Equipment & Systems Engineering
CATIA - Piping & Instrumentation Diagrams

Provide a complete set of tools to create, modify, analyze and document the logical design of piping networks, equipment and their associated instrument loops, ...

Product overview

CATIA - Piping & Instrumentation Diagrams 2 (PID) provides customers with a complete set of tools to create and manage logical diagrams of piping systems using industry standard conventions, terminology, and practices. The tools are focused on creating intelligent diagrams that capture the design standard and connectivity (i.e. equipment to equipment) of pipe routes. This intelligent diagram capability enables users to create and validate their 3D piping designs more productively. Additionally, the captured intelligence in the diagram can be reused for downstream during the design processes thus providing further benefits by reusing data, automating part selection from catalogs and providing a functional check that the 3D design complies with the 2D logical specification. CATIA - Piping & Instrumentation Diagrams 2 (PID) provides general diagramming tools to place and locate equipment, and to define and manage piping line definition. In addition, instrument control loops on pipelines can be defined, created and managed. PID functions provided methods to create intelligent annotations. They can be used to query design information, and to generate custom reports. All these design tools employ a highly intuitive and productive user interface that allows users to, modify, and manage their designs quickly and easily. CATIA - Piping & Instrumentation Diagrams 2 (PID) allows when integrated with the CATIA Piping Design 2 (PIP) product automatic parts selection and placement as well as check resulting designs for compliance with the PID diagram. Pipe lines can be re-specified in PID and the 3D Piping Design updated. The overall integration between the 2D and 3D products provides tremendous benefit to a customer's design process because it ensures design quality, facilitates update and significantly improves user productivity.

Product Highlights

- Enables integration between 2D P&ID diagrams and 3D detailed design to create ensure consistent designs
- Creation and management of intelligent piping lines and associated instrumentation and control loops
- Easy and fast definition and placement of equipment, piping and instrumentation components
- Creation and management of intelligent annotations
- Generation of reports based on attributes and piping line specifications (e.g., BOM)
- Creation of intelligent objects using
Product Key Customers Benefits

Integration between 2D diagrams and 3D detailed designs... CATIA - Piping and Instrumentation Diagrams - 2 product is integrated with the 3D Piping Design product. When Piping Design is used with P&ID, piping parts are automatically selected from project catalogs based on specification and function. The benefit is reduced errors in the final Piping Design. The high level of automation also provides benefits by ensuring the quality of the design.

Creation and management of intelligent piping lines... Designers can create piping lines with standard industry attribute information. Additionally, users define their own project-specific attributes to be included on piping line definitions. Once a piping line is defined, it can be shared across multiple P&ID documents to ensure consistency in the design. As components are placed and piping functions are created in the diagram, they automatically become members of a piping line; conversely, the attributes of the pipe line definition are propagated to these objects. Pipe line definitions can be imported from either an off-site design team member or legacy database to initialize the first layout.

Creation and management of instrumentation and control loops... Users can create instrumentation and control (I&C) loops with standard industry attribute information. In addition, users define their own attributes to be included on I&C loops. Once an I&C Loop is defined, it can be shared across multiple P&ID documents to ensure consistency of the design. As components and signal functions are created in the diagram, they will be automatically included in the appropriate I&C loop and appropriate attribute information will be propagated to these objects.

Definition and placement of equipment... A catalog facility is provided to allow users to quickly and easily place equipment objects from a catalog into their design. In addition, user defined project-specific equipment can be created and placed locally in the diagram design.

Placement and/or insertion of intelligent piping components and instrumentation components... Piping and instrumentation components can be placed from a catalog using a highly interactive user interface. This user interface includes dynamic design rule checking in order to ensure proper placement of the piping and instrumentation components. The placement facility allows placement into free space and insertion into piping line routes or I&C signals. As components are placed, they automatically inherit information from the appropriate piping line or I&C loop. In addition to placing an object from a catalog, the placement utility allows the user to place new copies of existing components from their design. Using the P&ID product with its built-in intelligence as a driver for specification driven 3D pipe/part placement, the user achieves true P&ID to 3D model integration.

Line routing and connectivity management... Users can route lines using a highly interactive user interface including dynamic design rule checking to ensure compatible connections. The routing facility provides the user with multiple routing modes including single step, horizontal/vertical, horizontal/vertical/45, and point to point routing modes.

Placement and management of off sheet connectors... Users can place off or on sheet connectors to define logical connections within or across documents. Once defined, these off sheets can be ‘queried’ to generate a list of associated elements or documents.

Creation and management of intelligent annotations... Users can create fully associative annotations as well as standard...
annotations within a diagram. These annotations may be linked to properties of objects and automatically updated based on property modifications or diagram changes. Single annotations may include standard text and multiple linked attribute values. Annotation templates with attribute link information are saved and placed in an annotation catalog from where they can be placed in the diagram as needed. Also, dynamic annotations with attribute links may be associated to catalog components. These dynamic annotations are then automatically updated upon component placement.

Generation of object IDs based on user-defined rules... Define ID rules (schema) to specify their company specific naming formats and conventions per objects. In addition, ID rules can be assigned to individual classes of objects. When objects are created in the design document, their ID’s will be generated automatically using the user defined ID rules.

Modification of intelligent diagrams... Designers are provided with a set of tools to effectively manage the modification of their design. Examples include a highly intuitive network stretch capability, query and modification of object properties, flow direction management, connect/disconnect capabilities, and deletion with automatic line repair, plus the ability to scale connected components and have the network adjust automatically. In addition, knowledgeware design rules can be used to create and/or manage modifications of the design. To illustrate this, sample rules are provided that modify the graphic representation of objects based on changes to the attribute values.

Query and Analysis... Users can perform a wide variety of queries and/or analysis against their design. Examples include searching for objects based on class, querying/analyzing connectivity, and querying of flow information. The designer can easily query object properties as well as physical properties and 2D/3D integration status. Additionally, the user now has the option of displaying the specification tree organized by discipline. A design check facility, based on knowledgeware enables the user to run design checks against P&ID drawing to identify potential errors or inconsistency in the design. Design rules can be assigned to individual classes of objects. A sample set of checks include, non-standard ID, unconnected off sheet or object, and inconsistent nominal size or pipe specification.

Generation of Reports (e.g., BOM)... A comprehensive reporting capability is part of the infrastructure supporting the P&ID product. Designers can generate reports using sample reports provided with the product. Sample reports include piping line from/to list, I&C loop list, equipment list, and valve list. In addition, users can define and create new reports or customize the sample reports to meet their specific requirements.

Creation of intelligent objects using "smart" component build facility and catalog tools... The product is built around the concept of "smart" objects that understand their classification, property, and behavior information. In order to create and manage the required "smart" components, a component build facility and a catalog management facility are provided the user. Once the user has created a catalog of smart components, the user will use these catalogs as part of the component placement facility to place the components into their design. In addition, industry-based starter catalogs are included as part of the product.
ABOUT CATIA V5R18

CATIA is Dassault Systemes’ PLM solution for digital product definition and simulation.

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