Technical Information hylasFM

The following pages shall give you an overview to subject and functionality of hylasFM. For further questions or proposals please contact us:

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F1   What is hylasFM?

F2   Which AutoCAD versions are supported by hylasFM?

F3   How is the workflow in hylasFM?

F4   Which features offers hylasFM?

F5   How does the data model of hylasFM looks like?

F6   Which requirements has the automatic structuring for CAD-floor plans?

F7   How will the pattern recognition of rooms take place in hylasFM?

F8   Does hylasFM allow working with scanned plans?

F9   How can plans be prepared for different purposes?

F10   Is it possible to connect deduction polygons (columns) with the room polygon to one single polygon?

F11   Is it possible to calculate automatically derived quantities like wall areas?

F12   How can the data, recorded with hylasFM be circulated to someone else?

F13   How can I test hylasFM?

F1   What is hylasFM?

hylasFM is an AutoCAD-application to record and structure efficiently floor plans of buildings. The goal of hylasFM are qualified, CAFM[1] applicable data structures.

During the data recording the existing graphical objects in the drawing are assigned with data. In a structure view all data and their links are clearly represented. The structuring concepts of hylasFM not only transcend typical CAD standards, furthermore they are more intuitive and safer.

For structuring CAD-plans two basically approaches have been established.

Parallel data recording and plan development

The structuring of the recorded geometry and the assignment of data will be done during or after measuring a building.

Structuring of existing plans:

In most of the cases facility management systems are based on existing floor plans. Though these plans include the data but often they have an inapplicable structure that are not up to the marks. HylasFM allows you to transfer (semi-)automated information of the CAD drawing into applicable structures for the facility management system.

Few clicks suffice to generate among other things the required polylines. Further data (e. g. equipment details) can be modelled and assigned to the automatically identified objects.

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[1] Computer Aided Facility Managment
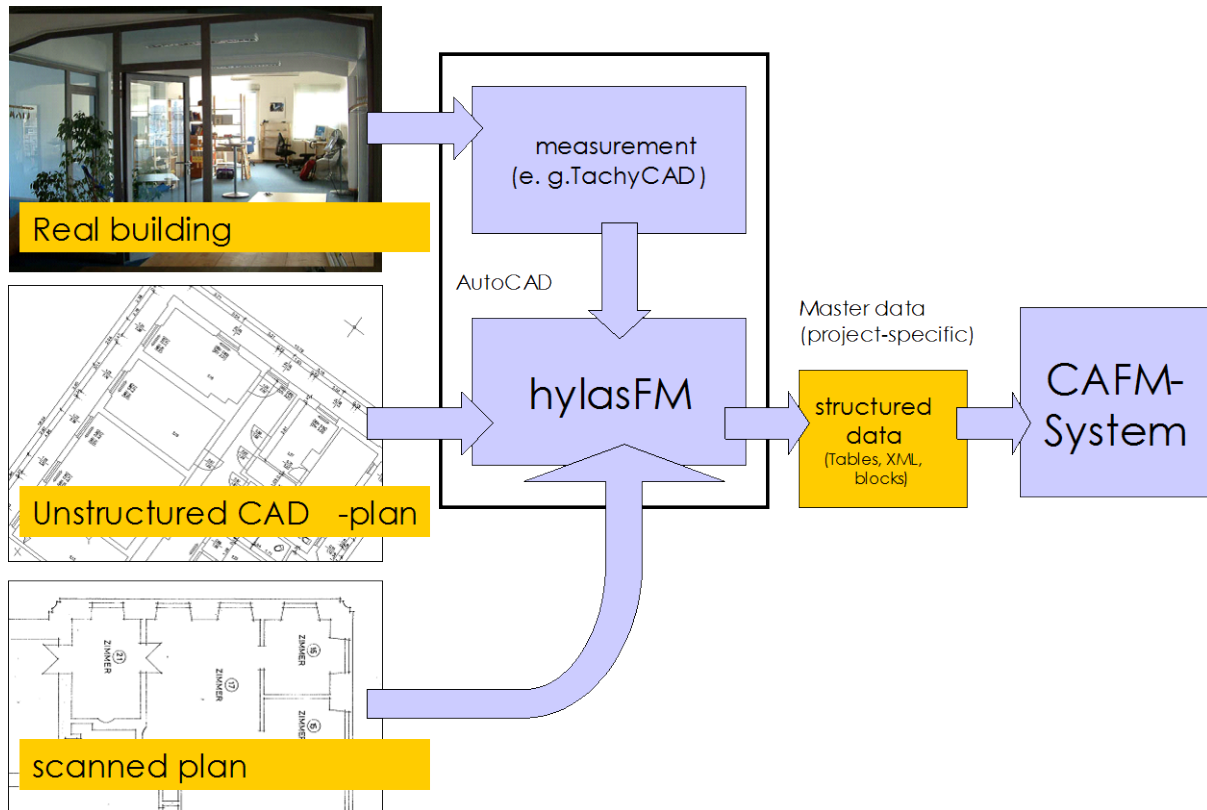
F2   Which AutoCAD versions are supported by hylasFM?

AutoCAD and AutoCAD LT 2010 - 2013 and all AutoCAD Verticals (Architecture, AutoCAD Map, Civil 3D...) are supported by hylasFM.

To create 3D-models based on 2D-floor plans it is necessary to work with AutoCAD Architecture.

F3   How is the workflow in hylasFM?

Because of different requirements due to different goals in Facility Management, hylasFM does not work with fixed data structures. It can be customized to certain problems. The typical method to handle a project consists of three steps: modelling, collection of data and export of data.

1. At first the requirements for the result are analysed and then the **data structure is modelled**. That means to define all things to collect. Which object has which attributes? How are the object linked with other objects. E. g. a room has a certain use and floor covering and the room can be linked with windows, doors or equipment.

2. The second step contains the main part, the **collecting of data**. The pre-defined objects and their links are created in the tree structure and the attributes are filled. In case there is no graphic or only a part of that, hylasFM supports the creation of graphics

3. Often data have to insert in a extern database system. For it hylasFM offers the **export of data**. Data can be exported as ASCII and MS Excel tables, XML, ESRI Shape files or in HTML format. It is possible to configure the export to get exactly the required data without much rework.

F4   Which features offers hylasFM?

- The CAD-Graphic will be linked with the data of the tree structure.
- Classes, attributes and links are freely definable. The provided templates for structure definitions can be added and modified.
- The collecting of all attributes is typed. That means it is predefined whether the attribute is a simple text, a real or integer number, a list of fixed values, a file or a calculation attribute. Geometric values (e.°g. length or distances) or text can be collected directly from the drawing by clicking objects or distances. So this speeds up the completion and avoids errors on data collection.
- Calculation attributes allow a complex evaluation. For instance an attribute „wall area" of a room can be calculated by a formula including the attributes " perimeter" and " height" in consideration of the openings (doors, windows) linked with the room.
- By using the intelligent outline trace polylines (e.g. for rooms or floors) can be created very fast and simple. Surface areas and perimeters will be calculated automatically in consideration of "Isle areas" (e.g. columns in the room). The definition of deductable surface areas is as possible as a weighted totals formation.
- As customary in relational database system, objects of different classes can be linked with each other by n:m - relations. For example every radiator will be correlated to one certain room. This correlation also

happens automatically by locating the geometric position of the objects.

- Previously defined plausibility can always be checked during the data collection So it is guaranteed, that for example every room belongs exactly to one floor.
- Different visualisation methods like hatchings, lines or symbols (blocks) display the collected objects depending on their attribute values. That allows a visual overview of collected objects or the control of the completed data collection in the drawing. Well-defined show and hide of certain attributes helps to create an agenda and legends are generated at the push of a button.
- In addition to areas also linear elements (e.g. kerbs, hedges) are evaluated. For it there exists a base class „curve" with the attribute „length" .
- Doors, windows and walls can be identified automatically by pattern recognition. After "training" also freely definable symbols (e.g. radiators, sanitations) can be recognized.
- AutoCAD-blocks can be converted very symple into hylasFM-objects and vice versa.
- There are different tools to improve a plan for instance identifying gaps, overlapping lines and double lines.
- To transfer data to the goal -CAFM or other software (e. g. MS-Excel) a comprehensive export function is available. We also like to implement special requirements for you.
- Layout plans can be converted semi-automatically into 3D Autodesk Architecture-objects.
- There are two predefined structure definitions to create a Room Book.
- There is a free hylasFM-Viewer for structured data to be circulated.

F5   How does the data model of hylasFM looks like?

One of the biggest advantages of the object-oriented data model in hylasFM is the possibility to extend it very simple. In accordance with assignment of

tasks to collect data the request structure can be modelled in hylasFM. That happens by definition of new classes, links and attributes. There is no restriction to certain CAFM-systems.

According to data collection for Facility Management it may exists an area class for the collection of common room information and an equipment class for collection of fixtures. A link between these classes allows to assign fixtures to a certain room. Filling the attributes means collecting the desired information of the class (room number, area surface, kind-of-use, etc.).

In addition to the user defined classes hylasFM has predefined some classes with special functions. These classes serve for instance to transfer area surfaces inside of polylines and to assign objects inside the polylines. By inheritance the special properties can be transmitted to user defined classes too. The classes *room door*, *window* and *wall* collected in many FM projects are also predefined classes.

The linking concept of hylasFM is particulary powerful because it is possible to design not only hierarchical but also any netlike links (n:m relations). So for example *one* door belongs to *two* rooms and *one* staff member can use or share with other staff members *any* equipment or rooms.

F6   Which requirements has the automatic structuring for CAD-floor plans?

Not any! Also with bad original data hylasFM achieves a high automation level. A good base for the automatic structuring are CAD-floor plans, which were drawn using object snaps. Mistakes like gaps or projecting lines are included.

Additionally hylasFM has tools for improving plans to correct such mistakes. An existing structuring on layers, in blocks or with polylines is not necessary.
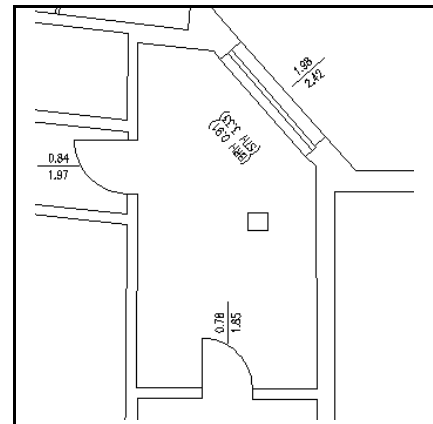
F7   How will the pattern recognition of rooms take place in hylasFM?

Below a room inside an existing floor plan will be defined with hylasFM. The equipment of the room will be assigned automatically.
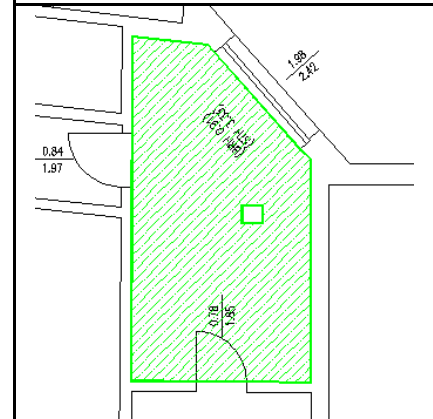

A CAD-plan has been loaded...
In this example all information is on one single layer.
There are no polylines.

At the push of a button hylasFM recognizes the contour of the room. The doors ans "islands" (e.g.columns) will be recognized and considered. One ore several room polygons has been created.

At the same time the room has been generated in the structure view. Further attributes (e. g. the floor covering) can be filled manually. The room is linked with the automatically created room polylines which are used to calculate the surface area.
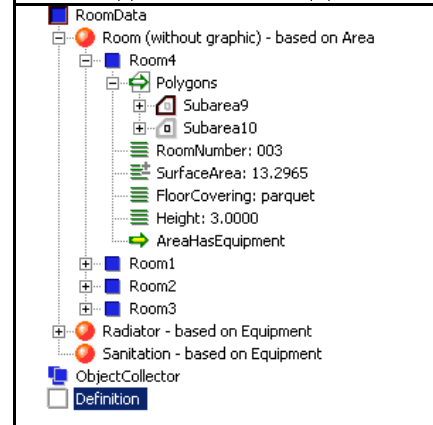
The existing radiators (symbols) in the drawing are identified as hylasFM equipments and will be linked with the room.
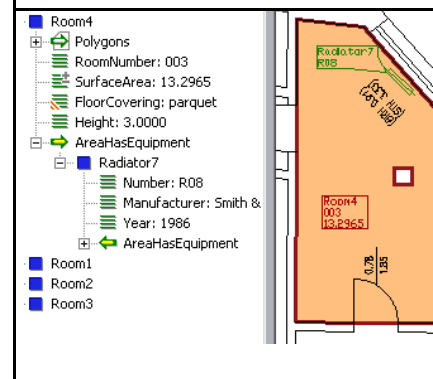
F8   Does hylasFM allow working with scanned plans?

Yes! The origin for hylasFM are CAD-floor plans. An automatic vectorization of scans will not be accomplished by hylasFM.

But scanned and rectified paper plans are suitable to vectorize manually and structure the data in one step. Not the described contour recognition is applied but outlines will be traced by mouse click. An approach is to vectorize only the information that are relevant for hylasFM (room polygons). All the other information will be collected only within the hylasFM objects. Necessary geometric information (width of an opening, position of a radiator ...) can be gripped in the CAD drawing.

F9   How can plans be prepared for different purposes?

hylasFM-attributes can be illustrated by hatches, AutoCAD-blocks or line signatures. For instance you can apply a type of hatch for a certain kind of room usage. After finishing data collection you will have a good image presentation and a better control to check the plausibility of room usages.
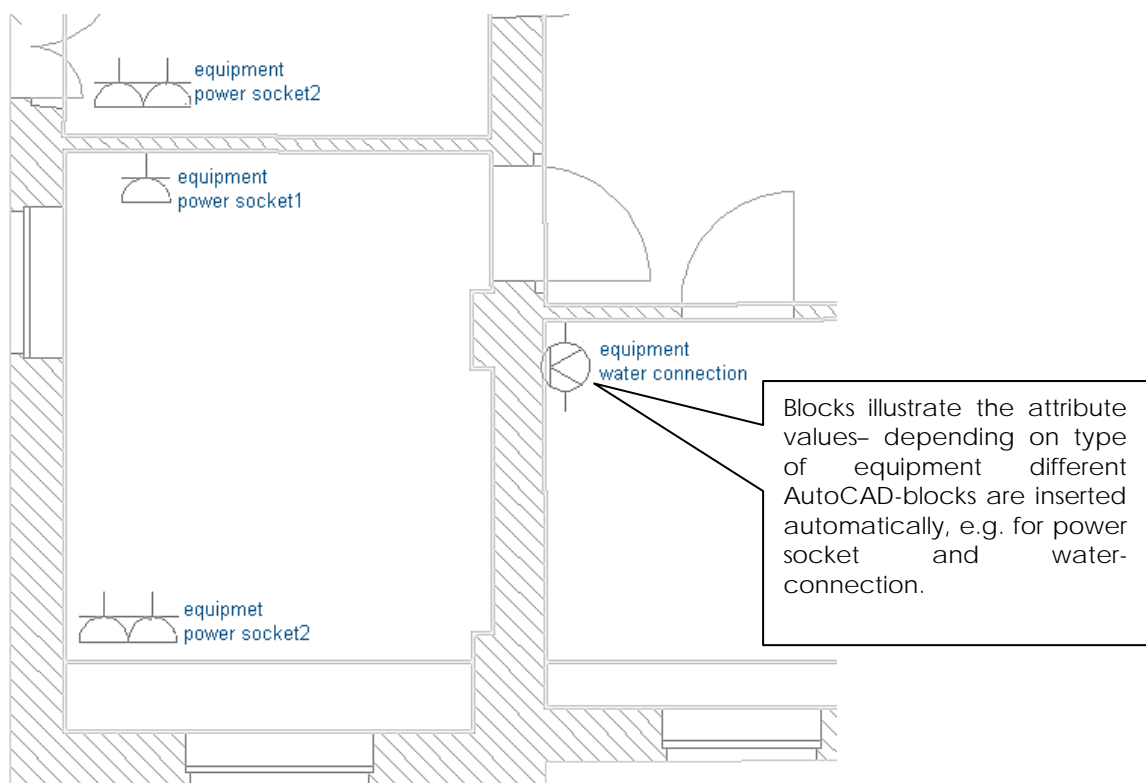
The visualizations will be updated after changing attributes. All area classes (e.g. rooms, outdoor areas, damages etc.) can be illustrated by hatches. It is also possible to have more than one visualization for one single object. For example there is an visualization for the usage of a room and one to differ the room is let or not. The existing hatch would be superimposed by the second one.
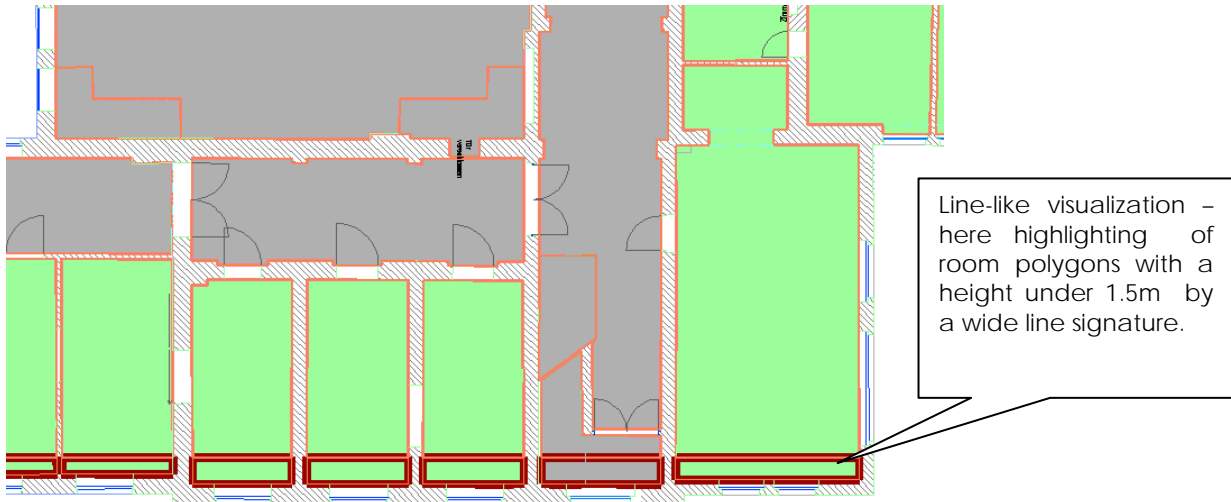
There is a wizard to simplify defining a visualization.

A legend arranged according to one's own taste can be inserted at the push of a button.

Objects without dimension (point signatures) can be visualized as AutoCAD-blocks. That means to every attribute value belongs one certain block symbol.

equipment
power socket2

equipment
power socket1

equipment
water connection

Blocks illustrate the attribute values– depending on type of equipment different AutoCAD-blocks are inserted automatically, e.g. for power socket and water-connection.

equipmet
power socket2

Line-like objects can be visualized as line - signatures. The following picture shows the visualization with an area hatch complimented by a visualization of subareas with a height under 1.5 m using a wide line width.

Line-like visualization – here highlighting of room polygons with a height under 1.5m by a wide line signature.

F10 Is it possible to connect deduction polygons (columns) with the room polygon to one single polygon?

Rooms with several polygons (e. g. columns) can be modified in the way that only one polyline appears. That is an important function to export data into certain CAFM-systems because some systems can only import one single line per room.

several polygons (room with columns) turn to one single area like polygon
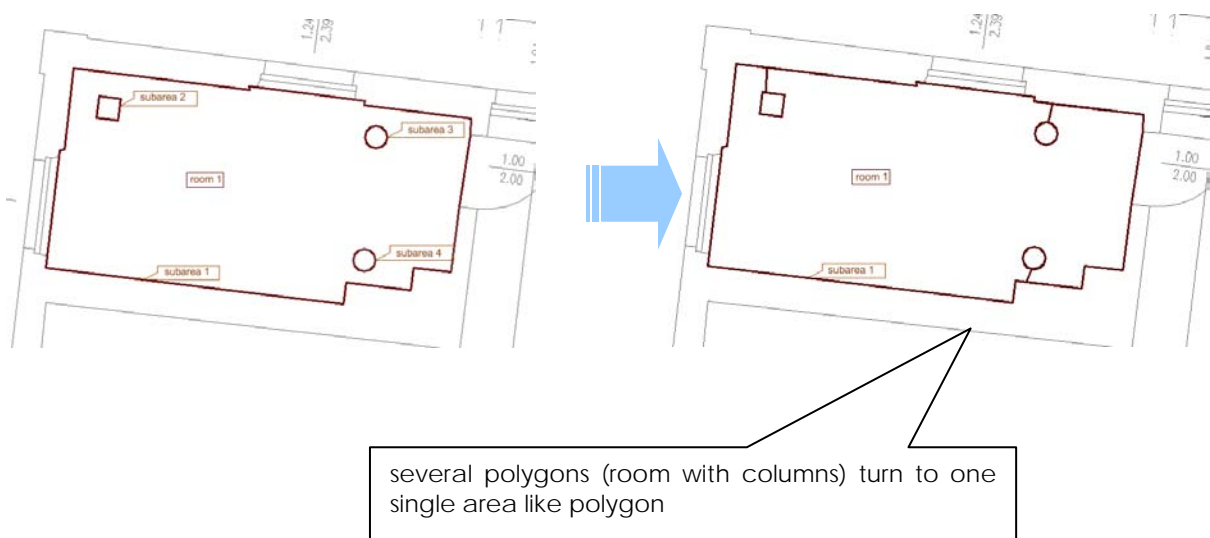
F11 Is it possible to calculate automatically derived quantities like wall areas?

Calculation attributes enable to link mathematically existing attributes in various manner. For example the area of a certain wall covering can be calculated using following formula:

Wall area = perimeter x height

- area of the openings

- area of the other wand coverings

The area of the openings (doors and windows) on the other hand could be calculated by height x width. It is also possible to define restrictions like "Include only openings with > 2.5 m²".

Sometimes it is desired to show the whole path of the equipments areal reference e. g. Property*10000.building5.floor1room17.door3* . Such codes can be generated automatically using calculation attributes.

The definition of calculation attributes avoids a redundant data collection. Only the primary data has to be collected (e.g. height and width of a door).

F12 How can the data, recorded with hylasFM be circulated to someone else?

In the course of the data collection with hylasFM all the data are contained in the corresponding AutoCAD drawing. For editing or circulation of the data there are several options:

1. In an AutoCAD drawing all hylasFM objects can be converted into AutoCAD blocks with attributes. That means a circulation as a pure AutoCAD drawing is possible.

2. The data shall be exported to a CAFM-system or another extern database. The export is possible in the following formats:

   - Tables in readable ASCII-format (for further processing in databases or in spreadsheets)
   - XML-files with the related scheme (for XML-browser)
   - special AutoCAD-structures (for AutoCAD based CAFM-systems)

- Autodesk Architecture objects (for Autodesk Architecture based CAFM-systems)

- direct export to special databases.

The data will be handed on the end user together with the free hylasFM-viewer.

3. For special tasks the export can be adjusted via easy to handle programming interface by user or by kubit. Using the programming languages VBA, AutoLisp, C++, Pascal etc. allows the access to the COM-object model of hylasFM.

F13   How can I test hylasFM?

We offer every prospective customer the possibility to test our software on a real project. That testing licence is free for you and without any commitments. If requested we support the testing licence with an introductive training. The testing licence allows you to find out whether our software meets your requirements. Part of the documentation is a tutorial, to show you the basic proceeding using simple examples.