



CLOUDWORX™ FOR INTERGRAPH SMART® ISOMETRICS

AUTOMATED PIPING ISOMETRICS FROM POINT CLOUDS

Intergraph Smart® Isometrics from Hexagon PPM is an easy-to-use yet powerful specification-driven, pipe-sketching application for the as-built plant. Based on Isogen®, Smart Isometrics produces industry-standard piping isometric drawings (isos) quickly and cost-effectively. The CloudWorx™ add-on uses the Leica Geosystems HDS Cyclone™ software platform to display point cloud data inside Smart Isometrics. This powerful combination enables you to perform a plant walkdown without leaving your office!

Piping Documentation

CloudWorx for Intergraph Smart Isometrics helps you quickly create piping isometrics 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.

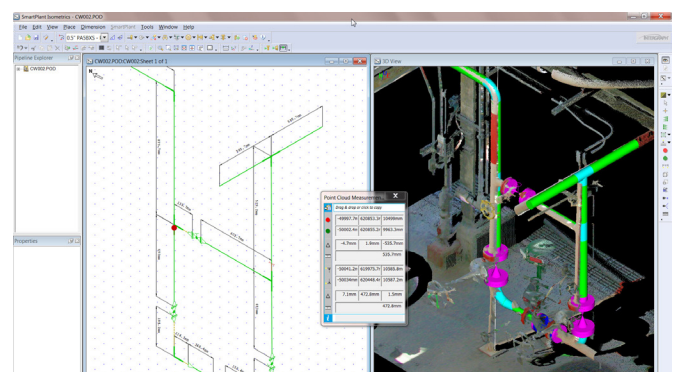
Even when no documentation exists, new isometrics can be created quickly and easily “as-needed” during day-to-day operations – for example, planning shutdowns or regular maintenance.

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.

As piping data changes, Smart Isometrics stores all changes you make in its integrated database. An API allows you to build integrations with your in-house applications that need piping data.

3D Model Piping Data Reuse

The software is complementary to 3D model-based solutions like Intergraph 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.



Point Cloud Data

CloudWorx for Intergraph Smart 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.

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 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 Intergraph Smart 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 Smart 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 – Smart 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 Smart Isometrics is lightweight and easy to install, manage, and use. It is part of SmartPlant Enterprise, which enables users to benefit from integration with other powerful solutions, such as Smart P&ID (via Smart P&ID Design Validation), Smart 3D, and Intergraph Spoolgen®.

ABOUT HEXAGON

Hexagon is a global leader in digital solutions that create Autonomous Connected Ecosystems (ACE). Our industry-specific solutions create smart digital realities that improve productivity and quality across manufacturing, infrastructure, safety and mobility applications.

Hexagon's PPM division empowers its clients to transform unstructured information into a smart digital asset to visualize, build and manage structures and facilities of all complexities, ensuring safe and efficient operation throughout the entire lifecycle.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 3.8bn EUR. Learn more at hexagon.com and follow us @HexagonAB.