PractiCAD
MetaLab

Making Things. Easy.™
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Screen Overview

Labels around the screenshot: Architectural items bin, Fittings bin, Menu, AutoCAD tools, PractiCAD tools, Command promt, Command line, Model space, Reports bin, Ultimatics bin, Piping bin, Tags bin, Automatics bin, Status bar, Direction box, Work box, Elevation box, Item box
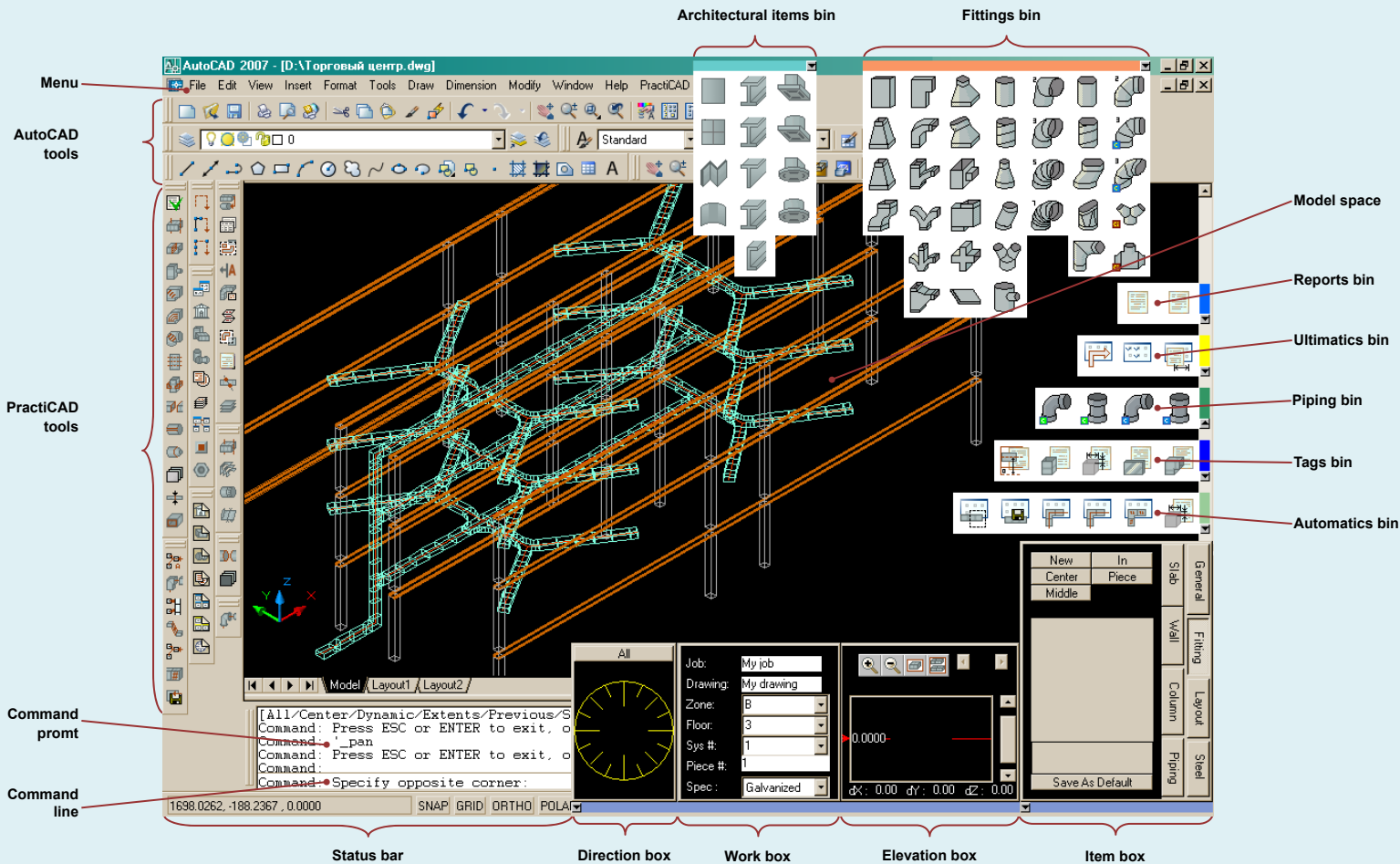
Toolbars & Menus

Almost all AutoCAD and PractiCAD commands (basic and automatic tools) are available as Menu commands, Toolbar buttons, and keywords in Command line and associated keyboard shortcut combinations.

To activate a command: Menu : select a category (series of left clicks on menu elements) ► Menu : select a command (left click) or
Toolbar : select a button (left click) or
Command line : type the command name ► Enter key or
Press a predefined shortcut combination

To deactivate a command: Activate another command or Press Esc key

To customize PractiCAD tools: Toolbar area (empty space) : right click ► Popup menu : move your mouse over PractiCAD ►
Popup menu : move your mouse over a tool category ► check or uncheck the tool categories (left click) ►
Toolbar Window caption : drag-and-drop the Toolbar window over the Toolbar area or

Toolbar area : right click ► check or uncheck the tool categories (left click) ►
Toolbar window caption : drag-and-drop the Toolbar window over the Toolbar area

To assign a shortcut combination to a command: Toolbar area : right click ► Popup menu : Customize ► Customize dialog : Keyboard bookmark ►
Customize dialog : select a command and press a new shortcut key ► Customize dialog : Close button

Drawing Components

PractiCAD provides you extensive fitting libraries, catalogs of architectural items, materials, allowance and tools to draw and detail architectural background and duct of rectangular, round and oval shape satisfied predefined system specifications. Also you can create your own libraries of tags and parametrizes automatic tools. You can get access to all available architectural, fitting, tag items and predefind parametrized automatic tools using working bins. A working bin is a custom selection of **PractiCAD** objects and automatic tools, assembled by you.

You can have as many bins as you want, and every bin can have any configuration. Any bin can be floated, or it can be docked.
When a bin is docked: During data input, it is positioned along a screen side. You can slide it along the screen side, and moving your mouse cursor over the bin caption will open and close the bin.
When a bin is floated: During data input, it can be positioned anywhere on the screen by dragging it into a desired position, and can be opened / closed by using a toggle button on the bin caption. Once a bin is open, you can select any bin element by clicking it once.

Sidebar labels: Screen Overview, Toolbars & Menus, Drawing Components

You can compose your fittings library of catalogs and set up your vorking bins with Fittings Library Editor.

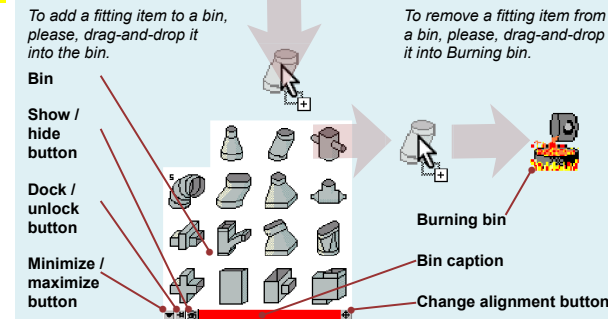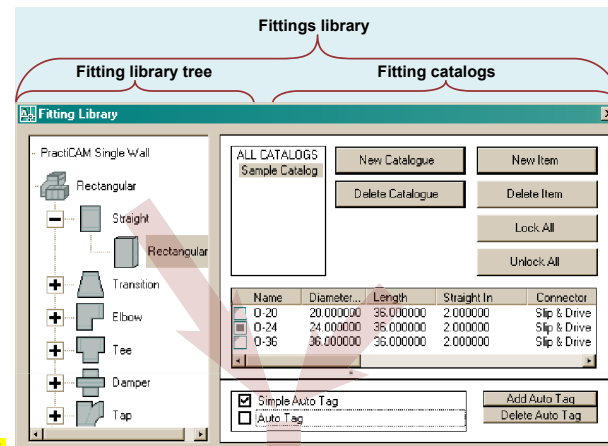|	
To create a new catalog:	**Fitting Library Editor** : New Catalogue **New Catalogue**
To delete a catalog:	**Fitting Library Editor** : Delete Catalogue **New Catalogue**
To add a fitting to a catalog:	**Catalogs list** : **select a catalog** ▶ New Item **New Item**
To delete a fitting from a catalog:	**Fittings list** : **select a fitting** ▶ Delete Item **Delete Item**
To set up the fitting parameters:	**Fittings list** : **select a fitting** ▶ **Parameters list** : **type the parameter values**
Lock / Unlock all fittings for edit:	**Catalogs list** : **select a catalog** ▶ Lock All **Lock All /** Unlock All **Unlock All**
Lock / Unlock a fitting for edit:	**Fittings list** : **check box at the left of the fitting** : **check / uncheck the fitting**
Lock / Unlock a fitting parameter for edit:	**Parameters list** : **check box at the left of the parameter** : **check / uncheck the parameter**
To add a fitting to a bin:	**Fitting library or Fittings list** : **drag-and-drop a fitting item into any existing fitting bin or onto empty space on your screen**
To move a fitting within a bin:	**Bin** : **select a fitting** ▶ **drag-and-drop the fitting to a desired position**
To delete a fitting from a bin:	**Bin** : **select a fitting** ▶ **drag-and-drop the fitting into 🔥Burning bin**
To delete a bin:	**Delete all fittings from the bin**
To dock a bin:	**Bin** : ⊞**Dock**
To change alignment of a bin:	**Bin** : ⊠**Unlock (if docked)** ▶ **Bin** : **drag** ✛ **Change Alignment** ▶ **Bin** : ⊞**Dock**
To float a bin:	**Bin** : ⊠**Unlock (if docked)** ▶ **drag the bin caption**
To show a bin (if minimized):	**Move your mouse over the bin caption**
To show a bin maximized:	**Move your mouse over the bin caption** ▶ **Bin** : ▲**Maximize**
To show a bin minimized:	**Move your mouse over the bin caption** ▶ **Bin** : ▼**Minimize**
To show / hide a bin:	**Move your mouse over the bin caption** ▶ **Bin** : ◙**Show / 🔳Hide**
To switch all fitting bins on / off:	**Toolbar** : 📄**Show / Hide Fittings**

Fittings library

Fitting library tree   **Fitting catalogs**

To add a fitting item to a bin, please, drag-and-drop it into the bin.

Bin

Show / hide button

Dock / unlock button

Minimize / maximize button

To remove a fitting item from a bin, please, drag-and-drop it into Burning bin.

Burning bin

Bin caption

Change alignment button
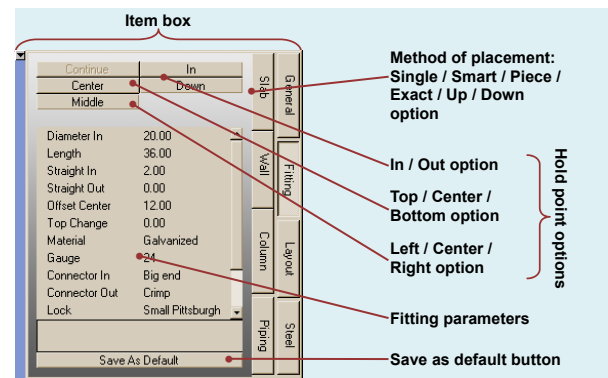
Work with Fittings

You can add fittings to your drawing one-by-one, using autodetailing, routing and auto routing tools or any other predefined automatic tools from your libraries. While adding fittings to your drawing you will need the Item box to control parameters of setting procedure and fitting parameters.

To customize the Item box:	**Toolbar** : 📄 **Box container** : **drag-and-drop the box onto drawing space** ▶ **adjust the box size** ▶ **adjust the box alignment and position**
To adjust the Item box size:	**Move your mouse over the the box window boundaries until ↔ sign appeared** ▶ **drag your mouse**

You can customize Item box alignment and position exactly the same way as you do with fitting bins.

To add a fitting(s) to a drawing:	**Add fittings you need to a bin** ▶ **Move your mouse over the docked bin caption** ▶ **a fitting bin : select a fitting (left click)** ▶ **Item box : specify hold point** ▶ **Item box : specify method of placement** ▶ **Item box : edit fitting parameters** ▶ **Specify fitting position and rotation**

Item box

Method of placement: Single / Smart / Piece / Exact / Up / Down option

In / Out option

Top / Center / Bottom option

Left / Center / Right option

Hold point options

Fitting parameters

Save as default button

Colored box at the left bottom of a fitting icon describes the fittings set being represented with the icon.

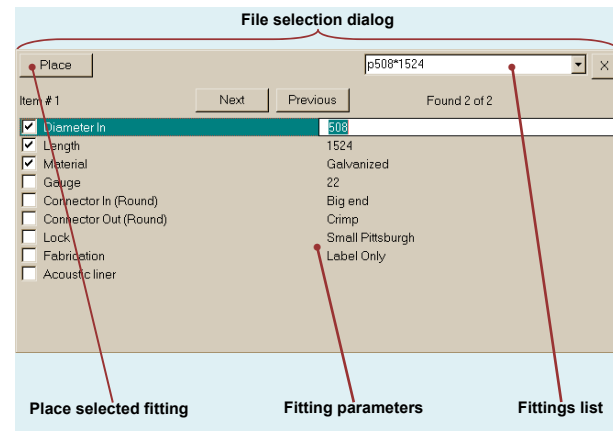|					
🔲	Custom fitting	No box	🔴	Selected fitting from a specified catalog	Red box
🔵	Fittings of a specified type from a specified catalog	Blue box	🟢	Fittings of a specified type from all catalogs	Green box

If You select a fitting marked with the blue or green box, Fitting selection dialog will appear, and You will have to select a fitting exemplar with it.

Work with Fittings

Work with Fittings

To select a fitting exemplar:	**Fitting selection dialog : checkmark selection parameters names ► Fitting selection dialog : type the parameters values ► Fitting selection dialog : `Place` Place**
To specify hold point:	**Show the Item box ► Item box : General / Fitting bookmark : select (left click) ► Item box : In / Out option : select ► Item box : Top / Center / Bottom option : select ► Item box : Left / Center / Right option : select**
To edit fitting parameters (while creating a fitting):	**Show the Item box ► Item box : select General or Fitting bookmark (left click) ► Item box : Fitting parameters : type values (you can use arrow keys for moving around the list)**
To save fitting parameters as default:	**Show the Item box ► Item box : Edit the fitting parameters ► Item box : Save as default**
Place a fitting:	**A fitting bin : select a fitting ► Model space : set start fitting line position ► Model space : set fitting line direction ► Model space : set end fitting line position**
Set method of placement:	**Show the Item box ► Item box : select Fitting bookmark (left click) ► Item box : Single / Smart / Piece / Exact / Up / Down option : select (series of left clicks)**
To set a fitting as a tap:	**A fitting bin : select a fitting ► Item box : edit the fitting parameters ► Command line : type Tap or T ► Model space : select a body fitting (left click) ► Tap Parameters dialog : select a body fitting opening ► Tap Parameters dialog : specify relative tap position ► OK**

File selection dialog

Place | p508*1524 | ▼ | ×

Item # 1 | Next | Previous | Found 2 of 2

- ☑ Diameter In — 508
- ☑ Length — 1524
- ☑ Material — Galvanized
- ☐ Gauge — 22
- ☐ Connector In (Round) — Big end
- ☐ Connector Out (Round) — Crimp
- ☐ Lock — Small Pittsburgh
- ☐ Fabrication — Label Only
- ☐ Acoustic liner

Place selected fitting   **Fitting parameters**   **Fittings list**

While placing fitting, please, follow the command line instructions.

Continue or <C>	Place the fitting at the end of preceding duct line.	Rotation or <R>	Rotate the fitting.
Tap or <T>	Place the fitting as a tap.	New or <N>	Start new duct line.

Placement methods:

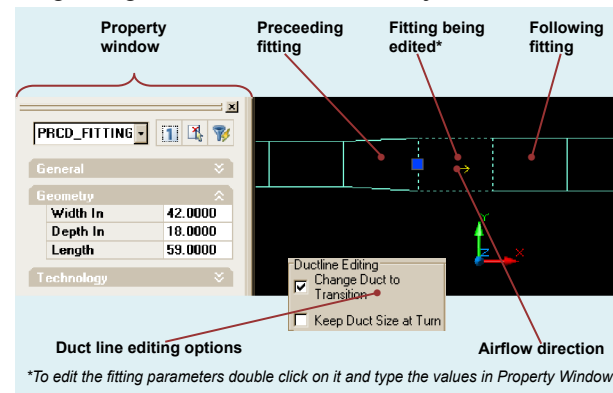|			
Exact or <E>	Places a line extending exactly to the point where you click in the drawing.	Piece or <P>	Single fitting or single standard length of duct by itself.
Up or <U>	Rounds duct pieces up to next full length to eliminate short pieces.	Single or <SI>	Places duct or fitting as one single piece no matter how long.
Down or <D>	Rounds duct pieces down to previous full length to eliminate short pieces.	Smart or <SM>	For fittings only, lengthens straights of fittings to eliminate short pieces.

Duct Line Fitting Editing

Tools ► Options... ► PractiCAD

PractiCAD allows you to edit fitting parameters in duct lines. The preceding and the following fittings in the duct line will be adjusted in accordance with duct line editing options.

To edit the fitting parameters:	**Model space : select the fitting (left double click) or Model space : select the fitting (right click) ► Appeared pop-up menu : Properties ► Property Window : type the fitting property value(s)**

Property window   **Preceeding fitting**   **Fitting being edited***   **Following fitting**

PRCD_FITTING ▼

General ⌄
Geometry ⌃
 Width In — 42.0000
 Depth In — 10.0000
 Length — 59.0000
Technology ⌄

Ductline Editing
☑ Change Duct to Transition
☐ Keep Duct Size at Turn

Duct line editing options   **Airflow direction**

Note: If Change Duct to Transition option is selected, the preceding or the following fitting will be changed to transition. The preceding fitting will be changed to transition if you hold fittings by input opening, and the following fitting – if you hold them by output opening.

*To edit the fitting parameters double click on it and type the values in Property Window

Takeoff Export

Automatics ► Ductwork ► Takeoff

|	
To export a takeoff:	**Toolbar : Takeoff ► Takeoff Export Editor : Set up selection method, selection conditions, grouping method, and destination folder and file name**
To set up selection method:	**Takeoff Export Editor : Selection**
To set up selection conditions:	**Takeoff Export Editor : Conditions**
To set up grouping method:	**Takeoff Export Editor : Group**
To set destination folder:	**Takeoff Export Editor : Takeoff**

Specifications

Your manufacturing standards. You can use SMACNA-based specifications
(Sheet Metal and Air Conditioning Contractors' National Association),
as well as any other conceivable specification sets.

**To set an active
specification set:**
Work box : Specification sets list :
select a specification set

Work box
Job name
Drawing name
Zone names list
Floor names list
Specification sets list
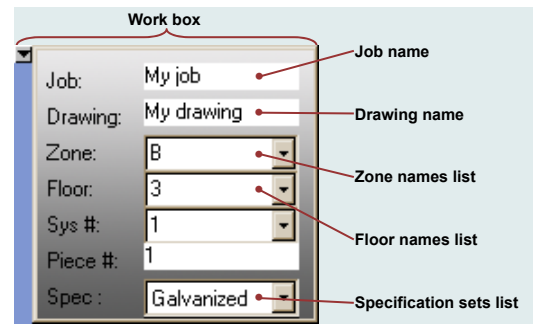
Specification Editing
PractiCAD ► Ductwork Libraries ► Specifications

To add a specification set: Specification sets list : add a specification set ► rename the specification set ► edit
To rename a specification set: Specification sets list : select a specification set + left click ► type a name ► Enter key
To edit a specification set: Specification sets list : select a specification set ► Condition type : select condition type
(None / Lager / Custom) ► Size break condition sets : add and edit size break condition sets
(for Lager and Custom types) ► Condition value ranges : edit ► Target fitting sets : select a fittings set ►
Parameters and values : edit values (for all fitting categories and condition value ranges)

Work with specifications in **PractiCAD** is based on rule – exception principle. All fittings are hierarchically organized in categories.
Rules specified for more general categories work for all its subsets if only no exception rules are defined for those subsets.
If you create a specification table for some fitting set it will be automatically duplicated for all its subsets up to individual fitting.

To add a specification table: Target fitting sets : select a fitting category
(up to individual fitting) ► Condition type :
select condition type (None / Lager / Custom) ►
add and edit a size break condition set ►
Condition Editor : specify condition properties ►
Condition Editor : OK ►
Condition value ranges : edit
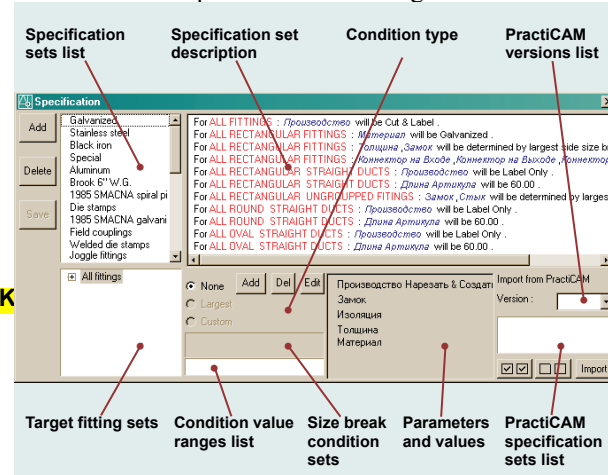
**To add a size break
condition set:** Size break condition sets :
add a size break condition ► Condition Editor :
specify condition properties ► Condition Editor : OK

**To delete a size break
condition set:** Size break condition sets :
select a size break condition set ►
Size break condition sets :
delete a size break condition

To add a condition value range: Condition value ranges list : select last range ►
type a value instead of ANY (last range will be splitted in two ranges) ► Enter key

To edit a condition value range: Condition value ranges list : select a range ► type a value instead ► Enter key

When your specification tables are created and condition value ranges are specified, you can edit your specification table rules.

To edit specification rules: Condition value ranges list : select a range ► Parameters and values : edit parameters

**To import a specification set
from PractiCAM:** PractiCAM versions list : select a version (select all, deselect all) ►
PractiCAM specification sets list ► Import

Specification
sets list
Specification set
description
Condition type
PractiCAM
versions list

Target fitting sets
Condition value
ranges list
Size break
condition
sets
Parameters
and values
PractiCAM
specification
sets list

Layout
PractiCAD ► Basic Tools ► Layout ►

Use the Layout tools to draw the layout lines on which you later place pipe, duct, or other objects.

To create a layout: Item box : Layout page : Number of lines : select (=1) ► Toolbar : New Layout ►
Item box : Layout page : Slop : type slop height and length ►
Model space : specify series of exact / relative vertexes positions ► Esc or Enter key

**To create a rack
with multiple parallel
lines:** Item box : Layout page : Number of lines : select (>1) ► Toolbar : New Layout ►
Item box : Layout page : Hold by line :
select the line number ► Item box : Layout page :
Slop : type slop height and length for every rack ►
Model space : specify start point for every rack ►
Model space : specify series of exact / relative
vertexes positions for selected rack ►
Esc or Enter key

**To convert AutoCAD
3D lines into layout:** Toolbar : Add Layout Lines Model space :
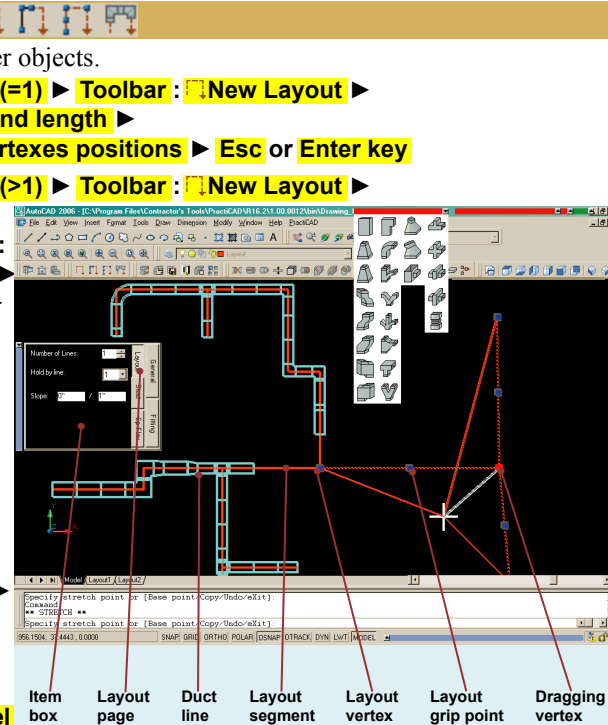select 3D lines

To split a segment: Toolbar : Split Layout ► Model space :
move your mouse over a segment ►
Model space : left click

To move a layout vertex: Model space : select vertex adjoining segments ►
Model space : drag-and-drop the vertex into
desired position or Command line :
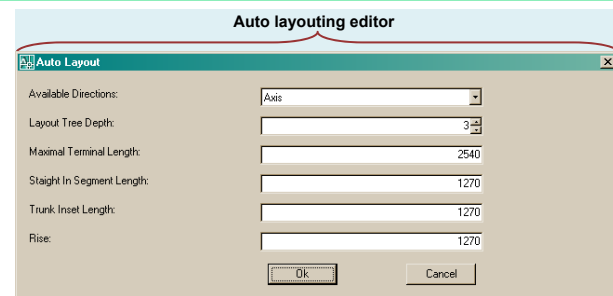specify the vertex position

To move a layout: Model space : select the branch segments ► Model

Item
box
Layout
page
Duct
line
Layout
segment
Layout
vertex
Layout
grip point
Dragging
vertex

Automatic Layout

PractiCAD ► Automatics ► Ductwork ► Auto Layout

| To route layout automatically: | **Toolbar : Automatic Layout ►**
Auto Layout Editor :
set up layout routing options ► OK ►
Model space : select air-devices ► Enter key ►
Model space : select entry point to the layout
(a layout segment or a fitting opening) |

Auto layouting editor

Auto Layout

Available Directions:	Axis
Layout Tree Depth:	3
Maximal Terminal Length:	2540
Staight In Segment Length:	1270
Trunk Inset Length:	1270
Rise:	1270

Ok Cancel

Auto Duct

PractiCAD ► Automatics ► Ductwork ► Auto Duct

PractiCAD allows you to route a duct line between 2 duct openings,
by layout or autoroute duct line from specified point to an air-devices set.

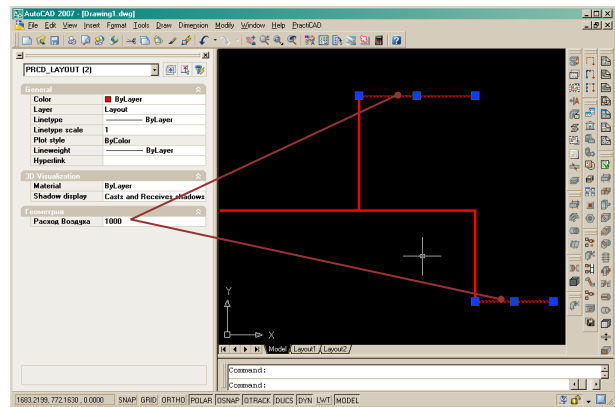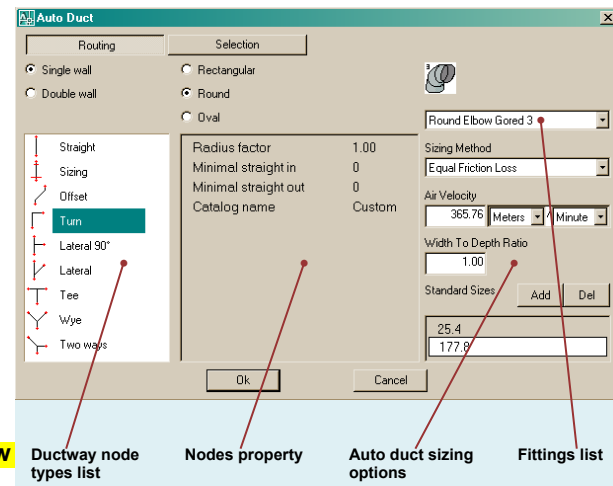| To route a duct line between
2 duct openings: | **Auto Duct Editor : Selection Selection ►**
Interactive connector selection ► OK ►
Model space : select In and Out connectors |
To detail a layout:	**Auto Duct Editor : Selection Selection ►** **Interactive layout selection ► OK ►** **Model space : select entry segment of a layout** **(Make sure that airflow is non-zero for** **the terminal segments of the layout)**
To auto route a duct line from a point to an air-devices set:	**Auto Duct Editor : Selection Selection ►** **Automatic Layout ► Automatics list :** **select an automatic ► OK ► Model space :** **Enter ► select air-devices ► Model space :** **select duct line entry point (Make sure that airflow** **is non-zero for the air-devices)**
To specify a detailing method:	**Auto Duct Editor : Routing Routing ► Duct shape (Rectangular / Round / Oval) : select ►** **Wallness (Single / Double) : select ► Nodes list : select a node ► Fittings list : select a fitting ►** **repeat for all nodes**
To set sizing options:	**Auto Duct Editor : Routing Routing ► Sizing method : select ► Air velocity : Enter key ►** **Width to depth ratio (for rectangular and oval) : Enter key ► Standard sizes list : set up**

Auto Duct

Routing Selection

Single wall Rectangular
Double wall Round
Oval

Round Elbow Gored 3

Straight
Sizing
Offset
Turn
Lateral 90°
Lateral
Tee
Wye
Two ways

Radius factor 1.00
Minimal straight in 0
Minimal straight out 0
Catalog name Custom

Sizing Method
Equal Friction Loss

Air Velocity
365.76 Meters Minute

Width To Depth Ratio
1.00

Standard Sizes Add Del

25.4
177.8

Ok Cancel

Ductway node types list   Nodes property   Auto duct sizing options   Fittings list

To detail a layout, please, click on its enter segment

Make sure, that terminal segments of your layout have non zero airflow parameter value

Auto Flexing
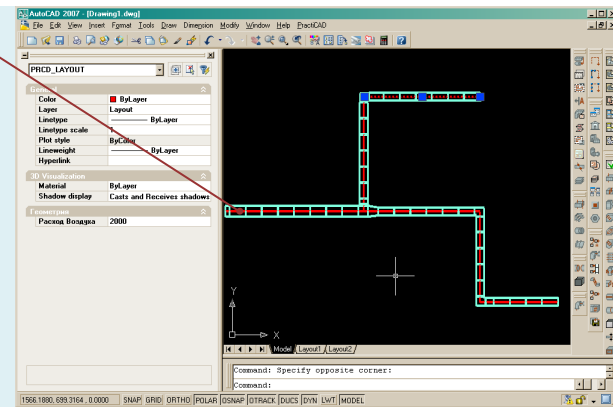
PractiCAD ► Automatics ► Ductwork ► Auto Flexing

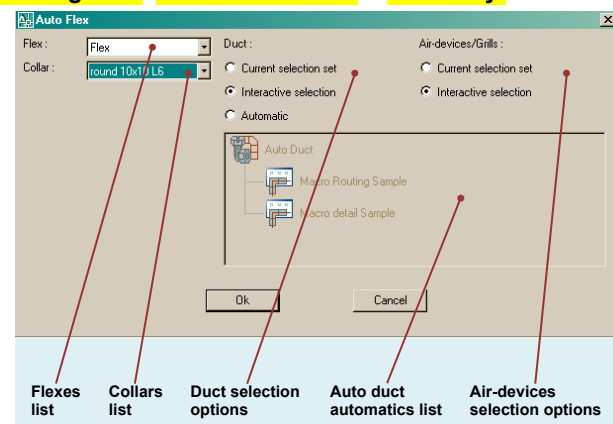| Attach air-devices to a duct line
with flexes: | **Toolbar : Auto Flexing ► Auto Flexing dialog : set flexing options + OK ►**
Model space : select air-devices ► Enter key ► Drawing area : select a duct line ► Enter key |
To select air-devices manually:	**Auto flexing dialog :** ☑ Select Air Devices **check mark**
To select fittings manually:	**Auto flexing dialog :** ☑ Select fittings **check mark**
To attach air-devices to a preset duct line:	**Duct selection : Current selection set**
To attach air-devices to a interactively selected duct line:	**Duct selection : Interactive selection**
To attach air-devices during auto routing:	**Duct selection : Automatic ►** **Automatics list : select an automatic**
To attach preset air-devices:	**Air-devices selection : Current selection set**
To attach interactively selected air-devices:	**Air-devices selection : Interactive selection**
To attach air-devices:	**Flexes list : select ► Collars list : select ► Duct selection : set ► Air-devices selection : set ► OK**

Auto Flex

Flex : Flex
Collar : round 10x10 L6

Duct :
Current selection set
Interactive selection
Automatic

Air-devices/Grills :
Current selection set
Interactive selection

Auto Duct
Macro Routing Sample
Macro detail Sample

Ok Cancel

Flexes list   Collars list   Duct selection options   Auto duct automatics list   Air-devices selection options

Checking Collision

PractiCAD ▶ Automatics ▶ Check Collision

Use the Checking collision tool to check whether items in your drawing collide with each other. You can check for collisions between one drawing item against another, check the entire drawing, or restrict checking to any types and groups of items you like.

PractiCAD marks each collision with round mark. Size and color of the mark can be defined by you.

This tool cannot automatically rectify the problems it finds. You must decide in each case what change is called for, and then revise the drawing accordingly.

To check collisions:	**Toolbar :** Check collision ▶ **Collision Checking Editor :** **specify type and selection of items to check** ▶ **Collision Checking Editor : OK** ▶ **Model space : select items** or **a group of items**
To check two items:	**Collision Checking Editor :** Two Objects **Two Objects**
To check a group of items:	**Collision Checking Editor :** Group **Group**
To check all drawing:	**Collision Checking Editor :** All **All**
To check a duct line:	**Collision Checking Editor :** Ductline **Duct line** ▶ **Collision Checking Editor :** **Selection Methods List :** **select method of fitting selection**

Collision Checking

Two Objects | Group | All | Ductline

Check	Color	Against
Fitting	By Layer	Fitting
Slab	By Layer	Slab
Wall	By Layer	Wall
Air Device	By Layer	Air Device
Grill	By Layer	Grill
Light	By Layer	Light
Steel	By Layer	Steel
Ceil	By Layer	Ceil
Column	By Layer	Column
Flex	By Layer	Flex
Steel	By Layer	Steel

Mark size: 20   ☐ Auto collision checking

☑ Clear collision layer before check

Ok   Cancel

Against column
enables you to decide which types of items you want to check for collisions with the selected type items

Color column
enables you to select a default color for collision marks

Check column
enables you to select a drawing item type

To objects	Looks for collisions between two entities.
To check single collision:	**Model space : select 1st entity** ▶ **Drouving space : select 2D entity**
Croup	Looks in the selected group.
To check group collision: **To select a duct line:**	**Model space : select group** ▶ **Enter key** **Model space : select a duct line (left click somewhere on the duct line)**
Duct line, From-To	Looks for collisions of a duct line part starting with selected fitting up to other selected fitting against all drawing items of predefined types.
To select a duct line part:	**Model space : select a starting fitting of the duct line (left click)** ▶ **Model space : select a finishing fitting of the duct line (left click)**
Duct line, Forward	Looks for collisions of a duct line part starting with selected fitting against all drawing items of the types selected for checking collisions with fitting items.
To select a duct line part:	**Model space : select a st arting fitting of the duct line**
Duct line, Backward	Looks for collisions of a duct line part finishing with selected fitting against all drawing items of predefined types.
To select a duct line part:	**Model space : select finishing a fitting of the duct line**
All	Looks for collisions of all entities of the specified type against all entities of predefined types.
To predefine item types **to check collision with:**	**Collision Checking Editor : Check column : select an item type** ▶ **Collision Checking Editor : Against column : set on / off one** or **more item types (left click on its name)** **(when the name is red – collision checking is on, when the name is grey – collision checking is off)**
To define color of collision **mark for the given item type:**	**Collision Checking Editor : Color column : left click in the item type correspondent line** ▶ **Color selection dialog : select a color** **(** ByLayer **– color selection by layer,** ByBlock **– color selection by block)**

Architecture

PractiCAD ▶ Basic Tools ▶ Architecturals

PractiCAD provides you libraries of 3D architectural items to create the architectural background for your work. You can create multiple catalogs of architectural items, place the items on working bins (palettes) and use them exactly the same way as you do with fittings (please, refer to Fittings). Item Box and Elevation Box are available also (please, refer to Coordinates Input).

To customize your **architectural bins:**	**Toolbar :** Architecturals **or Command line : type prcd_archlib**
To show / hide all **architectural bins:**	**Toolbar :** Show / Hide Architecturals **or Command line : type prcd_archbin**
To add an architectural **items to your drawing:**	**Add items you need to a bin** ▶ **Move your mouse over a docked bin caption** ▶ **An architectural items bin : select an item (left click)** ▶ **Item Box : General page :** **type item property values** ▶ **Specify item position and rotation (Z axis rotation is implied)**
To rotate an item around X axis:	**Type "X"** ▶ **Enter key**
To rotate an item around Y axis:	**Type "Y"** ▶ **Enter key**
To change an item Z elevation:	**Elevation box : type absolute** or **top / bottom relative item coordinates**

PractiCAD provides you extensive libraries of materials, gauges, allowance and various fitting accessories such as rods, vanes, spin collars and dampers. You can compose your own libraries or import libraries or selected items from **PractiCAM** installed on your computer.

Allowances:

	Connectors	prcd_conn
	Locks	prcd_lock
	Joints	prcd_joint
	Piping Joints	prcd_pipingjoint

Materials:

	Materials	prcd_material
	Piping Materials	prcd_pipingmaterial
	Gauges	prcd_gauge
	Liners	prcd_liner

Accessories:

	Spin collars	prcd_spincollar
	Radius vanes	prcd_vanerad
	Turning vanes	prcd_vaneturn
	Round vanes	prcd_vaneround

	Tie Rods	prcd_tierod
	Rods	prcd_rod
	Dampers	prcd_damper
	Stiffeners	prcd_stifext

To add an item to your library: Activate the Library Editor ► Library Editor : Add Add ► Library items list : rename the newly created item

To rename a library item: Library items list : select the item (left click) ► additional left click ► type a name ► Enter key

To delete a library item: Library items list : select the item (left click) ► Library Editor : Delete Delete

To edit a library item: Library items list : select an item (left click) ► Library item parameters : type values

To import a library item from PractiCAM: Library Editor : Version : select PractiCAM installation ► Library Editor : Library items list : check or uncheck items (☑☑ - check all, ☐☐ - uncheck all) ► Library Editor : Import Import

Library editor

Acoustic Liner Materials

Add | Delete | Save
1" Acoustic Liner
2" Acoustic Liner

Color
Cost   0.1300
Density   0.0397
Surface Density 0.0794
Thickness   2.0000

Import from PractiCAM
Version : PractiCAM 1.03.0251
☐ 1" Acoustic Liner
☐ 2" Acoustic Liner
☑ 1/2" Acoustic Liner

☑☑ ☐☐   Import

PractiCAD library items list | Item parameters | PractiCAM library items list | PractiCAM installations

## Fitting Accessories   PractiCAD ► Basic Tools ► Add Accessories ►

To add an accessory to a fitting: Toolbar : activate a command of setting an accessory or Command line : type the command ► Enter key ► Model space : select a fitting (left click) ► Fitting Accessory Editor : Location name : select an accessory place by name (In / Out / Center) ► Fitting Accessory Editor : Accessory type : select an accessory type ► Fitting Accessory Editor : Accessory counter : set number of accessories ► edit the Accessories parameters ► Fitting accessory Editor : OK

To edit an accessory parameters: Fitting Accessory Editor : Accessory items : select an Accessory item (left click) ► Fitting Accessory Editor : Accessory parameters : type values (you can use arrow keys for moving around the list)

To delete a fitting accessory: Toolbar : activate a command of setting an Accessory or Command line : activate the command ► Model space : select a fitting (left click) ► Fitting Accessory Editor : Accessory name : select an Accessory place by name (In / Out / Center) ► Fitting Accessory Editor : Accessory counter : decrease the number of accessories ► Fitting Accessory Editor : OK

Fitting accessory editor

Rods

Add | Delete | Save
Rod 1/2
Rod 3/4
Rod 1

Rod Diameter   12.7
Length Add   25.4
Rod Distance   25.4
Set Fastener ... No
Plate Length   101.6
Plate Width   50.8
Cost per Length 0.01

Import from PractiCAM
Version : PractiCAM 1.06.0397
☑ Rod 1/2
☐ Rod 3/4
☑ Rod 1

☑☑ ☐☐   Import

Accessory items | Accessory parameters | PractiCAM library items list | PractiCAM installations

To change the type of fitting accessories: Toolbar : activate a command of setting an accessory or Command line : activate the command ► Model space : select a fitting (left click) ► Fitting Accessory Editor : Location name : select an Accessory place by name (In / Out / Center) ► Fitting Accessory Editor : Accessory type : select an Accessory type ► Fitting Accessory Editor : OK
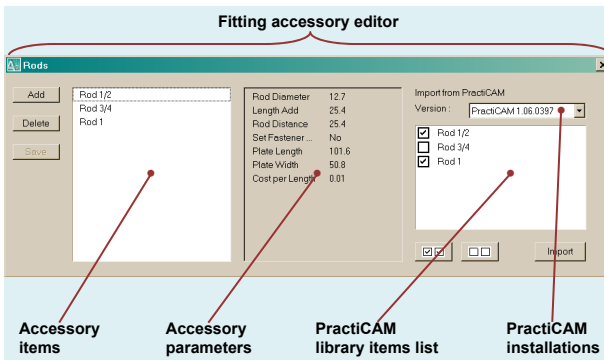
	Rods	prcd_accrod
	Radius vanes	prcd_accvanerad

	Spin Collars	prcd_accspincollar
	Dampers	prcd_damper

Coordinates Input

While placing an item on a drawing you need to specify hold point and hold point relative cursor position.

To specify the hold point: Item box : In / Out option : select ► Item box : Top / Center / Bottom option : select ► Item box : Left / Center / Right option : select

To specify hold point relative cursor position: Elevation box : type hold point relative cursor offset

Absolute cursor position can be set up by mouse click, snapping to an existing objects or typing coordinates in Command line.

To specify absolute cursor coordinates: Model space : left mouse click or Model space : snap to a drawing item or Command line : type coordinates ► Enter key

To snap to a drawing item: Status bar : depress OSNAP button ► Model space : move your mouse over the item ► Model space : select an appeared snap point (left click)

To enter relative position in 2D: Model space : move your mouse along desired direction ► Command line : type distance ► Enter key

Exact position in 3D	x,y,z	Relative position in 3D	$@x,y,z$
	$d<\alpha, h$		$@d<\alpha, h$
	$d<\alpha< \beta$		$@d<\alpha< \beta$
Exact position in 2D (Z is fixed)	x,y	Relative position in 2D (Z is fixed)	$@x,y$
	$d<\alpha$		$@d<\alpha$

x – X coordinate
y – Y coordinate
z – Z coordinate
d – distance in plane XoY
h – distance to plane XoY
α – angle in plane XoY
β – angle to plane XoY

Elevation box with multiple elevation marks allows quick and precise Z axis absolute or drawing space top or bottom relative positioning.

To customize the Elevation box: Toolbar : Containers ► Box container : drag-and-drop the box ► resize the box

Box container

To customize a box, please, drag-and-drop it onto working space.

To remove a box from a working space, please, drag-and-drop it into Burning bin.

To add an elevation mark: Elevation box : move your mouse over its left side until ┿ arrow appeared ► left click

To edit the elevation mark value: Elevation box : move your mouse over the elevation mark value ► left click ► type value ► Enter key or drag-and-drop your elevation mark

To remove an elevation mark: drag-and-drop your elevation mark outside the Elevation box

To edit current elevation: Elevation box : move your mouse over current elevation value ► left click ► type value ► Enter or drag-and-drop your current elevation mark along the side or over one of elevation marks

To zoom in your drawing space in Elevation box: Elevation box : Zoom in

To zoom out your drawing space in Elevation box: Elevation box : Zoom out

To set top elevation of your drawing space on / off: Elevation box : move your mouse over its right side ► Elevation box : Top / Bottom selector : Top elevation sign : left click

To set bottom elevation of your drawing space on / off: Elevation box : move your mouse over its right side ► Elevation box : Top / Bottom selector : left click on Bottom elevation sign

Frame space between Top and Bottom elevations: Elevation box : Frame space between Top and Bottom

Frame marked elevation drawing space: Elevation box : Frame marked elevation model space

Box resizing cursor
Dock / unlock button
Minimize / maximize button
Burning bin
Box caption
Change alignment button
Elevation box

When **the top elevation of model space** is set on, the model space top elevation relative item coordinates appears in Elevation box:
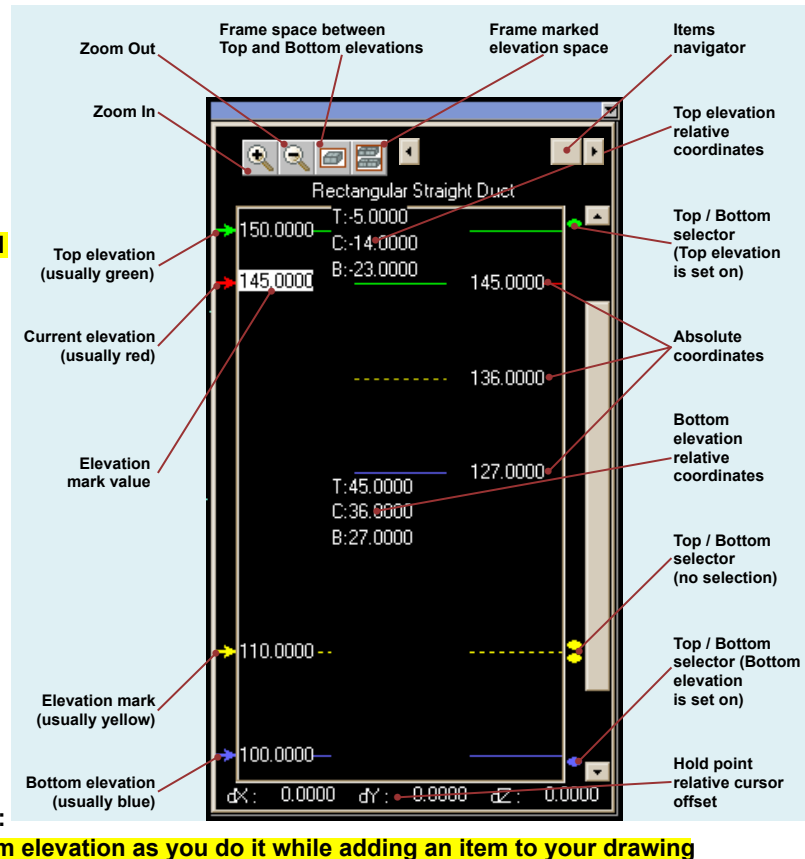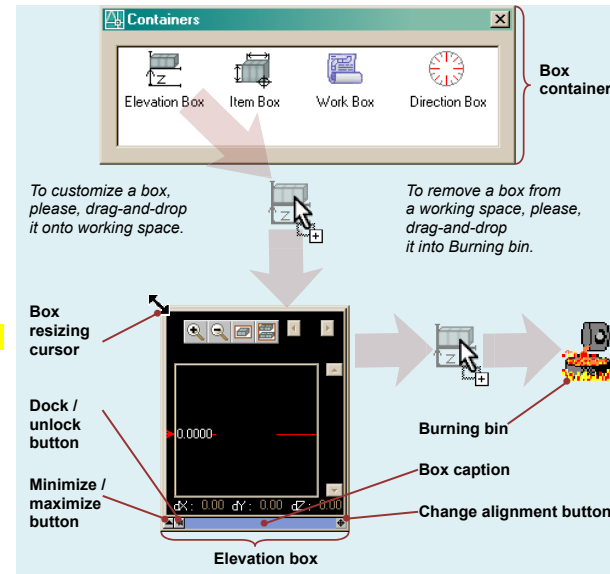- T – from item Top to model space Top distance
- C – from item Center to model space Top distance
- B – from item Bottom to model space Top distance

When **the bottom elevation of model space** is set on, the model space bottom elevation relative item coordinates appears in Elevation box:
- T – from item Top to model space Bottom distance
- C – from item Center to model space Bottom distance
- B – from item Bottom to model space Bottom distance

To change an item elevation (while adding an item to a drawing): Elevation box : type one of absolute or one of top / bottom relative item coordinates

To change a drawing item elevation: Model space : select an item or a group of items ► Elevation box : Items navigator : select an item ► change the item elevation as you do it while adding an item to your drawing

Zoom Out
Frame space between Top and Bottom elevations
Frame marked elevation space
Items navigator
Zoom In
Top elevation relative coordinates
Rectangular Straight Duct
T:-5.0000
C:-14.0000
B:-23.0000
Top / Bottom selector (Top elevation is set on)
Top elevation (usually green)
150.0000
145.0000
145.0000
Current elevation (usually red)
Absolute coordinates
136.0000
Elevation mark value
127.0000
Bottom elevation relative coordinates
T:45.0000
C:36.0000
B:27.0000
Top / Bottom selector (no selection)
110.0000
Top / Bottom selector (Bottom elevation is set on)
Elevation mark (usually yellow)
100.0000
Bottom elevation (usually blue)
Hold point relative cursor offset
dX: 0.0000 dY: 0.0000 dZ: 0.0000

Reports

Reports

To form a report: **Toolbar :☰Report or**
An automatics bin :
a report icon : select ►
Model space : select items ► Enter key ►
Model space : place report
(left click or Enter key)

Before create a report, you have to customize it. You can customize high usage reports once, save them to library, and use via bins. To create a report template please, see Report Library

To customize a report: **Report Editor : Selection Selection :**
set drawing item types and grouping method ►
Sketch Sketch Report template :
edit report template ►
Page Setup Page Setup : edit report view

To set the item selection,   **Report Editor : Selection Selection ►**
grouping and sorting   **Selection sets list : Add Add selection sets ►**
method: **for every selection set**
Types list : select item types ►
for every type
Item library : select items ►
Conditions list :
add and edit conditions ►
Grouping parameters list :
add and edit grouping parameters

Your report will consist of section for every selection set, and all data will be grouped and sorted by specified rules. You can specify a header and a footer
for every selection set, every group, every section, every page and for all the report.
Your report template consists of fields. Please, assign a string, a parameter,
or any expression with math operations and functions for every field.

To edit main   **Report template : drag-and-drop a section separator down ►**
section / header / footer: **edit lines ► edit colums ► edit field**

To split a column: **Report template : move your cursor on the**
column header until mark↑► left click

To split a line: **Report template :**
move your cursor on the line header until mark↑►
left click

To change column width: **Report template :**
drag-and-drog a column header separator

To change column height: **Report template :**
drag-and-drog a line header separator ↔

To change field size: **Report template :**
select a field (left click) ►
Report template :
drag-and-drog the field border separator ↕

To edit a field: **Field Editor : set field type ►**
Field Editor : set border sides ►
Field Editor : set alignment ►
Field Editor : edit field expression

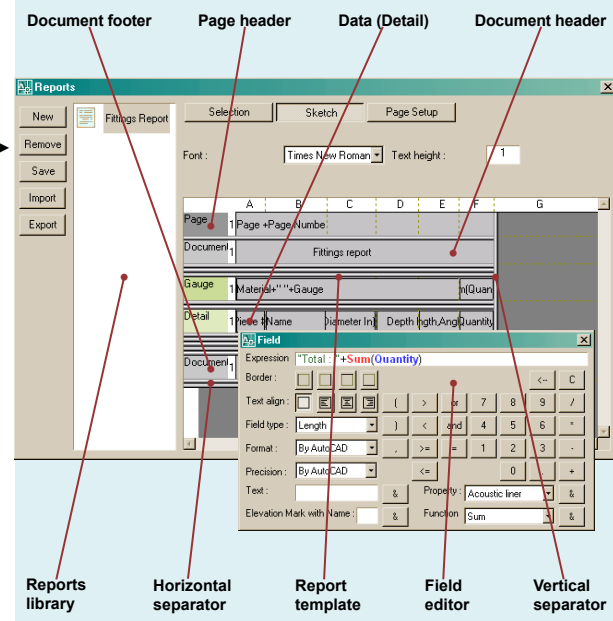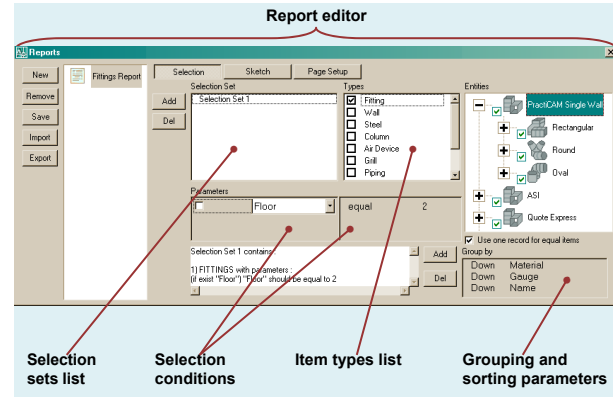**To set up page:**   **Report Editor : Page Setup Page Setup**

Reports Library

PractiCAD allows you to create exrended libraries of report templates with the Report Template Editor. Use the predefined report templates via bins exactly the same way as you do it with fittings.

To create a report template: **Toolbar :🗐Reports ►**
Report Template Editor :
Reports library :
New create a new template report ►
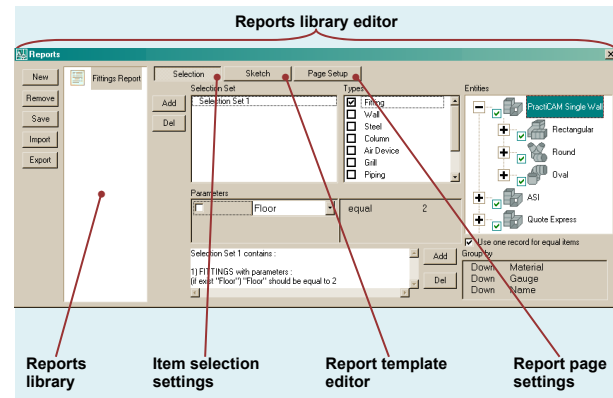**rename report template ► edit report template**

To rename a report template: **Reports library : select a report**
(left double click) ► type name ► Enter key

To delete a report template: **Reports library : select a report ►**
Remove delete the selected report template

To add a report to a bin: **Reports library : select a report ►**
drag-and-drop the report to Model space

Tags

PractiCAD enables you to place dynamic tags on 3D objects, containing a description you select. Every time you change parameters of a referee object or relocate it, the tag content will change automatically to conform to the object. Once you place a tag on the drawing, only you can change its position and callout line; **PractiCAD** does not do so automatically.
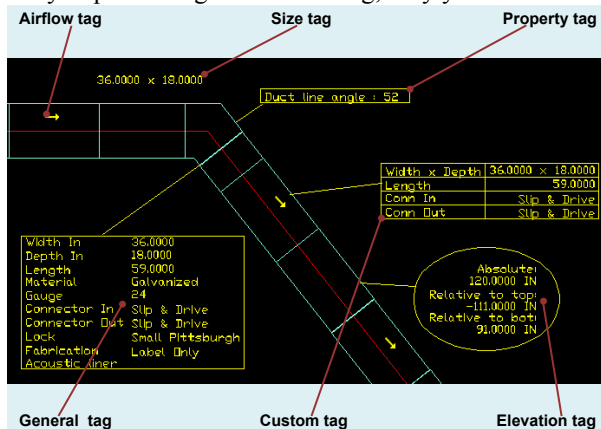
To create a single tag:	**Toolbar** : 🔲**Create tag** or **Command line** : type prcd_tag ▶ **Model space** : **select a fitting** ▶ **Tag Editor** : **edit tag appearance** ▶ **Tag Editor** : **edit tag content** ▶ **Tag Editor** : **OK** ▶ **Model space** : **specify tag position (left click)** ▶ **Model space** : **specify tag orientation** ▶ **Model space** : **specify callout line start position** ▶ **Model space** : **specify callout line end position**
To edit a tag:	**Model space** : **select a tag (right click)** ▶ **Popup menu** : **Edit tag** ▶ **Tag Editor** : **edit tag appearance** ▶ **Tag Editor** : **edit tag content** ▶ **Tag Editor** : **OK**
To delete a tag:	**Model space** : **select a tag (left click)** ▶ **Keyboard** : **Del** or **model space** : **select a tag (right click)** ▶ **Popup menu** : **Erase**

Airflow tag — Size tag — Property tag

General tag — Custom tag — Elevation tag

General Tags

|	
To edit a general tag:	**Tag Editor** : **Tag type** : **General** ▶ **Tag Editor** : **Properties list** : **set up**
To exclude a property from a tag or switch property value on / off*:	**Tag Editor** : **Tag type** : **General** ▶ **Tag Editor** : **Properties list** : **select a property value (left click)**
To show a property on a tag or switch property name on / off:	**Tag Editor** : **Tag type** : **General** ▶ **Tag Editor** : **Properties list** : **select a property name (left click)**

* All you will see on your tag are grey.
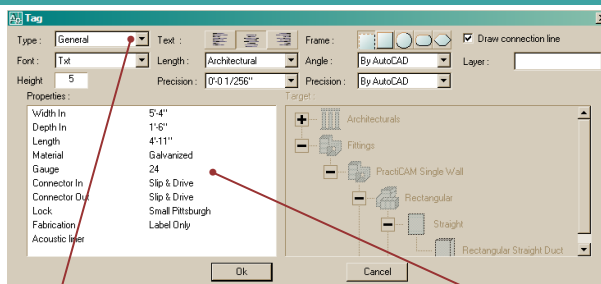
Tag type — Properties list

Size Tags

To edit a size tag:	**Tag Editor** : **Tag type** : **Size** ▶ **Tag Editor** : **Target shape** : **select shape** ▶ **Tag Editor** : **Properties** : **type prefix** ▶ **Tag Editor** : **Properties** : **Size1** : **select property** ▶ **Tag Editor** : **Properties** : **type separator** ▶ **Tag Editor** : **Properties** : **Size2** : **select property** ▶ **Tag Editor** : **Properties** : **type suffix**
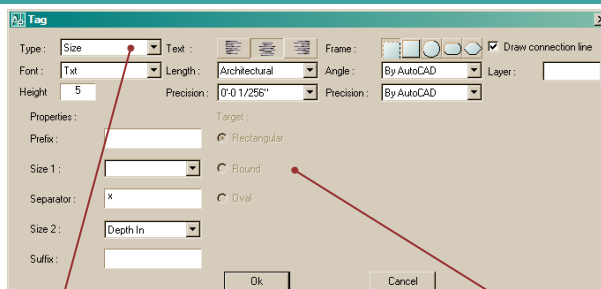
Tag type — Target shape

Elevation Tags

|	
To edit an elevation tag:	**Tag Editor** : **Tag type** : **Elevation** ▶ **Tag Editor** : **select a type of elevation** ▶ **Tag Editor** : **type section header** ▶ **Tag Editor** : **type section footer** ▶ **Tag Editor** : **type item Top coordinate prefix / suffix** ▶ **Tag Editor** : **type item Center coordinate prefix / suffix** ▶ **Tag Editor** : **type item Center coordinate prefix / suffix** ▶ **Tag Editor** : **check / uncheck items coordinates to show** ▶ **repeat the procedure for all types of elevation** : **Absolute, Relative to Top, Relative to Bottom**
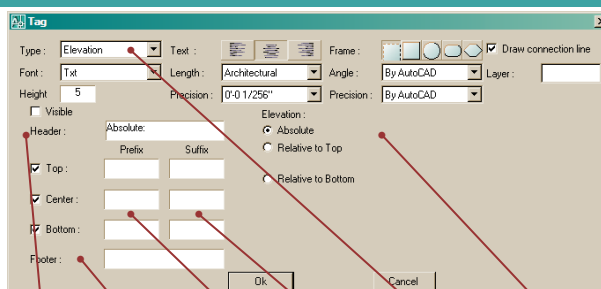
Section header — Section footer — Prefix — Suffix — Tag type — Types of elevation

Airflow Tags

|	
To edit an airflow tag:	**Tag Editor** : **Tag type** : **Arrow** ▶ **Tag Editor** : **select an arrow type** ▶ **Tag Editor** : **select an arrow size**
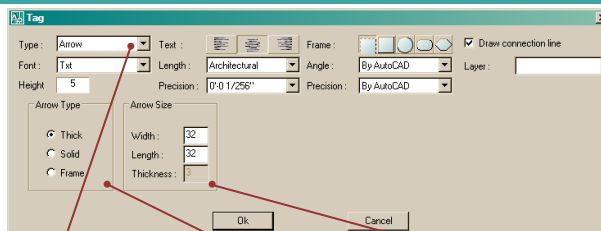
Tag type — Arrow type — Arrow size

Tags (side tab)

Property Tags

To edit a property tag:
Tag Editor : Tag type : Property ▶
Tag Editor : type the property prefix ▶
Tag Editor : Properties list : select a property ▶
Tag Editor : type the property suffix

Tag type   Property suffix   Properties list   Property prefix
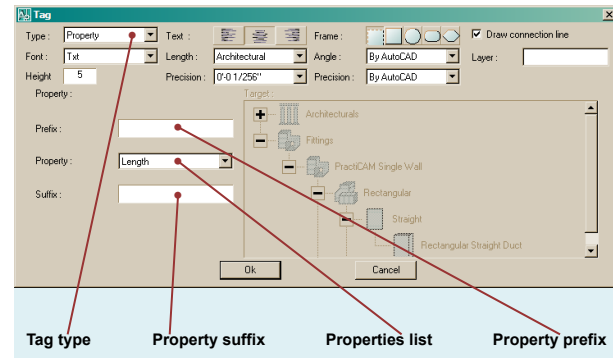
Custom Tags

To edit a custom tag:
Tag Editor : Tag type : Custom ▶ Tag Editor : Tag Layout : edit layout ▶
Tag Editor : Tag Layout : select a field ▶ Tag Editor : Field Editor : edit the field ▶
repeat the procedure for all fields

To add a row(s) to the tag:
Tag Editor : Tag Layout : move your mouse over the horizontal splitter bar until↕ appears ▶
drag-and-drop the splitter bar

To add a column(s) to the tag:
Tag Editor : Tag Layout : move your mouse over the vertical splitter bar until↔appears ▶
drag-and-drop the splitter bar

To split a tag column:
Tag Editor : Tag Layout : move your mouse over the tag column caption until↑ appears ▶ left click

To split a tag row:
Tag Editor : Tag Layout : move your mouse over the tag row caption until↑ appears ▶ left click

To change a column width:
Tag Editor : Tag Layout : move your mouse over the tag column caption separator until↔ appears ▶
drag-and-drop the separator

To change a column height:
Tag Editor : Tag Layout : move your mouse over the tag row caption separator until↕ appears ▶
drag-and-drop the separator

To change a field size:
Tag Editor : Tag Layout : left click on the field ▶
Tag Editor : Tag Layout : move your mouse over
the field bound until↕ or ↔appears ▶
drag-and-drop the bound

To edit a field:
Field Editor : select a field value type ▶
Field Editor : depress border sides to be drawn ▶
Field Editor : depress a field alignment type ▶
Field Editor : edit the field expression

The field expression is a combination of text, numeric and item property data combined
with general arithmetic operations and braces.

To add a text to the field
expression:
Field Editor : Text input field : type the text ▶
Field Editor : click & at the right of the text

To add an item property
to the field expression:
Field Editor : Properties list : select a property ▶
Field Editor : click & at the right of the property

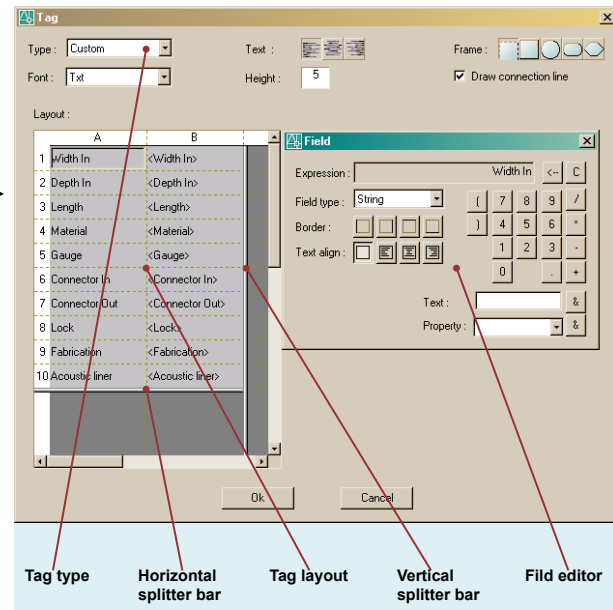To add a number or a sign of
arithmetic operation or a brace:
Field Editor : Keypad : click the button

To delete the last data
from the field expression:
Field Editor : click ← button at the right
of the field expression

To clear the field expression:
Field Editor : click c button

Tag type   Horizontal splitter bar   Tag layout   Vertical splitter bar   Fild editor

Tags Library

PractiCAD ▶ Toolsets ▶ Tags

PlactiCAD provides an ability to create extensive libraries of predefined tag templates. You can get access to them using working bins exactly
the same way as you do it with fittings.

To create a tag template:
Toolbar : Tags ▶ Tags Library Editor :
Tags Library : select a tag category ▶
Tags Library Editor : New ▶
Tags Library Editor : Target sets :
select a target set up to individual item ▶
Tags Library Editor : edit the tag

To rename a tag template:
Tags Library Editor : Tags library :
double left click on the tag template name ▶
type new name ▶ Enter key

To delete a tag template:
Tags Library Editor : Tags library :
select a tag template ▶ Tags Library Editor :
Remove Remove

To add a tag template
to a working bin:
Tags Library Editor : Tags library :
select a tag template ▶
drag-and-drop the template outside Tags Library Editor

Tags library   Properties list   Tags set   Target sets

Tags

Automatics

Automatics (side tab)
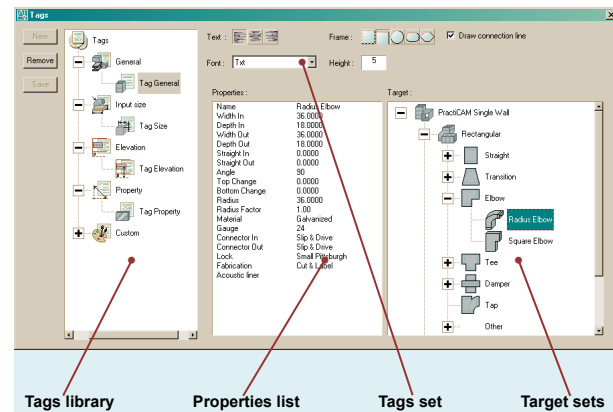
To edit an automatic tool:	**Automatics Editor : Automatics library : select an automatic ▶**
	Selection Selection : set item types and selection rules ▶
	Conditions Conditions : set up conditions ▶
	Placement Placement (if aplicable) : set up item relative tag or number position ▶
	Automatic specific settings : set up (Tag Tag for tag automatics) :
To set automatic conditions:	**Conditions Conditions : select item types and library items ▶**
	Properties list : left click ▶
	select a property ▶
	Conditions : left click ▶
	select condition (equal, not equal) ▶
	Conditions : left click ▶
	select or type property value ▶
	Properties list : checkmark the properties that should exist for true condition

Some automatics (auto tags and number) allows view plane selection and item relative drawing placement in accordance with space item orientation.

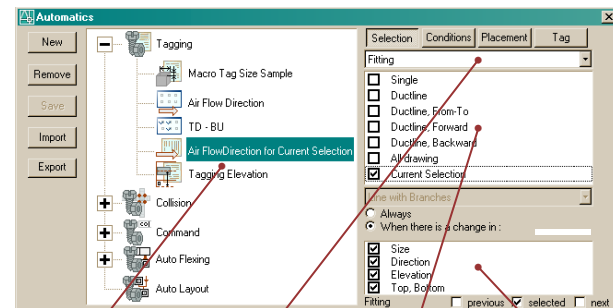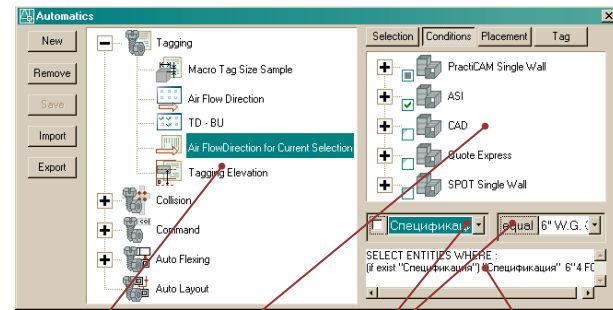|	
To set item relative placement drawing placement:	**Placement Placement ▶**
	Views list : select a view ▶
	Direction ranges list : add ranges ▶
	for every range ▶
	Direction diagram : select sectors (left click) ▶
	Item relative position : set

Automatics library · Item types list · Selection method · Selection conditions
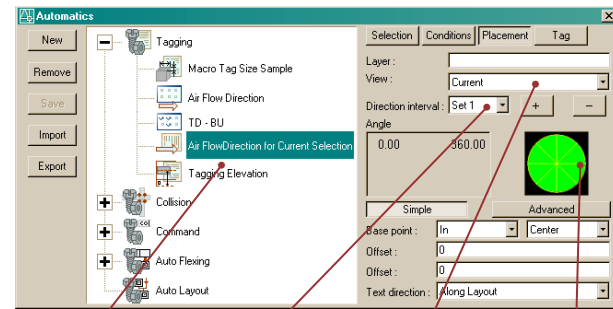
Automatics library · Fittings library · Condition properties and values · Condition descriptions

Automatics library · Direction ranges list · Views list · Direction diagram

Ultimatics

Ultimatics allows you to create, set up, and store to library high usage operating sequences of automatics and use them via bins exactly the same way as you do it with simple automatic tools.

|	
To create an ultimatic:	**New New (at the left side of Editor) ▶**
	File selection dialog : select a file with icon ▶
	rename the ultimatic ▶
	add automatics to the ultimatic ▶
	set automatics order
To delete an ultimatic:	**Remove Remove (at the left side of editor)**
To export an ultimatic to a file:	**Ultimatics list : select an ultimatic ▶**
	Export Export ▶
	File save dialog : select destination and file name ▶ Save Save
To import an ultimatic from a file:	**Import Import**
To add an automatic to an ultimatic:	**File open dialog : select a file ▶ Open Open**
	Ultimatics list : select an ultimatic ▶
	Automatics library : select an automatic ▶
	Add Add (at the right side of editor)
To delete an automatic from an ultimatic:	**Ultimatics list : select an ultimatic ▶**
	Automatics list : select an automatic ▶ Remove Remove (at the right side of editor)
Set automatics order:	**Automatics list : select an automatic ▶ Move Up Move Up / Move Down Move Down**
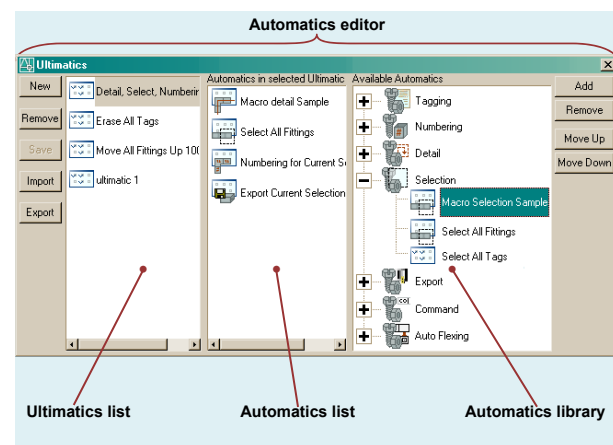
Automatics editor

Ultimatics list · Automatics list · Automatics library

PractiCAD Options

PractiCAD Options (vertical left margin)

To select a view mode:	**PractiCAD Options Editor : General General ▶ View mode : Entity types list : select item type ▶ View mode : check mark 3D or single line**
To set standard duct length:	**PractiCAD Options Editor : General General ▶ Duct line : enter standard duct length for every shape ▶ Use Default Stock Length check mark**
To set minimal duct leftover length:	**PractiCAD Options Editor : General General ▶ Duct line : enter minimal leftover length for every shape ▶ Use Minimal Leftover check mark**

Entity types list

Standard duct length settings

View mode

Minimal duct leftover length settings
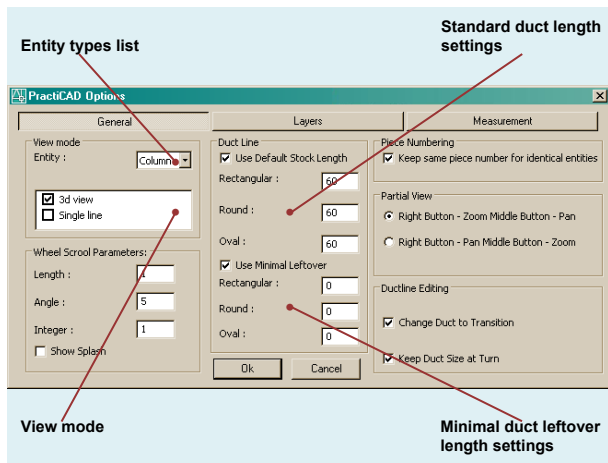
Layers

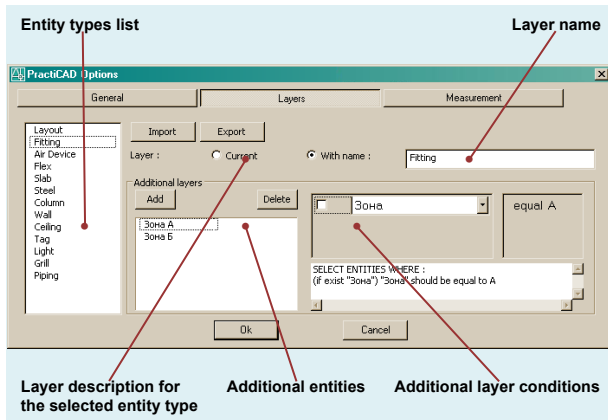|	
To place entities of a given type on a current layer:	**PractiCAD Options Editor : Layers Layer ▶ Entity types list : select a type ▶ Layer : select Current**
To place entities of a given type on a given layer:	**PractiCAD Options Editor : Layers Layer ▶ Entity types list : select a type ▶ Layer : With name select ▶ Layer : select**
To place entities of a given type by conditions on a separate layer:	**PractiCAD Options Editor : Layers Layer ▶ Entity types list : select a type ▶ Layer : With name select ▶ Aditional layers list : Add Add a new layer ▶ Aditional layers list : rename the layer ▶ set layer placement conditions**
To set layer placement conditions:	**Properties list : left click ▶ select a property ▶ Conditions : left click at the left side ▶ select condition (equal, not equal) ▶ Conditions : left click at the right side ▶ elect or enter the property value ▶ Properties list : check mark necessary roperties for condition truth**
To export layers settings:	**PractiCAD Options Editor : Layers Layer ▶ Export Export ▶ File Save dialog : select destination folder and file name ▶ Save Save**
To export layers settings:	**PractiCAD Options Editor : Layers Layer ▶ Import Import ▶ File open dialog : select a file ▶ Open Open**

Entity types list

Layer name

Layer description for the selected entity type

Additional entities

Additional layer conditions

Measure Units

PractiCAD uses standard AutoCAD measure units settings for lengths and angles. These are drawing settings.

Besides, there are a set of **PractiCAD** specific measure units settings, controlling area, weight, volume, price and time representation.

These are **PractiCAD** interface settings. Unless specified other, drawing and interface settings are used for values representation on tags and reports. Besides, tag and report field editor allows you to specify special value type and measure units for every field.

To set measure units for length and angles:	**Menu : Format : To export layers settings : Units**
To set PractiCAD measure units:	**Menu : PractiCAD : PractiCAD options ▶ PractiCAD Options Editor : Measurement Measure units**
To set representation measure units for a tag / report field:	**Field Editor : Field type : select Custom ▶ Field Editor : Field type : select field type (length / area / value / money / time) ▶ Field Editor : Field type : select measure units**

Field type

Dimension type

Measure units

Measure units for area

Measure units for time

Measure units for weight

Measure units for volume

Currency and currency rate