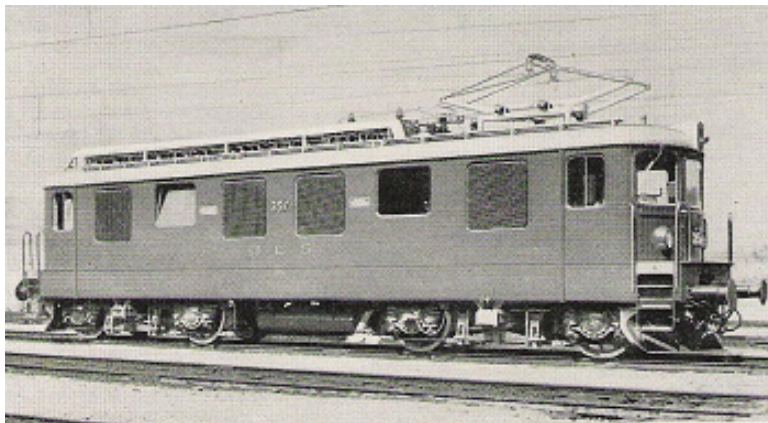


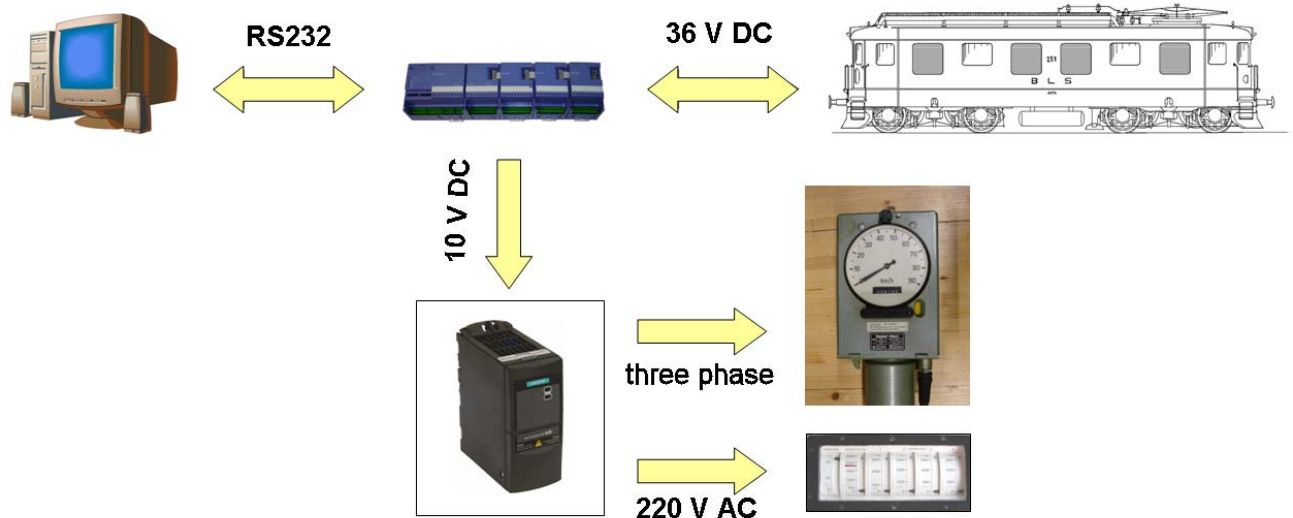
Simulator on the original vehicle

Ae 4/4 locomotive of BLS Lötschbergbahn

As part of a diploma thesis written at the Bern University of Applied Sciences, a driving simulator was installed in the historic locomotive Ae 4/4 251 of BLS Lötschberg railway. This is to be used in the future Museum of the BLS, and also to be shown at fairs. However, the locomotive must also be available for special trips. During the simulation, the vehicle with the exception of the traction part, is in full operation. The signals that the PC simulation requires to calculate the dynamics are taken from a terminal mounted in the engine room that mainly uses the signals from the train bus (multiple-unit control). The computer calculates the vehicle dynamics and track views and sends results such as speed, currents and voltages back to the vehicle. The signal adjustment takes place by means of a PLC and inverters.



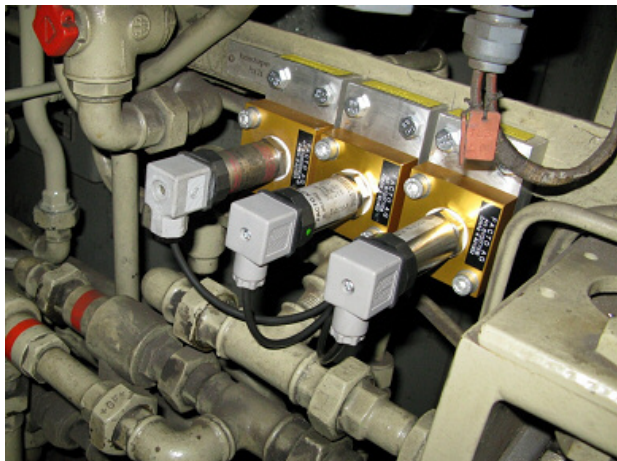
Historic locomotive BLS Ae 4/4 (built 1944)



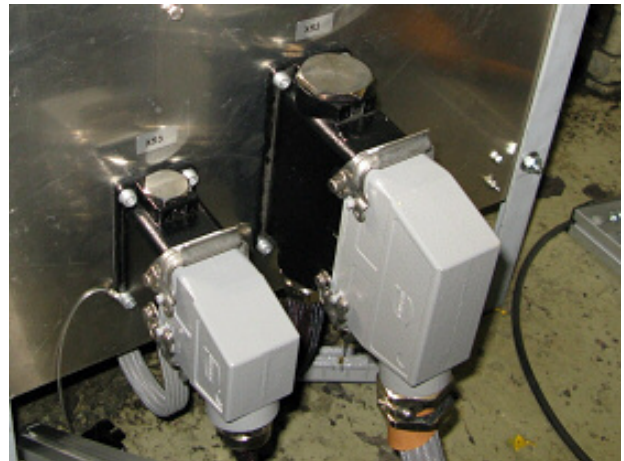
Simulator concept



PLC and frequency converter on portable rack in the engine room



Pressure sensors



Connection PLC-locomotive

The power supply to the vehicle can be via the overhead contact line (15 kV) or depot plug (220 V, 16.7 Hz single phase), the PLC is connected to the onboard DC electrical system, the frequency converters for speedometer and voltmeter via a separating transformer to the local 230 V 50 Hz network. The PC and the PC monitors are connected directly to the 50 Hz network. The PC is connected to the PLC via an optocoupler.

To view the line ahead a large screen is placed in front of the front window.



Screen in front of the cab front window



All equipment such as compressor, ventilation and step switch are in full operation during the simulation to give a realistic driving experience.



In full speed near Frutigen