

# Creo® Cabling & Piping Add-On

## BOOST YOUR CABLING & PIPING DESIGN PROCESS

Traditional mechanical products are getting complex with their increased dependency on electrical and hydraulic technology. At the same time Control Systems are advancing at an amazing rate, leading product designers to pay extra attention on electrical & fluid requirements.

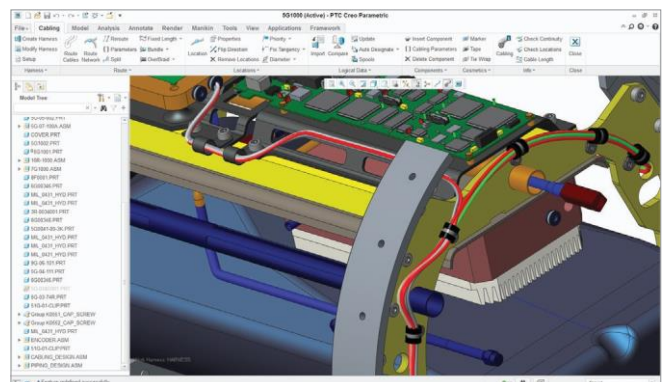
As designers have started taking advantage of Internet of Things, IoT, & sensors are added, the requirements for piping and cabling has increased. This means that designers are now dealing with more complicated piping and cabling routings, which traditionally have taken a low priority during product design.

To succeed now, designers must make electrical and fluid design a priority and an integral part of the detailed design process. Yet, as product complexity is increasing and schedules are continuously shrinking; it will get difficult to find the time and tools to design these increasingly complex routings?

Creo Piping & Cabling Extension (PCX) is the perfect 3D solution as it supports every type of industry and style of piping and cabling and allows you to streamline and accelerate the entire design process. Whether if you're designing products with a complex web of cables and harnesses, hydraulic or pneumatic hoses, high and low pressure tubing, copper work, or even large bore pipes, Creo PCX will handle the job, no matter how complex it does get.

### Key benefits

- Reduce costs and design time by eliminating the need for physical prototypes, made possible through virtual interference checking and automated manufacturability verification
- Automate routing and quickly determine the optimum path for manufacturing, price, and serviceability
- Ensure design rules & apply schematic logic rules area through specification-driven design
- Reuse of standard symbols, connectors, and fittings contained in a customizable library to increase design speed.
- Enable cost-effective manufacturing through accurate documentation, such as isometric drawings, bend tables, and BOMs
- Capture and document schematic information and manufacturing documentation
- Minimize errors & reduce time-consuming tasks by automating the capture of all relevant system information, like – schematic design, virtual prototype, or manufacturing documentation



Automated cabling design capabilities make it easy to move components and connectors without manually rerouting wires and cables.

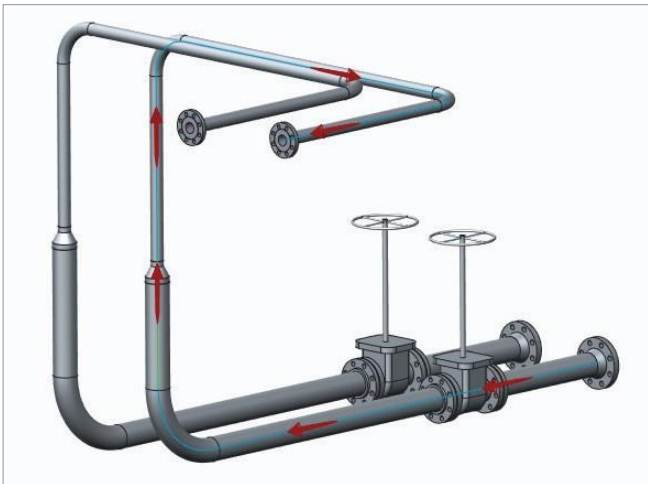
## Boost 3D routed systems design

### A time-taking, error-driven process

Determining the routes of pipes and cables can be a difficult, time-consuming task. To start with the making of a physical prototype and then routing the pipes manually through it; is a long, tedious process & generally error-prone. Because of the time and efforts involved, the engineers often accept the first route that works — not necessarily the optimal one.

Even worst of it all is, when an engineering change is being made to the design. It means the engineer must start over by recreating the physical prototype and rerouting the cabling or piping — hence wasting valuable time. In addition to that, more often the companies that create cabling prototypes don't document the cabling routes, making it difficult to service these products.

Further, to solve these issues, a company sends a service engineer to the field, which is costly. With Creo PCX, these problems can be avoided.



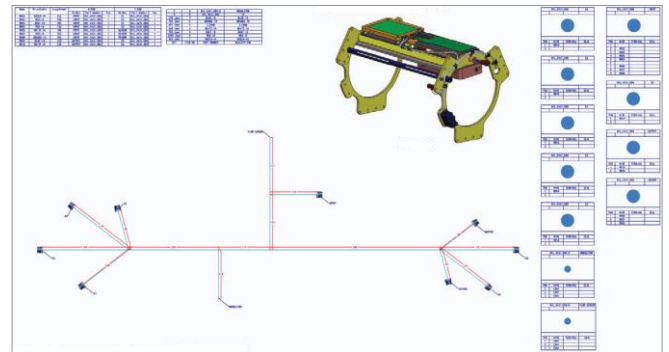
With Creo PCX, you can immediately determine the best piping routes between even the most complex systems.

## Creo Harness Manufacturing add-on (HMX)

Creo HMX effectively reduces the time to create documentation and the user expertise needed to create standardized manufacturing documentation. At the touch of a button & at any stage of the design process, manufacturing documentation can be created for buying to gain the most competitive manufacturing cost.

### Key benefits:

- Easily accommodate the late-stage changes in your engineering design faster and with less frustration
- The intuitive, easy-to-use user interface enables engineers to create manufacturing documentation to a pre-defined standard
- New streamlined solution improves user efficiency and productivity
- Documentation is automatically created to a preconfigured standard



Creo Harness Manufacturing Extension (HMX).

## Creo Schematics™ Lite

Creo Schematics Lite – provides each & every capability that designers of piping & cabling systems need to easily grab the logical connectivity information in 2D schematics. Included with Creo PCX, Creo Schematics Lite is an introductory schematic tool which grows with your design needs. Advanced capabilities, such as design reuse support, multiuser capabilities, customization for design automation, and central catalog, can be added optionally.

## Capabilities and specifications

### Design reuse

- Central Design Catalog
- Data tables
- Import legacy Pro/DIAGRAM data

### Piping diagrams

- Supports 2D pneumatic, hydraulic, process flow (PFD), PI&D, and HVAC
- Cabling diagrams
  - Supports 2D Block Interconnect, Circuit, and Wiring Interconnect design
- Electrical simulation
  - Seamless integration to E-Simulate
  - E-Simulate Lite is available only with the full version free of charge
  - E-simulate standard can be purchased from [www.virtual-interconnect.co.uk](http://www.virtual-interconnect.co.uk)
- 3D CAD support
  - Drives Creo 3D piping and cabling designs
  - Drives other 3D CAD routed systems designs

## Piping design

Creo PCX allows designers to fully automate the pipe-routing process. Designers no longer have to build physical prototypes & struggle through the trial-and-error process. They can determine — virtually — the optimal paths of the pipes in the model. Additionally, designers can create rules that are based on company's best practices or corporate policies. By establishing rules, the software can then verify that this optimal path is compliant with established manufacturing rules. Moreover, designers have an access to a library of standard fittings, which can be reused from product to product, reducing time-to-market and increasing designer productivity.

The fully associative nature of Creo Parametric™ makes sure that the pipe routing — and accompanying documentation — will automatically update whenever a design change is made to the model.

### Precisely efficient routing of pipelines & fittings:

- Leverage intelligent schematic information for design reuse
- Manipulate existing pipelines easily with an intuitive dashboard user interface, shortcut menus, and dynamic dragging
- Automate the creation of 3D routes from 2D schematics
- Automate fitting placement based on schematic information while adhering to design rules
- Concurrently route pipelines in a multi-user environment
- Asynchronous piping settings let you change the pipe shape, bend radius, corner type, or line stock on the fly

### Comprehensive suite of tools for fitting insertion:

- Automatically display the correct fittings based on schematic information
- Preview the placement of the object to achieve full control over the insertion
- Work with the correct pipes and fittings only by searching for fittings that meet the specifications of your project
- Automate the placement of gaskets, flanges, elbows, and other components

### Reinforce predefined rules via violation detection:

- Maximums and minimums of the bend radius
- Minimum branch separation and branch angle
- Placement & missing fitting & flow violation

### Full access over flow directions:

- Set initial flow direction based on routing – automatically
- Comfortably change flow direction for a series or pipe–line
- Reverse directional fittings with change of flow direction – automatically

### Verification of piping routes to prevent errors:

- Electronically verify 3D data — compared to logical data — to find out missing fittings and other common missteps
- Check for design rules, such as missing gaskets, in the model
- Create automatic cut lists, bend tables, and BOMs

### Extract information from the design for outputs with no hassles:

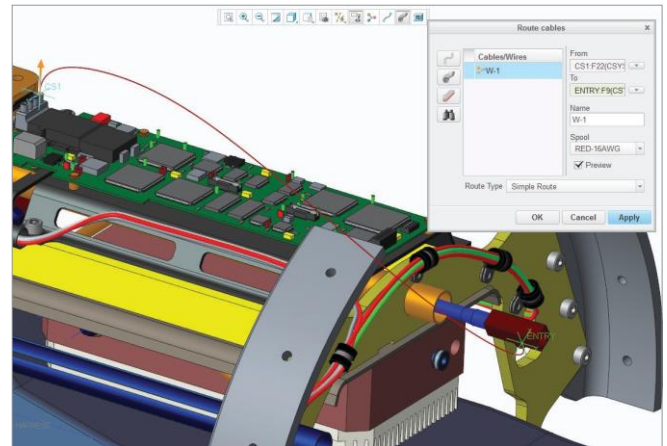
- Bill-of-Materials
- Bend machine and detailed fitting reports available
- Schematic consistency check
- Communication of piping system layout and detail in the form of isometric, installation, and pipe spool drawing
- Output to CNC bending machines

### Cabling design

Creo PCX avails you the power to extract logical information from 2D schematics while automating your 3D cable routing. You can quickly determine a working route, & easily find the optimal route that won't interfere with design. Additionally, since it's a Creo Parametric model, it has the advantage of complete associativity; which states that any change made to the product model is automatically reflected in the cabling routes. Save more time & money with lesser (if any) physical prototypes and shorter design cycles.

### Capabilities and specifications:

- Improved Bundle Representation
- Realistic depiction of shrink-wrap tubing with bundle transitions



Either determine the connections manually or from logical information. Creo PCX automatically generates a simple path which then enables the user to find the optimum path faster.

### Automate cabling routing

#### Improved realism in bundle display and best downstream use of cable design information

- Model tree with extensive information cables, cable contents, and wires
- Ability to select a single wire
- Highlights in display
- Wire parameters displayed

#### Electronically document the entire design process

- Automatically flattened 3D harnesses for manufacturing documentation

### **Automate the creation of completely defined 3D harnesses**

- Automate harness routing by referencing 2D logical information
- Digitally define complete 3D harnesses with connectors and components
- Modify cabling networks faster with drag handles and on the fly editing capabilities
- Automatically route ribbon cables and cable shields
- Create ribbon cables faster using automated capabilities
- Calculate mass properties and perform clearance evaluations

### **Concurrently route harnesses in a multi-user environment automate the flattening of 3D harnesses for manufacturing**

- Quickly flatten 3D harnesses to create accurate 2D harness documentation with intelligent dimension, BOMs, and pinouts
- Create fully associative, customizable lists and tables containing all must information to create the harness
- Detail the flat harness drawing with parametric notes, dimensions, symbols, and tables

### **Allows more effective enterprise communication**

- Produce fully associative detail drawings for 3D and flattened harnesses
- Create complete documentation, including intelligent dimensions, BOMs and pinouts
- Share schematics, documentation, and harnesses with the entire product development team using the Creo View™ visualization tool

### **The Creo Benefits**

Creo is a 3D CAD online solution that assists you in building better products faster by accelerating product innovation, reusing the best of your design & replacing the guess with facts. From the phase one of the product design to a smart, connected product with Creo. With augmented reality in each seat of Creo, everyone can easily visualize your designs. In the fast-changing world of the Industrial IoT, no other company can get you to substantial value as quickly and effectively as PTC.

#### **Language support**

- English, German, French, Italian, Spanish, Japanese, Chinese (Simplified and Traditional), Korean, and Russian.
- Creo Schematics Lite is available in English, French, German, Japanese, and Simplified Chinese

#### **Platform support and system requirements**

Please visit the [PTC support page](#) for the most up-to-date platform support and system requirements.

For more information, visit: [PTC.com/product/creo](https://www.ptc.com/product/creo) or contact your local sales representative.

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