RAILROAD X

Build your own Railroad World

MANUAL

Welcome to Railroad X !

Railroad X is more than just a Railroad Simulation. With Railroad X you can build your own railroad world in a dimension, which is almost impossible to realise in real model railroad: wide layouts with driveways and vehicles of all kinds – with cars and buses from all railroad eras. Whether you are a fan of steam trains or high speed railways, the limitations that exist when creating a model railway do not apply to the world of virtual railways.

Railroad X has a long history. The prototype of this software, EEP – Eisenbahn.exe, was created by Software Underground in 1998 and then continuously developed and enhanced each year. Since version EEP 4, the Publisher TREND and Soft Pro have been responsible for the development. In 2012, the founders of the program were responsible for the most extensive revision of the software since version EEP 3. After a year of hard work, they succeeded in creating a new version with Railroad X, which includes important features like a new grapical user interface, animated figures, interactive cabs and switch board function. Some of the new functions are only available in the Expert-Edtion, but the Basic-Edition can be updated without extra cost. Users will just pay the price difference between the Basic- and Expert-Edition from the TREND-Shop.

The innovation of EEP also needed to be reflected in the name and therefore EEP – Eisenbahn.exe Professional became Eisenbahn X, which is Railroad X in English. In some chapters of this manual the term EEP will still be used.

Railroad X represents the complete model railroading on PC. With Railroad X you can create your own virtual railway world in dimensions that would be impossible to realise with real model railways.

With Railroad X you can build layouts without any space limitations, models can be reproduced true to the original and have an extended signaling system. You can control the traffic automatically or manually and arrange a timetable based traction operation. Thanks to the large variety of models in the basic edition and TREND-Shop (www.eep.eu) you can reproduce original layouts and bring bygone eras of railroad history back to life.

Not only is there a wide variety of landscape and architecture available, the degree of realism and rendering is truly unique. With virtual Railroad X, your trains will pass through landscapes whose appearance changes according to the time of day and local weather conditions, thus providing an extraordinarily life-like atmosphere. Additionally, there are animated figures and animals enlivening the scene. Besides cows and horses, fishes and birds, you have animated travellers and passersby.

The whole Railroad X team wishes you a lot of fun with the virtual model railroading.

Railroad X

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Railroad X

Railroad X

1. Installation, start and registration of Railroad X

1.1 System requirements

In order to be able to install Railroad X, the following minimum system requirements must be met:

> **Windows XP / Vista / 7 / 8**
> **(32 or 64 Bit)**
> **Dual-Core 2,5 GHz,**
> **1GB Graphics, Pixelshader 3.0,**
> **2GB RAM, DirectX 10,**
> **Internet access**

The following configuration is recommended with regard to performance:

> **Windows XP / Vista / 7 / 8**
> **(32 or 64 Bit)**
> **Dual-Core 3,2 GHz,**
> **1GB Graphics, Pixelshader 4.0,**
> **4 - 8 GB RAM,**
> **DirectX 11, 5.1-Soundcard,**
> **Internet access**

Important to know: Railroad X is continuously developed further. You can use the gigantic supply of Add-ons, plug-ins and models in the Railroad X web shop more advantageously and faster if you have a fast DSL internet connection.

1.2. Installation

The DVD-ROM has an autorun feature that launches the Start menu automatically. If you have the Autostart feature disabled, please proceed according to the following points:

Windows Vista / 7: Click Start on the task bar at the bottom left on the round Windows icon and type in the search box "D: \ autorun.exe" one. Then press the Enter key.
"D:" you need to replace the drive letter that applies to your DVD-ROM drive.
Now click on the ***Install Eisenbahn.exe Professional 10.0*** field and then follow the installation directions. If DirectX is not already on your computer you can install this with the ***Install DirectX*** button. To close the menu, click ***Exit***.

Windows 8: after inserting the DVD on the desktop switch to the app on the desktop interface. Via computer link to your DVD drive you call and start the installation of EEP10.0 with a double click on the displayed contents of the DVD drive. To do this, select the button displaying *Install Eisenbahn.exe 10.0.*

If you receive safety instructions under Windows Vista/7/8 when you start the autostart menu or the installation routine, you can run the program "D: \ autorun.exe" without hesitation.
To be able to look at the manual to Railroad X, please click the start menu, as described above. Then click on the button *"Open manual"* to open the manual. You need the program Adobe reader for it. You can find an installation file for Adobe reader in the start menu. After successful installation and registration of Railroad X the manual is also directly available within the program by pressing the button *"Help">-"Open Manual".*

1.3. Starting the program

The procedure for starting Railroad X for the first time varies depending on your operating system:
To start Railroad X, click successively on *Start Programs* or on Windows Vista / 7 on the Windows icon */ all Programs* and then click *Trend.* Now click on the folder EEP10.0, and then click the icon "EEP 10.0 Start" to start the simulation. Alternatively you can start the simulation via the desktop icon "Railroad X".

Under Windows 8 you can start "Railroad X" via the App or desktop surface by a right mouse click over the tile/shortcut *"Railroad X">start "Run as Admin".* Alternatively, the start of the program via the desktop interface on the link "Railroad X" is also possible. Here select the link with the right mouse button and select *"Run as Administrator"* to confirm in the second step.

ATTENTION

Design-Settings (only in Expert version):
The Expert version has two different designs for the user interface, namely Petrol and Stahl. A rearrangement of the design is carried out via the desktop shortcut. Click on the *"Railroad X"* icon on it with the right mouse button and then choose *"properties"* from the dialog opening. In the category *"Target"* optionally add the following path for Petrol (Standard-Setting): *"C:\Program Files\TREND\EEP10\EEP10.exe"*

for Stahl: *"C:\Program Files\TREND\EEP10\EEP10.exe"* Design Stahl

The standard design (Petrol) of the Expert version is shown in the manual within the illustrations.

1.4. Registration

Before you can begin using Railroad X, you will be requested to register online.

Registration Form Online Registration /
Direct Registration

The online registration offers the advantage that the program is already activated after only a few steps. As soon as you have chosen the online product registration via clicking on the **"Product Registration on the Internet"**, a registration form will appear.

Registration Form Online Registration /
Direct Registration

Here you enter your **first and last name**, your **e-mail address** and the **EEP10 serial number.** These can be found on the DVD package or in the email that was sent to you when purchasing via download Please click on **'Direct Registration'** in the lower part of the pop-up window. Here the registration is **completely automatic.** After successful registration, EEP10.0 starts and you will receive an email from our registration server to your e-mail inbox. Please keep this e-mail with your registration number in a safe place.

The **"direct registration"** is for **new customers** and for **existing customers** who have already installed an EEP version on your PC. Model and system resources from existing customers as well as the already existing registration number are automatically recognised. To import resources after the program is started, simply confirm in the pop-up window that you want to have all your resources copied over.

By registering the product by e-mail all the fields have to be filled in the same way as for online product registration, as well as "direct registration" having to be selected. The only difference in the e-mail registration is that your registration number will be sent by e-mail. This process may take up to two business days. After receiving the e-mail with your registration number to start EEP10.0 once again, go to e-mail product registration and enter the registration number you received within the e-mail in the field Registration number (R / N). EEP10.0 then starts.
The "registration with multiple program installations on different computers" is selected only in very exceptional cases.

Registration on different computers

This occurs when you are already an existing customer with one or more EEP versions, but you want to install your newly acquired EEP-version 10.0 on another or new PC on which you do not have your existing EEP versions operating.
In this case, it is necessary to enter your existing registration number. Your registration number will be displayed in your shop account in our online store.
After confirming the below button with "OK" you will automatically be guided further through the registration steps.

Note: If you are not sure which your current registration number is in your shop account, please feel free to send an email to: technik@eepshopping.de

The advantage of registering
Why Register? The registration procedure that might seem a bit awkward and cumbersome at first glance will quickly prove to be beneficial and useful, because it gives you guaranteed rights of use which are not limited to a computer and will not be exhausted by the time registration. By registering, EEP10 is unlocked, but only on the computer on which the program was initially installed. But that does not keep you from using the program on another computer such as a laptop. That is what the advantage of registering is: As a licensee, you can claim for one or more computers with a single serial number for up to five activations per year. This gives you the opportunity for EEP10 to:

• Install and activate Railroad X repeatedly on one specific computer
• Operate Railroad X in parallel on two computers (e.g., your main computer and your laptop)
• Use any additional models and add-ons you have purchased on several computers

In principle, EEP must be enabled for each installation. When you request a re-activation of an already registered program, the computer where the program was reinstalled is checked. If this is the same as during the initial installation, the current hardware version is compared to the state that existed at the first activation. If no change in the hardware is found EEP10 will be activated again. This activation is not seen as a renewed registration. This ensures that the program can be installed on the same computer as often as desired, uninstalled and re-installed and can be activated (for whatever reason), without the right to up to five annual registrations being affected.

The situation is different when the already registered program is released again for another or for an upgraded computer. If the check shows that the computer is different or that the hardware status - for example, by installing a new graphics card, or memory expansion - does not match the state of the first registration, the program can be unlocked again until the maximum number of five annual registrations is reached.

This right of use, which comes into effect with your first registration, is not only limited to the main program EEP10, but automatically applies to all additional EEP10 models and extensions that are registered under your customer number.

1.5. Uninstalling
Click on *Start, Systems* and then on the icon *Software* (if you use "Windows Vista/7" on *Start, System* and *Programms and functions*). Select the entry of Railroad X and click on *Change/remove* (if you use "Windows Vista" choose *Uninstall*) and follow the instructions of the uninstall routine.

Under **Windows 8** change to desktop mode, switch to *"Settings" -> "System" -> "Uninstall Programs"*, select *"Railroad X"* and confirm with *"Uninstall".*

2. Screen layout

2.1. The start screen

Firstly, after you have correctly installed and registered Railroad X, you always get to the new start screen of the program, which offers you all available options. You select whether you want to start with a new layout, recall your last edited layout or open a stored layout. Furthermore, you can watch current trailers or videos of Railroad X.

The start screen

The plan window in 2D view and 3D window

When the two-dimensional plan window view is switched on, you are in Editing mode. This is the mode you use to edit terrains and build transportation networks by laying tracks, roads and waterways, and inserting trees, houses and signals. The nature of the ground and the landscape relief can also be edited and designed in the 2D view.
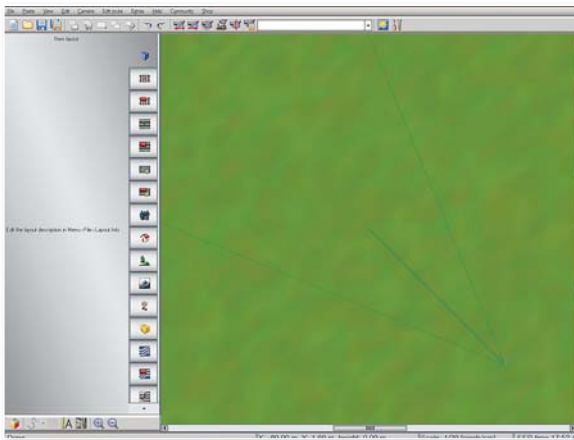
The plan window

The vertical bar, which separates the plan of the so-called tool dialog on the left, is particularly noticeable. The respective processing possibilities can be activated with the individual buttons.

They are introduced only briefly here. A special introduction to dealing with the individual tool dialogs follows further on. According to which option is selected, the display of the plan changes accordingly.

Railroad X

The bar

	1	Description of the Layout, full view of the layout in plan
	2	Editor for buildup of the track system and rail traffic
	3	Editor for inserting trackside elements like stations or bridges
	4	Editor for buildup of the road network
	5	Editor for inserting road bridges, etc.
	6	Editor for buildup of the tramway network
	7	Editor to insert trackside elements for tramway traffic
	8	Inserting animated figures and animals
	9	Properties editor
	10	Inserting landscape elements
	11	Editor for surface shaping
	12	Layout of a signalling system
	13	Inserting structures
	14	Layout of water- and airways as invisible tracks
	15	Inserting accompanying objects for water- and airways
	16	Editor for route control / Start of PlanEx to buildup a switching board

In the 3D window, which you can access via the button at the bottom left, the result of your designs is visible. In this mode, you can monitor your layout and explore and control the traffic manually. Here you can see from different adjustable camera angles, for instance how the vehicle operation proceeds.
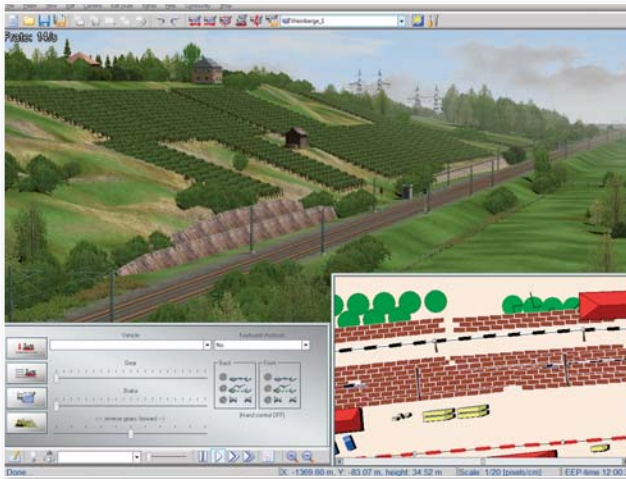
The 3D-window

Furthermore a 3D object editor is also at your disposal, with which you can insert and edit landscape elements, structures, roads, rolling stock and signals directly into the 3D view. Directly connected under the 3D-window are two more program elements: on the left you can see the operating menu – this is a switchboard for operating all rolling stock and controlling the functions and angles of the cameras.

Window for operating and radar window
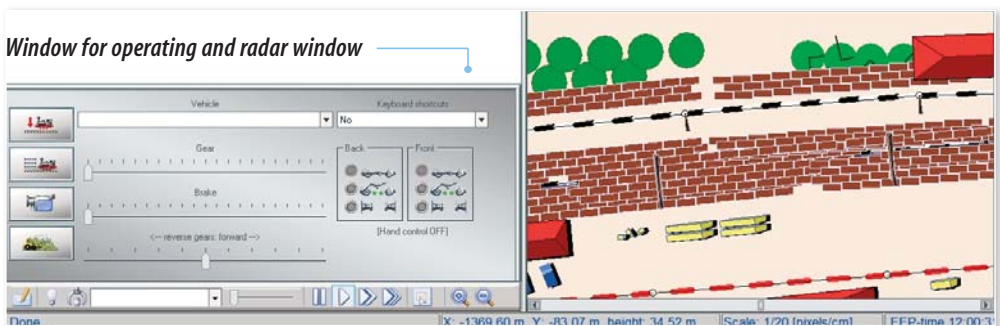
Important to know: Within the 3D view, the operating and radar windows are docked as default, however, they can be moved freely and scaled.. This can be very helpful if you work with two screens: You can watch the driving conditions on one monitor in the 3D view and on the other one you steer the rolling stock and check sides and signals.

You can activate the *Free movement of the windows* option in the dialog *program settings,* which you open with the corresponding file command or with a click on the button to open the tools. If this option is active, you can move the operation and radar windows arbitrarily and adjust the radar window by selecting the white icon in the title bar of the radar window with the right mouse button to determine the degree of transparency in the context menu. This adjustment is supported by Windows 7 and Vista, but not under Windows XP.

2.2 The toolbars
Railroad X is controlled by menu commands, buttons on control and toolbars and keyboard commands – so-called hotkeys – in both the 2D and 3D views. Functions only available in either the 2D or 3D window are auto-matically locked in the other mode. Even though the menu bar always remains visible, you can hide the tools, control and status bars. The majority of the program functions can be accessed through both the menu bar and the toolbar. However, there are some functions that can only be accessed through the menu bar or only through the toolbar.

2.2.1 Menu
The File menu can be used to create new layouts, open saved layouts, blocks and train runs, save open layouts/blocks/train runs, adjust the program settings, call up layout information, scan new models and close the program.
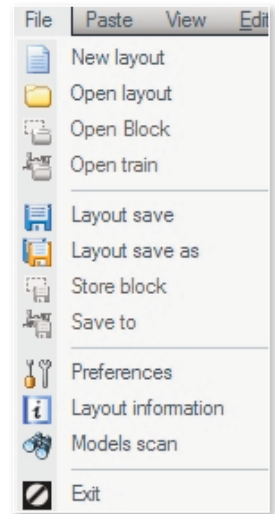
ATTENTION
If you save your layout with the function "save" you are asked which object classes should be stored. It is advisable, if you restrict the storage to single object classes, to store this under another name. Storage under another name or a consecutive number is always recommended and should – depending on how advanced the work is – be carried out approximately every 10 -15 minutes. Layouts which were included in the original EEP version but amended by yourself should be saved under a different name to avoid losing any of your work. The commands in the Insert menu can be used to undo and redo the last working step performed in the landscape editor, to select, copy and insert a block, to adjust the model being created to the background height, to delete models, and open the dialog window with the object configu-ration of a selected model.

Paste   View   Edit   Camera   Edit route

↶	Undo	
↷	Restore	
⬚⁺	Mark Block	Ctrl + B
⬚	Copy block	Ctrl + C
⬚	Insert block	Ctrl + V
✓	Adjust object underground level	Ctrl + F
🗑	Delete object	
ℹ	Object configuration	

Übersetzung fehlt hier!!!!

View   Edit   Camera   Edit route

	2D plan window
	3D window
	Maximized window
	3D full screen
	View increase
	View decrease
	Center
✓	Auto scroll
✓	Signals
✓	All contact points
✓	Landscape elements
✓	Properties
✓	Goods
✓	Track editor
✓	Street editor
✓	Tramtracks
✓	Waterways & hidden tracks
✓	Vehicles & trains
✓	3D camera
✓	Landscape relief
	Construction grid
	Display character device
✓	Menu bar
✓	Tool bar
✓	Status bar

The **View menu** is used to determine what is visible on the screen: Depending on the situation and requirements, you can open the 2D plan window, the 3D window, the maximised window and the 3D full view screen, or increase, decrease, centre and automatically scroll the view. You can also show and hide the construction grid, various category objects, tools and the control and status bars as required. All settings made in the View menu are saved automatically so that the program window opens the same way the next time you open the program.

Railroad X
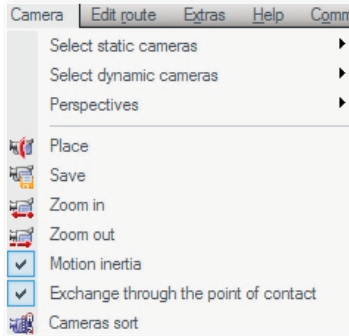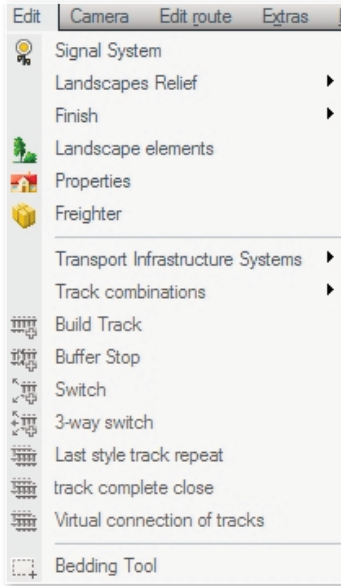
The **Camera menu** is used to select saved static or dynamic cameras (position), define the (camera) perspectives, set new camera positions and save, increase and decrease the zoom factor in the 3D-view. Furthermore, you find the options of movement sluggishness and change by contact point (only in this menu) which carry out a fluent camera movement and an automated camera change at automatic driving conditions.
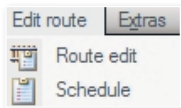
The **Route menu** is used to automate vehicle movements. It is only possible to edit a route using this menu and define and edit the timetable for automated vehicle movements.
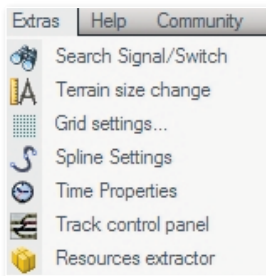
The **Extras menu** can be used to search for a switch/signal (with a known ID) in the layout, change the size of the terrain, adjust the grid and the Spline settings and determine the EEP time properties for automated vehicle movements.
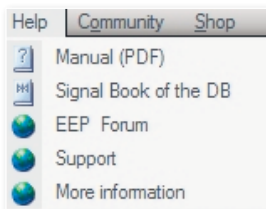
The **Help menu** opens the manual (PDF) and the DB signal book and connects you to the EEP forum on the Internet. You are also able to access additional information and find out about EEP & Railroad X.
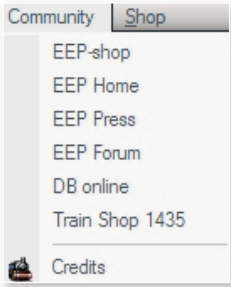
The **EEP Shop menu** lets you switch to the on-line EEP Shop, the Bahn Shop, to DB and to the www.eep.eu website without leaving the program.

2.2.2 The Toolbar

The majority of the Railroad X functions are activated very quickly and easily using the toolbar. Clicking on the following buttons allows you to:

The upper Toolbar

create a new layout	Centre the current camera view in Plan-view (2D-view) or radar-view (3D-view)
open a saved layout	centre the camera on the active rolling stock
save the open layout completely or partially	position the camera in the plan - or radar -window
save the open layout under a different name	save the current camera perspective
open a saved block	Activate stored static or dynamic camera positions
save an open block	configure the environment settings
select a block	Adjust program settings
copy the selected block to the clipboard	
insert the copied block	
Undo/Redo (action restore)	
move the camera forward	
move the camera away	

In the dialog **window of the program settings** (optional operation > New tool bars view mode) selects an optimized display mode, which removes inactive elements   dynamically. Not sure what this sentence means! This provides a better overview since the tools which can actually be used are exclusively visible at any given time. This paragraph does not relate to any text in the German version of the manual – please double check!

2.2.3 The Control Panel

While the upper Toolbar of the 2D- and 3D-view are identical, the lower Toolbars (below on the left) are different, because they are coordinated with the respective view. Only the scaling (increase or decrease) keys are identical, however, they can either refer to the plan orto the radar window. This function is mainly used in the plan window when precision is required.
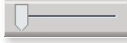
The lower Toolbar in 2D-view:

- switch to 3D-view
- set the Spline function (for positioning masts, lamps, etc., on tracks or roads)
- show the drawing grid
- show the measuring cross
- adjust the contrast and luminosity of the display in the Editor
- Zoom in and out in 2D-view

The lower Toolbar in 3D-view:

- Switch to 2D-view
- switch the lighting in the active rolling stock on and off
- pick up and load cargo such as containers, crates, etc. using special cranes
- start or move parts of rolling stock such as doors, shutters, crane jibs, etc.
- move animated parts of rolling stock
- Time-lapse function (fast run of predefined processes)
- XXX Should there be some text here?
- extending or reducing the view in the 3D window

3. Camera management

3.1 Operation and control
Camera manipulation is fundamental to building model railways with EEP. Everything that you see in the 3D view is seen through the perspective of a camera that you control using your mouse and/or keyboard. Depending on the camera mode, you can move the camera freely and explore the layout of your own accord or link the camera to a train to enjoy the railway landscape from the perspective of a passenger or an engine driver.

3.1.1 Positioning and adjusting the camera
Essentially, you can position a camera anywhere throughout the layout and move it in any direction. The perspective indicated by the green lines can be set in the 2D view or in the Radar window of the 3D view. The thin vertical line indicates the height while the second somewhat thicker line indicates the direction and distance from which the layout or respective object is being viewed.The angle of aperture of the camera is indicated using two dashed lines.

To determine the position and the line of sight of the camera, you click on the button *"Position camera"* (tool tip) in the tool bar. When this function is active, a small camera is added to the mouse cursor. This indicates that the camera can now be positioned as follows:

• Click the point where you want to position the camera without releasing the mouse button
• Hold the left mouse button down and drag the mouse cursor in the direction you want to view
• Release the mouse button to fix the viewing direction.

As you will see, the vertical line remains constant while the second line changes its direction and length: When the line is short, you are viewing the immediate surroundings; when the line is long, you are viewing further afield.
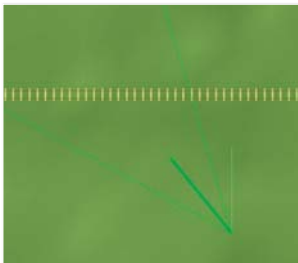
By default, the camera is positioned approx. 3 m above the layout surface, irrespective of the actual height of the terrain. However, you can also view the layout from a higher or lower positionby doing the following:

• Click the Setup *camera button* and move the mouse (without releasing the mouse button) to the desired camera position
• Press down the mouse button, press the [CTRL] key and drag the mouse cursor up or down depending on how high or low you want to position the camera
• Release the [CTRL] key when you have reached the height you want

- Drag the mouse (press down the mouse button while moving the cursor) in the desired direction
- Release the mouse button to fix the angle and the distance to the object.

If you centre the camera by clicking this button, the selected camera will be positioned so that the active rolling stock (trains) are located in the centre. A good tip for finding objects you are searching for!

TIP

With the respective option in the program settings, the orientation of the camera can be inverted horizontally or vertically.

3.1.2 Saving camera positions

It is worth saving particularly interesting camera perspectives. Clicking this button once allows you to save any camera position and angle in the layout. As soon as this function is active, a dialog appears where you can enter a name under which the camera position will be saved. You can also specify whether it is a static or a dynamic camera.
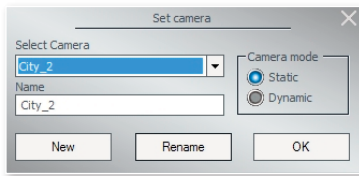
dialogue to store a camera position

Each layout has the capacity to save up to 80 static and 80 dynamic camera positions. To open a camera position that has been saved, activate the respective camera, open the associated list and select the desired position. You can also overwrite this camera position with different settings or save it under a different name.

Please note: The static camera always remains in one position and does not change perspective. The dynamic camera, on the other hand, is linked to rolling stock and therefore automatically changes its perspective.

3.1.3 The mobile camera

Besides the static and the dynamic camera in Railroad X Expert, a mobile camera is also at your disposal. While the static camera is linked to a location and the dynamic camera is coupled to rolling stock, the new mobile camera is very flexible. You determine the course as cameraman and director of the railroad scene. You can manage this camera as follows:

- In the operation window click on the button of the 3D object editor to switch on the 3D-editing mode.
- Before a mobile camera can enter into action, the path which the camera can take is limited. You choose it from the following:

Railroad X

As soon as a mobile camera is placed on its driveway, a camera symbol appears there. Analogous to the System driveway, the mobile camera also has an object menu. You open this as usual with a right click on the selected camera symbol to correct the camera position, to fix the camera setiings in the properties dialog and to also activate the camera at the end.
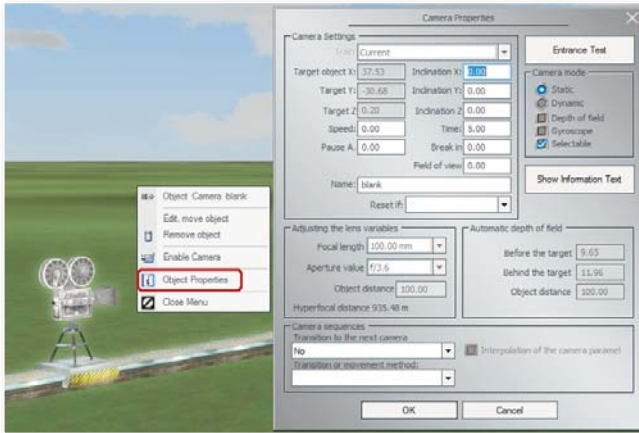
The camera can be adjusted precisely

For photo experts amongst the model railroader, the setting options which are offered in the dialog camera properties, are virtually sensational. Here you decide in which camera mode you want to use your mobile camera. If you choose the static mode, determine the angle of inclination of the camera in relation to the axes X, Y and Z as well as the speed and the duration. Furthermore, in the dynamic mode you can also define the camera settings with respect to the aim object.

Artistic pictures by sharpness regulation

If you switch on the option focus depth in addition to the static or dynamic camera mode, the virtual Railroad X camera adopts the qualities of a real reflex camera. This means that shutter and exposure subject to the target object and daylight must be adjusted individually – depending on how much focus depth you shall produce and what kind of picture effect is intended. In the dynamic camera mode you can set focal length and shutter, and in the static mode you can also set the object distance. The focus depth (also called depth of focus) adapts to the settings automatically: The further you fade in, the more the depth of focus is reduced. If several cameras are to be used, you can also decide on how the handing over from camera to camera shall be carried out. Making the right settings in the age of digital photography is certainly not self-evident and certainly not easy, but it also has its own unique charm.

3.2 Camera management in the 3D window

Clicking the camera icon once in the Control dialog of the 3D window opens the Camera menu (not to be confused with the Camera menu in the menu bar!) which is basically a control panel for the camera.
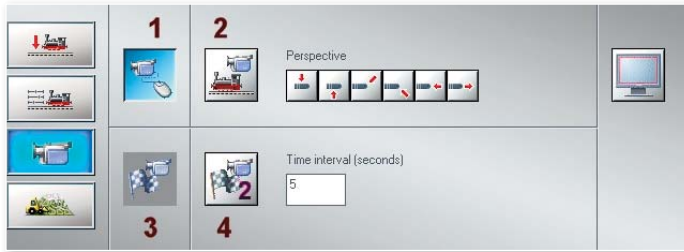
Different options for the camera work

1   Free Camera Movement to navigate though the layout without any restrictions
2   Linked Camera if you want to link the camera to the active rolling stock
3   Travelling Mode to follow a train with a dynamic camera
4   Timing Camera to transfer from camera to camera as soon as the rolling stock is in motion.

3.2.1 Dynamic camera

In dynamic camera mode, you can use the mouse and the keyboard to navigate freely through the 3D view without restrictions.

Mouse: While pressing down the right mouse button, drag the mouse to the centre of the 3D window. In the upper half you move forwards, in the lower half backwards. The nearer the mouse cursor gets to the upper or lower edge, the faster you move. Turning the wheel on the mouse moves the camera up and down. Click the centre of the right or left frame of the window to move the camera in the desired direction. If you position the mouse cursor diagonally over the centre and hold down the right mouse button you can move through the layout in a curve. Interesting tracking shots can be created depending on how you direct the mouse cursor.

Keyboard: In addition to controlling the camera with the mouse in the 3D view, it is alsopossible to use the keyboard as follows:
• Use the *arrow keys* to move the camera perspective up, down, left and right.
• If you hold down the *[CTRL] key* while using the arrow keys, the camera moves in the desireddirection while remaining at the same height.
• In order to raise or lower the position of the camera (whereby the perspective remains on the original object), press the *[SHIFT] key* while using the up or down arrow key.
• In order to move the angle of the camera to a central point, press the *[SHIFT] key* while usingthe *right or left arrow key.*
• Press the *[Page up]* and *[Page down] buttons* and the angle of the camera moves up and downvertically.
• Press the *space bar* to zoom in to the 3D view.
• Press the *[R] key* to zoom out.

3.2.2 The Static camera

This mode links a camera to the rolling stock selected in the Control dialog. The camera moves at the same speed as the rolling stock so that you can experience a journey through the entire layout with different views.
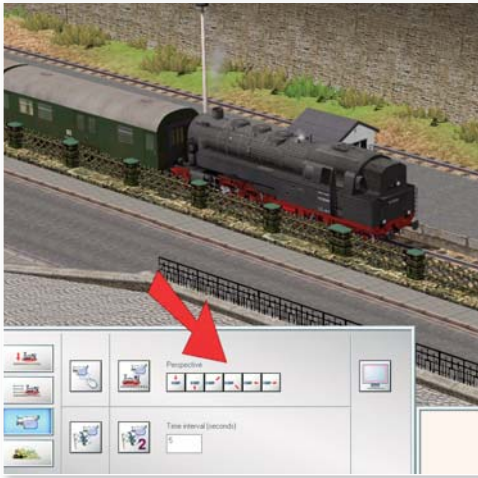
This camera remains at the selected rolling stock in different perspectives

You can use the buttons allocated to the static camera in the camera menu of the Control dialog to change the camera perspective to the respective directions indicated. The picture shows an HGV with a static camera looking out diagonally from top left. No matter where the HGV goes, the camera remains "docked".
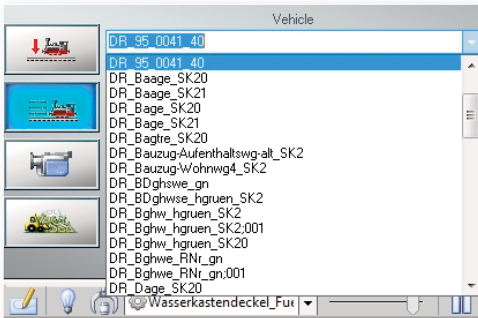
Select the vehicle that you want to follow

You can use the buttons allocated to the static camera in the camera menu of the Control dialog to change the camera perspective to the respective directions indicated. This sentence is a repeat of that at the beginning of this page. Not sure if it should also appear here. Figure 10 shows an HGV with a static camera looking out diagonally from top left. No matter where the HGV goes, the camera remains "docked". This sentence is a repeat of that towards the beginning of this page. Not sure if it should also appear here.

The perspective can also be adjusted individually using the mouse and the keyboard: Use the arrow keys or move the mouse with the right mouse button held down to change the angle of the camera around the active rolling stock. Use the space bar or [R] key or turn the mouse wheel to control the level of zoom, i.e., the distance of the camera from the rolling stock. You can also use the [8] key to switch to the cab view and move the line of sight using

the arrow keys. The static camera can be used to find rolling stock more easily in larger layouts. In the Control dialog, click the button to open the settings for the Vehicle and Train Speed and select the vehicle you wish to view. Then switch to the camera menu. There you can activate the linked camera, or press the [F9] key to move the selected vehicle into the field of vision.

3.2.3 Travelling mode

Travelling mode can be used to follow the train along the route, whereby the camera moves in such a way as to keep the train in the field of vision for as long as possible. To achieve this, dynamic cameras must be positioned along the route. Switches triggered by contacts always call up the camera nearest to the passing train. Therefore, position the dynamic cameras along the route so that they provide the best possible perspective. A little practice will give greatresults.

3.2.4 Timing camera

Camera management with the Timer Camera allows you to automatically change the camera position while main-taining the same aperture. Thus, the camera perspective remains unchanged regardless of the movement of the active rolling stock. The active rolling stock is focused on the centre of the screen. This is comparable to managing several cameras during a live transmission. As in that scenario, a moving object is transferred from camera to camera with the only difference being that the timing camera always assumes the final perspective angle. If you want to change the perspective, you have to do this between two of the time intervals you have set.

The change in location is triggered by a timer. You can specify the interval at which the change in location occurs by entering the number of seconds in the input box of the camera menu. We recommend using an interval between 3 and 10 seconds. As with the dynamic camera, you can also adjust the camera management and perspective of the automatically co-ordinated cameras using the buttons described above.

The time information determines the period after which the image is switched

3.2.5 Switching cameras using contacts

In addition to switching the camera perspective manually by replacing and adjusting them, it is also possible to trigger them automatically using contacts. In order to automate the switching of cameras during automatic vehicle movements, you must activate the Switch Using Contacts option in the Camera menu. When this function is active, the camera automatically follows the rolling stock to which you have assigned the camera contacts.

How does this work?

Let us assume you have a track circuit with one train on it. In order to automate camera management on an auto-mated operation, set contacts at the prominent positions where you want to switch cameras. When the train passes over a contact, the view automatically moves to the preset camera position and shows the scene from the perspective saved for that camera.

Railroad X

How are the contacts set in 2D-view?
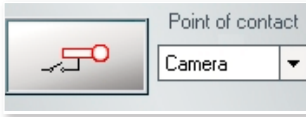
Selection box for the contact point of reference

- Activate the *Signal Editor* in the 2D view
- In the drop-down menu of the Signal Editor, select *Camera* as the type of contact point and click the button.
- Now move the mouse cursor in the layout plan to the track section where you wish to assign the contact.
- Click the selected section of track where you wish to insert the contact used to switch cameras.

> **Important to know:**
> Convenient, faster and clearer if you are working in the 3D-editor mode: Highlight the desired route using the left mouse button, open by right-clicking the context menu, select the *contact point for the camera* and determine the position with another left-click.
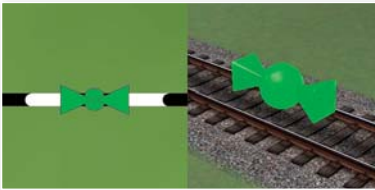
Contact point in plan- and 3D-view

The green symbol (in 3D mode in three-dimensional representation) that now appears indicates that the camera contact is in place. The two triangles indicate the direction from which the train must approach in order to trigger the contact and consequently switch the cameras. The contact you have set using this method can be moved along the route by holding down the left mouse button. In order to assign a contact to a saved camera and define the requried settings, right-click the selected contact. Use the following configuration menu to apply the settings for the camera contact by defining the direction of travel, route, vehicles, contact trigger conditions and camera control.
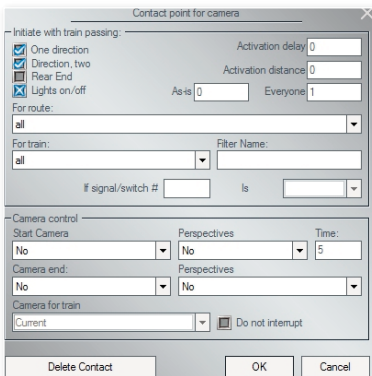
Setting options for camera contact points

Railroad X

4. Constructing and designing layouts

4.1 Discover and familiarise yourself with Railroad X

Most model railway fans and Railroad X users are mainly interested in designing and constructing layouts. It therefore goes without saying that this topic will occupy the lion's share of this manual. However, it can be difficult in the beginning. This is admittedly also the case with Railroad X. On-screen construction, switching between the 2D and 3D views, navigation and control using the camera – all this is new territory waiting to be discovered and mastered.

If you are not already familiar with Railroad X and PC-based model railway simulations, you should begin by taking a look at the supplied sample layouts. You can open these and run them without having to create anything. This is the best way to familiarise yourself with the program: You can see how the layouts designed in Railroad X operate and familiarise yourself with the work environment. The fullscreen mode allows you to experience fully automatic vehicle movements at their most impressive. Allow the camera management to take control and watch how a train approaches from a distance and then disappears into a tunnel. Observe what happens in the station, how the trains arrive and depart, how goods are loaded or unloaded by companies and everything else that is happening – this provides you with an enjoyable introduction to the world of on-screen model railways! To explore the layout under your own steam, use the [Esc] key to switch back to the window mode. Use the [F9] key to stop the automatic camera management and continue again after the pause. Take a moment to try the 2D view where you can study the layout and go on a journey of discovery with the camera. If you switch on the static camera and switch off the Switch Using Contact option in the Camera menu, you can criss-cross through the layout in any direction. You can also navigate through the series of camera positions in order to view the layout from the most interesting perspectives. If you then want to finally switch the camera management back to automatic mode, re-enable the function to enjoy all the stages and perspectives of the traffic flow again.
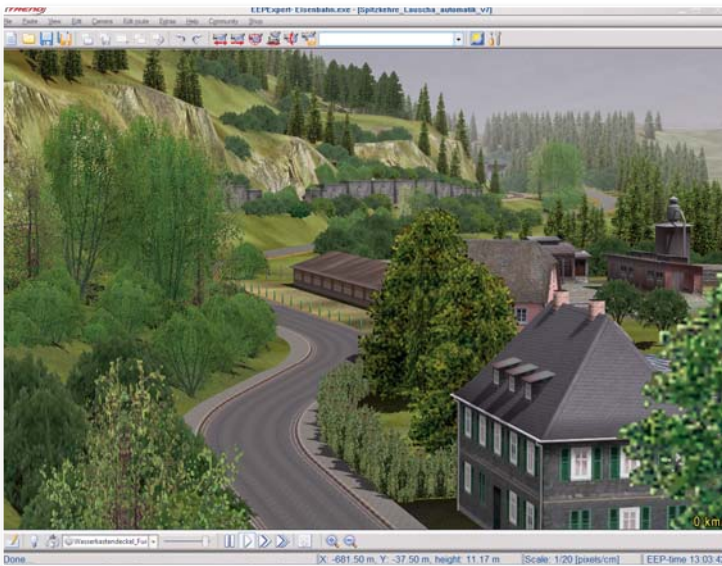
Maximized window with switched-menu bars (lower view)

Once you have gained a first impression and satisfactorily explored the Demo layout, the time has come to advance from being an observer to a designer. The Tutorials help you to get started and provide clear and realistic demonstrations of the most importantworking methods.

4.2 Creating a new layout

Just as you would expect, you can begin to design a new layout in the design view of the 2D Plan window by selecting File/New. When you use this command, a configuration menu appears where you first have to specify the length and width of the layout and the grid density in nodes. The greater the grid density, the more exact the formation of mountains and the spraying of the textures, but also the higher the demands placed on the system and the processing power. Taking into account the limited computing capacities, the grid density should not be set too high and 125 dots/km are recommended when using EEP for the first time. You can use this guideline to test the your computer's reaction times.

CAUTION

The grid density depends on the size and may therefore only be determined in relation to the width and length. A screen tip will provide suggestions for the minimum and maximum values. The highest possible number of dots is 250,000! A sample calculation is provided for a 5 x 1 km layout with the recommended number of dots set to 125 dots/km.

- 5 km x 125 dots/km = 625 dots
- 1 km x 125 dots/km = 125 dots
- 625 x 125   = 78,125 dots

Thus, this layout corresponds to almost one third of the maximum possible size when using the recommended resolution of 125 dots/km.Once you have measured the dimensions of the new layout, you can switch on the smart Landscape Generator which has already produced a basic design based on your specifications. You simply need to specify the percentages and maximum height of the mountains and,if you want,choose a ground texture motif.
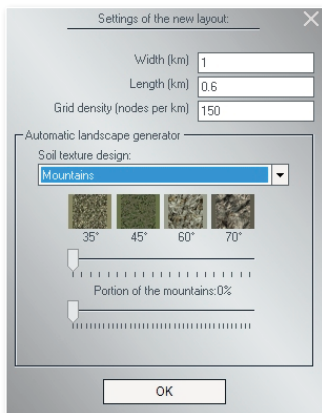
In the dialogue system the basic settings to layout size, soil composition and dot density are made

Once you have measured the dimensions of the new layout, you can switch on the smart Landscape Generator which has already produced a basic design based on your specifications. You simply need to specify the percentages and maximum height of the mountains and,if you want,choose a ground texture motif. A ground texture motif consists of four textures which vary according to shading and nuances rather than the ground motif. When you select a texture motif for the ground design of your layout surface, the entire layout is given the set of four default textures in a single spray process. The respective texture depends on the configured incline of the layout surface. If the incline of all four textures is the same, the textures will be mixed randomly in order to create a natural looking layout surface. If you do not select a texture motif, the layout surface designed by the random generator is covered with a standard texture.

> **TIP**
>
> **With the function fill layout with texture in the Edit menu, you can retexture or recolor the entire layout surface through mouse clicks. A few clicks of the mouse and the layout has a new look! How it works is described below. The scene that is generated randomly or according to your specifications is simply a basic layout that you can then expand on and modify into a real railway landscape.**

4.3 Modelling the landscape

There are two editors for modelling the landscape – the tried-and-tested Relief and Texture Editor in the 2D Plan window and the somewhat newer 3D Landscape Editor which you can use in 3D mode. You should familiarise yourself with both editors.

4.3.1 Relief and surface design in the 2D Editor

Use the 2D Relief and Texture Editor to design your railway landscape in the 2D Plan window. This means you are working in design mode and may switch to the 3D view after every working step to check the results. The editor

appears when you open the editor list in the 2D view and select the Relief and texture design option. As soon as the relief and texture editor is active, the palette containing the tools for the relief and texture design appears on the left-hand side of the 2D window.
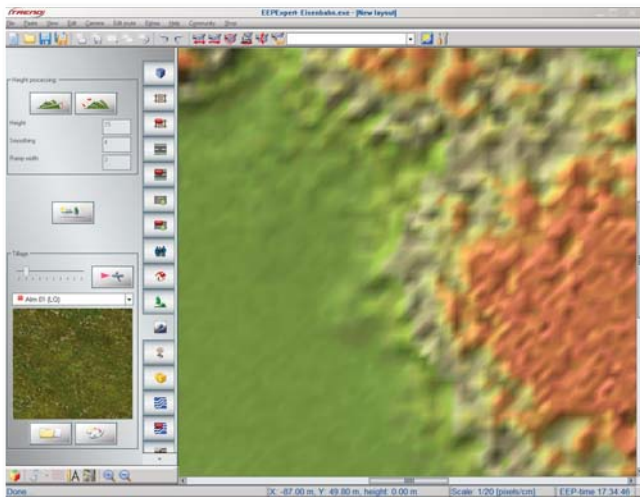
For the design of the surface there are tools available, with which you can create surveys and texture the landscape

With this tool in the relief and texture editor you can edit the surface of the Railroad X landscape.

Draw and model mountains

Draw and construct ramps

Set up and define local weather zones

Height	15
Smoothing	4
Ramp width	3

Specify the height, anti-aliasing and ramp width parameters

Alm 01 (LQ)
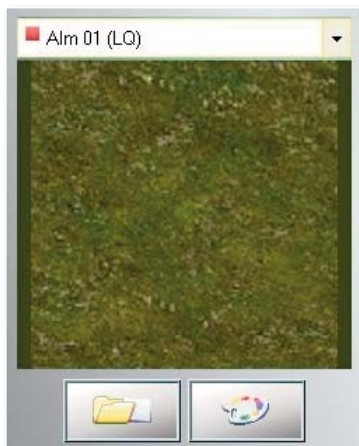
Select and edit ground textures and insert external ground images

Activate the spray gun for adding texture at the desired strength

– Tillage

Modelling mountains and ramps:
You will learn how to manipulate the relief and texture editor tools with practice. To familiarise yourself with the essential working methods, begin by constructing a simple mountain:

• Switch on the *Relief and Texture editor* and specify the **height** and **smoothing.** The height parameter measures the height or depth above or below mean sea level (AMSL) depending on whether the value entered is positive or negative. The smoothing relates to the edges, i.e., the graduation of the elevation profile. The greater the number, the smoother and flatter the sides of the hill. This requires that the inner and outer contours do not lie too close to one another.

- Once the parameters have been set, click the button which activates the drawing tool for the mountains. This switches the program to design mode.
- Now click on the drawing surface and use the left mouse button to draw a closed contour. Release the mouse button once the contour has closed.
- Draw a second contour which fully encloses the first – the first contour determines the surface and height of the plateau, the second the circumference of the foot of the elevation. The closer the contours are to one another, the steeper the mountain will be.
- Repeat this procedure several times until you are familiar with it, then switch to 3D view to assess your work in 3D.

The results in the 3D window may still leave something to be desired – the plateau with its jagged edges may appear somewhat bizarre and excessively craggy. However, this will improve with a little patience and intuition. Thanks to interpolation, i.e., repeated re-drawing of mountains or valleys with the same height parameters and similar co-ordinates, you will be able to create smooth edges and a realistic landscape with soft contours.
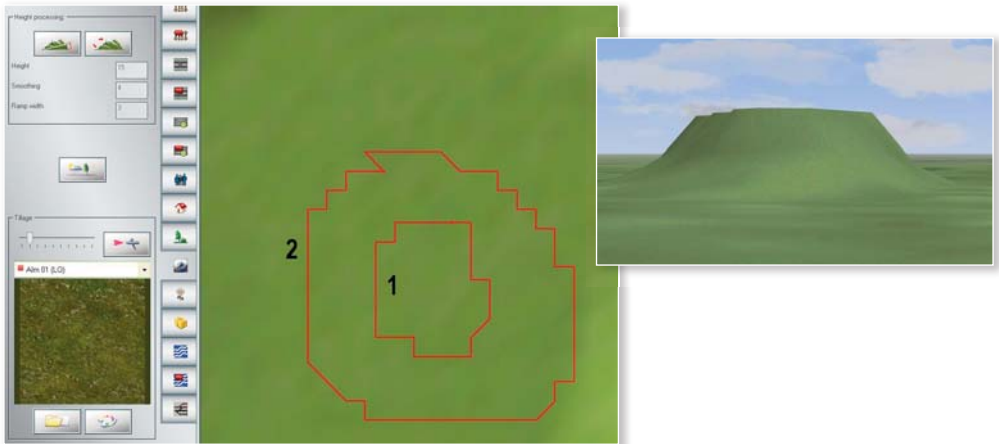
You can see how this happens in the examples shown in the following illustrations: It suffices to draw a small circle (1) in one of the two hill contours and draw the second, outer circle around both mountains (2). Thus, both elevations will be deducted from each other and sea level, i.e., the initial level (3). The effort is worthwhile: The contours appear smoother and the silhouette that appears in the 3D view (4) is much more pleasing to the eye.
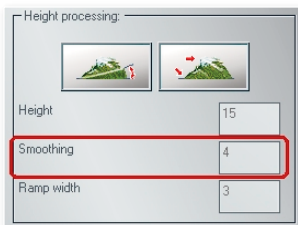
The second tool available in the Relief and Texture editor for designing reliefs activates the ramp function. Ramps are built in order to connect sections of different heights. In a model railway layout it is often not possible to avoid laying banks and embankments, and this is where the ramp tool comes into play. The construction principle is the same as that for the creation of mountains and valleys, only that this time you have to specify the ramp width rather than the height and smoothing parameters. The height values are taken from the start and end points of the ramp and are used as the base values for the gradient.

Once you have specified the width of the ramp, you can start drawing:
- Click the *Ruler* in the control panel to show the *measuring cross* – this improves your precision and makes drawing easier but it is not absolutely necessary for creating landscapes.
- Next, activate the *Ramp tool,* move the mouse cursor into the layout plan at the point where you want to place the ramp and drag the mouse with the left button pressed down to draw a connecting line to the point where the ramp should end.
- Release the mouse button to view the ramp in the 3D window.

It is also possible to draw curved ramps. For example, if you want your model and landscape to contain a river or stream winding along a valley in-between hills, you can also do this using the ramp function, but this time the various levels will be interconnected by curved lines.

Designing reliefs
Mountains, valleys or ramps: As long as the surfaces are bareand there are no meadows, woods, fields or rocks covering the ground, the landscape appears unreal and abstract. To create a realistic appearance, you can add textures to the bare relief which impart the flair and atmosphere of a genuine landscape.

The texture catalogue of the *Relief and Texture editor* contains a variety of ground textures for you to select, edit and apply. The process is simple:

- Select the texture you want from the *Texture Catalogue* using the preview.
- Click the *Colour Palette* to adjust the base colour to your needs and, if necessary, correct the scaling and angle of orientation or rotation.
- Then use the *Sprayer:* The greater the jet, the greater the surface you can spray.
- Click the icon to activate the Sprayer and drag the mouse with the left mouse button held down over the area that you want to cover with the selected texture.

The sprayed texture appears as coloured squares in the 2D plan window in the selected base colour and is given a natural effect using randomly generated shading. Of course, this does not mean that you have to use all textures with their default settings. Feel free to experiment a little to find out which shade, which scaling and which orientation give you the best results.

The function *Fill layout* with texture gives you the opportunity to fill the complete layout with a new texture or color in one fell swoop:

- Activate the *2D Editor* for the surface design.
- In the menu *texture settings* select the desired ground texture and - if desired - a different background color (by clicking on the button color of the ground texture).
- Finally, click the Edit menu on the menu item *surface condition* and in the unfolded submenu select *fill layout with texture.*

That's it. After a short calculation time your layout appears in a new "guise".

Please note: Save the layout you are working on under a new name at each stage so that you can follow the various editing stages and, if necessary, return to a previous version. In order to be absolutely sure, it is worth activating the Auto save option in the program settings and specifying the time intervals at which your work should be saved. The work stages are saved in the Resources\Layouts\AutoSave folder. In the dialog box of the program settings a path (deviating from the default path) to an existing folder can be selected, who will serve as the new "backup location" for your layouts. This folder can be created on an external drive, which is especially advantageous if you have installed EEP 10 on a SSD (Solid State Drive) and has a relatively small storage volume.

4.3.2 Relief and texture design in the 3D editor
Surface modelling is more vivid when processed immediately in 3D view rather than in 2D. To do this, open the 3D editor in the 3D window by clicking the button with the small digger at the bottom left of the control dialog. As soon as the editor is activated, a flashing note appears in the 3D window, indicating that the 3D relief and texture design mode is active. As long as you remain in this mode, any moving traffic and the automatic vehicle controls will be paused. Thus, you can take your time while using the 3D editor.
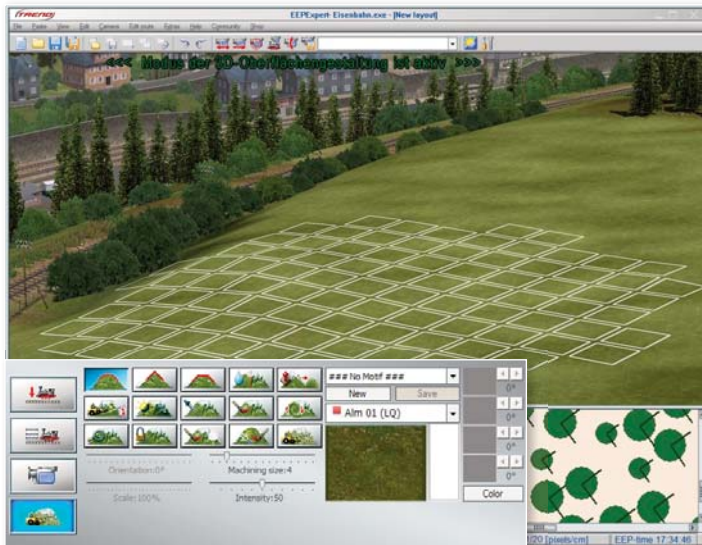
Also in the 3D view, the landscape can be edited

The **3D editor** provides you with everything you need to design the relief and texture of the layout. In addition to an enormous selection of ground textures, you will also find a variety of tools to assist in designing the relief and layout surface. Many tools have been designed so that you can use one and the same tool to carry out two actions with not just different but opposing effects. In order to apply the opposing technique, you must click on the relevant tool with the left mouse button while holding down the [CTRL] key (on the left hand side of the keyboard).

Have a quick go at the alternative uses of these tools:

- Click on the first tool which is for modelling mountains and hills, and move the mouse cursor in the 3D window to the surface you want to edit. A field of white squares will appear. You will generate a mountain in this highlighted area. Now activate the tool again and hold down the mouse button and the [CTRL] key. As you can see, a field of green squares now appears in the 3D window. The green indicates that a valley rather than an elevation will be created. Use the tools in the 3D landscape editor to change the landscape as you like.
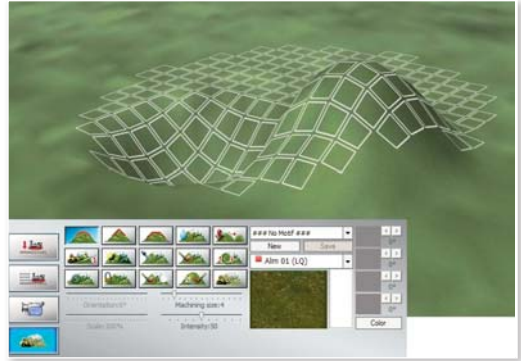
Create an elevation (left CTRL-key) /valley with a soft peak

Create an elevation/valley (left CTRL-key) with a sharp peak

Construct a levelled plateau/depression (left CTRL-key) with a levelled surface

Smooth out any unevenness in the relief/increase the erosion effect (left CTRL-key)
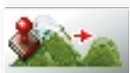
Test the height and create an elevation of the respective height/a valley of the corresponding depth (left CTRL-key)

Construct a ramp

Lighten/darken (left CTRL-key) the background colour of the ground texture

Take up a sample of ground texture using the pipette (if no texture motif is selected)

Cover the relief with the selected ground texture (if no motif is selected)

Rotate the orientation of the ground texture/Straighten out a distorted ground texture

Change the scaling of a texture/return to the original value of 100%

Lock the landscape relief against changes/unlock (left CTRL-key)

Mirrored (specular) light reflection effects on surfaces which can reflect incidental light (e.g., on water or ice).

Replace the selected ground texture, regardless of the set size of the spray tool. This is important, if only details or just a texture from a set of four ground textures, but not the other textures are replaced and reworked.

Select automatic surface generator

The surface generator works in two ways:
1. It changes the landscape surface only in the marked area. For this to work, the lock for the change of scenery needs to be activated and the landscape must be marked with crosses at the desired locations.
2. It changes the entire landscape surface apart from the areas that were previously marked to be excluded (locked).

Automatic surface generator	✕
Minimum height: 5	
Maximum height: 50	
☑ Only in the marked area	
portion of the mountains: 10%	
Generate	Cancel
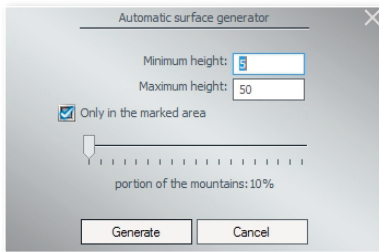
Automatic surface generation should be restricted to a limited range

The tools used to apply texture to landscape reliefs utilise different scroll bars. These controllers allow you to:

- Set the angle of orientation for the ground texture (on a scale of -45° to +45°) if the tool for the orientation of the ground texture is active
- Magnify or demagnify the editing surface, which can also be achieved using the comma [,] and full stop [.] keys
- Scale the applied ground texture (on a scale of 10% to 400%) if the scaling tool is active
- Regulate the threshold limit in order to adjust the brightness and/or reflection effect of light reflected off a ground texture
- Specify the intensity of any modified application of a ground texture using the pipette at a scale between 1 and 100

In addition to every imaginable category of ground texture, the 3D Landscape Editor also include 20 default texture motifs for you to select, edit and complement with new motifs. Ground texture or texture motif? You must choose one or the other in the initial dialog of the Landscape Generator.

If you give preference to one of the ground textures, you must activate the *### No motif ### option* in the drop-down menu before you select the category and texture. (Fig. 24) If you do not like the colouring, click the Colour button to use a colour palette containing the colour you want or have defined.
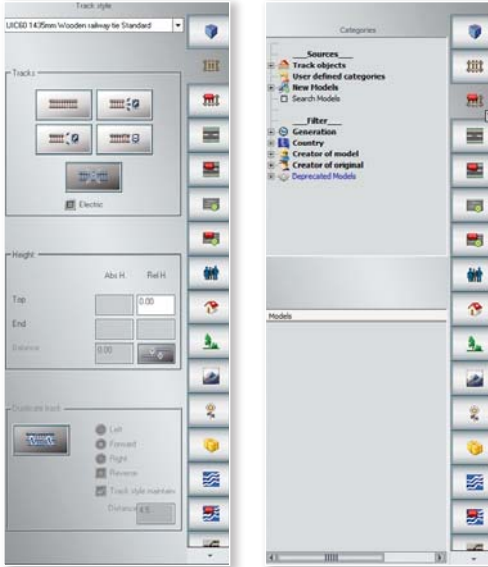
A simple ground texture requires no motive

Modern graphics engines enable a new technology known as Parallax Bump Mapping. This so-called bump mapping is used to calculate a relative displacement (parallax) of parts of a ground texture in relation to the observer and results in a more intense three dimensional effect. If you look at a layout surface sprayed with bump mapping from close up, you will notice a fine difference in height, emphasised by light and shade. The gaps between paving slabs, individual stones on a country lane, blocks of ice on a frozen river or cobbles on a paved road – all of these appear with a plasticity which can only be achieved using bump-mapped textures. The ground textures in the pop-up window are highlighted with either a red square or a blue cube. The red square indicates two dimensional ground textures while the blue cube indicates 3D bump-mapped textures that can be used to generate a layout surface with more impressive plasticity. You can achieve a more natural relief effect using the texture motifs. Remember that each texture motif consists of four ground textures that use a mixture of shading types and therefore have a very natural appearance. The texture that is sprayed on is determined by the incline of the landscape relief, which must be set for each texture within the set of four. Since the relief and texture design are linked, the preset textures are applied during the modelling of the relief. In a single pass you can thus create models of steep mountains, gentle hills and ramps that are covered with appropriate textures. You can see how a texture set varies by selecting a texture motif. As soon as you have selected a motif, the textures in each of the four shades of the default base colour appear in the small preview fields on the right, which you can modify using the colour palette should you wish. The activation angle of the landscape relief is also shown for each texture, which can be adjusted using the relevant buttons. In order to give greater freedom of design, you can extend the selection of motifs by collecting new texture motifs. The process is simple:

- Click the **New button** in the 3D Editor dialog and enter the name of the new motif.
- In the **texture menu,** select a ground texture which will appear in the preview pane and that you can colour as required and add to the new motif.
- In order to assign the texture to its place in the texture motif, right-click the texture in the preview pane. This opens a new menu.
- Move the mouse cursor to the item you want to use to assign the texture to the selected place in the motif. It does not matter what order you do this in as the position does not determine the use. The angle of the landscape relief alone determines which of the four textures will be used.
- Once the texture has been placed and appears in one of the four texture fields, you can use the associated buttons to set the angle of the landscape relief which determines when the texture should be applied. For example, if you enter 0° for the first texture, a texture is sprayed when the angle of the relief is 0°.
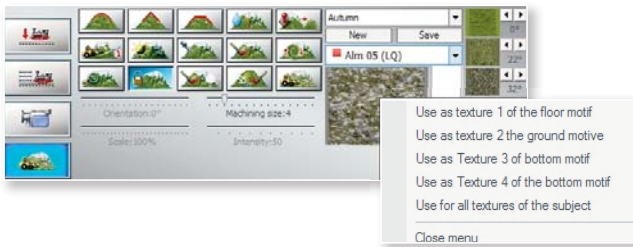
Scope of design options for creating your own ground textures

- Select and transfer the remaining three ground textures into the texture motif fields by differentiating the angle at which the spray process should be triggered from texture to texture.
- Save your new texture motif once you have checked the results in the 3D view by clicking the Save button. If the angles of all four textures of a motif are the same, the random generator is automatically activated which randomly mixes the textures so that the landscape relief is not lifeless and monotonous.

Block function to copy and save the landscape surface

Following feedback from Railroad X users, a block function has been implemented in the surface 3D-editor, which can copy and save the marked part of the areas of the landscape surface. Thus, not only is the the reproduction of a landscape surface fragment within the open system possible, but also the use of the stored block in other systems. The copied and stored blocks of the landscape surface contain all information about the height relief and the texturing used (the so-called Sprühtexturen) and can be rotated by 90° as well as having their dimensions scaled by + / − 25 %. This provides you with all the tools available to copy and edit particularly successful "Landscape spots" such as individual mountains and lakes.

To select a block in the 3D editor window, the button for marking and blocking the landscape surface must be pressed first and subsequently, the desired section of the landscape surface is marked whilst holding the left mouse button. The highlighted area of the plant surface is labeled with small yellow crosses, symbolising the contents of the block.
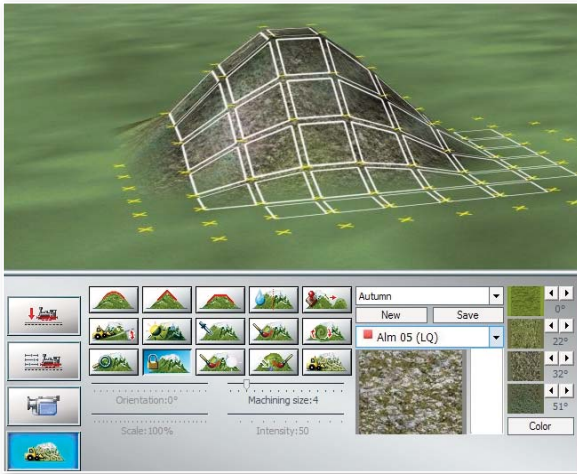
This allows you to exclude certain areas from further processing. By holding the left Ctrl key you can unlock this again.

The labeling of the area in the layout must not be done in one step, because the set markers on the landscape surface remain even when you release the left mouse button. In this way, you can be very specific and very accurate, especially as the size of the marking tool can be varied using the slider processing size. If you have marked a bit too much space this is not a problem as you can reset the unwanted marks by holding down the [Ctrl] key on the computer keyboard, or use the Undo-/Redo-Function.

If an area is to be copied, select the copying command from the right-click menu. The mouse cursor must be within the marked area otherwise it is not possible to copy the selected area.
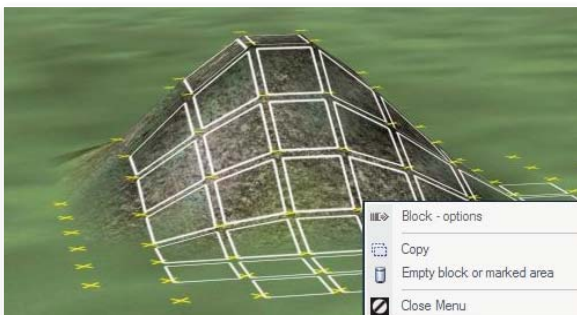
Copying is possible with a right click on the highlighted area.

With the marked area copied, you can move the mouse cursor in any direction, and an impression of the copied section of landscape will be on display directly under the mouse cursor. The – initially empty – shell of the landscape can be moved to another position whilst pressing the left mouse button and inserting the copied fragment immediately. If the copied fragment of the landscape surface is not yet released, you can perform other operations on the right-click menu, such as rotating the copied area to the left or to the right by 90°, or changing the scale (increasing or decreasing) in 25% increments. This procedure when copying the landscape is recommended mainly when the copied sector to be inserted is in the immediate vicinity.

Railroad X

For longer distances, and of course for the reuse of the copied area in other layouts, it is recommended to store the copied area as a block.

Save the copied area as a landscape surface block (*.bl1).
As long as the patterned segment of the surface is not inserted, it can be stored as a block for reuse. To do this, move the mouse cursor to the task bar and select the File menu, select *Save Block,* and then the dialog window to save the block file is opened. Of course you can also use the icon buttons within the block section.
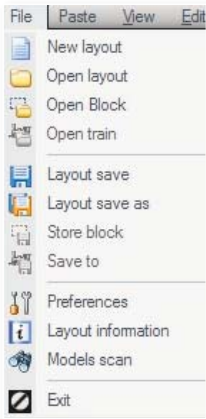
The landscape surface blocks with the file extension "*. bl1" default "resources / assets" are stored within the sub-folder and recalled from there.
The block files can also be stored in any other location on the hard disk. Of course, you can open any of these saved blocks via the File menu or the relevant button. This function will not work if a previously copied area is still in memory. If this is the case, go through the right-click menu to the command Empty block or marked area.

Copy and store of landscape blocks from the File menu

Important to know:
A newly loaded block or the copied and pasted area of landscape surface automatically adjusts to the terrain height, even if the object option adapt to ground height is not active!

TIP
The content of a block depends on the grid densities of the layout and is – as far as it is possible – automatically adjusted. If your layouts use very different grid densities, i.e. 150 grids per km in one layout and 500 grids per km in another layout, it may still be necessary to scale the invited (not sure if ‚invited' is the best word to use here!) block. From the menu of the right mouse button, the dimensions of the loaded block can be scaled double or half the output size, where you consecutively reduce or increase this multiple times by 25 %. You can achieve very good results when copying and pasting the landscape surface blocks when the layouts have approximately the same, or at best identical grid densities.

41

4.4 Environmental and weather conditions

The natural appearance of a landscape is never constant and it changes together with the varying lighting and weather conditions, time of day and seasons. These factors should therefore be taken into consideration with your on-screen railway landscape. The global settings for light and weather conditions are specified in the View dialog that you can open by clicking the button in the toolbar.
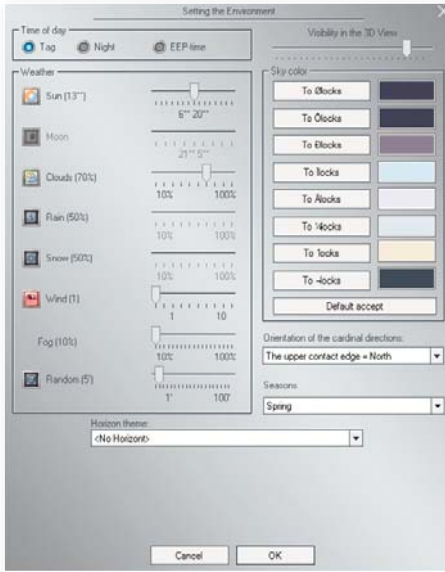
In the **View dialog**, first select day or night or EEP time. If you choose EEP time, the changeover from day to night occurs as specified by the system time that you can configure and speed up using the Time properties menu option in the Extras menu. You can also use the scrollbar to regulate the intensity of the rain, snow, sun, moon and wind. If you want the weather to change randomly, you must activate the relevant option.

Here you determine the environment settings

No two clouds are alike, so the **clouds option** in the View dialog can now be differentiated, selected and used: If the option is not turned on, the sky is cloudless. If the option is activated by a mouse click and a check mark, this results in a light cloud cover. A second click on the check box has a reinforcing effect – the clouds will be denser and the scenery darker. Even with the sun, activation with a second click has a reinforcing effectof the sun never being completely obscured, even in heavy cloud cover.

A cloudy day at the lake

In the dialog box for the environment settings is another slider for the fog. Unlike the distant haze, which is designed for laminating the transition to the horizon and is derived mathematically from a power function, it is the fog that is a "linear" phenomenon. The fog can be set globally for the entire system or individual. Weather zones
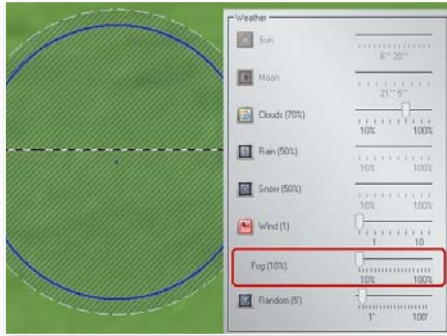
with very specific fog banks can be realised. What could previously only be realised through sight, can now be realised through the local fog-regardless of the actual visibility, which can also be set individually in the weather zones.

Slider for the fog in a weather zone

Please note: Logically it will only rain if there are clouds and the relevant setting has been activated. At a rain intensity of more than 50 %, thunder and lightning can occur in your railway landscape. The higher the intensity of the rain, the more often you will see lightning and hear thunder!

TIP **The weather option of snow was extended to the sleet variant. If you want to use this weather variant, you must click on the snow option a second time. Then the grey check box appears and the snowflakes are converted into sleet.**

Irrespective of the weather, you can define your own sky colour for the individual times of day and night. For example, to specify the colouring of the sky at daybreak or nightfall you simply need to click the button for the relevant time and select the desired colour from the colour palette which appears. The graduation of colours in the sky allows your layout to appear in different lights over the course of time – both with manual changes in time and the automatic flow of EEP time. The settings are saved with the layout data so that the individual character of each layout is emphasised through the interplay of light and colour. One click on the Accept default button sets the colour of the sky set in Railroad X as standard.

In addition to the time of day and the light and weather conditions, it is also possible to set the clipline in the 3D view and choose a horizon as a background.

Clicking on the new option *Seasons* opens a list in which you can define a season. The setting you make here, however, does not affect the landscape in general, but only the day or night, dawn and the sun, which varies with the change of seasons. With the orientation of the main cardinal points, the supposed solar and lunar orbit can be rotated by 90°, 180° and 270°. The orientation of the system remains unchanged.

Creating local weather zones:
The light and weather condition settings apply globally to the whole layout for which they have been defined and saved. However, irrespective of these, you can also create different weather zones within one and the same layout. You can therefore cause the weather conditions – depending on local settings – to change as the camera and

the observer (you that is) pass through the different weather zones. The zones defined by each of the weather settings are drawn up in the 2D view by clicking on the button in the Relief and Texture Editor:

Setting up weather zones in the plan

• Click the button which activates the working mode for setting up local weather zones.
• Use the mouse cursor – now in the shape of a cloud – to switch to the layout plan and hold down the mouse button to define the different weather zones. Draw the weather zones – which appear as blue circles and can be scaled and moved as required – so that the transition areas between the weather zones are gentle and not abrupt.
• Click on the weather zones you want to remove with the left mouse button while pressing the [DEL] key.

Even though weather zones appear as circles in the 2D window, they are really 3D spheres whose centres are defined by X, Y and Z (for the height) co-ordinates. If you place a weather zone in a mountain landscape, you must bear in mind the height of the centre of the individual weather zone as this can only be adjusted to the height of the terrain the first time. If a weather zone is moved, the height of the centre of the terrain must be adjusted manually.

CAUTION

When moving a camera in one or more weather zones, the maximum values for the respective weather conditions are already effective when 50% of the diameter of the weather zone is reached. This means that the weather changes abruptly when a new camera is positioned in the centre of a weather zone.
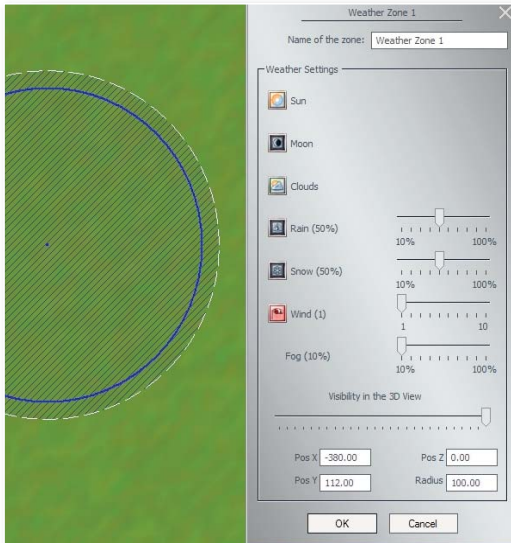
The weather conditions in the local weather zones are defined in the respective configuration menus that appear when you right-click the relevant circle in the Plan window. This lets you set the intensity of rain, snow and wind and the clipline for each weather zone in the 3D view, and specify whether the sun, moon, stars and clouds should appear. As the settings also include the clipline and wind strength, it is also possible to create banks of fog in narrow valleys or gusts of wind on open country, depending on the terrain.

Settings in the respective Weather Zone

4.5 Inserting landscape elements and structures

Once you have modelled the relief and the surface of the layout, the detailed work begins. It is now time to populate the still empty landscape, to plant trees and construct houses. Both landscape elements and structures are available and each has their own editor containing a great choice of models.

Positioning landscape elements:
In contrast to the editors for relief and texture modelling, the Landscape Elements Editor does not have a tool kit but instead provides large catalogues sub-divided by category and class. Be it flora, fauna or sounds, you can find more or less everything you might need to bring your railway landscape to life.

- Open the *Landscape Elements Editor* in the 2D view and then open the catalogue of the same name.
- Select a category and a class, look through the models which are now listed in the dropdown field below and make your selection using the preview function.
- Use the mouse cursor to switch to the 2D Plan window in order to insert the selected object by simply clicking the mouse.
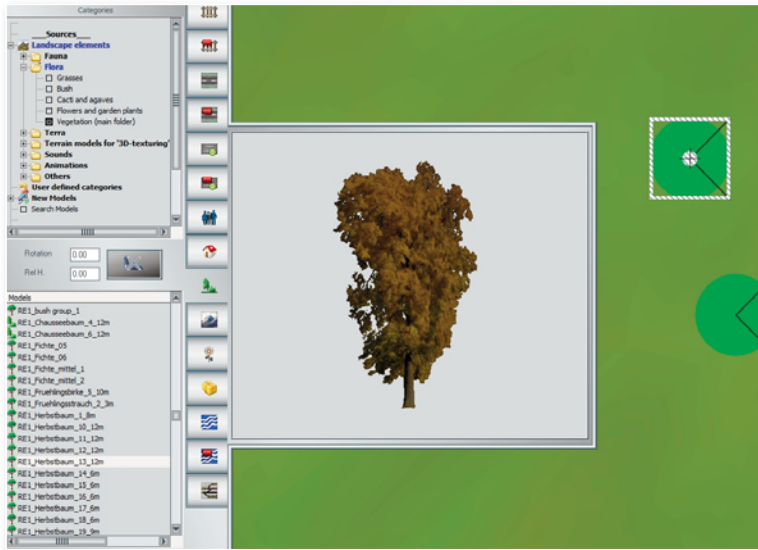
Placing of land-scape elements in the plan windows

Selected models are usually shown in the preview window in animated 3D. If you want to stop the automatic rotation, click on the 3D area in the preview window and press [Insert]. In this status the preview object can be brought into the desired position by holding down the right mouse button. Similarly, the distance in the model preview can be set by using the mouse wheel by rotating it forward or backward. To turn auto-rotate back on, press the [Insert] key again.
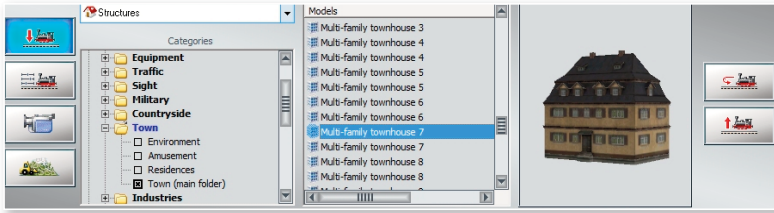
Control dialog for insertion of structures in the 3D window

The process is the same no matter whether you are inserting a clump of grass or a cow into the landscape. Sounds can be inserted in the 2D Plan window in the same way as flora and fauna, which although not visible in the 3D view, can be heard, provided your computer has a sound card fitted.

To make the scenes as natural as possible and alive, there is a special model *"leaf fall (in the action radius of 50m)"* that is offered, which simulates flying leaves. The model that is presented in the preview as a cube, but occurs as leaf fall in the layout, can be placed both in 2D and in 3D mode. A simulation of falling leaves is produced in an imaginary cylinder which is 20m high and has a radius of 50m. Within this range, which appears in the plan windows in the form of a shaded green circle, falling leaves will appear at irregular intervals, whereby the direction, amount and rate of fall depends on the wind strength. Of course you can see the leaf fall only when the camera is in the 50m wide range of action of the model.

Positioning the object with the mouse does not require great precision. As long as a model is selected, it is possible to put it in the desired position not just in the 2D design mode, but also "live" in the radar window of the 3D view. Have a go yourself:
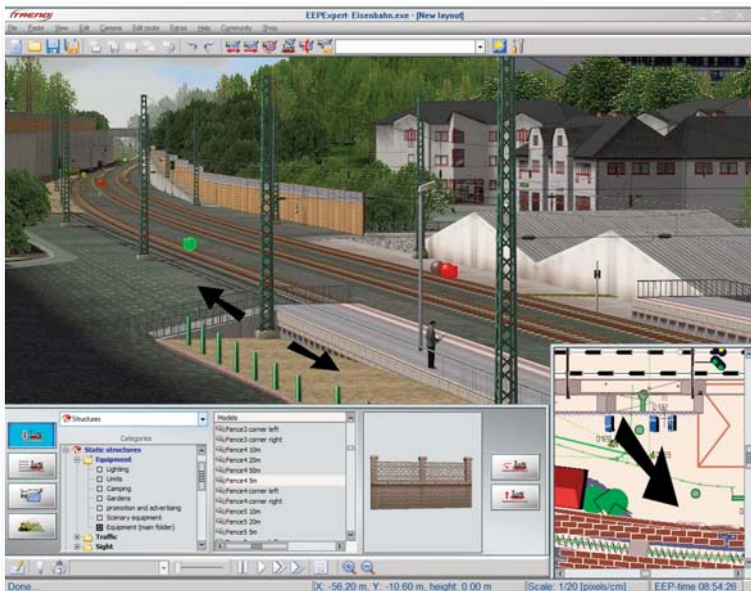
Structures can be adjusted precisely both in the 3D view and the radar window

Railroad X

- Switch to the 3D view, and in the Radar window select the model that you want to place.
- Hold down the left mouse button and move the selected model in the Radar window and at the same time in the 3D view follow how the movement of the mouse changes the position of the model in the landscape. If the mouse cursor is located in the centre of the object (cross cursor), the model may be rotated; if it is moved to the periphery (four arrow cursor), the object can be moved in any direction. Please note that it is only possible to move objects in the Radar window along the X/Y axes. If it is necessary to alter the height, this can only be changed in the 3D-view window.
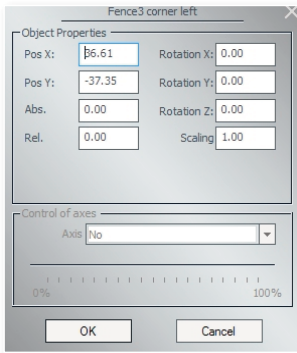
In the design mode of the 2D view, you can rotate and position selected models – the simplest way is to use the mouse but if you want greater precision, use the configuration menu, which you can open by right-clicking the selected object to determine the exact position, rotation and possibly also the scaling by entering the relevant parameters.

Dialogue for positioning of objects in the 2D view
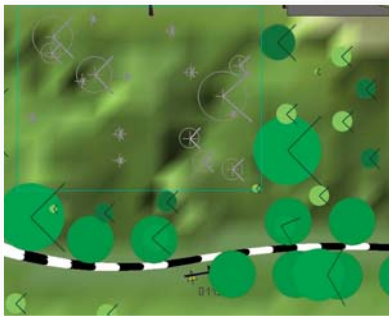
Inserting blocks:
Of course, you do not need to position each clump of grass and each tree individually in order to add vegetation to your layout. Use the block function to save your work. For example, it is easier to plant a forest by adding blocks of trees instead of individually, because blocks are treated as objects and are saved just like all other objects so that they can be copied and inserted again.

The process is simple:
- In the 2D Plan window, position and arrange the bushes and trees in your forest so that they can be grouped together.
- In the toolbar, choose the tool for selecting blocks and use the left-mouse button to draw a selection box around the entire group.
- Release the mouse button. The objects within the selected frame will now be treated as a single block which you may move, copy and insert in another place.
- Now use the relevant command in the Insert menu to use the block tool to join several blocks together to form a larger block. This will now be surrounded by a bright red, dotted frame.
- Next, right-click the new highlighted block to define the block settings such as maximum number, distance, scaling and rotation in the following dialog.

Please note: This block function is not limited to landscape elements, it may also be useful for constructing tracks, among other things: In the Block settings dialog that you can open byright-clicking the selected block, you can electrify blocks of track and adjust the track connections. It is only possible to save elements of one layer as a block, i.e., only landscape elements or only constructions.

In the Expert-Edition of Railroad X the block function is expanded to include the so-called lasso function. To activate the free choice of the block on the Lasso tool, click in the tool bar, click the button for the block selection, and press the [SHIFT] key while you surround the block objects with a closed geometric figure.
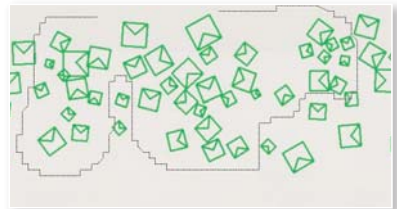
Inserting structures:

As with nature and landscape elements, you can also add architectural objects to your layout, which you can find in the Constructions editor. The Constructions catalogue is more diverse but otherwise it is structured in exactly the same way as the cataloguein the Landscape Editor.

In Railroad X there are clocks with individual hands and fluid movement of the second hand (even with persistent minutes jump – the translation for this needs to be rechecked as it currently does not make much sense or sound colloquial). These watches can be found in the catalog of the Constructions editor in the traffic folder. The rigid mechanism of a computer timer that only allows a second cycle, has been replaced by an algorithm which converts the current

frame rate in relation to the elapsed time thus providing smooth movement of the second hand and the so-called minutes jump.Please re-check the last part of this sentence – not sure what exact meaning is to be conveyed!

You will find not only buildings in the folders of the Constructions editor, but also components, signs, goods and equipment for loading objects of all kinds. The model selection and placement in the layout is the same as with the landscape elements. Whether landscape elements or structures,the placement as well as the processing in construction mode is simple, clear and precise, but only shows the objects in the abstract plan or drawing view. Therefore, the advanced 3D Editor provides much better options.

WARNING

Models that you additionally acquire, are automatically installed in the category *New Models / added recently.* By using the file command *Scan models* they are sorted into the respective folders provided.

Insert and edit landscape objects and structures with the 3D object editor
The new 3D editor is selected by clicking on the button shown in the control dialog. The flashing indication in the 3D window indicates that the 3D editing mode is active. Since it is not only possible to edit already placed objects but also to insert and edit new objects, the control dialog automatically shows the selection lists of the individual editors. This allows you to place and preview your objects in the 3D view.
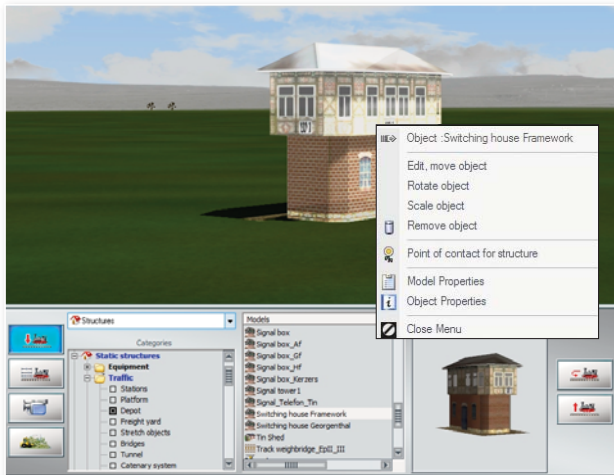
Insertion and the properties dialog in the 3D-view

The functions for editing objects in 3D mode – as in the 2D mode – are accessed via the context or Object menu, which you can open as usual by right-clicking on the selected object. With this menu command, you can now move your model in the 3D-view in each possible direction, scale, and rotate or even delete it. If you want to set the object position, select the Object menu, select *Model Properties* in the following dialog and set the input values that define both the position as well as the rotation and scaling. However, if you twist or turn a selected object for editing, it will adapt automatically to the surface and the level of the landscape. Occasionally it can certainly be useful to correct the respective height or depth. To do this, hold down the left mouse button and press the [Ctrl] key at the same time and drag the selected object either up or down.

Illuminating structures:

An "illuminating" example of the special properties of structures is the lighting function that ensures that lights do not go out when your layout reaches night time. As with the landscape elements, the structures also have a configuration menu which you can open with a right-mouse click on the selected object in the 2D Plan window. Use this to enter not just the parameters for determining the position, but also those used to switch and manage light and smoke. If you select the Light On option, it becomes light, and if you choose Light Off it remains dark. The same happens with smoke. If you activate the Smoke On option, smoke will come out of the stack, provided the property has a chimney.
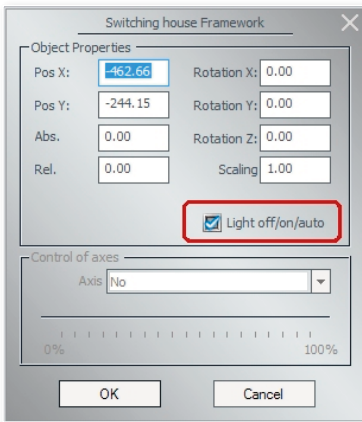
The lighting function is extended by the ability to automatically randomly switch lights on and off in structures. The automatic switch which repeats at regular intervals of between 30 and 60 seconds is managed by an internal random generator that – as with manual lighting – has to be separately activated in the configuration menu for each property. Switch the random generator on by clicking several times on the Light on/off/auto option. The automatic switching of lights starts when the tick is no longer black but instead appears grey.

For the light setting there are three states: off, on, automatic

Fires in structures:

More spectacular than the random automation of lighting effects is the outbreak of fire which you can switch on manually or automatically using a contact. This function, which you could admire for the first time in the Knuffingen model railway layout, is now only available in the respective functional models which have been designed with this in mind and which can be selected and positioned using the Structure Editor.

Bildlegende!!!!!!!

If the fire is to be triggered in one of these buildings automatically, select the structure in the 2D Plan window where you can right-click to open the Configuration menu and activate the Fire On/Off option. When this option is activated, a few seconds pass before the building catches fire. Clearing this option extinguishes the fire just as quickly.

To simulate a complex fire service deployment, it is possible to control the fire automatically using several contacts. In contrast to manual control, automatic control using contact points is performed using the Signal Control editor so that you have to switch from the Structure Editor to Signal Control. Select the Structure contact in the contact list, then switch to the 2D Plan window and use the mouse to position the number of contacts for the automatic control of the event along the traffic route you want.
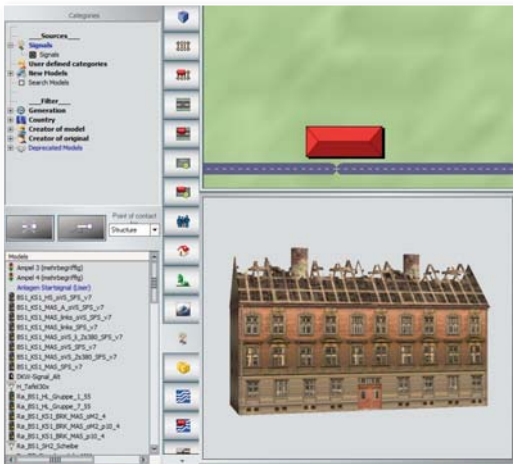
Contact points for structures are also set in the Signal Editor

Once the contacts for controlling the event flow have been placed, right-click the points in turn to open the Configuration menu of the respective contacts. Here, select the rolling stock that will trigger the fire and specify the intensity of the fire and smoke and any other settings relating to individual axes, the direction of travel and the route.
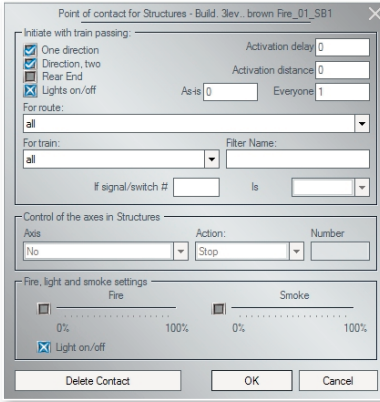
The more contact points you add, the more fire-fighting vehicles you can add so that different parts of the fire can be fought at different times. The fire is finally extinguished in the same way as it was triggered, i.e. by another contact, only that this time the intensity of the fire in the configuration menu must be set to zero. Of course, large fires must be extinguished using vehicles with water and water cannons. We have not gone into full detail here because this topic is discussed in depth together with signal controlling in a section of its own.

Right-click on the contact point, open the Preferences dialog

Structures with moving axes:
Architectural objects with additional functionalities include structures with moving parts such as cranes, wind turbines or mills, just to name a few examples. The corresponding objects can be selected in the Structure Editor in the 2D view and then set in motion in the 3D view. Both the type and the intensity of the movement can be controlled using the mouse and the keyboard.

The combinations are as follows
• first left-click   = a short movement or a movement to the next set angle (turntable)
• second left click   = stop
• left click + [SHIFT]   = continuous movement until the possible end
• left click + [SHIFT]   = reverses the continuous movement until the possible end
• right click + [SHIFT] = acceleration
• right click + [SHIFT] = reduction in speed of the movement
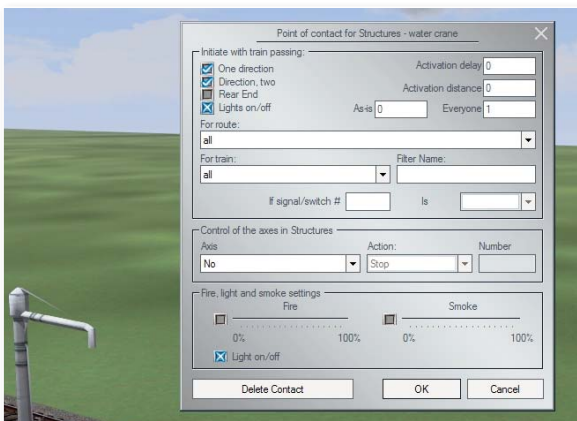
Right-click on the contact point in the 3D view via the menu to the object properties

Once set in motion, the movement triggered in this way continues, even if the layout is closed and opened again later. All moving parts in interactive structures can be controlled using contacts embedded in traffic routes to switch on/off the movement of the respective axes, or to move the axes to a position specified by the user in advance. An approaching train can therefore be used to automatically open and close a shed door for a locomotive. Accordingly, the position of the turntable can be controlled so that it automatically adjusts to the position of the locomotive. Moving parts in other constructions such as the loading facilities of coal hoppers or the filling pipe of a water crane can also be controlled automatically using contacts.

As with structural fires, the moving axes can be controlled automatically using Signal Controlling. To position the contacts on the desired traffic routes in the layout plan, the contacts for constructions must be active in the Signal Controlling editor and the relevant property selected in the layout plan. Once all the contacts have been inserted, open the Configuration menu of the respective contact in the standard manner to configure the vehicle, the respective axes and their movements for each individual contact via the Action drop-down menu.

4.6. Constructing transport networks

The core of a model railway layout is the traffic system. Everything else a layout has to offer and display is allocated and subordinate to the traffic system. Constructing a functioning transport network with different routes is the main task and should now be taken in hand and mastered. The Transport Network Editors will be selected in 2D-view from the vertical menu bar.

Railway Editor: This part of the Network Editor allows you to insert railway tracks into your layout.
Road Editor: This Editor provides you with various styles of rural and urban roads.
Light Railway/Underground Editor: This Editor contains special track styles, e.g., for trams; it also contains a lateral conductor rail (e.g. for urban railways in Berlin or Hamburg) or even a monorail and a cable for a cable car.
Aerial/Nautical/Wired Networks Editor: This Editor is mainly designed for dealing with track styles which are invisible in the 3D view and is used to construct traffic lines for air and sea travel. It is also used for traffic not connected to roads (i.e., agricultural vehicles and machines). It therefore also contains the "track" style Telegraph Line which you can use to construct a basic overland line. The transport networks in an EEP layout are essentially based on flexible segments which can be laid freely, engaged and disengaged, formed and combined within your editor – this apples to all four of the editors discussed here. The individual Editors do not differ much in terms of functionality and structure. It does not matter whether you are laying rails or roads, the process is always the same. Since everything in a model railway layout revolves around the railway, we shall limit ourselves to constructing a route using the Light Railway/Underground Editor as an example.

Please note:
Only one Editor may be active at any one time. The strict separation and subdivision of the transport networks into four Editors simplifies the overview and prevents unintended operation errors.

4.6.1 Laying tracks

Before starting to construct a track system, you should familiarise yourself with the functions and tools in the Light Railway/Underground Editor.
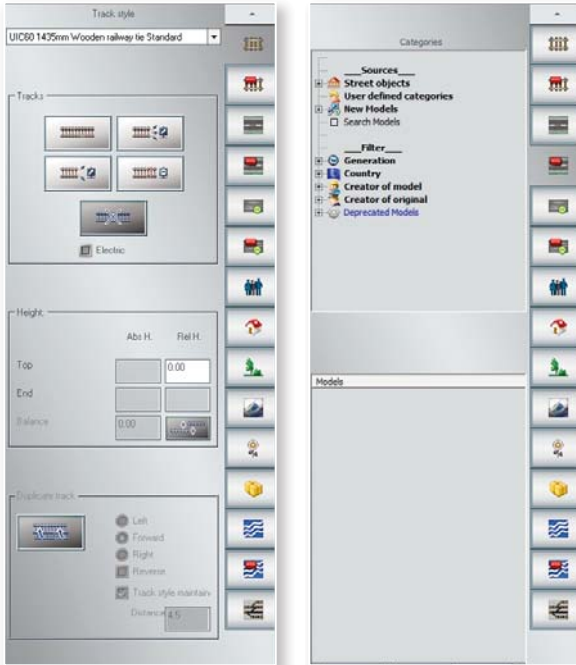
The tool dialogs to the track editor

The tool kit in the Light Railway/Underground Editor contains the following:
• Drop-down menu for track styles
• Buttons for laying and deleting track sections and switch mechanisms
• Input box for entering the track height and Alignment tool for adpating the landscape relief to the track height
• Button for opening selection catalogue for network entities that accompany tracks

The second tool dialog contains a selection catalog for track accompanying objects.

To set up a track system, first select the track style which matches your task from the dropdown menu. A dark or light track, just sleepers, various tunnels, light railway, narrow gauge or Transrapid. Once you have made your choice, the real work begins:
• In the Editor box, click the button to activate the Lay Track function.
• Use the mouse to switch to the layout plan and position the first track section by clicking with the mouse.

Your first track section can be inserted simply and quickly. The thin red arrow which extends beyond the end of the track section indicates the direction for further track connections. The green triangle (start) and green dot (end) at

the respective ends of the track section clearly indicate the orientation of the track section. Understanding the orientation of the track section where a contact is to be placed is very important later on when the contact is being configured. These green marks will appear again when the section is selected for editing.

Editing tracks:
If a track section is selected, it can be edited just like any other object. Depending on the shape of the mouse cursor, you can now move, rotate, bend, compress or stretch the track – either intuitively using the mouse or precisely in the Configuration menu.
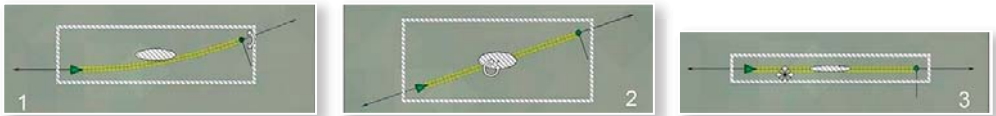
Bildlegende !!!!!!!!!!!

Right-click the selected track to determine the exact position of the track section. This opens the Configuration menu where you can specify the following track parameters:
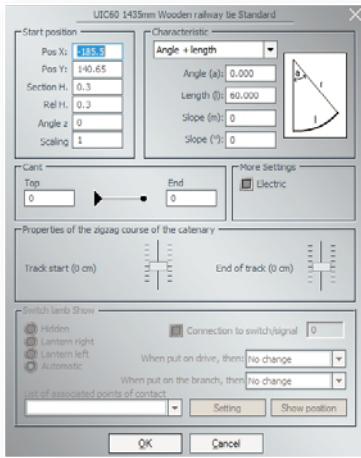
Right-click on a selected track to open the Properties dialog for precise entries

• The **Start Position** is determined by the initial co-ordinates, the absolute and relative height, and the angle at which the track is positioned in the layout.

• The **Characteristics area** specifies the camber of the track and depends on the angle and length of the track. You can either enter the angle and track length, or alternatively the angle and radius of the curve, or the length and the radius of the curve. In this same area you can also enter the incline in percent or in metres.

• Finally, Track **Superelevation** defines the elevation of the external rails and fall of the internalrails in a curve. In contrast to straight routes where both rails of a track lie at the same height, the outer rail of a curve is raised above the inner rail in order to counteract the centrifugal force. The value entered for the superelevation is given in millimetres.

Connecting tracks: What comes next? Just as you laid the first track section, carry on by connecting one track section to the next. They latch into place automatically and also automatically adjust their orientation as soon as the start of another track (green triangle) approaches the end of a track. If the previous track section now appears in blue, the last track section to be docked has been connected correctly.

TIP Laying tracks and other routes can be done more easily in the new 3D edit mode.

CAUTION

The first and last track sections in a "route" will always be coloured yellow, even when they have been connected correctly to the rest of the route! When at least three track sections have been docked to one another, the central section will become blue to indicate that the connections are good.

Parallel and subsequent tracks can be laid more quickly if you use the function for copying tracks:

- You can specify the direction in the *Copy Track box.* For subsequent tracks, select the Forward option, for parallel tracks, Left or Right.
- Select the *Reverse* option if you want to insert the subsequent track – in contrast to the original laying direction – at the beginning (green triangle) of the first track rather than at the end.
- Click the button to perform the action.

The vertical bending of infrastructure modules

The bending of infrastructure modules (railroads, roads, waterways) can be done by calling the dialog box of the properties of a track module, which is called in both cases with a right click of the mouse button, both in the 2D plan window as well as in the 3D editor. In order to achieve a bend of a track module, which is expressed in degrees, the appropriate calculation method initially be selected in the characteristic field, ie: angle + length + bend. Can then be entered in the "bend (z):" An angle can be entered, which is between 0 ° and 90°, and the takeover of the parameters is confirmed with the "OK" button.
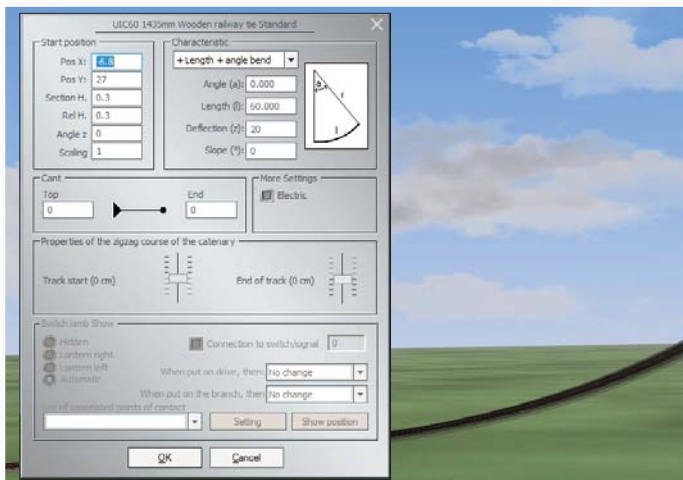
The vertical deflection of a track in the 3D-editor of track modules (Splines)

Granted, it is regarded more as a curiosity rather than "the usual construction". At this point it must be mentioned, however, that built by the skilful combination of vertical and horizontal deflection, and the skilful use of exaggeration, quite breathtaking routes may be, which can be measured by any known to us rollercoaster...
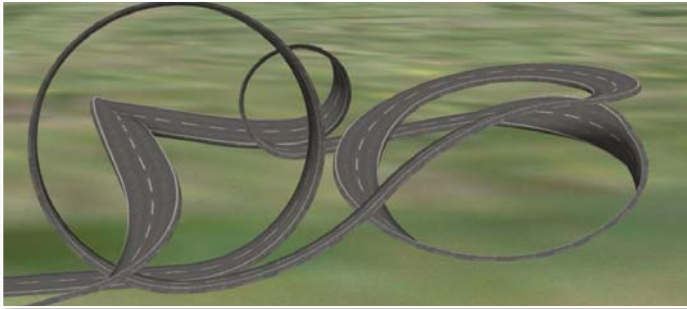
Bildunterschrift!!!!!!!

In Railroad X automatic closing of track gaps is possible. Was the combination of converging track segments often used to accomplish different angles and unequal height with a lot of patience and tact, as gaps can now be closed automatically:

*   First, activate the *2D Track Editor* and select the Edit menu and choose the *gap track command.* Then the free, not connected tracks will be provided with an additional marker.
*   Now click the highlighted ends of the track segments to be joined, and Railroad X already adds the missing pieces of track and closes the gap.

This only works if the tracks are laid so that a connection is possible and plausible. If the distance of the track strands or there is a bend of about 90°, an automatic closure of the rail gap is excluded. Possible differences in height, however, can be considered and balanced.

The *virtual connection of tracks* is also possible. Therewith track lines can also be connected, which are far away from each other and thus no longer in sight. In this way, the tracks can be connected at the beginning and at the end of a layout, without a "real" track having to be installed:

*   From the *Edit menu,* select *virtual connection of tracks.* Then all track lines which are not connected are provided with an additional marker.
*   Now click on the highlighted ends of the track segments to be joined in sequence. Thus, the tracks are automatically connected to each other and now no longer appear in yellow, but in blue.

The effect: The trains that arrive at the end point, thus automatically are back at pre-defined starting point.

Electrifying track sections:
Electric trains have been on the scene for about a century and Railroad X model railways is by no means limited to trains run on steam or diesel. If you activate the Electrify option in the somewhat unimposing box, any of the track you lay will automatically be given a catenary.

If you want to subsequently electrify a track section which has already been laid, you can activate the respective option in the track section Configuration menu, which you can open as usual by right-clicking the selected track.

An electrified track section is indicated in the layout plan by a line running down the centre which represents the catenary, as well as white circles which indicate the possible positions of the masts.

The electrification function may also be used to lay a telegraph or overland line. However, this requires the Invisible Nautical, Aerial and Wired Networks Editor, rather than the Railway Editor.

Power lines can be found in the Waterways Editor
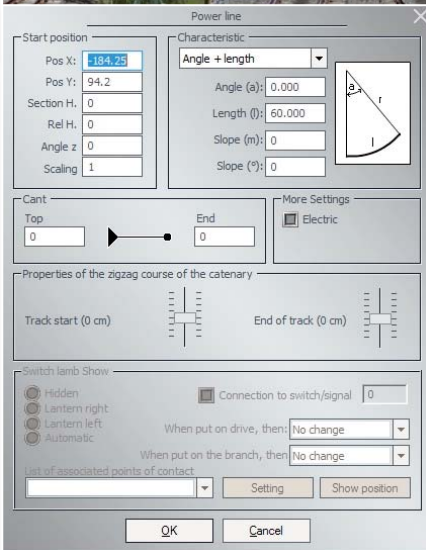
If this is switched on, select the telegraph line track style and activate the Electrify option. Only once this option has been activated will the normally invisible telegraph line "track" style of the catenary become visible. If this is switched on, select the telegraph line track style and activate the Electrify option. Only once this option has been activated will the normally invisible telegraph line "track" style of the catenary become visible. Catenaries on electrified sections can now be laid extremely quickly and easily in a zig-zag manner. In such a layout, the overhead line runs alongside the track axis rather than along its centre, which prevents wear along one side of the pantograph. The distance between the overhead line and the start and end of the track can now be specified easily yet precisely using the new scroll bar in the respective Track Property dialog in the Railway editor. Suitable masts can be found in the Structure editor of the **Structures\Traffic\ Overhead lines folder.**

Inserting SPLines:

The erection of catenary masts along an electrified route is relatively quick and easy to achieve using the SPLine function. Use this function to position and dock several catenary masts at equal distances along a route in a single action. You need not align any of the objects placed on the SPLine curve to the height of the layout surface, although you can adjust the height of the track. This makes it much easier to add catenary masts to tracks which do not lie evenly on the layout surface. You can adjust the track height by deactivating the **Align Object to map altitude** option in the Insert menu.

How does this work? Have a go yourself:

- In the Extras menu select the SPLine settings menu item.
- In the following Properties dialog, select the check boxes **Place Objects at Points Only** and **Relative Angle to SPLine Direction.**
- Now activate the SPLine function by clicking the SPLine tool in the Control Panel. This causes a SPLine line to appear in the Plan window.
- Move the mouse cursor right over the top of the track along which you want to place the masts.
- Press the right [SHIFT] key and click with the mouse. And that's it.
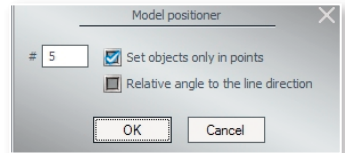
What happens? In the blink of an eye, the SPLine line appears on the targeted track and assumes the exact same course. Now you just need to select a suitable mast from the Structure Editor. The rest occurs automatically: Just as you laid the mast in the layout plan by clicking the mouse, the masts are distributed evenly and accurately along the track. Not only individual tracks, but entire track sections can receive catenary masts in this way. To extend the SPLine engaging function to several tracks, hold down the right [CTRL] key along with the right [SHIFT] key. While you have both keys held down, you can select one track after another for connecting to the structures.

Naturally, the SPLine function can be used manually or automatically. If you want to distribute the objects along a SPLine curve yourself, deactivate the Place Objects at Points Only option in the SPLine Properties dialog in order to specify yourself the number of objects which should be positioned at the same time. The objects are now placed along the curve at points specified by you rather than automatically.

Bildunterschrift!!!!!

The Angle *Relative to SPLine* Direction option should always be on when catenary masts, lamps and similar objects are distributed. If this option is deactivated, all the inserted objects point in the same direction; if it is activated, on the other hand, the angle of the objects follows the course of the SPLine curve.

Once the SPLine settings have been set, activate the SPLine function by clicking the SPLine tool in the Control Panel. The SPLine curve which appears will initially be a straight line with round and square markings. The squares indicate the positions where the objects will be inserted. If the *Place Objects at Points Only* option is activated, the square and round markings are identical in number and position; if it is switched off, the squares will be distributed evenly along the line according to the setting.

The position and shape of the SPLine line can be altered by clicking the round markings and dragging them to the desired position using the mouse. If you click on the curve and hold down the [CTRL] key at the same time, you can insert a new point as required and remove existing points. The more points there are on a curve, the more easily you will be able to achieve the desired shape. If the position of the squares corresponds to the desired position, you can select the object and insert it as usual with a click of the mouse. If objects are facing in the wrong direction, you can correct the orientation manually by double clicking on the objects in turn to rotate them.

Adding switches:
A route network with junctions requires switches, which can be designed and positioned using the prefabricated structural components in the Railway Editor:
- First select a track style to match your construction project. Click one of the two buttons, then select the switch mechanism for a double or a triple switch.
- Use the mouse to switch to the 2D plan window and position the first switch mechanism by clicking with the mouse on the existing track end.
- The switch mechanism, identified by a bar with a black square, is then put in position.
- In the Railway Editor, click the button to place and connect the initial legs of a track switch in the 2D Plan window. Once the first leg of the switch has been engaged, connect the second (and third if required) leg of the track switch in the same way. Since the second leg of the track switch usually has to be curved, first lay this track section next to the construction site.
- Then open the Configuration menu for this track section and under Characteristics select the details you want to work on. It will almost certainly be the third option of Length + Curve Radius.
- Enter the values you want, confirm them using OK and dock the curved section to the switch mechanism.

Once all the legs of the switch have been connected, a green arrow appears next to the switch mechanism in the 2D plan window, along with a four-digit number. The green arrow represents the switch lamp in the 2D plan and radar windows, which indicates the actual position of the switch and therefore the direction of travel. The switch lamp can be seen at this point in the 3D view and likewise indicates the direction of travel. In the 3D view, switches, like signals, may only be positioned on the intuitive surface of the model using the combination of the [SHIFT] key and the left mouse button. You can tell if the cursor is on the intuitive surface because the arrow cursor becomes a white hand.
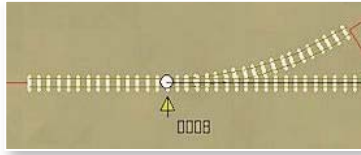
Weiche im 2D-Plan

Weiche im 3D-Fenster
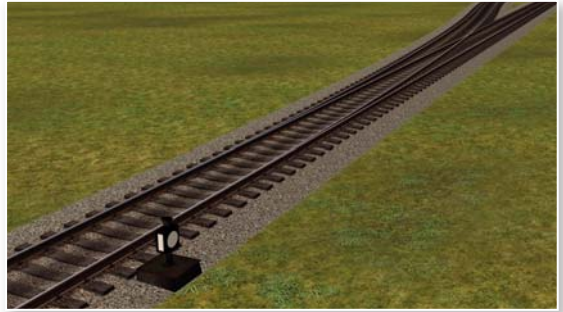
In order to specify the position of the switch lamp as required, which must be determined for every switch, switch back to the 2D view and right-click with the mouse on the switch mechanism of the Configuration menu of the respective switch. Use this to specify whether the switch lamp should be placed to the right or the left of the track and whether it should be invisible. If you select the Automatic option, the program places the switch lamps. The position of the lamps to the left or the right of the track is based on the order in which the legs of a track switch have been laid and on their angles. If you activate the *Connection to switch/Signal* option, you can create a logical connection to another switch or a signal to which you assign an ID. If you double-click on this option, you cause the logical connection to occur proportionally in reverse (this is indicated by a grey tick instead of a black one).

Switch settings in the track settings dialog

CAUTION

If you select the Hidden option, e.g., when displaying a modern track system with electric switch mechanisms, you will not be able to see any control elements in the 3D view. This means that the switch can only be set manually in the Plan and Radar windows. Of course you can also change the switch automatically using one or more contacts.

Using track combinations:

Designing each switch individually naturally takes a lot of time. You can save yourself this effort by resorting to the supplied track combinations, which you can select in the *Edit* menu and insert by clicking once with the mouse in the layout. The selection includes freely adjustable combinations of the following types:

• Junctions   • Scissors crossovers
• Parallel connections   • Track harps
• Curves   • S-Tracks

Standard combinations of junctions, double crossing switches, scissors crossovers and parallel connections are also available but these cannot be altered. The way in which these track combinations can be used is best illustrated using a junction as an example:

• Select the **Track Combination** option in the **Edit** menu and in the associated sub-menu select the Junction type. This opens the Configuration menu for the junction.
• Use this to specify the angle and radius of the junction and its distance from the parallel track.
• Next, enter the direction of the curved leg of the track switch and click OK to apply the changes to the entire junction.
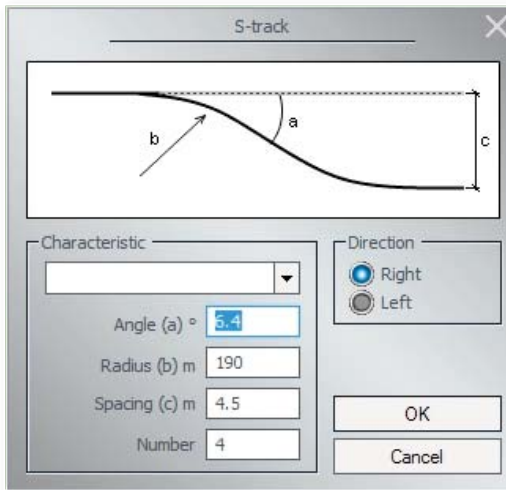
If you select a standard combination, the dialog appears immediately. However, you must consider that these parameters are not configurable, since the standard combinations are set automatically when selected.

Dialogue for the junction, called via the menu item Edit under track combination

Track combinations which you have accepted by clicking OK appear in the layout plan as a block which, provided it is selected, you can rotate or move. Double-clicking outside the marked area places the track combination in the right place.

If you want to connect a junction or another track combination to a track which has already been laid, you can easily dock and snap these into place:

• With the mouse button and left [SHIFT] key held down, drag the selected block with the track combination towards the previously laid track. As soon as the beginning of the block of track to be connected approaches the previously laid track, the block docks automatically.
• Now click twice with the left mouse button outside of the selected area in order to seamlessly dock the track combination onto the existing track.

Double crossing switches:
Special treatment is given to the double crossing switch track combination (abbreviated to DCT). Even though it is treated as a one-piece network object inserted into the track image of the layout, you can configure a DCT in the same way as any other switch, both manually and automatically using contacts.

As in a real model, in Railroad X the DCT also have special DCT lamps that indicate the active switch position. The DCT lamp positions can be controlled in the 3D, Plan and Radar windows. Clicking once on the DCT lamp with the left mouse button in the 3D window while holding down the [SHIFT] key, or on the corresponding symbol in the Plan window, moves the DCT to one of the other four possible positions. The image demonstrates how the DCT signals appear in the 3D and Plan windows and how the DCT switches can be configured in the dialog using contacts. Ten DCTs are supplied with Railroad X. You can find these by clicking the button in the Light Railway/Underground Editor and selecting a network object from the Others list. The number keys in the name of the DCTs indicate the track geometry, i.e., the radius, the gradient which is given as a ratio, and (in parentheses) the distance from the parallel track to which the DCT will be added.
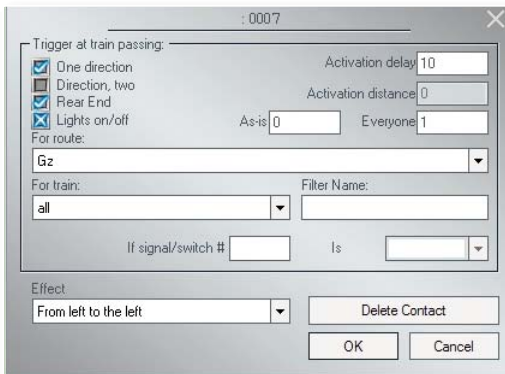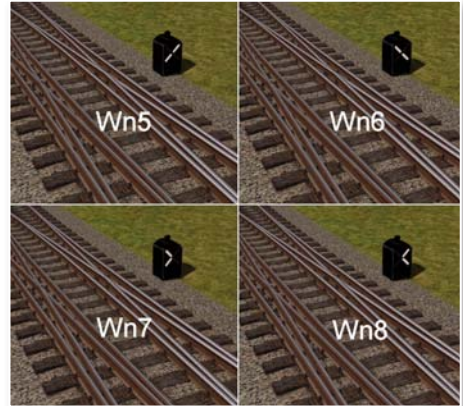
Dialogue to the contact point for the double crossing switch

DCT track geometry:
The radius: Even in the days of the regional railways, the radius also determined the permissible speed. The radius was originally measured from the external rail but DRG (DB and DR) later began to measure this from the centre of the track. The following standard radii were determined:

Radius of 190 m = 40 km/h   Radius of 760 m = 80 km/h (Introduced by DB at the beginning of the 1950s)
Radius of 300 m = 50 km/h   Radius of 1200 m = 100 km/h
Radius of 500 m = 60 km/h   Radius of 2600 m = 120 km/h (Introduced by DB during the 1960s)

Gradient: The gradient of a DCT is the tangent of the switch angle given as a ratio. The following gradients were used by the DRG (and later on as well): 1:6,6 1:7,5 1:9 1:12 1:14 1:18,5
Expressed in degrees (rounded): 8,6° 7,6° 6,4° 4,8° 4,1° 3,1°

Properties of the supplied DCT models:

DCT 190 1:9   The straight sections are each 40.36 m long and at the end lie 2.25 m apart (parallel distance 4.5 m), diverging radius 190 m, gradient 1:9 (corresponds to approx. 6.4°).

DCT 190 1:6.6   The straight sections are each 47.2 m long and at the end lie 3.5 m apart (parallel distance 7.0 m), diverging radius 190 m with 6 mstraight sections, gradient 1:6.6 (8.6°).

DCT 300 1:9   The straight sections are each 40.36 m long and at the end lie 2.25 m apart (parallel distance 4.5 m), diverging radius 300 m, gradient 1:9 (corresponds to approx. 6.4°).

CT 500 1:9   The straight sections are each 62.89 m long and at the end lie 3.5 m apart (parallel distance 7.0 m), diverging radius 500 m, gradient 1:9 (corresponds to approx. 6.4°).

When constructing automated switches, you must take into consideration the position of the DCTs as the switch signals are always read from left to right. As the position of the DCT cannot be specified as easily as that of basic switches (to the left or the right of the track), you will find a number of DCT models in the catalogue with switch lamps on the left side of the track, identified with the suffix "Left".

This notwithstanding, the "normal" DCT models may of course also be turned 180° in order to switch the position of the switch lamp from right to left. When connecting models using contacts which have been rotated, note that the direction has reversed as a result of the rotation so that they now read from right to left. Since the track geometry is the same for the normal right-hand and the left-hand DCTs, only the position of the switch lamps have to be turned from right to left in the 3D view.

The DCTs supplied are treated as track objects for technical reasons and therefore each consists of a total of eight connected track sections: four switch mechanisms and four connecting tracks. If one of these eight track sections is deleted, the DCT track combination will be dismantled and the entire track object removed.

When positioning and connecting DCTs with an existing track image, the following should be taken into consideration: If a DCT is positioned in a layout, one of the internal track sections must first be selected (the selecting frame includes the internal track). In this status, the DCT may be moved and rotated but not connected (clipped onto) to another track section because it is an internal track being connected to an external one.

To connect a DCT to another track section, click with the left mouse button on the empty layout area in the 2D Plan window next to the DCT but outside the selection box to deselect the inner track section. Only then may you select the external yellow track section that forms the four ends of the DCT. If you now move the DCT towards the other track by holding down the left-mouse button and the [SHIFT] key, the DCT is automatically aligned and docked onto the track when the left-mouse button is released. Of course, you can connect several DCTs to one another and integrate them into existing track plans.

Railroad X

End tracks:

The track module groups are terminated with end tracks, what else? In line with their purpose and definition, end tracks are terminated with a buffer block and this prevents them from being connected to other tracks. Buffer blocks are able to repel rolling stock as soon as it approaches the buffers. To identify end tracks in the layout plan and to differentiate them from other tracks, they are displayed with a cross beam on the end which marks the end of the route. End tracks are laid in exactly the same way as other tracks, only that this time you must click on the button displayed above to position an end track with a buffer block in the layout plan.
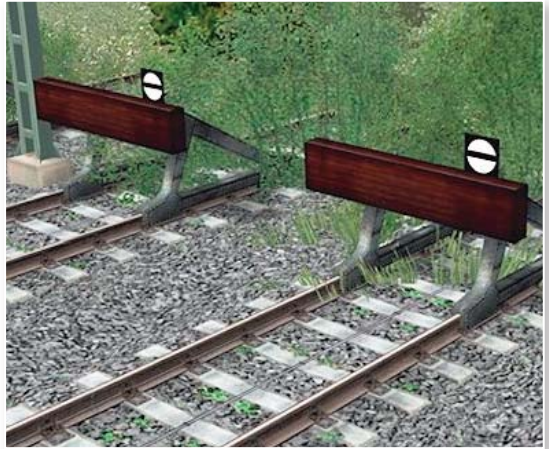
Lay tracks with the 3D editor for driveways:

With the 3D object editor not only can elements of the landscape and structures be inserted and edited in 3D mode, but also tracks and other railway infrastructure. This is done intuitively, in principle, and will be explained shortly.

After the 3D object editor has been activated in the Operation dialog and a track segment has been selected, it can be placed with a single click in the 3D window of the editor in the 3D view of the layout. The green arrowhead indicates the beginning of the track, and the green dot indicates the end of the inserted segment.
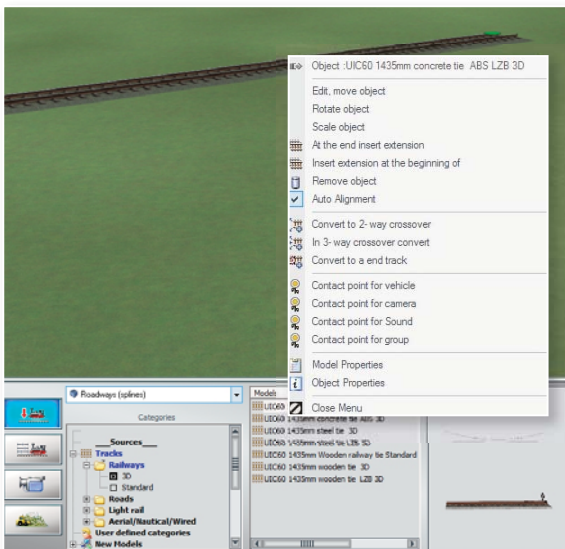
Dialogue for placement of tracks in the windows

A click with the right mouse button on the selected track opens the object menu with the available editing functions. As soon as a function is selected, animated arrows appear that indicate how the piece of track is processed, i.e. can be moved, scaled or rotated. If for example you want to bend a track and lay it in a curve, move the mouse cursor to the arrow or the point that marks the beginning or the end, and move the beginning or the end of the track in the desired direction.

65
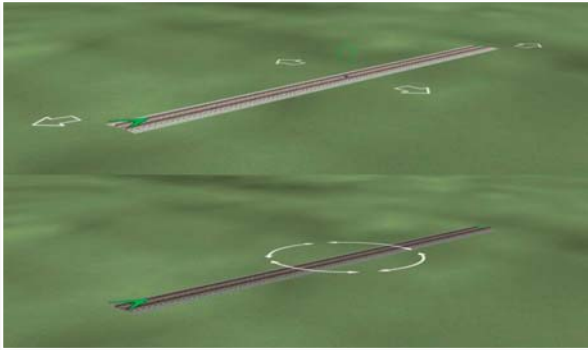
Orientation in 3D as a programm option

In addition, tracks can be copied via the object menu, and connected - while holding down the [Ctrl] key - be raised or lowered, however, the option to object must at ground level adjust be disabled on the Insert menu.

Important: Other than in the 2D editor where you find individual buttons for a switch drive, two-way crossover or a end track with buffer – the 3D-editor draws exclusively normal track pieces. Already placed tracks can be converted via the object menu into switches or end pieces with a buffer, and accordingly switch drives and buffers reconverted into normal track segments.

The automatic alignment of a copied track is optional

In Railroad X Expert automatic alignment of a copied or connected track was included as an option (in the right-click menu), so it can be turned on or off as needed. So far, copied or re-connected tracks in the 3D Editor automatically assumed the orientation of the previous track - to which they were connected - which in principle can still be handled this way. What is new, is that you can via the menu of the right mouse button, depending on the structural requirement, also disable this behavior, so absolutely free editing of the alignment (the height of the track end) is possible. By another call of the menu item, a check mark is set and the automatic alignment is enabled.
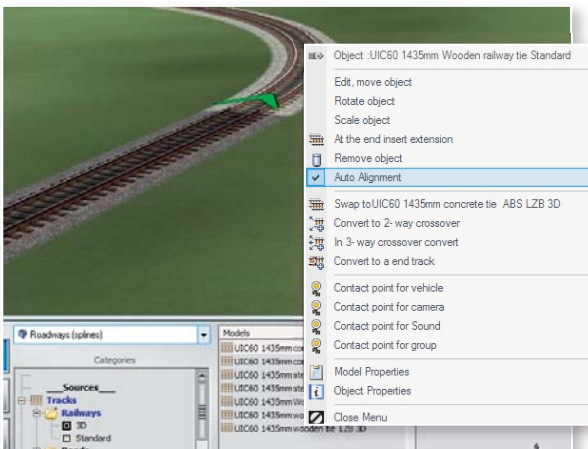
Automatic alignment of tracks

4.6.2 Using track objects

Track objects and objects which accompany tracks usually consist of one or more track sections and a construction. In the EEP model catalogue, bridges, stations or turntables, are listed under the heading of track objects for instance. However, tunnels are included under bridges, and transfer tables under turntables.

Network objects differ from normal tracks mainly in terms of their static design, which inevitably means that it is not possible to change the dimensions of the corresponding model and it may only be deleted. If, for example, a track section is deleted by a dual track bridge, the entire bridge model is then completely deleted.
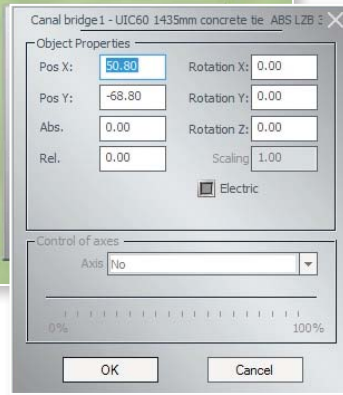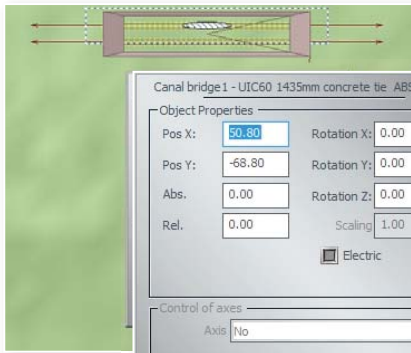
In order to erect a network object, the Route editor must first be switched on and the desired track style selected. In this context, this is of course the Light Railway/Underground Editor. An overview of the available network objects is provided by the model catalogue which you can open by clicking the button. There you will find a folder for the bridge, station and turntable categories along with a folder containing other objects which accompany tracks.

When inserting bridges the selected track style is applied

If you have decided on a suitable model, you can position the network object as you would any other object in the 2D Plan window. You can position it exactly using the Configuration menu which you open as usual by right-clicking on the selected track object. If, for example, you want to add a slope to a bridge, enter the desired angle of rotation in the Rotation x field and your bridge will be given a slope, or if the value is negative, an incline. It is not possible to create slopes or inclines for track objects using the height parameter in the editor field. Since this input box is used for tracks and not objects accompanying tracks, the initial and final height values remain the same.

Turntables and transfer tables:
Turntables were originally circular platforms with tracks mounted on top which allowed rolling stock to be rotated in tight spaces. The newer, larger turntables are no longer turned manually, and do away with the enclosure of the turntable pit which gave this structure its name. When constructing a turntable, it is worth searching for flat terrain with enough space for other structures.

In Railroad X, various track connections are situated around a turntable and, depending on your layout, may be connected to other tracks or simply to the actual turntable track which, after rotating in the 3D window, docks directly onto the other track sections. Connections may be attached either as tracks or track objects, e.g., in the form

of a roundhouse. In line with their importance, turntables are assigned their own category in the network object catalogue and the selection is therefore comparably large. If a turntable is selected and positioned in the Layout Plan, a track appears with prepared connection points.

Selection of the appropriate turnable

It is already possible to operate the turntable in the 3D view at this stage. Models without prepared track connections may be used in the 3D view to individually adjust the tracks (i.e. in radial intervals of 40° or 60°). To do this you simply need to click the turntable and wait until the desired position is reached. Then switch back to the 2D Plan View to join the connecting track to the turntable track. Repeat this process until you have joined all the tracks you require.

Turntables may only be operated in the 3D view. Simply clicking with the left-mouse button on the platform of the turntable is enough to set it in motion and rotate it until it reaches the next connection point. In line with the large models, EEP also contains turntables with different angular dimensions such as 7.5°, 10°, 15° and even 20°.

In this context, it is also important to note that not every locomotive shed model can be added to every turntable due to the different angular dimensions. When selecting a turntable locomotive shed, the first criterion to consider is the size of the turntable or – depending on the type of engine that is going to use it – the length of the turntable. When the turntable model has been selected, you can select a suitable locomotive shed model. The design abbreviations are a great help here, for example, "Turntable_26m_15Gr" can be docked immediately onto the "Roundhouse 1a, – 1b, and -1c" models.

CAUTION

The "Turntable1_26m_15Gr" model is, as already mentioned, a turntable without any prepared track connections. Therefore, after connecting sections of track or objects accompanying a track (round house) you must switch back to the 3D window and rotate the turntable again by one or more set angles before returning to the 2D window to dock onto another track object.

Double-clicking the structure sets the turntable in continuous motion. You can reverse the direction of rotation by clicking while holding down the [CTRL] key. With multiple right-clicks and holding down the [Shift] key, the Speed can be increased by pressing the [Ctrl] key, and you can slow down the movement and force a reversal of the direction of rotation.

Transfer tables:

As with turntables, transfer tables are used to quickly change the position of rolling stock in tight spaces. However, here the new position refers to a connected parallel track. The use of a transfer table is recommended when there are locomotive sheds or maintenance sheds.

In EEP, a transfer table consists of a mobile track deployed between two parallel approaches. The mobile track, embedded in a moveable platform, is moved along a pit in order to connect it to a track laid on the opposite side, depending on the settings. The transfer table is located under the turntable list along with the other network objects. The access and departure tracks to the mobile track on the transfer table may be connected as parallel tracks or as other objects accompanying tracks e.g., in the form of a locomotive shed. The mobile track is set up in the 3D view as it is only possible to put the drive unit of the transfer table in motion in this view. Once the track has reached a new position, you are able to return to the 2D view in order to dock onto other track sections.

To move a locomotive or any other rolling stock onto a parallel track, the locomotive must first be driven onto the transfer table. Once the locomotive has reached the correct position, you can click the mobile track of the transfer table to initiate a movement to the adjacent setting. Just like the turntables, the transfer tables may only be set in motion in the 3D view. Here too, you can double-click to set the transfer table into continuous motion whereby the platform stops automatically on the outside to the left or the right. The movement is stopped by clicking the mobile track again; you can reverse the mobile track by holding down the [CTRL] key while clicking.

4.6.3 Track and landscape

Any tracks you lay normally adjust to the level of the layout surface. For example, the standard track always lies flat at a height of 0.6 m relative to the ground. This obviously does not mean that it is not possible to construct ramps for creating elevations or inclines. For example, if a ramp climbs from 1 to 3 m, the track adjusts to this slope so that the height of the track rises from 1.6 m at the beginning to 3.6 m at the end.

To move a selected track to a different level above or below the landscape surface, the height parameters must be adjusted in the provided input box. A distinction is made between the absolute and relative height. The absolute height signifies the height of a model (track) in relation to the original, unchanged layout surface, which in reality is denoted as the height above mean sea level (AMSL). The relative height is equivalent to the difference in height between the model (track) and the landscape surface.

If a track is laid on a plateau that, for instance, lies 5 m AMSL of the layout surface, the absolute height is 5.6 m. The relative height, i.e., the height of the track above the raised layout surface remains constant at 0.6 m.

If the track runs horizontally, the initial and final height values remain the same. However, if the track rises, the values change. Entering different values for the start and end of the track allows you to lay tracks with an approach or departure gradient. The degree of the slope depends on the length of the track and the difference in height between the beginning and the end.
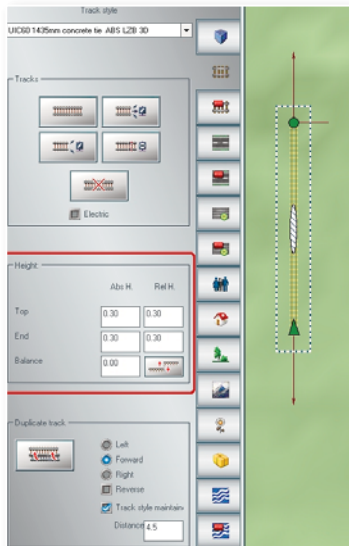
You can also modify a preset track height to lay previously inserted tracks at a lower level. For example, if you want to reduce the relative height of a standard track at 0.6 or 0.66 m by 0.3 m, you can relay the track at a height of 0.3 m (e.g., in the station area or in a holding group), without subsequently lowering it or having to subsequently raise the surface of the terrain.

The individual settings of the height of the transport route are made when no piece of transport route is selected (track, road, waterway). Therefore, there is only one active field in the input box for the height parameters, in which you can now enter the desired height difference. When you lay a new transport route section (track, road, etc), this takes into account the individual height settings so that the height of the transport route is now lower or higher than originally intended.

Display of absolute and relative track height

The individual preset transport route heights are also transferred to the stored track blocks, provided that the Adjust Object to Map Altitude option is switched off in the Insert menu. You can also enter the individual track heights for combinations of tracks. However, in this case you must take into account that these are automatically laid at a height of 0.0 m when the Adjust Object to Map Altitude option is disabled. Since there are many SPLines with different standard heights, EEP must first return to a height of 0.0 m in order to maintain functionality for roads, waterways or tram lines. Therefore, if you would like to lay a track combination such as a parallel connection, for example, with the "dark track" track style at a height of 0.3 m, you must first deactivate the Adjust Object to Map Altitude option and enter a relative height of (+) 0.3 m as the track combination function places all track styles at the same level of 0.0 m.


With the adjustment factor the embedding can be changed into the ground

With the so-called calibration factor for each track module now set, you need to decide how deep it is to be embedded in the layout surface (you adjust the landscape surface to the driveway). The adjustment factor (shown in centimetres) can be individually adjusted in the range from -10m to +10 m. In order for a subsequent adjustment of the landscape surface in 3D terrain editor is superfluous. The balance of the embedding level is usually done retrospectively after a track module has been laid and the landscape surface of the track height to be adjusted.

Constructing banks and railway embankments:
As a rule, tracks adjust to the level of the landscape surface. However, it is possible to reverse this and adjust the landscape surface to the track height. Just how expedient and useful this function is may be illustrated when adding banks and embankments. To adjust the landscape to the height co-ordinates of the track, click the button (see left). By activating this adjustment function, you can immediately adjust the landscape under the track along the selected track to the height of the track. If the track lies above the absolute height, a railway embankment is automatically added beneath the track. If the selected track section lies below sea level, a cutting is automatically created which adjusts itself to compensate for the height differences in the track. Since the newly docked track automatically takes on the height of the neighbouring track, this generates gentle ramps without having to construct them. In order to carry out the reverse and adjust a track to the landscape, you must transfer the relative height values of the beginning and end of the track into the field for the absolute height and add in the height of the bank. This is quite a laborious process.
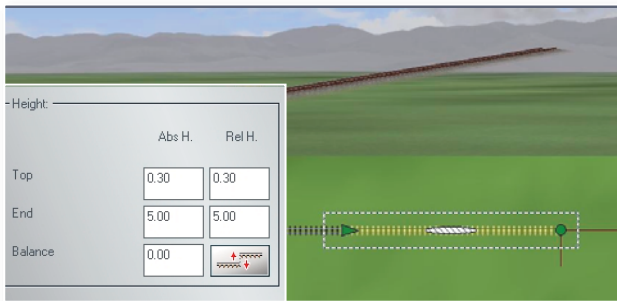
Height difference in the 2D-Ad and in the 3D image. It's missing yet the bendprocess.

CAUTION
The number of dots specified at the beginning when creating a new layout essentially determines the potential width of the ramp and its final appearance.

The following example demonstrates how to create a bank or embankment step-by-step:
- Lay a track with a relative height of 0.6 m at both the beginning and the end.
- Attach another track and give this a final height value of 1.6 m. The track then slopes upwards.
- Now attach another three tracks using the copy function, which automatically assumes the given slope. The last piece of track therefore has a final height of 4.6 m.
- Now select each of the individual sloping tracks in turn and, each time, press the button which activates the adjustment function and aligns the landscape surface to the track height.

You have now created a railway embankment that you can give a realistic appearance by adding suitable texture and landscape elements. There are also track styles that already possess their own railway embankment, e.g. Track1435 railway embankment ...".

4.6.4 Other transportation routes

In addition to the track systems for railway traffic, which are naturally the most important part of a model railway layout, there are also roads, tramway and aerial tracks and waterways. Since these transport routes are treated as tracks, you can also add roads, tram lines, nautical or aerial traffic to your traffic system. The styles of a network system may be combined so that the external appearance of the track body and the ballast can be modified on a section-by-section basis. However, a combination of different network systems is not possible as they are essentially processed separately from one another. Each network system has its own editor (layer) in the 2D Plan window.

Within a track system - in consideration of signals and the contact points – track modules can specifically be replaced.
- Open the respective driving route editor (tracks, tram tracks, roads, waterways) and activate the *3D Editor,*
- select the type of track to which the module to be replaced should be changed,
- with the right mouse button click on the routes module to be replaced in order to open its Object menu,
- select from the Object menu command that executes the replacement of track style.
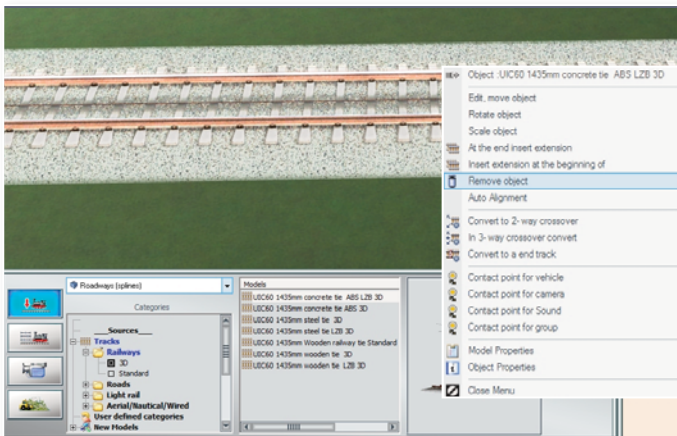
Replacement of a track style with another in the 3D view

Nautical and aerial routes are invisible in the 3D view and allow vehicles to be operated that are not connected to a track or a road. This allows you to regulate the movement of ships on rivers and lakes, or air transport. The invisible road style can be used for road vehicles since they can be associated with the visible styles of rural and urban roads. A lorry may therefore travel along an invisible road located within an asphalted industrial area before later turning onto a visible road and joining the rest of the traffic.

4.7 Omegas (animated characters)

With the Omega-feature, moving figures are available in Railroad X. They can populate roads, places or platforms and thereby behave quite reasonably. Everything is adjustable: origin and residence, place of disappearance, group size and composition, propagation area, moving direction and intensity. To set up a group of Omegas, call the Omega dialogue in the 2D view with the appropriate button from the menu bar.

Use the key on the top left (1) to set a mass in your system. You do this by clicking when you press this button on the point in the plan where the Omegas are to be used. The plan creates a symbol from a lattice structure with arrows and circles. This symbolism is explained later in more detail, since it contains several sensitive areas, which can be accessed through the dialog boxes for fine adjustment. In the white box the mass is listed after the onset (red, yellow, blue mass, etc.).

Do you want to delete a mass again, so choose there the respective mass and (2) Press the Delete key. For an existing mass you can now add more sources (3) or sinks (4), ie areas where the Omegas disappear..

Likewise, attractions (5) can be used or points which the Omegas avoid (6). With the buttons marked with a 7 or 8, you can create fields in the plan that affect the direction of movement of Omegas generally or limits them partially.

Tool dialog for inserting Omegas (animated chracters)

Moreover, a delay of the motion intensity can be affected (9 or 10). To prevent certain layout sections for Omegas, use walls that are impermeable, generally unlimited (11) or only limited to adjustable dimensions (12). Omegas usually move directly on the layout surface. However, in order to make them available on platforms or stairs, plateaus can be used. These can be unlimited (13) or limited to an extent in relation to the freedom of movement of Omegas (14). Finally, at the bottom of the dialog is the Omega function, which encloses the area within the mass like a cage.
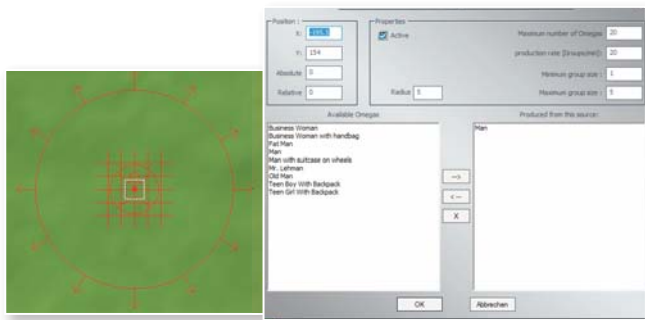
This dialog opens when you click the right mouse button into the inner region of the omega-symbolism
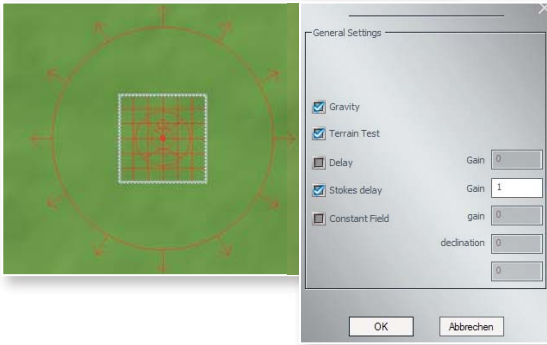
This dialog opens when you click the right mouse button in the middle range of the omega-symbolism.

When you move the cursor over each tool, buttons will be shown after a short time, indicating which function is behind it. Once a mass is used in the layout (press key and click the left mouse button in the plan), the individual influencing tools become active (2 to 15). Before you set up special intentions and limitations, you can determine the composition of the mass, the exact positions of your origin and the extent of your extension.

This dialog opens when you click the right mouse button into the outer region of the omega-symbolism.

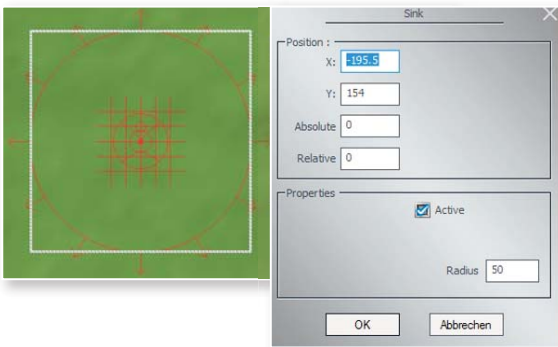The elevation data are especially important if you want Omegas to be created in trains which are just appearing or to simulate them getting off trains. To access the above dialog, click in the center of the mass symbolism in the plan windows first with the left mouse button and then within the white mark with the right mouse button. If you execute the left-right-click combination on the outside, it takes you to two more dialog boxes with input options.

The mean adjustment possibility concerns the nature of the basic movement to be performed by the mass and at the same time corresponds to the dialog box of the delay (9, 10) or the generation of fields for the intended movement.

The outer circle with the arrows provides an invisible boundary. If an Omega has exceeded this limit, it disappears. The expansion of this area, where the Omegas can play, is to be set on the radius. If the Omegas should disapear at one or more of certain spots on the layout again, the critical points are to be marked by so-called sinks (4).

With limited walls, the dimensions can be entered exactly

If on the other hand, more Omegas should be generated at other points, additional sources have to be set up (3). All influencing elements shown can be moved to any position, even those which are represented at the onset of mass.

An important tool to control the omegas are walls (11 and 12). These are one-sided passable (note arrow). While unlimited walls (11) extend to the bearing edge, a limited wall (12) can be varied in extent. So you can make sure with their help, for example, that Omegas pass certain inputs or passages. Again, the exact position on the coordinate and the rotation angle are filled in the space above information.
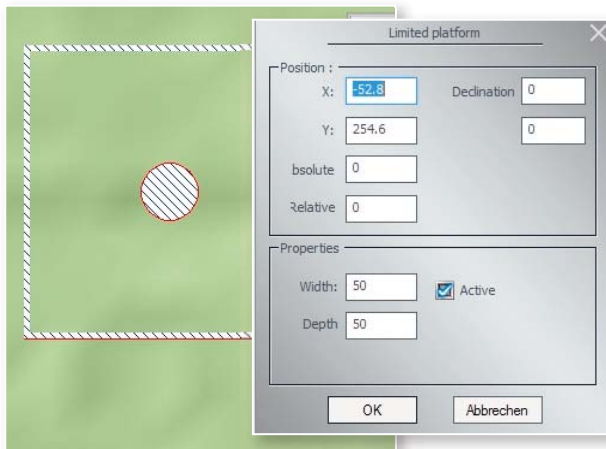
Remember that the Omegas have to reach the area above the plateau in order to move on it. Either the source must be above or a ramp has to be built.

More challenging is the insertion of plateaus and ramps (13 and 14). Such a plateau has to be adjusted not only at the desired height to make, for example, a platform model for Omega accessible, but the mass must be brought to the appropriate height. If Omegas are to be built at the height of the platform, coming from an elevator, the insertion

height must be entered via the dialog at the source. In a continuous plateau (13) it cannot happen that Omegas fall over the edge, but probably with limited (14). It is therefore always advisable that areas which should not be entered by Omegas, are protected by walls. Also cages (15) can keep the Omegas in check.

If the Omegas are to move not only on an elevated plateau, but use a ramp or even stairs, a limited plateau shall be placed on each model. Model top (stairs, ramp) and plateau are to be brought by means of shifting and scaling in coverage. Estimate the average height (e.g. at the center of the ramp) and enter the value in the dialog box of the plateau under "amount" field. Now estimate the angle of the slope and fix it in the Input area "inclination". Of course, the value using the trigon metric formula can be calculated exactly. Remember that plateaus are impenetrable from above for Omegas.

Important to know:
All control objects used in the plan for Omegas are to be selected by left-clicking. Then, according symbolism displayed, they can be scaled, moved, or rotated. A right-click then calls the dialog box. The symbols regarding the Omegas are visible only if you have selected Omegas in the menu bar .

In the systems folder you will find two tutorials on "Omega" in which finished sequence scenarios are constructed.

Railroad X

5. Putting layouts into operation

Even though you have created the landscape and a track system for the railway traffic, the layout is probably still incomplete, but it is ready for you to do a trial run.

Until now you have been working with the layout plan in the 2D window, but from now on you will be working mainly in the 3D window. In this window, not only is your railway landscape presented realistically in three dimensions, it is also more vital and dynamic. In the 3D window you can go on a journey of discovery, add vehicles, join trains, and monitor and control the vehicle movements. In short, you can experience a Railroad X world that is full of activity and life.
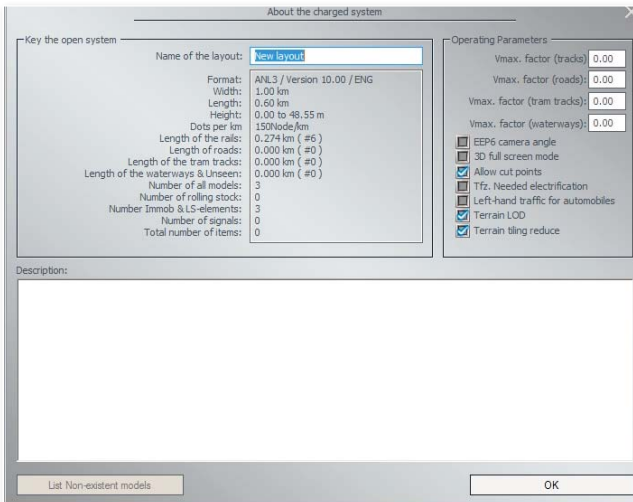
But before we turn to the operation, some adjustments should be made, reviewed or amended, which affect the appearance of the landscape. To do this, call up "Layout Information" under File in the menu. If the performance of your computer is good enough, the points "Terrain LOD" and "Terrain tiling reduce" should be ticked.

If the performance of your computer is good enough, the points "Terrain LOD" and "Terrain tiling reduce" should be ticked

77

You can find interesting information about the status of the layout and can create a description text that is displayed when you call the layout under the System overview in 2D window (upper button on the menu bar). Furthermore, you can define some parameters for the operation of your layout. In addition to switching to driving on the left you can choose that vehicles only drive on their own if the track is electrified.

5.1 Adding and rerailing rolling stock
Now that the field is ready and the track laid, it is time to add the rolling stock. This is done in the 3D window, or better referred to as the Control dialog. This is the Control Centre where you can manage everything taking place on the screen in 3D mode – the cameras, the Landscape Editor (which is only active in 3D mode) and last but not least the vehicle movements.

Vehicle movements may only be started after laying at least one complete route containing rolling stock. Services may only commence when the inserted rolling stock has its own power unit. You first have to select a locomotive to perform a test run.

Therefore, switch to the 3D window and proceed to your new control centre. To select a locomotive or another vehicle later on, click the button (left) in the control dialog. This switches you to the mode where rolling stock can be added and placed onto the rails. As soon as this mode is active, the vehicle catalogue opens: The categories and their folders are in the central field, to the left is a list of models and to the right the selected model appears in the preview pane.

Adding rolling stock
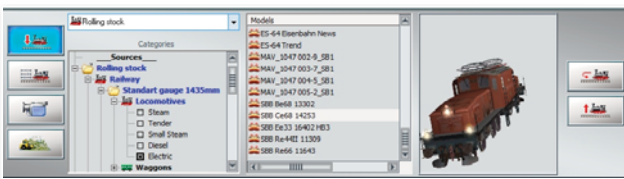
Choose rolling stock

In order to select a locomotive, click the tracks folder in the rolling stock category to reach the locomotives and make your choice. As soon as you click an object in the list, the model is displayed from all angles in the preview pane. Once you have decided on a model, switch to the Radar window and click the mouse cursor (which now looks like a mini locomotive) on the route where you want to insert the rolling stock. A dialog will appear where you can assign a unique and easily identifiable name to the model.
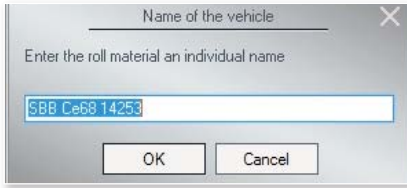
Prior to insertion of the rolling stock,
you can assign an individual name

Models with exchange textures, 3D cabins and new vehicle noise:

In Railroad X different models are available, which are provided with one or with up to three replacement textures. The replacement of a swap texture is possible in both the Basic and in the Expert version, whereas the exchange is 10 reserved for up to three textures of the Expert version of EEP reserved). In cases where two or even three replacement textures can be selected, a 2 or a 3 is added to the name. The specially constructed models for the purpose of exchange can be seen in the selection menu in the blue font color. To make a texture swap, click with the right mouse button on a corresponding model in the list and select *Properties.*
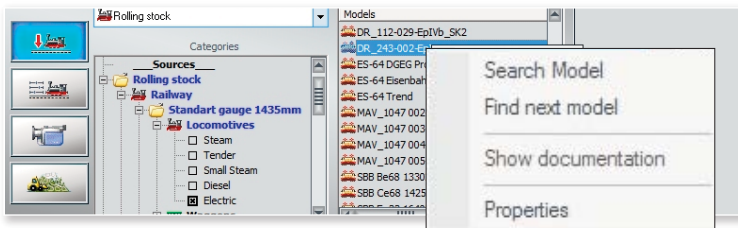
Under Properties, you can find any texture replacement options

Clicking on the **texture exchange** button opens the file selection dialog where you select the directory and file type levels of swap textures. As exchange textures, the formats GRAPHICS TGA, PNG, BMP or JPG are accepted , which can be edited in an image editing program of your choice. The formats *.Tga and *.Png are preferred as they have an alpha channel, which allows transparent texturing. The conversion from the original format to the DirectX graphics format *.dds is done automatically by Railroad X. In the conversion MIP map levels are generated and the appropriate texture compression (DXT5 or DXT3) applied. Locomotives and wagons with 3D cabins offer a great railway experience. While bitmapped cabin textures only partially allow a change of perspective, you can now explore it in a three-dimensional simulated cabin view. Or you can take a seat in a wagon to enjoy your model train scenery from inside the moving train. Such insights and perspectives can be realised if you choose an appropriate functional model and set it in motion with the numeric key [8].

Since rolling stock of the same type, e.g., wagons, often have to be added several times but the name only once, the identification numbers

are automatically added to the end of duplicate names. However, it is important to note that only one piece of rolling stock can be inserted onto a route module. If the track is already occupied, you must select another section of track for your locomotive or move or drive away from the existing vehicle.
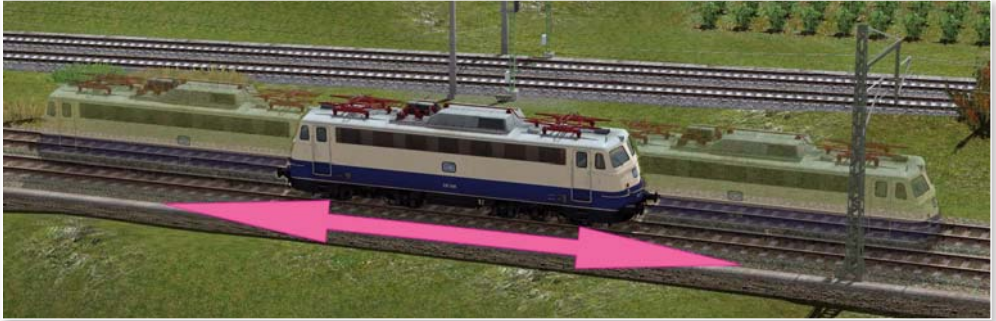
How do you move a locomotive or wagon? It's very easy – with the mouse:
- Move the mouse to the rolling stock you want to move.
- When you hover the mouse cursor over the rolling stock, it appears as a hand with an extended finger. Here, click while pressing down the [CTRL] key and drag the vehicle to the left or right
- In this way you can easily consign locomotives and wagons to branch tracks and sidings, and release the previously occupied tracks for other rolling stock.
- Any inserted rolling stock is automatically positioned in the direction of the track that has been laid. However, sometimes it is necessary to rotate a vehicle so that it faces the other direction. This is also very easy to do.
- In the 3D view, activate the vehicle you want to rotate by clicking on it.
- Click on the button (right) in the Control dialog. This activates the mode used to add rolling stock and insert it onto a track as well as rotate and delete it.
- Now click with the mouse on the button (see right) (only available in this mode) to rotate the rolling stock as required.

A single mouse click is all it takes to reverse the direction of the selected rolling stock. However, a certain amount of care is required: Firstly, rolling stock should normally only be rotated when not connected to other rolling stock, otherwise the entire block train will be rotated as well. Secondly, there should also be enough room to prevent collisions and unwanted couplings to other rolling stock.

It is just as easy to delete rolling stock from the 3D view as it is to rotate it:
- By clicking with the mouse, select the rolling stock you want to delete from the layout – this can be performed in the *drop-down menu* or in the *Radar window* or *3D view.*
- Next, click the button (right) in the Control dialog to remove the *inserted vehicle from the track.* This button only exists when rerail mode is active.

As with direction changes, any rolling stock to be removed should not be linked to any other rolling stock. Thus, it should be decoupled beforehand otherwise the entire train set will be removed.

5.1.1 Model-exchange function for all model types

By popular demand a replacement function for models in all layers has been implemented, whereby in the 3D editor not only can track styles (track style) be exchanged, but so can all model types, such as structures, landscape objects, rolling stock, signals, etc. - that can be found within the same layer. To replace a model in the model list, select (using the left mouse button) the first model which is to be relocated, and then click on the 3D model which is to be exchanged in the editor window. The selection (marking) of the model to be exchanged is signaled by constant blinking.
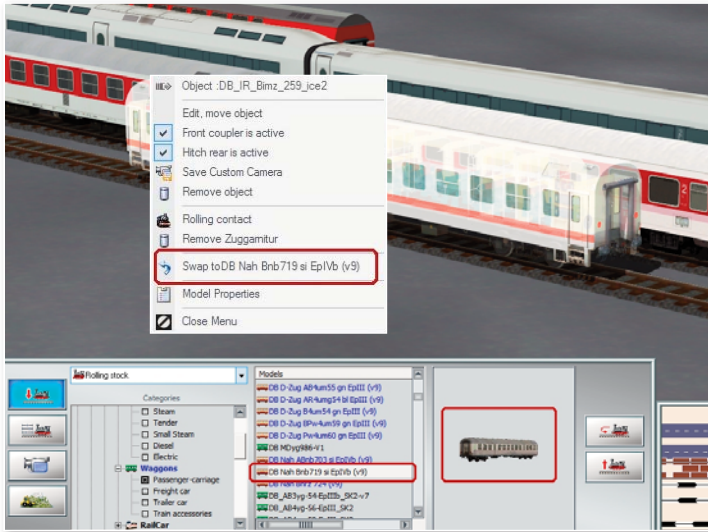
The actual exchange of the model is now completed via the right-click menu by clicking the exchange command in the opened menu.

Exchange of the model to the model in the selection list

When replacing a wagon within a coupled trainset, possible differences in the length of the objects should be considered, so that the entire train set is automatically shortened or lengthened to the optimum length.

Important Note:
The exchange of models is only possible within the same layer. Also, you may exchange structures to structures, rolling stock to rolling stock and signals to signals, whereas the exchange of different types of models, such as Landscape elements to property, or signals to track objects, is impossible.

5.2 Control rolling stock

You can set the locomotive you have inserted in motion. The instrument for controlling vehicle movements appears by clicking the button in rerail mode to switch to Vehicle Control. As soon as this button is activated, the model catalogue disappears to make way for the Control Desk. The Control Desk is used to control all vehicle movements on tracks, rails and roads as well as invisible air- and waterways.

Railroad X differentiates between two types of vehicle control: In manual operation mode, you can control individual pieces of rolling stock – comparable to a pilot using a joystick to determine the course and a gas pedal to determine the speed. In this mode, the rolling stock does not react to preset contacts or signals.
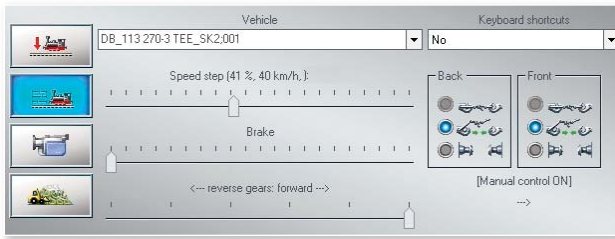
CAUTION

In this mode, the rolling stock does not react to preset points of contact or to signals! In *automatic mode* on the other hand, all services are controlled by contacts and signals without the need for you to intervene in the process. The vehicles travel automatically in the direction and at the speed you have configured in the Train Manager using the Target Speedslider – just as aeroplanes fly in autopilot without assistance from the actual pilot.

You can change the operating mode in the Control Desk using Vehicle control. To do this, click the button (see left) which becomes a toggle.

5.2.1 Manual control

When manual control is enabled, you have the final say over your rolling stock. Even though a locomotive in automatic mode stops in front of a "Stop" signal, if you are manually driving the train it will continue to move despite the stop signal.

To set an inserted locomotive in motion, you must first select it in the vehicle list in the control desk or in 3D view with the usual mouse click. However, it is quicker to select your listed locomotives and wagons by assigning them to a hotkey in the Hotkey list. For example, instead of calling up a locomotive with a difficult name to remember, such as DB E10 299 bl;002, simply use the selected key combination and the camera jumps to the selected locomotive and switches immediately to the respective linked camera mode.

The locomotive is set in motion using the Drive Level Controller, which regulates the fuel and controls the speed. In the same way, you can use the Brake Controller to throttle the speed and slow down the rolling stock. And finally, you can use the Gearbox Controller to select the direction of travel and gear ratio for the power train.

5.2.2 Automatic control

Automatic control of vehicle movements is only possible for rolling stock with its own power train. In automatic mode, rolling stock is controlled using contacts and signals without the need for you to intervene. You specify the settings and then allow the program to control the power train, speed and braking of the individual vehicles throughout the entire journey according to your specifications.

Railroad X

Automatic control can be switched on in either of the following ways: clicking the **toggle switch** in the vehicle control or clicking the relevant rolling stock while holding down the [SHIFT] key in the 3D window.
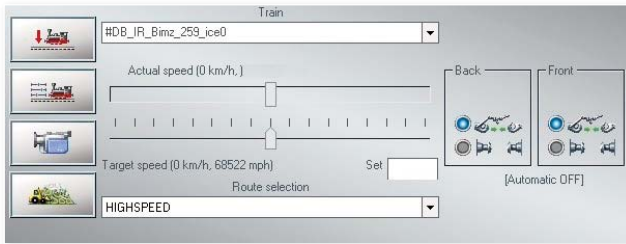

The picture shows the speed mode in the control of rolling stock

If automatic control is switched on, the control desk changes. While you can control the speed of travel using the regulating step command and braking command in manual control mode, in automatic mode you can only specify the target speed, and the controller runs the program.

To set your locomotive in motion in automatic mode, slide the Target Speed controller to the desired position or enter the speed in kilometres per hour (km/h) into the input box. The locomotive will start and maintain the prescribed speed throughout as signals allow. Any variations along the route are compensated by the software by using gears, running step regulator and brakes. The route, stops and terminal point of the locomotive is determined by the interplay between your contact configurations and any timetables specified for the individualvehicles in the traffic system. This topic is covered in more detail in the following chapter.

How do you bring a moving train in automatic mode to a stop? One would think that all you need to do is set the Target speed to zero. But this in itself is not enough. So what else is required? The train will only come to a stop when you double-click with the right-mouse button on the slider – this sets the target speed to zero. In automatic mode you can assign your trains to specific routes. This topic is also discussed in more detail in the following chapter.

5.2.3 Custom camera with rolling stock
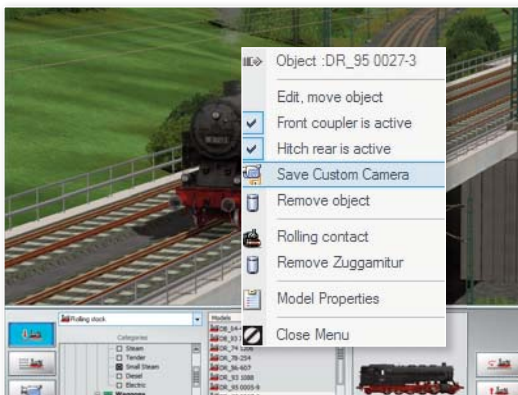
This function is an implementation of a multiple-user desire. The individual camera positions for each vehicle (rolling stock) can be defined and stored directly in the system file.

*Setting the visibility of the custom camera with the arrow key*

To save a custom camera, a vehicle must initially be selected (highlighted) in the 3D editor. While it is highlighted and flashing - which symbolises the edit mode - you can control the camera view by using the arrow keys and the [R] key and spacebar on the computer keyboard. From the right-click menu, then select Save, and select Custom camera.

Your defined and stored camera settings can be accessed via the button [9] on the computer keyboard, or through contact points. The corresponding entry in the dialog menu of the contact points is *"view of the custom camera".*

5.3 Creating trains

Locomotives and wagons are designed so that they can be coupled to form a block train. Coupling takes place as it would in a real model railway: Rolling stock is moved or pushed slowly towards other rolling stock or coupled using a mar-shalling hump.
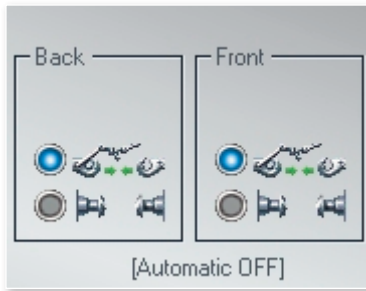
These symbols illustrate the three states of coupling of rolling stock

If rolling stock is added, the coupler at the front and rear are active so that it is possible to couple other rolling stock. Coupling is controlled using the relevant buttons in the control dialog which indicate and activate the relevant status. The indicators and buttons for the front and rear couplers represent the following:

Above: Rolling stock is connected to the coupler (front or rear). The indicator remains active (dark grey background) as long as both of the involved rolling stock items remain separated.

Centre: The coupler remains deactivated as long as the background is dark grey. The coupled rolling stock has been separated.

Below: The coupler remains activated as long as the background is dark grey. More rolling stock may then be coupled.

In the Expert version there are additional shortcuts (hotkeys) available for the vehicle control especially to facilitate the manual shunting. Apart from the existing keyboard commands that have the same function in automatic and in manual mode, there are now four additional hotkeys for manual coupling control:

A	= drive reverse		D	= drive forward

S	= stop / brake		H	= horn / / warning

Furthermore, you can - only in the Expert version – switch (forthcoming) signals and points at a distance of up to 500 m via hotkeys. With the key:

K (= coupling hook back) you influence the condition of the rear clutch and change this alternately by repeatedly pressing the button;

L (= coupling condition front) affected and changed according to the condition of the front clutch by repeatedly pressing the button;

K (= Train brake), you can manually control the brakes of the complete train to be on and off (the [S] key only affects the brake of the selected vehicle, not a complete train);

F (= switching state of switch) you can use the next switch at a distance of up to 500 m – switch through multiple key presses;

G (= switch state signals) change the signal image of the next main signal at a distance of up to 500 m. Multiple signals are switched by repeatedly pressing this key.
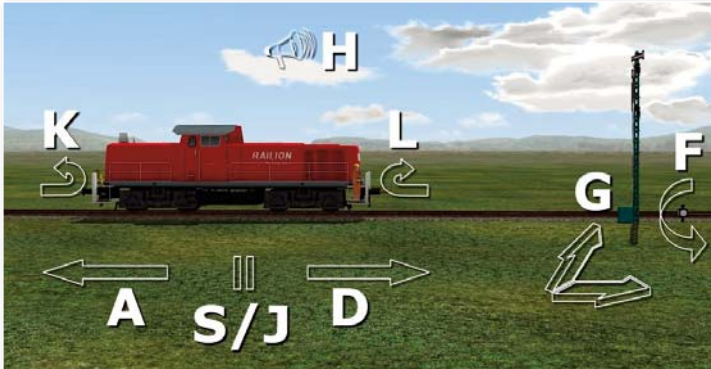

Hotkeys in the control of rolling stock

It is possible to couple and uncouple entire train sets and not just locomotives or wagons. This makes it possible to automatically control typical operations such as the separation of trains to continue on different routes or changing direction. More information is given in the following chapter. Once you have created a train,

it is worth saving the blocktrain under a separate name using the *File/Save Train* command in the menu bar so that the train may be used again at other points or in later layouts.

In Railroad X not only can individual locomotives or wagons be placed in 3D view, but also coupled rolling stock to train consists- provided that the respective track segment permits. Similarly in 3D mode, you can remove not just the complete train, but also individual cars without the train must be decoupled laboriously before. Simply select the car you want to remove by a mouse click, and click the command *Remove object* from the Object menu. To close the resulting gap in the train, click on the preceding or following wagon, select the Object menu, select Move object and push the car to the front or back until it can couple to the next car. In addition, trains can now also change their direction in the 3D view: Click on any car in the train consist and select the Object menu, choose the option Turn rolling stock and replace the locomotive at the beginning or end of the train, to continue the ride in the reverse direction.
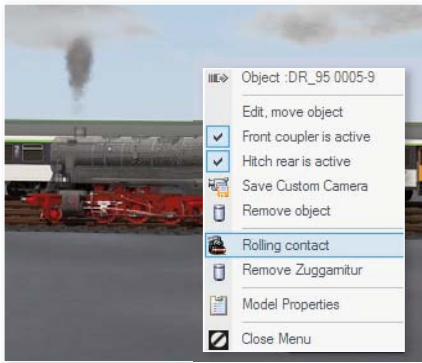
In the selection dialog you will find "Turn rolling stock"

5.4 Functional models

In general, the behaviour of rolling stock depends on the respective vehicle properties. These properties are taken into consideration when designing a true-to-life model. These properties include the dead weight, the power train and the braking and frictional forces. These vary for different rolling stock items and the combination determines the vehicle properties and behaviour. This applies to any of the vehicles which may be used in an EEP layout. Railroad X also contains a whole range of models fitted with special functions and which extend the functionality of the layout.

Pseudo-forces in models:
The Railroad X model catalogue contains various models which use pseudo-forces such as centrifugal and centripetal forces. The models designed according to the rules of Newton's laws of motion include a helicopter and a mountain cable car. These models stand out in terms of operation due to the fact they follow the rules of gravity: Radial acceleration causes them to move from side to side and the constraining force (inertia of the masses) makes them swing forwards and backwards when accelerating and braking. They therefore remain at a constant gradient and their horizontal operating position remains stable, irrespective of the incline of the route.

Railroad X

Vehicles with stoplights and indicators:

There are also passenger vehicles and trams with stoplights and indicators. The stoplights on these vehicles turn on when the brakes are actuated or when the vehicles come to a stop. The indicator function is only activated when a vehicle fitted with this option travels along a route with switches. The indicators show the direction to be taken only on the piece of the route before the junction or crossing. Therefore, when constructing road crossings, care must be paid to ensure that the switch mechanisms are long enough (e.g., 50 m) or that the speed of the vehicles is suitably restricted using contacts.

Vehicles with fire-fighting water:

The vehicles with additional functions include fire-fighting vehicles fitted with water canons and fire-fighting water. The fire-fighting water function has been developed in line with the Fire in Structures functionality discussed in the previous section.

The jet of water from these vehicles can be controlled manually or automatically by activating the respective contactsfor the vehicles. The manual metering of the water pressure can be controlled via the Axes drop-down menu and the associated sliders. In automatic mode, several contacts are usually set for vehicles in the signal controller which firstly control the position of the water canons and then the desired water pressure. The contacts for configuring the moving axes and the fire-fighting water can be set for all types of vehicles.

Steam, smoke and acoustic signals:

In terms of functionality, good old steam locomotives from Grandma's era have no reason to shy away from the latest generation of state-of- the-art electric locomotives. To increase the nostalgic charm of "museum" locomotives such as these, the steam has taken on a particular quality. Steam is not merely steam and it can be released in a myriad different ways such as:

• Via drain valves
• Via jet pumps when drawing water from tender
• Via boiler safety valves
• When operating the locomotive whistle

Train sets containing passenger coaches can also simulate steam heating, which is usually best in the last coach as the heating valve is usually always slightly open. With the extension of the steam options, accompanied by the typical hissing, it stands to reason that a locomotive whistle has also been included. To set off a typical warning signal of rolling stock, press the [H] key. Whether it is the horn sounds for cars or trucks, the signal horn of an electric loco-motive or a steam locomotive whistle, it is all dependent on the type of rolling stock. In general, however, all warning signals are either triggered manually using the [H] key or using vehicle contacts.

Rolling stock with moving axes and loading of goods:
Finally, there is also rolling stock with moving axes which are assigned to the group of functional models. These include the pantographs on electric locomotives, for example, and the lifting arms of cranes used to hoist freight onto goods wagons.


Analogous to the constructions with moving parts, rolling stock with moving axes may also be operated manually orautomatically. You can read how to auto-mate these movements using preconfigured contacts in the following section.

Whether or not a vehicle is fitted with moving axes is indicated in the list of moving parts in the control panel. You can see this when the model is activated by clicking with the mouse in the 3D view. Figure 75 (see page 89) shows a crane wagon that is hoisting crates. When the crane is activated, you can select the axes that control the hook and arm, and move them using the slider to the right of the list. If, for example, you direct the crane hook towards the crates using the axes control, you can start the loading process by clicking the button to the right of the slider. You can then also release the load from the hook by clicking the button again.

To further liven up loading scenes you can now add an animation which simulates the loading of coal, ballast, sand or other bulk cargo and literally creates dust. The animation, which is supported by various structures and rolling stock, can be triggered manually using the slider for the model's axes or automatically using contacts.
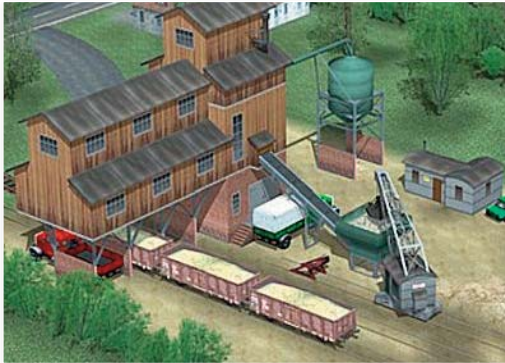
In Railroad X there are also different models with animated textures such as billboards, escalators, and conveyors available. While animated advertising columns with alternating spots are designed so that they run continuously, conveyors and similar models can be selectively turned on and off via contact points.

5.5 Show texts in mobile cameras or with the Information Display models

When building with Railroad X an objective is to provide self-made layouts to other users. To facilitate the exploration of this new virtual world (after all, others have never even seen it) and in order to certain, perhaps not to point at first glance visible events, the automatic display of texts were realised in the Railroad X Expert.

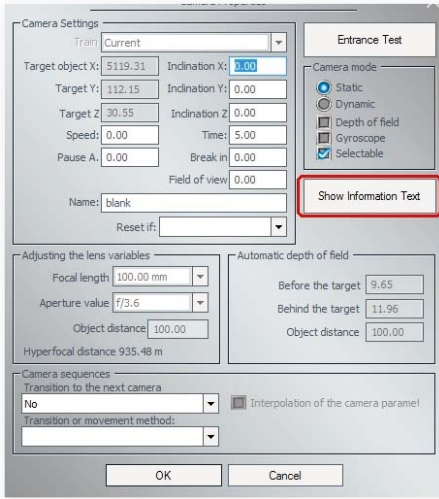The display of the text can be done in two ways:
• stored with the mobile cameras, in which the text display is only performed when a mobile camera is actively
• using so-called information models that allow a site-specific display

Text display in mobile cameras
The settings for the text display are made in the 3D-editor by calling the dialog box of the properties of a mobile camera, and with another mouse click on the button Show Information text.
As parameters for text display, the following options are available:
•　Alignment of the text block set, centred, left justified, right justified, scroll display.
•　Scales the text size of the characters from 0:50 (for half size, i.e. 50%) to 2.0 (for double size, i.e. 200%)
•　Feed speed of scrolling (only if the orientation was determined as a scroll viewer). The value results from the screen width / time. (0.2 means an advance of 0.2 screen width in a second)

- Text Color Opens another window for colour selection of characters.
- Permanent display duration of text in seconds.
- Text repeat repetition of the text (only when scrolling display has been activated).

Do not interrupt lock on the display of the text display when switching to another mobile camera that does not have text display. If this option is active, the text is displayed until the expiration of the predefined period of time, even if the image already provides a different mobile camera.

Text to display in the input box, enter the text to be displayed. A maximum of 1000 characters can be used.

Text display via so-called "information models"
In your Railroad X version you can find a new category in the dropdown menu of *Structures-Models: Structures> Attractions> Information Models*
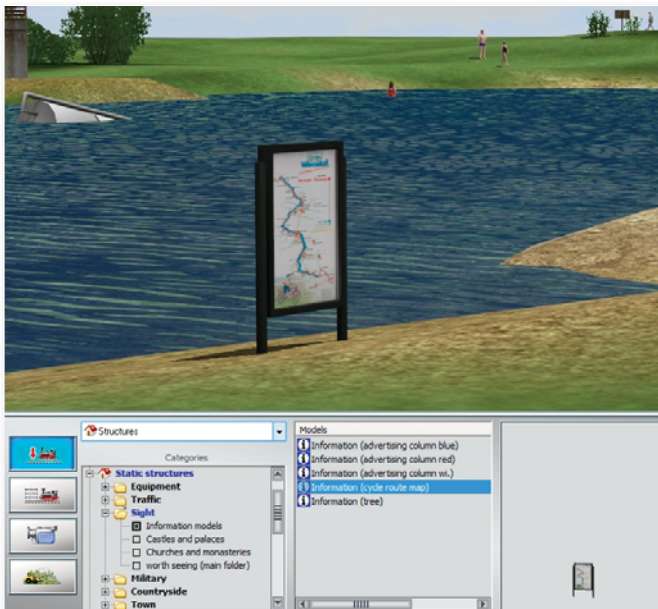

In this category, specially designed models are sorted, which allow the display of texts in 3D. This can really act around each object, from a small signpost on the roadside to a switchboard or an imposing cathedral. The advantage of this type of display is that the insertion of the lettering on the location of the model is not linked to a camera. Consequently, the text display is possible even when the viewer moves absolutely freely on the plant and comes in the predefined sphere of influence of the information model and is lured. The radius of action (the range) of such models can be adjusted in the range of 10 m to 500 m, either in the dialog box of the properties of the model by entering a value (in meters), or by pulling (Reduce / Enlarge) the shaded circle in the 2D plan window, which symbolises the radius of action.

Railroad X

As parameters for text display in the Properties dialog box of the information models, the following options are available:

- **Alignment of the text block set,** centred, left justified, right justified, scroll display.
- **Scales the text** size of the characters from 0:50 (for half size, i.e. 50%) to 2.0 (for double size, i.e. 200%)
- **Feed speed** of scrolling (only if the orientation was determined as a scroll viewer). The value results from the screen width / time. (0.2 means an advance of 0.2 screen width in a second)
- **Text Color** Opens another window for colour selection of characters.
- **Permanent display** duration of text in seconds.
- **Info bubble** little info bubbles rise above the model (similar to the smoke character principle), which attract the attention of the viewer: "Please come here, I want to show you something special ..."
- **Text to display** in the input box, enter the text to be displayed. A maximum of 1000 characters can be used.
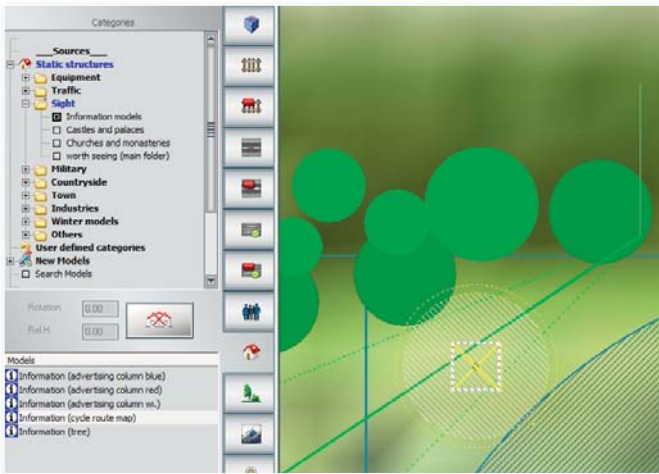
Editing the operating radius of information models in the 2D plan window. It should be noted here that the text to be displayed can also be obtained in the 2D plan window with the right mouse button.

An information model draws attention to itself in 3D
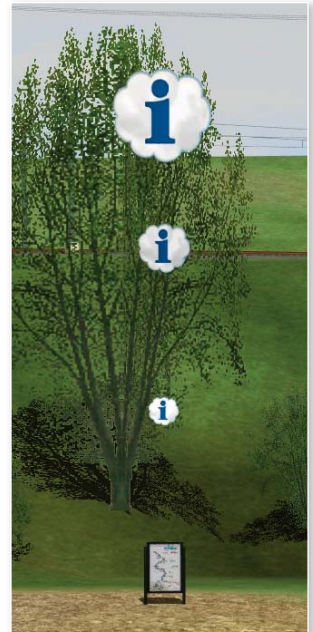
6. Signal controlling

6.0 The Signal controlling
From your experience and knowledge so far, the following is clear: Everything that runs   automatically in EEP 7 is controlled by the signalling system. Be it trains, camera movements, fire service deployment or the loading of goods, each step is executed by controlling signals.

Many of the details that were discussed in passing in the previous sections shall now be discussed in full detail here. Signals are used to control vehicle movements and to design and automate safer traffic flows. A signalling system usually consists of a main signal and a pre-signal. In EEP, barriers at level crossings are treated as railway signals even though are not considered as such in real-life train systems. Just as traffic flows are controlled using signals, vehicles may also be influenced by signal settings. An example in real-life train system are automated block sections. All automated flows in an EEP layout, no matter whether they relate to signals, switches, vehicles, constructions, the camera or specific audio backdrops, are controlled by contacts which can be set and defined within the Signal Control Editor. The *signal controlling area* is the main control centre that controls all automatic flows in the layout.

> # NOTE
> The Help menu contains the complete signal book of the DB AG as a PDF file that you can load at will, study and print. Just look into it, it's worth it!

6.1 Creating signals
Signal controlling is managed by the Signal Editor which you can select and open in the Editor list of the 2D Plan window. The Signal Editor manages the signal model catalogue and is responsible for allocating the contacts. The editor screen is arranged as follows: Between the categories and files in the upper section and the models in the lower section, buttons for the Contact Tool are located next to the relevant drop-down lists.
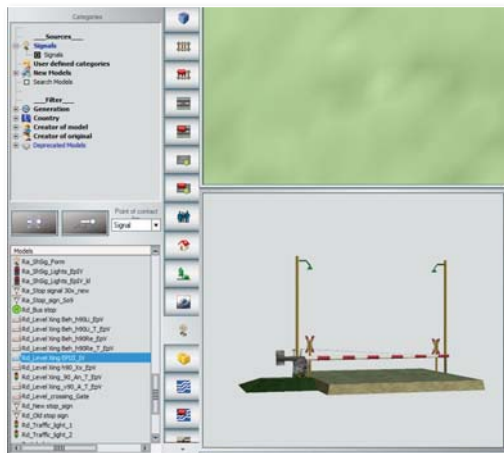

Positioning signals:
Signals are selected and positioned in the same way as with other models. Once you have selected a signal using the preview, you can place the signal by simply clicking with the mouse in the desired section of the track system. Since all of the signals are linked to routes in accordance with their definitions, they can logically only be placed on route modules.

The category is selected by double clicking

Railroad X
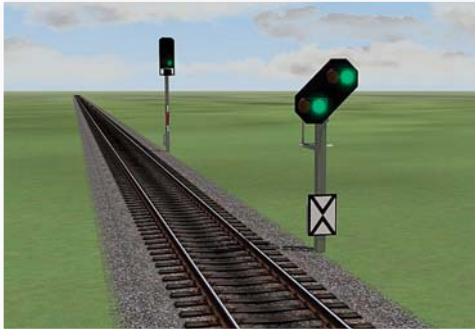
Signals in the 2D and 3D view

Pre- and main signals are indicated by the two symbols in the 2D Plan window. The signal arm represents the main signal and the pre-signal is represented by a dot. Both symbols can be selected in the 2D Plan and Radar windows using the mouse and then moved along the route module by holding down the mouse button. If you move a pre-signal past the main signal, the two objects switch by 180° and are automatically placed on the other side of the route, which naturally means they then apply to the oncoming traffic in the opposite direction of travel. To insert a signal into the 2D Plan, Radar or 3D windows, simply click the sensitive area of the signal while holding down the Shift key.

So far, signals were automatically placed to the right of the track (i.e. in the direction in which the tracks were laid). This has changed since EEP 8. In 3D mode, you now have the option to place your signals along the track direction or on the left of the track in the opposite direction without the warning signal from the main signal needing to be moved away. To set up a signal from the track to the left, click targeted to the left half of the track. You should zoom the camera in the 3D view as close as possible to the track, so you can distinguish the left and right halves. Just as the position can be the distance between the signal and the position of the Zughalts in the 3D view, determine, so far as you had in the plan view, and thus decide relatively abstract, at what distance from the signal the trains to come to a stop. In the *Object Properties* dialog, which is accessed via the object menu of the selected signal, you can set the *retention distance* and at the same time, set how many seconds *start delay* of train after switching the signal to start again.
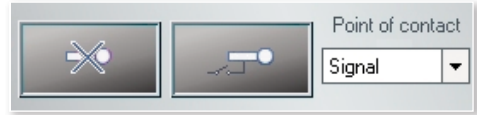

In the 3D window, the fine adjustment

6.2 Positioning contacts

6.2.1 Signal contacts

For a signal to automatically fulfil its function, it must be assigned to contacts.

Signals can be positioned just as easily as contacts:
• Activate the signal to which you want to allocate a contact point by clicking it with the mouse.
• In the contact list of the Signal Editor, select the *signal* contact and click the button (right) to activate the contact tool.
• Now click on the section of track where you want to insert the contact.

As with the signal, you can subsequently move a contact if it is not in the right location. Contacts can be positioned quickly. The settings used to determine how and when the actions linked to the contact are to be triggered require more consideration. The settings to be made for each contact are defined in the Configuration menu that you open by right-clicking the selected contact.

Use the *Signal Contacts* Configuration menu to specify:
• the direction from which the train has to come in order to trigger the contact
• when the contact switches
  – On *every* train (or only every 2nd, 3rd, etc.)
  – With what *delay* (in seconds)
  – At the *end of the train*
• Which *vehicle* / on which route the contact is to be triggered
• Conditions under which the signal or switch switches the contact *(if it is a signal/contact #)*
• *Effect,* i.e., the setting that the signal should take on when the contact is passed.
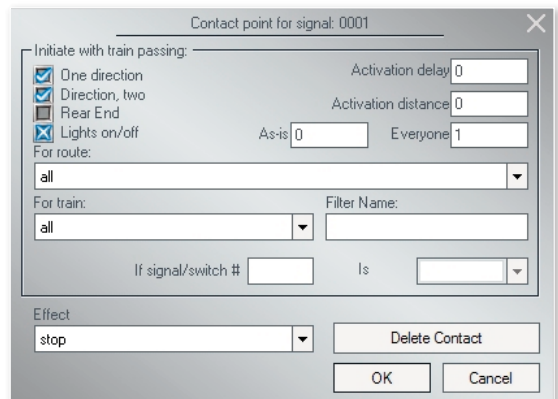
Railroad X

The contact that you configure in the configuration menu can be triggered according to your requirements or randomly. With the latter option, there will likely be a few surprises as the vehicles move. To activate the internal random generator, you must ensure that no train, not even every second or third passing train is set to trigger the contact. Why? Because the contact should be triggered randomly. You can set this by entering zero (0) in the Every entry field.

In Railroad X Expert: activation distance at contact points
By popular demand, the so-called "activation distance" was introduced in the contact points' dialog box. This is an additional distance (from the point of contact measured in metres), which has to be covered by the rolling stock so that the actual action of the contact point is raised.

The *If signal/switch #* function makes it possible to link contacts for controlling signals (and switches, vehicles, constructions, sounds and cameras) to the logical condition "if" according to the "true" or "false" criteria. This means that the action linked to the contact will only take place when the condition is fulfilled. If the condition for a contact is not fulfilled, the contact will not trigger the action.

In principle, you should now understand how signals are placed and controlled using contacts. You will find out how it actually works when you put it into practice.

Activation distance at contact points (for vehicles)

Important: Please ensure that logical conditions can only be set when they have been assigned to an ID number. This includes all signals, switches and double or single crossing switches whose consecutive ID numbers are shown in the Plan and Radar windows. This number must be entered without the initial zero!

To gain experience, first of all create a simple signalling system:
- In the Railway editor, create a simple track circuit.
- Switch to the Signal System Editor and select a signal to insert into a suitable section of the layout plan.
- Highlight the signal and select the signal contact from the Contact List of the Signal Editor.
- Next, activate the contact tool by clicking the button (right) and position two contacts in the layout plan between the pre- and main signal or just after the main signal.
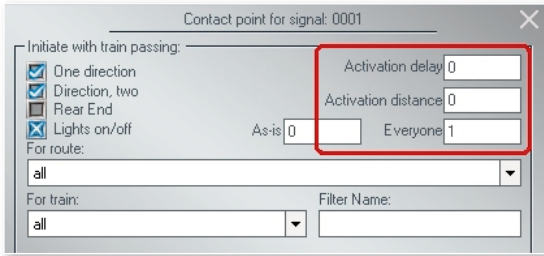
Enter activation delay here.84

This is the end of the first stage. In the second stage, you specify the actions that will be linked to the two contacts:
- First of all, select the contact located between the pre- and main signal.
- Next, open the configuration menu by clicking the selected contact.
- Select Direction 1, in the Delay activation field enter the number 20 and select the Free effect. You may ignore the remaining settings.
- Configure the second contact located after the signal according to the same principle.
- Now reactivate Direction 1 and the End of train option and for the second contact select **Stop**.
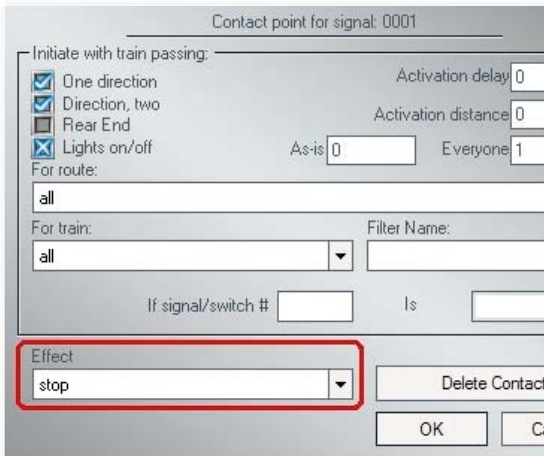
And that's it. When you now set the signal to Stop by clicking with the mouse and holding down the Shift key, the signal will be ready for controlling purposes.

What happens? When a train in automatic mode approaches the signal indicating "Stop" from the specified direction, it brakes and comes to a stop at the main signal. After the preset delay of 20 seconds, the signal switches to "Free" and the train continues. Once the last wagon has passed over the second contact, the signal switches back to "Stop" until the next train arrives and so on and so forth …

As you can see, you can create an automatic stop at a station using two contacts. If you have previously used a real model railway, you will almost certainly be aware of similarities in the way that these signalling processes are executed.
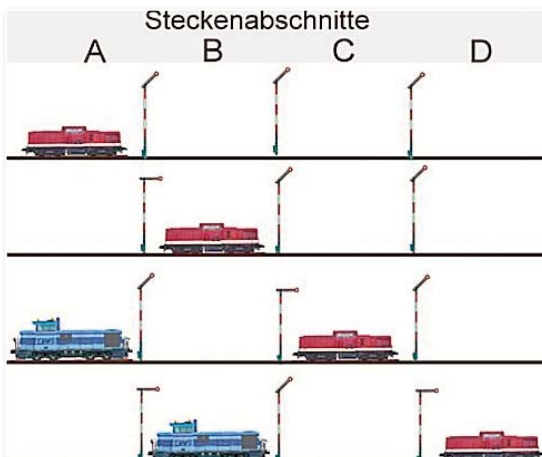
Level crossings:

As with signals, level crossings can be fully automated using contacts. A level crossing in an EEP layout has two barriers, one for each direction of travel. It is important not to place the level crossing too close to the point where the track and road cross. Otherwise, you risk placing the level crossing onto the track instead of the road. You can prevent this by subsequently moving the level crossing to the correct position. With level crossings it is important that the pre-signal of the second barrier or set of stop lights is moved in front of the main signal in order to secure the opposing direction of travel of the road traffic.

The contacts for the automated control must be set and configured individually for each of the barriers or set of stop lights. The contacts should only ever be activated for one direction of travel each. A fully automated level crossing secured on both sides of a single track line therefore requires the placement of eight contacts which ensure that the barriers close when the train approaches and open again once it has passed.

Block sections:

The control mechanism for contacts also allows you to place block sections. This includes sections on the free routes which are sub-divided into several block sections. This sub-division should ensure that individual block sections are only ever passed by one train at a time. This is realised using so-called block signals which are controlled by contacts. The flow can be pictured as follows: When a train passes through block section A and enters block section B, it switches block signal A at the end of block section A to "Stop" by passing over a contact, thus ensuring that the following train cannot enter block section B. When the first train then leaves block section B and enters block section C, it passes over another contact of block section A. According to this configuration, this contact switches block signal A to "Free" while another contact switches block signal B to "Stop" and so it continues. The planning and construction of a well-conceived signalling system with block section protection can prevent head-on and rear-end collisions.

Schema der Blockstreckensicherung

this list in the respective Properties dialog, which you open in the 2D Track Editor or in the 3D editor for roadways with a right click on the switch drive. If a switch drive has one or more contact points assigned, they are displayed in the list. After selecting a point of contact, click the Set button to begin editing the contact point.

6.2.3 Sound contacts

Contacts for sound can be used to assign typical sounds and noises to vehicles and constructions in the form of *.wav files.* These sounds include locomotive whistles, the clanging of a tram, the wailing of a fire-engine siren or speaker announcements on platforms. Thus, you can announce upcoming events before they actually occur – provided of course that the speaker is switched on! For example, to insert a sound contact for a horn or locomotive whistle into a track system, first select the section of track where you want to place the contact. Then, in the Signal Editor list, select the sound contact and click the button (left) to position the contact. When a train passes over the contact, the *.wav file* will be played back automatically.

This file is selected from the Contact Configuration menu where you can also define the other settings. Click the Insert Sound option once to open the folder containing all of the available sounds that can be played back at a controllable volume. Any other *.wav files* stored on your hard drive can also be transferred and inserted.

6.2.4 Vehicle contacts

Automatic control of vehicles using contacts is a topic we have already touched on several times and that every EEP user will encounter repeatedly. Here, it is the **main topic** that occupies model railway builders and computer-based railway simulations. Vehicles play a key role in the automation of an EEP layout as they pass over the contacts and trigger the associated actions. In the same way that vehicles set automated flows in motion, they themselves can also be set in motion through automation. As with signals, turnouts, constructions, sounds and cameras, this is realised using contacts allocated to the respective vehicles in order to automate specific flows. To position a vehicle contact on a route, switch – as usual – to the *Signal Editor,* select the point in the 2D Plan window where the contact is to be positioned, select the type of vehicle in the contact list and click the button (left) to position and configure the contact.
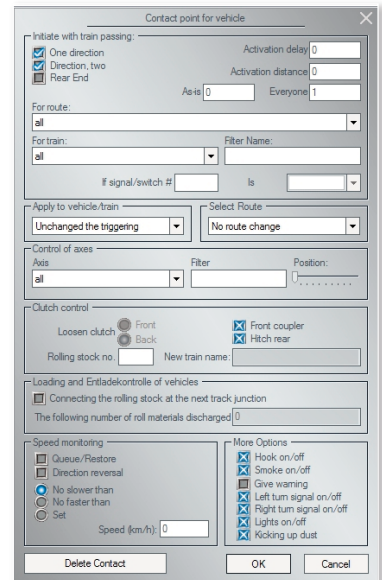
In the Contact dialog for vehicles, start by entering the general settings common to all contacts. These pertain to *signals triggered by passing trains,* vehicles and the route. Once you have specified the basic settings, you can specify the advanced options pertaining to the control of the automatic vehicle, namely:

• *Coupling controlling* for train runs
• Controlling *loading and unloading*
• *Speed monitoring*
• *Controlling moving axes*

You can also define a logical condition that is to be fulfilled before the contact actually switches.

Via the dialog window of the signals, a logical direct connection to another signal or a switch can be made simply and directly without the aid of contact points. In this way, logic operations with an "If" condition can be produced, as is the case with the contact points for switches and signals, but without providing contact points. This reduces the number of the monitored pulse (contacts) and simplifies the circuits.

With the direct connection between switching signals can block routes and flanks assurance easy to implement and form chains of signals and points that can be connected as a switch routes at station entrance and exits. Not sure what this sentence means!

To establish a logical direct connection to a signal, you open the object dialogue by right-clicking on the respective signal and within the interconnection field to another signal / switch, type the ID number (without leading zeros) of the signal or the switch to which the direct connection should be made. In the left side menu, select the signal image that defines the if-condition as a prerequisite. Similarly, you also determine in the selection menu to the right, the signal image or the switch setting, which is connected to the signal and the position should change when the condition is met.

The coupling control discussed in the previous section also applies to train runs so that entire train sets can be coupled and uncoupled. This makes it possible to automate typical railway operations such as separations or changes in direction. Separation means the timetabled division of a block train into two or more sub-trains which then continue to travel on different routes or which terminate. Changing direction refers to the change of direction of a train at a railway terminus. This is achieved by shunting the power train to the other end of the train, or coupling to another power train before returning on the same route.

The **coupling control** options used when passing over a vehicle contact determine how many units should be uncoupled at the front or the rear. You can also give the separated train section a new name so that it can be integrated into existing routes and timetables. The Release coupling – coupler front / coupler rear option is used to give a new name to the front or rear part of the block train. The new name corresponds to the name entered in the contact. If no name is entered, the former name is applied and suffixed with a consecutive number, which carries on counting – provided one already exists.
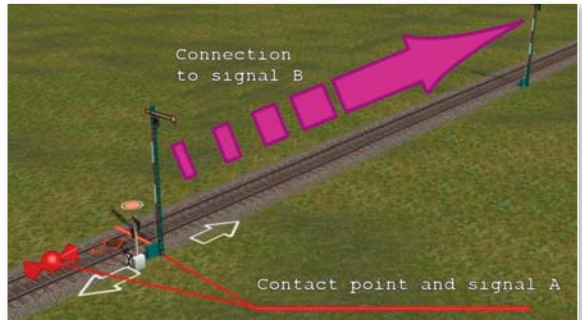

The speed monitor is defined by specifying minimum and maximum speeds that are not to be violated. If you activate the **Configure** option, the specified values must be adhered to exactly and not approximately.

If you select the **Return** option, the train will begin to travel in the opposite direction when it passes over the contact. This is an elegant way to deal with shunting and turning!

Finally, vehicle control also includes the loading and unloading control for freight transport and the controlling of moving axes. All these controlling mechanisms – which you have already come across in the examples of various functional models – may also be automated using contacts.

The contact point control of vehicles is extended to include additional options in the Expert version of Railroad X. Active is the first remote control of vehicles option by other vehicles. In this case, the vehicle does not need to trigger the contact points by itself, but only respond to the control pulses of the other vehicles, which perform the remote control.This type of contact point control is recommended especially for larger loading and unloading scenes, in which the often very high number of contact points can be placed alongside a longer route control, which improves both the overview and the differentiation of the control pulses. However, all other actions that can be triggered by remote control to control the vehicle support (e.g., the switching on and off of the lights, the lowering and raising of the pantograph or control of the speed).With the remote control there are at least two vehicles
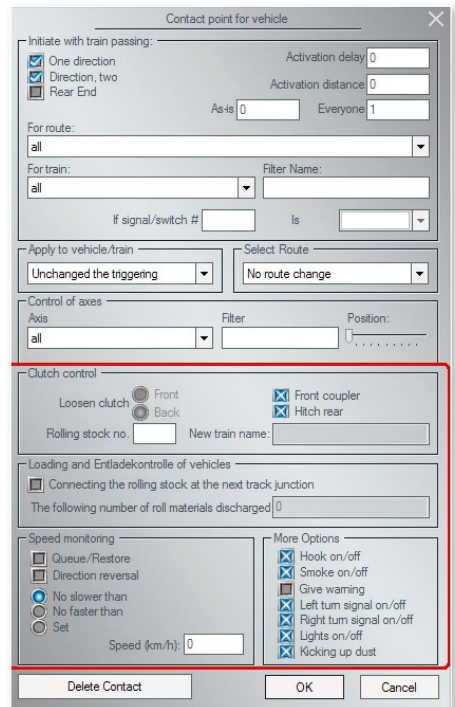
in action (one that triggers the action, and one that responds to the action). Thus, the new drop-down menu on the *vehicle / train use* was inserted in the contact points dialog for vehicles, where the target vehicle or the Train consist can be determined.

In addition, the contact point control for vehicles has been enhanced by the new option to turn on and off the flashing lights in the contact points dialog. If the check mark is set, the turn signal lights (left, right or both) is on, and if it is not set, it is turned off. If the check mark appears in front of a grey background, the flashing function is automatically controlled by the program.

Also new is the option of stirring up dust, which can be triggered by vehicles on dusty fields due to bumpy roads. Where precisely the dust is swirled up, depends on the manner of construction of the vehicle.
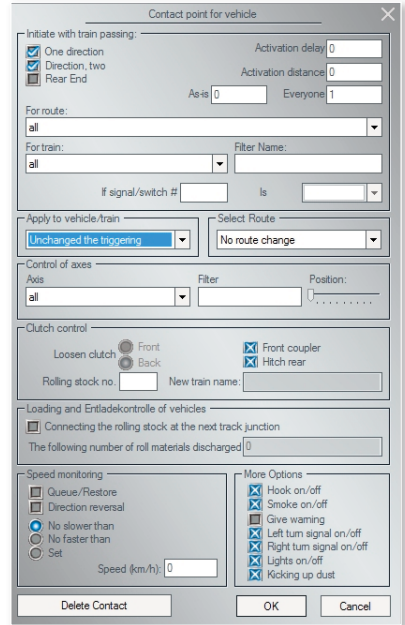
6.2.5 Copy contact points in 3D

In the 3D editor of the Expert version it is possible to copy each selected contact point in order to accelerate the creation and edition of return control sequences. The actual copying operation is performed as follows: First, with the left mouse button you select the contact point to be copied (it starts to flash), and then you click on it with the right mouse button to open the edit menu. Now select the menu entry *contact point copy from.* The copied contact point is instantly inserted into the centre of the track, so at this point, which is automatically selected also when setting up a new contact point in Railroad X.

When you copy the contact points, two important facts should be noted:
1. Should you want the copied contact point also have been placed in the middle of the track, then after copying there will be two identical contact points in the same place. In general, it is thus necessary to move one of these contact points something in order to then edit it.
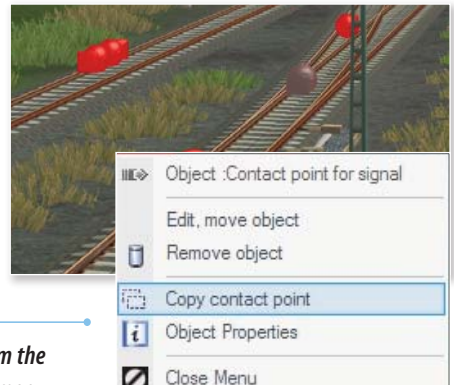
Copy a contact point in the 3D Editor from the right-click menu

2. Since it is a copy of a contact point, the pasted contact point has absolutely identical settings to the one it was copied from. In this regard, you should of course make other different settings because a duplicate of the primary contact point makes no sense.

6.3 Routes and timetables

If you want to specify the duration of a flow, automated vehicle movements can be controlled to a certain extent behind the scenes by a timetable. Routes can be used to determine the following for example:

• Regional services stop at a station while the ICE continues on its journey without stopping,
• Regional and intercity trains take different routes,
• Goods trains can bypass stations,
• Trams and buses do not travel along the same road,
• Buses in laybys change lanes and stop while cars and other vehicles continue onwards.

In order for these and other traffic rules to function and run automatically, these flows must also be pre-programmed. As a minimum, this requires that the routes are already defined. If certain pre-programmed flows are to start regularly at a specific EEP time, timetables must be created.

6.3.1 Defining routes and timetables

In order to operate rolling stock according to the subsequently created timetable, you must first of all specify the routes. However, it is not necessary to set up a timetable for an automated route. This is only necessary when you want a minute-by-minute operation. Otherwise it is sufficient to manage it using just the contacts.

You must be aware that: Routes relate to common transportation routes that may be travelled by several and various types of vehicles. The definition of a route makes it possible to switch all contacts for signals and turnouts for all vehicles operating on the same route rather than for each vehicle individually! The menu bar contains a separate menu for defining routes that can be opened in both the 2D and 3D views:

• In the **Route menu** select the Edit **route menu** item and then the New route option in the following dialog.
• In the Edit **route name box,** enter a meaningful name for your route and click Add.

Your entry will then be added to the list of routes and deleted from the input box so that you can define and add other routes to the list in the same way. Once you have entered all the routes, click OK to confirm and close the dialog. To change or delete an entry, select the route you want from the list. The Add option automatically becomes Edit. In this mode you can edit and delete confirmed entries.

Once you have defined the routes, added them to the turnouts in question, added vehicles and assigned these vehicles to the relevant routes, you can begin with automatic operation.

6.3.2 Defining routes and timetables

As already discussed, timetables only have to be created in order to automate flows according to specific times. Once you have defined the routes, added vehicles and assigned these vehicles to the relevant routes, you can define a timetable if required:

- Click the **Timetable option** in the **Route menu.**
- In the following dialog, select the vehicle for which you wish to create a timetable and click the **Add button.** This opens an entry field with the entry **.New timetable #1.**
- Overwrite this entry using an identifiable name.

Once the timetable has been created, you must first select the time and route and then define the signal and effect. This assigns the signal to the selected route and the intended control effect to the specified time.

Proceed exactly as follows:
- First of all, specify the signal – in our example the signal with the ID 0010 – and select the **Free** effect.
- Determine the time at which the signal should be switched to "Free" – in this case **08:01:01 EEP time.**
- Select and activate the route. This ensures that the contacts positioned along the route only react to the vehicles to which that route has been assigned.
- Finally, click **Add at the bottom right of the dialog.** The first timetable entry will then be applied.

Continue to add entries in this same manner until you have completed an entire timetable for the automated train operations in your layout.

Since schedules usually consist of recurring actions that differ mostly by the timing of each dispatched action, there is a copy function. Thus, complex schedules can be created without recurring actions having to re-entered again and again. When you paste a copied schedule action, additional time of 10 seconds is automatically added so that the copy is indistinguishable from the original schedule action. The entries copied on the Roadmap can be customised, both in terms of trip time, the route and the signal ID and the effect to be achieved. The copied items can be used in multiple schedules of the system.
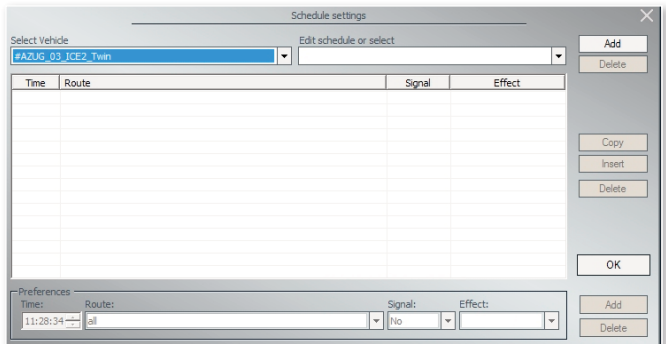
7. Settings and Support

7.1 Program settings

The program settings relate to the functionality of the program and the quality of the screen display. The particular options that you activate, deactivate and/or adjust individually influence the appearance and therefore the quality of experience of the virtual model railway. However, they may also place considerable demand on the processing power of your computer. Whoever is enticed by the fascinating potential of detailed computer graphics may have to pay for this under certain circumstances with disproportionately large computing times and loss of performance. It is therefore worth weighing the options and keeping both in mind – excellent graphics versus general performance. The settings and adjustments in the program settings can be opened in the dialog of the same name via the File menu or using the tool button in the toolbar.
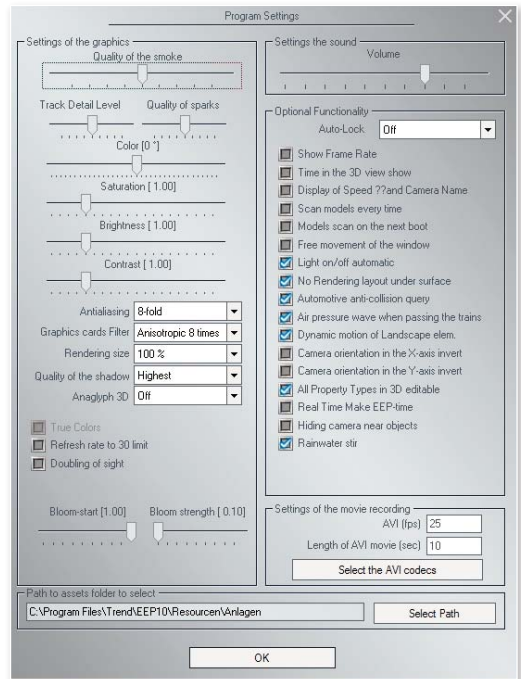
The largest area in the *Program settings* dialog is occupied by the graphics settings which should be checked with particular care. Many of the options new to Railroad X appear in the graphics area and these are highlighted in colour for quick identification.

Smoke Quality

The more smoke particles emitted, the more impressive the clouds of smoke appear, yet the greater the computing time.

Track Detail Level

The further you drag the slider to the right, the greater the level of detail and the finer the representation of the bends in the track, but the greater the demand on your graphics card.

Spark Quality

A range of vehicles produce sparks – from the wheels, catenary or smoke box (on steam locomotives). Sparks are no longer merely enabled or disabled, they can also be gradually added using a slider. This correction function, which makes it possible to balance out the tonality in a colour space, is new to EEP 7 and can be switched on and off. If the function is marked with a tick in the checkbox and therefore activated, the intensity of the correction can be increased or decreased using the slider.

Important:

The settings made here determine the final appearance of the layout, regardless of the current setting of the monitor. If a slider ist active a change of attitude will at any time be reset to the default settings by pressing [Pos1] or the [Home] key respectively.

Anti-aliasing

This function, which is activated via the respective option in the graphics card and can be switched on and off in Railroad X, smoothes out the annoying step effect by aligning the colour across neighbouring pixels.

Graphics card filter

This option is new to EEP 7 and relates to the texture filtering, which can be deactivated or activated at varying levels of quality.

Rendering size

This option is also new to EEP 7 and allows you to reduce the computing time required for rendering by up to 50%.

Shade Quality

The casting of shadows – also new to EEP 7 – may be deactivated or activated at low, medium or high quality.

30 frames/second

This setting, which is imperative, limits the refresh rate to 30 frames per second, yet still guarantees fluid image transition.

Doubling of sight

Activation of this option allows maximum adjustable sight in the 3D view to be doubled, but this provokes a significant decrease in the frame rate.

Bloom start/Bloom strength

This lighting effect creates a diffused light with blurred contours, i.e., something like a glow or an aura. The intensity and position of this effect in relation to the depth of the space can be set using sliders.

Sound volume

You can determine the volume of the reproduced sounds using a scroll bar. The following settings relate to the functionality of the program and can be activated or deactivated as required.

Auto backup

If this option is activated, your layout will be saved at regular intervals determined by you. A subfolder is created in the layout folder, which can be used to automatically save the layout. The number of backups depends on the memory capacity of your hard disk. If you want to save larger layouts regularly, it is worth deleting any unrequired intermediate backups to create space on the hard disk.

Display Frame Rate

The frame rate determines how many images appear on screen per second. When this display option is active, a counter appears in the upper left corner of the 3D window that calculates the current number of frames presented per second. A relatively smooth image is achieved at a rate of 17 to 25 frames per second. If the number of frames falls below 17, the image depending on the CPU and graphics card appears unsettled due to the jerky motion sequence.

Please note:

Image wobble indicates that the model density in the area around the layout is so high that the computer is unable to calculate the optimal number of frames. Avoid this by reducing the number of models to be calculated. Delete all the objects which will overload the performance, avoid large collections of models in a small space, thin out and lighten up any forests – this will make scrolling considerably smoother!

Display time in the 3D view

This displays the current EEP time at the top right of the 3D window. This can be set using the Time Properties option in the Extras menu.

Display of speed and camera name

With the activation or deactivation of this option, the camera name and the current speed of each rolling stock is displayed or hidden in full screen mode.

Scan Models on every program start

If additional models are purchased from one of the on-line shops or downloaded free of charge from the Internet, you must "scan" (register) these before opening the program. This takes place, depending on the setting, after each or the next program start. If you do not scan the models, they can be installed but will not be visible in the respective pop-up windows.

Important to know:

After installation of additional models you do not need Railroad X each time to restart! You can scan models in the file command right after installation. After scanning, the new models are at your disposal in Railroad X.

Scan models on next program start

You may register your new models in the program at a later date. This option is usually offered as you will not update new models each time the program starts. It is therefore not necessary for the program to scan the model folder each time it starts.

Free windows management

You are able to move the controller dialogs and Radar window freely around your screen and change the size of the Radar window.

Automatic lights on/off
If you select this option, any rolling stock with a lighting function will automatically switch on the lights at nightfall in Railroad X, and turn them off at day break. This function only works if the layout runs according to Railroad X time.

Forcing open turnouts
This option allows you to pass over incorrectly configured turnouts.

Load the most recent Railroad X project on start
If this option is activated, the layout you last worked on will automatically open each time the Railroad X program starts. If this option is not activated, the program starts with an empty layout.

Traction unit requires a catenary or conductor rail
This option is used to make the operation of your layouts more realistic. In order to set electric vehicles in motion, the tracks must be fitted with a catenary or conductor rail and the pantograph extended.

No rendering under the layout surface
If this option is active, any objects under the layout surface will remain invisible and therefore not be rendered. This reduces the computing time and improves performance. If you want to reproduce a subway track or observe the operations in a shadow station, you need to disable this feature.

Automotive anti-collision query
By activating this option, the risk that is involved in rear-end collisions in vehicle convoys can be excluded.

Air pressure wave when passing the trains
Enabling this setting causes the camera-eye of the beholder, the air pressure wave passing vehicles is suspended.

Invert camera orientation in the X-axis
With this option, the orientation of the camera in the horizontal direction is inverted.

Invert camera orientation in the Y-axis
With this option, the orientation of the camera in the vertical direction is inverted.

All object types in 3D editable
When this option is enabled all objects are editable, so that landscape objects, structures, driveways and rolling stock can be processed simultaneously in the 3D Editor - regardless of the currently active 2D editor. If the option is turned off, the editing on the object type of the active 2D editor is limited.

Take real time as Railroad X-time
If this setting is enabled, when you save a layout, the real computer time is taken. This means that the temporal stages documented and the lighting conditions can be adjusted automatically during the construction of a layout.

Railroad X

Hiding camera near objects
This option can be used to disruptive landscape objects – e.g. bushes or trees that interfere with the view of a passing train - to make them appear transparent. However, this does not affect the object itself, but only playback through the camera.

Kicking up rain water
If this option is enabled, the wheels of moving cars and other road vehicles spray clouds of rain water,provided that the intensity of precipitation is at least 40%. Unlike dust clouds that are triggered on road vehicles across the contact points, but are limited to specific sections, they are in the rain water clouds to a function that is set globally or disabled for all systems. Users of earlier versions of EEP may miss the option for needing to track electrification on locomotives in the settings dialog. This is now located under *File -> system information.*

Note on the toolbar display mode
With this program option inactive buttons hidden dynamic in the toolbars. If the option is not set, the buttons for the usual display scheme are simply greyed out, i.e. shown as inactive. Railroad X offers you the ability to create small video movies from your layout. The settings for the movie pictures are in the program settings dialog.

AVI (fps)
In order to achieve an optimum reproduction, which can later be recoded as DVD videos, it is worth choosing a frame rate of 25 images per second.

Length of AVI sequence
The length of the film in seconds should take into account the processing power and memory capacity of the computer. Selecting the AVI Codec. Clicking with the mouse on this button opens a small dialog window where you can select the compression program. As a rule, several codecs may be available depending on which programs are installed. Selecting the Full individual images (uncompressed) option from the drop-down list will give you the best output. However, depending on the selected video length, videos in this format require several gigabytes of hard disk space. Uncompressed videos are especially recommended as source material if they are to be written to CD or DVD.
Once you have specified the frame rate, length and compression, you can close the Program settings dialog and start recording the video by pressing the [F12] + [CTRL] key combination. The finished film is saved in the EEP installation folder.

! CAUTION
Any recordings made in travelling mode will be interrupted on the first change of camera due to technical reasons. Screenshots in the 3D view can be taken using the [F12] key and stored in BMP format in the EEP directory.

7.2. Hotkey-Table

Please make sure when using the keys that you are in still in the window, e.g. mouse over the 3D view when switching camera angles.

Mouse navigation

Scrolling in Plan or in the 3D view	mouse wheel to rotate the image border
Zoom / DeZoom in Plan or in the 3D view of	mouse wheel in the center of the image
Select a category: - Source / Filter	double click
Selecting Objects	left click (note mode, menu bar, control dialogue)
Exclamations of dialogue boxes	right-click on the object activated

Generally

F1 **Help**

Alt + Letter **select menu items**

Alt + F4 **application in the background**

Alt + Esc **quit / exit application EEP**

Plan Window

← → ↑ ↓ **scroll arrow keys**

Del **delete selected object**

F5 **switch to 3D thumbnail**

Num + — **to decrease scale**

Num + + **to increase scale**

Railroad X

3D windows

F4   **Full screen mode**

F5   **Switch to the editor**

F7   **Controls and layout windows**

F8   **Maximize window**

F9   **Separate camera from the vehicle**

F12   **Screenshot of the 3D view**

Ctrl + **F12**   **Creating AVI movies**

Esc   **Off Full screen view back to the window view**

← **→**   **Camera pan left / right**

↑ **↓**   **Tilt camera**
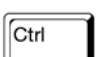
Ctrl + **←** **→**   **Left / right camera move left / right**
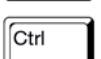
Ctrl + **↑** **↓**   **Up / down Move camera forward / back**

Spacebar + **+**   **Camera forward**

R or **−**   **Move camera backward**

PgUp   **Position of the camera increase**

PgDn   **Camera viewpoint reduce**

Pos1   **Centre camera on origin**

Key	Function
F10	Interrupt camera control via contact points
1	Camera driveview from left
2	Camera drive view from right
3	Camera drive view from the top left
4	Camera drive view from the top right
5	Switching to follow cam Camera drive look back
7	Switching to follow cam
8 or **0**	Switch to cab view
F9	Camera passenger ride on / off
D	Automatic mode: increase target speed forward
A	Auto mode: increase target speed backward
S	Automatic mode: set speed 0
H	Beep
K	Coupling hook rear
L	Clutch condition front
J	Train brake
F	Switching state of switches
G	Switching state of signals
Pause	Pause

Railroad X

In editor mode, object properties of a camera during recording test (3D-window)

Key	Function
F	Reduce focal length
G	Zoom focal length
J	Reduce aperture
K	arger aperture

Control dialogue

Key	Function
←	Scroll Left
→	Scroll right
↓ or PgUp	Scroll to the top
↑ or PgDn	Scroll down
Alt + Letter	Define the hotkey for selection of rolling stock

Radar window

Key	Function
←	Scroll Left
→	Scroll right
↓	Scroll to the top
↑	Scroll down
G	Last inserted load again
Num + −	To decrease scale
Num + +	To increase scale
0	Display the frame rate as a graph, lifting the display
+	Enlarge scale of the graph
−	Reduce scale of the graph

Technical Support

We have tested Railroad X with many and different hardware configurations, so difficulties should not usually occur. Nevertheless, it is not possible to try out all configurations. Before you call our technical support, please provide the following details about your hardware:

• **What operating system are you using?**
• **What processor and how much memory (RAM) does your computer use?**
• **Which DirectX version is installed on your computer?**
• **Which graphics card and sound card is installed in your computer ?**
• **What driver version of the graphics or sound card are you using?**

If you do not have the above information, the DirectX9.x diagnostic program can assist. To do this, click Start - Run and type DXDIAG as a command line. Under the menu system it provides you with the diagnostic program details of your computer. If you send us an e-mail, please send us the DxDiag.txt file as a packed Attachment (packed appendix). To obtain this file, open the DirectX diagnostic program, and then click the switch area Save All Information.

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Internet presence: www.railroad-X.com
                             www.eep.eu
                             www.eisenbahn-x.com
                             www.facebook.com/EEP.Eisenbahnsimulation

Railroad X Website
Whoever wants to find out about new models and layouts to Railroad X as well as the current developments should definitely visit the Railroadd X-website at ***www.railroad-x.com***

Online Community
You will find a professional forum at www.eepforum.de where you will be helped with any questions or problems. ou can also exchange ideas with other EEP users and participate in an interesting world around EEP. Current news and information about the program will be published there directly from the developer..

Railroad X

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