



*Fahrzeuginstandhaltung*

# Maintenance of electronic components as part of conversion and modernisation projects

From refurbishment and substitution to extending the service life of your components.

Improving passenger comfort and making technical optimisations are the focus of rail vehicle modernisation. And although every one of our projects is different, they do all have one thing in common: they preserve the value of your vehicles, always aiming to minimise any time spent in the maintenance depot and get your vehicles back on the rails as quickly as possible. Train control systems – your vehicle’s “nervous system” – are especially important when it comes to modernising your fleet.

## Refurbishment

Just like a mechanical component, your vehicle’s electronics are subject to ageing and contamination. These two factors both impair the function of the component. In the worst case scenario, there could be a total failure on the line, which would have far-reaching financial consequences.

### What we offer

#### Refurbishment of electronic components and assemblies

We remove contamination, renew aged components (e.g. batteries, capacitors, relays or switches), professionally clean the components (e.g. using dry ice, professional rinsing technology or ultrasound) and repair damage. We also rectify design flaws at this stage wherever possible.

On request, we can coat the electronic components with a protective varnishing after refurbishment to prevent future contamination, moisture or other functional impairments.

### The benefits for you

- Approvals are retained
- Service life is extended
- Proven designs can continue to be used thanks to retrofit measures
- Full guarantee for the entire product and not just for the component replaced
- Material availability on a par with new parts



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## Substitution

Electronic components are subject to a high degree of wear, especially in rail operations. It is therefore possible that a certain fault pattern could arise again and again on the same component. In order to optimise availability of the rail vehicle and prevent failures due to defects, replacing this component with a substitute may be beneficial for you.

### What we offer

#### Analysis of fault patterns and precautionary replacement of fault-prone components

Based on our in-depth expertise in electronic components from a wide range of classes, our repair databases provide comprehensive analyses of the systemic faults that arise in a large number of your components. This enables us to make forecasts about how likely it is that failures will occur.

### The benefits for you

- Vehicle out-of-service times are avoided by substituting parts in good time
- Suggestions made to exchange susceptible components within the scope of refurbishments to avoid consequential costs for you
- Extensive specialist knowledge of susceptible components and parts

## Extended service life

Due to the short innovation cycles at play in the industry, electronic components will often become unavailable before the end of your rail vehicles' overhaul cycles. This poses major challenges for many rail companies.

### What we offer

#### Availability of your parts and electronic components

We offer an obsolescence analysis service for all the electronic components in your vehicle, including a risk assessment and remedial actions. Your rail vehicle can therefore remain in use even beyond the service life of its electronic parts.

The analysis covers parts lists, repair statistics and the operational environment, and incorporates all relevant solutions to avoid obsolescence.

We examine the following:

- Degree of ageing
- Material availability
- Long-term storage properties
- Required quantities and failures during previous operation
- Repair and test capability of the part or component

Based on our analyses, we give you recommendations on value-preserving measures such as reconditioning, lifetime buy, long-term storage or further protection measures.

We also coordinate the future availability of spare parts for you. Whether stockpiling or supplier management – we offer you customised solution concepts that meet your needs.

### The benefits for you

- Long-term availability is guaranteed at calculable costs
- Optimum security of supply for your electronic components
- Risk of failure is minimised thanks to professional protection of spare parts supply

