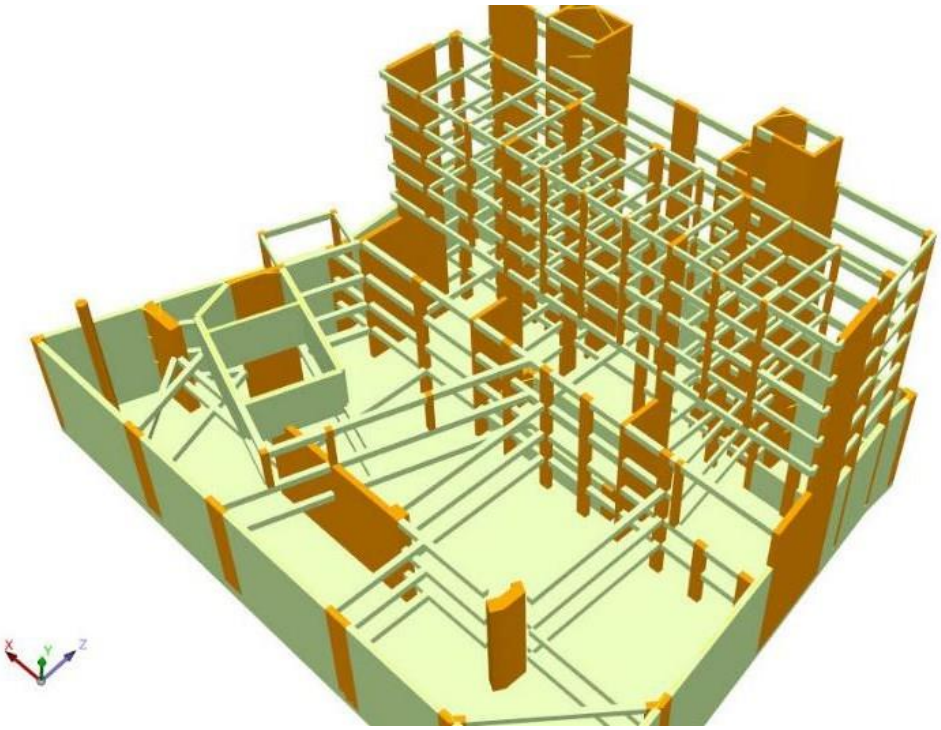
SCADA Pro 25tm

Structural Analysis & Design

User Manual

1.BASIC

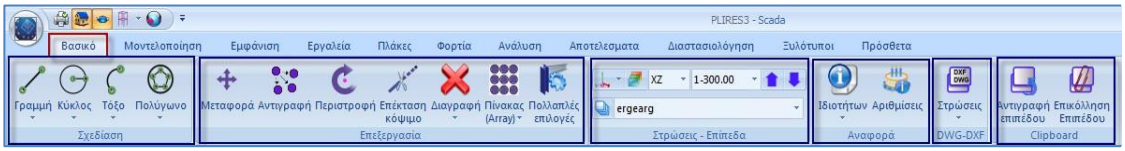


ACE HELLAS

INTEGRATED SOLUTIONS

CONTENTS

Chapter 1: Basic



The 1st Module is called "BASIC" and includes the following 6 groups of commands:

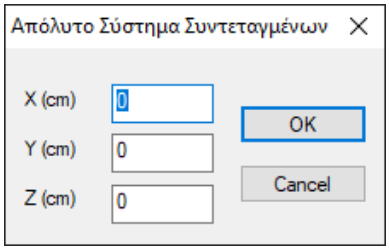
- √ Design
- √ Edit
- √ Layers-Levels
- √ Reference
- √ DWG-DXF
- √ Clipboard

Design

The "Design" command group contains the commands to design:
-Gram
-Circle
-Box
-Polygon
Each command includes the corresponding sub-commands that define the type and/or how they are drawn.

1.1 Line

Command to draw **rectilinear segments**.

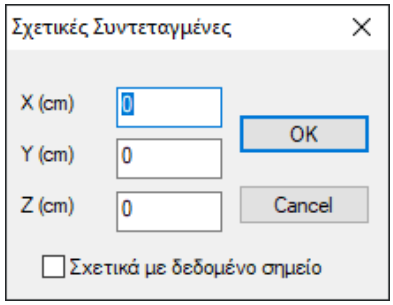


Line :Select the command and set the start and end point:

Graphics: left-click to set two points within the desktop, or

With coordinates, (absolute or relative):

left click to set a point on the desktop, then select the command ABS and enter the absolute coordinates



or the command REL to enter the relevant coordinates

Activate the checkbox Σχετικά με δεδομένο σημείο , set the relevant coordinates and move the mouse to a point (given point). A box will show you the point with the relative coordinates you set, relative to the given point.

Polyline : Command to draw polylines. Select the command and follow the previous procedure (see "Line").

1.2 Circle

Command to draw **circles**.

Centre-Actina :

Graphics: Set a point on the desktop that will be the center of the circle and a second point to set the radius,

With the coordinates: Set a point on the desktop and select the command ABS or REL to specify the end point of the radius of the circle.

Three Points :

Graphics: You successively define three points on the perimeter of the circle,
With the coordinates: The definition of points can be based on absolute or relative coordinates or on the points of attraction of objects (Osnaps).

Set the first point on the desktop and select the command ABS or REL.

Diameter :

Graphics: Set a point on the desktop that will be the centre of the circle and a second point to set the diameter,

With the coordinates: Set the first point on the desktop and select the command ABS or REL to specify the end point of the circle diameter.

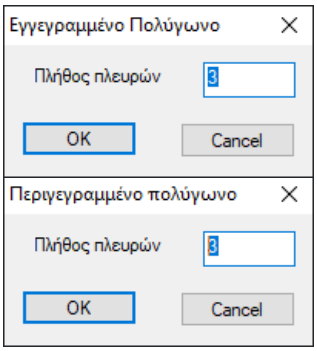
1.3 Arc

Command to draw **arcs**.
The definition of the arc can be done in one of the following two ways (like the " Circle " counterparts)
see "Circle"> Centre, Radius see "
Circle"> Three Points

1.4 Polygon

Command to draw **inscribed or circumscribed polygons** with a specified number of sides in a circle of a specified radius.

Registered :
Determine the number of sides of the inscribed polygon.
Next, you define graphically or numerically the radius of the circle in which the polygon will be inscribed.
ATTENTION: *The number of ribs must be at least 3.*



Described:
The way to use the command is the same as for the inscribed polygon.

Edit

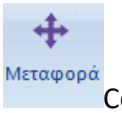
The "Edit" command group includes the commands:

-Transfer
-Copy
-Rotation
-Extension-cut
-Description

-Table/Offset/Create clone/Transfer Group
-Multiple Options

OBSERVATION: *Entities can be selected individually, by polyline, by window, by polygon and by group.* 

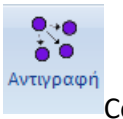
2.1 Transportation



Command to **transfer** one or more entities **in parallel at** the same time.

Select the command and then make the selection of the objects you want to transfer (). Then press the right mouse button to indicate the end of the selection and select a feature point (line end, pole top, beam end, etc.) and finally set the new point to transfer the objects.

2.2 Copy



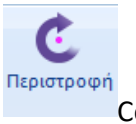
Command to **copy** one or more physical or design entities by creating one or more copies.

ATTENTION:

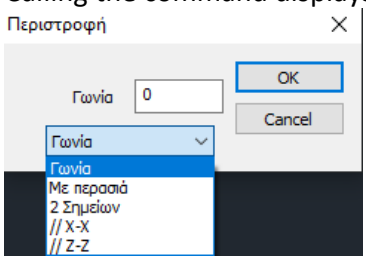
*This command only applies to copying **physical data**. Elements with a mathematical model do not obey it and you should use the "**Create Clone**" command.*

Select the command and then select the objects you want to copy (). Then press the right mouse button indicate the end of the selection and select a feature point (line end, pillar top, beam end, etc.) and finally set the new point to copy the objects.

2.3 Rotation



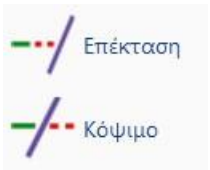
Command **to rotate** an object to bring it to the desired position.
Calling the command displays the following dialog box:



Select from the list how to set the rotation:
Angle: enter the "angle" of rotation in degrees (+, counterclockwise) and select the object or objects to be rotated. Complete the selection by pressing the right mouse button and finally select a feature point which will be the centre of rotation.
With perchance: First select the object to be rotated, then select the point to which the rotation will be made, and finally select the line along which the object will be rotated.
3 Points. Select the object or objects to be rotated. Complete the selection by pressing the right mouse button and then select the point to which rotation will be made. Finally, point to 3 points, which will form
2 sides with the 2^{o} point being the vertex of the angle. The angle is calculated clockwise.
//X-X: This option allows you to rotate an object with respect to the global X-X axis. After entering the rotation angle, select the object or objects to be rotated. Complete the selection by pressing the right mouse button and then select the point with respect to which to rotate.
//Z-Z: This option allows you to rotate an object on the global Z-Z axis. After entering the rotation angle, select the object or objects to be rotated. Complete the selection by pressing the right mouse button and then select the point with respect to which to rotate.

2.4 Expansion-Burning

Commands **to expand** or **trim** an object up to a limit you specify. The way to use it is as follows :

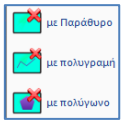


Select the "Extend" command and then select first the line which will be the boundary up to which the extension will be made and finally the entity (beam, line, etc.) you want to extend. Repeat or right click to complete the command.

The "Cut" command works similarly.

2.5 Delete

Command to **delete** one or more entities of the physical and/or mathematical model. Select the command and then select the objects you want to delete.

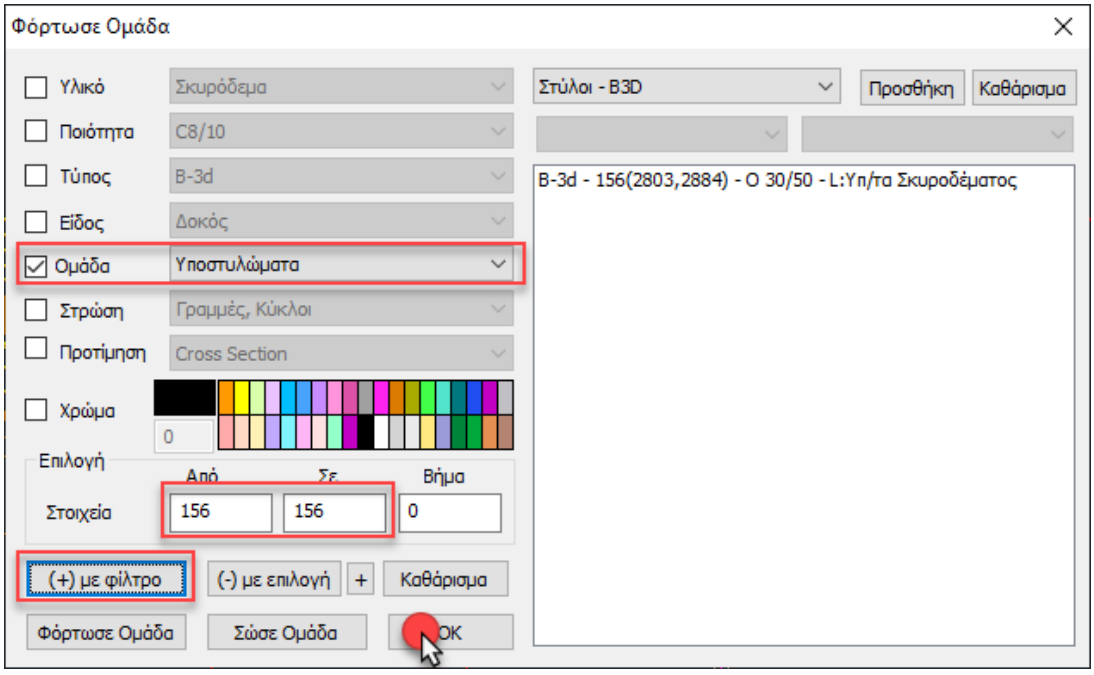


The deletion can be done either individually, with a window, or with a polygon, by selecting the corresponding command, or with a group by selecting  and  .

NOTE: *Recall that deleting only the mathematical model and objects belonging to a specific layer can be done with the layer manager command.*

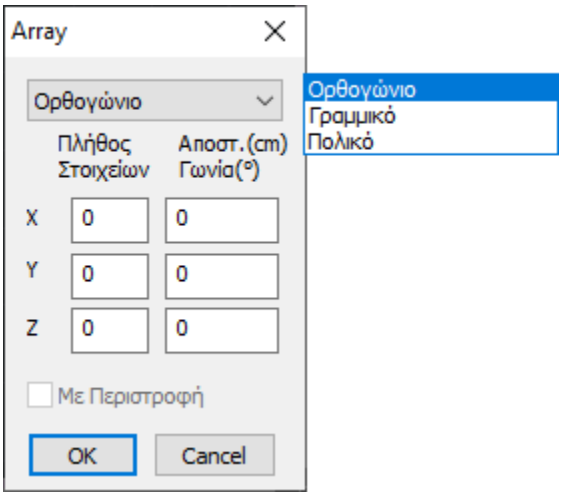
NOTE: *It is possible to delete an item by knowing its number:*

Select "Delete" and the command  *. Select layer, set the item number to From and To and press (+) with filter. Ok" and right click on the screen.*



2.6 Table

Command to **create** one or more **copies of** an object and arrange them in a rectangular, circular (polar) or linear arrangement.



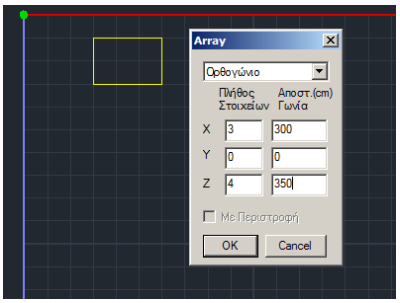
Select the command and in the dialog box:

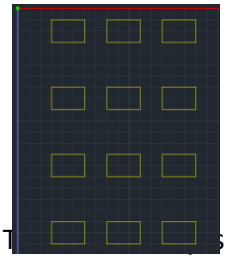
where at the top you can select the type of array rectangular, polar, linear). Then and depending on the type of array you choose you type the number of elements per axis direction and the distance or angle between them, Select on the desktop the element you want to copy and press the right mouse button.

EXAMPLE 1

Rectangular Array

Execute the command and in the dialog box that appears, select rectangle as the array type and then type the number of elements by X and the distance between them and respectively the number and distance by Z.
Finally, point to the sub-pillar you want to copy in a rectangular layout and press the right mouse button.





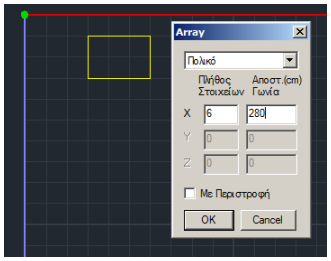
The canavos of the columns is formed as shown on the left.

T s a subcase of the rectangle, giving number of objects and distance only by X.

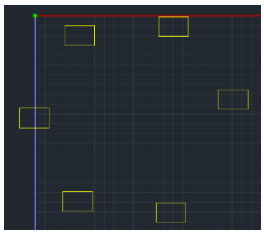
EXAMPLE 2

Polar Array

With the polar array the objects are arranged circularly with or without rotation.
By calling the command, select the polar from the dialog box and then set the number of elements and the angle to be covered by the layout.



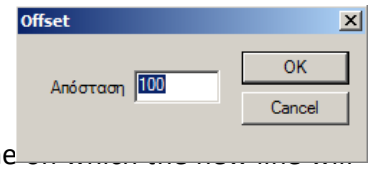
The rotate option specifies that as the objects are arranged in a circle, they will be rotated at the same time.
Then point with the mouse at the object to be ordered in a circle, press the right mouse button to end the selection and select a point that will be the centre on which the rotation will be based.



NOTE: *The Array command also works with mathematical members.*

2.6.1 Offset

Command to **draw** a line **parallel to** and at **a certain distance** from another line.
Select the command and in the dialog box that appears type the distance in cm at which the new line will be drawn.



Then select the line you want to offset and finally left-click on a point on one or both sides of the line to set the offset. from the other side of the original line (select the half-plane on which the new line will be drawn).
Repeat to draw more parallel lines with the same distance or right-click to complete the command.

2.6.2 Creating a clone

Command to create one or more **exact copies of** physical and/or mathematical data.

Select the command and then make the selection of the objects you want to copy with  . Then press the right mouse button to indicate the end of the selection and select a feature point (line end, pillar top, beam end, etc.) and finally set the new point for copying the objects.

NOTE: *This command differs from copying because it can also be used for mathematical elements, creating "clones", i.e. elements with the same, not only geometric, but also inertial characteristics.*

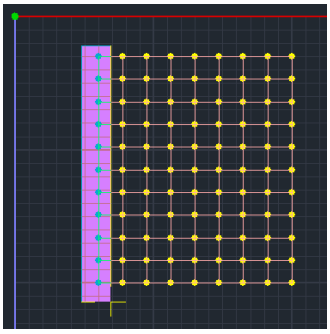
2.6.3 Group transfer

Command to perform a **parallel transfer of** one or more objects at the same time. Objects can only be selected with a window or polygon. Objects enclosed in the window are dragged, while objects intersected by the window are "dragged" and the part outside the window remains fixed. All elements including those of the mathematical model are included in the transfer and pulling.

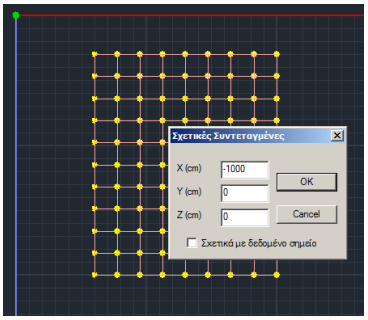
Select the command and objects and use the relative  or absolute coordinates to set the move.

EXAMPLE

In the grid you see in the picture, the first leftmost vertical column of nodes will be moved to a relative distance of 500 cm from their current position. Select the command and then use a window to select the leftmost vertical column of the canvas.

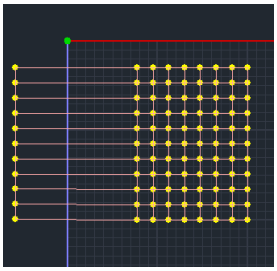


Notice how the window encloses the nodes that will be moved and intersects the rods that will be "pulled" i.e. their end that is outside the window will remain in place and will be moved along with the
node the edge contained within the window while remaining connected to the node.



Then set the relative distance of the movement to 10 m in the direction opposite to the positive of the universal X-axis.

The final state of the carrier after the transfer is shown on the right.



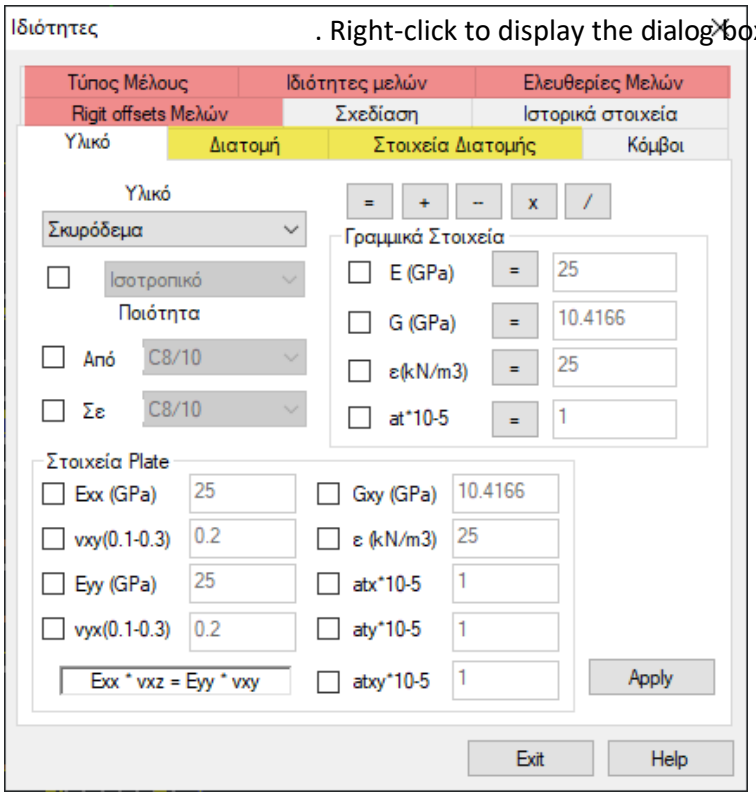
Notice *the new position of the nodes and the elongation of the bars that have not lost their connection to the nodes.*

2.7 Multiple options

Command to **manage** and **modify the properties of** an element or group of elements.

Select the command and the objects to modify by selecting one by one, or selecting with a polyline, or selecting with a window, or selecting with a polygon, or selecting a group

. Right-click to display the dialog box:



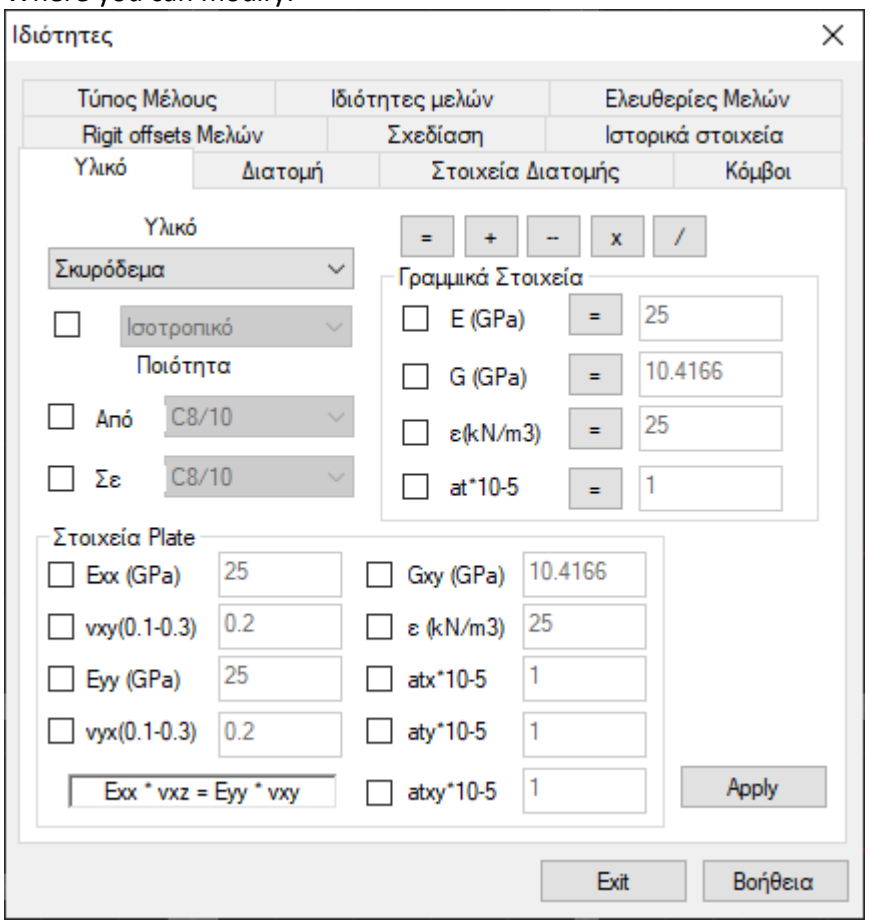
The dialogue box is divided into 10 different fields. Each field contains the corresponding properties of the selected item(s) with the possibility to modify them.

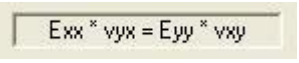
OBSERVATION:
In the new version of SCADA Pro a new "TAB" of commands named "Edit" has been added and includes all the features of Multiple Options and separate commands for greater convenience when editing an element or group of elements (*see User Manual 4. "Edit"*).

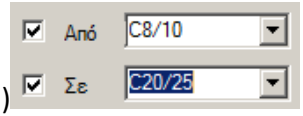
ATTENTION: *The fields marked with the word "**Cross-section**" refer exclusively to the elements entered as physical cross-sections and allow changes to their characteristics. Conversely, the fields with the word "**Members**" refer to the elements defined as members with cross-sectional attributes as well as the mathematical members of the cross-sections, and allow changes to their attributes.*

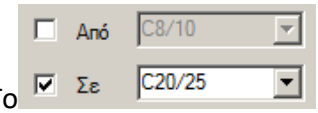
2.7.1 Material

Where you can modify:

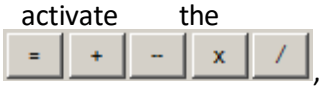


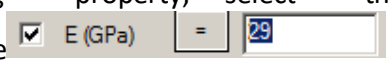
- the type of material, from the list of materials,
- the designation orthotropic or isotropic, (recall that a material is orthotropic when it has different properties in each direction. By selecting "Orthotropic", the parameters must satisfy the relation), 

- the quality of the material by selecting "From" (original material selected) "To" (modified material) 

, or only "To 

regardless of the original.

- the physical properties of linear and surface members. To modify a value, activate the corresponding property, select the act 

, enter the new value 

NOTE: In the subsequent modification of the material to be checked by default all its properties.

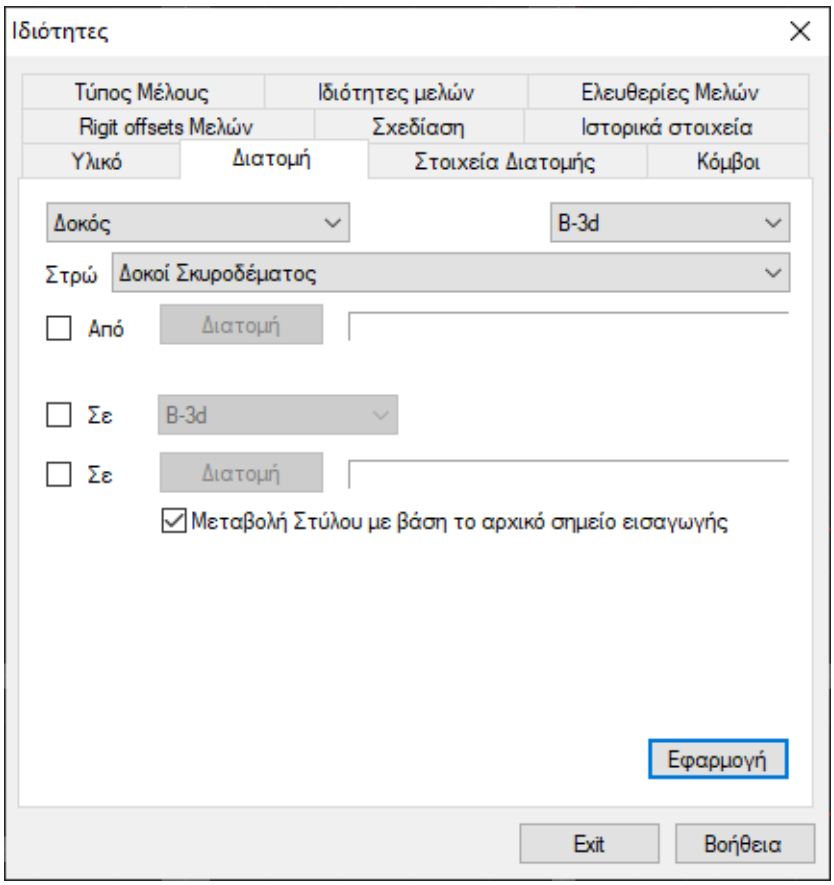
EXAMPLE

If, for example, you want to multiply the value of the elastic constant E, by a factor of 2, select x and enter the value 2.

Select Apply to save the modifications.

2.7.2 Cross section

Where you can modify a cross-section when it has been entered as a physical cross-section and change:



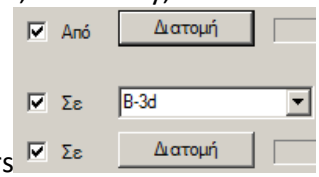
The building category, , 

The type of linear member, 

,

The layer the element belongs to, and finally,

The filters



as in the example:

EXAMPLE

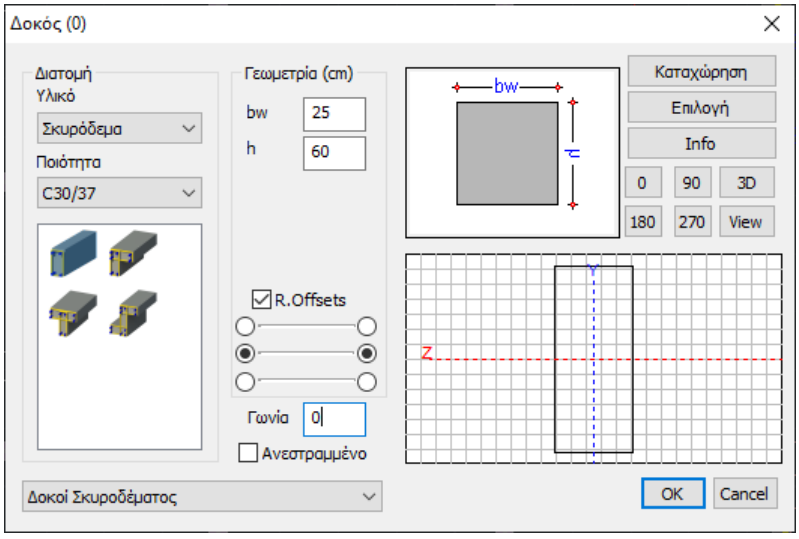
Modify, at one level, the dimensions of the cross-sections of the beams of one level from 25/60 to 35/70.
For this modification the existence or not of the mathematical model is irrelevant.

Select the command "Multiple options" 

and by activating the selection option with window  select the whole floor plan. Right click and the dialog box appears. The beams selected with the window may not all be 25/60, or you may have included columns and other elements, so a filter is required to filter the selection leaving only the 25/60 beams.

Select "Beam" and "B-3d", (if the mathematical model has not yet been created, then the choice of the type of linear member is irrelevant).
Select the layer of the beams, that it is "Concrete Beams" and finally, activate the checkbox "From" and the command . 

The beams dialogue box appears on the screen, where you enter the dimensions of the beams to be modified (25/60).

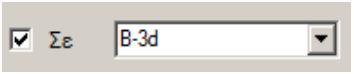


Activate the checkbox "In" and the command 

and enter the new dimensions (35/70).

case you want modify the dimensions of all beams independently, the procedure is the same, but without activating the "From" 

.

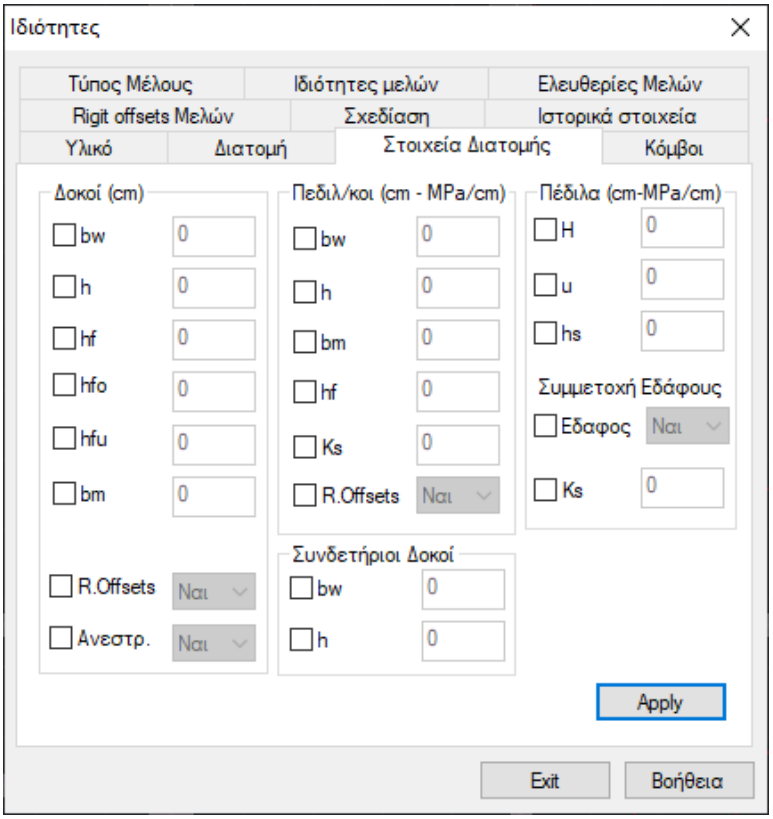
It is also possible to modify only the type of linear member (with an existing mathematical model). Select the objects and the command, activate the checkbox 

and from the list select the new type.

2.7.3 Cross-sectional data

Where you can modify the overall geometric characteristics (of the elements imported as physical cross-sections), namely:

- all the selected beams
- of all the selected pedestals
- of all the selected pedis
- of all selected connecting beams,



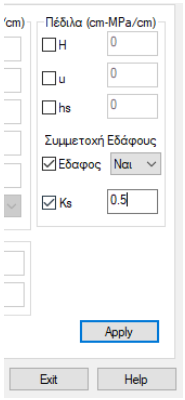
EXAMPLE1

To change, for example, the dimensions of all selected beams, activate bw and enter the desired value, 30cm 

. You can also enable or disable rigid offsets, provided of course that the mathematical model of the beams is available.

EXAMPLE 2

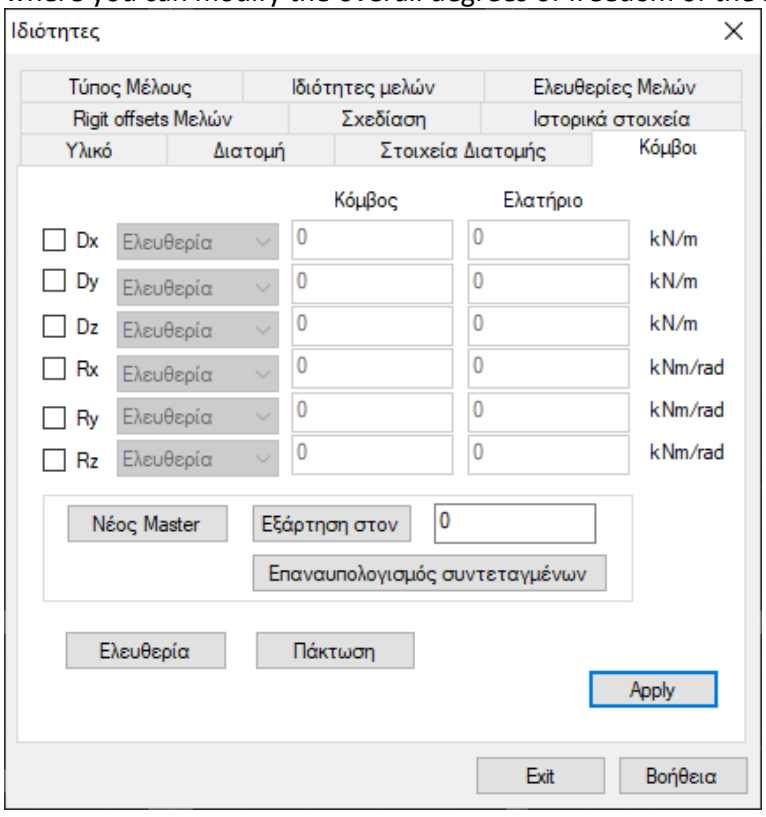
You can window select the entire 0 level that includes skids and set the Ground and spring's Ks involvement.

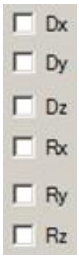


Apply to implement the changes. Exit to close the window.

2.7.4 Nodes

where you can modify the overall degrees of freedom of the selected nodes:

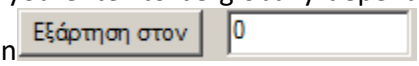




Activate the relative shift/rotation and select between: "Freedom", "Compression", "Dependence", "Spring".

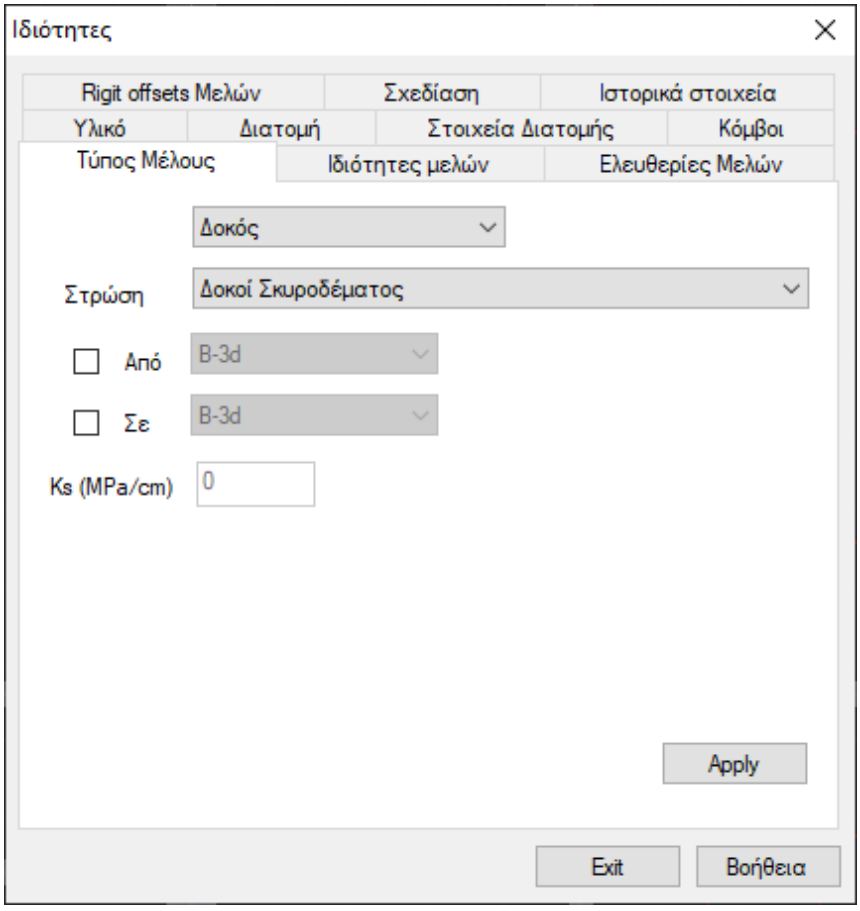
- "**Freedom**": allows the node to move and rotate freely in the corresponding direction

- "**Packing**": binds the movements and rotations of the hub
- "**Dependency**": means that the specific movement or turn of the node depends on the corresponding node, whose number you specify in the "Node" column which is automatically activated when you select "Dependency". Here you have the possibility to make movements and turns dependent on more than one node.
- "**Spring**": automatically activates the "Spring" field where you set the spring constants for the desired displacements and rotations.

If you want the node you enter to be globally dependent on another node press the "Dependency onbutton 

and enter the node number.
The "New Master" option implies dependency of the selected nodes on the Master. With the "Recalculate Syntax" option, the program automatically calculates the new syntax of the Master Node (Bulkhead Node).
The "Freedom" and "Pack" options respectively free and pack all degrees of freedom.
Select "Apply" to enter the changes and "Exit".

2.7.5 Type of Member



Where you can modify a member:
Select the category of building elements and change their type. Use "Layer" and/or "From" to filter the selected elements, or directly select "To" to change the type by selecting from the list.

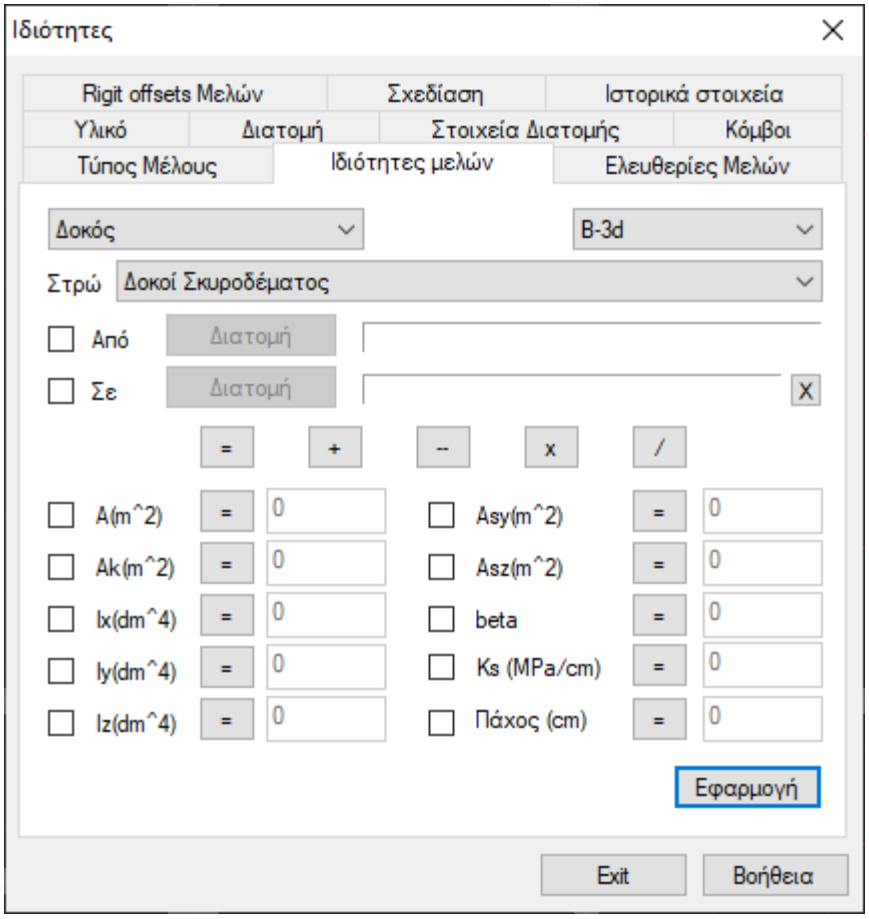
For the foundation data "on Elastic Foundation (ef)" activate the Ks field where you enter the value in Mpa/cm.

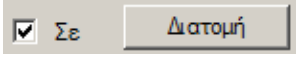
2.7.6 Members' properties

Where you can modify a cross-section when it has been entered as a mathematical member with a cross-sectional attribute (such as in standard constructions) and change:

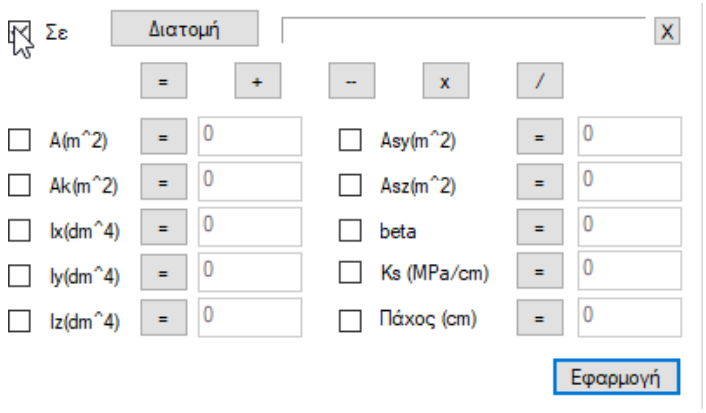
the physical properties of all selected elements of the same type or only those of a specific cross-section by activating the 

filter.



Select a new cross-section 

and the program automatically fills in the values, which you can modify or fill in yourself.

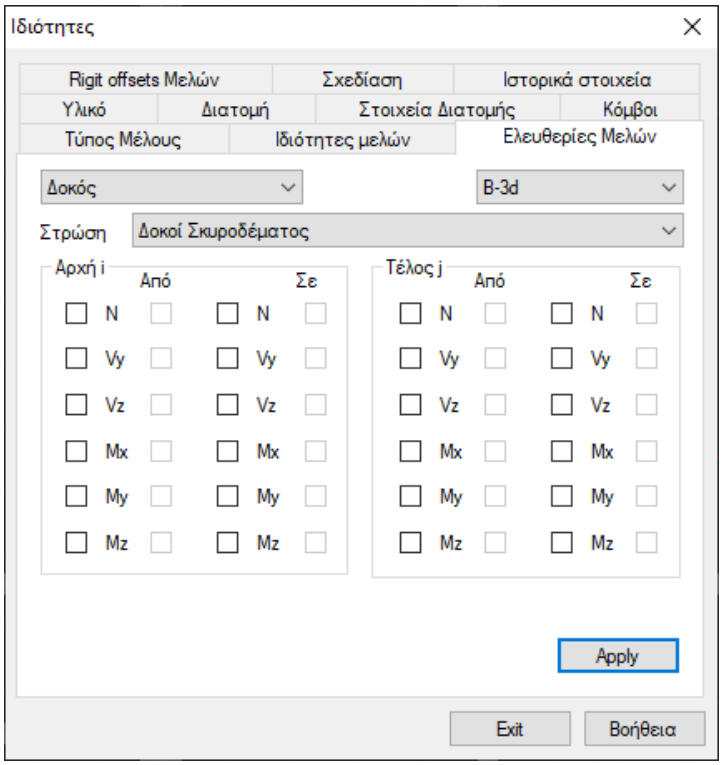


by activating the corresponding checkboxes, selecting an operation (=) and typing the new value. If, for example, you want to multiply the area by the factor 2, select the operation x and type 2.

Select Εφαρμογή to save the changes.

2.7.7 Members' freedoms

Where you can globally modify the start and end freedoms of all selected members of the same type.



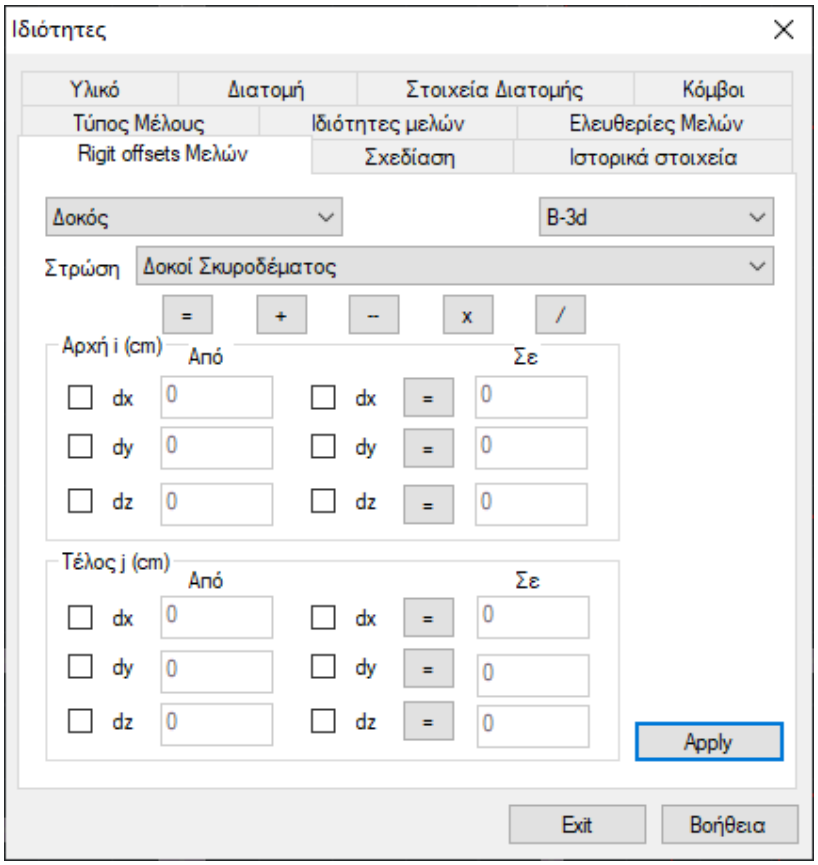
Select the intensive size(s) of the start to activate the "From" (which as always works as a filter and is optional) and the end to activate the "To" so that you can select:

☐ = the intensive is transferred

☑ = the intensive care unit is not transferable

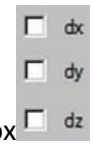
2.7.8 Rigid Members' offsets

Where you can globally modify the Rigid offsets of the selected members of the mathematical model.



NOTE: Recall that this command allows global modifications, while for individual modifications it is better to select the member and edit it directly from the "Properties" field.

Activating "From" acts as a filter. It is optional and requires entering the values of dx, dy and/or dz of the rigid offset to be modified.

To set a new value, activate the corresponding checkbox 

, select the action 

and enter the new value.

EXAMPLE:

Goal: To zero all rigid offsets by x (dx) of the beginning of the beams of a floor plan. Select the "Multiple Options" command, activate  command (windowed option) and select the entire floor plan. Right-click to display the dialog box. The selected group contains all the elements of the floor plan.

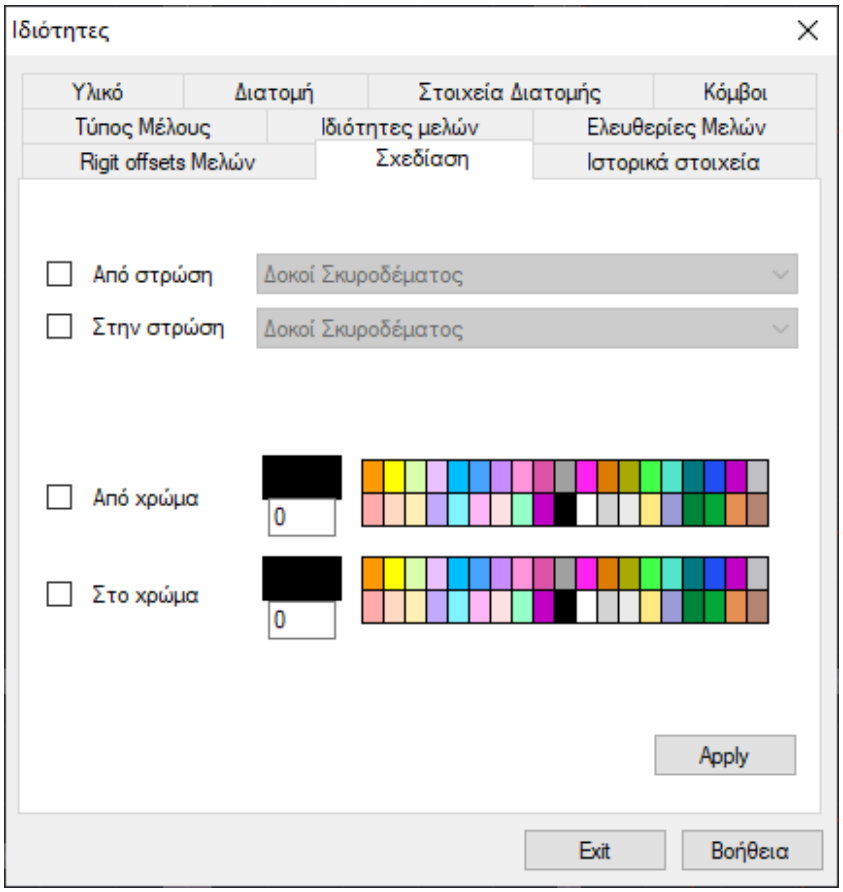
Select the beams from the list 

.
In the "In" field of "start" activate "dx" type the value 0 and select the operation = 

"Apply" and "Exit".

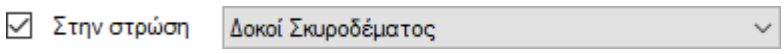
2.7.9 Design

Where you can modify altogether:



the layer & color of the selected elements.

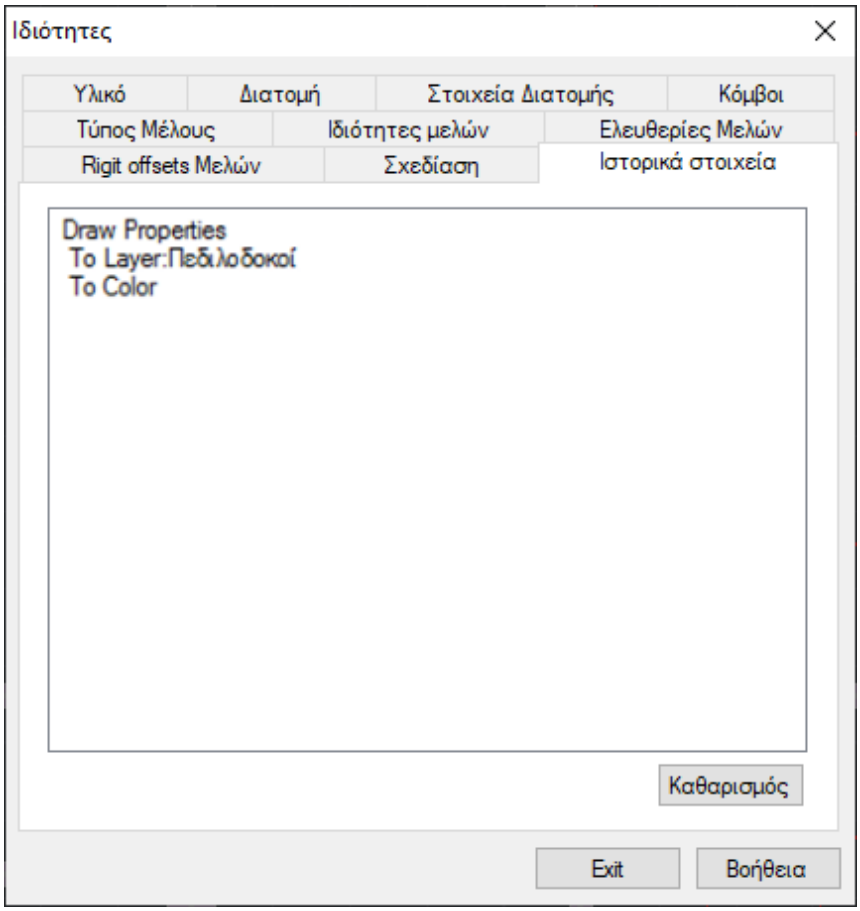
Enabling "From layer" acts as a filter. It is optional and requires the selection of the layer to which the items to be layered belong. Activating 'To layer' changes the layer of the selected or 'filtered' items.



In exactly the same way you can modify the colour of the selected or "filtered" elements.

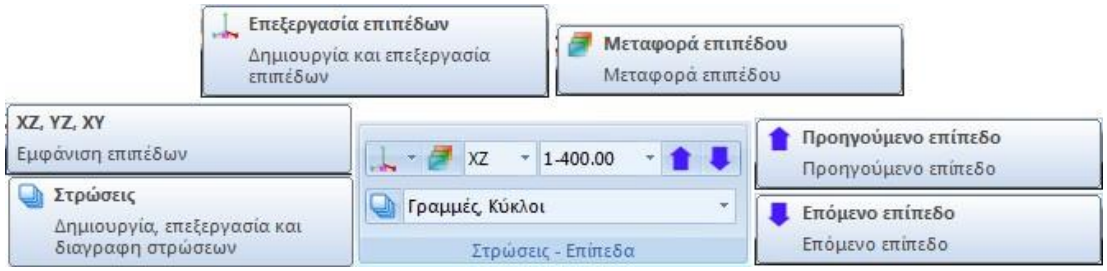
2.7.10 Historical Data

Where all modifications made to the selected item are displayed. Select "Clear" to delete the "Historical items".



Layers-Levels

The "Layers-Levels" command group contains commands for:

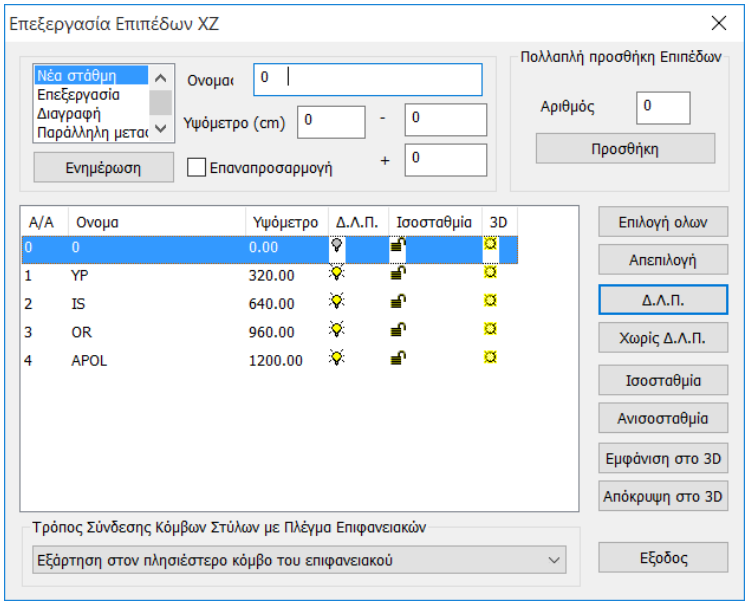


- Create
- Edit
- Transportation
- Go to
of the layers and layers the study.

Moving the mouse over a command displays the corresponding tooltip. A window with the title of the command and a short description of the command.

Command to **create** and **edit** layers.

By left-clicking on the icon, the dialog box opens for editing the HZ levels, which for SCADA Pro are the levels of the study floors:



New level: to create a new level, select "**New level**" and enter "Name" and "Altitude".

The fields **-** and **+** are filled in in case of anisostasy or slope or the existence of vertical surface, so that the data they include belong to this level (for the distribution of masses) and are displayed at this level.*

EXAMPLE:

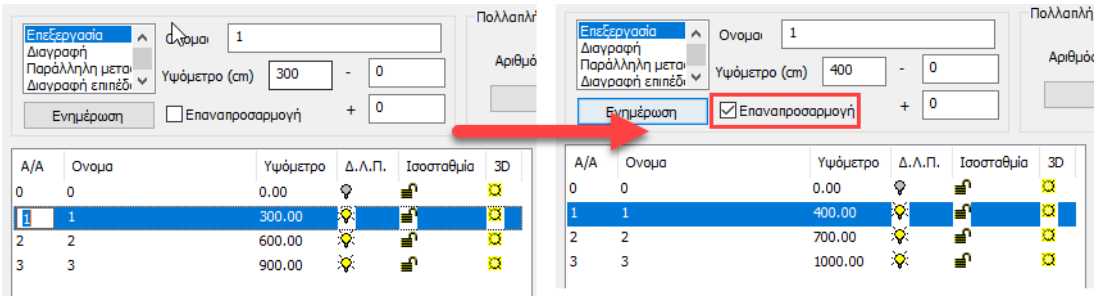
If, for example, the 2^{h} level with an altitude of 700 cm has an anisostasy at 600 cm. Type in -, 150 (cm). This way when you activate level 2^{h}, in addition to the entities belonging to level 2, all entities up to 150 cm below it will be displayed.

Edit: To modify an existing level, select "**Edit**" and the level from the list to turn blue , type a new name in the "Name" field or the new level in the "Altitude" field and "Update".

☑ Επαναπροσαρμογή Activating the Re-adjust command, allows to re-adjust the elevations of the existing levels to a possible change of the elevation of an intermediate level. The readjustment requires the absence of a mathematical model.

EXAMPLE:

Suppose that 3 levels have been created at heights 0,300,600,900 and you want to change the height of the 1st level without changing the individual heights of the floors. Select the level, the Edit command and the Readjust command. Change the Height value and select Update. The result you will get is that of the image below:



In the "**Multiple Add Levels**" field, and after setting an elevation, enter the Number of floors you want to create and select Add. This way you can create all the levels of the building in one go.

Delete: To delete a layer, select the layer, "**Delete**" and "Update". This deletion deletes the layer and all items belonging to it.

Parallel Transfer: With the "**Parallel Transfer**" command you can transfer a level from one position in the station ranking order to the next position. Select the level you want to transfer, select "Parallel Transfer" from the task menu and then select the "Update" button. The level moves one position down. This command is useful in cases where you want to insert a level between other stations and the original creation of this level was not in the correct position but at the end of the list of stations.

Delete Levels: the operation of the "**Delete Levels**" command at the end of the task list is similar to the previous deletion, except that only the level is deleted and not the elements belonging to it.

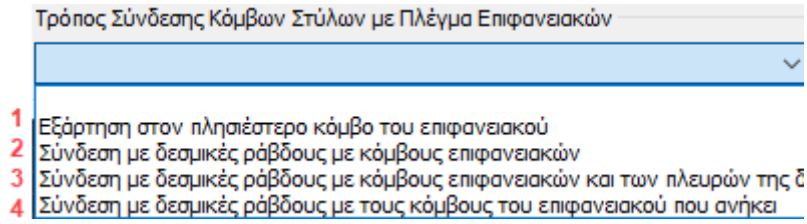
Each level after "Update" is entered in the list divided into 6 columns. In addition to the number, anonymity and altitude, each level is characterized by: "**D.L.P.**" (Diaphragmatic Plate Mode), "**Equidistance**" and "**3D**" with the respective symbols active or inactive.

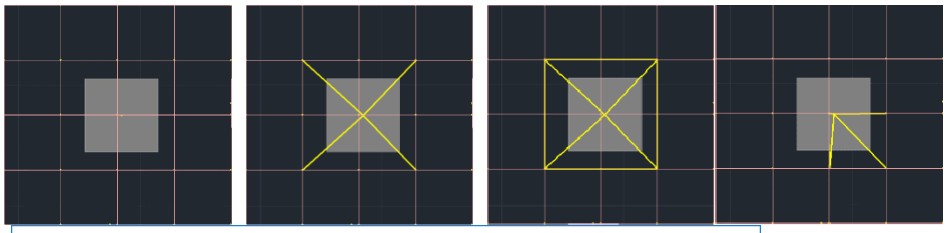
To modify these 3 features use the commands on the right.
First select the level or levels (ctrl and left key or "Select all") and the command:

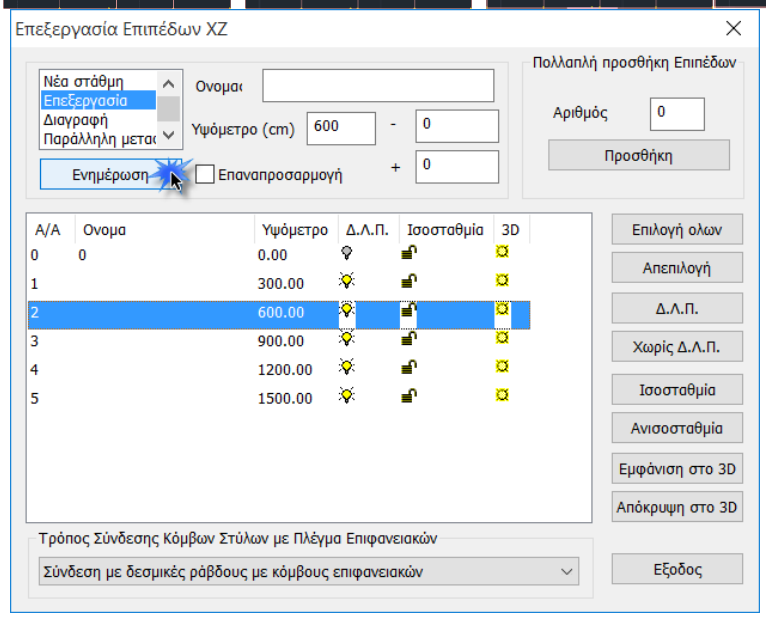
"**I.L.P.**" for plates with a diaphragm function or "**Without B.O.D.**"
"**Equalize**" to lock the altitude , which means that any new member will be inserted at that altitude regardless of where the insertion is made. "**Show in 3D**" in order to display the elevation in the 3D view of the model
"**Hide in 3D**" in order to hide the level in the 3D view of the model.

OBSERVATION: *It is not possible to import stations with the same altitude*

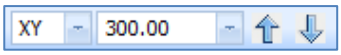
Connection of Column Nodes with Surface Grid
SCADA Pro allows the collaboration of linear and surface elements in the same interface. The need for binding between them is therefore born.
At the bottom of the window there is the choice of the way of connecting the nodes of the columns to the surface grid, for the selected level, by selecting one of the three ways, connecting the nodes either by simple dependency or by connecting through tie rods.







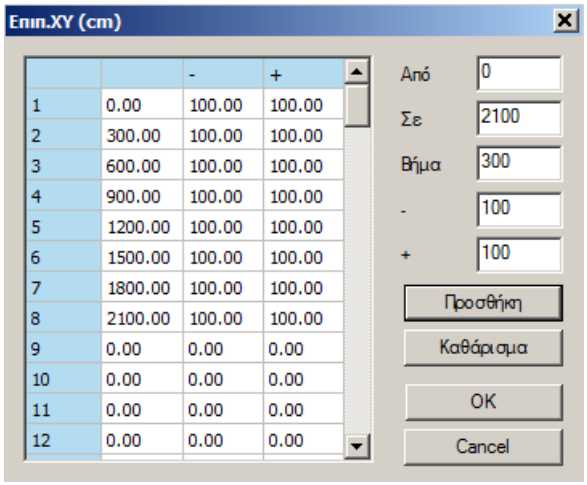
Select level XZ from the list and use the arrows to move up and down the floors.



Left-clicking on the arrow to the right of the icon opens the list of all levels:

Left click on the icon  to set layers parallel to the XY plane.

In the dialogue box that opens:



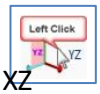
start "**From**" one value (0), "**Step**" every (300cm) up to "**At**" altitude (2100cm), with a range of "**-**" and "**+** " (100cm), which means that all entities at a distance up to +100, -100 from the active XY plane, will be displayed in it.

Select the XY plane from the list and use the arrow keys to change the altitude.

= 

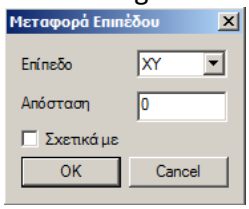
(see treatment of HZ levels)

As for XY levels 

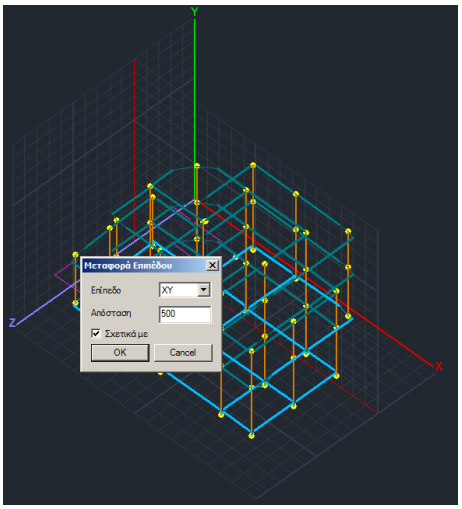
you create correspondingly the levels XZ 

.


Command to **transfer** the XY, XY or YZ work levels.
Left-clicking on the icon opens the dialog box:



Select the level, check the checkbox and specify the distance for the transfer.

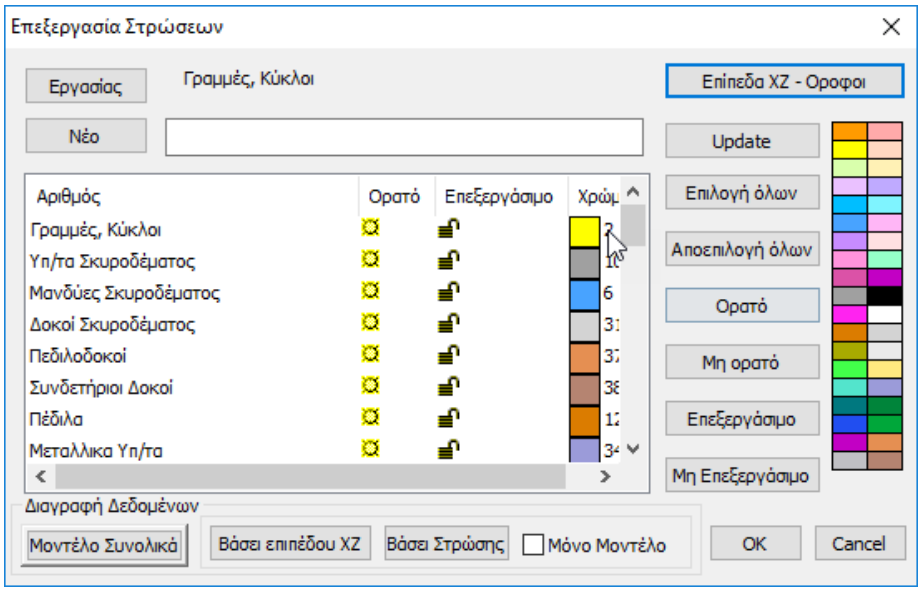


In the example on the left, the XY plane has been moved 500cm in relation to the start of the axes.

Switching to 2D display and back to 3D restores the displaced planes to their original position.

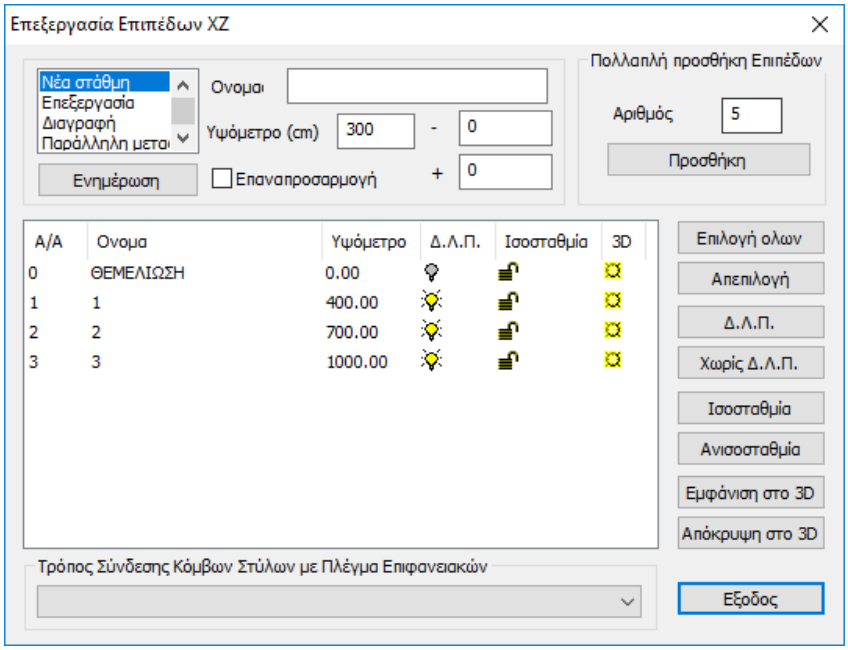
Layer processing

Command that allows to **manage** the predefined **layers of** the program and to create new ones.
Left-clicking on the icon opens the dialog box for editing the predefined SCADAPro layers and creating new ones:



"**Working**": to change the active layer. Select a layer from the list and "Work" command.
"**New**": to create a new layer. Enter a description and select "New".
"**XZ Levels - Floors**": to open the dialog box of the floor levels and edit it.)

Treatment of HZ levels



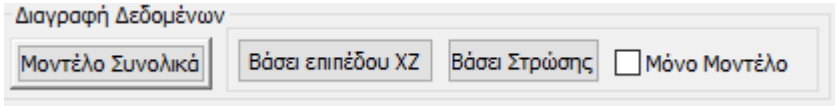
"**Update**": to save an existing layer with a changed name. Select a layer from the list, enter the new name, select "Update".

"**Select all**", "**Deselect all**": to make group modifications to all layers. The selection of layers from the list is done with the left mouse button and "ctrl".

"**Visible**." "**Not visible**": to hide or show the elements of the corresponding layer.

"**Editable**." "**Not editable**": to make it possible or not to modify the data of the given layer.

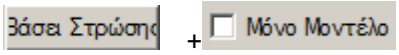
The "**Delete data**" field allows **deleting the mathematical model of** the study or part of it.



Μοντέλο Συνολικά: select to delete the entire mathematical model of the study.

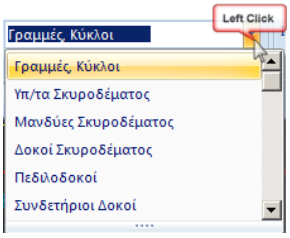
Βάσει επιπέδου XZ + Μόνο Μοντέλο : select one or more layers, keep the checkbox of "Model only" and "Based on HZ layer" inactive to delete all elements belonging to the selected layers and the active HZ layer. Βάσει επιπέδου XZ + Μόνο Μοντέλο : select one or more layers, keep the checkbox of "Model only" and "Based on HZ layer" to delete the

mathematical model of all elements belonging to the selected layers and to the active layer XZ.



: select one or more layers, keep the checkbox of "Model only" and "Layer based" unchecked to delete all study elements belonging to the selected layers.

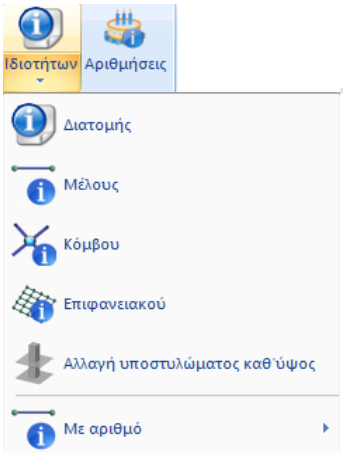
: select one or more layers, activate the checkboxes of "Model only" and "Layer based" to delete the mathematical model of all study elements belonging to the selected layers.



Left-clicking the arrow opens the list of all layers, and the active layer is always indicated in the window.

Reference

The "Reference" command group contains the commands to check and modify the properties of individual elements of the geometric or mathematical model:



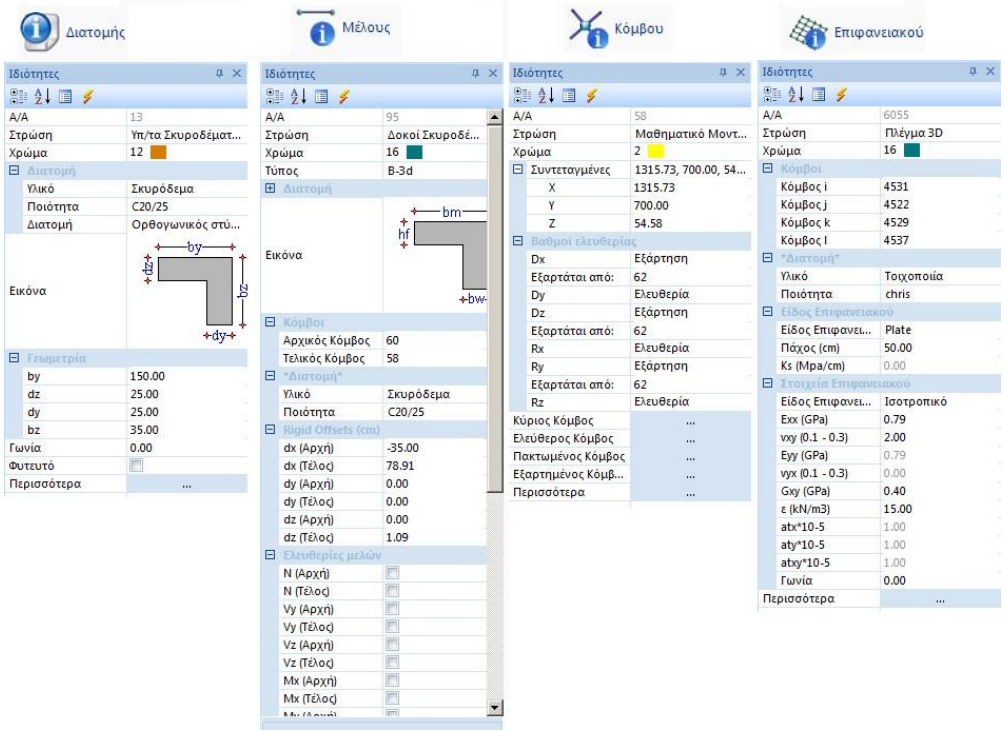
- Cross section
- Member
- Node
- Surface
- Change of column height
- With number

as well as the display of the numbers.

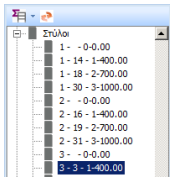
4.1 Properties

Select the command from the list (cross-section, member, node or surface) and select an element from the study that belongs to it. The properties of the selected element will be displayed in the "Properties" field.

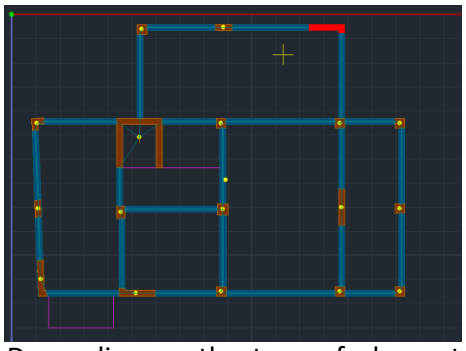
Another way to get the same result is to simply click on the item.



4.1.1 Cross section



Select the cross-section either by left-clicking on its outline in the 2D or 3D interface, or from the list in the "Tree".

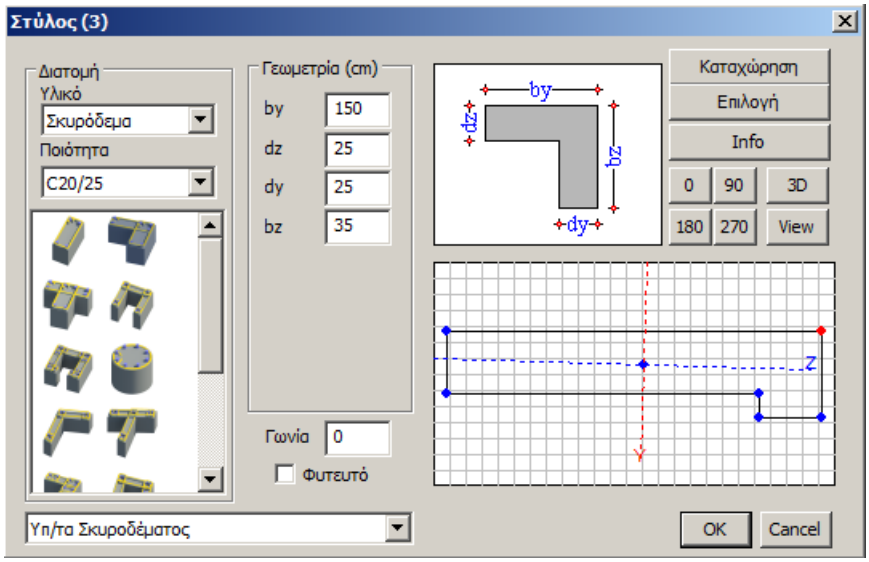


The selected item is coloured to make it easy to locate within the desktop.

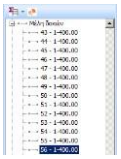
. Depending on the type of element, the "Properties" field displays its physical and geometric characteristics.

. Make the desired modifications directly within the "Properties" field or select the "More" command to open the dialogue box of the physical cross-section of the specific element.

For example, selecting a pole opens the pole dialog box:



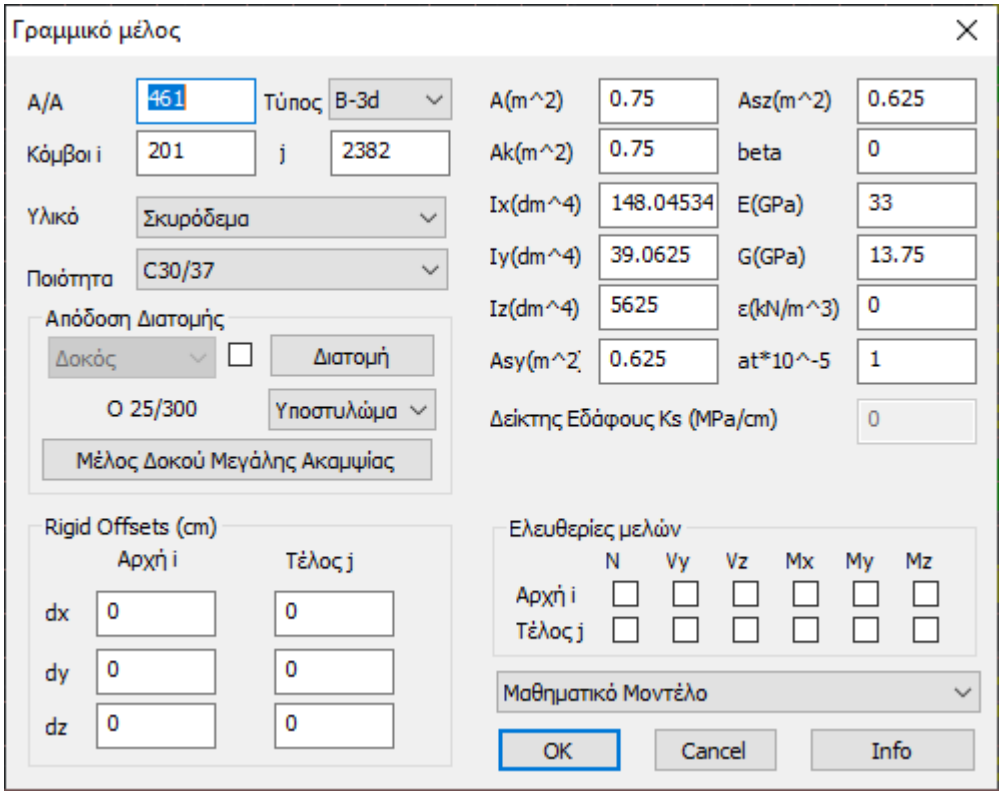
4.1.2 Member



Select the member either by left-clicking on its outline within the 2D or 3D interface, or from the list in the "Tree".

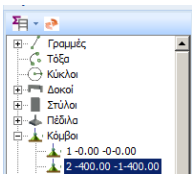
The selected member is coloured to make it easy to locate within the desktop.
The "Properties" field displays all the mathematical characteristics of the member, as well as the geometric elements of the cross-section to which the selected member belongs.

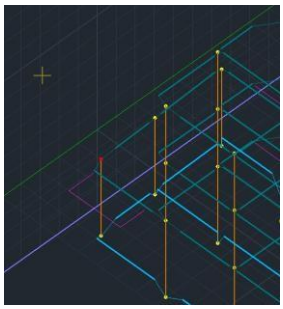
Make the desired modifications directly in the "bar" or select the "More" command to open the dialog box of the characteristics of the specific member:



4.1.3 Node

Select the node either by left-clicking on its outline within the 2D or 3D interface, or from the list in the "Tree".

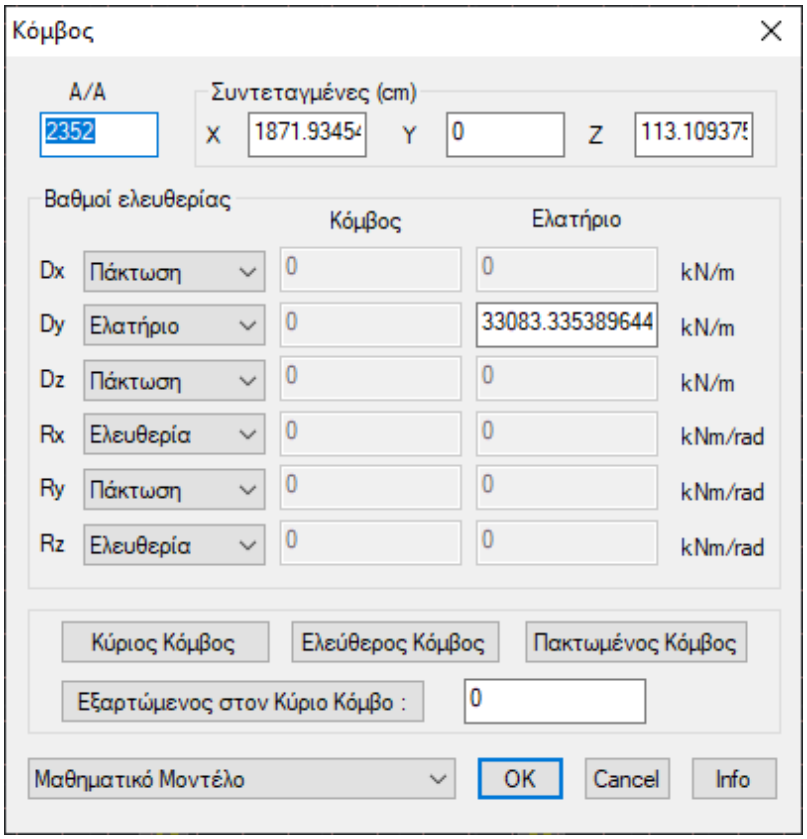




The selected node is coloured to make it easy to locate within the desktop.

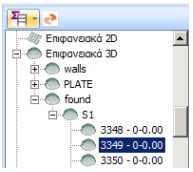
The "Properties" field displays all the mathematical attributes of the node.

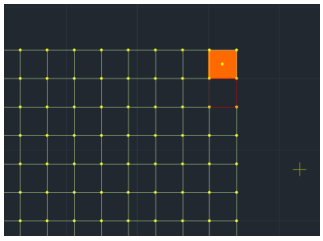
Make the desired modifications directly in the "bar" or select the "More" command to open the node's attributes dialog box:



4.1.4 Surface

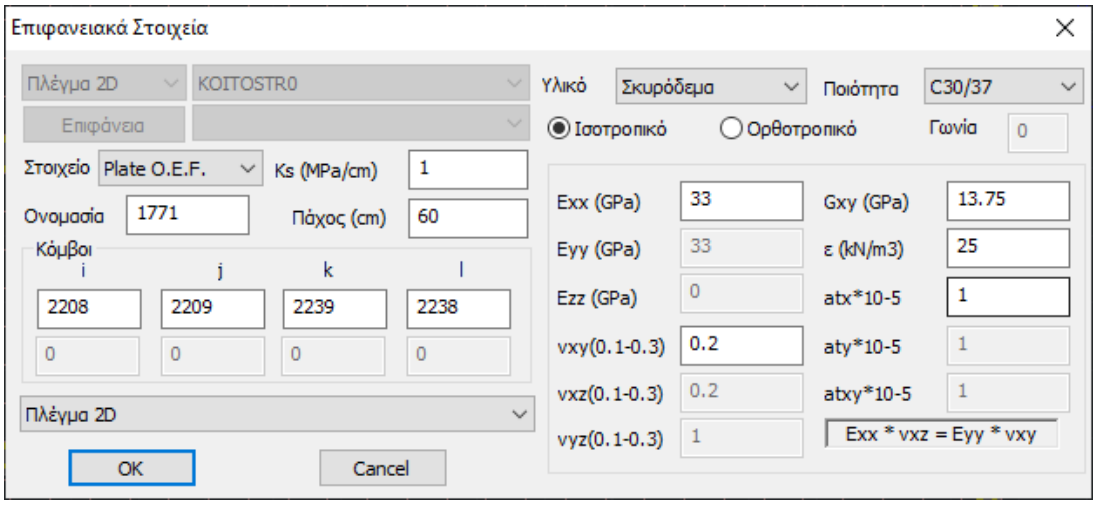
Select the surface either by left-clicking within the 2D or 3D interface, or from the list in the "Tree".





You have the option to select individual surface elements. The selected surfacing is colored to make it easy to locate within the desktop.

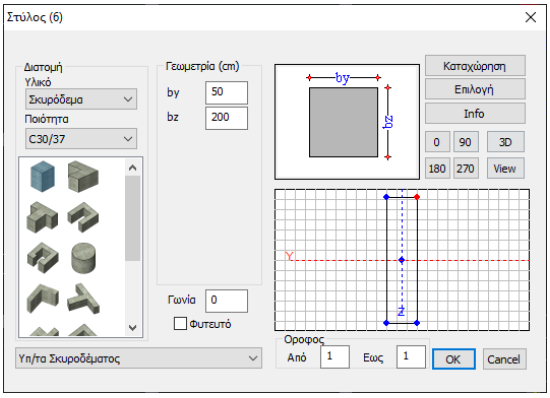
The "Properties" field displays all the characteristics of the selected surface. Make the desired modifications directly in the "bar" or select the "More" command to open the dialog box of the characteristics of the specific surface:



4.1.5 Change of column height

Command with which you can **change** the elements of a **column cross-section as a whole** at the desired level or levels.

Select the command, point to the substructure with the corner or side you want to remain fixed and in the dialog box that appears:



You make the change you wish to make and in the "Floor" section you set the level or levels you want the change to apply to.

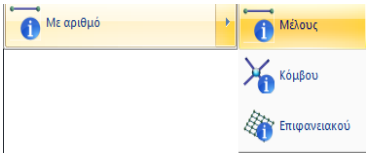
CAUTION. The increase in the cross-section of the column in height can only be carried out from the bottom up and not vice versa.

The same command can be found in the command list that opens by approaching a pole and pressing the right mouse button (see. Chapter 2 Modelling - Pillars)

Changing the height of a column requires the cross-sections of the columns have the same fixed points (see chapter 4 Tools-Fixed points)

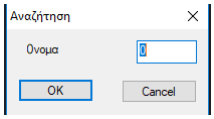
4.1.6 With number

In the new versions of SCADA Pro it was integrated the search of a member, node or surface by simply typing the number of element you want to search for.



Seekers.

Select the command, enter the number of the member, node or surface

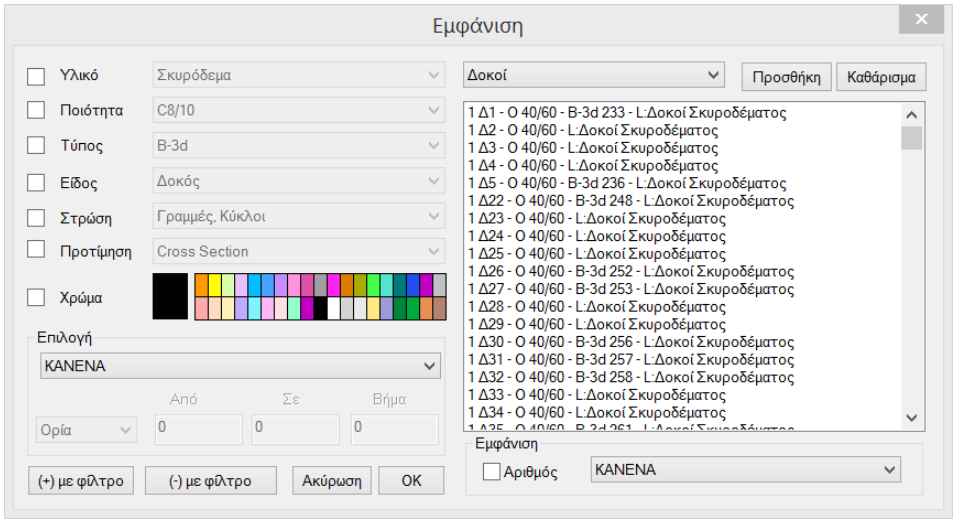


press OK and this appears in the Project Data, as well as on the desktop on the drawing.

4.2 Numbers

Command to **display** on the physical or mathematical model any information you want such as **numbers**, **degrees of freedom of members, nodes, moments of inertia**, etc.

Calling the command displays the following dialog box:



Select the items you want using the filters. Depending on the case, select "Material", "Quality", "Type", etc., or one of the groups in the list 

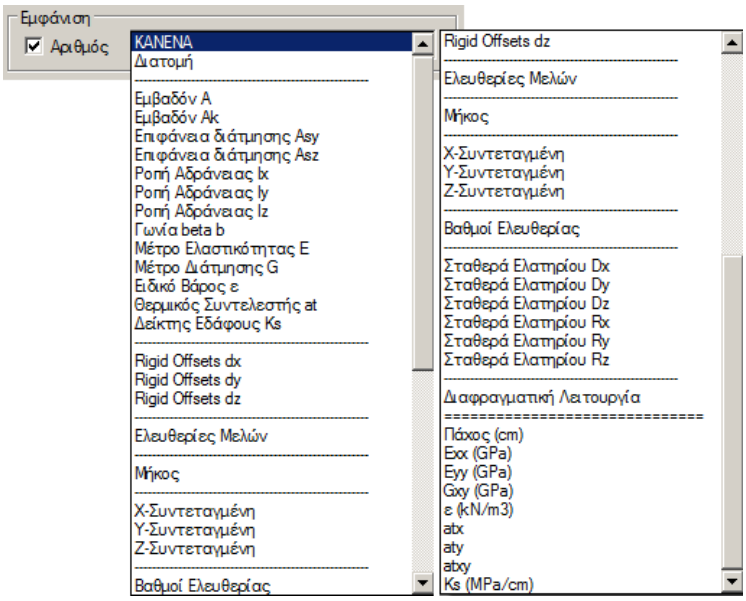
and "Add".

The commands 

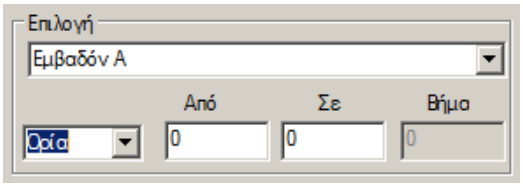
and 

are used to add or remove the selected items through a filter respectively.

Select the items you are interested in from the list (left key and ctrl, turn blue) and in the "Show" field:
Check the "Number" check box to display the numbering of the selected items.
From the list, select the information you want to display.



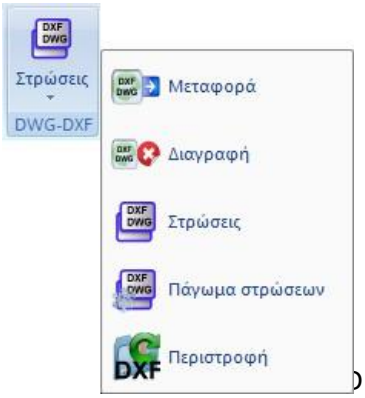
In the "Option" field of the dialog box:



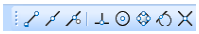
You can set additional filters based on the maximum and minimum values, or limits you specify. For example, to display the max and min cross-sectional area values of beams, or those included within the limits "From", "To" with a certain step, etc.

To make all the values you have displayed disappear, select "NONE" from the list, uncheck the "Number" checkbox and select .(-) με φίλτρο

DWG-DXF



The "DWG-DXF" command group is for auxiliary files. The user has the possibility to import 2D 3D dwg-dxf files into the SCADA interface and use them as guides for data import.
The auxiliary file has a dual role:

1. The design entities it includes act as tractions using the necessary osnaps. 

2 D drawing representing columns and beams are automatically converted into physical cross-sections using the corresponding tool. (see Section "Modelling"). While the lines of the 3D file can be automatically converted into cross-sections.

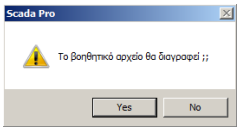
The "DWG-DXF" command group contains the commands for managing auxiliary files:
- **Transportation**
- **Delete**
- **Layers**
- **Layer freezing**
- **Rotation**

5.1 Transportation

Command to move a .dwg or .dxf file that you have imported into the SCADA interface. Select the " Move " command and left-click to point to the "from" and "to" points.

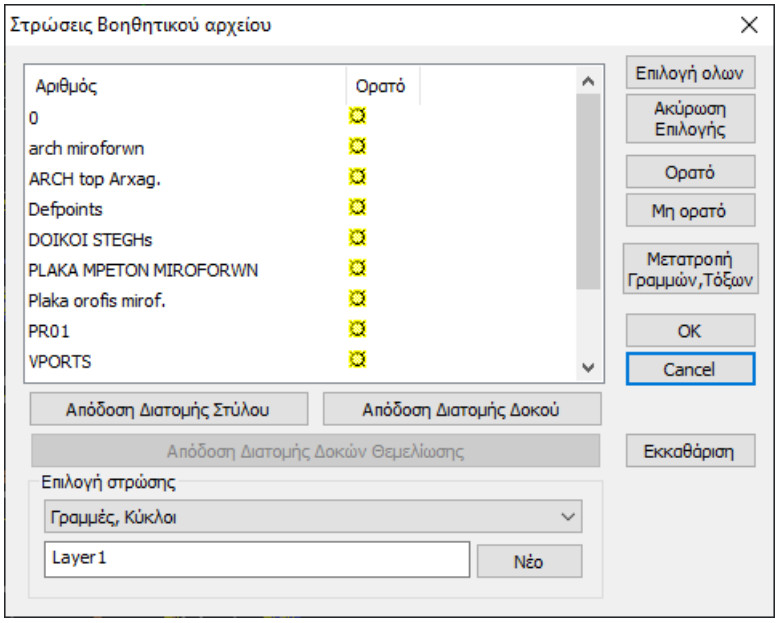
5.2 Delete

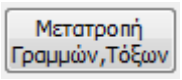
Command to delete a .DWG/.DXF file from the screen. Select the command " Delete " and "Yes" in the dialog box.



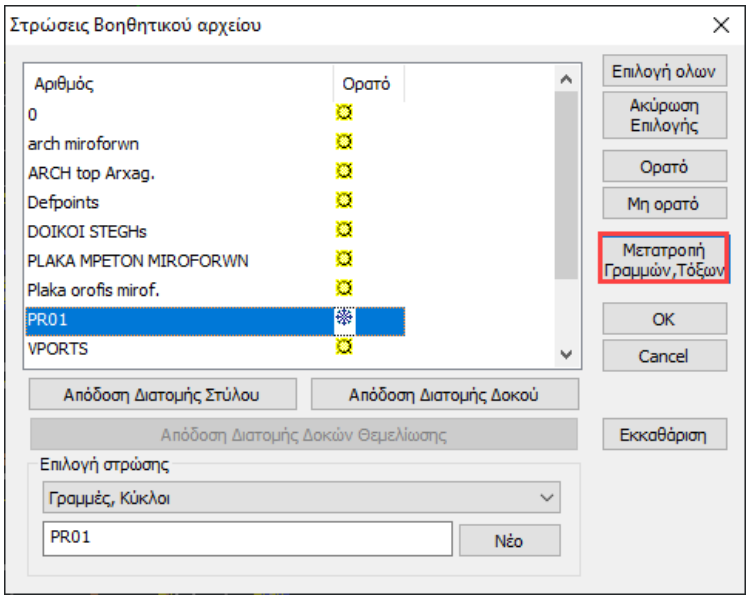
5.3 Layers

Select which layers of the file you have imported into the interface you want to be visible and which you do not want to be visible.
In the dialog box that appears, select one or more layers, the command "Visible" or "Not visible" and "OK".

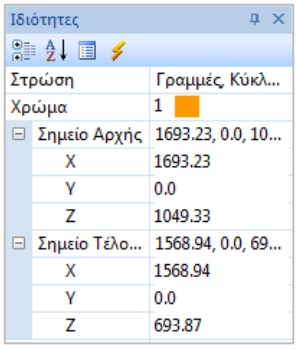




Command to automatically convert lines, arcs and circles to the corresponding design objects SCADA Pro.
When you call a helper file in the SCADA Pro environment, the objects that are imported are not SCADA Pro objects, but only helper lines that provide "traction" at their various points. To convert them into SCADA Pro design objects (lines, arcs, circles), select from the list the layer or layers to which they belong and the command " Convert Lines, Arcs".

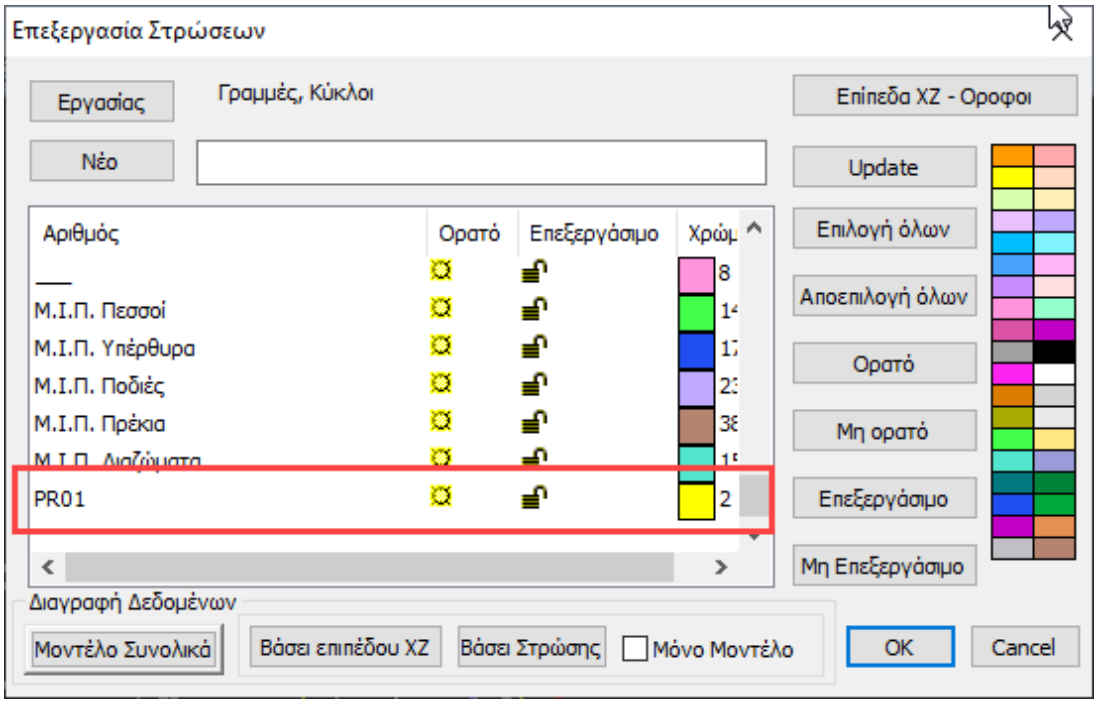


Automatically all the design objects of the selected layer are converted to SCADA Pro design objects with their respective properties.



The Select layer 

field allows you to define a new layer to which these lines of the plan that were converted to SCADA Pro lines will belong. Select New to create the new layer with the name of the layer of the drawing or type a new name and then New.
In the Edit Layers window, the new layer will be added at the bottom of the list.



3D dwg-dxf

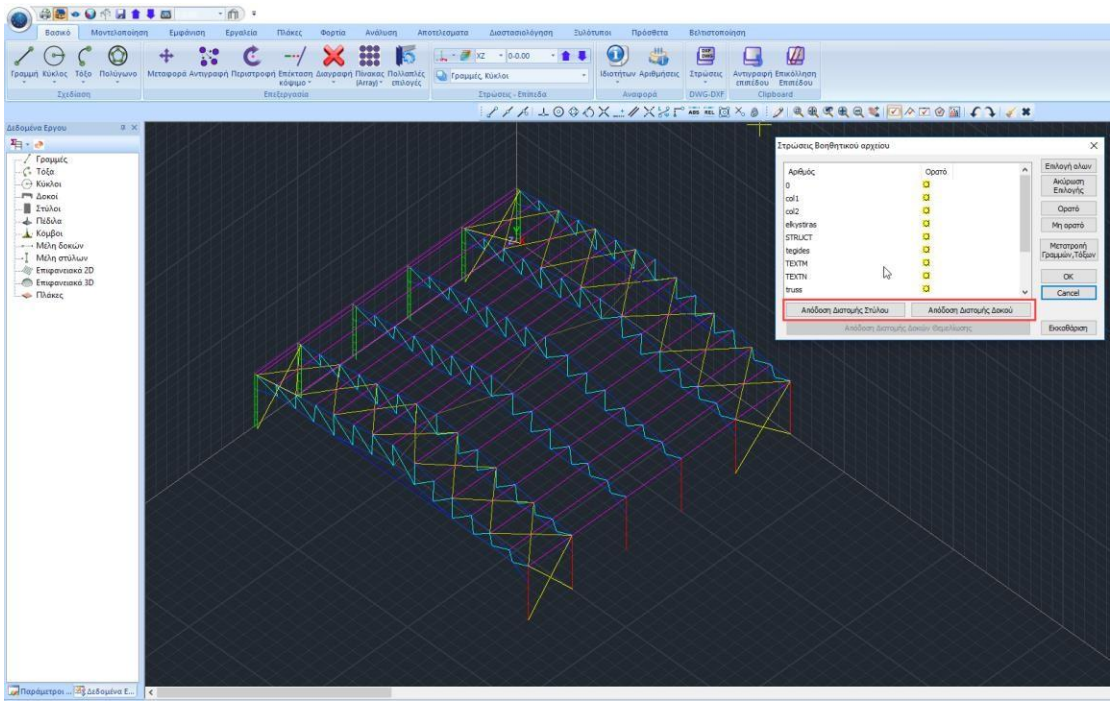
With SCADA Pro you have the ability not only to import a 3D dwg-dxf drawing but also to automatically assign the corresponding cross-sections of the beams and columns to the lines of the drawing.

First select the 3D view of the SCADA 

and through the Insert command, enter the 3D drawing.

By selecting 

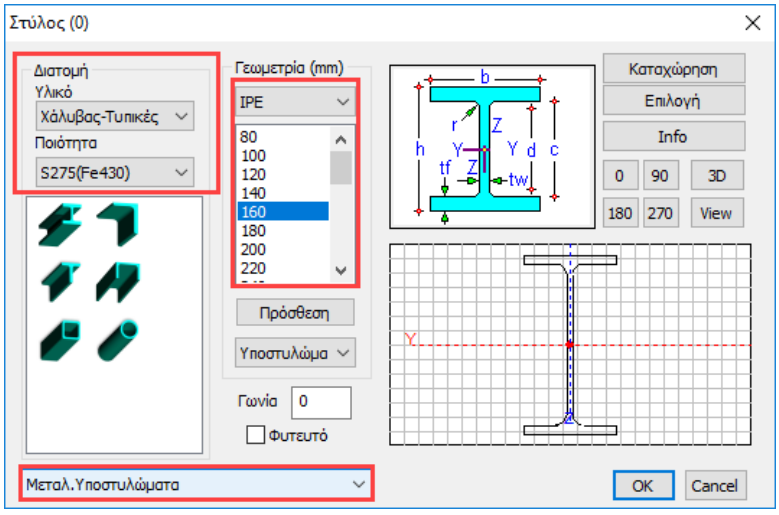
opens the list with all layers of the project.



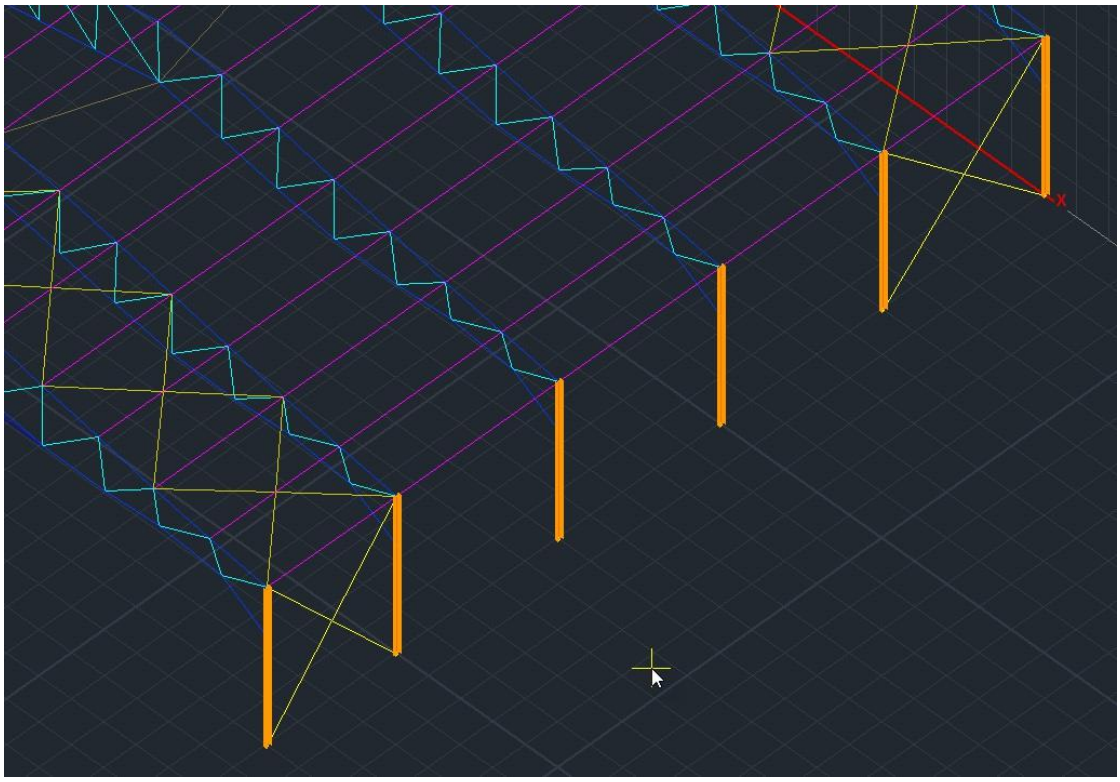
For the automatic assignment of the cross-sections to the lines of the drawing, the basic condition is that they are correctly mapped to the corresponding layers.

Select a layer from the list and, depending on whether it contains poles or beams, select the corresponding command at the bottom of the window

Automatically opens the cross-section window to select the cross-section to be assigned all lines of the selected layer. Also select the angle, insertion point and the SCADA layer to which they will be added.



Members with physical and mathematical properties are automatically generated.

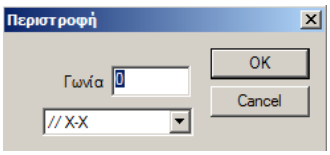


5.4 Layer Freeze

Command to freeze the layers of the .DWG/.DXF file you have imported into the interface.

5.5 Rotation

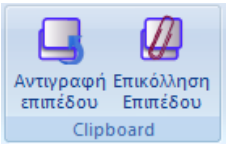
With this command you can rotate the entire DWG/DXF auxiliary file in the X-X or Z-Z global axis. This command is particularly useful when you want to work in the XY or XZ plane. Select the command and in the dialog box that appears:



enter the angle of rotation and the global axis in which you want the rotation to take place. The command is completed by selecting the centre of rotation.

Clipboard

The "Clipboard" command group includes the commands Copy & Paste Level.



With the "Copy Level" command all **physical elements** on the active level are selected to be copied to another level with the "Paste Level" command.

Display on your screen a floor plan with physical cross-sections. Select the command "Copy Plane" and use  to change the plane. Then select "Paste Plane" to copy all the physical elements of the previous plane to the new plane. Change the layer again with  and select "Paste Level" again, repeating the process for all layers containing the same elements.

ATTENTION:
The Copy - Paste Level command can also be used after the mathematical model has been created. However, the paste layer will only include the physical cross-sections and design entities, not the mathematical ones.
The Copy - Paste Layer command copies all the physical elements of the layer to the paste layer. A warning message cautions you not to create copies on top of each other. Choose, either to delete all existing elements of the selection level by replacing them with those of the selected one, or to keep them, but taking into account that if there are already elements in the same position, they will not be overwritten but will overlap, causing an error in the model!