

Editing of graphic outputs

Version 8.095



X3D – Editing of graphic outputs - Version 8.095
User Guide

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CHAPTER 1. GENERALITIES

The **X3D graphic library** is a set of high level graphic primitives: display functions of axes, legends, curves or surfaces, etc.

- It allows the application programmer to produce two and three dimensional graphs with a system of axes and legends displayed automatically.
- It allows the user to modify interactively the presentation of the graphs and to save this presentation in a style file for future use.

1. GENERAL FUNCTIONALITIES

1.1. Table display

Several windows specific to X3D or belonging to applications using this library contain tables. For example, the graph editing window contains a table where each row is the definition of a graph used by the application.

The format of these tables can be modified. With the mouse, the columns can be moved or resized.



- Move a column by placing the cursor of the mouse in the column header (the cursor takes the shape of a hand), clicking the left button of the mouse and moving the cursor to the desired location.



- To resize a column, place the cursor on the right border of the column header (the cursor takes an arrow shape), click the left button and move the cursor until the desired width is achieved. The width of the table columns is saved in the current database.

Physically enlarging a column does not entail that it will contain values with more characters.

1.2. Scrolling list associated to cells of a column in a table



Scrolling lists are associated to cells of several columns in various tables. By placing the cursor on the right end of a cell, this cursor appears if a list is associated to the cell. By activating the cell, a button is displayed at the right end of the cell. Click on this button to display the scrolling list associated to the cell.

1.3. Tooltip

If the value of a text field, the header of a column or the value of a cell in a table is not completely visible, a tooltip shows the entire text when the cursor is placed over the text field, the header or the cell of the column.

1.4. Accelerated scrolling of a list

For several scrolling lists, it is possible to scroll directly close to the desired value, by entering the first characters of the value in the white cell.

1.5. Navigation in a table

The vertical and horizontal scrolling bars can be used to scroll through the contents of a table. The **[Enter]** key is equivalent to clicking OK in the current window.

When the cursor is in a cell, pressing **[Home]** or **[End]** brings the cursor to the beginning or end of the contents of the cell, respectively.

To go from one cell to the next one on the right, press the **[Tab]** key. When the cursor is at the end of a row, **[Tab]** brings the cursor to the first cell of the following row. To go from one cell to the previous one on the left, press **[Shift]+[Tab]**. When the cursor is at the beginning of a row, **[Shift]+[Tab]** brings the cursor to the last cell of the previous row.

If the cursor is in a cell, the **[Up Arrow]** key brings the cursor to one cell above, in the same column; the **[Down Arrow]** key brings the cursor to one cell below, in the same column.

Pressing **[Page Up]** or **[Page Down]** moves the cursor towards the top or bottom, in the same column, by the number of visible rows minus one, except if the top or bottom of the table is reached.

1.6. Wheel of the mouse

The wheel of the mouse can be used to scroll through all the X3D windows, data entry forms, lists of values and graphs.

1.7. Saving the work environment in the registry

When closing a module, the work environment is saved in the registry of the user's workstation. The work environment, or the current usage parameters of the application, includes:

- the names and directories of the last data files or database;
- the names and directories of the last style, markers, patterns and logo files;
- the characteristics of the current domain and its application status;
- the default drawing attributes; etc.

The information in the registry will be used when the application is launched again. The registry involved is shown in this tree structure:

```
HKEY_CURRENT_USER
├── Software
│   └── SOBEK
│       └── Application (ex: LOG)
│           ├── FormLastQuery
│           ├── Geo
│           ├── Import
│           ├── X3D
│           └── ...
```

1.7.1. Saving the work environment in HKEY_LOCAL_MACHINE

In specific cases where a computer is used by several users (ex: computer rooms at universities), it may be useful to read the registry in the HKEY_LOCAL_MACHINE tree structure

(for the computer) instead of the HKEY_CURRENT_USER structure (for the user). To do this, define the parameter "HKEY" at the end of the Target in the properties of the Geotec module shortcuts. Geotec will read the values in HKEY_LOCAL_MACHINE, and then in HKEY_CURRENT_USER if they don't exist in the first tree structure.

PLEASE NOTE: We discourage using the registry editor to modify directly the values. After an improper editing of any registry, the behaviour of the application is unpredictable.

2. SPECIAL FONTS AND ATTRIBUTES

It is possible to use special fonts and/or attributes in a chain of characters. The format can be used for any chain of characters in X3D (for example: an axis title, a graphic object, etc.). The format to use is: **[text to modify]"font/biu+-"** where:

- b : bold
- i : italic
- u : underlined
- + : superscript
- : subscript

2.1. Use in a query

To present the preconsolidation pressure with its symbol, the query (TESTS_E or an equivalent query) would contain the following **bold** part:

```
...
union select sample.site_no, sample.boring_no, sample.sample_no,
depth as depth_top, depth+length as depth_bottom, 4 as rank,
'[s]"symbol"[p]"/-"' as result from sample inner join consolidation
on (sample.sample_no = consolidation.sample_no) and (sample.boring_no =
consolidation.boring_no) and (sample.site_no = consolidation.site_no)
...
```

The column showing the TESTS_E query then shows σ'_p when a consolidation test is done on a sample.

2.2. Use in objects

To present only the boring number in bold letters, in the header of a boring log for example, the user can insert a text object and enter, in the Text field of its property window:

BORING: [&&BORING.BORING_NO]"/bu"
The object then shows BORING: **BH-01**

2.3. Use in fields of the database

It is also possible to use the format for any value in the database. For example, in the DESCRIPTION field of the STRATIGRAPHY table, the user could enter:

[FILL]"/bi"|Gravel with pieces of concrete.

The description then shows:

FILL

Gravel with pieces of concrete.

CHAPTER 2. FILE MENU

The contents of the **File** menu in each application that uses **X3D** differs depending on the context. The first format in Figure 2-1 is from the modules using only databases (Log, Lab, Pro, Time, Dam); the second is from Site, which also uses data files.

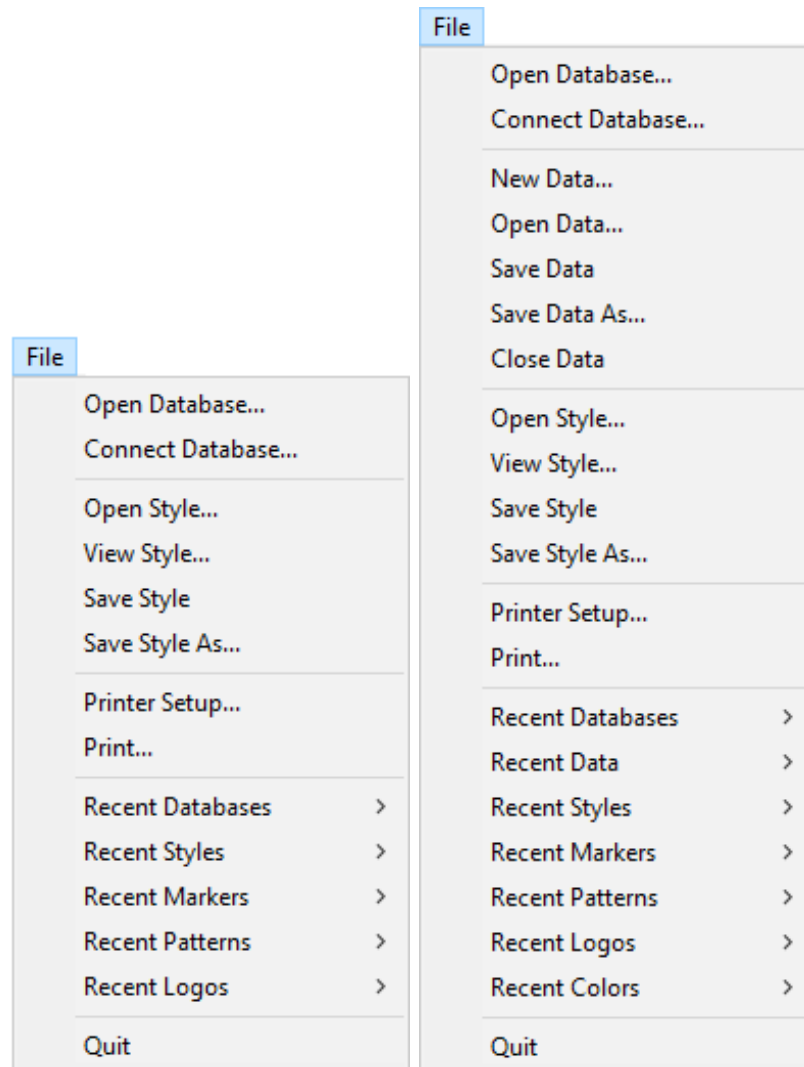


Figure 2-1 - Examples of the File menu

The **File** menu allows the user to:

- open a **.mdb** database;
- connect to a database;
- create, retrieve, view and save data, in the Site module and the SM2 graphic library;
- create, retrieve, view and save the graphic characteristics defined in a **style file (.sty)**;
- select and configure the **printer** and **print** the graphic outputs;

- retrieve a database or data file, a style file, markers or patterns file, a logo or a color file from the last 9 used.

When opening a module, the last style file (**.sty**) used is loaded. If the file was deleted or moved, the standard window for file opening is displayed.

When an application is first used, a default style file provided by Sobek is displayed. The **Geotec8.mrk** and **Geotec8.ptn** files are loaded, these files being installed in the **C:\Geotec80\Style** directory, where **C:** is the disk on which the application is installed. The user can choose other markers and patterns files.

When exiting the application, the different parameters used are saved in the registry of the user's workstation for future use.

1. CONNECTION TO A DATABASE

For modules using X3D, connecting to a database can be done in different ways:

- Directly in the application shortcut;
- Via the **Connect Database** option of the **File** menu.



The **Open Database** option of the **File** menu or this button opens the standard window for file selection. The extension proposed by default is **.mdb**, **.accdb**, **.db3**. The directory proposed by default is the one where the last database used is located, or during the first use, the **C:\Geotec80\Access** directory.

Each time the user selects a database via the **Open Database** option, the module creates the **Geotec_Access** and **module_Access** connection aliases in the administration environment of the ODBC data sources and associates the selected database to it. When opening a module, if a connection alias is provided in the connection string, this alias is used to connect automatically to a database. **Geotec_Access** will find the last database used by a Geotec module, while **module_Access** will connect to the last database used by the module.

1.1. Call connection

The connection to the database can be done directly when calling the application by entering the following string as target. The string will be:

C:\Geotec80\Bin\Module.exe username/password@odbc:connection_alias

C:\Geotec80\Bin\Module.exe is the application call string.

- **C:\Geotec80\Bin** where **Geotec80\Bin** is the directory where the application executable is located. This directory may have been modified during the installation by the computer technician.
- **Module.exe** where **Module** is the name of the executable, for example **log**.

username/password@odbc:connection_alias is the connection string:

- **username/password** username and password for the database used, for example **geotec/sobek**;

these elements are only with SQL Server and Oracle only, but must always be present for the connection string to be read correctly

- **@** separator introducing the database designation;
- **odbc:** or **oracle:** indicates if the database management system is connected via an ODBC driver, or if it is Oracle;
- **connection_alias** designates the source database as defined with the ODBC data source administrator or with Oracle, for example **geotec_access**.

By adding the parameter “HKLM” at the end of the connection string, the module will read the parameters defined in the registry in the HKEY_LOCAL_MACHINE tree structure instead of the HKEY_CURRENT_USER structure. See paragraph 3.8.1 of chapter 1 of this guide.

1.2. Connection via the File menu



When retrieving data without being connected to a database, or when selecting the **Connect Database** option or this button, the connection window shown in figure 2-2 is displayed.

This window shows the different parts of the connection string described in the previous paragraph. For an ODBC connection via this window, the username and password are not necessary.

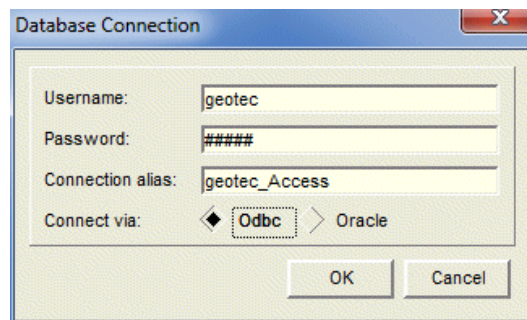


Figure 2-2 - Connection to a database via a module

2. DATA FILES

Data files can be used in the Site module and in the SM2 graphic library.

2.1. Creating a new data file

The **New Data** option allows the user to select a background file. The user can select in the scrolling list the different types of background files. A background file must be opened for the user to edit new cartographic data, which he can then save in a new file that will not contain the background.

If the user selects the **Cancel** button in the background file opening window, Site or SM2 will return to the situation preceding the selection of the **New Data** option. The user cannot edit the information of a background file.

2.2. Opening a data file



To open a data file, select the **Open Data** option or click on this button in the application toolbar; this displays the standard window for file opening. The user can select the desired type of files.

The user can browse to choose the desired data file. The directory displayed initially is the one specified in the preferences. The user can also open a data file via **Recent Data**.

If an AutoCAD **.dxf** file is selected, it is automatically converted to a **.sit** file. However, the **.sit** file is only saved if requested by the user via the data saving options of the **File** menu (see paragraph 2.3).

If a data file is opened while modifications to the current data file have not been saved, a message is displayed to save or not the file.

2.3. Saving a data file



To save the modifications to the current data file, the user selects the **Save Data** option or this button, in the application toolbar.

Select the **Save Data As...** option to save the data file under a different file name. The default extension is the same as the extension of the current data file.

2.4. Closing a data file

To close the data file, click the option **Close Data**. If modifications were done on the current data file, a message is displayed asking to save or not the current file.

3. STYLE FILES

A style file contains all characteristics of a graphic presentation. It is a reusable template. Each style file has characteristics specific to the application in which it was created. The application is responsible for the content of the style file; X3D manages the manipulations in the style file.

3.1. Opening a style file



To load a style file, select the **Open Style** option or click on this button; this displays the standard window for file opening where the file type to be retrieved is **.sty**. The user can browse to choose the desired style file. The directory displayed initially is the one containing the last style file used. The user can also open a style file via the **Recent Styles** option.

If a style file is opened while modifications to the current style file have not been saved, the message shown in figure 2-3 is displayed.

Each style file contains a part specific to the application for which it was created. If the user chooses a style file designed for an application other than the current one, a message is displayed and asks the user if he wants to select another style file:

- if no, the application remains open with the current style file;
- if yes, the standard window for file opening is displayed and the user can choose another style file created by the current application.

If the file chosen as the style file to open is an ASCII file of **.sty** extension but not a style file, a message warns the user and the application stays in the current situation. If the file chosen is not an ASCII file, or is an ASCII file with an extension other than **.sty**, the behaviour of the application is unpredictable.

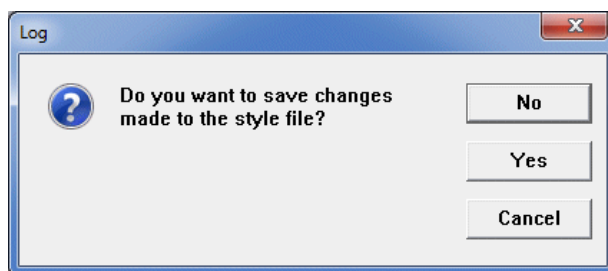


Figure 2-3 - Saving the modifications to the style file

It is necessary to retrieve data to fill all the graphs and objects after changing the style file.

The style files can be used with both English and French data dictionaries. The comparison is done automatically.

3.2. Viewing a style file

The **View Style** option is used to view the current style file in a text format that contains information about the format of the page and graphs, the titles and legends, the axes characteristics, the names of the graphic editing elements files, the markers and patterns used in the graphs, and other information related to the page. Figure 2-4 shows an example.

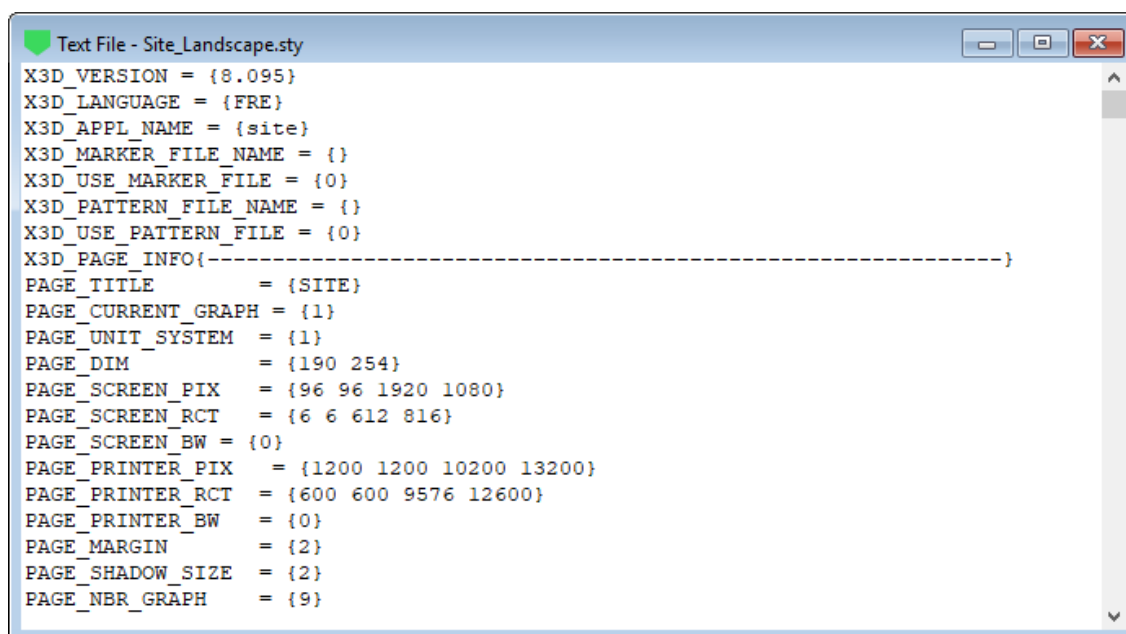


Figure 2-4 - Viewing a style file

The display attributes (font, size, text style) of the file viewed can be changed via the **Font** menu of the menu bar. Its content cannot be modified, but can be printed.

The user can also use other text editors to view the style files. In the **File** tab of the preference editing window, select the executable of the text editor. Then, when selecting **View Style**, the viewing will be done with the selected editor.

3.3. Saving a style file

If modifications done on the current style file are not saved, the user will be asked to save when he tries to open another style file or to exit the module: click **Yes** to save the style file.



The user can update the current style file by clicking the **Save Style** option or this button. Select the **Save Style As...** option to save the style file under a different file name. The default extension is **.sty**.

4. PRINTING

4.1. Printer configuration

The **Printer Setup** option is used to choose and configure the printer. This option opens the standard window for printer setup and configuration.

To obtain printings identical to what is shown on the screen, the option to print True Type fonts as graphs must be selected in the printer setup. Other graphic options may also be required. These options vary from one printer to another.

Printing is automatically done in “Landscape” if the height of the page is smaller than the width, and in “Portrait” otherwise.

4.2. Printing a single graphic report

A graphic report is a graphic result produced by the application, which is displayed on screen and can be printed on paper or in a file. A graphic report is at least one page long. It contains one or many graphs. For example, a graphic report produced by **Log** is a boring log; this report has one to n pages and is made of several graphs: the various columns as well as the legend blocks. Depending on the application, one or many graphic reports can be generated simultaneously. For example, **Log** can generate as many boring logs as defined for a chosen site.



Clicking on this button starts the printing of the current graphic report with the current printer.

If the application only works with one graphic report or if only one of the graphic reports is active, selecting **Print** opens the window shown in figure 2-5 where the user can specify the range and destination for printing the current graphic report.

- The **Printer** button opens the standard window for printer setup.
- The radio buttons in the top area of the window define the printing range for the current graphic report:
 - ◆ **All** Printing all pages
 - ◆ **Odd** Printing odd pages
 - ◆ **Even** Printing even pages
 - ◆ **Current** Printing the current page
 - ◆ **Selection** Printing a selection of pages defined in the text field according to the syntax shown as an example in the message zone of the window.

If the current graphic report has only one page, only the **All** radio button is active.

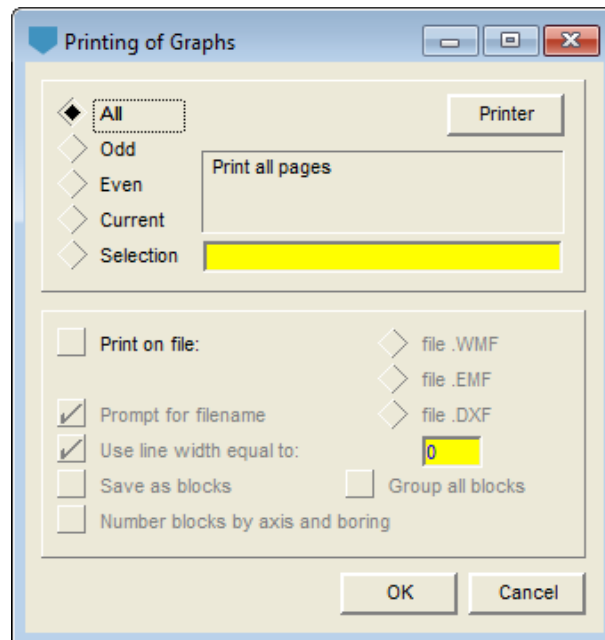


Figure 2-5 - Printing graphic reports

- If the box **Print on file** is not checked, printing will be done on paper with the current printer, including PDF creators. Checking the box activates the radio buttons to choose the file type for the graphic report, instead of paper. The **WMF** and **DXF** formats are read by AutoCAD, and the **EMF** format can be inserted in Microsoft Word (see paragraph 4.4 for details about the printing particularities of these files).
- When printing on file, the user can **prompt for filename**. The file name by default is the concatenation of the primary keys (site and boring numbers, site and axis numbers, etc.).

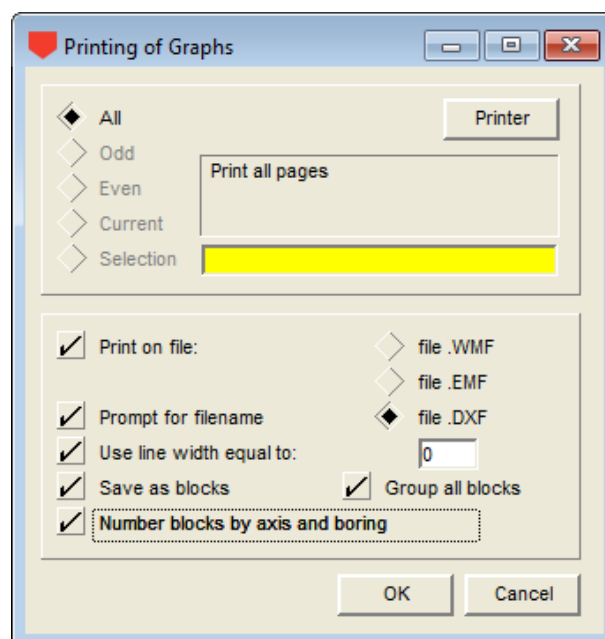


Figure 2-6 - Printing graphic reports in Pro

- When printing on file, a **line width** can be defined by selecting the check box and entering the width value in the field. It will be applied to all the lines in the graphic output.
- When printing on DXF file in Pro (see Figure 2-6), **each boring can be saved as a block**. It is also possible to **group all the blocks** to facilitate the editing in AutoCAD.
- When printing on DXF file in Pro, the user can also ask to **number each block based on its axis and boring numbers**. Otherwise, the nomenclature is based on a sequential number for the borings and an integer corresponding to the printing date, to have a unique number per block.

4.3. Batch printing

If several graphic reports are active, selecting the **Print** option displays a window as shown in figure 2-7.

The context of the application determines the exact message and the wording of the buttons. Generally, a button is for printing all active graphic reports; while the other is for the current one only.

When proceeding to printing (all or the current graphic report), the window shown in figure 2-5 to define the printing range and destination is opened.

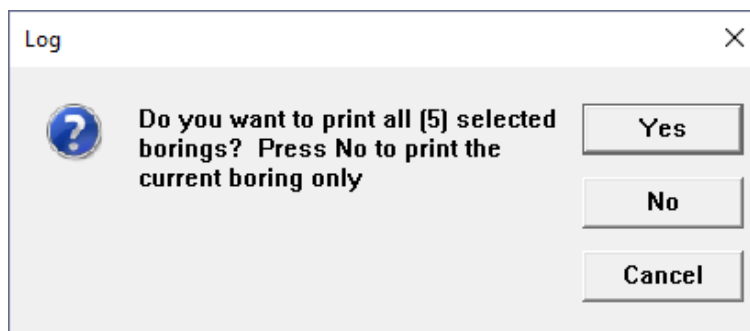


Figure 2-7 - Batch printing



It is possible to select only some of the graphic reports to print, by unchecking the undesired records in the box opened by clicking on this button, located in the application toolbar.

4.4. Printing particularities

4.4.1. Printing dotted and dashed lines

In order to print dotted and dashed lines as they appear on screen, the width of the « line » attribute must be 0 mm in the drawing attributes configuration window.

4.4.2. Printing in normal mode

- All texts defined on opaque background are drawn correctly. The colors are interpreted in different tones of grey and the appearance on paper is quite different from what is seen on screen. A pale color text on dark background does not show.
- The fill zones do not appear as on screen.
- The non-solid lines are always represented, whatever the line (straight or curve).

4.4.3. Printing in PostScript mode

- All texts defined on opaque background are drawn correctly. The colors are interpreted in different tones of grey depending on the printer. The appearance on paper is close to what is seen on screen. A pale color text on dark background stands out well.
- The non-solid lines are not represented with curved lines.

4.4.4. EMF file

- When a file is imported in Microsoft Word, the visual appearance is acceptable even though no color of opaque background for the texts is shown. All the texts are shown as if there was a white opaque background, whether it is fixed by the application or not.
- The fill zones do not appear as on screen.
- The non-solid lines are not visible on screen with the curved lines.
- When printing in normal mode:
 - ◆ The texts defined on opaque background are represented with no background.
 - ◆ The fill zones appear differently than on screen.
 - ◆ The non-solid lines are always represented as defined, even if they are not visible on screen with curved lines.
- When printing in PostScript mode:
 - ◆ All texts are printed on white opaque background, whether it is defined by the application or not. As on screen, all the color background defined by the application are ignored.
 - ◆ The fill zones appear as displayed on screen, which is different than the original converted in EMF format.
 - ◆ The non-solid lines are not represented with the curved lines.

4.4.5. WMF file

- This type of file can be used with:
 - ◆ Microsoft Word, but the results are not convincing!
 - ◆ AutoCAD; the resulting file is very similar to the original.
The background filling of opaque texts is ignored, without other effects.
The fill zones and the non-solid lines for curved lines are ignored.

4.4.6. DXF file

- All texts are shown without hiding what is under an opaque background. However, all pale texts on dark background are respected, even if the background color (tone of grey) is not represented. There is only one font style.
- The fill zones are ignored.
- The non-solid lines are respected only for straight lines (horizontal, vertical or inclined).
- There is no difference of output between the PostScript and normal printing modes.

4.4.7. PDF file

- The **PDF** format does not support texts on opaque background (the results are unpredictable, especially with inclined texts on opaque background).
- The fill zones and all lines are respected on screen and when printing in PostScript and normal mode.

4.5. Printing automatism for borehole logs

It is possible to create scheduled tasks to print borehole logs with the **Windows Task Scheduler** tool. Two parameters are defined by the user for each task:

- Type: The boring type to print (TYPE field of BORING table)
- Days: The number of days since the last boring modification date (number of days between the current date and MODIFICATION_DATE of the BORING table)

To create the automatism:

1. Create a task (ex : Geotec CP, Geotec TF, etc.).
2. Customize the trigger (weekly, monthly, time of trigger, etc.)
3. Customize the action
 - a. The program (example : **C:\Geotec80\Bin\Log.exe**)
 - b. The arguments include the connection alias for the database, the boring type and the number of days between the modification date and the current date.

Geotec/gi@geotec_access type=tf days=7

The query retrieves the borings with the correct type, and whose modification date is greater or equal to the current date minus the number of days.

Example 1: With a current date of 2019-05-22 and 0 days, it includes the borings modified on 2019-05-22.

Example 2: With a current date of 2019-05-22 and 7 days, it includes the borings modified on 2019-05-15 or more recently.

The PRINTING_DATE is updated for each boring when it is printed (BORING table).

The automatic printing is done on the default printer. It is important to define the parameters (ex : output directory for PDF files, paper size, etc.)

The style file to associate to each boring type can be selected in the FILE_NAME field of the BORING_TYPE table (opened via the **Types of borings** button of the selection window). In the **File** tab of the **Preferences** in Log, by selecting "Save file name with path", the complete location of the style file will be saved. If the option isn't checked, only the file name will be saved, and it will be searched for in the directory of the current style file. In both cases, if the style file is not found, the current style file will be used for printing.

A .txt report is generated every time a scheduled task is launched to indicate the number and list of printed borings. It is saved in the directory of output files defined in the preferences of Log on the workstation.

5. RECENT FILES

Each **Recent...** option opens a submenu showing a list of the last 9 files used in the category corresponding to the option. The files are sorted in the reverse order of their opening order. Select a file to open it.

6. CLOSING THE APPLICATION



The **Quit** option of the **File** menu is used to quit the application. Clicking on this button located in the application toolbar has the same role.

When exiting an application, the utilization parameters are saved in the registry of the user's workstation (see chapter 1). The information in the registry will be used when the application is loaded again.

CHAPTER 3. EDIT MENU

The **Edit** menu varies with the context. An example is shown in figure 3-1. The **Undo** option is never active. The **Cut**, **Copy**, **Paste** and **Delete** options are the same as in all the Windows applications.

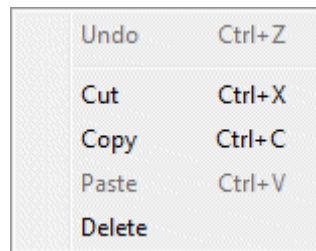


Figure 3-1 - Edit Menu

1. CALL FROM THE MAIN GRAPHIC WINDOW

If the **Edit** menu is called while the active window is the main graphic window, no option in the menu will be available.

2. CALL FROM AN EDITING WINDOW

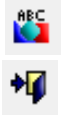
If the **Edit** menu is called while the current window is an editing window and the cursor is in a text field, the **Paste** option is available if a value has already been cut or copied, not necessarily in the same window. The **Cut**, **Copy** and **Delete** options are available if a value is selected.

It is also possible to use the shortcuts **[Ctrl]+[X]** (cut), **[Ctrl]+[C]** (copy), **[Ctrl]+[V]** (paste) and **[Delete]**.

3. CALL DURING THE EDITING OF GRAPHIC OBJECTS

When the application is in graphic editing mode and one or more objects are selected, the **Cut**, **Copy** and **Delete** options in the **Edit** menu as well as in the pop-up menu of the object are active. If an object was cut or copied, the **Paste** option is also available. The shortcuts presented in the previous paragraph are also available.

CHAPTER 4. OBJECT MODE



The graphic editing mode is opened via the **Objects** option of the **Tools** menu or this button located in the X3D toolbar. The Object mode remains active until the user closes it by clicking again on Objects in the Tools menu or on this button which is located at the bottom of the graphic editing toolbar.

The **Insert** menu groups graphic editing options. The corresponding buttons are in the graphic editing toolbar. The menu and toolbar are shown in figure 4-1. The options of the **Insert** menu allow the user to define and edit objects to be added to a graph or the current page.

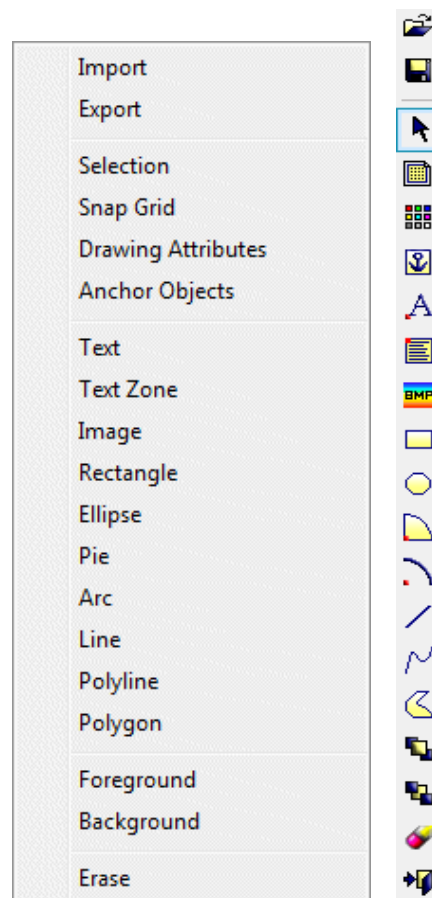


Figure 4-1 - Insert menu and graphic editing toolbar

This allows the customizing of models with fixed elements such as logos, frames, labels, etc. These elements will be displayed every time the model is used, whatever the data presented.

1. IMPORTING OBJECTS



It is possible to import objects previously saved in an external **.obj** file (see next paragraph) by selecting the **Import** option or by clicking on this button in the graphic editing toolbar.

Selecting this option opens the standard window for file selection. The default directory is of the current style file. The file type in this window is **.obj**. Only **.obj** files can be read.

The user can browse through the directories to find the object file. When it is selected, click **Open**. If objects are already associated to the style file in which to import, the application asks if the existing objects should be deleted before opening the selected **.obj** file.

Each imported object will be associated to the graph with the same number as the graph to which the object was anchored when saved in the **.obj** file. If no graph has this number, the imported object will be associated to the **page** (graph **0**). The imported object keeps its original size. With respect to the new graph, the object will be placed in a position proportionally equivalent to the one it had with respect to the original graph. It is therefore possible that the imported object be outside the limits of the page. In this case, reduce the display to see outside the page; the object can then be moved inside the limits of the page (see paragraph 3.6).

2. EXPORTING OBJECTS




It is possible to save objects in an external **.obj** file. First, select the objects to be exported. Then, select the **Export** option or click on this button in the graphic editing toolbar.

Selecting this option opens the standard window for file saving. The default directory is the one of the current style file, but the file can be saved in other directories. The file must have the **.obj** extension to be read.

Exporting objects stores the dimensions and drawing attributes of these objects, as well as the numbers of the graphs to which they are associated. The position of each object with respect to its parent graph, expressed in proportion to the dimensions of this graph, is also exported.

3. MODIFYING OBJECTS



In graphic editing mode, when no option is selected, the cursor looks like  and it is possible to select objects in order to move, modify or delete them. Clicking on the **Selection** option or on this button has the same effect.

3.1. Single selection

When the **Selection** mode is activated, click on an object to select it. Handles are then displayed around the rectangle containing the objects.

Even after selecting an object, the **Selection** mode remains active. When an object is selected, click outside all objects in order to deselect it.

3.2. Multiple selections

Several methods exist to select more than one object at a time; however, the **Selection** mode must be activated.

The user can select all objects inside a rectangular zone. To do so, place the cursor at one corner of the zone, outside all objects, click and hold down the left button of the mouse, move

the cursor to the diagonally opposed corner of the desired zone, and release the button. A dotted rectangle shows the movement of the cursor.

Several objects can also be selected by holding down the **[Ctrl]** key while selecting them.

It is also possible to display the pop-up menu using the right button of the mouse (see paragraph 3.3) and to click the **Select all** option to select all the objects added to the page and to its graphs. The user can also press simultaneously the **[Ctrl]+[A]** keys to select all objects.

If several objects are selected, it is possible to unselect one of them, by pressing the **[Ctrl]** key and clicking on the object. To rapidly deselect all selected objects, open the pop-up menu with the right button and click on **Unselect all**.



After multiple selections, handles may seem to be missing around some selected objects. After deselections, some handles may remain displayed. Click on this button to refresh the page in order for all the handles to appear or disappear, accordingly.

3.3. Pop-up menu

At all times, right clicking will open a pop-up menu of operations. The number of options varies with the situation. Figure 4-2 shows the pop-up menu displayed when one object is selected and the copy buffer is empty. The **Properties** option is active if only one object is selected.

3.4. Object properties

Each object has a certain number of properties. These can be modified via a window opened by double-clicking on the object or by selecting the **Properties** option of the object's pop-up menu (see previous paragraph).

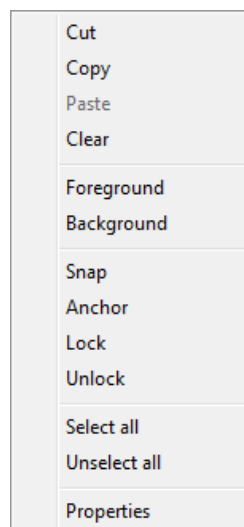


Figure 4-2 - Pop-up menu of operations

Depending on the object type, the number of properties and their availability varies slightly. However, these properties are always present:

- The **object type**, which can never be modified
- The number of the **parent graph** to which the object is associated, which can be modified

if no specific anchoring is defined (see paragraph 6), an object will be associated to the page (graph **0**) when created

- The **position in X and Y of the anchor point** of the object in the page; the global coordinates are expressed in millimeters, with respect to the origin of the page, i.e. the lower left corner
- The position of the anchor point of an object expressed **proportionally** to the dimensions of the parent graph
- The **position in X and Y of the anchor point** of the object expressed in the **local coordinates** of the parent graph

to choose to express the position of the anchor point in global or local coordinates, check the box labelled **Local mode**

when creating an object, the position of its anchor point is always expressed in global coordinates

the coordinates of the anchor point, global or local, can always be modified unless the object is locked

- By default, all objects are drawn over the graphs contained in the page. It is possible to display an object behind the graphs by clicking the box labelled **Background**. If the object is entirely or partly under a graph with a filling, the part of the object that is covered by this graph will not be visible

This background option is different than the **Foreground** and **Background** options of the pop-up menu. These options are used to modify the stacking of the objects with respect to each other (see paragraphs 17 and 18), not with respect to the graphs

- To clip an object, check the box labelled **Clip**
The clipping limits are the borders of the graph to which the object is associated. If an object is clipped, any part of the object outside the limits of its parent graph is not displayed
- To lock an object, check the box labelled **Lock**
- The four fields at the bottom left of the property window show the distances between the origin of the page to the sides of the rectangle framing the object, whether this object is anchored to the page or to a graph, and whether its coordinates are global or local; these values cannot always be modified

Each property window is described with the object type.



3.5. Locking objects

Locking objects is used to fix their position with respect to the entity containing them. Locked objects cannot be moved. However, it is possible to move the entity containing the locked objects, moving them at the same time.

To lock objects, select them, open the pop-up menu and select the **Lock** option. It is also possible to select an object, open its property window and check the box labelled **Lock**.


To unlock objects, select them, open the pop-up menu, and click the **Unlock** option.

3.6. Moving objects

When objects are selected, if they are not locked, the cursor takes this shape  when in the zone containing the selected objects, indicating that they can be moved. Hold down the left button of the mouse and move the cursor, which now looks like a hand , until the objects are at the desired location.

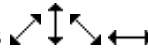
Another possibility is to open the pop-up menu, to select **Cut**, to place the cursor where the upper left corner of the rectangle containing the selected objects will be, to open the pop-up menu again and to select **Paste**. The selected objects are then displayed in their new position. The user can also use the standard **Cut** and **Paste** buttons of the application toolbar, the **Cut** and **Paste** options of the **Edit** menu or the **[Ctrl]+[X]** and **[Ctrl]+[V]** shortcuts. Finally, the position of the object's anchor point can be modified in its property window.

3.7. Copying objects

To copy selected objects, hold down the left button of the mouse and the **[Shift]** key, and move the cursor, which now looks like a hand  until the objects are copied at the desired location.

Another possibility is to open the pop-up menu, to select **Copy**, to place the cursor where the upper left corner of the rectangle containing the selected objects will be, to open the pop-up menu again and to select **Paste**. A copy of the selected objects is then displayed at the new position. The user can also use the standard **Copy** and **Paste** buttons of the application toolbar, the **Copy** and **Paste** options of the **Edit** menu or the **[Ctrl]+[C]** and **[Ctrl]+[V]** shortcuts.

3.8. Resizing objects

Except for texts, all objects can be resized. Place the cursor on one of the handles around the object to resize. The cursor will take one of these shapes . Click and hold down the left button of the mouse. Move the cursor to the desired dimensions and release the button. The selected object is then resized. The user can also modify the object's dimensions in its property window.

This can be used to impose a distortion or to create a mirror effect, by moving a corner beyond the diagonally opposite corner.

Modifying the shape of an adjustable object will automatically resize the rectangle containing the object.

If a text zone is resized, it affects the rectangle containing the text and, consequently, the text wrap. However, the font and text style are not affected.

3.9. Erasing selected objects

When objects are selected, it is possible to delete them by clicking **[Delete]** or by opening the pop-up menu and selecting the **Clear** option. Paragraph 19 explains how to erase objects that are not selected.

4. SNAP GRID



Select the **Snap Grid** option or click on this button to display the snap grid configuration window shown in figure 4-3. The snap grid is practical to position graphs or objects in the page.

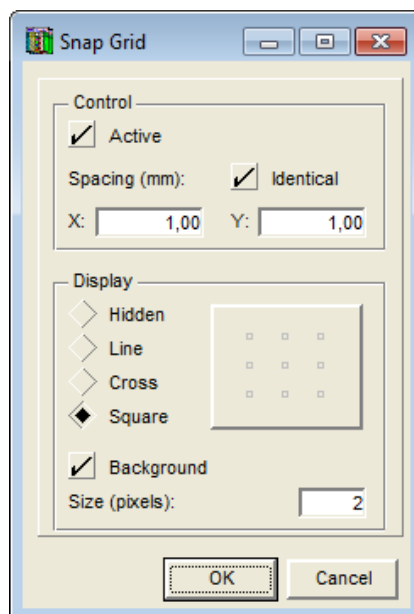


Figure 4-3 - Snap grid configuration window

- When the snap grid is **active**, the objects can only be moved on the magnetic points.
- The **spacing** between the points of the grid can be **identical**, in X and Y. The spacing is defined in X and Y, in millimeters.
- The grid has four possible displays. It can be **hidden**, it can be shown with **lines**, or with **crosses** or **squares** at its nodes.
- Next to the radio buttons, a button is used to open the drawing attributes window (see chapter 9) to modify the display of the snap grid.
- The grid can be displayed in **background**.
- The user can also define the dimension in pixels of the markers displayed at the nodes.

5. DRAWING ATTRIBUTES OF OBJECTS



The **Drawing Attributes** option of the **Insert** menu and this button located in the graphic editing toolbar are used to open the **Attributes** window. The drawing attributes defined in the **Attributes** window will be used for the objects inserted afterwards.


By clicking on the **Default** button of the **Attributes** window opened for a selected object, its attributes change to the default attributes defined in the preference editing window in the **Default** tab (see chapter 9).

It is possible to modify the drawing attributes of an object by selecting it and opening its property window.

6. ANCHORING OBJECTS

Anchoring objects is defined as associating objects to an entity, either the page or any graph defined in the page. The objects are positioned relatively to the entity to which they are anchored. If this entity is moved, its anchored objects also move. If the entity is deleted, so are the objects. By default, the objects are anchored to the page (graph 0).



To define the entity to which the objects to be created will be anchored, select the **Anchor Objects** option or click on this button; the cursor takes this shape . Then, click in the desired entity (a graph or the page); a symbol similar to this button will be displayed at the bottom left of the chosen entity.

Tip: to choose the page as the anchoring entity while the page is covered with graphs, click outside the page, in any margin, or do not click on any graph.

All newly created objects will be anchored to the chosen entity.


To change the anchoring of already defined objects, choose the entity to which the objects should now be anchored, as described above. Then, select the objects, open their pop-up menu and select **Anchor**.

It is also possible to open the property window of the object whose anchoring must be changed and to enter the number of the entity (number of the parent graph) to which the object should now be anchored.


Objects can be implemented outside the graphic page. The user must realize that printing these objects is dependent on the sizing of the page.

7. INSERTING A TEXT



Select the **Text** option or click on this button to insert a text. The cursor takes this shape . Place the cursor where the anchor point of the text (lower left corner) will be located, and click. This opens the property window of a text, shown in figure 4-4.

The object type, **Text**, is entered. The location of the **anchor point** of the text can be modified and expressed in local coordinates. The **parent graph** to which the text is associated is indicated by its name and number. If an anchoring is not defined (see paragraph 6), the object being created is associated to the page (graph 0). The text can be **clipped** and **locked**.

In the middle of the window, there is an input field for the **text** to display. The entry can be done directly in this field, or in a text-editing window displayed by clicking on the  button. The font in the editing window can be changed by clicking on the **Font** menu. There are a maximum of 512 characters that can be displayed in each text.

It is possible to insert the text of an ASCII file. In the text editing window, select **Open** in the **File** menu and choose the desired file whose content is then displayed in the editing window. The default directory is the input files directory defined in the preferences.

A line feed is done with **[Enter]** in the text editing window, and with the “**]**” character in the entry field of the property window.

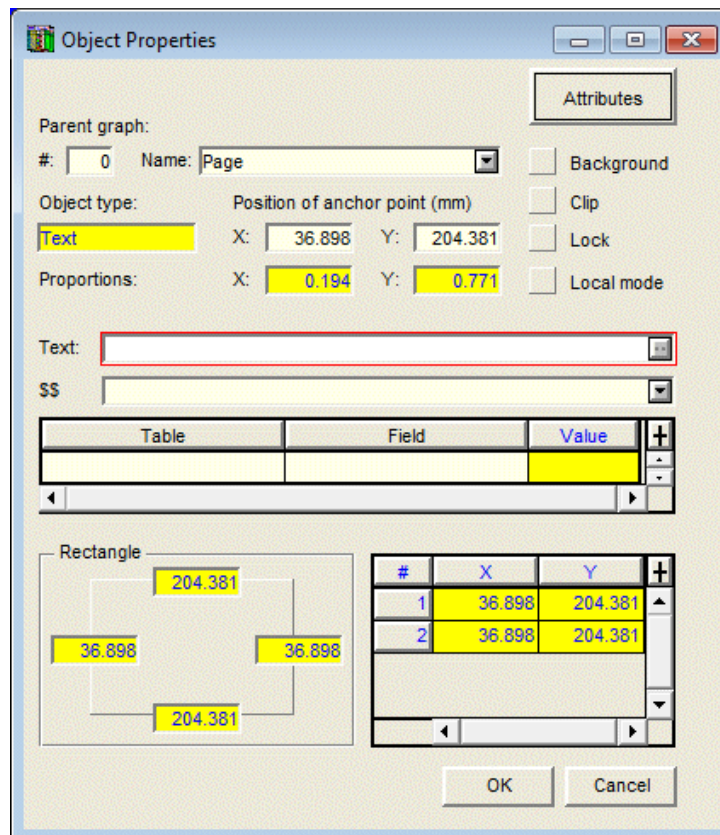


Figure 4-4 - Properties of a text: Starting to insert

The text entered can contain dynamic expressions such as the date, or a value from the database. The dynamic expressions are associated to keywords whose syntax is **\$\$word**. A list of general keywords including the date, time, name of the current style file, etc. is prepared by the X3D library. The application completes this list with specific keywords. This list is displayed by clicking on the arrow button associated to the **\$\$** field. The selection of a keyword adds it to the text entry field, preceded by **\$\$**. Several dynamic expressions can be added in a text.

When the application is connected to a database, it is possible to add to the text a value from the database. Select a table from the database via the list associated to the **Table** cell of the center table (the button to call the list is displayed when putting the cursor in the cell). Similarly, choose a field from that table in the **Field** cell. The lists show the tables and fields that exist in the connected database. The resulting keyword is entered in the entry field preceded by **&&**, as shown in figure 4-5. Several keywords from the connected database can be added in a text.

If the field belongs to a table that was already read by the application, its current value will be displayed for your information in the **Value** column. If several values can be associated to the chosen field, the last value read is displayed. If the selected field is empty or belongs to a table that has not been read by the application, the expression “**n/d**” is displayed for your information in the **Value** column; this expression will not be displayed in the resulting text, which remains empty. The user must retrieve data to ensure that it is not due to a table not having been read.

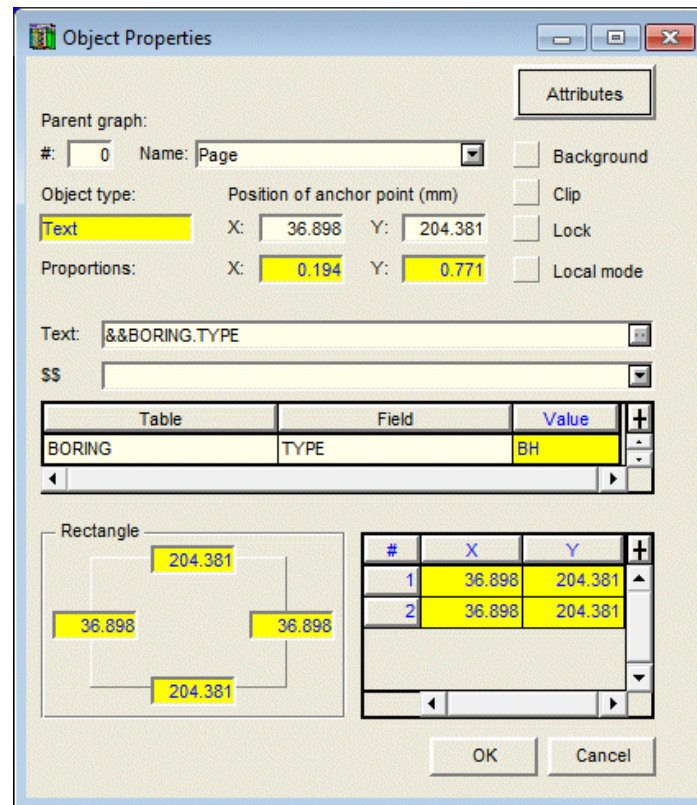


Figure 4-5 - Properties of a text: Entering a value from the database

If the **&&** characters are replaced by **@@**, an expression equivalent to the value of the field designated by the keyword will be displayed, if this equivalence is defined in the **EQUIVALENCE** table. If the equivalence does not exist, the **DESCRIPTION** of the value in the **LIST_ENG** table (or **LIST_FRE** if the module is used in French) will be displayed. Otherwise, the value of the field is displayed.

Example 1:

The **EQUIVALENCE** table contains the following record: **BORING** (table name), **DIP** (field name), **90** (value), **Verticale** (expression in French) and **Vertical** (expression in English).

If an object is defined with the keyword **@@BORING.DIP**, and if, for the current boring, the value of the **DIP** field in the **BORING** table is **90**, the expression **Verticale** or **Vertical** will be displayed, whether the module is used in French or in English. If the **DIP** field of the **BORING** table contains **80** for the current boring, **80** will be displayed by the **@@BORING.DIP** keyword.

Example 2:

The **LIST_ENG** table contains the following record: **BORING** (table name), **TYPE** (field name), **TR** (value), **Trench** (description).

The **LIST_FRE** table contains the following record: **BORING** (table name), **TYPE** (field name), **TR** (value), **Tranchée d'exploration** (description).

If an object is defined with the keyword **@@BORING.TYPE**, if for the current boring, the value of the **TYPE** field in the **BORING** table is **TR**, and if no equivalence is defined in the **EQUIVALENCE** table for this table, field and value, the expression **Trench** or **Tranchée d'exploration** will be displayed, whether the module is used in English or French.

In the **EQUIVALENCE** table, if an expression is associated to the value:

- “**all**” for a given field, this expression will be displayed, whatever the value of the field to be displayed via the **@@table.field** keyword.
- “**null**” for a given field, this expression will be displayed if the field to be displayed via the **@@table.field** keyword contains no value.

Each keyword added to the text via the **\$\$word** list or via the lists of tables and fields in the central table is placed at the end of the text. It can be moved using “cut-paste”.

If a keyword is a number or a date, the user can define its format right after the keyword.

- The numeric format is of type “**9.999**”. This example indicates that the value will have three decimals.
- The supported date and time formats are:

yyyy-mm-ddThh:mi:ss	2012-10-16T13:19:53 (ISO format)
yyyy-mm-dd hh:mi:ss	2012-10-16 13:19:53
yyyy-mm-dd	2012-10-16
yy-mm-dd	12-10-16
yyyy-mm	2012-10
mm-dd	10-16
jj m2 yyyy	16 10 2012
jj month yyyy	16 October 2012
jj m3 yyyy	16 Oct 2012

The formats can be written in capital or lowercase. The “y” (year) can be replaced by “a” (année), the “d” (day) by “j” (jour), the word “month” by “mois”. Any character, except “a”, “y”, “m”, “j”, “d”, “h”, “s” can be used as separator. All parts of the date format can be inverted.

Click **OK** to complete the text entry. By default, the text is aligned on the lower left corner, unless another alignment was previously defined via the **Drawing Attributes** option of the **Insert** menu or after selecting an existing object.

If the property window of the text is re-opened, the positions of the key points around the text are displayed at the bottom right of the property window, as shown in figure 4-6. The fields defining the rectangle framing the text are not modifiable.

The drawing attributes of the text can be modified by clicking on the **Attributes** button in the property window. Chapter 9 of this guide gives more information about the configuration of the drawing attributes.

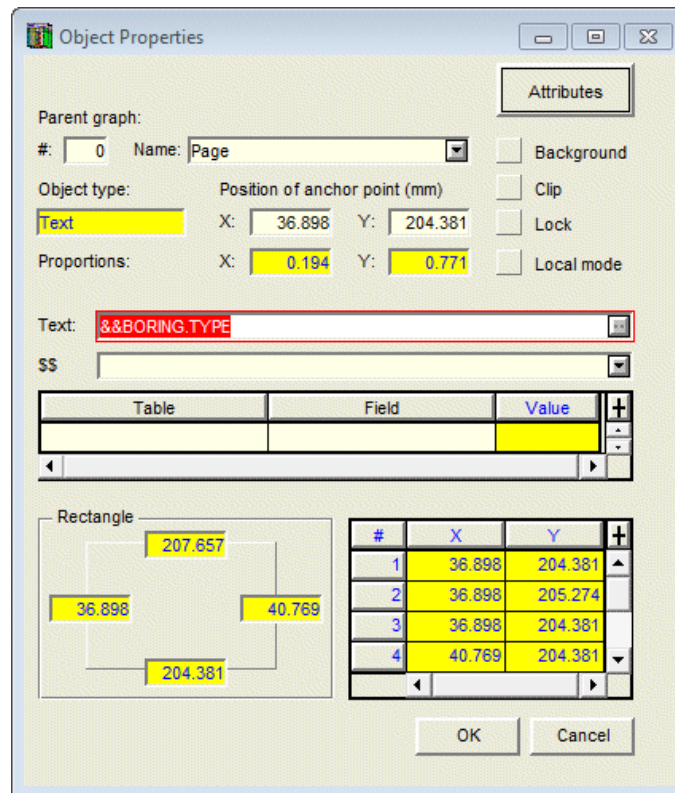




Figure 4-6 - Properties of a text completely defined

8. INSERTING A TEXT ZONE



Select the **Text Zone** option or click on this button to insert a text zone: an object consisting of a rectangle containing a text. The cursor takes the following shape . Place the cursor where one of the corners of the text zone should be located, and hold down the left button. Move the cursor until the dotted rectangle following its movement has the appropriate dimensions for the text zone, and release the button. This opens the property window for a text zone as shown in figure 4-7.

The object type, **Text Zone**, is entered. The number of the **parent graph** to which the text zone is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The text zone can be **clipped** and **locked**.

Inputting text is done the same way as for text objects, either directly in the **Text** field or via the text editing window opened by clicking on the  button (see previous paragraph). It is possible to insert the text of an ASCII file. It is also possible to insert **\$\$word**, **&&table.field** or **@@table.field** keywords (see previous paragraph).

The text string is automatically cut ("Word Wrap") to fit in the rectangle defined. The text is adjusted when the dimensions of the rectangle change. If the rectangle is too small, the text will go beyond the rectangle's borders.

The drawing attributes of the text zone can be modified, including the border and the background of the rectangle forming the zone, via the window opened by clicking on the

Attributes button. The alignment button in the drawing attributes window sets the position of the text's anchor point in the rectangle. By default, the text is aligned on the upper left corner.

The text zone can have rounded corners. The two fields at the bottom right are used to define the corner shape. The rounding value cannot exceed half the length of the side to which it applies.

The dimensions of the rectangle can be adjusted using the four fields at the bottom left of the property window. The rectangle can also be resized as described in paragraph 3.8.

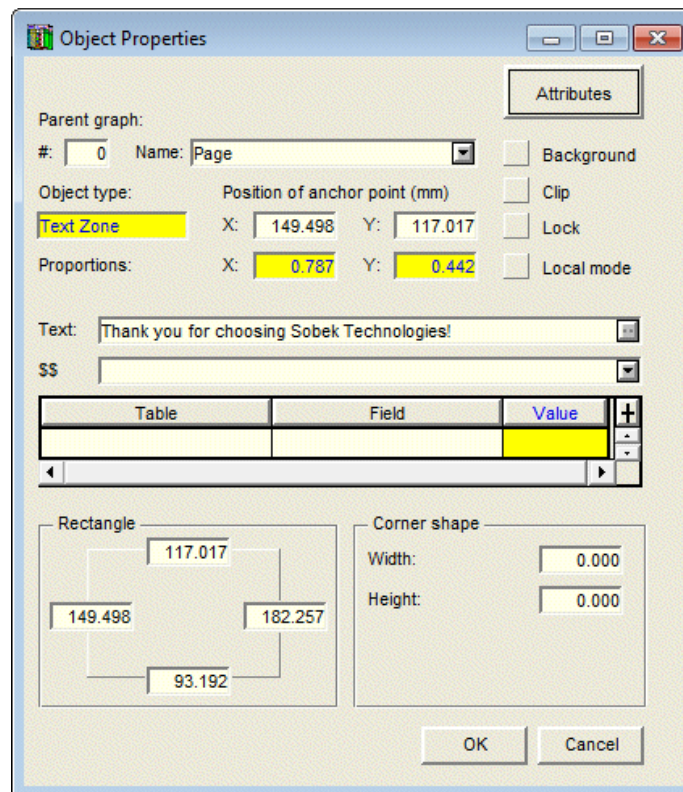




Figure 4-7 - Properties of a text zone

9. INSERTING AN IMAGE



Select the **Image** option or click on this button to insert an image stored in an image file.

The cursor takes the following shape . Place the cursor where one of the corners of the zone containing the image should be located, and hold down the left button. Move the cursor until the dotted rectangle following its movement has the appropriate dimensions for the zone, and release the button. This opens the property window as shown in figure 4-8, where the object type is **Image**.

In the **File** field, the user can enter directly the name of the image file to display. If the file is not preceded by the access path, the application will search for the file in the input files directory defined in the preferences. If the file is not found, the object will contain the file name preceded by the input files directory. The user can also select a file by clicking on the  button, which

opens the standard window for file selection. The directory is of the input files. The user can browse to find a file in another directory. When the file is selected, click **Open**.

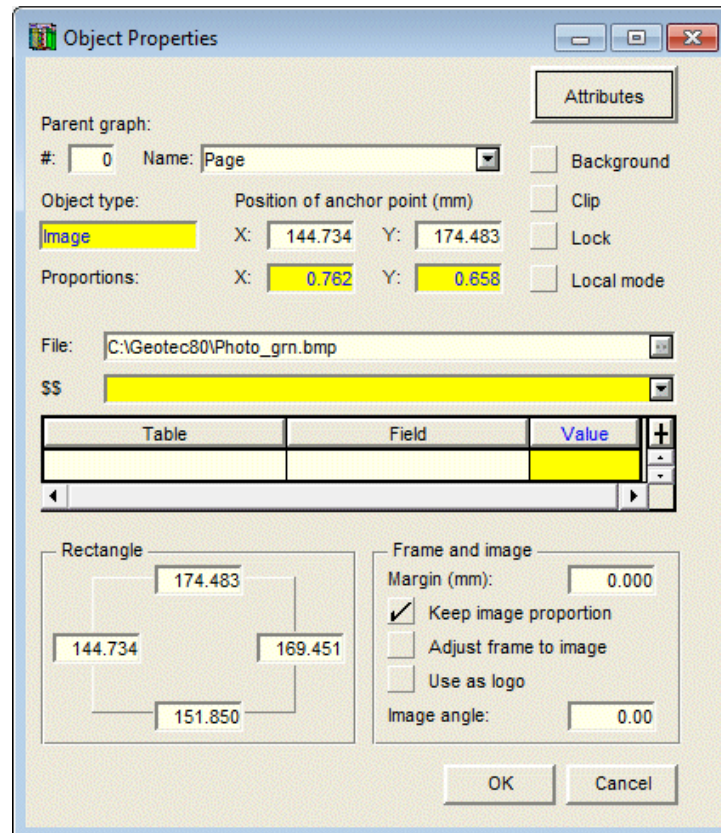


Figure 4-8 - Properties of an image

The file type proposed by default is **"Image Files"**, which groups the types mentioned below. The user can restrict the list to a certain category by changing the type via the scrolling list.

- Bitmap Files (*.bmp);
- GIF Files (*.gif);
- Jpeg Files (*.jpg, *.jpeg, *.jfif);
- PCX Files (*.pcx);
- PNG Files (*.png);
- TGA Files (*.tga);
- TIF Files (*.tif, *.tiff).

If the application is connected to a database, the user can indicate in **File** a field name where a file name can be found, possibly with its access path, with the format **&&table.field** (example: **&&boring.photo_no**). The field can be selected via the central table and its scrolling lists associated to the cells.

By default, the size of the image is adjusted to fill the maximum of the rectangle area while keeping the original proportions; the box **Keep image proportion** is checked. The image is displayed at the top or left of the object. Even if the image does not fill the entire area of the rectangle, the object containing the image keeps the dimensions of the rectangle, as shown in figure 4-9 (a yellow background was defined for the object to show the area filled by the image

in the object). If the box **Keep image proportion** is not checked, the image will fill the entire rectangle area but will be deformed with respect to the original.



Figure 4-9 - Object containing an image

The presentation and content of the object can be modified in its property window. The number of the parent graph to which the image is associated and the location of its anchor point, defined in global or local coordinates, can be modified. The image can be clipped and locked.

If a value is entered in the field **Margin (mm)**, the image will be reduced to leave the width of the margin around the image, as shown in figure 4-10.



Figure 4-10 - Object containing an image with margin and no frame adjustment

If the box **Adjust frame to image** is checked:


- If there is no margin and drawing attributes are defined for the line, a frame is drawn to the size of the image. In this case, the frame is visible only if the line is thick; otherwise, it is covered by the image.
- If a margin exists and drawing attributes are defined for the line, a rectangle is drawn, and the distance between its sides and the sides of the image is equal to the margin.

The position of the rectangle in the object depends on the alignment set in the drawing attributes window for the object. The background defined in this window only fills the adjusted rectangle, as shown in figure 4-11.



Figure 4-11 - Object containing an image with margin and frame adjustment

If the box labelled **Use as logo** is checked, the expression **\$\$logo** replaces the chosen file name in the **File** field, and the file becomes the current logo file in the **File** tab of the preference


editing window (see chapter 6). If the **File** field contains the expression **\$\$logo**, clicking on the  button will open the standard window for file selection at the directory of the current logo file.

The content of the file can be inclined in the object, by entering the value in the field **Image angle**.

The dimensions of the object can be adjusted using the four fields at the bottom left of the property window. The object can also be resized as described in paragraph 3.8. The dimensions of the image in the object are adjusted consequently.

10. INSERTING A RECTANGLE



Select the **Rectangle** option or click on this button to insert a rectangle. The cursor takes the following shape . Place the cursor where one of the corners of the rectangle should be located, and hold down the left button. Move the cursor until the dotted rectangle following its movement has the appropriate dimensions, and release the button. The rectangle is displayed with the current drawing attributes.

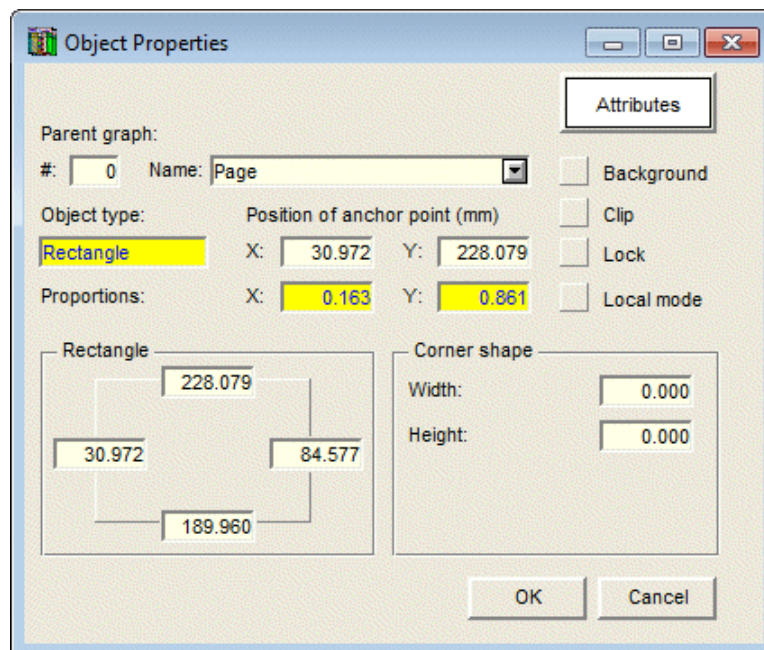


Figure 4-12 - Properties of a rectangle

The presentation of the rectangle can be modified in its property window, as shown in figure 4-12. The object type, **Rectangle**, is entered. The number of the **parent graph** to which the rectangle is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The rectangle can be **clipped** and **locked**.


The drawing attributes of the rectangle can be modified, including the border (line), the background (filling) and the pattern, via the window opened by clicking on the **Attributes** button.

The rectangle can have rounded corners. The two fields at the bottom right are used to define the corner shape. The rounding value cannot exceed half the length of the side to which it applies.

The dimensions of the rectangle can be adjusted using the four fields at the bottom left of the property window. The rectangle can also be resized as described in paragraph 3.8.

11. INSERTING AN ELLIPSE

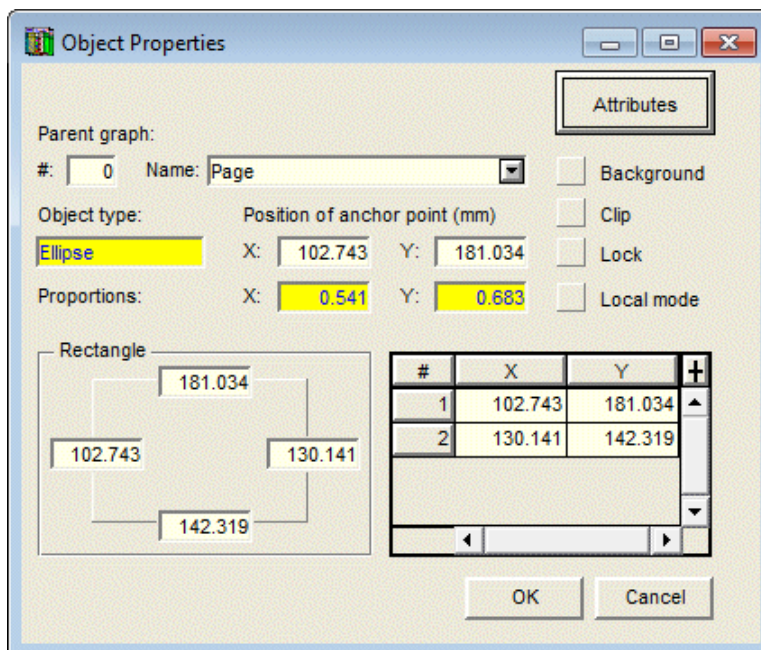


Select the **Ellipse** option or click on this button to insert an ellipse. The cursor takes the following shape . Place the cursor where one of the corners of the rectangle containing the ellipse should be located, and hold down the left button. Move the cursor until the dotted ellipse following its movement has the appropriate dimensions, and release the button. The ellipse is displayed with the current drawing attributes.

The presentation of the ellipse can be modified in its property window, as shown in figure 4-13. The object type, **Ellipse**, is entered. The number of the **parent graph** to which the ellipse is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The ellipse can be **clipped** and **locked**.

The drawing attributes of the ellipse can be modified, including the border (line), the background (filling) and the pattern, via the window opened by clicking on the **Attributes** button.

The dimensions of the rectangle containing the ellipse can be adjusted using the four fields at the bottom left of the property window. The rectangle containing the ellipse can also be resized as described in paragraph 3.8.



The dialog box shows the following settings:


- Parent graph:** # 0, Name: Page
- Object type:** Ellipse
- Position of anchor point (mm):** X: 102.743, Y: 181.034
- Proportions:** X: 0.541, Y: 0.683
- Attributes:** Background, Clip, Lock, Local mode (all unchecked)
- Rectangle:** A diagram showing a rectangle with dimensions 181.034 (height) and 130.141 (width). The bottom-left corner is at (102.743, 142.319) and the top-right corner is at (130.141, 181.034).
- Table:**

#	X	Y
1	102.743	181.034
2	130.141	142.319

Figure 4-13 - Properties of an ellipse

12. INSERTING A PIE



Select the **Pie** option or click on this button to insert a pie chart. The cursor takes the following shape . Place the cursor where the center of the ellipse containing the pie should be located, and hold down the left button. Move the cursor until the dotted line following its movement has the appropriate dimensions, and release the button. The pie is displayed with the current drawing attributes. When created, a pie is always the quarter of a circle or ellipse.

The presentation of the pie can be modified in its property window, as shown in figure 4-14. The object type, **Pie**, is entered. The number of the **parent graph** to which the pie is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The pie can be **clipped** and **locked**.

The drawing attributes of the pie can be modified, including the border (line), the background (filling) and the pattern, via the window opened by clicking on the **Attributes** button.

The dimensions of the rectangle containing the pie (part of an ellipse) can be adjusted using the four fields at the bottom left of the property window. The rectangle containing the pie can also be resized as described in paragraph 3.8.

The table at the bottom right of the property window shows the coordinates of the three points defining the pie. These fields, except the coordinates of point 1 which is the center of the ellipse, can be modified. The shape of the pie can therefore be altered; however, this is easier to do with the mouse.

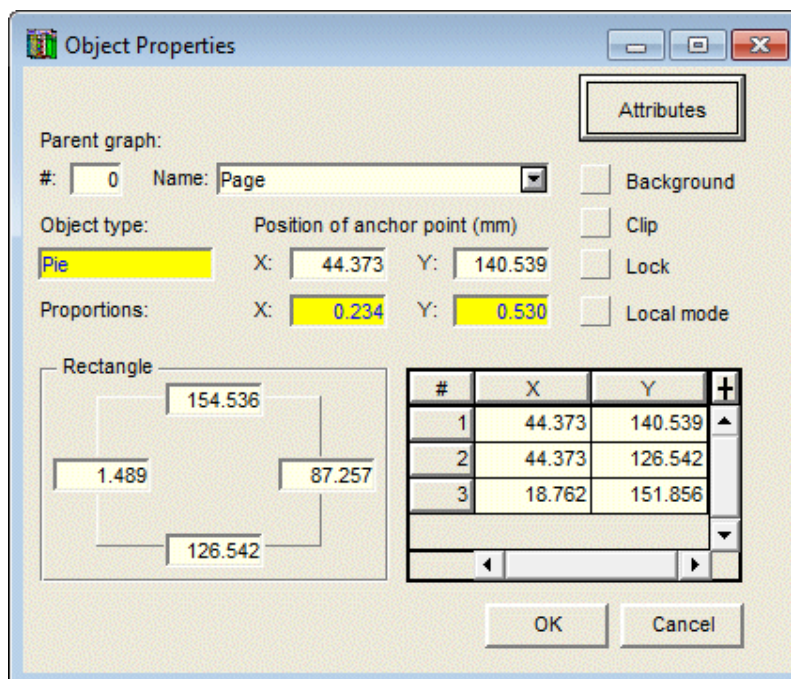





Figure 4-14 - Properties of a pie

To adjust the shape of the pie, select it and bring the cursor on one of the two “summits” of the pie. The cursor takes the shape . Click and hold down the left button; the cursor takes the shape . Move the point to the desired position and release the button.

13. INSERTING AN ARC



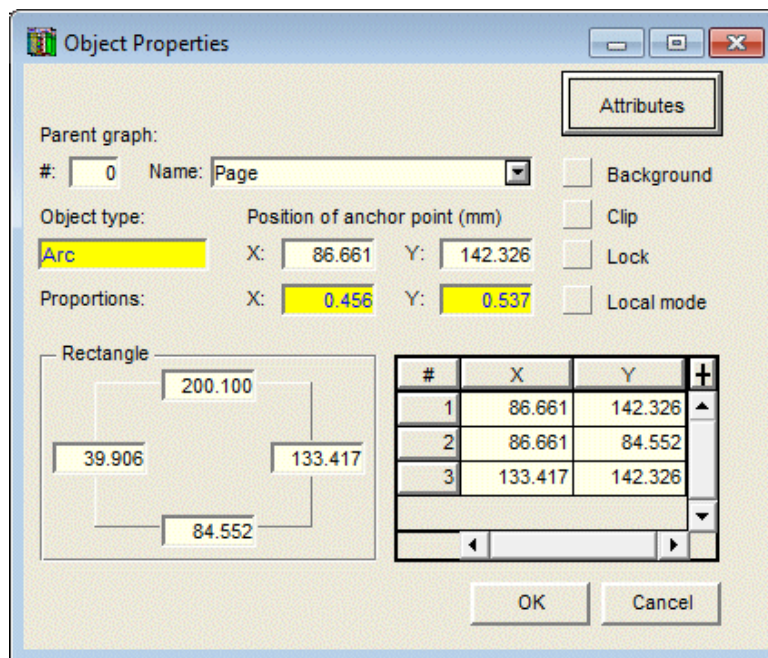
Select the **Arc** option or click on this button to insert an arc. The cursor takes the following shape . To insert an arc, click and hold down the left button of the mouse. Move the cursor until the dotted line following its movement has the appropriate dimensions, and release the button. The arc is then displayed with the current drawing attributes. When created, an arc is always the quarter of a circle or ellipse.

The presentation of the arc can be modified in its property window, as shown in figure 4-15. The object type, **Arc**, is entered. The number of the **parent graph** to which the arc is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The arc can be **clipped** and **locked**.

The drawing attributes of the arc can be modified, i.e. the border (line), via the window opened by clicking on the **Attributes** button.

The dimensions of the rectangle containing the arc (part of an ellipse) can be adjusted using the four fields at the bottom left of the property window. The rectangle containing the arc can also be resized as described in paragraph 3.8.

The table at the bottom right of the property window shows the coordinates of the three points defining the arc. These fields, except the coordinates of point 1 which is the center of the ellipse, can be modified. The shape of the arc can therefore be altered; however, this is easier to do with the mouse.





The dialog box shows the following settings:

- Parent graph:** # 0, Name: Page
- Object type:** Arc
- Position of anchor point (mm):** X: 86.661, Y: 142.326
- Proportions:** X: 0.456, Y: 0.537
- Rectangle:** Dimensions 200.100 x 84.552, with offset values 39.906 and 133.417.
- Table of points:**


#	X	Y
1	86.661	142.326
2	86.661	84.552
3	133.417	142.326
- Options:** Background, Clip, Lock, Local mode (all unchecked).

Figure 4-15 - Properties of an arc

To adjust the shape of the arc, select it and bring the cursor on one of its two ends. The cursor takes the shape . Click and hold down the left button; the cursor takes the shape . Move the point to the desired position and release the button.

14. INSERTING A LINE



Select the **Line** option or click on this button to insert a line. The cursor takes the following shape . To insert a line, place the cursor where one end of the line will be. Click and hold down the left button of the mouse. Move the cursor until the dotted line following its movement has the appropriate dimensions, and release the button. The line is then displayed with the current drawing attributes. To obtain a horizontal or vertical line, hold down the **[Shift]** key while defining the line.

The presentation of the line can be modified in its property window, as shown in figure 4-16. The object type, **Line**, is entered. The number of the **parent graph** to which the line is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The line can be **clipped** and **locked**.

The drawing attributes of the line can be modified, including the border (line) and the marker for its ends, via the window opened by clicking on the **Attributes** button.

The table at the bottom right of the property window shows the coordinates of the points defining the line. These fields can be modified. The dimensions of the rectangle containing the line are shown at the bottom left.

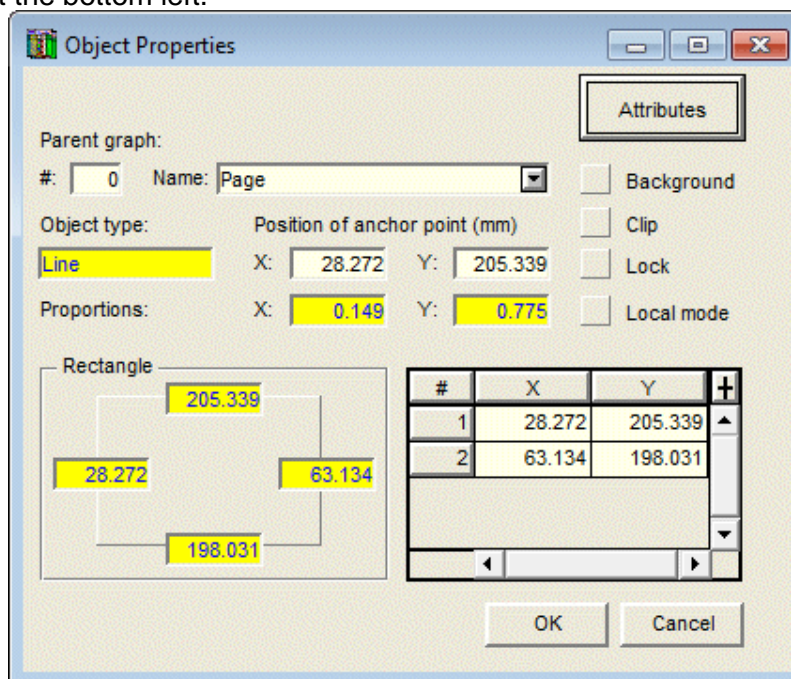





Figure 4-16 - Properties of a line

It is easier to adjust the shape of the line with the mouse. Select the line and bring the cursor on the point to be moved. The cursor takes the shape . Click and hold down the left button; the cursor takes the shape . Move the point to the desired position and release the button.

15. INSERTING A POLYLINE



Select the **Polyline** option or click on this button to insert a polyline. The cursor takes the following shape . To insert a polyline, all of its points must be defined with a click. To obtain a horizontal or vertical segment, hold down the **[Shift]** key between two points. When the last point of the polyline is defined, right click to display the pop-up menu shown here and select **Terminate** to finish inserting the polyline.

Add a point
Delete a point
Terminate

The presentation of the polyline can be modified in its property window, as shown in figure 4-17. The object type, **Polyline**, is entered. The number of the **parent graph** to which the polyline is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The polyline can be **clipped** and **locked**.

The drawing attributes of the polyline can be modified, including the border (line) and the marker for its summits, via the window opened by clicking on the **Attributes** button.

The table at the bottom right of the property window shows the coordinates of the points defining the polyline. These fields can be modified. The dimensions of the rectangle containing the polyline, shown at the bottom left, are automatically modified and cannot be edited.

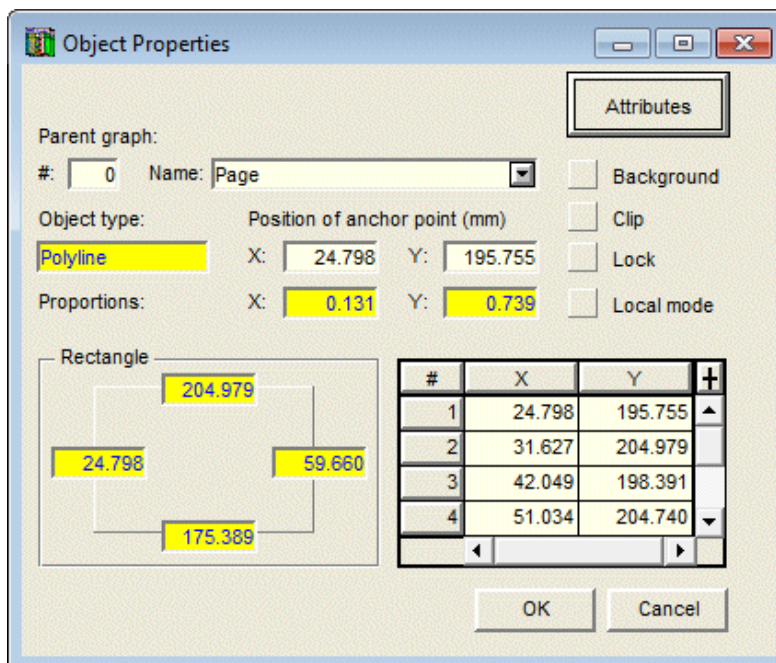




Figure 4-17 - Properties of a polyline

When a polyline has been completely defined, it is possible to modify its shape by editing the coordinates of its points but it is easier to do so with the mouse. To move one point of the polyline, select the polyline and bring the cursor on the point. The cursor takes the shape . Click and hold down the left button; the cursor takes the shape . Move the point to the desired position and release the button.


When the polyline is selected, it is also possible to delete or add a point. To delete a point, place the cursor on the point, and right click to display the pop-up menu shown here; and select **Delete a point**. To add a point, place the cursor on the point that will follow the new point, and right click to display the pop-up menu. Select **Add a point** and move the cursor to the position for the new point. Left click to finish the addition.

Add a point
Delete a point
Terminate

If a polyline has only one point, the marker defined (or a little circle if no marker was defined) will be displayed at this point. Finally, the rectangle containing the polyline can be resized as described in paragraph 3.8.

16. INSERTING A POLYGON



Select the **Polygon** option or click on this button to insert a polygon. The cursor takes the following shape . To insert a polygon, all of its points must be defined with a click. To obtain a horizontal or vertical segment, hold down the **[Shift]** key between two points. When the last point of the polygon is defined, right click to display the pop-up menu shown here and select **Terminate** to finish inserting the polygon.

Add a point
Delete a point
Terminate

The presentation of the polygon can be modified in its property window, as shown in figure 4-18. The object type, **Polygon**, is entered. The number of the **parent graph** to which the polygon is associated and the location of its **anchor point**, defined in **global** or **local coordinates**, can be modified. The polygon can be **clipped** and **locked**.

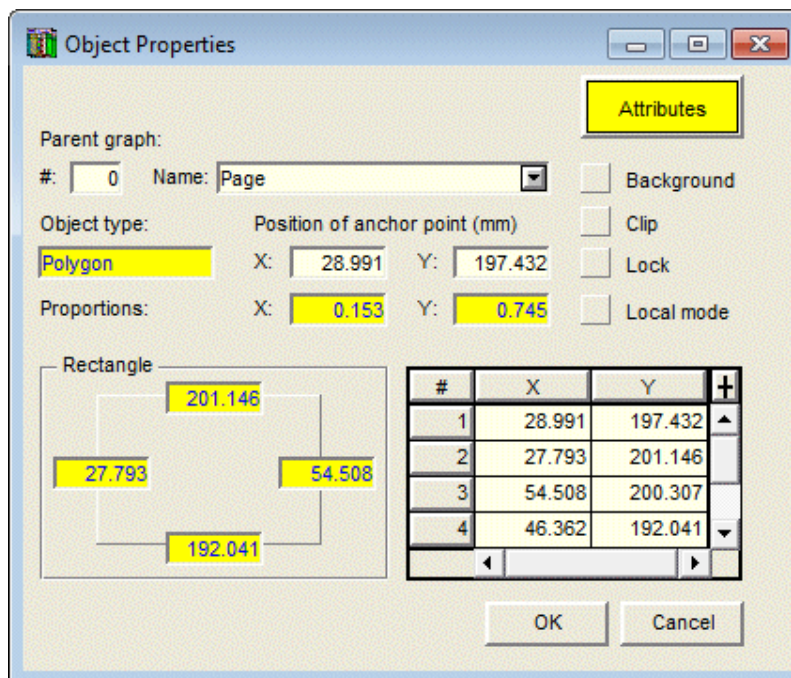




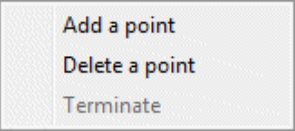
Figure 4-18 - Properties of a polygon

The drawing attributes of the polygon can be modified, including the border (line), the background (filling) and the pattern, via the window opened by clicking on the **Attributes** button.

The table at the bottom right of the property window shows the coordinates of the points defining the polygon. These fields can be modified. The dimensions of the rectangle containing the polygon, shown at the bottom left, are automatically modified and cannot be edited.

When a polygon has been completely defined, it is possible to modify its shape by editing the coordinates of its points but it is easier to do so with the mouse. To move one point of the polygon, select it and bring the cursor on the point. The cursor takes the shape . Click and hold down the left button; the cursor takes the shape . Move the point to the desired position and release the button.

When the polygon is selected, it is also possible to delete or add a point. To delete a point, place the cursor on the point, and right click to display the pop-up menu shown here; and select **Delete a point**. To add a point, place the cursor on the point that will follow the new point, and right click to display the pop-up menu. Select **Add a point** and move the cursor to the position for the new point. Left click to finish the addition.




Add a point
Delete a point
Terminate

A polygon must have at least 3 points to be defined. Finally, the rectangle containing the polygon can be resized as described in paragraph 3.8.

17. MOVE TO FOREGROUND



As objects are inserted, the last objects added can cover previous ones. To move an object to the foreground, select the **Foreground** option or click on this button.


The cursor takes the shape . Place the cross of the cursor in the object to move to the foreground and click.

Please note: The “foreground” mode stays active until another option is selected.

18. MOVE TO BACKGROUND



As objects are inserted, the last objects added can cover previous ones. To move an object to the background, select the option **Background** option or click on this button.


The cursor takes the shape . Place the cross of the cursor in the object to move to the background and click.

Please note: The “background” mode stays active until another option is selected.

This background option is only for the objects with respect to one another. It cannot be used to place an object in the background of the graphs in the page. To do so, click on the **Background** box in the object’s property window (see paragraph 3.4).

19. ERASING NON-SELECTED OBJECTS



Paragraph 3.9 explains how to erase selected objects. It is possible to erase non-selected objects. Select the **Erase** option in the **Insert** menu or click on this button. The cursor takes the shape . Place the cursor in the object to erase and left click.

Please note: The “erase” mode stays active until another option is selected.

CHAPTER 5. VIEW MENU

The options of the **View** menu are used to change the display characteristics of the graphs in the current page. The buttons corresponding to the options of the **View** menu are in the top part of the X3D toolbar located on the left side of the screen in each application. The menu and toolbar are illustrated in figure 5-1. Based on the application, some options of the **View** menu are not appropriate and are either inactive or hidden.

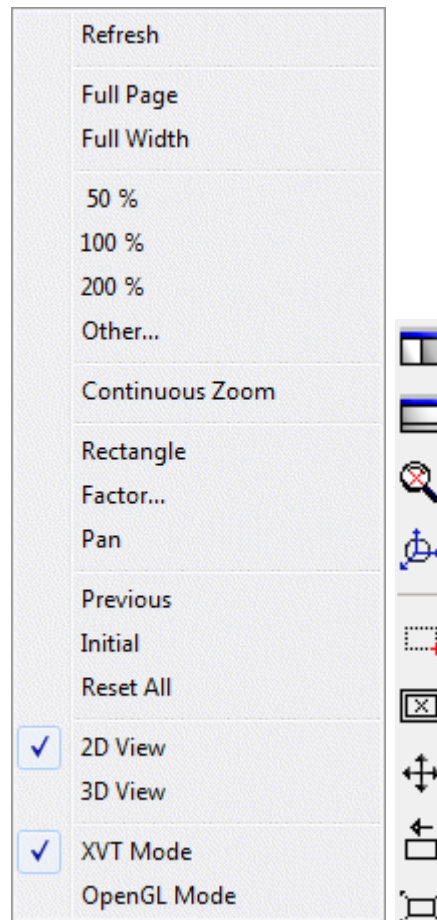


Figure 5-1 - View menu and top of the X3D toolbar (Site module)

1. REFRESH



The **Refresh** option (the first in the **View** menu), or this button in the application toolbar, is used to regenerate all graphs contained in the page in their current limits.

2. ZOOMING ON THE PAGE

The 2nd and 3rd groups of options in the View menu, between **Full Page** and **Other**, are options to zoom on the whole graphic page; in other words, these options provide “hardware” zooms. The options provide a blow-up or reduction of the contents of the window showing the graphic page. These options are active in all applications.

No zoom creates a distortion of the page, which always maintains the same width/height proportion.

2.1. Full Page and Full Width



The selection of the **Full Page** option or the opposite button adjusts the display of the graphic page to be displayed entirely in the window.



The selection of the **Full Width** option or the opposite button adjusts the display of the graphic page to the full width of the window containing it. If the height of a page is greater than its width, the vertical scrolling bar is available.

2.2. 50%, 100% and 200%

Selecting the **50%**, **100%** and **200%** options fixes the magnification percentage of the graphic page to the value corresponding to the selection. At 100%, the graphic page is very similar to how it would appear once printed on 8 ½ by 11 inches format.

2.3. Other



Selecting **Other** lets the users define a magnification percentage for the graphic page. The button on the left has the same role.

3. ZOOMING ON THE GRAPHS

The 5th and 6th groups of options in the View menu, between **Rectangle** and **Reset All**, are options to zoom in particular graphs in the graphic page; in other words, these options provide “software” zooms. The options are used to expand or reduce the display of the graph. They are not active in all the applications.


3.1. Rectangle, Factor, Pan

When one of these three options is selected, only the **View** and **Window** menus remain active. Once the zoom is done, the button is deselected or the **Refresh** option is clicked, the menus become active again.




Select the **Rectangle** option or the opposite button to define the portion of the graph to enlarge. Hold down the left button of the mouse, and move the cursor to obtain the rectangle that will be zoomed in on. **This rectangle must be completely contained in a graph.** For the graphs with an imposed distortion, the dimensions of the selection rectangle are adjusted in order for the enlargement to be contained in the same frame as the original display. For the graphs without an imposed distortion, the zoom is done on the selection rectangle delimited by the user. A distortion is then created. In all cases, the limits of the axes are modified automatically to reflect the change of display of the graph.



The **Factor...** option or the opposite button is used to specify the transformation ratio of a graph. A factor of 2.0 doubles the scale. A factor of 0.5 reduces the scale by half. After selecting this option, the cursor appears as . Click on the point of the graph around which the transformation will be done, and enter the transformation factor in the dialog box. The result of this transformation is in a frame of same size as the original display.



The **Pan** option or the opposite button is used to shift the contents of a graph. After selecting this option, the cursor appears as . Click on the point of the graph to move, and hold down the left button of the mouse. Move the point to the desired location in the graph. A dotted line shows the shift that will be done. Release the button and the contents of the graph will be shifted.

The **Rectangle**, **Factor** and **Pan** options can be deselected by clicking again on the corresponding button or by refreshing the page.

3.2. Previous, Initial, Reset All



The **Previous** option acts as a toggle. Selecting it or clicking on the opposite button restores the limits of the current graph as they were before the last change. By selecting **Previous** again, the limits are brought back to how they were after the last change.

The **Initial** option is used to restore the coordinates of the current graph as they were when the page was opened.


The **Previous** and **Initial** options have an effect on the current graph. The current graph is the last one in which the user did an operation or clicked.



The **Reset All** option or the opposite button applies to all graphs of the page; the limits are brought back to their initial values.

4. CONTINUOUS ZOOM



The 4th group of the View menu has the option **Continuous Zoom**, with its equivalent button shown on the left, which is used to do “hardware”, “software”, pan and 3D zooms. When the option is selected, the cursor looks like . The page stays in “continuous zoom” mode and the option in the View menu is checked until the mode is deselected. The possible actions in “continuous zoom” mode are also available in normal mode if the **[Alt]** key is pressed and held down.

4.1. “Hardware” zoom

In “continuous zoom” mode, a “**hardware**” **zoom** is done with the left button of the mouse. Hold down the left button of the mouse and move towards the top to increase the size of the window in the screen, or towards the bottom to reduce the size. If the application is in normal mode, pressing **[Alt]** and the left button is equivalent. This option works in all applications.

A “**hardware**” **zoom** can also be done the same way but with the right button of the mouse by clicking outside all graphs.



Finally, a “**hardware**” **zoom** can be done with the wheel of the mouse. By clicking outside all graphs, move the wheel towards the top or bottom to increase or reduce the size of the window on the screen, and refresh the page with this button, the **Refresh** option of the View menu, or the **[F5]** key.

4.2. “Software” zoom

A “**software**” **zoom** is done with the right button of the mouse. Place the cursor in the graph whose display is to be changed (and the axes limits). Click and hold down the right button, and bring the cursor towards the top of the screen to increase the scale, or towards the bottom to reduce the scale. If the application is in normal mode, pressing **[Alt]** and the right button in the desired graph is equivalent.



A “**software**” **zoom** can also be done with the wheel of the mouse. Click in the desired graph, scroll the wheel towards the top or bottom to increase or reduce the scale and refresh the page with this button, the **Refresh** option of the View menu, or the **[F5]** key. During the process, a dotted line shows the increasing or reducing factor of the graph.

This “**software**” **zoom** is not active in all the applications.

4.3. Pan zoom

It is possible to move the contents of a graph with the wheel of the mouse. Click and hold down the wheel on the point of the graph to move. In the frame of the graph, drag the selected point to the location it must have after the move, and release the wheel. If the application is in normal mode, pressing **[Alt]** and the wheel is equivalent.

By doing the same steps but after clicking outside all graphs, the entire graphic page is moved in the window, if horizontal and/or vertical scrolling bars are present.

4.4. 3D zoom



When a PLAN_VIEW is in 3D by selecting the **3D View** option in the View menu or the opposite button located in the application toolbar (Site and Dam modules) or when the 3D_VIEW is displayed (Pro module), it is possible to change its view point by placing the cursor in the 3D graph and clicking the left button of the mouse (in continuous mode). Hold down the left button and move the graph until the desired view point is achieved. If the application is in normal mode, pressing **[Alt]** and the left button is equivalent.

A “**software**” **zoom** can also be done in 3D graphs, the same way as described in paragraph 4.2.

5. OPENGL



The PLAN_VIEW in Site and Dam can be displayed in OpenGL mode (instead of normal XVT mode). For this, select the option **OpenGL Mode** of the **View** menu or the opposite button located in the application toolbar.

The OpenGL mode is used to view solids and surfaces with hidden lines and faces and shadows in 3D. The **XVT mode** is the standard display mode. See the Site guide.

CHAPTER 6. TOOLS MENU

The options of the **Tools** menu are used to define the usage settings for the application and to edit the graphic components produced by the application: the characteristics of the graphic page, of the graphs, legends, axes, markers and patterns used. The buttons corresponding to the options of the **Tools** menu are in the bottom part of the X3D toolbar located on the left side of the screen in each application. The menu and toolbar are illustrated in figure 6-1.

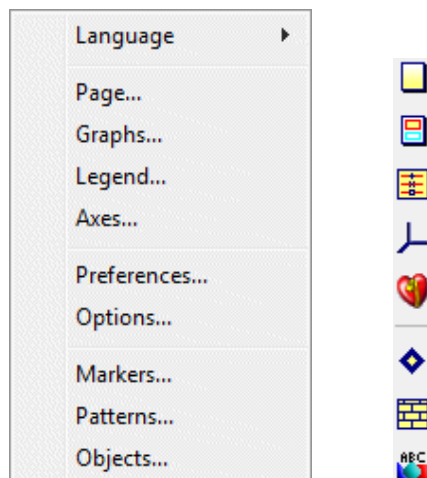


Figure 6-1 - Tools menu and bottom of the X3D toolbar

The main types of components for an X3D graph are:

- There is only one **page** per window.
- The **graphs** are associated to the page.
- The **objects** are associated to the page or the graphs.
- The **data** are represented in graphs as **curves** with or without **markers**, as **histograms** with or without **patterns**, as **text**, etc.
- The **system of axes** and the **legend** are associated to a graph and the data.

1. LANGUAGE SELECTION

Selecting the **Language** option opens a submenu where the user can select English or French as the utilisation language of the module. All the labels in the windows and the various messages sent by X3D and the application will be in the language selected. The language of the lists of values will be automatically modified. The language can also be changed in the **General** tab of the preference editing window (see paragraph 6.1.1).

When exiting the application, the current language is saved in the registry of the user's workstation for the application. At the next utilisation, the application will be in the last language used.

2. PAGE



Select the **Page** option or click this button to open the page editing window shown in figure 6-2. This window is used to configure the current page, i.e. the one in the foreground which contains all the graphs.

In the page editing window, the user can change the dimensions and the display portion of the page, on the screen or the printer.

2.1. Dimensions of the page

The fields in the **Page dimensions (mm)** section are used to define the dimensions of the page, in millimeters.

The scrolling list associated to the **Standard** field is used to select a predefined format, such as “letter”, “legal”, “A0”, etc. The dimensions associated to the “Screen” format are those sent by the pilot of the screen of the workstation. Those associated to the “Printer” format are those sent by the pilot of the current printer. The dimensions associated with the other formats are set so they can be used by the current peripherals.

The **Width** and **Height** fields are used for the direct input of the page dimensions in millimeters.

The radio buttons located on the right interchange the values contained in the **Width** and **Height** fields in order to position the page in the **Portrait** or **Landscape** orientation.

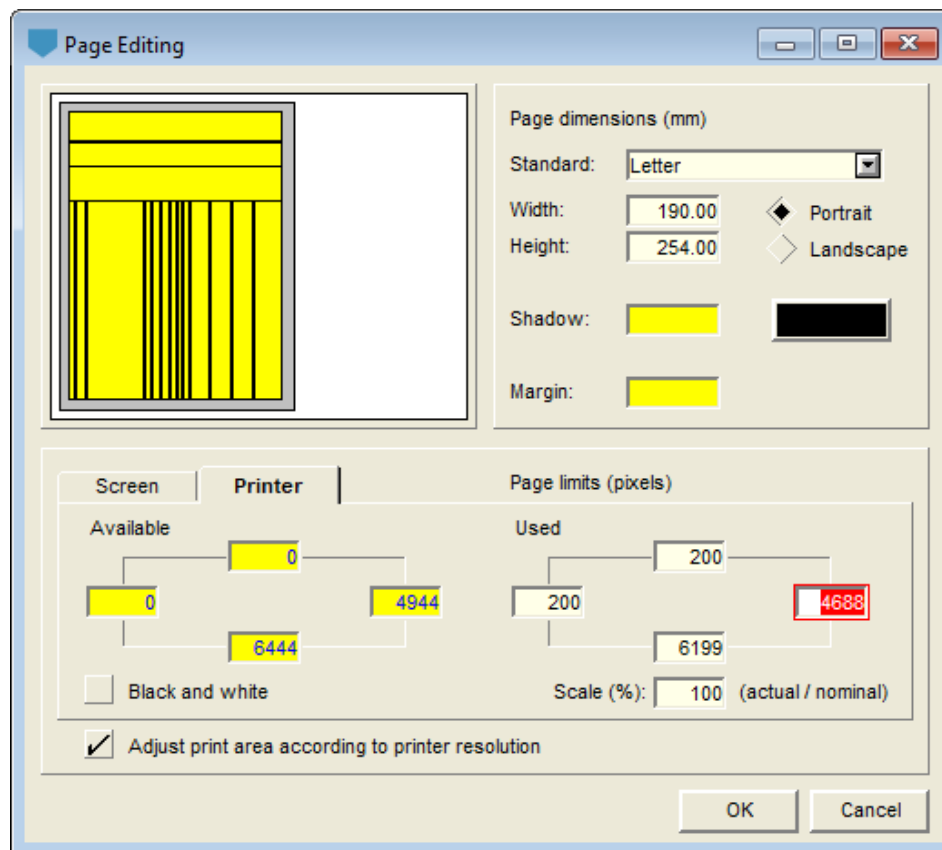


Figure 6-2 - Page editing window

When the **OK** button is clicked after changing the page dimensions, a message will appear asking the user if he wants to adjust the dimensions of the graphs contained in the page to the new dimensions of the page. If the automatic adjustment of the graphs is not asked, the user will change the dimensions of each graph in the graph editing window (see paragraph 3).

The **Shadow** field is used to change the width of the shading at the bottom and right of the page. **The shading will not be drawn when printing.**

Clicking on the button at the right of the **Shadow** field displays the drawing attributes configuration window to modify the page shading. Only the modifications to the pattern, filling and line attributes have an effect. The drawing attributes are described in chapter 9.

The **Margin** field is for the width of the margin around the page on screen only. The shading and margin widths are applicable for a zoom of 100%; they vary proportionally to the zoom percentage.

There are several ways to prepare a new graphic page. The user can select a page with maximal dimensions and place the graphs in a way to keep a margin all around, inside the page. The user can also size the page while considering the margins and then fill the page with graphs. In this case, the user must position the margins in the **Used** part of the **Printer** tab (see paragraph 2.2). The positions on the screen and the printer are kept in the style file.

With a page smaller than the printable area, it is possible to print objects that are outside the page, which is not the case if the page has maximum dimensions, meaning that the page occupies the entire printable area.

Whatever the work habits to prepare a graphic page, the user must be aware that:

- the maximal dimensions available returned by the printer pilot are at the limits of the printable area and it is strongly recommended to consider some slightly smaller dimensions;
- if a graphic page is designed to scale, any resizing, for example to respect printing margins incorrectly evaluated, could result in a loss of the precision of the fixed scales.

The page also appears in the graph editing window (see paragraph 3) with the predefined number "**0**". The graph "**0**" can be selected like any other graph. Its dimensions can be modified, but those of the left and bottom must be at 0. In the graph editing window, the user can also define a filling for the page; this filling never hides any information since the page is always the first element displayed.

2.2. Position and dimensions of the display

The bottom section of the page editing window is used to position and size the displays on the screen and printer, via the **Screen** and **Printer** tabs. The user defines the limits of the page, in pixels. The page is shown in the preview area at the top left.

The four fields under **Available** show how many pixels are available for the current unit, the screen or the printer. The fields under **Used** allow the user to position the page on the screen or the printer. The user can manually set the display scale. The field **Scale (%)** is used to set a magnification percentage for the page on screen or printer.

The dimensions of the display always respect the proportion between the height and the width of the original page. Changing the scale modifies the maximum limits of the display. Changing a limit modifies the opposite limit without affecting the scale. The horizontal and vertical scrolling bars can be used if the graphic page is not completely visible in the screen.

The **Black and white** option forces a black and white display or print of the page, except for the logo. **When the Black and white option is activated, the colors of the XVT filling zones are no longer displayed.**

By default, X3D **adjusts the print area according to the resolution of the printer**. If the user does not want the adjustment when he switches printers, uncheck the box.

3. GRAPHS



Select the **Graphs...** option or click the opposite button to open the graph editing window shown in figure 6-3.

This window is used to change the characteristics of the graphs contained in the current page. The user can enable or disable graphs, make them visible or invisible. He can also change the dimensions, position and attributes of each graph. In addition, the user can change the title of each graph, including its position and attributes. The retrieval and processing of the data displayed in the graphs are specific to each application.

In the graph editing window, the current graph is displayed with a yellow background in the preview area and is selected in the bottom table.

The user can use the vertical scrolling bar to scroll through the table of graphs. If the cursor is inside a cell, the **[Up Arrow]** and **[Down Arrow]** bring the mouse to the previous or next row, and the **[Page Up]** and **[Page Down]** keys are used to scroll the table by the number of visible rows minus one. The **[Home]** and **[End]** keys bring the cursor to the beginning or end of the active cell. These navigations do not change the selection of the current graph.

Clicking **OK** or **Cancel** confirms or cancels the modifications done in the graph editing window.

3.1. Types of graphs

There are five types of graphs.

- The **basic graph**

This graph is automatically generated by the application and represents the current page. Its dimensions are defined in the page editing window. In the graph editing window, it is always the first in the table of graphs. It is numbered **0** in the **#** column and is **named Page**. Its origin, the left and bottom fields, is set at 0, but its other dimensions can be modified. If the page dimensions are modified in this window, they will be automatically modified in the page editing window, and there will be no request to readjust the graphs.

- The **primary graphs**

These graphs are directly associated to the page. They have **0** in the **#P** column, which contains the number of the parent graph.

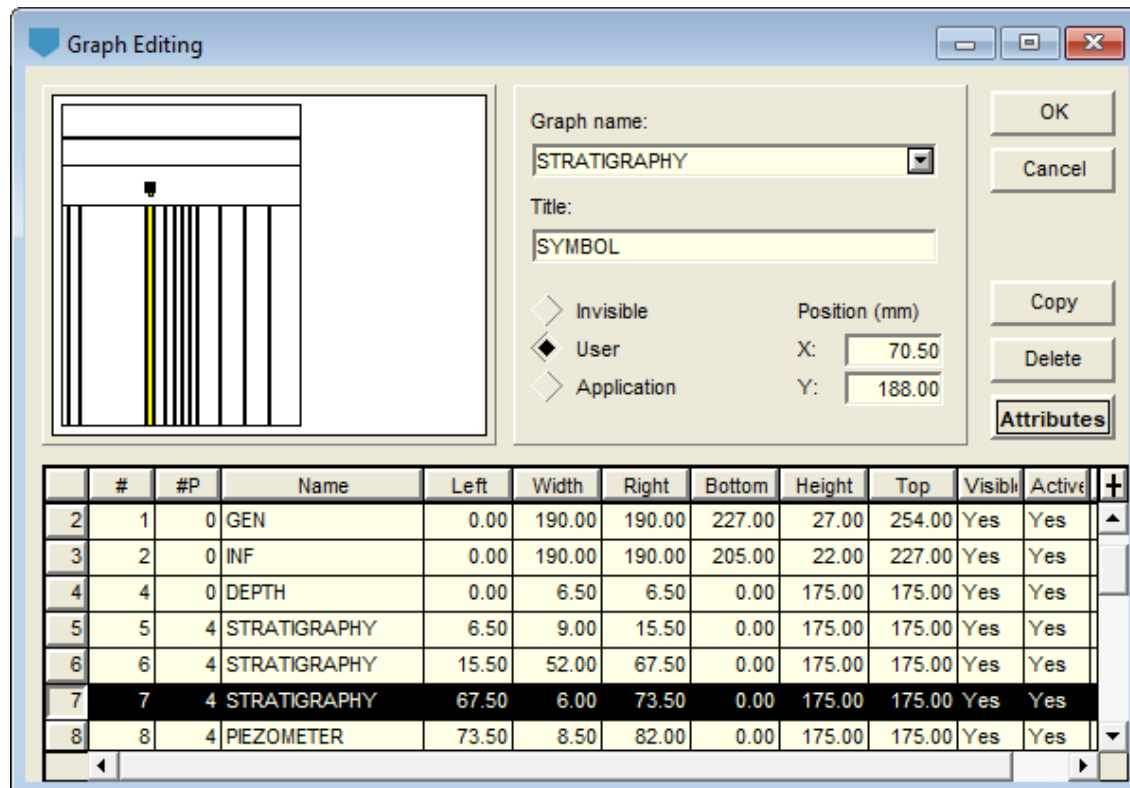


Figure 6-3 - Graph editing window

- The **secondary graphs**

A secondary graph is dependent on a primary graph whose number appears in the **#P** column.

The dependency relationship between a primary graph and secondary graphs is defined by the application. For example, the **Log** module for the production of boring logs will treat the various property columns as secondary graphs dependant on the **DEPTH** primary graph, the column of depths. The dependency relationship between the secondary graphs and the **DEPTH** graph is the **Y** axis, i.e. the depth.

- The **sub-graphs**

A sub-graph is drawn inside a primary graph. The display of the sub-graphs is managed entirely by the application. A negative number appears in the **#P** column of a sub-graph.

For example, the **Pro** module for the production of profile views treats each property column of the borings represented along a cross-section and in a 3D view as a sub-graph.

- The **tables**

Technically speaking, a table is not a graph. The “curves” belonging to a table are actually the columns of the table.

A table is designated by a value greater or equal to **100** in the **#** column.

The graphs numbers are attributed automatically when they are created, and can be modified. The graphs are sorted in ascending order of their numbers in the graph editing window. The user must define the number of the parent graph, and adjust the value in the **#** and **#P** columns to modify the graph type.

3.2. Current graph

The graphs of the current page are represented in the preview area located on the top left of the graph editing window. The graphs are shown as rectangles, with a yellow background for the current graph, and an empty background for the others. If the title of the current graph is not selected as **Invisible**, it is symbolized in the preview area by a rectangle and its anchor point. The row representing the current graph in the table at the bottom of the window appears in reverse video.

To make a graph current, click once in the desired graph before opening the graph editing window. If the graph editing window is already opened, to make a graph current:

- select it in the scrolling list associated to the field **Graph**;
- select it in the table at the bottom of the window by clicking in the grey cell left of the row defining the graph;
- click it in the preview area;

In the preview area, if the user clicks in an area shared by several superimposed graphs, all these graphs will be selected in the table and the first one will be identified as the current graph. Changes to the status of the title and to the position of its anchor point will only affect the current graph; however, modifications to the drawing attributes will affect all the selected graphs.

The section at the right of the preview area displays:

- the name of the current graph, as defined in the table at the bottom of the window;
- the title; if the title is defined by the application, it is displayed but cannot be edited;
- the status of the title;
- the position of the anchor point of the title in the **X** and **Y** fields; these coordinates are expressed in millimeters and are measured from the bottom left corner of the page; see paragraph 3.4 for more details about the graphs titles.
- the **Attributes** button used to open the drawing attributes configuration window (see paragraph 3.3).

3.3. Graph attributes

Clicking on the **Attributes** button allows the user to change the drawing attributes of the current graph in the drawing attributes configuration window (see chapter 9). The following attributes can be modified:

- The background color of the graph by selecting **Filling**;
- The color, thickness and style of the border line of the graph by selecting **Line**; the **Width** field can be used to define the line thickness.

The border of the graph can be hidden by the limits of the panels and mostly by the axes.

- The title font, size, style, orientation, the interline, the offset of the title relative to its anchor point, its alignment relative to the anchor point and its format, using the controls in the right section of the drawing attributes window;

- The color of the title by selecting **Text**; the size of the title can also be defined via **Height**.

The attributes of a **Table** graph (# higher or equal to **100**) affect the title, border and background of the table. Paragraphs 4.3.4 and 4.3.6 describe how to modify the presentation of the columns headings and the presentation of each column respectively.

3.4. Title of a graph

The position of the title of the current graph can be modified by editing the **X** and **Y** fields or by moving the title box in the preview area. The values in the **X** and **Y** fields are the coordinates of the anchor point of the title, expressed in millimetres, measured from the bottom left corner of the page. The anchor point has no role for the title of a **Table** graph.

The **Invisible** checkbox allows the user to hide the title of the graph. The **User** checkbox displays the title of the graph from the **Title** field. The **Application** checkbox displays the graph identification if provided by the application.

The title of the graph defined by the user is entered in the **Title** field. For a title to be displayed on several lines, enter the “**l**” character where a line feed is required.

The title of a **Table** graph is positioned according to the horizontal alignment of the text. It is copied in the table editing window (see paragraph 4.3.2).

Click on the **Attributes** button to modify the text attributes of the title (see chapter 9).

It is possible to edit the page title (graph 0), but the title will never be displayed.

3.5. Graph characteristics

The table at the bottom of the window is used to change the characteristics of the graphs. In this table:

- The **#** column contains the number of the graphs
- The **#P** column contains the number of the parent graphs (see paragraph 3.1).
- The **Name** column contains the identification of the graphs. A scrolling list is available, and the applications first show the names of the graphs specific to the application, followed by the list of tables and views in the database established by the application.

- The columns between **Left** and **Top** contain the position and dimensions of the graphs.

The values contained in the position and dimension cells can be modified. However, the origin of the page is always reset to 0. When a value in a cell is modified, an update is automatically done in the complementary cell when the cursor leaves the modified cell. For example, if the user changes the width of a graph, after leaving the cell, the value in the **Right** column for this graph is automatically recalculated according to the values in the **Left** and **Width** columns.

The position and dimensions of a **Table** are defined in the graph editing window. However, as mentioned in paragraph 4.3.1, the display of the table does not necessarily reflect these values.

- The **Visible** column indicates if the graphs will be visible or not.

The cells in this column can contain **Yes** or **No**. Double-clicking in the cell changes the value to the other possible one. By default, when the value is modified in the **Visible** column, the value in the **Active** column is also modified.

- The **Active** column indicates if a graph can become current; an inactive graph cannot become current. When the user clicks on an active graph, its name is shown in the status bar and we can open its corresponding data entry form with a double click. The **Active** option is mostly useful when working with superimposed graphics. The user can deactivate one of the graphs in order to work with the other one.

The cells in the **Active** column may contain **Yes** or **No**. The value can be changed with a double click.


- The **Site** module is the only one that uses that **OGL** column. This column is only used when **Site** is in **3D** and **OpenGL** modes. Enter the radius of the cylinder of properties (in geographic meters) which corresponds to the maximum value of the axis. Note that no clipping is done. See the guide of Site for more details.

3.6. Copy and Delete

The **Copy** and **Delete** buttons apply to the current graph, i.e. the one that is selected in the table.

- Clicking on the **Copy** button or pressing the **[Insert]** key creates a complete copy of the selected graph, including its curves, legend and axes, and is inserted immediately after the original graph.

The new graph has the same characteristics as the original graph, but a different #. After the creation of a new graph, the numbers of the graphs as well as the references to the parent graphs are updated, if necessary. If there are "gaps" in the numbering, they are partially or totally filled.

- Clicking on the **Delete** button or pressing the **[Delete]** key deletes the selected graph. If the **Delete** button was selected by mistake, exit the window immediately by clicking on the **Cancel** button or . Deleting a graph leaves a gap in the numbering. If secondary graphs were dependent on the deleted graph, the references to the deleted graph are kept. The user must modify the references to the deleted graph or delete all the secondary graphs that no longer have a parent graph. It is the same for the sub-graphs that depend on a deleted primary graph.

4. LEGEND AND CURVES



If the current graph is not a table (# of the graph inferior to **100**), select the **Legend...** option or click on the button on the left to open the **legend and curve editing** window. If the current graph is a table (# of the graph higher or equal to **100**), the **Legend...** option or the button on the left opens the **table editing** window.

4.1. Current graph

The graphs of the current page are shown as rectangles in the preview area located on the top left of the legend and curve editing and table editing windows. The current graph has a yellow background.

To make a graph current, click once in the desired graph before opening the legend and curve editing windows. If the editing window is already opened, to make a graph current:

- select it in the scrolling list associated to the field right of the preview area;
 - click it in the preview area;
- with this method, if graphs are superimposed, the user must make inactive the graph that should not be current.

4.2. Legend and curve editing

The legend and curve editing window, shown in figure 6-4, is used to create and change the characteristics of the curves and legend of the current graph.

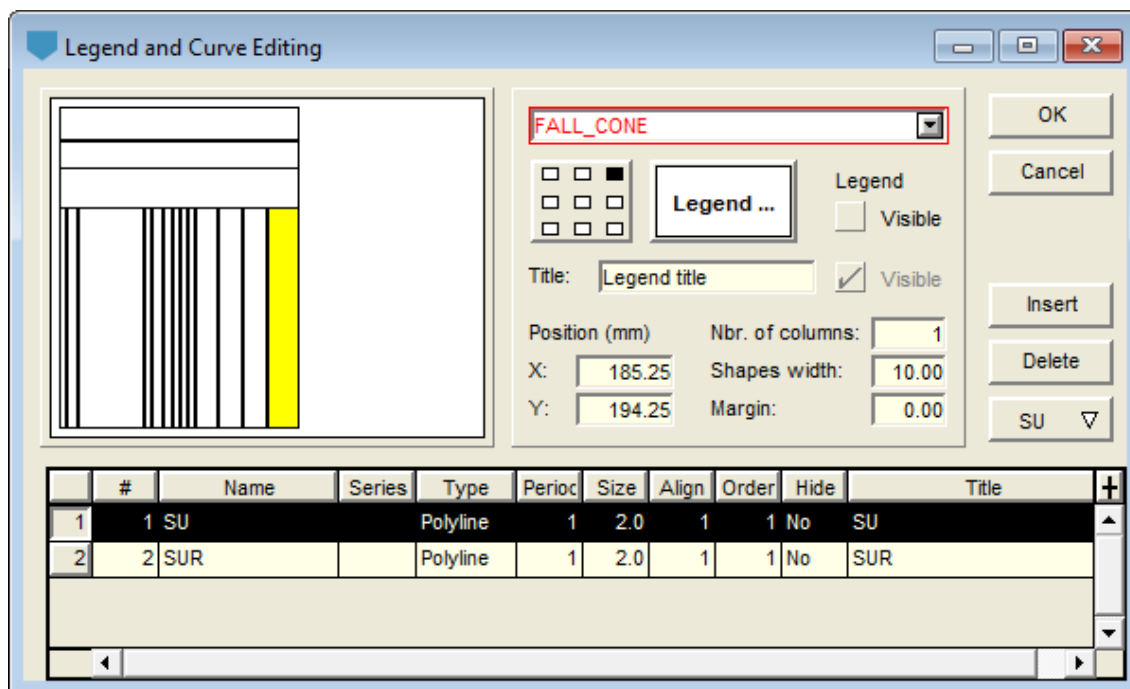


Figure 6-4 - Legend and curve editing window

A graph can contain several curves. Some characteristics of the curves are specific to each application. See the specific guides for more information.

The characteristics of the legend of the current graph are displayed under graph name at the top of the window, while the characteristics of the curves of the current graph are displayed in the table at the bottom of the window.

The user can use the vertical scrolling bar to scroll through the table of curves. If the cursor is inside a cell, the **[Up Arrow]** and **[Down Arrow]** bring the mouse to the previous or next row, and the **[Page Up]** and **[Page Down]** keys are used to scroll the table by the number of visible rows minus one. The **[Home]** and **[End]** keys bring the cursor to the beginning or end of the active cell. These navigations do not change the selection of the current curve.

Clicking **OK** or **Cancel** confirms or cancels the modifications done in the legend and curve editing window.

4.2.1. Positioning the legend

The 1st **Visible** checkbox indicates if the legend will be displayed or not. If the legend is visible to a primary graph that has secondary graphs, the legend will show the curves of the primary and secondary graphs.

To position the legend in the graph, the user specifies the coordinates of its anchor point in the **X** and **Y** fields under **Position** (in millimeters relative to the bottom left corner of the page), or moves the anchor point with the mouse in the preview area.



The alignment of the legend relative to its anchor point can be modified with the button shown on the left. Click one of the nine positions to select the position of the legend relative to its anchor point. The result is shown in the preview area. If no alignment is defined, the bottom left corner is set by default as the anchor point.

4.2.2. Title and attributes of the legend

The title of the legend is specified in the **Title** field. This title can be written on several lines, the line feed character being “**␣**”.

The 2nd **Visible** checkbox indicates if the title of the legend will be displayed or not.

The **Nbr. of columns** field is used to specify how many columns the legend will have.

The **Shapes width** field is used to specify the length of the symbols displayed in the legend. These symbols normally consist of a segment with a marker in the middle. The attributes of the symbols are those defined for the curves (see paragraph 4.2.3).

- If the shapes width is negative, the symbols are placed on the left of their text identification; if it is positive, the symbols are on the right.
- If only the markers are to be displayed as symbols in the legend, without the segment, set the shape width to **0** or remove the line, if only the points are displayed in the curve.

The **Margin** field is used to specify the space between the sides of the legend box and its content, and between the longest text identification and its symbol.

The button right of the alignment button for the legend opens the drawing attributes configuration window (see chapter 9) to change the attributes of the box and the texts of the legend. In this window, you can modify:

- the background color of the legend by selecting **Filling**;
- the color, style and thickness of the border line of the legend, by selecting **Line** and by using the **Width** field;
- the color of the texts in the legend and the size of the characters, by selecting **Text** and using the **Height** field;
- the font of the texts in the legend, their size, style, orientation, the interline and the offset using the controls on the right of the attributes configuration window.

4.2.3. Presentation of the curves

The table at the bottom of the legend and curve editing window is used to define the curves of the current graph. In the **Lab** module, the curves for the various samples are actually defined in the page, since they are represented in each graph. See the specific guide for more details.

- The **#** column contains the curve numbers, which can be modified. However, the management of the numbers is done by the application. For example, some applications can give specific numbers for predetermined curves; others can order the curves according to the numbers provided by the user, etc.
- The **Name** column contains the identification of the curves associated to the graph. By “curve”, we mean at set of similar data whose representation is not necessarily a curve. For example the curve of stratigraphic codes presented by **Log** is a column of symbols.

For a curve to be represented, it usually needs to correspond to a field of a table or view in the database. However, some curves with a predetermined number and name are automatically generated by the module. For example, the **Layers** curve is automatically generated with the number **101** by **Log** when a **Stratigraphy** graph is created; the attributes of this curve define how the limits of the layers will be drawn in boring logs. The curves with numbers of **100** or greater are automatically generated by the application.

A list with the fields from the table of the database represented by the graph is available in the Name column. The new curves selected by the user have a number between **1** and **100**.

If curves have a **negative** number, they are generated by the application and cannot be deleted or modified (except their attributes). **Lab** module uses this function a lot.

The guides of the modules present in details their legend and curve editing window.

- The **Series** column has two roles:
 - ♦ It is used to specify which series of data must be displayed in the curve. This use only applies to few data tables whose values are based not only on X, Y and possibly Z, but also on another qualifying value. For example, with **Log** and **Pro**, if a curve represents a field from the **PROPERTY_VALUE** table, the property to represent will be specified in **Series**.
 - ♦ Adding @@ in **Series** is used to display equivalences to values when they are defined in the **EQUIVALENCE** table, or else in the **LIST_ENG** or **LIST_FRE** table.
If the equivalent expressions are textual, they will be displayed only if the curve is of type **Default** or **Text** (see below). If the equivalent expressions are numeric, they will be displayed no matter the curve type.
- The **Type** column defines the format in which the data will be presented in the graph. A scrolling list associated to the cells of the column suggests:
 - ♦ **Default** presentation defined by the application;
 - ♦ **Text** values expressed textually;
 - ♦ **Point** scatter plot;
 - ♦ **Histo** envelope of the histogram;
 - ♦ **Step** envelope of the bars;
 - ♦ **Polyline** polyline;
 - ♦ **Polygon** polygon;

- ◆ **Color** color corresponding to value;
- ◆ **Pattern** pattern corresponding to value;

The application defines the format in which the data can be displayed. The user selects the desired type in the list. If the chosen type is not treated by the application, the selection will have no effect.

- The **Period** column contains the period of the markers along the curve, if the curve type is **Polyline**. It indicates their display frequency; a period of 1 means one marker per point of the curve, a period of 2 means one marker per two points of the curve, etc. With a period of 0, the markers are not displayed. The **Period** is used by the **Histo** type to indicate which lines of the histogram will be displayed, and for the **Step** type to indicate the vertical alignment of the steps.
- The role of the **Size** column is defined by the application, depending on the graph or the curve type. If the curve is “conventional”, the value entered in the **Size** column is the size of the markers of the curve points. If the curve is of **Text** type, the **Size** column corresponds to the height of the text.
- The **Align** column plays a role if the curve is of type **Text** and if the application allows it. The texts of the curve will be aligned to the left, center, or right if the value of the alignment is **1**, **2** or **3** respectively. With the curves of type **Histo** or **Step**, an alignment of 3 is used to present inverted graphs.
- If the **Order** cell of a curve contains 0 or a negative value, the curve is not represented in the legend. The curves with a **positive** order value are represented in the legend and organized according to their order.

An application can force the display of some curves in the legend, if the legend is visible. For example, **Lab** will display the curves of the samples displayed in each graph presented.

- The display of the curve in the graph depends on the value in the **Hide** column. By default, the value is **No**. If a curve is not represented in the graph, it is not in the legend either.

Some applications force the display of curves with data present; in this case, changing **Hide** to **Yes** has no effect. If the user does not want to see these curves, he must hide them with the configuration of their drawing attributes, as described below.

- The **Title** column contains the titles of the curves that appear in the legend. By default, the title of a curve is identical to its name when a curve is created.

Some applications use the **Title** column to request the display of the value of a field from a table in a specific format. See the guides of these applications for more details.

The **Insert** button is always active while the **Delete** button is active as soon as one or many rows of the table are selected (by clicking in the grey cell containing the curve number).

- Clicking on the **Insert** button or pressing the **[Insert]** key inserts a new curve at the beginning of the table or after the selected curve. If several curves are selected, it will be inserted after the first selected one. Inserting a new curve will update the numbers of the curves. If there were “gaps” in the sequencing order, they are filled in partly or completely.
- Clicking on the **Delete** button or pressing the **[Delete]** key deletes the selected rows. The numbering of the curves is not adjusted.

The predefined curves specific to some applications (their # is higher or equal to **100**, or negative) can be deleted, but they are automatically regenerated by the application. A good way to reset curves is to delete them.

The drawing attributes of the selected curve are defined via the window opened by clicking on the button located under the **Delete** button (see chapter 9). The attributes to be edited are:

- the color, style and thickness of the lines of the curve by selecting **Line** and with the **Width** field, if the curve is of type **Histo**, **Step**, **Polyline** or **Polygon**;
- the type and diameter of the markers for the points of the curve by selecting **Marker** and with the **Diameter** field, if the curve is of type **Point** or **Polyline**;
- the color, size, font, interline, angle, offset, style, alignment and format of the characters by selecting **Text**, with the **Height** field and with the controls at the right of the attributes configuration window, for all curve types;
- the filling in the area contained by the curve by selecting **Filling**, if the curve is of type **Histo**, **Step** or **Polygon**;
- the pattern in the area contained by the curve by selecting **Pattern**, if the curve is of type **Histo**, **Step** or **Polygon**;

The application keeps the final control on the editing possibilities. In the case of **Default** type curves, the application defines the display.

4.3. Table editing

The table editing window, shown in figure 6-5, is used to create and change the characteristics of the current table.

The **Lab** module uses the tables the most. See the specific guide for more information.

The user can use the vertical scrolling bar to scroll through the rows at the bottom of the table editing window. If the cursor is inside a cell, the **[Up Arrow]** and **[Down Arrow]** bring the mouse to the previous or next row, and the **[Page Up]** and **[Page Down]** keys are used to scroll the table by the number of visible rows minus one. The **[Home]** and **[End]** keys bring the cursor to the beginning or end of the active cell. These navigations do not change the selection of the current row.

Clicking **OK** or **Cancel** confirms or cancels the modifications done in the table editing window.

4.3.1. Position and dimensions of the table

The position and dimensions of the graph defining the table, as they appear in the graph editing window (see paragraph 3.5), are those of the table, without including the **Symbol** column, if visible.

If no alignment is defined (no point selected in the alignment button), the table will occupy the rectangle defined for the graph, with its origin being the bottom left corner of the table. The columns are resized in order to adjust to the dimensions of the graph. In the preview area, the table appears in yellow with a solid border, and the bottom left corner is the anchor point. If the **Symbol** column is visible, the preview area shows that the column is outside the limits left of the table.

☐ ☐ ☒ If an alignment is defined, the selected point on the alignment button represents the position of the anchor point of the table in the rectangle that defines the graph. When an alignment is defined, the table is resized to display all the data of the table according to the various drawing attributes defined for the headings, columns, and table title. The table can therefore be larger or smaller than the rectangle defining the graph. The position of the anchor point is shown in the **X** and **Y** fields. These coordinates cannot be modified.

In the preview area, the table appears in yellow with a dotted border to show that it is the rectangle of the graph definition, not necessarily the area that the table will occupy. The anchor point of the table is shown according to the selected alignment. If the **Symbol** column is visible, the preview area shows that the column is outside the limits left of the table.

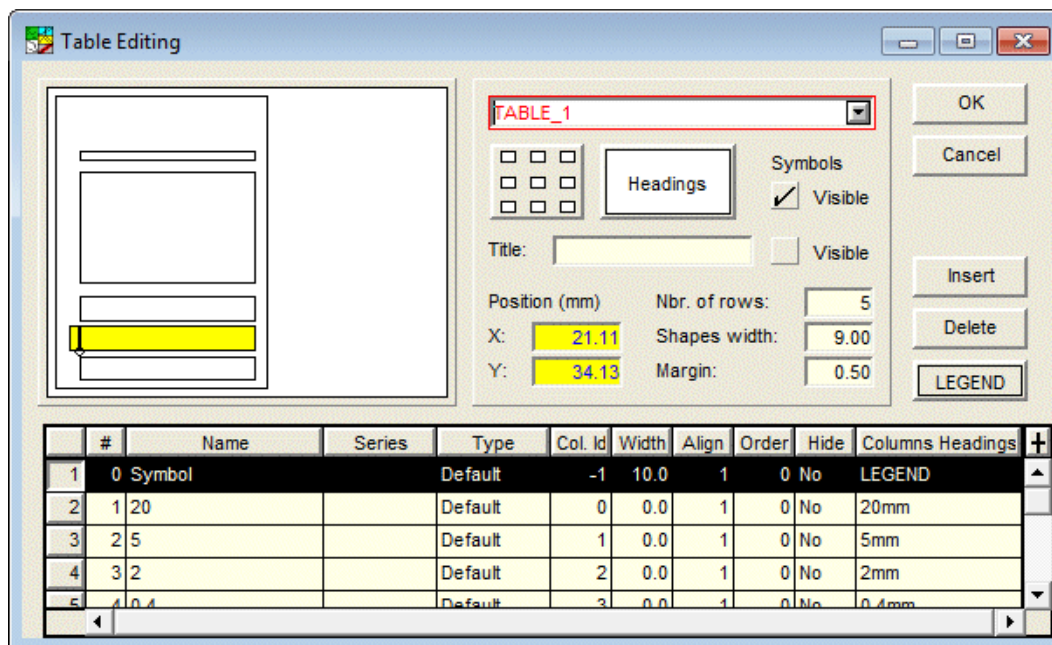


Figure 6-5 - Table editing window

4.3.2. Title of the table

The title of the table is specified in the **Title** field. This title can be written on several lines, the line feed character being “**l**”. The status of the title (invisible, user or application) is defined in the graph editing window (see paragraph 3.4). The attributes of the title are also defined in the graph editing window, by clicking on the **Attributes** button (see paragraphs 3.3 and 3.4).

The second **Visible** checkbox is used to indicate if the title of the table is displayed or not. If yes, its area is included in the rectangle's limits, unlike the column of symbols.

4.3.3. Rows and margin of the table

The **Nbr. of rows** field specifies how many rows the table must display. This number does not include the eventual title or the row of columns headings.

If the table is without alignment (displayed in the dimensions of the graph), it is possible that the number of rows specified cannot be displayed or that the rows do not fill the entire table,

depending on the height of the rectangle, the presence of the title and the height of the characters in the rows.

If the table has an alignment, all the displayable rows are shown, up to the number of rows specified.

The **Margin** field specifies the minimum offset between the content of the cells and their borders, in millimeters. This offset applies to all sides. This offset applies to the title, the headings and all the cells of the rows, including the column of symbols if visible.

The drawing attributes of the lines separating the rows are controlled by the drawing attributes of column **0** (Symbol), whether or not this column is visible (see paragraph 4.3.5).

4.3.4. Columns headings

The **Headings** button calls the **Attributes** window (see chapter 9) to change the drawing attributes of the table's columns headings. In this window, the user can modify:

- The color and XVT pattern of the background of the headings, with **Filling**;
- The color, style and thickness of the headings' upper and lower borders, by selecting **Line** and with the **Width** field; if a border is defined for the table, it will hide the upper border of the columns headings.
- The color, size of characters, font, interline, angle, style and alignment of the text of the headings, by selecting **Text**, with the **Height** field and with the controls at the right side of the attributes window.

If no alignment is defined, the absolute value of the offset distance is interpreted as the distance between the text and the left vertical border of the cells; the offset angle is not considered.

4.3.5. Display of the symbol column

The 1st **Visible** checkbox under **Symbols** is used to display or not the column **0** (Symbol). If this box is checked, the **Hide** cell of row 1 shows **No**; if the box is not checked, the cell shows **Yes**.

The **Shapes width** field is used to specify the size of the symbols displayed in the symbols column. If the field contains **0**, only a marker represents each symbol. The application defines the symbols that characterize the data presented.

The drawing attributes of the column of symbols can be modified. Select column **0** by clicking the grey cell left of its row, and click on the button located under the Delete button to open the **Attributes** window (see chapter 9). In this window, the user can modify:

- the color and XVT pattern of the background of the **Symbol** column, with **Filling**;
- the color, style and thickness of the lines dividing the rows of data by selecting **Line** and using the **Width** field.

4.3.6. Presentation of the columns

The table at the bottom of the **table editing** window is used to define the columns of the current table. The table of columns shows the following information:

- The **#** column contains the numbers of the columns, which can be modified (except number 0). It is impossible to replace a number by a number already used by another column. When the user clicks **OK** in the table editing window, the columns are displayed from left to right according to the order of their numbers.

The next time the window is opened, the rows are ordered according to their # in the table of columns.

- The **Name** column contains the identification of the columns associated to the table.

Depending on the application, the choice of the columns may be done directly in the **Options** window (see the guide of **Lab**). It is also possible to display values of a field of a table or view in the database. In this case, a list with the fields from the table of the database represented by the **Table** graph is available in the **Name** column.

- The **Series** column has two roles:

- ◆ It is used to specify which series of data must be displayed in the column. This use only applies to few data tables whose values are based not only on X, Y and possibly Z, but also on another qualifying value. For example, with **Lab**, if a table column represents a field from the **PROPERTY_VALUE** table, the property to represent will be specified in **Series**.
- ◆ Adding @@ in **Series** is used to display equivalences to values when equivalent expressions are defined in the **EQUIVALENCE** table or in the **LIST_ENG** or **LIST_FRE** table for the field designated by the column.

- The **Type** column has no role in the case of a table. Data is always expressed as text.

- **Col. Id** identifies the columns with their initial number. These values cannot be modified.

- The **Width** column defines the width of the columns.

- ◆ The effective width of the columns with a defined **width** greater than 0 depends on this defined width.

In a table without alignment (displayed with the dimensions of the graph's rectangle), the proportion between the defined widths is used (except for column 0). In a table with alignment, the defined widths are used for the display.

- ◆ The effective width of the columns with a **width** of 0 depends on the length of the values contained, including the heading.

The display of a column of width 0 is adjusted, **as much as possible**, to fit the longest value on one line. The heading can be displayed on several lines if it is made of several words with a total length exceeding the length of the longest value of the column or if it contains the character "|".

In a table without alignment, it is possible that no column can display the totality of its content. However, in a table with alignment, the columns with a defined width of 0 will show their entire content, while the columns with a defined width greater than 0 will show only what their width allows.

- The **Align** column has no role in the case of a table.
- The **Order** column has no role in the case of a table.
- The display of the column in the table depends on the value of the **Hide** cell. By default, the value is **No**.

- The **Columns Headings** column contains the labels of the columns headings.
Some applications control entirely the label of the columns headings, or ask the user to define them in the **Options** window. Refer to the specific guides.

The **Insert** button is always active while the **Delete** button is active as soon as one or many rows of the table are selected (by clicking in the grey cell containing the number of the row).

- Clicking on the **Insert** button or pressing the **[Insert]** key inserts a new row at the beginning of the table or after the selected row. If several rows are selected, it will be inserted after the first selected one. Inserting a new row will update the numbers of the rows. If there were "gaps" in the sequencing order, they are filled in partly or completely.
- Clicking on the **Delete** button or pressing the **[Delete]** key deletes the selected rows. The numbering of the rows is not adjusted. **It is not possible to delete the column 0.**

To modify the drawing attributes of a column, select the column and open the **Attributes** window (chapter 9) by clicking on the button under the **Delete** button. For all columns except the symbol column, the attributes that can be modified are:

- the color and XVT pattern of its background, by selecting **Filling**;
- the color, style and thickness of its left border by selecting **Line** and with the **Width** field;
- the color, size, font, interline, angle, style, alignment and format of the content of its cells by selecting **Text**, with the **Height** field and using the controls at the right of the attributes configuration window.

If no alignment is defined, the absolute value of the offset distance is interpreted as the distance between the text and the left vertical border of the column; the offset angle is not considered.

The application has the final control on the editing possibilities. The drawing attributes that can be modified for the symbol column are outlined in paragraph 4.3.5.

5. AXES



Select the **Axes...** option or click the opposite button to open the axes editing window shown in figure 6-6. This window is used to configure the axes of the graphs in the current page and to change the attributes of the titles, labels, grids and tick marks. Clicking **OK** or **Cancel** confirms or cancels the modifications done in the axes editing window.

5.1. Choice of the graph

The axes characteristics can be edited for the current graph. To make a graph current, click once in the desired graph before opening the axes editing window. If the editing window is already opened, select the desired graph in the scrolling list associated to the field at the top left of the window.

In the case of a primary graph that has secondary graphs, the axes must only be modified for the primary graph. The values of all the graphs will be displayed according to the axes of the primary graph.

The **Title** field is used to change the graph title (the title is also written in the graph editing window).

Some applications do not permit the 3D display of graphs (for example, **Log**). The view point options in the **View** menu are absent, and the **3D** checkbox in the axes editing window cannot be checked.

The Site and Dam modules allow the 2D or 3D display of a PLAN_VIEW (graph #1) of cartographic type. The **3D** checkbox can then be used to activate the 3D display.

The **Hide** box at the top right of the window is used to hide the axes of the graph, without having to remove the drawing attributes.

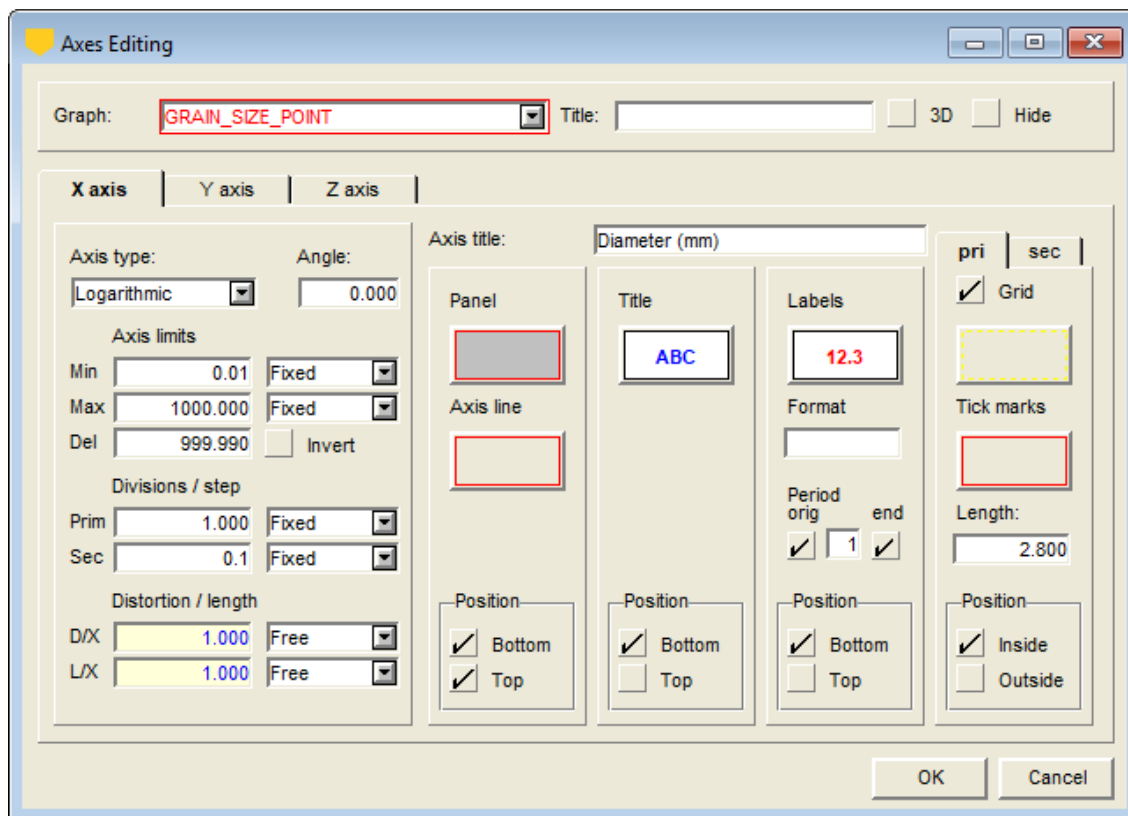


Figure 6-6 - Axes editing window

5.2. Choice of the axis

Each graph has three axes. For a 2D graph, the Z axis is not used. The axes editing window has three tabs (one for each axis) that access the definition panels for the characteristics of each axis. At the bottom of the **Y axis** and **Z axis** panels, the **Copy X** button copies all the characteristics of the X axis for the current axis.

5.3. Axis title

The **Axis title** is written in the corresponding field. The axis title can be displayed on several lines by using the “**l**” character for a new line.

The presence and display characteristics of the axis title are managed by the controls of the zone under the label **Title**.

For a 2D graph, the checkboxes at the bottom of this zone are identified as **Bottom** and **Top** for the X axis and as **Left** and **Right** for the Y axis. For a graph that can be shown in 3D, the checkboxes are all identified as **Origin** and **End**. The axes titles for cartographic graphs are displayed only in 3D mode, not in 2D.

If none of these boxes is checked, the axis title is not displayed. If the two boxes of the current axis are checked, the two axes of the 2D view, or two of the four axes of the 3D view, will have a title.

The title is always displayed in the middle of the axis, no matter the text alignment with respect to its anchor point.

With a time axis (see paragraph 5.4), the axis title will not be displayed.

The text attributes of the axis title (color, font, style, etc.) can be modified via the drawing attributes configuration window (see chapter 9) opened by clicking on the button under **Title**. It is not possible to display inclined titles. To move a title with respect to the axis, it is preferable to use the line spacing value, which indicates the distance between the axis or the labels and the title; this distance is function of the height of the characters. With a negative line spacing value, the axis title is displayed inside the graph.

5.4. Axis type

For each axis, the user selects the axis type in the scrolling list associated with the **Axis type** field. The axis can be of **linear**, **logarithmic**, **time** or **domain** type:

- The **linear**, **logarithmic** and **time** types are standard types of axes.
- The **domain** type is used for the axes of a map; if one axis is of domain type, the others are as well. Cartographic graphs must have axes of domain type.

The **Angle** field is designed to receive the angle between the axes of a cartographic domain and the cardinal directions ("oriented domain"). The angle value is the same for the X, Y and Z axes. Usually, the angle of the oriented domain is managed by the application and modifying this value has no effect.

5.5. Axis limits

The limits of an axis are the extreme values that the axis can have. They can be specified in different ways in the **Min** and **Max** fields. The scrolling lists beside these fields are used to specify the type of values:

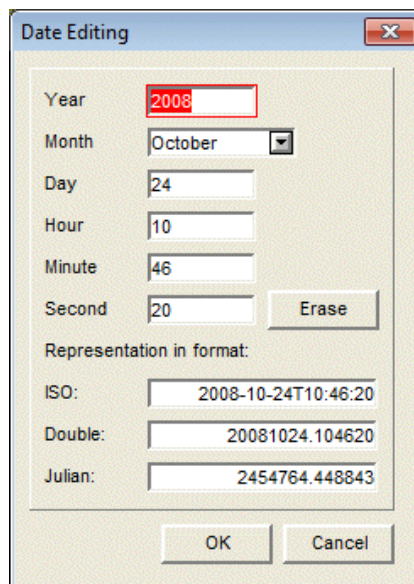
- **Exact value** – the value in the field represents the exact minimum or maximum value of the graph. The value is determined by the application and from the data represented in the graph; it cannot be modified by the user. For a cartographic map, the axes limits are always exact.
- **Rounded value** – the value represents the first rounded value, according to the specified primary step, outside the exact value (less than the minimum exact value, greater than the maximum exact value); it is determined by the application and cannot be modified.

- **Fixed value** – the value is specified by the user; the field can be edited and the user can change the values.

The **Del** field contains the difference between the limit values for the axis. It can only be modified if both the **Min** and **Max** fields are with fixed value. Modifying the **Del** field automatically modifies the **Max** field.

Checking the **Invert** box will invert the values along the current axis, i.e. the maximum limit is at the origin of the axis.

With an axis of type **time**, the values are treated in Julian days but are displayed in the double format (such as 20081024.105) for better readability. To input the fixed limits of a time axis, double-click in the fields of limits to open the date editing window, shown in figure 6-7.



The image shows a 'Date Editing' dialog box with the following fields and values:

Field	Value
Year	2008
Month	October
Day	24
Hour	10
Minute	46
Second	20

There is an 'Erase' button next to the Second field. Below these fields, there is a section 'Representation in format:' with three rows:

Format	Value
ISO:	2008-10-24T10:46:20
Double:	20081024.104620
Julian:	2454764.448843

At the bottom are 'OK' and 'Cancel' buttons.

Figure 6-7 - Date editing window

The values of the axes limits are sometimes managed automatically by the application or defined in a specific window. For example, with **Log**, the limits of the Y axis of each graph are fixed in the options window where the height of the columns, the depth per page, etc. are defined (see the specific guide).

5.6. Division or step

The **step** represents the value on the axis between each tick mark. The **primary step** covers the entire axis length. The **secondary step** is defined between two primary tick marks. As with the axes limits, the values displayed in the **Prim** and **Sec** fields have different meanings depending on the selection from the scrolling list associated to these fields:

- **divisions** – in the **Prim** field, it is the approximate number of divisions between the axes limits; in the **Sec** field, it is the approximate number of divisions per primary step. The number of divisions is rounded to obtain steps that are multiples of 1, 2, 5 or 10. The user can modify the value proposed by default.

- **calculated** – it is the value of the step calculated according to the number of divisions. This value cannot be directly modified by the user. This option displays the result for the number of divisions entered. By changing the number of divisions with the **divisions** option, the value for the **calculated** option is automatically modified.
- **fixed** – it is the step value fixed by the user.

5.7. Distortion / length

The values of distortion (**D/X**) are significant only for the **Y** and **Z** axes. The distortion represents the ratio between the value in coordinates of one millimeter on the **Y** or **Z** axis and a millimeter on the **X** axis. Modifying the distortion of the **Z** axis of a graph is shown in the **View Point** window of the **View** menu (see chapter 5).

The length (**L/X**) is valid only for 3D graphs and represents the ratio between the length of the **Y** or **Z** axis in millimeters and the length of the **X** axis.

The values of distortion and length can be **fixed** (by the user) or **free** (calculated by the application). If a distortion is fixed, the limits of the axes may be adjusted, the rounded limits being adjusted before the fixed or calculated ones, and the limits of the **Y** and **Z** axes before those of the **X** axis. The application always tries to display all values.

5.8. Attributes of the panels and axis lines

The panel represents the perpendicular plan behind the current axis when the graph is in 3D.

The display attributes of this panel can be changed by clicking on the button located below the **Panel** label. The following attributes can be modified:

- the background color (filling) of the panel;
- the type of pattern on the panel background;
- the color, thickness and style of the border line of the panel border; the line may be hidden by the axes.

Clicking on the button under **Axis line** allows the user to change the display attributes of the axis line:

- its color, thickness and style;
- the offset distance from the axis to the border of the graph (valid in 2D only). A positive value moves the axis towards the top or right, and a negative value moves it towards the bottom or left, with respect to the border of the graph.

The **Bottom** and **Top**, **Left** and **Right** or **Origin** and **End** checkboxes in the definition of the three axes are used to define which axis line will be displayed.

5.9. Attributes of the labels

The display attributes of the labels can be modified by clicking on the button located under **Labels**. With **Text**, the user can define the display of the labels. The alignment and the offset of the labels with respect to their anchor point can be modified. The labels are normally displayed outside the graph and are centered relative to the primary tick marks. They can be displayed inside the graph by entering a negative offset distance.

The **Format** field is used to specify a display format (number of decimals, exponent, etc.) for the labels. The syntax of the **C language** (%g, %.2f, %.0e, %s for example) or the format **9.99** and even **a.aa** are acceptable.

The **Period** field is used to define the display period for the labels along the axis at the primary tick marks. A period of 2 means that a label will be displayed every 2 primary tick marks. The **orig** and **end** checkboxes are used to specify if labels are displayed at the ends of the axis.

The **Bottom** and **Top**, **Left** and **Right** or **Origin** and **End** checkboxes define along which axis the labels will be displayed. The tick marks will be displayed along the same axes as the labels.

5.10. Attributes of the grids and tick marks

For each axis, the user can define primary and secondary grids and tick marks, by selecting the **pri** or **sec** tab.

The presence of the primary and secondary grids is controlled by the **Grid** checkbox.

The grids and tick marks attributes can be modified by clicking on the corresponding buttons under **Grid** and **Tick marks**. By selecting the **Line**, the grids or tick marks attributes are defined, accordingly. The grids are traced perpendicularly to the axis; in 3D, they are traced on the back panels delimited by the axis.

The **Length** field specifies the length of the primary and secondary tick marks, depending on the tab selected.

The **Inside** and **Outside** checkboxes define the side of the axis on which the tick marks will be displayed.

6. PREFERENCES



Select the **Preferences** option or click on this button to open the preference editing window. This window has 3 panels, **General**, **Default** and **File**, available via the tabs. The three panels contain controls to define some operating parameters of X3D and the current module.

The selection of the parameters is effective once the user exits the preference editing window by clicking on **OK**. The values of the parameters defined in the preference editing window are saved in the registry of the user's workstation for the module (see chapter 1).

6.1. General panel

6.1.1. Choice of the language

The modules can be used in English or French by clicking on the radio button next to the chosen language.

The user can also select the **Language** option of the **Tools** menu, which opens a sub-menu allowing the language selection (see paragraph 1).

6.1.2. Display of the toolbars

The **top** toolbar is the bar of buttons located right under the menus. It contains the shortcuts to the application tools, i.e. those specific to the different modules. If the **Top** box is checked, the application toolbar is visible.

The **left** vertical toolbar is either the X3D toolbar (see chapters 5 and 6) or the graphic editing toolbar (see chapter 4), depending on the application mode determined by the **Objects** option of the **Tools** menu. If the **Left** box is checked, the toolbar is visible.

If the **Bottom** box is checked, the status bar located at the bottom of the screen is visible. What is displayed in the status bar depends on the application and the context, but can include:

- The current record numbers
- Messages;
- For a 2D graph, the number and name of the graph as well as the position of the cursor in X and Y in the units of the graph;
- For a 3D graph, the number and name of the graph as well as the position of the cursor in R and U (right and up) in millimeters with respect to the origin of the page;
- When the cursor is outside all graphs but in the page, the number (0) and name (Page) of the graph as well as the position of the cursor in R and U (right and up) in millimeters with respect to the origin of the page.

6.1.3. Decimal symbol

The user can use the **Point**, **Comma** or the decimal symbol of the **System** for the display in the module and the X3D windows.

If **System** is selected and a character other than the point or the comma is defined as the decimal symbol on the workstation, this character will be displayed as the decimal symbol but the application will not perform operations.

6.1.4. Tooltips

In the rectangle **Tooltips**:

- the **Initial delay (ms)** is used to enter the delay in milliseconds before the display of the tooltip of an element after the cursor is placed on that element.
- the **Display time (ms)** is used to enter the display duration of the tooltips in milliseconds.
- the **Detection range (mm)** determines the distance within which the cursor must be from an element for its tooltip to be displayed.
- if the box **Detect cartographic entities** is checked, a tooltip will display information about the cartographic entities when the cursor is placed on them.
- if the box **Detect geotechnical entities** is checked, a tooltip will display information about the geotechnical entities when the cursor is placed on them.

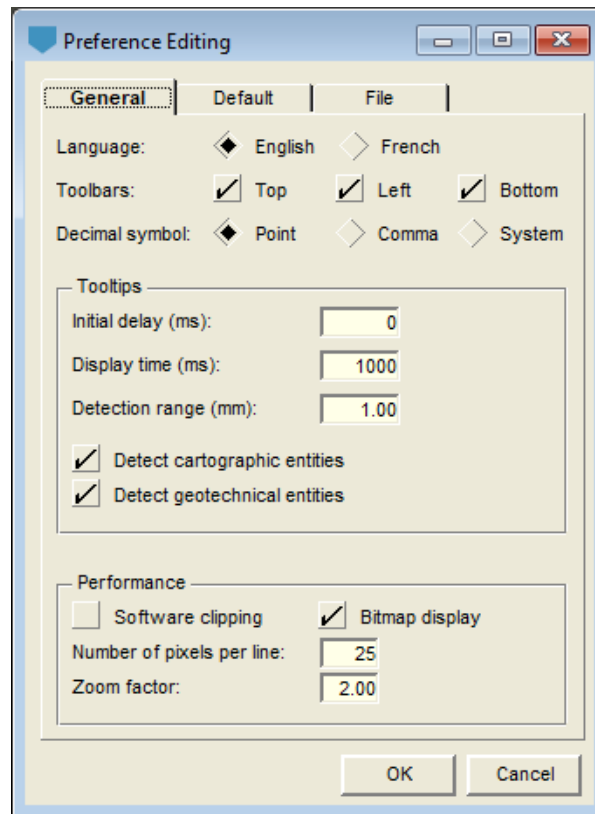


Figure 6-8 - General panel of the preference editing window

6.1.5. Software or Windows clipping

X3D has specific clipping functions known as **Software clipping**. By default, the box is not checked (Windows clipping used).

With the **Windows clipping**, the patterns and fillings, the markers and the texts are clipped very precisely along the borders of the shapes containing them. In some situations, the use of the Windows clipping can slow down the printing or generate very large files. These effects occur particularly when printing **.pdf** files.

With the **software clipping**, the printings are faster, but the clipping is less precise, especially when the shapes implied in the clipping are complex, and all the text strings that should be clipped disappear completely.

6.1.6. Bitmap or standard display

X3D supports two display modes, the first one is known as **standard**, the second as **bitmap**. By default, the box is checked (Bitmap mode).

With the **standard** mode, the display of the graphic page is done line by line. Since this display can be slow on some computers, the display of the graphic page is not systematically launched every time an event affects the display. For example, if the user opens an editing window and moves this window, there may not be a new display to cover the area located where the initial position of the window was. Refreshing the display will be done when the window is closed, by selecting the **Refresh** option of the **View** menu or by clicking the Refresh button.

With the **bitmap** mode, the graphic page is displayed globally. Since this display is fast, it is possible to update it in most cases. However, the bitmap mode uses a lot of memory; therefore, with large zooms, the workstation's memory limit can be reached. In this situation, the bitmap mode is automatically replaced by the standard mode.

6.1.7. Vertical scrolling

The field **Number of pixels per line** is used to define the extent of the scrolling triggered by clicking on the arrow buttons at the top or bottom of the potential vertical scrolling bars of the various windows supported by X3D and by the application using it.

6.1.8. Zoom factor

The **Zoom factor** field is used to define the enlargement or reduction factor of the graphic page in “software zoom” or “hardware zoom” modes. If the factor is 1, the movement of the mouse towards the top or bottom will not change the display of the page. The greater the factor, the faster the enlargement will be for a given movement of the mouse. If the factor is smaller than 1, the display will be reduced when the mouse is moved towards the top. See chapter 5 for more information.

6.2. Default panel

6.2.1. Appearance of the entry forms

The user can modify the appearance of all windows and entry forms used by the application. To do this, click on the big button in the **Entry forms** rectangle to open the editing window for the appearance of entry forms and to define their components, shown in figure 6-9.

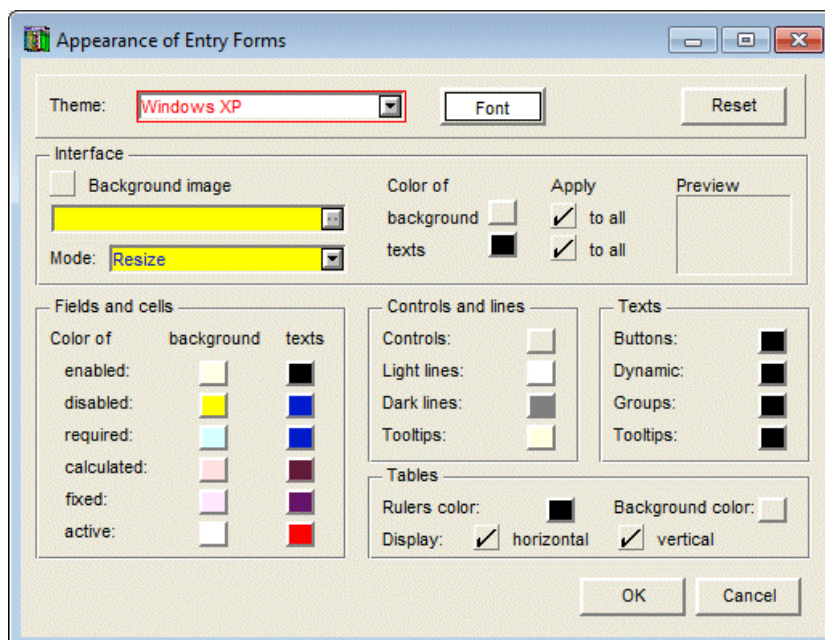


Figure 6-9 - Editing window for the appearance of entry forms

This window mostly has buttons to define a color with the standard Windows screen for color selection, as shown in figure 6-10. The window will be in English or French, depending on the Windows installation.

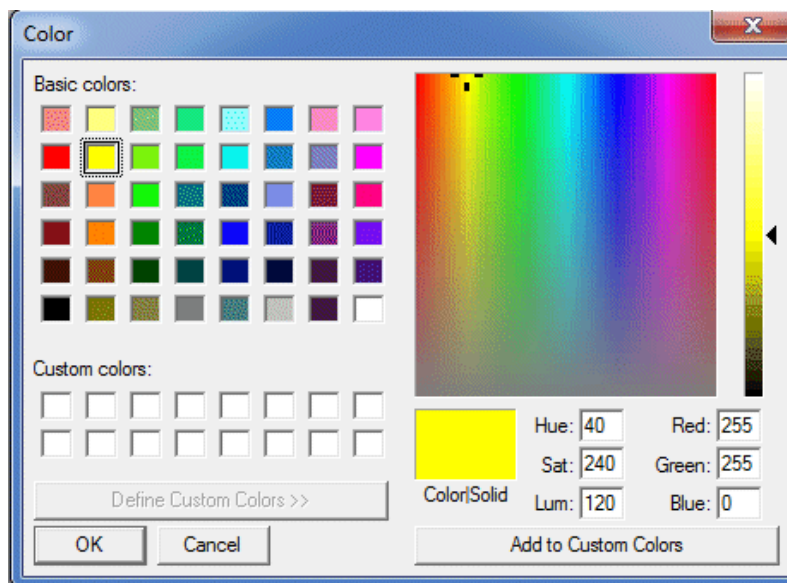


Figure 6-10 - Color selection window

6.2.1.1. Predefined colors and initialization

The user can select a set of predefined attributes for the display of the entry forms, by selecting an element from the scrolling list associated to the **Theme** field, illustrated in figure 6-11. The selection can have an effect on all attributes.

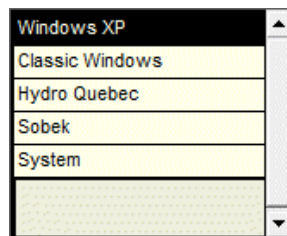


Figure 6-11 - List of themes

Selecting a theme does not restrain the user from modifying the color of one of the elements, but the palette will not be modified. The changes will be kept until this theme or another is selected.

Clicking on the **Reset** button changes the display attributes of the entry forms to the basic values defined in X3D. These attributes are the same as for the Windows XP and Sobek themes.

6.2.1.1.1. Fonts

The user can select the character font to use in the windows, by clicking on the **Font** button, which opens the standard font selection and configuration window of Windows. This window will be in English or French depending on the Windows installation.

The user can select the font, style, size and effects.

The selected configuration applies to all the texts, including the values in the fields and cells of tables. You may need to exit the application and enter it again for the font change to apply to values entered in the fields and cells of tables.

If the user selects a large size of characters, the entry forms only show partly the various labels. The user will close and reopen the application; the windows and their content will be larger to take into consideration the font size. It is similar if the font size decreased.

The minimal size for the characters used for the entry forms is 8 points.

6.2.1.2. Interface

The elements of the **Interface** section are used to define:

- The general background of the windows and eventually of the rectangles that they contain
- The color of the texts

6.2.1.2.1. *Background image*

To display an image in the background of the entry forms, the user first checks the **Background image** box, which activates the two fields under this checkbox.

The upper field shows the name of the file selected as background for the forms. The selection of the file is done by clicking on the button right of the field which opens the standard window for file selection.

The lower field labelled **Mode** has a scrolling list used to choose the display mode of the chosen background image: **normal**, **resize** or **tile**. The **resize** mode is the default mode.

The background image applies to the general background of the forms and to the background of the rectangles that the forms may contain. It does not apply to the background of the tables or buttons.

The background image is displayed in each rectangle where it applies. The origin of the image is the upper left corner of each rectangle. If the normal mode is selected, it is possible that the background of a form or rectangle is not completely covered by the image. In this case, the uncovered portion has the background color of the interface (see next paragraph).

6.2.1.2.2. *Background color*

The background color of the interface applies to the general background of the forms. The current color is the one of the button associated to the **background** label in the **Interface** zone. The user can change this color by clicking on the button.

If the user changes the background color of the interface, the neighbouring checkbox labelled **Apply to all** is emptied. If the user checks the box, the background color of the interface will also be used for the background of the rectangles, the buttons (push buttons, checkboxes, radio buttons and tabs) and the background of tables. Then, the button associated to the **Controls**

label in the **Controls and lines** zone, and the button associated to the **Background color** label of the **Tables** zone will have the color of the button of the interface background.

If the user modifies the color of the controls or of the table background, the checkbox **Apply to all** associated to the background color of the interface is emptied if it was checked.

6.2.1.2.3. Text color

The color of the interface texts applies to the texts in the windows except the group identifiers, the labels of buttons, the texts dynamically acquired by the application, the tooltips and the texts in the fields and cells of tables. The current color of the interface texts is the one of the button associated to the **texts** label in the **Interface** zone. The user can change this color by clicking on the button.

If the user changes the color of the interface texts, the neighbouring checkbox labelled **Apply to all** is emptied. If the user checks the box, the color of the interface texts will also be used for the group identifiers, the labels of push buttons and the texts dynamically acquired by the application. Then, the buttons associated to the **Buttons**, **Dynamic** and **Groups** labels of the **Texts** zone will have the color of the button of interface texts.

If the user modifies the color of one of the elements of the **Texts** zone except **Tooltips**, the checkbox **Apply to all** associated to the color of the interface texts is emptied if it was checked.

6.2.1.3. Fields and cells

The buttons of the **Fields and cells** zone allow the user to define a color for the fields and cells of tables in the entry forms. The different fields and cells are:

- **Enabled**: the fields and cells that can receive a value from the user
- **Disabled**: the fields and cells that, in a given context, cannot receive a value from the user
- **Required**: the fields and cells that must necessarily receive a value from the user
- **Calculated**: the fields and cells that are usually not in the database, and whose value is the result of a calculation done by the application
- **Fixed**: the fields and cells which contained a value resulting from a calculation done by the application but that was modified by the user
- **Active**: the fields and cells whose content can be edited when the cursor is in them

6.2.1.4. Controls and lines

The buttons in the **Controls and lines** zone have the following roles:

- **Controls**: This button is used to define the background color of the rectangles and buttons (push buttons, checkboxes, radio buttons and tabs) contained in the windows.
- **Light lines**: This button is used to define the color of the pale lines used to limit an element in a window or to suggest its elevated or imbedded relief.
- **Dark lines**: This button is used to define the color of the dark lines used to limit an element in a window or to suggest its elevated or imbedded relief.
- **Tooltips**: This button is used to define the background color of the tooltips.

6.2.1.5. Texts

The buttons of the **Texts** zone have the following roles:

- **Buttons:** This button is used to define the color of the labels of the push buttons.
However, the buttons used to call the drawing attributes editing window show the current drawing attributes for the graphic element involved.
- **Dynamic:** This button is used to define the color of the values dynamically acquired by the application. They are written directly in the interface or in a rectangle, outside a field or a button.
These texts are, for example, values read in a file or provided by the system and displayed on a purely informative basis.
- **Groups:** This button is used to define the title color of groups of elements forming a zone, such as the “**Interface**” or “**Fields and cells**” strings in the editing window of the appearance of the entry forms.
- **Tooltips:** This button is used to define the text color of the tooltips.

6.2.1.6. Tables

The controls of the **Tables** zone have the following roles:

- **Rulers color:** This button is used to define the color of the limits of the cells in a table.
- **Background color:** This button is used to define the background color of the tables contained in the forms (not the background color of the cells of the tables).
- **Display:** The **horizontal** and **vertical** checkboxes are used to define if the horizontal and vertical limits of the cells in a table will be displayed or not.

6.2.1.7. Conserving the defined parameters

When the editing window for the appearance of entry forms is exited with **OK**, the values of these parameters are saved in the registry of the user's workstation for the application. When the application is used again, the entry forms will be displayed as the user previously defined them.

6.2.2. Confirm before saving

If the checkbox **Confirm before saving** is clicked, a message is displayed during navigation every time a modification is done to the data asking the user to save or not the modification. Otherwise, when navigating, the modified data is automatically saved in the database.

6.2.3. Notify for missing fields

If a field is not present in the database (due to changes in the database version, for example), a message will pop-up to inform you.

6.2.4. Maximum field length for the display of lists

The user can specify the **maximum length of a field defined in the database to display lists**. For example, if the user does not want lists displayed for descriptions of 255 characters, he can

set the value to 254. After this value is modified, the user may have to exit and re-enter the application for the change to be applied.

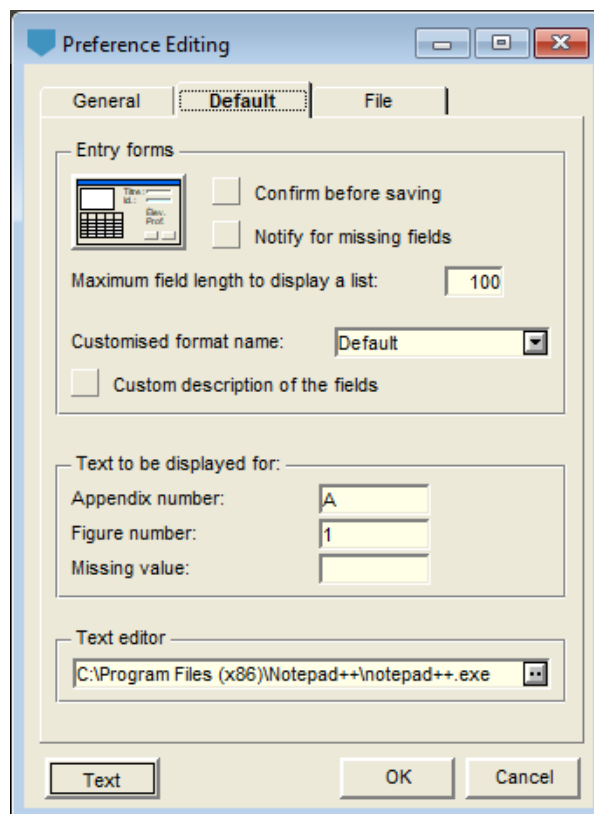


Figure 6-12 - Default panel of the preference editing window

6.2.5. Customized format

The configuration of all Geotec forms is saved automatically in the tables REPORT and REPORT_COL. The original format provided by Geotec is the **Default** format, saved with the name FORM_DEF.

If you want to create a specific format, enter a new name in the field **Customised format name**. This name will be added to the list and available to all users of the current database. This format is saved under the name FORM_DEF_name.

When a modification is done by the user (ex: move or resize a column, hide a field, change the number format, etc.) it is saved in the selected format.

If the box **Custom description of the fields** is checked, the tooltips will display the values of the DESCRIPTION field defined in the REPORT_COL table for each table, for the selected format. These descriptions are provided when the database is first opened in the current language used but can be modified.

If the box isn't checked, the tooltips will display the field descriptions provided by Geotec in the current language used.

6.2.6. Appendix number

The expression in the **Appendix number** field provides the value of the **\$\$APPENDIX** keyword.

6.2.7. Figure number

The expression in the **Figure number** field provides the value of the **\$\$FIGURE** keyword.

6.2.8. Missing value

The expression in the **Missing value** field provides the value of the **\$\$NIL** keyword. The application also uses this expression to identify missing values that are not managed by the equivalences, particularly in tables.

6.2.9. Text editor

To view style, markers or patterns files, the user can select the executable of a text editor. If the field stays empty, the X3D default text editor will be used.

6.2.10. Default drawing attributes

When an application using X3D is first used, minimal drawing attributes are defined by default for the graphic entities that will be created. These basic default attributes are:

- Texts in black with 2.82 mm characters (size 8) using the normal Arial font;
- Solid black lines of 0.1 mm thickness;
- No filling, no marker and no pattern.

These attributes will remain the default attributes as long as they are not modified. The default attributes established when the application is closed are saved in the work environment of the application for the next use.

Modifying the default drawing attributes does not change the drawing attributes of the entities, graphs or objects already defined in the page. It will be possible to use these default drawing attributes for graphic objects by clicking on the **Default** button in their attributes window (see chapter 9).


To modify the default drawing attributes, click on the button labelled **Text** at the bottom of the window. If the drawing attributes configuration window is opened in this context, clicking on the **Default** button brings back the drawing attributes to the basic values defined above.

6.3. File panel

This panel is used to define the default directories for the input and output files, as well as the logo file and the text editor to use to view files.

6.3.1. Input files

It is possible to define a default directory for all the input data files. The file selection window will open on this directory by default, except for databases, style files, markers and patterns files, in which case the selection window opens on the directory of the current file.

The user can select the directory of the input files by clicking on this button . The user can also use the directory of the database by clicking on the radio button corresponding to this choice.

By checking the box **Save file name with path**, the complete path of the file is saved when the user selects a file in a Windows file opening window, for any file field in the database (ex: PHOTO_NO in BORING or in TRENCH). Otherwise, only the file name is saved, and it is assumed that it is located in the input files directory.

6.3.2. Output files

For output files, the same logic applies as for the input files. The output files are saved in the selected directory.

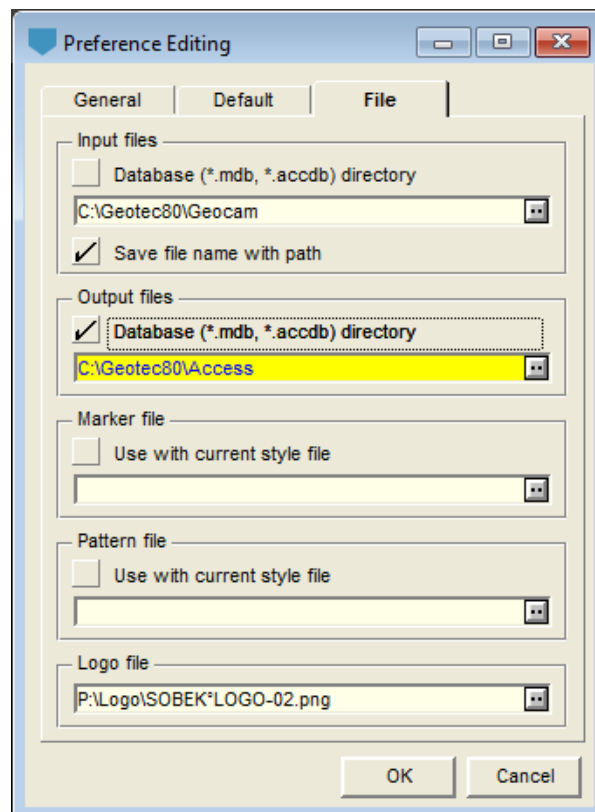




Figure 6-13 - File panel of the preference editing window

6.3.3. Marker file

The user can choose a markers file to use with the current style file by selecting the file with the  button and by checking the box **Use with current style file**. This information is saved in the style file. Otherwise, the current markers file is used.

6.3.4. Pattern file

The user can choose a patterns file to use with the current style file by selecting the file with the  button and by checking the box **Use with current style file**. This information is saved in the style file. Otherwise, the current patterns file is used.

6.3.5. Logo file

The selection of a logo file changes the figure associated to the image type object defined with the **\$\$LOGO** keyword. The logo files are image files such as **.bmp**, **.gif**, etc.

7. OPTIONS



The **Tools** menu has the **Options** item (or the button shown here, located in the application toolbar), which opens a window specific to each module. The options window is described in the documentation of each module.

8. MARKERS

8.1. Marker editor



Selecting the **Markers** option or clicking on the button shown on the left opens the marker editing window on the current **.mrk** markers file and activates a reduced version of the graphic editing toolbar and the **File** menu, as shown in figure 6-14.

With this editor, the user can modify the appearance of the markers defined in the current **.mrk** markers file, whose name and path are written in the **File** field of the window. The main part of the editor is the editing section where the selected marker is displayed. In the section, the dashed square represents one mm² in the graphic page.

8.2. Management of the markers file

8.2.1. Selecting the current markers file

When an application using X3D is launched, the last markers file used is loaded as the current markers file.

Before opening the marker editor, it is possible to change the current file by selecting a file from the **Recent Markers** option in the **File** menu.

In the marker editor, a markers file can be selected from the scrolling list associated to the **File** field. This list shows the last 9 markers files used (role equivalent to the **Recent Markers** option of the **File** menu).



The user can also change the markers file by selecting the **Open...** option of the **File** menu, by clicking the button shown here located in the graphic editing toolbar or by clicking on **Browse** in the editor, which opens the standard window for file selection on the directory of the current file. The proposed extension is **.mrk**.

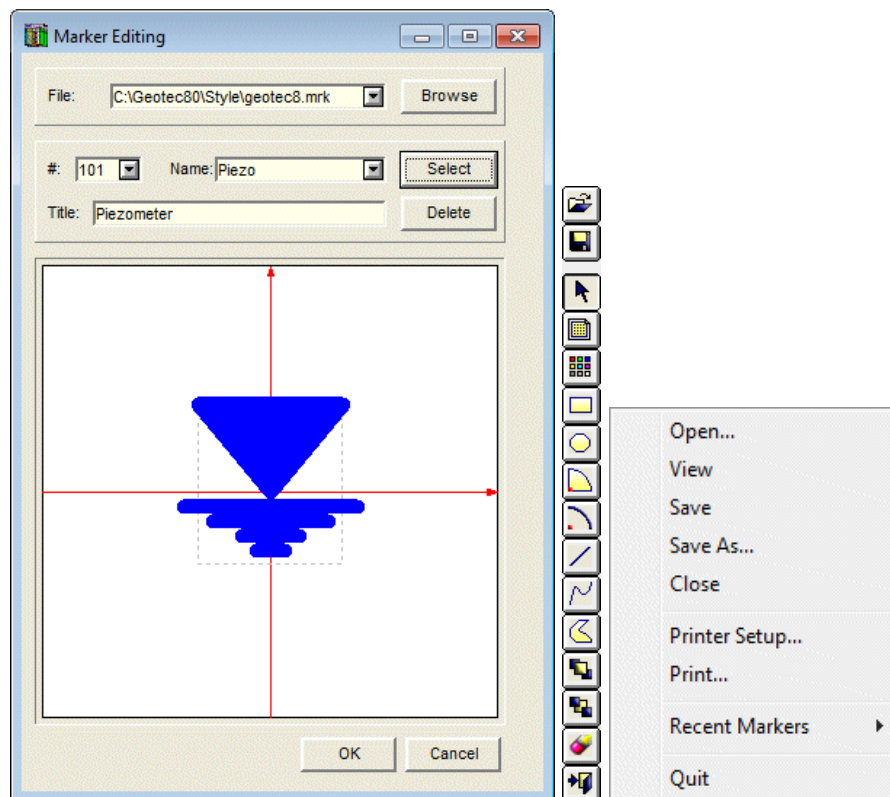


Figure 6-14 - Marker editor, graphic editing toolbar and File menu

8.2.2. Saving the markers file

The current markers file is updated when the user exits the editor by clicking **OK**. It is not updated if he clicks **Cancel** or the **X** of the editor. If the user changes the marker when the current marker was modified, a message is displayed to ask if the modified marker should be saved or not.



It is always possible to save the markers file being edited by selecting the **Save** option of the **File** menu or clicking on the button shown on the left. When the marker editor is opened, selecting the **Save As...** option of the **File** menu opens the standard window for file saving where the user can define a new path and / or a new name for the markers file in memory, which then becomes the current markers file.

It is also possible to exit the marker editor with the **Close** and **Quit** options of the **File** menu. The first option cancels the changes made in the editor, while the second saves them.

8.2.3. Viewing the markers file

When the marker editor is open, select the **View** option of the **File** menu to display the content of the current markers file in the text editor selected in the preferences.

8.3. Current marker – selecting a marker

When a markers file is opened for the first time during a work session, the 1st marker in the file is displayed. The next times during the same work session, the last selected or edited marker will be displayed.

To select another marker:

- Display the scrolling list associated to the # field and select the number of the desired marker;
- Click on the **Select** button, which opens the palette of markers defined in the current markers file, as shown in figure 6-15.

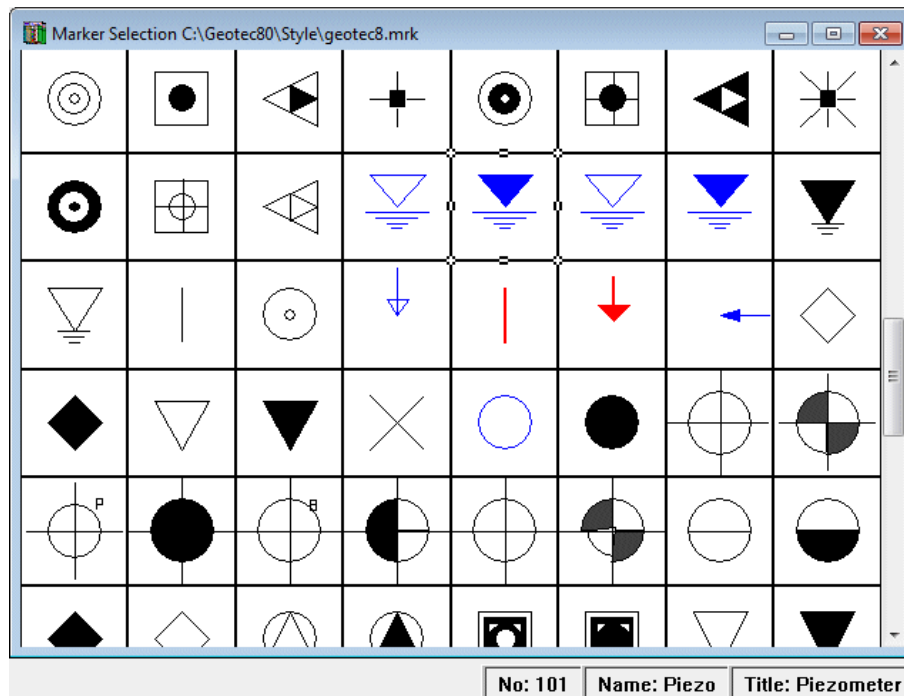


Figure 6-15 - Palette of markers

The current marker is identified by “handles” on its border. When the cursor of the mouse moves on the selection palette, the identification of the marker on which the cursor is placed is shown in the status bar, including its **number**, **name** and **title**.

The user can zoom on the palette of markers via the **Full Page**, **Full Width**, **50%**, **100%** (default value), **200%** and **Other...** options of the **View** menu.

To select another marker, click in the square in which it is represented, and close the window. The selected marker is then displayed in the preview area of the marker editing window. Its **number**, **name** and **title** appear in the fields at the top of the editor. These values are modifiable. However, the user will not be able to give a marker a number that already exists in the markers file.

8.4. Creating a marker

To create a new marker, open the marker selection palette by clicking on **Select**, move to the bottom of the palette and select the empty square that appears after all the existing markers. The number proposed by default for the new marker is 1 greater than the highest number already saved in the markers file. The user then adds the components of the marker as detailed in paragraph 8.6.

8.5. Deleting a marker

The **Delete** button deletes the selected marker from the current markers file. The marker disappears from the palette but its number is not reallocated to another marker.

8.6. Editing a marker

As indicated in paragraph 8.1, a reduced version of the graphic editing toolbar is activated in the marker editor. The user can add objects to the current marker. These objects and the other options of the toolbar are described in chapter 4 of the X3D guide. The editing is done the same way as the insertion and modification of graphic objects in the page.

8.7. Printing a marker

The **Print** option of the **File** menu is not functional in the current version.

9. PATTERNS

9.1. Pattern editor



Selecting the **Patterns** option or clicking on the button shown on the left opens the pattern editing window on the current **.ptn** patterns file and activates a reduced version of the graphic editing toolbar and the **File** menu, as shown in figure 6-16.

With this editor, the user can modify the appearance of the patterns defined in the current **.ptn** patterns file, whose name and path are written in the **File** field of the window. A pattern can be made up of 3 types of different superimposed elements:

- **Grains**, in one or many layers;
- **Hatchings**, in one or many layers;
- **Objects** or graphic shapes, in only one layer.

9.2. Management of the patterns file

9.2.1. Selecting the current patterns file

When an application using X3D is launched, the last patterns file used is loaded as the current patterns file.

Before opening the pattern editor, it is possible to change the current file by selecting a file from the **Recent Patterns** option in the **File** menu.

In the pattern editor, a patterns file can be selected from the scrolling list associated to the **File** field. This list shows the last 9 patterns files used (role equivalent to the **Recent Patterns** option of the **File** menu).



The user can also change the patterns file by selecting the **Open...** option of the **File** menu, by clicking the button shown here located in the graphic editing toolbar or by clicking on **Browse** in the editor, which opens the standard window for file selection on the directory of the current file. The proposed extension is **.ptn**.

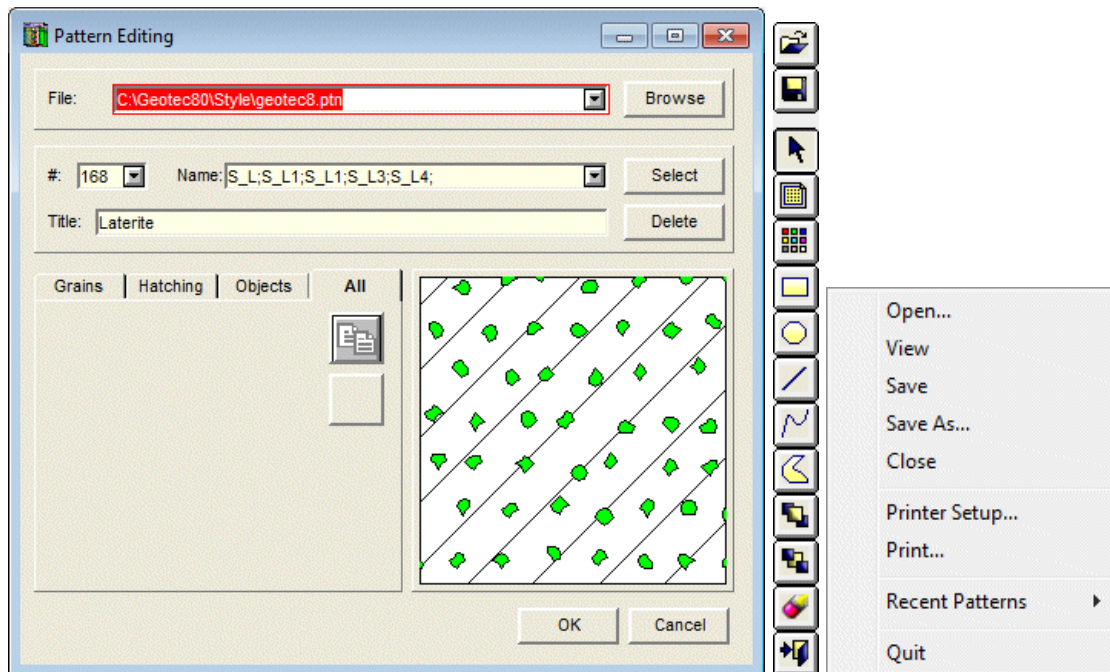


Figure 6-16 - Pattern editor, graphic editing toolbar and File menu

9.2.2. Saving the patterns file

The current patterns file is updated when the user exits the editor by clicking **OK**. It is not updated if he clicks **Cancel** or the **X** of the editor. If the user changes the pattern when the current pattern was modified, a message is displayed to ask if the modified pattern should be saved or not.



It is always possible to save the patterns file being edited by selecting the **Save** option of the **File** menu or clicking on the button shown on the left. When the pattern editor is opened, selecting the **Save As...** option of the **File** menu opens the standard window for file saving where the user can define a new path and / or a new name for the patterns file in memory, which then becomes the current patterns file.

It is also possible to exit the pattern editor with the **Close** and **Quit** options of the **File** menu. The first option cancels the changes made in the editor, while the second saves them.

9.2.3. Viewing the patterns file

When the pattern editor is open, select the **View** option of the **File** menu to display the content of the current patterns file in the text editor selected in the preferences.

9.3. Current pattern – selecting a pattern

When a patterns file is opened for the first time during a work session, the 1st pattern in the file is displayed. The next times during the same work session, the last selected or edited pattern will be displayed.

To select another pattern:

- Display the scrolling list associated to the **#** field and select the number of the desired pattern;

- Click on the **Select** button, which opens the palette of patterns defined in the current patterns file, as shown in figure 6-17.

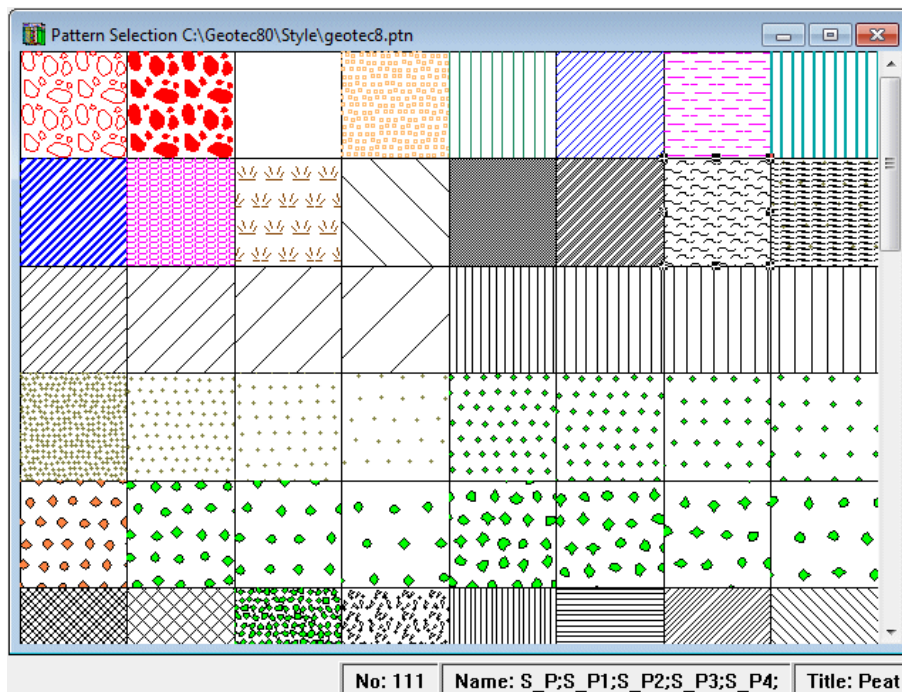


Figure 6-17 - Palette of patterns

The current pattern is identified by “handles” on its border. When the cursor of the mouse moves on the selection palette, the identification of the pattern on which the cursor is placed is shown in the status bar, including its **number**, **name** and **title**.

The user can zoom on the palette of patterns via the **Full Page**, **Full Width**, **50%**, **100%** (default value), **200%** and **Other...** options of the **View** menu.

To select another pattern, click in the square in which it is represented, and close the window. The selected pattern is then displayed in the preview area of the pattern editing window, right of the **All** panel. Its **number**, **name** and **title** appear in the fields at the top of the editor. These values are modifiable. However, the user will not be able to give a pattern a number that already exists in the patterns file.

9.4. Creating a pattern

To create a new pattern, open the pattern selection palette by clicking on **Select**, move to the bottom of the palette and select the empty square that appears after all the existing patterns. The number proposed by default for the new pattern is 1 greater than the highest number already saved in the patterns file. The user then adds the components of the pattern as detailed in paragraph 9.6.

9.5. Deleting a pattern

The **Delete** button deletes the selected pattern from the current patterns file. The pattern disappears from the palette but its number is not reallocated to another pattern.

9.6. Editing a pattern

As indicated in paragraph 9.1, a pattern is made up of 3 different types of elements. With the **Grains**, **Hatching** and **Objects** tabs, the user accesses the panels of the elements for editing. The panel opened with the **All** tab shows the entire pattern in the proportions it will have in the graphic objects.

In the **Grains**, **Hatching** and **Objects** panels, the zone at the right of the window is an editing zone where the grains, hatching and simple graphic entities will be drawn. This zone is repeated in the entire area occupied by the graphic object to which the pattern applies.

9.6.1. Editing the grains

By clicking the **Grains** tab, the editing panel for the grains is displayed, as shown in figure 6-18. The user can edit the different layers of grains that are superimposed.

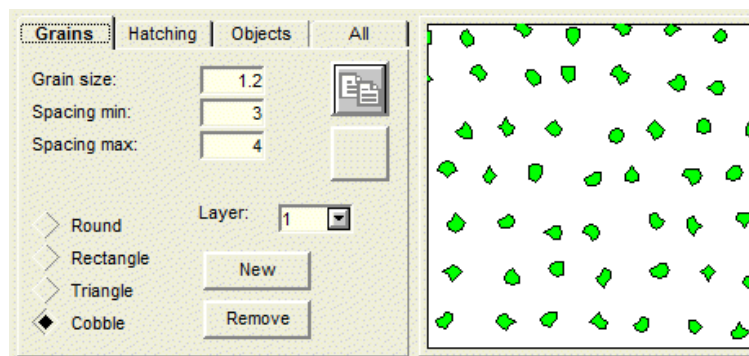


Figure 6-18 - Editing panel for the grains of a pattern

The selection of the layer to edit is done in the scrolling list associated to the **Layer** field. Clicking on the **New** button creates a new layer of grains, whose number is added to the numbers of the existing layers. When a new layer of grains is created, it has default values for its geometry, its dimensions, etc. Clicking on the **Remove** button deletes the current layer of grains, and the numbers of the layers are readjusted.

For each layer of grains, the user specifies the size of the grains and their minimum and maximum spacing, as well as their geometry. All dimensions are in millimeters. Identical minimum and maximum spacing mean that the layer has equidistant grains; otherwise, the grains are generated at random distances from each other, but without exceeding the fixed spacing limits.

The possible geometry for the grains is: **round**; **rectangle**; **triangle**; **cobble**. With the “cobble” geometry, each grain takes a semi-circular shape whose diameter varies randomly between the value in **Grain size** and half this value.



The user can modify the drawing attributes of the layer of grains with the button shown here, located in the graphic editing toolbar.

The buttons in the middle of the panel are used to copy and paste respectively a layer of grains. The “paste” button becomes active when a layer is copied in memory.

9.6.2. Editing the hatchings

As for the grains, a pattern can have different layers of hatchings that are superimposed. By clicking on the **Hatching** tab, the editing panel for the hatchings is displayed, as shown in figure 6-19.

The selection, creation and deletion of a layer of hatchings are done as for the grains.

For each layer of hatchings, the user specifies the line spacing, the offset from the origin and the angle of the lines with the horizontal. The line spacing and the offset are measured perpendicularly to the lines. The offset is the distance between the origin and the first line of hatchings. Depending on the orientation of the hatchings, the origin is:

- the bottom line of the tile (horizontal hatchings)
- the right side of the tile (vertical hatchings)
- the lower left corner of the tile (hatchings with an angle to the horizontal between 90° and 180° exclusively)
- the lower right corner of the tile (hatchings with an angle to the horizontal between 0° and 90° exclusively)

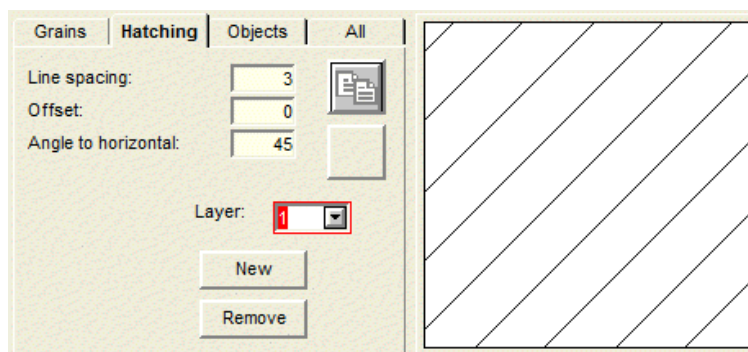


Figure 6-19 - Editing panel for the hatchings of a pattern



The user can modify the drawing attributes of the layer of hatchings with the button shown here, located in the graphic editing toolbar.

The buttons in the middle of the panel are used to copy and paste respectively a layer of hatchings. The “paste” button becomes active when a layer is copied in memory.

9.6.3. Editing the graphic shapes

The last component of a pattern can be a layer of graphic shapes. By clicking on the **Objects** tab, the editing panel for the graphic shapes is displayed, as shown in figure 6-20.

The buttons of the reduced version of the graphic editing toolbar are then active. The user can add graphic shapes to the layer of the current pattern. These graphic objects and the other options of the toolbar are described in chapter 4 of the X3D guide. The editing is done the same way as the insertion and modification of graphic objects in the page.

In this panel, the **dX** and **dY** fields are used to define the dimensions of the dashed square in the editing zone, in millimeters. This square will be repeated in the entire area occupied by the graphic object to which the pattern applies.

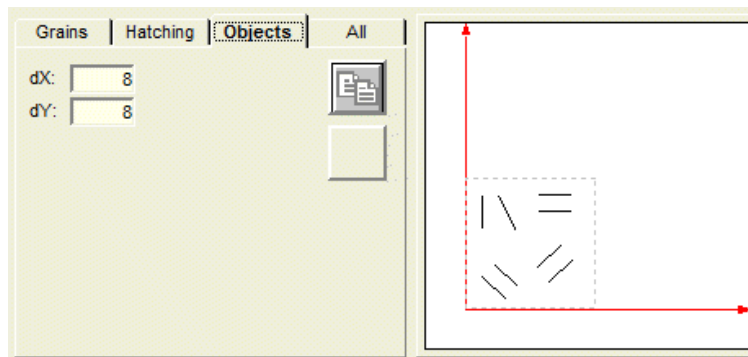


Figure 6-20 - Editing panel for the graphic shapes of a pattern

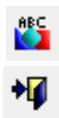
9.6.4. Copying an entire pattern

In the **All** panel, the “copy” button stores in memory all the layers of the pattern. In a new pattern, if we click on “paste”, all the layers in memory are pasted in this new pattern. However, if the user goes in the **Grains** or **Hatching** panel of a new pattern, clicking on “paste” introduces only the layer of grains or hatchings that was current at the time of the copy.

9.7. Printing a pattern

The **Print** option of the **File** menu is not functional in the current version.

10. OBJECTS



The graphic editing mode is opened via the **Objects** option of the **Tools** menu or this button located in the X3D toolbar. The Object mode remains active until the user closes it by clicking again on Objects in the Tools menu or on this button which is located at the bottom of the graphic editing toolbar. Chapter 4 of the X3D guide describes the Object mode.

CHAPTER 7. DATA MENU

The **Data** menu is shown in figure 7-1. In general, this menu has two groups of options:

- The first group is used for the management of data specific to the current application. It contains the **Retrieval by...**, **Record** and **Entry...** options.
- The second group includes the utilities. It contains the **Open Table...**, **Data Sheets...**, **Report...** and **Import File...** options.

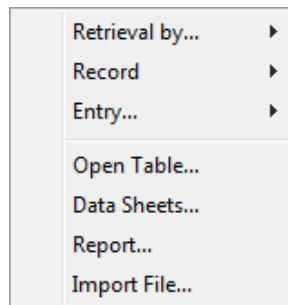


Figure 7-1 - Data menu

1. CONNECTION TO A DATABASE

Before managing the data specific to a database, the user must connect to one of them. For all applications using X3D and a database, the connection is done directly when calling the application, or via the **Open Database** or **Connect Database** option of the **File** menu.

If an option of the **Data** menu is chosen before a database is connected, the connection window will be displayed. See chapter 2 for all the details about the connection to a database.

2. GEOTECHNICAL DATA MANGEMENT

The management of the data from the connected database is done in the various modules. The user can insert, modify or delete information from the database which will be reflected in the other modules of Geotec. See the Geo guide for data entry forms

3. DATA RETRIEVAL

The **Retrieval by...** option opens a sub-menu with five options: **Simply Query**, **Customized Query**, **Google Map**, **Polygonal Limit** and **Group of Records**, as shown in figure 7-2. These options are used to execute different types of queries to find the desired data.

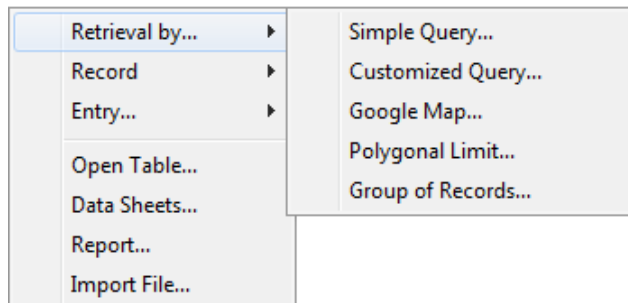


Figure 7-2 - Sub-menu of the “Retrieval by” option

3.1. Simple Query



To do a simple query, choose the **Simple Query** option, this button located in the application toolbar, or press **[F7]** in the main window. The entry form opened by default depends on the application and the type of data to retrieve for graphic display.

When opened, the entry form will be in “Query mode”, visible by the title and blue background of the entry form (figure 7-3). The user can enter a query in any field of any entry form. Enter the desired value in the field or choose the value in the data list which shows all the values in the database for this field. Each list also shows an “**is NULL**” item to retrieve all records with no value in the current field.

By using the **[F7]** key a second time, the conditions of the last query are called. The **Last** option of the **Query** menu has the same role.

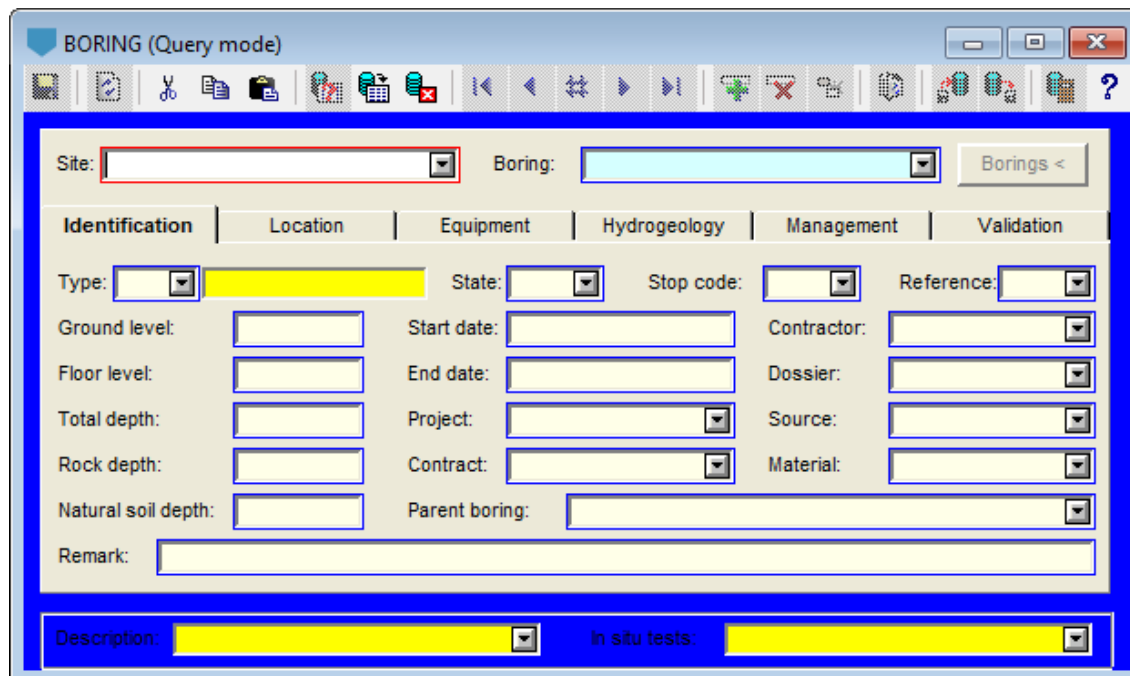

 A screenshot of a software window titled 'BORING (Query mode)'. The window has a blue border and a toolbar at the top. Below the toolbar, there are two dropdown menus: 'Site:' and 'Boring:', followed by a 'Borings <' button. The main area is divided into six tabs: 'Identification', 'Location', 'Equipment', 'Hydrogeology', 'Management', and 'Validation'. The 'Identification' tab is active. It contains several fields: 'Type:' (dropdown), 'State:' (dropdown), 'Stop code:' (dropdown), 'Reference:' (dropdown), 'Ground level:' (text box), 'Start date:' (text box), 'Contractor:' (dropdown), 'Floor level:' (text box), 'End date:' (text box), 'Dossier:' (dropdown), 'Total depth:' (text box), 'Project:' (dropdown), 'Source:' (dropdown), 'Rock depth:' (text box), 'Contract:' (dropdown), 'Material:' (dropdown), 'Natural soil depth:' (text box), 'Parent boring:' (dropdown), 'Remark:' (text box), 'Description:' (dropdown), and 'In situ tests:' (dropdown).

Figure 7-3 - Entry form for Boring in “Simple query” mode

3.1.1. Search characters

It is possible to use the “%” or “_” characters to search. “%” is used to replace several characters when doing the search. For example, if the user wants to do a query for all borings starting with T, he will write “T%” in the Boring field. “_” replaces a single letter or a single number in the value when doing the search. If the user wants to do a query for all borings between 90 and 99, he will write “9_”.

3.1.2. Excluding records

It is possible to exclude records from the query, by using the “!” character, corresponding to “not LIKE”. The “!” can be used for a precise value, or with replacement characters.

Example: !TP% to return everything except borings starting with TP.

Example: !%2015% to return everything except boring with the value 2015 in their number.

3.1.3. Selection of multiple records

In query mode, you can select more than one value of a list. Hold down the [Ctrl] key and click on the desired values for non-consecutive values or use the [Shift] key for consecutive values, by clicking on the first and last value of the series. Then click on [Enter] when the selection is done. All values will then be displayed, separated by « ; ».

The multiple selections can also include exclusions, by separating them with « ; ».

Example: !TP%;!%2014% to exclude records starting with TP and records with 2014 in their number.

3.1.4. Numerical values and dates

It is also possible to execute queries on numerical values and dates. Use < or > to find records smaller or greater than a certain value or date. The date must be complete (ex: >2015-05-15)

3.1.5. Executing the query



To execute the query, the user can use the [F8] key, this button located in the toolbar of the entry forms, or the **Execute** option of the **Query** menu.

3.2. Customized Query

Please note: the customized queries are less common and more complicated than the simple queries.



To do a customized query, choose the **Customized Query** option of the **Retrieval by** sub-menu of the **Data** menu, or this button located in the application toolbar. The query editing window is shown in figure 7-4.

When the customized query editing window is first opened, the conditions displayed are the default ones, specific to the application. The values entered are those of the last query, be it simple or customized.

Most of the window consists of a table where each line represents one of the data retrieval conditions.

In the top zone labelled **Query**, the controls allow the user to save in the database the group of conditions under a given name. In this zone, the user can also select a group of conditions already saved (see paragraph 3.2.11). The user can also delete a group of conditions.

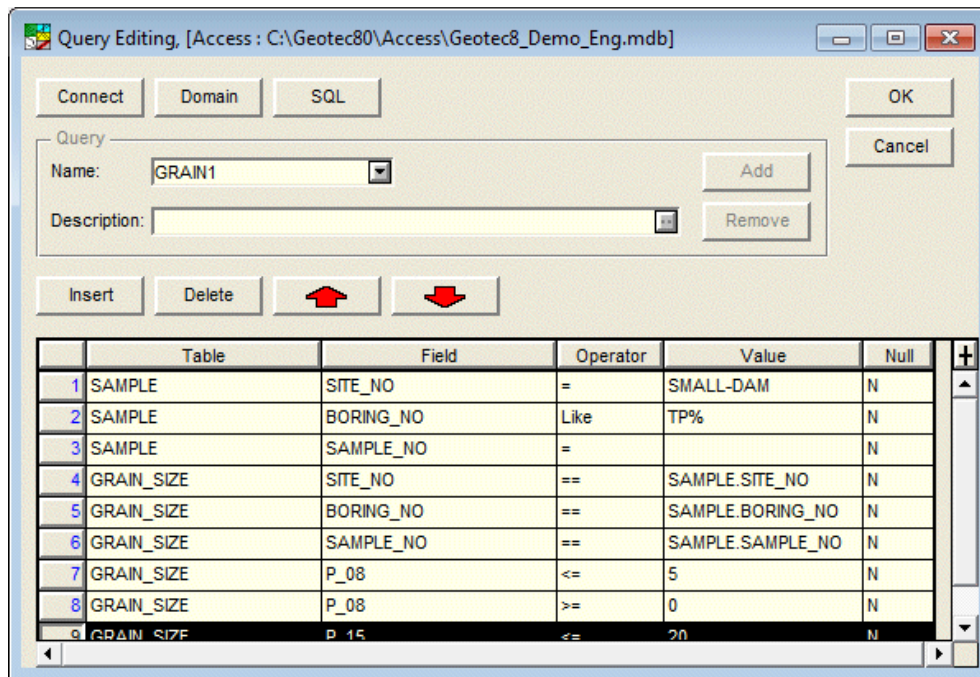


Figure 7-4 - Definition window for a customized query

3.2.1. Creation of a condition

The creation of a condition is done in an empty row of the conditions table. The addition of a condition creates a new row in the conditions table.

3.2.1.1. Selective condition

By selective condition, we refer to a condition that has a chosen criterion in all its elements, with the eventual exception of **Null**. To create a selective condition, the steps are:

- Select a table from the database by clicking in the cell of the **Table** column, which displays the call button for scrolling lists to the right of all cells in the row of the condition, and by selecting the table in the scrolling list (see figure 7-5) or directly typing its name in the cell. Selecting a table may automatically create join conditions (see paragraph 3.2.6).
- Select a field of the table in the cell of the **Field** column. This selection is done the same way as for the table; the scrolling list displays the fields from the selected table.
- Select an operator in the cell of the **Operator** column. This selection is done the same way as for the table and field. Figure 7-6 shows the scrolling list of the operators.

With the **“Like”** and **“Not Like”** operators, the **“%”** and **“_”** characters can be used in the value as a replacement character, as in a simple query (see paragraph 3.1). Do not confuse the **“==”** operator which is a join operator between two tables and the **“=”** operator which is the equality operator.

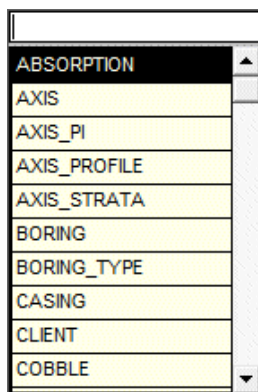


Figure 7-5 - Example of a scrolling list of tables



Figure 7-6 - Scrolling list of the conditions operators

- Select one or many values, accordingly, in the cell of the **Value** column. This selection is done the same way as for the table, field or operator. If the operator is "=", "**Like**" or "**Not Like**", it is possible to choose several values, the separation character being ";".

The scrolling list will allow selecting one or many values, depending on the operator. Hold down the **[Ctrl]** key and click on the desired values for non-consecutive values or use the **[Shift]** key for consecutive values, by clicking on the first and last value of the series.

The list of the possible values in a condition depends on all other conditions defined in the table.

- Ask to retrieve the records that do not have a value in the field of the condition, by entering **Y** or **N** in the cell of the **Null** column. If the field chosen in the condition is not with required value, the **Null** cell contains **N** by default.

In some cases, the user may want to retrieve the records with no value in a field, in addition to the records with the chosen value for this field. For example, since borings are generally vertical, the DIP field will often contain no value, sometimes 90, and a value lower than 90 if the boring is not vertical. To retrieve only the vertical borings, the condition should be that the DIP field of the BORING table is equal to 90 degrees or empty, so with **Y** in the **Null** cell.

For example, if the condition is on the CATEGORY field of the GRAIN_SIZE table with "Not Like" as the operator and «EX» as the value, the query will return all the records with a value other than EX in the CATEGORY field of the GRAIN_SIZE table. The records with no value in this field will only be retrieved if the condition contains **Y** in the **Null** cell.

3.2.1.2. Non-selective condition

A non-selective condition has one or many elements with no defined criterion. The following examples using the **Log** module describe the purpose of a non-selective condition:

- If the user wants to retrieve the borings having a dip value entered in the database, whatever the value, and exclude the borings without a dip value, he creates a condition on the DIP field of the BORING table using the “<>” operator, an impossible value, 370 for example, and **N** in the **Null** cell.
- If the user wants to retrieve all the borings in which a piezometer is defined, he creates a condition in which he only selects the PIEZOMETER table and leaves empty the other elements of the condition. This condition is interpreted as a retrieval of the records of borings present in the PIEZOMETER table, without another specification.

3.2.2. Modification of a condition

Modifying a condition is done by selecting a new element of this condition, the table, field, operator, value or presence of records with the empty field.

The lists of the possible values in a condition always take into account the other conditions of the table.

Changing an element in a condition erases all the elements in the cells to the right of the modified element. Therefore, changing the name of the table in a condition implies selecting a field from this table as well as the other elements of the condition.

Modifying a condition may lead to the deletion and/or addition of join conditions (see paragraph 3.2.6).

3.2.3. Deletion of a condition

To select or unselect a condition, click in the grey cell on its left. A condition is selected when it is in reverse video. The **Delete**, **Previous** and **Next** buttons are then active. To delete a condition, select it and click on **Delete**.

Deleting a condition may lead to the deletion of join conditions (see paragraph 3.2.6).

3.2.4. Insertion of a condition

Clicking on the **Insert** button inserts a new empty row in the conditions table. The new row is inserted at the top of the table if no condition was selected, or after the selected row. The user can then create a condition in the new row.

3.2.5. Moving a condition

The user can move a condition in the table by selecting it and clicking on one of the buttons with an up and down red arrow, to move the condition up or down by one row in the table.

3.2.6. Join conditions

3.2.6.1. Automatic join conditions

The following example defines a join condition, more specifically an automatic junction condition.

To select all the borings from the “SMALL DAM” site that have a piezometer, the user creates a condition on the SITE_NO field of the BORING table using the “=” or “Like” operator and the “SMALL DAM” value. He then creates a new condition whose only criterion is the PIEZOMETER table. By selecting this table, the two join conditions illustrated in figure 7-7 are automatically created.

2	PIEZOMETER				N
3	PIEZOMETER	SITE_NO	==	BORING.SITE_NO	N
4	PIEZOMETER	BORING_NO	==	BORING.BORING_NO	N

Figure 7-7 - Example of automatic join conditions

These conditions mean that the application must locate all the borings identified by the pair SITE_NO - BORING_NO present in the BORING and PIEZOMETER tables.

For join conditions to be created automatically there must be a relationship between the tables of the conditions. In the previous example, the SITE_NO and BORING_NO fields in the PIEZOMETER table are not only part of the key of the PIEZOMETER table but also form an external key that links the PIEZOMETER table to the BORING table.

The elements of an automatically generated join condition cannot be modified but the condition can be deleted. This deletion may make the condition at the origin of the deleted join condition unnecessary (without any effect).

3.2.6.2. Join conditions entered by the user

This example explains when the user should create a join condition to specify the retrieval.

If the user wants to retrieve the borings that have the same category as at least one of their respective samples, he must create the join condition shown in figure 7-8.

4	SAMPLE	CATEGORY	==	BORING.CATEGORY	N
---	--------	----------	----	-----------------	---

Figure 7-8 - Example of a join condition entered by the user

To create this join condition, the user creates a new condition on the table and field to compare, SAMPLE and CATEGORY in our example. He then selects the “==” operator. Choosing the value, “BORING.CATEGORY” in our example, is done via the scrolling list of the **Value** cell, as shown in figure 7-9. The user then simply clicks the desired value.

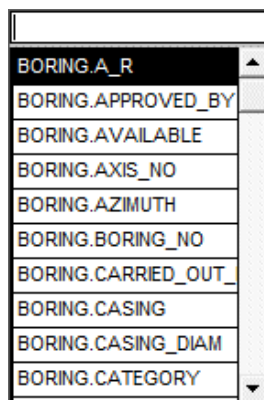


Figure 7-9 - Scrolling list of values in a join condition

3.2.7. Viewing the SQL command

Clicking on the **SQL** button opens a tool tip, shown in figure 7-10. The SQL command displayed is either the one used to build the scrolling list of values valid for the selected condition, or the one reflecting all the conditions if no condition is selected.

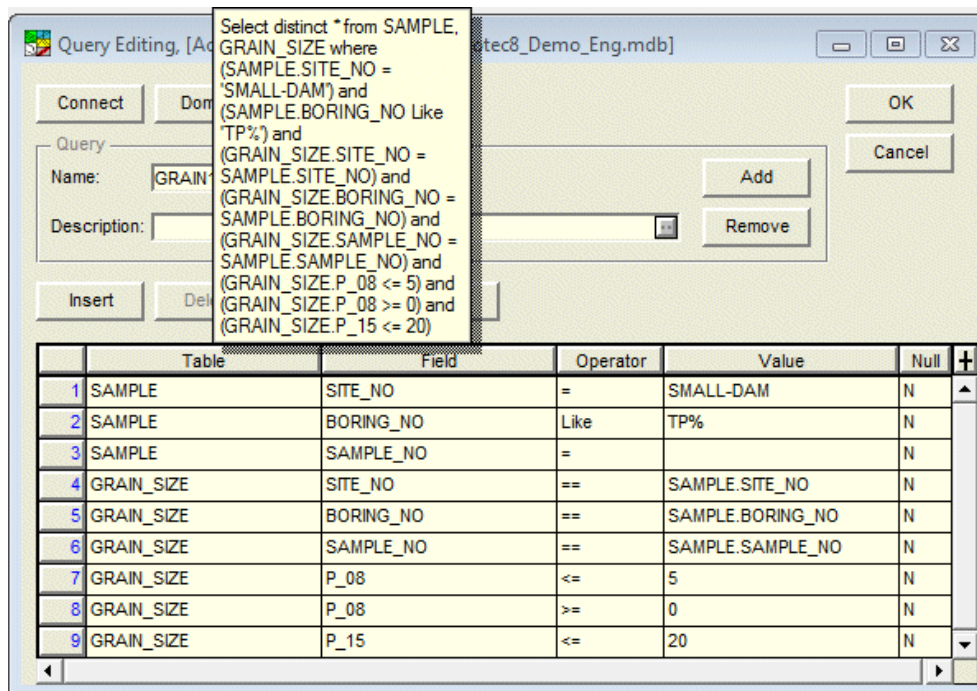


Figure 7-10 - Example of an SQL command

3.2.8. Default conditions

Each application has specific default conditions. Selecting the **Default** value from the scrolling list associated to the **Name** field in the **Query** zone (see paragraph 3.2.11) replaces the content of the table with the default conditions of the application. The values entered as criteria for these conditions are the last values used.

For example, with **Log**, the default conditions are on the SITE_NO and BORING_NO fields of the BORING table.

3.2.9. Predefined conditions

Conditions on the domain in which the borings must be located can be established.

The **Domain** button at the top of the editing window of customized queries opens a window in which the domain for the retrieval of borings can be defined. It is an alternative to the queries by polygonal limit (see paragraph 3.4). The window shown in figure 7-11 is then opened.

The two panels designated by **Current** and **Previous** are identical. The **Current** tab shows the values of the current defined domain, while the **Previous** tab shows the last values defined in the window.

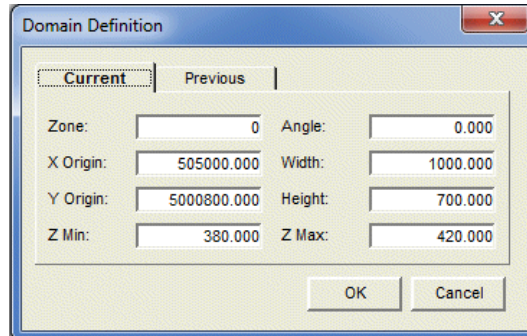


Figure 7-11 - Domain definition window

The values in the domain window are defined as:

- The **zone** in which the domain is located.
- The orientation of the domain, i.e. the angle between the edges of the domain and the cardinal directions (**Angle**);

The normal orientation is 0. The angle increases positively when turning in counter clockwise direction from the normal orientation, and negatively in the other direction.

- The coordinates of the origin of the domain (**X Origin** and **Y Origin**); this origin is located at the bottom left corner of the domain;
- The size of the domain (**Width** and **Height**);
- The minimum and maximum elevations of the top and bottom of the borings (**Z Min** and **Z Max**).

After clicking **OK**, the conditions on the domain are found in the table of the conditions in the editing window for the queries, as shown in figure 7-12.

3	BORING	EASTING	>=	505000.000	N
4	BORING	EASTING	<=	506000.000	N
5	BORING	NORTHING	>=	5000800.000	N
6	BORING	NORTHING	<=	5001500.000	N

Figure 7-12 - Conditions on the domain

3.2.10. Launch / cancellation of the query

To launch the data retrieval, click **OK** in the query editing window or press the **[F8]** key. The data found are then displayed in the graphs and objects defined in the style file used. Clicking on **Cancel** closes the query editing window without launching the data retrieval.

3.2.11. Management of queries

The user can save a query in the database, i.e. the group of established conditions (see the description of the **QUERY_NAME** and **QUERY_CONDITION** tables in the guide of the entry forms). A previously saved query can be selected, modified and deleted.

The controls used for the management of the queries are in the rectangle labelled “Query” in the editing window of the customized queries (see figure 7-4).

3.2.11.1. Selecting a query

To select a query in the database, click on the arrow button right of the query name field. In this list, the “**Default**” term is displayed first, followed by the saved queries in alphabetical order.

To choose a query from the list, click on its name. Then, the name of the selected query, its description and its conditions are displayed in the fields and table of the conditions editing window.

3.2.11.2. Saving a query

To be able to save the current query in the database, the **Add** button must be active.

For the **Add** button to be active, the name of the query must be different than “**Default**”, at least one of its conditions must have changed, its description must have been edited, or its name must have changed. Thus, if the user selects a query without changing its conditions, description or name, it is not possible to save the query.

To save the current query, click **Add**. If the name of the query already exists, it will be updated in the database. If the name of the query does not exist in the database, its definition and conditions will be added. It is not possible to modify the “**Default**” query.

The name of the query is entered in the **Name** field of the **Query** zone. If a query is selected, the user can change its name. If the user provides a query name that already exists in the database, a message will notify the user and he must enter another one.

The **Description** field is used to enter a string of up to 255 characters to describe the query. It becomes active when a name other than **Default** is used. The button on the right of the **Description** field opens the text editing window.

3.2.11.3. Deleting a query

To delete a query, select it and click on the **Remove** button of the **Query** zone. The **Remove** button is not active for the **Default** query.

3.3. Google Map



The **Google Map** option of the **Retrieval by** sub-menu of the **Data** menu opens the window shown in figure 7-13. This window is used to display the location of borings, sites and regions, (and axes and limits via Pro and Site) in Google Map.

Once data are retrieved, place the cursor on an entity and Google Map will display a tooltip with information about the entity. For borings, information includes the site and boring numbers, type, state, zone, northing, easting, elevation, rock depth, maximum depth, latitude and longitude. For sites and regions, information includes the site or region number, the zone, and the latitude and longitude of the site or region center.

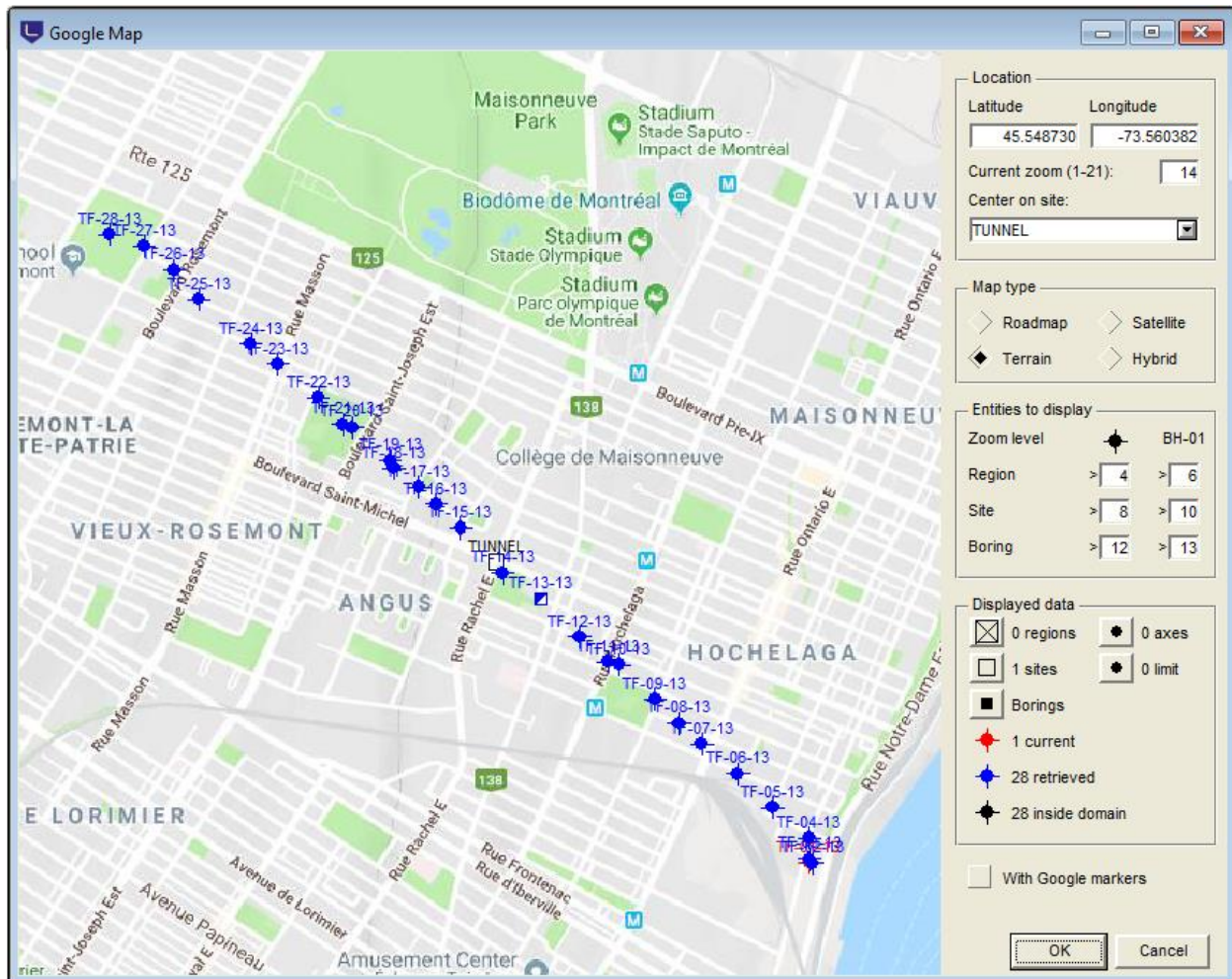


Figure 7-13 - Google Map

3.3.1. Location

The longitudes and latitudes of the geotechnical entities (borings, sites, regions) must be entered or calculated in the database in order to see them on Google Map. See corresponding paragraphs of chapter 2 of the Geo guide for all details about the calculations.

The **latitude** and **longitude** of the map center are shown. The user can modify the center manually or by moving the map using the mouse.

The **current zoom** can be manually set or modified with the scroller of the mouse. The greater the zoom number, the greater the close-up.

It is possible to **recenter the map on a site** from the database. The list shows all sites whose longitude and latitude have been inputted or calculated.

3.3.2. Map type

The typical options for display are available: **Roadmap**, **terrain**, **satellite** and **hybrid**.

The color attributes for the regions, sites and borings inside domain can be set differently for the **satellite** and **hybrid** modes. See paragraph 3.3.4.

3.3.3. Entities to display

The user can define the **zoom level for each type of entity**.

Under the marker, the user defines the zoom above which a marker will be shown for each region, site or boring in the map domain. In the example below, if the current zoom is 8 or smaller, the borings and the sites will not be displayed.

Under the text BH-01, the user defines the zoom above which the entity number will be shown for each region, site or boring in the map domain. In the example below, if the current zoom is 9 or 10, the sites will be shown as markers but without their identification, and the borings will not be displayed.

3.3.4. Displayed data

Each of the five buttons opens the Attributes editing window.

- **Regions** and **Sites**: a marker and its diameter can be defined, as well as the font, its size and the text alignment. With **roadmap** and **terrain**, the marker and text are black. With **satellite** and **hybrid**, another color can be defined for the marker, which will also be used for the text.
- **Borings**: the marker used for each boring is the one in the current markers file whose name is the concatenation of the type and state of the boring, for example, TP_R for a realized test pit. If no corresponding marker is found, the one defined for **borings** is used. The marker and its diameter can be defined, as well as the font, its size and the text alignment.
 - ◆ The **current boring** is always **red** (marker and text). It is the first boring from the query and shown in the graphic page.
 - ◆ The **retrieved borings** are always **blue** (marker and text). They are the borings retrieved in the query other than the current one.
 - ◆ The **borings inside the domain** include all borings located in the domain of the map and visible at the current zoom. The number includes the current and the retrieved borings. With **roadmap** and **terrain**, the marker and text are black. With **satellite** and **hybrid**, the color defined for the marker **Borings** will be used for the marker and text.
- **Axes** and **Limit**: the limit associated to the current site or surrounding all data is shown, as well as the axis retrieved if the query is done via the Pro module. The default attributes are

the same as the **Axis_Curve** and the **Limit** curves of the plan view but can be modified for Google Map.

3.3.5. Interactive editing

In Google Map, the user can right click to display the contextual menu shown in Figure 7-14.

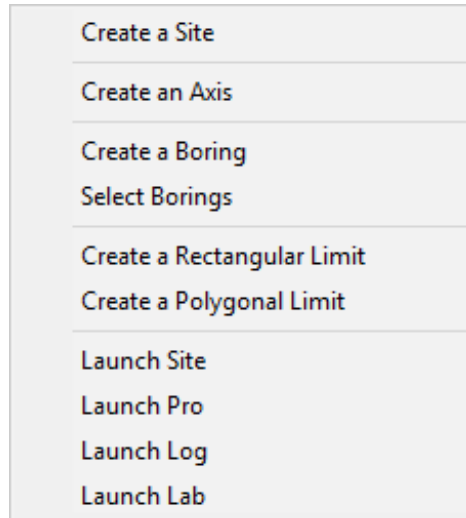



Figure 7-14 - Interactive menu in Google Map


3.3.5.1. Creating a site

By selecting **Create Site**, the cursor takes this format: . If the user wants to cancel right away, right click and select **Cancel**. To create the site, left click at one corner of the new site, hold down and move the cursor to the diagonally opposite corner; a dotted line shows the area created. When the button of the mouse is released, the site entry form is displayed.


By default, the MTM and NAD83 systems are used. The X and Y coordinates of the bottom left corner, its longitude and latitude, the zone used for the calculation, as well as the width and height of the area are automatically entered. If Google Map is displayed in background, the zone is determined from there. Otherwise, the zone used is the site's zone previously displayed.

The user then enters the site number and any other information in the entry form, and saves the new site.


3.3.5.2. Creating an axis

By selecting **Create Axis**, the cursor takes this format: . Left click at each point of the axis. A dotted line shows the movement of the cursor. When the last point of the axis is defined, right click to display the pop-up menu and select **Cancel** to erase the axis being created, or **Terminate** to edit and save the new axis. The axis entry form is then displayed and shows the coordinates of each point clicked. The user can then enter the axis number and any relevant information in the entry form, and save.

3.3.5.3. Creating a boring

By selecting **Create a Boring**, the cursor takes this format: . Left click at the location of the boring. The boring entry form is then displayed and shows the coordinates of the added boring. The user enters the boring number and any relevant information in the entry form, and saves.

3.3.5.4. Selecting borings

By clicking **Select Borings**, the cursor takes this format: . Click and drag a rectangle containing the desired borings. The borings selected are then displayed in blue. The user may also select or unselect borings by pressing the [Ctrl] key and clicking on the desired borings.

When all desired borings are selected, right click to display the menu shown in figure 7-15. The option **Create a Group of Borings** will open the selection entry form; each boring selected is identified with its site and boring number. A selection number corresponding to the current boring number is displayed by default, and can be modified. The user then enters any other information in the entry form, and saves the new group of borings.

With the option **Delete these Borings**, all borings selected and whose state is **Planned** will be deleted, after confirming the message displayed. Records for borings of another state cannot be deleted this way.

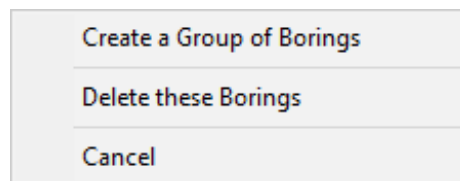





Figure 7-15 - Selection of borings


3.3.5.5. Creating and modifying a rectangular limit

By selecting **Create Rectangular Limit**, the cursor takes this format: . If the user wants to cancel right away, right click and select **Cancel**. Left click at one corner of the rectangular limit, hold down and move the cursor to the diagonally opposite corner; a dotted line shows the area created. When the button of the mouse is released, the limit entry form is displayed; the X and Y coordinates of the four corners of the limit are automatically entered. The current site number is displayed as reference site. The user enters the limit number and any other information, and saves the new rectangular limit.



3.3.5.6. Creating and modifying a polygonal limit

By selecting **Create Polygonal Limit**, the cursor takes this format: . If the user wants to cancel right away, right click and select **Cancel**. Left click at each point of the polygonal limit. A dotted line shows the movement of the cursor. When the last point of the polygonal limit is defined, right click to display the pop-up menu and select **Terminate**. The limit entry form is then displayed; the X and Y coordinates of all points of the limit are automatically entered. The current site number is displayed as reference site. The user enters the limit number and any other information, and saves the new polygonal limit.

Any rectangular or polygonal limit can be modified with the mouse. When the cursor is on a limit, it takes this format: . By right clicking, a contextual menu is displayed.

When **adding a point to the limit**, the cursor becomes . The point will be added between the two closest points to the cursor. A message is displayed, showing the exact coordinates of the point. To stop the addition of points, right click and select **Terminate**.

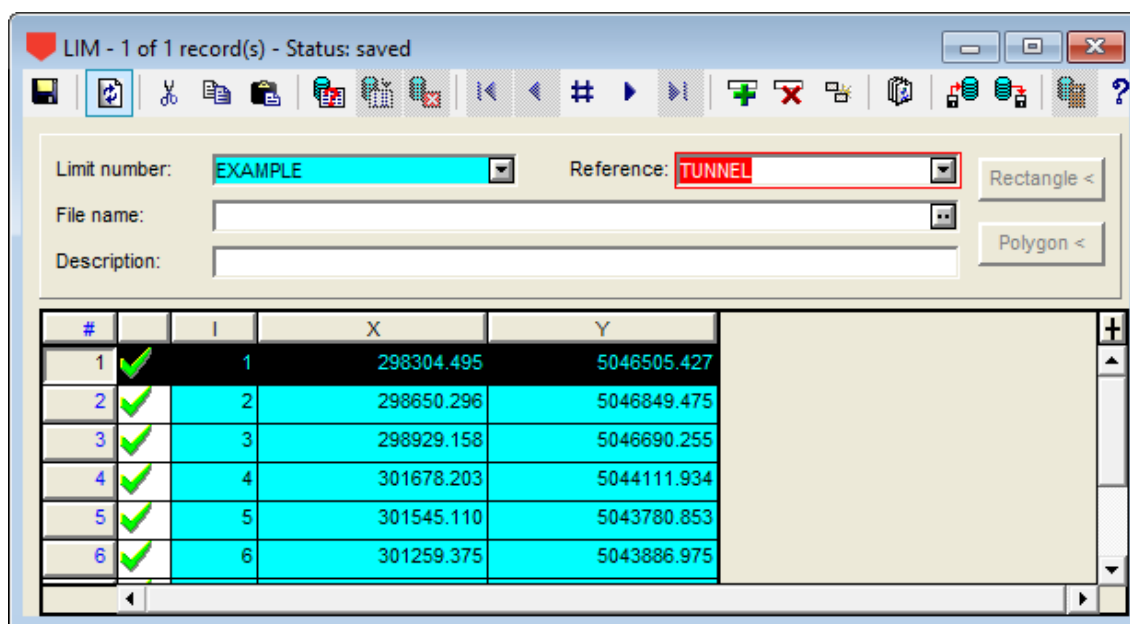
When the cursor is over a point of the limit, the option **Delete this Point from Limit** is active. A message is displayed to confirm the deletion of the point.

When the cursor is on a point of the limit, it takes this format: . By clicking on the point, it takes the format . Move the point to the desired position, and release the button of the mouse; a message is displayed to confirm the move.

3.4. Polygonal Limit



Select the **Polygonal Limit** option of the **Retrieval by...** sub-menu of the **Data** menu, or click on this button located in the application toolbar, to open the definition window for the polygonal limits, as shown in figure 7-16.



#	I	X	Y	
1	✓	1	298304.495	5046505.427
2	✓	2	298650.296	5046849.475
3	✓	3	298929.158	5046690.255
4	✓	4	301678.203	5044111.934
5	✓	5	301545.110	5043780.853
6	✓	6	301259.375	5043886.975

Figure 7-16 - Definition window for the polygonal limits



When opened, the LIM form is in “Query mode”, visible by the title and blue background of the entry form. The bottom table show the points of the limit. The user chooses the limit number and executes the query with the **[F8]** key or the button shown here from the entry form toolbar. The data associated to the limit are then displayed in the table and the fields. All records (borings, axes) located within this limit are returned by the query, except the borings with a zone number different than the zone of the reference site. If the zones are not specified, the application does not apply any restriction.

The buttons **Rectangle<** and **Polygon<** are only active in the **Site** module. They are used to define polygonal limits directly with the mouse. See the user guide of the Site module for more details.

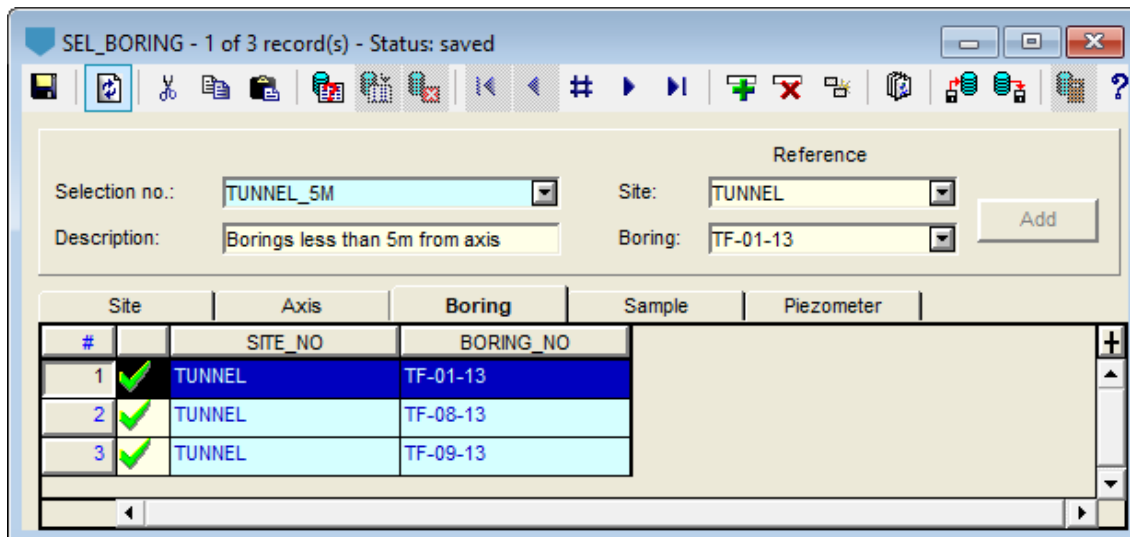
Limits can also be manually inserted. The user only needs the easting and northing coordinates of 2 opposite points of a rectangle to create a rectangular limit.

The **reference** is selected from the list of all the sites in the database, and indicates the site to use as reference for the limit.

3.5. Group of Records



Select the **Group of Records** option of the **Retrieval by...** sub-menu of the **Data** menu or click on this button located in the application toolbar, to open the selection window by groups of records, as shown in figure 7-17.



	Site	Axis	Boring	Sample	Piezometer
#		SITE_NO	BORING_NO		
1	✓	TUNNEL	TF-01-13		
2	✓	TUNNEL	TF-08-13		
3	✓	TUNNEL	TF-09-13		

Figure 7-17 - Selection window by groups of borings

When opened, the SEL form is in “Query mode”, visible by the title and blue background of the entry form. The user clicks on one of the 4 tabs at the bottom of the form to indicate in which table the records are located (SEL_SITE for records of sites, SEL_AXIS for those of axes, SEL_BORING for those of borings, SEL_SAMPLE for those of samples, SEL_PIEZO for those of piezometers). The user then chooses the selection number and executes the query. The data associated to the selection are then displayed in the table and the description field.


When a query was done in one of the graphic modules, the **Add** button becomes active. By going to the desired panel, clicking on the **Add** button will insert all the records in memory, which you can then save with a selection number.

The **site** and **boring** fields under the **Reference** label show the site and possibly the boring numbers of the record selected in the bottom table by clicking on the numbered button left of the row.

The groups of borings are particularly useful for the display of CPTu data done close to a boring. The main boring would be the reference - to display its stratigraphy, samples, etc. - and the CPTu would also be in the group, to display their measured and/or calculated properties.

The groups of records are also useful for the selection of samples from one of several borrow pits which have desired grain size properties.

4. RECORD

The options of the **Record** sub-menu of the **Data** menu correspond to the  buttons in the main page and the entry forms. The menu is also available when a data entry form is opened. The user can directly call the **first** or **last** record; he can go to the **previous** or **next** record or call a specific record **number** by entering it in the box that is displayed.

5. DATA ENTRY FORMS

In the Geotec modules, the most appropriate data entry forms are included as options in the **Entry...** sub-menu of the **Data** menu and as buttons in the application toolbar (see figure 7-18 for the Lab module). Refer to the specific guides for the data entry forms and the applications.

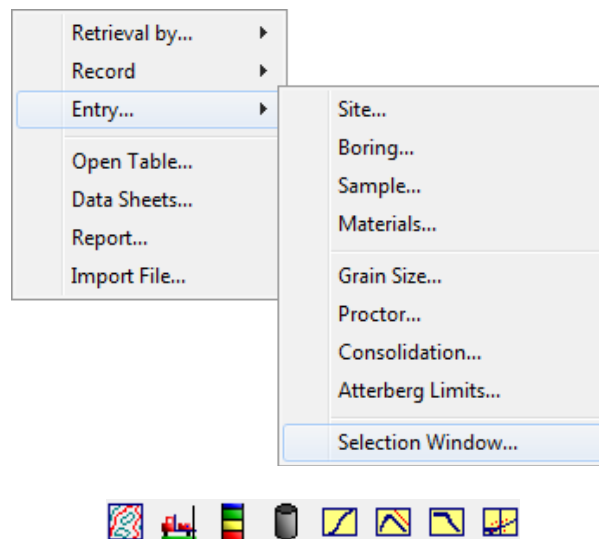


Figure 7-18 - Data menu: Entry (Lab module) and corresponding buttons

6. OPEN TABLE



The **Open Table** option of the **Data** menu or this button located in the application toolbar is used to open any table or view (query) from the database. The window shown in figure 7-19 is displayed.

We can **include in the scrolling list** all the **tables** and/or all the **views (queries)** of the database, by checking the appropriate box at the bottom of the window. The user can then choose the desired table or view in the list.

The user also select the display format for the entry form to open. The display formats can also be changed via the **Display** menu when the entry form is open. The formats are described in chapter 1 of the entry forms guide. By clicking on **Open**, the entry form is displayed.

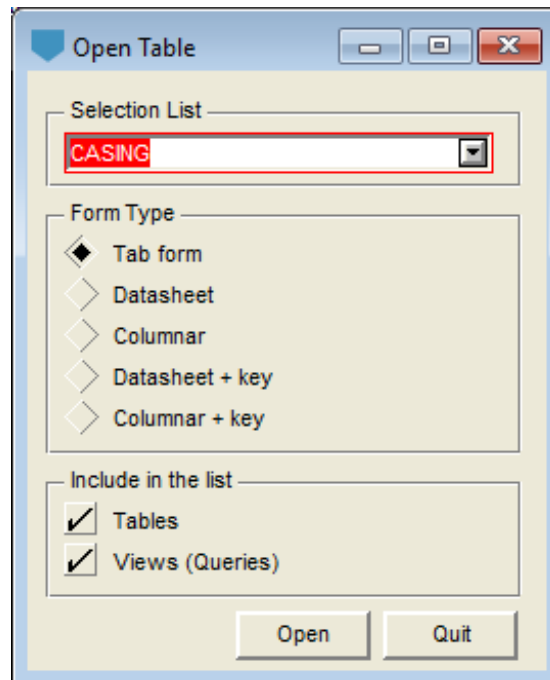


Figure 7-19 - Open Table

7. DATA SHEETS



The **Data Sheets** option of the **Data** menu or this button and located in the application toolbar is used to open a data sheet on the table associated to the current graph. The data sheets are used for visualisation. No change made here is saved in the database.

8. REPORT



The **Report** option of the **Data** menu or this button located in the application toolbar is used to open the **Configuration window for the forms and reports**. The same button located in an entry form toolbar or the **Report** option of the **Action** menu will open the window with data for the current table.

The configuration window is used to define the display parameters of an entry form as well as the data sheets. It is also used for the production of specific reports, external files presenting the data from the current table. The configuration window is presented in figure 7-20.

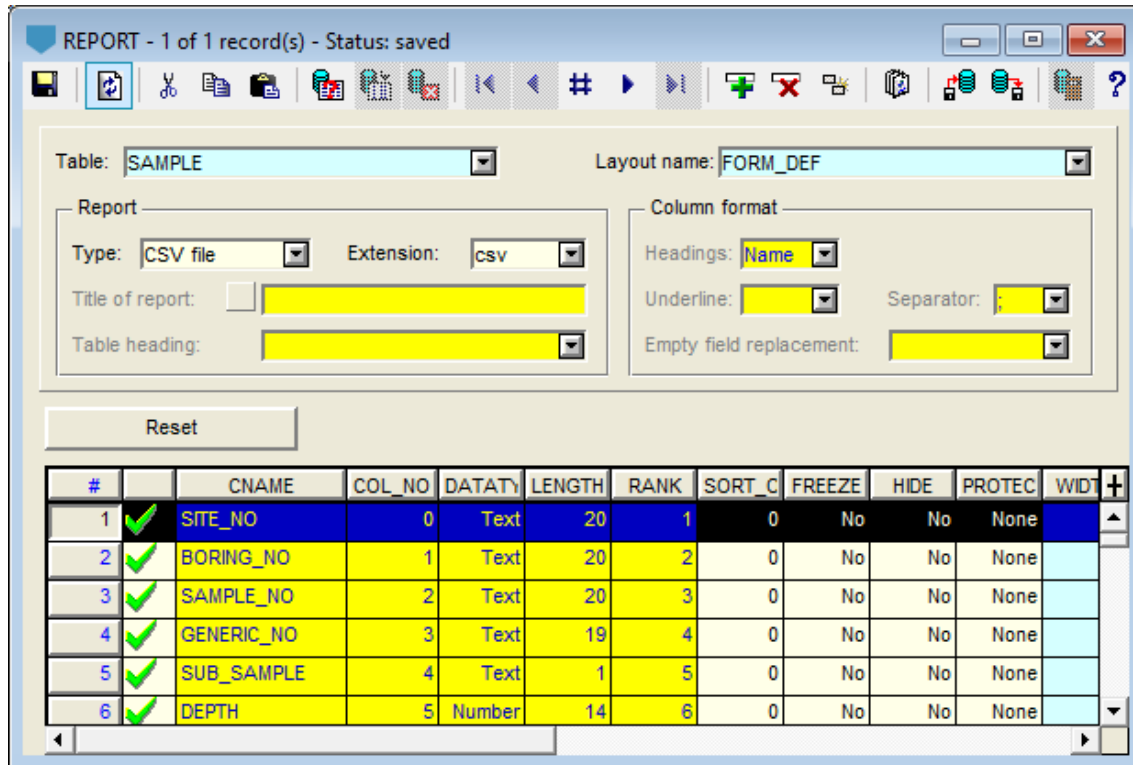
When an entry form is opened for the first time (for example, the sample form), a record for the table is automatically created in REPORT with the table name (example: SAMPLE) and FORM_DEF as the layout name, as well as records in REPORT_COL displayed in the table at the bottom of the configuration window, which contain the default configurations for the fields of the defined table.

When changes are done to the configuration, they are saved in these 2 formatting tables. Any field added to a table during updates will be added at the end of the fields already defined.

If the record is deleted or if the layout name is modified, another record with the FORM_DEF layout will be created. To reset the format of an entry form, the simplest is to delete its record in REPORT.

If a customised format *name* other than Default is added in the preferences window (see chapter 6 of X3D), new records for the tables used will be automatically created and saved with the layout name FORM_DEF_ *name*.

A query can be done as in all the other entry forms to retrieve the configuration of a table from the scrolling list.



#	CNAME	COL_NO	DATATy	LENGTH	RANK	SORT_C	FREEZE	HIDE	PROTEC	WIDT
1	SITE_NO	0	Text	20	1	0	No	No	None	
2	BORING_NO	1	Text	20	2	0	No	No	None	
3	SAMPLE_NO	2	Text	20	3	0	No	No	None	
4	GENERIC_NO	3	Text	19	4	0	No	No	None	
5	SUB_SAMPLE	4	Text	1	5	0	No	No	None	
6	DEPTH	5	Number	14	6	0	No	No	None	

Figure 7-20 - Configuration of the entry forms and reports

8.1. Configuration via REPORT_COL

The table at the bottom of the configuration window presents the parameters of the fields from the **table** defined at the top of the window. When a user moves, hides (by dragging the field outside the form) or modifies the dimensions of the columns in the Datasheet (+) or Columnar (+) display formats or in the data sheets, the information is saved in REPORT_COL.

The **Reset** button is used to reset the values of the current row in the REPORT_COL table. Several rows can be selected at the same time for resetting.

- The **CNAME** column contains the field names. The values cannot be modified.
- The **COL_NO** column contains the field number as defined in the database, the first field defined being #0. The values cannot be modified.
- The **DATATYPE** column indicates the field type, as defined in the database. The values cannot be modified.

- The **LENGTH** column indicates the field length in characters. The values cannot be modified.
- The **RANK** column defines the order in which the columns or rows (in Columnar(+) format) are displayed from left to right or top to bottom, the value “1” defining the column at the far left or top. The values cannot be modified in the configuration window.

The rank values are modified when the user moves the columns in the various display formats of the table or in the data sheets.

- The **SORT_ORDER** column is used to define the sorting priority for each column for the data presentation. A position order number means an increasing order; a negative order number means a decreasing order. The “0” order number keeps the sort order already defined. The sorting will first be done on the values of the field with “1” or “-1” as sort order, then on the values from the field with “2” or “-2”, etc. By default, the data are presented in the order returned by the query.

Changing the value of a **SORT_ORDER** cell affects the value of one or many other **SORT_ORDER** cells.

- The cells of the **FREEZE** column contain “No” by default. A “Yes” in a cell of the **FREEZE** column means that the eventual horizontal scrolling bar of the table of data sheet will affect only the columns right of the one to which the cell belongs. Only one cell of the **FREEZE** column can contain “Yes”. This option works only for the fields located in the left third of the table.
- The **PROTECT** column indicates the protection against editing. By default, the protection is at “None”. By double-clicking in the cell, **Partial** is indicated, meaning that the user can only select values in a scrolling list. By double-clicking again, **Total** is indicated - the field will be disabled.
- The **HIDE** column is used to define if the field will be visible or not in the table or data sheet. By default, the value is “No”. To change the value, double-click in the cell. When the entry forms are in Table or Table+ format, the user can also hide fields by dragging the column header outside the entry form.
- The **WIDTH** field expresses in number of characters the widths of the columns of the table or data sheet. By default, the widths are equal to 1 more than the lengths of the fields, with a minimum of 5 and maximum of 20. The user can change these widths. They are also modified when the user adjusts the width of the columns with the mouse in the tables or data sheets.
- The **LINE_FEED** column is used to indicate with **Yes** or **No** if the values represented in the column will be displayed on several lines with a word wrap when the value is not displayed entirely in the cell.
- The **FORMAT** column is used to enter the format with which the data should be displayed. If the format is not appropriate for the data type, the values will not be displayed, or will be displayed with a default format. Two types of format can be used:
 - ◆ A **C** expression (“%g”, “%.2f”, “%.0e”, “%s” for example);
 - ◆ A mask, for example: “999.99” for have a number with two decimals, “9.99e” for a number in scientific notation, “text” for the value to be considered as a character string even if it is a number, “yyyy-mm-dd hh:mi” for a date.

- The **NULL_VALUE** column is used to enter a character string, of 50 characters maximum, to be displayed instead of values missing from the column in the table or data sheet.
- The **TITLE** column is used to enter the strings desired as the columns (fields) titles. By default, the field name is entered.
- The **DESCRIPTION** column shows the tooltip message defined in the data dictionary. The values can be modified by the user. According to the option selected in the preferences window (see chapter 6 of this guide), it is either the description defined in this field or the description provided by the software in the language used that will be displayed in the tooltips.
- The **LIST** is used to indicate with **Yes** or **No** if the list of distinct values from the database is shown (yes) or hidden (no). By default, the value is Yes.

8.2. Report parameters

The section in the middle of the configuration window is used to define a specific report to be produced. The columns of the report are the one of the configuration used.

- The **type of report** is selected from the scrolling list that has 5 choices: Block, Tabular, Personal, CSV file and Export. According to the type of report selected, there are more or fewer parameters that have a role and for which the user can intervene.
- The output file **extension** may be defined or not by the user, depending on the report type. The value is either imposed or proposed by default.
- The **title of the report** can be edited for the **Personal** type reports. The title is only shown in the report if the box left of the title field is checked.
- The **table heading** can be edited for the **Personal** type reports. In the other cases, a value indicating the table name is either imposed, or the field is not used.
- The user can choose as **headings** of the report columns the field names or the titles defined in the configuration table, by clicking on **Name** or **Title**, respectively, in the scrolling list.
- The **Underline** field is used to define with which character the columns headings will be underlined in the report.
- The **Separator** field is used to indicate with which characters the columns of the report will be separated.
- The **Empty field replacement** field is used to enter a string of up to 50 characters, to fill the fields without value in the report. The string entered in this parameter does not have priority on the string entered for a field in the **NULL_VALUE** cell of the configuration window.

9. EXPORTING A REPORT



To produce a CSV report with the data retrieved, click on the **Export** button in the entry form toolbar or on the **Export** option of the **Action** menu. The file saving window opens on the directory of the output files. The current configuration format defined in the preferences, either FORM_DEF if it is default, or FORM_DEF_name if another name is defined, will be used for the report. See chapter 6 of X3D.

The Export option is also available directly in the report window (see paragraph 8) to produce specific reports.

10. IMPORTING EXTERNAL DATA



The option **Import File** of the **Data** menu or this button located in the application toolbar opens the window to **Import External Data**. The same button located in an entry form toolbar or the **Import File** option of the **Action** menu will open the window to import in the current table.

10.1. Import window

The import window is used to import .csv files or application files specific to some tables.

The first field **Table name** is inactive if the import window was opened directly from an entry form. If it is opened from the application toolbar, the user will need to select the table in which to import from the scrolling list showing all the tables of the database.

The **separator** can be selected by the user, but is adjusted automatically when reading the file, unless two types of separators are found.

10.1.1. Selection and display options

10.1.1.1. Select a file

By clicking on **Select and read a file**, the Windows selection window opens on the last import directory used. After selecting a file, the data are automatically read and displayed in the table of the tab labelled **Data from current file**, as well as the file name and total number of records read. The file path is also written in the **Path** field. See Figure 7-21.

10.1.1.2. Select a directory

By clicking on **Select a directory**, the Windows selection window opens on the last import directory used. After selecting a directory, the list of all .csv files of the directory is displayed in the table of the tab labelled **List of files**, as shown in Figure 7-22. The path is also written in the **Path** field.

10.1.1.3. Application file

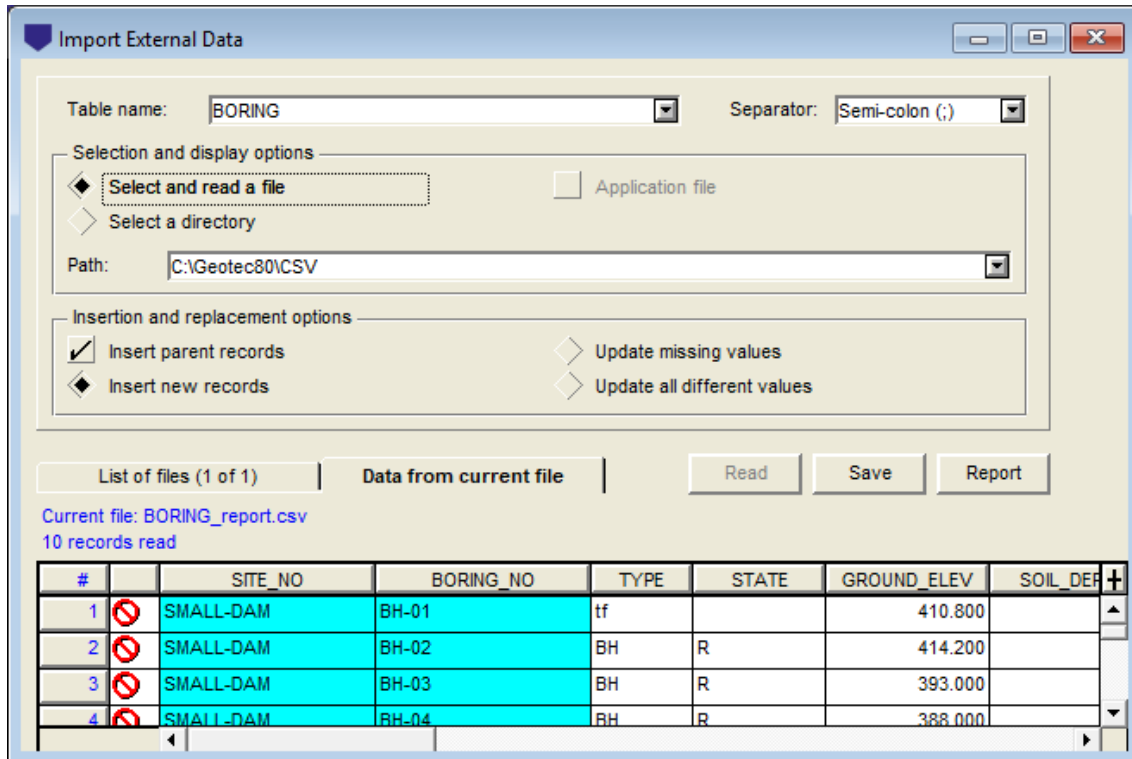
For the CPTU and axis entry forms, it is possible to insert an application file with a specific structure. This option will then be active.

For the CPTU entry form, if the box **Application file** is checked, the file extension is modified for “.drf”, the box “**Insert parent records**” is automatically checked and the replacement option “**Insert new records only**” is selected. See chapter 4 of the Geo guide for all details about the import of .drf files.

For the axes entry form, if the box **Application file** is checked, the file extension is modified for “.prf” (seismic profiles file), the box “**Insert parent records**” is automatically checked and the replacement option “**Insert new records only**” is selected. The .prf files have a specific formatting. They are used to insert profiles of stratigraphic layers along an axis and the measured seismic velocities. Please contact us if you need to exact format.

10.1.1.4. List of directories

The **Path** field gives the list of the last 9 directories used.



#	SITE_NO	BORING_NO	TYPE	STATE	GROUND_ELEV	SOIL_DEP
1	SMALL-DAM	BH-01	tf		410.800	
2	SMALL-DAM	BH-02	BH	R	414.200	
3	SMALL-DAM	BH-03	BH	R	393.000	
4	SMALL-DAM	BH-04	BH	R	388.000	

Figure 7-21 - Importing external data – Data from current file

10.1.2. Insertion and replacement options

10.1.2.1. Insert parent records

When the option **Insert parent records** is checked, the software will verify if the parent records of the data to insert already exist in the database. If yes, the insertion of the parent record will be omitted. If not, parent records with only the assigned numbers will also be created at the import. For example, if a .csv file of samples is inserted by the site and borings of the samples do not exist, they will also be created.

If the option is not checked and the parent records do not exist, the new data will not be saved. An error message indicating why will be created in the report and the user will need to manually insert the parent records before trying to reimport the data.

10.1.2.2. Insert new records

The option **Insert new records** is always selected. It indicates that all records whose keys do not exist in the database will be inserted.

Example: if a file contains information of 10 borings, 5 of which are already defined in the DB, only the other 5 will be inserted.

10.1.2.3. Update missing values

If the option **Update missing values** is selected, then when records are already present in the DB and some fields defined with a value in the .csv file are empty in the database, these data will be inserted when importing. The other data already in the database will not be affected.

Example: if a file contains the X and Y coordinates of borings that are already inserted in the database but whose fields EASTING and NORTHING are empty, these coordinates will be inserted.

10.1.2.4. Update all different values

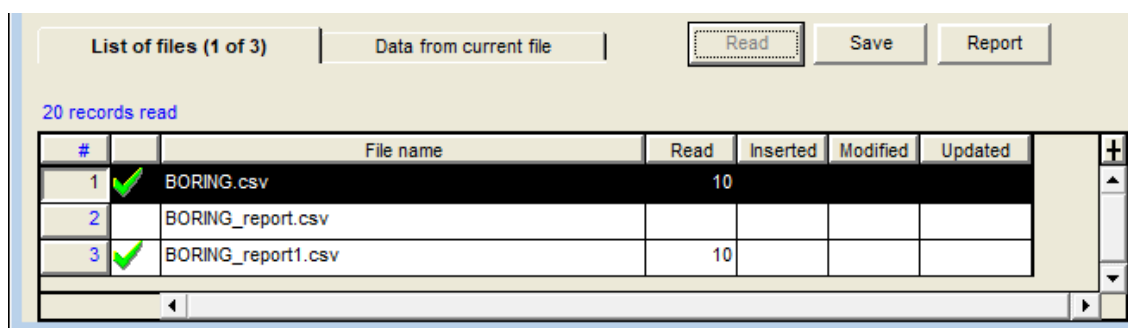
If the option **Update all different values** is selected, then all the values of the .csv file that are different than the existing values in the database will be inserted and will replace the existing values. Note: if cells are empty in the .csv file, they will not affect existing values in the DB.

It is possible to delete values from the DB. To do this, write **NULL** or **!** as value in the desired cells of the .csv file.

10.1.3. Read and save in database

After selecting a file, the data are automatically read and displayed in the table of the tab **Data from current file**, as shown in Figure 7-21.

After selecting a directory, the list of files is automatically displayed in the table of the tab **List of files**, as shown in Figure 7-22.



#	File name	Read	Inserted	Modified	Updated
1	BORING.csv	10			
2	BORING_report.csv				
3	BORING_report1.csv	10			

Figure 7-22 - Importing external data – List of files

By clicking on the **Read** button, all checked files are read and the total number of records read is indicated in blue, as well as in the **Read** column for each file. It is possible to uncheck files by clicking in the cell in the column left of the file name.

By selecting the row corresponding to a file (by clicking in the # column), we can click on the tab **Data from current file** to read and see the data from the selected file.

After selecting a file or directory, the user clicks on **Save** to save in the database. The total number of new records inserted will be displayed in blue, as well as in the **Inserted** column for each file. When the options to update missing values and / or different values are selected, the number of modified records for each file is indicated, as well as the number of updated values.

A transaction file is created for all operations every day. By clicking on **Report**, this file is opened with the text editor selected in the preferences window (see chapter 6 of this guide). The transaction file is saved in the directory of output files (see chapter 6 of this guide). This **Report** indicates the name of each file read and its directory, the number of records read, existing and inserted, the number of records and fields updated if applicable, as well as the tables involved.

10.2. Format of the .csv data files

The standard .csv files must have a row containing the field names to insert, which must correspond to the fields names as defined in the database. To obtain the field names, place the cursor of the mouse inside the field and press the **F1** key; a tooltip appears showing the field name, among other properties.

All values follow. When the program reads the .csv file, it verifies if the field names exist in the selected table and then reads all these values. If a field name is not found for the selected table, the column will be ignored.

The standard .csv files must contain the primary keys; otherwise it is impossible to know where to insert the data.

To delete data from the database, for example to delete all values of GROUND_ELEV for the 7 borings of table 7-1, enter **!** or **NULL** and select the option "update all values".

Table 7-1 - Example of .csv to insert into the BORING table

SITE_NO	BORING_NO	EASTING	NORTHING	GROUND_ELEV
PETITE-DIGUE	TF-01	300000	5000000	!
PETITE-DIGUE	TF-02	300010	5000010	!
PETITE-DIGUE	TF-03	300020	5000020	!
SMALL-DAM	TP-01	300030	5000030	!
SMALL-DAM	TP-02	300040	5000040	!
SMALL-DAM	TP-03	300050	5000050	!
SMALL-DAM	TP-04	300060	5000060	!

Table 7-2 - Example of .csv to insert into the GRAIN_SIZE_POINT table

SITE_NO	BORING_NO	SAMPLE_NO	SIZE	PASSING
PETITE-DIGUE	PU-01	1	80	100
PETITE-DIGUE	PU-01	1	56	90
PETITE-DIGUE	PU-01	1	40	88.9
PETITE-DIGUE	PU-01	1	31.5	80
PETITE-DIGUE	PU-01	1	20	71
PETITE-DIGUE	PU-01	1	10	55
PETITE-DIGUE	PU-01	1	5	41.55
PETITE-DIGUE	PU-01	1	0.08	24.5
PETITE-DIGUE	PU-01	1	0.0351	13
PETITE-DIGUE	PU-01	2	80	98
PETITE-DIGUE	PU-01	2	56	87
PETITE-DIGUE	PU-01	2	40	68
PETITE-DIGUE	PU-01	2	31.5	51
PETITE-DIGUE	PU-01	2	20	41
PETITE-DIGUE	PU-01	2	10	27
PETITE-DIGUE	PU-01	2	5	25
PETITE-DIGUE	PU-01	2	0.08	8

CHAPTER 8. WINDOW AND HELP MENUS

1. WINDOW MENU

In addition to the standard **“Tile”**, **“Cascade”** and **“Arrange Icons”** options, each option of the **Window** menu represents an open window in the application. The option that represents the active window is indicated by a check mark. If the user clicks on one option of this menu, the corresponding window becomes active.

2. HELP MENU

“Keyboard Shortcuts” opens a window with the description of the keyboard shortcuts that can be used in the entry forms for various types of functions: Action, Query, Record, Field, Table and Help.

“About” gives information about the versions used by the application, the PIN and type of licence, as well as the expiration date of the licence or the maturity date of the annual support and maintenance contract.

“Contents” and **“Search for help on...”** are not active.

CHAPTER 9. DRAWING ATTRIBUTES

1. INTRODUCTION

When an application using X3D is first used, some graphic entities may already exist, such as graphs and objects. Each entity is displayed with specific drawing attributes, like the line thickness and the background color. Also, minimal drawing attributes are defined by default for the graphic entities that will be created. These basic default attributes are:

- Texts in black with 2.82 mm characters (size 8) using the normal Arial font;
- Solid black lines of 0.1 mm thickness;
- No filling, no marker and no pattern.

These attributes will remain the default attributes as long as they are not modified. The default attributes established when the application is closed are saved in the work environment of the application for the next use.

To modify the default drawing attributes, open the preferences editing window and click on the button under the **Drawing attributes** label in the **Default** panel (see chapter 6). Modifying the default drawing attributes does not change the drawing attributes of the entities, graphs or objects already defined in the page.

Clicking on the **Default** button in this window will replace the default attributes with the basic minimal values defined above.

In most graphic entities configuration windows, there is at least one button used to display the drawing attributes editing window, shown in figure 9-1. Several elements can be modified, like:

- in the graph editing window, the background, border and title of the current graph;
- in the axes editing window, the axis line of the selected graph (with the button under “**Axis line**”) and the title of this axis (with the button under “**Title**”).

The default attributes defined in the preferences editing window can be used by clicking on the **Default** button in their attributes window.



The **Drawing Attributes** option of the **Insert** menu or this button, located in the graphic editing toolbar when the application is in graphic editing mode, opens the **Attributes** window. The attributes defined in the **Attributes** window will be those of the future objects created.

In graphic editing mode, the attributes of a selected object can be modified by clicking on the button shown here above, or via its property window opened by double-clicking on the object or with the **Properties** option of the pop-up menu displayed with a right-click.

Clicking on the **Default** button of the **Attributes** window opened for objects gives these objects the default attributes defined in the preferences editing window.

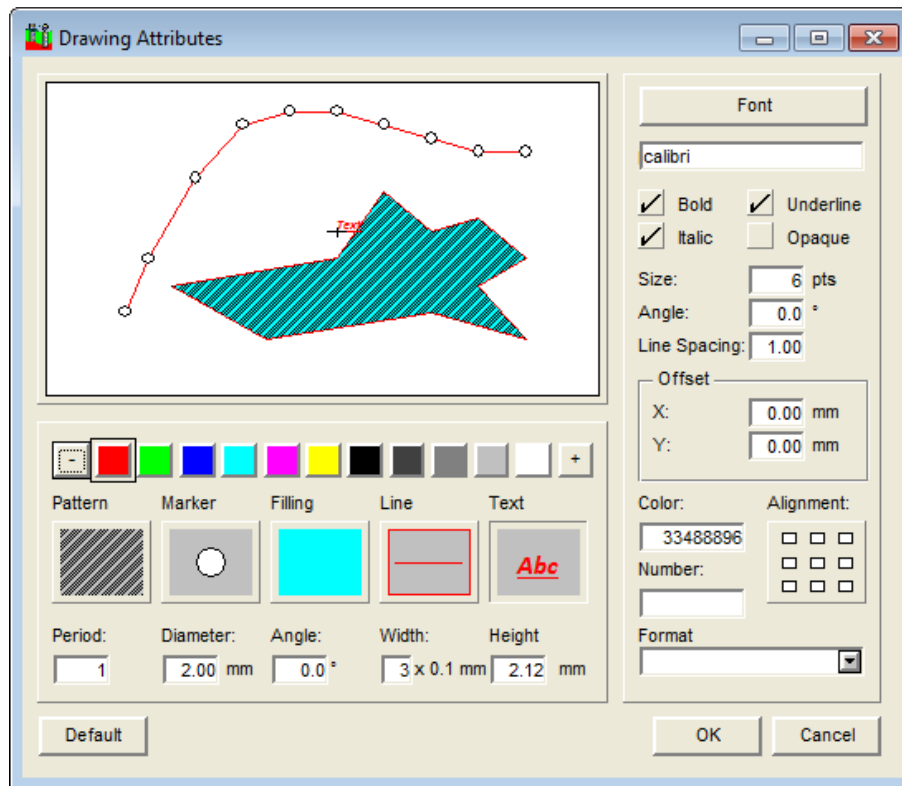


Figure 9-1 - Drawing attributes configuration window

In the attributes window, it is possible to modify, as applicable, the following components:

- the text (XVT)
- the line (XVT)
- the filling (XVT)
- the marker (X3D)
- the pattern (X3D)

These components are represented at the bottom of the window by large buttons displayed under their title. The series of color buttons under the preview area is used to define the color of the selected component.

The attributes of some components, particularly the text, can be detailed by a series of other specific controls.

The preview area, with its polygon, polyline and text, displays the configuration of the current attributes. Double-clicking in the preview area opens the XVT window for the configuration of attributes, as shown in figure 9-2.

This configuration window displays all the panels that can be opened to edit the XVT text, line or filling. The **Reset** button sets everything back to the values selected when the window was opened.

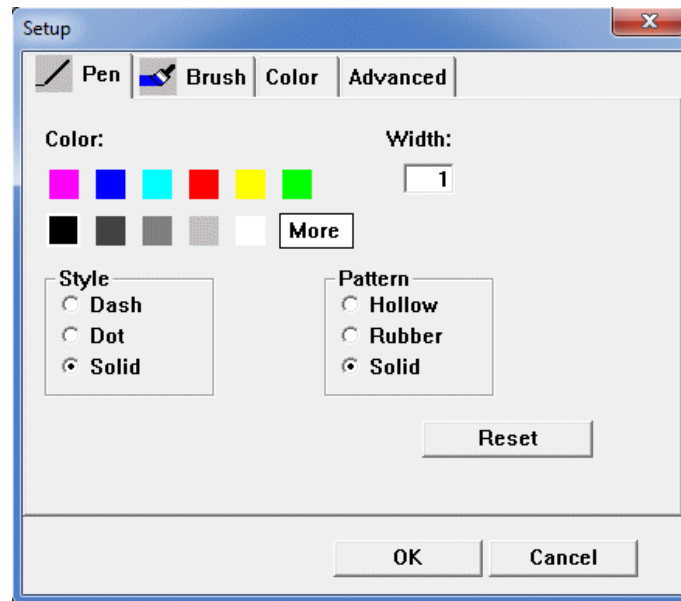


Figure 9-2 - XVT window for the configuration of attributes

2. SELECTING A COMPONENT

A graphic entity, a curve, axis, superimposed object to a graph, etc., can include one, many or all of the components.

To assign a color or style to a component, it must be selected. Click on the button of a component to select it; it then appears pushed in.

If the component's button is selected, click on a color button under the preview area to change the component's color. Clicking on the "-" button hides the component, without deleting the object containing it. Clicking on the "+" button opens the color personalization window (see paragraph 8).

Double-clicking on a component's button:

- opens the configuration window specific to the selected component in the case of an **XVT** component;
- opens the marker or pattern selection window, depending on the component selected, in the case of an **X3D** component.

A component remains selected until another is selected. It is not necessary to select a component to modify an attribute other than the color, XVT style, or X3D marker or pattern choice. For example, changing the height of characters will have an effect even if the **Text** component is not selected.

When a component is selected, its color's number is shown in the **Color** field of the attributes window (see figure 9-1). If a marker or a pattern is selected, when the corresponding button is clicked, the number of the marker or pattern is written in the **Number** field.

3. XVT TEXT EDITING

Double-clicking on the **Text** button opens the XVT window illustrated in figure 9-3.

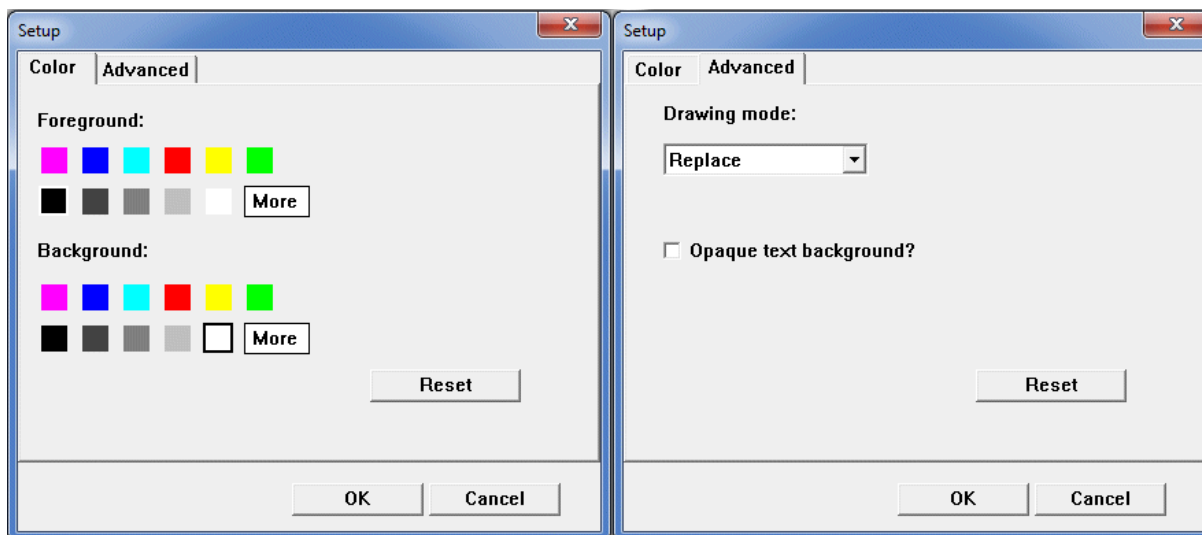


Figure 9-3 - XVT window for text configuration

The **Color** panel is used to define the text color in the **Foreground** section and the background color of the text in the **Background** section. Clicking on **More** allows the user to select a customized color (see paragraph 8).

In order for the text background color to be visible, open the **Advanced** panel and check the **Opaque text background?** box. The **Opaque** checkbox of the **Attributes** window has the same role. In the **Advanced** panel, the **Drawing mode** field has no role.

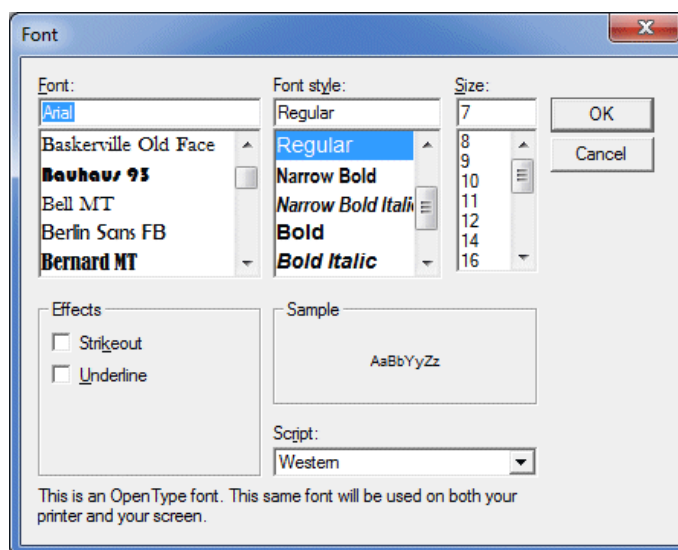


Figure 9-4 - Font definition window

In the **Attributes** window, the **Height** field defines the exact height for the characters; in millimeters. With the font selection done by clicking on the **Font** button, the user can choose a

size, in points. This selection modifies the value in millimeters in the **Height** field and in points in the **Size** field. Figure 9-4 illustrates the text font definition window.

In this window, the user can change the font, style and size of the text. The user can select the **Strikeout** and **Underline** boxes below the **Effects** label. The user can also select the type of characters desired in the list associated to the **Script** field. The result appears below the word **Sample**.

The name of the font can be entered directly in the **Attributes** window under the **Font** button. The user can directly select the **Bold**, **Italic** and **Underline** styles and define the height of the characters in the **Size** field.

The **angle** of the text is indicated in degrees with respect to the horizontal, in the counter clockwise direction. By default, the text is horizontal; its angle is 0. Figure 9-5 shows different text angles.

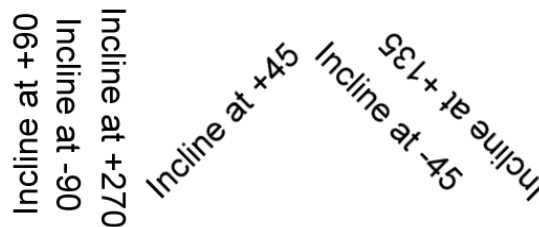


Figure 9-5 - Text angle

The **Line Spacing** of the text is expressed in character height. The text lines will be:

- superimposed with a line spacing of 0;
- without a space between them with a line spacing of 1;
- with a space of one character's height, with a line spacing of 2, etc.

Below the **Offset** title, two fields define how the text will be shifted compared to its anchor point. For the **offset in X**, a positive value is towards the right. For the **offset in Y**, a positive value is towards the top.

The **Alignment** button positions the text with respect to its anchor point. The nine white rectangles of the **Alignment** button symbolize the nine possible positions of the anchor point compared to the rectangle containing the text. Click on one of these boxes to select it. Click it again to unselect it.

The **Format** field is used to indicate the format of the elements whose attributes are getting modified. Two display format options are permitted:

- a **C** expression ("%g", "%.2f", "%.0e", "%s" for example);
- a mask, for example: "999.99" to have a number with two decimals, "9.99e" for a number in scientific notation, "text" for the value to be considered as a chain of characters even if it is a number, "mm-dd-yyyy hh:mi" for a date.

A scrolling list is associated to the **format** field, as shown in figure 9-6. The user is not limited to these masks, but can use them to initiate others.

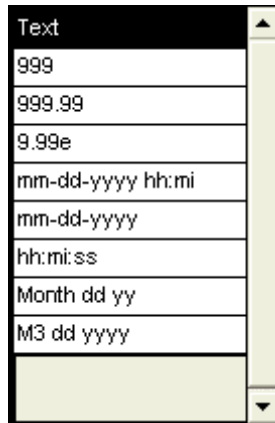


Figure 9-6 - Scrolling list of typical formats

The **Text** button with the **Abc** label shows the font, style and color of the text. The word “**Text**” in the preview area shows the font, style, color, size, style, alignment, angle and offset of the text.

4. XVT LINE EDITING

Double-clicking on the **Line** button opens the XVT window illustrated in figure 9-7.

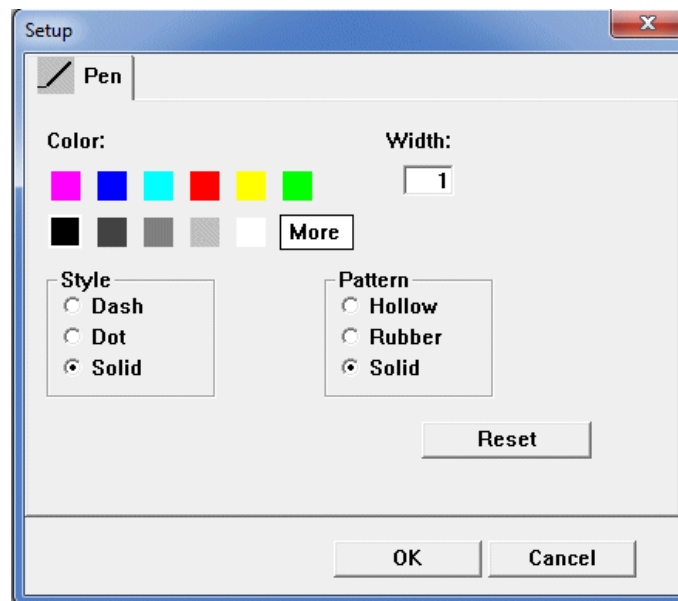


Figure 9-7 - XVT window for line configuration

In this window, the user can define the line color. Clicking on **More** allows the user to select a customized color (see paragraph 8). The user can also select the line style by selecting one of the three radio buttons under **Style: Dash, Dot or Solid** (full line). Lastly, the user can define the **width** of the line. It is expressed in tenths of a millimeter. The **Width** field also appears in the **Attributes** window directly under the **Line** button. The radio buttons of the **Pattern** section have no role.

In the **Attributes** window, the frame and line under the **Line** button and the polygon and polyline in the preview area have the color, style and width of the line.

Depending on the screen definition, it is possible that the chosen color cannot be displayed. The closest basic color is then used. Also, the resolution of the screen will affect the line style according to the selected thickness; increasing the width of a line will eventually result in a dashed or dotted line appearing as solid.

For the printouts, the result depends on the selected pilot and on the configuration of printing properties. To obtain dotted or dashed lines when printing, the width indicated in the attributes window must be 0 mm.

5. XVT FILLING EDITING

The **Filling** button allows the user to choose a filling background for any closed area (rectangles of a graph, legend, histogram, object of polygonal form, etc.). Applying a filling to an open area has no effect.

If a closed area is filled, everything displayed underneath is hidden. Having hidden or visible elements in a filling area depends on the display sequence of the different components. This sequence is usually imposed by X3D or the application but can sometimes be controlled by the user. For example, in the case of superimposed graphs, the user can decide the order in which they will be displayed, using their number.

The user can display an **X3D** pattern over the filled area (see paragraph 7).

Please note, if the **Black and white** option of the page editing window is selected (see chapter 6), the filling colors are not displayed; however, the filling pattern and the hidden elements remain in effect.

Double-clicking on the **Filling** button opens the XVT window illustrated in figure 9-8.

The **Brush** panel is used to define the filling color. Clicking on **More** allows the user to select a customized color (see paragraph 8). In the **Pattern** section, the user selects the XVT filling pattern. The top left box sets an “empty” pattern; no filling is displayed. The second top left box sets a solid pattern. The other boxes set patterns with hatchings or squares.

The **Color** panel is used to define the background color of the filling. This color is visible only if the pattern selected is striated. There is always a background color (white by default).

The filling color, its pattern and the background color are shown in the **Filling** button and fill the polygon in the preview area of the **Attributes** window.

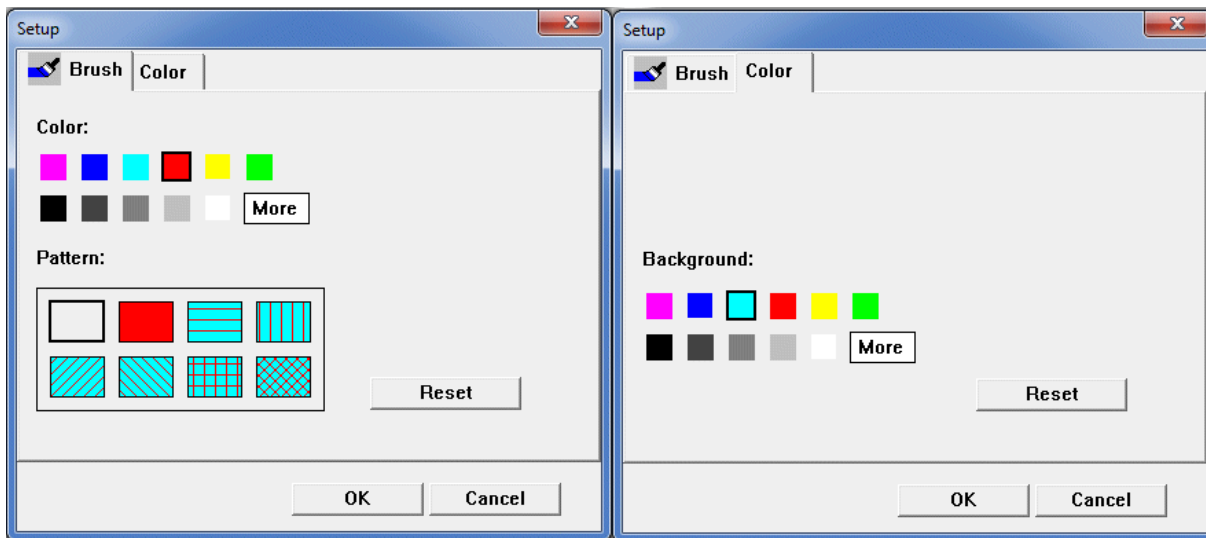



Figure 9-8 - XVT window for filling configuration

The XVT fillings are “computerized” patterns. Consequently, the result can vary from one printer to another. To ensure to always obtain the same pattern, we recommend the use of the **X3D** patterns (see paragraph 7).

If texts disappear under a filling zone during printing, it is probably due to a bad configuration of the printer. For example, with an “HP LaserJet” printer in mode “vectorial graphs”, the overlaying is incorrect and the user must select the mode “graphs in dot mode” (also known as “screened graphs”).

6. SELECTION AND PRESENTATION OF A MARKER

The button of the **Marker** component is used to select a marker that will be applied to the summits of the polylines and the line extremities. Double-click on the **Marker** button to open the marker selection window. An example is shown in figure 9-9.

The palette displayed includes the markers defined in the current .mrk markers file, whose path is shown in the window title. The markers file can be selected from the **Recent Markers** option of the **File** menu or from the marker editor (see chapter 6). To select a marker, click on it in the palette and close the palette with the  button.

Once the marker is selected, it is possible to assign a new color to it by clicking on one of the color buttons under the preview area of the **Attributes** window. A multi-colored marker becomes single-colored. Even if a new color is assigned to the selected marker, it will not be modified in the markers file. To modify a marker and keep the changes, it must be edited (see chapter 6).

The marker selection button is accompanied by these fields:

- **Period:** to define the frequency of the markers; a period of 0 shows no marker; a period of 1 shows a marker at each point; a period of 2 shows a marker at every two points, etc.;
- **Diameter:** to enter the size of the marker in millimeters;

- **Angle:** to define the display angle of the markers with respect to the vertical; the rotation is measured in the counter clockwise direction with a positive angle value.

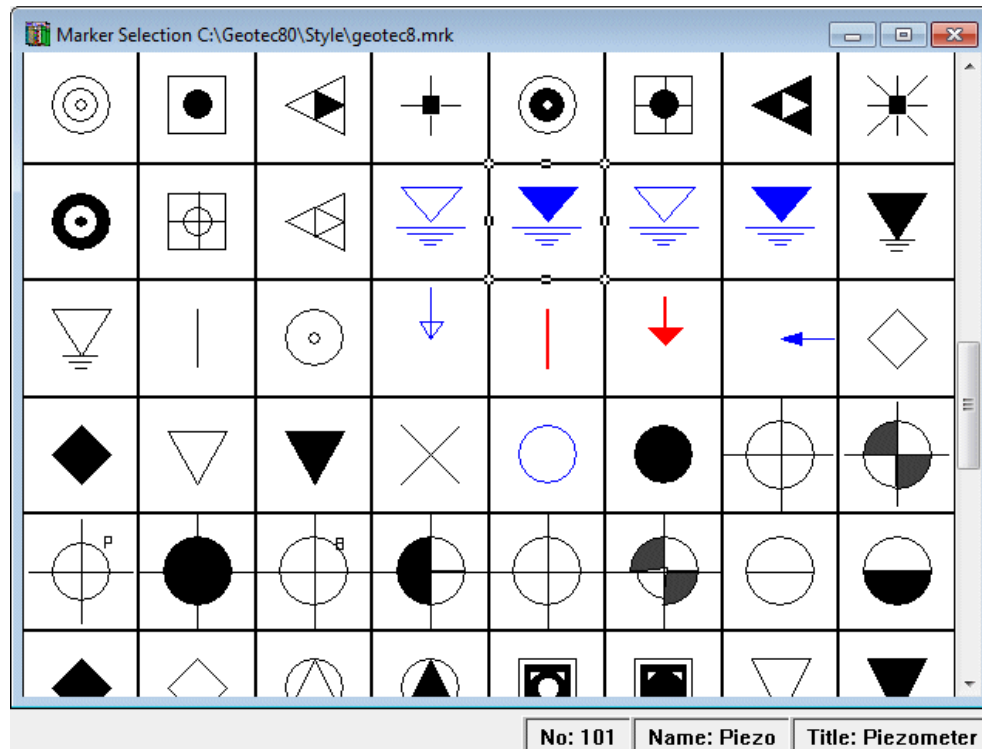



Figure 9-9 - Marker selection window

The selected marker is shown in the **Marker** button and at the summits of the polyline in the preview area of the **Attributes** window. Its number is indicated in the **Number** field if the Marker button is selected.

7. SELECTION AND PRESENTATION OF A PATTERN

The **Pattern** button allows the user to choose an **X3D** pattern that will be applied to closed areas. Double-click on the **Pattern** button to open the pattern selection window. An example is shown in figure 9-10.

The palette displayed includes the patterns defined in the current .ptn patterns file, whose path is shown in the window title. The patterns file can be selected from the **Recent Patterns** option of the **File** menu or from the pattern editor (see chapter 6). To select a pattern, click on it in the palette and close the palette with the  button.

Once the pattern is selected, it is possible to assign a new color to it by clicking on one of the color buttons under the preview area of the **Attributes** window. Even if a new color is assigned to the selected pattern, it will not be modified in the patterns file. To modify a pattern and keep the changes, it must be edited (see chapter 6).

The selected pattern is shown in the **Pattern** button and fills the polygon in the preview area of the **Attributes** window. Its number is indicated in the **Number** field if the Pattern button is

selected. It is possible to choose a filling with an XVT pattern and to display an X3D pattern on top.

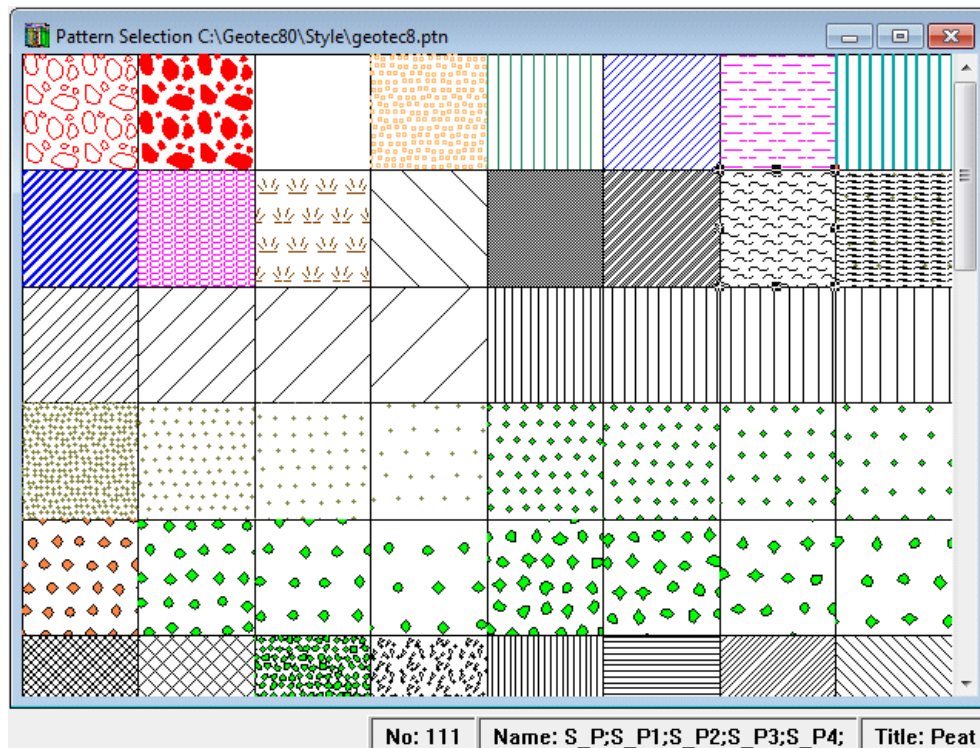


Figure 9-10 - Pattern selection window

8. PERSONALIZATION OF COLORS

By selecting the **More** box in the XVT windows for the configuration of attributes or by clicking on the “+” button in the **Attributes** window, the user can customize the color to apply. These selections open the color editing window.

To define a new color, place the cursor in the matrix or directly provide the values of hue, saturation, luminosity, red, green and blue. The **Color|Solid** box is filled by the defined color. By clicking on **OK**, the selected color becomes the color of the current attribute and its corresponding number is indicated in the **Color** field of the attributes window. **Currently, the addition of custom colors is not implemented.**