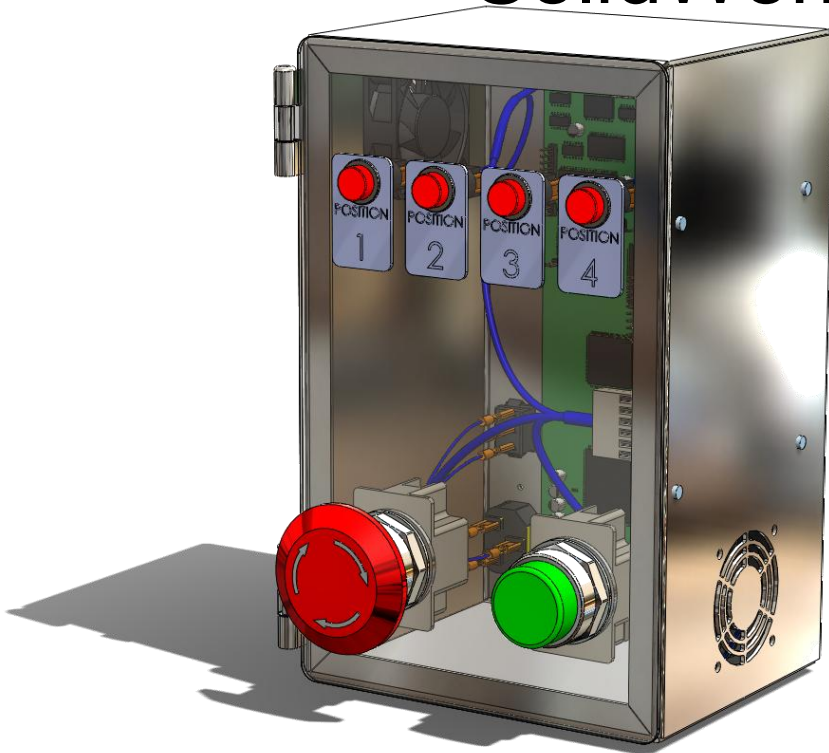


North East SolidWorks User Conference

Cable and Harness Design Using SolidWorks Routing

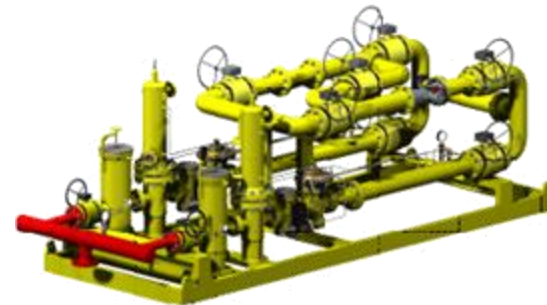
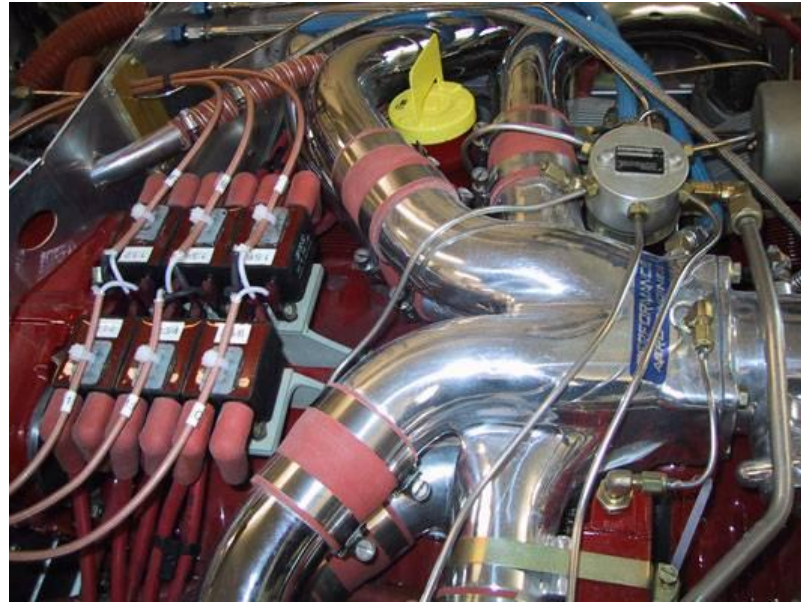


Gabe Enright

Senior Applications Engineer

CADD Edge Inc.

- Why Routing?
- SolidWorks Skills
- Creating Routes
- Libraries
- Learning Routing
- Tips & Tricks



- Move Routing Design Forward in Design Process
- Claim space
- Create consistent Products
- Prevent Errors

Actual Quotes

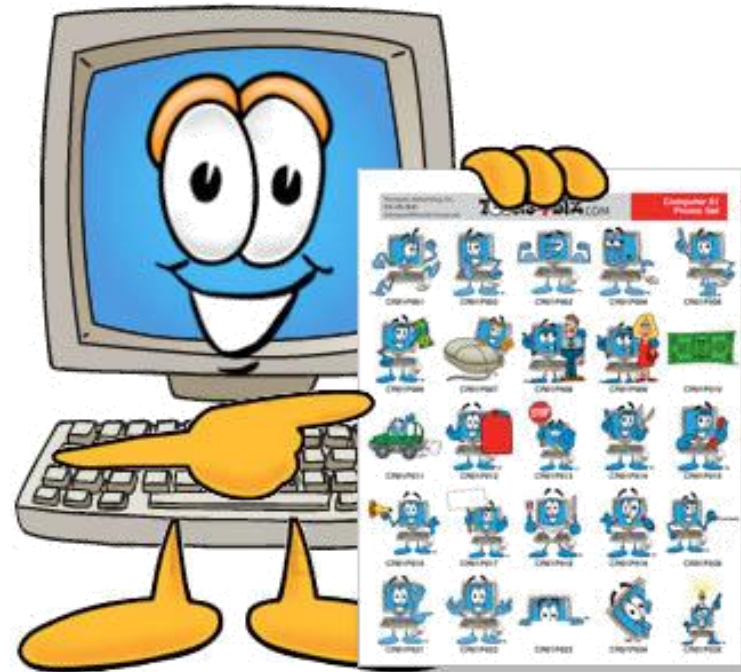
“Wire Harnesses are the last thing we design before the box”

“Once we put all the wiring in we couldn’t close the cabinet door”

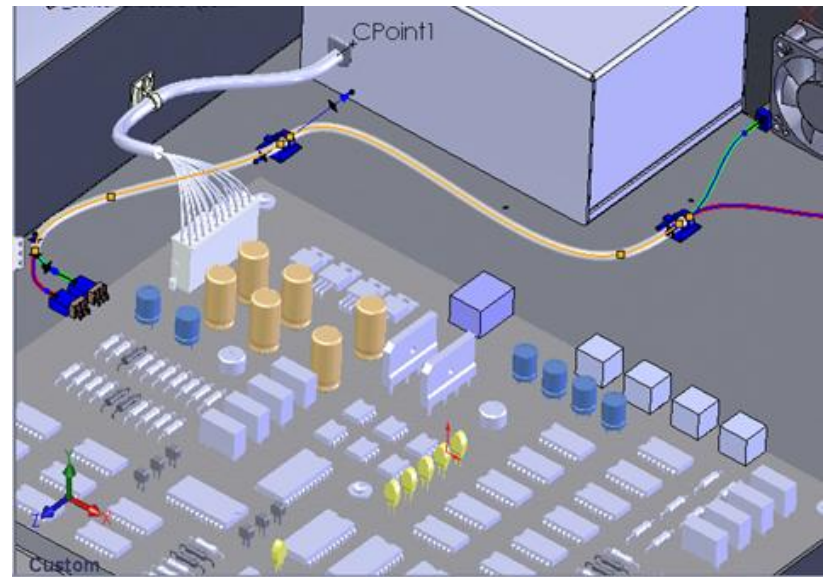
“If our welder ever quits we are going to have to buy back a machine to learn how its plumbed”

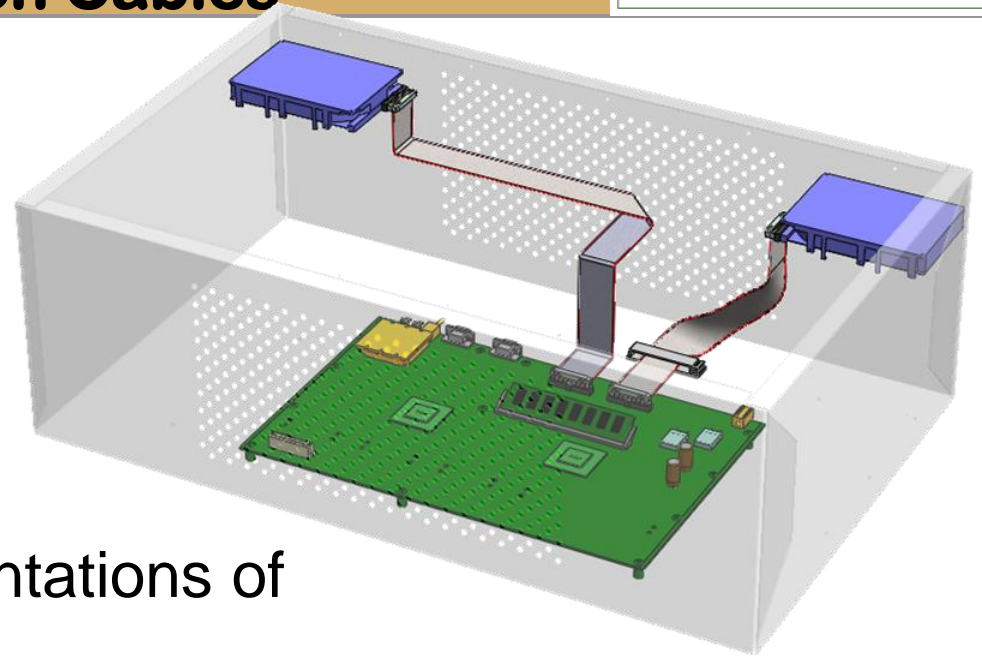


- Top Down Assembly modeling
- Mate References
- 3D sketching
- Display States
- Virtual Parts



- Place connectors
 - Manually or Via From To
- Create Routes between connectors
 - Use clips to constrain them
- Add Wires
 - Manually or Via From-To
- Document
 - Flatten Assembly
 - Manufacturing
 - Annotation



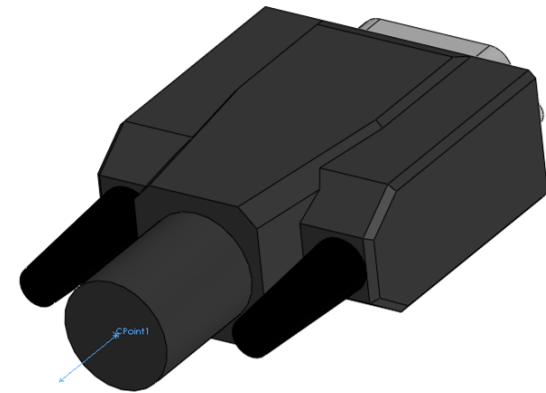


- New in 2009 SP2
- Create Physical Representations of Ribbon or Flat Cables
- Limitations
 - Edit Wires cannot be used to assign wires to a ribbon cable.
 - From-to Lists cannot be used with ribbon cables.
 - Auto Route is the only way create routes. Manual sketching is not allowed.
 - Repair Route cannot be used.

- What's in it?
- What else is out there?
- Strategies for creation.



- Geometry
- Connection points
- Mate Reference
- Axis of Rotation
- Add to Connector library



LEARN WITH THE WIZARD!!

(the software not me)

- Folder Structure
- Components



| | |
|--------------|----------------|
| Connectors | SLDPRT, SLDASM |
| Clips | SLDPRT, SLDASM |
| Wire & Cable | XML |
| Other parts | XML |

- Build Manually (tedious)
- Import Excel

Cable/Wire Library

C:\demo\Electrical Routing Demo 2008\Electrical Library\cable.xml

Wire List

| ID | Name | Part Number | Description | OD | Color | SWColor | Min Bend Radius | Size/Gauge |
|----|-------------|----------------|---------------------|--------|--------|---------|-----------------|------------|
| 1 | 30ga-BLACK | 9978-30GST-BLK | 30g Stranded BLACK | 0.81mm | BLACK | | 5mm | |
| 2 | 30ga-WHITE | 9978-30GST-WHT | 30g Stranded WHITE | 0.81mm | WHITE | | 5mm | |
| 3 | 30ga-RED | 9978-30GST-RED | 30g Stranded RED | 0.81mm | RED | | 5mm | |
| 4 | 30ga-GREEN | 9978-30GST-GRN | 30g Stranded GREEN | 0.81mm | GREEN | | 5mm | |
| 5 | 30ga-BLUE | 9978-30GST-BLU | 30g Stranded BLUE | 0.81mm | BLUE | | 5mm | |
| 6 | 30ga-YELLOW | 9978-30GST-YEL | 30g Stranded YELLOW | 0.81mm | YELLOW | | 5mm | |
| 7 | 30ga-VIOLET | 9978-30GST-VIO | 30g Stranded VIOLET | 0.81mm | VIOLET | | 5mm | |
| 8 | 30ga-ORANGE | 9978-30GST-ORG | 30g Stranded ORANGE | 0.81mm | ORANGE | | 5mm | |
| 9 | 30ga-GRAY | 9978-30GST-GRA | 30g Stranded GRAY | 0.81mm | GRAY | | 5mm | |
| 10 | 30ga-BROWN | 9978-30GST-BRN | 30g Stranded BROWN | 0.81mm | BROWN | | 5mm | |
| 11 | 24ga-BLACK | 9978-24GST-BLK | 24g Stranded BLACK | 1.12mm | BLACK | | 5mm | |
| 12 | 24ga-WHITE | 9978-24GST-WHT | 24g Stranded WHITE | 1.12mm | WHITE | | 5mm | |
| 13 | 24ga-RED | 9978-24GST-RED | 24g Stranded RED | 1.12mm | RED | | 5mm | |
| 14 | 24ga-GREEN | 9978-24GST-GRN | 24g Stranded GREEN | 1.12mm | GREEN | | 5mm | |
| 15 | 24ga-BLUE | 9978-24GST-BLU | 24g Stranded BLUE | 1.12mm | BLUE | | 5mm | |
| 16 | 24ga-YELLOW | 9978-24GST-YEL | 24g Stranded YELLOW | 1.12mm | YELLOW | | 5mm | |
| 17 | 24ga-VIOLET | 9978-24GST-VIO | 24g Stranded VIOLET | 1.12mm | VIOLET | | 5mm | |
| 18 | 24ga-ORANGE | 9978-24GST-ORG | 24g Stranded ORANGE | 1.12mm | ORANGE | | 5mm | |
| 19 | 24ga-GRAY | 9978-24GST-GRA | 24g Stranded GRAY | 1.12mm | GRAY | | 5mm | |

Buttons: Browse..., Save, Save As, OK, Cancel

Available Colors for Wires

- BLACK
- WHITE
- RED
- GREEN
- BLUE
- YELLOW
- MAGENTA
- CYAN
- GRAY
- LIGHTGRAY
- DARKRED
- DARKGREEN
- DARKBLUE
- LIGHTBROWN
- DARKMAGENTA
- DARKCYAN

C:\ProgramData\SolidWorks\SolidWorks 2010\design library\routing\electrical\components.xml

Component List

| ID | Name | SolidWorks Document | Configuration | Description | Pins List |
|----|----------------|--------------------------------|---------------|----------------------|---------------|
| 1 | db15-plug | db15-e.sldprt | Default | Connector | 1,2,3,4,5,6,7 |
| 2 | db9-plug | db9 male.sldprt | Default | Connector-9 Pin Male | 1,2,3,4,5,6,7 |
| 3 | 5pindin-plug | plug-5pindin.sldprt | Default | Connector | 1,2,3,4,5 |
| 4 | plug-sma | plug-sma.sldprt | Default | Connector | 1,2,3,4,5,6 |
| 5 | plug-6pin-mini | plug-6pin-minidin.sldprt | Default | Connector | 1,2,3,4,5,6 |
| 6 | ring_term_18-2 | ring_term_18-22_awg-x-6.sldprt | Default | Connector | 1 |
| 7 | ring_term_awg | ring_term_awg-14-16_awg-x | Default | Connector | 1 |
| 8 | plug-usb1 | plug-usb1.sldprt | Default | Connector | 1 |
| 9 | plug-usb2 | plug-usb2.sldprt | Default | Connector | 1 |
| 10 | socket-6pinmin | socket-6pinminidin.sldprt | Default | Connector | 1,2,3,4,5,6 |
| 11 | connector (3pi | connector (3pin) female.SLD | Default | Connector | 1,2,3 |
| 12 | LED | LED.SLDPRT | Default | Light | 1,2 |
| 13 | LED - RS_276-0 | LED - RS_276-068.SLDPRT | Default | Light | 1,2 |
| 14 | connector (3pi | connector (3pin) male.sldprt | Default | Connector | 1,2,3 |
| 15 | 5Pinner | aa5pin.sldprt | Default | End Connector | 1,2,3,4,5 |
| 16 | 3Pinner | aa3pin.sldprt | Default | End Connector | 1,2,3 |

Cable/Wire Library

C:\ProgramData\SolidWorks\SolidWorks 2010\design library\routing\electrical\cable.xml

Wire List

| ID | Name | Part Number | Description | OD | Color | SWColor | Min Bend R | Size/Gau |
|----|------------|-------------|-------------|-----|-------|---------|------------|----------|
| 1 | 20g yellow | 9982 | 20g yellow | 2mm | Y | Yellow | 2mm | 2.5 |
| 2 | 20g white | 9983 | 20g white | 2mm | W | White | 1mm | 2 |
| 3 | 20g red | 9984 | 20g red | 2mm | R | Red | 1mm | 16 |
| 4 | 20g blue | 9985 | 20g blue | 2mm | B | Blue | 1mm | 22 |

Header Definitions(From/To)

Column headers for data import. Use ';' to enter multiple values.

Wire name:
Wire Name;Wire

From reference:
From Ref

From pin:
Pin;From Pin

Part number:
From Part number;Part number;Partno

To reference:
To Ref

To pin:
Pin;To Pin

Part number:
To Part Number;Partno;Part number

Cable name:
Cable;Cable name

Core name:
Core Identifier;Core Colour;Core

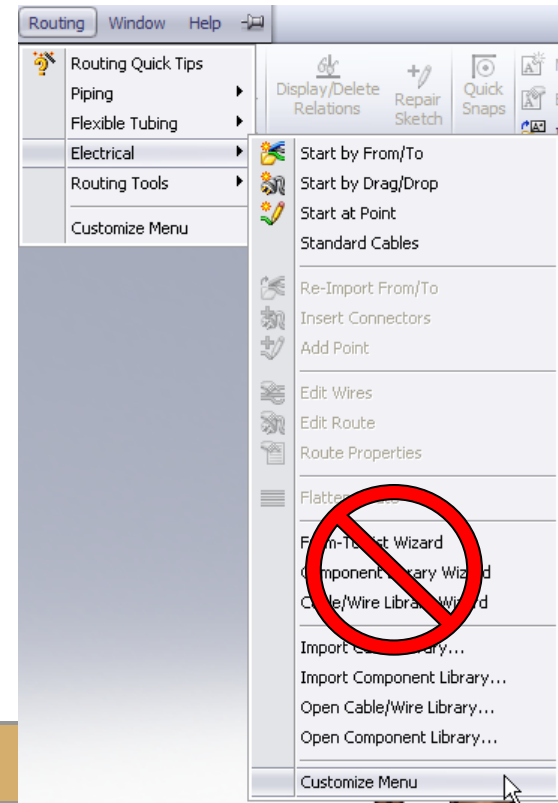
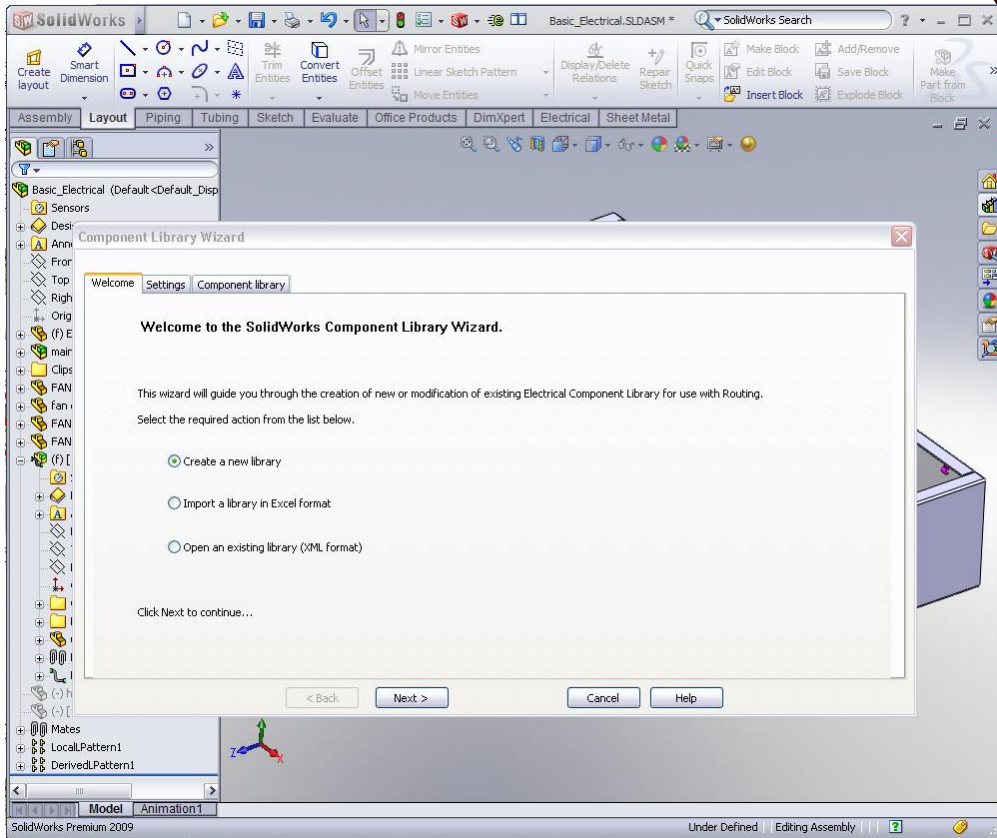
Colour:
Colour;Color

Wire spec:
Wire/Cable Spec;Cable Spec;Wire Spec;Spec

G16

| | A | B | C | D | E | F | G | H | I |
|----|------|-----------|----------|-------------------|----------|--------|-------------------|--------|-------|
| 1 | | | | | | | | | |
| 2 | Wire | Wire Spec | From Ref | From Part Number | From Pin | To Ref | To Part Number | To Pin | Color |
| 3 | W1 | 9982 | motor1 | 5pindin-plug | 1 | xcon1 | plug-6pin-minidin | 1 | |
| 4 | W2 | 9983 | motor1 | 5pindin-plug | 2 | xcon1 | plug-6pin-minidin | 2 | |
| 5 | W3 | 9984 | motor1 | 5pindin-plug | 3 | xcon1 | plug-6pin-minidin | 1 | |
| 6 | W4 | 9985 | battery1 | plug-6pin-minidin | 1 | xcon1 | plug-6pin-minidin | 2 | |
| 7 | W5 | 9982 | battery1 | plug-6pin-minidin | 2 | xcon2 | plug-6pin-minidin | 1 | |
| 8 | W6 | 9983 | battery1 | plug-6pin-minidin | 3 | xcon2 | plug-6pin-minidin | 2 | |
| 9 | W7 | 9984 | battery1 | plug-6pin-minidin | 4 | xcon3 | plug-6pin-minidin | 1 | |
| 10 | W8 | 9985 | battery1 | plug-6pin-minidin | 5 | xcon3 | plug-6pin-minidin | 2 | |
| 11 | | | | | | | | | |

- AVOID or Request Enhancements to



Reseller Led Training



SolidWorks Tutorials

- Mold Design
- Molded Product Design
- Multibody Parts
- Pattern Features
- PhotoWorks
- Revolves and Sweeps
- Routing - Electrical**
- Routing - Pipes and Tubes**
- Sheet Metal
- Smart Components
- SolidWorks API Tutorials
- SolidWorks eDrawings
- SolidWorks FloXpress
- SolidWorks Motion
- SolidWorks SimulationXpress
- SolidWorks Utilities
- SolidWorks Workgroup PDM
- Surfaces
- TolAnalyst Tutorials
- Toolbox
- Weldments
- All SolidWorks Tutorials (Set 1)

SolidProfessor

- 2009 SolidWorks Routing
 - Routing Basics
 - Routing Introduction
 - Routing Overview
 - Routing Components
 - Start a Route by Drag and Drop
 - End a Route by Drag and Drop
 - Start a Route on the Fly
 - Start a Route from Existing Components
 - Routing Settings
 - Tube Routes
 - Piping Routes
 - Electrical Routes
 - Electrical Conduits
 - Creating Route Components
 - Drawings



Who Am I?

I'm Wes Mosier, just a guy who's been using 3D cad software for the past 18 years, with electrical, mechanical, architectural, fabrication & process piping experience.

A few years ago I realized that other users were asking me about the SolidWorks Routing Add-On, and decided to write a little manual to help them learn how to get the most out of it. [\(more\)](#)

Recent News...


SolidWorks World 2008 was held recently in San Diego California. If you skipped it, then you missed out on what was probably the largest, best SolidWorks World yet!

Contact Me!

Questions about my manual? Got stuck with SolidWorks and just need a tip? Want to advertise on this site? Have a cool Piping or Tubing pic and want me to show it here? Then just send an email to WesMosier@ForefrontStudios.com

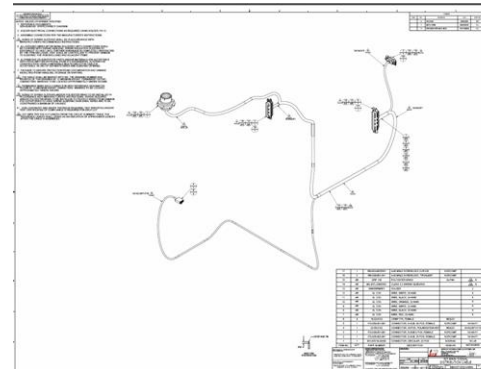
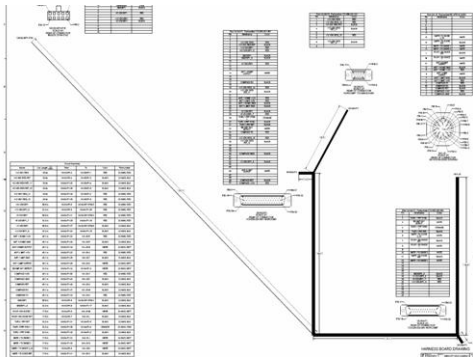
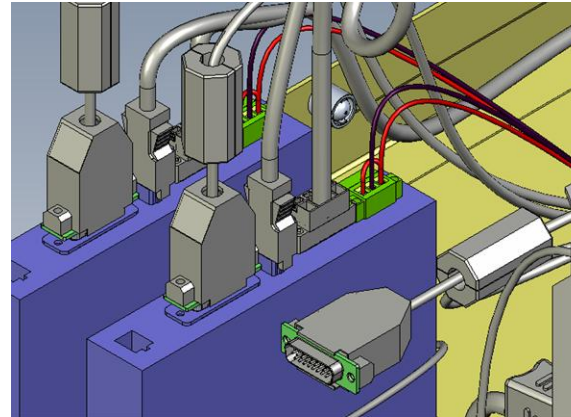
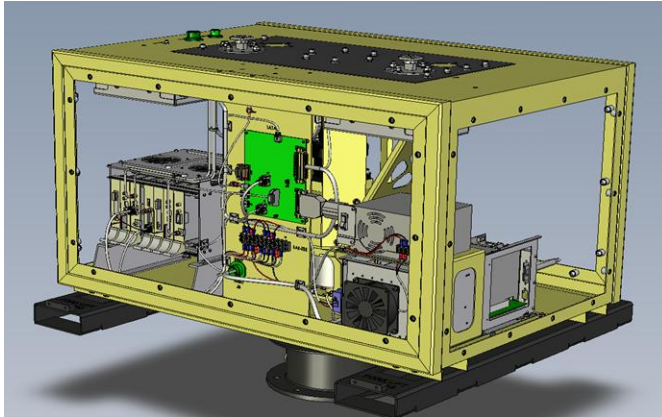
SolidWorks Routing Manual

The Piping & Tubing Design Guide is over 250 full color pages long and covers areas such as how the SW 2008 routing package works, file management, how to start routes, creating your own custom components, working with drawings, and many more topics!! [\(more\)](#)



SW 2008 Tubing Manual

Independent Routing Manual
www.forefrontstudios.com
 Tube and Pipe specific



- Courtesy of Kirk L. Jess
– RCX Radar Systems

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Questions

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