

Cabling using Pro/ENGINEER Wildfire 4.0

Course Code	TRN-2186-T
Course Length	3 Days

Overview

In this course, you will learn how to create 3-D electrical harnesses using Pro/ENGINEER Wildfire 4.0. This includes using schematic diagrams created with Routed Systems Designer 8.0 to pass information into 3-D harness designs created within Pro/ENGINEER Wildfire 4.0.

You will also learn how to route electrical harnesses, create flattened harnesses for manufacturing, and document harness designs by creating flattened harness drawings that include customized BOM tables and wire list information.

At the end of each module, you will complete on-line learning assessments that reinforce your understanding of the course topics. There is also a wrap-up assessment at the end of the course.

After successfully completing the course, you will be able to create 3-D electrical harnesses and associated manufacturing deliverables using Pro/ENGINEER Wildfire 4.0.

It is strongly recommended that cabling engineers attend this course and the *Creating 2-D Schematics with RSD 8.0* course. This will enable a full understanding of the complete process and an understanding of how the configuration of deliverables from RSD such as wiring diagrams provide essential input for creating electrical harness assemblies in Pro/ENGINEER Wildfire 4.0.

Prerequisites

- Introduction to Pro/ENGINEER Wildfire 4.0.
- *Creating Schematics using RSD 8.0 (Recommended)*

Audience

This course is intended for engineers, involved in the 3-D routing of electrical cabling and wire harnesses, and related roles. The topics in this course are also available as Web-based training courses.

Topics

- Diagram and Harness Development Process Overview
- Creating Wiring Diagrams in Routed Systems Designer (RSD)
- Transferring RSD Information into Harness Designs
- Creating Electrical Harness Assembly Structures
- Routing Wires and Cables in Harness Designs
- Creating Flat Harnesses for Manufacturing
- Creating Harness Drawings

Agenda

Day 1

Module 1	Diagram and Harness Development Process Overview
Module 2	Creating Wiring Diagrams in RSD
Module 3	Creating Harness Assembly Structures

Day 2

Module 4	Establishing Logical References
Module 5	Creating Networks
Module 6	Routing Wires and Cables

Day 3

Module 7	Modifying Wire and Cable Routings
Module 8	Creating Flat Harnesses
Module 9	Documenting Harness Designs



Table of Contents

Cabling using Pro/ENGINEER Wildfire 4.0

DIAGRAM AND HARNESS DEVELOPMENT PROCESS OVERVIEW	1-1
Introduction	1-1
Objectives	1-1
Lecture Notes	1-2
Diagram and Harness Development Process Overview.....	1-3
RSD Diagram Types: Block, Circuit, and P&ID	1-5
RSD Diagram Types: Wiring Diagrams	1-6
RSD Concepts and Terminology (2-D)	1-7
Cable Harness Design Concepts and Terminology (3-D).....	1-8
Documenting Harness Designs: Concepts and Terminology	1-9
Lab Exercises.....	1-10
Exercise 1: Reviewing Wiring Diagrams	1-10
Exercise 2: Reviewing 3-D Harness and Piping Designs	1-16
Summary	1-24
 CREATING WIRING DIAGRAMS IN RSD	 2-1
Introduction	2-1
Objectives	2-1
Lecture Notes	2-2
Wiring Diagrams Overview	2-3
Creating Wiring Diagrams.....	2-4
Logical Referencing Overview	2-7
Configuring Wiring Diagrams for XML File Export.....	2-8
Lab Exercises.....	2-9
Exercise 1: Creating Wiring Diagrams in RSD	2-9
Exercise 2: Configuring Properties and Exporting to XML	2-37
Summary	2-47
 CREATING HARNESS ASSEMBLY STRUCTURES	 3-1
Introduction	3-1
Objectives	3-1
Lecture Notes	3-2



Planned Assembly Design.....	3-3
Skeletons	3-4
Data Sharing Tools.....	3-5
Large Assembly Management Tools.....	3-6
Electrical Assembly Structure Guidelines.....	3-7
Electrical Assembly Structure: Sub-Assembly Option.....	3-8
Electrical Assembly Structure: No Sub-Assembly Option	3-9
Electrical Assembly Structure: Sub-Assemblies at Top-Level	3-10
Creating Connectors.....	3-11
Connector Entry Ports	3-12
Assembling Components using Component Interfaces	3-13
Lab Exercises	3-14
Exercise 1: Configuring Assemblies for Cable Harness Design	3-14
Exercise 2: Creating Cable Harness Assembly Structures	3-27
Exercise 3: Assembling Connectors and Components	3-35
Summary	3-43
 ESTABLISHING LOGICAL REFERENCES 4-1	
Introduction	4-1
Objectives	4-1
Lecture Notes	4-2
Transferring Information Overview	4-3
Logical Referencing Overview.....	4-4
Design Hierarchy	4-6
Viewing Logical Reference Information.....	4-7
Lab Exercises	4-8
Exercise 1: Establishing Logical References	4-8
Summary	4-19
 CREATING NETWORKS 5-1	
Introduction	5-1
Objectives	5-1
Lecture Notes	5-2
Autorouting Overview	5-3
Creating Networks	5-4
Routing Tools.....	5-5
Network Design Tools	5-6
Lab Exercises	5-7
Exercise 1: Creating Networks	5-7
Summary	5-24



ROUTING WIRES AND CABLES	6-1
Introduction	6-1
Objectives	6-1
Lecture Notes.....	6-2
Routing Process - Automatic Routing	6-3
Routing Process - Manual Routing	6-4
Splices Overview.....	6-5
Lab Exercises.....	6-6
Exercise 1: Autorouting and Manual Routing	6-6
Exercise 2: Creating Splices	6-28
Summary.....	6-39
MODIFYING WIRE AND CABLE ROUTINGS	7-1
Introduction	7-1
Objectives	7-1
Lecture Notes.....	7-2
Updating Harness Designs from RSD	7-3
Modifying 3-D Cable Harnesses	7-4
Bundles Overview	7-7
Cosmetic Features.....	7-8
Lab Exercises.....	7-9
Exercise 1: Passing RSD Changes onto Harness Designs.....	7-9
Exercise 2: Modifying Components and Harness Routing	7-19
Exercise 3: Creating Additional Harness Features	7-45
Summary.....	7-64
CREATING FLAT HARNESSES	8-1
Introduction	8-1
Objectives	8-1
Lecture Notes.....	8-2
Harness Manufacturing Overview.....	8-3
Manual Flattening Tools.....	8-4
Automatic Flattening Tools	8-5
Information Tools	8-6
Lab Exercises.....	8-7
Exercise 1: Creating Flat Harnesses	8-7
Summary.....	8-37



DOCUMENTING HARNESS DESIGNS	9-1
Introduction	9-1
Objectives	9-1
Lecture Notes	9-2
Nail Board Drawing Views	9-3
Harness Manufacturing Information	9-4
Creating Pro/REPORT Tables.....	9-5
Lab Exercises	9-7
Exercise 1: Documenting Harness Designs	9-7
Summary	9-34
HARNESS PRO/REPORT PARAMETERS	A-1
Introduction	A-1
Objectives	A-1
Lecture Notes	A-2
Lab Exercises	A-3
Harness Pro/REPORT Parameters.....	A-3
Summary	A-6