



Application report

# Fit for the future – Modernisation of control cars

---

**Partner** Enotrac  
**Area** Railway technology

# Railway technology

## Controlling

## Control technology

## Energy and power protection systems

### Partner

Enotrac offers highly specialised engineering for railway and infrastructure operators, municipal transport companies, the railway industry, public authorities and other public transport engineering firms.



### ComatReleco products in use

- MRM11R multifunction monitoring relay
- Time modules CT32R, C31D/R and C32D/R
- Insulation monitor ESU-D2R
- Semiconductor contactors CC1H415SS

The three BDt 4361–4363 car transport control cars have been at the heart of the Matterhorn Gotthard Railway's car transport service through the Furka Tunnel for almost 45 years. Day after day, they ensure that passengers and their vehicles pass safely through the mountain.

With the decision to comprehensively modernise the HGe 4/4 II locomotives, it made sense to also make the ageing control cars fit for the future. Thanks to the renovation that has now been carried out, they should remain in reliable service for another 20 years or so.

#### Technical renewal for even greater reliability

Since the vehicles were put into service, the requirements for control technology, safety and system integration have changed significantly. The original equipment of the vehicles no longer fully met these specifications. The technical renewal covers both the control cars and the locomotives and is intended to ensure their smooth cooperation.

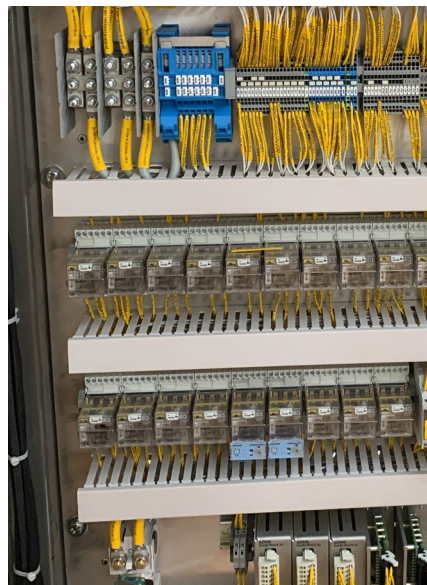
#### Component selection with a focus on quality

As the general contractor for the control cars, Enotrac took on the planning and implementation of the measures on behalf of the railway operator.

The components used were selected with a clear focus on reliability, durability and suitability for railway use. Enotrac relies on products that have already proven themselves in comparable vehicles under harsh operating conditions. Relays and contactors from ComatReleco have been used successfully in rolling stock for many years and meet the high requirements for availability and operational safety in tunnel traffic.

#### Modernisation of the locomotives

During the overhaul, central electrical assemblies in the HGe 4/4 II locomotives were replaced and standardised. These include control technology, safety-related functions, and control and protection systems. A total of



*Time modules reliably control time-dependent processes, thereby contributing to safe train control.*



*Multifunction monitoring relays secure the power supply and protect the vehicle electronics.*

around 70 relays are used today, including time relays, undervoltage relays, safety relays and power contactors. These perform essential tasks in vehicle control, power distribution and the monitoring of operating conditions.

#### Modernisation of the control cars

The BDt control cars were also completely overhauled. In addition to structural revisions and the removal of age-related damage such as corrosion, the control technology and safety-related systems were renewed. The driver's cab was standardised and adapted to the new system architecture. Each vehicle now has 27 relays installed, including two time modules and a multifunctional monitoring relay to control the train busbar. These components contribute significantly to a secure power supply and the early detection of faults.

Two of the three control cars have already been successfully refurbished and are in operation. The conversion of the third control car is planned for this year. Once the technical upgrade has been fully implemented, the availability of the modernised vehicles will be ensured for the next 20 years, while at the same time laying a stable foundation for future operational requirements for car transport services.