INTRODUCTION TO Pro/CABLING™
Pro/ENGINEER® Wildfire 2.0

Subject: Pro/CABLING

Lesson #1

Topics:

- **Terms you need to know**
- **Creating a harness**
- **Creating a spool**
- **Creating a wire**
- **How to designate components**
- **How to route a wire**

Tutorial Guidelines

How to Read This Tutorial

Below is a quick outline of how to read this tutorial. Underneath each item is an example of how it might be used throughout the document.

All menu picks in Wildfire are designated by **#this text**.
- **Part** menu: **#Feature, #Create, #Datum, #Plane, #Default.**

Explanation or comments about what you're doing are noted by *this text*
*** To begin, we will create a new part with default datum planes ***

Any file selection is noted by ***<this text>***
- **File** menu: **#Open, Name: *<handle>*, #OK**.

Any input into Wildfire will be displayed with **[this text].**
- **File** menu: **#New, Name: [surf_1], #OK**.

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All material written in this document has been thoroughly reviewed for accuracy and tested for the release designated on the title page. However, FroTime is not responsible for any information that is incorrect or does not operate correctly when the tutorial instructions are followed.

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I. INTRODUCTION – TERMS YOU NEED TO KNOW

What is a Harness?
A Harness is a part model comprising of routed wires, cables, and bundles in an assembly with all of their necessary parameter information.

What is a Sub-harness?
A Sub-harness is a subset of a harness. Sub-harnesses may be manufactured separately.

What is a Cable?
A Cable is two or more conductors which are contained in the same jacket.

What is a Wire?
A Wire is a cable with a single conductor.

What is a Conductor?
A Conductor is an internal current carrying entity within a cable.

What is a Spool?
A Spool is used to determine the majority of parameters, which describe a wire or cable. It is analogous to a reel of wire or cable from which individual wires or cables are cut. One spool can provide for only one type of wire or cable, but multiple wires or cables can be cut from the same spool. Spools must be designated in a cabling assembly before cable routing can begin.

What is a Bundle?
A Bundle is a group of cables, wires, or other bundles that are sheathed together.

What is a Sheath Spool?
A Sheath Spool is used to specify sheathing for bundles. Shrink, tape, and tube sheath spools may be created.

What is a Component?
A Component is a part or subassembly at which wires and cables terminate.

What is Designating?
Designating a connector supplies information about the connector model to the assembly. A connector must be designated before a cable can be routed to it.

What is an Entry Port?
An Entry Port is a coordinate system located on a connector which will be the terminal point for a routed cable or wire.

What is Route (Routing)?
A Route is the path that a wire, cable, or bundle follows on an assembly model. It is comprised of a series of points called locations, which define the cable.

What is a Location?
A Location is defined as a point that defines a wire, cable, or bundle route. They will display as small green dots if Center Line is selected in the ENVIRONMENT menu, and will not appear at all if Thick Cables is selected. The geometric placement of these locations can be modified at any time.

What is a Cable Portion?
A Cable Portion is the segment of wires or cables between two cable locations.

What is a Marker?
Markers are cosmetic features which represent shrink-wrap tubing that is placed on a cable during manufacturing to identify them. They are always represented as a cylindrically shaped feature with a nametag. The nametag can be hidden by turning the datum display off. The dimensions of markers can be modified as necessary.

What is a Tie Wrap?
A Tie Wrap is a cosmetic feature that physically binds several wires or cables together. They appear as a two dimensional circle which encompasses the cables when in "Centerline" mode, and as a cylinder of pre-defined thickness when in "Thick Cables" mode dimensional values for Tie Wraps are defined automatically, and the values are functions of the thickness of the bounded cables.
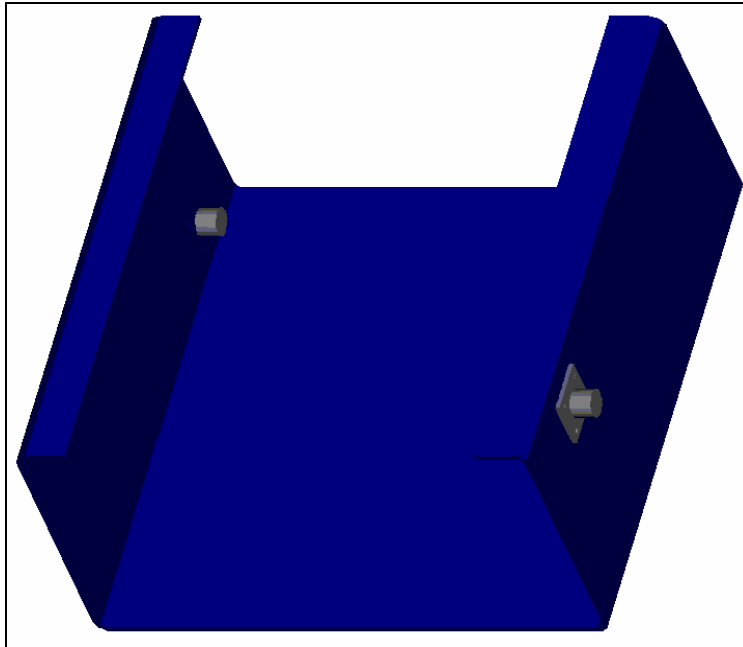
II. <u>Tutorial Lesson – CREATE A HARNESS</u>

** Bring the assembly named "box2" into session **

- FILE menu: **#File**, **#Open, Name: <box2.asm>, #OK**
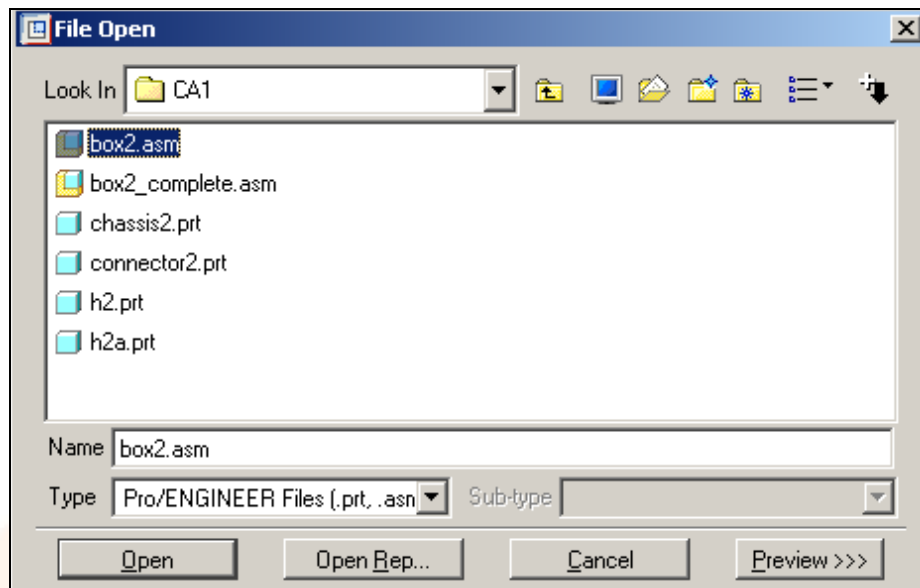
** box2.asm can be seen in the following image **

** Activate your cabling module. **

- Applications menu: **#Cabling**

** Create your harness "h2" **
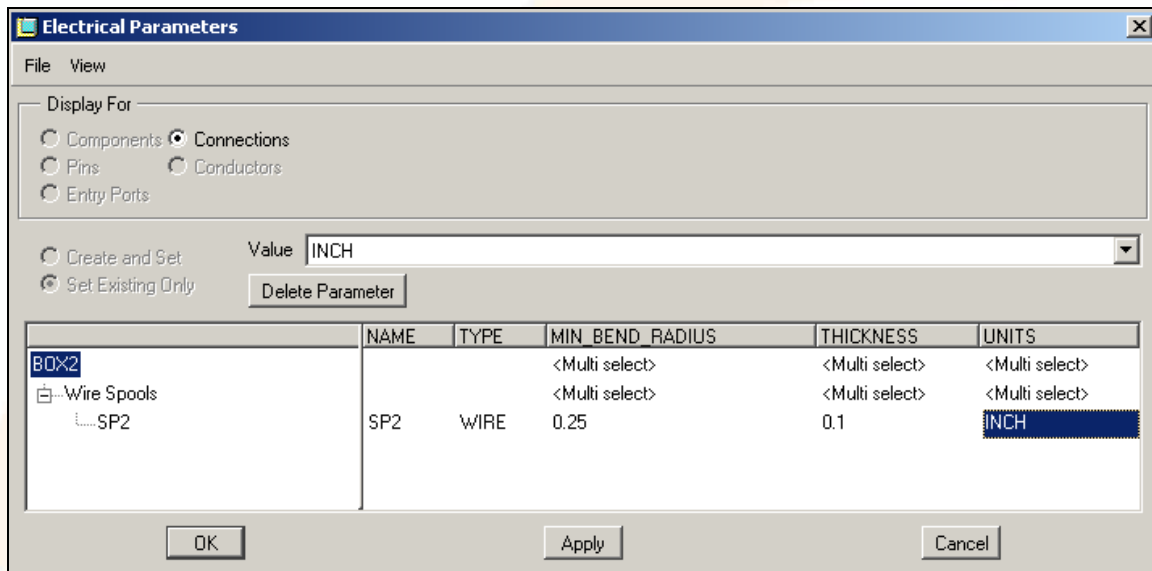
- CABLING menu: **#Harness, #Create, Name: [h2], #OK**

III. Tutorial Lesson – CREATE A SPOOL

*** Create your spool "sp2" for your wire ***

- CABLING menu: **#Spools**
- SPOOLS menu: **#Create**
- CREATE SPOOLS menu: **#Wire, Name: [sp2], #OK**

*** Edit your spool table for a min bend radius **[.25]** and a thickness **[.1]** ***

- Electrical Parameters box: **#OK.**

IV. Tutorial Lesson – CREATE A WIRE

*** Create your wire "w1" ***

- CABLING menu: **#Feature**
- PART FEATURE menu: **#Create**
- CABLE FEATURE menu: **#Wire, Name: [w1], #OK**

*** Select a spool to build your wire "w1" from ***

- SPOOLS NAMES menu: <**sp2**>
- CABLE FEAT menu: **#Done/Return**
- PART FEAT menu: **#Done/Return**

*** Turn on your CDS (coordinate systems)   ***
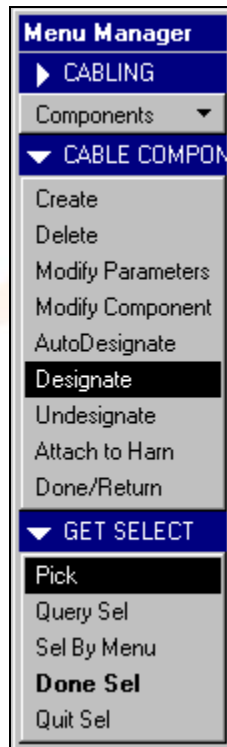
- Utilities menu: **#Environment**

*** Pick the Coordinate System box and select OK at the bottom of the menu ***

- Environment dialog box**: #OK**

V. Tutorial Lesson – DESIGNATE COMPONENTS

*** You must now designate your components ***

- CABLING menu: **#Components**
- CABLING COMPONETS menu: **#Designate**

*** Pick the connector on the right side of the chassis ***

*** Accept default value for component parameters ***

*** Now select the Entry Ports you wish to use on the connector (CS1) ***
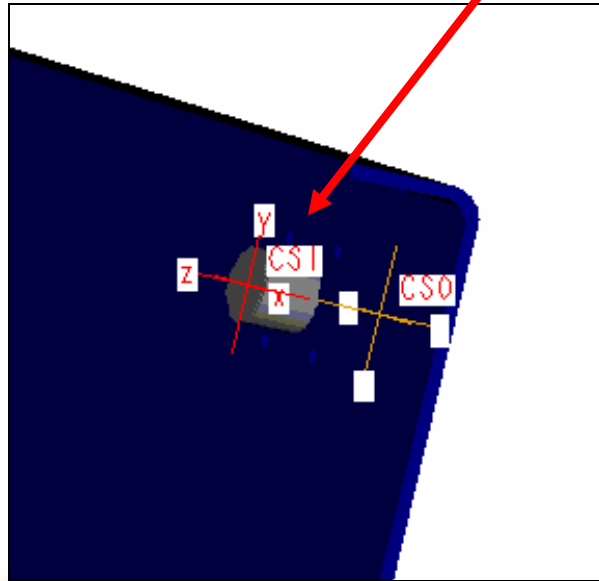
- MOD CONN menu: **#Entry Ports**

*** Pick coordinate system CS1 on the right side chassis connector ***

*** Accept default value for internal length ***

- PORT TYPE menu: **#Wire**

- CABLE COMPONENTS menu: **# Done/Return**

*** This is the right side chassis connector and Entry-port CS1. ***

*** Now designate the component on the left side of the chassis ***

- CABLING menu: **#Components**
- CABLING COMPONETS menu: **#Designate**

*** Pick the connector on the left side of the chassis ***

*** Accept default value for component parameters ***

*** Now select the Entry Ports you wish to use on the connector (CS1) ***

- MOD CONN menu: **#Entry Ports**

*** Pick coordinate system CS1 on the left side chassis connector ***

*** Accept default value for internal length ***

- PORT TYPE menu: **#Wire**
- CABLE COMPONENTS menu: **# Done/Return**

VI. Tutorial Lesson – ROUTE A WIRE

** You are now ready to route your wire "w1" from the right side chassis connector to the left side chassis connector. But first lets add a column to the model tree to make the selection easier. **

- MODEL tree: **#Setting, #Tree Column**

Now this new dialog box will appear.
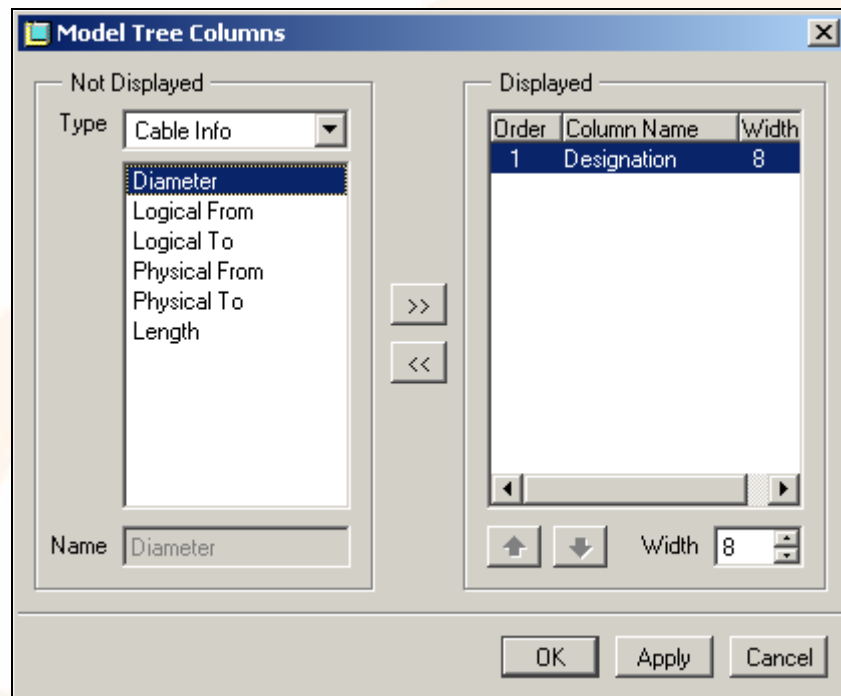
MODEL TREE COLUMNS: [under type, select Cable info], **#Designation, #** [>>] , **#Apply, #OK**

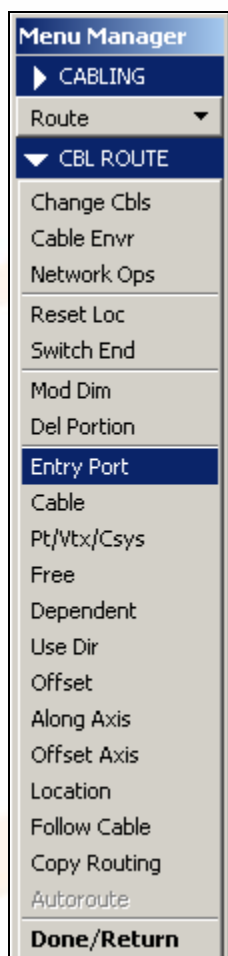***Now lets route the cable to the connectors.***

- CABLING menu: **#Rout**e
- CABLE SEL menu: **#Add**
- ADD CABLES menu: **#Incomplete, #Whole Cables**
- ADD CBL SEL menu: **#Select**

- MODEL tree: **#Wire id 1 (w1), #Select**
- CABLE SEL menu: **#Done Sel**

** Select Entry Ports to route wire (from/to). **

- CBL ROUTE menu: **#Entry Port**

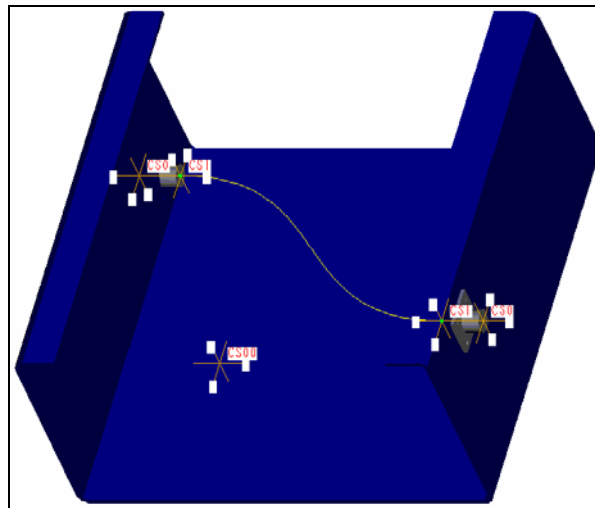*** Select Entry Port CS1 on the right side chassis connector. ***

** Make sure you reselect "Entry Port" form the CBL ROUTE menu before selecting the left side entry port CS1. **

- CBL ROUTE menu: **#Entry Port**

** Now select Entry Port CS1 on the left side chassis connector. **

- CABLE SEL menu **#Done/Return**

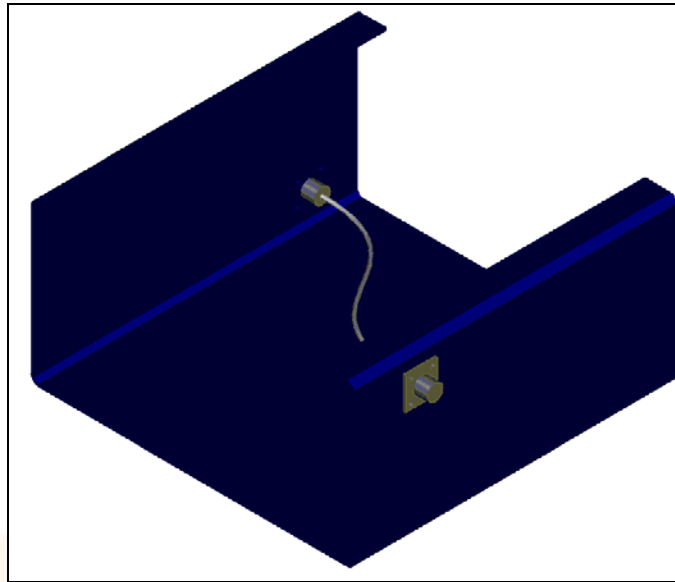*** You should see your wire routed as shown below. ***

** Turn off your CDS and display cables as "thick" **

- TOOLS menu: **#Environment**

** Deselect the Coordinate System box **

** Select the "thick cables" display box **

*** Set your Display Style to **#No Hidden** ***

** Your CDS's should now be off and your wire should appear "thick". **

** You have just routed your first wire in Pro/CABLING™...Congratulations! **

VII. <u>Summary</u>

After completing the above tutorial, you should be able to do the following:

- Create a harness
- Create a spool and understand how to modify spool parameters
- Create a wire and understand the different parameters associated with it
- Designate components
- Route a wire through an assembly

This was an introductory tutorial that showed new cabling users the basics of creating and routing wires through an assembly. In addition, important terms associated with the cabling module were covered.

This concludes the 1st Frotime cabling tutorial. To continue your cabling training please obtain the 2nd Tutorial in the Frotime cabling series at www.frotime.com!

<u>NOTES</u>

CA1_WildFire_02

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CA1_WildFire_02