

## Proof of Concept for AI-Based Diagnosis of Electronic Assemblies at Knorr-Bremse (July to October 2026)

Desoltik is proposing a proof of concept to validate its AI-based Current-over-Time (CoT) diagnostics for electronic assemblies at Knorr-Bremse. We understand diagnostics as a key prerequisite for cost-effective repair and remanufacturing processes. Especially with complex electronic assemblies, we see the use of AI as a crucial lever for detecting fault patterns early on and efficiently deriving appropriate follow-up processes.

The goal of the proof of concept is to assess whether selected electronic units or PCB-based assemblies can be quickly and reliably classified into relevant circularity paths such as reuse, repair, remanufacturing, or scrap using Desoltik's AI-based diagnostics. In doing so, the project specifically examines the unique challenges faced by Knorr-Bremse in the diagnostic process and evaluates the concrete procedural benefits that Desoltik's solution can deliver on the shop floor.

The proof of concept consists of the following nine steps:

### 1. Scope Definition and Product Selection

Joint selection of a suitable family of electronic products for the pilot project, such as braking, steering, door, or other control-related systems. In this process, the use case, process steps, and success criteria are coordinated.

### 2. Definition of Samples and Data Set

Compilation of a representative sample set consisting of known good parts as well as defective or suspicious units, supplemented where possible by repair findings, test results, or return information.

### 3. Mapping of Relevant Failure Patterns

Identification of the most important defect classes and decision-making logic for the selected product family, e.g., functional vs. defective or specific failure patterns.

### 4. Measurement Setup and Test Design

Setup of the simple CoT measurement environment and definition of relevant measurement parameters such as power supply, sampling rate, and measurement duration.

### 5. Recording of Electrical Signatures

Measuring the current consumption of selected samples to capture boot and activation signatures as non-invasive electrical fingerprints.

### 6. Pattern Analysis and AI-based Classification

Automated analysis and classification of the measured current waveforms to identify relevant fault classes.

#### **7. Comparison with Reference Results**

Comparison of AI-based results with existing reference information from Knorr-Bremse, such as repair diagnoses, functional tests, or expert assessments.

#### **8. Assessment of Procedural and Economic Benefits**

Evaluation of the extent to which the method supports early decisions regarding reuse, repair, or disposal, and its contribution in terms of reproducibility, time and cost savings, and integration into existing repair processes.

#### **9. Summary of Results and Roadmap for Next Steps**

Completion of the proof of concept, including a concise summary of the technical results, suitable application areas, and a recommendation for a potential integration project in an operational environment.

#### **Expected Outcome of the Proof of Concept**

The proof of concept is intended to demonstrate whether Desoltik's Current-over-Time method is suitable as a rapid initial assessment step for electronic assemblies in circular processes at Knorr-Bremse and what technical and procedural benefits it can provide.

#### **Outlook for Production Operation**

A successful proof of concept would form the basis for a subsequent 6–12 month implementation project aimed at deploying an operational solution at Knorr-Bremse. This would include measurement hardware, product-specific pipelines and AI models, connection to Desoltik's compute infrastructure, and support during the initial phase of production. Beyond implementation, Desoltik could provide long-term maintenance and service support to ensure stable operation and continuous improvement.