



PILATUS-BAHNEN

New train control system for rack railways

 Solutions & Services for Industry

Mount Pilatus is one of the most popular destinations in the Central Swiss Alps. It is popular for international tourism, regional excursions and corporate events in equal measure. In 2022, PILATUS-BAHNEN transported almost half a million passengers. Thanks to extensive investment in new rolling stock and infrastructure for the rack railway, PILATUS-BAHNEN is further enhancing the attractiveness of Mount Pilatus as a prime excursion destination.



«We invested around 50 million Swiss francs to ensure that not only our new rolling stock, but also all the associated systems meet the latest standards and are future-proof. This is why we decided to use only proven materials and experienced partners for the new PILATUS rack railway.»

Patrick Blaser, Head of Technology & Operations at PILATUS-BAHNEN AG



The vehicle fleet and technical infrastructure of the world's steepest rack railway have been continuously modernised and adapted since its opening in 1886. The focus of every investment – besides an unforgettable mountain experience – has always been the safety of passengers and staff. The most recent investment is one of the largest in the rack railway's history and essentially involves the complete replacement of the previous rolling stock, along with the integration of a new dispatcher assistance system.

«We invested around 50 million Swiss francs to ensure that not only our new rolling stock, but also all the associated systems meet the latest standards and are future-proof», is how Patrick Blaser, Head of Technology & Operations, explains the importance of the project for his company. «For the new PILATUS rack railway, we therefore opted for innovative solutions such as VBBa and PbS and experienced partners», adds Patrick Blaser.

Actemium was selected as the supplier to integrate the new dispatcher assistance system. Actemium developed a solution that was specifically tailored to the requirements of rack railways. The existing VBBa module was combined with a newly developed PbS (Position based Signalling) system.

The VBBa (Visualisation and Operating System for Railways) is a remote control system also developed by Actemium in line with SIL2, which has already been in use on other railways in Switzerland and abroad for a number of years.

PbS is a new development consisting of train control and signalling technology that does not require external signals. The signalling system guarantees safety at level crossings.

- + Every level crossing along the length of the route is secured, meaning the trains can run in compliance with FDV without the need for any external signals.
- + The train control system also ensures that the train cannot pass any signals showing STOP and that the specified maximum speeds are not exceeded.
- + Moreover, the system incorporates an innovative collision warning system.
- + The central driver's cab control panel gives the locomotive drivers all the information they need to operate and monitor the vehicle from the point of view of the PbS. Points can be switched or routes set depending on the selected operating mode; both can be done directly from the train.

PbS also supports ATO (Automatic Train Operation). The rolling stock on the Pilatus Railway is operated with Grade of Automation 2 (GOA 2). This enables automatic acceleration and braking and takes the strain off the train drivers so that they can concentrate even better on unexpected events on the line and intervene more quickly in an emergency.

«Services can now run every 35 minutes on our rack railway thanks to these technical innovations. This reduces passenger waiting times and significantly increases the attractiveness of Mount Pilatus as an excursion destination», says Patrick Blaser.

PbS also simplifies operational processes and helps to reduce safety risks. The next step will be to integrate a train control system that will enable routes to be set automatically according to the timetable.

«We are very pleased that we were able to deliver the project successfully with Actemium's support and that the railway was able to commence operations on schedule – following approval for the initial application by the Federal Office of Transport», concludes Patrick Blaser on the collaboration with Actemium.

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