Solidix

1/ Introduction :

Solidix is a program based on a spreadsheet allowing to draw in 3D a set of simple geometric shapes. The position and size of each element can be configured according to the content of cells. This allows you to vary the proportions of a set.

Currently Solidix manages :

- the dots.
- the lines.
- the plans.
- the pavers.
- the pyramid.
- the cylinders.
- the cone.

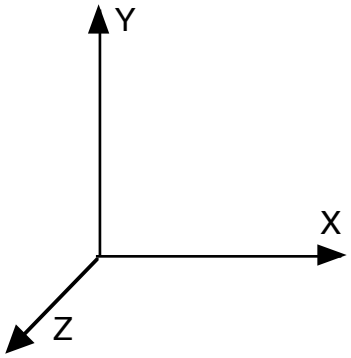
2/ The Spreadsheet :

It is a modest spreadsheet with the possibility of using the 4 operations (+, -, *, /), and the functions sin(), cos(), tan(), sqr(), pow() et pi(). Parentheses are also handled.

- To enter a comment. Select the cell then type your text.
- To enter a numeric value (for example: 123). The equal sign is not mandatory before entering the numbers. ("=123")
- To enter a value with reference to a cell (for example: B2). You must type the equal sign before entering the cell coordinates. ("= B2"). Otherwise the contact details will be interpreted as a comment.

3 / Graphical display :

The geometric shapes are drawn in the following 3D coordinate system:



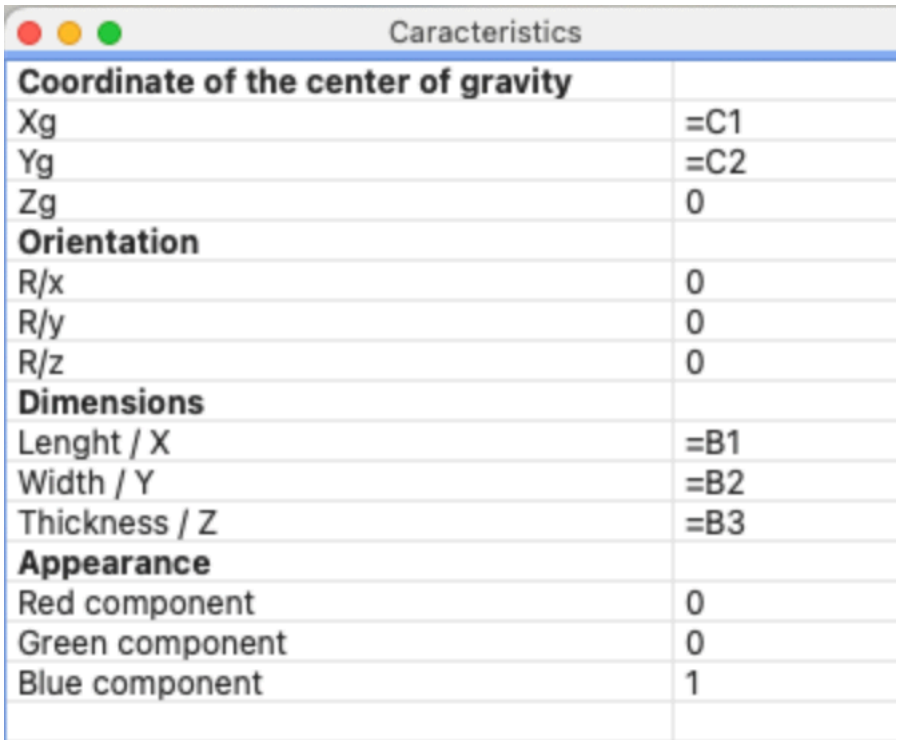
You can move, rotate and zoom the graphic representation using the control buttons on the left.

These buttons also have keyboard shortcuts:

- movements: arrow keys. Or scroll with mouse.
- rotations: option + arrow keys. Or click-drag with mouse
- zooms: “+” and “-” keys. Or Option-scrolling.

4/ Shapes :

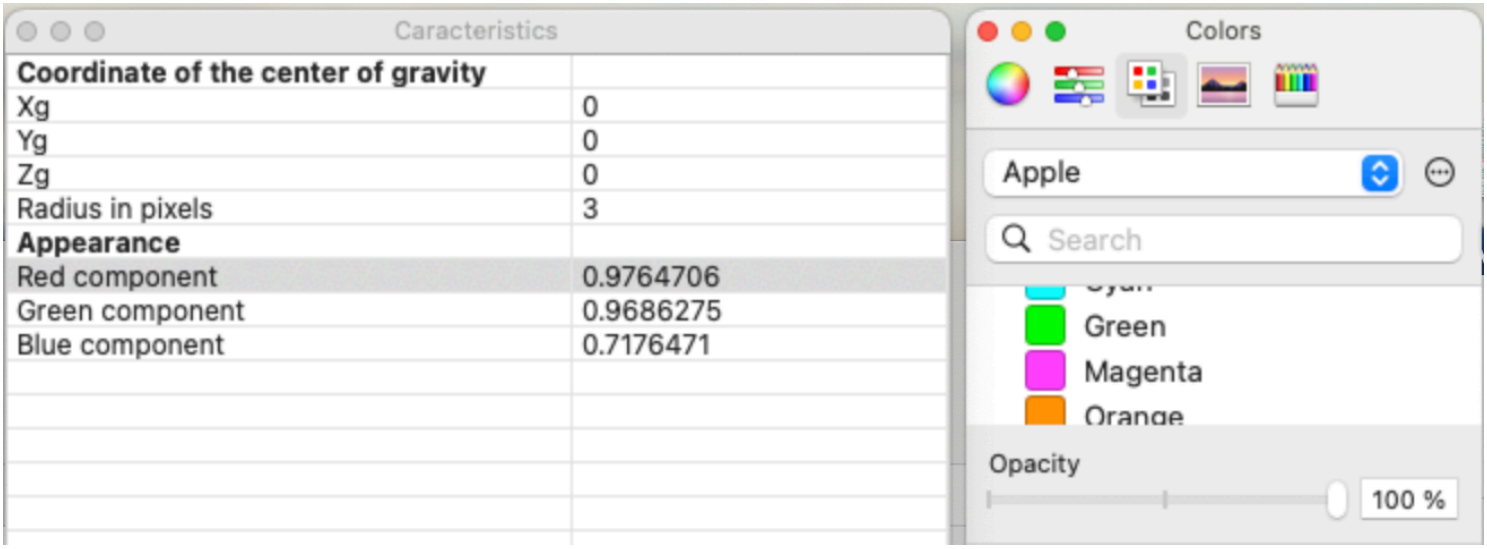
To edit the characteristics of a shape, select the cell that contains the shape to be edited.
The parameters are accessible in the characteristics window.
It is possible to enter formulas by referring to the cells of the spreadsheet.
See the example below:



R / x: Angle in degrees corresponding to a rotation around the X axis.
R / y: Angle in degrees corresponding to a rotation around the Y axis.
R / z: Angle in degrees corresponding to a rotation around the Z axis.

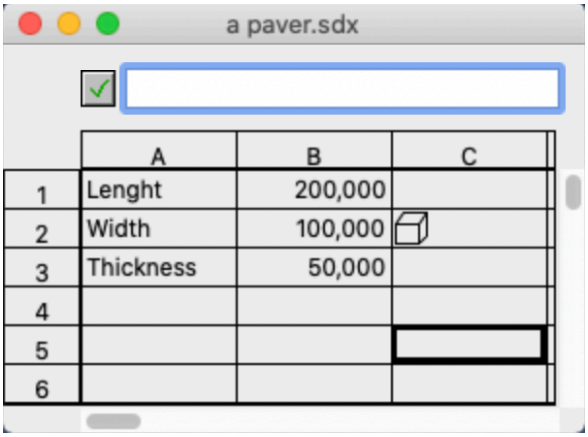
Red Component: value between 0 and 1 of the Red component.
Green Component: value between 0 and 1 of the Green component.
Blue Component: value between 0 and 1 of the Blue component.

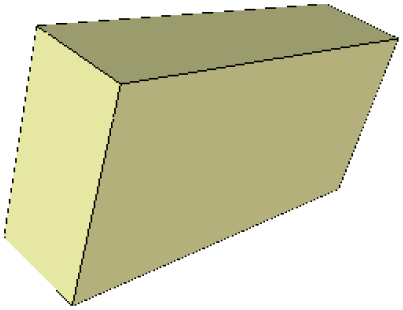
By double-clicking on one of the components, the color selection window appears. Then, select the desired color.



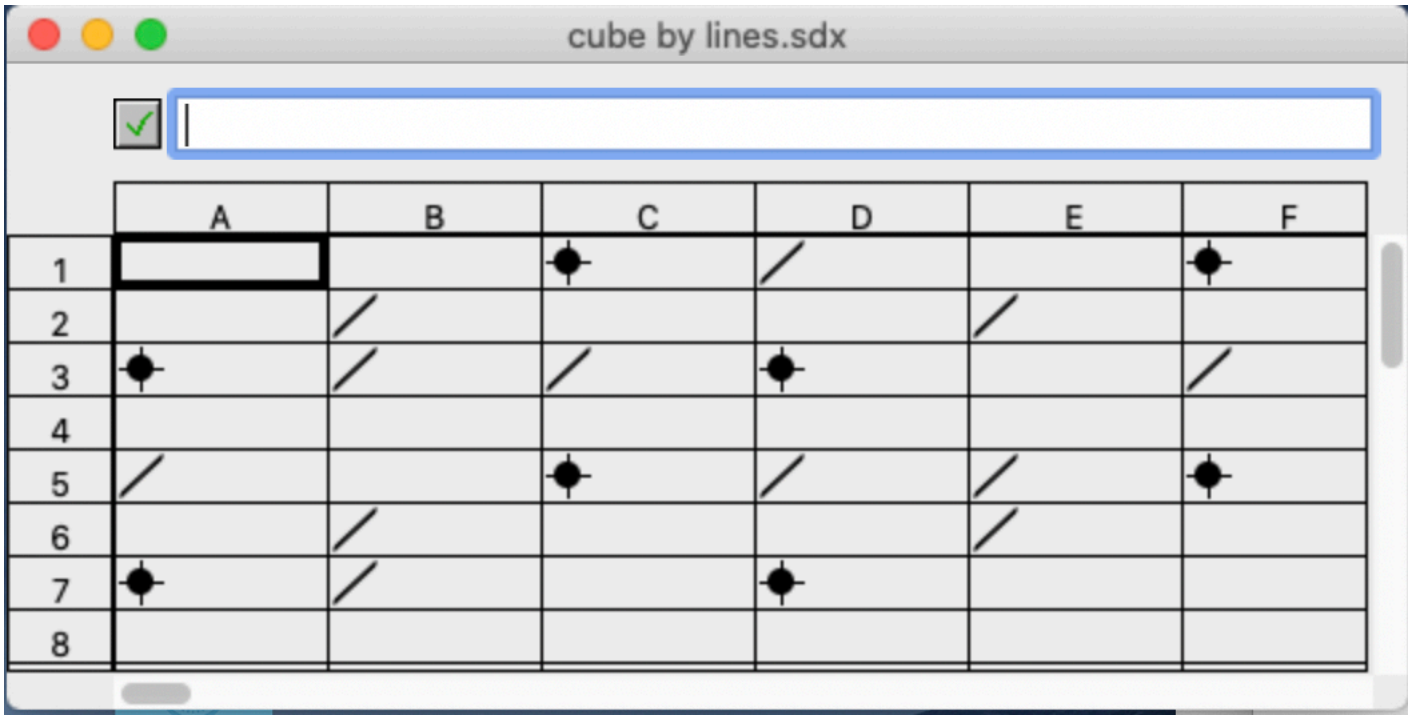
5/ Some examples provided :

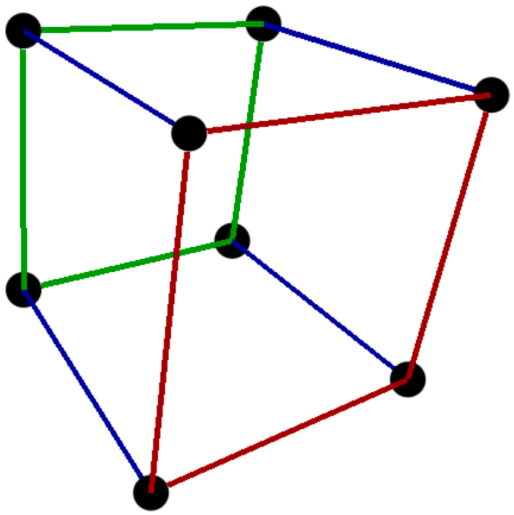
5.1 / A paver :





5.2 / Cube made up of lines and dots :



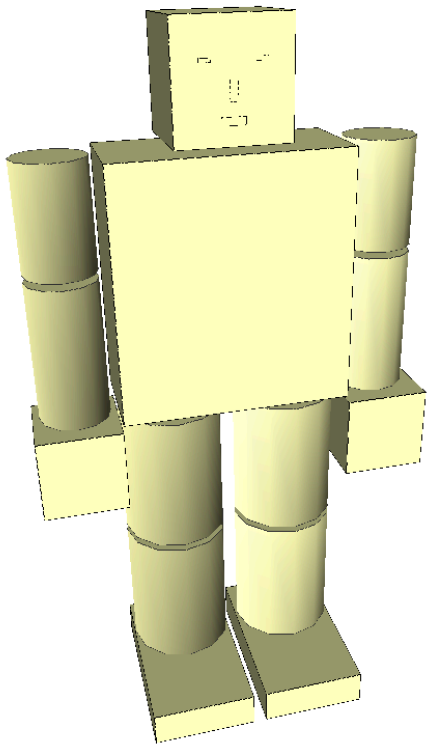


5.3 / Robot :

Robot.sdx

Foot left

	A	B	C	D	E	F
1	Foot left		Foot right			
2	Tibia left		tibia right			
3	Hand left	thigh left	thigh right			
4		forearm left	arm left			
5		torso				
6	Hand right	forearm right	arm right			
7		Head				
8	eye left	noze	eye right			
9		mouth				
10						

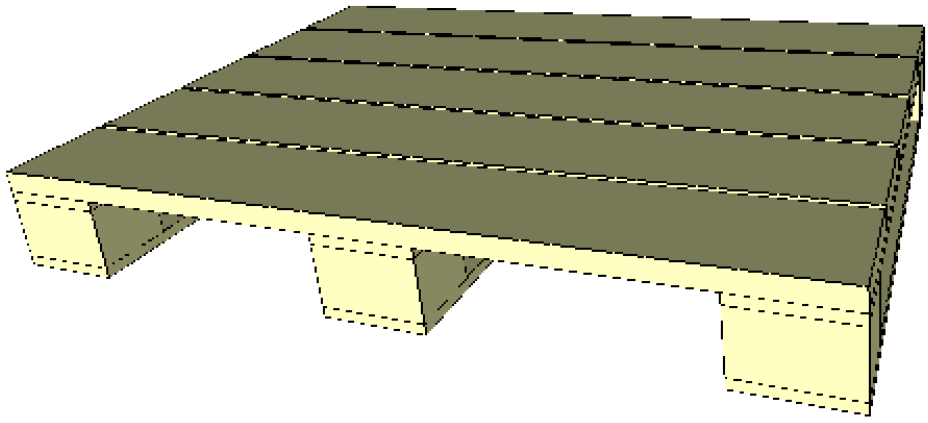


5.4 / Palet :

Pallet.sdx

Pallet

	A	B	C	D	E	F	G	H
1	Pallet	width	800,000					
2		Lenght	1200,000					
3		Hight	150,000					
4								
5	Studs	Width	100,000					
6		Lenght	150,000					
7								
8	Upper bord	Width	152,000					
9		Thickness	30,000					
10		Clearence	10,000					
11								
12	Bottom board	Thickness	15,000					
13								



6/ The menus :

6.1 / Apple :

6.1.1 / About Solidix: opens a window indicating the version of the program and the contact details of the author.

6.2 / File :

New
Open…
Save…
Save As...
Quit

6.3 / Édition :

Undo : Unmanaged function.
Cut : Allows you to edit text and cells.
Copy : " " " " "
Paste : " " " " "
Delete : Clear text fields and cells.

6.4 / Cells :

6.4.1 / Add point : Creates a new "Point" element in the selected cell.
The characteristics can be edited in the "Characteristics" floating window.

Caracteristics

Coordinate of the center of gravity	
Xg	0
Yg	0
Zg	0
Radius in pixels	3
Appearance	
Red component	0,98
Green component	0,97
Blue component	0,72

6.4.2 / Add line : Creates a new line item in the selected cell.
The characteristics can be edited in the "Characteristics" floating window.

Caracteristics

Coordinates of the beginning of the line	
x	0
y	0
z	0
Coordonate of the end of the line	
x	0
y	0
z	0
Line thickness in pixels	1
Appearance	
Red component	0,98
Green component	0,97
Blue component	0,72

6.4.3 / Add plane en X, en Y, en Z :

The plane is defined by its normal vector. It is the vector perpendicular to its surface.
A plane in X, Y, Z has its vector oriented respectively, along X, Y, Z.
The characteristics can be edited in the “Characteristics” floating window.

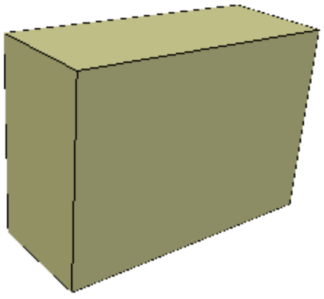
Caracteristics

Coordinate of the center of gravity	
Xg	0
Yg	0
Zg	0
Orientation	
R/x	0
R/y	0
R/z	0
Dimensions	
Lenght	10
Width	5
Appearance	
Red component	0,98
Green component	0,97
Blue component	0,72

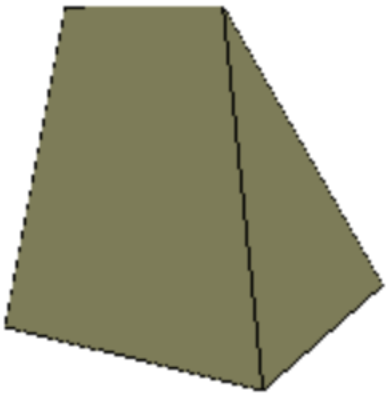
6.4.4 / Add paver : Creates a new paver element in the selected cell.
The characteristics can be edited in the “Characteristics” floating window.

Caracteristics

Coordinate of the center of gravity	
Xg	0
Yg	0
Zg	0
Orientation	
R/x	0
R/y	0
R/z	0
Dimensions	
Lenght / X	10
Width / Y	7
Thickness / Z	4
Appearance	
Red component	0,98
Green component	0,97
Blue component	0,72



6.4.5 / Add Pyramid : Creates a new Pyramid element in the selected cell.
The characteristics can be edited in the “Characteristics” floating window.



6.4.6 / Add cylindre : Create a new “cylinder” element in the cell selected.
The characteristics can be edited in the floating window « Characteristics".

Caracteristics

Coordinate of the center of gravity	
Xg	0
Yg	0
Zg	0
Orientation	
R/x	0
R/y	0
R/z	0
Dimensions	
Lenght / Y	10
Radius	5
NB of facets	12
Appearance	
Red component	0,98
Green component	0,97
Blue component	0,72

6.4.7 / Add cone : Create a new “cone” element in the cell selected.
The characteristics can be edited in the floating window « Characteristics ».

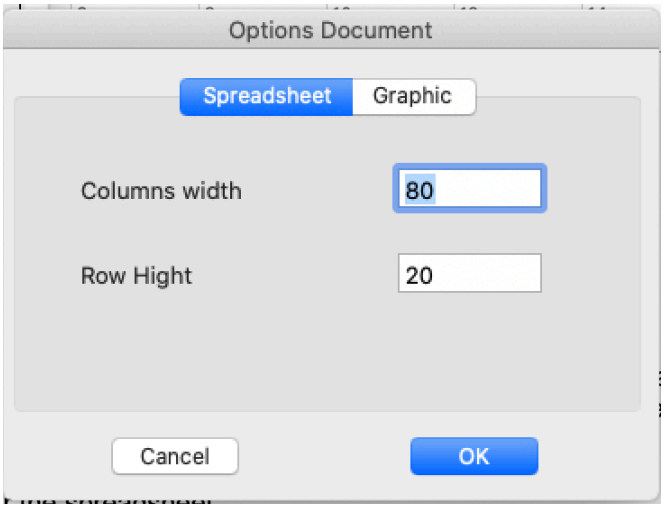
6.5 / Option :

6.5.1 / Calculation : Starts the calculation of each cell. This is normally done automatically.

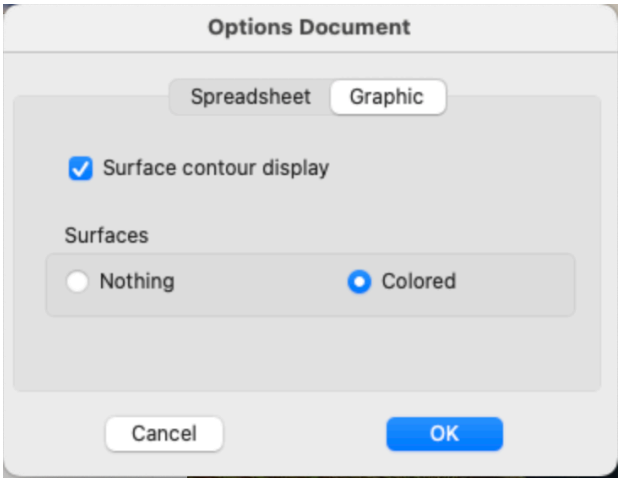
6.5.2 / Graphic : Displays items graphically in a new window.

6.5.3 / Options :

Set options for the spreadsheet.



Also allows you to set options for 3D graphics display.



Surface contour display : A black line will be drawn around all surfaces.

Surfaces:

- Nothing : The surfaces are not filled, they are transparent. it allows to have a graphic display of the wire type.
- Colorized : Surfaces are shown in colour.

7 / The author :

Program written by Yannick CALLAUD in RealBASIC then with Xojo.

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http://yannickcallaud.com

8 / Distribution of Solidix :

Solidix became Freeware from version 2.0.0.

9/ Program developments:

- version 2.2.0 : 3 Octobre 24:
  . Added Cone and Pyramid elements.
  . Added pi() and pow() functions.
  . If you enter "=" you automatically switch to formula entry mode.
  . Double-clicking in an alphanumeric or numeric cell allows you to replace its contents with a new entry.
  . Double-clicking on the color components in the characteristics window opens the color selection window.
- version 2.1.1 : 16 Septembre 24:
  . Bug correction in the evaluation of numeric expressions, and on the complete recalculation of cells.
  . Bug correction of the zoom, which did not work for a structure in the xoy plane.
  . Bug correction that prevented the complete execution of the calculation of cells.
  . Bug correction on copy and paste.
  . Addition of the atn(), asn(), acs() functions.
  . Addition of management of the arrow keys to navigate in cells.
  . Improvement of the editing of an alphanumeric and numeric cell. It is no longer necessary to click in the cell to edit it.
- version 2.1.0 of 7 September 24:
  . Updated many routines to ensure compatibility with future versions of Xojo.
  . The about dialog is displayed for 2 seconds when launching the Application.
  . Bug correction on the calculation of the normal vector to the surface, which improves the graphic representation of cylinders.
  . Bug correction that did not allow the Full Surfaces option to be activated.
  . Added Color parameters (Red, Green, Blue) for each object.
  . Added "line thickness" parameters for the line object.
  . In the graphics window, the arrow keys move the graphic representation.
  The "+" and "-" keys are used for zooming.
  The arrow keys with Option allow rotations along X or Y.
  . The spreadsheet has 500 rows instead of 200 in the previous version.
  . Rewritten cell formula evaluation routines. sin(), cos(), tan(), sqr() fonctions are allowed.

- version 2.0.3 : 10 December 23: New application icone.
- version 2.0.2 : 5 April 23: Correction bug for Windows.
- version 2.0.1 : 18 Dec 19: Correct few bugs. And create English version.
- version 2.0.0 : 5 Nov 19: Switch to FreeWare. Add movement and orientation of the 3D view using the mouse or trackpad. Added scrolling of the spreadsheet with the mouse and trackpad. 3D representation with OpenGL, which makes it possible not to represent the hidden faces and edges.
- version Solidix 1.0.0; 03 Apr 04 :
  . The Geometrix name having been registered, the program is now called Solidix.
- version 1.7.1; 22 July 02 :
  . The lines that separate the surfaces making up a cylinder are no longer drawn.
  . The tab, CR and enter keys allow editing of the characteristics.
- version 1.7.0; 20 July 02 :
  . The positions of the different windows are saved in a file preferences.
- version 1.6.0; 04 July 02 :
  . Entering the parameters of the elements is now done in a window floating.

• version 1.5.0; 23 Feb 02 :
  . Double clicking on a Geometrix document opens the application and it is displayed automatically.
• version 1.4.0; 25 Apr 01 :
  . Add the possibility to modify the number of facets of a cylinder element.
  . The map icon gives direction.
• version 1.3.0; 05 July 00 :
  . Addition of “cylinder” element.
• version 1.2.0; 8 Mars 00 :
  . Add options to set the reading direction of the table which allows to define the display order of graphic objects.
  . Add options for graphical display. Choice of surface tint and the presence of contours.
• version 1.1.0; 20 Jan 00 :
  . Adding control buttons during the graphic display.
    - Movements in the plane.
    - Rotation according to X and Y.
    - Zooms in + or -.
  . It is possible to resize the graphics window.
  . Add comments accessible with the help bubbles.
  . Add options to define the reading direction of the spreadsheet during the representation graphic

• version Geometrix 1.0.0; 15 Nov 99 : First version made available to the public.