

APM Base

User's Guide

APM Base

Management system of APM WinMachine databases

Version 9.2

User's Guide

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Introduction

Preliminaries

APM Base is intended for database management, delivered with **APM WinMachine** and for user database creation. User has following opportunities at work with databases in **APM Base**.

- *To open* databases delivered with **APM WinMachine** and to use them at work of system modules.
- *To add* in structure of the databases delivered with **APM WinMachine** the sections, groups, objects and to use it in modules.
- *To create* database and to use its information in modules.
- *To unload* data from databases with its saving in separate file on disk.
- *To export* database part with its saving in other database.

The database contains the information, which can be used by **APM WinMachine** modules. The information placed in a database, can be divided conditionally by following principle.

- *Numerical* information in table form (tolerance, landings, etc.).
- *Graphic* information (parametrical model, **APM Graph** file).
- *Text* information (technical documentation).
- *Graphic information as addition to text* (figures).

The border between these information types passes rather conditionally, because parameter list of its standard sizes (numerical information) is applied on each parametrical model (graphic information) practically.

Hardware and software requirements

APM Base runs on the IBM PC family computers (including all true IBM compatibles) with Pentium II or compatible processors and higher. **APM Base** is intended for personal computers with operational systems MS Windows 2000, XP, 2003.

Brief guidebook

Introduction (this section) contains the brief description of **APM Base**, hardware and software requirements are listed also.

Chapter 1. Work with APM Base contains the description of objects entering into databases, database structure and basic working principles.

Chapter 2. APM Base Interface contains recommendations on **APM Base** interface settings.

Chapter 3. Command Reference gives the complete description of all commands located in main menu and toolbars.

Chapter 4. APM Base Objects describes work with database objects (folder, table, figure, text, parametrical model, **APM Graph** file) in detail. The description of contextual menu options for each object is resulted.

Fonts used in this book

To help you reading this book we used the following set of fonts

<code>a:\setup</code>	This font represents the text the way it occurs on the screen, and also text, which user should enter with the keyboard
SETUP.EXE	We use all capital letters for the names of files and keys
Help	APM Base command names and buttons of dialog boxes are shown in boldface
<i>Results</i>	Italics is used for the frame names of dialog boxes and controls

How to contact APM

To contact APM you can use one of the following ways:

Send fax. Our Moscow fax number is +7(495) 585-06-11.

Call by phone +7(495) 514-84-19, 585-06-11 (Moscow).

Write a letter and send it to


Research and Software Development Center APM Ltd
Oktyabrsky boulevard 14, office №6
Korolev, Moscow Region, 141070, Russia

e-mail: com@apmwm.com

Chapter 1. Work with APM Base

Database opening / creation

APM Base start is carried out by corresponding command **Start / Programs / APM WinMachine / APM Base**. APM WinMachine group is created at system installation. APM Base start is possible from APM Integrator group also. APM Integrator icon is placed on desktop after APM WinMachine installation.

After APM Base is start, it is necessary to open databases necessary for work. For database opening (or all at once), and user database creation also should press **Open database** button , being in the left top corner of the basic window. After that, there will be *Database manager* dialog box shown below.

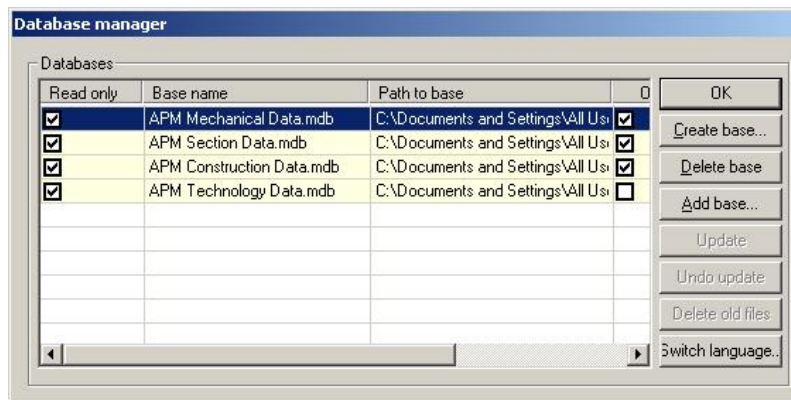


Fig. 1.1 Database manager dialog box

The list of databases shows in this dialog box. To work with a concrete database, it is necessary to put a tag in the *Opened bases* column. We shall consider list columns in detail.

Read only - opened databases will be inaccessible to editing objects (change / removal / moving / addition).

Base name - file name (*.mdb) of databases MS Access.

Path to base - way to database placed on local or network disk.

Opened bases - databases will be opened after pressing button **OK**.

Current language – language that chosen as current for database.

Databases can be installed for each user separately. This version of **APM Base** includes following databases placed in following folders (see Appendix also):

APM Mechanical Data

C: \ Documents and Settings \ All Users \ Application Data \ APM Winmachine \ DataBase \ APM Mechanical Data

APM Section Data

C: \ Documents and Settings \ All Users \ Application Data \ APM Winmachine \ DataBase \ APM Section Data

APM Construction Data

C: \ Documents and Settings \ All Users \ Application Data \ APM Winmachine \ DataBase \ APM Construction Data

Buttons of this dialog box.

OK - allows to fix changes in this box and to open selected databases.

Create base... - allows to create new database with its addition in the database list.

The system will suggest to specify a folder and to enter a file name for new database saving. It is necessary to choose a database current language. Further the system will suggest to set the base

password for information protection. At password installation the system will request it at database opening.



Fig. 1.2 Available languages



Fig. 1.3 Password manager

Delete base - allows to remove selected database from the database list.

Add base - allows to add database in the database list.

Update - allows to update database, for example, at path change.

Switch language... - allows to update switch the database language if the database is created with support of several languages. Command invokes the dialog box shown below that allows to select database language. We shall consider this dialog box commands.

Load - allows to load selected language into database.

Delete language - allows to remove language from the list. This command is accessible from the contextual menu also.

Add language that base on exist language... - allows to add new language to the list. This command is accessible from the contextual menu also.

Cancel - this command closes dialog box without modification.

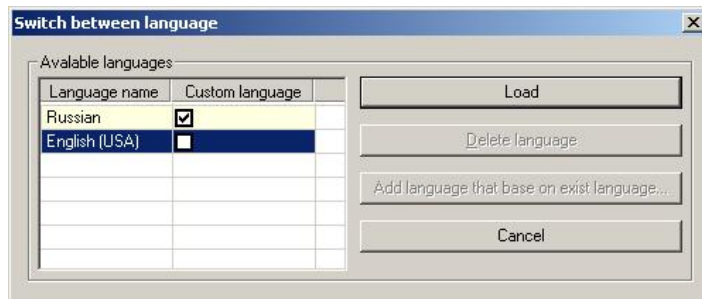


Fig. 1.4 Switch between languages dialog box



Fig. 1.5 Available languages


It is necessary to press button **Esc** if you want to close *Database manager* dialog box without saving.

After the database, that you want to open, is marked by a tag, and button **OK** is pressed, database structure will be visible in the left part.

APM WinMachine databases

The databases delivered with **APM WinMachine** contain parametrical models of standard elements, the models used by **APM WinMachine** modules for creation of parametrical drawings, initial tabulated data for bearing calculation, metrology tabulated data etc.

Databases using by **APM WinMachine** modules is resulted in following table.

All parametrical models of databases can be inserted into the drawing. **Draw / Block / Insert Object from Database...**  command is used for this purpose. Besides geometry, parametrical models are contained characteristic data, for example power, nominal rotation frequency, efficiency of electric motors; dynamic and static carrying capacity of bearings, etc. Presence of such information allows you to use databases as the reference book.


Following operations cannot be applied to objects of standard bases: *delete*, *save as...*; this operations breaking database integrity. If it is necessary to save object all over again it is necessary to create a copy of this object (this operation is accessible to all standard objects), and then the object copy can be saved for an insert in any user database. Database objects delivered with **APM WinMachine** can be edited. After editing, it is necessary to set path to the new data table.

Table 1.1 – Databases using by APM WinMachine modules

APM WinMachine module	Location in database tree	Data characteristic
APM Mechanical Data – Standards – GOST – ...		
APM Drive	...Basic parts and its elements – Reducer boxes...	Models of reducer boxes
APM Graph	...Metrological data: Parallelity, angularity, axial runout tolerances, Cylindricity and circularity tolerances, Quality class, Linear and angular sizes normal values, Deflections, Tolerance of coaxiality, symmetry, intersection of axes and radial runout, Roughness after treatment, Preferred tolerance band, Roughness classes, Flatness and straightness tolerances...	Data of contextual and drop-down menus at setting the sizes, roughnesses, tolerances ...
APM Trans	...Mechanical transmissions and its parts...	Models of transmissions
APM Shaft	...Shafts and axles: shaft elements, Conical shaft section, Axles (GOST 9650-80), Cylindrical shaft section, Cylindrical shaft section with radial hole...	Models of shaft elements
APM Bear	...Bearings...	Data of bearing characteristics
APM Spring	...Springs...	Models of springs
APM Graph	...Welding...	Data of labeling and welding methods
APM Graph	Other sections	Models of standard elements
APM Section Data – Standards – GOST – ...		
APM Graph	...Sections – ...	Models of standard elements
APM Graph	...Compound sections – ...	Models of standard elements
APM Construction Data – Standards – GOST – ...		
APM Graph	Concrete beams (GOST 20372-90), Gates (GOST 18853-73), Windows (GOST 11214-86), Windows (GOST 12506-81), Slabs (GOST 17608-91), Breast-slab (GOST 8484-82), Girders, Bearing piles (GOST 19804.7-83), Rabbet ledges and balcony doors section, Concrete footstep (GOST 8717.0-84), Concrete trusses (GOST 20213-89), Structural drawing, Cast-iron pipes (GOST 6942-98).	Standard element models of construction drawing
APM Graph	...Steel construction joints – ...	Joint models

Database objects

After creation of a new database the user should fill it. For this purpose, it is necessary to select contextual menu option enables by the right mouse button click in the database tree.

 **Create folder...** - the new folder will be created which name will need to be entered in *Create folder* dialog box

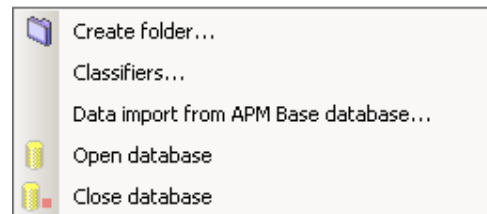





Fig. 1.6 Contextual menu of created database


It is possible to import data from database using a corresponding command of the contextual menu.


The database structure consists of following objects.


 **Folder.** In **APM Base** it is possible to view database contents of concrete folder only. The folder is designated by the standard icon accepted in Windows.


 **Object group** - object of database structure where can be parametrical models only. It is probably to open group of objects (as a folder) and to look models entering into its structure. It is impossible to unite models in group if the same variable has different expressions or the model data contains different number of rows.

 **Parametrical model APM Graph** - object that can be a part of *object group* or *folder*. Parameters of *parametrical model* shows in *Data* window, and the view of this model for its chosen standard size shows in *View* window. *The parametrical model* can be inserted into the drawing at opening a database from the graphic editor.

 **File APM Graph** - the object representing the drawing, created in **APM Graph**.

 **Table** - object where numerical data that can be used is presented.

 **Picture** - object that can exist independently in database structure or to be a part of the table. This object is intended for illustration.

 **Text file** - a text file of *.txt or *.rtf format. The object is intended for storage of text explanatory and the engineering specifications. File of any format can be chosen as *text file* object. For example, *.pdf. However, viewing of this file will be carried out by corresponding Windows application (Adobe Acrobat program for considered example).



Database structure

Work with database structure assumes itself carry of various objects from one place to another. All database objects can be moved or copied to other place of database with all contents.

To move objects from one place of a database to another it is simple enough to hold the left mouse button and to drag object to the necessary database place. In this case the moved object will leave in the previous place and will appear in that place where it has moved.

Commands of moving database elements are accessible from the corresponding toolbar also.

Table 1.2 – Move tree elements operations toolbar commands

Command		Command reference
	Move up (Ctrl+U)	Moves object upwards in tree within the limits of folder
	Move down (Ctrl+D)	Moves object downwards in tree within the limits of folder

If it is required to copy object it is enough to execute dragging procedure, holding **SHIFT** key.

Remark.

If the user has removed database object, and then replaced it on that place with its copy, this copy will not be identical to initial object. That copy cannot work with system modules as original object. Additional setting of modules is necessary for work modules with such copy.

Each database object has the unique identifier that connected database object with system modules. The identifier is generated at database installation and allows to distinguish the objects delivered with databases which cannot be removed. The identifier of moved object is saved at moving objects inside of database structure.

If the user creates object copy, it will have the identifier distinct from the original. In this case modules cannot work with that object without additional settings.

It is not supposed performance of following operations at change of database structure:

- delete and change object position delivered with APM database;
- add the table or the sketch in structure of object group.

Remark.

Databases delivered with APM WinMachine are standard, therefore it is recommended to open them ONLY FOR READING. It is better to create a new user database for editing.

Opened objects of databases

For opening of concrete database object it is necessary to select object in database structure and to press **Enter** on keyboard (or the left mouse button double click).

After these operations the selected object will open in the separate dialog window that located in the right part of main window. User can open many objects; each of them will be opened in separate window. Exception is made **APM Graph** files, which cannot be open more than 20. Sheets located in the top part of object viewing window carry out switching between opened objects.

The contextual menu of the opened window header is accessible to work convenience with the open database objects. It is possible to save changes in active window and the active window can be closed.

Besides it is possible to create new group of windows on verticals or horizontals and to place active window in it. At creation of new group of windows the open windows area decreases, therefore such operation is expedient if it is necessary to work with the several opened objects.

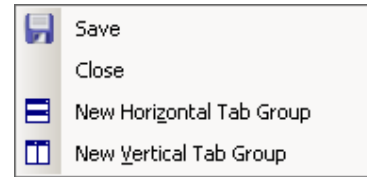


Fig. 1.7 Contextual menu of opened window header

It is convenient to use **Window / Windows...** command for work with windows. In the appeared dialog box user can select necessary window from the list and apply to it following actions: *Activate*, *Save*, *Close Windows* or *Minimize*.

The system accepts changes and closes dialog box by pressing **OK** button.

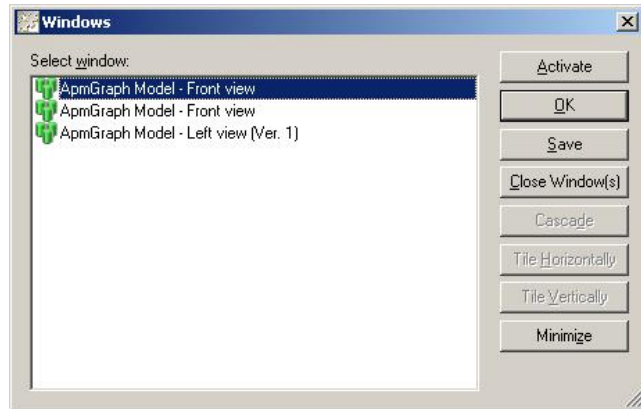



Fig. 1.8 Windows dialog box

Comment sheet it is accessible to each database object except for *Folder*. There are dates of creation and last change of object, classifier and comments.

It is probably to edit *Added by* and *Comment* fields.

Use **Comment** command  for viewing the sheet contents.

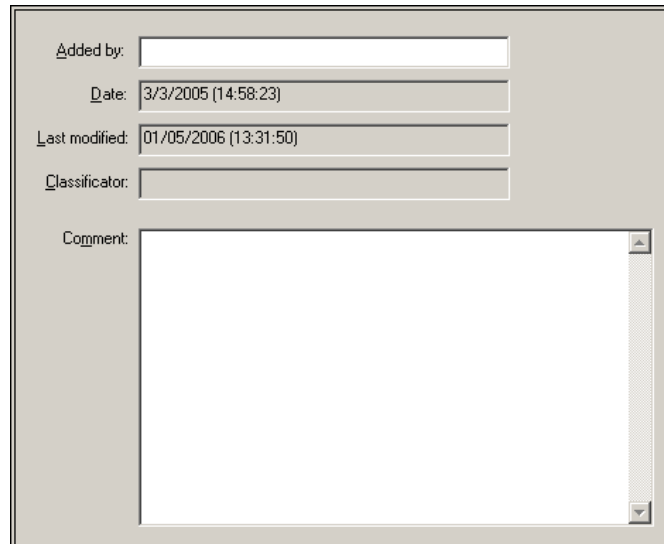


Fig. 1.9 Comment sheet

Classifiers

The classifier is a keyword (group of words) that defines concrete object of a database unequivocally. Classifier can be appropriated to object, or not. In last case **APM WinMahine** modules cannot work with that database object. At search in database, user chooses this keyword, and concrete object will be found.

It is necessary to create the list of classifiers of database objects to set the classifier to any object. It is possible to do it, having selected **Classifier...** command of contextual menu. There will be dialog box where list of the classifiers shows.

Add button allows you to add classifier to the *Classifiers* dialog box. It is necessary to enter classifier name and press **OK**.

Edit button allows you to change classifier name.

Delete button allows you to delete classifier from list.

Cancel button closes *Classifiers* dialog box.

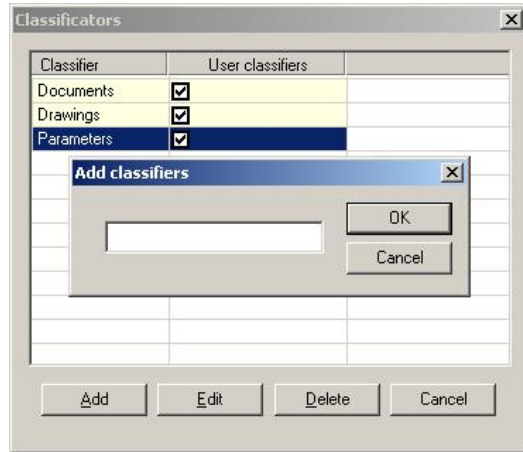


Fig. 1.10 Classifiers dialog box

It is necessary to select **Set classifier** to set classifier for concrete database object and then select classifier to that object from drop-down list in the appeared dialog box.



Fig. 1.11 Set a classifier dialog box

Object finding in database

It is probably to find object by following ways: on data string or on classifiers. We shall consider each type in detail.

Search on data string is convenient for using if the object name or comments is partially known. The command **Edit / Find...** (Ctrl+F) is used for object finding in database. It is necessary to enter word or word combination, to note necessary attributes and to press **Find again** button in the appeared dialog box. The found elements (in considered case it is elements of database tree) are selected. We press the **Find again** button once again for search of the following object containing that word or word combination.

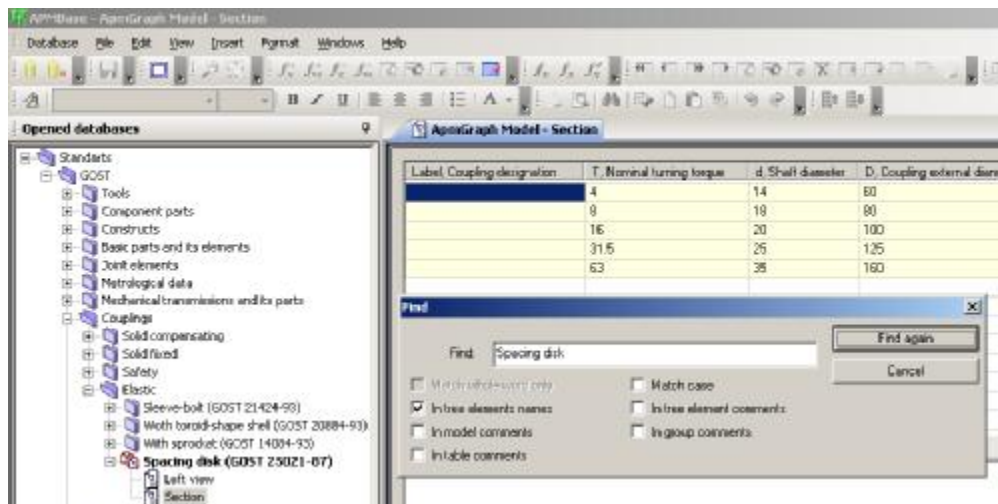



Fig. 1.12 Find dialog box (find in tree element names)

Find on classifiers is convenient for using if it is necessary to find objects of the certain group (classifier) and type (folder, object group, table, etc).

The command **Edit / Find on classifiers...** (Ctrl+J) is used for object finding in database on classifiers. Thus there will be Find bar on the right. It is necessary to select classifier from the drop-down list.

Having pressed the button search parameters  you can note objects in the contextual menu where it is necessary to find.

The *Find results* are presented in the bottom part of window in the form of the list of database objects corresponding to the selected classifier. Double click on object opens object in window.

At tag installation in *Find options*, searching is accessible only in following objects: *Parametrical model, Object Group, Table*. This function allows to find, for example, variables or their values used in tables.

System will give out the message at the incorrect entering of find options.

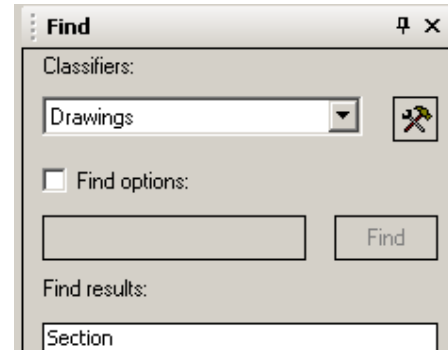


Fig. 1.13 Find bar (find on classifiers)

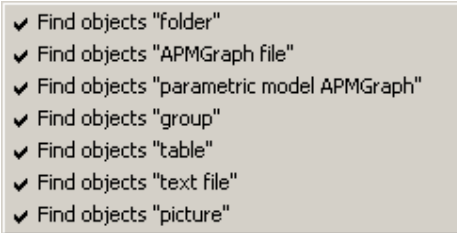


Fig. 1.14 Find in... (find on classifiers)

Chapter 2. APM Base Interface

APM Base main window consists of main menu, toolbars, database tree, status bar and window of opened database object with its sheets. APM Base elements are shown below.

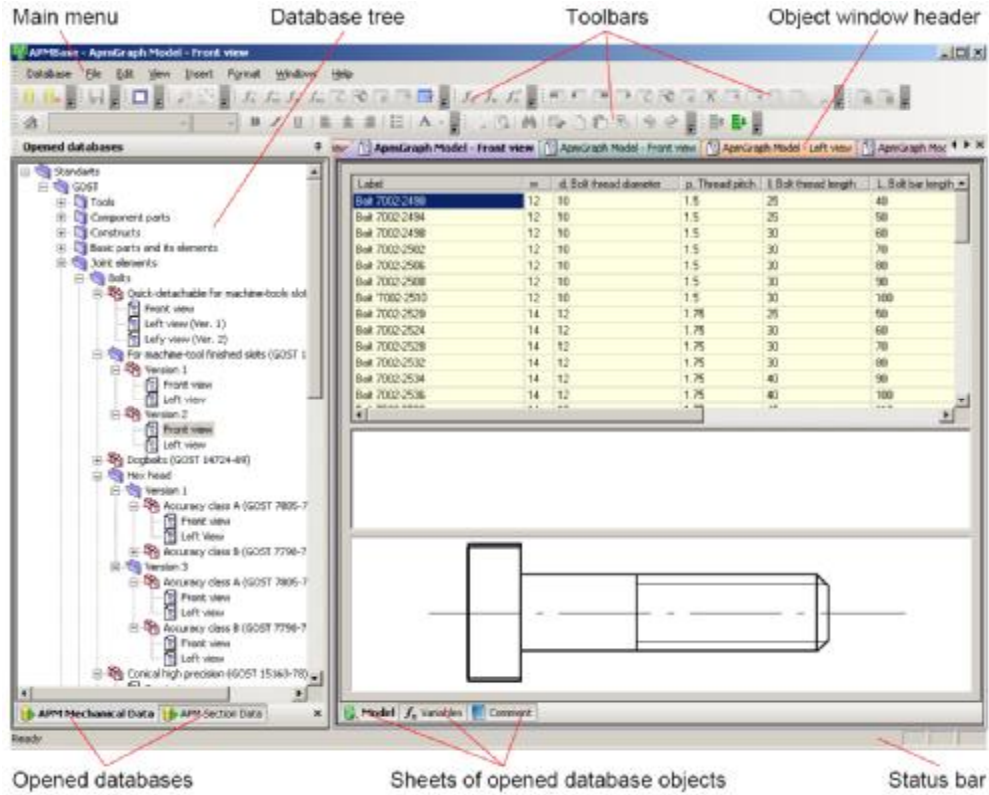


Fig. 2.1 APM Base external interface

Toolbars

Toolbars contain buttons of APM Base commands. Toolbar buttons are grouped by the operations and object types. The list of toolbars is presented in main menu structure, external view is shown below. User has opportunity to adjust all toolbars and command icons. The brief description of toolbar buttons is presented in next chapter.

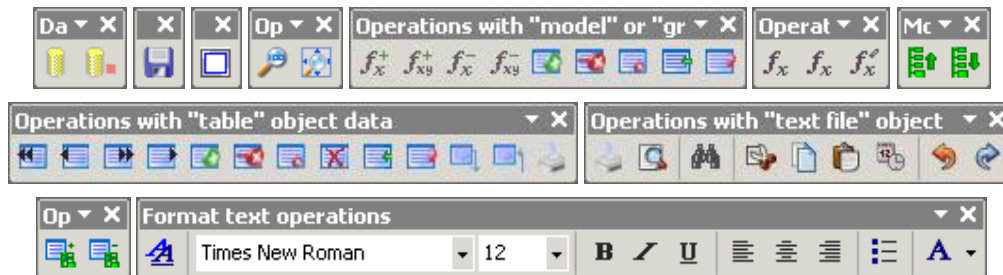


Fig. 2.2 APM Base toolbars

Main menu

The main menu is located in the top part of window and contains **APM Base** commands. The description of main menu commands is resulted in next chapter. In case performance of commands is impossible, for example, commands of text editing are impossible for parametrical model, such commands and menu elements will be inaccessible.

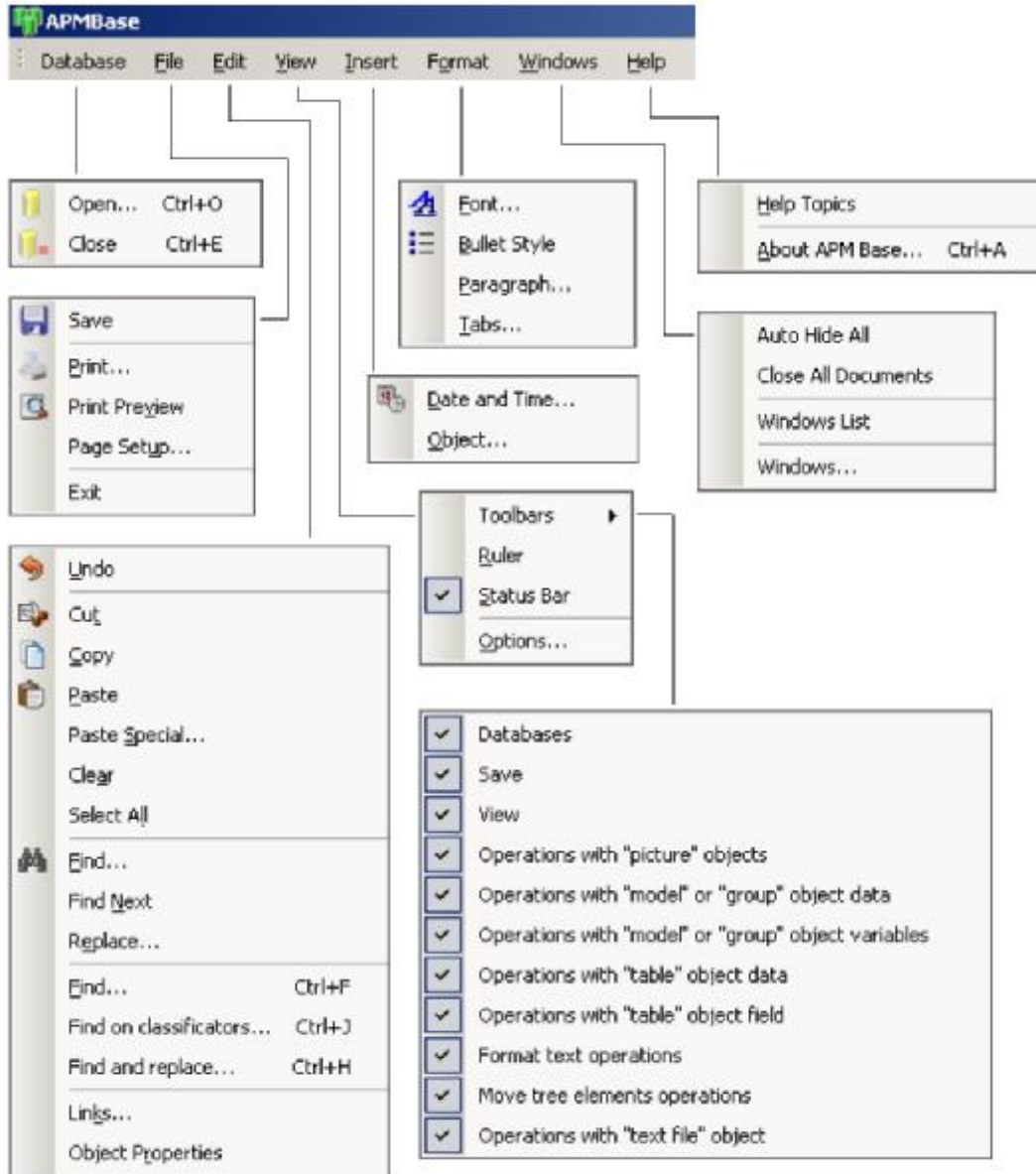



Fig. 2.3 APM Base main menu structure

User has opportunity of setting and configuration of main menu elements. The detailed description of menu settings is resulted below.

Settings

Users can adjust the menu and toolbars at own discretion: to add and delete buttons of the main menu and toolbars, to create user toolbars, to hide and display toolbars and to move them also. The main menu can be adjusted as toolbar, but it is impossible to hide the main menu.

The toolbars can arrange one after another in one line. For example, at the first start of **APM Base** the toolbars take up position from left to right by way of arrangement in the **View / Toolbars** menu.

For viewing the button list of toolbar, it is necessary to press the button  and further add or delete buttons. It is necessary to select buttons from the drop-down menu for their display on toolbar.

The toolbar contextual menu is accessible by pressing the right mouse button on any toolbar. User can on / off toolbar displaying. **Customize...** command enables *Customize* dialog box shown below.

The toolbars list is resulted on *Toolbars* sheet of *Customize* dialog box. It is necessary to press **New** button for user toolbar creation and enter toolbar name in the appeared dialog box. The user toolbar can be renamed or deleted. **Reset** button allows to restore toolbars configuration by default.

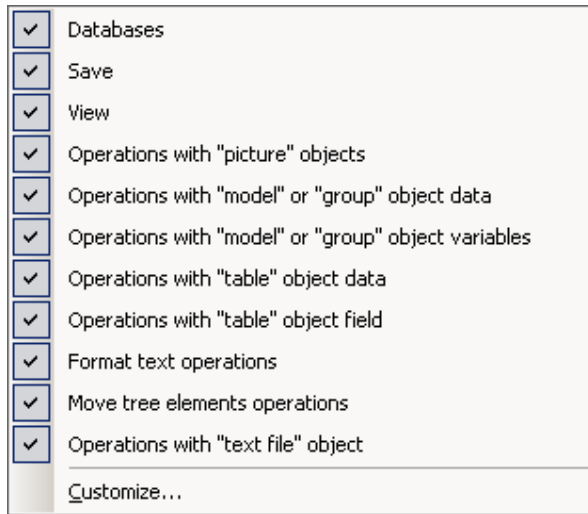


Fig. 2.4 Toolbar contextual menu

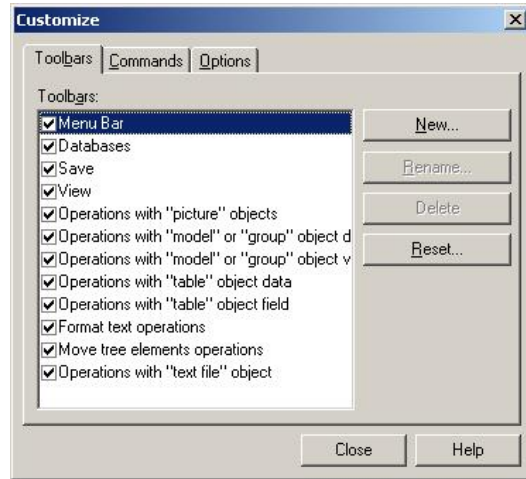


Fig. 2.5 Customize dialog box (toolbars sheet)

Commands sheet contains the list of *categories* and *commands*. To add toolbar command, it is necessary to choose category and to drag command from this sheet to necessary toolbar.

Options sheet contains additional menu settings: animations, shortcuts, screen tips, etc.

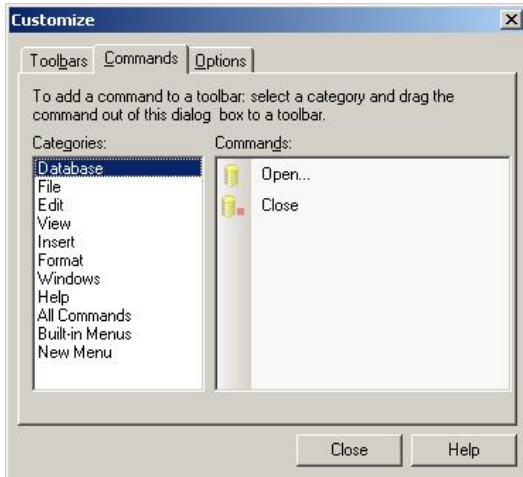


Fig. 2.6 Customize dialog box (commands sheet)

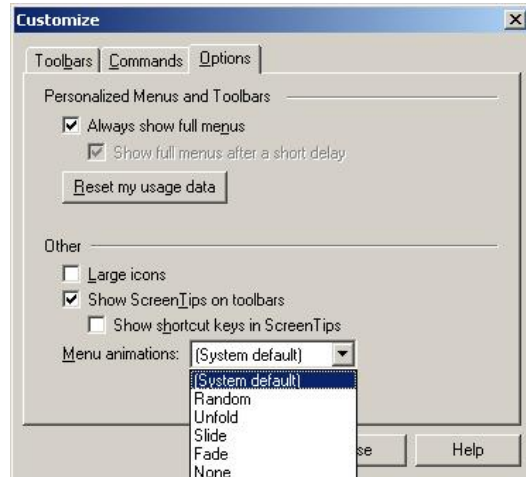


Fig. 2.7 Customize dialog box (options sheet)

Chapter 3. Command Reference

Database menu

Open

This command allows you to enable *Database manager* dialog box for database opening or creation.

Shortcuts:  or Ctrl+O

Close


This command allows you to close selected database.

Shortcuts:  or Ctrl+E

File menu

Save

This command allows you to save changes in database.

Shortcut: 

Print...

This command allows you to print current text file or table.

Shortcut: 

Print preview

This command allows you to view document in print mode.

Shortcut: 

Page Setup...

This command allows you to set page parameters.

Exit

This command allows you to exit program.

Edit menu


Undo

This command allows you to cancel last operation of text editing.

Shortcut: 

Cut

This command allows you to cut selected text fragment to clipboard.

Shortcut: 

Copy

This command allows you to copy selected text fragment to clipboard.

Shortcut: 

Paste

This command allows you to insert text fragment from clipboard.

Shortcut: 

Paste Special...

This command allows you to insert contained clipboard to the text document in following format: MS Word, figure, *.rtf file, not formatted text.

Clear

This command allows you to clear selected text fragment.

Select All

This command allows you to select all text.

Find...

This command allows you to find text fragment in current document.

Shortcut: 

Find Next

This command allows you to find next text fragment in current document.

Replace...

This command allows you to replace text fragment.

Find...

This command allows you to enable *Find* dialog box to finding in database tree.

Shortcut: (Ctrl+F)

Find on classificators...

This command allows you to enable *Find* dialog box to finding on classificators.

Shortcut: (Ctrl+J)

Find and replace...

This command allows you to enable *Find and Replace* dialog box to finding and replacing in database tree or database object comments.

Shortcut: (Ctrl+H)

Links...

This command allows you to change connected objects.

Object Properties

This command allows you to enable *Object Properties* dialog box.

View menu

Toolbars

This command enables dialog box that allows you to toggle toolbars on and off. Set checkmark against toolbars you want to have toggled on and remove checkmark to have it toggled off.

Ruler

This command allows you to enable / disable ruler of text documents.

Status bar

This command allows you to enable / disable status bar showing.

Options...

This command allows you to set text parameters.

Insert menu

Date and Time...

This command allows you to insert date and time in text document.

Shortcut: 

Object...

This command allows you to connect or insert object that created in another program.

Format menu

Font...

This command allows you to enable *Font* dialog box.

Shortcut: 

Bullet Style

This command allows you to insert marker before the paragraph.

Shortcut: 

Paragraph...

This command allows you to enable *Paragraph* dialog box.

Tabs...

This command allows you to enable dialog box where you can set tabulations.

Window menu

Auto Hide All

This command allows you to hide all trees of databases.

New Horizontal Tab Group

This command allows you to create new group of windows on horizontals and to place active window in it.

Shortcut: 

New Vertical Tab Group

This command allows you to create new group of windows on verticals and to place active window in it.

Shortcut: 

Close All Documents

This command allows you to close all opened documents.

Windows List

These commands allow you to activate opened windows.

Windows...

This command allows you to enable *Windows* dialog box where you can select necessary window from the list.

Help menu

Help Topics

This command allows you to enable **APM Base** help.

About APM Base...

This command enables dialog box that contains information about program.

Databases toolbar

Open

This command allows you to enable *Database manager* dialog box for database opening or creation.

Shortcuts:  or Ctrl+O

Close

This command allows you to close selected database.

Shortcuts:  or Ctrl+E

Save toolbar

Save

This command allows you to save changes in database.

Shortcut: 

View toolbar

Show All

This command allows you to show figure entirely.

Shortcut: 

Operations with “picture” object toolbar


Normal view

This command allows you to show picture according to monitor resolution.

Shortcut: 

Fit to window

This command allows you to fit picture to viewing window.

Shortcut: 

Operations with “model” or “group” object data toolbar

Add variable...

This command allows you to add variable from the list to the data table header of parametrical model.

Shortcuts:  or Ctrl+A

Add all variables

This command allows you to add all variables to the data table header.

Shortcut: 

Remove variable

This command allows you to delete variable from table header.

Shortcut: 

Delete all

This command allows you to delete all variables from the data table header.

Shortcut: 

Add string

This command allows you to add data string in the table for data addition.

Shortcuts:  or Ins

Delete string

This command allows you to delete data string, which element is selected.

Shortcuts:  or Shift+Del

Delete data

This command allows you to delete data of the selected cell.

Shortcuts:  or Del

Paste

This command allows you to insert clipboard data.

Shortcut: 

Copy table in buffer

This command allows you to copy table header and data to clipboard.

Shortcut: 

Operations with “model” or “group” object variables toolbar


Add variable...

This command allows you to add new variable.

Shortcut: 

Delete variable

This command allows you to delete selected variable.

Shortcut: 

Change variable...


This command allows you to edit selected variable.

Shortcut: 

Operations with “table” object data toolbar

Previous string

This command allows you to change string upwards concerning selected.

Shortcut: 

To first

This command allows you to change selected string to first string.

Shortcut: 

Next string

This command allows you to change string downwards concerning selected.

Shortcut: 

To end

This command allows you to change selected string to end string.

Shortcut: 

Add string

This command allows you to add string in the table end for data addition.

Shortcuts:  or Ins

Delete string

This command allows you to delete data string, which element is selected.

Shortcuts:  or Shift+Del

Delete data

This command allows you to delete data from selected cell.

Shortcuts:  or Del

Delete all

This command allows you to delete all strings.

Shortcut: 


Paste

This command allows you to insert clipboard data.

Shortcuts:  or Ctrl+V


Copy

This command allows you to copy data to clipboard.

Shortcut: 


Export

This command allows you to export data to *.xls format file (MS Excel).

Shortcut: 

Import

This command allows you to import data from *.xls format file (MS Excel).

Shortcut: 

Print


This command allows you to print table.

Shortcut: 

Operations with “table” object field toolbar

Add field...

This command allows you to add field with parameters setting.

Shortcut: 

Delete field

This command allows you to delete field.

Shortcut: 

Format text operations toolbar

Font

This command allows you to enable *Font* dialog box where you can set font.

Shortcut: 

Font type

This command allows you to set font type from drop-down list for current selection.

Font size

This command allows you to set font size from drop-down list for current selection.

Bold

This command allows you to set bold font for current selection.

Shortcut: **B**


Italic

This command allows you to set italic font for current selection.

Shortcut: 


Underline

This command allows you to set underline font for current selection.

Shortcut: 


Left alignment

This command allows you to align text by left side.

Shortcut: 


Center alignment

This command allows you to align text by center.

Shortcut: 

Right alignment

This command allows you to align text by right side.

Shortcut: 


Bullets

This command allows you to insert bullet.

Shortcut: 

Font color

This command allows you to set font color.

Shortcut: 

Move tree elements operations toolbar

Move up

This command allows you to move object upwards in tree within the limits of folder.

Shortcuts:  or Ctrl+U

Move down

This command allows you to move object downwards in tree within the limits of folder.

Shortcuts:  or Ctrl+D

Operations with “text file” object toolbar

Print...

This command allows you to print current text file.

Shortcut: 

Print preview

This command allows you to view document in print mode.

Shortcut: 


Find

This command allows you to find text fragment in current document.

Shortcut: 


Cut

This command allows you to cut text to clipboard.

Shortcut: 


Copy

This command allows you to copy text to clipboard.

Shortcut: 


Paste

This command allows you to insert clipboard data.

Shortcut: 

Date and Time...

This command allows you to insert date and time in text document.

Shortcut: 

Undo

This command allows you to cancel last operation.

Shortcut: 

Redo

This command allows you to return last cancelled operation.

Shortcut: 


Chapter 4. Database Objects


It is necessary to select database object to work with it (not changing containing information). The contextual menu will be available by the right mouse button click which contents will differ depending on selected object.


The object should be opened for work with this object data (information changing). Let's consider work with each object in detail.


Folder


APM Base folder has the same value, as folder (directory) in Windows. It is possible to view contents of concrete folder in the database editor only. Contextual menu command reference is shown below.


 **Create folder...** The new folder will be created in the selected folder or in empty database which name will need to be entered in appeared dialog box.

 **Create group...** The object group will be created in the selected folder which name will need to be entered in appeared dialog box.

 **Create table...** The new table will be created in the selected folder which name will need to be entered in appeared dialog box.

 **Add table...** User has opportunity to add preliminary saved table from separate (*.abt **APM Base** Table) file to selected folder. The standard dialog box opens where it is necessary to specify file directory.

 **Add APM Graph parametric model...** User has opportunity to add *.agp file of parametrical model to the selected folder.

 **Add ApmGraph file...** User has opportunity to add *.agr file of drawing (sketch) to the selected folder. The standard dialog box opens where it is necessary to specify **APM Graph** file directory.

Add picture... User has opportunity to add picture to the selected folder. The picture is explaining object. The format of such picture can be various.

Add text file User has opportunity to add text file of *.txt or *.rtf format to the selected folder. It is probably to add documents of other formats also, for example *.pdf. Thus viewing of this document will be carried out by corresponding Windows application.

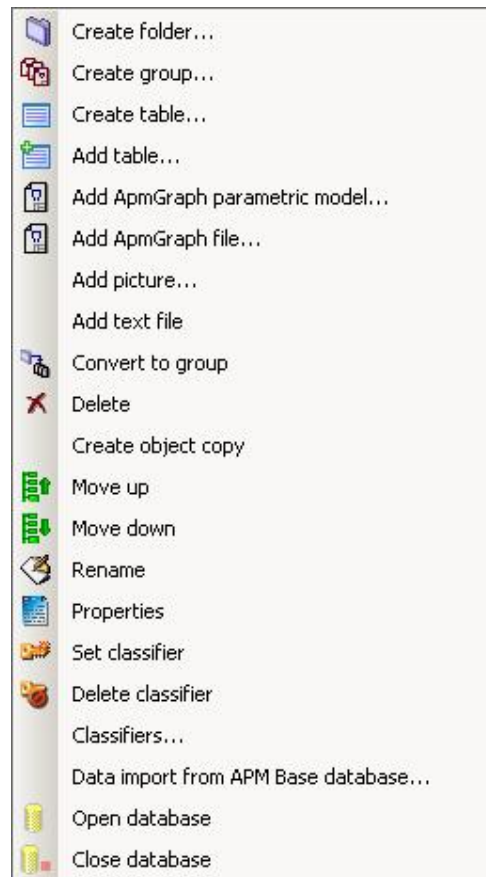






Fig. 4.1 Folder contextual menu







 **Convert to group.** This operation is possible only if elements located in folder has *.agp file format (parametrical model). In this case the selected folder becomes object group.

 **Delete.** This command deletes the selected object from database.

Create object copy. It is possible to create a copy of the selected object in the same *folder* or *object group*.

 **Move up.** This command allows you to move object upwards in tree within the limits of folder.




 **Move down.** This command allows you to move object downwards in tree within the limits of folder.

-  **Rename.** User has opportunity to rename object as it is accepted in Windows.
-  **Properties.** This command enables *Properties* dialog box of the selected object.
-  **Set classifier.** This command sets classifier to the selected object from the classifier list of the appeared dialog box.
-  **Delete classifier.** This command deletes the classifier appropriated to selected object.
- Classifiers...** This command enables dialog box with classifier list. It is possible to add, change or delete classifier by means of buttons in this dialog box.
- Data import from APM Base database...** This command imports data to opened database from other APM database (*.mdb). Its internal structure should correspond to the structure accepted in **APM Base**. The standard dialog box opens where it is necessary to specify *.mdb imported database directory. The imported database will be placed in the root catalog.
-  **Open database.** This command allows you to enable *Database manager* dialog box for database opening or creation.
-  **Close database.** This command allows you to close current database.

Object group

Object group is database object where can be only parametrical models **APM Graph**. The object group is characterized by values of the variables entering into group of parametrical models. Editing of the data entering into group is similar to data editing of parametrical model (see the description of parametrical model).

Parametrical models of the same devices can be a part of object group, for example a bolt with various views representing it (front view, left view, section, etc.). It is probably to open object groups (as folders) and to look what models enter into its structure. Many options of object group contextual menu are similar to corresponding options of folder contextual menu; therefore we shall consider those options which differ from resulted above.

-  **Open.** User has opportunity to open the selected database object.
-  **Add APM Graph parametric model...** User has opportunity to add *.agp file of parametrical model to the selected object group. Let's note that any other object (folder, table ...) cannot be added in object group. It is impossible to unite models if the same variable has different expressions in them or the different number of strings contains in data of model.
-  **Convert to folder.** The selected object group will be converted to folder.

Other options of object group contextual menu are similar to corresponding options of folder contextual menu.

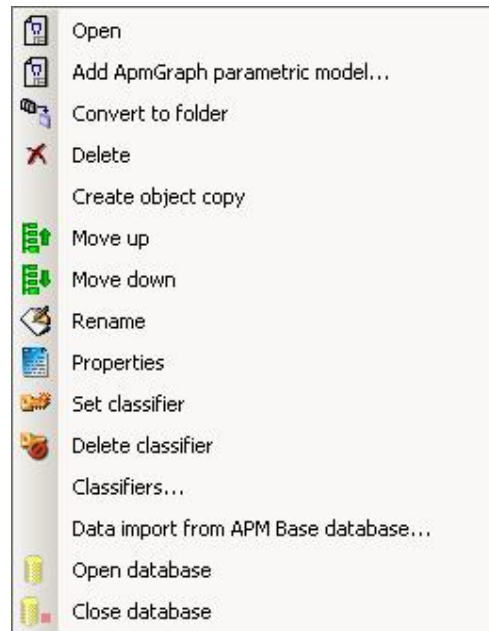




Fig. 4.2 Object group contextual menu


Parametrical model

Parametrical model APM Graph is object which can be a part of object group or folder. Parameters of parametrical model show in *Data* window. Variables-messages and errors (if it take place) for a concrete standard size of model are shows in average part of data window. The parametrical model can be inserted into the drawing at database opening from the graphic editor.

As well as in the previous case, many options of this contextual menu are similar to corresponding options of folder and object group contextual menu; therefore we shall consider those options which differ from resulted above.

 **Open.** User has opportunity to open the selected parametrical model.

 **Save as...** This command allows to save selected parametrical model to separate file of *.agp or *.dxf format. It is necessary to specify directory where the file will be saved and enter its name in the appeared standard dialog box.

 **Reinsert...** This menu command allows to update corresponding object in database. To do that, it is required to specify a way to file that will update the selected object.

Other options of parametrical model contextual menu are similar to corresponding options of folder contextual menu.

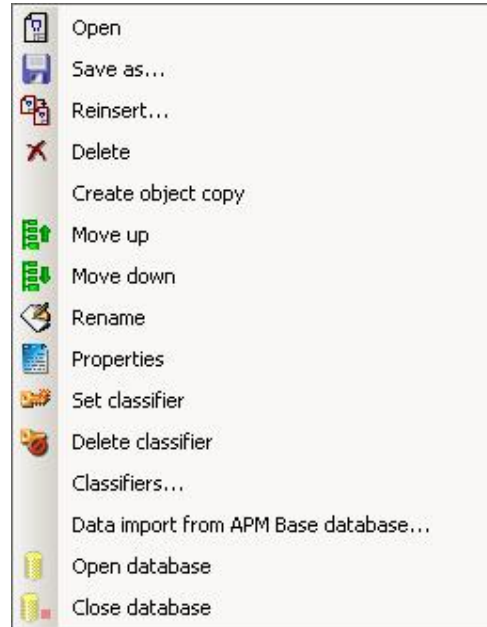


Fig. 4.3 Parametrical model contextual menu

Model, *Variables* and *Comments* sheets are accessible after opening of parametrical model. We shall consider work with these sheets in detail.

Model sheet. The top field is intended for the task of variable values of parametrical model in the form of the table. It is possible to add variables in column headers of the table, to add empty strings, to enter data into strings from the keyboard using contextual menu commands. For introduction of values of variables move the cursor to the necessary field and enter value from the keyboard. Data of table cells can be inserted from the clipboard also. Variables-messages cannot be added as varied data in the table.

Parametrical model commands are accessible from the corresponding toolbar also (see previous chapter).

Comments, name and variable-message are presented in the central field.

The parametrical model view on the basis of the selected data string is displayed in the bottom field. Dynamic moving of this view is carried out by holding of the right mouse button; model scaling – by mouse scroll. The left mouse button double click opens window of model viewing.

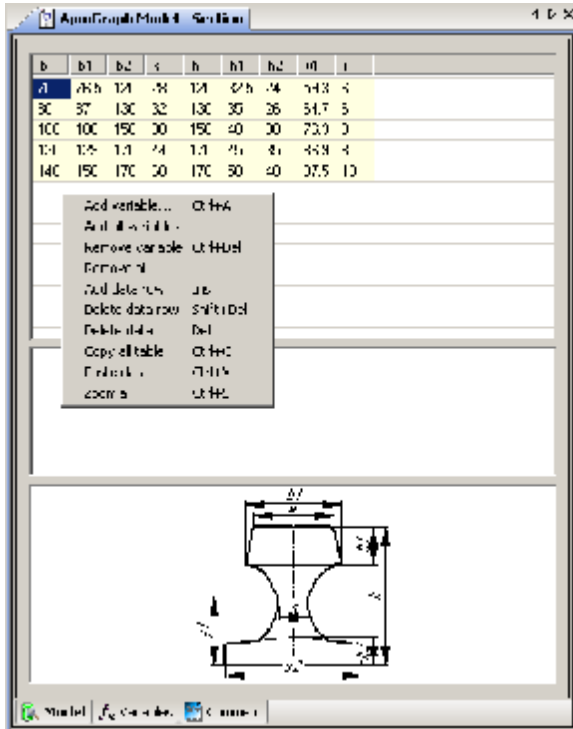


Fig. 4.4 Model sheet

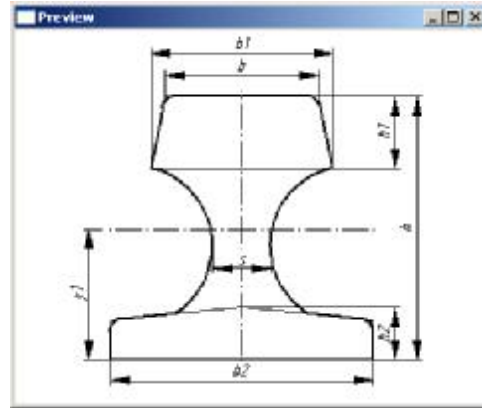


Fig. 4.5 Preview window

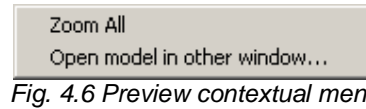


Fig. 4.6 Preview contextual menu

Variables sheet contains the information about variables used in parametrical model. Variables can be divided conditionally into the basic and additional.

The basic variables are added together with parametrical model **APM Graph** and used at model creation. The basic variables cannot be removed. Comments are accessible to change at such variables and values by default only. It is possible to change message color and background color for *message variables*.

Additional variables are added by user to parametrical model and do not participate directly at model creation. Additional variables differ from the basic variables by grey color.

Necessity of additional variables arises for creation of additional messages. The additional variables (which are not containing expressions, i.e. independent) are accessible in *Model sheet* as column headers and therefore, can be used for creation standard size row.

For commands enabling it is necessary to use the contextual menu or buttons of the corresponding toolbar (see previous chapter).

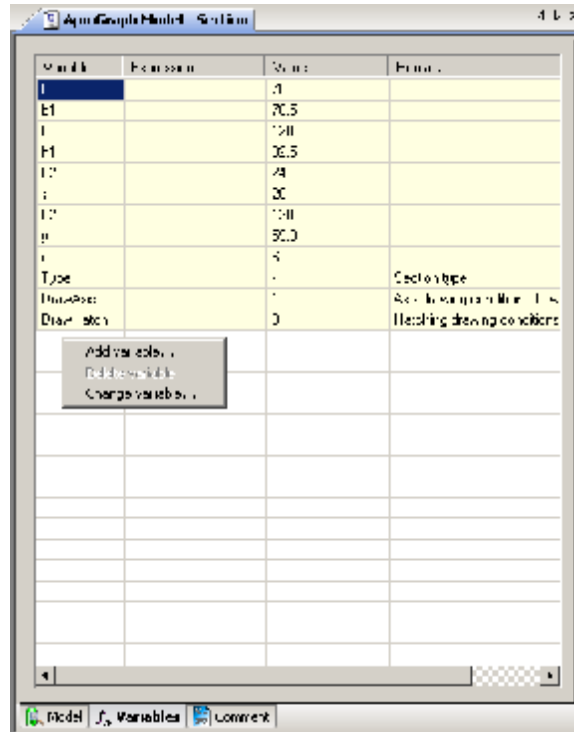


Fig. 4.7 Variables sheet

Add variable... command enables dialog box for creation of new variable or variable-message.

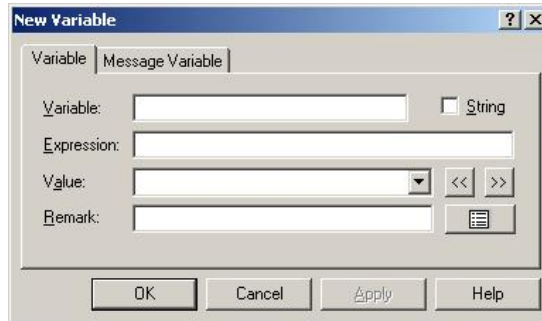


Fig. 4.8 New Variable dialog box (Variable sheet)

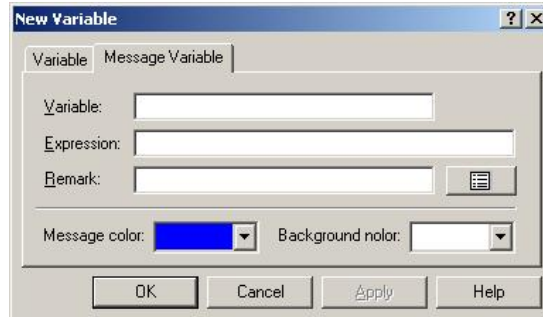





Fig. 4.9 New Variable dialog box (Message Variable sheet)

You can set corresponding parameters of new additional variable. *The variable* should have the unique name consisting from header or lower case letters of the Latin alphabet, numbers, sign ‘_’. Number should not begin name. The variable can be numerical or string. The variable type is set at its creation at installation of corresponding tag. It is necessary to appropriate value to numerical variable even if expression is set to it. In case the variable sets expression (analytical or string), further variable value will be automatically counted according to expression. Expression should be function of the variables declared to this moment. Syntax of analytical and string expressions is stated in **APM Graph** user's guide (Parametrization section). It is possible to set comment to variable. The button  displays dialog box where you can set comment language.

Variable values can be presented in the form of the drop-down list. For addition and removals of numerical values are used corresponding buttons:  – add to... and  – remove from...

It is necessary to place the mouse cursor at string and holding left mouse button drag the selected string to new place for change variable position.

Message Variable sheet. These variables are intended for information conclusion in the central field of *Model* sheet.

User can choose text color and background color of the message using palettes.

Delete variable command is accessible for additional variables only.

Change variable... command enables dialog box shown below where you can edit variable.

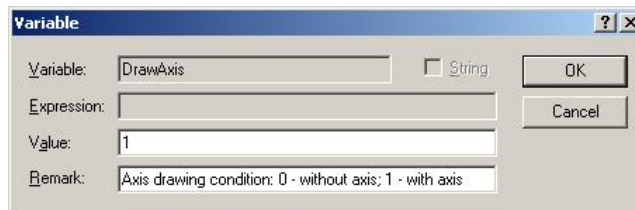




Fig. 4.10 Variable dialog box


Comments sheet contains object properties.

APM Graph file

APM Graph file represents the drawing executed in **APM Graph**. As well as in the previous case, many options of this contextual menu are similar to corresponding options of folder and parametrical model contextual menu; therefore we shall consider those options which differ from resulted above.

 **Open.** User has opportunity to open the selected **APM Graph** file without editing.

 **Save as...** This command allows to save selected parametrical model to separate file of *.agr or *.dxf format. It is necessary to specify directory where the file will be saved and enter its name in the appeared standard dialog box.

 **Reinsert...** This menu command allows to update corresponding object in database. To do that, it is required to specify a way to file that will update the selected object.

Other options of APM Graph file contextual menu are similar to corresponding options of folder contextual menu.

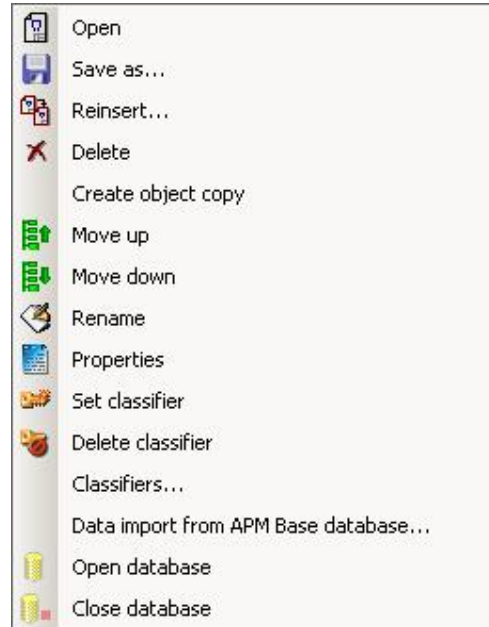





Fig. 4.11 APM Graph file contextual menu

Table

Table is database object where numerical data are stored. As well as in the previous case, many options of this contextual menu are similar to corresponding options of folder and parametrical model contextual menu; therefore we shall consider those options which differ from resulted above.

 **Open.** User has opportunity to open the selected table and edit it.

 **Add picture...** This command allows to add picture to the selected table. This object is intended for illustration. The table can contain some pictures.

 **Save as...** This command allows to save selected table to separate *.abt format file for insert to other database. It is necessary to specify directory where the file will be saved and enter its name in the appeared standard dialog box.

Other options of table contextual menu are similar to corresponding options of folder contextual menu.

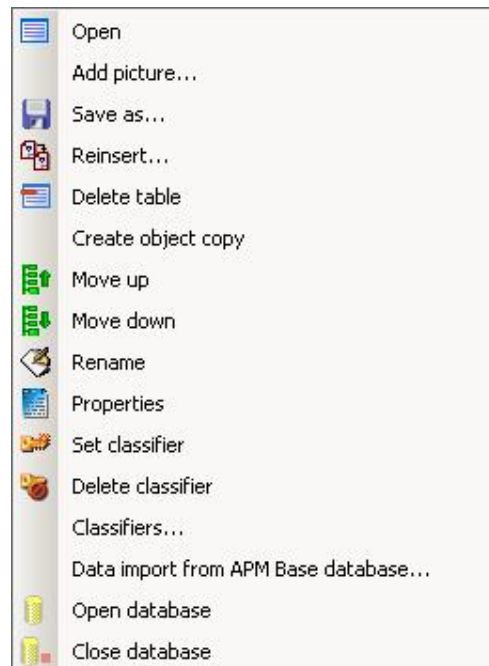


Fig. 4.12 Table contextual menu

Table sheet. There are headers of table columns in the top part of data field. The headers consist of two parts: name (for example, Label) and comment to this name. Headers of table columns are defined in *Field properties* sheet. Using contextual menu commands of the *Table* sheet it is possible to add an empty string and to enter data from the keyboard. Data of table cells can be inserted from the clipboard or imported.

Table commands are accessible from the corresponding toolbar also (see previous chapter).

Remark.

Insert in the table other table part by clipboard can be successfully executed only if formats of corresponding fields of inserted table and initial table are coincide. Otherwise the message of impossibility of such operation will be given.

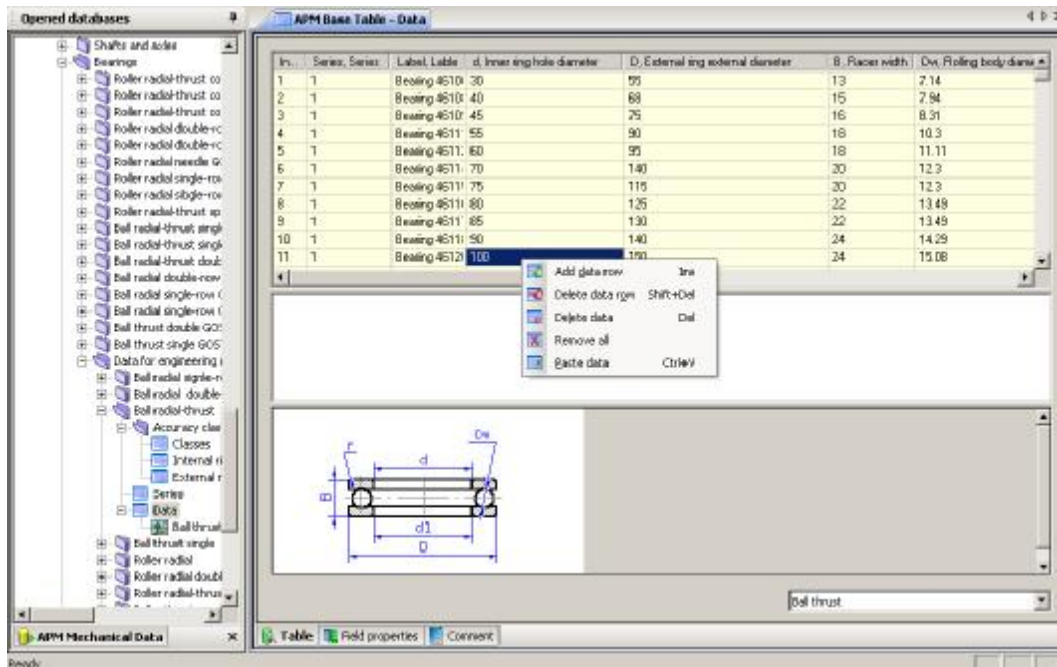


Fig. 4.13 Opened database object (table sheet)

Pictures that added to table are displayed in preview window. Switching between pictures is carried out by drop-down menu, located below preview window.

Field properties sheet. Each table string of this sheet contains the description of column parameters *Table* sheet. The top string of *Field properties* sheet corresponds to extreme left column of *Table* sheet.

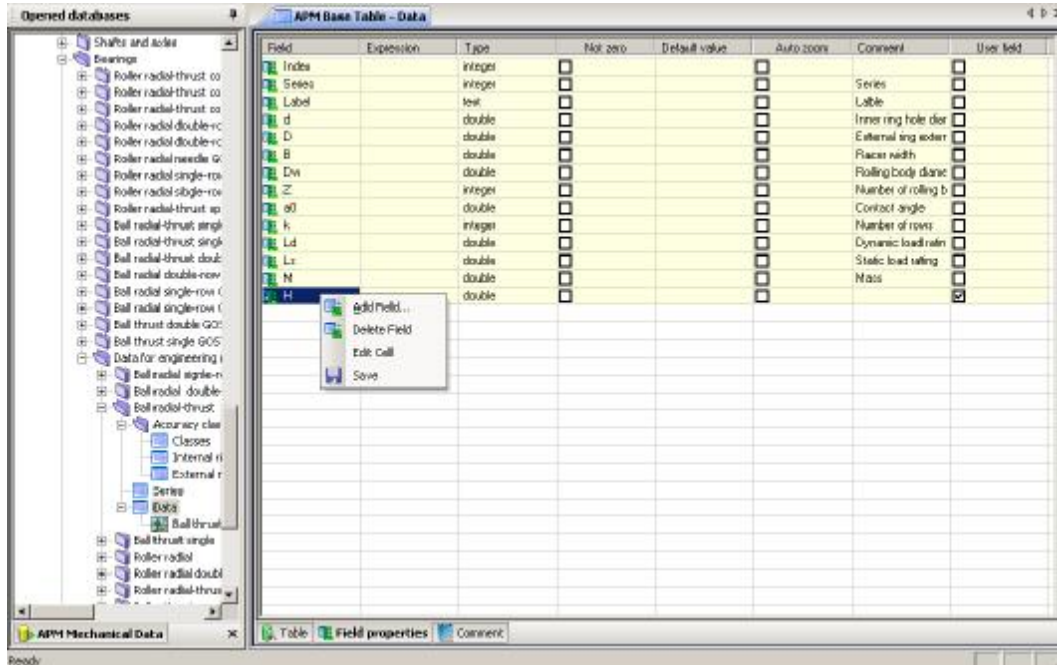


Fig. 4.14 Opened database object (field properties sheet)

Let's consider properties of table fields defining parameters of data columns presented on Table sheet in detail.

Table 4.1 – properties of table fields

Parameter	Parameter description
Field	The field name of data column is specified in this parameter. This name together with comments is born in header of table column. The field name should consist of letters of the Latin alphabet and numbers, to begin with the letter. Lower case and capital letters of the Latin alphabet have different sense. The field name acts as a variable name that can be used in arithmetic and logic expressions for calculation of any numerical data.
Expression	Expressions can be written in this field that can be used at numerical value calculation. Expressions can be arithmetic (when result turns out in the form of numerical value), logic (when result will be 1 or 0 ("true" or "false")), and mixed also when value of logic expression is factor of any arithmetic expression.
Type	The data type is set in this field. There is opportunity to select data type from the drop-down list. If to select one of column cells. Data types: <i>Integer, Boolean, Double, Text</i> .
Not zero	Zero is impossible value in corresponding data field if tag is set in this field.
Default value	Value by default is set in this field. This value can be set, or not set. In the event that the variable with a name set in parameter "Floor", If the variable is not used in arithmetic or logic expressions it is supposed to not set its value. Otherwise, it is necessary to set variable value by default.
Auto zoom	Value of the previous string will be increased on unit at transition to next data string in the given table column if tag is set. This operation can be used at the numbering of strings, etc.
Comment	Comments can be written to corresponding table column in this field. Comments can be both in Russian and in English languages. The content of this cell is added (through a comma) to parameter "Field" and this set becomes header of corresponding column of the table with data.
User field	This field is added by user if the tag is set. Such data will not delete and be updated at installation of new database versions.

User has opportunity to create columns in existing database in the Table sheet and additional parameters of existing columns with use of following tools.

You can add field, delete field, edit sell and save changes using contextual menu of *Field properties* sheet.

Remark.

The opportunity of editing of cell contents is given in that case when that table column is selected where the information can be edited.

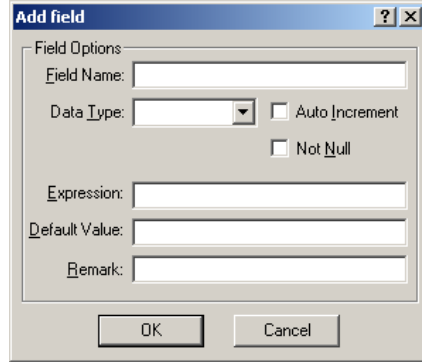




Fig. 4.15 Add field dialog box

These commands are accessible from the corresponding toolbar also (see previous chapter). *Comments* sheet contains object properties.

 **Picture**

Picture is object that can exist in database structure independently or to be table part. This object is intended for illustration. The format of such figure can be various. Many options of this contextual menu are similar to corresponding options of folder and parametrical model contextual menu; therefore we shall consider those options which differ from resulted above.

 **Open.** User has opportunity to open the selected file without editing.

 **Save as...** This command allows to save selected table to separate *.abp format file for insert to other database. It is necessary to specify directory where the file will be saved and enter its name in the appeared standard dialog box.

Other options of picture contextual menu are similar to corresponding options of folder contextual menu.

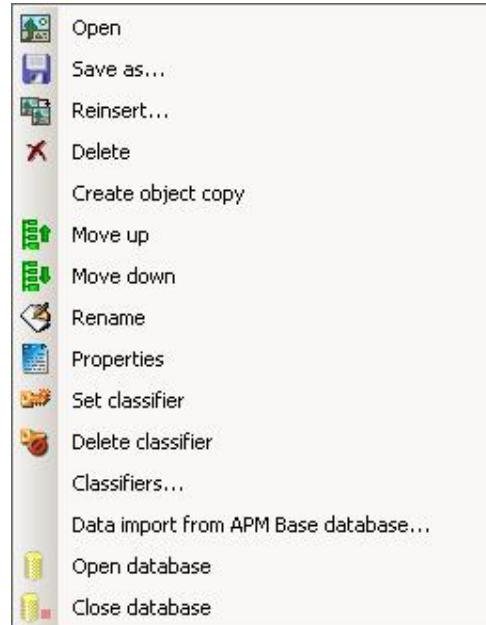




Fig. 4.16 Picture contextual menu

Picture commands are accessible from the corresponding toolbar (see previous chapter).

Text file

Text file object is text file of *.txt or *.rtf format. The object is intended for storage of text explanatory and the engineering specifications. File of any format can be chosen as *text file* object. For example, *.pdf. However, viewing of this file will be carried out by corresponding Windows application (Adobe Acrobat program for considered example). Many options of this contextual menu are similar to corresponding options of folder and parametrical model contextual menu; therefore we shall consider those options which differ from resulted above.

 **Open.** User has opportunity to open the selected file with editing of *.txt or *.rtf formats.

 **Save as...** This command allows to save selected text file in *.txt or *.rtf formats. It is necessary to specify directory where the file will be saved and enter its name in the appeared standard dialog box.

Other options of text file object contextual menu are similar to corresponding options of folder contextual menu.

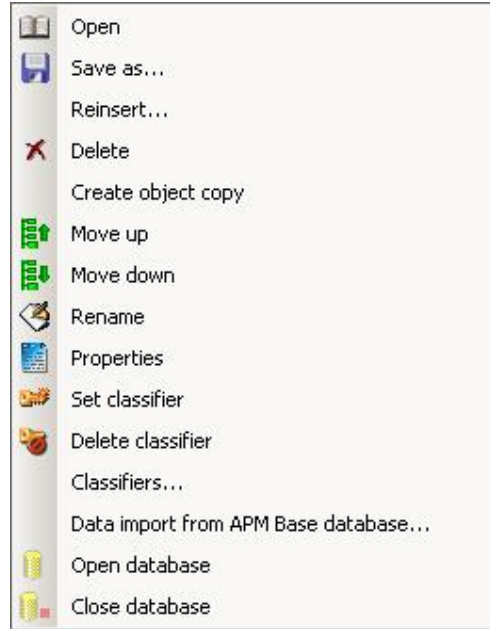


Fig. 4.17 Text file contextual menu

Editing of the opened text file of *.txt or *.rtf format in many respects is similar to editing the document in standard Windows application (text editor WordPad). The detailed descriptions of work with the text are stated in the WordPad documentation.

Commands of text editing are accessible from the main menu and from the corresponding toolbar (see previous chapter).

Settings of text file parameters are carried out in the *Parameters* dialog box enabled by **View / Options...** main menu command where you can set necessary changes.

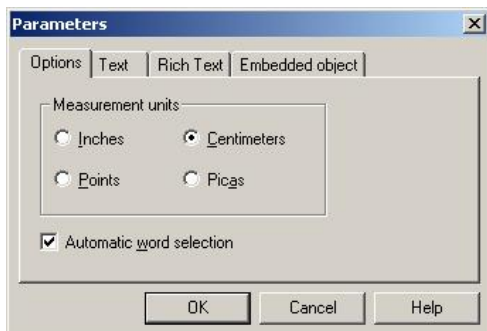


Fig. 4.18 Parameters dialog box (options sheet)



Fig. 4.19 Parameters dialog box (text sheet)

Appendix – APM database composition

APM Mechanical Data

1	Tools
2	Component parts
3	Constructs
4	Basic parts and its elements
5	Joint elements
6	Metrological data
7	Mechanical transmissions and its parts
8	Permanent joints
9	Shafts and axles
10	Couplings
11	Bearings
12	Springs
13	Pipings and its connectors
14	Closure elements, lubricating materials and tools
15	Sections
16	Asynchronous electric motors
17	Hydro and pneumatic circuit elements
18	Elements of civil-engineering drawing
19	Drawing elements
20	Electric circuit elements

APM Section Data

1	Sections	Roll-forming closed weld square section Roll-forming closed weld rectangular section Roll-forming equal-flange z-section Roll-forming equal-flange c-section Roll-forming equal-flange channel Hot-rolled double-T-iron Hot-rolled parallel faces flange double-T-iron Hot-rolled square section Hot-rolled round section Hot-rolled nonequal-flange angle Hot-rolled equal-flange angle Hot-rolled thin-wall double-T-iron with narrow flanges Hot-rolled thin-wall channel with narrow flanges Hot-rolled channel High T-iron Low T-iron Z-section Cane rail Parallel faces flanges T-iron
2	Compound sections	Double-T-iron Equal-flange angle Non equal-flange angle Channel

APM Construction Data

1	Concrete beams
2	Gates
3	Windows
4	Slabs
5	Girders
6	Bearing piles
7	Rabbit ledges and balcony doors
8	Structural drawing
9	Concrete footstep
10	Concrete trusses
11	Cast-iron pipes
12	Steel construction joints