RIVET GAMES

Train Simulator 2019

Surselva Line

Reichenau-Tamins to Disentis/Mustér

1 Route Information

1.1 History

Construction of the first 19.3km section of the line from Reichenau-Tamins to Ilanz began in the autumn of 1900 and this part was opened on 1 June 1903, but due to other priorities, the remainder of the line to Disentis was not completed for another 9 years.

During construction, the Rhine gorge presented workers and engineers with major challenges, as the rock is very brittle and the water level of the Anterior Rhine rises very high after heavy rain and during snowmelt. In addition, this unstable rock from the Rhine Gorge could not be used for the construction of walls and track, so construction materials had to be brought from more distant quarries.

1.2 Route Overview

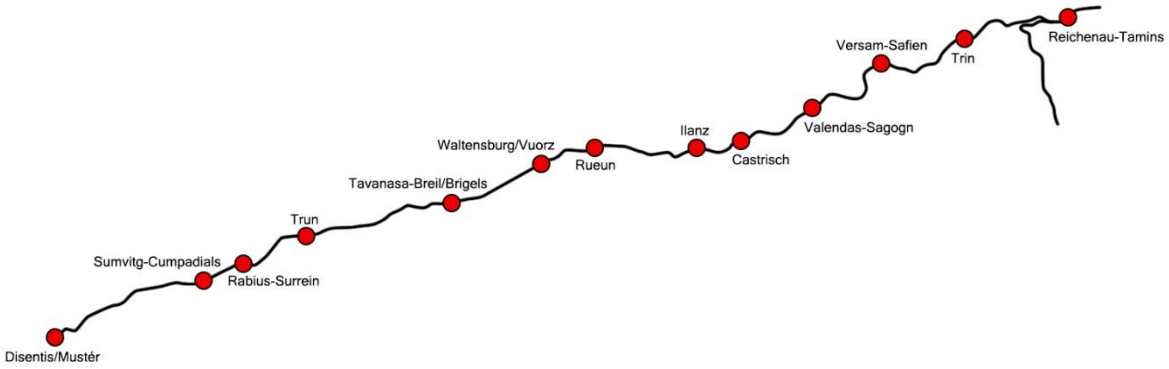
The line begins at the junction station of the Surselva Line and the Albula Railway at Reichenau-Tamins, it then crosses the Anterior Rhine and runs to the entrance of the Rhine gorge at Trin station before running along the narrow Ruinaulta gorge. After passing through Versam-Safien, Valendas-Sagogn and Castrisch stations, the line runs through the shallower and wider Anterior Rhine valley to Ilanz where it returns to the side of the road and then climbs at a gradient of 1.6% to Trun. From Trun, the line runs on the northern valley slope with a gradient of 2.7% through the stations of Rabius-Surrein and Sumvitg-Cumpadials to Disentis/Mustér. Between Sumvitg-Cumpadials and Disentis, the valley becomes narrower and steeper, so there are many engineering structures and bridges, such as the 106-metre-long Val Russein viaduct between Sumvitg-Cumpadials and Disentis.

1.3 Route Features

Key features included in this simulation are:

- The route from Reichenau-Tamins to Disentis/Mustér
- RhB L type signalling system including:
    - Animated Brake Test and Abfahrbefehl (departure indicators)
    - Operating "Besetztes Gleis" indicators for entering occupied platforms
    - Three-state ground signals between main signals
    - ZSI safety system
    - Functionality to allow passenger request stops
- 13 Highly detailed station models
- Catenary models representing the unique style of the overhead line equipment
- Bridge and tunnel portal models accurately representing the stunning engineering of the route
- Atmospheric building models that capture the unique architecture of the region
- New Sb-t and Sl wagons with various loads
- The route is fully configured for Quick Drive scenarios
- Nine Career scenarios including a tutorial for the RhB Pack 02 Ge 4/4 II locomotive
- Two Railfan scenarios

1.4 Route Map



2 Traction - Thomson Interactive - RhB Enhancement Pack 02

A number of different trains operate on the Surselva line, with the hourly service operated using a Ge 4/4 II. This route has been designed to operate with the Ge 4/4 II originally developed and published by Thomson Interactive Ltd as RhB Enhancement Pack 02 for their Arosa Line add-on.

RhB Enhancement Pack 02 is an essential requirement for this Surselva Line simulation to operate. The pack includes a manual on how to drive the Ge 4/4 II along with other useful information.

If you do not already own this pack then you can purchase it from the Valve Inc. Steam store here: https://store.steampowered.com/app/642803/

3 Signals used on the Surselva Line

3.1 Signals and Permissible Speeds

Swiss railways use two main families of signalling - the “L” system and the “N” system. The Surselva Line is part of the Rhaetian Railway (RhB) network and it uses a variant of the “L” system. The main difference in the RhB version of the “L” signalling is that the speeds that relate to the signal aspects are different from other L systems.

The L system has signals indicating the state of the next section of track (“Main” signals) and signals providing advanced warning of the state of these main signals (“Distant” signals).

RhB signals use distinct main and distant signal heads as shown in the next section and these can be mounted either individually to form a main signal (Hauptsignal) and a distant signal (Vorsignal) or both mounted on the same signal post (Combined Signal).

Main signals show that the line immediately ahead is blocked or the line is clear at the current line speed or display a reduced speed that must be achieved by the driver before passing the main signal.

Distant signals provide advanced warning of a speed reduction commencing from the next main signal and usually provide ZSI Safety System protection (see below).

In Switzerland, signals are normally positioned on the left-hand side of the track, however, where there is reduced visibility or multiple tracks, they can be also positioned on the right-hand side of the track.

3.2 Main and Distant Signals

This table illustrates the signal aspects and associated permissible speeds that are used on the RhB network.

Note: All shunting operations should take place at a maximum of 30 km/h in station areas.

Aspect	Meaning	Distant Signal (Vorsignal)	Main Signal (Hauptsignal)
Aspect 0	**Stop**		
Aspect 1	**Clear** – Maximum speed is as shown on relevant speed signs		
Aspect 2	**30 km/h** Maximum Speed		
Aspect 3	**45 km/h** Maximum Speed		
Aspect 6	**30 km/h** Maximum Shunting Speed (Short Journey – Expect Obstruction) You are alerted by the ZSI safety system when you pass the distant signal ***and*** the main signal that is displaying Aspect 6.		

3.3 ZSI Safety System

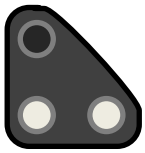
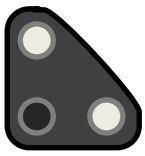
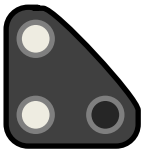
You are alerted by the ZSI safety system when you pass a distant signal (Vorsignal) that is displaying a warning. In the driving cab, the ZSI Acknowledge Button and ZSI Warnung Lamp will start to flash accompanied by an audio beep.

When this happens, you must press the ZSI Acknowledge Button (or the “Q” key) immediately otherwise the emergency brakes will be applied automatically. Once pressed there will be five further lamp and audio alerts to remind you that you are driving under a distant signal caution.

A ZSI alert will also be activated when you pass a main signal displaying Aspect 6 (Short Journey – Expect Obstruction).

3.4 Ground Shunt Signals

These signals are normally mounted on short ground posts, however at stations they are sometimes mounted below the platform canopy. When they are located alongside a Main Signal they co-act and display the appropriate aspect according to the aspect the Main Signal is set to.

Aspect	Meaning	Ground Shunt Signal
Stop	Stop at this signal	
Warning	The next Main Signal or Shunt Signal is at Stop or you are entering a siding / end of line	
Clear	The next signal is displaying a proceed aspect	

3.5 Signal Examples

The following examples illustrate the most common signal combinations along with an explanation of their use.

This is a main signal (Hauptsignal) that is currently showing Aspect 3 to alert the driver that 45 km/h is the maximum permissible speed allowed beyond this point.

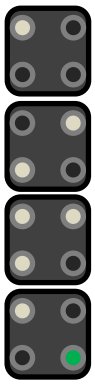
Head 1 is the Main Signal Head

Head 3 is a co-acting Ground Shunt Signal

Head 4 is a Brake Test / Departure Indicator

If vehicles are uncoupled or coupled to a train then the driver must carry out a brake test before departure.

Break test signals
During the brake test, the ground staff communicate with the driver using this indicator as follows:



Apply Brakes

Release Brakes

Brake Test Successful

Ready for Departure (Abfahrbefehl)

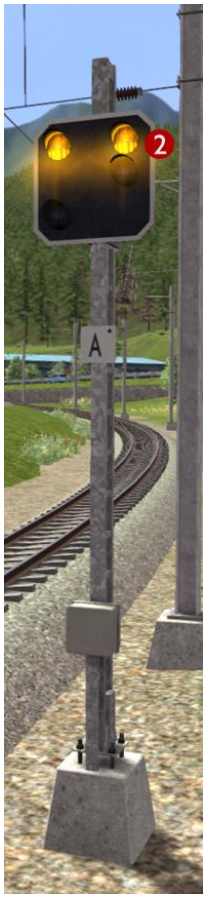
Although these indicators are displayed in this simulation they do not need to be obeyed while driving a scenario.

This is a combined signal that is currently showing Aspect 3 on the Main Signal Head to alert the driver that 45 km/h is the maximum permissible speed allowed beyond this point. The Distant Signal Head is showing that the next signal ahead is displaying Aspect 0 (Stop).

Head 1 is the Main Signal Head

Head 2 is the Distant Signal Head

Distant signals usually provide ZSI protection.



This is a Distant Signal that is currently showing that the next signal ahead is displaying Aspect 0 (Stop).

Head 2 is the Distant Signal Head

Distant signals usually provide ZSI protection.

This is a Distant Repeater Signal that is currently showing that the next signal ahead is displaying Aspect 0 (Stop).

A Repeater Signal can be identified by having a smaller Distant Head. These signals are located between a Main Signal and its preceding Distant Signal at locations where visibility is restricted such as on tight curves or where bridges obstruct the view.

Head 5 is the Distant Repeater Signal Head

*Repeater signals **DO NOT** provide ZSI protection.*

This combined signal on approach to a station has an additional Occupied Track Indicator.

If you need to proceed past a signal showing a Stop aspect in to an occupied track then you will need to press TAB during the scenario to ask the signaller for permission. If permission is granted then the signaller will set the Main Signal Head to the aspect shown here. The Main Signal Head will display Aspect 2 to limit your speed to 30 km/h and the Occupied Track Indicator (Besetztes Gleis) will illuminate with four horizontal lights. The Distant Signal Head will go dark.

Head 6 is the Occupied Track Head (Besetztes Gleis)

If the Main Signal Head does not have the lights necessary to display Aspect 2 then Aspect 0 (Stop) will continue to be displayed and the Occupied Track Indicator will illuminate with four diagonal lights instead meaning you have consent to overrun the signal.

3.6 Shared Departure Signals

Each shared departure signal has corresponding lm marker boards positioned next to each departure track. These are the white signs with the black triangles. The lm aspect number on each sign indicates which aspect on the shared signal relates to each track. When waiting at a shared departure signal you must not pass the lm marker board unless the correct aspect is shown on the shared signal. This ensures adequate clearance between your train and the converging line.

For example, the illustration above requires aspect 1 (1 green light) for departure from the left-hand track and aspect 3 (2 green lights) on the shared signal for departure from the right-hand track.

3.7 Level Crossings Without Barriers

The signal shown below indicates whether the level crossing road signals are activated to protect the level crossing ahead. If the crossing road signals are flashing red then this indicator flashes a single yellow light to advise the train driver. If this signal is dark then the train must not proceed over the level crossing.

3.8 Request Stops

The Surselva Line contains a number of stations that are request stops. The train only stops if a passenger on the train or a passenger waiting at the station activates a request button.

The signal shown above is activated if a passenger at the station presses a button at the information point. When activated the two white lights on the signal board flash together, this indicates to the driver that passengers wish to board their train.

The driver must also check the Request Stop Halt Indicator Lamp on the cabin desk on approach to a request stop. If this is illuminated (see below) then a passenger wishes to leave the train and has already pressed one of the onboard request stop buttons.

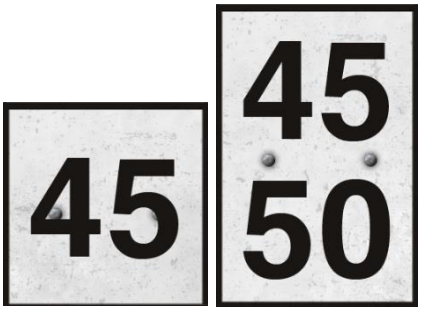
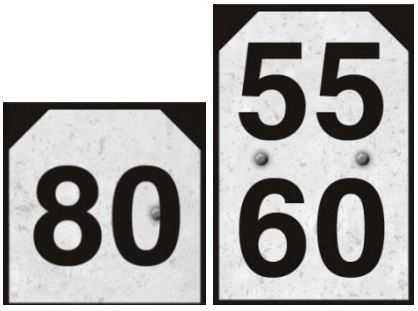
You must make sure that at least one passenger door opens on the train when making a request stop.

4 Trackside Signs

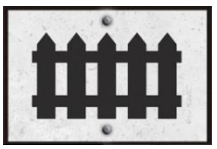
4.1 Speed Signs

The line speed on RhB routes is advised using track speed signs. For a reduction in speed the driver first sees a reduce speed sign that indicates the target speed. The driver must then reduce his speed before passing a commencement sign situated ahead of the first sign.

Note that if a main signal indicates a lower speed than that on the trackside sign, then the main signal must be obeyed – it takes precedence.

	Meaning	Signs
Reduce Speed	Reduce your speed to that shown on this sign before you reach the next speed restriction commencement sign. *If the sign shows two speeds the higher speed applies to passenger trains and the lower speed to freight trains.*	
Speed Restriction Commencement Sign	Your train must have reduced speed to that advised at the previous Reduce Speed Sign before passing this sign.	
End of Speed Restriction Sign	If the speed restriction is on a short section of the line then this sign indicates that the driver can return to the speed prior to the speed restriction once the rear wagon or coach has passed this sign.	
Increase Speed	This sign indicates that the driver can increase the train speed once the rear wagon or coach has passed this sign to the speed shown. *If the sign shows two speeds the higher speed applies to passenger trains and the lower speed to freight trains.*	

4.2 Other Signs and Signals

	Meaning	Signs
Whistle Sign	The driver should sound his whistle or warning horn at this sign.	
Level Crossing Sign	This sign is mounted on signal posts prior to a level crossing.	
Limit of Shunting Sign	Outside station areas these signs indicate the limit of shunting operations. During scenarios you do not need to obey these signs as they are only positioned for visual completeness.	
End of Electrification Sign	Where the overhead catenary wires end, these signs are used to alert the drivers of electric trains to proceed no further than the sign. They are suspended from the catenary wires or mounted on the junction indicators where only one route ahead in not electrified as shown below.	
Tramway Area	This sign provides advance notice of the commencement of tramway running.	
Tramway Running Commencement Sign	This marks the location where tramway running starts and the associated rules apply.	
End of Tramway Running Sign	This sign indicates that the driver can return to normal railway operations and rules once the rear wagon or coach has passed this sign.	

5 Other Information

This document is provided as a guide to Rivet Games' Surselva Line add-on route for Train Simulator, a product provided for entertainment purposes.

There is more information on this route at http://www.rivet-games.com/surselva along with links to detailed reference material.

If you do notice errors in this document, please let us know at support@rivet-games.com.

Please give feedback on the Rivet Games forums: forums.rivet-games.com, as well as leave a review on the Steam store to help others decide whether they would enjoy this route.

6 Acknowledgements

We would like to thank the Rhaetian Railway for their assistance in developing this route and for permission to use their branding on models included with this product.

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