

EnergyPlugged

Overview

EnergyPlugged is an Autodesk® AutoCAD® plug-in to create and edit EnergyPlus input files.

EnergyPlugged was conceived to improve and speed up EnergyPlus model creation without losing control of it, preserving EnergyPlus' flexibility and allowing errors to be found.

With EnergyPlugged you can:

- draw your tridimensional building in AutoCAD or import it from your favorite CAD program
- select each surface with a click and get the geometry data
- check potential relations between objects and select the one you need
- continue adding and editing EnergyPlus objects in the editor
- import datasets objects (schedules, internal gains, ...) in the same or in different layers
- exchange objects between layers
- convert values into SI and IP units
- add and edit comments to objects in the editor for future revisions
- save an .idf file from each layer

Installation

EnergyPlugged is an ObjectARX® application that requires Autodesk® AutoCAD® 2007 or later to run.

To install EnergyPlugged you need to place the file EnergyPlugged.arx (the dynamic-link library) in the directory you prefer and then recall it within AutoCAD:

- menu: **Tools – Load Application...**
- search EnergyPlugged.arx and click **Load** if you want the application be loaded just for this AutoCAD session

or

- click **Contents...** below Startup Suite then **Add...** and search EnergyPlugged.arx to load the application each time you start AutoCAD

“EnergyPlugged.arx successfully loaded.” will appear both in the dialog and in the Command Line.

A new command named “EPLUGGED” is now installed within AutoCAD and each time you recall it in the Command Line EnergyPlugged will launch.

Refer to Customize Commands in the AutoCAD help to add “EPLUGGED” to toolbars, menus, and other user interface elements.

The first time you launch EnergyPlugged you will be asked to find Energy+.idd that comes with EnergyPlus and is placed in the EnergyPlus root directory.

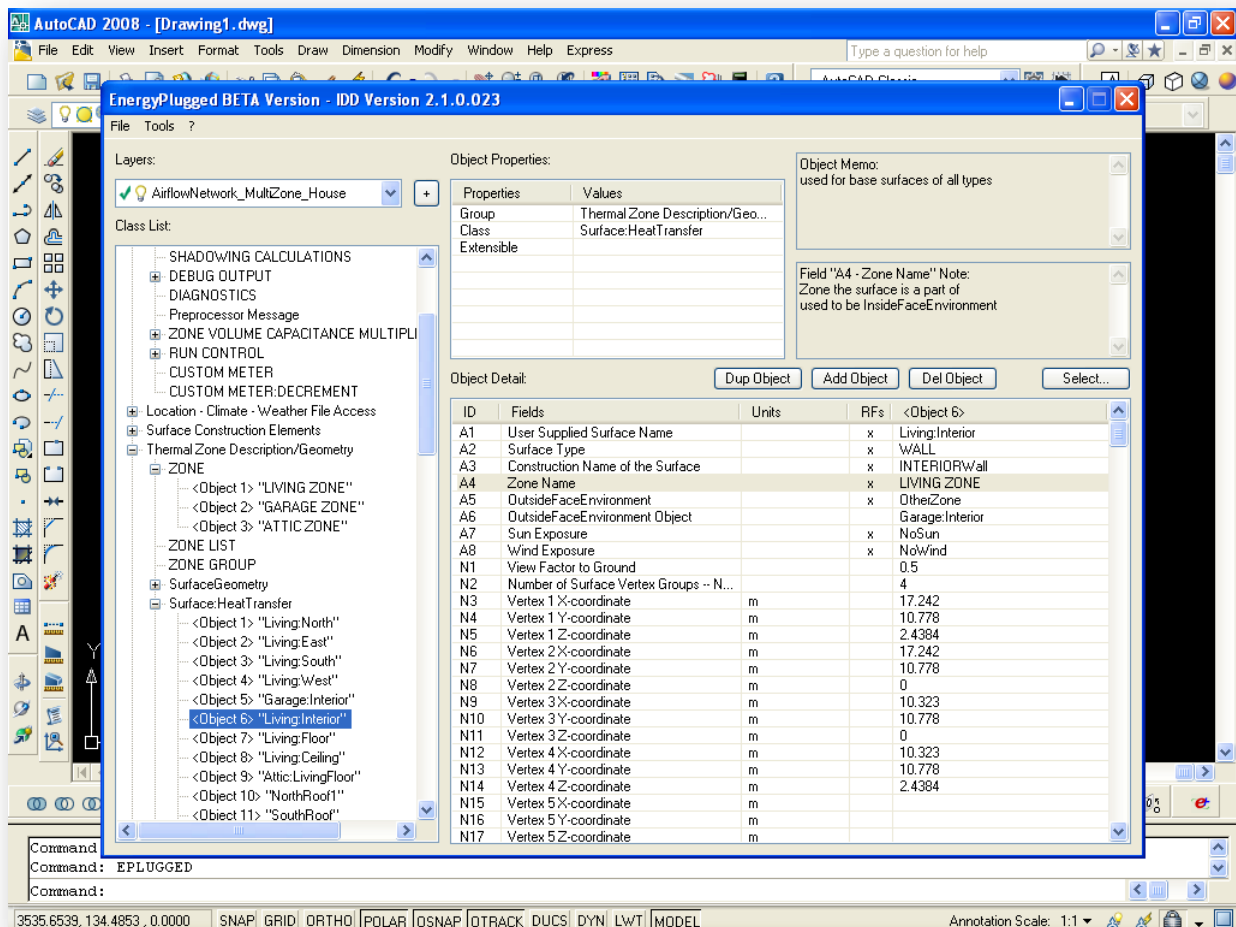
Uninstalling EnergyPlugged



If you added EnergyPlugged.arx to the Startup Suite within AutoCAD:

- menu: **Tools – Load Application...**
- click **Contents...** below Startup Suite then select EnergyPlugged.arx and click **Remove**

Then go to the directory where you placed EnergyPlugged.arx and delete EnergyPlugged.arx and EnergyPlugged.ini (created by the application, stores Energy+.idd path).

Main Window:



- menu **File – Open in filename layer...** to open multiple files with each one in a layer named as file
 - menu **File – Open in current layer...** to open multiple files all in current layer
 - menu **File – Save as...** to get Save Manager window
 - menu **File – Change dictionary...** to select another EnergyPlus IDD for next startup
 - menu **File – Exit** to close EnergyPlugged
 - menu **Tools – Object List - Reference...** to get Object List - Reference window
 - menu **Tools – Layer Manager...** or click on + next to Layers to get Layer Manager window
 - menu **Tools – Relations...** to get current selection relations in Relations window
 - menu **? – About EnergyPlugged** to get information about EnergyPlugged
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- click on Layers items in  column to set current layer (the one with tick). Objects that you create are drawn on the current layer
 - click on lamps () in Layers items to switch on or off layers
 - select an object and Layers will show its layer
 - click on Layers name to change current selection layer
 - right click on Class List then **Open All** to expand all groups and classes
 - right click on Class List then **Close All** to collapse all groups and classes
 - click on **Dup Object** to duplicate current selected object in current layer

- click on **Add Object** to add an object to current selected class in current layer
- click on **Del Object** to delete current selected object
- click on **Select...** to select regions you previously created in the tridimensional environment to get vertices coordinates (only available for surface objects with vertices)
- click on <Object x> column values to edit values in Field window

“RFs” in Object Detail stands for required fields as stated by EnergyPlus IDD.

Surface selection is limited to regions

“Regions are two-dimensional areas you create from closed shapes or loops” (AutoCAD help).

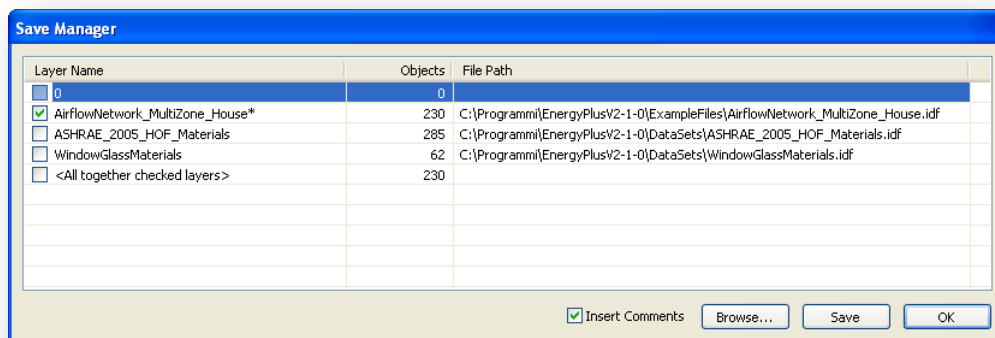
EnergyPlugged recognizes regions that are composed by a single closed shape made up of lines (no holes within).

Tips on drawing regions

Start drawing a 3D Solid for each zone. Then explode it to get a region for each planar side. Continue drawing closed lines and convert them into regions for windows, doors, shading elements...

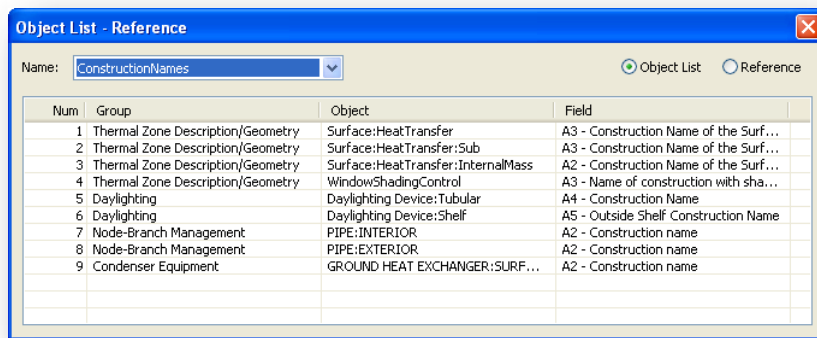
Import mesh from other CAD programs then convert them into regions (“region” and select it). Multiple coplanar regions can be united (“union”), subtracted (“subtract”) and intersected (“intersect”) so if you have a planar surface composed by multiple regions you can convert them into a single region.

Save Manager:



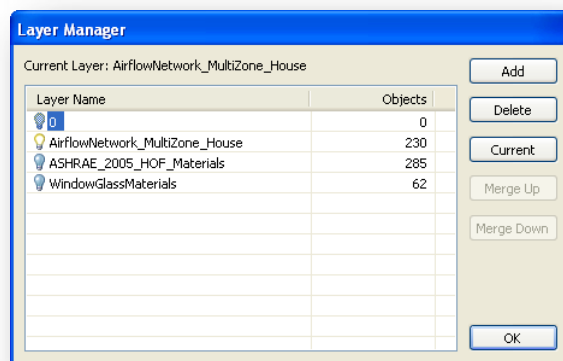
- check layer to save to file (when Save is clicked)
- click on File Path item or click on **Browse...** to change selected layer file destination
- check <All together checked layers> to merge all checked layers’ objects in a file (requires a File Path item, single layers will not be saved to their files)
- check **Insert Comments** to insert each field comment into the saved file
- click **Save** to save
- click **OK** to close without saving

Object List - Reference:



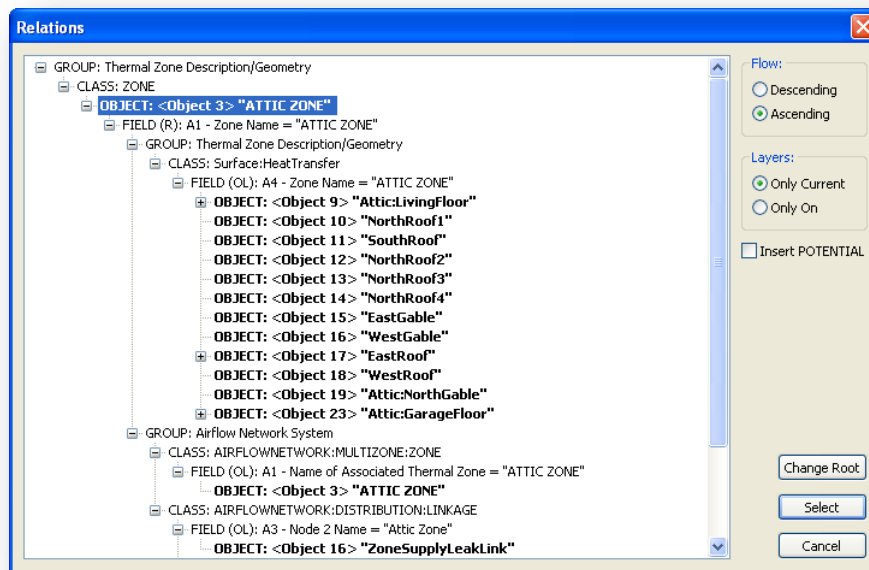
- select Name to list Object List - Reference relation found in Energy+.idd
- check **Object List** to list "pointers" fields
- check **Reference** to list "pointed" fields

Layer Manager:



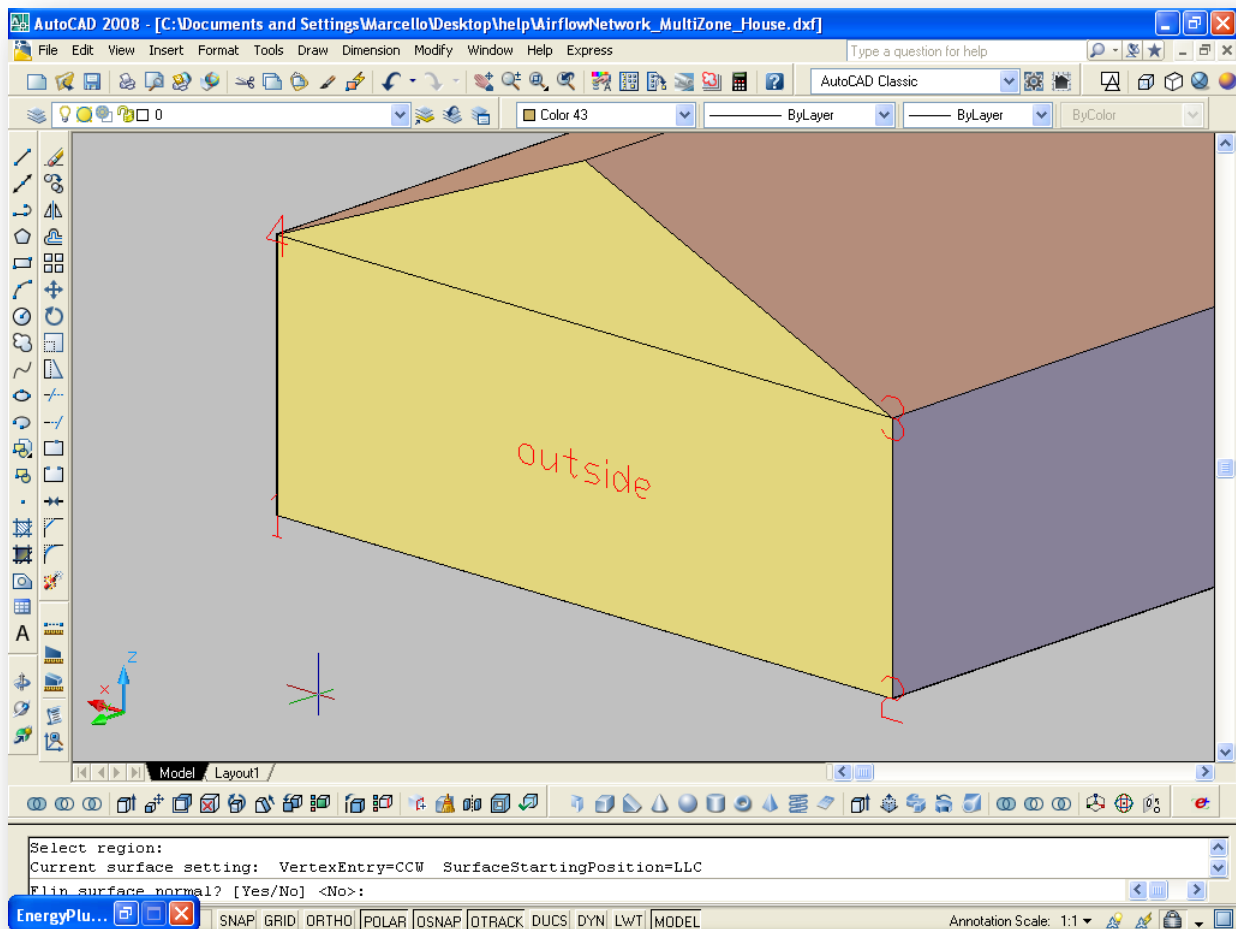
- click on layer name to change
- click on lamp to switch on or off the layer
- double click on layer name or click on **Current** to set current layer
- click on **Add** to insert new empty layer
- click on **Delete** to delete selected layers
- click on **Merge Up** to merge selected layers objects into upper selected layer
- click on **Merge Down** to merge selected layers objects into lower selected layer

Relations:



- click on + to expand
- click on - to collapse
- check **Descending** to show an Object List -> Reference flow
- check **Ascending** to show a Reference -> Object List flow
- check **Only Current** to show relations found between current layer objects
- check **Only On** to show relations found between objects in layers that are switched on
- check **Insert POTENTIAL** to add all usable relations
- click on **Change Root** to change first item to highlighted item
- click on **Select** to close and select highlighted item

Select surface:



- select a region to get vertices' coordinates
- type Y to flip surface normal (surfaces are always specified as being viewed from the outside of the zone to which they belong; if you read "outside" from the right side then the normal is pointing toward you) or type N to leave it unchanged
- type CCW to get CounterClockWise vertex entry or type CW to get ClockWise vertex entry (look at numbers on vertices, they change accordingly)
- type LLC to get LowerLeftCorner as surface starting position or LRC (LowerRightCorner) or ULC (UpperLeftCorner) or URC (UpperRightCorner) or SF to step forward or SB to step backward
- type a surface name to fill User Supplied Surface Name
- click enter to store data in current object and to "paint" surface name on surface in the 3D environment

REMEMBER:

- no link remains between 3D surface and data in table
- no editing applied to the region will update data in table
- vertices' coordinates are current UCS coordinates

Edit Field:

Properties	Values
Required field	Object List
Type	ZoneNames
Object List	

- click on Value to change or select available References if field is Object List tagged
- check **Only Current** to get References found in current layer (if field is Object List tagged)
- check **Only On** to get References found in layers that are switched on (if field is Object List tagged)
- edit Comment to add or edit comment
- click **C** to open Units Conversion

Units Conversion:

Value	Unit	New value
10	ft -> m	3.04785126485828

- select conversion to convert Value into New Value
- click on **Keep new** to close and update field Value with New Value

About EnergyPlugged:

www.geocities.com/energyplugged/index.htm

Feedback and help with debugging are appreciated!

energyplugged@yahoo.it

marcello.dallolio@yahoo.it