RCS – traffic management for Europe’s densest rail network.

Controlling and monitoring with Swiss precision.
SBB has developed the mobility concept of the future for traffic.

RCS IS THE ANSWER TO MANY OF TODAY’S NEEDS ARISING FROM DENSE RAIL TRAFFIC. THANKS TO ITS MODULARITY AND SCALABILITY, THE RCS SYSTEM FAMILY OFFERS A GREAT DEAL OF FLEXIBILITY AND WILL BE ABLE TO ADAPT TO CHANGING REQUIREMENTS IN THE FUTURE.

The Rail Control System (RCS) is a standardised, integrated control system for rail traffic. RCS is not a single piece of software – it is a group of applications which perform functions such as managing routes, showing the operating situation and rail control and managing topology data. Due to the open system architecture, RCS can be scaled up by adding specific modules.

Our services

As a customer, you can choose to integrate tried-and-tested RCS system components into your own system and access a network of industry and software specialists who work well together.

Advice: A strong team of experienced rail traffic planners and business analysts will help you make the most of your railway network’s capacity and prevent disruption.

Potential solutions: Thanks to many years of successful collaboration between industry and software specialists, our team finds potential industry-specific, technical solutions while focusing on the objectives of the customer in question.

Software: The RCS system components form a tried-and-tested basis for modifying and upgrading existing traffic management solutions and developing new ones to suit the customer.

Integration: SBB certified partners provide software-related services, from consultancy and the modification of RCS modules to the integration of your personalised system. You benefit from the experience of one of Europe’s best railways with skilled software specialists.
The RCS dispatch system monitors rail traffic across the entire SBB railway network. Since 2009, we and other infrastructure operators have been using RCS as a standardised, integrated control system for rail traffic – and this on the most heavily used rail network in Europe. 8,000 passenger trains and 2,000 freight trains operate in Switzerland each day. RCS manages this extremely highly concentrated volume of rail traffic on a daily basis with ease and has been specially designed to handle even higher volumes in the future.

RCS is the central platform for controlling train traffic currently running on the Swiss railway network and a key factor in the high degree of punctuality achieved. In four train control centres, RCS-Dispo is used to monitor and manage rail traffic.
The system that provides a broad overview.

1,000,000 conflicts are resolved each day.

Thanks to RCS, 125 million passengers can be transported safely and punctually on the SBB network.
1,400 locomotive control commands result in daily energy savings sufficient for 12,500 households.

SBB controls 11,000 trains with RCS each day.

With RCS, SBB transports 210,000 tonnes of cargo each day.

EVERY YEAR, SBB PRODUCES 170 MILLION TRAIN-PATH KILOMETRES. TO PUT IT MORE SIMPLY, THIS EQUATES TO 4,250 JOURNEYS AROUND THE EARTH. THIS MEANS THAT 11,000 TRAINS OPERATE EACH DAY WITH UP TO 1,000 RUNNING SIMULTANEOUSLY – 24 HOURS A DAY, SEVEN DAYS A WEEK AND 365 DAYS A YEAR – TRANSPORTING MORE THAN ONE MILLION PASSENGERS DAILY.
The RCS system family.

RCS IS A VERSATILE AND HIGHLY EFFICIENT GROUP OF APPLICATIONS.

RCS makes it possible to extend the limits of the railway network’s capacity and increase the density of trains running simultaneously. With these optimisations, investments in railway infrastructure can be reduced.

RCS products RCS-Dispo (with additional modules RCS-ADL and RCS-HOT) and RCS-ALEA respond to various needs in the following areas:

- Rail traffic control throughout the network.
- Displaying the target and current traffic status on the SBB network.
- Providing forecasts.
- Ensuring connections.
- Increasing energy efficiency and reducing energy costs.
- Optimising arrival at hub stations.
- Real-time internal communication for rail services.
- Alerting internal and external emergency teams.
- Providing data for other rail-service-related peripheral systems such as customer information.

The standardised control system provides consistent information from rail traffic planning, enabling conflicts to be detected quicker and more accurately in future. Thanks to RCS, SBB staff now have access to better tools for performing their tasks. Relevant information can be accessed by all concurrent dispatchers from a central location at any time. Punctuality and reliability have been improved. The impact of any arising service disruptions can be analysed and evaluated efficiently resulting in the rapid deployment of respective countermeasures.

- **RCS-Dispo** shows the actual and target status across the network and is the tool used by dispatchers and rail traffic controllers in the train control centres.
- **RCS-ADL** ("green wave") provides locomotive drivers with speed recommendations resulting in enhanced passenger comfort, and energy and resource savings.
- **RCS-HOT** optimises the flow of multiple trains through bottlenecks such as tunnels and other typically congested traffic hubs.
- **RCS-ALEA** significantly improves communication when incidents occur on the network.
RCS-DISPO – The rail control system for all situations

The RCS platform ensures that operation is as safe as possible and facilitates mitigation of operational risks. Automation results in a reduction of staff workload, thus reducing operating expenses. The basic module RCS-Dispo is key to controlling SBB’s network.

RCS-Dispo provides a standardised picture of processes (real-time timetable display) for all units and staff members involved in rail service procedures.

- RCS-Dispo shows an extremely precise forecast in near-real time for the journey progress of each individual train throughout the entire network.
- RCS-Dispo brings together rail-service-relevant information from various systems in a standardised user interface for the whole network.
- RCS-Dispo speeds up and simplifies dispatcher communication by providing integrated telephony.

RCS-ALEA – your back-up for all occurrences

The alarm and incident assistant (ALEA) significantly improves communication in cases of disruption and is designed to interact smoothly with RCS-Dispo. The amount of information that needs to be processed in the event of an incident affecting rail operations is extremely large. Everyone involved has to correctly interpret highly complex data. All decisions made are forwarded by ALEA quickly, individually and in a targeted manner to the large number of employees who execute the respective processes.

RCS-ALEA is a tool that has been specifically developed to meet user requirements. It supports all employees who are involved in rectifying irregularities and disruptions to rail operations.

RCS-ALEA channels this case-specific information and distributes it extremely rapidly. Sophisticated filtering and distribution functions help make the huge quantities of data involved a useful work aid rather than a burden. In addition to the text functions, dispatchers in control centres can make operating strategies and passenger guidance visible to everyone, and furthermore, modify the same to take into account current disruptions.

- RCS-ALEA recognises who is responsible for the process in the event of an incident.
- RCS-ALEA reduces the length of secondary delay.
- RCS-ALEA displays the entire area affected by the disruption (even if service is interrupted completely).
RCS-HOT – The automatic train route optimiser

RCS-HOT (HOT stands for Hub Optimisation Technology) is a control programme used to optimise train management at problematic points on the track network, particularly at bottlenecks: the programme calculates the perfect driving profile for each individual train and uses external installations to signal the respective profile to the engine driver. The optimal sequences are also determined and implemented automatically using the control technology to make best possible use of train-path capacity.

Thanks to its direct access to railway control technology, RCS-HOT changes the relative dependencies of other trains, allowing them to traverse problematic areas in the most efficient sequence.

This enables bottlenecks, such as Zurich’s western approach, to be traversed in the ideal order without unnecessary braking, even with high traffic volumes, increasing timetable stability and reducing delays. SBB plans to introduce the technology at other problematic points. For example, HOT will also be implemented for the Gotthard Base Tunnel to keep traffic flowing as smoothly as possible on the new Swiss north–south link.

RCS-ADL – The “green wave”/ADL

The objective of the adaptive control (ADL) module is to reduce energy consumption by preventing trains from making unnecessary stops and having to go through the energy-intensive process of accelerating from standstill. ADL calculates the optimum speed and sends this to a tablet used by the engine driver. ADL greatly reduces unplanned stops at signals, saving energy and enhancing passenger comfort.

This is how the “green wave/ADL” works: the system is part of the railway traffic control system. It detects conflicts between trains and calculates the ideal speeds to enable the trains to reach their destination without unplanned stops and with the greatest possible energy efficiency. The rail traffic dispatcher in the train control centre approves the driving recommendations, which are then immediately transmitted to the engine driver.

At present, almost 1,400 trains are controlled every day, saving 136,000 kilowatt hours a day. Over a whole year, this is equal to the energy consumption of 12,500 households. In future, up to 2,000 trains are set to be controlled every day.

- Travelling by rail is punctual, safe and environmentally friendly. SBB is a sustainable and environmentally conscious railway company. The “green wave”/ADL will allow it to reduce its energy consumption, thus playing its part in the government’s energy strategy for the benefit of everyone in Switzerland.
- The “green wave”/ADL enables engine drivers to drive smoothly by avoiding unnecessary stops. This improves energy efficiency, cuts energy costs and reduces wear and tear on the rolling stock and lines.
- The “green wave”/ADL communicates speed recommendations to locomotive drivers, who then decide whether or not to implement these recommendations.
For our customers, we build, operate and maintain SBB’s three networks: the track network, rail power network and telecommunications network for rail operations.

Switzerland has the world’s most heavily used rail network. 11,000 trains transport 1.25 million passengers and 210,000 tonnes of cargo each day. We at SBB Infrastructure work to ensure that all this runs smoothly. We maintain and upgrade existing installations, plan the rail network of tomorrow and draw up projects for new structures and extensions, whether they involve track or platform extensions or are major projects such as the Zurich cross-city line, the cross-border link from Geneva Cornavin to Annemasse, or the new Gotthard Base Tunnel.

We produce the rail power and ensure that it is transmitted from the power plant to the locomotives in the right amount at the right time. We also operate our own telecommunications network for railway operations.

The Rail Control System (RCS) dispatch system monitors railway traffic across the entire SBB track network. Since 2009, we and other infrastructure operators have been using RCS as a standardised, integrated control system for rail traffic – and this on the most heavily used rail network in Europe. 8,000 passenger trains and 2,000 freight trains per route kilometre run in Switzerland each day. RCS manages this extremely high volume of rail traffic with ease and has been specially designed to handle even higher volumes in the future.