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# PTC 301_Routed Systems 3.0 Update


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Product Management Director

Wed 10th June 2015

# Agenda



- Welcome
- PTC Creo Schematics 3.0
  - Enhancements coming in M020
  - Integration with PTC Creo Illustrate for Schematics
- PTC Creo Piping and Cabling Design Extension 3.0
  - M4ISO -
- PTC Creo ECAD-MCAD Collaboration Extension 3.0
  - Enhancements coming in M040
- PTC Creo Advanced Framework Extension 3.0
- PTC Creo Intelligent Fastener Extension 3.0

# PTC Creo Schematics

# PTC Creo Schematics

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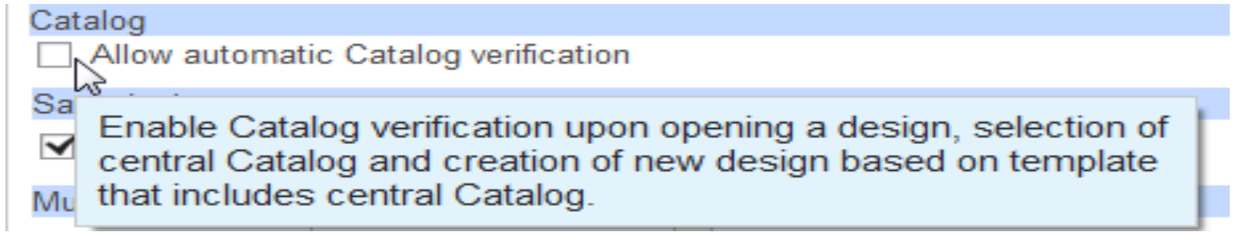
## Overview

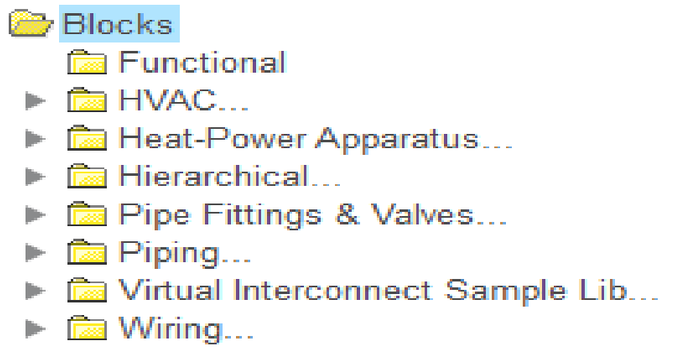
- Catalog Improvements
- Routing
- Instancing and Deleting
- Design Management
- Performance
- Reporting
- Data Sharing
- Technical Publications

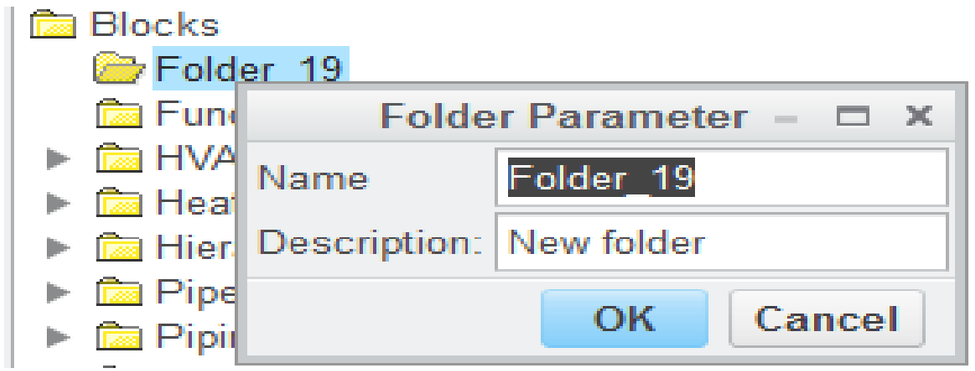
# Catalog Improvements

## Capabilities

- Automatic Central Catalog Verification
  - Validate During Opening of Design
- Folder Display Collapsed by Default
  - All Explorers
  - Folder Display Retained for Design Session
- Folder Creation and Naming
  - Single Operation



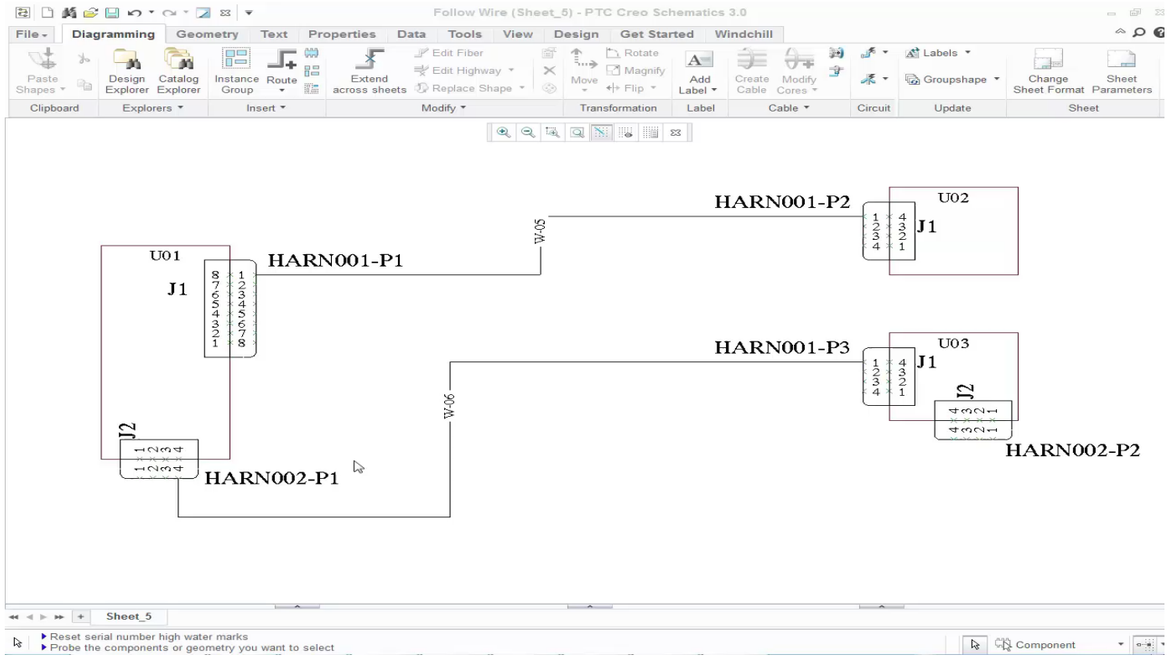

## Benefits

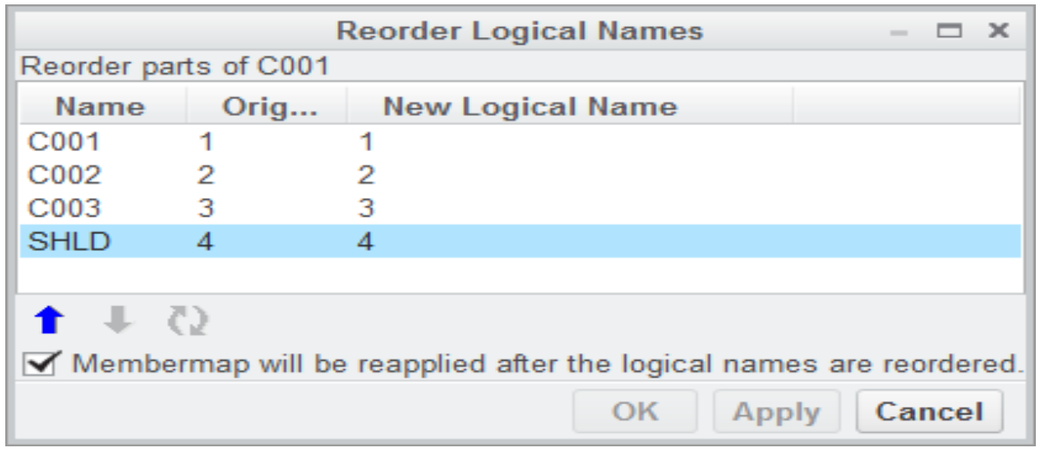
- Guaranteed Catalog Accuracy
- Improved user Productivity

# Routing

## Capabilities

- Follow Wire
  - Follow Path of Existing Wire Through Multiple Highways and Sheets
  - Distance is Maintained
  - Follow Part of an Existing Path
- Re-ordering Cable Shields



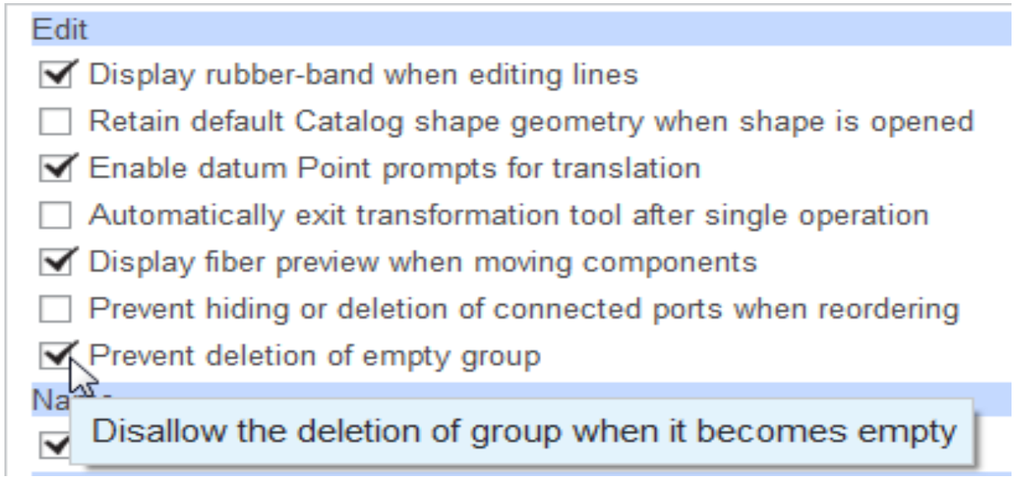

## Benefits

- Improved user Productivity

# Instancing and Deleting

## Capabilities

- Automatic Application of Connector Datasets
  - When placing from a report .
    - BID – CID
    - BID-WID
    - CID - WID
- Automatic Design of Empty Groups
  - New Configurable Option



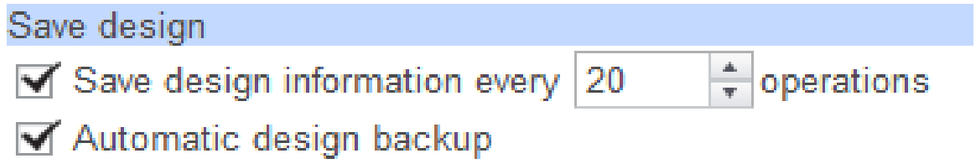

## Benefits

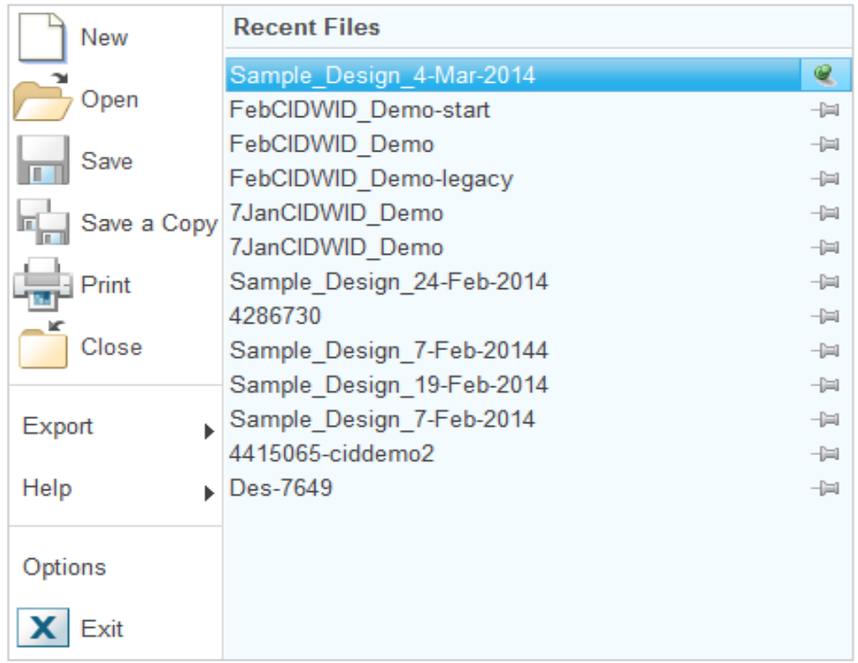
- Improved Productivity

# Design Management Cont.

## Capabilities

- Automatic Design Backup
  - Automatically Store a *.rsd During Save Operation
  - Automatic Recovery of Design when Corruption is Detected.
- Save As
  - Save active design as a new name
  - Save active design to a packed *.rsd
  - Save active design to design template *.rsdt
  - Active design remains open during save as operation
- Pinned Designs
  - Pin Designs to Start Menu




## Benefits

- Reduced Data Loss
- Improved Design Management Flexibility
- Improved Productivity

# Design Management

## Capabilities

- Location Sets
  - Utilized by Design Sheet Templates
- Improved Design Error Messages
  - Fatal
    - Send design to tech support for repair
  - Warning
    - Instructions on how to manually fix the design
- System Parameters
  - Ability to Remove Custom Values from System Parameters
  - Sub Type Net Available by Default

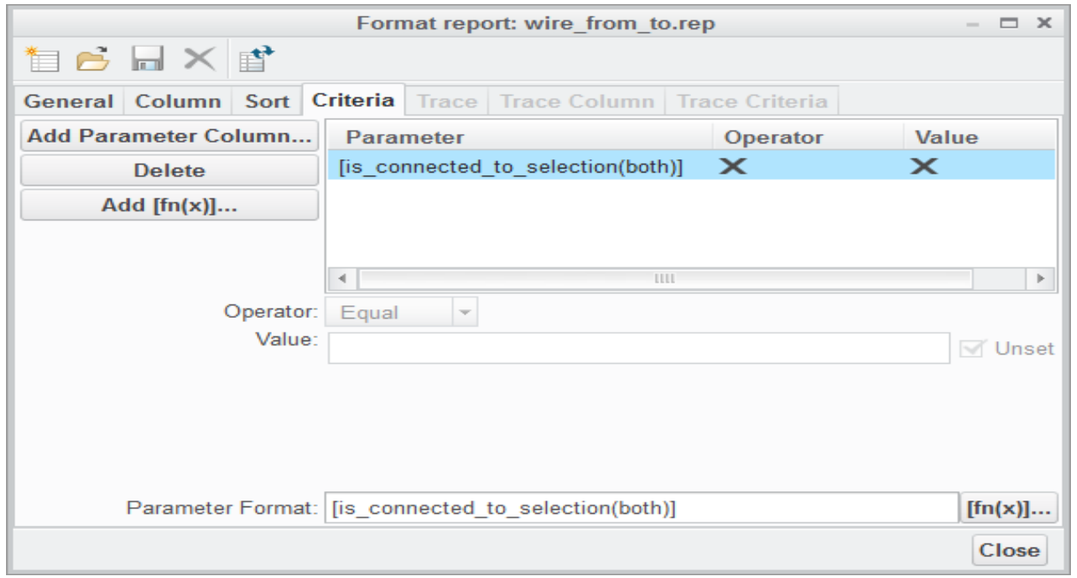
## Benefits

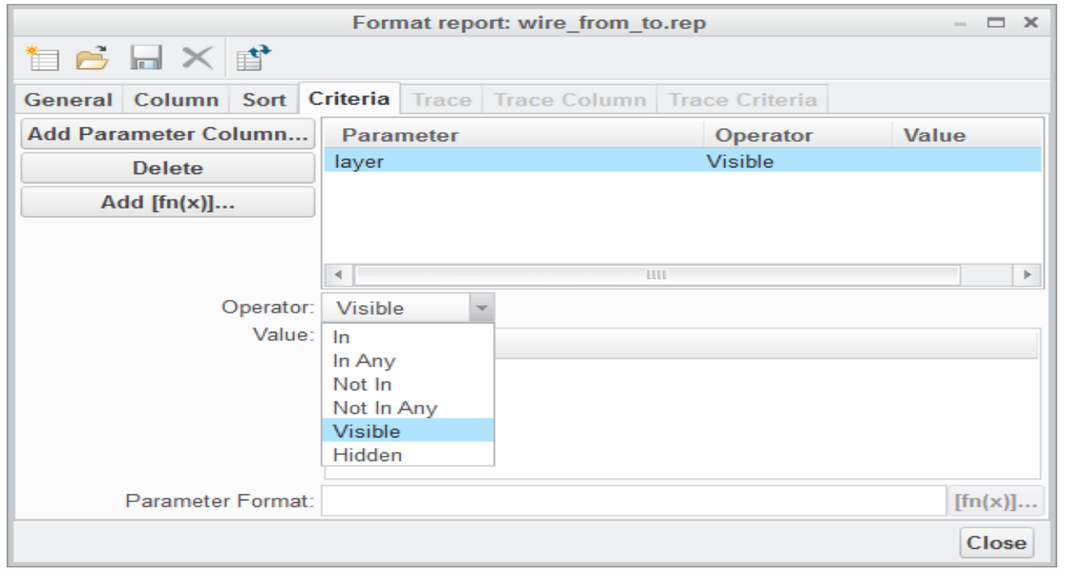
- Reduced Setup Time
- Improved Feedback

# Reporting

## Capabilities

- From To Reporting
  - Based on Selected Component
  - New OOTB Option
- Layer Visibility
  - Report on Visible or Hidden Layers



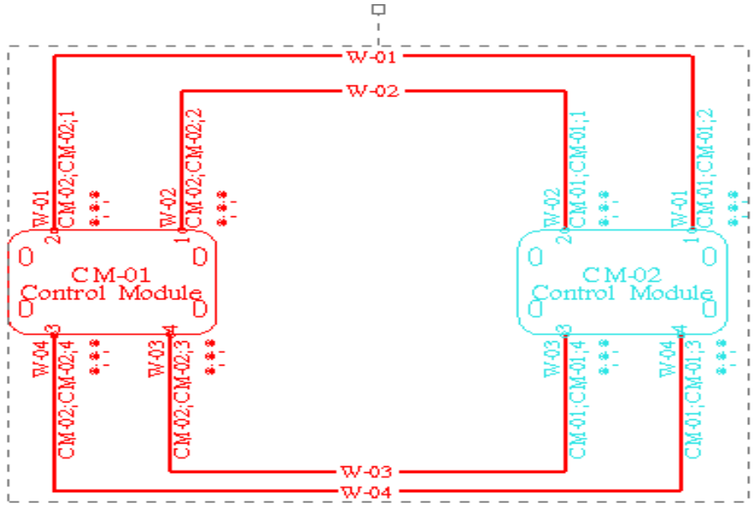

## Benefits

- Accurate Reporting
- Increased Reporting Flexibility

# Performance

## Capabilities

- Embedded Parameters
  - Secondary Highlighting
- Design Closure
  - Removed Design Reorganization for Instant Closure
- Improved Datatable Performance
- Updating Labels on Closed Sheets
  - All Labels Updated Prior to Printing or Exporting




Fiber Parameters | Cable or Pipe Parameters

| description | full_name | layer | name |
|---|---|---|---|
| Control Module | CM-01 | DEF_LINES | CM-01 |
| Control Module | CM-02 | DEF_LINES | CM-02 |

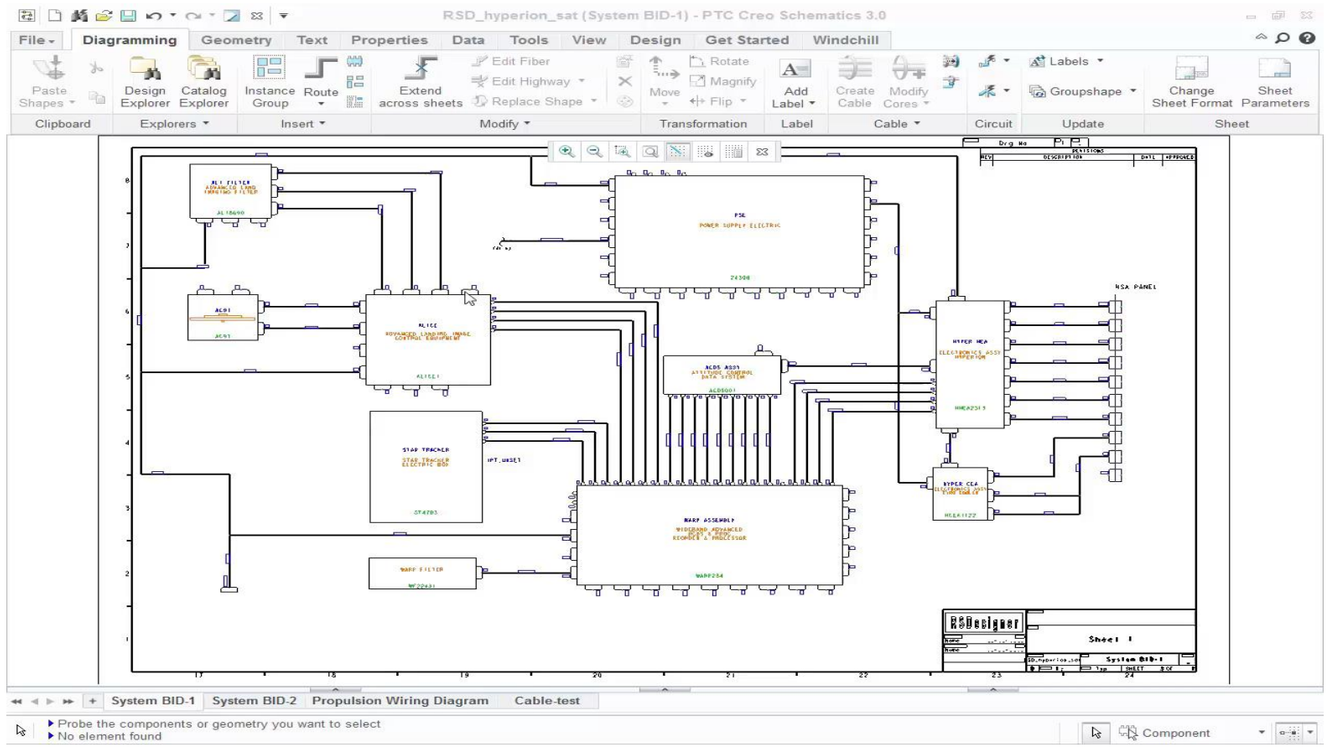
## Benefits

- Improved User Feedback
- Improved User Productivity
- Improved Design Accuracy

# Design Review

## Capabilities

- Export to EDA
  - Intelligent Viewable in PTC Creo View
    - Access all Parameters
    - Fiber Tracing
  - Utilized by PTC Creo Illustrate
    - Late 2014




## Benefits

- Improved Design Reviews
- Improved Data Sharing

## M020 Enhancements

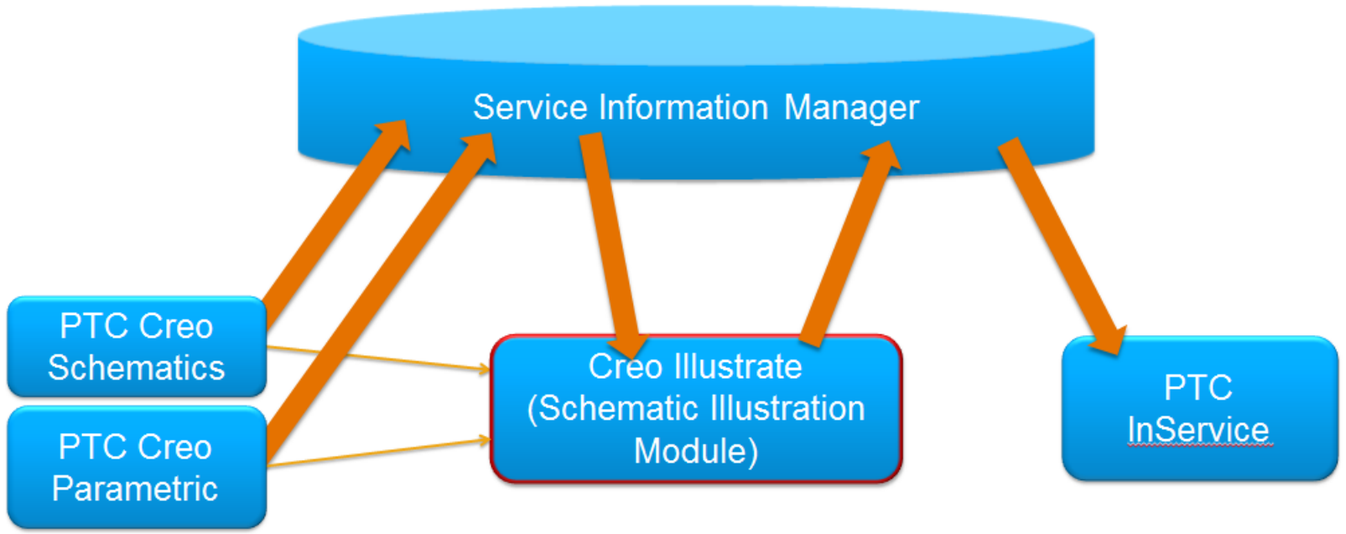
- 64 Bit Support
  - Increased memory capacity for
    - Diagram Import
    - Exchanging Design Sheets
    - Working with Large Designs

- Enhanced Cable Decoration Manipulation
  - Cable decorations automatically move with nearest connector.
    - Distance between connector and decoration maintained where possible

# PTC Creo Illustrate for Schematics



- New module of PTC Creo Illustrate for repurposing electrical and fluid engineering schematics
  - Block, Circuit, Wiring, and Fluid diagrams
- Prescriptive modifications to re-style and visual layout of source diagrams
  - Automatic and manual modifications
- Dynamic Cross selection and navigation between 2D schematic and 3D model
  - Enables troubleshooting in both logical and physical environment
- Enables dynamic wire tracing and accurate part location and identification



# PTC Creo Illustrate for Schematics

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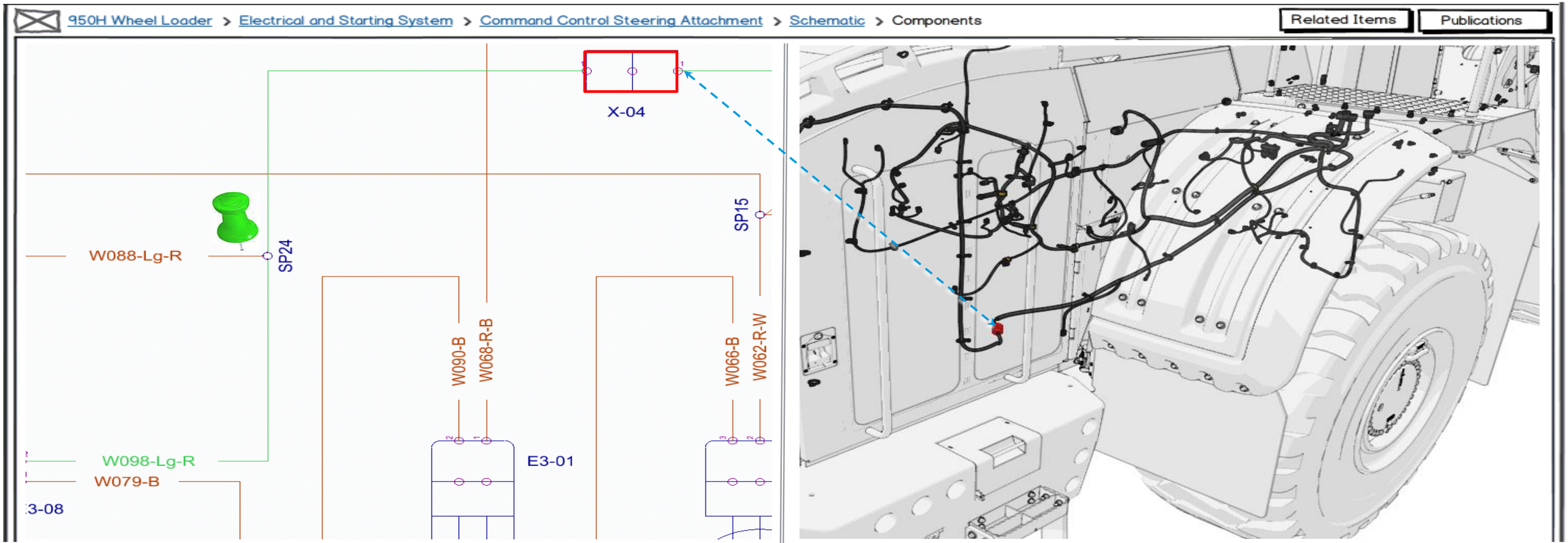
- Concurrent Design
  - Changing Text on Schematic Design Sheet
  - Applying Color & Styles
  - Hide/Remove objects
  - Move objects (retain logical connectivity)



# Cabling Design

# PTC Creo Piping and Cabling Design Extension

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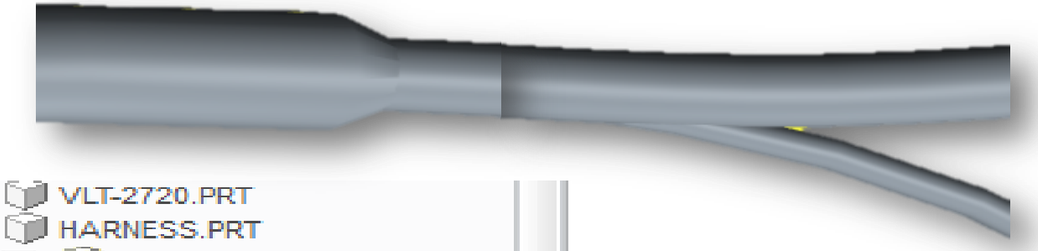
## Overview

- Bundle representation
- Creo View integration
- Harness Manufacturing Extension
- M4ISO

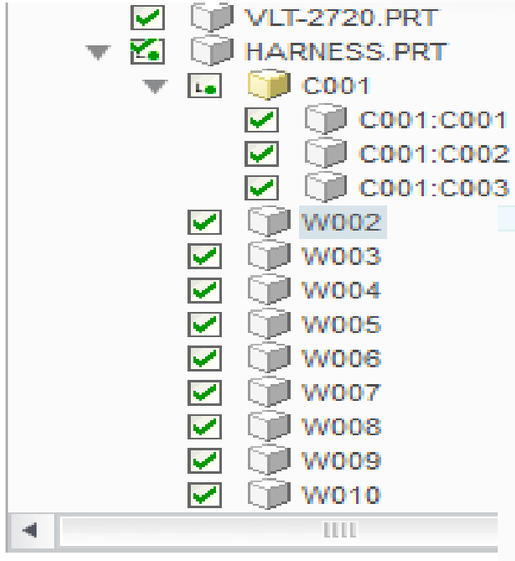
# Improved Design Detail and Downstream Data Sharing

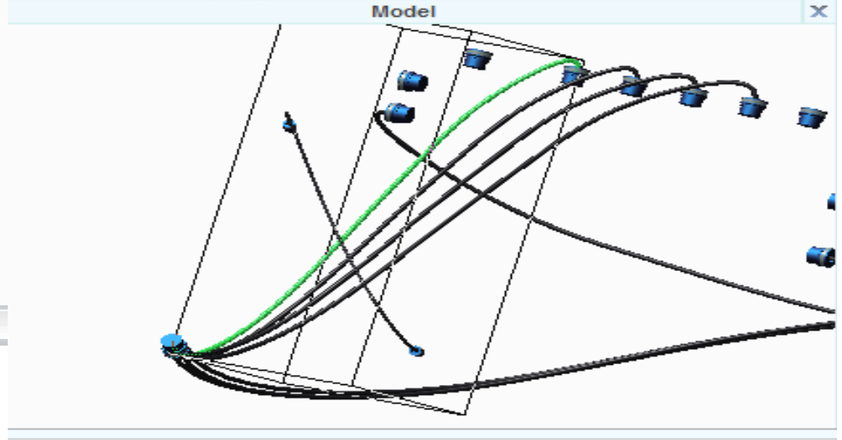
## Capabilities

- Bundle Representation Improves
  - Bundle transitions will provide a more realistic depiction of shrink-wrap tubing



- Improved Integration with PTC Creo View
  - Model tree includes more information:
    - Cables
    - Cable contents
    - Wires
  - Ability to select a single wire
    - Highlights in display
    - Wire parameters displayed




W002

| Name | Category | Value |
|---|---|---|
| NAME | Cable Parameters | W002 |
| SPOOL | Cable Parameters | GREEN-10 |
| TYPE | Cable Parameters | WIRING_WIRE |
| LAYER | Cable Parameters | DEF_LINES |
| REF_DES_FROM | Cable Parameters | INPUT |
| ENTRY_PORT_FROM | Cable Parameters | ENTRY |
| REF_DES_TO | Cable Parameters | S-2 |
| ENTRY_PORT_TO | Cable Parameters | ENTRY |

## Benefits

- Improved realism in bundle display
- Better downstream use of cable design information

# Harness Manufacture Extension

# PTC Creo Harness Manufacturing Extension **New Extension**

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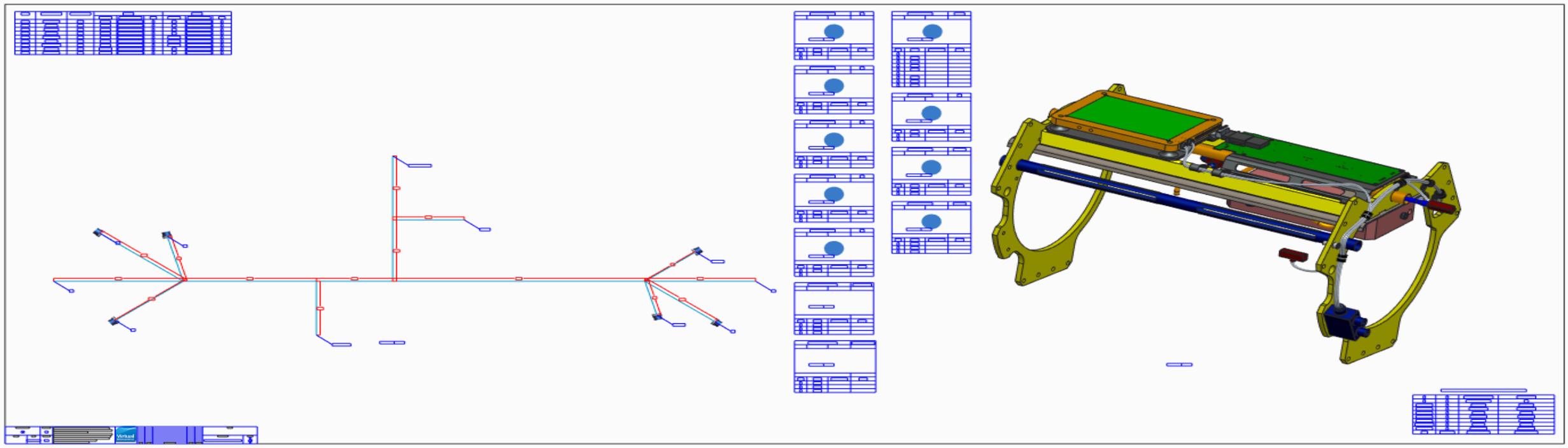
## Introduction

Using the traditional harness manufacturing solution to create all the required manufacturing documentation for an average harness would take in excess of two hours.

PTC Harness Manufacturing Extension automates the documentation process reducing the time to less than five minutes.



# PTC Creo Harness Manufacturing Extension

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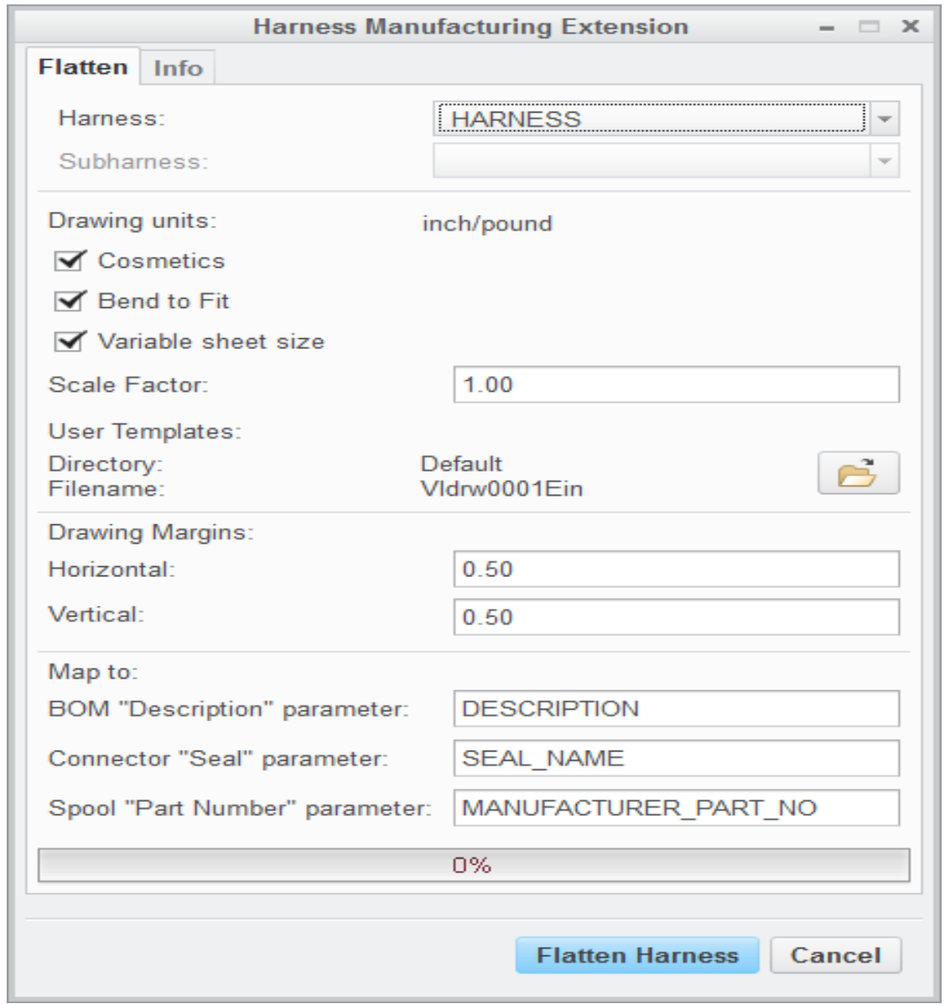
## Improved User Productivity

### Capabilities

- Create standardized manufacturing documentation
- Supports Sub Harnesses
- Option to include cosmetic feature
- Control scale factor
- Custom drawing templates
- Variable sheet size option
- Control parameter mapping

### Benefits

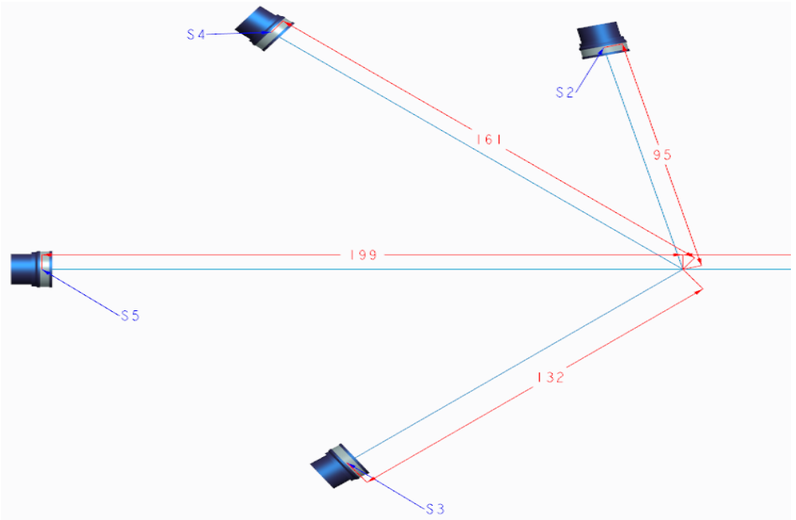
- Improved user productivity
- Minimal manufacturing knowledge required



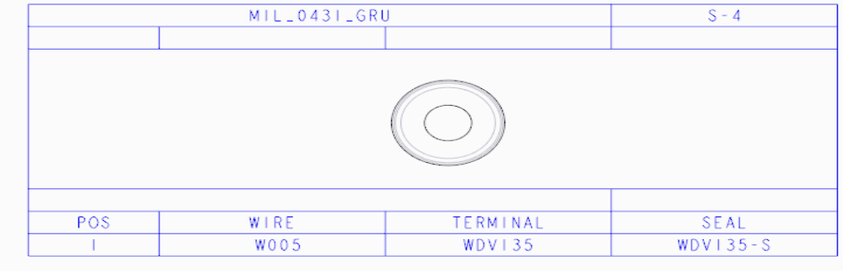
# Standardized Documentation

## Capabilities

- Fully annotated stick layout
- From To report
- Pin out report for each connector
- 3D view of harness within assembly context
- Bill of Material




| Name | Wire/Cable | Length(mm) | X-END | | | Y-END | | |
|---|---|---|---|---|---|---|---|---|
| | | | RefDes | Part Number | Pos | RefDes | Part Number | Pos |
| W002 | GREEN-10 | 680 | INPUT | MIL_0431_GRU | 1 | S-2 | MIL_0431_GRU | 1 |
| W003 | YELLOW-10 | 783 | INPUT | MIL_0431_GRU | 1 | S-5 | MIL_0431_GRU | 1 |
| W004 | GRAY-10 | 718 | INPUT | MIL_0431_GRU | 1 | S-3 | MIL_0431_GRU | 1 |
| W005 | YELLOW-10 | 755 | INPUT | MIL_0431_GRU | 1 | S-4 | MIL_0431_GRU | 1 |
| W006 | WHITE-10 | 710 | INPUT | MIL_0431_GRU | 1 | SENSOR | MIL_0431_GRU | 1 |
| W007 | RED-10 | 710 | INPUT | MIL_0431_GRU | 1 | SENSOR | MIL_0431_GRU | 1 |
| W008 | ORANGE-10 | 700 | INPUT | MIL_0431_GRU | 1 | SENSOR | MIL_0431_GRU | 1 |

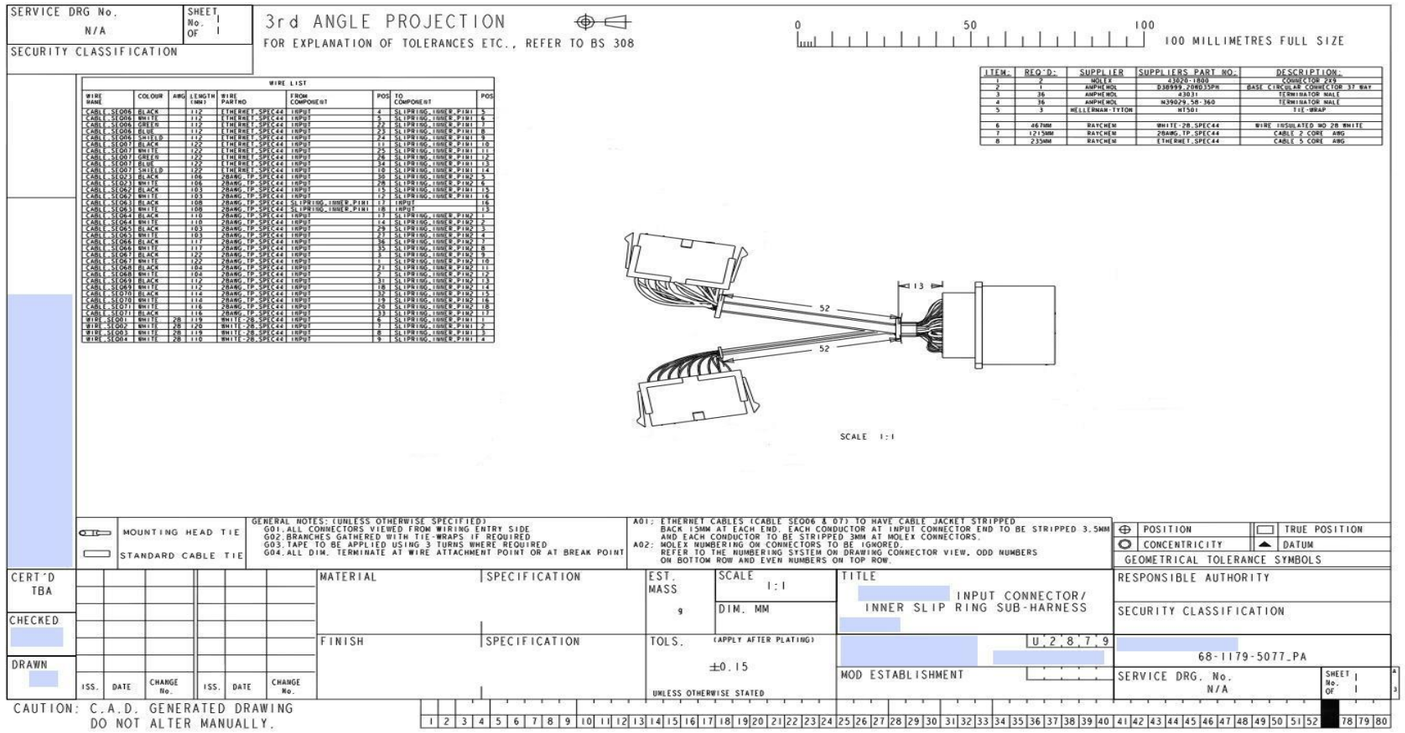



## Benefits

- Standard drawing
- Improved design workflow

# Typical Harness Mfg Documentation Predominantly White Goods, Consumer Electrical etc

| | Functionality | |
|---|---|---|
| Limitations | Connectors | 5 |
| | Wires | 50 |
| Features | Auto Dimensioning | ✓ |
| | Automatic Design Rule Checking | X |
| | Back annotation to Creo Schematics | X |
| Reporting | Bill of Materials (BOM) | ✓ |
| | BOM including spools usage | X |
| | BOM including wedges, cavity seals etc | X |
| | Wire From/To List | ✓ |
| | Cutting List | X |
| | Connector Cavity Table including strip length | X |
| | Connector Cavity Table including location view | X |




3 Connectors 36 Wires

PTC Creo Parametric  2 hours to generate

PTC Harness Manufacturing Extension < 5 minutes

Assuming $40 hourly rate immediate saving of $80 per harness

# PTC Creo Harness Manufacturing Extension Standard Version

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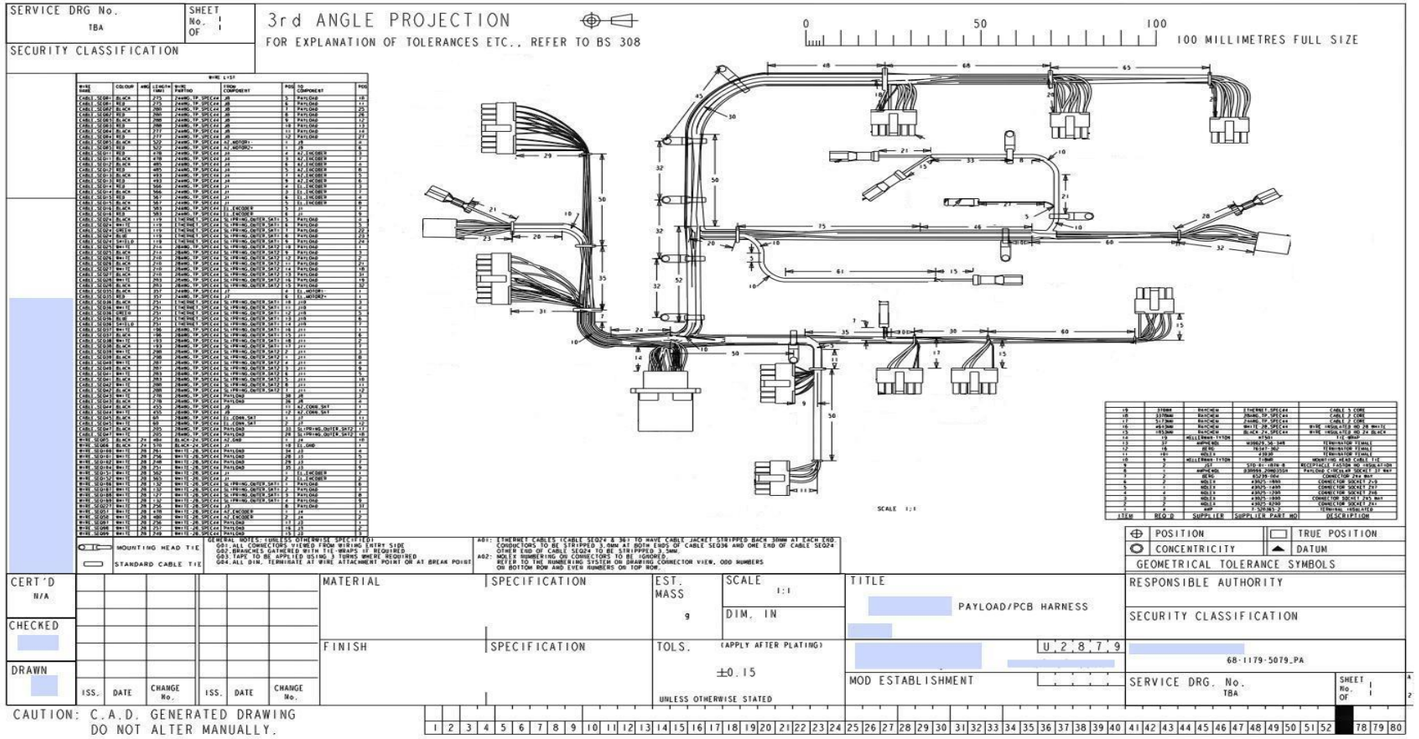
## Typical Harness Mfg Documentation Predominantly Automotive, Heavy Equipment, Machine Des

| | Functionality | STD |
|---|---|---|
| Limitations | Connectors | 20 |
| | Wires | 100 |
| Features | Auto Dimensioning | ✓ |
| | Automatic Design Rule Checking | X |
| | Back annotation to Creo Schematics | X |
| Reporting | Bill of Materials (BOM) | ✓ |
| | BOM including spools usage | ✓ |
| | BOM including wedges, cavity seals etc | X |
| | Wire From/To List | ✓ |
| | Cutting List | ✓ |
| | Connector Cavity Table including strip length | ✓ |
| | Connector Cavity Table including location view | X |




20 Connectors 80 Wires

PTC Creo Parametric ~1.5 days to generate

PTC Harness Manufacturing Extension < 10 minutes

Assuming $40 hourly rate immediate saving of $450 per harness

# PTC Creo Harness Manufacturing Extension Advanced Version

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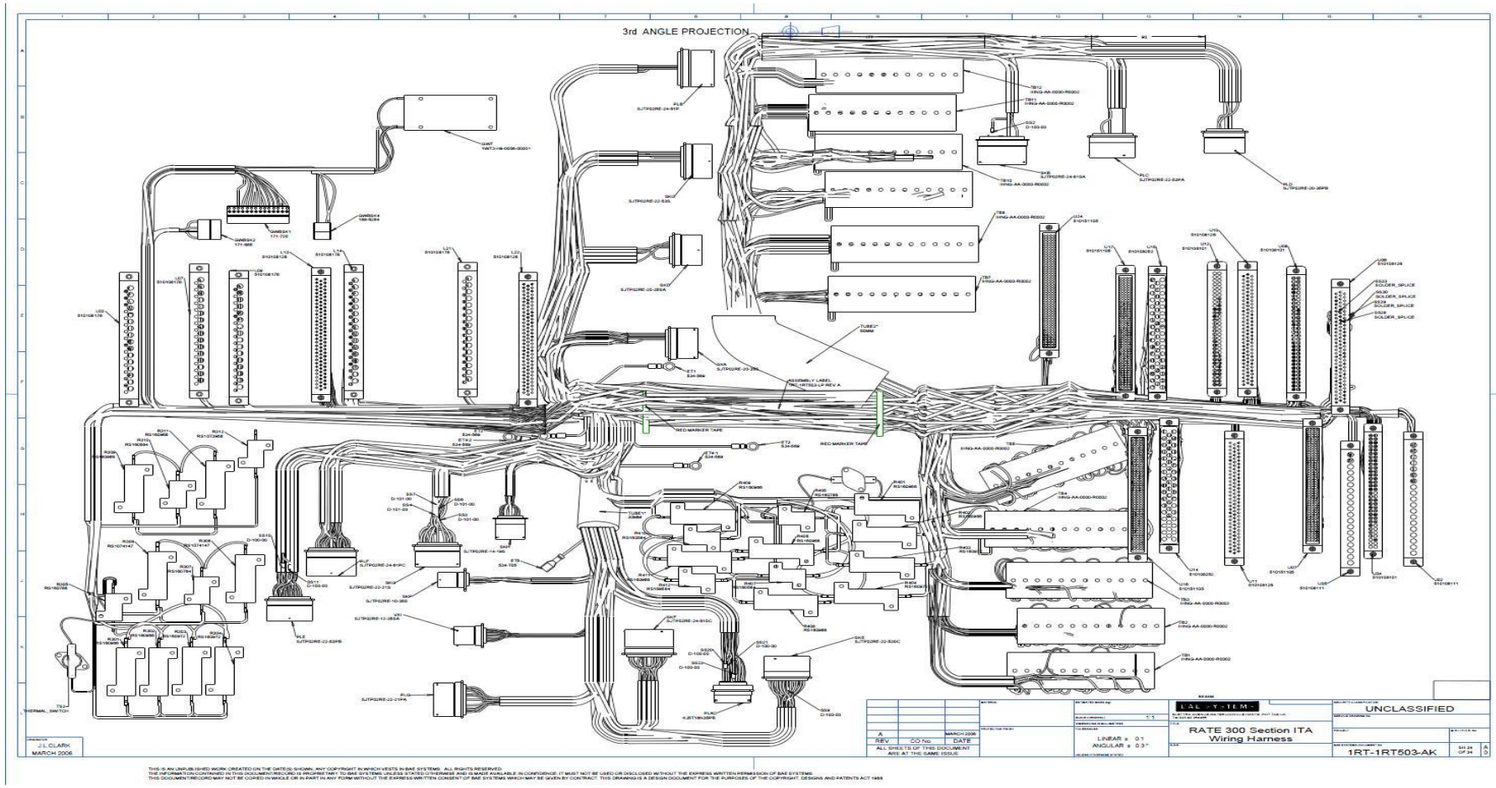
## Typical Harness Mfg Documentation Predominantly Aerospace and Defence

| | Functionality | Adv |
|---|---|---|
| Limitations | Connectors | Unlimited |
| | Wires | Unlimited |
| Features | Auto Dimensioning | ✓ |
| | Automatic Design Rule Checking | ✓ |
| | Back annotation to Creo Schematics | ✓ |
| Reporting | Bill of Materials (BOM) | ✓ |
| | BOM including spools usage | ✓ |
| | BOM including wedges, cavity seals etc | ✓ |
| | Wire From/To List | ✓ |
| | Cutting List | ✓ |
| | Connector Cavity Table including strip length | ✓ |
| | Connector Cavity Table including location view | ✓ |




82 Connectors 80 Wires

PTC Creo Parametric ~3 to 4 days to generate

PTC Harness Manufacturing Extension < 15 minutes

Assuming $40 hourly rate immediate saving of $1050 per harness

# PTC Creo Harness Manufacturing Extension

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## Summary

- Improved Standardization
  - Consistent manufacturing documentation
- Improved User Productivity
  - Small harness – 2 hours to less than 5 minutes
  - Medium harness – 1.5 days to less than 10 minutes
  - Large harness – 3 days to less than 15 minutes
- Improved Design Workflows
  - Create documentation at any point in the design process
    - High level manufacturing estimates
  - Efficiently recreate to same standard and layout at design release
- Expandable solution
  - 3 different packages to suite your harness complexity

# Piping Design

# ISOMETRIC Drawings

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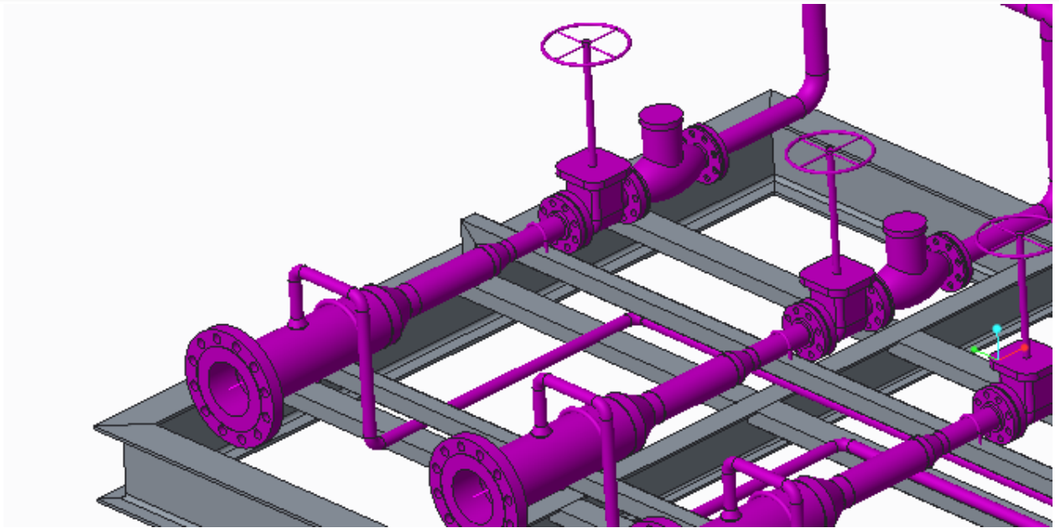
- Unscaled piping isometrics are the most common contractual document for passing information from pipe design to manufacture.

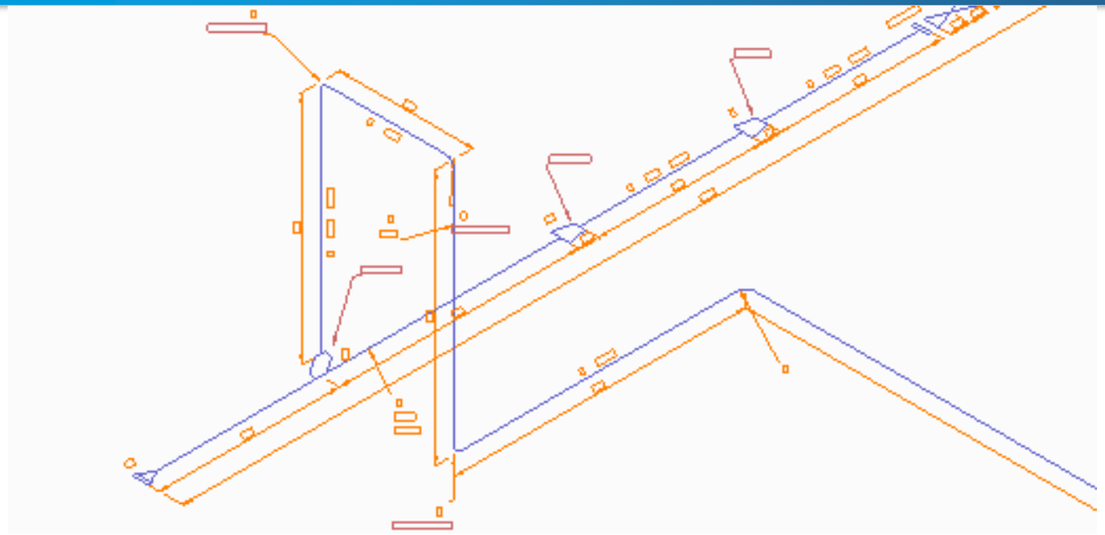
- Existing Partner Solution
  - ISOGEN
    - Changed pricing structure to charge per run
    - Customer feedback was not positive

- New Partner Solution
  - M4ISO
    - Alternative solution to ISOGEN
    - Comparable capabilities
    - Subscription or perpetual licensing
    - Unlimited runs

# Isometric Drawing Creation







- Scaled Isometric view
  - Single or dual row dimensions
  - Labels for plant locations, parts list references, bend angles, pipe spool IDs etc
  - Cross-hatch out-of-plane geometries
  - Scaled 3D pipe view
- Configurable Tables
  - Bill Of Materials, Cut Length Pipe list, Spool IDs
  - Export tables to EXCEL

- Produces piping isometrics automatically in seconds
  - Medusa
  - DXF
  - PTC Creo Detail Drawing
- Configurable Styles
  - North angle
  - Number of components per drawing
  - Line styles, font etc

# M4ISO Interactive Solution

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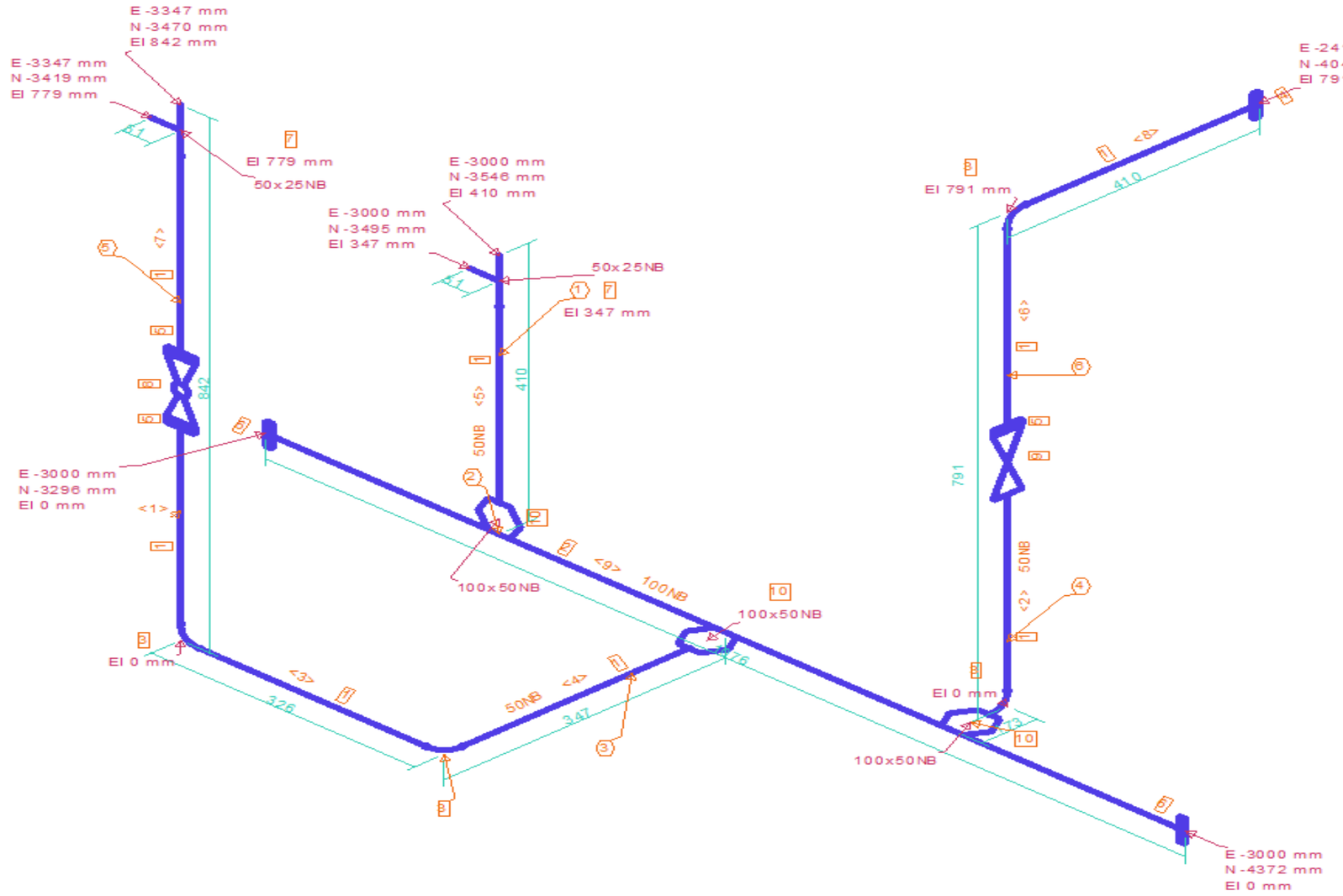
File Help

Diagram style: Simple A2 | North Angle: 180 | Max Components per page: 50

Page 1 | Item Details | Cuts | Spools



# Example: Dual Row Dimensions, Tables & 3D View

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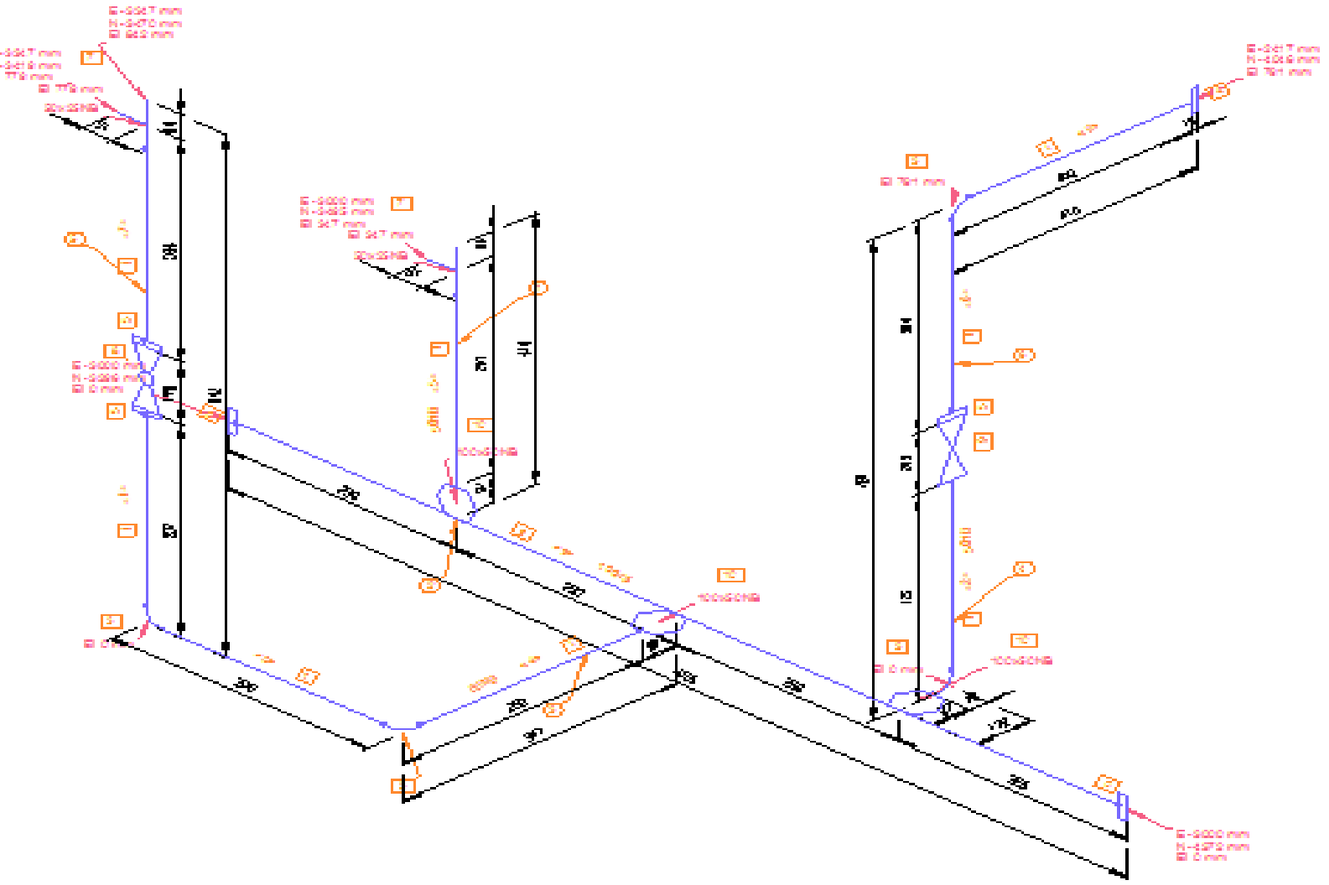
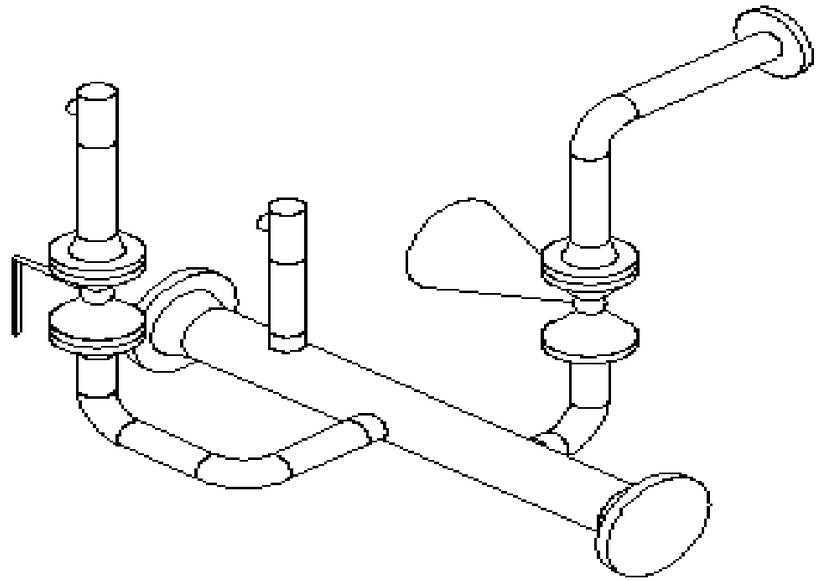


| Group | Ref | Item Code | Item Total | Type | Material |
|---|---|---|---|---|---|
| Fittings | | | | | |
| | 1 | BC0PH65K | 1564 mm | TUBE | ASTM A105 |
| | 2 | BC0PH9KW | 924 mm | TUBE | ASTM A105 |
| Components | | | | | |
| | 3 | BC0OZMGO | 4 | 90LR-ELBOW | ASTM A105 |
| | 4 | BC0OYU5K | 1 | SLIP-ON-FLANGE | ASTM A105 |
| | 5 | BC0OZ2M8 | 3 | WN-FLANGE | ASTM A105 |
| | 6 | BC0OZ3P0 | 2 | WN-FLANGE | ASTM A105 |
| | 7 | BC0P7K5K | 2 | REDUCING-TEE | ASTM A105 |
| | 8 | BC0P18JY | 1 | BALL-VALVE | ASTM A105 |
| | 9 | C4VW0CKK | 1 | GLOBE-VALVE | ASTM A105 |
| | 10 | C4VW0QNW | 3 | WELDOLET | ASTM A105 |

| Cut Ref | Cut Length | End Prep |
|---|---|---|
| 1 | 98 | Butt, Butt |
| 2 | 148 | Butt |
| 3 | 174 | Butt, Butt |
| 4 | 174 | Butt, Butt |
| 5 | 186 | Butt, Butt |
| 6 | 224 | Butt, Butt |
| 7 | 236 | Butt, Butt |
| 8 | 324 | Butt |
| 9 | 924 | Butt, Butt |

| Spool | Pipe Name | Spec |
|---|---|---|
| 1 | P_SPOOLS | A3A |
| 2 | P_SPOOLS | A3A |
| 3 | P_SPOOLS | A3A |
| 4 | P_SPOOLS | A3A |
| 5 | P_SPOOLS | A3A |
| 6 | P_SPOOLS | A3A |



# M4ISO Summary



- Integrated with PTC Creo Piping Design
- Integrated with PTC Creo Detail Design
  - Produces piping isometrics automatically in seconds
  - Automatically avoids elements overlaying each other
  - Fully dimensioned and annotated drawings
- Configurable output
  - Choose the style of Isometric
  - Pick from B.O.M., Cut piece and Spool tables
  - Add options from Fully flexible Dimension and annotation scheme
- Avoids expensive re-work
  - Isometric geometry directly reflects the 3D assembly, but fitted onto the paper!
- Cuts project times and costs
  - M4ISO significantly lowers the cost of Isometric drawing production
  - It has a significantly lower cost of ownership than other leading products

# Show Offer

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- 30% Software discount for all orders received by 30th October 2015
- Register your interest by 31st July 2015 http://www.cad-schroer.com/iso4creo

| Software License | License Price | Annual Maintenance Price |
|---|---|---|
| **Starter License** | $2,037 | $510 |
| **Additional License** | $1,519 | $370 |

# ECAD MCAD Collaboration

# PTC Creo ECAD Collaboration Extension

PTC® Live Global

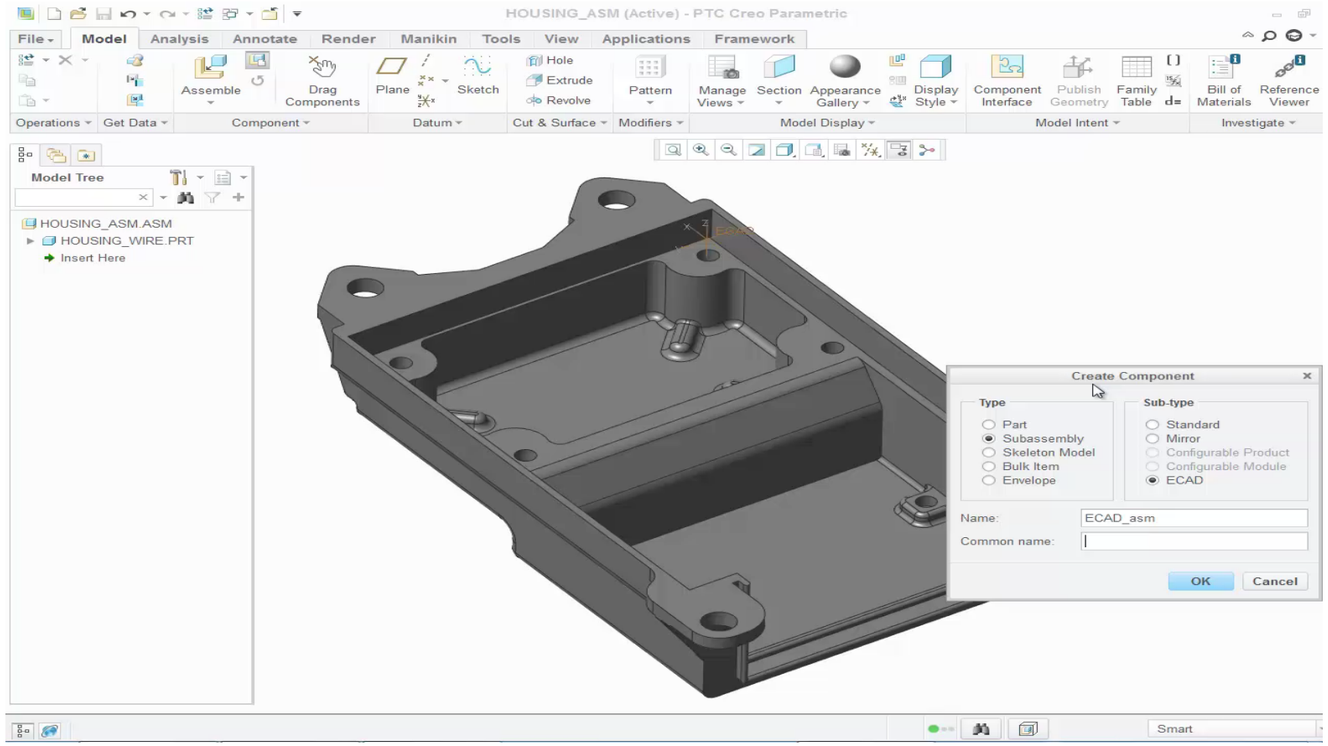
## Overview

- Improved PTC Windchill Integration
- Improved User Experience
- Rigid Flex Boards
- Copper Support
- User Defined Areas

# Improved PTC Windchill Integration

## Capabilities

- New Assembly Sub Type
  - Unique Identification in Model Tree
  - Utilized for Rigid and Flex board
  - Dedicated ECAD Ribbon
    - ECAD Board
    - ECAD Assembly
  - Streamlined Component Assembly
- Legacy Designs Not Supported
  - Migrate using IDX
- IDF Not Supported




## Benefits

- Identify ECAD Assemblies in Windchill
- Faster Component Assembly
- Streamline UI

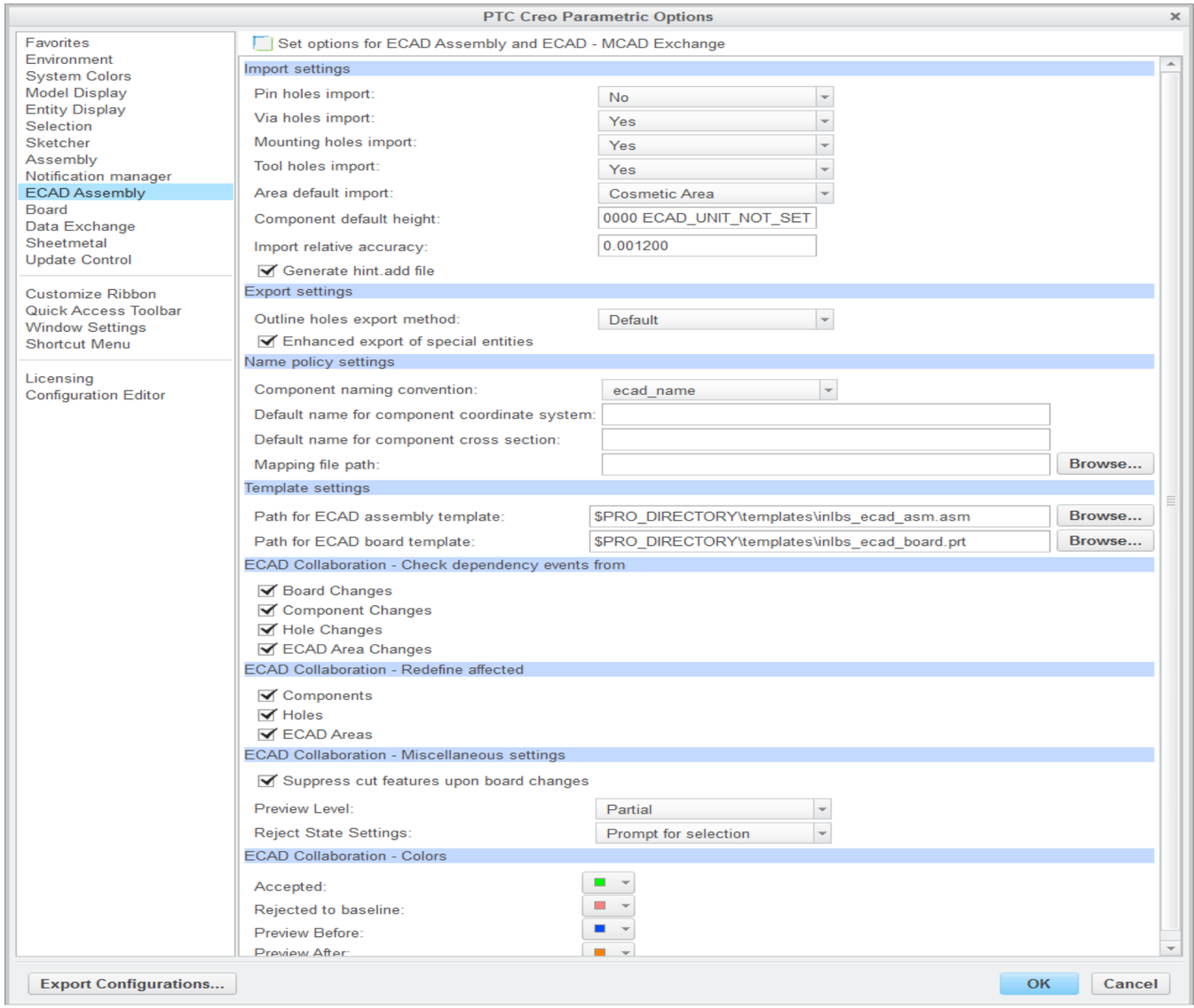
# Consistent User Experience

## Capabilities

- Common ECAD Configurations via Options
- Control Flex Region Colors

## Benefits

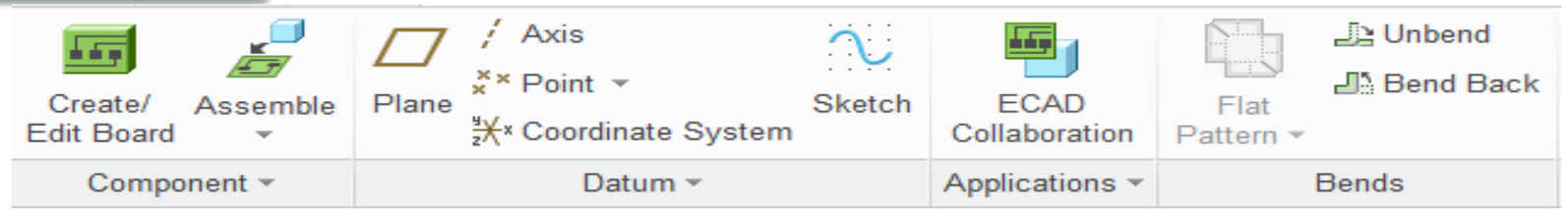
- Faster Configuration
- Improved Access to Common Settings
- Consistent User Experience

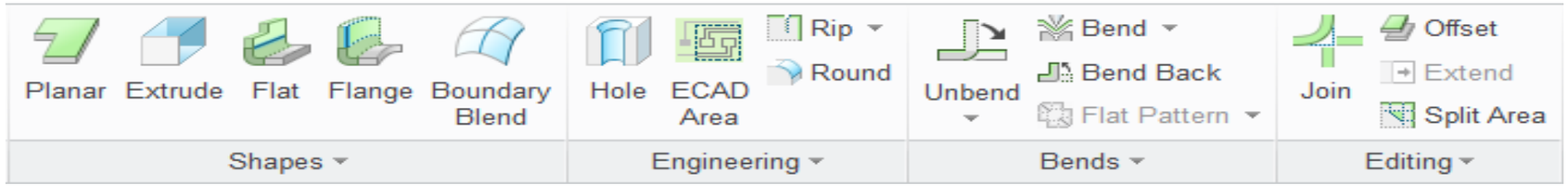


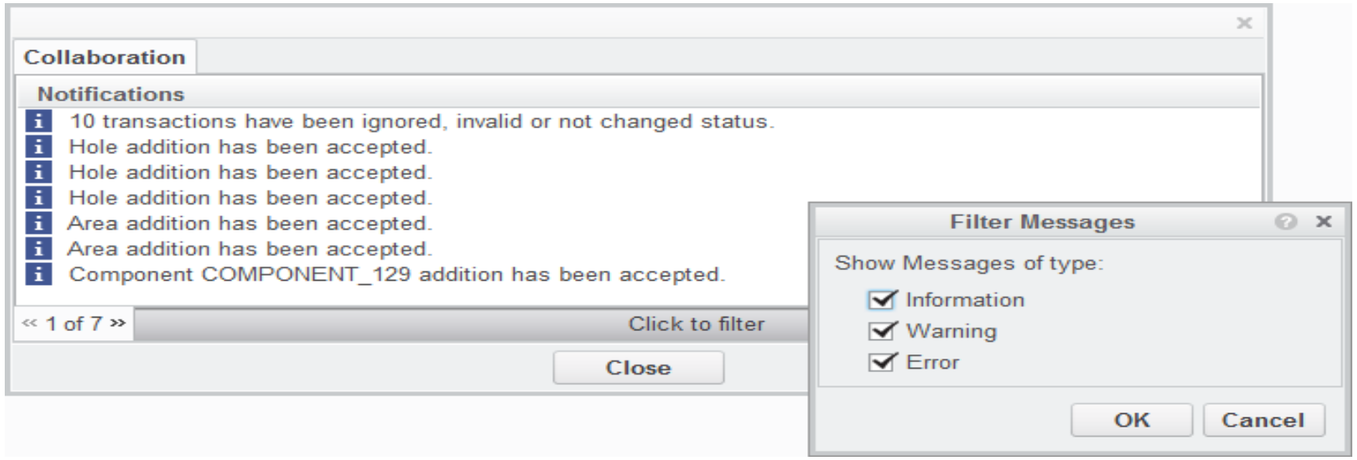
# Consistent User Experience

## Capabilities

- New Ribbon Tabs
  - Board Design
  - Assembly Design
- New Collaboration Window
  - Filtering Capabilities



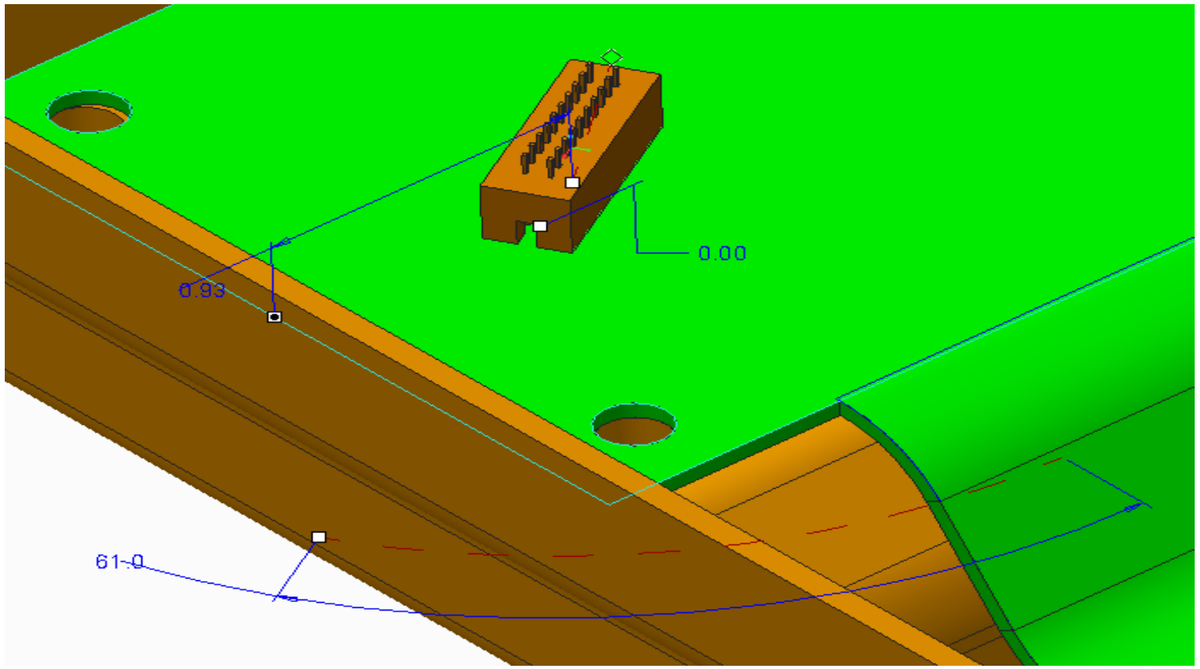

## Benefits

- Consistent User Experience

# Rigid Flex Boards Cont.

## Capabilities

- Developed Utilizing Proven Sheetmetal Technology
- Flexible Areas
  - Manually created
    - Information Transferred to ECAD
- Bend Information
  - Bend Lines – Automatically Created
  - Bend Areas – Automatically Created
- Component Placement
  - Select Top or Bottom of Board
  - Utilize Drag Handles to Position



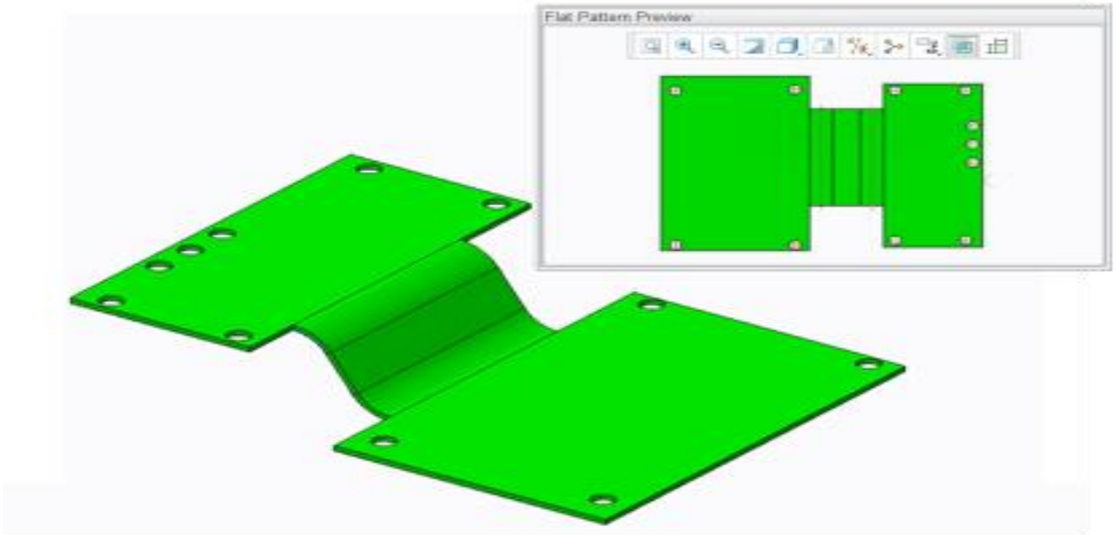

## Benefits

- Reduced Training
- Improved Workflows
- Improved ECAD Communication

# Rigid Flex Boards

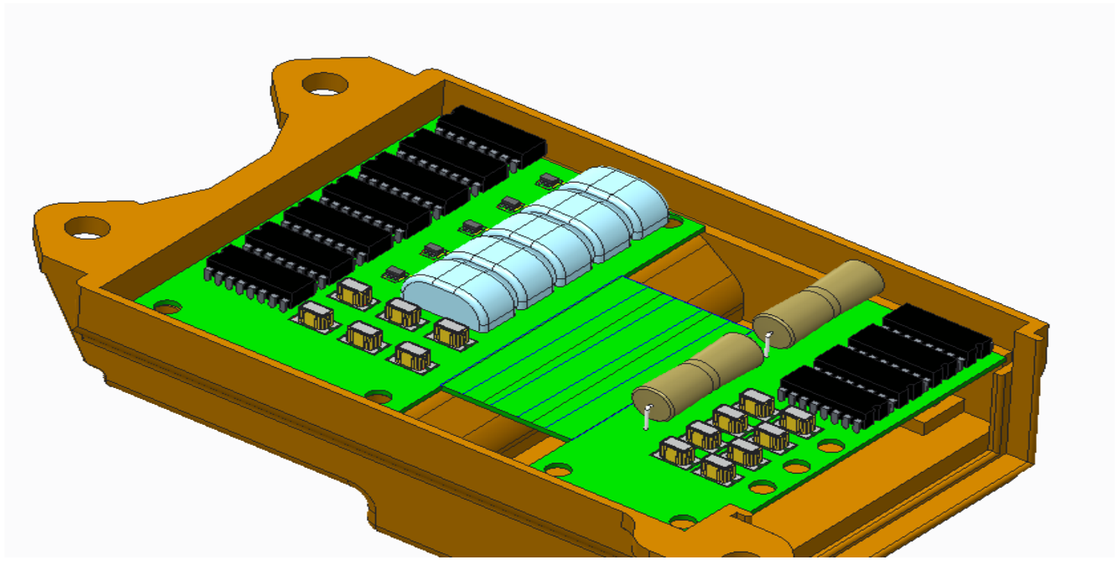
## Capabilities

- Flat Patten Preview Window
  - Verify NO Overlapping Segments
- Flatten Board or Assembly
  - All Board Features Flatten
  - All Components
- Export IDX in Bent State
  - Board Flattened Under the Hood Prior to Export




## Benefits

- Improved Design Accuracy
- Streamlined Workflow



# PTC Creo ECAD Collaboration Extension

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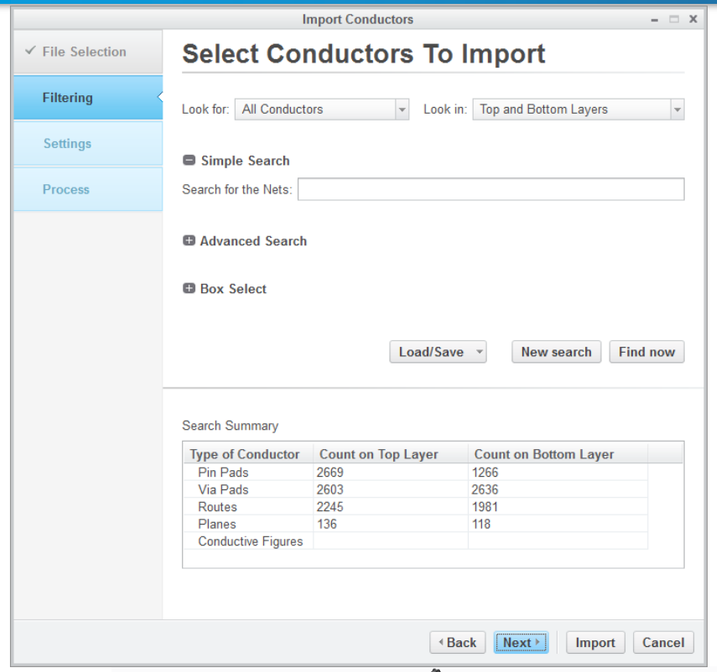
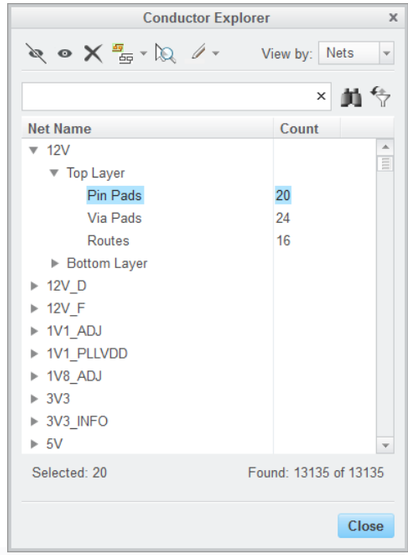
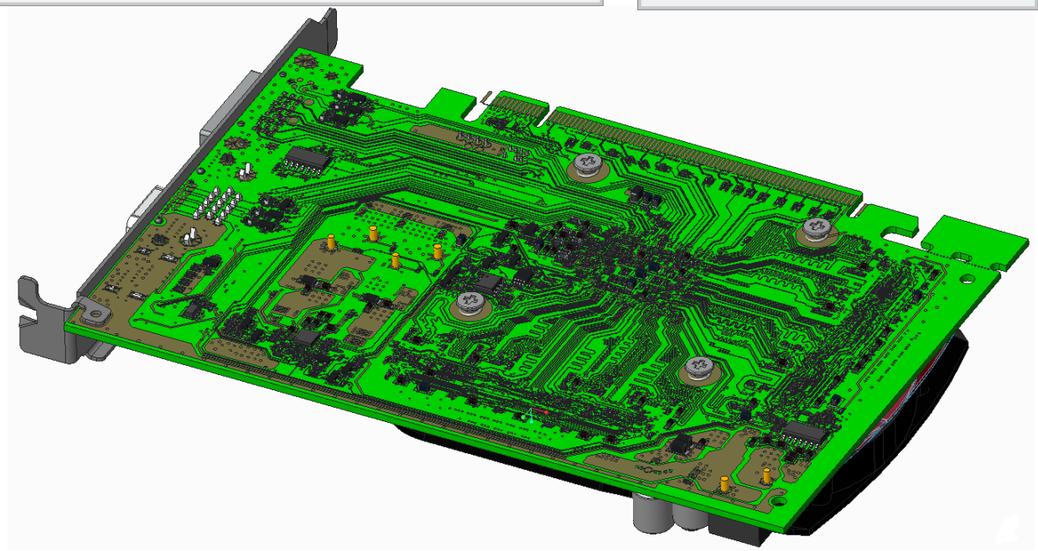
## M040 Enhancements

### Capabilities

- Conductor Support
  - Simple Import wizard
    - Filter conductors to import
    - Control import by area
    - Set conductor geometrical representation
  - Interactive Conductor Explorer
    - Hide, Colorize and Set geometrical representation
  - Intelligent Rigid Flex support
    - Conductors bend follow bending of board



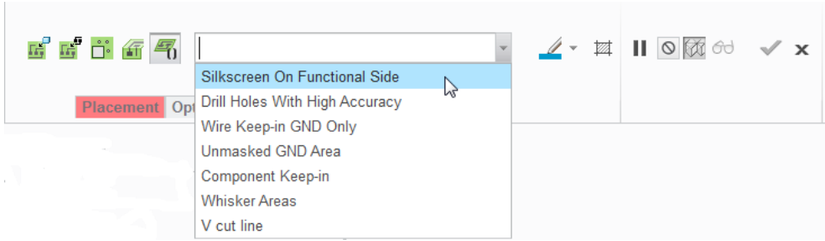
### Benefits

- Higher Fidelity Design
- Improved Accuracy
- Reduced Design Time

# M040 Enhancements

## Capabilities

- User Defined Areas
  - Enabling tighter integration with ECAD solutions
  - Adhere to company standards with configurable library of areas
    - Company specific names and colors (*.csv)




## Benefits

- Improved Collaboration
- Improved Accuracy

# Advanced Framework Extension

# PTC Creo Advanced Framework Extension

PTC® Live Global

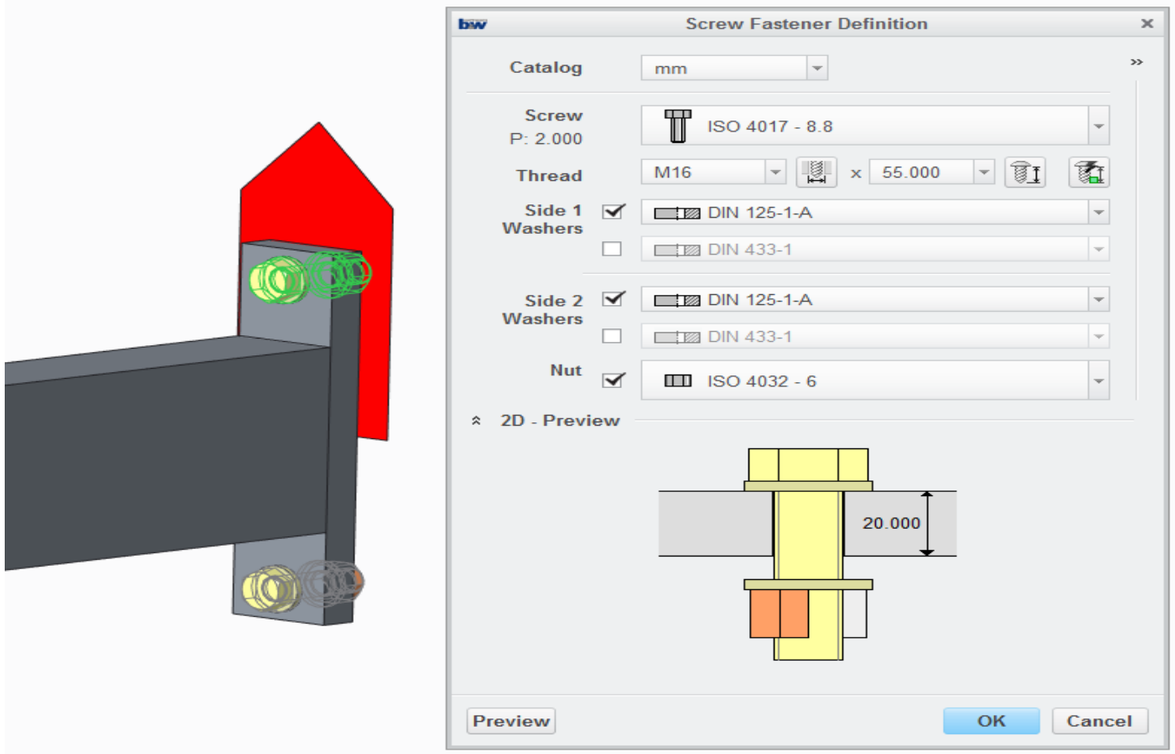
## Overview

- Standard Sub Assemblies
- Assembly of Equipment and Connectors
- Right Click Options

# Standard Sub Assemblies

## Capabilities

- Define a Screw Connection
  - Screws are automatically assembled with sub assembly
  - Holes are automatically created in adjoining parts
- Improved Copy Component UI
  - Control Names
  - Control what to copy
  - Automatic selection for Required Part
    - Ignores Standard Components



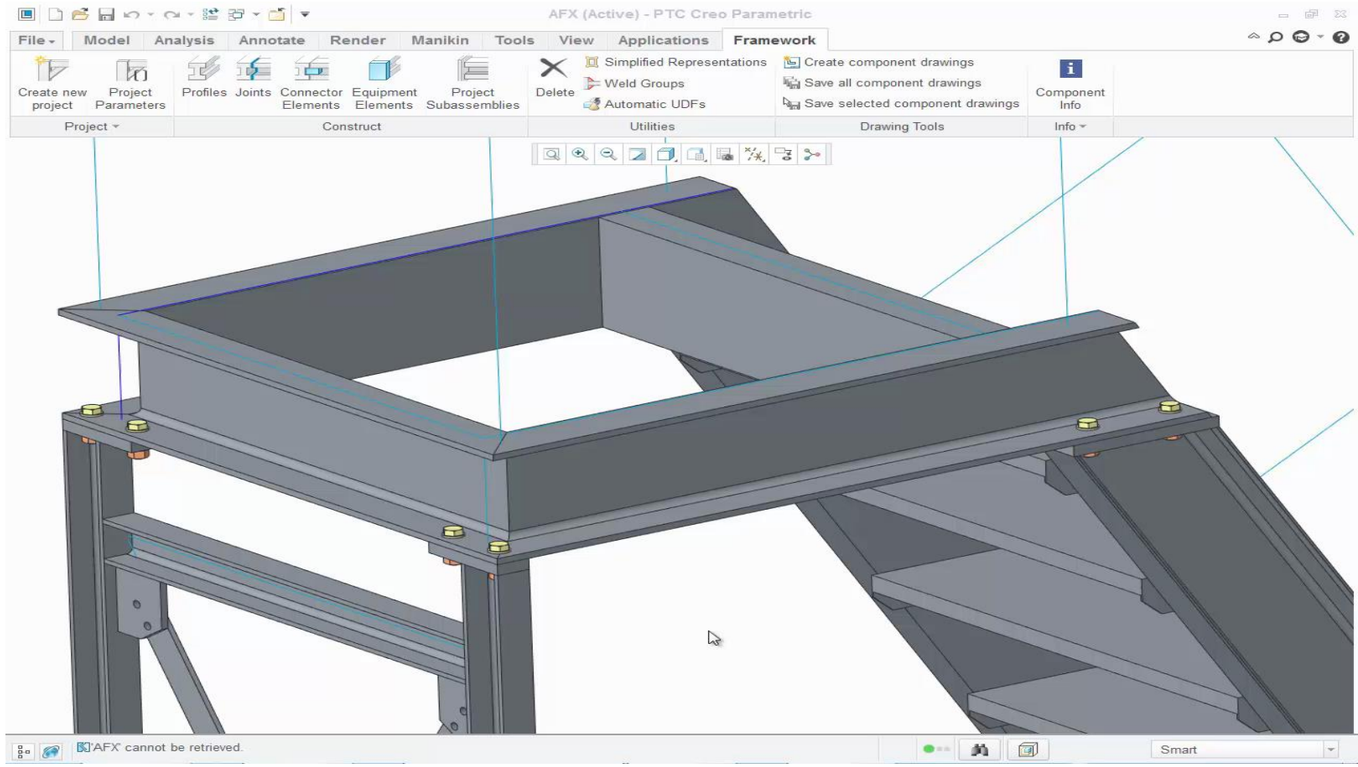

## Benefits

- Improved User Performance
- Enhanced Library Control
- Improved Design Flexibility

# Assembly of Equipment and Connectors

## Capabilities

- Improved Reference Selection
  - Select All References in One Action
- New Measurement Capabilities
  - Utilize Measurements During Insertion
    - Two Points
    - Single or Dual Lines
    - Cylinder



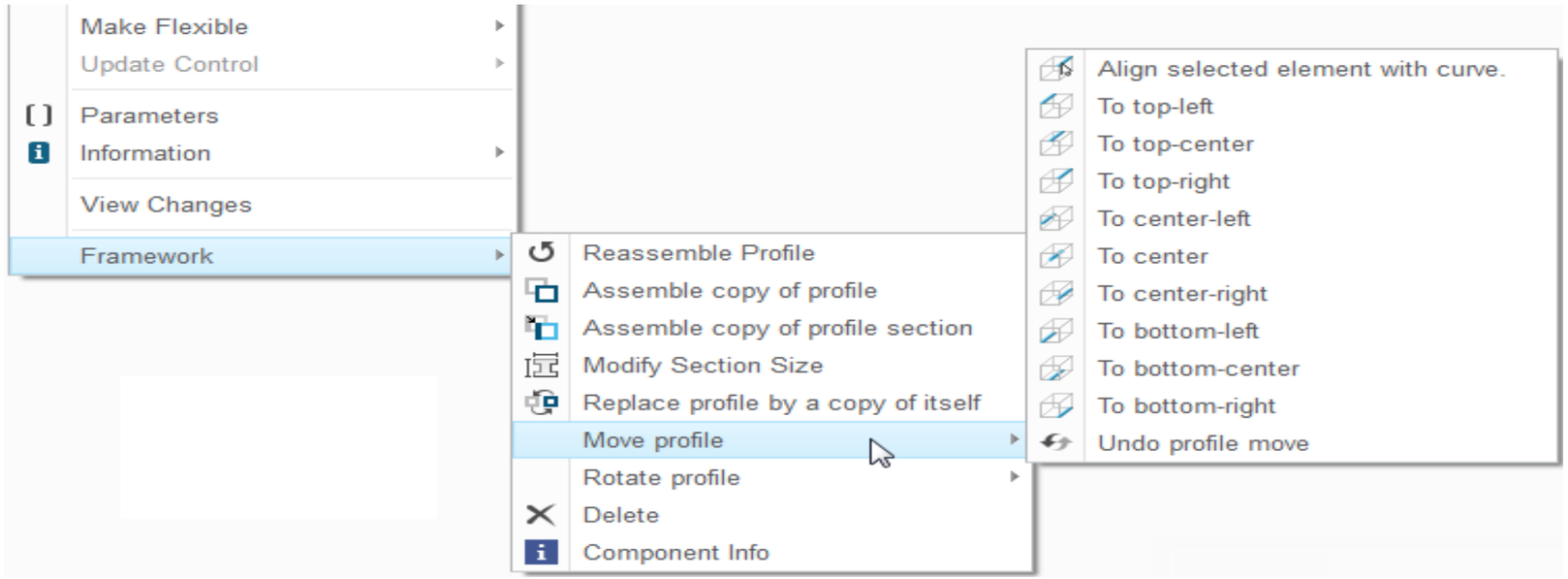

## Benefits

- Streamlined Workflow
- Improved User Performance

# Right Click Menu

## Capabilities

- Access Common Commands
  - Profiles
  - Equipment
  - General Manipulation



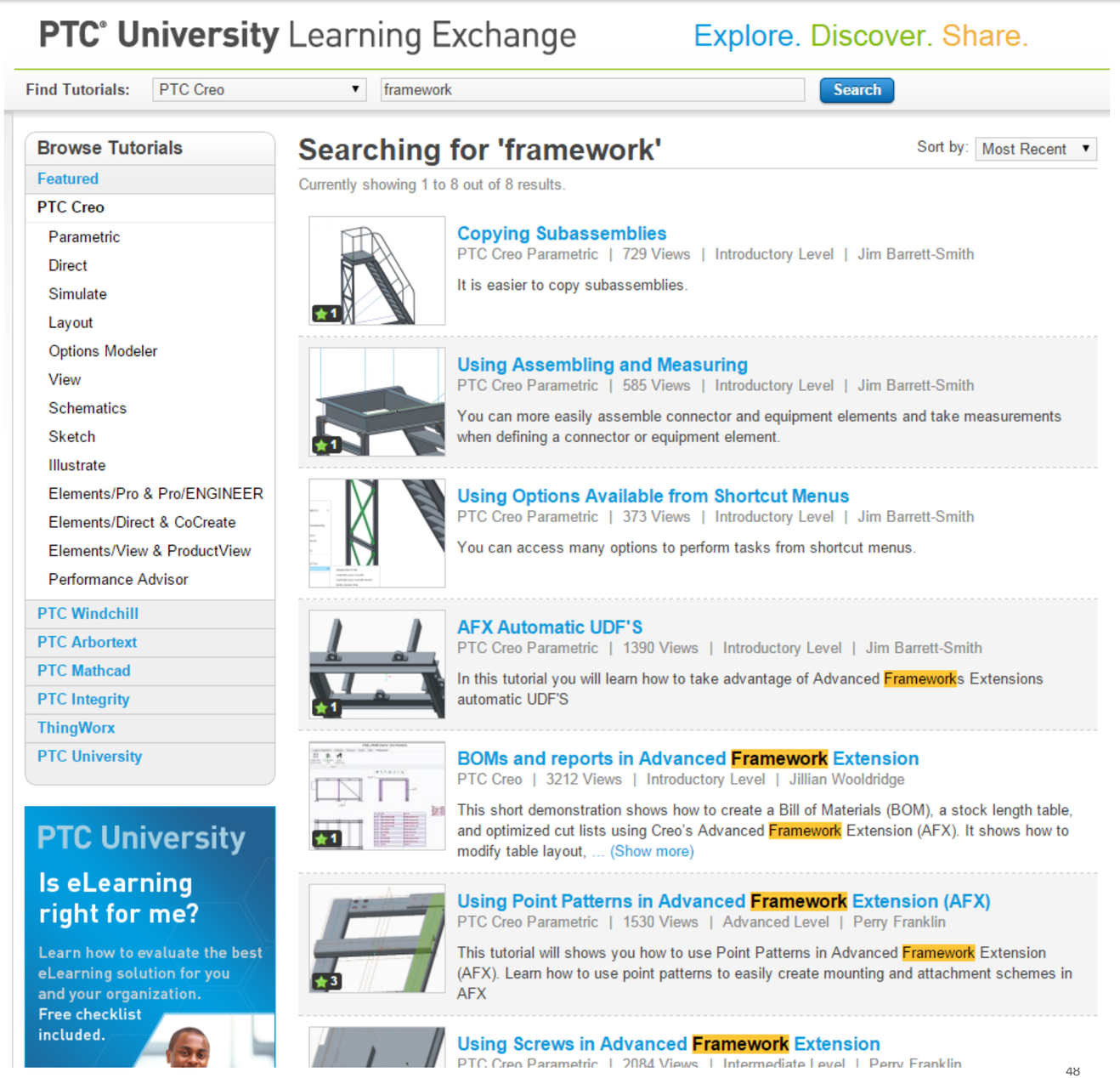

## Benefits

- Streamlined Work Flow
- Reduced UI Interaction

# Training Content

PTC® Live Global

- Learning Exchange
  - Search for “Framework
  - Introduction to AFX
  - Enhancements
- Help Center
  - Easy to use search tools to find help
- PTC Community
  - Dedicated Group



# Intelligent Fastener Extension

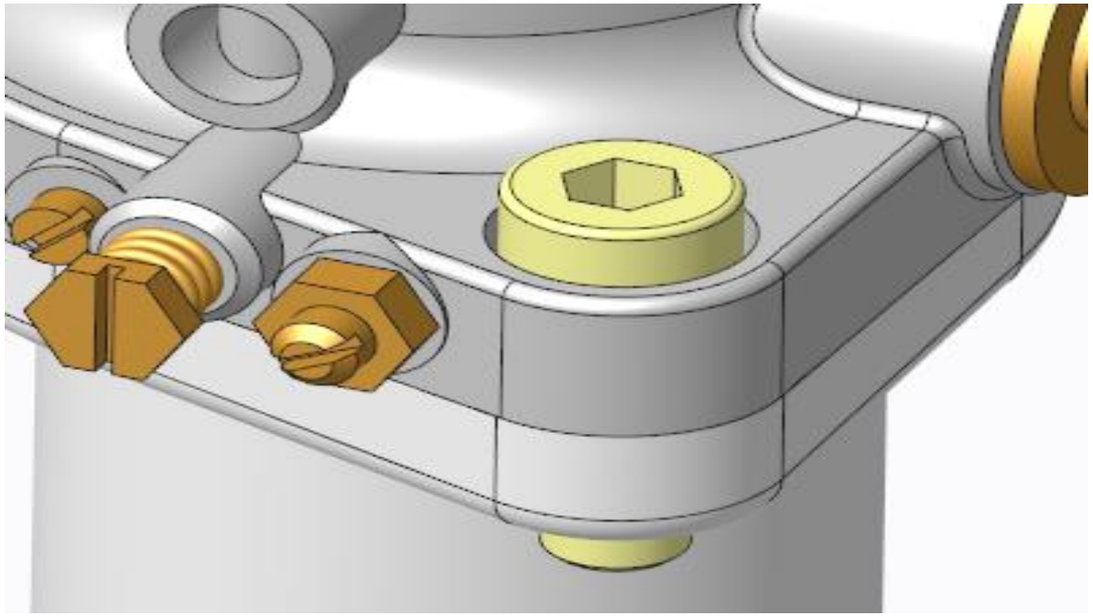
# Intelligent Fastener eXtension (IFX)

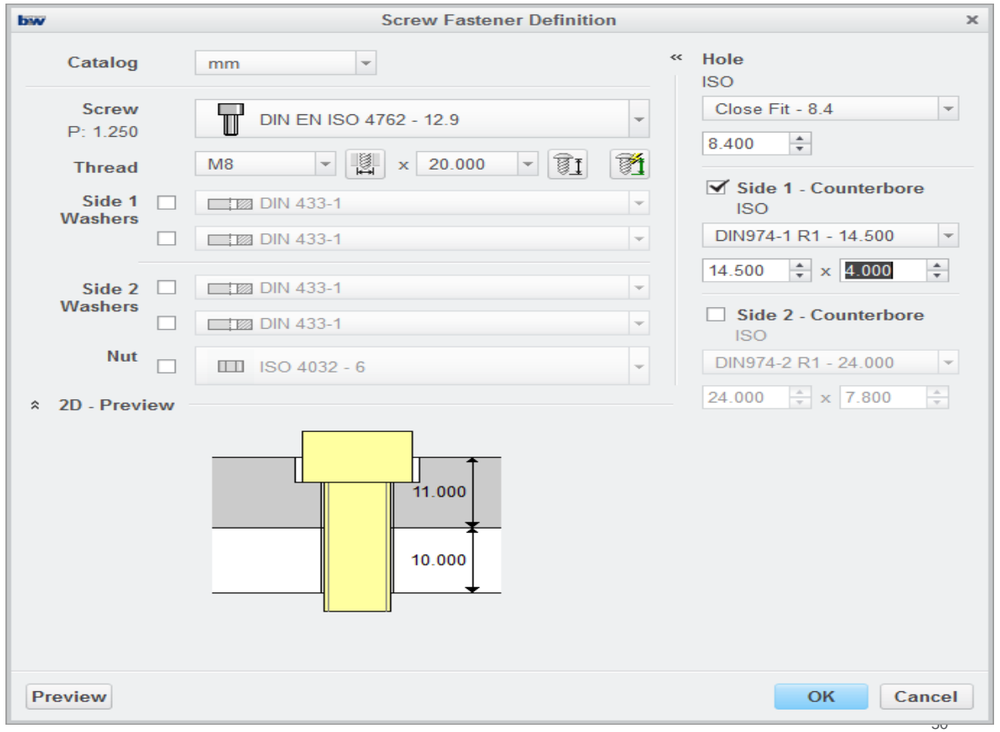
PTC® Live Global

## Introduction

Using traditional modelling techniques to create a hole in each part and assemble the socket head cap screw will take the average user at *least* 35 mouse clicks and 96 seconds.

PTC Creo Intelligent Fastener eXtension (IFX) automates the creation of holes and assembly of fasteners within a single user interface reducing the workload to 11 mouse clicks and 19 seconds.





# PTC Creo 3.0 – Intelligent Fastener eXtension (IFX)

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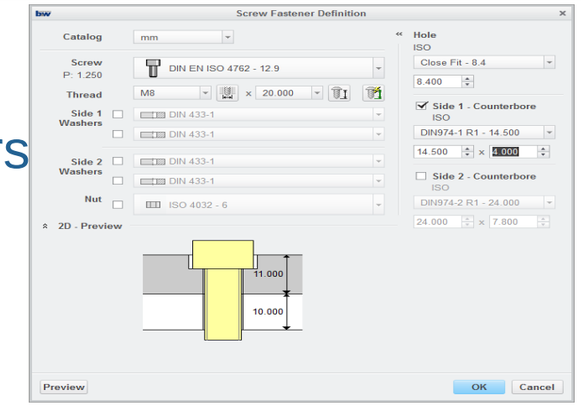
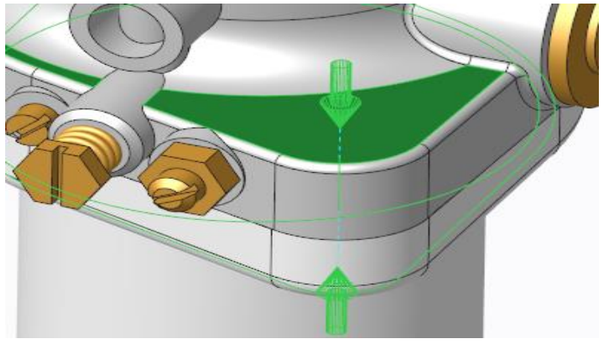
## An Improved Workflow

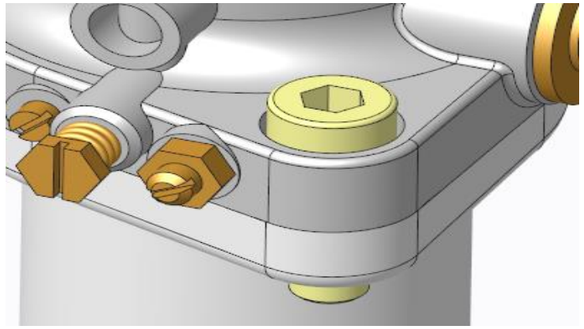
With little of no training any PTC Creo user can utilize IFX to assemble fasteners

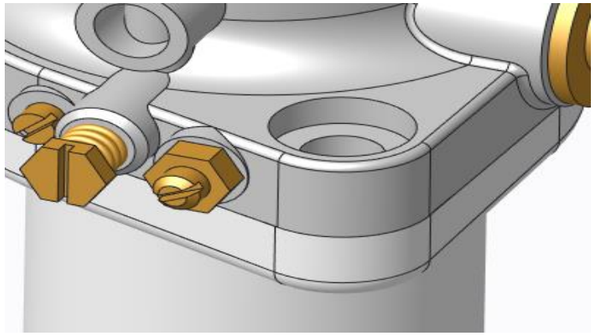



- The easy to use interface allows the user to:
  - Define the position of the fixing by selecting either a datum point, datum axis or free point
  - Select a plane to locate the screw head
  - Select a plane to locate the nut head or end of threaded hole
  - Define the desired fixing configuration from a comprehensive OOTB library



- With placement and hardware configuration defined IFX will:
  - Automatically calculate the fastener length
  - Create the required holes at the part level
    - No assembly references*
  - Assemble the fastening hardware
  - Prompt to pattern if selected references are patterned





- After design changes IFX provides tools to:
  - Check whether fasteners are long enough*
  - Check holes are aligned with fasteners*

*Full version of IFX only

## Library Limitations

| | Description | Lite | Full |
|---|---|---|---|
| **Library** | Screws mm & Inch<br>ANSI<br>DIN EN ISO 1580, 2009, 4762,<br>DIN 84, 85, 580, 912, 921, 931, 933, 960, 961, 963, 6912, 7380, 7984, 7990, 7991<br>EN 14399<br>EN ISO 1207<br>ISO 2010, 4014, 4016, 4017, 4018, 7045, 7411, 7412, 8676, 8677, 8678, 8765, 14579, 14580, 14581, 14582,<br>JIS | ✓ | ✓ |
| | Washers mm & Inch<br>Plain – wide & narrow<br>Lock – regular & heavy<br>DIN ISO 125, 127,128, 433, 434, 435, 6916, 6917, 6918, 7980, 7989, 7090, 7091, 7092<br>ISO 7093<br>EN 14399 | ✓ | ✓ |
| | Nuts, mm & Inch<br>ISO 4032, 4033, 4035, 7040, 8673, 8674, 8765, 10511, 10512<br>Din 439, 555, 934, 971, 982, 1587, 6915, 6923, 1661<br>EN 14399 | ✓ | ✓ |
| | Dowels mm & Inch<br>ISO 2338, 8733, 8734, 8735, 8740, 8748, 8750, 8751, 8752<br>DIN EN 28740 | | ✓ |
| | Customization | | ✓ |

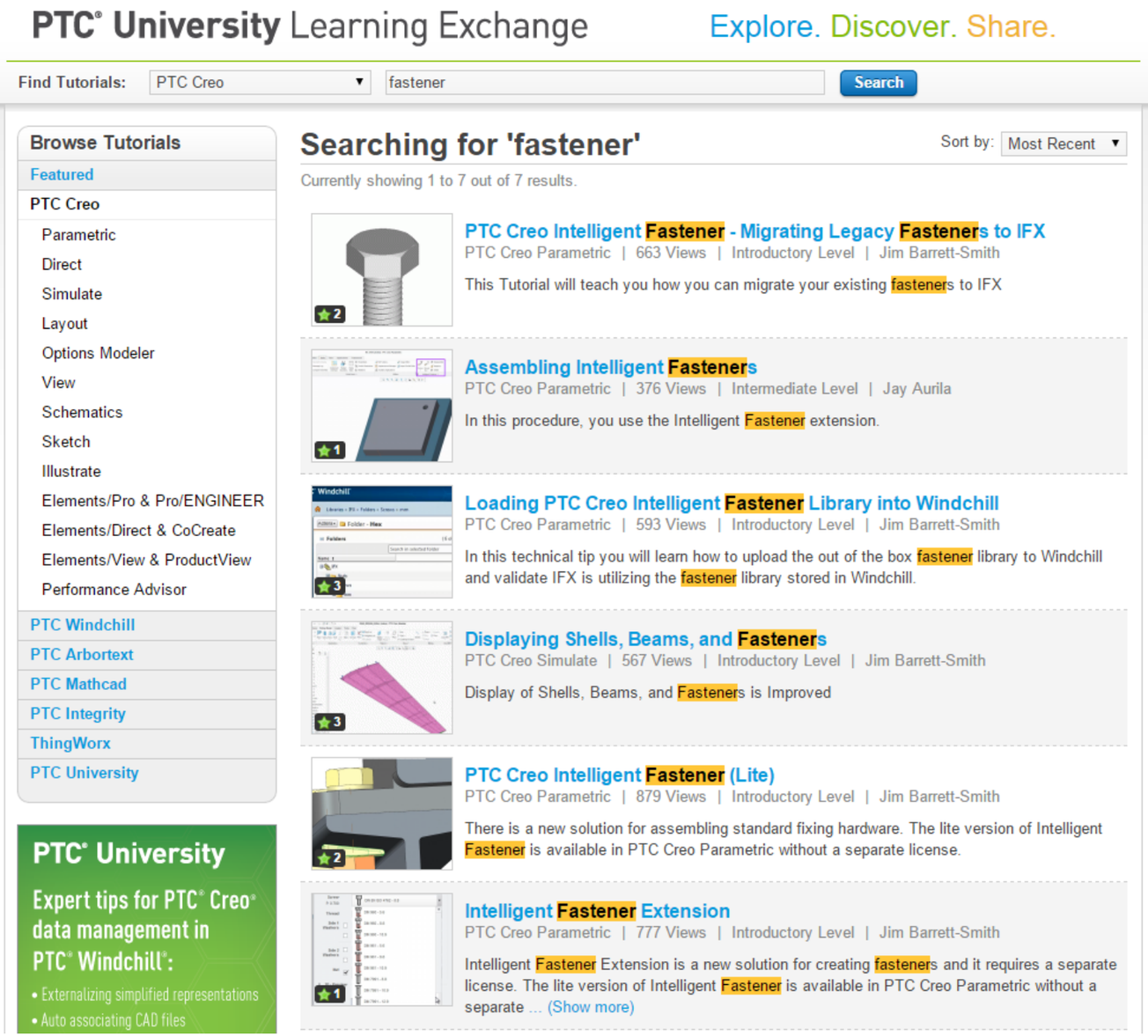
## Placement and Validation Limitations

| | Description | Lite | Full |
|---|---|---|---|
| **Placement** | Automatic hole Creation | ✓ | ✓ |
| | Counterbores | ✓ | ✓ |
| | Automated length selection | ✓ | ✓ |
| | Automated thread diameter selection | ✓ | ✓ |
| | Pattern fastener during placement | ✓ | ✓ |
| | Assemble fastener on all points/axis | | ✓ |
| | Create holes without external references | | ✓ |
| | Alignment of fasteners on beams with sloped inner surfaces | | ✓ |
| | Assembling nuts to subassemblies (encapsulated / welded nuts) | | ✓ |
| | | | |
| **Validation** | Updating hole positions | | ✓ |
| | Fastener length | | ✓ |

# Training Content

PTC® Live Global

- Learning Exchange
  - Search for “Fastener”
  - Introduction to IFX
  - Loading Library into Windchill
  - Migrating Legacy Fasteners
- Help Center
  - Introductory Tutorial
  - Advanced Tutorial coming
    - Summer 2015
- PTC Community
  - Dedicated Group



# PTC Creo Intelligent Fastener eXtension (IFX)

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## Summary

- Improved Standardization
  - Comprehensive library of fasteners
    - Fully customizable*
- Improved User Productivity
  - At least 90% quicker
    - Assembling just 46 fasteners will save one hours work.
  - At least 68% less clicks
  - Deletion of fasteners will automatically delete associated holes
- Improved Design Workflows
  - Automatic creation of holes without assembly references*
    - Remove requirement to manually align fastener holes
- Improved Design Accuracy
  - Verification tools to check*
    - Fixings are long enough
  - Fully aligned mounting holes*

*Full version of IFX only

- Your feedback is valuable
- Don’t miss out on the chance to provide your feedback
- Gain a chance to win an instant prize!
- Complete your session evaluation now

# PTC® Live Global

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