

## OPTIMIZE YOUR WORKFLOW FOR AUTOCAD PLANT 3D







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### INTRODUCTION

Plant design and engineering is a very consulting-intensive industrial sector. In order to realize consulting projects, a high level of know-how on individual work processes and regional and international requirements is very important. Over the years, customer requirements on the efficiency of their processes, especially in plant engineering, have steadily increased. Requirements that can only be partially realized with standard software. Against this background, auxalia has developed its own tools, the auxalia PlantTools, to be able to use Autodesk Plant Solutions products even more efficiently. In addition to that the own development department offers the possibility to implement individual solutions according to the customer's requests.

auxalia PlantTools are a set of applications and utilities specifically designed to enhance the workflow and functionality of AutoCAD Plant 3D and have been developed from the real life needs of plant customers from a variety of plant industries. In addition to developing high end applications and utilities for Autodesk's Plant Solutions, auxalia's full solution oriented approach is geared to ensure the successful adoption of AutoCAD Plant 3D. auxalia's experts possess the knowledge and experience to get your organization maximizing the returns on your plant design investment more than 35 years experience in plant engineering.

OPTIMIZATION OF PROCESS-CONTROLLED PLANT DESIGN AND ENGINEERING

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### ACCESS TO DATA WITHOUT CAD

auxalia PlantDataManager, a part of the PlantTools, was developed so that customers could have access to plant project data without having AutoCAD Plant 3D installed on their computers¹. Users of PlantDataManager can modify plant project data or add non-placed objects and data and link those to external databases to plant project objects or calculate data.

PlantDataManager is a stand-alone application that enables access to and control of plant project data from standard desktop and laptop computers that do not have AutoCAD plant products installed.

With PlantDataManager, project engineers, process engineers, instrumentation engineers, and designers can access plant project data in an intuitive tabular user interface. PlantDataManager allows multiple users to edit project data even while the drawings containing the data are open in production.

**PlantDataManager** significantly extends the native data handling capabilities of AutoCAD Plant 3D, providing increased flexibility and functionality of your plant design workflows.

Not-Placed Objects (NPOs) are project elements that exist in the system without a graphical representation in the drawings. They serve various purposes, such as predefining components before the drawing phase, assisting designers during drawing creation, or enriching project data with external or maintenance-related information. NPOs ensure that all relevant elements - whether placed in drawings or not - are included in reports and data lists, providing a comprehensive view of the project. This feature supports better planning, integration of non-visual components, and enhanced project documentation.

\_ | D | X File Link Calculations Properties Palette Help Find ACAD P&ID Line History Project Desig... Flow ... 😓 C... 🖺 Ou... 🖺 W... Insid... Pipe Are... Operati... PET\_LineAnnota - () to 00 ( PlantTools 2019 Primary Line Segment Project Name: PlantTools 2019 Project Version: 20 84,11 114,3 3,6 107,1 0,00900... Tag 0,62 100-?-BA-12 Project Description: 10 59,47 76,1 2,9 70,3 0,00388... 0,72 65-10HC01-Spec 10HC01 0,8 55 155.94 168.3 4.5 159.3 0.01993. Views P&ID Classes O P3D Classes Design Flow Speed (m/s) Version Date & Time User 06.05.2021 13... db Flow Rate (m³/h) 28.04.2021 13... db Calculated Size (mm) 03.12.2020 16... db Pipe Line Segments V 9 21.10.2020 13... cb Wall Thickness (mm) Signal Line Segments V 8 13.08.2020 10... do Inside Diameter (mm) Location V 7 13.08.2020 10... do Pipe Area (m²) V 6 13.08.2020 10... cb 3 0815-004-PID-11 v0 3 0815-005-PID-10\_v0\_rA **-** -0815-006-PID-10\_v1 Service 0,1 150-10HC01 3 0815-008-PID-10\_v0\_rB 20 84,11 114,3 3,6 107,1 0,00900. 0,62 100-10HC01 3 0815-009-PID-10 € 20 84,11 114,3 3,6 107,1 0,00900. 0,62 100-10HC01 0815-009-PID-10\_v1 7-7-7-7 0815-010-PID-10\_v2 7-7-7-7 © 0815-011-PID-10\_v1 HH HH + Record 4 of 37 + HH +

The image below shows data changes in yellow and a history of previous changes in the middle.



With **PlantDataManger** you can export and import your project data from and to PlantDataManager as well to be more flexible when editing data.

### **Target group**



- Project Managers
- Project Engineers
- P&ID Designers
- 3D Designers

### **Important functions**



- Edit your project data more conveniently
- Edit your project data without AutoCAD Plant 3D
- Combine your project data with other data sources
- Export/import your project data to Excel for external editing
- Create data without symbols (Not-Placed Objects)
- Use PlantDataManager with your Autodesk Construction Cloud projects

au:xalia PlantTools meet AutoCAD Plant 3D

<sup>&</sup>lt;sup>1</sup> Collaboration Projects require a license of AutoCAD Plant 3D 2023 or highter

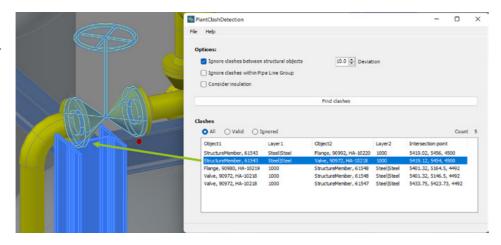


### INNOVATIV SOLUTIONS FOR EVERY TASK

**auxalia PlantExpressTools**, a part of the PlantTools, is a must-have set of utilities to assist Autodesk plant project administrators in common tasks not easily accomplished in AutoCAD Plant 3D.

### **PlantClashDetection**

can detect clashes between Auto-CAD Plant 3D objects, AutoCAD solids, blocks and xrefs.

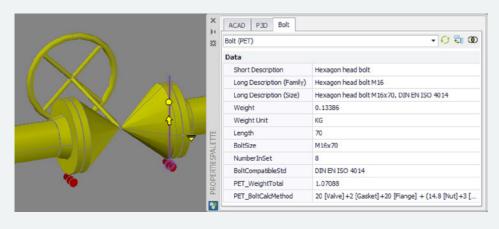


### **Assemblies**

Group your P&ID symbols & Lines into logical groups. Assemblies can be stacked or distributed over multiple drawings.

### **PlantProjectCreate**

Create project through other applications including creating initial drawings. Project and drawing properties can also be set automatically.



### **Bolt Calculation**

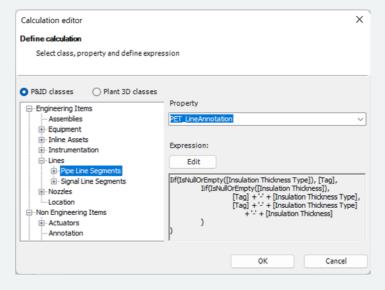
Replaces the standard BoltSets and calculates exact bolt lengths and weights either as bolt sets or single bolt parts.

### **Ex-/Import of Project Setup**

Export and import your classes, properties, and symbol properties to create, delete and change them.

### **Update Line Annotation**

Checks and updates annotations of your line segments in P&ID, in case line annotations are not linked to their line segments anymore.



### **Calculated Properties**

Calculates property values comparable to defining an Excel formula. Often used to concatenate or split other property values.

### Coordinates

Calculates X-, Y-, (Z-) values of a user-definable grid in your P&ID drawings.

### Copy/Rename project

Rename your project or copy your project (with or without drawings) and all your files in your project.

### **Ex-/Import of Selection List**

Export and import your project selection lists for faster project setup.



**PlantExpressTools** offers a large set of new functionality for AutoCAD Plant 3D and allow faster changes for your project setup.

### Target group



- P&ID Designers
- 3D Designers
- Project Managers
- Project Engineers
- CAD Managers

### **Important functions**



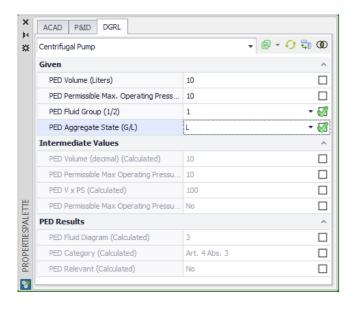
- Use a wide range of new CAD functions to speed up your design work
- Use new and improved user interfaces like PropertiesPalette or SymbolsPalette
- Additional Update functions to keep your drawings current
- Speed up project setup tasks

au:xalia PlantTools meet AutoCAD Plant 3D



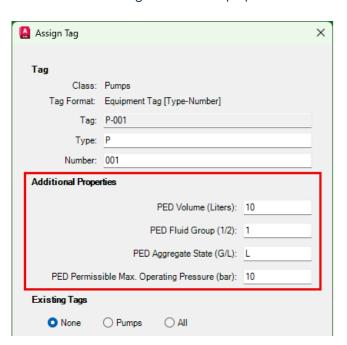
### Copy & Paste

The Copy & Paste function enables users to duplicte values from one line or symbol and apply them to multiple other lines or symbols, even across different drawings. This feature streamlines data entry, ensures consistency, and improves efficiency when working with repetitive elements in a project.



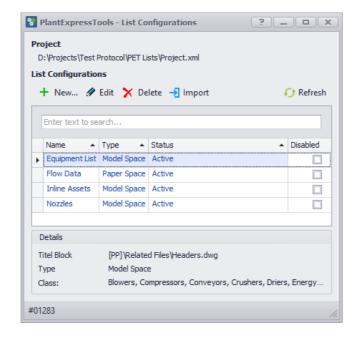
### **Extended Assign Tag**

See more properties in the Assign Tags dialog to make it more convenient filling our additional properties.



### **Create Lists**

Generates lists in your P&ID drawing. For example, like equipment lists.



### **Rule-based Block Insert**

Automatically inserts P&ID assemblies based on userdefinable rules. Most useful when you are working with standardized assemblies.

### In-Place Edit

The In-Place Edit function allows you to modify P&ID assemblies, directly within the drawing without opening the AutoCAD Block Editor. This enables you to make changes while maintaining full visibility of the surrounding elements, ensuring better context and accuracy during editing.



### **Tag/Acquisition Update**

Checks and updates your Tags and Acquisitions in case of changes in project setup.

### From/To

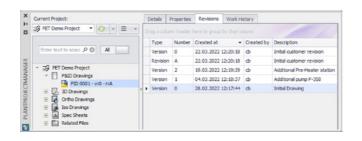
Creates additional From/To data for your Line Segments and Line Groups.

### **Update Selection Lists**

Keeps your Selection Lists up to date by using external sources like databases or Excel.

### **Plant Project Manager**

A new user interface with new functionality. You can define file name formats and create version or revisions of drawings.

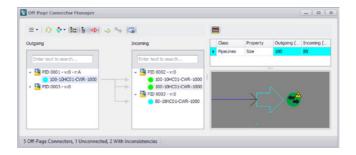


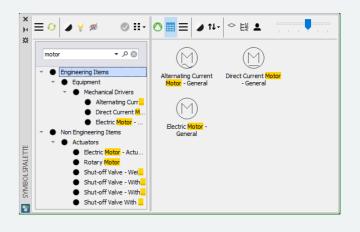
### **Change Log**

Logs every change in any property value. The history of changes can either be seen and searched in the PropertiesPalette or PlantDataManager.

### **Off-Page Connector Manager**

The Off-Page Connector Manager is a completely new way of managing and connecting Off-Page Connectors in a project.





### **Symbols Palette**

Provides a new user interface when inserting your symbols and lines by showing only the Symbols/Lines you have in your current project.

### **Check Nozzle Size**

Compares and notifies you if nozzle and pipe line segment sizes don't match.

### **DWG Export**

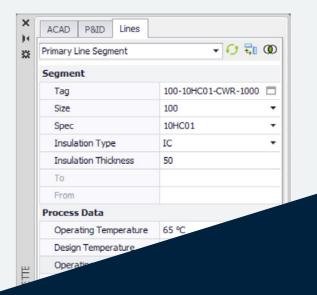
Exports your P&ID and 3D drawings in a batch process as standard AutoCAD objects.

### Renumbering

The Renumbering function allows you to renumber properties of your symbols. This is often used when the Tags should be renumbered.

### **Properties Palette**

A new user interface to manage your properties. You can create tabs, groups, and select the properties in the order you need them.





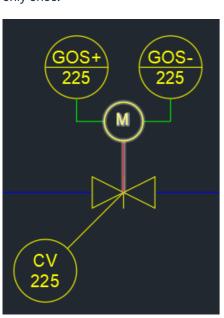
### AND OPTIMIZE DATA FLOW

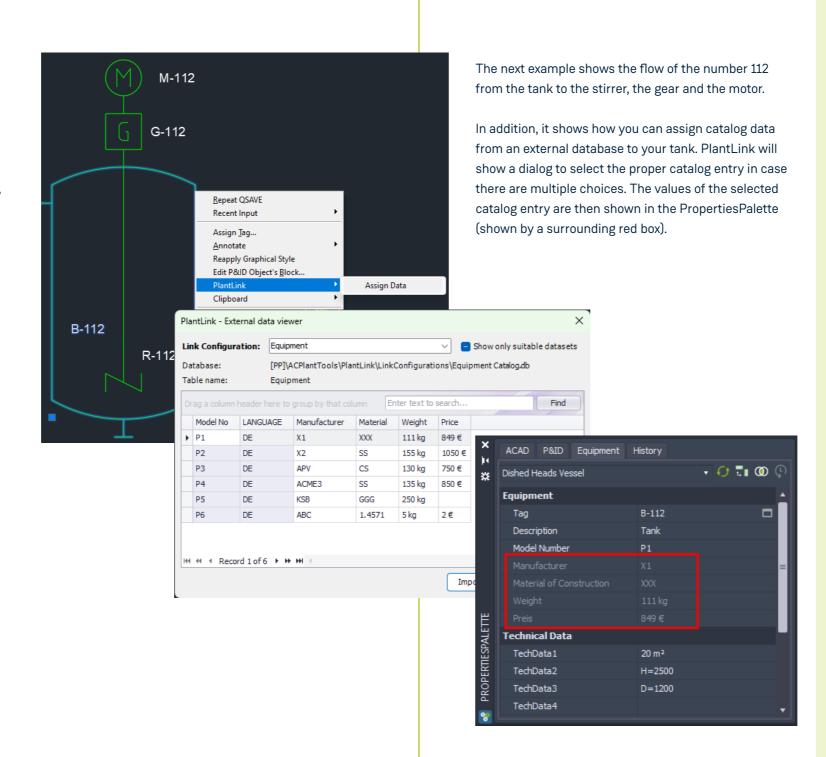
auxalia PlantLink, extends the capabilities of your project by allowing to link various external data to your AutoCAD Plant 3D drawing objects. PlantLink can also improve the dataflow within your P&ID which cannot be accomblished by acquisition rules.

PlantLink can also control AutoCAD properties like layer, color, or HyperLink.

If you want to fill your drawing properties based on an external data source (e.g. to fill out your title block data) you can use PlantLink for this as well.

The following picture on the left shows how the Loop Number flows from the control valve to the actuator and to the limit switches. This automatism avoids errors during data entry because the number will be typed in only once.







**PlantLink** significantly extends the use of data with your plant project data by enabling linking to external and internal data sources.

### Target group



- Project Managers
- CAD Managers
- Project Engineers

### **Important functions**



- Combine your project data with other data sources
- Improve data flow within P&IDs
- Control Layer, Color and more



### ELEVATE YOUR INSIGHTS: COMPARE REPORTS ACROSS REVISIONS

auxalia PlantReporter, a part of the PlantTools, is a tool for the creation of formatted reports, data/spec sheets, and data exports from AutoCAD Plant 3D. Reports can be created for a group of multiple projects too. PlantReporter is simple and intuitive to configure and provides output at the push of a button for any project team member. Because PlantReporter is stand-alone from the Autodesk plant applications<sup>1</sup>, any user with just PlantReporter can access up-to-the-second project data output from a standardgrade computer.

PlantReporter allows you to create versions and revisions of reports and compare them afterwards. All versions/ revisions of a report/list you ever created are available at all time. You can compare any version/revision against each other to track and manage changes in your project's life cycle.

Of course, PlantReporter can incorporate the so called Not-Placed-Objects (NPOs) into your report which can be created through PlantDataManager and PlantSpec-Driven. If you combine PlantReporter with the functionalities of PlantLink and PlantDataManager, you will have a potent and complete engineering solution. Information from your project P&ID or 3D model combined with the information from external databases allows you to create and generate accurate reports at any given moment in a project. PlantReporter is easy to use and allows you to present and share your project data in any way you need.

### **Equipmentlist**

Project: PlantTools 2019
Comparison: Ver: 10 vs. Ver: 12



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**PlantReporter** extends and enhances reporting capabilities by both enabling reporting of plant project data without Autodesk products and by providing additional configurability.

### Target group

PlantTools meet



- Project Managers
- Project Engineers

### Important functions



- Create lists and data sheets without AutoCAD Plant 3D¹
- Create revisions and compare
- Include data not in P&ID drawings
- Use PlantReporter with your Autodesk Construction Cloud projects

<sup>&</sup>lt;sup>1</sup>Collaboration Projects require a license of AutoCAD Plant 3D 2023 or highter



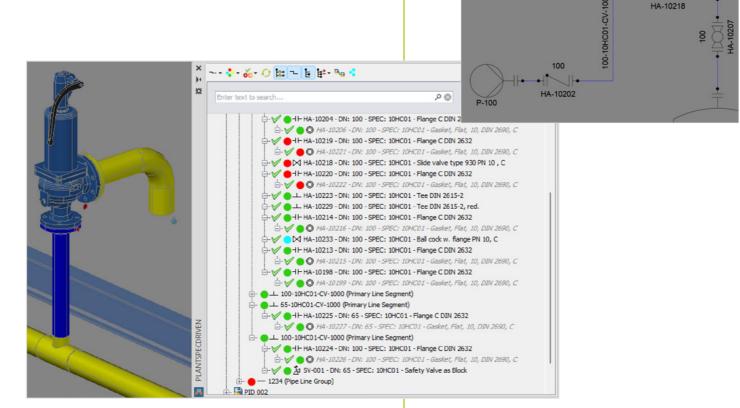
## FROM P&ID TO 3D: SPEC-DRIVEN DESIGN AND CONNECTIVITY

auxalia PlantSpecDriven, a part of the PlantTools, lifts the workflow from P&ID to 3D to a new level unknown to AutoCAD Plant 3D users. It not only speeds up the transition from P&ID to 3D but checks for inconsistencies along the way keeping you informed about the status of your project.

PlantSpecDriven lets you assign the parts from pipe specs to your valves and fittings. It will filter your pipe specs for suitable parts based on spec, size, and other filter criteria.

PlantSpecDriven can also substitute your P&ID symbol based on the part you selected from your pipe spec. Flanges and other fittings can be automatically inserted to the valve and inline instruments. It even goes so far, as to insert parts like gasket or stub ends as invisible parts to your P&ID. Which can be used when creating a Bill of Material from your P&ID drawing.

When transitioning your P&ID drawing to 3D PlantSpec-Driven will show you the status of your transition in a tree structure. This tree also shows any inconsistencies between your P&ID and 3D drawings.





**PlantSpecDriven** allows you to assign catalog data from your AutoCAD Plant 3D specs to your P&ID Symbols.

### **Target group**



- P&ID Designers
- 3D Designers
- Project Managers

### **Important functions**



- Use parts from your Pipe Specs for your P&ID Valves and Fittings
- Transition your P&IDs to 3D by reusing your pipe Spec data from P&ID
- See the progress of the transition from P&ID drawings to 3D design
- Create Bill of Materials from P&ID drawings



### SYNCHRONIZE CONFIGURATIONS EFFORTLESSLY

Because plant customers have varied requirements for their design solutions, Autodesk developed highly configurable environments for AutoCAD Plant 3D.

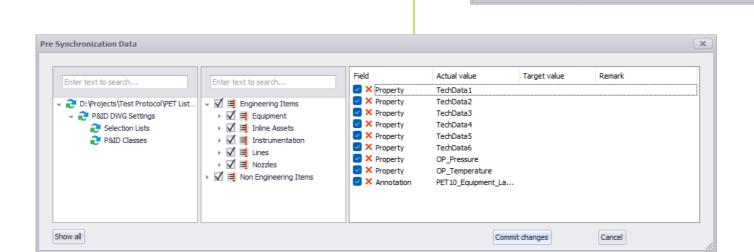
Most companies will create a default configuration, or reference project, to conform to specific internal and/ or external standards. auxalia PlantSync, a part of the PlantTools, enables your organization to easily synchronize configurations between your AutoCAD Plant 3D projects. Once your project administrators have spent the time to develop reference project(s) for your organization, managing even minor changes to base reference projects can be difficult.

PlantSync makes the job of managing configuration modifications and updates fast and simple through an intuitive user interface.

PlantSync enables project administrators to synchronize projects easily by first analyzing the differences between projects. The project administrator then has the option to synchronize individual differences or all differences in a project.

PlantSync can synchronize one project to a source project or multiple projects to a source project.

On the image below, you see the main user interface with the selected source project and multiple target projects. Next the Pre-Synchronization is performed to check for differences. In the lower right image, you see the differences where you still can choose what you want to have synchronized.



eliminary version 8.0.1.4284 installed



**PlantSync** enables project administrators to maintain standards in a single "template project" and update one or many live projects quickly and easily.

# Target group • CAD Managers

### Important functions



- Transfer individual parts of your configuration to other projects
- Check for differences between projects

au:xalia PlantTools meet AutoCAD Plant 3D



The auxalia WESTCAM Group combines the strengths of three leading technology providers: auxalia, a specialist in digital solutions for the construction industry, WESTCAM, an expert in product design, manufacturing and quality assurance, and ICN, a provider of mechanical engineering and construction software. Together, they offer a comprehensive portfolio of software, services and hardware along the entire life cycle of projects and products.

With headquarters in Hamburg, Mils/Tyrol and ,s-Hertogenbosch and a team of around 180 experts, the group has a strong presence in Germany, Austria, Switzerland, the Netherlands, Italy, the Czech Republic and Slovakia. It stands for innovation, sustainability and personal customer service. By pooling its expertise, the auxalia WESTCAM Group creates holistic digital platform solutions that are up to the challenges of the future.

### YOUR CONSULTANTS FOR SUCCESSFUL PLANT DESIGN AND CONSTRUCTION

We offer a comprehensive consulting, training and technology portfolio that enables you to make your work processes in plant design more efficient. Take advantage of our experience and expertise in plant engineering and make an appointment for an initial individual and non-binding consultation.









"PlantTools help our firm maximize the potential of AutoCAD P&ID/Plant3D. With their data-extension, reporting, and automation capabilities, nearly any new idea or concept can be realized.

PlantTools personalized customer support is also second to none."

CRAIG WOOD
CRB CONSULTANTS, KANSAS CITY, USA

"Our corporate claim highlights our ability to translate state-of-the-art technology into profitable plants, laying the groundwork for our clients' commercial success. Due to our high requirements CADSTUDIO developed a new PlantTool especially for our company: Plant-SpecDriven!

We also use all other PlantTools in a very efficient way. We registered 25 % time-saving in our 3D piping and the error rate dropped to a minimum. We are very satisfied with the PlantTools, life is a lot easier in our daily work."

GERHARD KAIPER
SENIOR PROJECT ENGINEER
AND CAD-SYSTEM-ADMINISTRATOR
VOGELBUSCH BIOCOMMODITIES, AUSTRIA

"We love Plantlink because of it's unlimited possibilities to link to external and internal data sources. We highly missed this option in our daily work till we detected PlantLink. CADSTUDIO provides an awesome support and constantly implements new functionality into the PlantTools. auxalia also responds quickly and flexibly to client requests."

HERMANN SEMLITSCH ENERGY GROUP CAD ADMINISTRATOR, OVIVO AQUA AUSTRIA GMBH

"I'm using the PlantTools (mainly the Plant ExpressTools and PlantSync) because it is so easy to make selection lists and to get changes into existing projects that have to be changed with a short down time. Just create a selection list and import it into P&ID or Plant3D within seconds.

Changes of settings and symbols can be done outside a live project and easy synchronised with the desired projects. The downtime of the projects is just seconds and multiple destination projects are possible. I'm saving a lot of time, and time is money!"

DINANT WEENK
PROJECT ENGINEER AND CONSULTANT
WEENK ENGINEERING, THE NETHERLANDS









