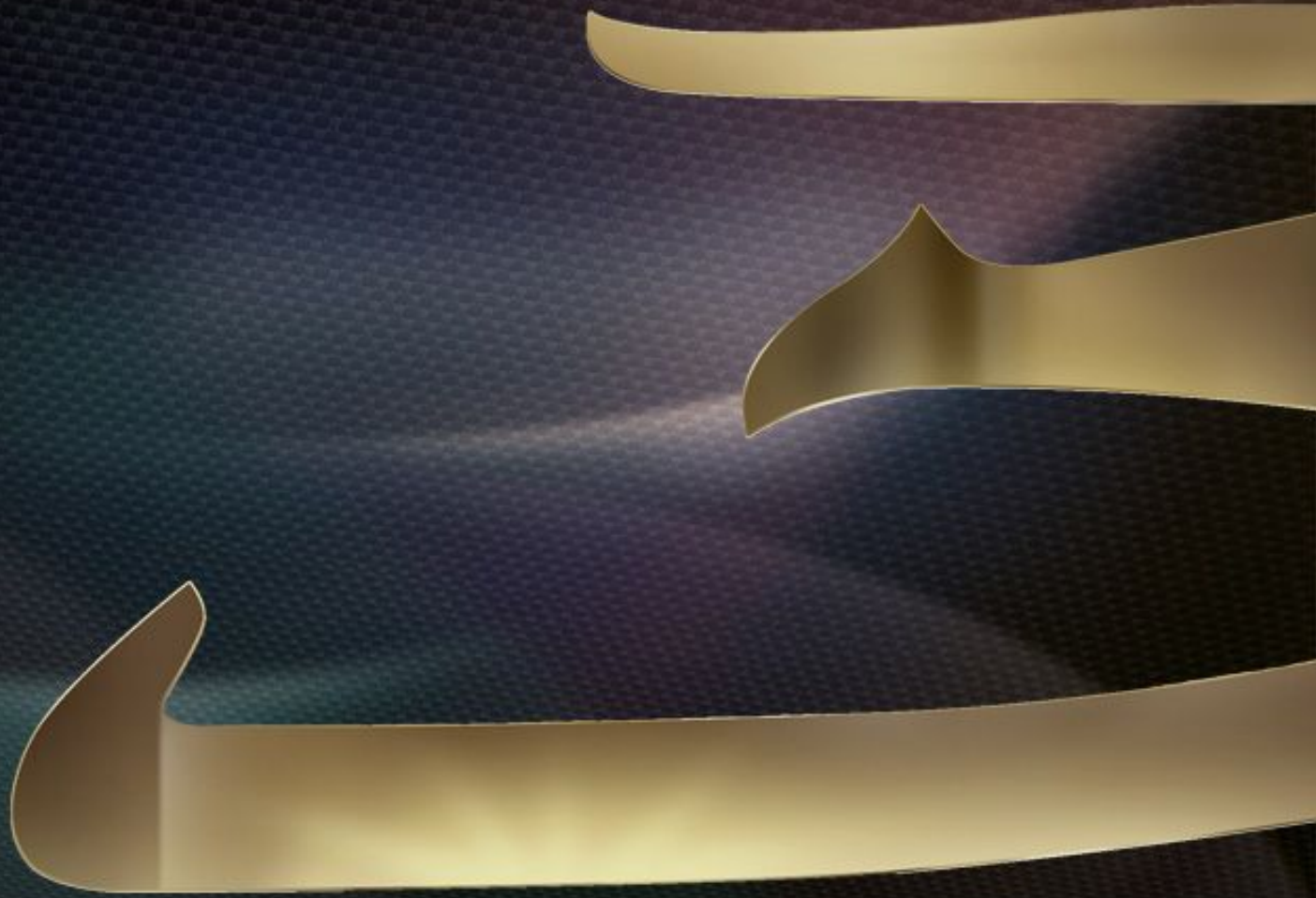


User Manual



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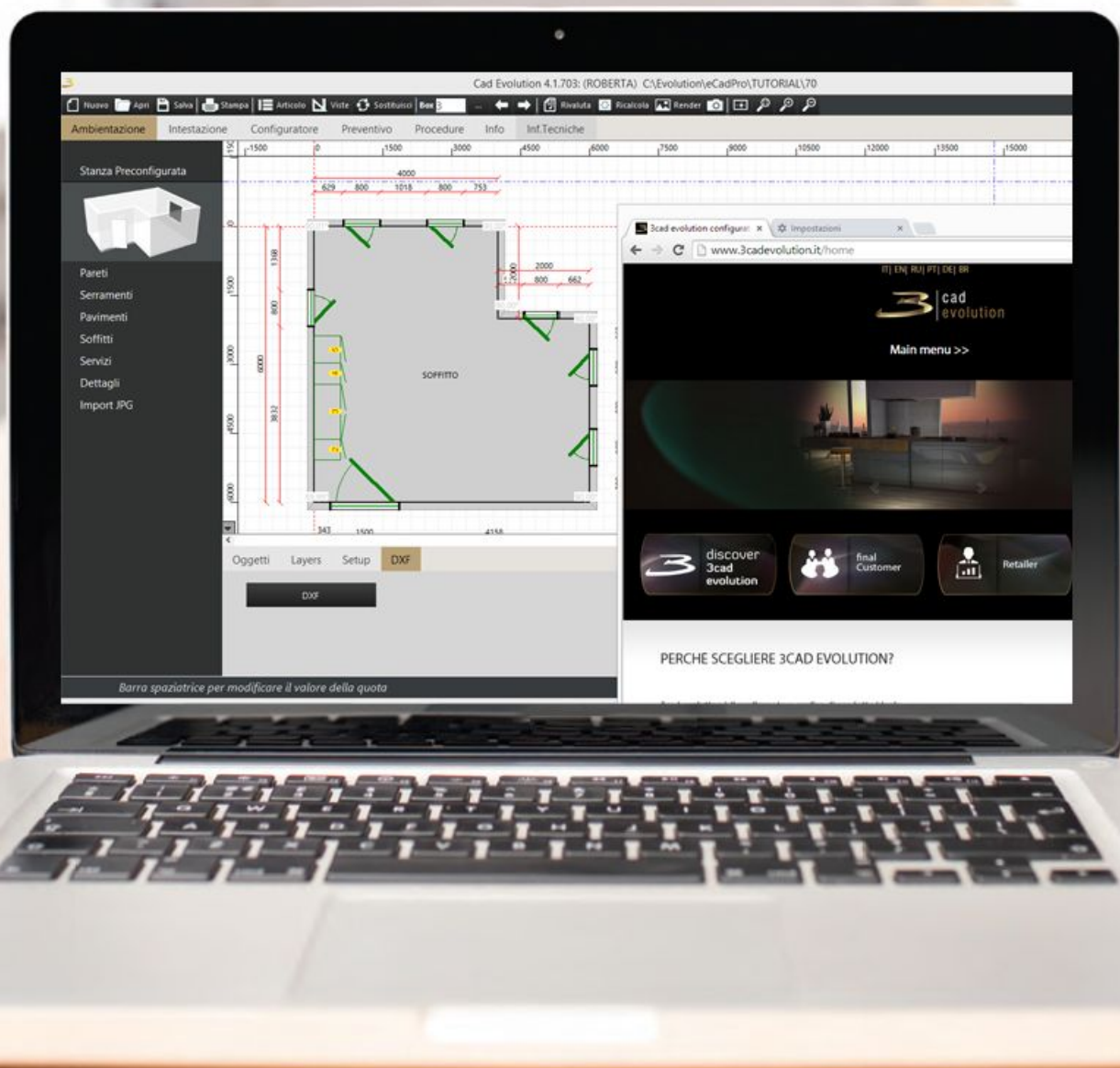
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1

INTRODUCTION



1 Introduction

It's a guide for new users, this manual illustrates the functionality and the features of the **3cadevolution** product.

1.1 User definition for this product

The target users for this manual are those who find **3cadevolution** as a tool to make quotations, orders or projects.

1.2 How to read this manual

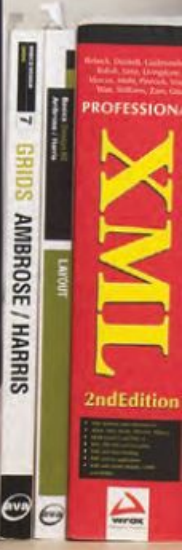
This manual describes in detail the operation and the utilization of the **3cadevolution** application and it is meant for the previously described users.

The purpose of this manual is to describe all of **3cadevolution** functionality and their possible use. First of all we will explain the versions, how to install it and the program requirements, explain its different features and how to use them. This guide supports the technical manual which explains how to make rules, meant for more advanced users that want to make their own catalogues and use this product at an advance level.



2

PRODUCT DEFINITION



2 Product definition

2.1 Technical requirements

2.1.1 The graphic engine requirements

3cadevolution uses a 3D graphic engine designed for speed and performance.

To achieve these targets, the engine is heavily dependent on the characteristics of the new generation graphic cards.

Despite seeking compatibility with all of the graphic cards on the market, the following limitations had to be applied:

 **3cadevolution** can not operate as a terminal emulator with tools such as: **Citrix, Terminal Server**, etc., since the elaboration is mostly executed by the video card, which can not be used in emulated environments;

 **3cadevolution** does not work with cards which do not support 3D (before 2000).

In addition to this there are many differences between graphic cards for performance and quality, therefore it is necessary to carefully analyze this particular matter. There is an enormous difference in terms of performance between a good quality graphic card and a second-rate one, this can dramatically affect speed, design quality, overall quality and printing speed (which depends on the graphic card) and graphic effects.

It is quite simple to replace the graphic card of a PC with a more suitable one, with minimum expense, but unfortunately this is not possible with laptops.

2.1.2 Hardware and software requirements

3cadevolution has been design to work on PCs with Microsoft Windows.

The Windows versions supported are: XP Service Pack 3 and later versions, Vista, Windows 7, Windows 8, Windows 8.1. Windows Me, Windows98 and XP Service Pack previous versions are not supported.

3cadevolution requires the installation of a **SQL Server** database.

For this reason the MSDE and SQL Express free versions (the last one is on the setup CD), and the 2005, 2008, 2012 and 2014 professional versions of the Microsoft **SQL Server** (MSSQL) are supported.

Since the access to the database is linked to the specifications of the MSSQL, especially for the intense use of the **TRANSACT-SQL**, it is not possible to use a database which is not Microsoft such as MySQL or Oracle, because they are not compatible to the **TRANSACT-SQL** dialect.

An existing session of MSSQL can not be used unless it has been installed as case sensitive, in this case it is necessary to install a new MSSQL session. However it is reccomendable to have a MSSQL session for **3cadevolution** usage and not mixing it with other company EPR databases. However it is possible to link **3cadevolution** company database to other company databases, whether they operate in the MSSQL environment or not.

Minimum configuration:

-  Operating system: Microsoft Windows XP SP3, Windows Vista, Windows 7(32 e 64 bit), Windows 8, Windows 8.1.
-  Processor: Intel® Core™ i3 ;
-  RAM memory: 2 GB;
-  Video card: 1 GB video memory, 3D compatible with shader 3.0;

Recommended configuration:

-  Operating system: Windows 7 (64 bit), Windows 8, Windows 8.1.
-  Processor: Intel® Core™ i5 ;
-  RAM memory: 4 GB;
-  Video card: shader 4.0 compatible e 2GB dedicated memory, NVIDIA 4GB video card not recommended;
-  Other: USB port for the HW security dongle.

2.2 Program installation

There are three ways to install the program:

1. The *Server* or stand alone installation: it installs the entire program for its full use.
2. *Client* installation for an additional PC connected to the network with **3cadevolution** installed: in order to allow several users to use the program with a common database.
3. **ECadLite** installation.

Verify the following before installing:

-  Have the security hardware protection device (dongle).
-  Have sufficient hard disc space (15Mb for the *Client* and further space depending on the catalogues: an average of 500Mb per catalogue).
-  Have the administration rights to install on the PC (in particular PCs with Vista e Windows 7, Windows 8 and Windows 8.1¹).

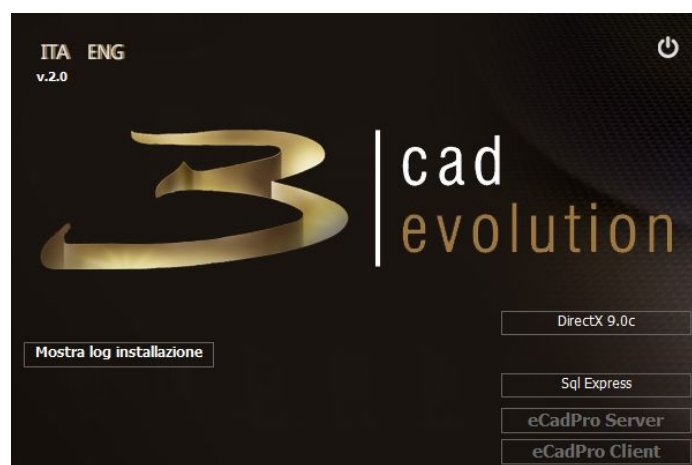


Figure 2.1: **3cadevolution** installation loader.

Inserting the CD will display a screen as shown in figure 2.1. After loading the program loader, it will run an automatic control of the prerequisites required for the setup.

¹ When installing on operating systems such as Vista, Windows 7, Windows 8 and Windows 8.1, launch the CD Setup by right clicking on the executable and launching it in the mode: Run as administrator.

- 1) Click on the Sql Express button, as shown in figure 2.2. Install with administrator rights the DotNet Framework 2.0 or 3.5, the version will depend on the database instance that will be used later on, and at last install the Sql Express (2008 R2, 2012 sp1 or 2014).
- 2) Install the eCadPro Server (in order to manage the program directly from the PC) or eCadPro Client (when the computer, with others, is part of a network connected through a server, as for example in an office network).



Figure 2.2: Sql Express database instance installation.

eCadPro Server installation: install eCadPro and restore bcp.

- a) It is required to select the language for the installation and to press OK, as shown in figure 2.3.

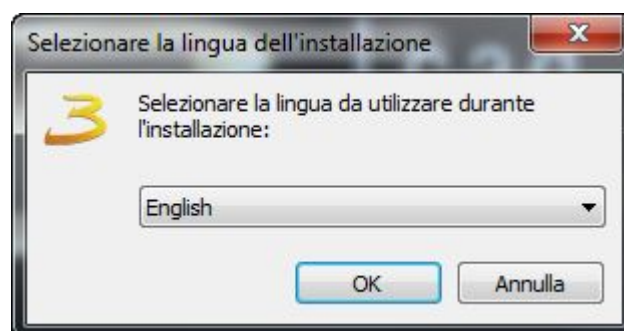


Figure 2.3: Select language.

- b) The folder proposed in the Avvio/Start menu may be used, or click on **Forward**, or choose another folder, see figure 2.4.

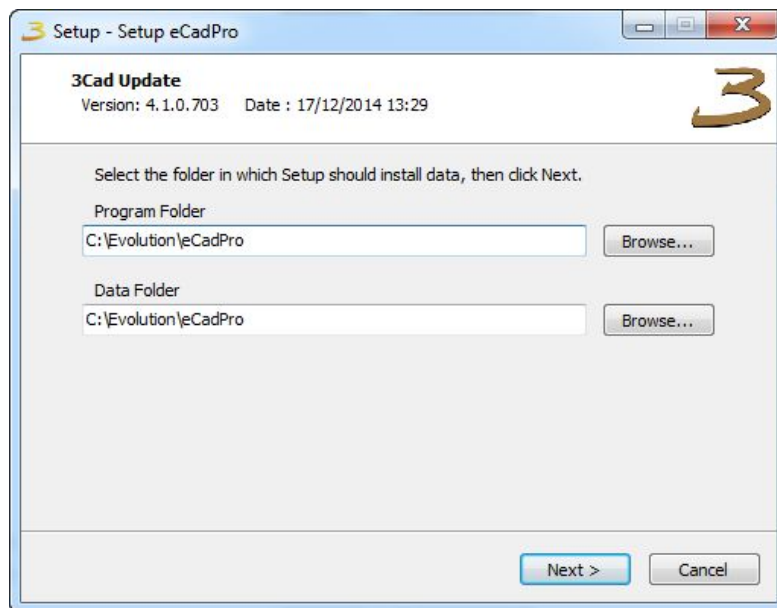


Figure 2.4: Selection of the installation folder

- c) If you want to create the **3cadevolution** icon on the desktop or in the quick start bar, check the appropriate box and click on **Forward**, see figure 2.5.

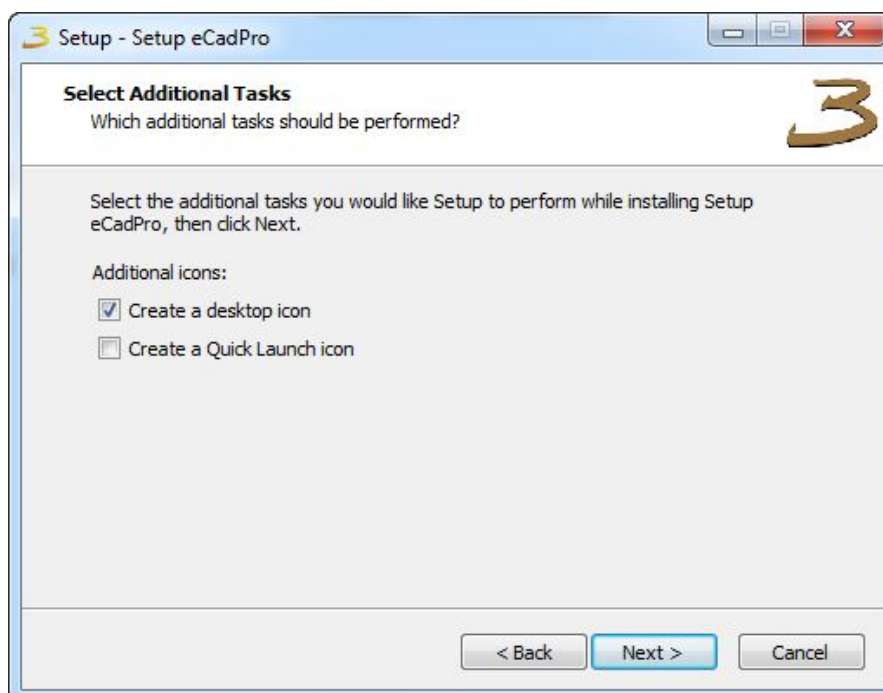


Figure 2.5: To create the Desktop/Quick start icon.

d) Click on **Install** to launch the installer, see figure 2.6.

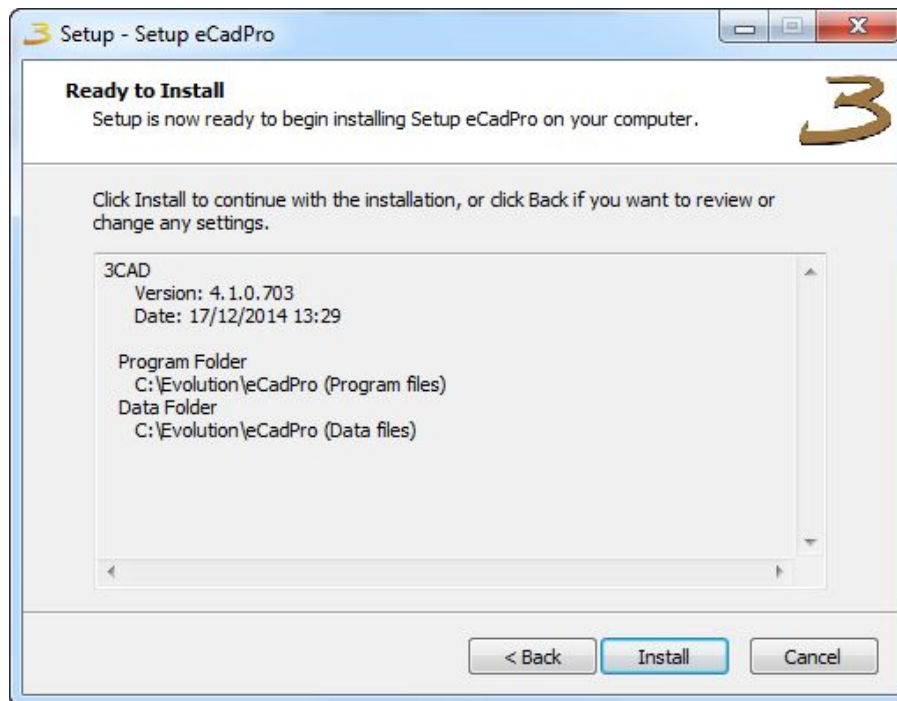


Figure 2.6: Start installer.

The following items are automatically installed after the installation of the *Server* type program:

-  Restore of the *BCP* files,
-  Program updates, in the *files* folder.

eCadPro Client INSTALLATION: install eCadPro and set the work folder on the server.

If this kind of installation is selected, the first request is to insert the path for the database, which means, the mapped path of the network containing the _ECADPRO and the catalogue folders, see figure 2.7.

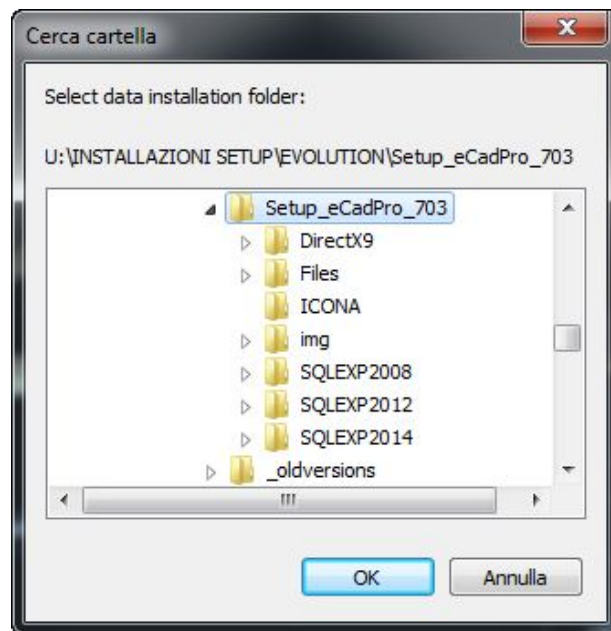


Figure 2.7: Data path selection

The same steps are followed after "b)" from the eCadPro Server installation.

N.B. It may happen to the users in possess of Windows 8 and Windows 8.1 that the mapped units are not shown, then it is required to proceed as follow:

1. Click on the Start button, then select Execute, in the "Open" box type regedit and then select OK.
2. Mouse right click on the registry subkeys
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System.
3. Select New, and then the DWORD value.
4. Type EnableLinkedConnections, and then press the ENTER key.
5. Mouse right click on EnableLinkedConnections, and then click on Modify.
6. Type 1 in the "Data Value" box, and then click OK.
7. Exit the registry editing and restart the computer.

2.3 Installing a catalogue

Two icons are created after the **3cadevolution** installation, the first one is for the program itself, the second one is linked to **EcadUtil**, which contains the catalogue Create, Cancel, Copy, Restore, Equalizing utility procedures and database maintenance.

Let's proceed to see how to use the **EcadUtil** utility program.

The screen in figure 2.13 is activated upon launching the program (unless the program is unable to identify the database, in which case the following sub-section should be looked at):

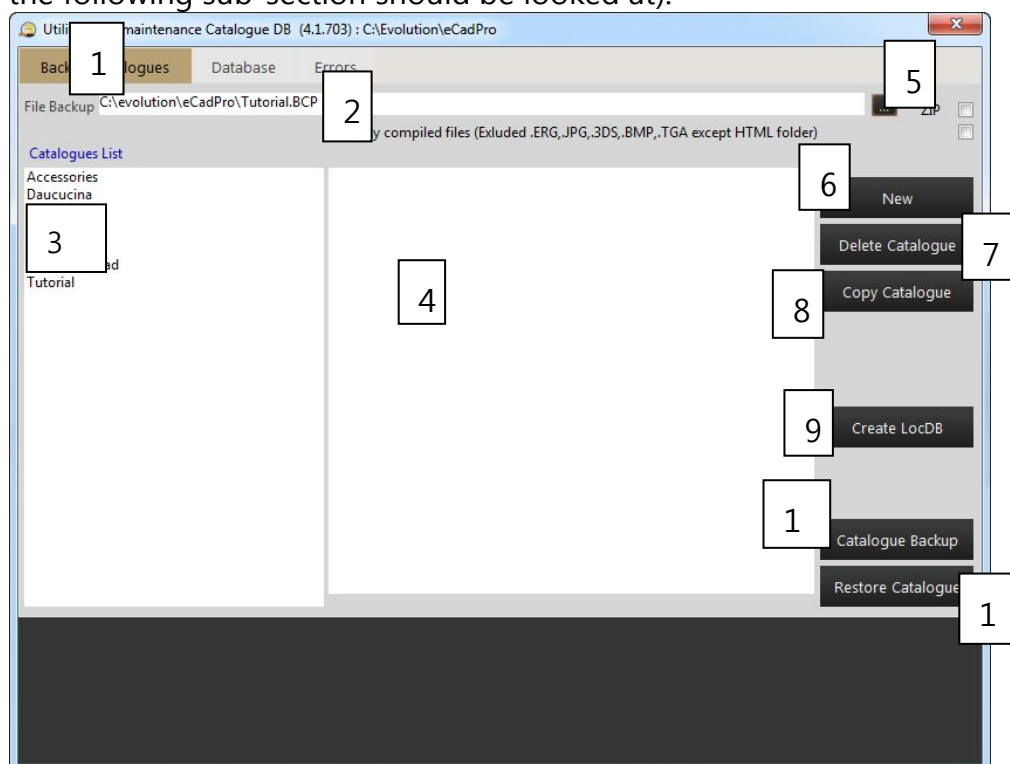


Figure 2.13: catalogue installation.

1. As for all parts of the **3cadevolution** application, the screen is divided in several tabs (4 in this case: catalogues backup, database, errors and paths). The active tab is highlighted in gold.
2. Here we insert the backup file on which we intend to work on: catalogue data are saved inside a single file, this file usually carries the name of the catalogue and a BCP extension, it's usually saved in the file where the catalogues have been installed (the installation default sets them in C:\evolution\ecadPro).

3. Here we have the list of the catalogues that have been installed and are visible to the Ecadmaster program, which is not a catalogue but the database where the client records, orders and production data are saved. **3cadevolution** uses a database for each catalogue and it saves all of the catalogue information in a folder which has the same name of the catalogue.
4. The system uses this area to show the copy and restore activities progress.
5. Select this check before making the *backup* in order to copy the catalogue in the compile format only. This preserves from the possibility to distribute the rules and 3D data files in the source version. The data will be usable only in the compile format and therefore it won't be possible to alter them. In any case it's a company decision to distribute its catalogue in source or compiled format.
6. With this button it is possible to create a new catalogue.
7. The cancellation of a catalogue is definite and it is removed from the database as well as from the folders that uses them. However the orders created by those catalogues are not removed. Therefore be aware to verify to have updated copies of the data before executing a cancellation.
8. It duplicates an existing catalogue by creating an identical copy named "*nomecatalogo_COPIA*", which name by the way may be changed.
9. It creates a local database.
10. After selecting a catalogue from the list (3) and by pressing this button (10), you activate the copy operation which creates a BCP file containing all of the information. The file complete name is shown in (2).

11. The restore operation is the opposite of the backup operation, which is achieved by starting from a BCP file, which can be selected through a search on other devices. To restore a catalogue it should not be present on the disc in order to avoid unintentional file overlapping. Of course it is possible to restore a catalogue with a different name , but attention must be given to previous price quotes using that catalogue which are not going to be available after the name change. To restore a new version of the catalogue by overwriting over the previous version, the previous catalogue must be deleted.

The maintenance features of the catalogues are quite simple to interpret and set. **3cadevolution** is based on contents which are found inside the catalogue, and without them the product is unusable. They may be self-built or supplied externally. These procedures enable to copy, cancel, rename and duplicate a catalogue.

2.4 Database

The utility program second page enables to work with the database in order to perform some maintenance.

A catalogue consist of two parts: a database and a folder containing the catalogue work files.

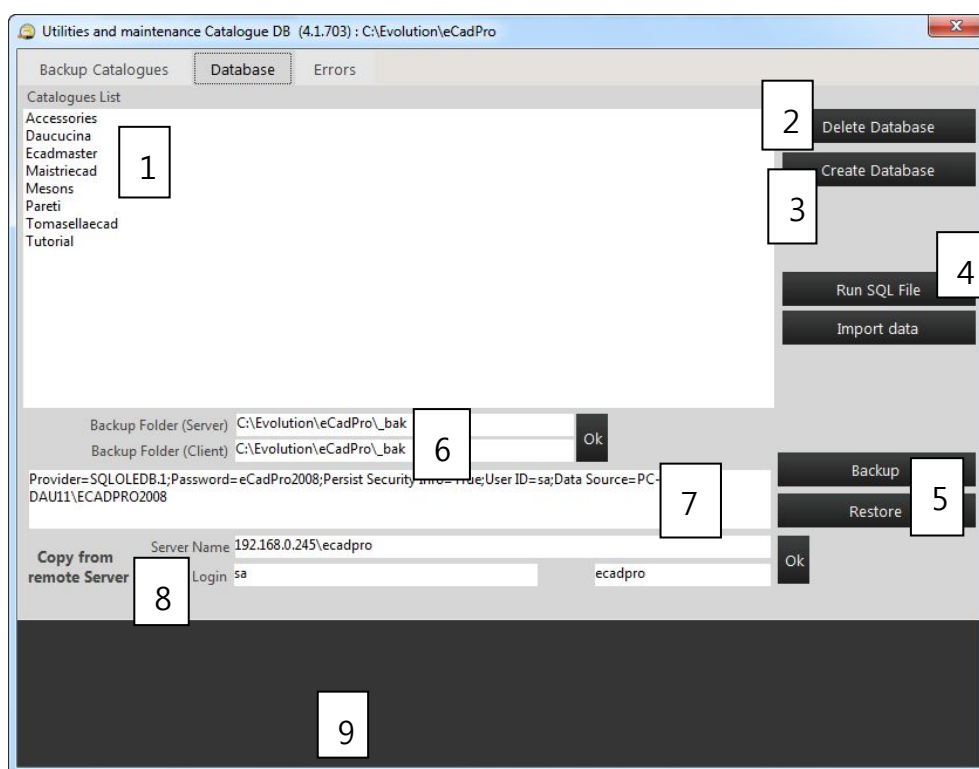


Figure 2.14: Database maintenance

In the previous section we have seen how to work with the whole database, and now we will concentrate on the database maintenance activities, such as copying and modifying the data inside the folder of the catalogue.

These are operations that may be performed directly by the user with Windows Explorer.

1. If the program is connected, the available *database list* will be shown. **3cadevolution** works if the Ecadmaster database has been created and if at least a catalogue has been installed.
2. This button *deletes the selected database* (several databases may be selected at the same time).
3. It enables to *create a company database*. A name is required for the database and therefore it is created and synchronized². The program considers Ecadmaster as a special name which is created with its own specific structure. In order to create the database, this database must not be on the list. For the creation of the database and for the catalogue, the previously described rules for the names apply.
4. It executes the *sql query*.
5. *Backup and Restore*: they correspond to the normal copy operations of the SQL Server database. For the less experienced operators, we could say that the Backup takes all of the data of a database and puts them in a [nomedatabase].BAK file inside the folder shown in (6), while the restore takes the [nomedatabase].BAK file and imports it to the database. This is a very important operation, especially if we have classified information inside the database, however it is best for **3cadevolution** to make copies of the catalogue by using the BCP files. It's also advisable to make a copy of Ecadmaster where the orders and production data are stored.
6. *Paths*: The database Backup and Restore is normally saved on a set path (the sub-folder _BAK is the default for catalogues installation). It is possible here to modify and set the path to save the Backup files. Nevertheless when a SQL Server network is installed two paths are given, actually they are the same but seen respectively from the machine on which the SQL Server is physically installed and from the connected PC Client.

² The synchronizing operation of the database is very important since it enables to automatically make changes on the database structure when passing from one program version to the other. If between program versions there have been implemented new tables, new fields or the structure of the Stored procedures has been modified, the synchronizing operation will enable to align the databases so that the structure is in compliance to the new managements. The technical manual mentions the synchronizing of the (*.DDF and *.SQL) files. It must be said that it's advisable not to modify the database structure or the maintenance utilities procedure of the database. There's in fact a risk that a subsequent synchronizing operation may cancel these modifications.

Obviously due to the different mapping of the Client these paths may be different.

7. *Messages area.*
8. *Copy from another Server.* this utility enables to link a second connection to copy a database from another server: first of all the connection characteristics must be declared and then if the database list is linked it should be filled out and hence the copy buttons from and to the other database is to be enabled.
9. *Communications area.*

The last visible folder in figure 2.15 pertains to the errors and log area where it is possible to verify potential errors and reports that the program has revealed while executing its various operations.

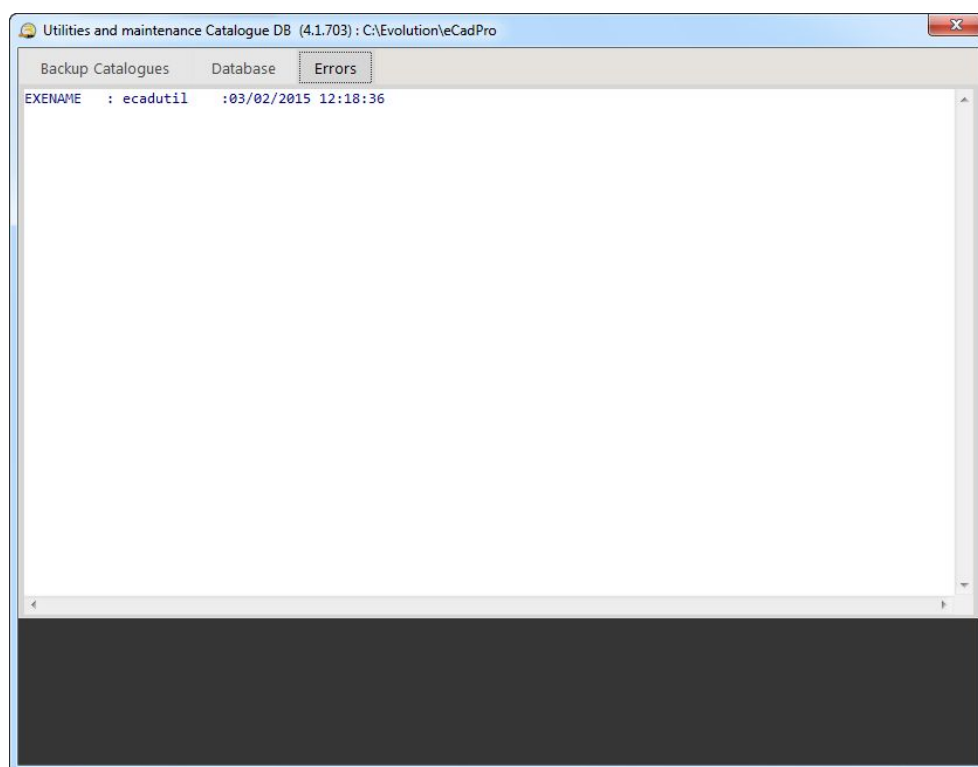


Figure 2.15: Errors and log area



Figure 3.1: 3cadevolution uploading

3

THEORY OF OPERATION



We ♥
3rd
evolution!

all.
Michel

3 Theory of operation

3.1 Work Initio

For the product operation description in this manual the following catalogues are used: PARETI (WALLS) which is linked to the environment, TUTORIAL and COMPLEMENTI (ACCESSORIES).

Let's start the program selecting the icon on the desktop, and verify to have the dongle inserted in the USB port.

The screen in figure 3.1 will appear for a few moments, which will show the current version installed in the program.

Then it will move on to the program main screen, shown in figure 3.2.

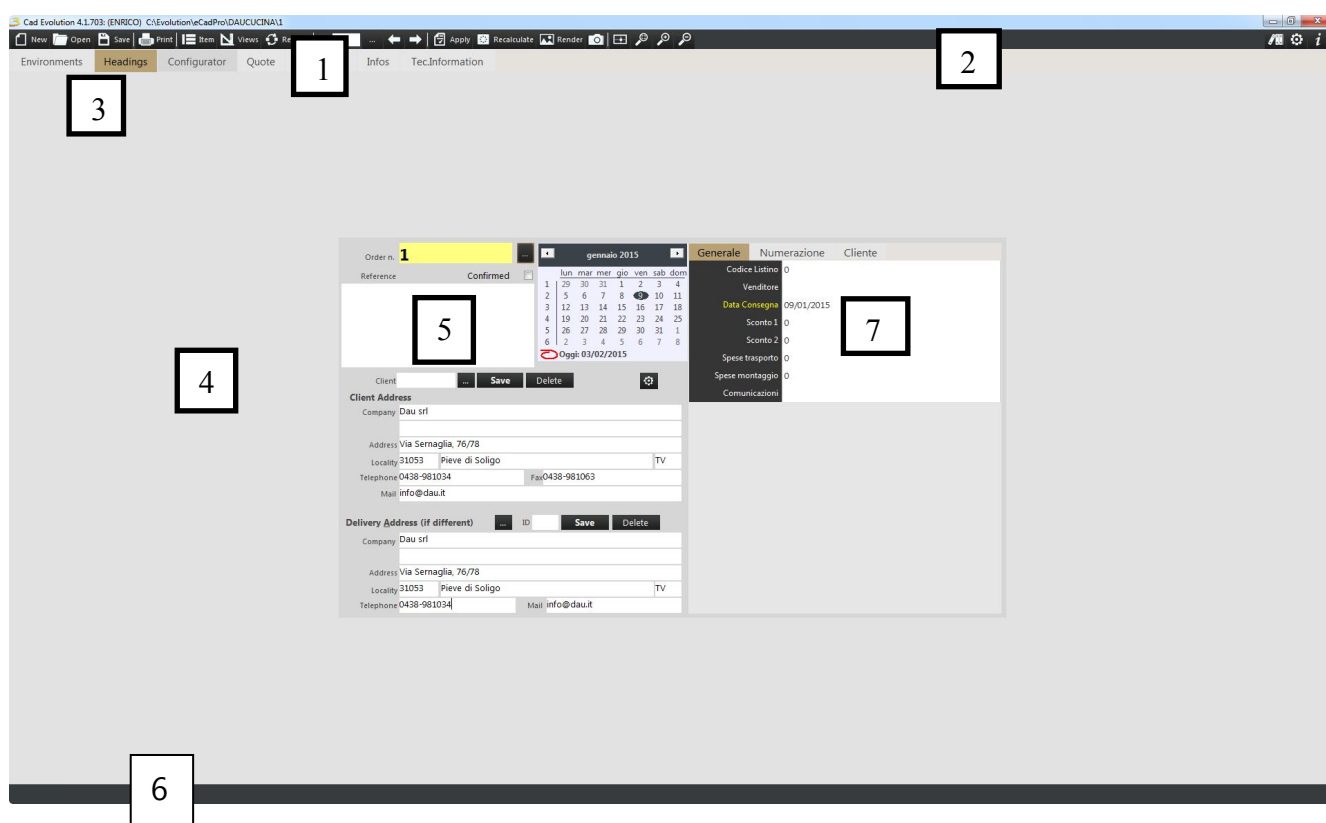


Figure 3.2: The program main screen.

Let's move on to illustrate the interface.

1. The title shows the program version, the user name, the program path and the quotation/order number we are working on. The program path is particularly useful because it shows in which folders we are working on.
2. The main toolbar. The program has various contextual toolbars which usually consist of buttons with a description and by passing the mouse over the button it activates a help which briefly explains its function.
3. Main functions tabs: *environment* is where we have the plan setting, the walls and the 2D environment, *heading* is where we insert the client data for the quotation/order, *configurator* is where we design the order, *quote* is where we control the materials list, *procedure* is where we gain access to the program accessories, including this manual.
4. Work area: it is contextual to the selected tab.
5. The data area is made up of various controls, buttons, input boxes, calendars and checks. The Rule is among them, which we will speak of in point 7.
6. Message area: here the work in progress information is shown or a progress bar is displayed for the processes requiring time.
7. Rule: it is the configurator main characteristic and it is used in all of its parts. Substantially it is a sheet with the questions listed on the left side and on the right side the possible answers, which are conditioned by the previous answers. It is a full fledged program within the program which enables to quickly modify structures, data and to create the required infrastructure for the 3cadevolution configurator operation, for the prints and for other processes where it is used. The rule is in fact used where customizations and specific descriptions are required, to be created with little effort and yet with good results.

3.1.1 Buttons used for the graphics

3cadevolution is designed to give the best response to the standard mouse with 3 buttons and the scroll wheel. It is advisable to use the program only with the mouse with these characteristics.

In general terms the mouse is used for the graphic:

-  **Left Button Single Click:** it selects the object,
-  **Left Button Double Click :** Object activation,
-  **Left Button Depressed + Movement:** rotation or contextual selection (in the configurator tab),
-  **Left Button + Ctrl:** to select a variant or an object,
-  **Left Button + Alt:** rotation (in the configurator tab),
-  **Center Button (Scroll wheel) Depressed + Movement:** work plan movement,
-  **Scroll wheel Forward and Back:** zoom level increase or decrease,
-  **Mouse Right Button:** contextual menu with associated functions, it is accessible from anywhere in the program and it enables to perform additional activities.

3.1.2 Shortcuts

There are several keyboard shortcuts (*Shortcuts*): the shortcut buttons are placed in various points of the program which enables to quickly access to this or that function without necessarily going through the various menus.

The shortcuts are listed on the following table:

Shortcuts

Combination	Function
F1	Item window
F2	Views management
Ctrl+F1	Front view
Ctrl+F2	Profile view
Ctrl+F3	Plan view
Ctrl+F4	45° left isometric view
Ctrl+F5	45° right isometric view
Ctrl+DX	Move
Ctrl+T	Calculate top
Ctrl +S	Save Order
Shift+F3	Plotter rule enable
F4	Apply
F5	Print order
Ctrl +F	Find Item
F3	Item menu
Ctrl +A	Create Macro
Ctrl +D	Divide Macro
Ctrl +Z	Undo
F6	Associations Editor
F7	Variants Editor
F8	Lines Editor

Combinations	Function
F9	Dump Variables
F10	Rule Editor
Ctrl+R	Rule Editor
F11	Graphic Editor
Ctrl+G	Graphic Editor
Ctrl +L	Upload Order
Ctrl +J	Create Job
Ctrl +I	Create miniature
Ctrl +H	Help ShortCuts

Table 3.1: Shortcuts.

3.2 Heading

To create a new quotation/order (from now on we will say *order* to be short) press the *New* button on the system toolbar, the program will set to the Heading tab shown in figure 3.3.

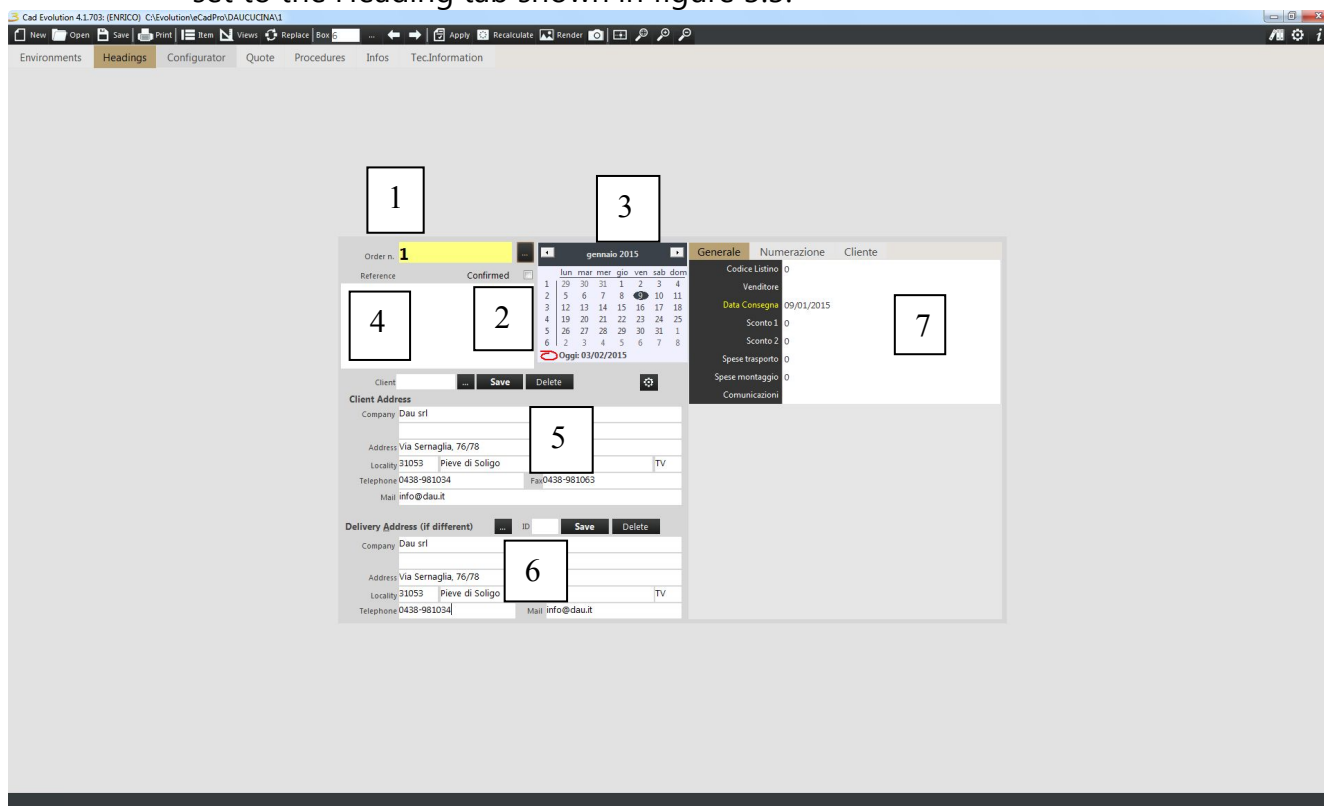


Figure 3.3: Heading

1. First of all, inside this tab the *order number* is assigned. The numbering is automatically assigned by the program, a specific number may be manually assigned, the program only accepts whole numbers up to 6 digits (from 1 to 999999). Inserting a preexisting order number in **3cad evolution** and pressing return will upload the order. Next to the order number there is a search button (search buttons are present in various areas of the program). By pressing this button, the last orders inserted are displayed and they may be uploaded from the list.
2. *Confirmed* the "confirmed" check-box distinguishes a quote from an order. When it is checked, and upon saving, the order is transferred to the management system which generates all of the processes necessary for the order. If the order is inserted within a

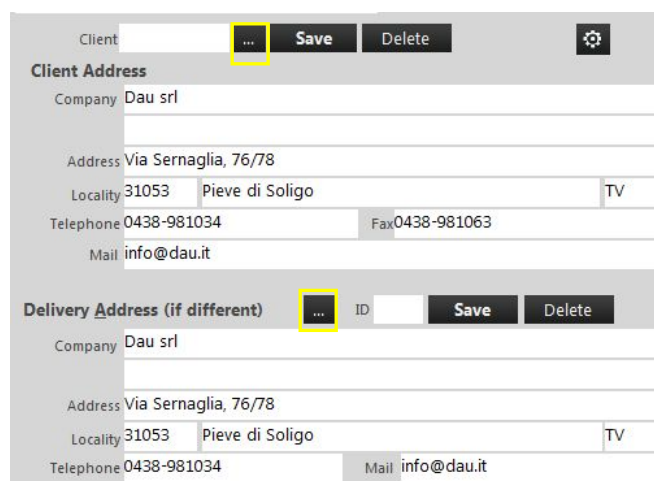
load at the moment of its uploading, it could turn out as blocked (in this case a lock will appear before confirming it and the order can not be modified).

3. The *Calendar* sets the order date by inserting the date when it was created. The order may manage other dates: entry date, delivery date and price list date. And in the customizable part of the heading (7).
4. *Reference*. in this field we have several lines available to write essential data pertaining to the order.
5. *Client*. **3cadevolution** searches for the delivery customer inside the database. The data may be in the management system, in such case it is not editable, nor created from this interface. To each customer a numeric code is assigned and it can be recalled with the search button. If the installation allows it, we may create, overwrite (save button) or cancel (cancel button) the customer details directly from this interface where the selected customer's basic information were made available.

! When inserting, be careful, **do not use special symbols** (? & | \ / < > : etc..).

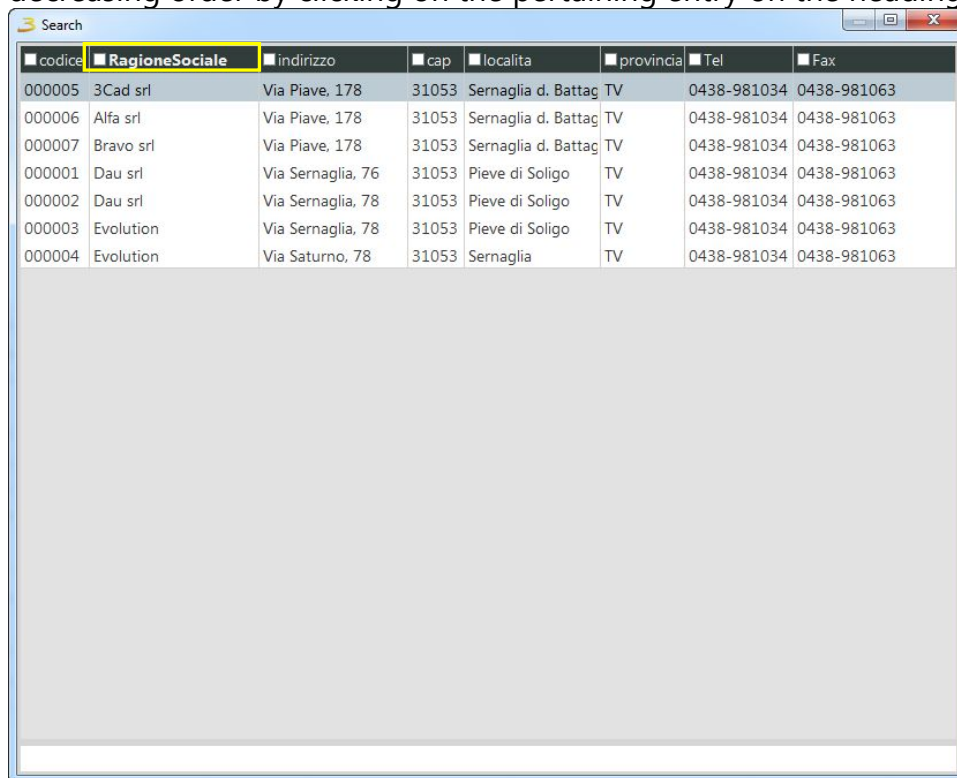
Fill out the "Delivery Address" section if the delivery address is different.

N.B. In the customer search window, accessible by pressing the following buttons



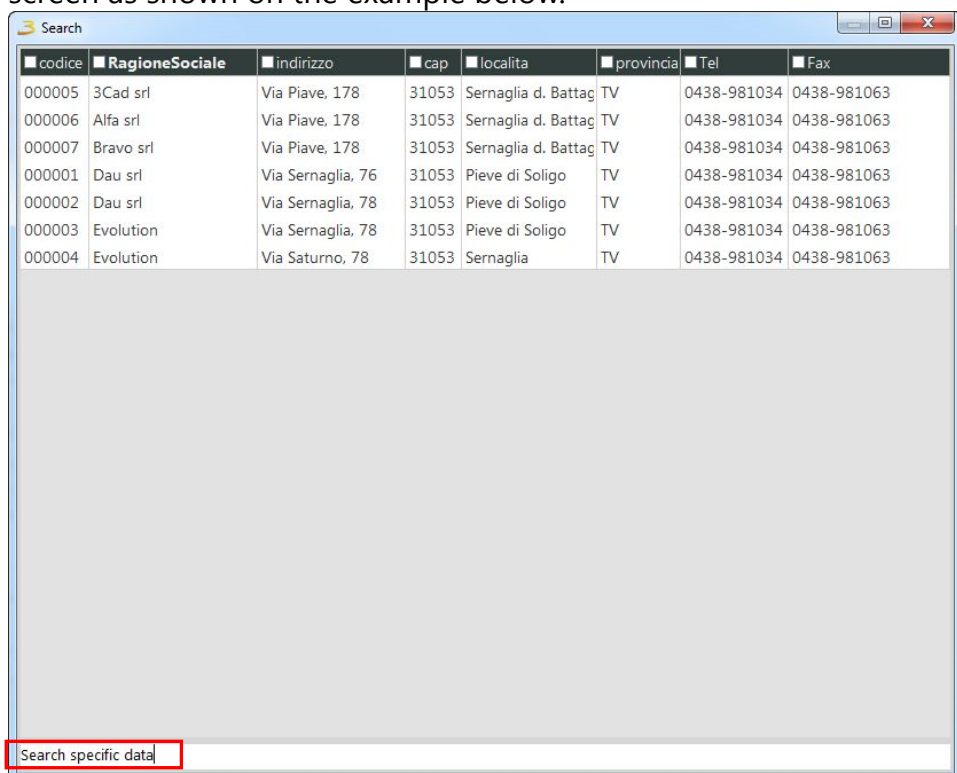
The screenshot shows the software interface with two main sections: 'Client' and 'Delivery Address (if different)'. Both sections have a search button (three dots) highlighted with a yellow box. The 'Client' section includes fields for Company (Dau srl), Address (Via Sernaglia, 76/78), Locality (31053 Pieve di Soligo), Telephone (0438-981034), Fax (0438-981063), and Mail (info@dau.it). The 'Delivery Address' section has similar fields, with the same data entered.

Searches are possible by numeric and alphabetic increasing or decreasing order by clicking on the pertaining entry on the heading.



codice	Ragione Sociale	indirizzo	cap	localita	provincia	Tel	Fax
000005	3Cad srl	Via Piave, 178	31053	Sernaglia d. Battag	TV	0438-981034	0438-981063
000006	Alfa srl	Via Piave, 178	31053	Sernaglia d. Battag	TV	0438-981034	0438-981063
000007	Bravo srl	Via Piave, 178	31053	Sernaglia d. Battag	TV	0438-981034	0438-981063
000001	Dau srl	Via Sernaglia, 76	31053	Pieve di Soligo	TV	0438-981034	0438-981063
000002	Dau srl	Via Sernaglia, 78	31053	Pieve di Soligo	TV	0438-981034	0438-981063
000003	Evolution	Via Sernaglia, 78	31053	Pieve di Soligo	TV	0438-981034	0438-981063
000004	Evolution	Via Saturno, 78	31053	Sernaglia	TV	0438-981034	0438-981063

In the example we have followed the alphabetic name of the locality, if we need to search for a specific datum we would have to click on the screen as shown on the example below.



codice	Ragione Sociale	indirizzo	cap	localita	provincia	Tel	Fax
000005	3Cad srl	Via Piave, 178	31053	Sernaglia d. Battag	TV	0438-981034	0438-981063
000006	Alfa srl	Via Piave, 178	31053	Sernaglia d. Battag	TV	0438-981034	0438-981063
000007	Bravo srl	Via Piave, 178	31053	Sernaglia d. Battag	TV	0438-981034	0438-981063
000001	Dau srl	Via Sernaglia, 76	31053	Pieve di Soligo	TV	0438-981034	0438-981063
000002	Dau srl	Via Sernaglia, 78	31053	Pieve di Soligo	TV	0438-981034	0438-981063
000003	Evolution	Via Sernaglia, 78	31053	Pieve di Soligo	TV	0438-981034	0438-981063
000004	Evolution	Via Saturno, 78	31053	Sernaglia	TV	0438-981034	0438-981063

Search specific data

6. Destination: to complete the customer information, a delivery address is required if a different one is on record. These addresses may also be searched, created, modified and deleted if the program allows it. In case there is only one destination address the program will propose it when the customer is inserted.
7. Other data: the structure of the information on the left side of this screen is linked to a rule, if the M02 module is available (to edit rules and the button is visible on the side, which enables to edit it by inserting new fields or functions). The rule is a hierarchical structure of questions where the answers are given in advance (default answers) and they may always be replaced by other possible preconfigured answers. The following information is inserted in the example: price list code, reference and delivery dates, payment terms and discounts, this information may be different among the 3cadevolution clients, based on the EPR system linked to it or to company settings. However the data editing inside the rule still follows a criterion similar to the other information set.

Once the quotation has been set as a heading (in case of a quotation it is also sufficient to just confirm the assigned number and leave the rest blank) it is possible to proceed to insert the environment and/or to configure the product.

3.3 Upload and save

The *Open* button enables to read an order previously saved on disc by accessing the screen as shown in figure 3.4.

The screen is divided in 5 tabs (or 4, in case there aren't any projects in the Gallery).

The files of saved orders are found in the second tab (Orders). Here it is possible to select an order by typing its number in the Nr.Order box, or by selecting from the underlying file list (the xxxxx.eve files are orders saved in the _ecadpro\ordini folder). It is possible to find an order by digiting a portion of the order number in the filter field, or by clicking on the search button and digiting portion of the text (that was inserted in the order as reference in the Heading tab).

Selecting an order as shown in figure 3.5, on the right we will see the preview, while on the bottom portion we will find the data of the client that was saved

3 Copy in Galley: it enables to copy the selected order in the Gallery folder in the catalogue. Before the order is copied, another screen for the destination path selection and for the name allocation is displayed to the user .

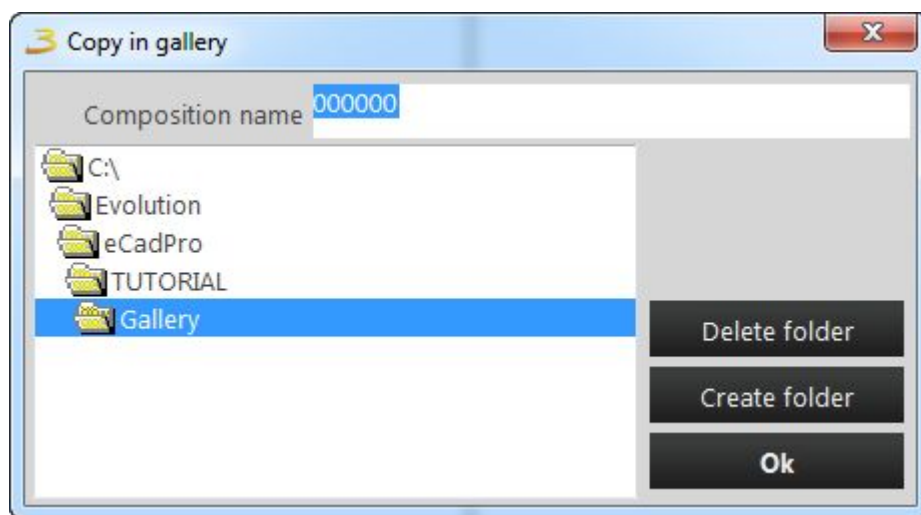


Figure 3.4: Copy in gallery.

Once the first order has been moved, a new Gallery tab will automatically appear for the displaying of the compositions that are in the folder.

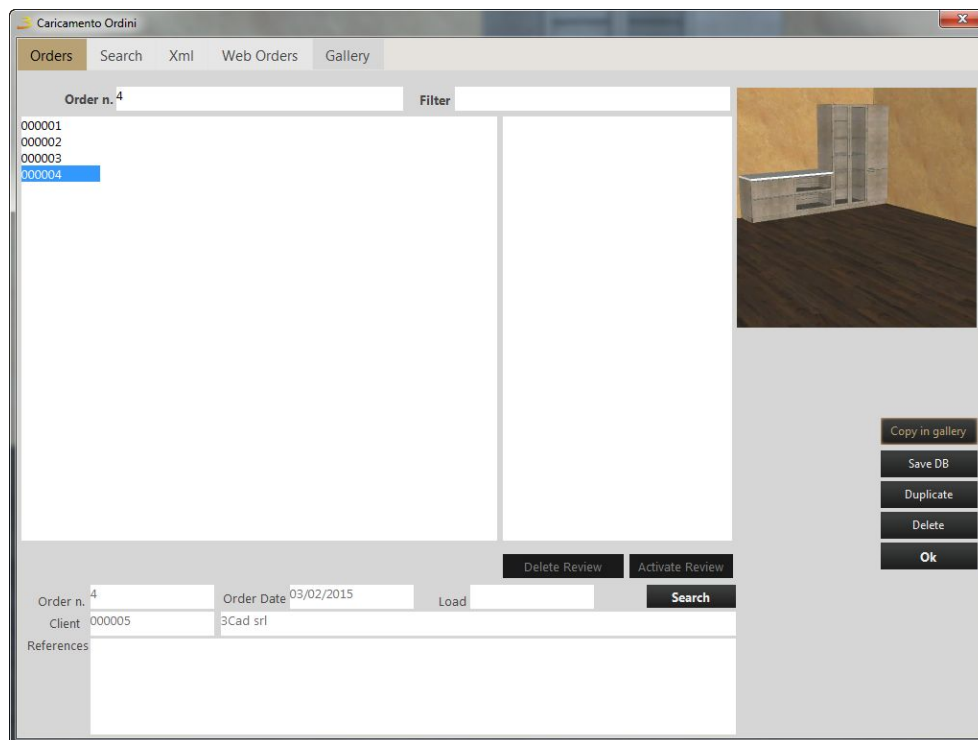


Figure 3.5: Order uploading.

-  **SaveDB** button. It enables to save the order on the database (in case the data is copied or canceled from the database).
-  **Delete** button: it physically eliminates an order that was inserted.
-  **Duplicate** button: it enables to create a new order as a copy of an existing one. If an order is to be duplicated, *it is recommended to only use this procedure and not to copy* for example the xxxxx.eve file by using Windows.
-  By pressing the **Ok** button: the order is uploaded.
-  **Delete and Activate Review**: if activated they are referred to the possibility to upload an order, based on the moment they are saved. If for example several operators are working on the same order, and after performing a save, on the second blank screen, references of the order number, the date and time of saving will be available for

that order. Clicking on Delete will delete one of the performed saves, instead by clicking on Activate Revision, a predefined save revision will be activated.

The second tab (Find) shown in figure 3.6, enables to activate a full search of the orders on the database. Such search is linked to a rule and therefore it is easily editable according to the needs. It is possible to display the lines of the orders inserted in the database by using the *Display Lines* button or possible *spares*.

Numero	Data	Data Cons	Riferimento	Carico	Prezzo	Cliente	Utente
1	12/01/2015	12/01/2015			0		ROBERTA
2	23/12/2014	23/12/2014			0		ROBERTA
3	23/07/2014	23/07/2014			0		ROBERTA
4	23/07/2014	23/07/2014			0		ROBERTA
5	14/07/2014	14/07/2014			0		ROBERTA
6	14/07/2014	14/07/2014			0		ROBERTA
7	14/07/2014	14/07/2014			0		ROBERTA
8	24/07/2014	24/07/2014			0		ROBERTA
9	08/09/2014	08/09/2014			0		ROBERTA
10	16/07/2014	16/07/2014	Demo Ralph		0		ROBERTA
11	24/07/2014	24/07/2014			0		ROBERTA
12	24/07/2014	24/07/2014			0		ROBERTA
13	24/07/2014	24/07/2014			0		ROBERTA
14	24/07/2014	24/07/2014			0		ROBERTA
15	24/07/2014	24/07/2014			0		ROBERTA
16	24/07/2014	24/07/2014			0		ROBERTA
17	24/07/2014	24/07/2014			0		ROBERTA
18	25/07/2014	25/07/2014			0		ROBERTA
19	28/07/2014	28/07/2014			0		ROBERTA

Figure 3.6: Orders search on database.

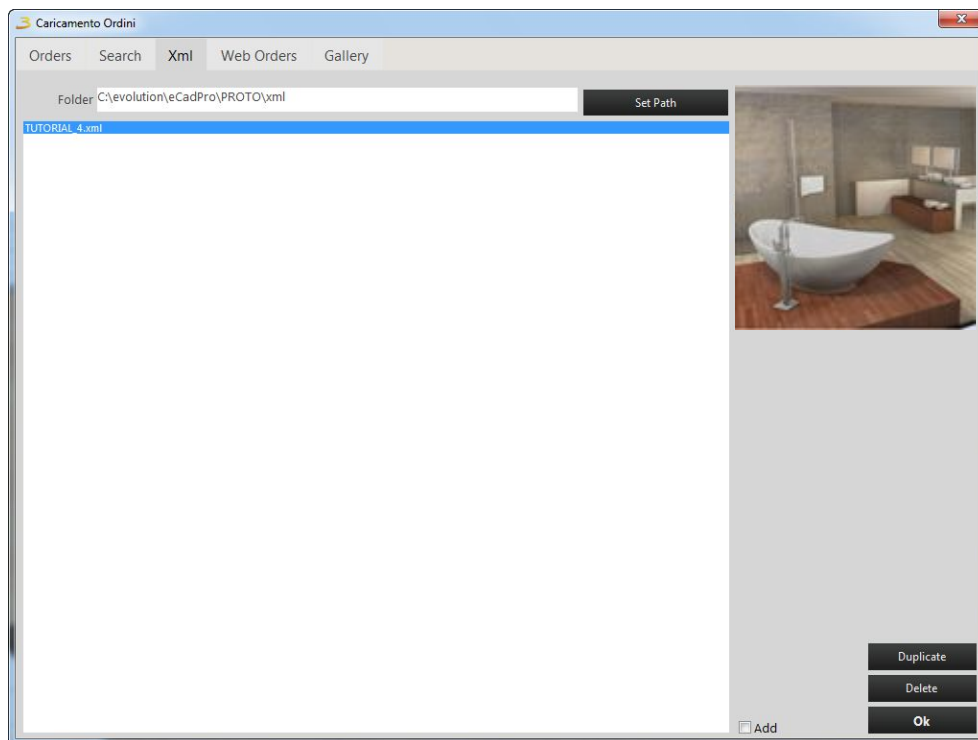


Figure 3.7: Search for the xml orders.

The XML tab enables to upload an order in *XML* format (quick exchange).

```
<?xml version="1.0"?>
- <ORDINE>
  - <TESTA>
    <PERCORSO>TUTORIAL</PERCORSO>
    <PRG>ECADPRO</PRG>
    <DATA>18/12/2014</DATA>
    <NUMERO>58</NUMERO>
    <USER></USER>
    <LISTINO>001</LISTINO>
    <DATAARRIVO>18/12/2014</DATAARRIVO>
    <DATACONSEGNA>18/12/2014</DATACONSEGNA>
    <CLIENTE></CLIENTE>
    <RIF></RIF>
    <MODELLO>001</MODELLO>
    <VARGLOB>#gene.erg,MODELLO=001,_MON=,FRONT3D=01</VARGLOB>
    <VARDER>_FIASX=501,_FIADX=501</VARDER>
    <TIPO>0</TIPO>
    <VARGEST>_STR;_FIN;_MAN;KIT</VARGEST>
  - <VAR>
    <XDATAC>18/12/2014</XDATAC>
    <_NOMEMODELLO>001</_NOMEMODELLO>
    <PARDERIVA>_FIASX=501,_FIADX=501</PARDERIVA>
    <_M_TUTORIAL>001</_M_TUTORIAL>
    <_V_TUTORIAL>#gene.erg,L=600,A=650,P=604,MODELLO=001</_V_TUTORIAL>
    <_M_TUTORIAL_001>#gene.erg,L=600,A=650,P=604,MODELLO=001</_M_TUTORIAL_001>
  </VAR>
  <ITEMS></ITEMS>
</TESTA>
```

Figure 3.8: Example of xml files.

The Web Orders tab enables to set a folder for the orders arriving through the Web from different operators.

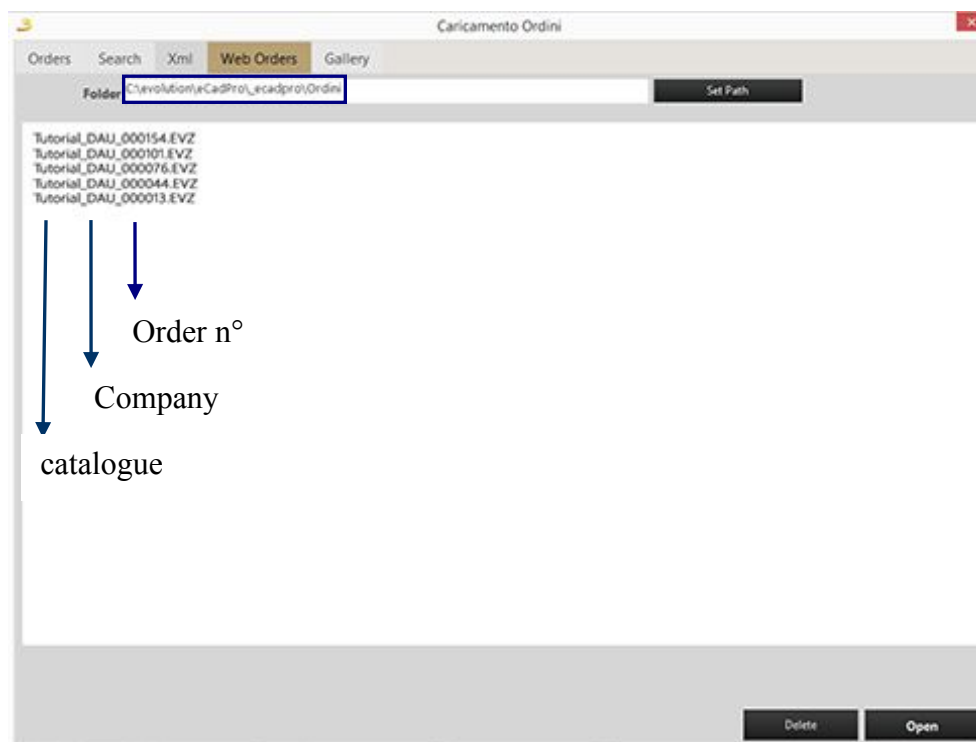


Figure 3.9: Web orders search.

When saving an order a xxxxx.eve file is created and a procedure to save the EPR data on database is activated. These procedures are editable for the various installation setups, but in case of errors and malfunctions the .eve file is master.

3.4 Environment

The environment is not fundamental for the product configuration, it can be omitted, but quit often it may be required to place the product inside this context. The environment is used because it enables the plan presentation and the architectural constraints.

The environment can be done in several ways, from a *DXF* file, a background or from a free drawing, by creating just the walls or even with constraints of different nature that may help to better place the objects to configure.

An environment is easy to modify and replace, it is important to remember that the environment is created in a 2D setting which can be viewed in 3D in the configurator.



What ever is inserted in the environment is only editable in the environment itself, NOT in the configurator nor vice versa.

The interface shown in figure 4.1 uses the "PARETI" catalogue.

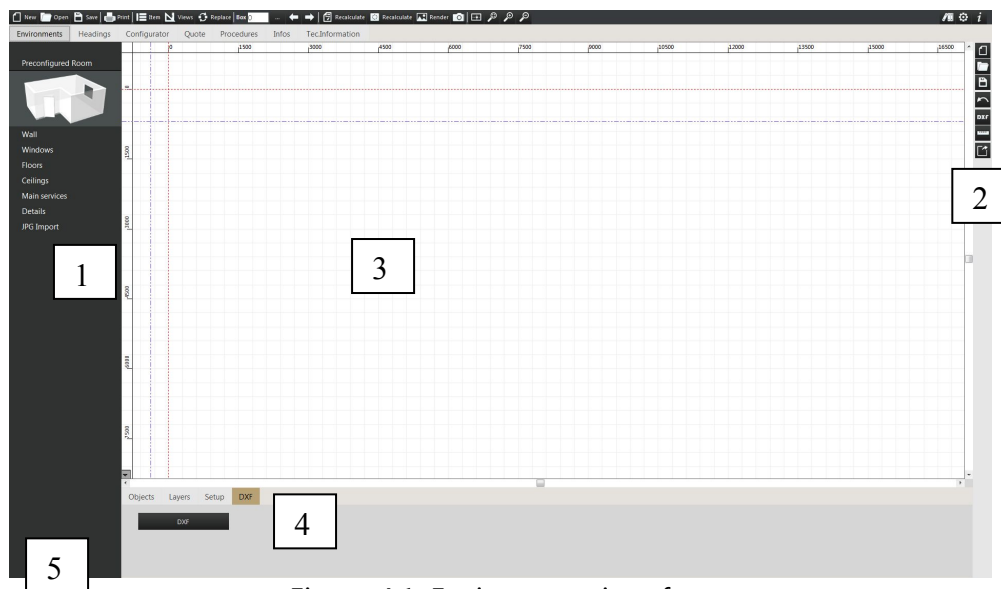
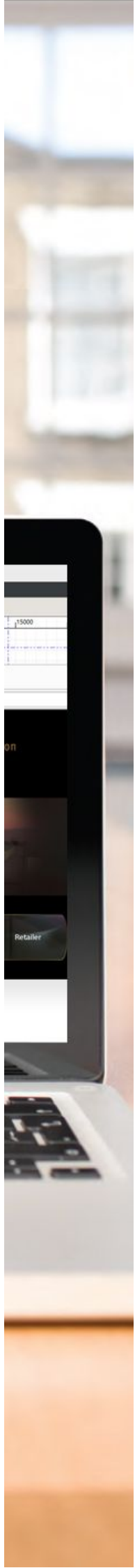


Figure 4.1: Environment interface

- (1) catalogue items area.
- (2) Toolbar.
- (3) Work area.
- (4) Various settings.
- (5) Status messages.

1. **catalogue items area:** the elements to be inserted are divided in categories; preconfigured rooms, walls, windows and doors, architectural constraints, floors, ceilings and backgrounds can be inserted. A series of selectable parametric objects are listed inside the interface, these objects can be inserted inside the elements.
2. **Toolbar:** A few utility commands are on the right hand side of the screen:
 - ✓ DELETE PLAN: It cleans the entire work area, it deletes all elements inserted in the environment up to that point.
 - ✓ OPEN AN EXISTING PLAN: it opens a previously saved plan (not linked to the order).

- ✓ **SAVE PLAN WITH NAME:** it saves the current plan. The environments are saved independently from the orders and the orders only contains a reference to the work environment. With the same plan it is possible to create different environments to show to the customer. Therefore there are several ways to save it.
- ✓ **UNDO:** it goes back of one action, quit useful in case of error.
- ✓ **IMPORT DXF:** it enables to import a plan in DXF format. The DXF file can be used as a background for the realization of the environment or to be used directly in the 3D to better control the distances. Pressing the DXF button, after finding on disc the file containing the plan, the screen shown in figure 4.2 will appear, where the program identifies the various layers being used and the user must declare which of them should be inserted in the project and which ones should have the hookup lines. Furthermore on the bottom of the screen there is a box for the scale, which enables the user to correctly readjust the plan taking in consideration that the program operates in mm.



DXF Layers					
Import	Magnetic Points	Name	Visible	Color	Elements
☒	☒	WALLS	☒	0	132
☒	☒	0	☒	8388608	238
☒	☒	BATHROOM FINISH	☒	33768	37
☒	☒	DIMENSIONS	☒	8421376	4
☒	☒	FINISH	☒	128	106
☒	☒	WINDOWS	☒	8388608	23
☒	☒	DOORS	☒	32896	37
☒	☒	COLUMNS	☒	12632256	60
☒	☒	STONE	☒	8421504	2
☒	☒	ACCESSORIES	☒	18711680	106

Scale: Delete Ok

Figure 4.2: DXF Layers.

- ✓ **SET MEASUREMENT:** it enables to measure the distance between points and at the same time to create a dimension: it is required to press the "measure" button and to click inside the work area. At this point when selecting the extremities of the dimension, it will enable to move them to the desired length.
- ✓ **EXPORT DWG:** dwg format export of the environment. By clicking this button it is possible to have a preview of the file on the viewer (Load button) and to save it in dwg format in the DWG folder C:\Evolution\eCadPro_EXPORT\DWG\ (Save button).



It is important not to create too many hookup lines, otherwise the move operations could become extremely inaccurate.

3. **Work area:** It is defined by two lines, which are visible in top and on the left. When the mouse operates in this work area, it generates two light blue dashed lines indicating the pointer X and Y coordinates. Depressing the RH button on the mouse gives access to a contextual menu.

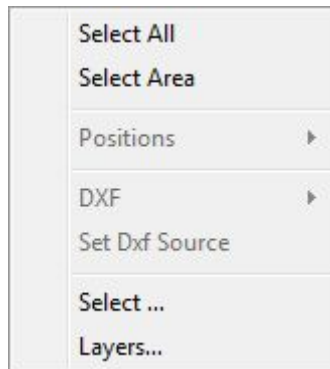


Figure 4.3: Contextual menu in Environment.

The content of this menu may vary on the basis of the operation that is being carried out.

Let's examine in detail the menu shown in figure 4.3:

-  *Select All*: it selects all of the objects in the work area;
-  *Select Area*: it permits to enable the selection of objects through a bounding box;
-  *Positions*: it is used to move an objects in relation to other objects, and it is done by inserting the amount of the movement;
-  *DXF*: it offers two options when selected, to delete the dxf file or to view/hide the various layers and/or unlink them from the magnetic points;
-  *Set DXF source*: after selecting this entry a point of origin for the dxf must be selected on the work area;
-  *Select...*: it enables to select the elements present in the work area and to group them together per category (even the free dimensions make up a category).
-  *Layers...*: it opens the Layers management window.

Whenever an element category on the left is selected and in the work area an element of a different category is selected, this will be selected only if the "Layers Auto" entry is checked (this will enable the program to automatically skip from one element category to the other without the manual selection of the user).

Figure 4.4 shows the layers list with two check boxes, where “V” stands for the layer being visible and “E” for the layer being editable.

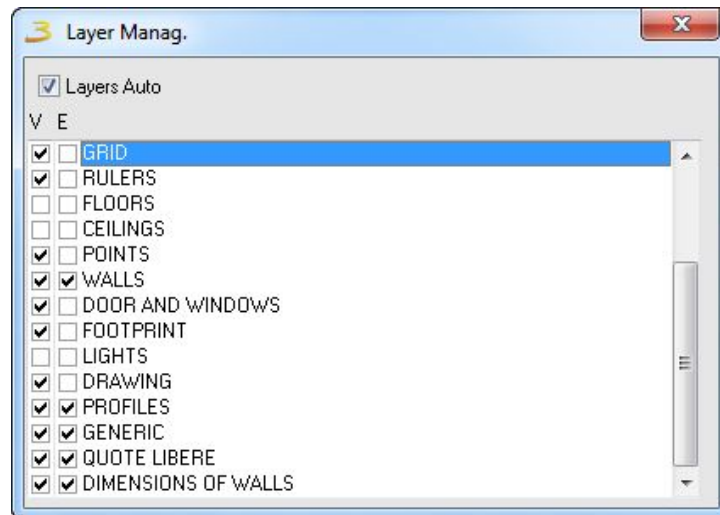


Figure 4.4: Environment Layer Management.

Always with regard to the utilization of the work area, the mouse scroll wheel controls the zoom (+ and -) or the work area movement with the same zoom by pressing and holding the mouse scroll wheel button.

4. **Varies settings:** This section is made up by four tabs: Objects, Layers, Setup and DXF.

✓ **OBJECTS:** It shows all of the elements inserted inside of the environment, the blue central button shows the name of the object, which is always editable from the bottom box. On the right the characteristics of the element are displayed (which are editable from this screen), instead the blue buttons with the arrows are used to move from one element to the other.

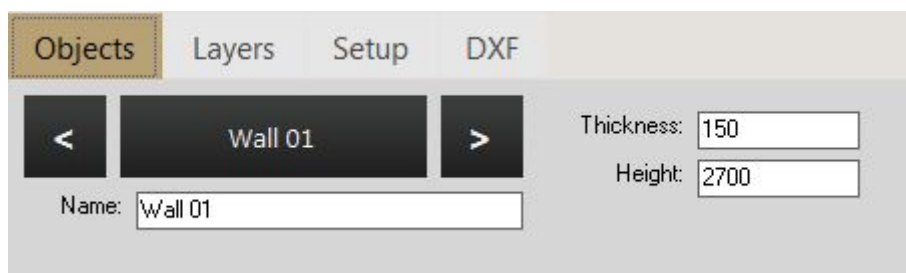


Figure 4.5: The Environment Object Tab.

- ✓ **LAYERS:** Here we find all layers of the environment fitted with two selection boxes which show/hide the layers, and enable/disable the ability to modify them.

Objects Layers Setup DXF		
Vis.	Mod.	Layer Name
☐	☐	FLOORS
☐	☐	CEILINGS
☒	☐	POINTS
☒	☒	WALLS
☒	☐	DOOR AND WINDOWS
☒	☐	FOOTPRINT

Figure 4.6: The environment Layers Tab.

- ✓ **SETUP:** It enables to access the setup window of the environment, where it is possible to change a few parameters, for example to display the grid, rulers and magnetic points; to enable the snap and the grid thickness. It is important to properly set these values since the mouse movement is bound to values assigned to the snaps and to the magnetic points (unless we switch over to the free mode with the F button).

Objects	Layers	Setup	DXF
☒ [F] Snap	☒ [D] Background Sensitivity (Dxf...)	☐ [O] Orthogonal	
☒ [R] Automatic Relations	☒ [E] Snap with other Objects	☒ [L] Auto Layers	
☐ [A] Fixed Angles	☒ [I] Automatic insertion	☐ Recognition Dxf	
	☒ Display Grid	☒ View rulers	

Figure 4.7: Setup Tab in the environment.

- ✓ **DXF:** it has a DXF button, that if selected, it will initiate a search for a file in the DXF format among its files and use it as a base to insert the elements in the environment.

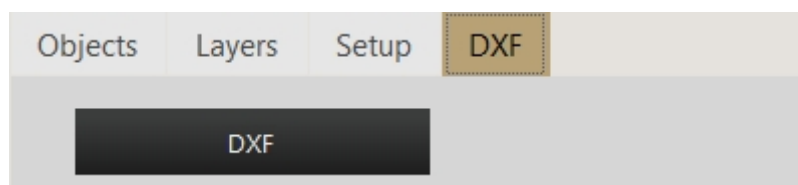


Figure 4.8: DXF Tab in the environment.

- Status messages:** This message area indicates the functions that are active.

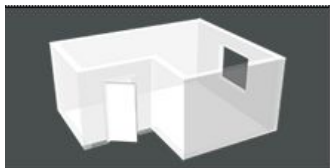
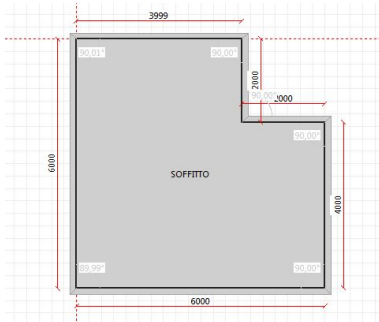
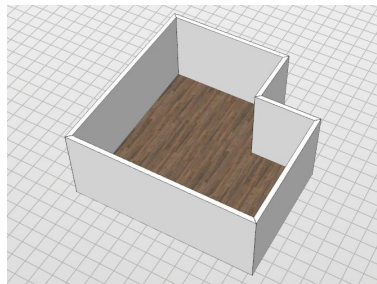
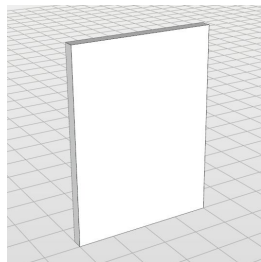
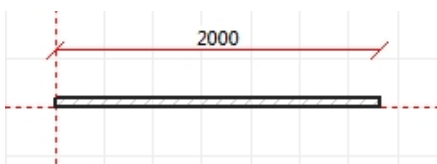
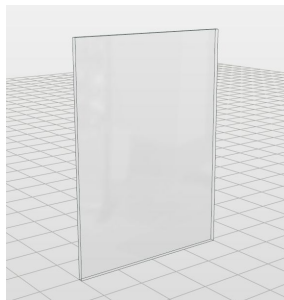
Drag to adjust the size or move ... use the space bar to edit from the keyboard

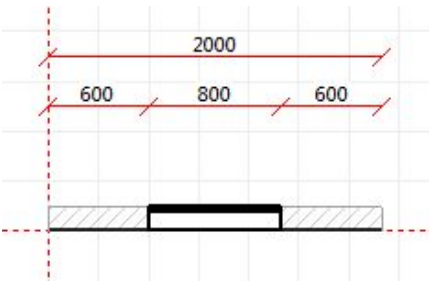
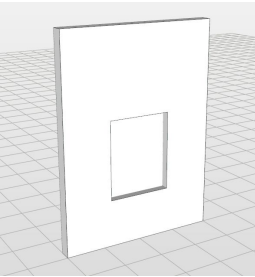
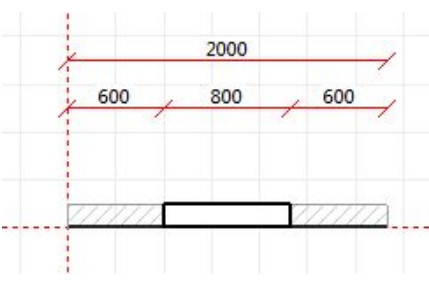
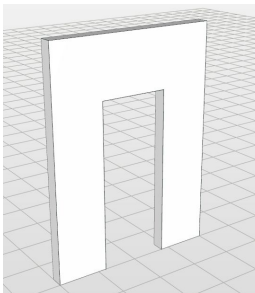
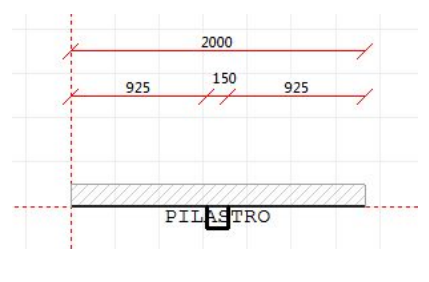
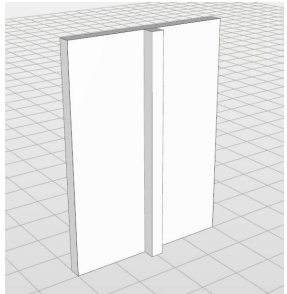
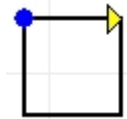
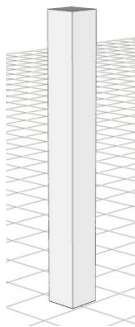
Figure 4.9: Status message area.

3.4.4 Creating the environment

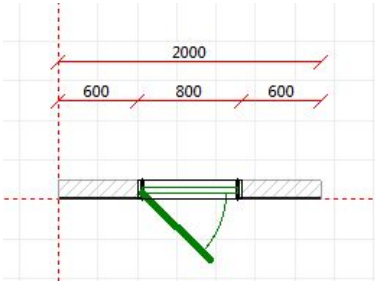
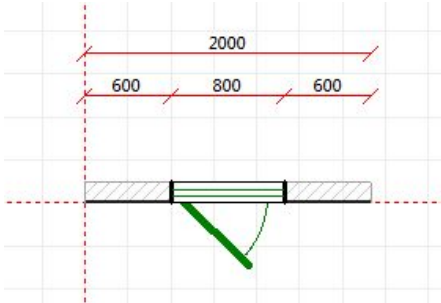
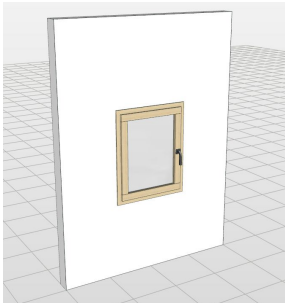
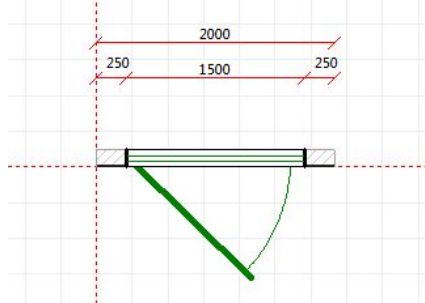
The "Walls" (Pareti) catalogue is divided in the following sections: Preconfigured Room, Floors, Ceilings, Utilities, Details and Jpg Import. Here below are the tables describing each subsection illustrating the buttons, their representation in the environment work area and in the 3D configurator.

WALLS (PARETI)

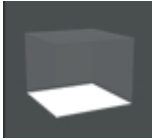
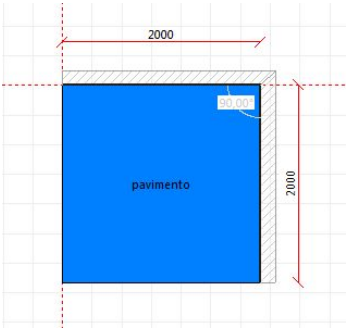
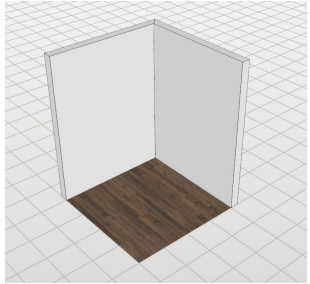
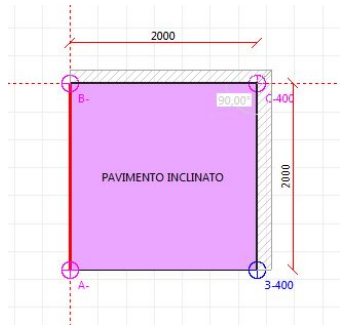
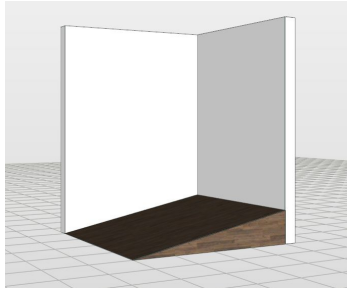
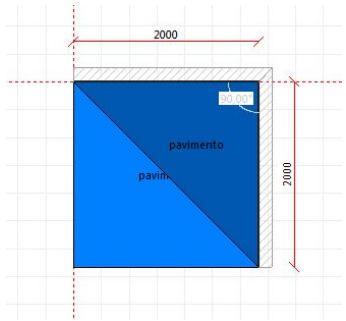
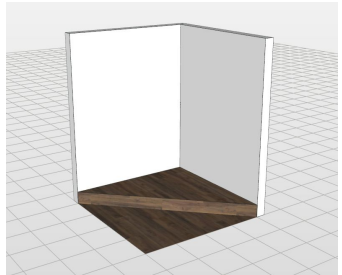
BUTTON	REPRESENTATION IN THE WORK AREA	REPRESENTATION IN THE CONFIGURATOR
		
PRECONFIGURED ROOM		
		
FREE STANDING WALL		
		
GLASS WALL		

		
NICHE		
		
PASS THROUGH NICHE		
		
PILLAR ATTACHED TO WALL		
		
FREE STANDING PILLAR		

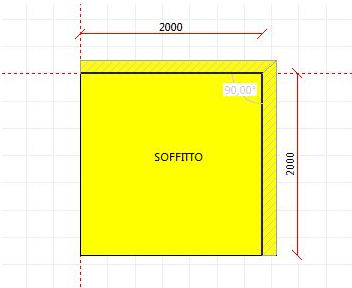
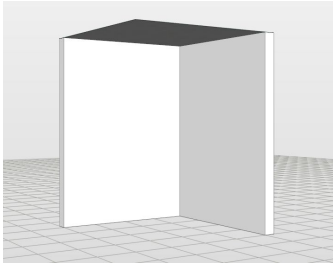
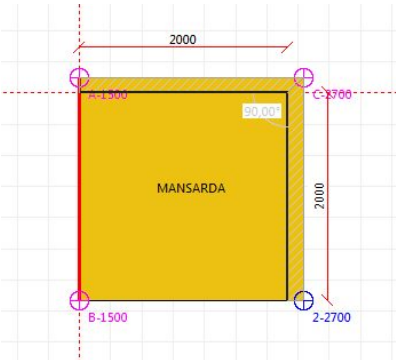
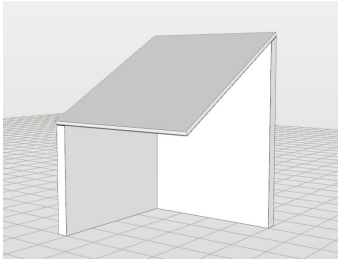
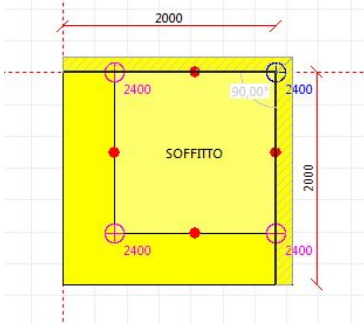
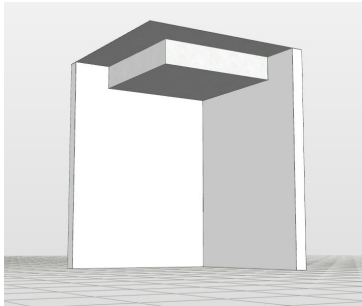
3 DOORS & WINDOWS

BUTTON	REPRESENTATION IN THE WORK AREA	REPRESENTATION IN THE CONFIGURATOR
		
DOOR		
		
WINDOW		
		
FRENCH DOOR		

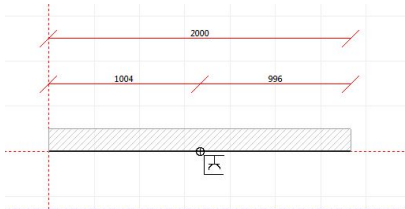
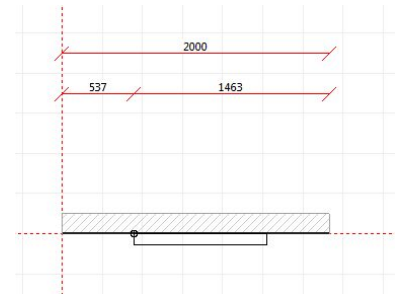
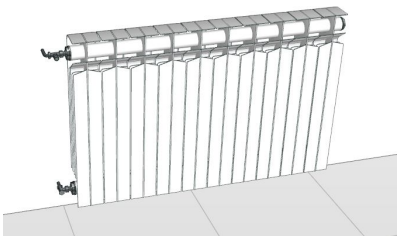
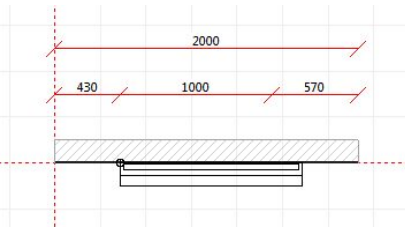
3 FLOORS

BUTTON	REPRESENTATION IN THE WORK AREA	REPRESENTATION IN THE CONFIGURATOR
		
FLOOR		
		
SLOPING FLOOR		
		
FOOTBOARD		

3 CEILINGS

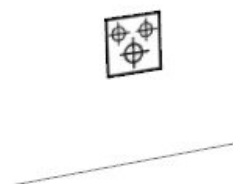
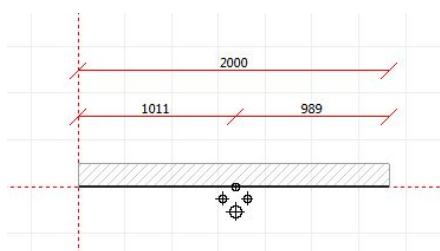
BUTTON	REPRESENTATION IN THE WORK AREA	REPRESENTATION IN THE CONFIGURATOR
		
CEILING		
		
SLOPING CEILING		
		
FALSE CEILING		

3 UTILITIES

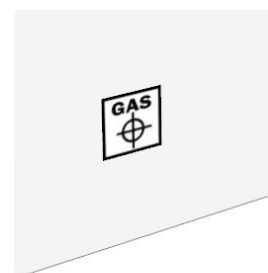
BUTTON	REPRESENTATION IN THE WORK AREA	REPRESENTATION IN THE CONFIGURATOR
		
ELECTRIC SOCKET		
		
HEATER		
		
AIR CONDITIONING		



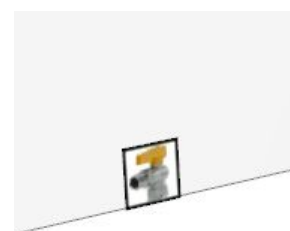
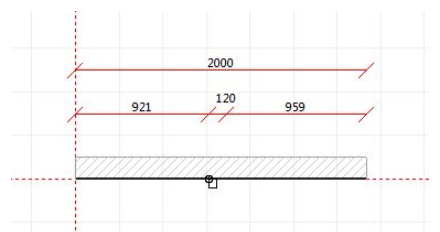
WATER TAP



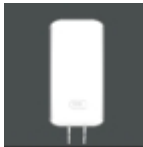
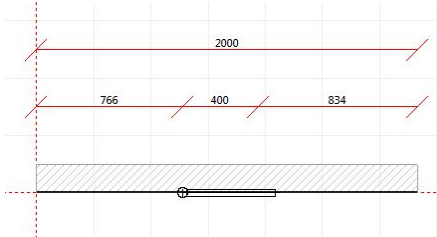
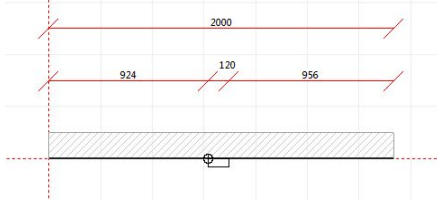
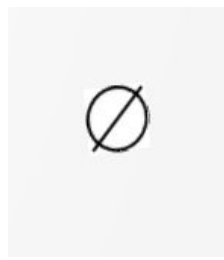
HYDRAULIC SYSTEM



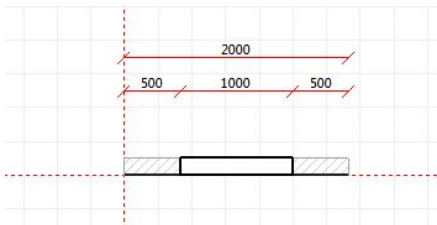
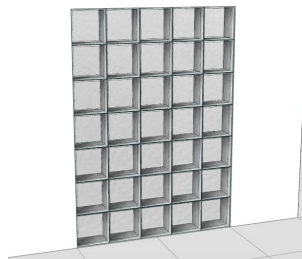
GAS SYSTEM



GAS VALVE

		
BOILER		
		
HOOD HOLE		

3 DETAILS

BUTTON	REPRESENTATION IN THE WORK AREA	REPRESENTATION IN THE CONFIGURATOR
		
GLASS BLOCK		

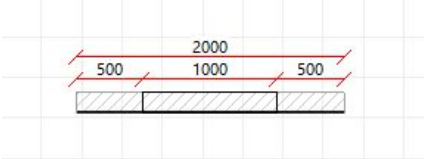
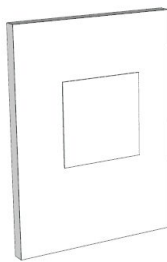
		
TILES		

Table 3.7: Details.

BACKGROUND IMPORT

The buttons shown enable to insert a background image from which to obtain a technical plan. With a scaled drawing (in the image format), even sent by fax or however not in the vector format, it may be imported inside the environment by using the Background button



The button enables to insert a scale, by importing a known size, and clicking on a specific point of the drawing (X and Y).

The line of rotation is set on the drawing with the same method with



this button .

Once the background is set, it will be possible to use it as a guide line for the walls and for the constraints (this system does not give the same precision of a drawing in the DXF format).

A wall to be placed in the work area is selected from the catalogue area, and this operation will create a drawing as shown in figure 5.1.



Figure 5.1: To create an environment.

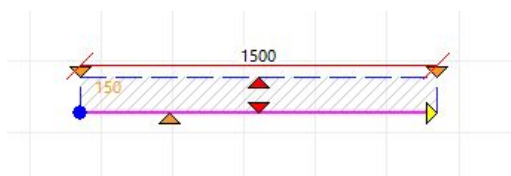
To correctly create and modify a room:

- 1- A room is **ALWAYS** create **clockwise** (looking toward the screen).
- 2- The walls are inserted **from Left to Right** (imagining to look at the walls on the front view from inside the room).
- 3- The project starts from the origin of the axes, that is the point of intersection between the two red lines (0,0). Bear in mind that over a distance of 50 meters from the origin, the project can be difficult to manage, which depends on the performance of the graphic card in use.



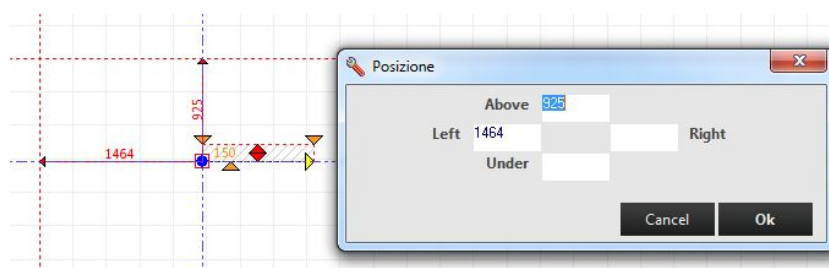
Clicking on the free standing wall icon and moving it with the mouse toward the left (on the plan view), we will see that the mouse pointer drags a small semi-transparent wall.

On the detail we see that there is a small blue dot on the mouse pointer.

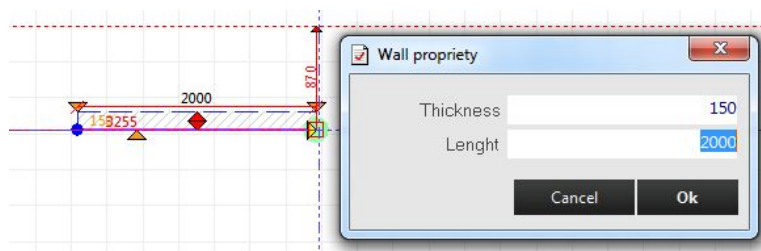


This will be the first point to position: that is where the wall begins.

Mouse left click to fix this first point or press the space bar and insert the coordinates.



At this point the mouse pointer switches from the blue dot to a yellow arrow; the second point of the wall needs to be specified, or yet where the wall ends.



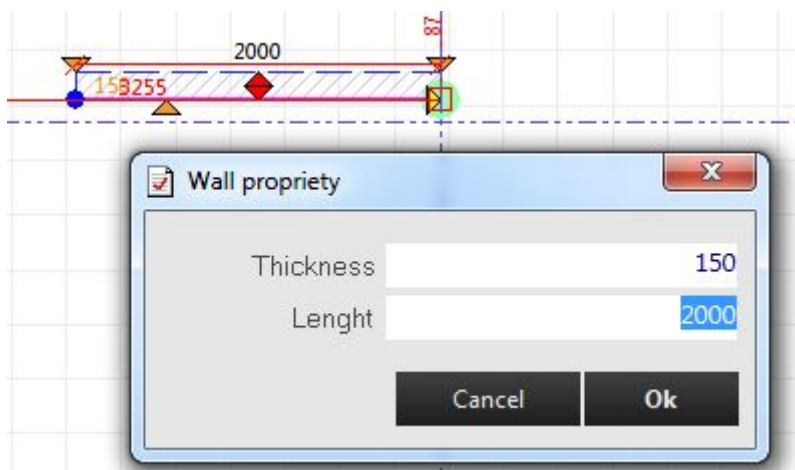
Press the "O" letter on the keyboard to enable the orthogonal mode before determining the second point. This feature makes it easier to create a room with "right angled walls". Press again the "O" key to disable the mode.

N.B.

Depress SHIFT to temporary enable the orthogonal mode, while moving the mouse pointer to indicate the point where the wall will end.

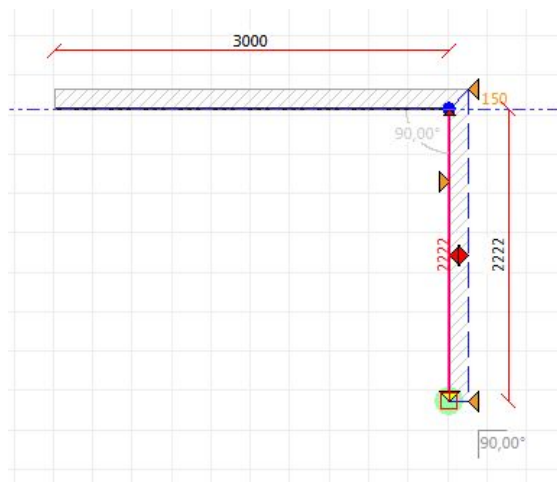


The wall size can be precisely determined by pressing the space bar (or enter) before inserting the wall final point (as shown in the underlying example) or by manually selecting the desired point with the mouse pointer.



The space bar will open a window in order to specify the wall thickness and length in MILLIMETERS.

Press the ENTER key or OK after inserting the size (e.g. 3000 mm).



Useful combinations:

SHIFT + click = walls are inserted at 90° angles (temporary activation of the orthogonal mode).

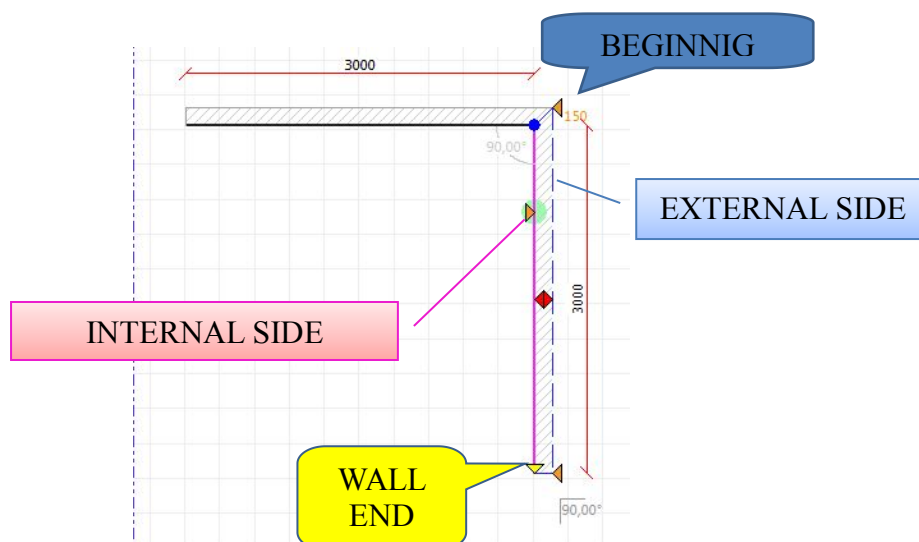
CTRL + click = it changes the wall thickness.

We have confirmed that the first wall (the horizontal one) is 3 meters long. The program at this point is ready to insert another one and at this point it requires the direction and the length of the next wall.

NB: in this case the program will only request to specify the second point of the wall, since it begins where the previous one ended.

Once the second wall is set at 3 meters, the insertion mode is blocked by pressing the ESC key on the keyboard.

This is the result:



WALL EDITING

The program for the wall insertion enables a series of facilitations and it displays a list of selection buttons. By double clicking on the selected wall or by pressing F1 on the keyboard, it will enable the access to the rule for the height and materials editing as shown in figure 5.2.

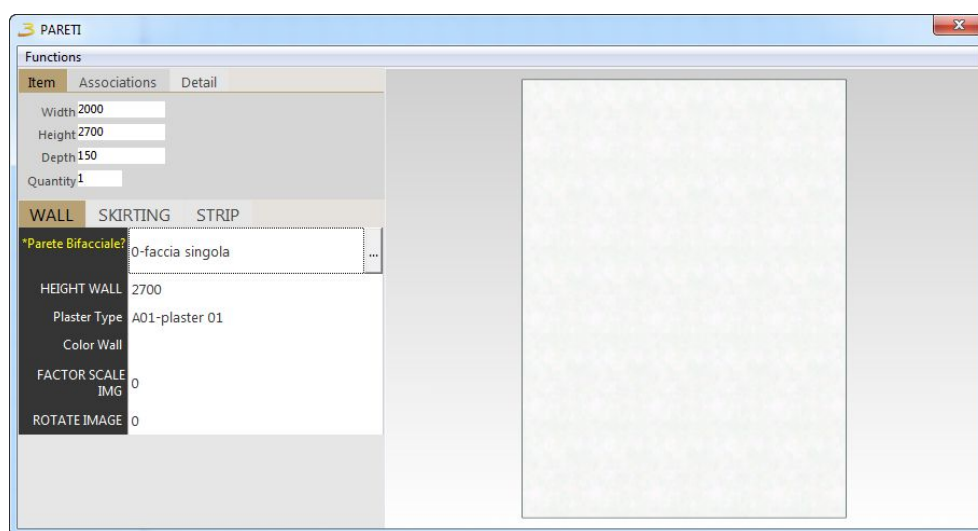


Figure 5.2: Rule for the wall editing.

Upon selecting the wall, see figure 5.3, several operations may be carried out:

-  Moving the insertion point (blue dot) moves the wall;
-  Dragging the thickness modification button (orange arrows) changes the wall thickness, or selecting them and pressing the SPACE bar (or ENTER), see figure 5.4.
-  Dragging the wall end yellow arrow, changes the wall length, or selecting it and pressing the SPACE bar (or ENTER) temporary changes the wall length and thickness, see figure 5.5.
-  Clicking on the dimension of the wall, it is possible to modify its length and decide whether to change it from the wall beginning or end, maintaining or changing the angle, see figure 5.6. In case of error it is possible go back (CTRL +Z or the  button).

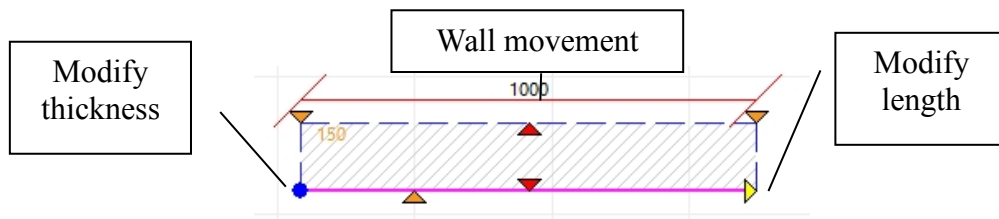


Figure 5.3: Selected wall.

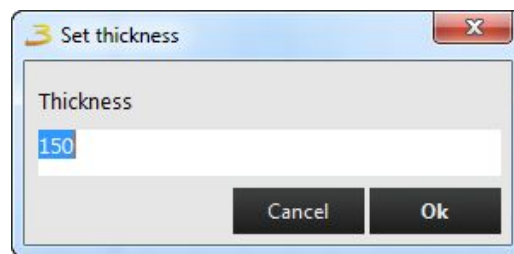


Figure 5.4: To set wall thickness.

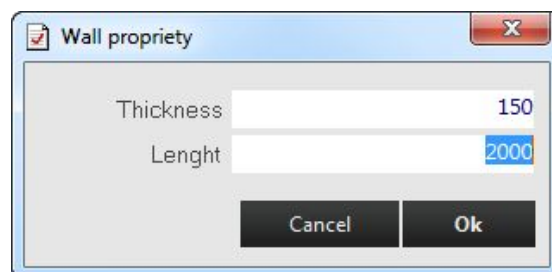


Figure 5.5: To set wall thickness and length.

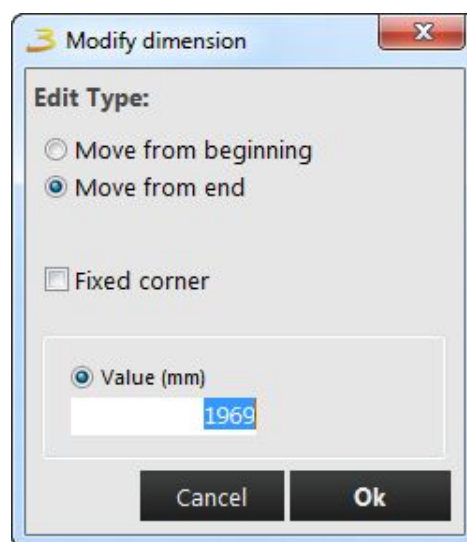


Figure 5.6: To set the wall new length.

After inserting the wall, the program predisposes itself for the next wall and it shows its size by displaying the dimensions. It is also possible to change the angle between the walls and maintain their dimensions. To do this, it is necessary to place the mouse pointer over the corner when the yellow label appears, press the SPACE bar (or ENTER), figure 5.6. At this point a window will appear as shown in figure 5.7.

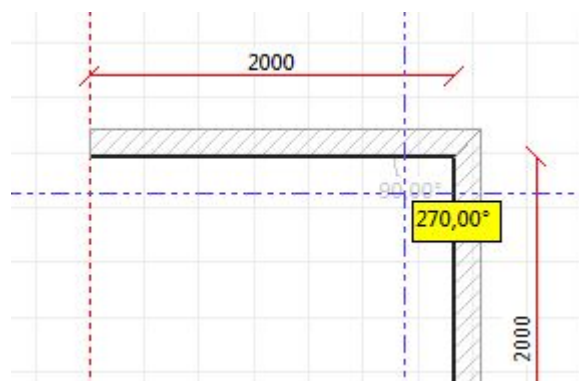


Figure 5.6

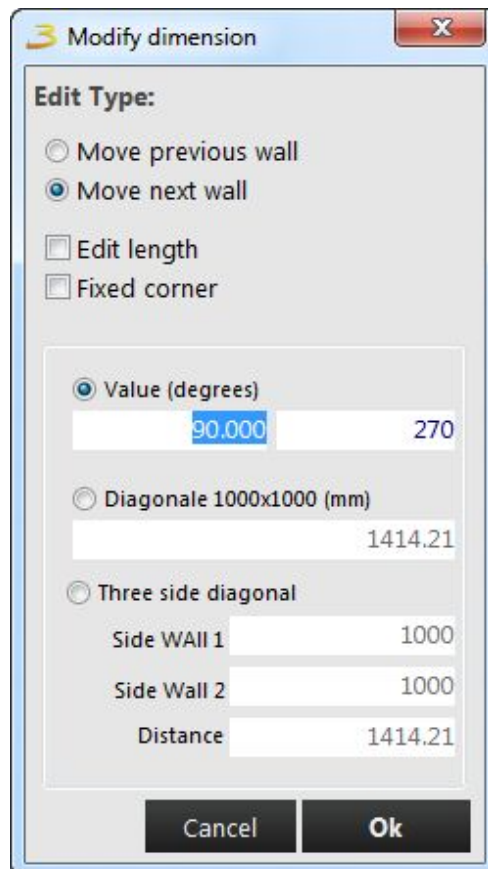


Figure 5.7

From here it is possible to change the angle, showing the degrees or the diagonals, and deciding which wall to move.

At this point we may carry out several tests to create and modify an environment. By pressing the mouse right button over a wall displays the functions that will allow us to customize the environment.

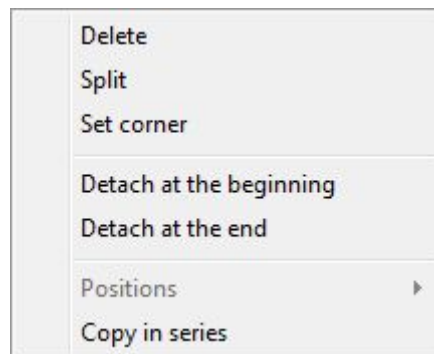


Figure 5.8: Environment editing contextual menu.

- ✧ Delete: it deletes the selected wall;
- ✧ Split: it enables to split the wall in two parts at the specified point, see figure 5.9;
- ✧ Set corner: it enables to set an angle for a single wall, figure 5.7;
- ✧ Detach at the beginning, Detach at the end: it enables to detach the wall from others connected to it, see figure 6.1;
- ✧ Copy in series: it enables to create copies of the walls by setting parameters from the menu, see figure 6.2 and figure 6.3.



Figure 5.9: Split wall

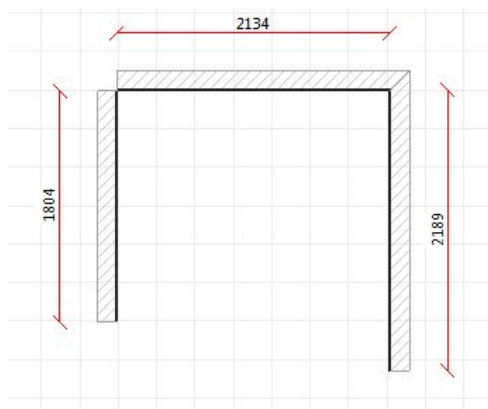


Figure 6.1: Detach wall

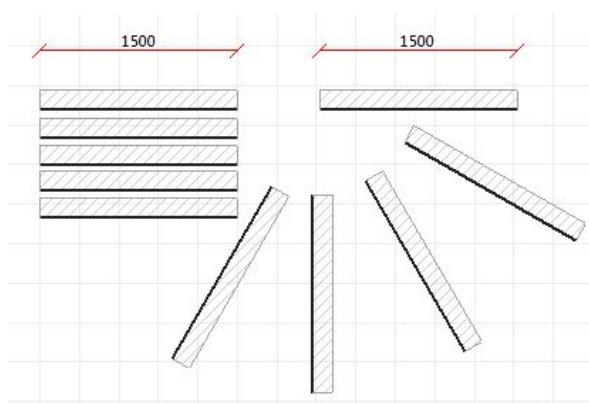


Figure 6.2: Copy in series

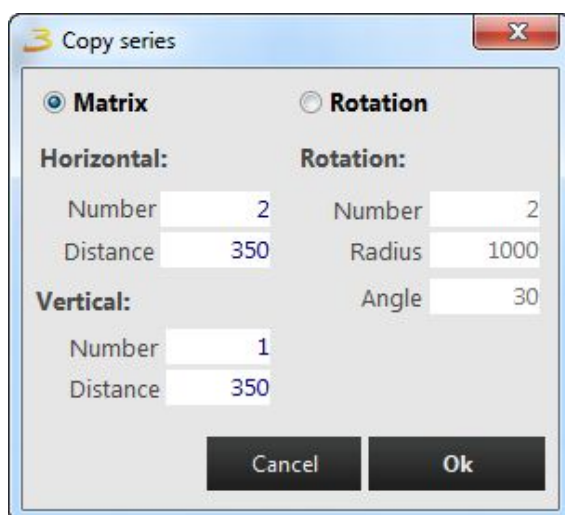


Figure 6.3: Copy in series window

After creating the walls, we can move on to insert some architectonic constraints. For example let's insert one as shown in figure 6.4.



Figure 6.4: Inserting a door.

The dimension lines are immediately generated.

Even the architectonic constraint has an insertion point dependent to the wall. There is also an arrow to set and modify its size. It is possible to intervene on the dimensions to change position and size. Several architectonic constraints may be inserted, such as: doors, windows, electrical and hydraulic systems, which will all have the same characteristics.

3.4.5 Inserting floors and ceilings

The program gives the option to insert a normal or sloped floor or a footboard.

To make a normal floor, select the dedicated button on the left toolbar, and then with the mouse pointer, select each point where to place the floor corners. The floor may even have a casual shape, see figure 6.5.

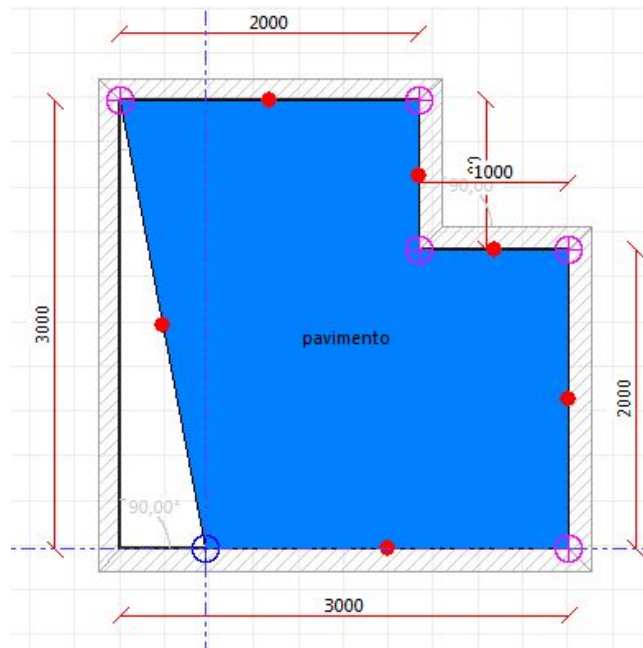


Figure 6.5: Making floors.

To insert a sloping floor select the appropriate icon in the floor section, and then place the vertexes of the floor perimeter.

A notice will appear at the end of this operation, requesting to select a point for the dimension (height) and then a window as shown in figure 6.6 is displayed, where to specify the parameters to make the slope.

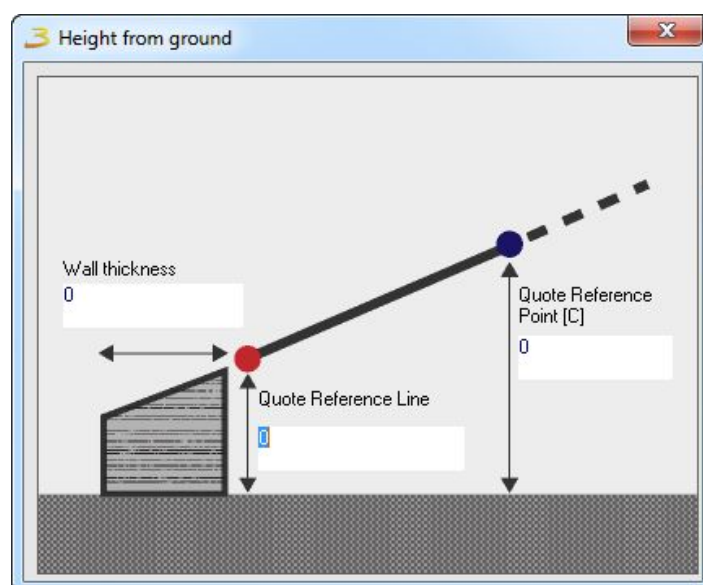


Figure 6.6: Setting the ramp height.

The footboard height is specified in the rule (double click on the object or select the object + F1), 100 is the height default. The floor thickness is considered when placing the footboard.

It is also possible to create round shaped floors by clicking and dragging the blue dots or by selecting them and pressing the space bar (or enter), figure 6.7.

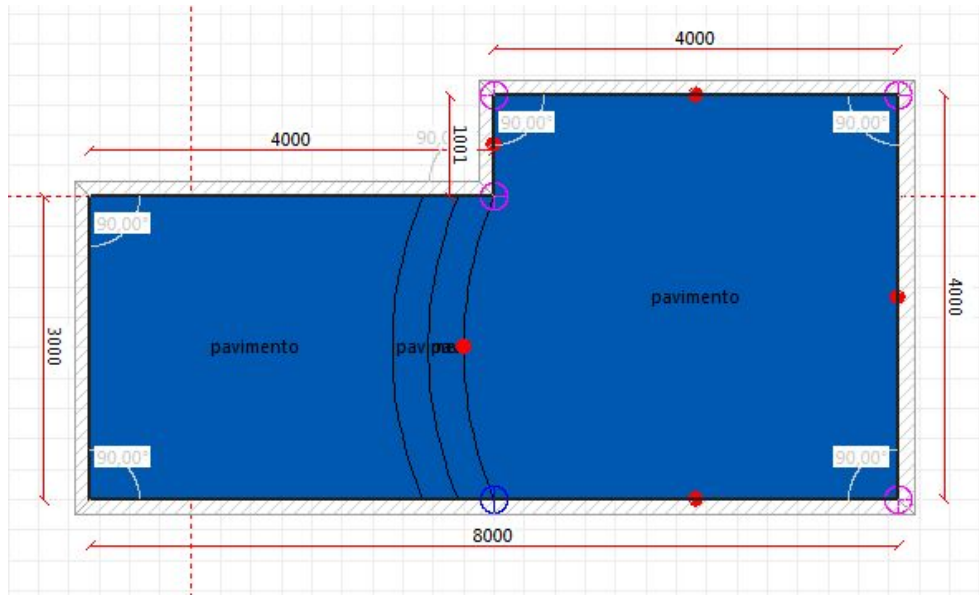


Figure 6.7: Chambered footboard

The same rules are applied to make ceilings.

There are three types of ceilings: ceiling (normal), sloping ceiling and false ceiling.

- ✓ The normal ceiling is inserted by plotting the room perimeter, vertex by vertex.

- ✓ First of all to create a sloping ceiling it is required to set the walls at the maximum required height (carry out a multiple selection with the SHIFT button + mouse click and press F1 to enter into the rule and modify the wall height parameter) then, after selecting the sloping wall icon, the ceiling vertexes are inserted, bearing in mind, that each couple of vertexes will have a different height. Once the ceiling area has been defined this message will appear "*Select a point to set dimensions*". At this point the height of the blue vertexes defining the red reference line and of the two pink opposite vertexes are required. It is necessary to left click on one of the pink dots in order to open the dialog window from which to insert the heights of the vertexes (see Figure 6.6)



The *Height from ground* (fig. 6.6) window will only appear if one of the pink dots are selected, any other selection will void the possibility to change the height of the vertexes. At any time it is possible to repeat this operation by simply selecting the ceiling and pressing the mouse right button and select the menu entry "Set height...".

- ✓ The false ceiling is inserted with the same procedure used for the footboard: the perimeter is defined and inside the rule the height is set (double click on the object or select the object + F1)

3.5 Configurator

In this section we will see the functions required in order to insert a configurable object in the graphic environment. First of all we need to select the *Configurator* tab on the upper toolbar.

The configurator first access opens the Order Header window. The **catalogue**, the **model** and the **global variants** can be defined in this window.

For training purposes we will select the **TUTORIAL** catalogue.

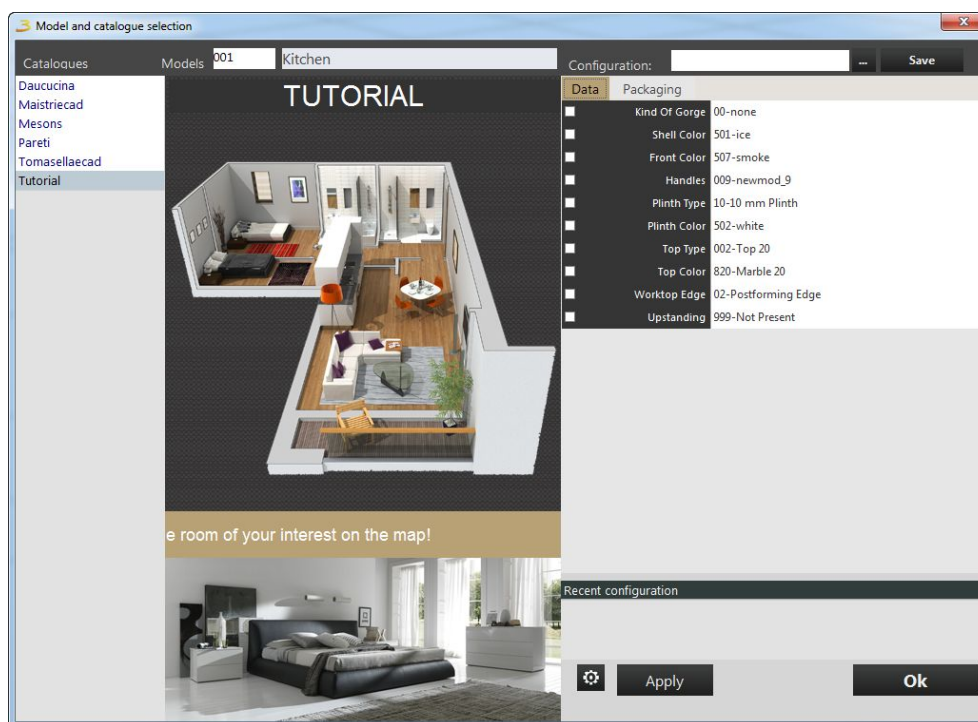


Figure 6.8: catalogue and Model selection.

Press OK to enter into the CONFIGURATOR, which is divided in four areas:

-  Items Search and Selection, on the left;
-  Items display and management Work Area, center screen;
-  Toolbar with function buttons, on the right bar;
-  Status bar on the bottom dark gray section (hovering of the mouse pointer over any button in the graphic will display its functional description);

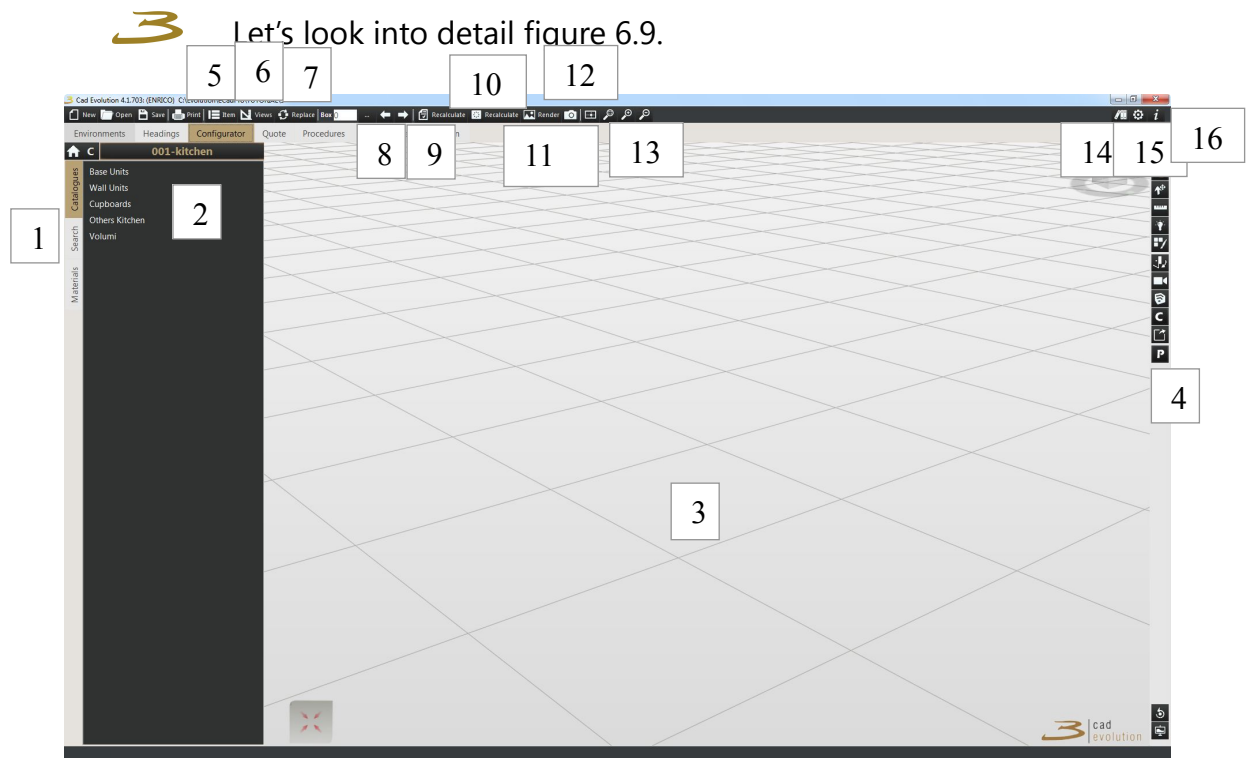
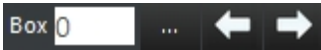


Figure 6.9: Configurator

1. This is the secondary configuration tab: the secondary display of the graphic is selected here, which is divided in **Catalogues** (the main graphic, the object selection and any pertaining variants), **Materials** (which enables to modify the BASIC COLORS that will affect all elements using that material) and **Search** (where a search by: code, description or item size is done).
2. **Items** selection tree: it is divided by items typologies, which are customizable according to the requirements.
3. **Work area**: here we have the 3D view of the composition in the configurator, with the possibility to directly interact with the object, through the top and right toolbars.
4. The 3D secondary toolbar with **function keys**.
5. **Item edit**: it allows you to modify the item from its rule, all the way to the finish.

6. **Views management:** this window enables to switch through the different views (including the *merged elements* such as tops), as well as manage the graphic settings (lights, shadows, lines, backgrounds, grids, axes and other graphic effects, chromatic and perspective corrections).
7. **Replace button:** it replaces an item with another one selected from the items selection tree (2).
8. **Select box:** in this field the box (item) number is displayed following the order it was inserted in the configurator. The adjacent buttons enable the box list or to switch selection between boxes (items). 
9. **Apply command:** with this command it is possible to change the model or the variants applied to the composition.
10. **Recalculate linear elements:** this button launches the recalculation to merge: tops, backsplashes and plinths, which are indicated as merged linear elements.
11. **Render:** with this button it is possible to use the Render Farm service, the user can request and receive high quality renderings. This service is available through dedicated servers, that are fully managed by the 3cad Group. The 3cad Group guarantees speed and quality for this service. This service enables the user to use its work station for other activities while the rendering is being processed.
12. **Save JPG:** this button enables to save an image. The size is defined in pixels (e.g.: 800*600). The image is saved in: directory eCadPro/foto/.

13. **Zoom buttons.** 

The first button is to place the whole project in a frame view, the second button, is the Zoom selection box which is used to enclose the area to zoom. The mouse scroll wheel is used to increase or decrease the zoom level, this same function is carried out by the last two buttons.

14. **Catalogues List:** it displays the list of the catalogues available and the one in use is checked (to switch over to another catalogue, this button  on the left side of the screen must be selected)
15. **Application Setup:** it enables to make modifications that will modify the ecadpro.ini file (Be aware! That some modifications may affect the correct operation of the program).
16. **Information:** the program version, the dongle identification number, the user and the available modules are listed in here.

THE 3D SECONDARY TAB:

-   UNDO: it goes back one step;
-   MOVEMENTS: it allows movement inside the work area (this function is enabled on first access to the configurator);
-   MOVE OBJECTS: it enables to move and rotate the selected object;
-   PLOTTING: for manual plotting of frames, tops, backs and shelves (button available if required by the catalogue);
-   DIMENSIONS: the plane on which to measure is selected and then the points are specified, the dimensions will be displayed on a separate window (it is possible to set the dimensions of the distances from the walls);
-   LIGHTS: it enables to manually or automatically insert lights, in order to perform a rendering;
-   MATERIALS: it is possible to change the materials applied to the typologies, this is done by selecting the images on the materials edit window. After selecting the MATERIALS button, and using these buttons  , displayed on the bottom left of the work area, it may be chosen to extend the modifications to all elements  or to a single one ³, or to reset it to the original situation  ;

³ The shown button is obtained by double clicking on the button 

  **MOVE:** this button enables to perform movements when clicking and holding the mouse pointer over parts of the item;

  **RECORD:** it enables to record a short video, and on the bottom right of the screen the following buttons will appear:



These are for raising/lowering the camera view.



It places the observer in the center of the room and/or composition.



To move around the scene.



Record/Stop the scene recording.



Play



Save video clip.

  To import objects from Sketchup;

  **ACCESSORIES/TECHNICAL DRAWING:** it enables or disables the accessories visualization;

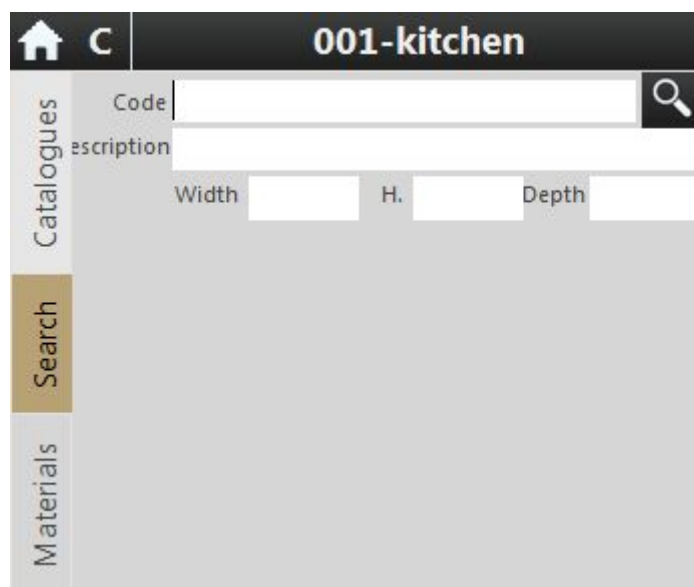
  **EXPORT:** it enables to export in the following formats: Logic, Sketchup, 3DS, Xml, Tops XML, DWG, PovRay and Collada.

  **AXONOMETRY/PERSPECTIVE:** it activates the axonometric or perspective projection;

  **RECREATE DRAWING:** it redesigns the entire composition;

  **FULL SCREEN:** full screen display of the composition, the item selection toolbar is removed; the video, dimensions and photograph controls are still available.

To insert a configurable object in the graphic, it is necessary to scroll down the left column, on the typology drop menu list, until reaching a list of objects represented by their picture and item code. Clicking over the image representing the item will upload it into the graphic, here it is possible to modify it in accordance with the rule, through the Item Editing window. An alternative way to insert an item would be to type its item code in the Search tab, on the left hand column as shown in figure 7.1.



The screenshot shows a software interface titled '001-kitchen'. On the left is a vertical sidebar with three buttons: 'Catalogues', 'Search' (which is highlighted with a gold background), and 'Materials'. The main area contains a search form with the following fields: 'Code' (with a magnifying glass icon), 'Description', 'Width', 'H.', and 'Depth'. Each of these fields has a corresponding input box. The 'Search' button is located below the 'Catalogues' button and above the 'Materials' button.

Figure 7.1: Find Item.

3.5.1 Catalogue selection

A catalogue must be selected before being able to configure an element. Unlike the Lite version **3cadevolution** is a program predisposed for multicatalogue use, which enables the operator to make a single order with items from different catalogues.

To access the catalogue setup screen, the Configurator tab must be selected, and upon the first access, the catalogue selection window will automatically appear.

Press this button  in order to view the catalogue selection window if required.

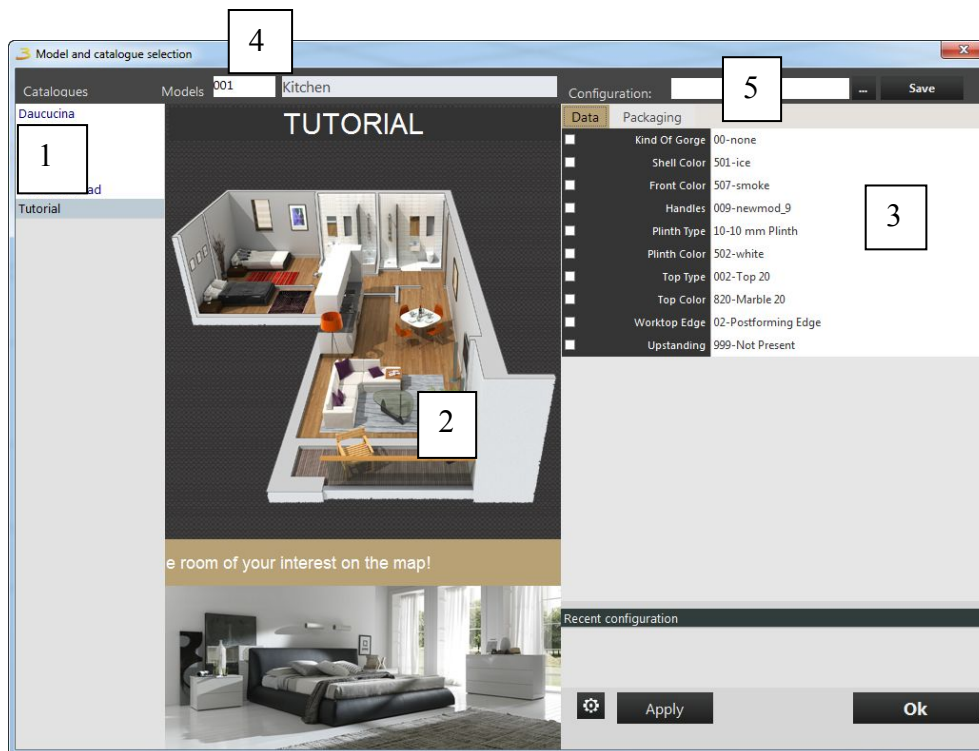


Figure 7.2: Catalogue selection.

1. **Catalogues:** several catalogues may be available. Each catalogue is linked to a name and it may be divided in different models. Each model has its independent management of: data, variants and configurations.

2. **Models list,** which may be displayed in many different ways. It is often configured as a HTML page of which content is fully dynamic.

3. If the model requires it, a series of variants may be setup, and they can also be grouped in configurations (the configuration is a list of prearranged answers linked to a code or to a model). An image or group of images can be linked to a model or configuration. The answer selection follows the logic of the rules, which will be discussed on the next chapter.

4. The **model currently in use.**

5. The **configuration currently in use**⁴.

⁴ The model is mandatory, the configuration is not.

3.5.2 Rules management

The Rule is the main object through which the configurator creates: drawings, prices and bill of materials.

The configurator, unlike a CAD, doesn't use graphical primitives such as: lines, polygons and boxes for drawing and at the same time it doesn't have an archive of on hand graphical objects. Each object drawn by the configurator is arranged for just about an infinite number of variables, for the: sizes, colors and shapes. The objects are made as an result of a defined number of answers from questions that are made by the operator to define the characteristics of the object.

The questions are set in a hierarchical structure and the answers can be linked in different ways, in respect to the: selected item, model, to the answer of previous questions and to the fact that some answers are possible but not recommended (in this case an extra step is required to access it) or obsolete (in this case they will not be settable, but only be available for orders previously inserted).

The question/answer system is crucial for the configurator. In fact each object generated is certainly an elaboration generated by a unique set of common characteristics. Such characteristics or variants can take different shapes, from free text, that need to be typed in, to tables of different structures for a specific result.

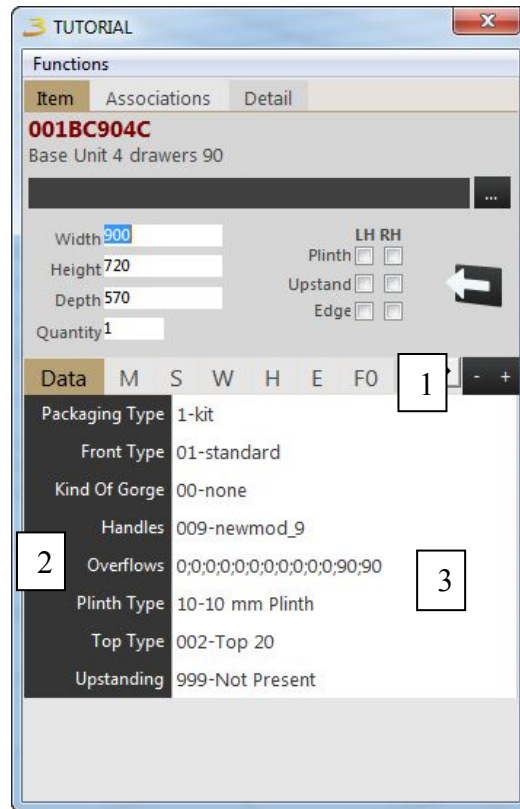


Figure 7.3: Rule.

- (1) Rule heading divided in tabs.
- (2) Questions list.
- (3) Answers list.

The rule, in the example in figure 7.3, is a normal one for a kitchen base in the "TUTORIAL" generic catalogue. Here we can see it setup with different pages, the question coloring could be different to point out the different sub-groups. Examples of answers to variants are shown in figure 7.4.

3.5.3 Editing of the selected item

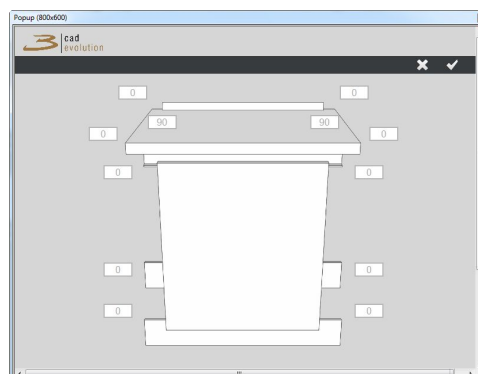
This is the main window for the item editing in the graphic, and it is divided in two main parts; the upper one is for the item description and the lower one is for the question/answer structure. The variants are important for the item editing, they are usually divided in tabs depending on the group they belong to. A few examples are shown in figure 7.6.

_BST - Shell Type (529x365)	
Code	Option
12	doors and drawers
11	open shelf
13	Oven
14	Sink
17	xfcssa

(a) The shell type variant, example of one of the most common variants, is a list of codes and options. When access is gained to this kind of table, the fields can be organized by clicking on the title column, or by accessing a particular field with the mouse or with the keyboard keys. Such variant can also be found in a tree menu with titles and sub-titles.

_FIN - Front Color				
Wood	Matt Lacquered	Glossy Lacquered	Glass	
				
white oak	ash oak	snow oak	honey oak	dark oak
				
beech	zebra stripes	zebra stripes white	zebra stripes	zebra stripes dark

(b) The *_fin* variant: is a graphic type variant, where one or more tabs (top and eventually on the right) lay out the graphic answers in a grid where the code of the option and the associated photo is shown.



(c) A specific variant made for the overflows where a shape graphically shows the result of the inserted data.

Figure 7.4: Examples of variants type answers.

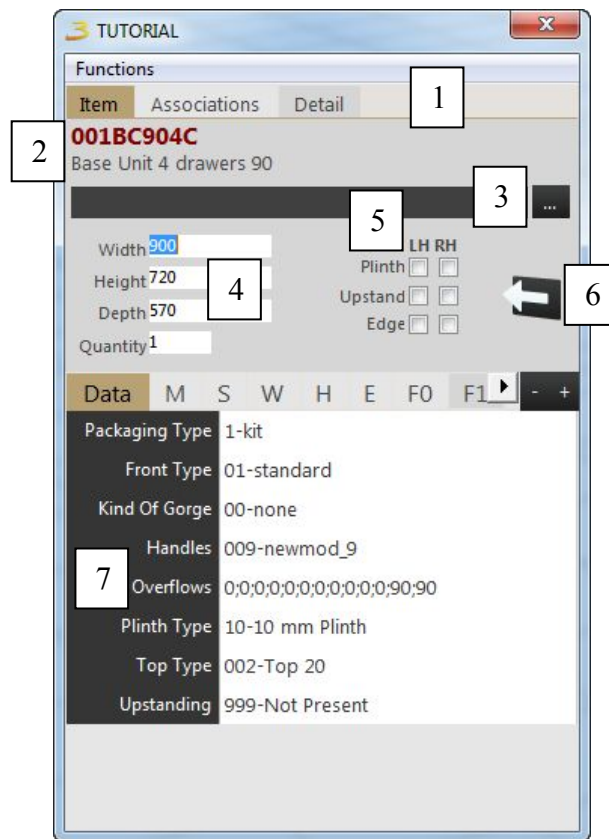


Figure 7.5: Item edit.

- (1) Item, Associations and Details tabs.
- (2) Item code and description.
- (3) Find item code.
- (4) Dimensions and quantity.
- (5) Insertion of: plinths, backsplashes, left and right frames and the open button.
- (6) Box left and right orientation (if present).
- (7) Editable variables list of the selected item.

FRONT3D - Front Type (529x365)	
Code	Option
01	standard
02	classic
03	glass

(a) This is an example of one of the most simple variants, made with two columns: Codes and Options.



(b) Here the structure is slightly more complex, on the left we have a tree structured list with the value of the variant and its respective code, instead on the right side, we have the preview picture of what we are going to apply to the element (usually this kind of display and the following one, are used to provide a visual preview of the modifications that we want to perform).



(c) Instead on this one, we have the selection with tabs placed above the window. The selection preview is multiple and it is made by an image with its code below it.

Figure 7.6: Example of variants type answers.



Figure 7.7: Open direction.

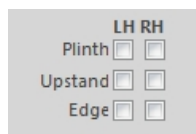


Figure 7.8: Flag.

3.5.4 System variables

In addition to the definable and customizable views previously shown, **3cadevolution** provides a certain number of variables to be used inside the rule.

The symbol in figure 7.7 shows the opening direction of the door and the direction of some bases requiring a left and right opening.

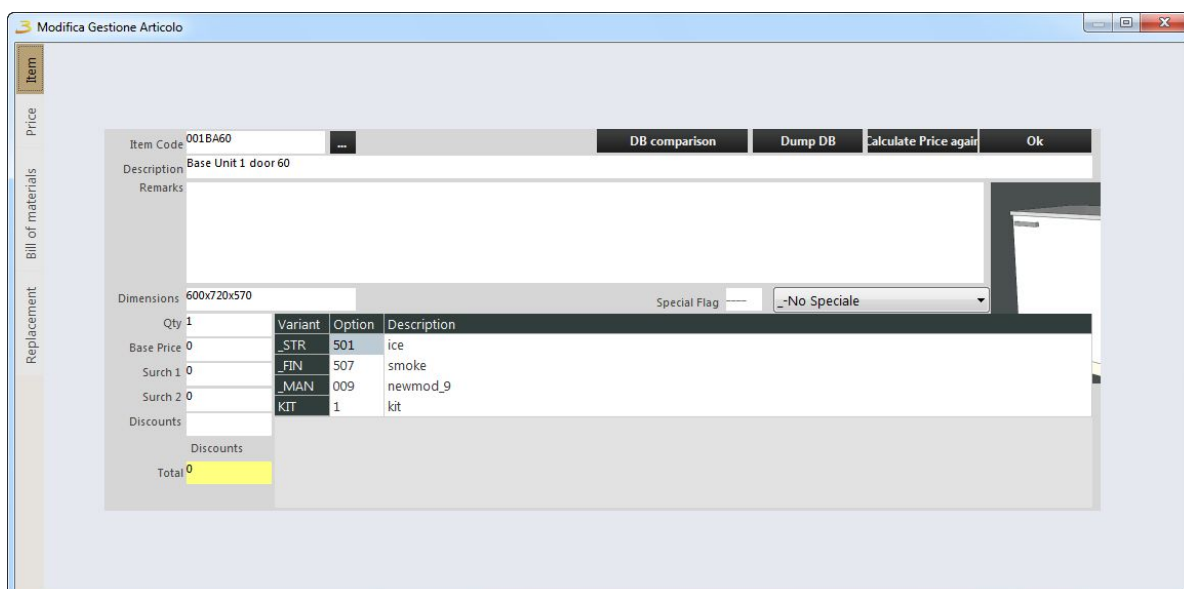
The flags in figure 7.8 have the check boxes to enable or disable some elements (it is usually about lateral elements or openings, this is why they are shown as left and right): plinth, backsplash, frame and the open flag.

These flags allows us to interact with the selected element by opening: drawers and doors or for any other thing that has been enabled or set.

In some cases, these flags are not found on few elements; which would be the case where certain objects are not enabled, due to the existence of one or more of these parameters.

3.5.5 Item editing management

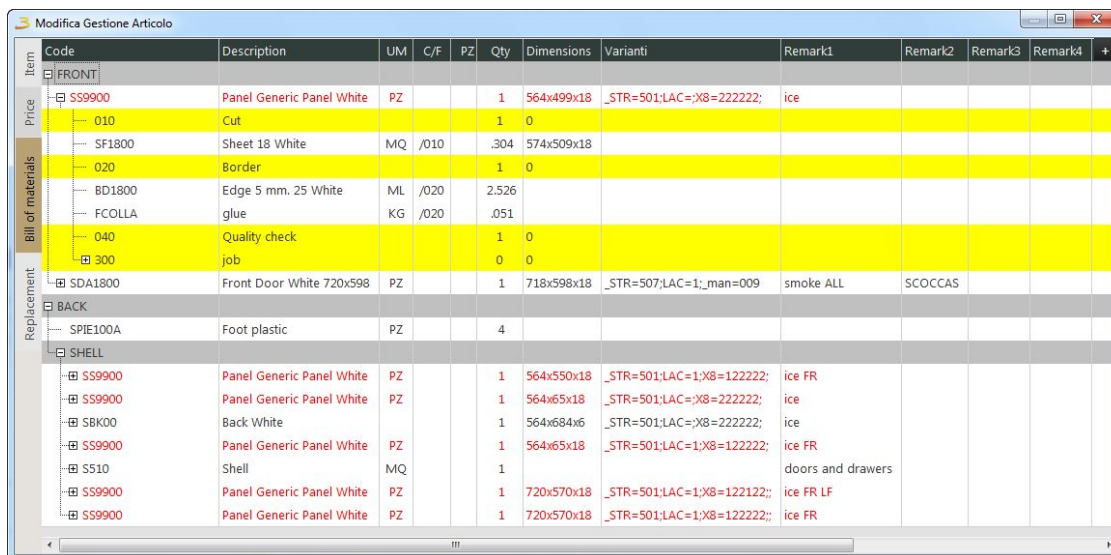
Mouse left click over the item description window, will open the item editing management window as shown in figure 7.9.



The screenshot shows a software window titled "Modifica Gestione Articolo". It contains a form for editing item details. The "Item Code" is "001BA60". The "Description" is "Base Unit 1 door 60". The "Dimensions" are "600x720x570". The "Special Flag" is set to "No Speciale". Below this, there is a table with columns "Variant", "Option", and "Description". The table contains three rows: "_STR" with option "501" and description "ice", "_FIN" with option "507" and description "smoke", and "_MAN" with option "009" and description "newmod_9". There is also a "KIT" variant with option "1" and description "kit". At the bottom, there are fields for "Base Price", "Surch 1", "Surch 2", "Discounts", and "Total". The "Total" field is highlighted in yellow and shows a value of "0".

Figure 7.9: Item management.

This screen contains the main information concerning the object, with the possibility to modify notes and have more detailed information, including prices, price increases and discounts. Furthermore, the bill of material of that item is available through the dedicated tab, as shown in figure 8.1.



Item	Code	Description	UM	C/F	PZ	Qty	Dimensions	Varianti	Remark1	Remark2	Remark3	Remark4	+
FRONT													
Price	SS9900	Panel Generic Panel White	PZ			1	564x499x18	_STR=501;LAC=;X8=222222;	ice				
	010	Cut				1	0						
	SF1800	Sheet 18 White	MQ	/010		.304	574x509x18						
	020	Border				1	0						
	BD1800	Edge 5 mm. 25 White	ML	/020		2.526							
	FCOLLA	glue	KG	/020		.051							
	040	Quality check				1	0						
	300	job				0	0						
Bill of materials	SDA1800	Front Door White 720x598	PZ			1	718x598x18	_STR=507;LAC=1;_man=009	smoke ALL	SCOCCAS			
Replacement	BACK												
	SPIE100A	Foot plastic	PZ			4							
	SHELL												
	SS9900	Panel Generic Panel White	PZ			1	564x550x18	_STR=501;LAC=1;X8=122222;	ice FR				
	SS9900	Panel Generic Panel White	PZ			1	564x65x18	_STR=501;LAC=;X8=222222;	ice				
	S8K00	Back White				1	564x684x6	_STR=501;LAC=;X8=222222;	ice				
	SS9900	Panel Generic Panel White	PZ			1	564x65x18	_STR=501;LAC=1;X8=122222;	ice FR				
	S510	Shell	MQ			1			doors and drawers				
	SS9900	Panel Generic Panel White	PZ			1	720x570x18	_STR=501;LAC=1;X8=122122;	ice FR LF				
	SS9900	Panel Generic Panel White	PZ			1	720x570x18	_STR=501;LAC=1;X8=122222;	ice FR				

Figure 8.1: Bill of material

3.5.6 Item detail

The item detail window, which is accessible through the item editing management window, is very important to view information pertaining to the selected element.

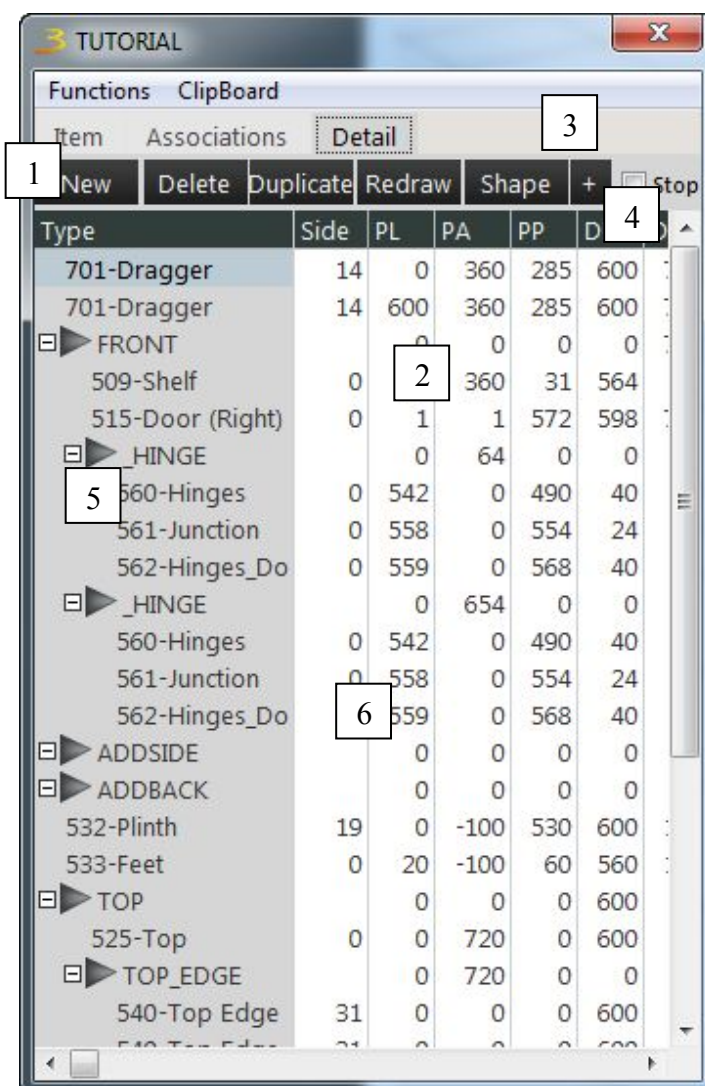


Figure 8.2: Item detail.

- (1) Commands for: adding, deleting or editing typologies.
- (2) Column header for each typology.
- (3) This button expands to full screen the length of the details table.
- (4) It locks the changes.
- (5) Typologies list.
- (6) Some of the cells content.

In this window all of the typologies details are listed, including the selected element, and all pertaining information which are listed as: side, position in width, position in height, position in depth, rotation on the x axis, rotation on the y axis, primary color, secondary color, finishing, handle, shape, object, typology parameter (from 1° to 10°), codes, variants, level, discounts, nt1, nt2, nt3, nt4, nt5 and cx.

These typologies can be modified with the above mentioned menu as shown in figure 8.3:

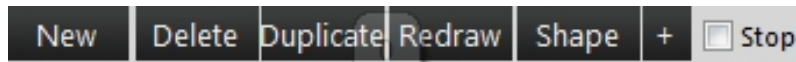


Figure 8.3: Item detail.

-  **New:** to add a new typology to the list,
-  **Delete:** to delete the selected typology,
-  **Duplicate:** to duplicate an existing typology,
-  **Redraw:** to redraw the object with the new changes,
-  **Shape:** it opens the shapes editor,
-  **+ o -:** to extend or reduce the dialog box,
-  **Lock:** it locks the changes made on the typologies.

3.5.7 Variations control

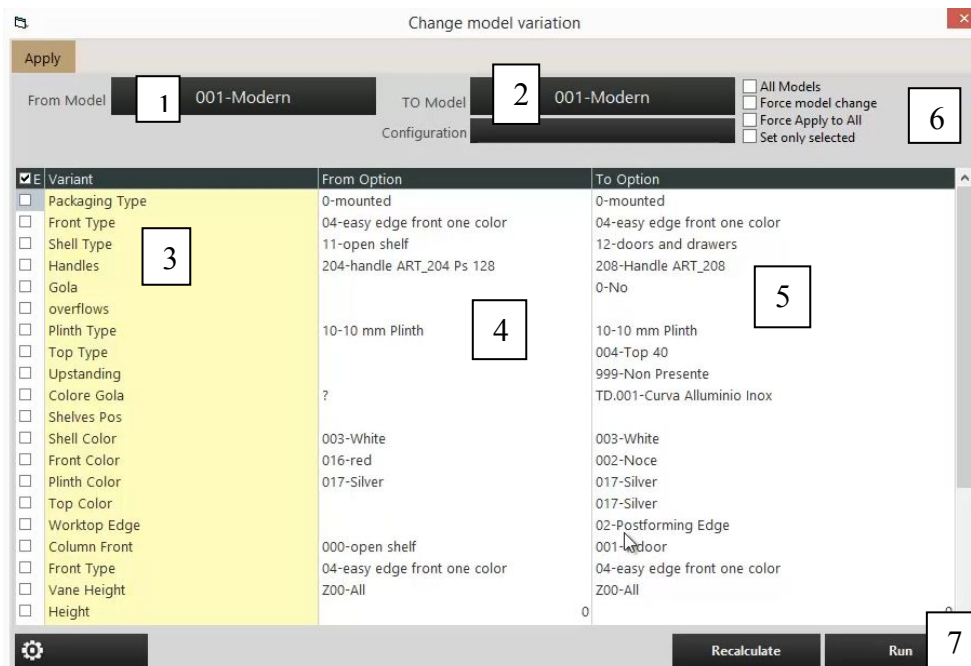


Figure 8.4: Apply changes.

Press the *Apply* button on the top toolbar to access the *apply changes* window.

1. Initial model when the order was created (the one chosen in the heading).
2. Change to model: the model changes made here will change the model of the items on the final project.
3. List of variables: this is the same list found on the rule heading, and it can be modified at any time.
4. Start options: variants active in that moment.
5. Editing options: the list of options are found in this column, which is possible to modify from the value in use. The choice is the same used in the *item edit*.
6. With this flag it is possible to edit all elements and force the model change.
7. Apply changes.

The window shown in figure 8.4 is important for the changes performed on an entire order, it is made of three columns: the first is highlighted in yellow and it contains the same variants found on the *heading*, the second contains the values the order has in that moment, the third column contains the editable values in order to make changes on the composition.

Upon selecting these last values press the **Run** button and the screen shown in figure 8.5 will appear, this screen will highlight in yellow the items that may make the variations that we have decided on the previous screen.

It is possible to decide whether to modify all of the items highlighted in yellow or just a few (for the second situation it is necessary to deselect the items that are not to be changed).

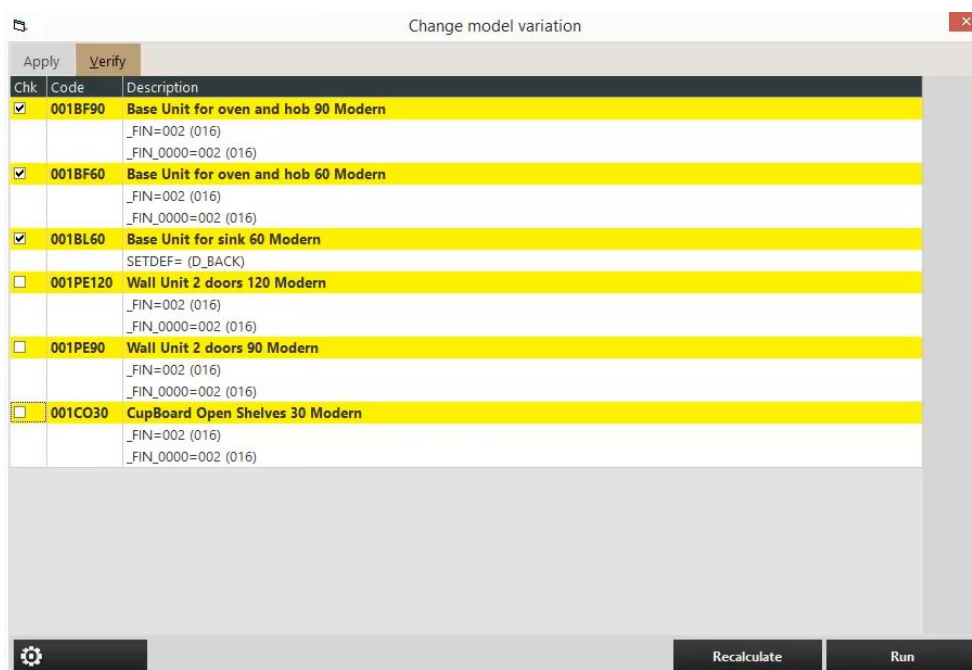


Figure 8.5: Comparison between the changes and the existing values.

With the relative model change button, it is possible to change the model of all elements that will allow it and that are present on the model chosen for the change.

3.5.8 Movement and links

The *Movement* button  enables us to move the project around the 3D orbit, as if the project was within a sphere.

! With this function active it is not possible to select and move objects, but only to open the *item detail* window.

The project can be moved around by selecting a side of the cube, displayed in the upper right hand corner, shown in figure 8.6.

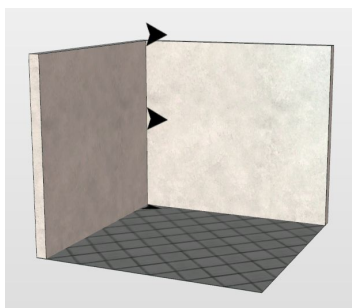


Figure 8.6: Movement cube

It is required to select the wall end where to insert the object, which is done by enabling the "Move Object" function on the right toolbar  and then selecting the desired wall.

! When the arrow is active , it is possible to rotate the project, unless:

- The movement function isn't enabled again;
- With the arrow active we use the ALT key (keyboard) + mouse left button.



With the wall selection, it is possible to specify which wall and the direction of the object insertion.

Selecting the “Move Object” button enables to interact with the elements in the graphic and to move them around the scene. When an object is selected its edges are marked with red lines, with black dots representing the encumbrance and colored arrows representing the axes (on the aft bottom left hand corner).

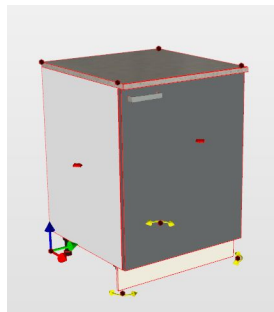


Figure 8.7: Selected object

For the free movement of the object, hover the mouse pointer over the element, left click and hold, then drag the element to the desired position.

For movements along the axes, place the mouse pointer over any arrow, and with the previously described procedure, move the object along the selected axis (axes: red x, blue y and green z). An alternative method is to place the mouse pointer over the arrow and when it turns gray press the SPACE bar and type in the exact distance of the movement. There are also yellow arrows on the bottom of the box, for the rotation of the element in respect to a calibrated grid, see figure 8.8, with this method it is possible to rotate with precision.

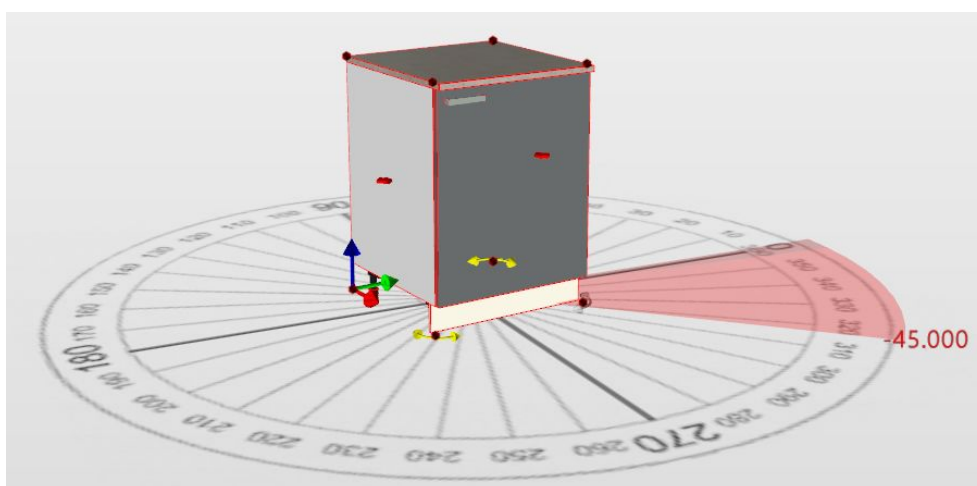


Figure 8.8: Object rotation calibrated grid.

For the angle manual input, press the SPACE bar when the calibrated grid appears and then type in the desired rotation value in degrees (negative or positive value).



Figure 8.9: Object snaps and align buttons.

In figure 8.9 there are buttons for the objects alignment and links between objects.

- 3 A** Self-alignment with the walls: by closing an object to the wall (without the use of the directional arrows) it will turn to its "back" to the wall and align itself to it.
- 3 S** It hooks up (snaps) object to object: it enables the snaps. When a box is dragged up to another box, it hooks up to it by its vertexes. The dragged box will also hook up to the construction lines that were previously inserted in the environment screen through the CadDimentions/Plotting.
- 3 M** Magic Link: if the catalogue in use has it, this key will provide an even more precise snap between boxes.
- 3 F** Free movement: the movement is completely free and without constraints. This function disables A, S and D.
- 3 D** Enables/Disables the collisions: the boxes do not penetrate the ones previously inserted when this function is activated, but they will be placed next to each other. It also activates the AddLink (these functions determine the type of links between the boxes, for example when a corner base is inserted, this function asks if the next box will go to the left or right). It also works between walls and objects.
- 3 W** Self-align between boxes: dragging a box next to another one will align itself to that box.
- 3 +/-** With the buttons +/- (on the keyboard) it is possible to rotate by 90° increments the box being dragged (moved).

3 H Orthogonal view: the selected wall is set to the orthogonal view.

3 Q Dynamic dimensioning: it displays the minimum distances between the selected box and the other ones on the order. When this function is active it is possible to move the objects, which is done by selecting the dimensions, pressing the SPACE bar will open a window where to insert the new dimensions, see figure 9.1.

Note that key **Q** can take on 3 statuses (if on the path `..\evolution\ECadPro\ecadpro\ecadpro.ini` this parameter has been set `abilitaQuoteMultiStato=1`).

The three statuses:



Red - Object attached to the wall - it displays the distance between the selected box and the utility systems/doors & windows. If utility systems are installed on the wall the program will display the distances, otherwise it will display the distances between wall ends.



Yellow - Object attached to the wall - it displays the distances between the box and the wall ends.



Green - Object attached to the wall - it displays the distances between boxes on the left and/or on the right. In absence of other boxes it displays the distances from the wall ends.

3 G Go back to the father Placer : this key is not always present, it is enabled only if the son of a placer is selected. When the key is pressed, the selection passes from the son to the father of the placer.

NB. The A S D keys are always activated when **3cadevolution** is launched.

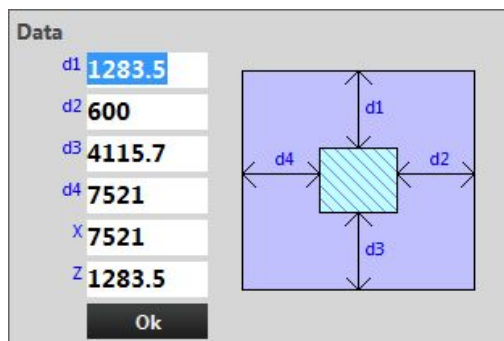
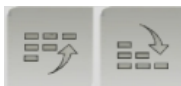


Figure 9.1 : Object movement with the dynamic dimensions.

In figure 8.9 there are other buttons with the following functions:



: displays the encumbrances;



: lowers/raises all walls;



: lowers/raises only the selected walls.

Mouse right click on the work area opens a drop menu as shown in figure 9.2:

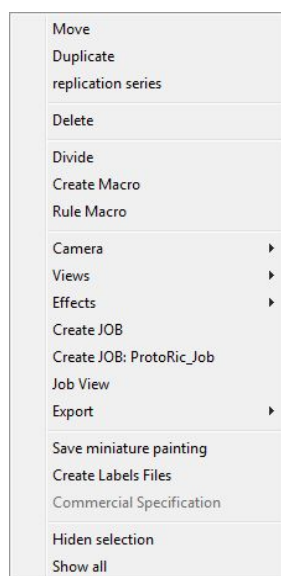


Figure 9.2: Configurator contextual menu.

With these functions, we can interact with the graphics and the elements.

The menu content:

MOVE: moves the element by inserting parameters in the window shown in figure 9.3;

DUPLICATE: generates a single copy of the element and the operator places it where required, see figure 9.4;

REPLICATION IN SERIES: reproduce N copies of the element, with the window shown in figure 9.5;

DELETE: deletes the selected object;

CREATE MACRO: saves a macro, see figure 9.6;

MACRO RULE: it enables to gain access to the rule of the macro, see figure 9.7;

CAMERA: saves the current view and it enables to scroll through the saved views, it is also useful to make several renderings in a single operation;

VIEWS: enables to view the boxes as opened or to view the project in one of the standard views, see figure 9.8;

EFFECTS: it allows to use effects while viewing the project (the same ones found in the views management window);

CREATE JOB: displays the processes system of the working of the elements making up the item, see figure 9.9;

JOB VIEW: if it's defined in the catalogue, it schematizes the job processes in a 3D drawing: the holes, the milling and also inserting the required objects for the workings;

EXPORT: it allows to export the order in different formats, the full list is shown in figure 10.1;

SAVE MINIATURE IMAGE: it create a preview of the item for the item selection menu on the left column;

CREATE FILES LABELS: it creates labels for the files;

SPECIFICATIONS: to edit the items specification files, see figure 10.2;

HIDE SELECTION: it temporally hides the selected element, leaving the encumbrance in view, see figure 10.3;

SHOW ALL: displays all inserted boxes, including the ones hidden with the *Hide Selection* command.

To select multiple elements press and hold SHIFT (keyboard) + CLICK (mouse left button), see figure 10.4. Then click with the mouse right button on the work area, two new entries will appear (in the window in figure 9.2): CREATE GROUPING and BREAK GROUPING.

The first entry creates a single group with the selected boxes, until broken up with the *Break Grouping* command.

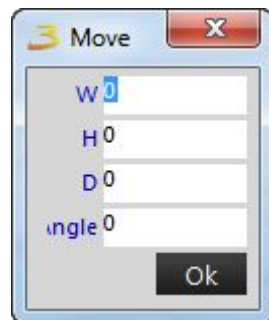


Figure 9.3: Object movement

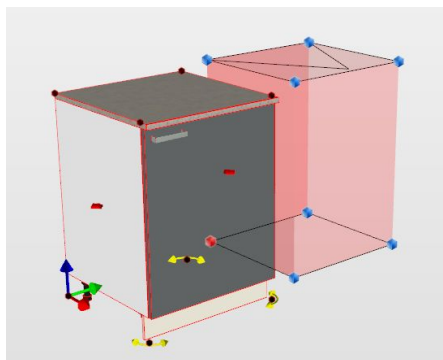


Figure 9.4: Duplicate the object

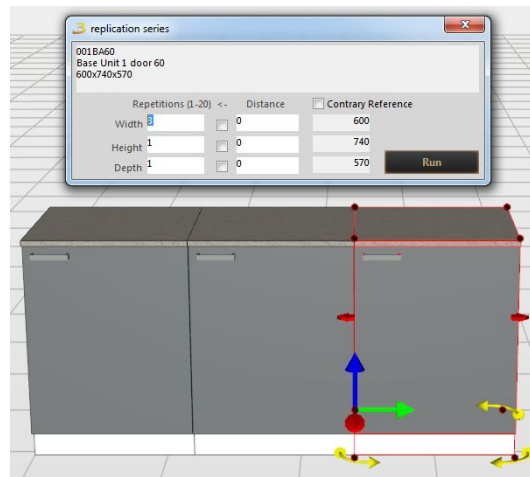


Figure 9.5: Replication in series

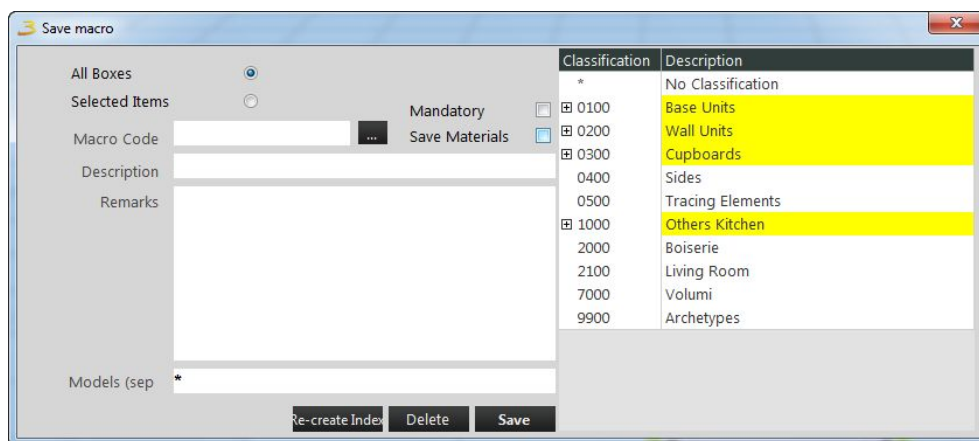


Figure 9.6: Create macro

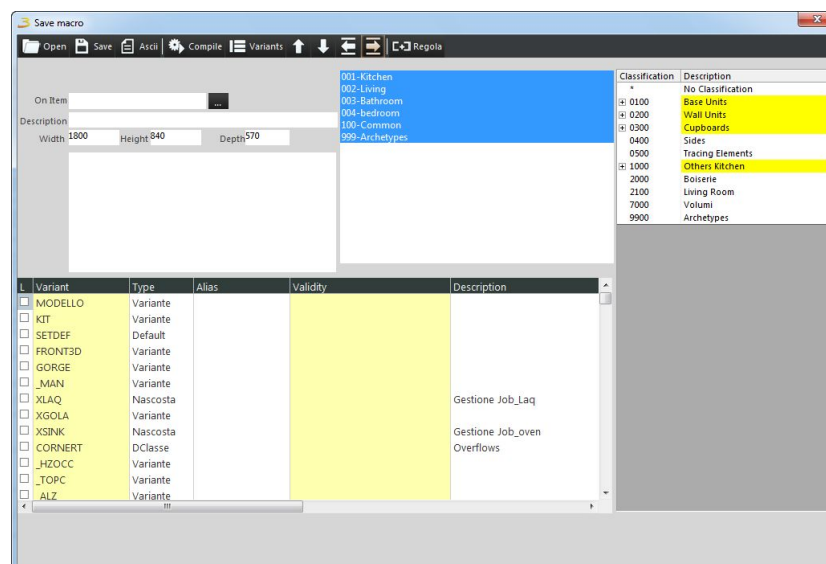


Figure 9.7: Macro rule

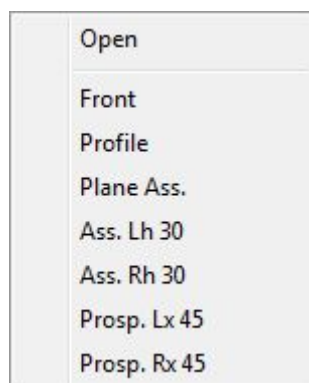


Figure 9.8: Views

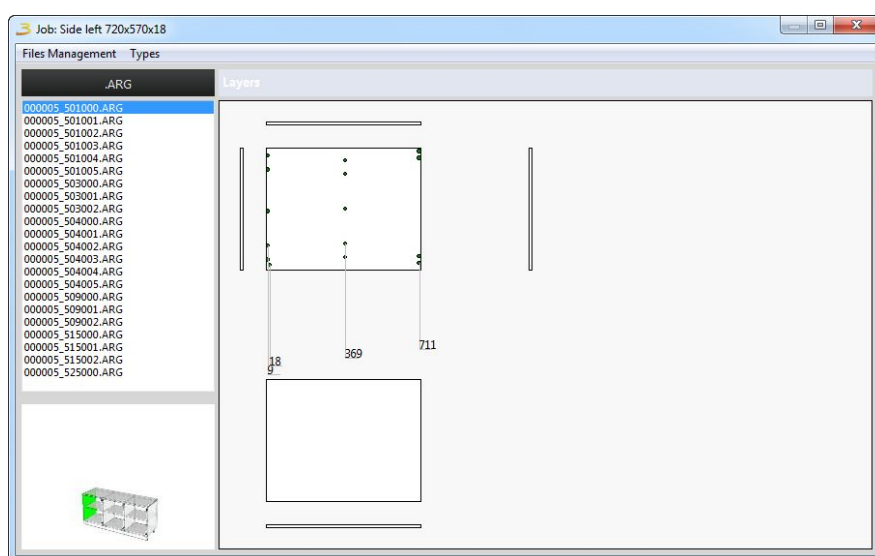


Figure 9.9: Create Job

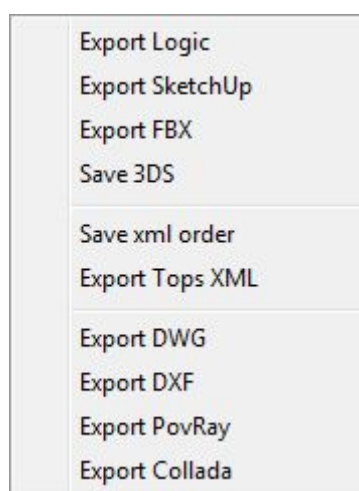


Figure 10.1: Orders export formats

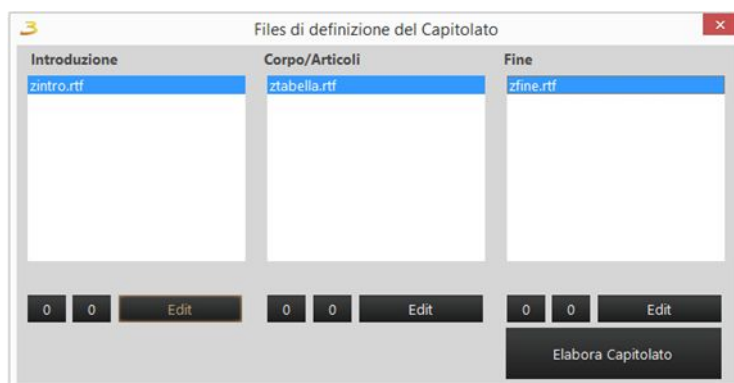


Figure 10.2: Specifications

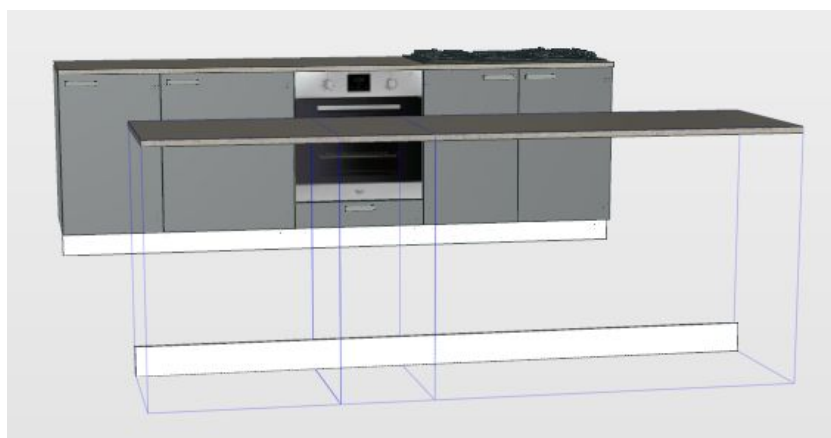


Figure 10.3: Hide selection

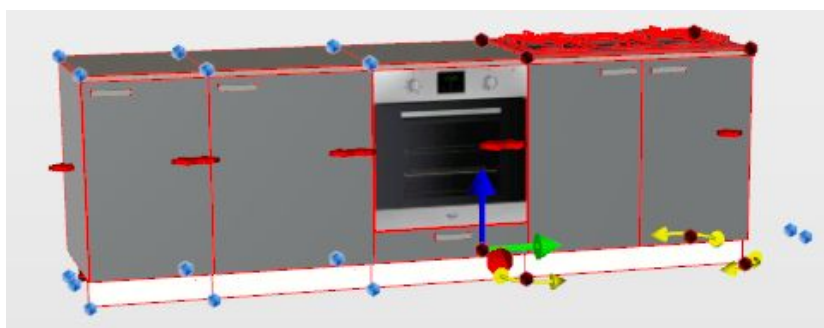


Figure 10.4: Multiple elements selection

3.5.9 Views management

With the Views Management command it is possible to modify the program and views parameters. The top section of the Views Management window has listed the views available in the program, see figure 10.5. These views can be selected in the graphics, by clicking the mouse left button in the work area, and a drop menu will be displayed. The standard views dedicated section, enables to choose the box open or shut viewing mode (it is useful to perform changes inside the box, as for example inside a closet).

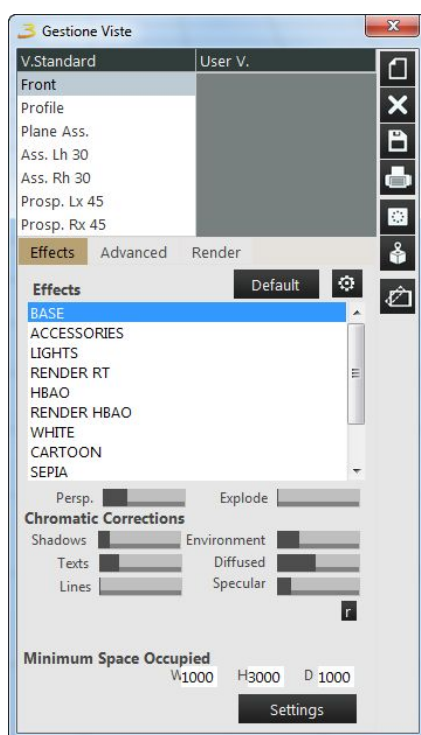


Figure 10.5: Views management.

In the Effects section (accessed through the tab in the Views Management window or the mouse right button drop menu) several different graphics customizations are available⁵ by selecting the settings button (bottom right), such as:

- **Lines:** enables/disables the item profiles;
- **Silhouette:** enables to highlight more precisely the shape of the items;
- **Texts:** enables to visualize the texts;
- **Walls:** displays the walls and floors;

⁵ All graphics settings modification results will depend on the video card installed on the PC.

- **Stats:** displays the statistics;
- **Background layout:** displays the imported DXF;
- **Flight View:** displays a window showing the plan of the project;
- **Skybox:** creates a background (allocated on the sides of a cube) to make the environment appear bigger and to use it on the objects reflections;
- **Logo:** 3cadevolution logo on the screen bottom right hand corner;
- **Background:** it assigns a color to the background to emphasize the realism;
- **Grid:** enables the construction grid;
- **Box Culling:** removes from the view, the objects shown from the back;
- **Face Culling:** optimizes the display of the 3D objects;
- **Drag Lite:** improves the movement of objects;
- **Enable Layers:** enables the up front visualization of the utility systems even when there are elements obstructing the view (useful for prints);
- **Hide-Wall Camera:** hides the walls when the scene is in the rear;
- **Dynamic Dimensions:** enables the display of the dimensions.

Further settings:

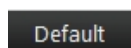
- **Perspective:** enables a perspective view correction.
- **Explode:** items explosion.

The chromatic corrections are referred to the visual appearance:

- **Shadows:** increases/decreases the shadow intensity;
- **Texts:** to edit the dimensions text size;
- **Lines:** to edit the width of the lines of the objects;
- **Environment:** increases/decreases the chromatic contrast of the elements;
- **Diffused:** diffused lights (sum of the lights inserted in the scene);
- **Specular:** lights reflection level.

The lights must be inserted correctly in order to see these chromatic corrections (see "*3.5.10 - Lights management*").

There are other commands:



It forces the recovery of the Effetti.txt file.



To gain access to the rule of the effects.

 : resets the effects settings.

Minimum Space Occupied
 W1000 H3000 D 1000

: sets the scene minimum dimensions (it is useful when using this button )

Description of the buttons on the left of the Views Management window, see figure 10.5:

-  1. To create a new view identical to the current one;
-  2. To delete the selected view;
-  3. To save the views for later use;
-  4. To gain access to the print window;
-  5. To create views, with the dimensions of the merged elements;
-  6. To visualize the single box (selected);
-  7. Clip planes.

Detailed description of the above mentioned buttons:

VIEWS PRINT

The Views Management window offers the possibility to create useful views with the items dimensions, in order to print them. First of all, press this button  (in the Views Management window) which opens the window in figure 10.6.

It is divided in three sections: upper toolbar, central work area and views management left side toolbar.

The upper toolbar, figure 10.7, enables to set the printer, display the print preview, print, display the number of pages and to go through them, enables the various zoom modes, undo, insert text and images.

The left section has three tabs: Print, Archive and Manual.

Upon the first access the manual tab will be active and from here we can insert the below mentioned views, by dragging them in the central work area or we can create new ones as the sum of several views on the same page. The following buttons are found on this page

: save, delete or reset a view, and insert images or text.

In the Print tab there are fields to be filled out with texts that will be incorporated in the print out.

The Archive tab enables to store the print typologies saved with the Save button; it is always possible to delete a print with the Delete button.

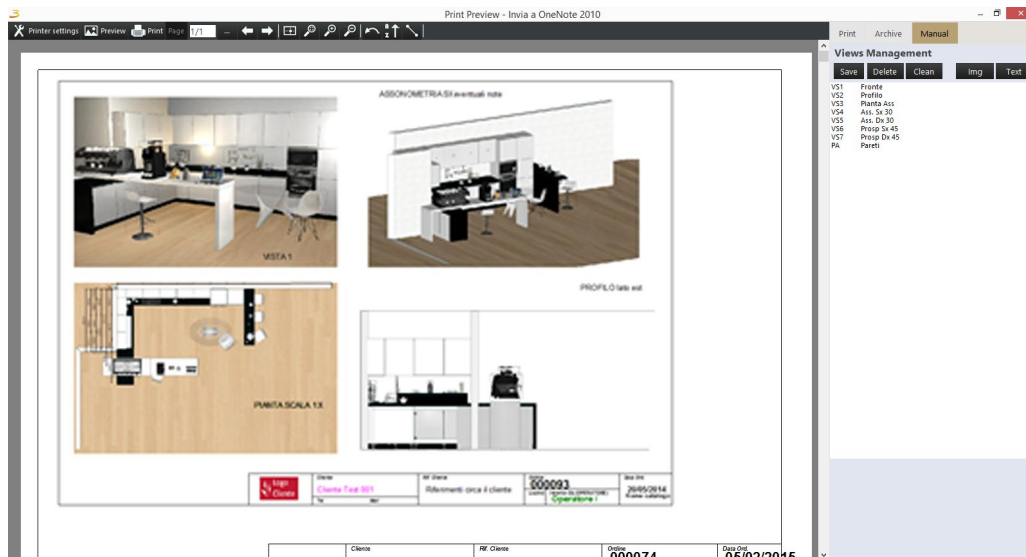


Figure 10.6: Print preview window

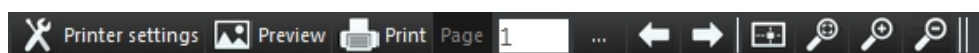


Figure 10.7: Print preview toolbar

CREATE VIEWS FOR MERGED ELEMENTS

It enables to launch a procedure to calculate all merged elements and it produces several views, as many as the elements, with their respective workings and dimensions. The user views shown on the example image, see figure 10.8, are referred to the top (#T 0), to the front plinth (#T 1) and to the back finishing (#T 2). These are all of the merged elements that the program has managed to find on our test order.

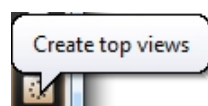
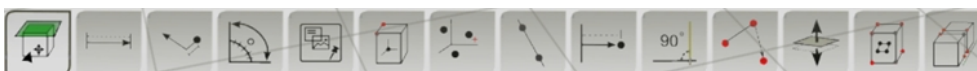


Figure 10.8: Create top views button

DIMENSIONS MANAGEMENT

We can create views useful for the dimensions of the items and print them. Modifying the name of the new view is done by mouse double clicking over the view name. Once the dimensions button has been selected, we should choose the plane on which to perform the measurements in the work area.

Several standard points will be highlighted, which are situated on the object extremities, and after selecting the required function, we can: add, modify and delete some dimensions.



BUTTON	DESCRIPTION
	This button enables to select the work plane: the mouse pointer will highlight the area of interest which corresponds to the three axes.
	Dimensioning from point to point. This button enables the dimensioning of the item (through significant points on the extremes of the composition). For example, to get the width of a base unit: select the plane of the top and link the top extremities with the mouse. Then it will be possible to move the dimensions, by placing the mouse pointer over the value and move the dimension with the mouse left button.
	Selecting this button enables to create new snap points, which can be freely placed by the user.
	Arch dimensions: click on the origin of the circumference, then the first end and then the second end.

	Dimensions note: select the point where to place the text to be displayed, define the style, the type of object to insert and the text size.
	Free mode: manages the free placing of points and dimensions, there are no snaps nor other interferences.
	To create a new snap point, by placing the pointer over a known point, press the SPACE bar and insert the relative dimensions of x and y in respect to that point.
	To insert a dimensioning line, where two points must be specified in order to create one.
	It creates an offset point: select a preexisting point on a line and clicking on another point on the same line will open a window where to insert the distance between the two points.
	It creates a line perpendicular to an existing one: a point on the line must be selected or just click on the line and then move along its length.
	Polyline for plotting, several points are specified, pressing ENTER will display the points distances and coordinates.
	It moves the work plane where the dimensions are displayed, the distance of the new work plane from the old work plane must be inserted.
	It increases the detail of the snap point, it will also display those belonging to the sub-elements.
	Hide/Show the snap points.

Table 10.9



On the bottom left, there is a dot generator, which creates dots to highlight specified parts of the composition (for example they could be useful for the assembly plan).



To work it must be in the "Move objects" mode , not in the "Movement" mode .



to move to the dot or set of dots, with the next number;



to move to the dot or set of dots, with the previous number;



it enables to insert the description of the dot or a set of dots with the same number;



it enables to change the the dots shape if in the eCadPro\ecadpro\matbase folder, one or more of the: pallino1.dds, pallino2.dds, pallino3.dds, etc... files are present, the dds format is required;



when selected and therefore colored in red, it is possible to insert dots with this number by clicking in the work area (use the previously mentioned "+" and "-" buttons to insert dots with other numbers).

CLIP PLANES

This function is quite useful to select part of an order to be displayed. It is recommended for big orders in order to create a customized size break up of the view.

To create a view with the clip planes, select "New view" on the Views Management menu and select Clip Planes: this opens the plan view of the order. Use the mouse pointer to define the plane position, by selecting the first two anchor points, and then extend the triangle (which symbolizes the clip plane) as needed.

Three new buttons appear on the bottom left of the work area, see figure 11.1

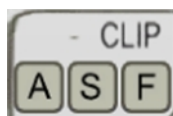


Figure 11.1: Clip planes functions

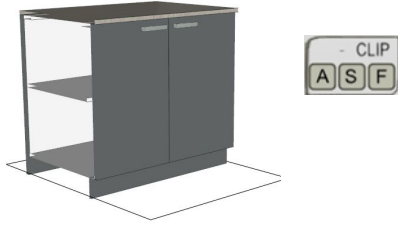
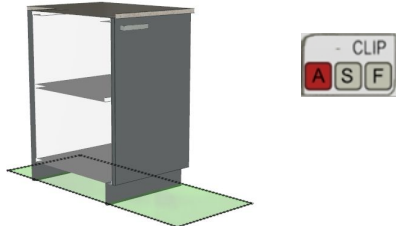
A – This button edits the current clip plane: the size of the basic rectangle where the composition is found may vary in size in order to have a bigger or smaller section to examine, see figure 11.2.

S – Changes the way to display the phantom objects and it can take on two statuses: red or green.

S red: the elements are cut by the clip plane perimeter and are displayed (even with the missing portion) as phantoms in order to allow the visualization of the whole element inside this area, see table 11.2;

S green: it is used with the F key (to hide boxes); with this key we can see as phantoms the boxes that were previously hidden, see table 11.2.

F – Saves the clip in dwg format, it hides or redisplay the selected items of the composition, in addition it can create or remove the automatic dot generator (with the ID number, code and description), see table 11.2.

	This is how the project is shown when using the clip planes; the interior of the items are visible when rotated.
	The A key enables to modify the area to visualize, increasing or decreasing it.

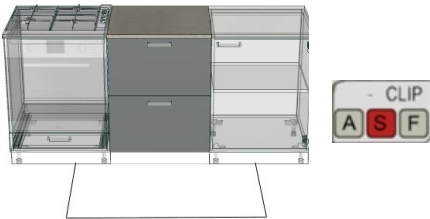
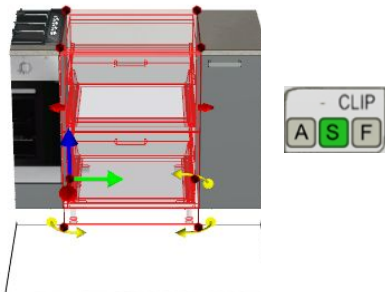
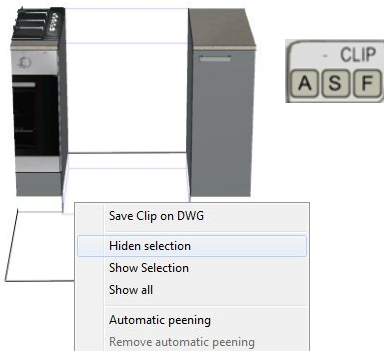
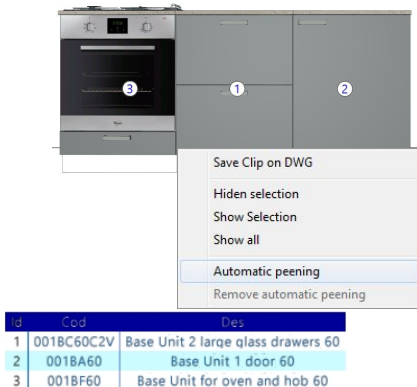
	If we use the S key (red), the boxes found along the plane perimeter, and cut by it, are displayed as phantoms.												
	With key S active and selecting "Hide selection" on the F key menu, the boxes previously hidden become phantoms.												
	If the F key is selected a menu appears, as shown in this example, we can hide an item that was selected before hand*.												
 <table><thead><tr><th>Id</th><th>Cod</th><th>Des</th></tr></thead><tbody><tr><td>1</td><td>001BC60C2V</td><td>Base Unit 2 large glass drawers 60</td></tr><tr><td>2</td><td>001BA60</td><td>Base Unit 1 door 60</td></tr><tr><td>3</td><td>001BF60</td><td>Base Unit for oven and hob 60</td></tr></tbody></table>	Id	Cod	Des	1	001BC60C2V	Base Unit 2 large glass drawers 60	2	001BA60	Base Unit 1 door 60	3	001BF60	Base Unit for oven and hob 60	In this example with the F key the automatic dot generator has been enabled.
Id	Cod	Des											
1	001BC60C2V	Base Unit 2 large glass drawers 60											
2	001BA60	Base Unit 1 door 60											
3	001BF60	Base Unit for oven and hob 60											

Table 11.2: Clip planes Keys

* This option differs from the Hide selection found on the contextual menu enabled by the mouse right button when activated in the configurator work area, and it also hides the encumbrance lines.

An internal render called Raytracing is accessible through the Views Management window. After selecting the render tab, several settings are available: gamma, environment light, quality level and the option for the reduced viewing format; once the parameters are set, press the Render button and wait for the resulting image.

3.5.10 Lights management

The correct positioning and setting of the lights is fundamental in order to obtain the desired chromatic effect and a good rendering result.

We will illustrate the procedure and settings for: RealTime, RayTracing and RenderFarm.

Let's begin by opening the Views Management window (F2) and

selecting the lights button  on the side toolbar. New buttons, for the lights placement, will appear on the bottom left of the work area, see figure 11.3.

They are for the manual, automatic placement and the on/off switching of the lights.

MANUAL PLACEMENT: the lights (light source) are to be placed where required to emphasize the composition. Press the manual

placement button  and then click the position on the scene where to place it. On the screen a control console will appear with different control features.

The lights height default placement is at 1 meter from the ground, this height can be modified.

AUTOMATIC PLACEMENT: upon clicking this button  a notice will appear stating that the lights inserted manually will be deleted and the lights height, position and intensity will be calculated based on the scene, items quantity, and any accessories present.



Figure 11.3: Lights insertion buttons

Following the lights (light source) manual or automatic placement, it is possible to change their position, see figure 11.4, by clicking on the center of the light icon and holding the mouse left button, move the light as required.

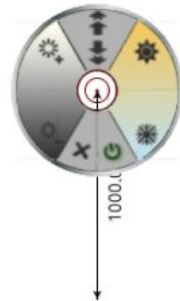


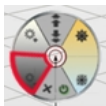
Figure 11.4: Light source



To set the light source height.



To increase the light source intensity.



To decrease the light source intensity.



To increase the color temperature.



To decrease the color temperature.



On/off light source.



Delete light source.

It is recommended to place the lights on the plan view or however to avoid placing them on front or axonometric views.

Light sources can be inserted anywhere in the scene, for example to simulate the sun light or beacons.

From the Views Management window, we can carry out chromatic corrections, for example on the shadows, increasing the light intensity

will decrease transparency of the objects which in turn will accentuate the shadow.

The following settings are adjustable: ambient (environment) light is the indirect light present in the environment, the diffuse light is the diffusion intensity of the lights in the environment, the specular light is the light reflected by the objects, the text and lines size.

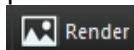
In RealTime and on the RenderFarm rendering the shadow can be enabled/disabled with the keyboard S button, after selecting the light source.

The light source can also be switched over from omnidirection lights to beacon and vice versa with the keyboard O button.

3.5.11 Rendering

The RenderFarm is a service for the realization of high quality renderings in little time and the ability to leave the work station open for other activities.

The proper placement and adjustment of the lights is a mandatory requirement for a good rendering with the RenderFarm which is processed via email to the server by clicking the dedicated button



on the top toolbar.

A window will open, as shown in figure 11.5, and it is made up of three tabs: User Management, Sending Options and Resources.

Users Management: this tab contains the user personal data and the activities list;

Sending Options: once an operator is registered in the system; its email, password (hidden by asterisks) and available credit is shown on the top portion of the dialog window.

Then we have the operator's name, the name of the catalogue, the order number, key words and the order description (these last two fields are useful to find an order without the order number (for example if lost).

In the center, a list of the views available for the rendering (the current view and the views saved with the contextual drop menu in the configurator).

The views to render are checked and the quality level is set (Basic, medium, high or panorama).

Resources: It contains the list of the rendering requests.

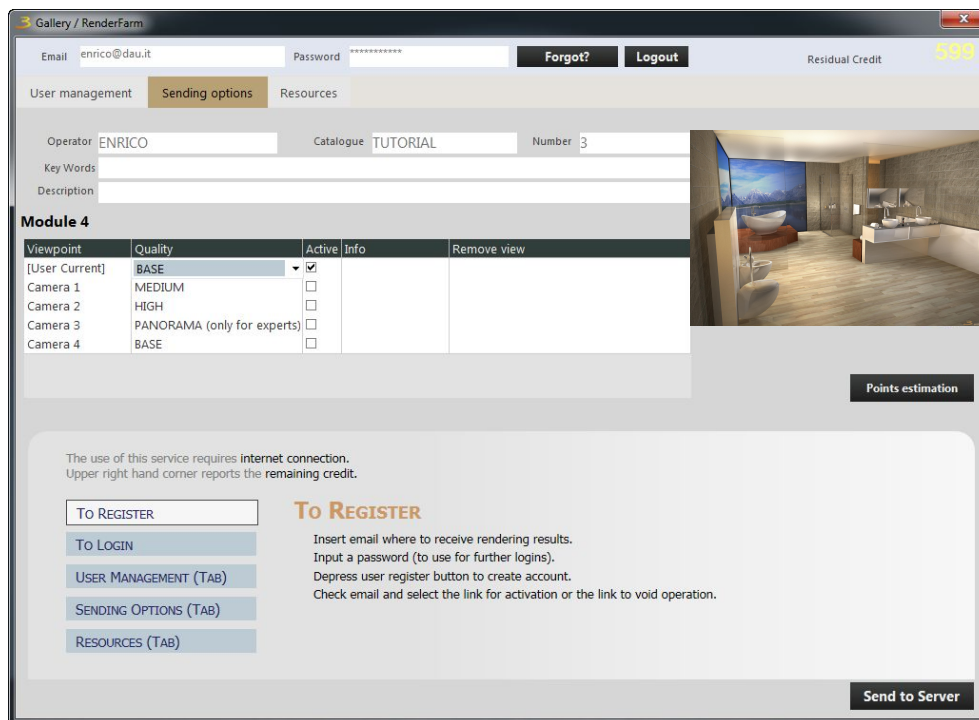


Figure 11.5: RenderFarm window

3.5.12 Tops views

The composition plan view: enables us to launch a procedure to calculate the merged elements and to create as many views as the elements, with their respective processing and dimensions.

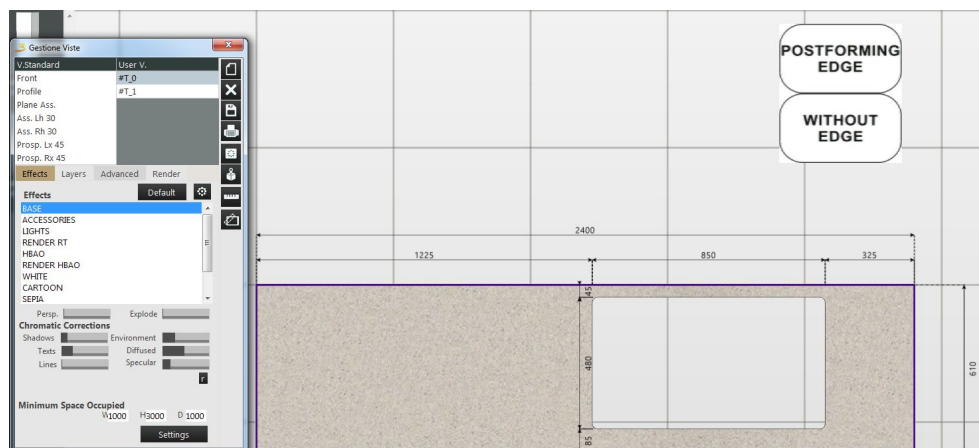


Figure 3.55: Tops views

When this procedure is launched, the Layer tab will appear, where the dimensions level to display is decided, see figure 11.6.

It is possible to manually modify the dimensions of the merged elements through the dedicated button, it is also possible to open the shape (sagome) editor in order to manually modify the shapes in the graphics.

The user views can be referred to the view of the top, of the backplash, of the plinth or any type of merged element that the program finds when analyzing the project. Let's remember that it is possible to create new views, delete, save or print them with the buttons on the left side of the Views Management window.

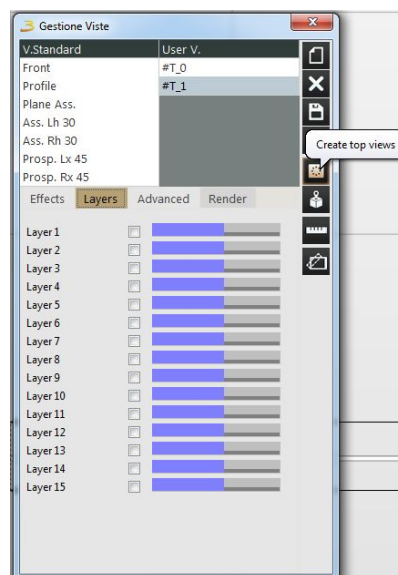


Figure 11.6: Tops views.

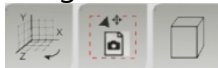
3.5.13 Photomatch function

This feature enables to place a 3D drawing inside a photograph, which is a valid technique to verify how a new item would look inside an existing environment.

The following is the operational procedure for the Photomatch:

1. Take pictures of the environment to furnish (be careful to keep the angle views straight).
2. Specify and measure at least one height reference, to be used later on for the positioning of the photograph.
3. Create a new environment with 3cadevolution.

At this point:

1. Enter the Views Management window and activate the Photomatch function by selecting the ADVANCED tab.
2. Press the *Add photo* button to upload, select a photograph and press the *Load* button to insert the photo in the configurator.
3. Three icons will appear on the bottom screen:  the first one is for placing the axes, the second to set the hidden objects and the third one to move the whole item.



The furniture is inserted globally and not on individual elements.

The axes positioning is the most complex function:

1. Press the mouse center button to determine the conventional axes origin (normally an angle on the ground of the photo).
2. The mouse left button to align the axes to the escape lines identified on the photograph.

It is important to use the focal in order to adapt it to the camera, the bottom left sliding bar is for setting the grid proportion and the height from the ground is specified by clicking the blue dot and pressing the SPACE bar: this reference point enables to properly insert the furniture.

If we press again the mouse central button, we will see that parts of the photograph will be covered by the 3D drawing which is in front. We remove these parts with the second button, which defines the foreground area.

In addition to this we can also move the furniture within the photograph, this would involve to reassign the covered areas.

Once we have terminated, see figure 11.7, we can proceed to save it (two files are saved; one for the photograph and the other with the references). Changing any characteristic, graphics effect, light settings, etc., will affect the photograph, which is constantly updated.



Figure 11.7: Photomatch

3.5.14 Dragger

The dragger is a function to resize a box in length, width and depth, with the use of standard dimensions and without the need to manually insert the new size.

It is visually displayed with a red arrow  found on one or more dimensions. Click on it and drag to the desired size.

Black dots will appear to indicate the different possibilities: the size is displayed as the arrow approaches a dot, see figure 11.8. Place the arrow by the desired dot to resize an item.

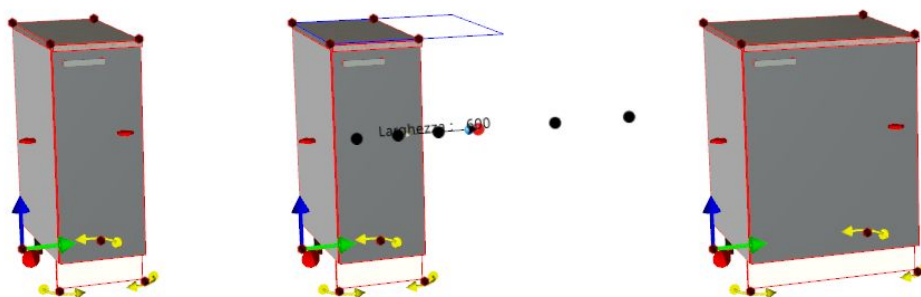


Figure 11.8: Dragger

3.5.15 Addition

This function is found on the item editor window, identified with the "+" button, see figure 11.9.

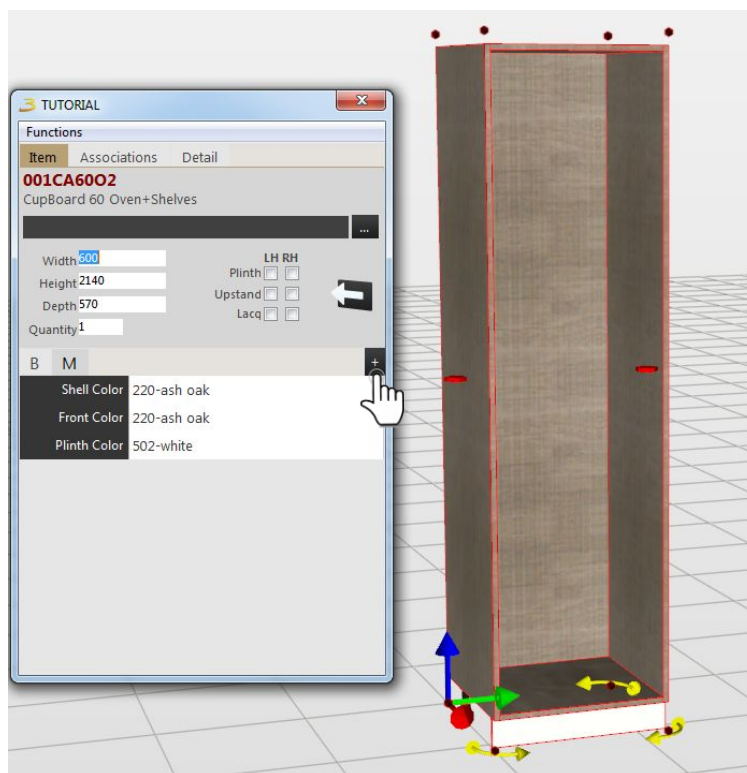


Figure 11.9: Addition



Clicking the addition button enables to add elements to the item (the example shows a column with oven).

This operation enables to transform a non-series item into the sum of off the shelf elements. A selection window will appear by clicking the addition button "+", from which to choose the element to add , see figure 12.1.

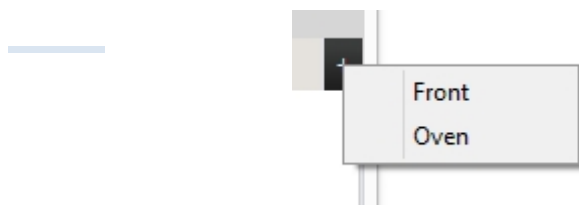


Figure 12.1: The addition selection

The chosen element will be added to the graphics. (figure 12.2). In the item window another button (-) is created, which if necessary will delete the added element.

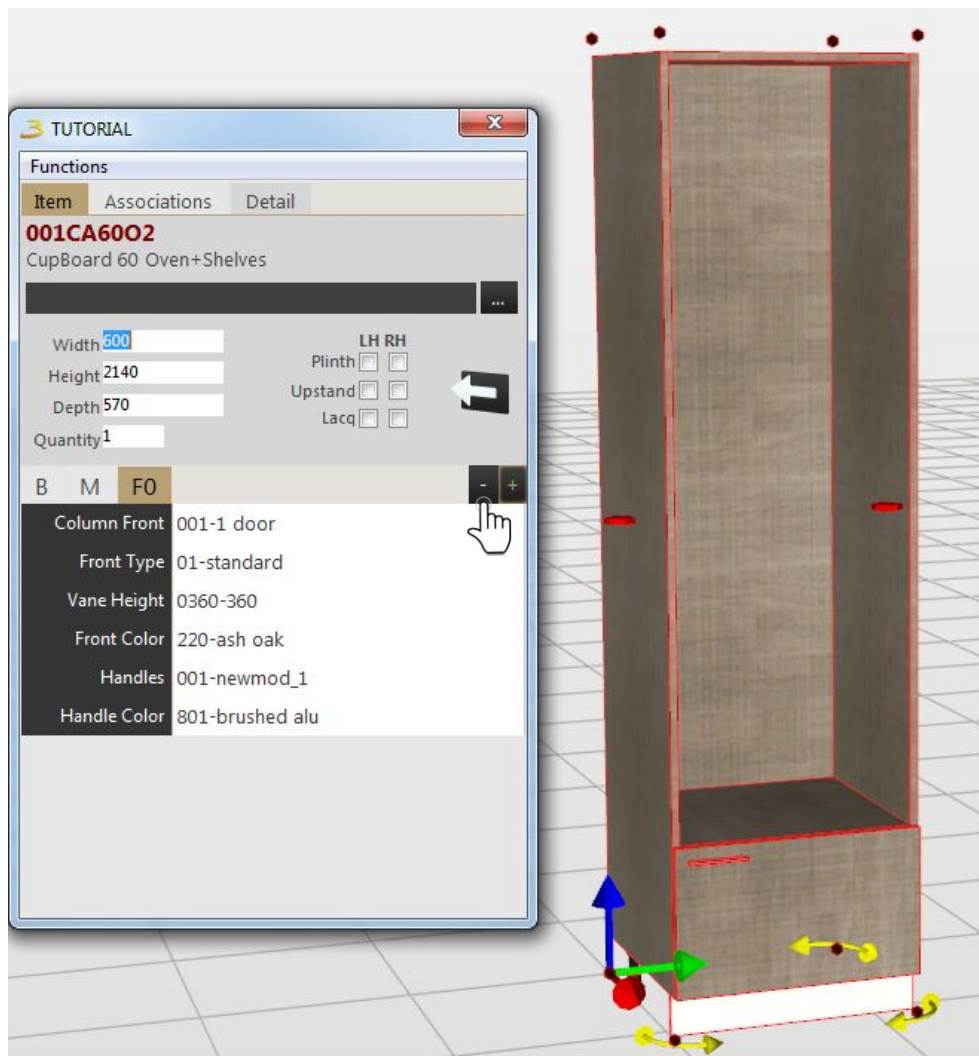


Figure 12.2: Addition example

To delete an addition, click the related tab inside the item window; it will turn gold, proceed to click the (-) button to delete the added element.

Continue to use the addition until all required elements are added to the item, see figure12.3.



Figure 12.3: Item made with the addition.

3.5.16 Divider

The divider function is for the item customization, and it is located on the item editor window, where several tabs are found. The first tab is for the variants main group, the following ones are for the spaces created with this function, see figure 12.4.

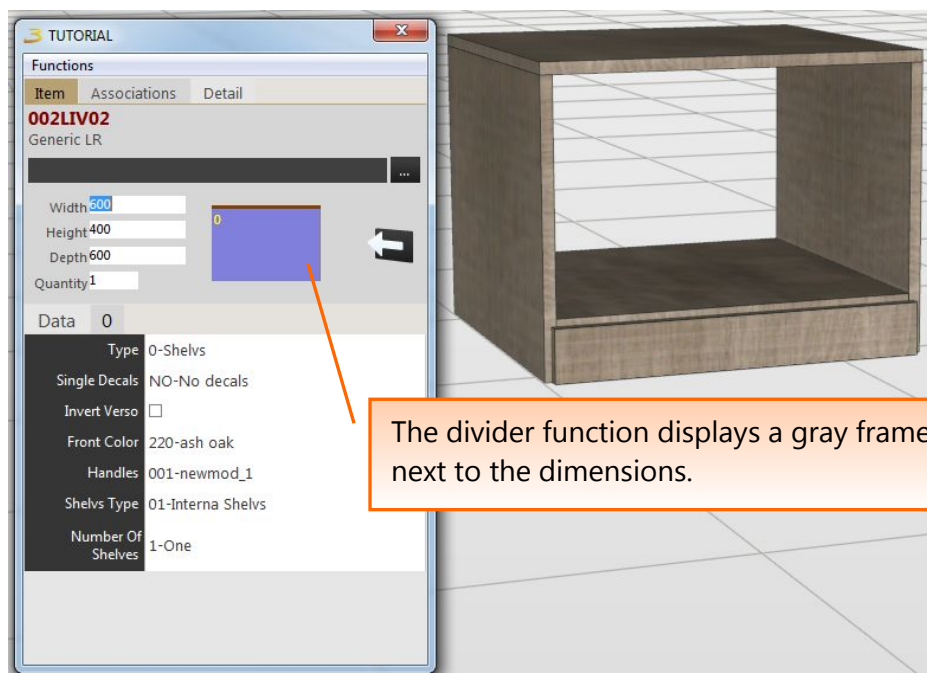
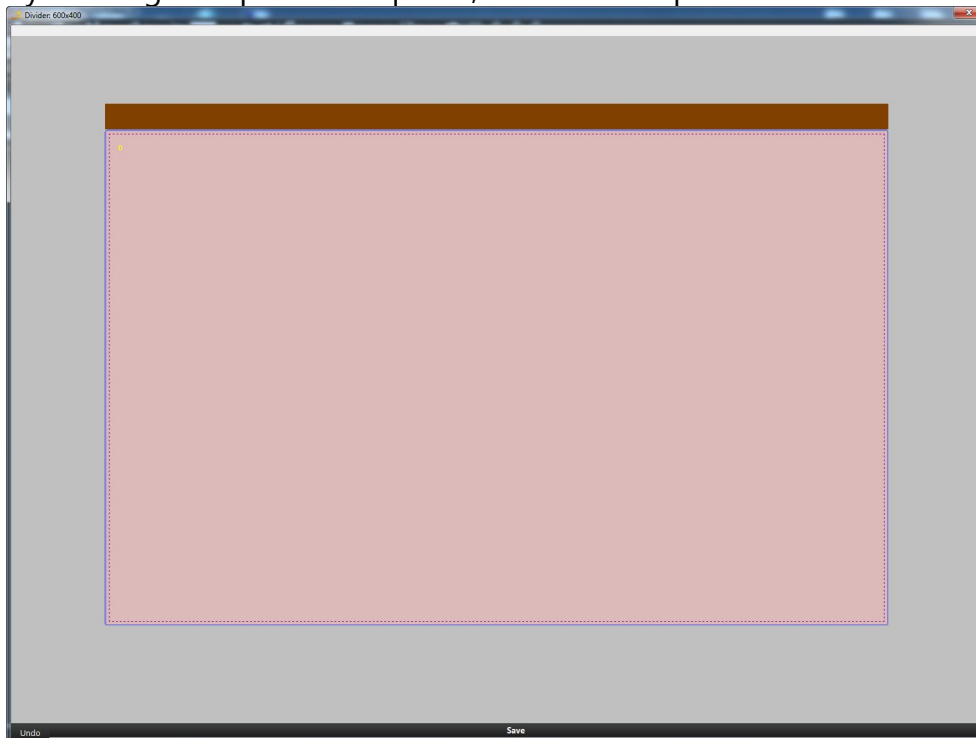


Figure 12.4: The item editor window with the divider

Double clicking on the gray frame will open a window to edit the item by dividing the space as required, see the example below.

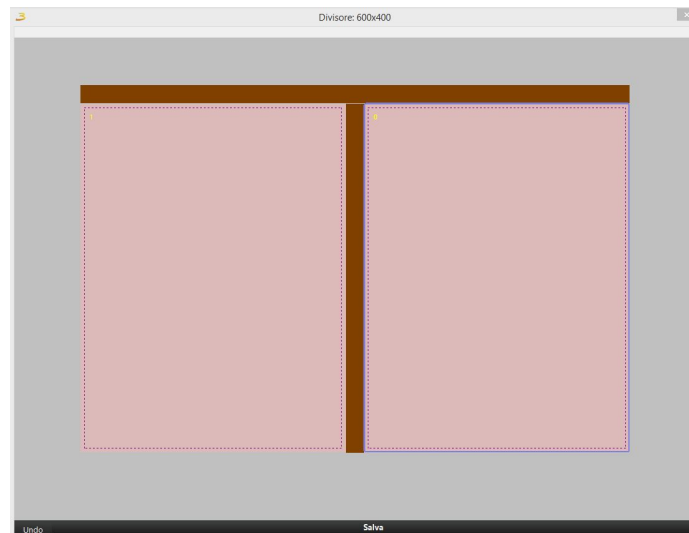


Use the mouse right button to edit this space, a drop menu with the following entries will appear:

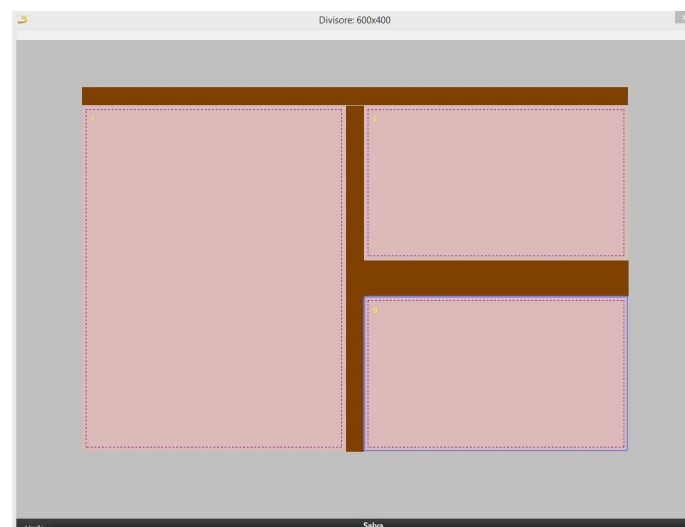


Detailed description of the menu entries:

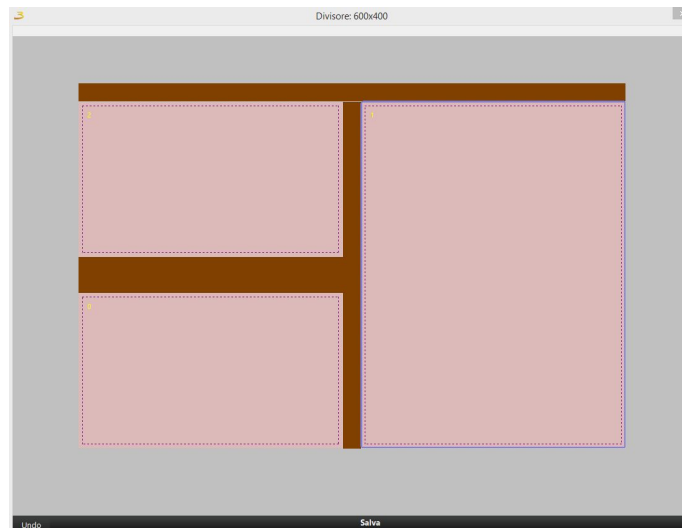
ADD VERTICAL DIVISION - It automatically adds a vertical divider and places it in the calculated mid position of the selected area.



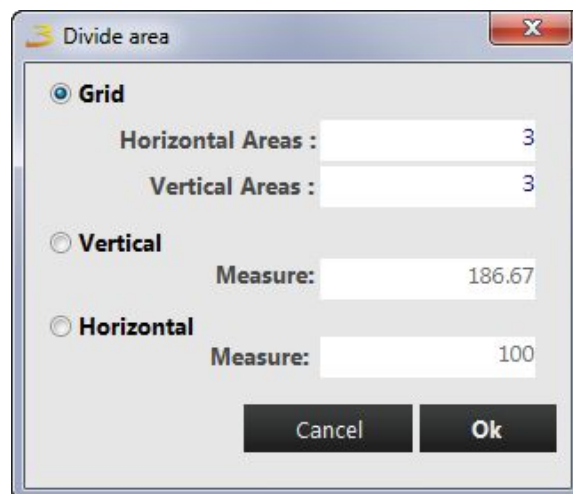
ADD HORIZONTAL DIVISION - It automatically adds a horizontal divider placing it in the calculated mid position of the selected area.



MIRROR VERTICALLY - It reflects the frame around the vertical axis.



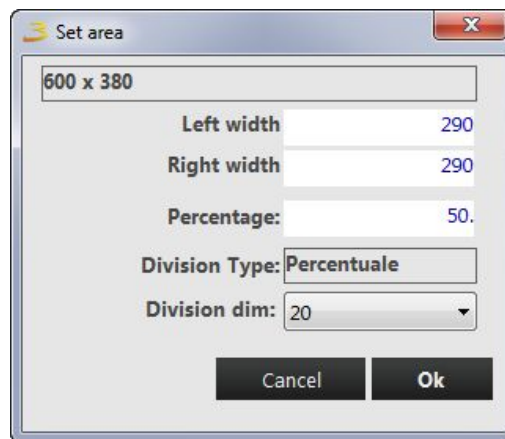
DIVIDE - It opens a window to enable the insertion of the vertical and horizontal dividers to divide the available space and to place them at the same distance from each other (grid). It is also possible to manually set the distance of the divider on the two axes.



DELETE ALL - It deletes all dividers made in the customizable area.

DELETE DIVISION - It deletes the selected divider (place the mouse pointer over the divider to delete it).

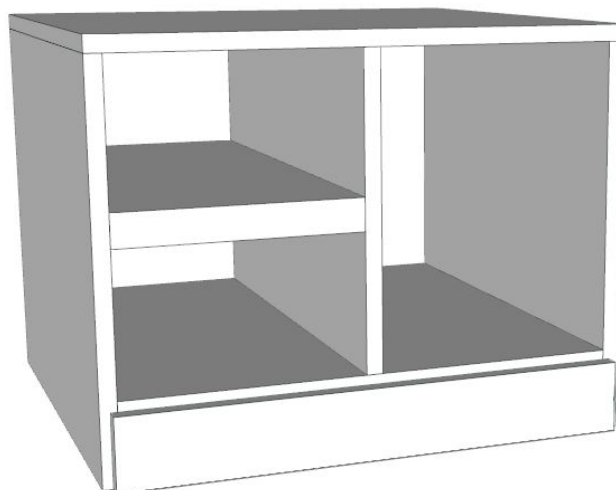
SET - This function is the first window with the dimensions of the divided area.



From this window it is possible to set: the **left and right distance** of the division, the space dividing **percentage** (it refers to the top division for a horizontal insertion, to the left division when dealing with a vertical insertion), the **division type** (distance or percentage), which enables the manual setting of the divider, the **Division Dim.** which indicates the divider thickness.

UNDO - It goes back one operation.

SAVE - It saves the modifications carried out in the customization area.

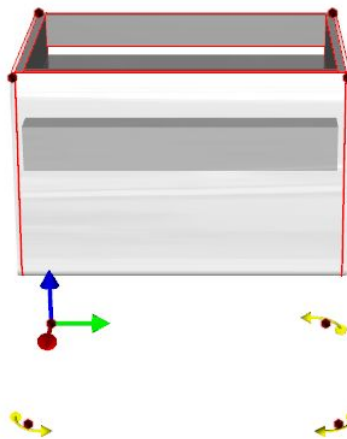


Example. Creating an item with the divider.

3.5.17 Placer

The placer function speeds up the placement of items closely related to others.

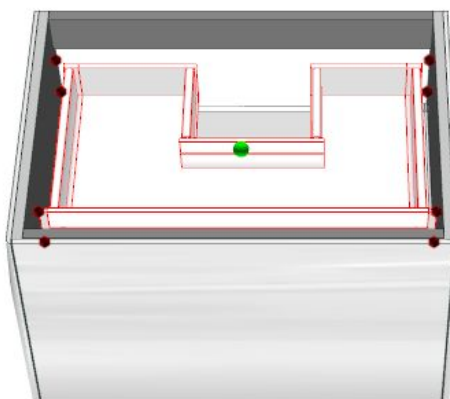
After placing the first item it is possible to place the next one in the work area where a gray rectangle is displayed to indicate the correct placement of the second item in respect to the previous one.



This system enables to place items without the need of: the *keys* and to calculate the dimensions for the exact placement of the items.



It is sufficient to place the item over the gray rectangle (which will turn red) and click once: the second item will automatically place itself correctly into position.



3.5.18 Multicatalogue placer

The multicatalogue placer function allows us to insert items from different catalogues.

The following icon is the one that identifies the multicatalogue placer:



Pressing this icon opens a menu containing all of the insertable items belonging to other catalogues.



Example: item insertion with the multicatalogue placer

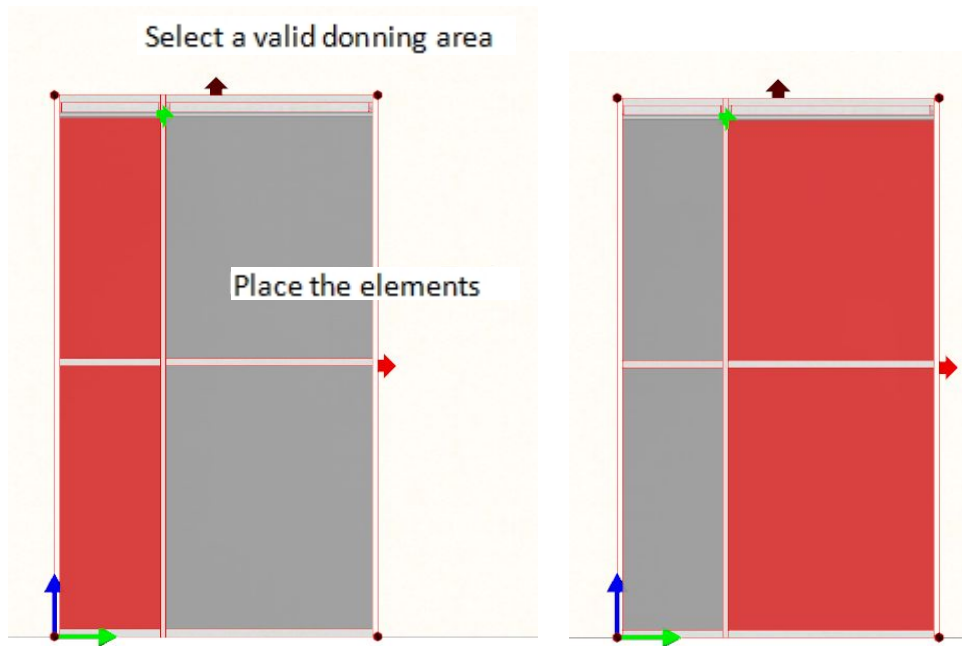
3.5.19 Donning area

This function allows you to place and move certain items inside the container item.

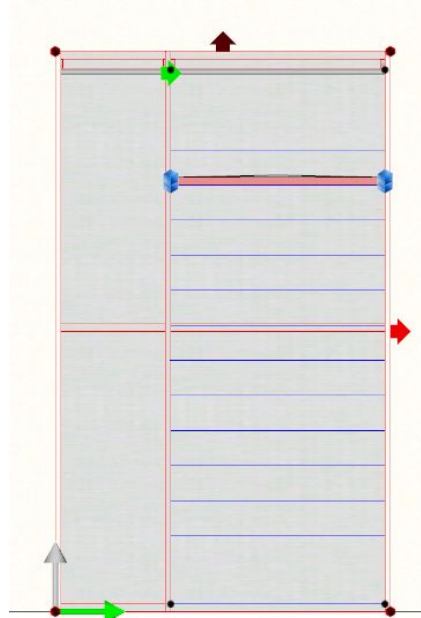
First of all let's insert a closet and select the front view, to facilitate the next steps, then mouse right click on the work area selecting the VIEWS entry and then OPEN.

The next step is for the insertion of a few internal elements, such as internal dividers, shelves, drawers, etc...

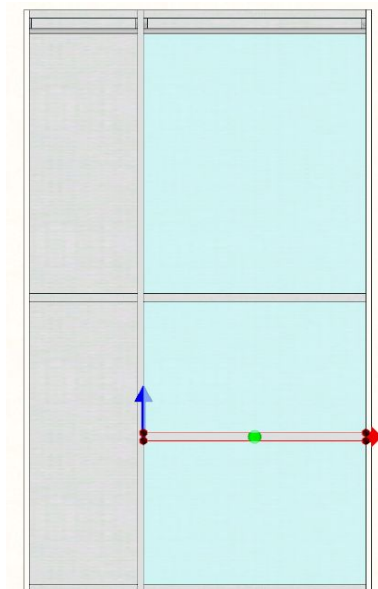
Select the element on the left column menu, a shelf in our case. The program will highlight in red the areas where this element can be placed inside the item, then it is just required to click on the desired highlighted area to insert the element.



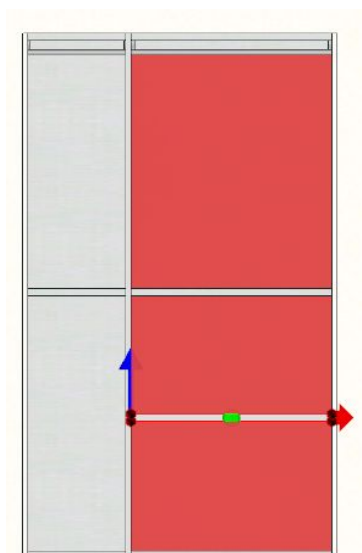
Let's click on the second space which is now proposing all possible cases for placing the shelf and maintaining the preset pitch.



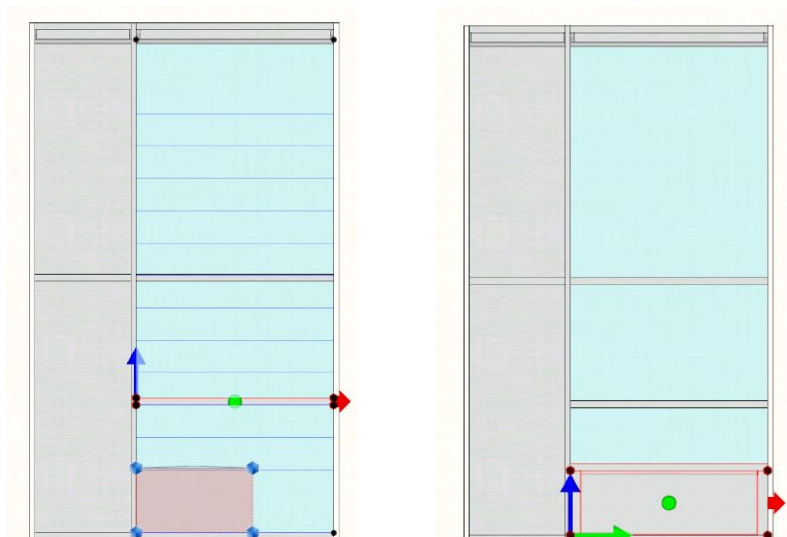
The program will correctly place the shelf in the selected area. The blue arrow is for moving the element up and down along the height axis.



The same procedure applies for the insertion of other internal elements, for example a drawer. When the drawer is selected, the space is highlighted in red.



Select the space and position where to insert the drawer, a second click to confirm the position.



3.5.20 Plotting

If the catalogue has this function (shown with this button  on the right toolbar) it is possible to manually plot: frames, backs and/or tops. It is sufficient to click this button and select from the list of available elements on display for this function (the list of elements depends on the catalogue in use, see example below).

- Alzatina A Tracciamento
- Cornice Sop A Tracciamento
- Cornice Sottopensile A Tracciamento
- Gola A Tracciamento
- Zoccolo A Tracciamento

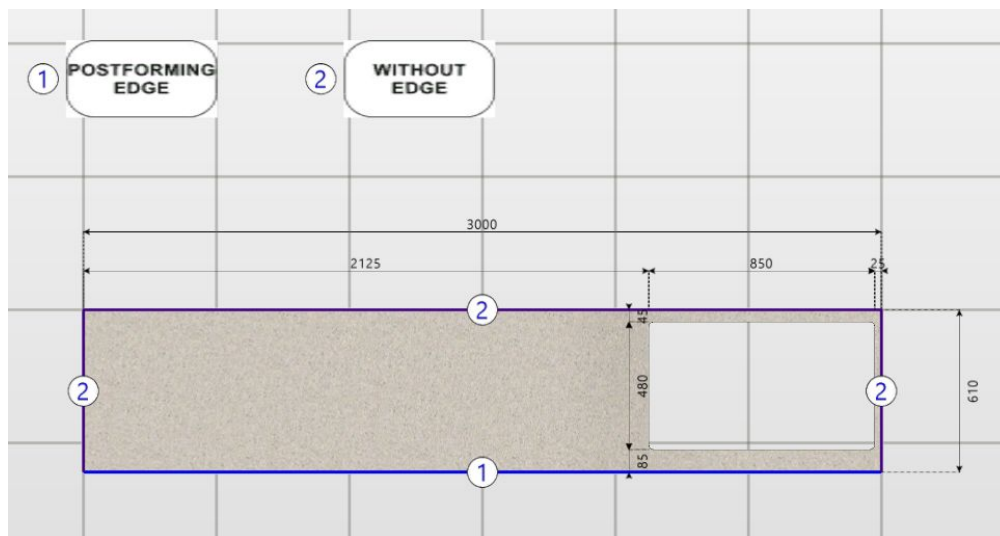
3.5.21 Top list

There are different ways to plot a linear element on an item, which depends on the catalogue structure.

After creating a composition and clicking the recalculate button, the tops list will appear on the left, without gaining access to the views management.

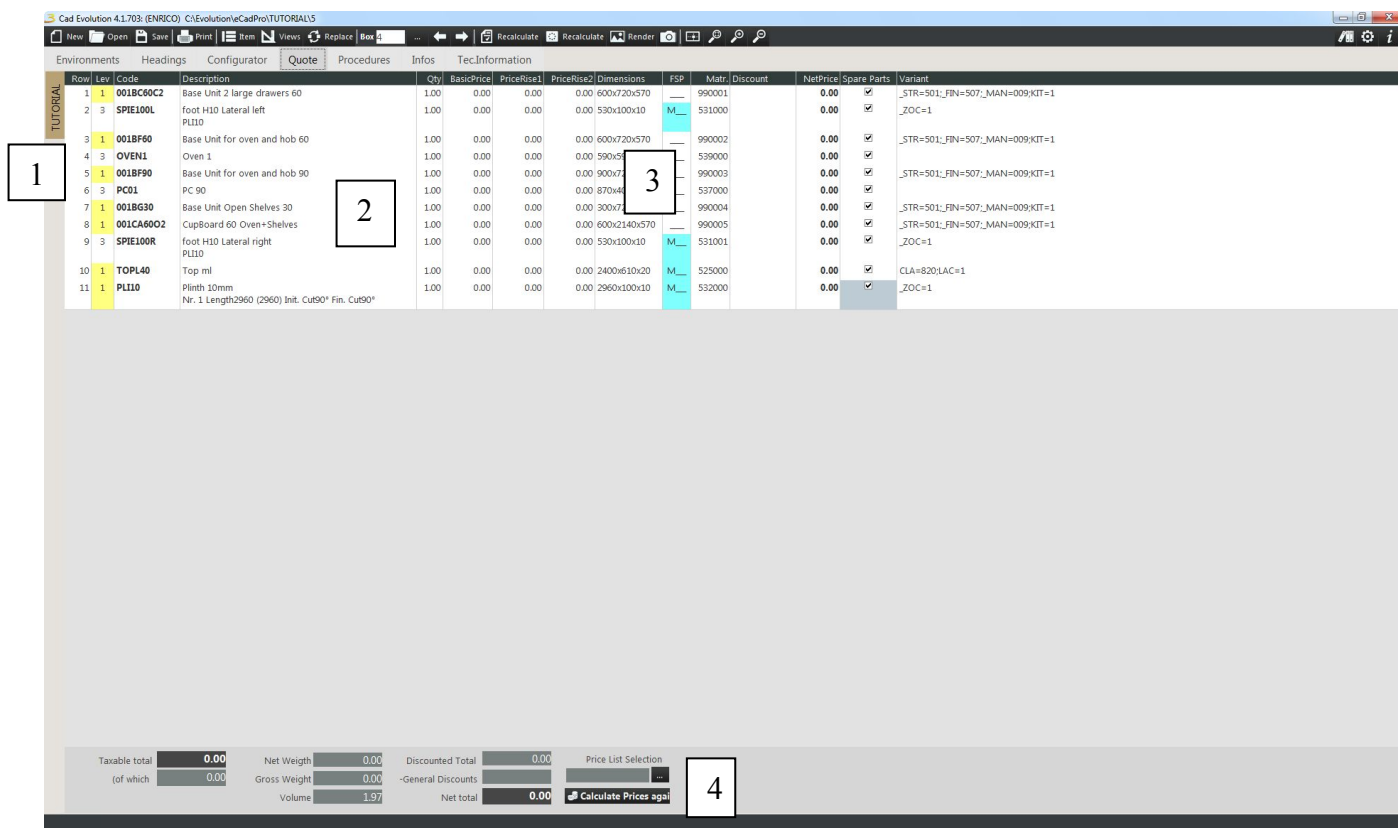


Clicking on these entries will initiate the calculation of the merged elements with their respective processes and dimensions, see the figure below.



3.6 Quote

The Quote tab gives access to the price calculation in **3cadevolution**. The following figure shows the layout of the quote screen (figure 12.5):



Row	Lev	Code	Description	Qty	BasicPrice	PriceRise1	PriceRise2	Dimensions	FSP	Matr	Discount	NetPrice	Spare Parts	Variant
1	1	001BC60C2	Base Unit 2 large drawers 60	1.00	0.00	0.00	0.00	600x720x570	---	990001		0.00	☒	_STR=501;_FIN=507;_MAN=009;KIT=1
2	3	SPIE100L	foot H10 Lateral left PL110	1.00	0.00	0.00	0.00	530x100x10	M_	531000		0.00	☒	_ZOC=1
3	1	001BF60	Base Unit for oven and hob 60	1.00	0.00	0.00	0.00	600x720x570	---	990002		0.00	☒	_STR=501;_FIN=507;_MAN=009;KIT=1
4	3	OVEN1	Oven 1	1.00	0.00	0.00	0.00	590x590	---	539000		0.00	☒	
5	1	001BF90	Base Unit for oven and hob 90	1.00	0.00	0.00	0.00	900x720	---	990003		0.00	☒	_STR=501;_FIN=507;_MAN=009;KIT=1
6	3	PC01	PC 90	1.00	0.00	0.00	0.00	870x44	---	537000		0.00	☒	
7	1	001BG30	Base Unit Open Shelves 30	1.00	0.00	0.00	0.00	300x720	---	990004		0.00	☒	_STR=501;_FIN=507;_MAN=009;KIT=1
8	1	001CA6002	Cupboard 60 Oven+Shelves	1.00	0.00	0.00	0.00	600x2140x570	---	990005		0.00	☒	_STR=501;_FIN=507;_MAN=009;KIT=1
9	3	SPIE100R	foot H10 Lateral right PL110	1.00	0.00	0.00	0.00	530x100x10	M_	531001		0.00	☒	_ZOC=1
10	1	TOPL40	Top ml	1.00	0.00	0.00	0.00	2400x610x20	M_	525000		0.00	☒	CLA=820\LAC=1
11	1	PL110	Plinth 10mm Nr: 1 Length2960 (2960) Init. Cut90° Fin. Cut90°	1.00	0.00	0.00	0.00	2960x100x10	M_	532000		0.00	☒	_ZOC=1

Taxable total	0.00	Net Weight	0.00	Discounted Total	0.00	Price List Selection	---
(of which	0.00	Gross Weight	0.00	-General Discounts			
		Volume	1.97	Net total	0.00	Calculate Prices again	

Figure 12.5: Quote.

1. Since **3cadevolution** is a multicatalogue configurator, these tabs enables to select the catalogue from which to display the quote.

2. List of items in the graphics. This list contains the items that makes up the composition. This window is divided in several columns with information pertaining to each item.

In order:

Line: items numbering;

Lev: the code level (level 1 is all the elements in the graphics, level 3 shows the elements in the graphics, derived from the rule, the appliances and accessories management);

Code: item code;

Description: item description;

Qty: quantity of every single element;

BasicPrice: item basic price without discounts or price increases;

PriceIncrease1 and **PriceIncrease2:** price increases;

Dimensions: width, height and depth of the element;

FSP: special flags for the special price calculation;
S/N: item serial number;
Discount: discounts to apply to the item price;
NetPrice: calculated price with increases and discounts;
Spare Parts: spare parts flag;
Variants: variants applied to the object.

3. In this section, we find the information concerning the: sum, discounts and information about the order from the selected catalogue.

4. Price recalculation: following modifications click on this button to update the prices in the quote window.

Description of figure 12.6

Taxable total	0.00	Net Weight	0.00	Discounted Total	0.00	Price List Selection
(of which	0.00	Gross Weight	0.00	-General Discounts		...
		Volume	1.97	Net total	0.00	 Calculate Prices again

Figure 12.6: Quote example, information concerning amounts and discounts.

- Taxable total: the order total, price increases included (visible on the underlying line),
- Net Weight, Gross Weight, Volume: sum of the weights and volumes of all objects,
- Discounted Total: taxable total subject to discounts (header discounts and applied to each item).

3.7 Prints

The print icon situated on the top toolbar is for printing orders or projects. This function will display the specific tab for prints, see figure 12.7:

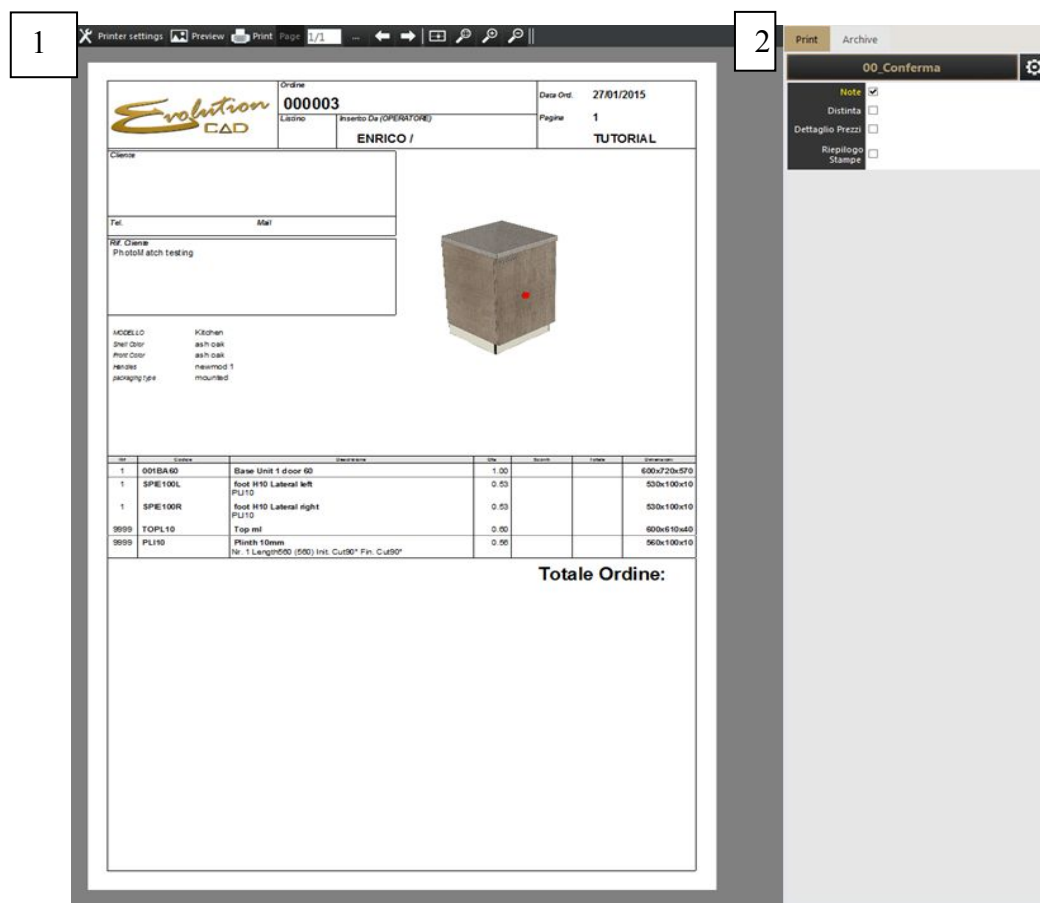


Figure 12.7: Print.

The main toolbar (1) has various buttons:

Printer settings: this function sets the printer and the information for the sheet,

Preview: it creates a preview of the sheets to print, based on the selected rule and on the modifications carried out on its variants,

Print: to print the order or project,

Page: it selects the page to display. The arrows are for moving from one page to the other and the dots are for displaying the pages list.

There are buttons to frame all or to select the area to enlarge, zoom in or zoom out.

On the right there is a menu with all of the printing rules under the "Print" tab (2), check the box of the rule you want to use, see figure 12.8,

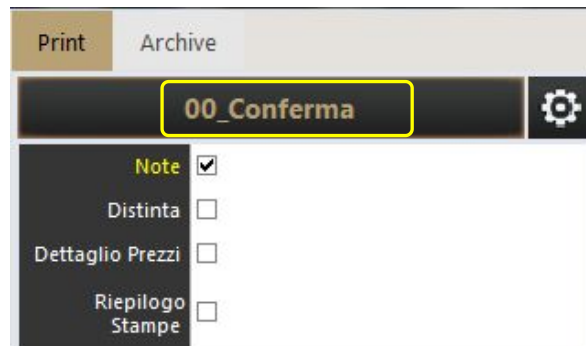


Figure 12.8: Printing rules menu

this will display all of the feasible prints of the selected rule, see figure 12.9:

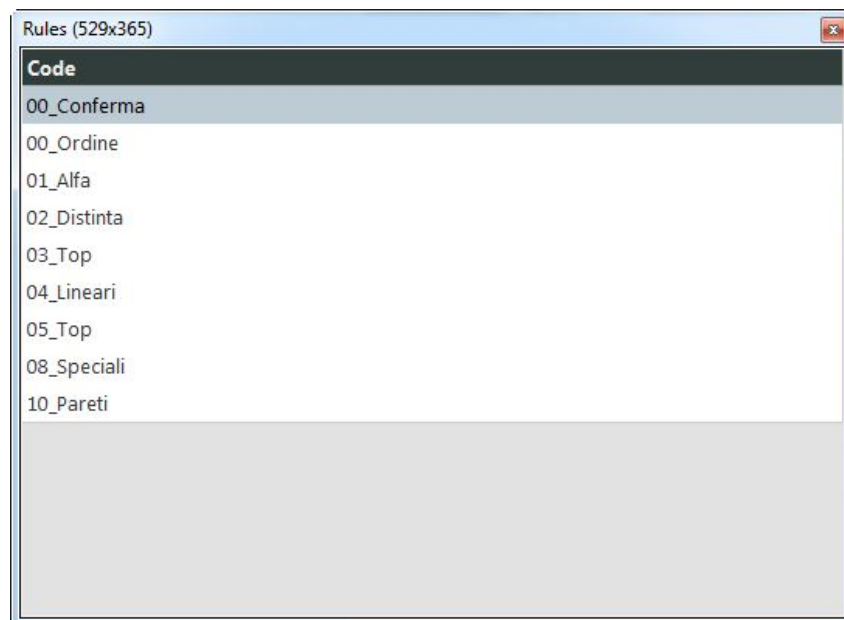


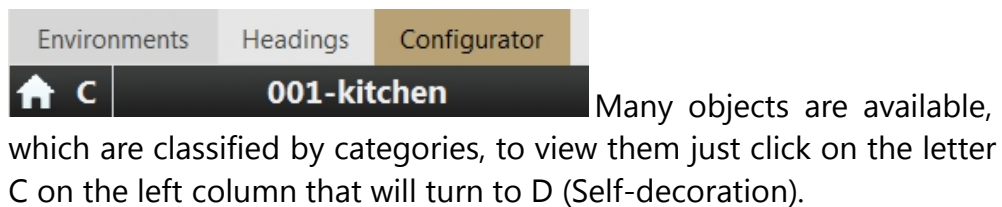
Figure 12.9: Print rule selection.

The print preview generates a sheet on the graphics that represents the actual print area with its content.

In this section it is possible to print: price quotes, labels, bill of materials, linear elements and any available customizations.

3.8 Accessories

The accessories catalogue is used for the placement of furniture elements in the project: it includes a series of 3D objects, which are easy to place and modify, in order to make a complete project with 3cad Pro or Lite.



Then just as from the furniture catalogue, it will be possible to select items from the column on the left, see figure 13.1.

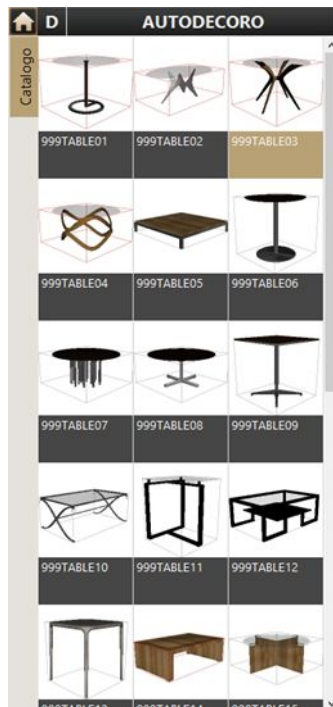


Figure 13.1: Furniture accessories catalogue

The accessories catalogue contains parametric objects with advance construction rules, for example standard and spiral staircases. There are also features to make objects in the free mode, for example the shapes function (see figure 13.2).

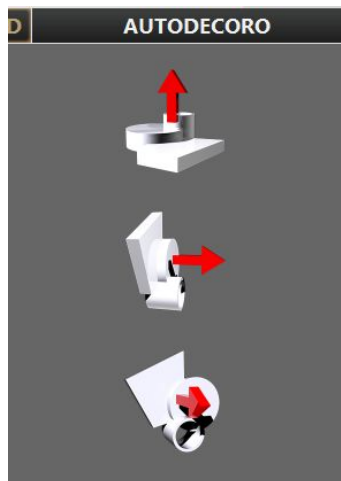


Figure 13.2: Shapes from the Accessories catalogue

Select the desired icon to insert a shape represented as a square (height, width and depth extrusion) in the work area, that will be modified with the shape editor (see chapter 3.9 Shapes management). With the dragger or through the item window, by inserting a new value, the newly created shape can be extruded.

This is also valid for all of the objects in the catalogue: their sizes are editable, by using an intuitive and easy system with arrows, or by modifying the parameters in the rule editor (The F1 key displays this window).

The advanced materials management is possible:

- ✓ Import new materials;
- ✓ Modify the materials proprieties, such as: reflection, metallic reflection, RGB and other advanced proprieties.

A description and price can be assigned to the ornament elements, that will show up on a separate quote. It is also possible to determine the formula for the price calculation, by choosing between: PZ, ML in Length, ML in Height, ML in Depth, MQ, Width x Depth, MQ Width x Height, MQ Height x Depth, MC, formula or coefficient in order to facilitate any calculation that otherwise would be done manually.

It is also possible to import external 3D files and to insert 3ds, x or collada objects (easily available on the web).

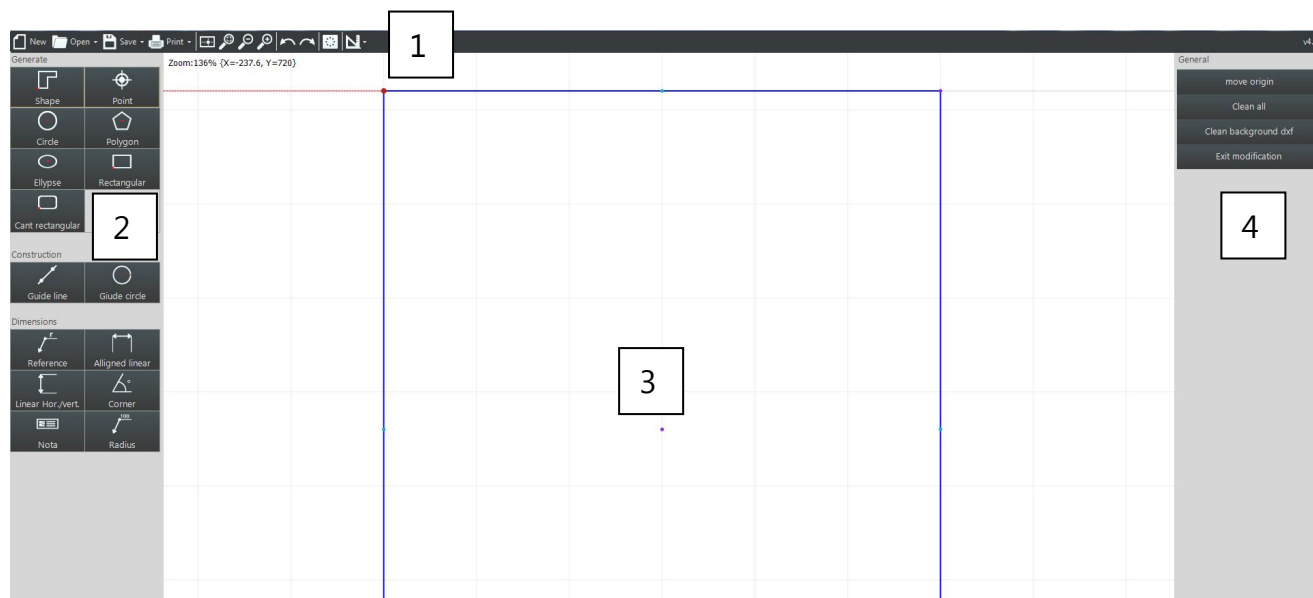
To create a drawing as realistic as possible a skybox can be inserted from the accessories catalogue.

To quickly display the project with or without accessories we need to select the C button on the left toolbar, which will switch to the D status.

3.9 Shape management

The CAD2D is divided in two parts:

1. Horizontal menu with the main controls;
2. Toolbar for the insertion of elements;
3. Drawing area;
4. Toolbar for the element proprieties.

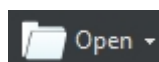


1. HORIZONTAL MENU

There is a toolbar with several function on the top portion of the screen.



This button enables to create a new shape (deleting the current one on the drawing).

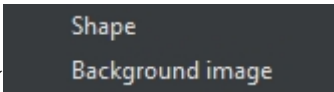
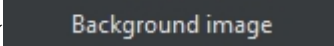
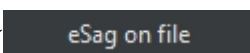
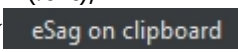
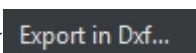
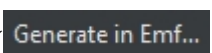


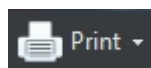
When selected, it opens the following files:

- ✓ Shapes previously made starting with EcadPro;
- ✓ eSag, shapes saved in textual format;
- ✓ dxf, files from Autocad used as background;
- ✓ Image type files with different extensions



It enables to:

- ✓  save the shape as jcad;
- ✓  save the shape as text format (.txt);
- ✓  save the shape as text format on the clipboard (*it's the temporary memory where data is saved for transfer elsewhere, such as the copy-paste command*);
- ✓  export as dxf format;
- ✓  transform the shape into emf file;
- ✓  transform a dxf file into eSag format (text);
- ✓ 



This button enables to display the print preview, set print parameters or direct printing.



These buttons maintain the same functionality as on the top toolbar on the configurator:

- ✓  FRAME ALL: frame view of the whole project;
- ✓  ZOOM WINDOW: selecting this button, the zoom of the area selected with the mouse left button, is performed;
- ✓  ZOOM OUT: zoom decrease;
- ✓  ZOOM IN: zoom increase;
- ✓  UNDO: to go back one step;

- ✓  REDO: to skip forward on the action timeline;
- ✓  RECALCULATE: it carries out the Boolean calculations;
- ✓  VIEWS: enable/disable the viewing of the guide axis, origin, grid and/or snap, it permits to invert the shape in respect to the vertical axis.

2. TOOLBAR

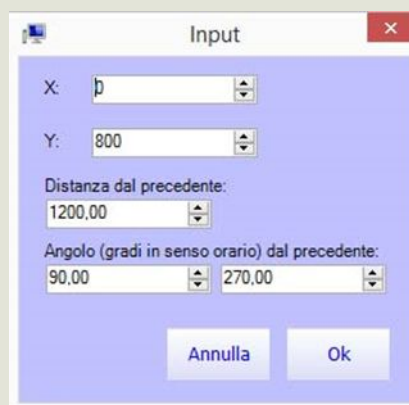
The toolbar on the left hand side is for the insertion of all possible elements:

ICON	DESCRIPTION
------	-------------



It creates a n sided polygon in the free mode.

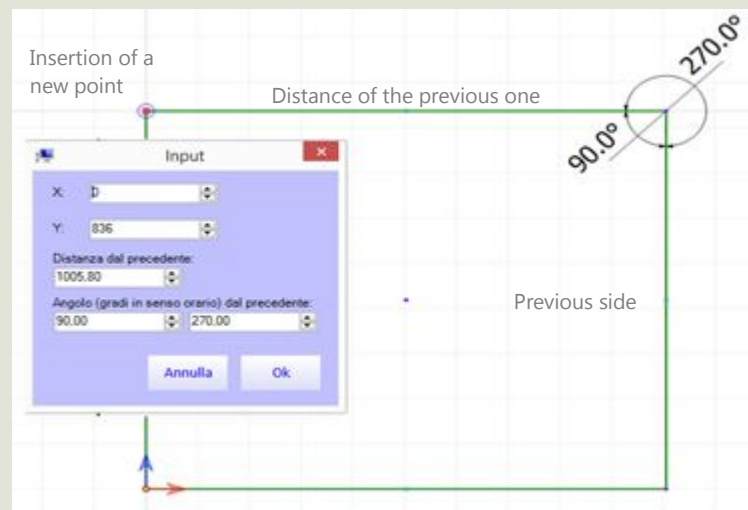
There are two ways to make it: click with the mouse to point out the vertexes of the polygon or before inserting the next point of the shape, press the space bar to get this screen:



The dialog box titled 'Input' contains the following fields and buttons:

- X:
- Y:
- Distanza dal precedente:
- Angolo (gradi in senso orario) dal precedente:
- Buttons: Annulla, Ok

It is possible here to insert the coordinates of the vertex, distance of the next point or the angle (internal or external) formed by the previous side and the one created by the insertion of this last point (*see example*).



To modify a point, once the shape is terminated, click on it and drag or press the space bar (or enter) and input the coordinates.

A side of the shape can be moved in parallel in respect to itself and maintain the adjacent sides bound to its extremities, by dragging them by their midpoint.



Point

Set magnetic points where to anchor other elements.

By pressing *enter* when inserting the element, its center can be specified.

This point can be moved later on: by clicking it and then dragging it elsewhere or clicking it, press the space bar (or enter) and input the new coordinates.

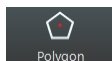


Circle

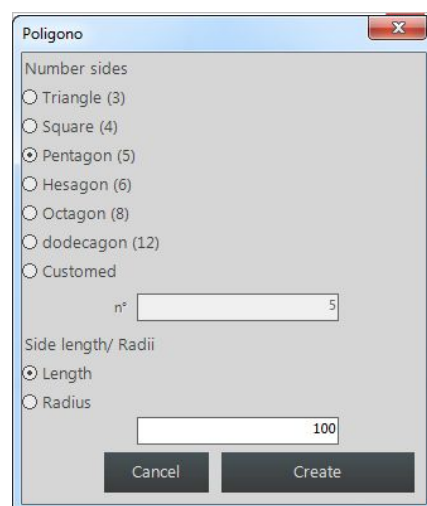
Make a circle after inserting its radius.

To change the shape dimensions: drag a point of the circumference inside or outside of it, to change its radius or select the shape, press the space bar (or enter), a window will open which will allow to change the radius of the circle.

By pressing *enter* when inserting the element, its center can be specified.



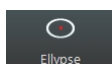
It creates an equilateral polygon and it is required to specify the n° of sides, the side length or the radius of the circle where to inscribe the polygon.



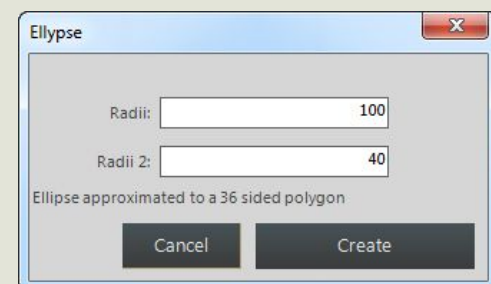
The settings can not be changed once the shape has been inserted, for example the number of sides.

This polygon, represents a free shape which form can be modified, by dragging the points or the selected segments.

By pressing *enter* when inserting the element, its center can be specified.



To make an ellipse (approximated to a 36 sided polygon) after specifying the size of the two radii.



Once the shape has been inserted, its settings can not be changed.

By pressing *enter* when inserting the element, its center can be specified.



It makes a rectangle after inserting the height and length.

By pressing *enter* when inserting the element, its center can be specified.

After inserting the shape, its settings can be modified, for example the length of the base, can be changed by selecting the shape and pressing *enter*.

Of the rectangle shape the extremities coordinates can be changed or move the sides (by clicking on their midpoint) in parallel with their alignment.

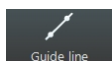


It creates a chamfered rectangle, the length, height and radius need to be determined.

Once the chambered rectangle has been inserted, its values can not be modified.

By pressing *enter* when inserting the element, its center can be specified.

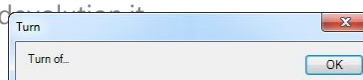
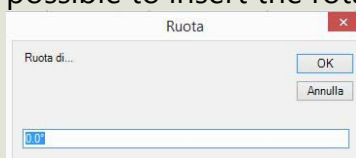
ICON DESCRIPTION



A reference line made by selecting two points.

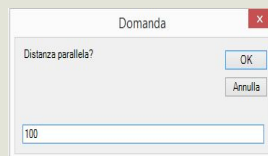
When one or more of these lines are inserted, the intersection between them and/or guide circles create magnetic points to enable a better insertion of the shape or of the dimension.

Once the guide line has been inserted and selected, pressing the space bar will open a window from which it is possible to insert the rotation angle of the line.

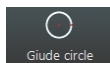


By clicking on a guide line with the mouse left button (holding it) and then releasing it over the desired position or by pressing the space bar which will open this window, we can make guide lines parallel to the ones previously made.

Here the exact distance between the two lines is shown.



Furthermore with the selected guide line it is possible to cut the shape, just click the button Taglia Sagoma (Cut Shape) on the right column and then select it.

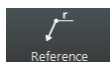


It is a reference circle to use in order to better insert shapes or dimensions.

Inserted with the free mode or by specifying the radius.

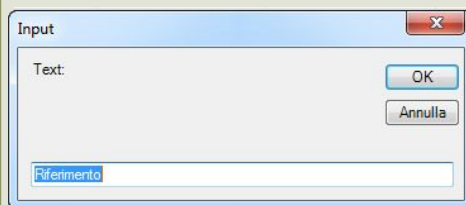
From this menu it is possible to dimension shapes or to add notes.

ICON DESCRIPTION



The reference dimension is editable.

By clicking this button a window will open to enable the insertion of the text of the dimension.

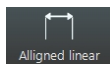


Then the point representing the element to which the dimension is referred to is selected.



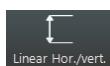
The cursor indicates that the point can be dimensioned.

The dimension is movable if the arrow tip is selected and dragged, instead to change the text, it must be inserted in the properties bar of the selected element (on the right column).



The aligned dimension is the free dimension that calculates the distance between two points to be selected.

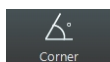
Once it has been inserted, the dimension is modifiable: it is possible to change the position of the points that forms it or modify the distance of the dimension of these points.



The horizontal/vertical orthogonal dimension passes through two dimension points representing their projection on an axis, so that the dimension always remains orthogonal.

The horizontal dimension is plotted as default and to change the orientation it is sufficient to press the Alt button once the dimension has been selected, instead it is required to drag it to reestablish the horizontal position.

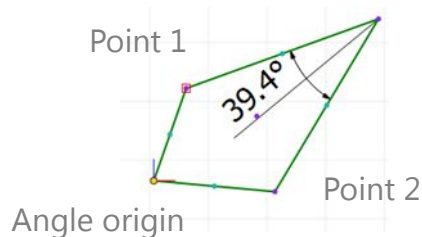
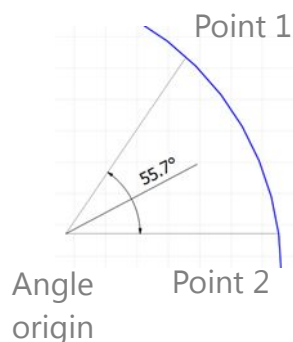
The dimensions are editable: it is possible to change the position of the points that forms it or to change the dimension distance from these points.



The angular dimension measures the angles.

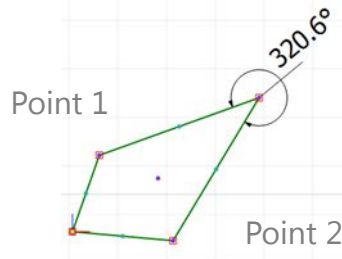
It is required to follow this exact order to create one:

1. The angle origin
2. Point 1
3. Point 2



Besides it is possible to drag the central point of the dimension, to orientate it or widen it. In fact when the mouse

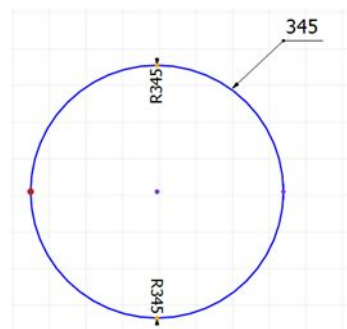
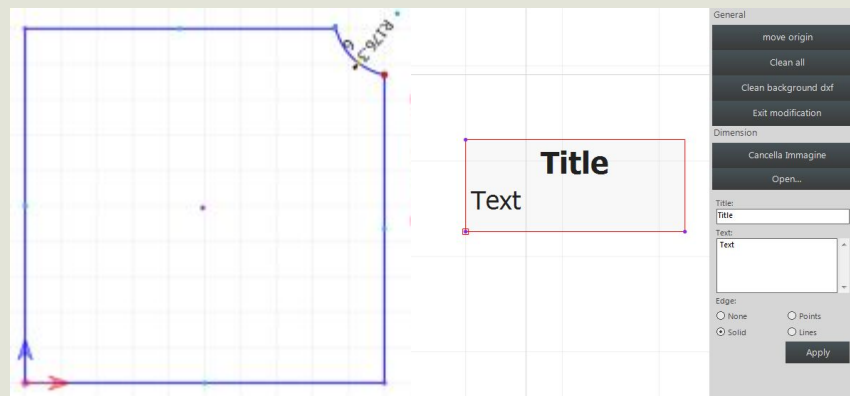
passes the orthogonal axis at its vertex, the dimension changes orientation.



The note dimension is the dimension that enables to insert text within the editor.

To insert it, it is necessary to click the point where to place it and then on the left column (properties toolbar) insert: the title, the text of the note and the type of edge for the text box.

Obviously the note box can be resized by selecting and dragging the vertexes of the rectangle.

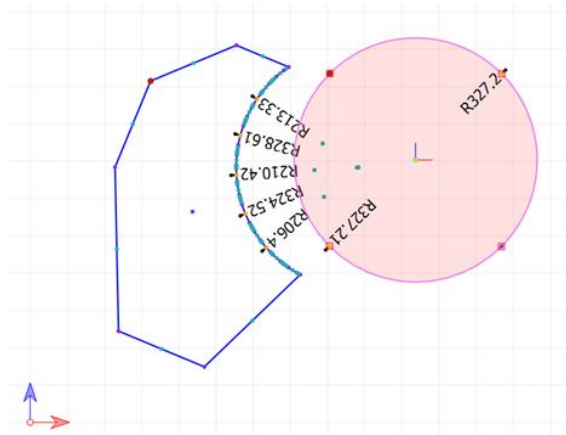


The radius dimension gives the value of the radius itself.

To insert this dimension it is necessary to select a point on the circumference.

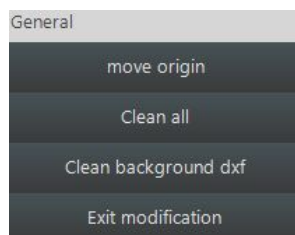
3. DRAWING AREA

This is the work area, where all elements forming the shape are inserted.



4. PROPRIETIES TOOLBAR

MENU STANDARD ENTRIES



On the right hand column the general menu is displayed, which contains the controls for the cad, but not for the selected object and these controls are always in view.

- **MOVE ORIGIN (SPOSTA ORIGINE)**
This button enables to move the origin, which is the (0, 0) point on the Cartesian plain.
- **DELETE ALL (PULISCI TUTTO)**
It deletes all elements inserted in the work area.
- **DELETE DXF BACKGROUND (PULISCI DXF DI SFONDO)**
It deletes the drawing imported in the dxf format only.
- **EXIT EDIT (ESCI DALLA MODIFICA)**
It frees up the mouse controls and it is used when the user has created all of the points required for the shape.
It does the same as the Esc key on the keyboard.

NOTES

Each shape has a first point where its construction begins.

Once a shape is made it is possible to choose any point and set it as the first one.

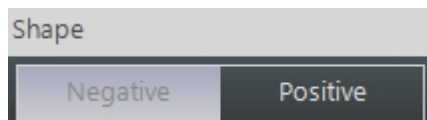
This operation could be useful to export the shape in the eSag format. Every shape has an origin, an application point and a reference in space.

This is important because it is the point from which the shape is mirrored or rotated. In default a point of origin is assigned to each shape, but it could be moved by dragging it with the mouse and at the same time depressing the Alt key on the keyboard.

OPERATIONS ON THE SHAPE

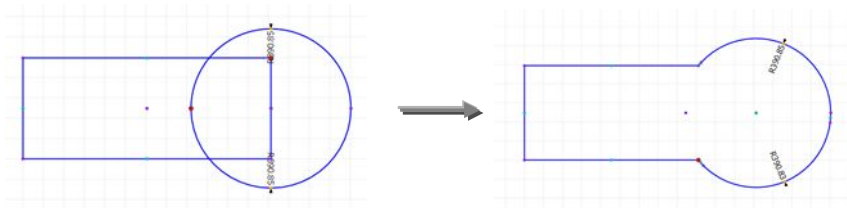
A point within the shape is clicked in order to select the shape and on the right a column will appear with all the operations that can be performed on it.

The shapes can be merged or divided, by making them positive or negative.



MERGE BETWEEN SHAPES

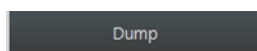
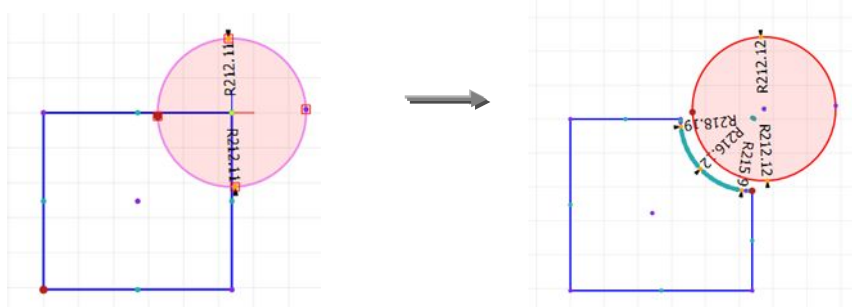
It occurs when the shapes are declared positive (besides it is the default value when the shape is inserted) and then the Boolean button is pressed  on the top toolbar.



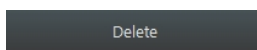
DIVISION BETWEEN SHAPES

It is useful when hole are required inside the shape or to make special forms by cutting shapes between them.

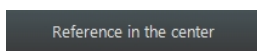
The division defines which shapes will be cut (and therefore marked as negative) and by clicking the Boolean button on the main toolbar.



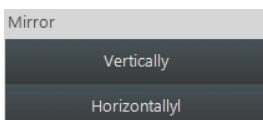
Copies the shape on the Clipboard in eSag format.



Deletes the entire shape.



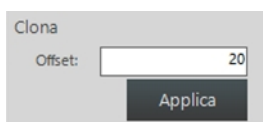
Sets the origin of the shape in the center, this function is useful to rotate or even to mirror the shape.
Be aware that this function is not available for the ellipse and chamfered rectangle.



Used to mirror in respect to the shape origin: horizontally or vertically.



The shape is moved by dragging it or by mouse or by inserting the value of the X and Y axis. The X and Y values move the origin of the shape in respect to the cad origin.



The shape can be copied by inserting an offset value. The shape is bigger if the offset is a positive value and smaller if the offset value is negative.

It is possible to rotate the shape by inserting a specific value, between 0 and 360, which represents the angle of rotation. The shape will rotate in respect to its origin.

OPERATIONS ON A POINT

Set first point

A selected point can be set as the First point with the *Set first point* button.

Move

Diff. Y:

Diff. X:

Punto

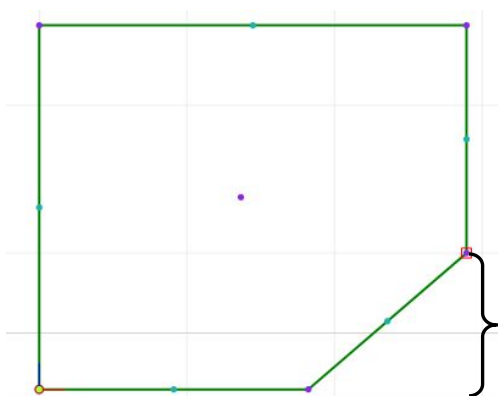
A point can be moved by dragging it or changing it with movement values inside the text boxes.

The Diff. X value shows how much the point needs to be moved in respect to the vertical axis, instead Diff. Y determines the movement in respect to the horizontal axis.

Join diagonal

Distance:

This function enables to insert a diagonal on the selected point. The shape is cut on two segments of the point of the specified value.



Set first point

Move

Diff. Y:

Diff. X:

Punto

Join

Radii:

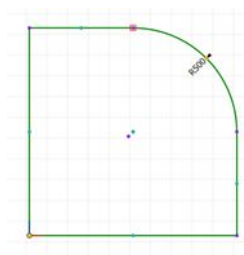
Join diagonal

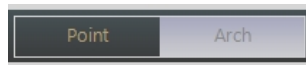
Distance:

Join

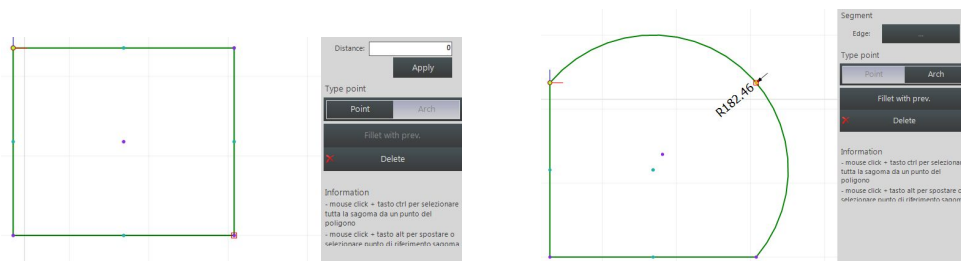
Radii:

This function enables to link the corner with an arch with a specified radius.

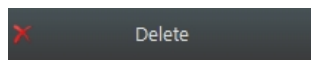




Cad shape enables to manage a point as a point or arch (passing through that point).



By selecting the arch mode and with the button below, it is possible to link it with the next point.



Deletes the selected point.



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