ZUKEN®

E3 series®

## SPECIAL FUNCTIONALITY IN E3.Harness Flattening

- Electrical and mechanical collaboration
- Import 3D geometric data
- Automatic and manual harness backbone selection
- Automatic flattening of 3D harnesses
- Supports cable clips and protection
- Supports splices
- No wires required in MCAD system
- Automatic formboard creation
- Dynamic links from formboard and schematic
- Manufacturing reports, wire lists, bill-of-materials

# E3.Harness Flattening - Fully integrated electrical and mechanical harness design

## Introduction

Zuken's E3.series is used for documenting and detailing electrical and fluid design projects. Its flexibility supports the entire process from definition and design, through manufacturing and maintenance. A unique object-oriented architecture ensures all stages of the design are fully synchronized.

E3.Harness Flattening tool enables users to flatten 3D geometric harness data exported from supported MCAD systems. It prepares the flattened harness structure for import into E3.formboard where the manufacturing detail can be completed.

MCAD systems enable mechanical engineers to model their products in 3D. For full digital mockup, harnesses designed in E3.series are routed in the chosen MCAD system.

The E3.3DRoutingBridge transfers to-from connection data and connector information from E3.series to your chosen MCAD system. Once transferred, harnesses can be routed in the mechanical assembly.

NOTE: Only geometric bundle data is required in the MCAD system, thus avoiding any performance issues when working with wires. Therefore, only connector information need be transferred using E3.3DRouting Bridge.

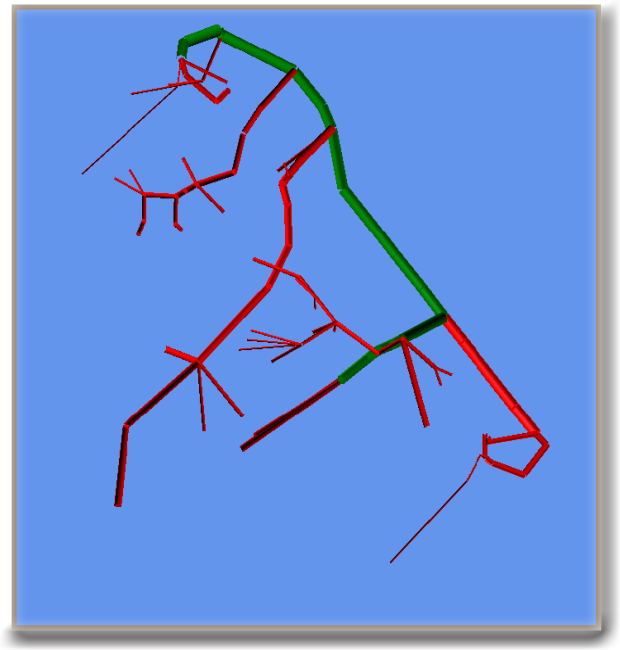
## Supported systems

Working in conjunction with E3.cable and E3.3DRouting Bridge, E3.Harness Flattening is supported in Dassault Systemes CATIA V5 and PTC Creo Parametrics. Additional utilities are required to export 3D geometric data from MCAD systems.

## Harness definition

Automatic functions in E$^3$.series help the user avoid errors such as: automatic selection of mating connectors, connector pin terminals selected based on the wire gauge, and finish and short-circuit prevention.

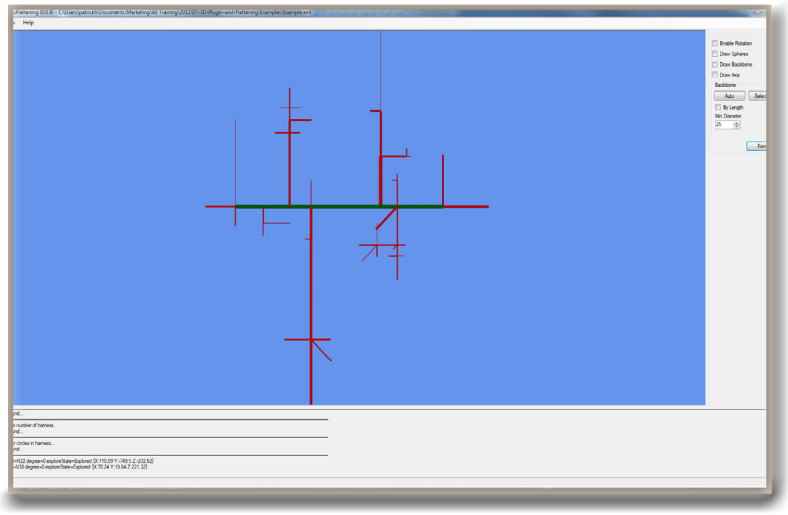
Any wire or cable properties, such as color, cross-section, shielding, twisted-pair, length, insulation, stripping distance, additional lengths, material number or tooling, can be fed into the production environment.



Harness backbone selection

## Mechanical CAD interface

E$^3$.3DRouting Bridge allows schematic and connection information from E$^3$.series to interface with all major MCAD systems. This collaboration between E$^3$.series and the chosen MCAD tool means designs may be carried out concurrently. Mechanical engineers and electrical engineers work independently, combining their designs when necessary.



Flattened harness

## Flattening

3D geometric data extracted from supported MCAD systems is imported into the E$^3$.Harness Flattening tool. The harness is then visualized in 3D to determine the most appropriate backbone. Once selected – either manually or automatically, based on the diameter of the bundle – the harness is flattened with all branches emitting from the backbone.

## Manufacturing readiness

Once flattened, the harness data is then imported into E$^3$.formboard. Included in the import are segment lengths, connections, wires, connectors, splices, protection and clips. If the original schematic was defined in E$^3$.series, connectors will automatically associate with the logical schematic and wires will automatically route in the harness.

# Additional E$^3$.series options

### E$^3$.cable
Provides enhanced functionality for designing cables and cable harnesses. Different views of the design enable specific documents to be created for production, start-up and service.

### E$^3$.panel
For general arrangement drawings of cabinet enclosures. Work in either 2D or 3D, place devices, cable ducts and mounting rails and prepare panels for manufacture.

### E$^3$.formboard
Creates build-to-print detailed 1:1 harness designs; linked dynamically to E$^3$.cable drawings.

### E$^3$.3D Routing Bridge
Transfer wire, cable and cable harness information to 3D MCAD systems. After routing, the individual wire lengths can be transferred back to E$^3$.series.

### E$^3$.topology
Evaluate system harnesses early in the design flow for factors such as length, weight and cost. Enables tradeoff analysis of harnesses and sub-harnesses to optimize manufacturing performance and cost.