

# SF SMARTPRODUCTION

## PRODUCT DOCUMENTATION AND BACKTRACKING

### Control of an Assembly Line for Airbag Gas Generators with Java

As a result of the project Line 2000 of TRW Airbag Systems and Software Factory a new software generation has been developed as a 100% Pure Java application to control the assembly lines for gas generators at TRW Airbag Systems.

#### Flexible Automation of a Production Line

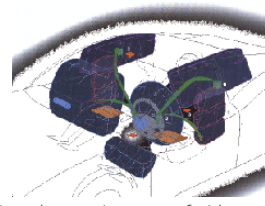
Gas generators for airbag- and retention systems are mass products with many variants. As a result an assembly line with a high degree of flexibility is required. On the other hand a highly automated assembly system consisting of a large number of mechanical and electronic components is required to meet today's productivity goals. In the end, the extreme consumer safety requirements for gas generators demand a complete and consequent documentation of all process parameters for every single item produced. To meet this opposed requirements software had to be designed supporting flexible assembly line configurations and documenting all relevant process parameters.

Based on the line configuration the product variants are configured and defined by parameters and process sequences. The product variants are stored as master data to the products. To start job on the production line only the product variant is to be selected from the master data and a quantity is to be defined. In a single assembly line up to four different products can be manufactured simultaneously.

#### Challenges

The cycle time less 5 seconds in the production line leads to high requirements for safety, availability and quality of the software package. The soft- and hardware components necessary for running the line are redundant, so the line can be run even if one of the components breaks down.

An important advantage with the Linie 2000 concept is the line editor, which is capable to model any kind of assembly line configuration to control the sequences of the components required (modules, stations, material feeds, measuring devices, packaging stations, etc.).



*Complex requirements of airbag systems can only be met in a production process with high-quality software*



#### Core Components of Software Factory's Line 2000 software

- Controls of the assembly line
- Communication module to Simatic S7
- Documentation system for the process parameters
- Statistical process control SPC
- Monitoring of the availability of all components
- Line editor for configuring the assembly line
- Product editor for the configuration of different product variants
- Job management

More than 20 assembly lines are successfully running with this software generation..



#### SF Summary

- Flexible automation of a production line using a 100% Pure Java application
- Line Editor to model any kind of assembly line configuration



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