



VIBE DYNAMIS

Virtual powernet development

In a nutshell

VIRTUAL POWERNET
SIMULATION

DYNAMIC SCENARIO
MODELING

ARCHITECTURE
VALIDATION

USE CASE DRIVEN
SIMULATION

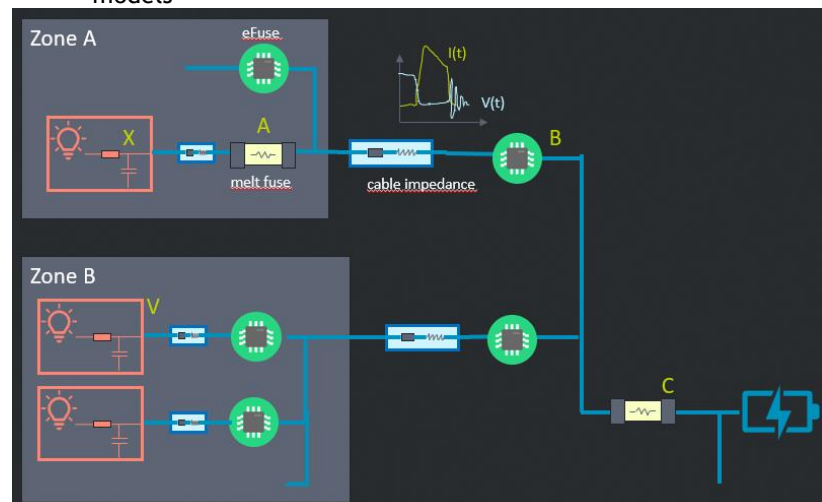
SOFTWARE
DEVELOPMENT

Short Description | VIBE DYNAMIS (Virtuelle Bordnetz Entwicklung Dynamische Simulation) is a simulation platform for the virtual development and evaluation of 12V automotive powernet architectures. It includes a generic component library—such as cables, loads, sources, controllers, and protection elements—and enables simulation of dynamic scenarios including electrical shorts, power-up sequences, and load dumps. With a parameterizable interface and support for detailed modeling of eFuses, consumers and converters, the tool facilitates use-case-driven analysis and system validation such as e.g. protection strategies.

Significant Advantages | VIBE DYNAMIS enables fast, risk-reduced, and cost-efficient development of 12V powernet architectures by bringing simulation into the early design phase. Testing electrical architectures under real-world conditions—especially under fault or high-load situations—can be complex, time-consuming, and costly. VIBE DYNAMIS addresses this challenge through a simulation-based approach that allows for early evaluation of component behavior, safety concepts, and system stability. By modeling the physics of high dynamic events, the platform supports efficient and reliable powernet design—well before physical testing.

Use Cases

- Evaluation of eFuse-based architecture designs and safety concepts
- Simulation of (highly) dynamic events such as electrical shorts, load dumps, and power-up sequences, including:
 - Analysis of protection element selectivity (e.g. coordination of fuses **A**, **B**, **C**)
 - Short circuit effect analysis at defined failure points (e.g. **X**)
 - Voltage stability monitoring at critical consumers (e.g. **V**)
- Example scenarios include short/power-up simulations using simplified models



Application Example of TWT VIBE DYNAMIS

FEATURE LIST

- Generic library for 12V powernet components
 - Cables
 - Consumer loads
 - Power sources
 - eFuses and melt fuses
 - Controllers
- Detailed eFuse models with I^2t protection, diode characteristics, and realistic switching behavior
- Realistic melt fuse models with tool support to be parametrized following data sheet behaviour
- Consumer models including input impedance and featuring input for typical or measured load profiles
- Support for standard and custom dynamic scenarios (e.g. short circuit, power-up, load dump)
- Modular structure with support for zone-based control logic
- Current version includes basic cable and consumer models, idealized source models, simplified eFuse switching, and minimal use-case scenarios

CONTACT

For more information,
reach out to us at

Dr. Martin Obstbaum

info@tw-t-gmbh.de



TWT

Stuttgart
Munich
Friedrichshafen
Ingolstadt

Headquarters:

Industriestraße 6
70565 Stuttgart
www.tw-t-gmbh.de