.

- Choose the axbox in which the constant shall appear in the list.
- Now enter the name of the constant in the left bottom input field, e.g.: Threshold.
- Then fill in the input fields for Value: and Colour:. In the example in figure 9.7 these are Value: 10 and Colour: blue.
- Confirm each of your entries with Set.
- Now the constant you have created will appear in the shortlist for Constant:. At the same time TopoVit will draw the according graph in the selected axbox.

The constants must be created seperately for each axbox.

9.1.2.3 Set time interval

You can vary the X and Y axes with From, To and Yscale.

In order to edit the scaling of the Y-axis, use the two input fields for Yscale (↪ fig. 9.8). When you leave one of the fields blank, the original value is kept.

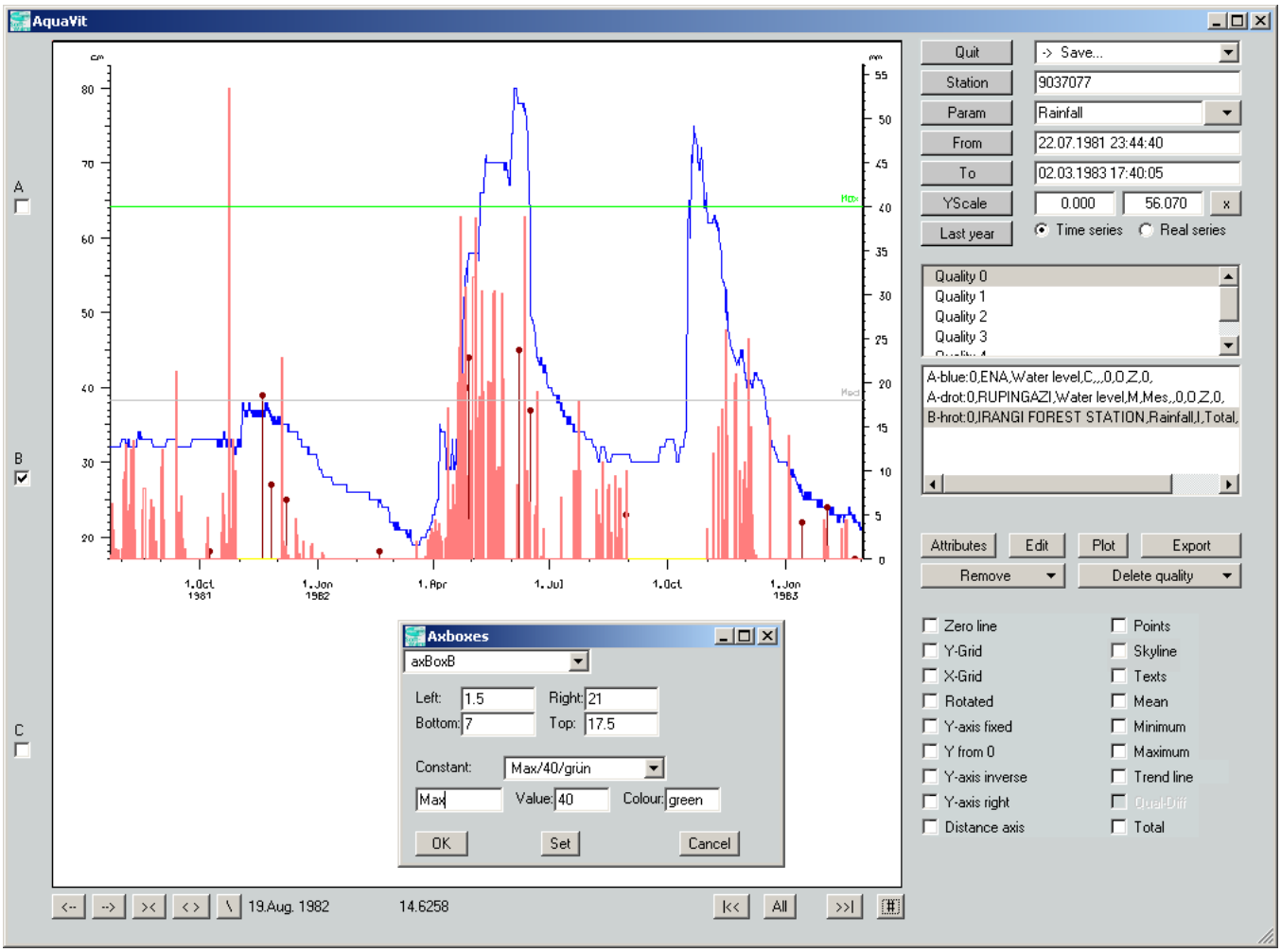


Figure 9.7: Two axboxes on top of each other – with two constants

Figure 9.8: Scaling of the Y-axes

Figure 9.9: Direct entry of the period

The editing period is adopted from the main window. However, you can also enter a time interval in the input fields beside From and To.

When the input fields are left blank, the whole last year up to today is displayed automatically. In order to obtain the last year existing in the time series, click Last year.

You can use the buttons below the axbox for the variation of the displayed time interval (↪ fig.

9.10).
$\boxed{<-}$ or $\boxed{->}$ scroll the time interval over half the range of the time period to the left or right. Click $\boxed{<>}$ or $\boxed{><}$, in order to double or half the time interval.
$\boxed{\backslash}$ stands for "Zoom previous" and restores the previous displayed section (several steps possible).

Figure 9.10: Modify time interval

It is also possible to set the time interval to the first and/or last date of the current selected series as value for the axbox. $\boxed{|<<}$ only adopts the first and $\boxed{>>|}$ only the last existing date. When you want to display the first as well as the last date of a series, click $\boxed{\text{All}}$.

HINT:
Although values of a certain series are drawn on here, the uprising time interval counts for all axboxes of the display.

With the radio buttons ◉ Time series ◯ Real series you can choose whether time series or real series (Example: Runoff curves or pump characteristic curves) shall be displayed.

9.1.2.4 Save and restore layouts

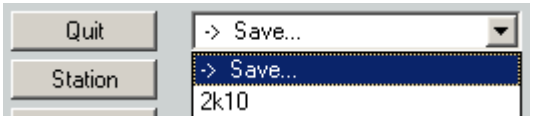


Figure 9.11: Save and restore layouts

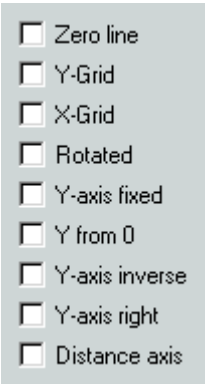
You can load the complete layout of TopoVit with the shortlist in figure 9.11 and file it under any name. Click [– > Save... | ▽] and the window in figure 9.12 will appear.

Figure 9.12: Save layout

Confirm the storage with [OK], so that TopoVit saves all axbox positions and settings as well as the loaded series and their settings. The other entries in the shortlist are pre-saved layouts which can be reloaded. This way the layout which was active when saving is re-established.

9.1.2.5 Further settings

These settings always refer to the axbox marked with a tick.



☑ Zero line	draws a horizontal auxiliary line at 0
☑ Y-Grid and ☑ X-Grid	draws horizontal and vertical auxiliary lines
☑ Rotated	swaps the X-axis with the Y-axis so that the content of the axbox is rotated
☑ Y-axis fix	fixes the scaling of the Y-axis so that this is not automatically adapted anymore when the time interval is modified
☑ Ymin 0	sets the lower value of the YScale to zero
☑ Y-axis inverse	inverts the scaling of the Y-axis
☑ Y-axis right	sets the Y-axis to the right of the axbox
☑ DistanceAxis	displays the points of time of the X-axis as time period (beginning at 0)

9.1.3 Display and edit series

Series are selected with the buttons, input fields, lists and alternative choices shown in figure 9.13.

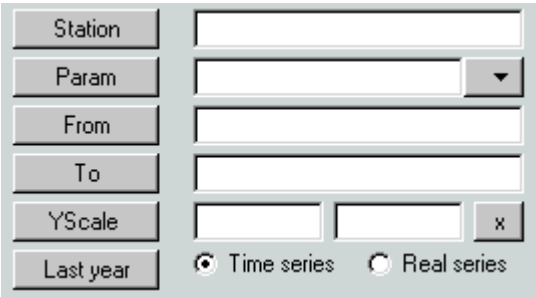


Figure 9.13: Display series

9.1.3.1 Load series

And this is how you load the series of your choice:

- First make the alternative choice ◉ Time series ◯ Real series with which of both series you want to operate.
  This is only switchable as long as no series has been loaded.

- Then select an axbox in the display.

- Enter the name of the station for which you want to load a series in the input field [Station]. Once you have selected one or more measuring sites in the main window of the program system you are working with, these will appear in the series list of the TopoVit-window (↪ fig. 9.14).
  The button [Station] leads you to the Time series selection (↪ chapt. 13.7.3), by aid of which you can search for a time series to be edited.

- You can either enter a parameter in the accompanying input field for [Param] or select it in the list [▽] on the right.
  In order to have the possible parameters for the selected station indicated, click [Param]. A list appears, in which you can choose a parameter per mouse click.

- You can also leave the input fields for [Station] and [Param] blank. TopoVit will then search for all stations resp. parameters in the program system with which you have started TopoVit. Owing to circumstances this may take a while.

- When you have filled in Station and/or Parameter, click Return subsequently. This way the desired series will be displayed in the according axbox and listed in the series list (↪ fig. 9.14) in the TopoVit-window.

- When you have left out one or more input fields or when several series match the entered specifications, a list is presented in which you can choose the desired series.

9.1.3.2 Select and delete series

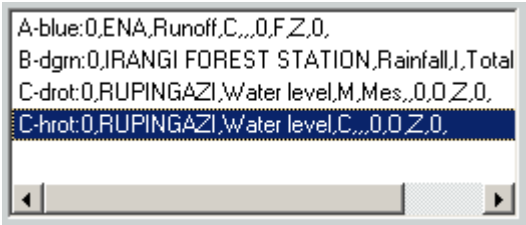


Figure 9.14: Select series

In the shortlist in figure 9.14 you find all displayed series indicating axbox and display attributes (display colour, station name, parameter).

To be able to edit a series, it must be clicked on in the list of loaded series (↪ fig. 9.14). The axbox in which the series is displayed is tickmarked.

When you prefer to give a series a different colour, double-click the desired series in the list of loaded series. This can be repeated until the desired colour appears.

When you want to delete a series, select this in the list. Then choose the entry Series in the list ▽ Remove . With this list it is also possible to remove All series at once.

> HINT:
> These series are only deleted in the display and in the list but not essentially.

9.1.3.3 Select and delete qualities

Figure 9.15: Qualities

The highest quality of the currently selected series is marked in the quality list (↪ fig. 9.15). When you want to have another quality shown, click the desired quality in the list. TopoVit displays the selected series in the desired quality.

Via the menu ▽ Delete quality you can delete one or more qualities of the currently selected series.

Complete deletes the complete selected quality in the quality list,

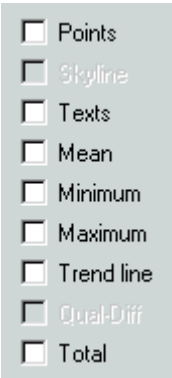
Chosen quality in the displayed period deletes the selected quality in the quality list in the time interval adjusted for the axbox,

All qualities in the displayed period deletes all qualities (except 0) in the time interval adjusted for the axbox

...in the series.

9.1.3.4 Further settings

The checkboxes below enable you to make further settings for the display of series.



☑ Points	displays the values as points in the axbox, when ☑ Skyline is activated this checkbox is called Bar
☑ Skyline	modifies the display of the values in the axbox from single rectangles per value to one polygon; is only active when an interval time series is selected in the series list
☑ Texts	activates the display of texts in the axbox
☑ Mean	shows the mean of the values within the displayed time interval
☑ Minimum	shows the minimum of the values within the displayed time interval
☑ Maximum	shows the maximum of the values within the displayed time interval
☑ Trend line	calculates the trend line and shows this in the displayed time interval for the selected series
☑ Qual-Diff	(the function of this checkbox will be converted soon)
☑ Total	displays the total of the values in mm (bottom right in the TopoVit-window)

9.1.3.5 Series attributes

The button [Attributes] opens the window Time series attributes (↪ fig. 9.16). The desired series must be selected in the series list for this purpose.

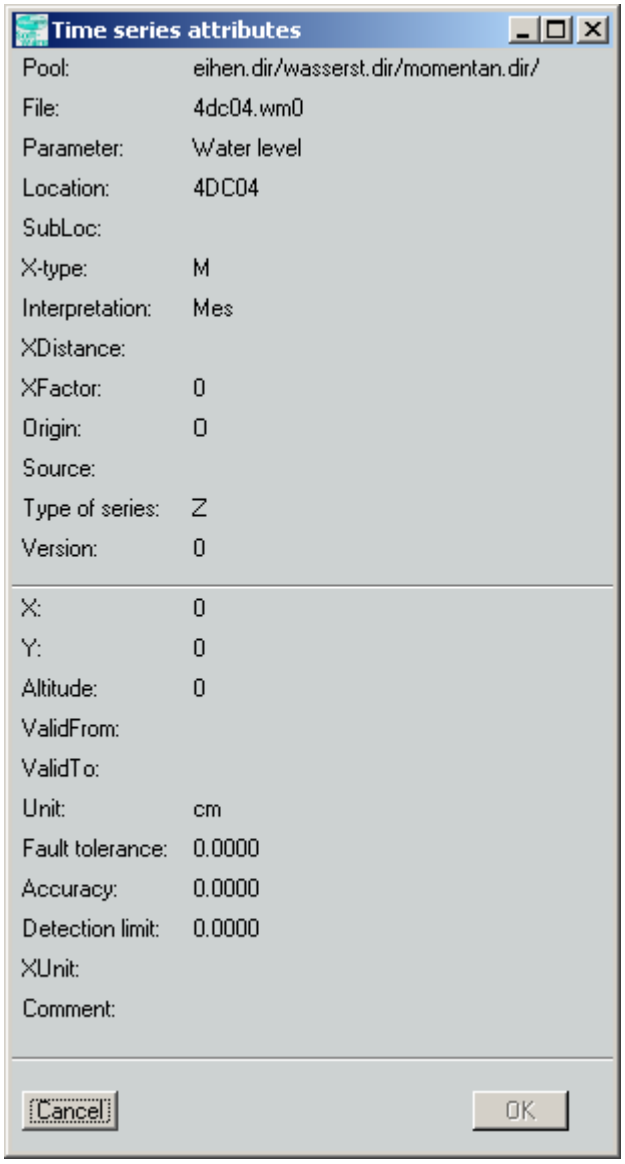
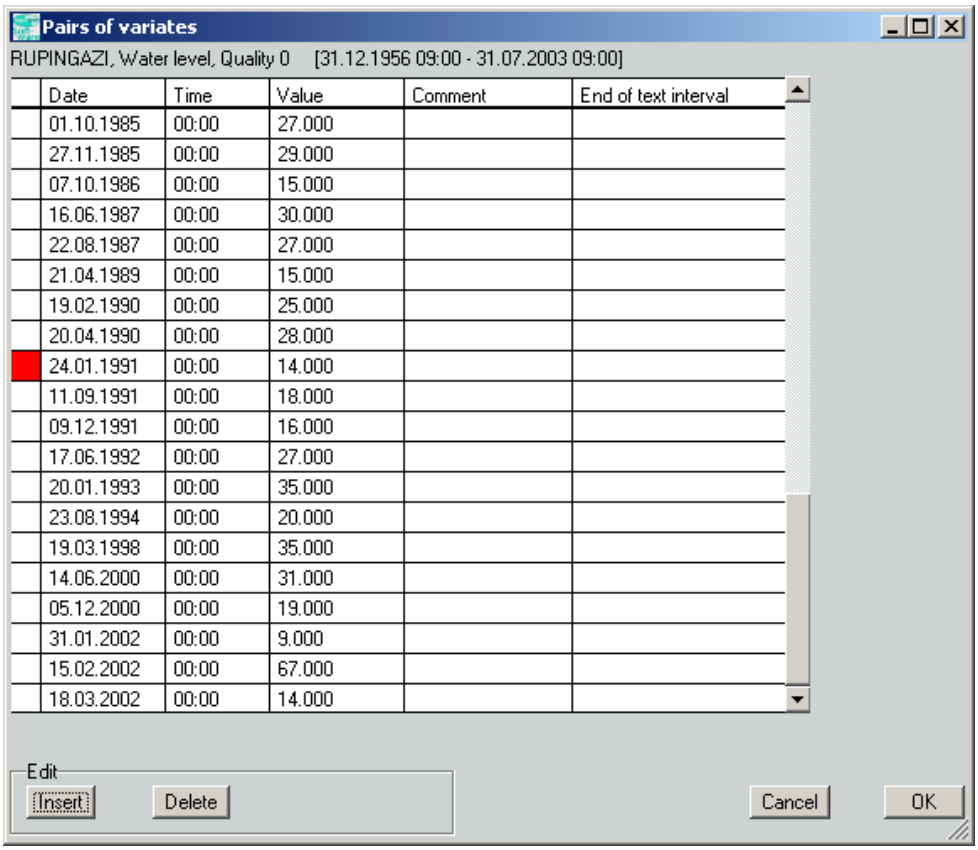


Figure 9.16: Dialogue box Attributes

This window gives you an overview of the attributes set for a series in Time series information and attributes (↪ chapt. ??).

9.1.3.6 Value pair editor

In order to open the value pair editor, click Edit in the TopoVit-window (See also chapt. 13.6.2). The window in figure 9.17 opens. The content of the adjusted time interval of the selected time series is displayed here tabularly as time and value pairs (pairs of variates). Here you can insert, delete and modify values.



Date	Time	Value	Comment	End of text interval
01.10.1985	00:00	27.000		
27.11.1985	00:00	29.000		
07.10.1986	00:00	15.000		
16.06.1987	00:00	30.000		
22.08.1987	00:00	27.000		
21.04.1989	00:00	15.000		
19.02.1990	00:00	25.000		
20.04.1990	00:00	28.000		
24.01.1991	00:00	14.000		
11.09.1991	00:00	18.000		
09.12.1991	00:00	16.000		
17.06.1992	00:00	27.000		
20.01.1993	00:00	35.000		
23.08.1994	00:00	20.000		
19.03.1998	00:00	35.000		
14.06.2000	00:00	31.000		
05.12.2000	00:00	19.000		
31.01.2002	00:00	9.000		
15.02.2002	00:00	67.000		
18.03.2002	00:00	14.000		

Figure 9.17: The value pair editor

When you want to modify an existing value, select it directly with the mouse or with the arrow keys of the key pad. The field you are in is coloured grey, the corresponding line is marked red on the left. Now you can Insert or Delete lines with the buttons below. In addition, also values and comments can be inserted in the table.

To delete a line, you must select this or one of its fields and click Delete. In order to delete more lines, mark these by clicking the right mouse button on the first column (a blue square appears) and then click the button Delete.

In order to apply new time value pairs click Insert. A new blank line is inserted and the curser is activated. The arrow keys take you from one field to the next whereas the curser stays activated until you complete the entry with Return. However, the completion is only possible once you have filled in all essential fields of the line.
Click Delete when you want to terminate this process.

HINT:

By clicking on the column titles, you can sort the table lines alphanumerically. So, when you click on Value, the lines are sorted in ascending order (from lowest to highest). Click on Date to revoke this sorting.

In order to close the value pair editor, click OK. In case you have modified something within the editor, you will now be asked whether these modifications shall be adopted or abolished or whether you want to carry on editing.
To close the editor without adopting any possible changes, click Cancel.

9.1.4 Plot series

9.1.4.1 Plotting

The button Plot brings you to the pop-up window Output in figure 9.18. You can choose here in which size and format series are put out and whether they shall be black and white.

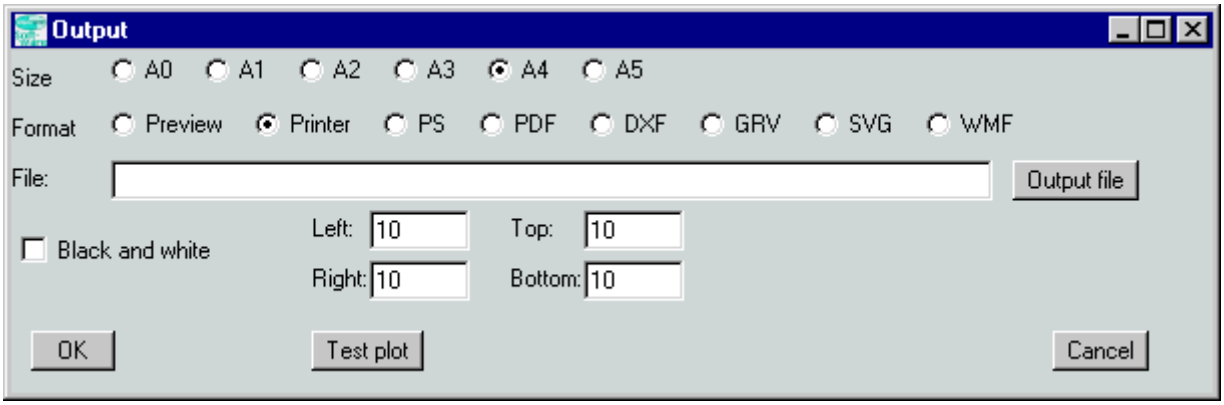


Figure 9.18: Output options

In order to print the content of the display range, choose ⦿Printer.

When you want to see a preview of the display range, choose ⦿Preview. TopoVit then starts a new program which shows the preview.

Select ⦿PS, ⦿PDF, ⦿DXF, ⦿GRV, ⦿SVG or ⦿WMF to define a file format with which you want to store the file.
Subsequently, a file name must be entered in the input field for File: in which the content of the display range shall be stored.

9.1.4.2 Export

When you enter Export, the data selection appears (↪ chapt. 13.7.4), via which you choose the directory to submit the export file to. Complete the path in the input field in the bottom section with the name the file to be exported shall have. When you click on OK, the gauging data will be stored in CSV format in the selected directory.

Chapter 10

Rating Curve Editor

This window helps you with the evaluation of flow gaugings, the creation of rating curves and rating curve validities as well as the calculation of reduction values.
Here you can have displayed, appropriate to a station, the flow gaugings for a certain period as well as the reduction values and rating curves of your choice.

10.0.5 Loading of graphics and editing

In order to display and edit flow gaugings, frequencies, rating curves, reduction values, rating curve validities and auxiliary curves graphically or tabularly you will find the functions in figure 10.2 at your disposal.

10.0.5.1 Presettings

Select the gauging station in the station list (↪ chapt. 13.5.4) beside the [Quit] -button and, if necessary, select the sub-labelling in the list below.

Furthermore you decide whether the test or the production version shall be edited according to the ETA or the retain method.

In case several rating curves exist, select the desired one in the shortlist [Rating curve XY ▽] below the station list.

The editing period is adopted from the main window, but can also be entered in the according input fields.

In the list [All ▽] you select a period for which the flow gaugings of the indicated time period shall be displayed. You can also load further (time) periods which will then automatically be displayed in different colours.

10.0.5.2 Display

You can [▽ Display] the Flow gaugings, Curves, W/Q value pairs, Frequencies and the Transverse profile on the canvas (↪ fig. 10.1).

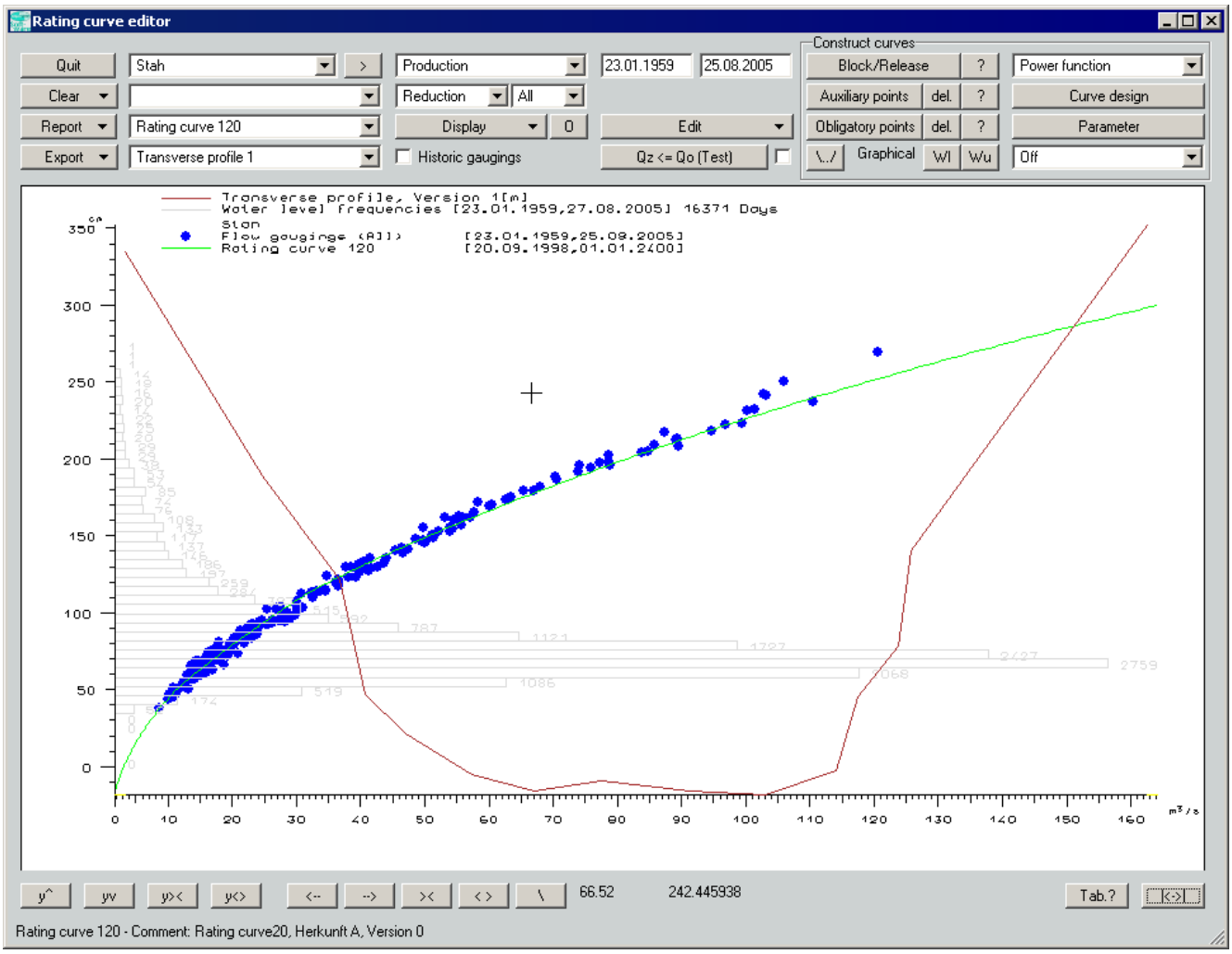


Figure 10.1: Display of rating curves and flow gaugings

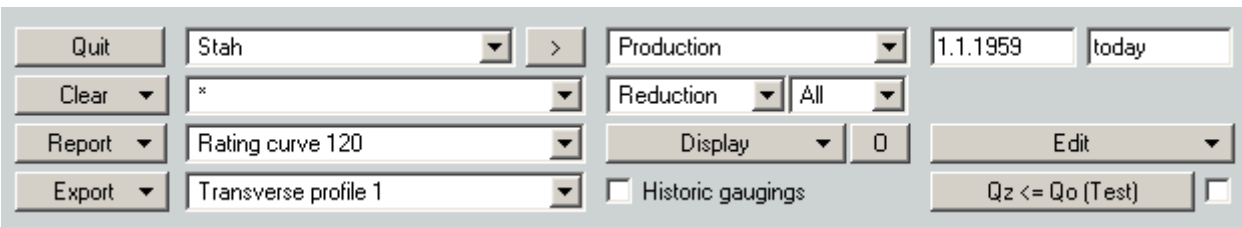


Figure 10.2: Loading of graphics and editing

Reduction values and Curve validities are each put out as *Test* or *Production* in a separate window (TopoVit) (↪ fig. 10.3). Reduction values can be put out here as existent in the system (calculation occurs via the functions described in chapter ??) or temporarily calculated from loaded curve. Curve validities and reduction values are also gathered tabularly in the menu ▽ Edit (↪ fig. 10.18 and 10.19).

You can have Auxiliary curves deriving from flow velocity and flow section (↪ fig. 10.4) or from

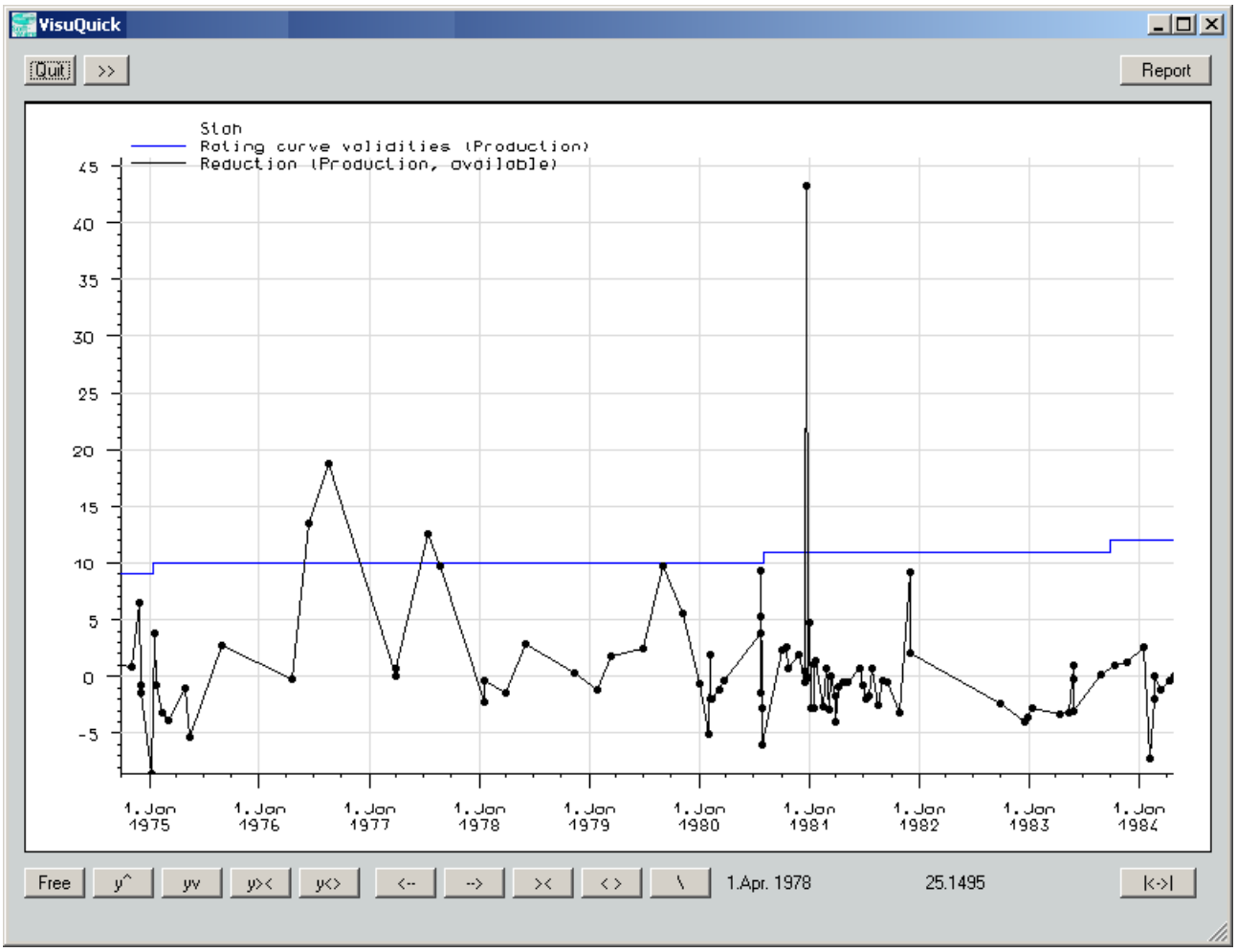


Figure 10.3: Display of reduction values and rating curve validities

$C*\sqrt{I}$ and profile coefficient (↪ fig. 10.5) or from flow section and hydraulic radius (Manning-Strickler ↪ fig. 10.6) displayed in separate windows.

The auxiliary curves can be edited graphically and also extrapolated. Use the functions in the upper section of the according window for this purpose.
Select the curve to be edited („black“ or „red“) in the shortlist. The indication for the position of the cursor in the bottom section always refers to the curve selected here and its X-axis. Enter in the accompanying field the number of Construction points for the construction of the curve (initial and final point not included). There must be at least 5. They will be displayed via the according button or via the Return key while the cursor is resting on the input field. You can Insert or Delete additional construction points with the corresponding triggers. The curve immediately aligns itself to the modified construction points.
The figure 10.4 shows an example of an edited auxiliary curve.
You can calculate a rating curve and accordingly a rating curve proposal from the product of the auxiliary curves (may potentially be modified).

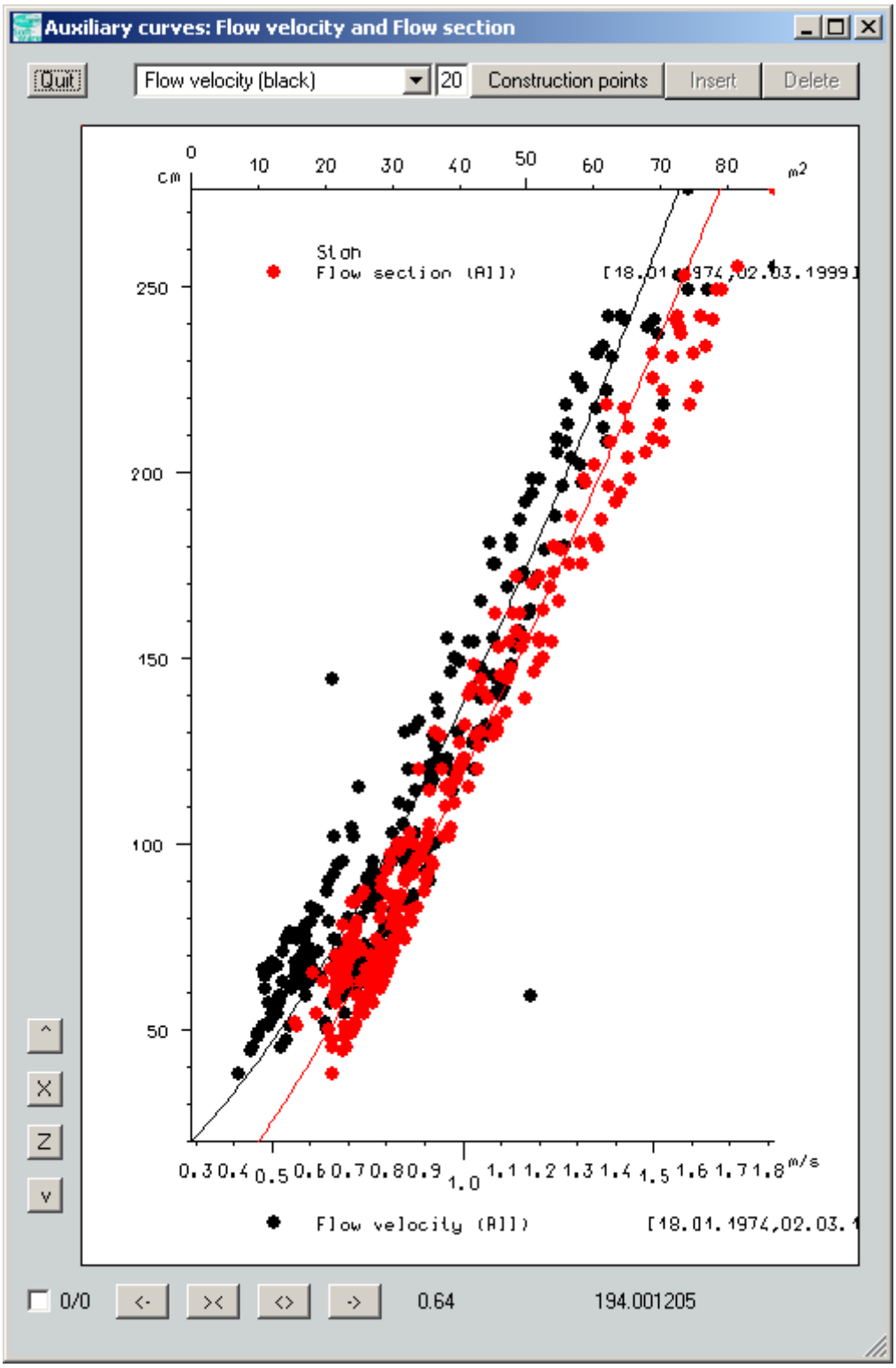


Figure 10.4: Auxiliary curves from flow velocity and flow section

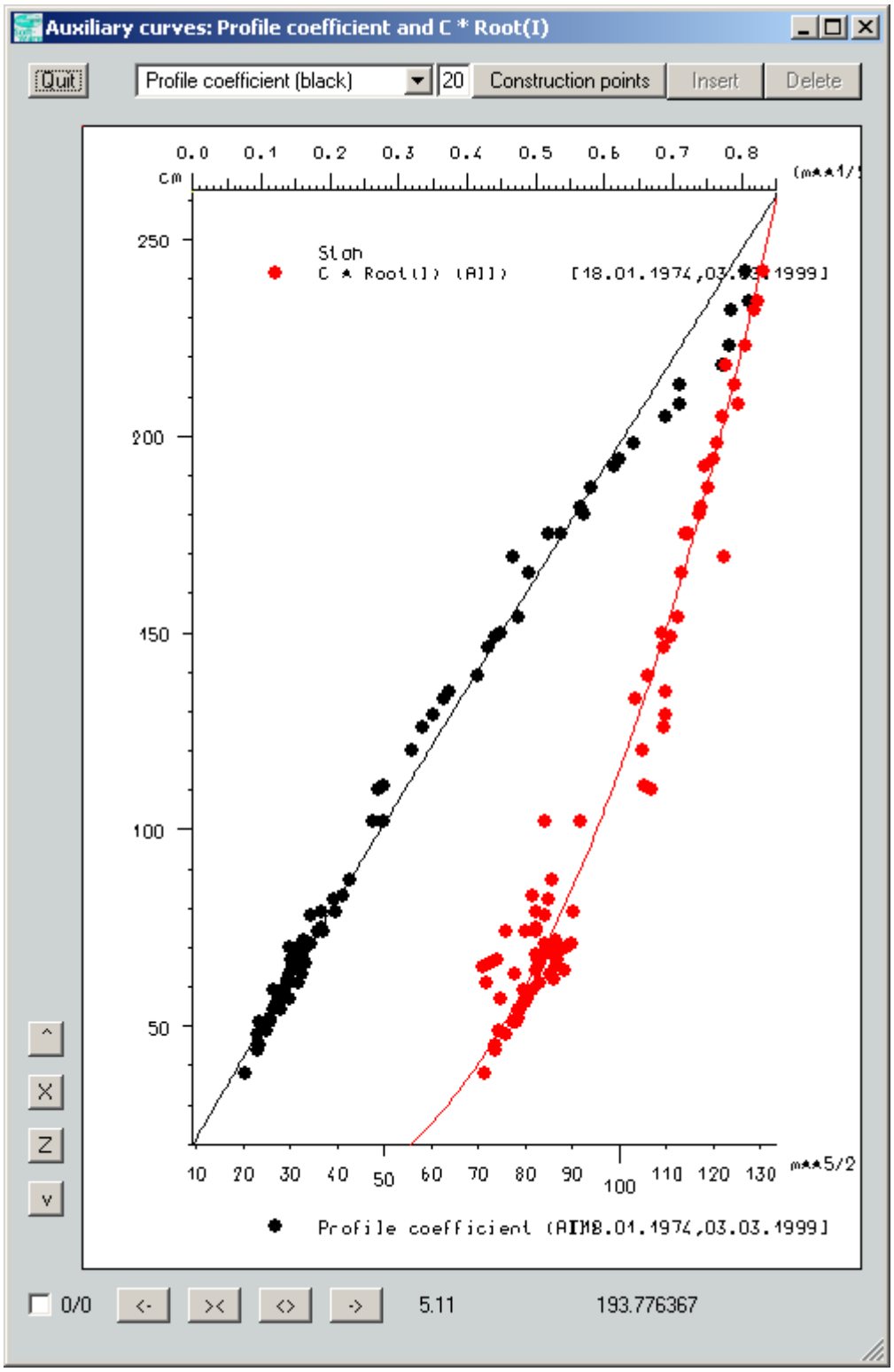


Figure 10.5: Auxiliary curves from profile coefficient and $C * \sqrt{I}$

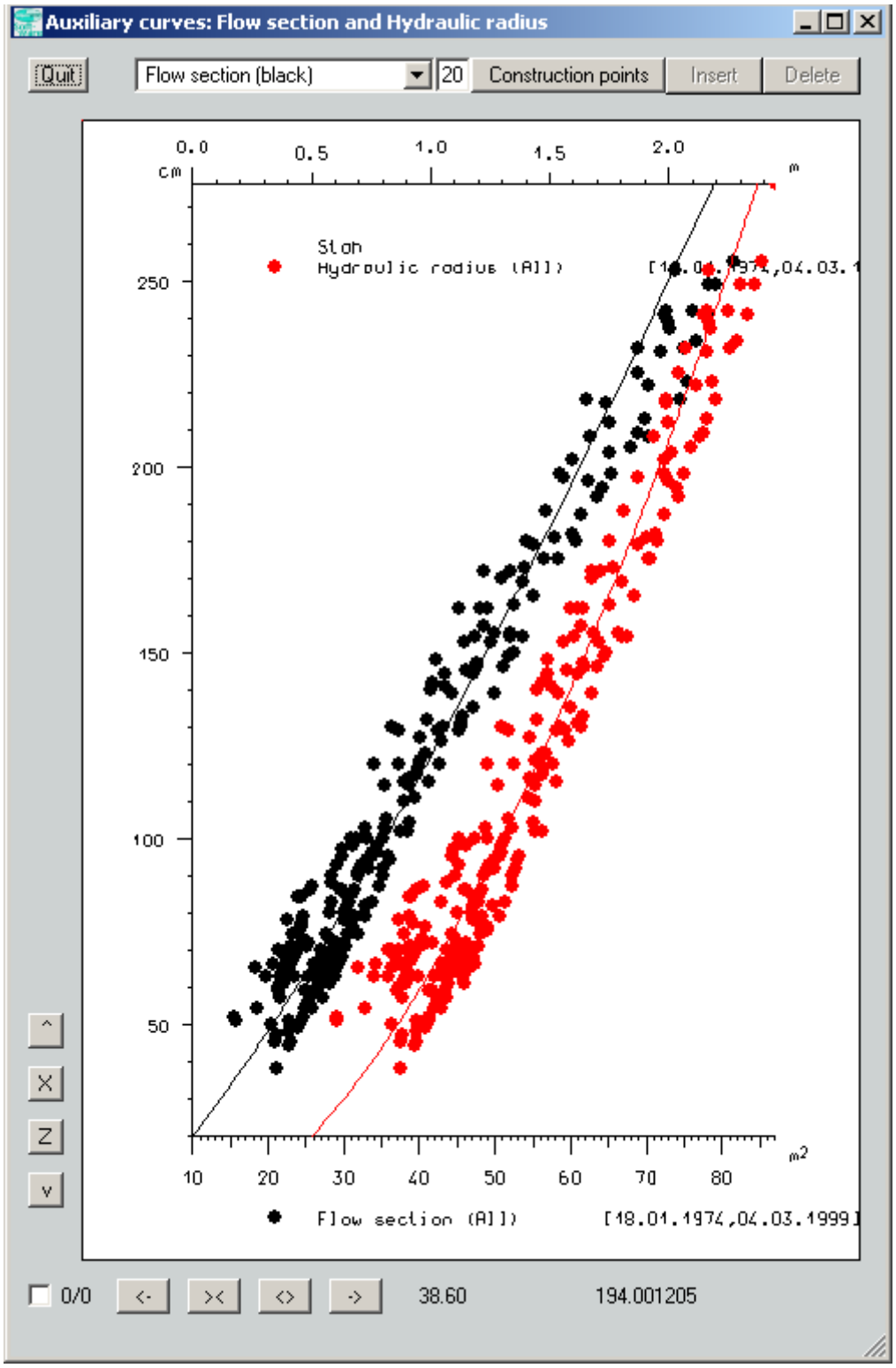


Figure 10.6: Auxiliary curves according to Manning-Strickler

Influence on the graphical display Via the button [0] beside [▽ Display] you attain a window with which you can put influence on the curve graphic (↪ fig. 10.7).

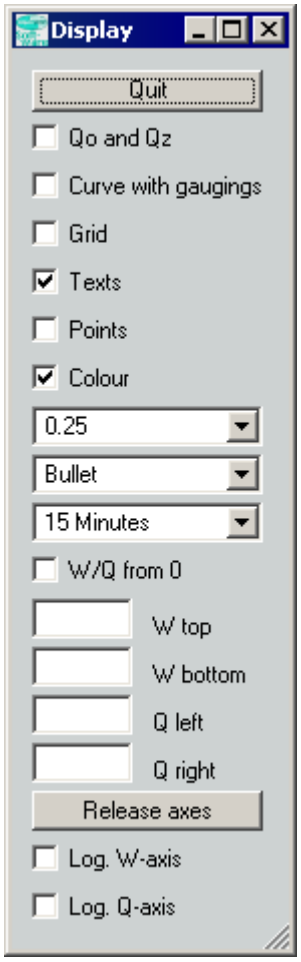


Figure 10.7: Options: Influence on the curve display

- The checkbox ☑ Grid lines draws grid lines for the axbox.
- The checkbox ☑ Texts labels the flow gaugings with their date.
- The checkbox ☑ Points displays the inflexion points of the selected rating curve.
- The graphic can be displayed in ☑ Colour or in a straight line pattern.
- The shortlist [0.25 | ▽] assigns the text- and symbol size of the axbox.
- You determine with the checkbox [▽ Large dot] with which symbol the flow gaugings are displayed.
- The checkbox ☑ W/Q ab 0 lets the X and Y axes start at O.
- You can change the displayed range of values by modifying the values for W top (Y-max), W bottom (Y-min), Q left (X-min) and Q right (X-max). Using the ☑ Return key sets the new range of values.

- ☑ Log. W-axis presents the water level axis on a logarithmic scale.
- ☑ Log. Q-axis presents the runoff axis on a logarithmic scale.

For further modification of the graphical display you have the following functions below the canvas at your disposal:

- The buttons on the left below the canvas scroll or scale the Y-axis range.
- The buttons in the middle below the canvas scroll or scale the X-axis range (↪ chapt. 13.5.17).
  The button [\] makes the display jump to the last displayed section (↪ chapt. 13.5.17).
- [Tab?] positions the table of the flow gaugings (↪ fig. 10.14) to the one which was clicked after activation of the trigger.
- [| < − > |] tunes in the full dislay range again.

10.0.5.3 Remove from display (Clear)

By means of the menu [▽ Clear] you can remove all loaded flow gaugings, rating curves or other presentations like, for instance, frequencies or auxiliary points from the graphical dislay.

> HINT:
> In order to delete a curve completely from the system, this occurs either via the function [▽ Edit] (↪ chapt. 10.0.5.4) or via TopoVit (↪ chapt. 9.1.3.3).

10.0.5.4 Edit

By means of [▽ Edit] you open the respective window for the tabular editing of Flow gaugings, Curves, Curve validities, Reduction values as well as the Transverse profile (↪ fig. 10.14 - 10.19). You can edit the curve validities and reduction values as test version and as production version (depending on what you have preselected in the according list).
In addition, you can create, graphically edit as well as delete curves or envelope curves.

Creation of a new rating curve or power function When you invoke [▽ Edit] → Curves ▷ → W/Q tabular ▷ → Create you open the window in figure 10.9.

Here you determine whether it is a mean rating curve, an upper or a lower envelope. Enter the version number of the new curve (numerical entry only possible from 0 to 9999) in Version. By aid of **W min** and **W max** you specify the definition range for the rating curve. On activation of the button [Create] the table opens (↪ fig. 10.15 and 10.16) with which you can record the curve tabularly.

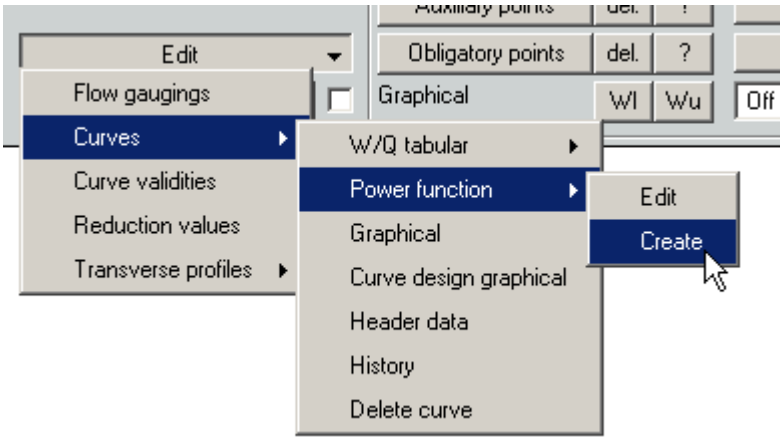


Figure 10.8: Menu Edit

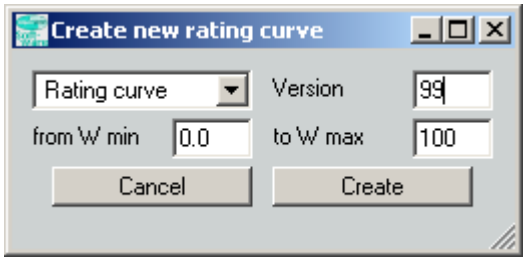


Figure 10.9: Window for the creation of a new rating curve

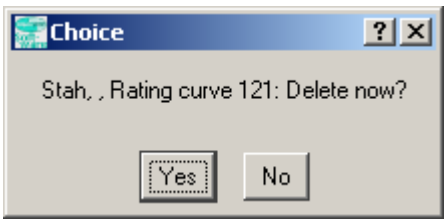


Figure 10.10: Choice Deletion of curves

Deletion of a curve You can remove the current rating curve/envelope appearing in the short-list from the system via the menu ▽ Edit → Rating curves ▷ → Delete curve.
A safety query occurs which you please confirm with "Yes" or "No".

On the deletion it will automatically be checked in which time periods the rating curve was valid. For these periods the calculated runoff is set to a gap.

Header data for a rating curve ▽ Edit → Rating curves ▷ → Header data opens a window in which you can enter, modify or delete comments in the current rating curve.

Tabular editing The tabular editing of flow gaugings, curves, curve validities, reduction values and the transverse profile occurs in the following imaged tables.
The general procedure for the tabular editing is explained in chapter 13.6.2 (Special hints).

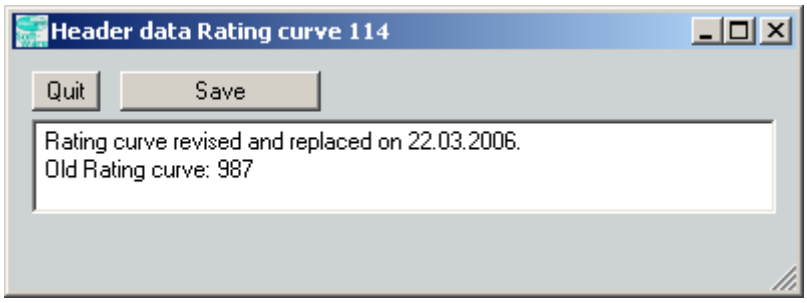


Figure 10.11: Header data of a rating curve

HINT:
When **editing curves** the value selected in the table is automatically marked with a red edging in the graphic (↪ Abb. 10.12).

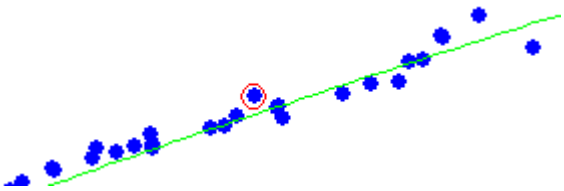


Figure 10.12: Marked flow gauging

Contrariwise, a displayed gauging is marked in the table on activation of the trigger Tab? and by clicking in the graphic.

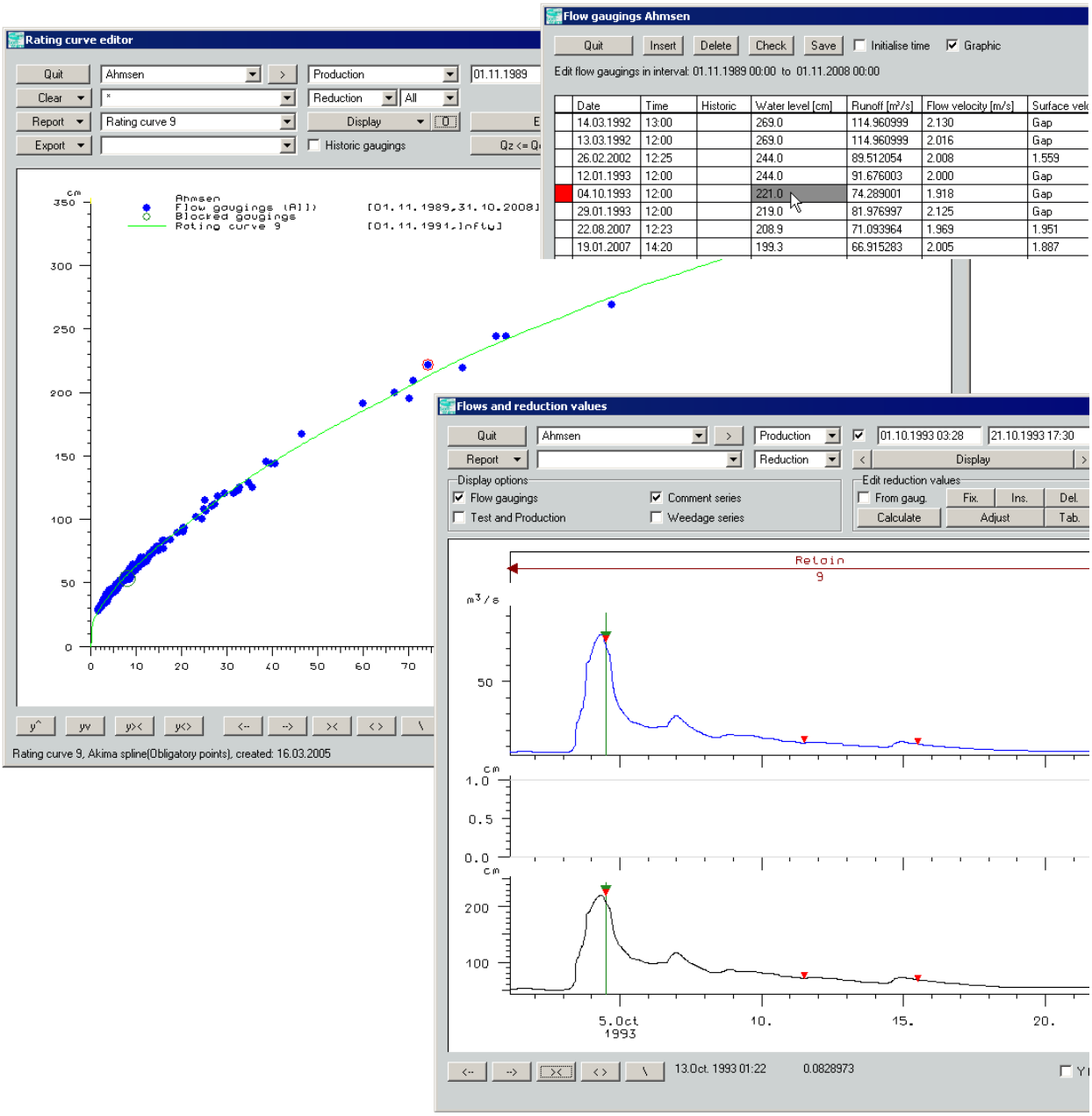
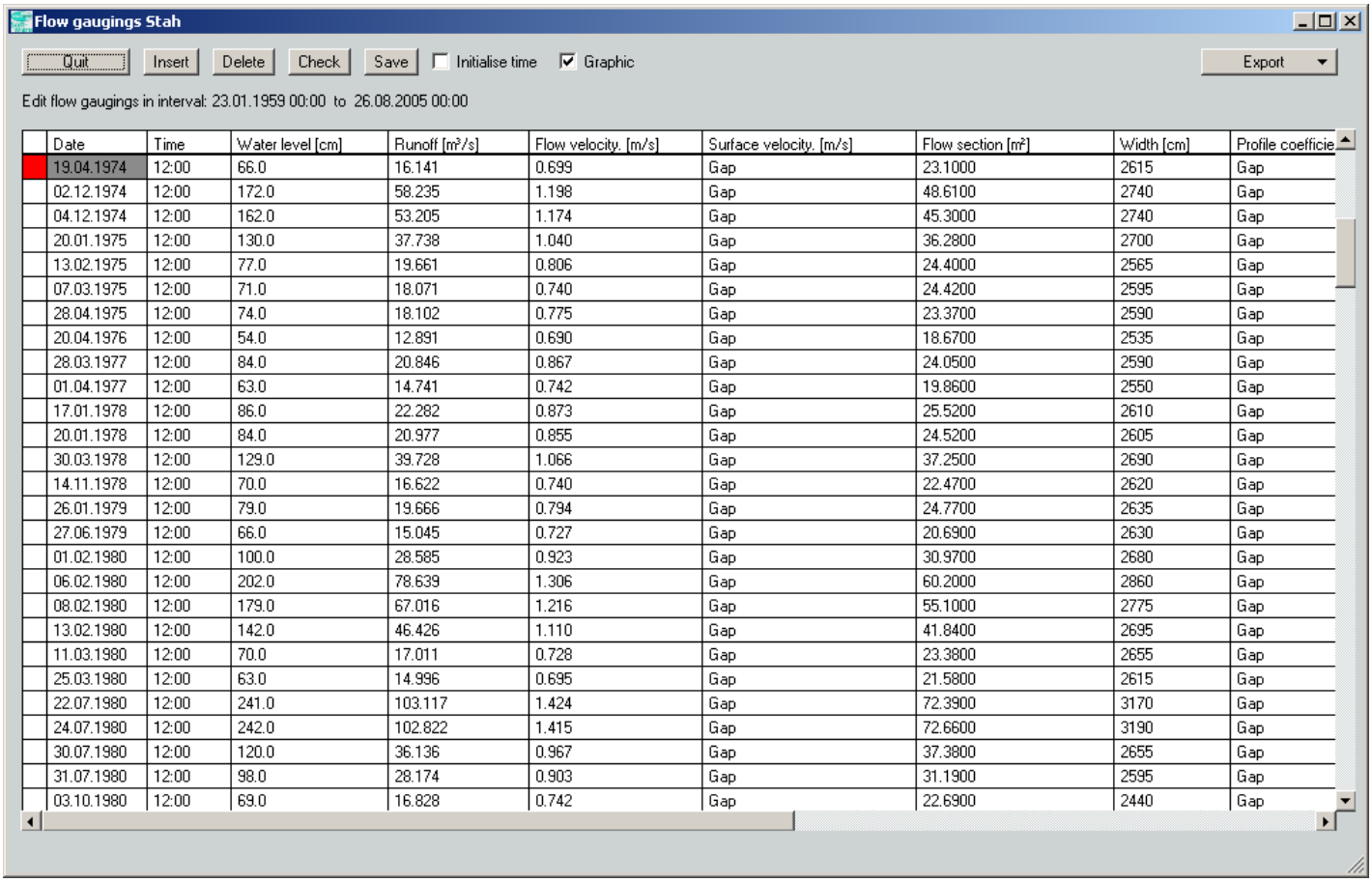
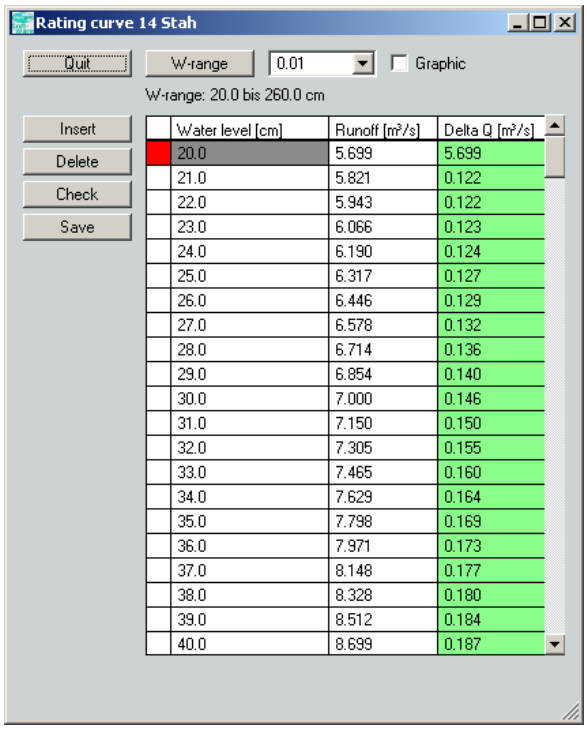


Figure 10.13: Markierte Abflussmessung in Tabelle, Kurveneditor und Abflüsse und Veränderungswerte



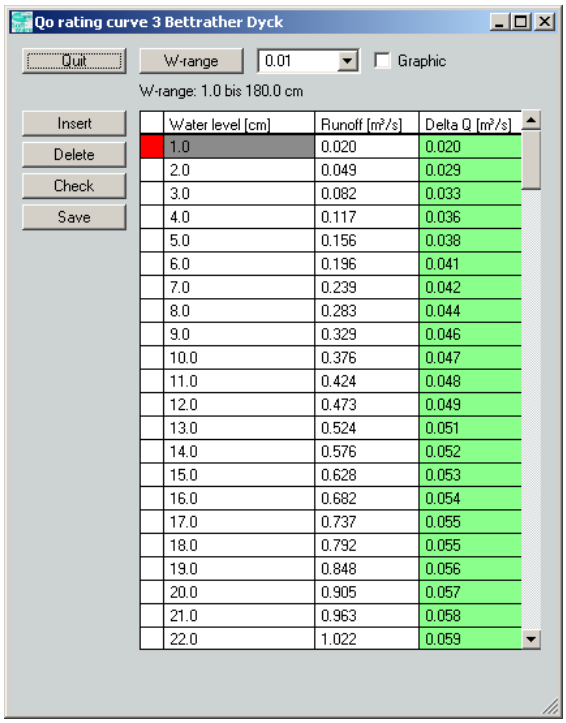
Date	Time	Water level [cm]	Runoff [m³/s]	Flow velocity. [m/s]	Surface velocity. [m/s]	Flow section [m²]	Width [cm]	Profile coefficie
19.04.1974	12:00	66.0	16.141	0.699	Gap	23.1000	2615	Gap
02.12.1974	12:00	172.0	58.235	1.198	Gap	48.6100	2740	Gap
04.12.1974	12:00	162.0	53.205	1.174	Gap	45.3000	2740	Gap
20.01.1975	12:00	130.0	37.738	1.040	Gap	36.2800	2700	Gap
13.02.1975	12:00	77.0	19.661	0.806	Gap	24.4000	2565	Gap
07.03.1975	12:00	71.0	18.071	0.740	Gap	24.4200	2595	Gap
28.04.1975	12:00	74.0	18.102	0.775	Gap	23.3700	2590	Gap
20.04.1976	12:00	54.0	12.891	0.690	Gap	18.6700	2535	Gap
28.03.1977	12:00	84.0	20.846	0.867	Gap	24.0500	2590	Gap
01.04.1977	12:00	63.0	14.741	0.742	Gap	19.8600	2550	Gap
17.01.1978	12:00	86.0	22.282	0.873	Gap	25.5200	2610	Gap
20.01.1978	12:00	84.0	20.977	0.855	Gap	24.5200	2605	Gap
30.03.1978	12:00	129.0	39.728	1.066	Gap	37.2500	2690	Gap
14.11.1978	12:00	70.0	16.622	0.740	Gap	22.4700	2620	Gap
26.01.1979	12:00	79.0	19.666	0.794	Gap	24.7700	2635	Gap
27.06.1979	12:00	66.0	15.045	0.727	Gap	20.6900	2630	Gap
01.02.1980	12:00	100.0	28.585	0.923	Gap	30.9700	2680	Gap
06.02.1980	12:00	202.0	78.639	1.306	Gap	60.2000	2860	Gap
08.02.1980	12:00	179.0	67.016	1.216	Gap	55.1000	2775	Gap
13.02.1980	12:00	142.0	46.426	1.110	Gap	41.8400	2695	Gap
11.03.1980	12:00	70.0	17.011	0.728	Gap	23.3800	2655	Gap
25.03.1980	12:00	63.0	14.996	0.695	Gap	21.5800	2615	Gap
22.07.1980	12:00	241.0	103.117	1.424	Gap	72.3900	3170	Gap
24.07.1980	12:00	242.0	102.822	1.415	Gap	72.6600	3190	Gap
30.07.1980	12:00	120.0	36.136	0.967	Gap	37.3800	2655	Gap
31.07.1980	12:00	98.0	28.174	0.903	Gap	31.1900	2595	Gap
03.10.1980	12:00	69.0	16.828	0.742	Gap	22.6900	2440	Gap

Figure 10.14: Tabular editing of flow gaugings



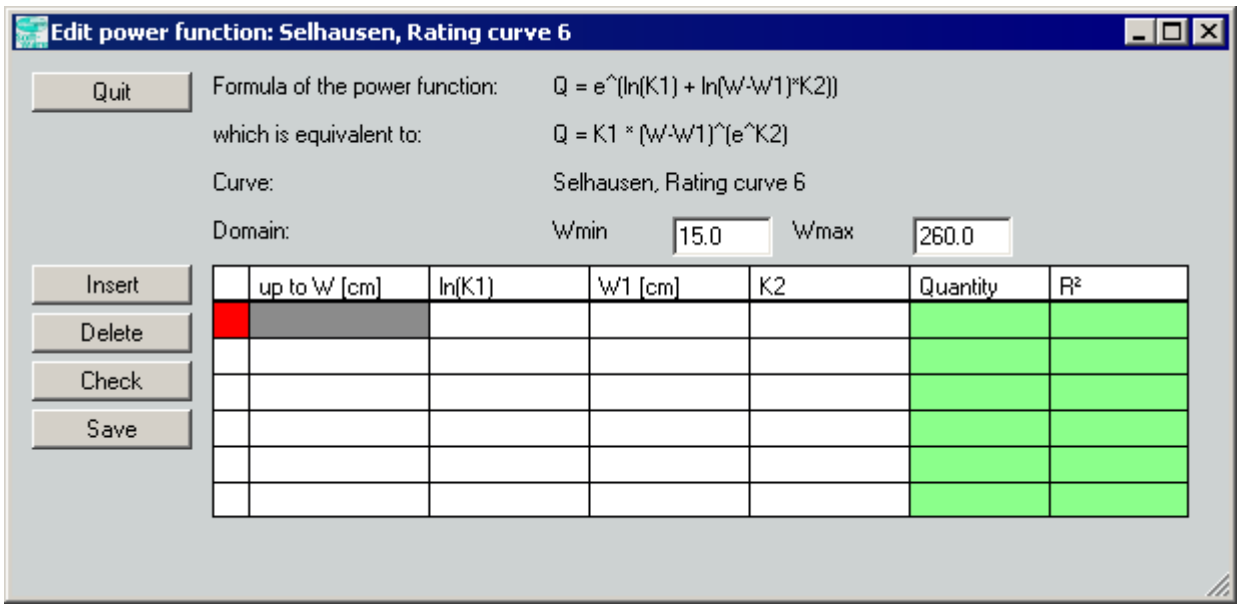
Water level [cm]	Runoff [m³/s]	Delta Q [m³/s]
20.0	5.699	5.699
21.0	5.821	0.122
22.0	5.943	0.122
23.0	6.066	0.123
24.0	6.190	0.124
25.0	6.317	0.127
26.0	6.446	0.129
27.0	6.578	0.132
28.0	6.714	0.136
29.0	6.854	0.140
30.0	7.000	0.146
31.0	7.150	0.150
32.0	7.305	0.155
33.0	7.465	0.160
34.0	7.629	0.164
35.0	7.798	0.169
36.0	7.971	0.173
37.0	8.148	0.177
38.0	8.328	0.180
39.0	8.512	0.184
40.0	8.699	0.187

Figure 10.15: Tabular editing of a new rating curve



Water level [cm]	Runoff [m³/s]	Delta Q [m³/s]
1.0	0.020	0.020
2.0	0.049	0.029
3.0	0.082	0.033
4.0	0.117	0.036
5.0	0.156	0.038
6.0	0.196	0.041
7.0	0.239	0.042
8.0	0.283	0.044
9.0	0.329	0.046
10.0	0.376	0.047
11.0	0.424	0.048
12.0	0.473	0.049
13.0	0.524	0.051
14.0	0.576	0.052
15.0	0.628	0.053
16.0	0.682	0.054
17.0	0.737	0.055
18.0	0.792	0.055
19.0	0.848	0.056
20.0	0.905	0.057
21.0	0.963	0.058
22.0	1.022	0.059

Figure 10.16: Tabular editing of an envelope



up to W [cm]	ln(K1)	W1 [cm]	K2	Quantity	R²

Figure 10.17: Tabular editing of a power function

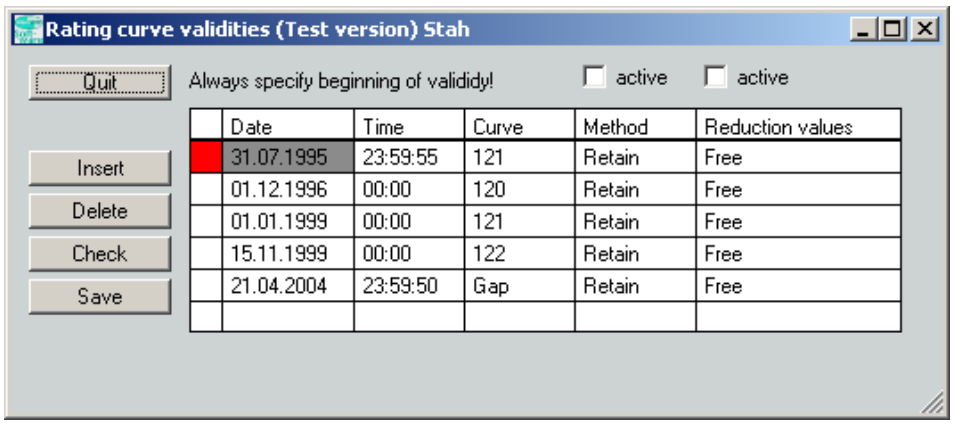


Figure 10.18: Tabular editing of rating curve validities

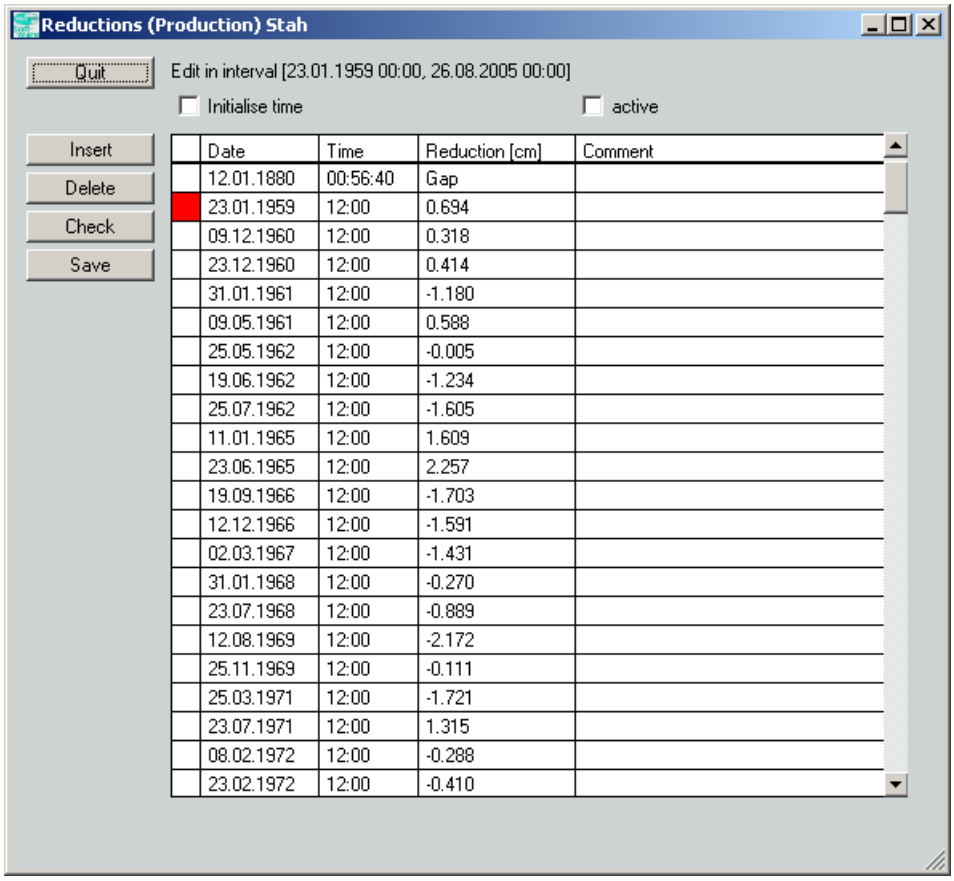


Figure 10.19: Tabular editing of reduction values (production)

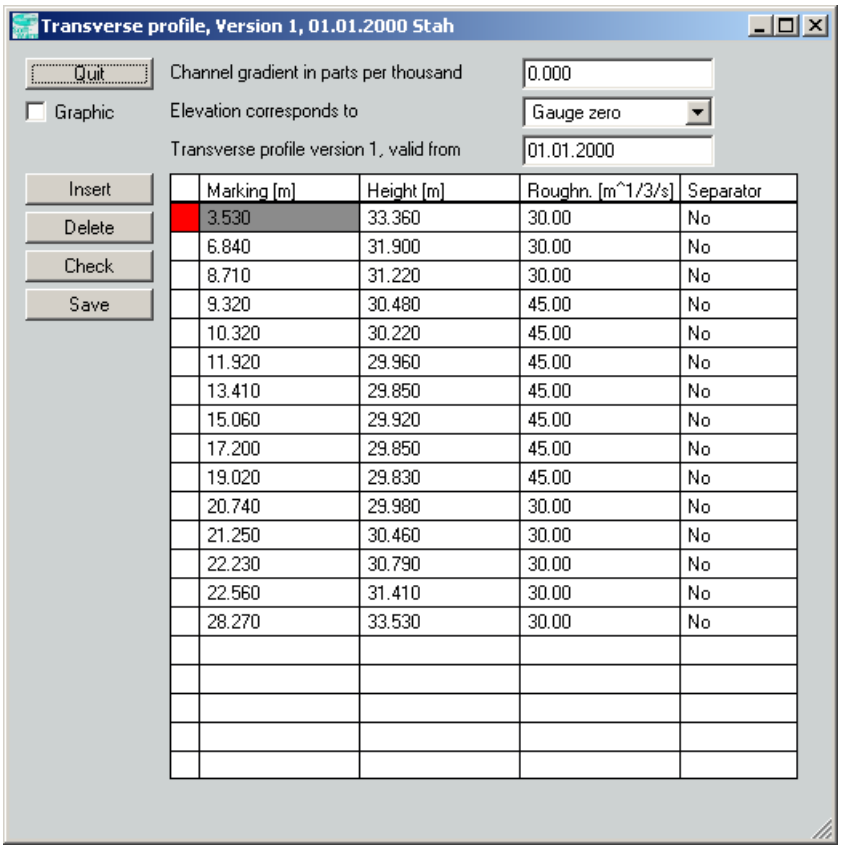


Figure 10.20: Tabular editing of the transverse profile

Graphical editing You can return already existing rating curves to the editing mode (↪ fig. 10.23) via the menu ▽ Edit .

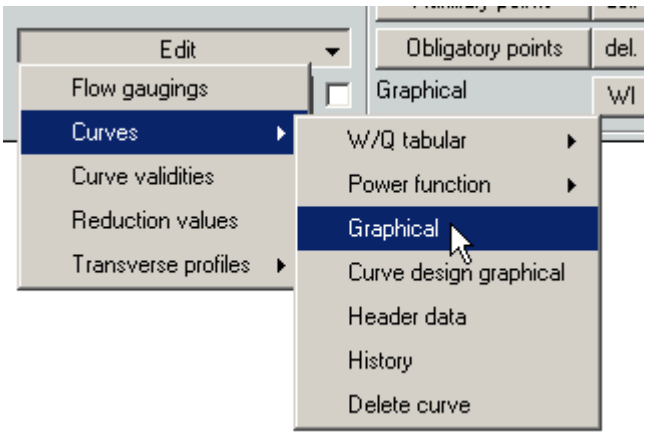


Figure 10.21: Invocation Graphical editing of rating curves/envelopes

All saved distinctive construction points of the selected curve are transmitted to the list of obligatory points. These obligatory points open all the editing possibilities described in chapter 10.0.6, e. g. you can lengthen the curve by adding points or change the course by setting additional

obligatory points.
When obligatory points already exist the query in figure 10.22 appears.

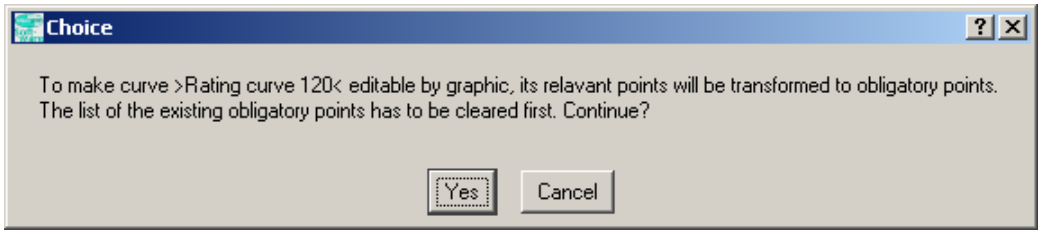


Figure 10.22: Query Graphical editing

Thus, the graphical editing can only take place once all preapplied obligatory points are removed. Accordingly, you can also edit a test curve. (Menu ▽ Edit → Rating curves ▷ → Test curve graphical).

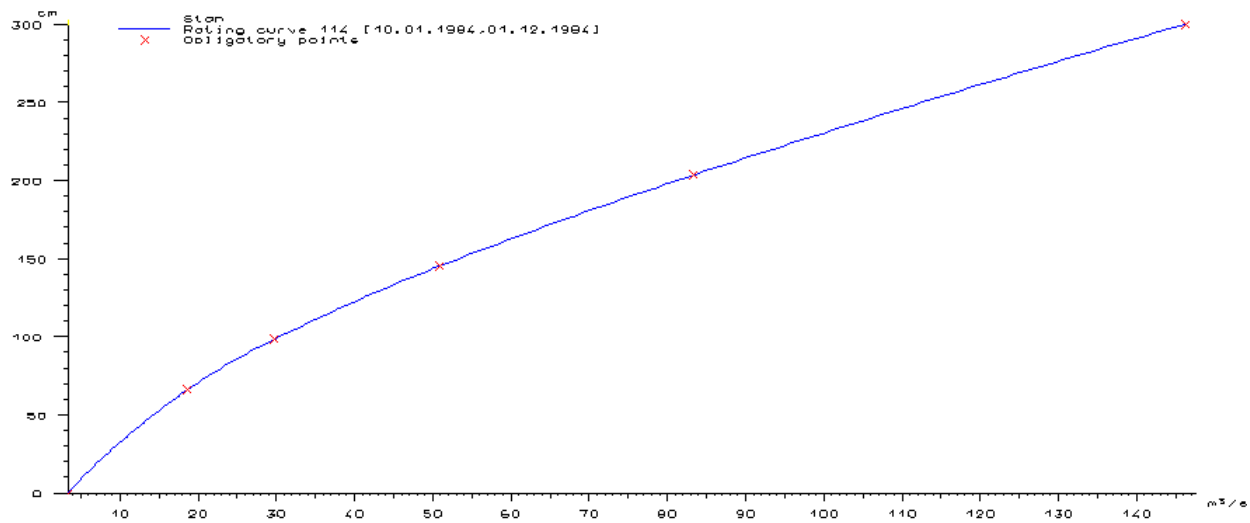


Figure 10.23: Curve in editing mode

When the rating curve or the test curve are in the editing mode you edit them with the functions in the frame Construct curves (↪ chapt. 10.0.6). In order to save, approach the window for editing parameters (↪ fig. 10.25).

10.0.5.5 Limit Qz by Qo

Qz <= Qo (Test) ☐ causes Qo to limit Qz testwise (helpful when envelope curves intersect). When the checkbox is activated the above mentioned action is executed permanently (Qz <= Qo (Permanent) ☑).

10.0.6 Constructing curves

The frame Construct curves supplies the functions for generating and editing (rating) curves (↪ fig. 10.24). TopoDesk gives you the possibility here to construct curves graphically (↪ chapt. 10.0.6.2 or according to various calculation methods (↪ chapt. 10.0.6.1).

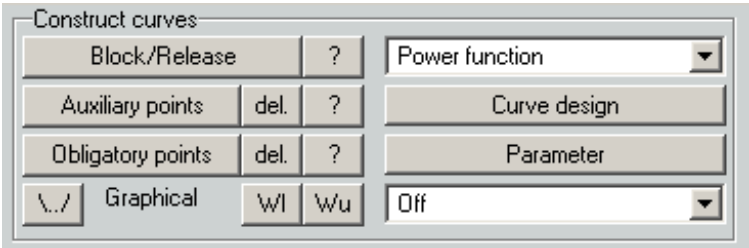


Figure 10.24: Functions for constructing and editing curves

10.0.6.1 Constructing curves according to various calculation methods

In order to construct a new rating curve the flow gaugings must be displayed. Then select the method for the regressive calculation or for the spline interpolation of the rating curve. This occurs in the shortlist Exponential function ▽ . At least five obligatory points must be drawn in the graphic for the *Akima spline*. The according auxiliary curve must be loaded beforehand for *Velocity * Flow section*, *C * Root(I) * Profile coefficient* and *Manning-Strickler*. When you activate the Proposal button the according curve is calculated and displayed graphically.

By means of the triggers in the left section of the frame you can influence the course of the curves according to your desire:

- You can mark certain flow gaugings which shall not be involved in the calculation of the rating curve with the button Block/Release. Accordingly, you release the blocked points again with this function. (Alternatively you can release all blocked points with ▽ Clear → Blocked gaugings.)
  Blocked flow gaugings are also not involved in the calculation of reduction values.

- In order to influence the regressive rating curve calculation you can set Auxiliary points in the axbox which, on the construction of the curve are treated like measuring points though with a higher weight.

- For the spline calculation it is necessary to set the Obligatory points. The interpolating Akima spline is used as spline method.

- The auxiliary and obligatory points are deleted with the accompanying button del.. (Alternatively, you can remove all Auxiliary points and Obligatory points completely via Clear ▽ .)

- The ? buttons open the output window in which all blocked gaugings and set auxiliary or obligatory points are listed.

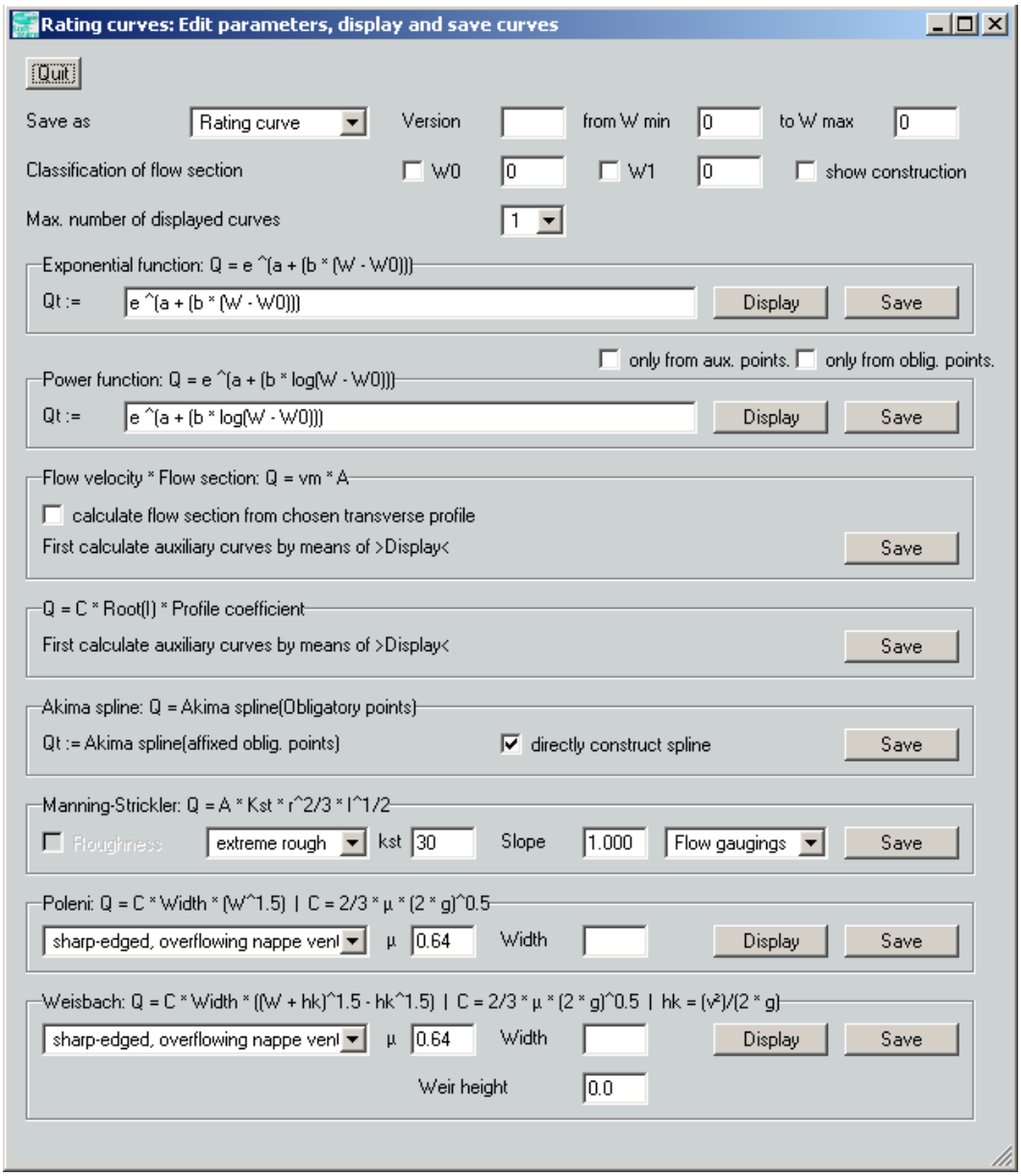


Figure 10.25: Window Rating curves: Edit parameters, display and save curves

Select [Parameter] for the saving of as well as for the precise influence on the rating curve to be generated. The window for editing parameters opens (↪ fig. 10.25).

Here you can

- influence the structuring of the flow section in the following ways:
  - ☑ W0: A minimum water level is considered for the calculation, like, for instance at a threshold or a weir.
    In the accompanying window you set the minimum water level of the gauge for runoff=0.
    The default state is always W0=0.

  - ☑ W1: The rating curve is classified in low and mean water level.
    In the accompanying window you determine the transition from the low to the mean water region.

- have the construction of the transition curve displayed (☑ show construction).
- limit the maximum number of test curves to be displayed. This way, when a new test curve is proposed the eldest proposal is removed from the display once the maximum number of test curves is exceeded.
- modify the functional equation for the calculation of power as well as exponential functions, display the according rating curve and save.
- when calculating auxiliary curves from flow velocity * flow section ☑ calculate flow section from chosen transverse profile as well as
  save the rating curve which was calculated from flow velocity * Flow section and displayed beforehand as auxiliary curve.
- save the rating curve which was calculated from $C * \sqrt{I} *$ profile coefficient (P) and displayed beforehand as auxiliary curve.
- save the Akima spline formed by the set obligatory points. In addition you can choose here whether the Akima spline shall be calculated directly after the insert or the deletion of the obligatory points (☑ construct spline directly).
- construct rating curves according to Manning-Strickler. For this purpose, the auxiliary parameters flow section and hydraulic radius, calculated from the flow gaugings of a selected time period, are displayed in an auxiliary window. This window also presents the functional coherences as curves. Like the other auxiliary parameters, these can also be edited graphically.
  Finally the curve proposal is calculated according to Manning-Strickler from the auxiliary parameters, the Manning-Strickler coefficient „kst“ and a given slope.
  You can modify the Manning-Strickler coefficient „kst“ and the „Slope“ in the window for editing curve parameters (↪ fig. 10.25).
- display and save the runoff according to Poleni as well as to Weisbach by selecting the hydraulic characteristics of the overfall coefficients in lists and by entering the overfall coefficient and the overfall width.

Before saving, give a version number to the newly calculated rating curve and define a lower and an upper limit in the top of the window.

HINT:
You can **save** an edited curve under an existing or a different version number. This also enables the possibility to copy a curve.

In order to **change the name** of a rating curve go to Time series info and attributes (↪ chapt. ??/fig. ??).

10.0.6.2 Construct rating curves graphically

In the bottom line of the frame Construct curves you find the functions for the graphical editing of rating curves.

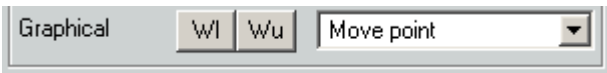


Figure 10.26: Functions for the graphical editing of rating curves

In order to edit a curve graphically, it must be in the editing mode. For this purpose, first select the entry Rating curves ▷ in the menu ▽ Edit and then – depending on the type of loaded curve – graphical or Test curve graphical. The distinctive points of the curve are changed to obligatory points and displayed as red crosses.

By means of the shortlist you define how the curve shall be edited:

- *Off*
  → the graphical editing is switched off
- *Move point*
  → enables the scrolling of obligatory points (by clicking and holding the left mouse button)
- *Shape curve*
  → shapes the curve by moving an obligatory point (by clicking and holding the left mouse button)
  → when only a curve section shall be formed you can define two obligatory points which margin this section:
  - click Wl and then the lower obligatory point (Wl is then framed with a red circle)
  - click Wu and then the upper obligatory point (Wu is then framed with a red circle)
- *Curve in W direction*
  → moves the curve in W direction (by clicking and holding the left mouse button)
- *Curve in Q direction*
  → moves the curve in Q direction (by clicking and holding the left mouse button)

The figures 10.27 to 10.29 exemplify the different editing modes.

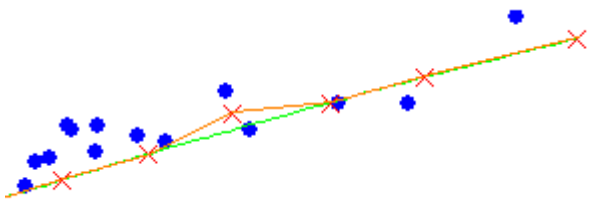


Figure 10.27: Edit rating curve: Move point

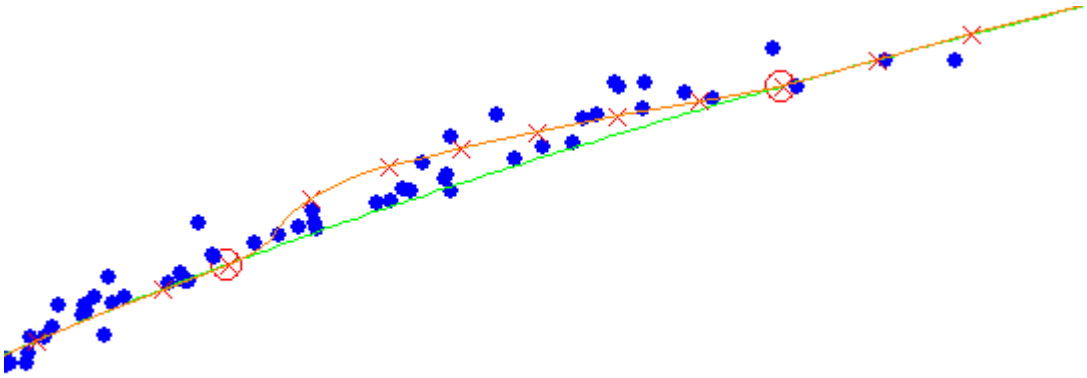


Figure 10.28: Edit rating curve: Form curve

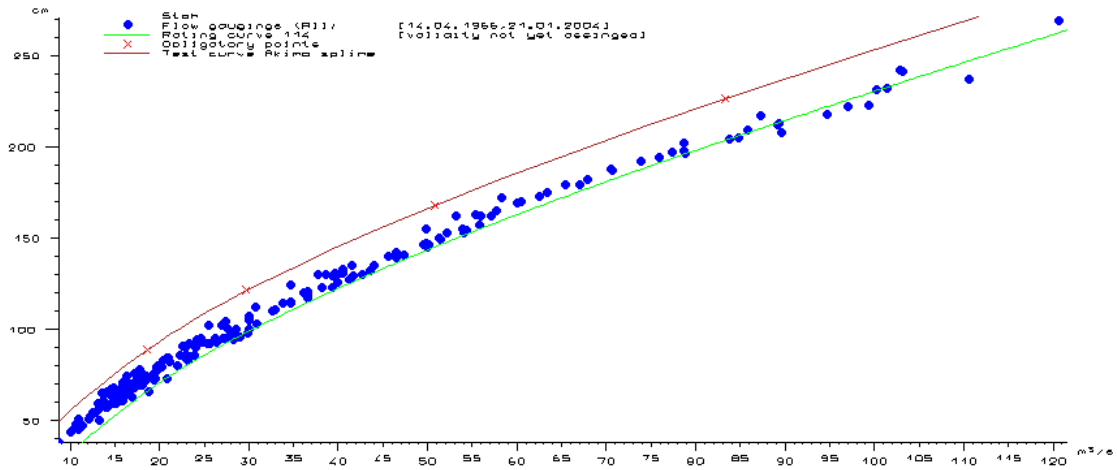


Figure 10.29: Edit rating curve: Curve in W direction

10.0.7 Report

Reports can be created for the rating curves under the menu ▽ Report .

Flow gaugings, discharge tables, rating curve validities and reduction values are put out as tables; rating curves (alone or with reduction values and rating curve validities) and auxiliary curves are put out as displayed in this window.

When you select the submenu Title for rating curve you can edit a new title for the rating curve in the now appearing window. When you delete this title again in the window, the rating curve obtains its initial title again. The choice whether to print the report in landscape format or portrait format is made in the system settings (↪ chapt. 5.3.2). Discharge tables are put out solely for the curve which is selected in the list of the existing curves. In the case of envelope curves, it is sufficient to select a curve with the desired version number in this list.

The Visualisation Lippstadt confronts the existing reduction values with the values calculated from the flow gaugings. Water level series, flow gaugings and rating curve validities are also displayed. This report can be created for any time intervals, for test and production data and for any paper formats.

Please note that the report „Rating curve validities“ checks the exceedence and shortfall of rating curves. This report puts out rating curve validities of both the ETA and the retain method (and also in common) in the defined chronological sequence (↪ fig. 10.39).

Find examples for the report on the following pages.

aqua_plan

Niersverband

Page 1

Flow gaugings: Bettrather Dyck (Rating curves and reduction values, test)

Vorflut und Hydrologie

Interval: 01.11.1997 00:00 to 01.11.2000 00:00

27.04.2005 09:12

Date	Time	Water level [cm]	Runoff [m³/s]	Flow velocity [m/s]	Surface velocity- [m/s]	Flow section [m²]	Width [cm]	Delta W [cm]	Water depth [cm]	Profile coefficient [m**5/2]	Wetted perimeter [cm]	Valid rating curve Comment	calcul. reduction value Eta [] / Retain []	
05.11.1997	10:50	65.0	1.60	0.254	0.292	6.29	1140	0.0	67.0	4.893011	1162	Envelope 7 unobjectionable	Eta	0.654
01.04.1998	13:20	50.0	1.61	0.349	0.375	4.61	1080	0.0	54.0	3.178090	1097	Envelope 7 unobjectionable	Eta	0.294
13.05.1998	15:15	84.0	1.97	0.246	0.233	8.01	1250	0.0	87.0	7.029271	1303	Envelope 7 unobjectionable	Eta	0.780
03.06.1998	15:45	114	4.34	0.354	0.379	12.25	1350	0.0	121.0	12.617209	1402	Envelope 7 unobjectionable	Eta	0.644
02.07.1998	11:15	101	2.87	0.282	0.305	10.17	1310	0.0	112.0	10.024157	1370	Envelope 7 unobjectionable	Eta	0.750
12.08.1998	13:30	88.0	1.45	0.164	0.171	8.82	1250	0.0	93.0	7.842530	1283	Envelope 7 unobjectionable	Eta	0.954
02.09.1998	13:15	102	1.73	0.162	0.184	10.66	1290	0.0	107.0	10.216094	1335	Envelope 7 unobjectionable	Eta	0.984
15.09.1998	09:30	180	8.88	0.417	0.504	21.29	1440	0.0	182.0	27.107993	1552	Envelope 7 unobjectionable	Eta	0.887
14.10.1998	12:50	87.0	2.15	0.245	0.273	8.77	1240	0.0	92.0	7.767664	1274	Envelope 7 unobjectionable	Eta	0.763
19.11.1998	11:30	73.0	2.22	0.322	0.309	6.92	1200	0.0	76.0	5.661333	1232	Envelope 7 unobjectionable	Eta	0.546
05.05.1999	12:45	81.0	2.15	0.260	0.314	8.24	1230	0.0	85.0	7.084216	1260	Envelope 7 unobjectionable	Eta	0.694
09.06.1999	13:00	85.0	1.79	0.211	0.212	8.46	1200	0.0	90.0	7.523119	1233	Envelope 7 unobjectionable	Eta	0.841
07.07.1999	13:30	93.0	1.99	0.209	0.223	9.56	1280	93.0	97.0	8.912290	1316	Envelope 7 unobjectionable	Eta	0.858
25.08.1999	13:15	69.0	1.84	0.274	0.297	6.69	1170	0.0	71.0	5.319675	1194	Envelope 7 unobjectionable	Eta	0.622
08.09.1999	12:00	80.0	1.86	0.236	0.260	7.87	1220	0.0	85.0	6.662178	1251	Envelope 7 unobjectionable	Eta	0.768
06.10.1999	13:45	67.0	1.74	0.274	0.276	6.34	1150	0.0	70.0	4.942048	1175	Envelope 7 unobjectionable	Eta	0.628
03.11.1999	12:30	71.0	2.40	0.349	0.363	6.87	1200	0.0	73.0	5.508633	1223	Envelope 7 unobjectionable	Eta	0.444
12.04.2000	13:00	74.0	2.48	0.334	0.383	7.42	1200	0.0	79.0	6.123364	1229	Envelope 7 unobjectionable	Eta	0.475
10.05.2000	14:50	72.0	1.98	0.272	0.312	7.26	1190	0.0	76.0	5.978654	1220	Envelope 7 unobjectionable	Eta	0.619
07.06.2000	12:30	73.0	2.04	0.288	0.312	7.07	1180	0.0	77.0	5.765078	1206	Envelope 7 unobjectionable	Eta	0.613
05.07.2000	13:10	107	4.15	0.365	0.383	11.35	1330	0.0	108.0	11.050713	1374	Envelope 7 unobjectionable	Eta	0.582
16.08.2000	14:20	66.0	1.81	0.283	0.294	6.42	1160	0.0	70.0	5.005065	1184	Envelope 7 unobjectionable	Eta	0.579
20.09.2000	11:45	56.0	1.71	0.321	0.358	5.31	1110	0.0	60.0	3.854649	1129	Envelope 7 unobjectionable	Eta	0.411
11.10.2000	11:30	82.0	3.70	0.432	0.489	8.56	1240	0.0	87.0	7.533391	1271	Envelope 7 unobjectionable	Eta	0.255

Figure 10.30: Report Flow gaugings tabularly

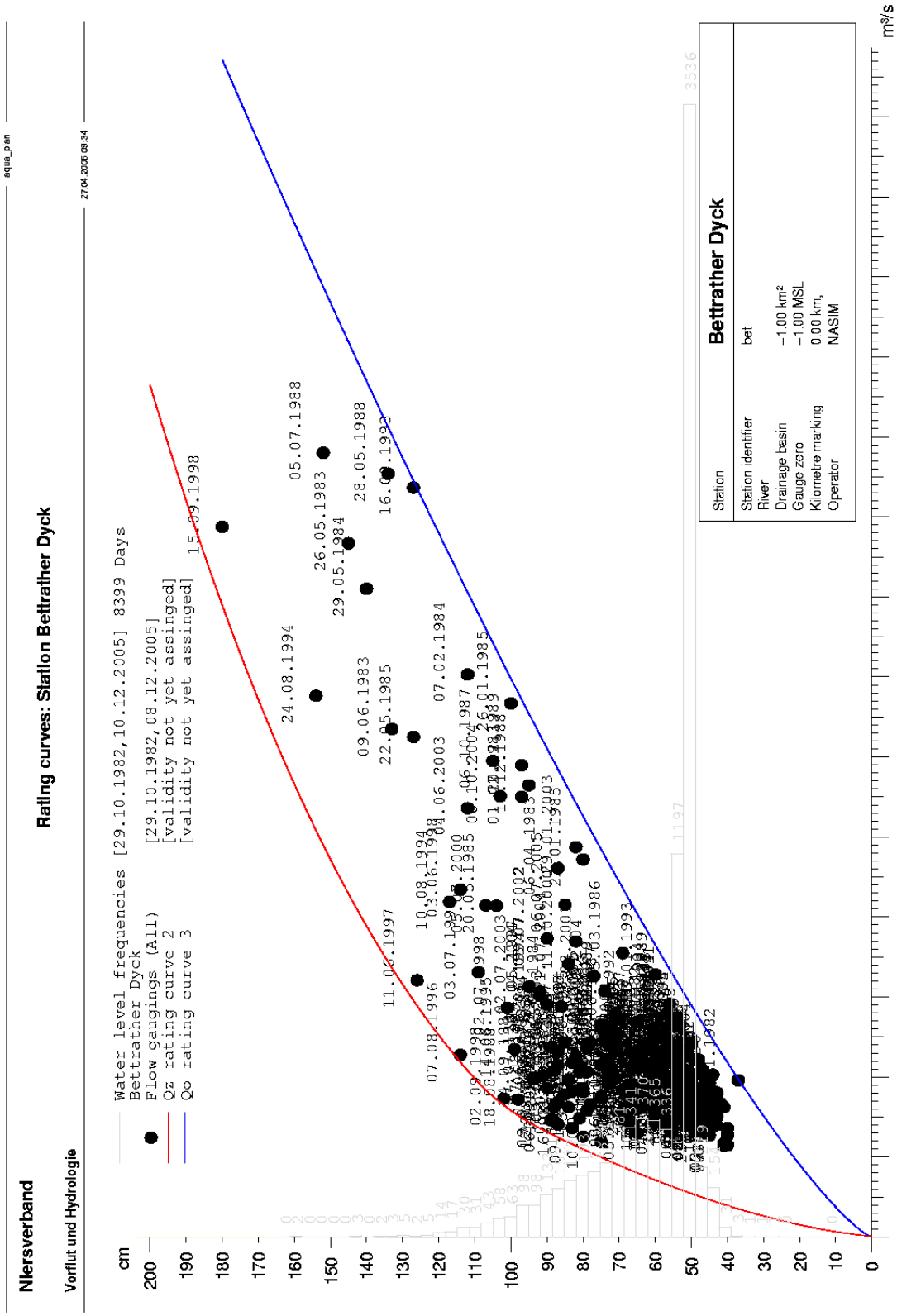


Figure 10.31: Report Rating curve graphic

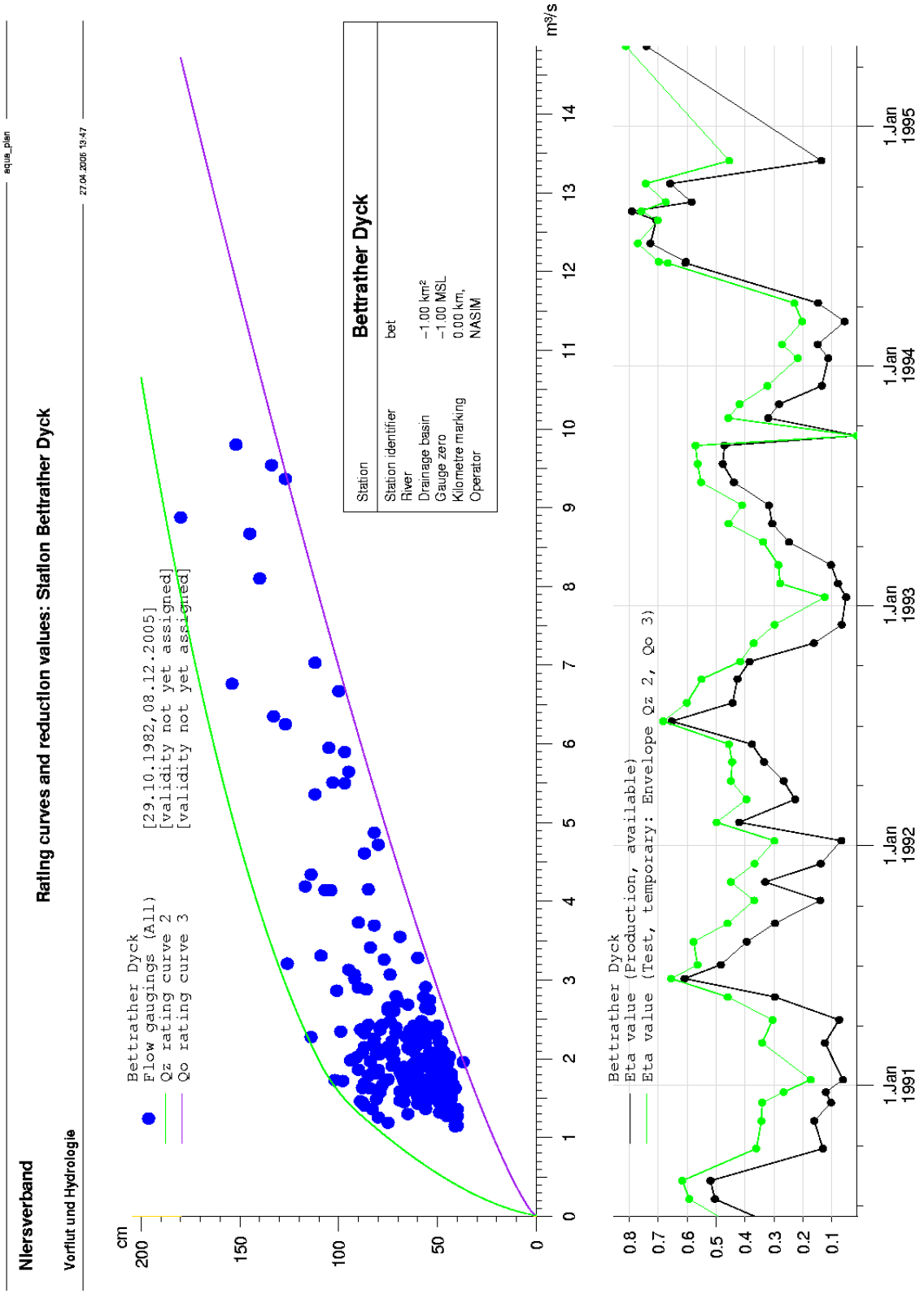


Figure 10.32: Report Rating curve with reduction values and rating curve validities (1)

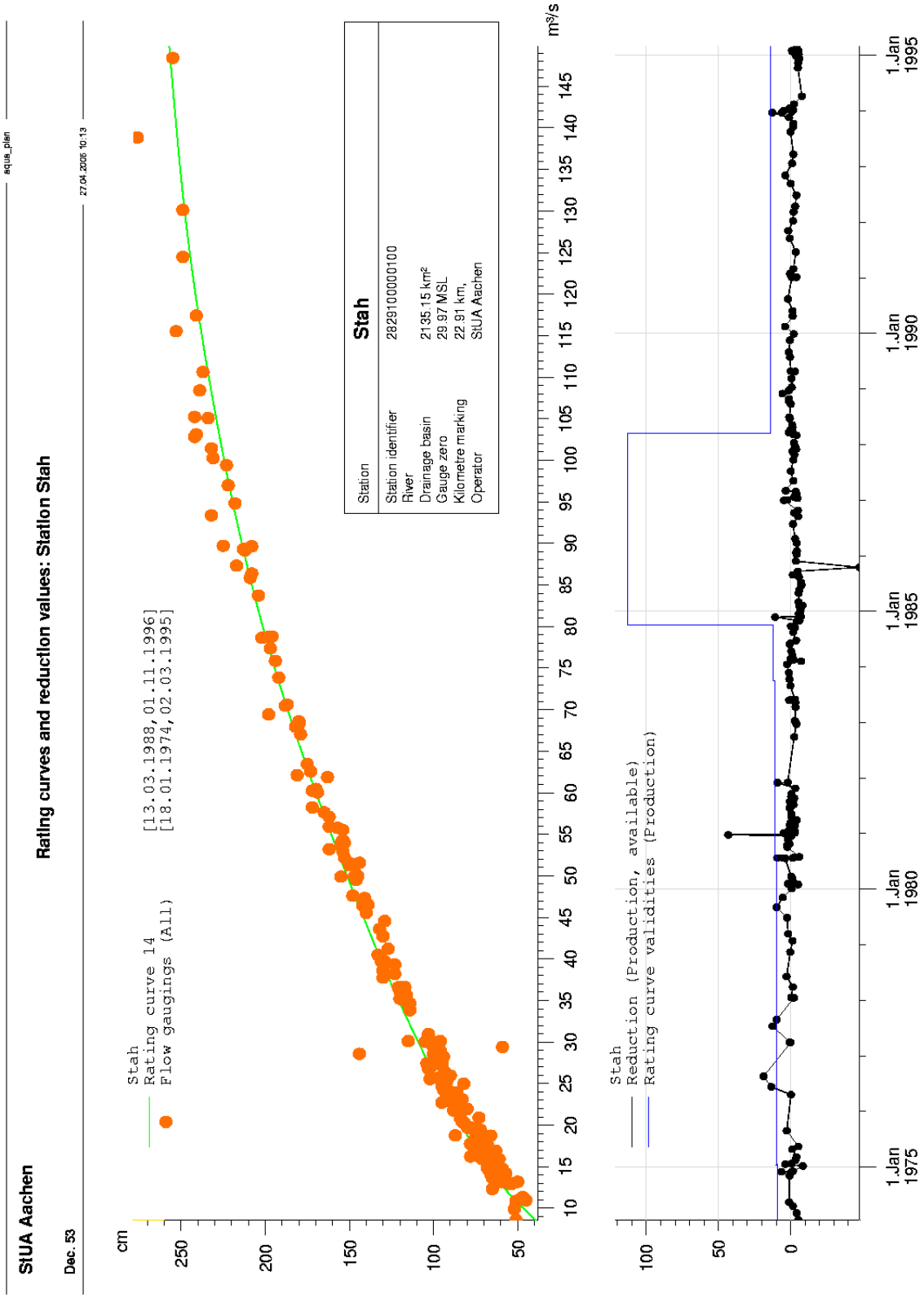


Figure 10.33: Report Rating curve with reduction values and rating curve validities (2)

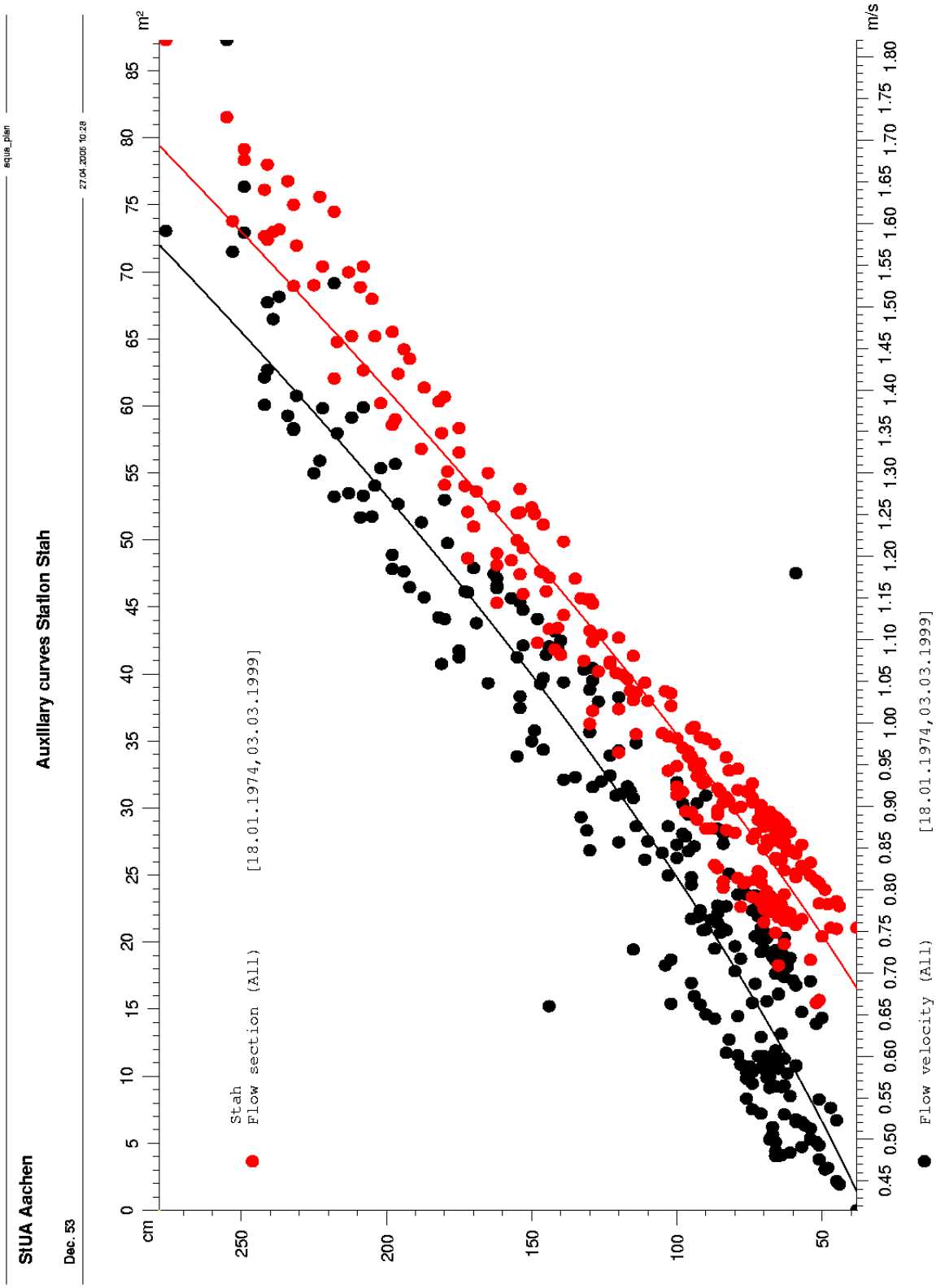


Figure 10.34: Report Auxiliary curve calculated from flow velocity and flow section

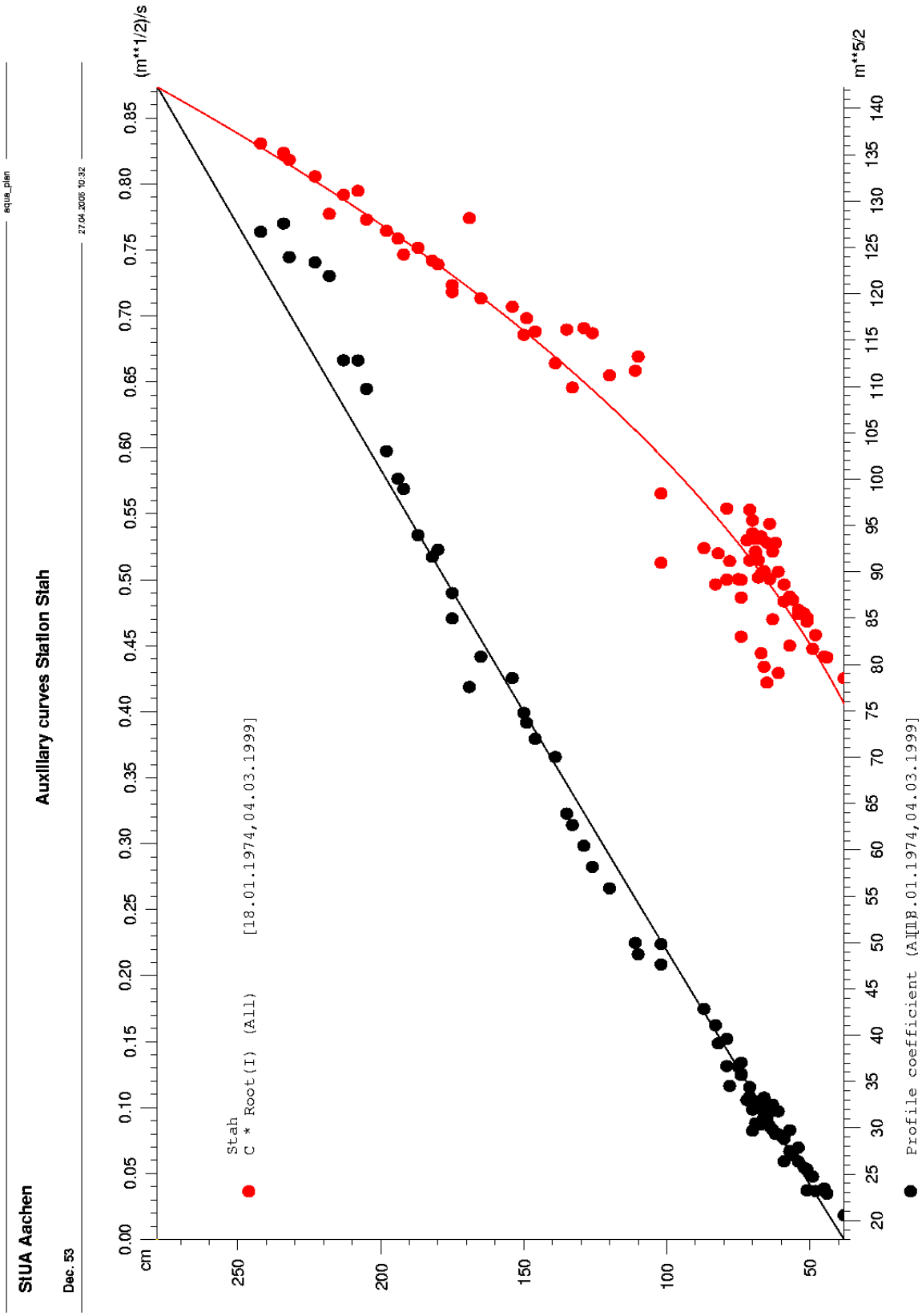


Figure 10.35: Report Auxiliary curve calculated from profile coefficient and $C * \sqrt{I}$

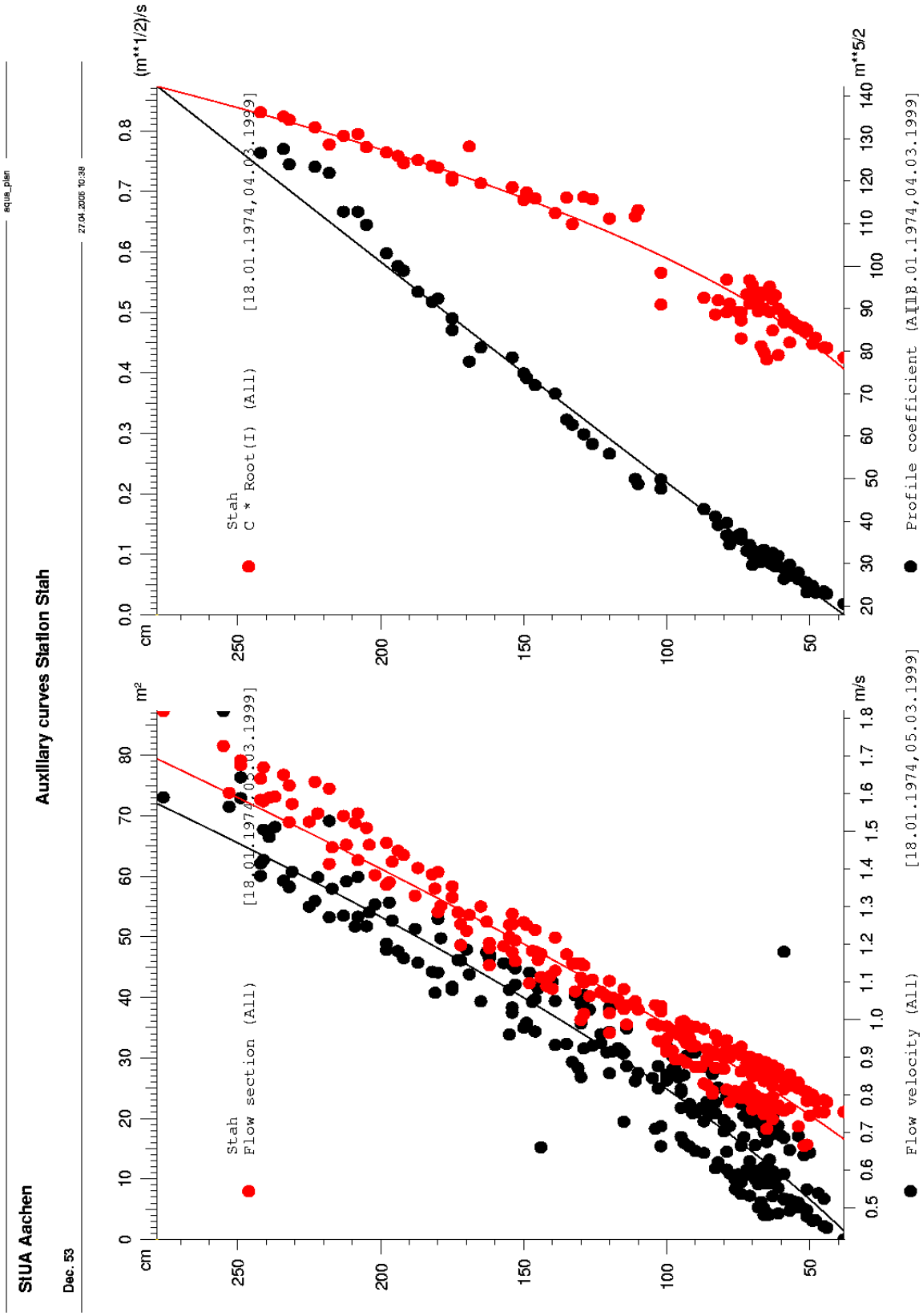


Figure 10.36: Output of both auxiliary curves in one report

aqua_plan

Niersverband Page 1

Bettrather Dyck

Vorflut und Hydrologie **Stage discharge relation**

27.04.2005 13:01

Envelope 7		Valid from	**04.08.2004 00:00**
		Current curve	
Measuring site	**Bettrather Dyck**		
Station identifier	**bet**	Validities acc. to	**Production**
Water level from	**–5 to 200 cm**	Dist. from estuary	**0 km**
River		Position waterside	
Code of river		Gauge zero	**–1 MSL**
Code of catchment area		Aboveground drainage area.	**Ad 0 km²**
Stream		Easting	**2532036**
Topographic map		Northing	**5679303**
Country			
Remarks			

Runoffs in m³/s

cm	0	1	2	3	4	5	6	7	8	9
–10						0.000	0.003	0.005	0.008	0.011
							0.003	0.014	0.026	0.038
0	0.014	0.018	0.022	0.026	0.031	0.037	0.042	0.048	0.054	0.061
	0.052	0.066	0.081	0.098	0.114	0.132	0.151	0.170	0.191	0.212
10	0.067	0.075	0.083	0.090	0.098	0.107	0.115	0.124	0.133	0.143
	0.235	0.258	0.282	0.308	0.335	0.363	0.391	0.421	0.453	0.484
20	0.153	0.162	0.172	0.183	0.194	0.205	0.216	0.228	0.240	0.252
	0.518	0.553	0.588	0.625	0.663	0.703	0.744	0.786	0.829	0.874
30	0.264	0.276	0.288	0.301	0.313	0.326	0.340	0.353	0.366	0.380
	0.920	0.967	1.017	1.067	1.119	1.172	1.226	1.281	1.337	1.393
40	0.394	0.409	0.423	0.437	0.452	0.467	0.483	0.498	0.513	0.529
	1.450	1.507	1.565	1.623	1.682	1.742	1.802	1.862	1.925	1.987
50	0.545	0.561	0.577	0.593	0.610	0.626	0.643	0.661	0.678	0.695
	2.050	2.114	2.178	2.244	2.310	2.376	2.445	2.513	2.583	2.654
60	0.713	0.731	0.748	0.767	0.785	0.804	0.822	0.841	0.860	0.879
	2.725	2.798	2.871	2.946	3.022	3.098	3.176	3.254	3.335	3.415
70	0.898	0.917	0.937	0.956	0.976	0.995	1.015	1.035	1.056	1.076
	3.498	3.581	3.665	3.751	3.838	3.927	4.016	4.107	4.197	4.290
80	1.097	1.118	1.139	1.160	1.182	1.204	1.225	1.247	1.269	1.291
	4.382	4.476	4.571	4.667	4.763	4.861	4.958	5.056	5.154	5.255
90	1.313	1.335	1.359	1.383	1.409	1.435	1.463	1.491	1.521	1.551
	5.357	5.461	5.569	5.678	5.790	5.904	6.020	6.137	6.256	6.374
100	1.582	1.614	1.649	1.683	1.721	1.759	1.799	1.840	1.884	1.930
	6.494	6.615	6.735	6.857	6.980	7.102	7.226	7.349	7.473	7.598
110	1.978	2.029	2.080	2.132	2.186	2.240	2.296	2.351	2.408	2.465
	7.722	7.847	7.972	8.097	8.232	8.367	8.502	8.637	8.773	8.908
120	2.524	2.583	2.643	2.703	2.765	2.827	2.891	2.956	3.022	3.088
	9.043	9.178	9.313	9.448	9.584	9.718	9.850	9.979	10.11	10.20

Figure 10.37: Report Discharge tables

StUA Aachen

Rating curve validities (Production): Stah

Dec. 53

Period: [31.10.1905 00:00, 01.11.1996 00:00]

27.04.2006 10:45

Valid from Date	Time	Rating curves/ Envelope curves	Water level [cm] from	to	Runoff [m³/s] from	to	Last entry in history
31.10.1905	00:00	Rating curve 1	30.0	330	5.40	282	
01.01.1926	00:00	Rating curve 2	30.0	330	4.60	278	
01.11.1936	00:00	Rating curve 3	30.0	310	4.60	200	
31.10.1937	00:00	Rating curve 4	20.0	310	2.70	200	
01.11.1947	00:00	Rating curve 5	0.000	350	0.000	205	
08.11.1955	00:00	Rating curve 6	0.000	260	0.199	114	
01.11.1960	00:00	Rating curve 7	20.0	270	2.20	121	
01.11.1964	00:00	Rating curve 8	20.0	290	6.80	132	
01.11.1970	00:00	Rating curve 9	10.0	300	5.50	173	
15.01.1975	00:00	Rating curve 10	20.0	260	6.60	120	
01.08.1980	00:00	Rating curve 11	20.0	280	7.20	145	
01.10.1983	00:00	Rating curve 12	20.0	270	7.50	138	
		Warning: W with reduction falls below (e.g. 14.12.1983, 18.3 cm) Rating curve 12 Water level, continuous with Reduction, continuous, Production					
02.10.1984	00:00	Rating curve 113	20.0	269	5.70	144	
13.03.1988	00:00	Rating curve 14	20.0	260	5.70	157	

Figure 10.38: Report Rating curve validities Reduction method

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Rating curve validities (Production): Kesseler 3

Dec. 53 **Period: [01.01.1953 00:00, 31.12.2005 23:59]**

27.04.2006 11:40

Valid from Date	Time	Rating curves/ Envelope curves	Water level [cm] from	to	Runoff [m³/s] from	to	Last entry in history
01.01.1953	00:00	Rating curve 51	5.00	452	2.77	187	
		Warning: W falls below (e.g. 27.07.1959, 1.00 cm) and exceeds (e.g. 22.07.1956, 461 cm) Rating curve 51					
		Water level, continuous, TS sequence (free)					
30.06.1962	00:00	Rating curve 52	7.00	451	2.96	186	
		Warning: W with reduction falls below (e.g. 30.06.1964, 2.00 cm) and exceeds (e.g. 18.07.1965, 504 cm) Rating curve 52					
		Water level, continuous, TS sequence (free) with Reduction, continuous, Production					
01.08.1965	00:00	Rating curve 53	10.0	425	4.79	123	
01.01.1968	00:00	Rating curve 54	10.0	460	4.79	203	
20.05.1973	00:00	Rating curve 55	14.0	424	4.51	111	
01.05.1978	00:00	Rating curve 56	20.0	460	3.93	188	
01.11.1982	00:00	Rating curve 57	10.0	430	1.92	101	
18.01.1986	00:00	Qz rating curve 6	0.000	480	3.15	317	
		Qo rating curve 6	0.000	480	4.80	336	
14.12.1989	00:00	Qz rating curve 7	0.000	480	3.00	185	
		Qo rating curve 7	0.000	480	4.80	195	
01.01.1993	00:00	Qz rating curve 8	0.000	480	3.00	317	
		Qo rating curve 8	0.000	480	4.80	336	
31.12.2005	23:59	No curve defined					

Figure 10.39: Report Rating curve validities ETA and reduction method

aqua_plan

StUA Aachen

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Reductions (Production): Stah

Dec. 53

Interval: [18.01.1974 00:00, 06.03.1999 00:00]

27.04.2006 10:49

Date	Time	Reduction [cm]	Comment	Date	Time	Reduction [cm]	Comment
18.01.1974	00:00	Gap		01.02.1980	12:00	−5.052	
18.01.1974	06:00	Gap		06.02.1980	12:00	1.938	
18.01.1974	12:00	−5.191		08.02.1980	12:00	−2.045	
05.03.1974	12:00	−4.092		13.02.1980	12:00	−1.955	
19.04.1974	12:00	−1.455		11.03.1980	12:00	−1.145	
14.05.1974	12:00	1.092		25.03.1980	12:00	−0.345	
05.11.1974	12:00	0.889		22.07.1980	12:00	3.855	
30.11.1974	12:00	6.538		23.07.1980	12:00	−1.501	
02.12.1974	12:00	−0.767		24.07.1980	12:00	5.302	
04.12.1974	12:00	−1.474		25.07.1980	12:00	9.383	
08.01.1975	12:00	−8.522		30.07.1980	12:00	−2.751	
20.01.1975	12:00	3.755		31.07.1980	12:00	−6.023	
24.01.1975	12:00	−0.708		03.10.1980	12:00	2.305	
13.02.1975	12:00	−3.198		17.10.1980	12:00	2.536	
07.03.1975	12:00	−3.902		24.10.1980	12:00	0.752	
28.04.1975	12:00	−1.012		25.11.1980	12:00	1.931	
16.05.1975	12:00	−5.320		17.12.1980	12:00	−0.515	
28.08.1975	12:00	2.747		18.12.1980	12:00	0.418	
20.04.1976	12:00	−0.182		23.12.1980	12:00	43.258	
11.06.1976	12:00	13.462		29.12.1980	12:00	−0.082	
19.08.1976	12:00	18.754		04.01.1981	12:00	4.702	
28.03.1977	12:00	0.074		05.01.1981	12:00	−2.809	
01.04.1977	12:00	0.710		15.01.1981	12:00	−2.759	
15.07.1977	12:00	12.605		16.01.1981	12:00	1.116	
26.08.1977	12:00	9.748		20.01.1981	12:00	1.419	
17.01.1978	12:00	−2.218		18.02.1981	12:00	−2.678	
20.01.1978	12:00	−0.329		27.02.1981	12:00	0.662	
30.03.1978	12:00	−1.479		11.03.1981	12:00	−2.874	
05.06.1978	12:00	2.883		12.03.1981	12:00	0.039	
14.11.1978	12:00	0.291		27.03.1981	12:00	−1.651	
26.01.1979	12:00	−1.212		30.03.1981	12:00	−3.974	
13.03.1979	12:00	1.774		09.04.1981	12:00	−0.877	
27.06.1979	12:00	2.458		24.04.1981	12:00	−0.553	
04.09.1979	12:00	9.725		08.05.1981	12:00	−0.488	
08.11.1979	12:00	5.552		16.06.1981	12:00	0.676	
04.01.1980	12:00	−0.695		30.06.1981	12:00	−0.775	

Figure 10.40: Report Reduction values

Chapter 11

Master data structure (Database internals)

11.1 Master data structure

11.1.1 Introduction

The master data of TopoDesk are stored in a data base. This data base comprises several tables which are viewable as dbf data in the `stammdir` directory. Some fields are dependent on others and cannot be viewed on their own. Certain datasets must have a minimum rate of filled in fields in order to be well-defined and effectual. These special coherences shall be explained in the following.

11.1.2 Involved files

The files which are involved in the configuration of the master data base are located in the `stammdir` directory. These are:

dbdeclare.ini: This is where the structure of the master data base is deposited. It is a text file, in which the description of the table fields is listed in groups (they start with [DB_Tablename]). The fields are listed with their internal name and type. The numbers at the beginning of the line allege the order of the fields.
The table links are filed in the groups starting with DATABASE_CONTEXT. Here, there are the following groups (for explanations see coherences):

DATABASE_CONTEXT_CODES: The code tables are configured here, meaning which field in the main data set is replaced by which.

DATABASE_CONTEXT_EXTENSION: The extensive tables are declared here.

DATABASE_CONTEXT_ZUORDNUNG: Here you find the allocation fields and their solving.

DATABASE_CONTEXT_SPEZ: This group is a little more complicated and defines how the specific extensions are linked.

feldgui.ini: Here you find the translations of the internal names to those names appearing in TopoDesk. In order to keep the names of the fields in TopoDesk modifiable and not having to change the structure of the data set each time, the tables are filed together with their fields in feldgui.ini and a cleartext name is allocated so that, for example, WAWI can also be water management administration. The input works the following way:
Internal_Name= Cleartext[&Table width][@Auxiliary text][%Unit]
[ ] means optional.

***.dbf:** These files contain the tables (see below: Terms ⇒ dbf file).

***.dbt:** Especially long text parts are written to swap file here. They are named like the associated dbf files. There is not necessarily a compatible dbt file to each dbf file but in case there is, they must always be treated (adjusted, renamed, saved etc.) together.

11.1.3 Terms

Table: A table, also called relation, consists of columns and rows. We also call the columns **fields**. The rows contain the **datasets**, which are also called tuples.
An example:

Station	Parameter	Purpose
0815	Water level	Demo
4711	Runoff	Test

Here, the columns (fields) are **Station, Parameter, Purpose** and the rows (datasets) are: **0815, Wasserstand, Demo** and **4711, Runoff, Test**. All datasets of one table have the same fields. Thus, they have the same **Structure**.

Relation: see **Table**

dbf-Datei: These files contain the tables. Each file represents a table. Coherences between the tables are not saved in the dbf files. The right shall be reserved to the databank administrator to edit these files seperately. The names of the fields in the dbf files usually do not accord to the common names in TopoDesk (see section Involved files ⇒ feldgui.ini). Dbf files are subject to uncomfortable restrictions for the naming of fields. Therefore the fields are decoded for the display in the window (see **Involved files**)

Keys: There are certain fields in a dataset which clearly identify the whole dataset. These fields (one or more) are called keyfields. This(these) field(s) together are called the key. When faulty data is entered here, like, for instance, double entries in the keys, this can lead to unpredictable errors.

11.1.4 Coherences

A complete MasterDataSet is composed of several tables. TopoDesk puts this dataset together on the basis of the information out of dbdeclare.ini and entries in the fields. This way, the dataset of a rainfall measuring site is different to the dataset of a hydrometry station. TopoDesk uses the information in the field `Sachgebiet` (subject field) in the main table (see below) in order to extend the dataset. This means that datasets of different stations may be incompatible according

to their structure.
There are different ways of extending or modifying a dataset:

Specific extensions: There are certain extensions available for each station. These are defined by the contents of a field in the main table.
Example: Rainfall extensions. In the field `SACHGEBIET` (subject field) of the station `0815` the entry is `10`. In dbdeclare.ini you can find how to proceed with this entry. By means of the table `SACHGEBIET` (subject field) the `10` is now decoded into `niederschlag` (rainfall). The structure of the dataset is extended by the fields in the table `niederschlag` (rainfall) and filled with contents of the dataset `0815` in this table.
This means, there is exactly one dataset as extension subject field to each dataset in the main table. When the master data is created manually, there must be corresponding datasets in the specific extension relations in the main table, here the example `niederschlag.dbf` (rainfall).

Example: There is a dataset with the `ORT` (location) Aachen and the `SACHGEBIET` (subject field) 10. In this case, there must be a dataset in the specific extension relations corresponding to the subject field 10 (here `niederschlag` (rainfall)) in which at least the field `ORT` (location) is filled in.

Extensions: Extensions: These tables serve the extension of the main table without having to change its structure. This way, customer-specific fields, for instance, can be added easily.

Temporal extensions: There are also tables that contain more entries to one station. An example herefor are time-dependent extensions such as the coordinates. Thus, there are several datasets in the table `zeit_lage` (time_location) which are distinguishable by the time of their validity that are linked to the station `0815`. This is why a point in time is needed for the creation of a current dataset. Now, with this point in time, the according dataset is searched for in `zeit_lage` (time_location) and the structure of the primary dataset is extended and filled. This means that the key of `zeit_lage` (time_location) is composed of `ORT` (location) and `BEGINN` (begin).

Codes: There are short forms for certain data. Not the data (address, telephone, mail etc.) of the owner of a station, for example, is saved in the main MasterDataSet, but just a short form, a code. This code can then be decoded into a complete dataset in a certain table. The fields which are transferred from the code tables to the primary dataset are configurable in dbdeclare.ini.

Allocations: Some fields are dependent on others. The field `KREIS` (district), for example, is dependent on the contents of the field `KOMMUNE` (commune). Thus, `KREIS` (district) is not a direct field, but an allocated one. The allocation tables are used for this purpose. Within these, a `KREIS` (district) is allocated to each dataset in the table `KOMMUNE` (commune). The main dataset is extended by the field `KREIS` (district) and the compatible district is searched for via `zuordnung_kommune` (allocation_commune) and filled. This means that one cannot place `KREIS` (district) in the main table. Only `KOMMUNE` (commune) is placeable. This only works when an allocation to an available district exists for a commune in `kommune` in the allocation relation `zuordnung_kommune` (allocation_commune).

11.1.5 Tables and contents

kerndaten:	This is the **main table**. Nearly all other tables depend on this. A new station is first created here. Stations which don´t have an entry here cannot be found by TopoDeskṪhe field `ORT` (location) is the key. Additionally, a subject field can be allocated to each station.
benutzer:	The users are saved here. No dependencies.
grundwasser:	Specific extension for subject field groundwater.
gewaesserguete:	Specific extension for subject field water quality.
hydrometrie:	Specific extension for subject field hydrometry.
klima:	Specific extension for subject field climate.
niederschlag:	Specific extension for subject field rainfall.
erweiterung_callisto:	Extends the main table by callisto fields
beobachter:	Code table for observer.
betreiber:	Code table for operator.
besitzer:	Code table for owner.
betreuung:	Code table for supervision.
unterhaltung:	Code table for maintenance.
bearbeiter:	Code table for editor.
einzugsgebiete:	Code table for drainage areas.
messmethode:	Code table for method of measurement.
hersteller:	Code table for manufacturer.
kommune:	Code table for commune.
morphologie:	Code table for physiography.
kreis:	Code table for district.
verband:	Code table for association.
wasserwirtschaftsverwaltung:	Code table for water management administration.
sachgebiet:	Code table for subject field. Here, also, the subject field specific day and year changes are saved.
parameter:	Code table for parameter. Here, also, the parameter specific day and year changes as well as the colour for the display of parameters in axboxes are saved.
geber:	Sensor table. The sensors of the stations are saved here.
zuordnung_kommune:	A district is allocated to each station.
zuordnung_vergleichsstation:	Comparative stations can be allocated to each station.
zuordnung_wawi2:	A WMA 2 (water management administration) is allocated to each WMA.
zuordnung_wawi3:	A WMA 3 is allocated to each WMA 2.
zeit_stromflaeche:	Time-dependent river district area.
zeit_beobachter:	Time-dependent observer codes.

zeit_einzugsgebietsflaeche:	Time-dependent catchment areas.
zeit_geber:	Time-dependent sensors.
zeit_lage:	Time-dependent northings and eastings
zeit_hoehe:	Time-dependent heights.
zeit_pegellatte:	Time-dependent staff data.
zeit_seilkrananlage:	Time-dependent cable way installations data.
zeit_stationierung:	Time-dependent station deployment data.
zeit_betreuung:	Time-dependent supervisors.
zeit_unterhaltung:	Time-dependent maintainers.
zeit_bearbeitung:	Time-dependent editors.
code_ablesung:	Code table for reading
code_aussage:	Code table for interpretation
code_beobachterfunktion:	Code table for observing function
code_entstehungsart:	Code table for emerging type
code_geraetetyp:	Code table for device type
code_gewaesser:	Code table for rivers
code_grundwassermessstelle:	Code table for ground water measuring site
code_gwsymbol:	Code table for ground water symbol
code_herkunft:	Code table for origin
code_karte-a:	Code table for map a
code_karte-b:	Code table for map b
code_kontrolle:	Code table for check
code_netzordnung:	Code table observational network order
code_ordnung:	Code table for order
code_qualitaeten:	Code table for qualities
code_registriersystem:	Code table for recording system
code_reihenart:	Code table for type of series
code_strom:	Code table for major river
code_wartung:	Code table for maintenance
code_xdistanz:	Code table for x distance
code_zeitbezug:	Code table for time reference
code_quelle:	Code table for source
code_ytyp:	Code table for y type
code_sprache:	Code table for language
code_gewaesserart:	Code table for waterbodies
code_messsystem:	Code table for measuring system

Chapter 12

Special hints for TopoDesk

12.1 Qualities

The time series are edited in quality layers according to the following pattern:

- 0 Original
  Initial (basic) time series (not to be changed)
- 1 Purged
  Remedy of gross faults
- 2 KaliSync
  calibrated/synchronised
- 3 Gaps filled
  Elimination of gaps
- 4 Corrected
  all other corrections
- 5 Released
  do not change time period anymore

In the applications, the quality layers are used according to these specific functions.

12.2 Blocked periods

Depending on the access rights of the logged in user (↪ chapt. 2.2), hydrographs can be blocked for the editing or the viewing.

Periods in already existing series in the system can be blocked or unblocked by the authorised editor via the window Check and correct continuous time series (↪ chapt. **??**).

When the logged in user does not have the access rights to unblock time series, these can neither be visualised nor be put out in tabular reports.

- In the **Visualisation** blocked periods are marked by a grey bar (↪ fig. 12.1). Furthermore, the according hydrograph segment is not displayed for the unauthorised user (↪ fig. 12.2).
- Blocked periods cannot be edited in any TopoDesk window without the according access rights.
  A blocked period is generally existent. When these series are used for evaluations or for the export, blocked segments are treated as gaps should the editor not possess the according access rights. The blocked time periods of the initial time series are visible in time series sequences.
- The numerical values of the blocked period are not displayed in tabular **Reports** (blocked periods are treated as gaps).
  The reports Time series survey and Qualities,Gaps,Comments (↪ chapt. **??**) display blocked periods graphically and in colour.
  <The gap list puts out the blocked periods tabularly.
  The gap overview in the Quick-Info of the main window (↪ chapt. 4.2.3.1) also gives information about blocked periods.

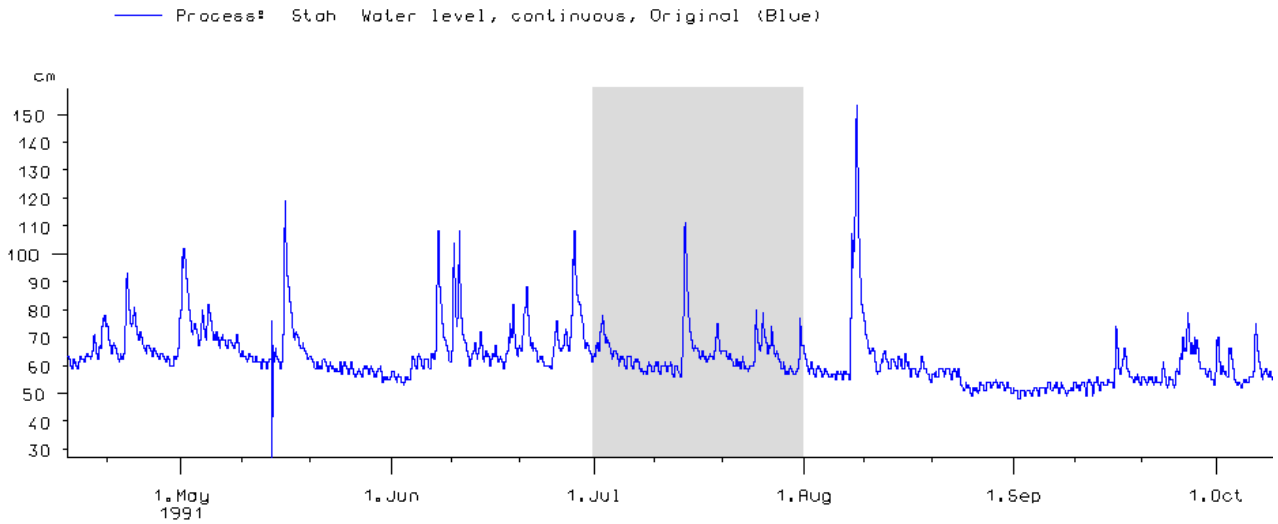


Figure 12.1: Visualisation of blocked periods (user has an according access right)

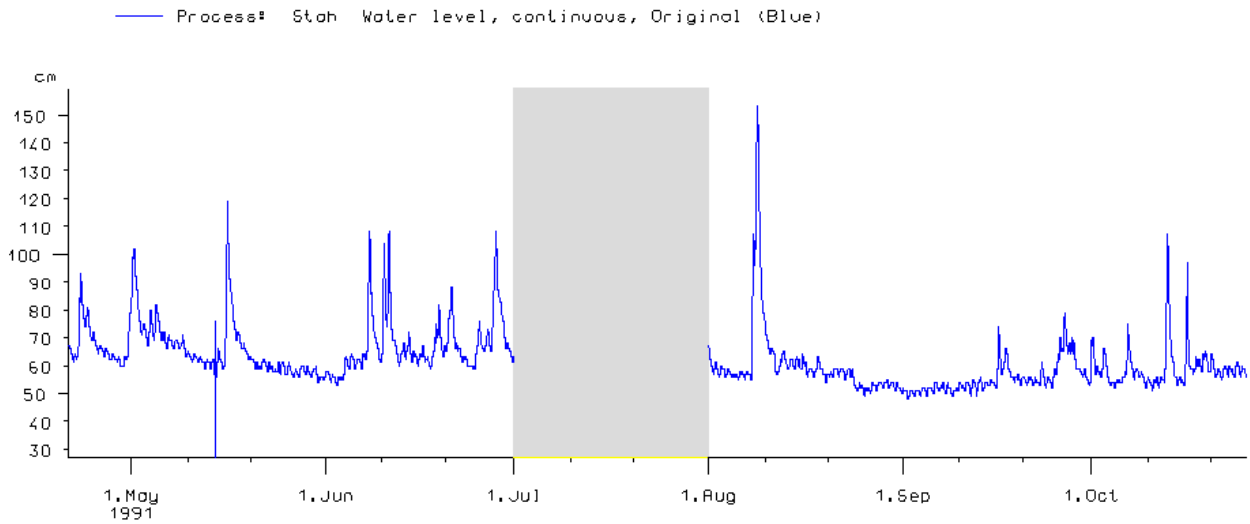


Figure 12.2: Visualisation of blocked periods (user has no according access right)

Chapter 13

General hints

13.1 Start and quit programs

toposoft program systems are started from the Windows desktop by double-click with the left mouse button.

In order to exit toposoft program systems properly, select **Exit** in the menu File . All the subprograms can be exited with the button Quit. This button is generally located in the top left-hand corner of the window.

Furthermore, you have the possibility to close most of the windows of the toposoft program systems by means of the button which is always in the top right-hand corner of the window. Those windows that will not react to this button must be exited via Quit.

13.2 Online auxiliary

All windows are equipped with an online auxiliary. This explains the control elements. When you rest your cursor on an element, the auxiliary text will appear in a box.

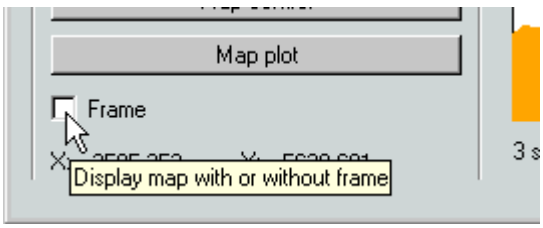


Figure 13.1: Online auxiliary

13.3 Presets in properties of the shortcut

Via the window „Properties“ (↪ fig. 13.3), which you open via the “Windows“ window, you can make different presets for TopoDesk . These are explained in the following sections.

In order to open the window, right-click the icon of the according toposoft program system in the “Windows“ window. In the appearing context menu (↪ fig. 13.2) now click on Properties. The window „Properties“ will open.

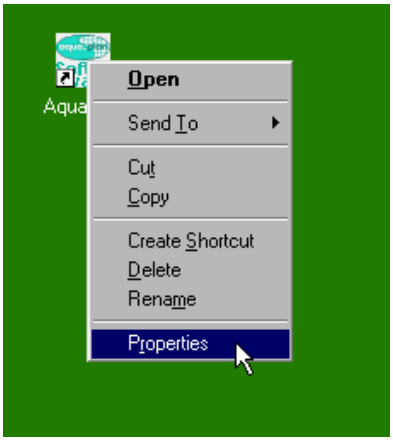


Figure 13.2: Context menu

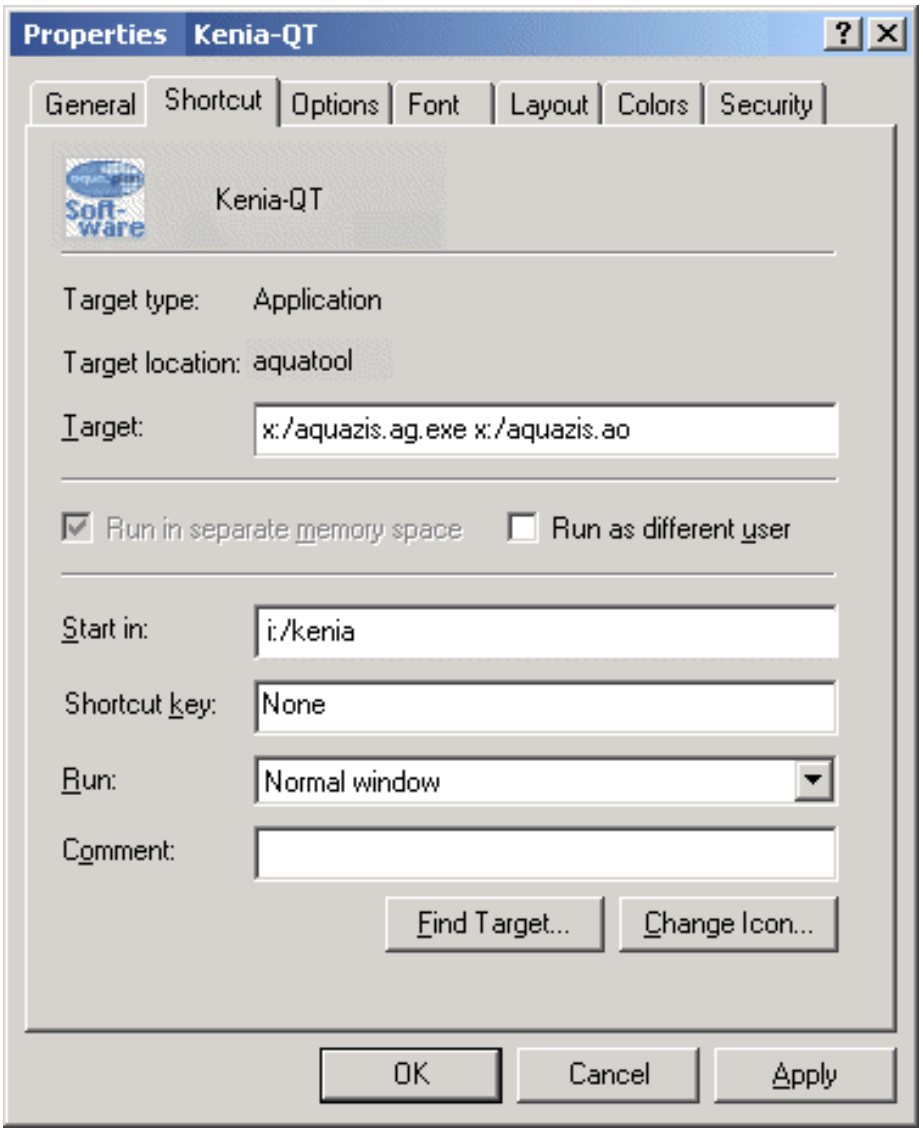


Figure 13.3: Properties of the selected program

On the register card Shortcut in the input field for Target:, you will find indicated the absolute path for the program to be invoked (ag.exe) as well as for the selected module (ao-file):

```
x:\topodesk\bin\ag.exe x:/topodesk/bin/topodesk.ao
```

Local devices or connected network devices can be involved. The two path indications can now be added with information, e.g. to change the appearance of TopoDesk (↪ chapt. 13.3.1), to always start in a certain language (↪ chapt. 13.3.3) or to suppress the login window (↪ chapt. 13.3.4). The additions described in the following can be used cumulatively.

13.3.1 To change the appearance of TopoDesk

Three possibilities for changing the appearance of all TopoDesk windows are available: the „Platinum“style, the „Windows“-style and the „Motif“style. In figure 13.4, all three styles can be seen (left: Platinum, middle: Windows, right: Motif).

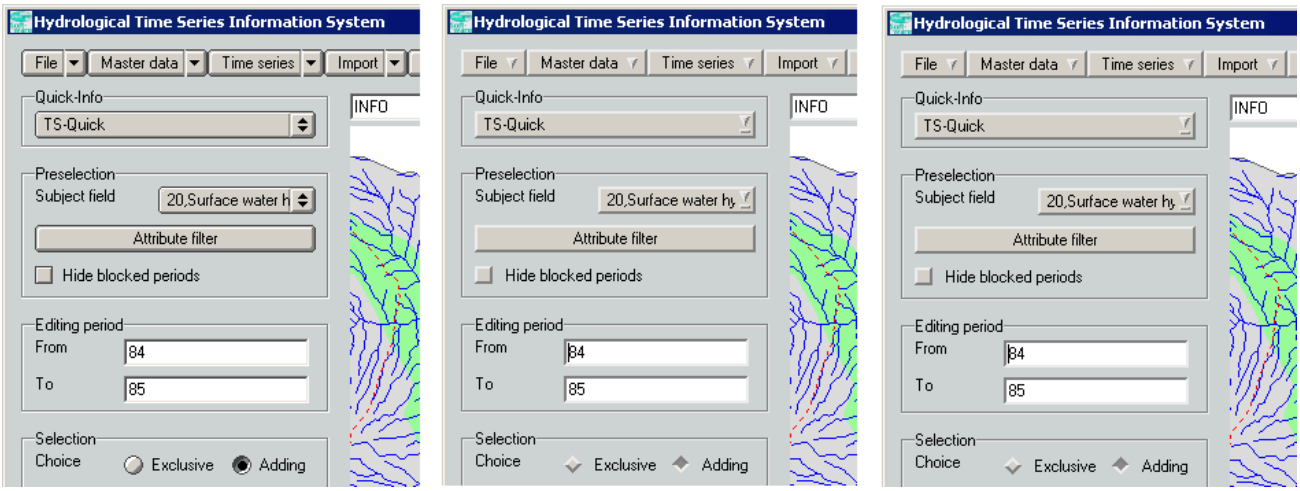


Figure 13.4: Styles of TopoDesk: Platinum, Windows, Motif

In the delivery status, TopoDesk is displayed in the platinum style. In case you would like to change this, either enter `-s windows` or `-s motif` between the two path indications in the input field for **Target:**. This change will take effect from the next invocation.

Entry for the Windows style: 0

```
x:\topodesk\bin\ag.exe -s windows x:/topodesk/bin/topodesk.ao
```

Entry for the Motif style:

```
x:\topodesk\bin\ag.exe -s motif x:/topodesk/bin/topodesk.ao
```

Entry for the Platinum style:

```
x:\topodesk\bin\ag.exe x:/topodesk/bin/topodesk.ao
```

or

```
x:\topodesk\bin\ag.exe -s platinum x:/topodesk/bin/topodesk.ao
```

The pictures in this documentation that were taken of the TopoDesk windows show the Windows style.

13.3.2 To change the size

By means of an additional indication in the properties, you also have the possibility to scale the size of all windows of TopoDesk . For this purpose, enter `-g` *factor* between the two path indications in the input field for **Target:**, e.g. `-g 0.9` or `-g 1.2`. For a factor 1,1, complete the entry in the following way, for example:

```
x:\topodesk\bin\ag.exe -g 1.1 x:/topodesk/bin/topodesk.ao
```

From the next invocation, TopoDesk will be scaled by the indicated factor.

13.3.3 To change the language

Under **Target**, you can also define the language with which you want to start TopoDesk . For English, for instance, complete the indication as follows:

```
x:\topodesk\bin\ag.exe -l en x:/topodesk/bin/topodesk.ao
```

Possible indication codes:

Sprache	Eingabekürzel
English	-l en
French	-l fr
Swiss Standard German	-l ch
Italian	-l it
Spanish	-l es
etc.	

Via the indication codes, you arrange for the program to access the according translation file alingua.dbf. In this table relation, all German texts that are used in topodesk are listed in the first column. It is not allowed to make any changes in this column. The further columns are reserved for the other languages and can be changed and completed arbitrarily. toposoft always adapts the German column as well as the English translation to the current changes in topo .

> HINT:
> Via alingua.dbf, you can also provide or change translation texts yourself. Please contact our hotline if you wish to do so.

Under ▽ File → Choose language you can change between the languages comprised in the current alingua.dbf.

13.3.4 To suppress the login window

You can have the login executed automatically by topodesk or suppress the appearance of the login window. Should the login be executed automatically, specifications for your user name and password must be made in the input field for Target:.

Example:
Your name is Charlotte and your password is “Sweden“. In order to suppress the appearance of the login window in topodesk , enter the following as Target:

```
x:\topodesk\bin\ag.exe x:/topodesk/bin/topodesk.ao us=charlotte pw=Sweden
```

Meaning of the abbreviations: `us=`[*user*] `pw=`[*password*]

With this entry, you suppress the login for the user Charlotte. The next time she starts the program, she will be logged in automatically.

13.4 Mouse button assignments

For working with the map and the axboxes as well as with the window Preview (↪ chapt. 13.8.1), there are special assignments for the mouse buttons.

Generally, one can distinguish between the single mouse click and the rubberband.

> **Rubberband**
> In order to draw a rubberband, first click on a point in the map or in the axbox and, while holding down the button, drag a rectangle on the diagonal. This way, you can zoom into certain areas or select several objects in one step.
> In some programs the rubberband or the rectangle are generated differently: Left click into the graphic display on the point where you want to have an edge of the rectangle. Then left click into the graphic display again, this time on the point where you want to have the diagonal edge of the rectangle. Now your markings will be displayed in the graphic display and the graphic will automatically be updated so that it will show the area you have marked with the rectangle.

Map:

- Left mouse button
  This serves the selection and deselection of gauging sites (↪ chapt. 4.2.3.4) by mouse click on the different gauging site symbols or by drawing a rubberband; when you press the Shift key at the same time, you can deselect areawise.

- Middle mouse button
  When you click on a gauging site symbol, the selected program for Quick-Info will be opened (↪ chapt. 4.2.3.1).
  When a new gauging site is being installed (↪ chapt. 6.2.2), a click into the map will adopt the position coordinates into the according input fields of the window Create a new station (↪ fig. 6.4)

- Right mouse button
  This is used for rubberband zooming. When you move the mouse and hold the Shift key at the same time, you magnify the map section.

Axboxes:

- Left mouse button
  This is used for selecting axboxes (when more than one are displayed in the graphic). The selected axbox can be recognized by its thick displayed Y-axis. Renewed clicking of the

selected axbox extends the display to the whole graphic. Repeated clicking revokes this display.
By clicking the Shift button and, at the same time, drawing with the left mouse button you scroll in the according direction.

- Right mouse button
  This is used for rubberband zooming. In association with time series, the zooming only affects the X-axis, in association with rating curves, it affects both X- and Y-axis.

Preview:

- Left mouse button
  By holding this button, you can move the displayed report. (In this case, you don't need to hold the Shift button for scrolling.)

- middle mouse button
  This is used for browsing through the report pages. By holding the Shift key at the same time, you scroll backwards.

- right mouse button
  This is used for rubberband zooming. By holding the Shift key at the same time, you magnify the section.

  HINT:
  Should you not have a three-button mouse, you can also obtain the functions of the middle mouse button when you click the left mouse button and hold down the Shift key.

13.5 Function and handling of the interactive elements

13.5.1 Menu

Basically, you invoke a utility program in a menu by moving the mouse to the menu and by clicking the left mouse button. The menu then will open and you select the title of the desired utility program with the cursor. This is now indicated in colour and can be selected by single click.

13.5.2 Button

When you click a button with the mouse, a utiliy program will be executed.

13.5.2.1 Selected button

-->
Buttons surrounded by a dotted line are selected elements and can be confirmed with the Return key.

13.5.2.2 Buttons for zooming and scrolling

Map:

The navigation buttons for the map are located in the main window in the frame Navigation (↪ chapt. 4.2.3.5).

Axboxes:

The buttons for zooming and scrolling are located below the axboxes. The following are at your disposal:

y ∧	scroll upwards → moves the displayed Y-axis section upwards
y ∨	scroll downwards → moves the displayed Y-axis section downwards
y ><	zoom out → magnifies the displayed Y-axis section
y <>	zoom in → minifies the displayed Y-axis section
< −	scroll to the left → moves the displayed X-axis section to the left
− >	scroll to the right → moves the displayed X-axis section to the right
><	zoom out → magnifies the displayed X-axis section
<>	zoom in → minifies the displayed X-axis section
\	zoom previous → reestablishes the previous displayed section (several steps possible)
| < − > |	whole range → displays the MaxFocus
<< − | − >>	By means of 100 ▽ you choose the percentage with which you want to scroll in X direction

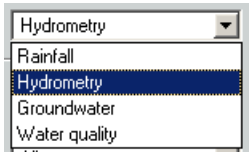
13.5.2.3 Trigger

A trigger is a button which only starts to execute a utility program after you have clicked

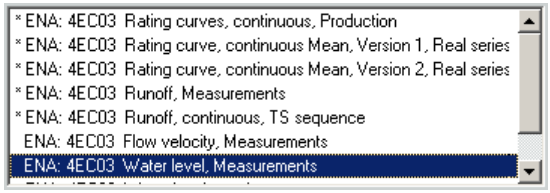
in an axbox at least once with the left mouse button. This is helpful, for example, when in this way you want to add one or more points in time to the invoked utility program. The complete number of required clicks and the number of the next click are indicated in the status line (in most cases they are additionaly indicated by the number of asterisks on the button). Triggers can be switched off by renewed clicking.
Triggers surrounded by a dotted line are applied the same way as all buttons: they are selected elements and can be activated again with the Return key (↪ 13.5.2.1).

13.5.3 Shortlists (general)

You can open a shortlist via the arrow on the right-hand side. Then you select the desired entry and click it with the mouse. Now the shortlist will close again and present the chosen entry.
The listed entries are sorted in alphanumeric order. For long lists, it is advisable to go ahead as follows: Left-click once into the text of the shortlist. This activates the list which is indicated in colour. Now, by clicking an initial letter (or the initial number), you can reach the first entry in the list beginning with this letter (number). By repetitive clicking of this letter you browse down the list as long as entries with this letter are existent.



Shortlists can either be presented closed (see above) with only one visible entry or open with several visible entries.



There are shortlists with which you can choose **more than one** entry. In this case, the individual texts are prefixed by an asterisk. With this asterisk, the choice will be **selected**. By single left-click, you either undo the selection or activate it again.
Apart from this, **one** entry per list can be **marked** blue.

Some shortlists are accompanied by a button with a plus sign. When you activate [+], a table window will open via which a further list entry can be defined.

13.5.4 Shortlists (Station list)

The gauging site list or station list is a special kind of shortlist. It provides all existing gauging sites. Depending on the invocation, the station list may contain only the lists selected in the map.
You define in the display selection area in the master data window (↪ chapt. 6.2) under which

indication (Station-ID, Name, Owner-ID etc.) the stations are to be listed.
The button [>] is a further characteristic. With this button, you open a window with which you can limit the listings by using wildcards (↪ chapt. 13.5.15).

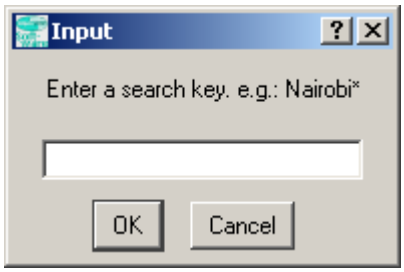
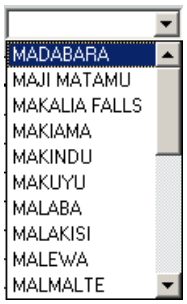


Figure 13.5: Input window for station search term

13.5.5 Combo list

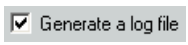


On one hand, the combo list offers the selection of the appending list, on the other hand, it can also be described as an input field. There is no visual difference to the shortlist.
The auxiliary text appears when the mouse cursor is moved over the triangle beside the input field.

13.5.6 Alternative choice

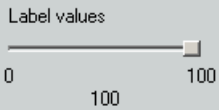
The desired choice can be made by left-clicking the ⊙ point or the text in an alternative choice. The choice possibilities can be offered horizontal (beside each other) or vertical (on top of each other).

13.5.7 Checkboxes



A (control-) checkbox is performed by a little square and a text. By clicking the square with the mouse it will be activated or deactivated. Activated ☑ means that the text (or that which is written in the auxiliary) shall apply, deactivated means it shall not apply.

13.5.8 Slider



A slider is a controller. The lower and upper margin are indicated beside the slider. The current adjusted value is displayed in the middle. By moving the slider, you select the current value.

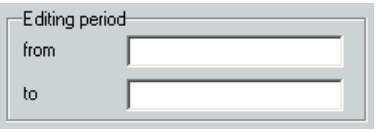
13.5.9 Texts

Texts serve the explanation of other control elements. In few exceptions, also these have auxiliary texts.

13.5.10 Input entry

The white field signifies an input entry. It is mostly accompanied by a text describing the content of the input field. In order to enter something here, you must first click into the input field or skip from another field into this one with the Tab key. The entries can also be linked with AZURprograms which are activated with the Return key.

13.5.11 Time input



Valid time inputs always represent exactly one point in time. When you enter the date with only 2 digits, e.g. 98, the current century will be added (= 2098). When a point in time arises which is more than 2 years later than now (in this case 2098 is many years later than now), 100 years will be substracted. The entry of 98 in the year 2009 would therefore lead to 1998.

When you enter a point in time without a time of day, the time of day which was defined as day change for the according parameter will be added. The settings for the day change are made under ▽ File → System settings → Subject fields and parameters (↪ chapt. 5.3.3).

Dates such as today, yesterday or the day after tomorrow specify a valid date. The indication now determines the point in time up-to-the-second.

For time inputs defining a time period, one always considers the whole range of the time expanse. Within the hydrometry *2003* usually means from the 1.11.2002 at 0:00 to the 1.11.2003 at 0:00 (Exception: when *calendar year* is preset, the dates 1.1.2003 at 0:00 to 1.1.2004 at 0:00 occur). Within the subject field rainfall the presetting *today* would, for example, lead to 6.5.2009 at 7:30 to 7.5.2009 at 7:30.

Instead of the points, you can also use commas for the time input. This is advisable, in particular, for the input via the number block of the keyboard.

Time input fields and axboxes:

When the mouse cursor is in one of the time input fields, click Return and the desired time period will be displayed in the axbox. At the same time, the time inputs described above will be transcribed to exact points in time (in the hydrometry *1,5,89* will be transcribed to *01.05.1989 00:00*, on entry of *09* in the input field **from** the entry for rainfall will be transcribed to *01.11.2008 07:30* in the field **from** and to *01.11.2009 07:30* in the field **to**).

When zooming and scrolling in the axbox, the entered time period stays in the fields. This way, the initial time period can easily be displayed again.
However, the entries can also be modified arbitrarily and with a Return click into one of the fields, the display will be adapted in the axbox.

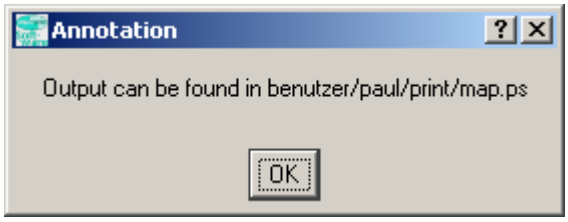
In some cases, the time input fields are prefixed with a checkbox ☑ . On activation of this checkbox, the actual point in time displayed in the axbox for the beginning or end of the display will be adopted in the input fields and adapted with each new zooming and scrolling. When the checkbox is deactivated, the initial entry remains. So when you click the Return key you can get back to your first entered time period over and over again.

13.5.12 Dialogue window

Dialogue windows are input, hint or choice windows which lead and support you during certain editing steps.

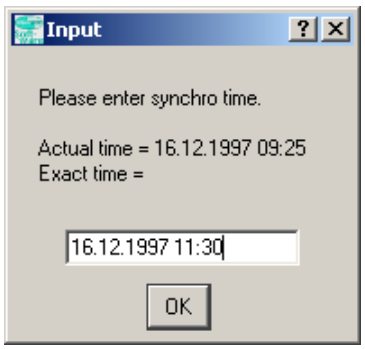
ATTENTION:
The editing session always stays interrupted until one of the buttons is activated.

13.5.12.1 Hint window



Hint windows give you information about the last editing step.

13.5.12.2 Input windows

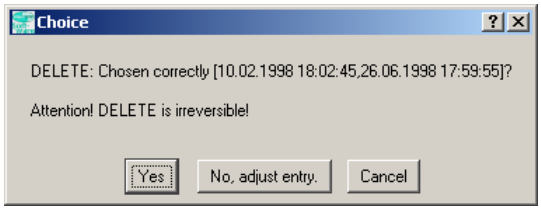


Input windows appear when additional entries are needed for further editing.

13.5.12.3 Choice window

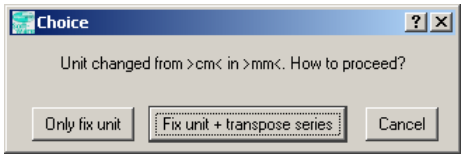
Choice windows appear when editing steps can have far-reaching consequences (for instance, deletion of a series) or when more precise information is needed in order to continue.

OK box



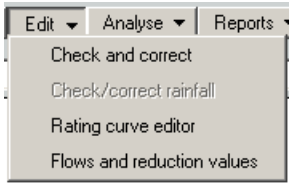
For especially sensitive decisions, you will be requested in an OK box to confirm again with OK before the command is executed. When the action shall not be executed, click Cancel.

Select box



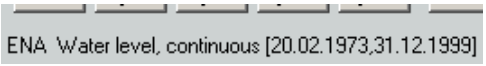
A select box will appear when the further editing requests a decision.

13.5.13 Inactive control elements



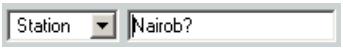
Control elements which are not released for use will be displayed in grey writing.

13.5.14 Status line



Each window provides a status line in the bottom edge of the window. This is where editing hints, warnings and error messages are output.

13.5.15 Wildcards

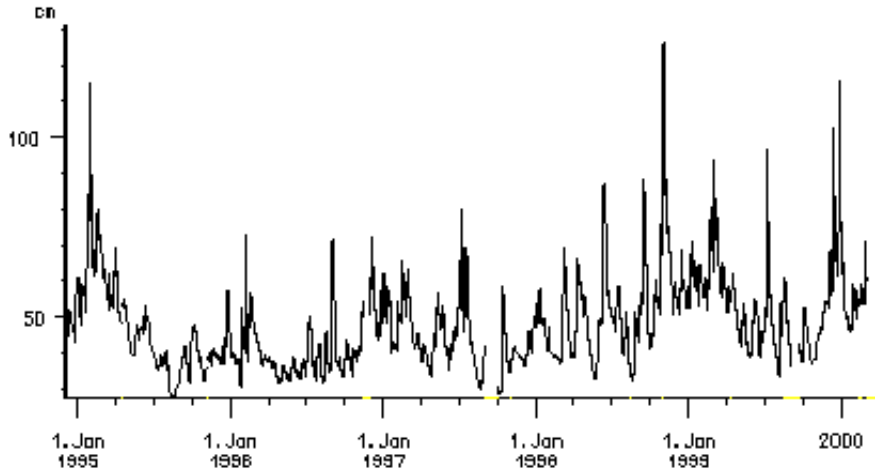


Wildcards are replacement characters for other signs. The joker signs ***** and **?** can be used as wildcards.
When searching terms, ***** replaces more signs and **?** replaces only one sign. The application of several placeholders within one searching process is possible.
When, for instance, you enter "∗256" for station, all stations will be listed whose names end on "256", e.g. "LU/256", "KR/256" or "x78915256".
On entry of "?256", a four-digit station name which ends on "256", for instance "A256" or "1256", will be searched for.
Wildcards can be set at any part of the search term, for example "topo∗", "123?567" or "abc??f∗x".
When the search term includes a "∗" or "?", you must prefix the according sign with a backslash (\), so that the system is aware that this is not a wildcard.

13.5.16 Canvas

The canvas is a graphical section in which several kinds of graphical objects can be displayed. In TopoDesk , this is the part of the window where the axboxes and the map are displayed.

13.5.17 Axboxes



Time series and rating curves are displayed in axboxes. They are zoomable and scrollable by means of the right mouse button (↪ chapt. 13.4) and the buttons below the canvas (↪ chapt. 13.5.2.2).

HINT:

Chapter 13.5.11 specifies how to deal with the time input fields in accordance with the axboxes.

13.5.17.1 Display of the axboxes

The position of the mouse cursor is índicated in the window by X and Y values. The X value reflects the time in time axes and the real value in real axes.
In those ranges in which the displayed series has gaps, the X axis is coloured in yellow.
When several axboxes are loaded, each one can temporarily be extended to the whole canvas for a closer view. For this purpose, you select the desired axbox by left-clicking into it. Its Y axis will now be displayed thicker. (↪ fig.). Another click enlarges the axbox. This display can then be undone again by a new click.

13.5.17.2 Texts in time series

Texts contained in time series will usually be displayed as well (↪ fig. 13.6). Mostly, they are written horizontal in the upper part of the axbox. If the text refers to a point in time, this will be marked with a small upright slash below the text. When a time interval is assigned to the text, this will be marked by a line below the text (↪ fig. 13.7).
In their display options, individual modules offer the possibility to fade texts out or in (e.g. TopoVit).
13.8). In this case, however, there will be no horizontal marking of interval texts.

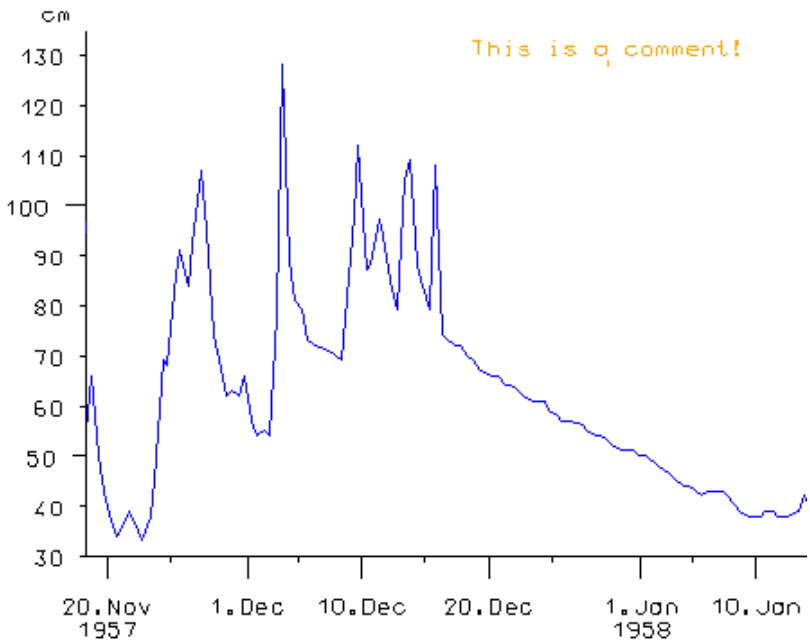


Figure 13.6: Text in the time series

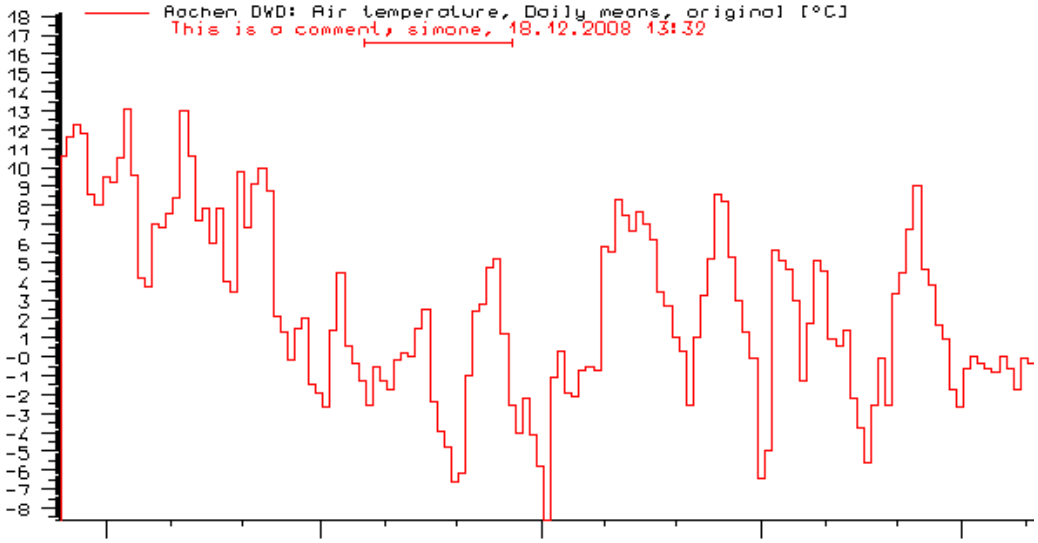


Figure 13.7: Interval text

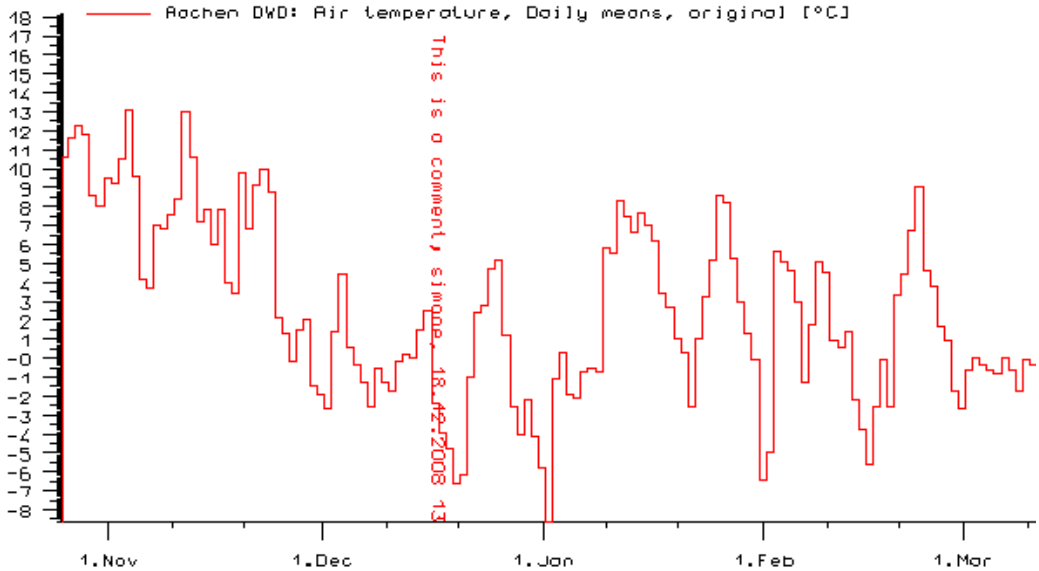
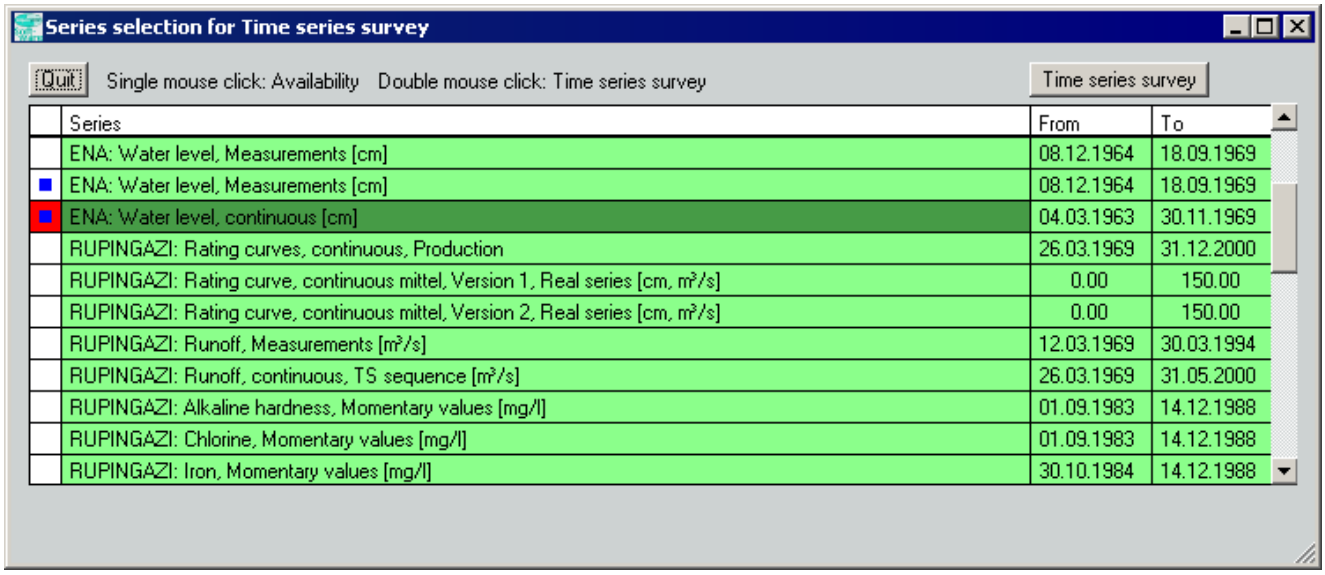


Figure 13.8: Vertical text

13.6 Tables

13.6.1 Dealing with tables (DB Grids)



Series	From	To
ENA: Water level, Measurements [cm]	08.12.1964	18.09.1969
ENA: Water level, Measurements [cm]	08.12.1964	18.09.1969
ENA: Water level, continuous [cm]	04.03.1963	30.11.1969
RUPINGAZI: Rating curves, continuous, Production	26.03.1969	31.12.2000
RUPINGAZI: Rating curve, continuous mittel, Version 1, Real series [cm, m³/s]	0.00	150.00
RUPINGAZI: Rating curve, continuous mittel, Version 2, Real series [cm, m³/s]	0.00	150.00
RUPINGAZI: Runoff, Measurements [m³/s]	12.03.1969	30.03.1994
RUPINGAZI: Runoff, continuous, TS sequence [m³/s]	26.03.1969	31.05.2000
RUPINGAZI: Alkaline hardness, Momentary values [mg/l]	01.09.1983	14.12.1988
RUPINGAZI: Chlorine, Momentary values [mg/l]	01.09.1983	14.12.1988
RUPINGAZI: Iron, Momentary values [mg/l]	30.10.1984	14.12.1988

Tables can have different functions in TopoDesk:

1. They serve the information/survey needs (e. g. list of the selected stations)
2. They serve the preselection when invoking subfunctions (e. g. in TopoVit or in the time series reports)
3. They serve the gathering/editing purposes of data (e. g. Single value entry) ↪ chapt. 13.6.2

The following principles count for DB grids:

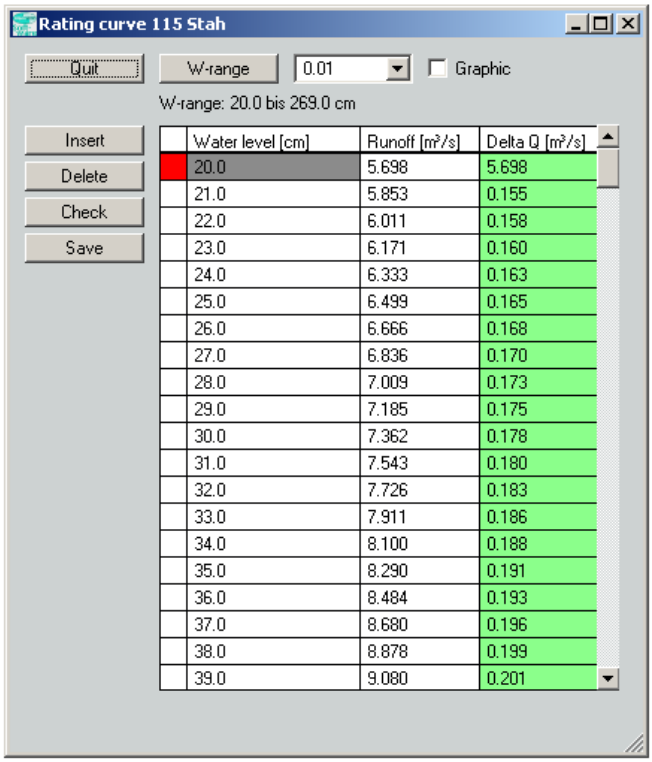
- They can appear independently in an own window or capture an area in a seperate window.
- Green filled cells are not editable.
- Preselection:
  The first column indicates whether the row is marked or selected.
  - Selected row: The first cell of the row in which you are at present is marked red, the clicked cell will have a different colour than the rest of the grid (usually dark green). To select a row, left click on it.
  - Marked row: The first cell of a row contains a blue square.
    In order to mark a row, right click on it. To cancel the marking, do so again.
    In order to mark all rows in one step, right click on the first cell of the headline row. Another right click will cancel these markings.
    In some tables the marking is functionless, however, it can be helpful for scrolling in long tables (to set "orientation points").
  - A row can be marked and selected at the same time.
  - Only one row can be selected, but several ones can be marked at the same time.

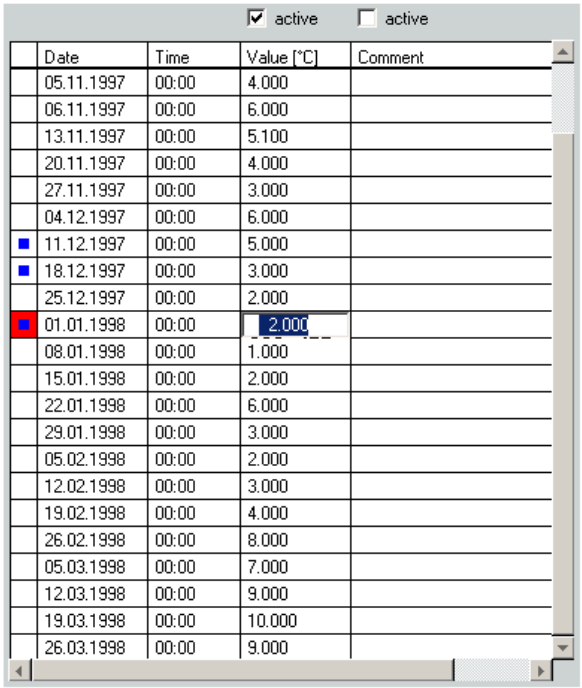
In case you have made the preselection via the first column, you open the sub program via the according button at the top right.

- To sort:
  In the most DB grids, alphanumeric sequence in a column is possible. A mouse click in the top cell (headline) of a column causes the sorting of the whole table according to the entries of the clicked column. Another click will reverse the sorting order.
  If, for example, you click the column headline Date, the whole table will be sorted in ascending order by date. Another click on Date will sort in descending order.

- To edit:
  The editing in DB Grids will be explained in the next chapter (↪ chapt. 13.6.2).

13.6.2 Tabular editing





The tabular editing always follows the same principal:

- The time period to be edited will be adopted from the window in which the table has been entered.

- Green filled cells are not editable.

- Grey filled cells are editable. Here you have the following fields:
  - Input field: For the entry, the according field must be activated by mouse click; it then turns dark grey and becomes writable.

  - Yes/No field (Toggle): By double-click, the entry skips between Yes and No.
  - List field: A double click into the field will reveal a shortlist from which the desired entry can be selected.
  - Memo field: A double click into the field will reveal a window where you can enter a text.

- As a point in time for the sums to be gathered, the **right side**, thus the **end** of the reading or evaluation interval, is used. This abides by the German regulations for precipitation (DVWK-Regeln 126/1988):
  "The measurement result is to be registered in the measurement report under the day it was calculated." (p. 7)
  "All measurement and observation data is to be registered on the day [...] it was calculated." (P. 35)

- Total values are captured with the number buttons, a **","** or a **"."** in front of the post-decimal value and/or with a **"G"** or **"g"** for gap (in the event of failure during measuring).

- The number of the post-decimal positions of the total values is dependent on the selected fault tolerance. When the fault tolerance is set to 0,01, for example, values will be performed with two post-decimal positions.

- [Insert] creates a new empty row in which values can be inserted below the red-marked one.

- [Delete] deletes one or more rows according to the following rule:

  - Marked rows have priority, that means, if rows are marked (blue square), only these will be deleted, no matter whether another row has been selected as well or not.
  - The currently selected row will only be deleted when there is no marking.

- [Check] checks the entries for plausibility during the editing.

- For navigation, use the Tab key, the cursor keys (← ↑ ↓ →) or the mouse.

- To confirm your entry, use the Return key and you will then skip to the next field or row. In some tables, there are checkboxes above the columns with which these can be activated or deactivated for the editing. With the Return key you then skip into the next active column.

- The checkbox ☑ Assign time (not available in every table) determines whether the date shall be preset when adding new rows. When the checkbox is activated, the time in the added row will be preset with the selected time step.

- [Save] immediately stores the entries which have been entered so far.

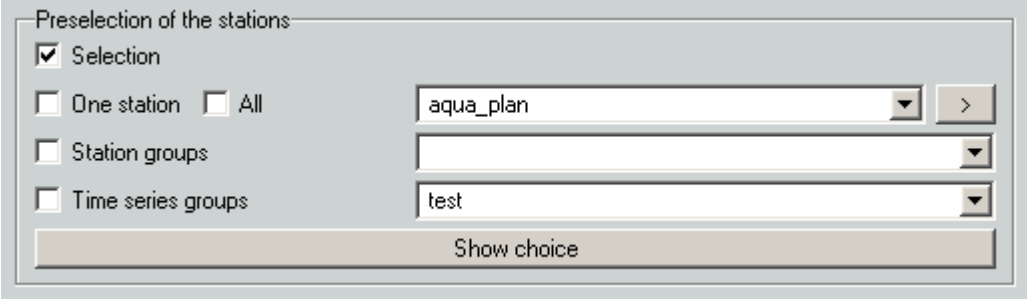
- In case changes have been made without saving, a query will pop up asking if you want to save when you exit the window with [Quit].

  HINT:
  The marking or selecting of a row (↪ chapt. 13.6.1) has no influence on the tabular editing.

13.7 Preselection

13.7.1 Preselection of the stations

You will come accross the frame Preselection of the stations in TopoDesk in many places, there where stations have to be selected for further editing.



The stations can be selected in different ways:

- by selection in the map
- as individual station by aid of the stationlist with search function (↪ chapt. 13.5.4)
- as station groups (should they have already been applied) (↪ chapt. 4.2.3.4)

When you click [Show choice] the stations selected here are displayed in a seperate window.

13.7.2 Series selector

The table window Series selector (↪ fig. 13.9) serves the systematic selection of series before the opening of sub programs. In the system settings (↪ chapt. 5.3.10) you define, whether the series selection is to be upstreamed always or only when more than a number of series to be defined is offered.

Along with the general basic principles for dealing with tables (↪ chapt. 13.6.1), the series selector has the following characteristic: Beside the button for invoking the respective sub program, there is a [?] button. When you click this button, the whole number of provided series and how many are currently marked will be indicated on the left.

13.7.3 Time series selector

The window Time series selector (↪ fig. 13.10) is offered in different places in the system (e.g. TopoVit, Edit TS sequences). With its help, you filter the series you need for further editing from the existing time series.

When, on invocation of the time series selector, a station is already selected for editing and when this station contains series, these will automatically be provided in the table of the time series selector. The lower section indicates the number of found series.
When you have not yet defined a station or when the selected station has no series, the table will

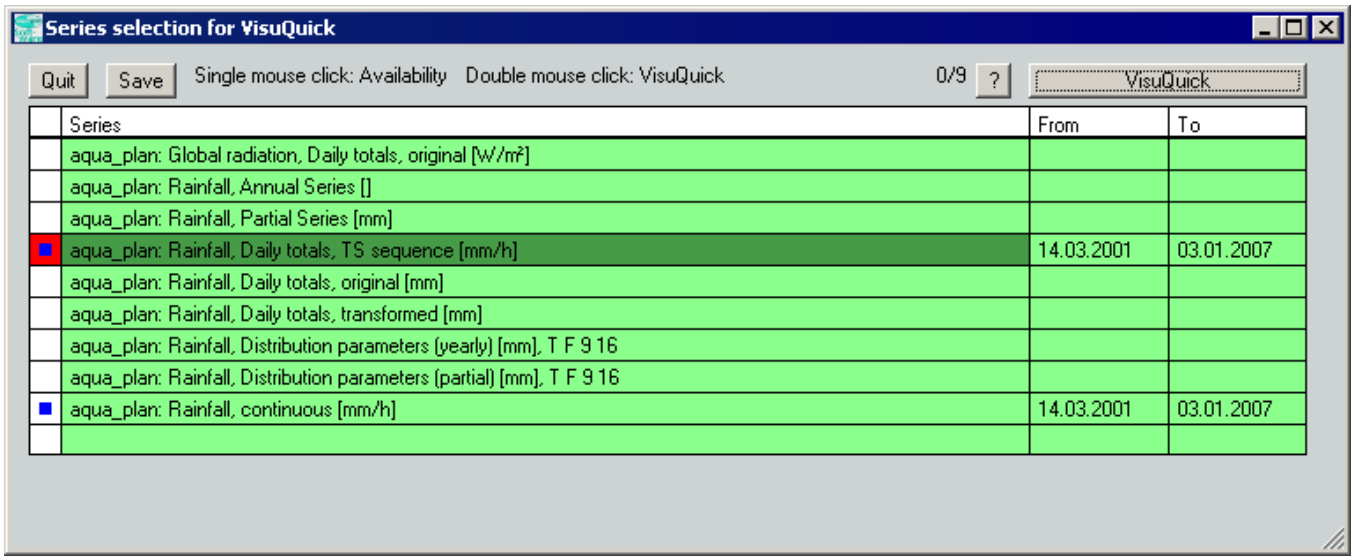


Figure 13.9: Window Series selector

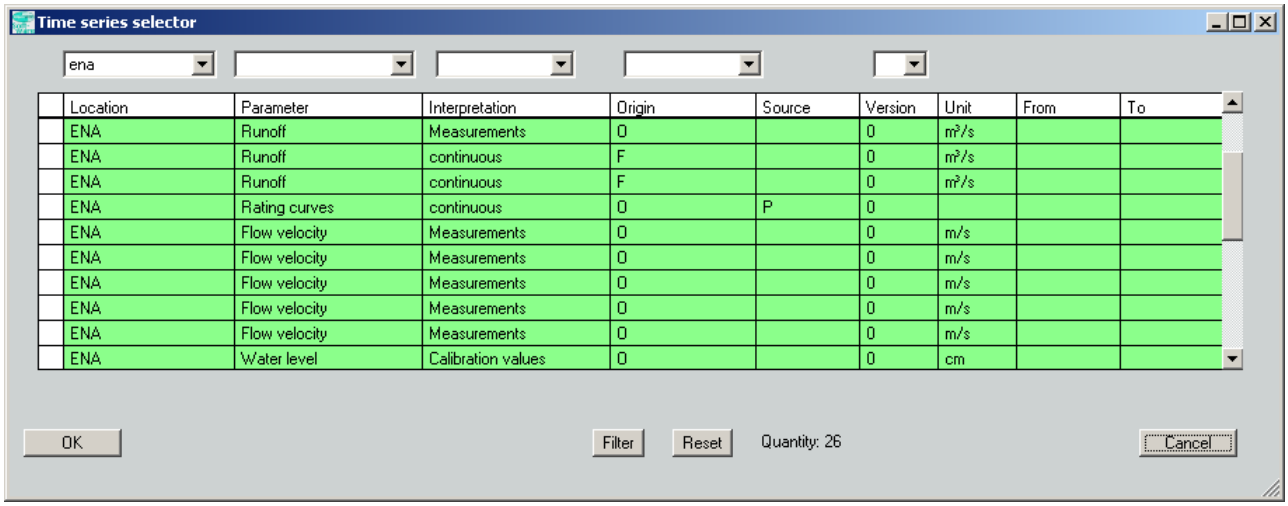


Figure 13.10: Window Time series selector

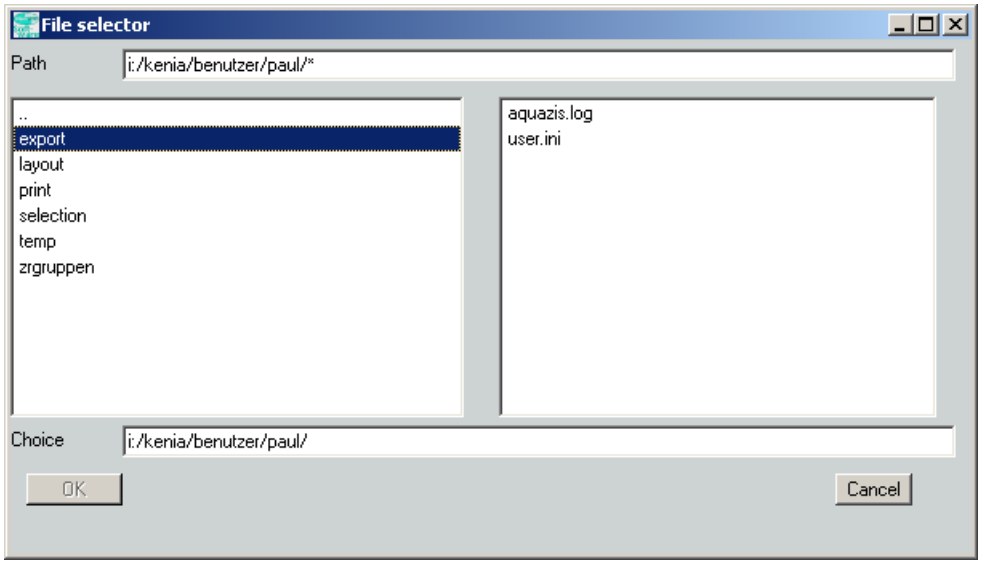
appear empty. Now, from the station list, select the station of which you want to edit the series. The table then will fill itself with all series existing for this station.

The scope (validity period) of a series is indicated when you left-click into the according line.

By means of the shortlists in the upper section you can filter the displayed series. When, for instance, you select *Runoff* in the shortlist Parameter ▽ and then click Filter, only the existing runoff series will be displayed. Reset empties the table.

When you want to edit one of the listed series, mark this row and click OK. (A double-click in the according row will lead to the same result.)
The window will then close and the series will be adopted in the application.

13.7.4 File selector



There are the following possibilities for choosing a file in the file selector:
Write the according path in the upper input field and click Return.
Alternatively, you can click yourself through to the desired file by means of the two fields below. The left field comprises the directories and the right one contains the files. A double-click in a directory will update the entered path with this directory. By double-click on .. you skip to the directory above this one. When you click onto a file once, this will be absorbed in the input field Selection:. When you click the Return key or Ok, this file will be selected (or directly by double-click).
You can change the device via an entry in the upper field (e.g. f:) followed by a click on Return.

13.8 Output of reports and data exchange

Reports can be ordered in most windows of the toposoft program systems. They are forwarded - according to the presetting - either directly to the selected medium (printer or file) or presented on the screen before the print is started (↪ chapt. 13.8.1).
In case they are to be output in a file, there are several formats available here (↪ chapt. 13.8.3).

13.8.1 Preview

The window Preview (↪ fig. 13.11) appears on the issue of reports and on the print of the graphic when *Screen* has been selected in the printing settings.

> TIP:
> This presetting selection is recommendable in most cases since it allows a visual control of the report before it is printed or exported.

The printing order can be sent from the preview.

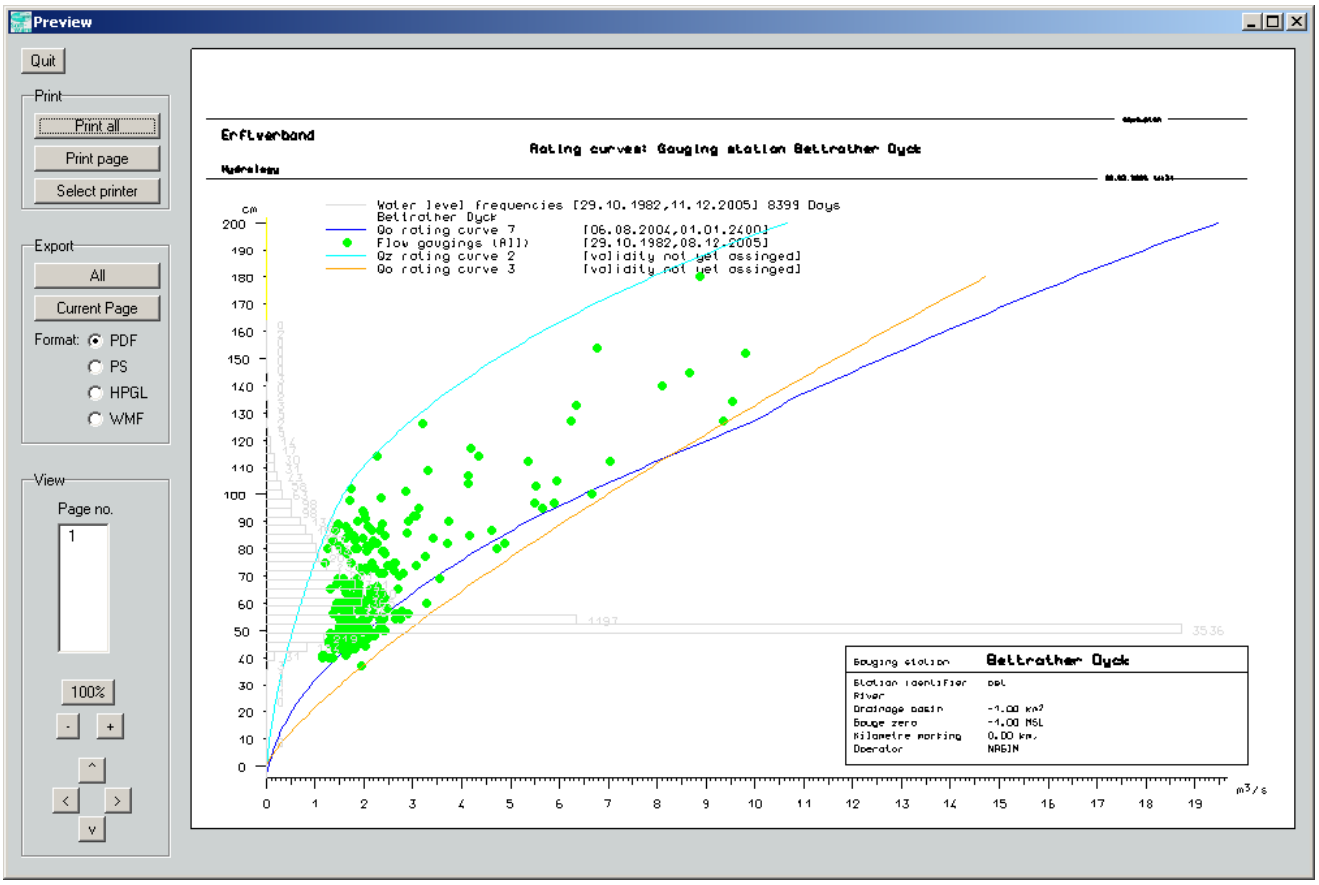


Figure 13.11: Window Preview

The frame Print: If the entire content of the preview shall be printed, click onto All in the frame Print. In order to print only the indicated page, click Current page. By clicking these buttons, the print job will directly be forwarded to the printer chosen under Select printer.

The frame Export: The frame Export enables the report displayed in the preview to be exported or saved. For these purposes, choose the desired file format in the list. In order to export the whole preview, click All. In order to export the current page, click Current page.
In both cases, the input window in figure 13.12 will appear on activation of the button. The path as well as the file name can be changed here on request. The subdirectory `print` of the respective user directory (↪ chapt. 13.8) will be suggested as directory.

The frame View: The frame View enables direct access to a certain page with the list under Page no.. The visible section is magnified or minified with + and -. Click 100% to revisualise the whole page. In order to move the display to the left, to the right, up or down, you can use the four buttons in the bottom left of this frame. Alternatively, the report can be dragged with the left mouse button. By means of the right mouse button, you zoom within the preview. In addition, read chapter 13.4.

13.8.2 Export/Print to a file

13.8.3 Output formats

In the toposoft program systems, the following formats for the output to a file are available:

- PDF
- PS (Postscript)
- HPGL
- WMF (Windows Meta File)
- JPG
- PNG (Portable Network Graphic)

Some of the reports can also be exported to the DBF format.
This function, however, is not available in the report preview.

Specifics on the further processing of DBF files in other programs

Since Excel converts all characters according to the DOS character encoding when DBF files are being opened, German umlauts, French accents and special characters will be written in our DBF files according to the international DOS standard and transformed back to ISO when being read.

13.8.4 Path for printing to a file

There is a special subdirectory `print` in the user directory of the respective user for all printed outputs to a file. Accordingly the path reads:

`../benutzer/`*`username`*`/print`.

This is the default path which TopoDesk suggests for the export. If necessary. this path can be changed individually in the input window (↪ fig. 13.12).

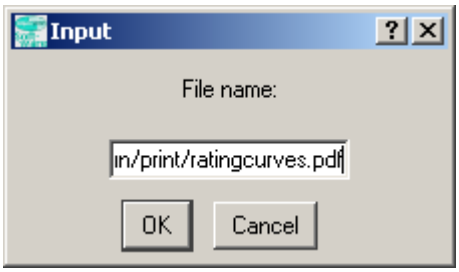


Figure 13.12: Input window for the export to a file

HINT:
In topodesk, this default setting can be changed in the printing control under output directory.

After exiting the window with OK, a hint window will appear to confirm the chosen path (↪ fig. 13.13).

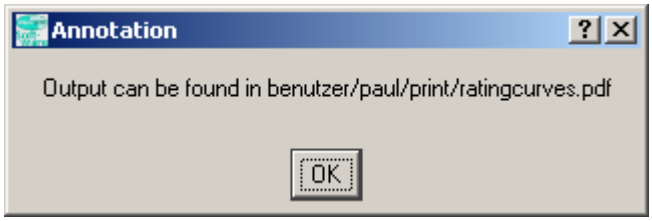


Figure 13.13: Hint window for the export to a file

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