



CLOUDWORX® FOR SMARTPLANT® ISOMETRICS

Automated Piping Isometrics from Point Clouds

SmartPlant® Isometrics is an easy-to-use yet powerful Microsoft® Windows®-based, specification-driven, pipe-sketching application for the as-built plant. Based on ISOGEN® technology, SmartPlant Isometrics is the first choice of piping engineers and designers for producing industry-standard piping isometric drawings (isos) quickly and cost-effectively.

The CloudWorx® add-on uses the Leica Geosystems HDS Cyclone™ software platform to provide access to point cloud data inside SmartPlant Isometrics. This powerful combination enables you to perform a plant walkdown without leaving the comfort and safety of your office!

PIPING DOCUMENTATION

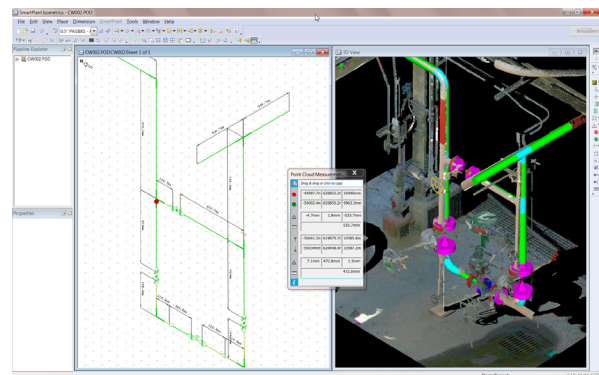
CloudWorx for SmartPlant Isometrics helps you quickly create piping isometric documents using ISOGEN. The easily understood sketching functionality and automated drawing creation means that users do not need CAD or 3D modeling skills and enables experienced piping designers to be very productive in creating as-built piping data. Because the piping configuration is defined through a sketch, and measurements are constrained to lie on principal axes, a practical, fabrication-ready drawing is easily produced.

Even in situations where no documentation exists, new piping isometric documents can be created quickly and easily “as-needed” during the day-to-day operation of the plant – for example, in planning shutdowns or regular maintenance, or when systems change and a new inspection regime needs to be documented.

Plus, the availability of a point cloud means that engineering teams or sub-contractors can be given access to all of the data they need without having to visit the facility – enhancing safety, cutting schedules, and reducing cost.

3D MODEL PIPING DATA REUSE

The software is complementary to 3D model-based solutions like Intergraph’s Smart 3D, PDS®, or CADWorx®, since the same ISOGEN software is used to produce the deliverable. Results are consistent and the underlying data (regardless of its source) can be reused, for example, to create documentation for inspection of piping systems, including the automated, rule-based placement of inspection location points.



SMARTPLANT ENTERPRISE FOR OWNER OPERATORS

When used in conjunction with SmartPlant Enterprise for Owner Operators (SPO), the comprehensive, as-built documentation can help ensure the integrity of the piping asset. SPO adds change management and audit capability when piping documents are published to the plant engineering data store and maintained through time.

The new SPO TruView integration enables the use of photo-realistic views of the plant to access plant data. CloudWorx for SmartPlant Isometrics can use the same point cloud data to create “as needed, as-built” piping documentation for plant operations, planning, or inspections.

POINT CLOUD DATA

CloudWorx for SmartPlant Isometrics is unique in supporting the direct integration of point cloud data with a piping isometric document and in enabling the user to define the piping configuration – the orientation of the piping and the content of the system – separately from its dimensions. The result is overlaid graphically on the point cloud. Powerful editing tools make it straightforward to build a complete piping model from a combination of inputs, including:

- Fitting.
- Measurement.
- Direct input.
- Dynamic adjustment of the location of pipe fittings and whole sections of pipe against the point cloud.

The emphasis is on producing a practical, usable document – suitable for different purposes such as planning, inspection, and fabrication.

The industry-leading Leica software platform provides point cloud services. This means that SmartPlant Isometrics users can immediately benefit from years of development and expertise in point cloud display and manipulation. Point cloud information from almost any source can be used.

DELIVERABLES

CloudWorx for SmartPlant Isometrics can be learned quickly and is easy to use because no CAD or 3D modeling skills are required. The solution produces industry-standard deliverables which are consistent with those produced by plant design systems that also use ISOGEN to generate their deliverables.

TYPICAL WORKFLOWS

The piping isometric drawing is often used to document the physical piping system, because it provides a convenient summary of the topology of the pipe and its contents. It can be used for many purposes, such as:

- Documenting corrosion monitoring points on piping systems.
- Planning for maintenance or shutdowns.
- Performing small, site-based, piping-focused projects.

In the past, this often meant that duplicate documents had to be created for each requirement.

Using Intergraph SmartPlant Enterprise technology, this overhead and inefficient work practice can be eliminated. A single version of each piping document can be kept “live,” with a comprehensive audit trail and deliverables for any plant-based task produced on demand.

In combination with SmartPlant P&ID, the isometric can be compared with the other key piping document – the P&ID. This helps you maintain a consistent, synchronized, physical, and logical piping engineering design basis.

AS-BUILT COMPARISON

Because ISOGEN is used in nearly every plant engineering project, Issued for Construction (IFC) piping data is often available in the form of IDF or PCF data files. Using CloudWorx for SmartPlant Isometrics, these files can be visualized on top of the point cloud and, if necessary, modified to match reality. This workflow can be the same regardless of the origin of the piping data – SmartPlant 3D, CADWorx, PDS, or many third-party systems.

INTEGRATIONS

Many plant-based engineering teams and their piping contractors are small and lack the IT infrastructure that a large EPC or construction company would possess. CloudWorx for SmartPlant Isometrics is lightweight and easy to install, manage, and use. It is part of Intergraph's SmartPlant Enterprise, which enables users to benefit from integration with other powerful solutions, such as SmartPlant P&ID (via SmartPlant P&ID Design Validation), SmartPlant 3D, and SmartPlant Spoolgen®.

ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph's industry-specific software to organize vast amounts of data to make processes and infrastructure better, safer and smarter. The company's software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, operation and data management of plants, ships and offshore

facilities. Intergraph SG&I provides geospatially powered solutions, including ERDAS technologies, to the public safety and security, defense and intelligence, government, transportation, photogrammetry, and utilities and communications industries. Intergraph Government Solutions (IGS) is a wholly owned subsidiary of Intergraph Corporation responsible for the SG&I U.S. federal business.

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