INSTALSYSTEM 5 – AUTOMATION OF THE DESIGN PROCESS

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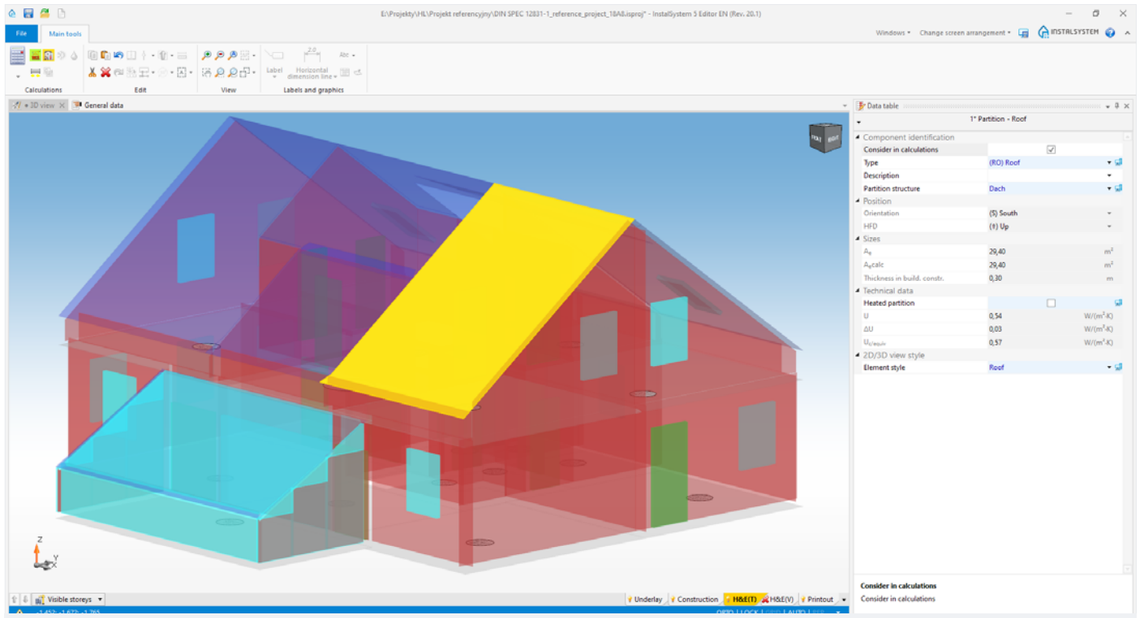
Times when CAD / CAE programs were called just electronic drawing boards have long been forgotten. Currently the installation model being created in engineering programs should carry data and parameters that will be used to perform comprehensive calculations. Until now, however, some stages of project implementation, required to obtain a complete calculation model and project documentation, were work- and time-consuming, and the model modifications were problematic. Thanks to many years of cooperation with designers and the inventiveness of the InstalSoft team, many of these stages have been accelerated and automated. The article presents selected improvements.



1 Automatically generated thermal partitions from the building structural model

3D model of the building and installation

The 3D model in the *InstalSystem 5* package can be imported from IFC file or can be created automatically on the basis of plan view drawings and other data of individual elements. Many additional tools support and accelerate the 3D model view creation, for example: general data, possibility to copy entire floors (or parts of the installation to the floors above / below), risers automatically covering the appropriate floor range.

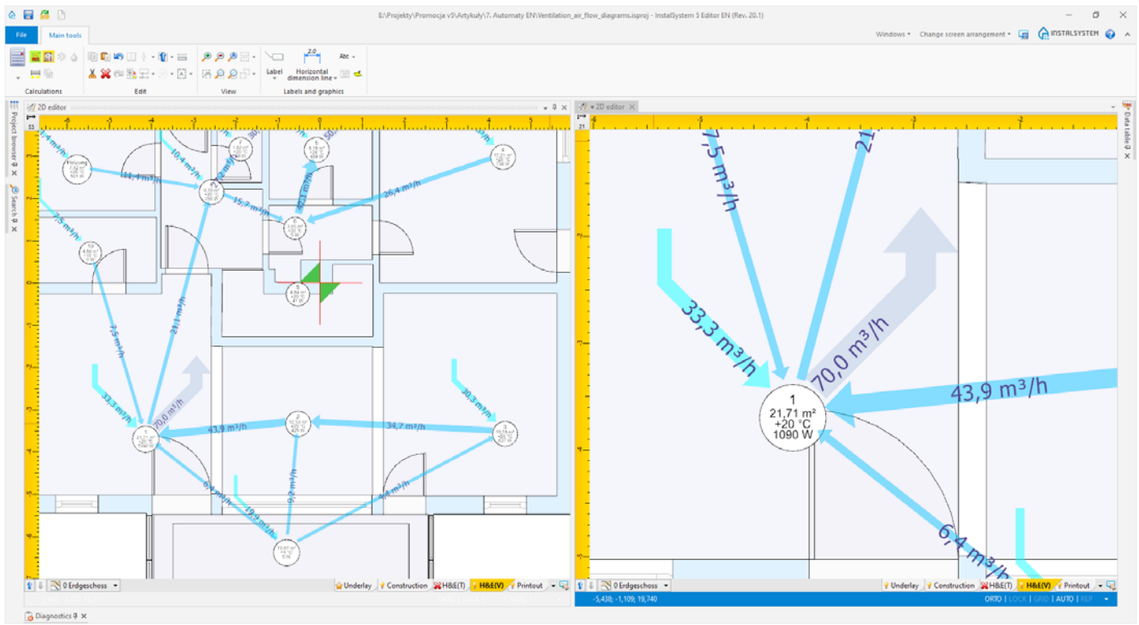
Creating the building structure

The procedure of creating a building structure in *InstalSystem 5* package resembles the real process of creating a building, it is fast and intuitive. Complete building structure, required for heat demand calculations, can be obtained from IFC file or can be created directly in the program. After drawing room shapes and the building contour and launching „Automatic walls, slabs and roofs" function, all walls, slabs and floors are generated automatically. For such a generated building structure, roof, windows and doors should be inserted, thus obtaining a complete building structure.

Heat demand calculations

After obtaining a complete building structure, it is necessary to determine the ther-

→ Watch that short video!



2 Ventilation air flow diagrams

mal parameters of building partitions. Based on the definition of the thermal partition, the *InstalSystem 5* package automatically assigns thermal parameters to the appropriate drawing (construction) partitions. Slabs are divided into separate thermal partitions when they are located above several rooms with potentially different internal temperatures (the roof is divided similarly). In buildings with basement, the part of the wall below the ground is also automatically recognized. To facilitate the analysis of ventilation air flows, a balance and diagram of ventilation air flows is created together with the value of the air flows.

Division of heating/cooling zones into required number of circuits

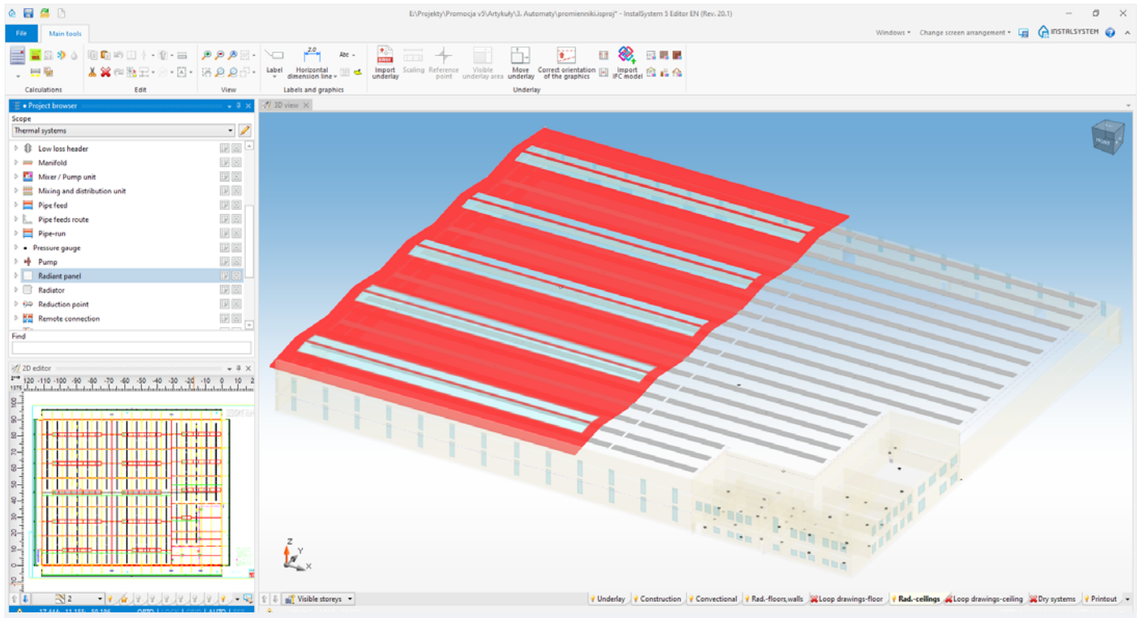
When designing radiant heating or cooling, to obtain pressure drops and loop length at an acceptable level, it is necessary to lay several (sometimes a dozen or so) loops in larger rooms. After inserting heating/cooling zones, the *InstalSystem 5* package automatically divides them into the required number of circuits. One of the division criteria ‚according to equal pressure losses' is especially applicable to large surfaces where the medium is distributed in the Tichelmann system (without mass flow regulation on manifold). Division of zones according to this criterion allows to obtain a similar length of the loop, taking into account the length of pipe feeds to the manifold, in all circuits. This is a unique feature, which manual replacement is extremely difficult and time-consuming!

Drawing of pipe feeds between the manifold and heating/cooling floors

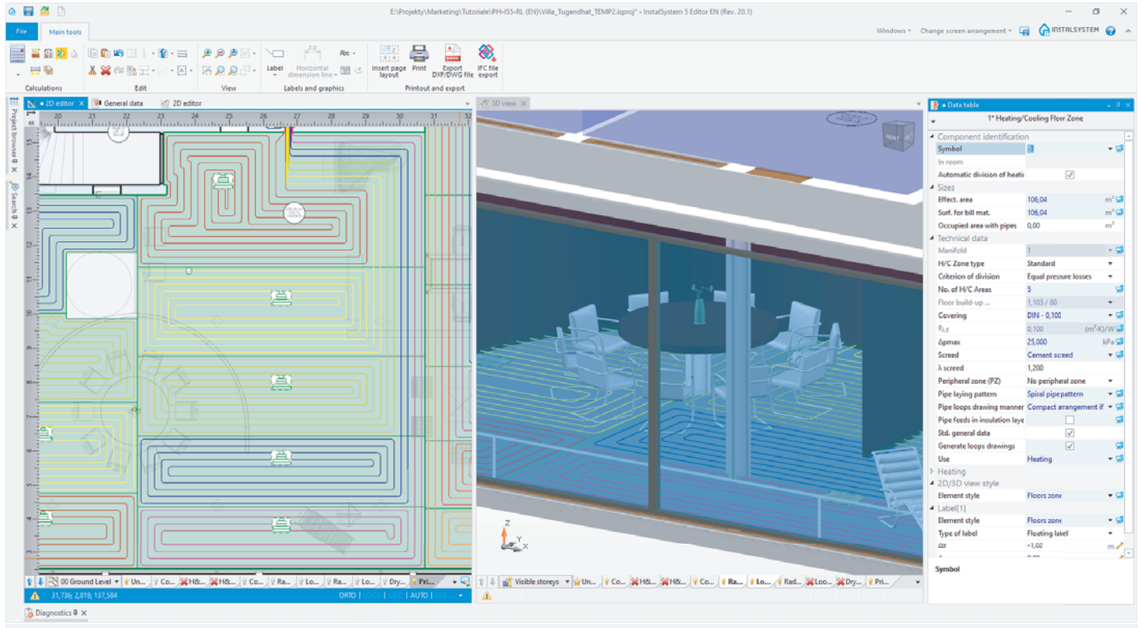
For indicated route (or routes), *InstalSystem 5* package automatically generates pipe feeds in required number, arranged with appropriate spacing. Any corrections in the project, resulting in a change in the required number of pipe feeds or the distance between them, again generate the correct layout of pipe feeds.

Arrangement of ceiling panels / suspended radiators

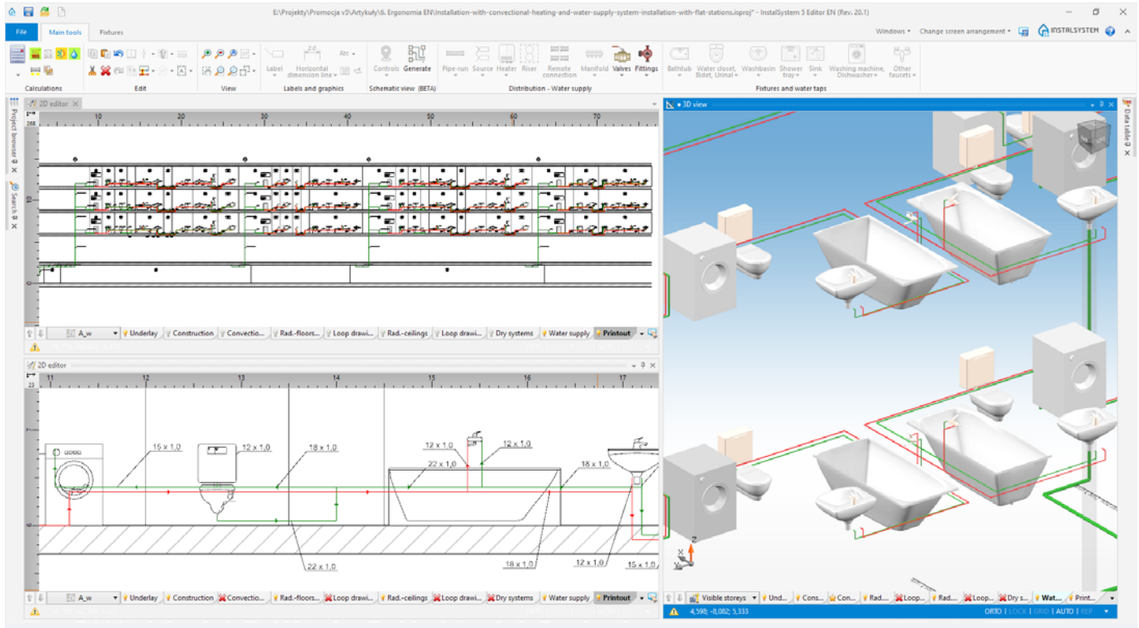
When planning the placement of ceiling



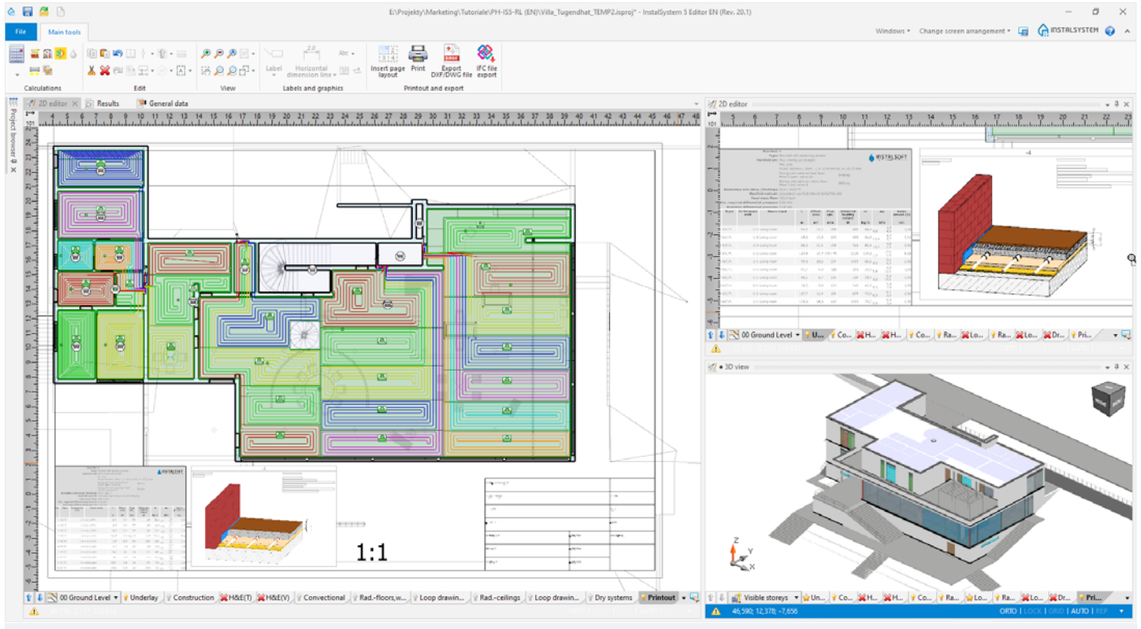
4 Automatically arranged ceiling steel radiators in a warehouse



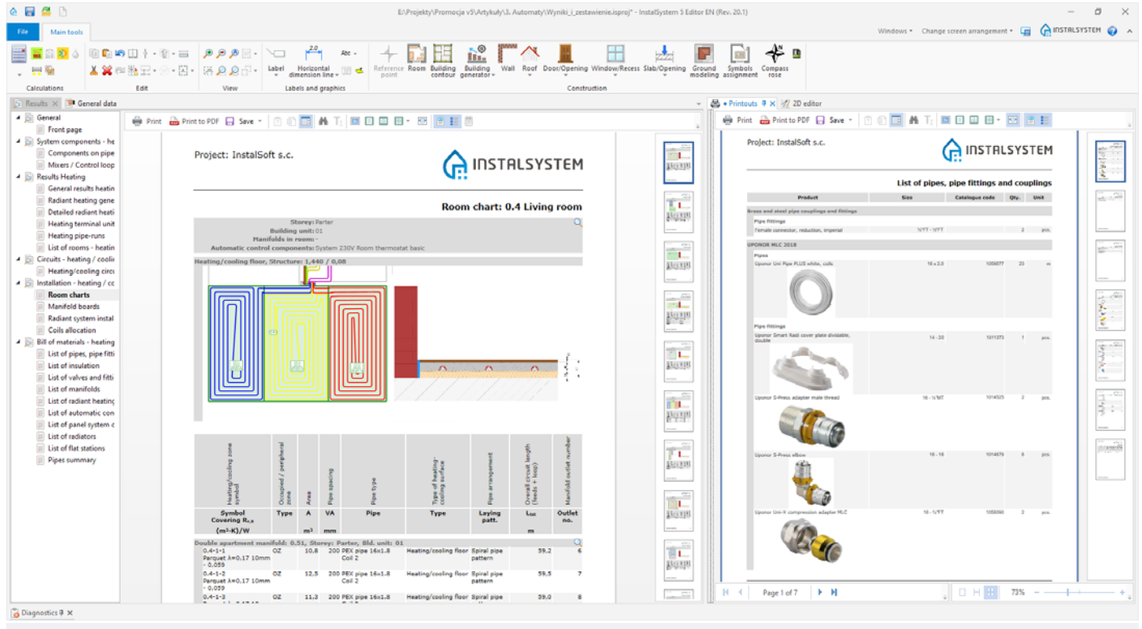
3 Heating&cooling zone automatically divided into circuits with loops and pipe feeds drawings



5 Example of automatically generated schematic view of tap water installation



6 Example plan view with additional graphic elements



7 Room chart printout preview and list of Uponor MLC elements

panels, a number of factors should be taken into account, including: structural elements or equipment of the facility (columns, skylights, etc.), zones occupied by people, suspension height, available panel dimensions and installation parameters. The ‚Zone of panels' tool allows you to quickly fill the entire or indicated area with the ceiling panels or suspended radiators, basing on the manufacturer's (saved in program catalogues) or user guidelines.

Schematic views

After creating an installation model using plan views and 3D view, schematic view of the installation can be obtained in just a few (literally!) clicks. By inserting starting point (or points) and optionally end point (or points) anywhere in the installation, the designer has full control over the number and scope of presented schematic views. Using available tools you can also easily control the detail of the information presented on schematic view.

Graphical documentation

Starting from drawings of pipe loops in floor and ceiling heating/cooling systems, to additional graphic information, such as labels, cross-sections of surface radiators, manifold charts or drawing charts – all these elements of drawing documentation are generated fully automatically, with the possibility of modifying the style and scope of presented information.

Calculations and bill of materials

Click on one button launches comprehensive calculations. The scope of performed calculations depends on the number of modules available in the configuration of the package. The most comprehensive variant currently includes thermal calculations of the building as well as thermal and hydraulic calculations of the designed heating, cooling and tap water supply installations (module for sewage installations is under preparation and shall be released in 2021). Comprehensive material lists are also generated and contain all elements necessary to build the installation, from specific manufacturers' or neutral catalogues.

Summary

Automation of many design stages contributed to radical reduction of time required on different stages of project implementation. However, what is most important and most distinctive *InstalSystem 5* on the market is the ease and speed of correcting design assumptions, which automatically result into final effect. Work has become more effective and enjoyable.

More detailed information about the program's functions can be found on our YouTube channel and in *HelpSystem* platform. Please download free trial version and share your opinion on the program and expectations about its further development

Give me 5

INSTALSYSTEM 5

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