eep

EISENBAHN.EXE PROFESSIONAL 13

MANUAL

Welcome to Eisenbahn.exe professional

With **Eisenbahn.exe professional** ('EEP' for short), you can create complex railway worlds on your PC or notebook. You can edit the terrain, shape mountains and valleys, populate layouts with structures and set up a sophisticated transport infrastructure. The different routes can then be loaded with rail and road vehicles, which can be controlled using an elaborate signal system. Even air and maritime traffic is possible. The focus is, of course, on railway trains with steam, diesel and electric locomotive engines as well as passenger carriages and freight wagons, a wide range of which are available. In addition to high-quality, faithfully reproduced rolling stock, EEP also offers great game depth with endless construction and travel possibilities for layouts.

The complete model railway simulation for the PC was invented more than 18 years ago and has since enjoyed huge popularity thanks to its complex further development. Over the course of many years, the programme has been furnished bit by bit with detailed routes, a powerful signal system, freely editable timetables, an immense selection of vehicles, dynamic weather, automatic day/night cycles, animated characters and animals, and much more.

What's new in EEP 13 ?

1. The programming has been further optimised to support more processor cores, resulting in *EEP 13* running up to 20% faster and more efficiently than before. This has a direct effect on the framerate, especially in densely built-up layouts.

2. The programme's registration routine has been changed and greatly simplified ➜ Chapter 1.2

3. The installation of models has been simplified ➜ Chapter 1.5

4. Adjustable transparency for control, overview and Lua windows ➜ Chapter 2.1

5. Camera orientation by clicking in the overview window ➜ Chapter 3.1.1.2

6. Cross-layer editing of blocks and layer hiding at the touch of a button ➜ Chapter 4.5

7. Random variation when placing landscape elements and structures ➜ Chapter 4.5.2

8. Sound effect for switch points can be switched off ➜ Chapter 4.6.1

9. Animated water effects and floating objects ➜ Chapter 4.6.7

10. New sky effects (vapour trails and rainbows) ➜ Chapter 4.9

11. Gamepad controls ➜ Chapter 5.2.2

12. Gentle coupling ➜ Chapter 5.3

13. Improved vehicle physics for road vehicles ➜ Chapter 5.5.1

14. Assignment of custom sound effects for starting, braking, coupling ➜ Chapter 5.5.4

15. Tooltips for objects and contacts ➜ Chapter 5.6.3

16. Track control panel (TCP) with extension ➜ Chapter 7

Furthermore, many user requests have been taken up and implemented as always. This all results in *EEP 13* being much more than just a continuous development of the software.

The entire EEP team hopes you have lots of fun building model railways!

Licence agreement and warranty

The use of the train simulation *EEP 13* is subject to the terms of the enclosed licence agreement which you must agree to before you can install and use the software.

EEP 13 can only be used once the programme has been registered. The programme is activated upon registration and entry of the purchased personal serial number. Following the initial registration, the user is entitled to activate the programme up to five times per year on new, upgraded or additional computers. These personalised usage rights apply not only to the main *EEP 13* programme, but also to additionally purchased models as the personal customer number is also entered when these are purchased. This guarantees that these models only work on the computer that has been activated using the same EEP serial number and registration number.

All hardware and software names mentioned in this manual are registered trademarks and should be regarded as such. We have taken every care to publish complete and accurate information in this manual, the programme and other information sheets. TREND Redaktions- und Verlagsgesellschaft mbH Deutschland does not assume any warranty, legal responsibility or liability for the use of this information. TREND cannot be held liable for any damage resulting from the malfunction of programmes, circuit layouts, etc., or for the infringement of patent or other rights of third parties resulting therefrom.

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Allgemeiner Hinweis	Auf der Startseite und unter dem Menüpunkt *„Hilfe"* finden Sie ein umfangreiches Video Tutorial, welches Ihnen den Einstieg in EEP erleichtert.

1. Installing, launching and registering *EEP 13*

1.1 System requirements

For the installation of *EEP 13*, the following minimum system requirements must be fulfilled:	• Windows 7 / 8 / 10 • (32 Bit) • Dual-Core 2,5 GHz, • 1 GB Grafik, Pixelshader 3.0, • 4 GB RAM, DirectX 9, • Internetzugang
In terms of performance, the following configuration is recommended:	• Windows 7 / 8 / 10 • (32 oder 64 Bit) • Dual-Core 3,2 GHz, • 2 GB Grafik, Pixelshader 4.0, • 16 GB RAM, • DirectX 11, 5.1-Soundkarte, • Internetzugang

Good to know:
EEP is being continually developed. The huge range of add-ons, plug-ins and models in the EEP online shop is easier and faster to use if you have a fast DSL internet connection.

1.2 Installation (DVD version)

1.2.1 First-time installation (without a previous EEP installation)

.Product registration information

EEP 13 product registration

To use EEP 13 you must register the product. Product registration can be done directly over the internet (an active internet connection is required) or by e-mail. The registration via the internet takes only a few seconds.

Product registration over the internet

Product registration over the telephone

Exit

After inserting the EEP DVD-ROM, launch the programme *'autorun.exe'* on the DVD. Click on the 'Install' button in the autostart menu that appears and follow the instructions.

If you receive security warnings while launching the autostart menu or during installation, you can safely confirm the execution of the programme. After completing the installation, please start *EEP 13*. You can start the pro-

gramme from the autostart menu on the DVD, for example. Now select **'Product registration over the internet'**;

EEP 13 will next ask if you already have a TREND EEP online shop account.

If you do not have a TREND shop account yet, please click on **'No'** and then enter your details in the window that appears. Enter your serial number in the field provided. Now click the **'Register'** button. This requires an internet connection.

EEP will now contact our registration server, which will activate your licence and assign you a registration number (R/N).

Now forward the registration number to the shop via the highlighted link and please write this number down; you will require it if you wish to install additional content with your *EEP 13* licence.
Installation and registration are now complete. The *EEP 13* start screen will appear. Here you can start the demo layout, watch the video tutorial, visit the EEP shop or start your own layout.

1.2.2 Installation with pre-existing version of EEP, from EEP 7 onwards

If you already have a previous version installed on your computer, **from EEP 7 onwards,** and have registered in the shop, you already have a registration number (R/N). This number is used to authorise all programmes and models purchased in the shop and should be maintained across all versions of EEP. In this case, please proceed as follows so that EEP can check and transfer the registration number in your shop account. This will ensure that you can continue using all the models you previously purchased in *EEP 13.*
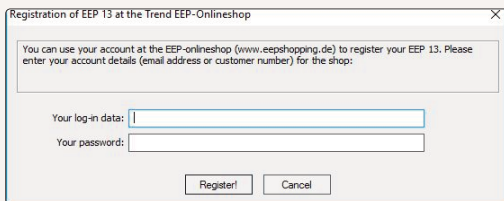
Please answer *'Yes'* to the question in the following dialogue window.
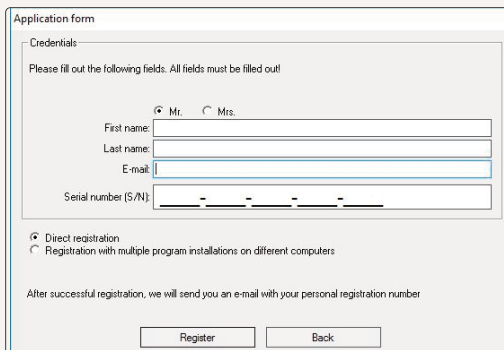
Please enter the required information in the window that appears. Another window will now appear with all of your details already filled in. Please enter your *EEP 13* serial number here and click on 'Register'.

Import resources from previous EEP versions

EEP 13 detected a valid installation of a previous EEP version. Click on this button to import any models and custom made categories into your EEP 11 installation.

Import progress

| Import | | Exit |
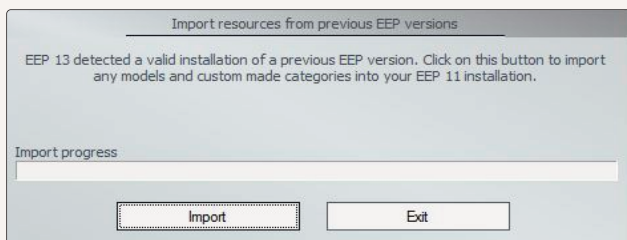
The following window will then appear.

Please click on 'Import' and then enjoy the new features of *EEP 13.*

1.3 Advantage of registering

Why register? The registration process may seem tedious and inconvenient at first glance, but it will soon prove advantageous and helpful as it guarantees that your usage rights are not limited to one computer and are not confined to the one-time registration. By registering, *EEP 13* is initially only activated for the computer on which the programme was first installed. But this does not stop you from using the programme on another computer – for example, a laptop. The advantage of registering: as a licensee, you can make use of up to five activations per year on one or multiple computer with just one serial number. This allows you to

- install and activate *EEP 13* multiple times on the same computer,
- use *EEP 13* on multiple computers simultaneously,
- use additional models and add-ons you have purchased on multiple computers, without having to purchase it again for each device.

Generally, *EEP 13* needs to be activated each time it is installed. If you request a reactivation of a programme you have already registered, the computer on which the programme has been reinstalled will be checked. If this is the same computer as during the initial installation, the current hardware setup will be compared with the setup as it was during the first installation. If no hardware changes are detected, *EEP 13* will be reactivated, but this activation will not be considered a new registration. This ensures that the programme can be installed, uninstalled, reinstalled and activated on the same computer (for whatever reason) as many times as you like, without affecting your right to up to five registrations per year.

This is different if the previously registered programme is being activated on a new or modified computer. If the check determines that the computer is a new one or that the hardware setup does not match the setup during the initial registration – due to the installation of a new graphics card or additional memory, for instance – the programme can be reactivated until the maximum number of five registrations per year has been reached.

These usage rights, which become effective with your first registration, are not just limited to the main *EEP 13* programme, but also apply automatically to additionally purchased models and add-ons for *EEP 13* which, like the programme, are also registered to you personally using your customer number.

1.4. Uninstallation

Please left-click on *Start, Control Panel* and then on the *'Add or Remove Programs'* icon (or if using Windows Vista/7/8/10, click on *Start, Control Panel* and *'Programs and Features').*
Now select the entry for the game by clicking on it in the list displayed. Then click on the button *'Change/ Remove'* (or if using Windows Vista, click on *'Uninstall'*) and then follow the uninstallation instructions.

If using Windows 8, please switch to desktop mode, go to *Settings, Control Panel, Uninstall programmes,* then select *EEP 13* and confirm uninstallation by clicking *'Uninstall'.*

1.5. Installing new models

As the option to install new models has been overhauled, we have provided a separate point for it here. New models, whether these are models purchased in the TREND EEP online shop or free models from a designer's own website, can be integrated into the programme as follows:

Start *EEP 13*
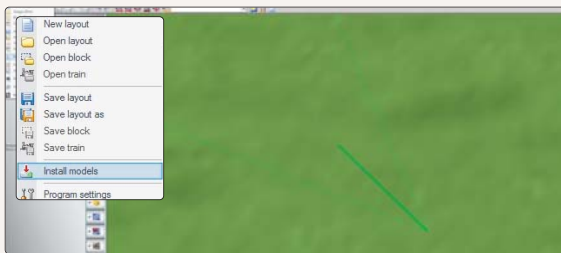
Click on the *'New layout'* button
In the planning window in the 2D view, click on the *'File'* menu and then on the option *'Install models'.*
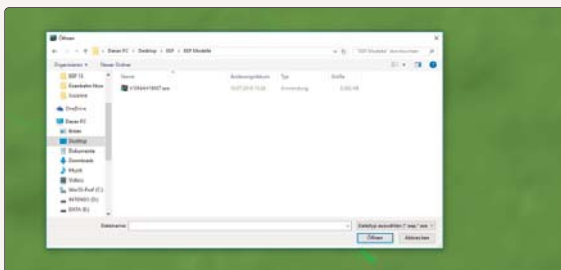
Select the folder where the models you wish to install are stored.

Click on *'Install'.*
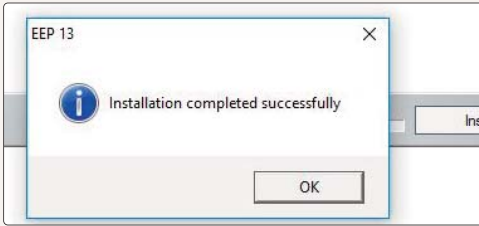
Following successful installation, you will receive the following message.
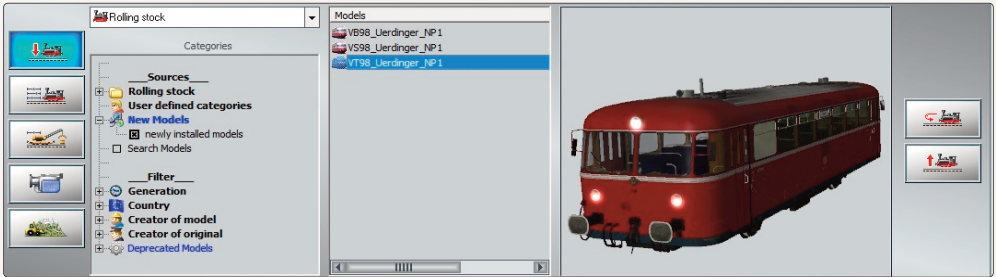
You will find your model in the *'newly installed models'* folder.

You can take it directly from here and insert it into the layout currently open. Thus, unlike in earlier versions of EEP, the scanning of all models before the initial insertion of a new model is no longer required. Scanning is, however, still necessary for models installed in EEP to be sorted into and shown in the correct categories.

2. Screen layout

After successfully installing and registering *EEP 13*, upon launching the programme you always arrive at the start screen, which should offer you all available options. Choose whether you would like to start with a new layout, load your last edited layout or open a saved layout. You can also start the video tutorial.

2.1 The planning window of the 2D view and the 3D window
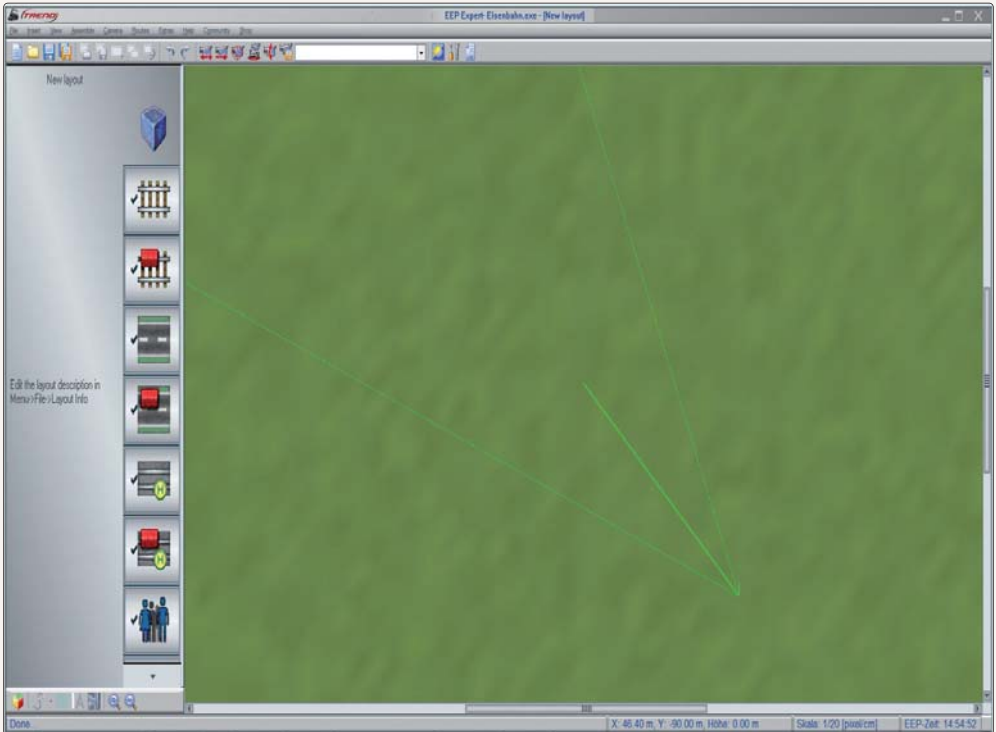
The 2D window (planning window) shows you the layout in a two-dimensional drawing view. This is the view in which you will mainly be planning and constructing your layouts. In the 2D view, you will lay tracks, roads and waterways and also insert most landscape elements, structures, signals and contacts. You can also edit and shape the terrain properties and landscape relief in the 2D view.

The vertical tab bar is particularly prominent, separating the plan from the so-called tool dialogue on the left. The individual buttons activate the respective editing options. They are only presented here briefly. A special introduction to the use of the individual tool dialogues follows later. The display of the layout in the plan changes, depending on the option selected.

> Layout description, full view of the layout in the plan
> Editor for building the rail network for railway traffic
> Editor for inserting track-related elements such as stations and bridges
> Editor for building the road network

> Editor for inserting road bridges, etc.

> Editor for building the tram network

> Editor for inserting tram-related elements

> Insert animated characters and animals

> Structures editor

> Insert landscape elements

> Surface design editor

> Create a signal system

> Insert loadable goods

> Create water and air route, camera rails, telegraph lines, etc.

> Insert water and air route-related objects

> Editor for control tracks and pre-set routes

The results of your construction can be viewed in the **3D window,** which can be accessed via the button in the bottom left. In this mode, you can view and explore your layout and control the traffic manually. Here you can follow the rail transport operations from different adjustable camera angles.

3D Windows
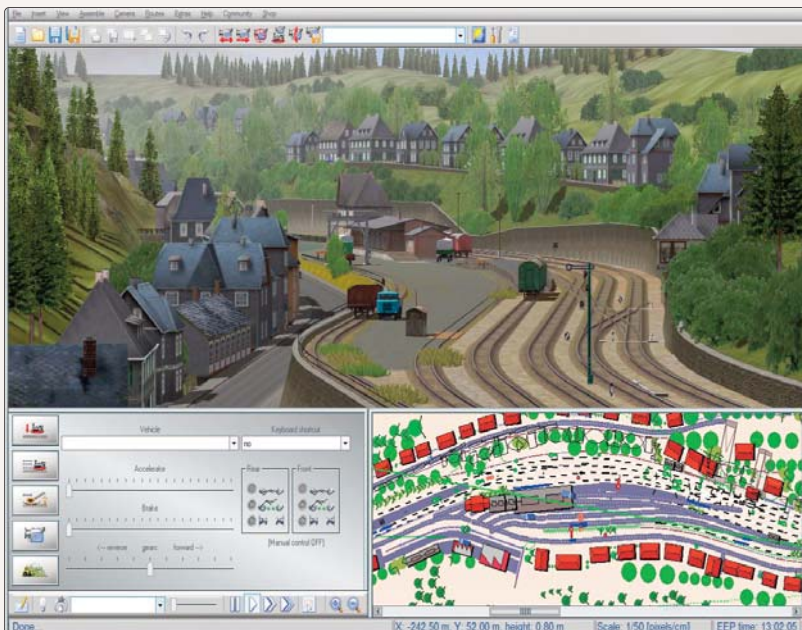
Additionally, there's also a 3D object editor available which you can use to insert and edit landscape elements, structures, tracks, rolling stock and signals directly in the 3D view. There are two additional programme elements docked beneath the 3D view window: on the left you see the *control dialogue* – a control panel with which you can control all rolling stock as well as set the function and angle of the camera. To the right of that, you'll find the *overview window,* which shows the currently selected section of the layout plan and simplifies the controls and the orientation in complex layouts. Here you can set the rolling stock on their tracks (re-track). You can manually control signals and switches not only in the 3D window itself, but also in the overview window.
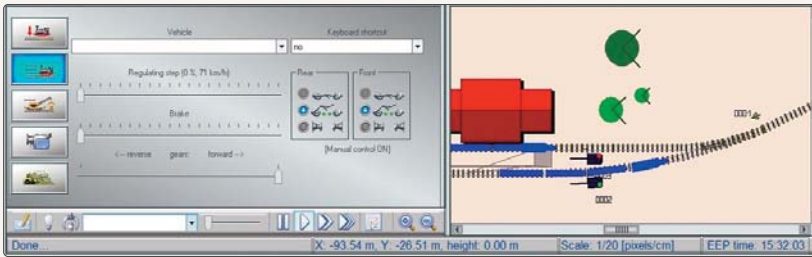
*Control dialogue
and overview
window*

Good to know:
The control dialogue and overview window are docked beneath the 3D view by default, but can be undocked, scaled and moved freely. This can be very helpful if you are working with two screens: on one monitor you are observing the rail operations in 3D view, while on the other you are controlling the rolling stock, switches and signals. The *'Undock windows'* option can be activated in the *programme settings dialogue,* which you can open using the corresponding menu option or by clicking on the button in the tools. When this option is active, you can move the control dialogue and overview window wherever you like, or even make the overview window and control dialogue transparent. You can do this by clicking on the top-left corner of the window and selecting the level of transparency from the context menu. The same applies to the EEP event window in which both system messages and texts created by the Lua script can be displayed (cf. Chapter 6.5 and the Lua manual in the help feature of EEP).

2.2 The function bars

EEP 13 is controlled using menu commands, buttons on control bars and tool bars, and keyboard commands – so-called hotkeys – both in the 2D and 3D views. Features that are only available in the 2D or 3D window are automatically locked in the other view. While the menu always remains visible, the tool bar, control bar and status bar can be hidden.
Most programme features can be activated via both the menu and the tool bar. There are, however, some features that can only be accessed via the menu or via the tool bar.

2.2.1 The menu
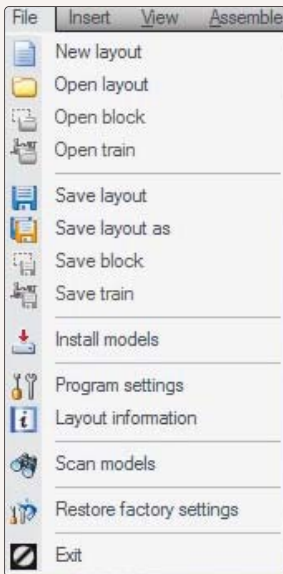
File menu: Via the File menu, you can create new layouts; open saved layouts, blocks and train consists; save open layouts, blocks or train consists; adjust the programme settings; view layout information; scan recently added models and exit the programme.

ATTENTION: If you save your layout using the *'Save as'* feature, you will be asked which object classes should be saved. If you limit saving to individual object classes, it is recommended that you save under a different name. Saving under different names or with sequential numbers is always advisable and – depending on your construction progress – should be done every 10-15 minutes. Layouts that come with EEP, but which have been modified with your ideas, should always be saved under a new name as this is the only way of preserving the original layout!
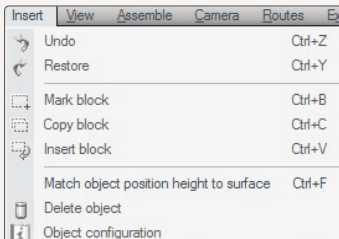
Insert menu: With the commands in the Insert menu, you can undo and redo the latest steps; select, copy and paste a block; adapt the placed models to the height of the surface or delete them; show the dialogue window with the object configuration of a selected model.

View menu: You can determine what is shown on the screen via the View menu: depending on the situation and your requirements, you can display the *2D planning window,* the *3D window,* the *maximised window* and the *3D full screen; zoom in, zoom out, centre* and *automatically scroll the view.* You also have the option to show or
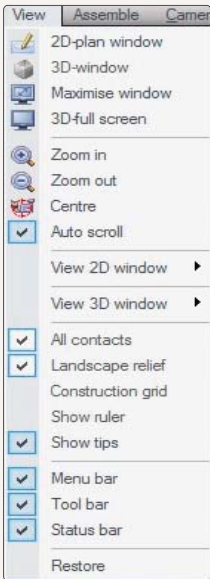
hide the construction grid, objects in various categories, the tool bar, the control bar and the status bar, if required. The settings you choose in the View menu are saved automatically so the programme window will look the same as when you left it the next time you launch the programme.

The menu options *View 2D window* and *View 3D window* allow you to choose which elements are and are not displayed in the planning window and 3D window – and even individually for each editing mode in the planning window. So, you could hide the landscape elements, for example, when you're working in the signal system.

A black checkmark in a button shows you that the layer is currently visible. As an alternative to making this selection in the menu, you can also right-click on the button for each layer to make it visible or invisible.

Layer-Management

Attention:
The settings for the signal editor in the planning window are also used to determine what is visible in the overview window.

Hier ist noch alles zu sehen

All elements in the scene are visible. Now you can adapt this view. Switch to the planning window and select the signal editor. Then right-click to hide the structures and landscape elements.

Landschaftselemente und Immobilien wurden ausgeblendet

Switch to the **planning window** and select the **signal editor.** Then right-click to hide the structures and landscape elements.
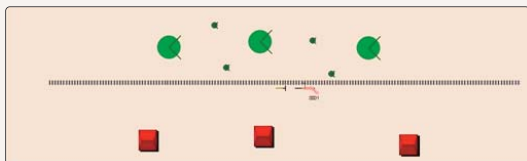
Die komplette Szenerie im Radarfenster
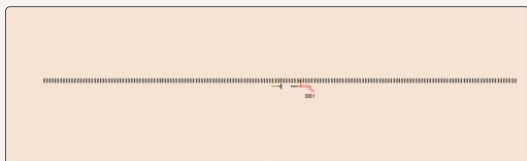
Nun auch hier ohne die Landschaftselemente und Immobilien

You can now configure the view in the overview window to suit your needs.
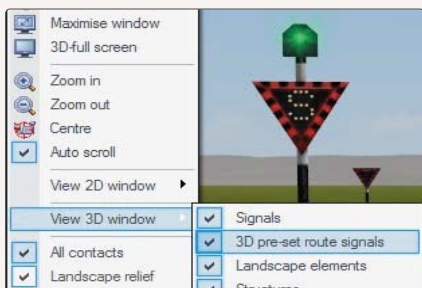
The display of the different object categories in the 3D window can only be changed via the *'View'* menu and the *'View 3D window'* menu option. Here you will find the option to hide the special 3D models for pre-set route signals, among other things.
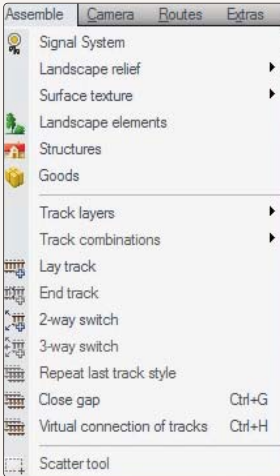
Edit menu:
This menu offers a range of special tools for layout construction in 2D. Here you can load track combinations, calculate track connections or scatter landscape elements in a selected area, for example.
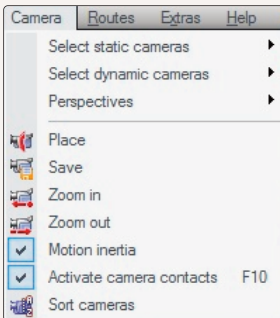
Camera menu:
The *Camera menu* allows you to select a saved *static* or *dynamic* camera, set the *perspective,* set and save new camera positions, and zoom in and out of the 3D view. Additionally, you will also find the *'Motion inertia'* and *'Activate camera contacts'* options (only in this menu), which create a flowing camera motion and an automatic camera change during automatic rail operations.
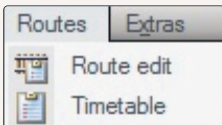
Routes menu:
The *Routes menu* is responsible for the automation of rail operations. You can create a list of route names here which are used as filters in automatic operation or compose entire timetables.

Extras menu:
In the *Extras menu,* you can search for a signal/switch (with known ID) within the layout, change the layout size, change the grid and spline settings, set the EEP time properties for automatic rail operations, and extract resources from the package file. You will also find the *Properties Explorer* (see Chapter 5.2.4), the *Lua Wizard* (see Chapter 6.5.1) and the *Control Panel Editor* (see Chapter 7) here.
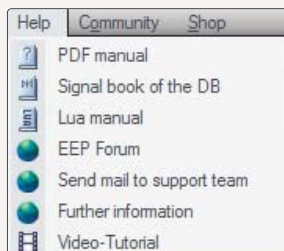
Help menu:
The *Help menu* provides access to the manual (PDF), the 'Deutsche Bahn' (DB) signal book (in German), the Lua manual and the video tutorial. You will also find our technical support here.
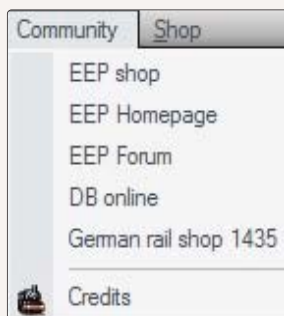
Community menu:
In the *Community menu* you will find, among other things, a link to the EEP forum (www.eepforum.de) where countless EEP users discuss topics relating to the programme each day.
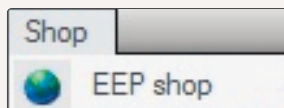
Shop menu:
From the *EEP Shop menu,* you can access the EEP shop, which offers a large number of additional models and finished layouts.

2.2.2 The tool bar

Most of EEP's features can be activated quickly and easily via the tool bar. By clicking the following buttons, you can quickly access the following core functions.

1 Start a new layout

2 Open a saved layout

3 Save the open layout in its current state (this replaces the previous version)

4 Save the layout under a different name

5 Open a saved block

6 Save the open block

7 Select a block

8 Copy the selected block to the clipboard

9 Insert the copied block

10 Undo/Redo

11 Bring camera closer

12 Pull camera back

13 Centre planning window (2D view) or overview window (3D view) on the current camera position

14 Align camera to the rolling stock active in the control dialogue

15 Set up camera in the planning or overview window

16 Save current camera position

17 Activate saved static or dynamic camera positions

18 Configure environment settings

19 Adjust the programme settings

20 Lua script language

2.2.3 The control bars

While the top tool bars of the 2D and 3D views are identical, the bottom tool bars (bottom left) are different as they are geared towards each view. Only the zoom buttons are identical but they relate to the 2D plan on one hand and the overview window in 3D mode on the other. In the planning window, this bar is predominantly used when precision is required.

The bottom tool bar in 2D view:
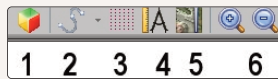
1 Switch to 3D view

2 Use the spline function (for positioning masts, lanterns, etc. on tracks or roads)

3 Show or hide the grid display

4 Show or hide the protractor

5 If landscape relief is turned on: show ground texture;
   if landscape relief is turned off: toggle background colour between black and grey

6 Zoom in or out of the 2D window

The bottom tool bar in 3D view:

| 1 2 3 | 4 | 5 | 6 | 7 | 8 |
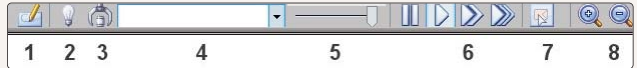
1 Switch to 2D view

2 Switch the lighting on or off in active rolling stock

3 Grab and load goods such as containers, crates, etc. with special cranes

4 Selection box for moveable axes, such as doors, tailgates, crane jibs, etc. (if available on the selected model)

5 Control moving parts on rolling stock

6 Time-lapse function (fast run-through of pre-set sequences)

7 Selection of editable objects

8 Zoom in or out of the 3D window

2.3 The gizmo (manipulator)

Using the gizmo will greatly simplify the construction of your layouts. You can already identify most of the features in the following picture.
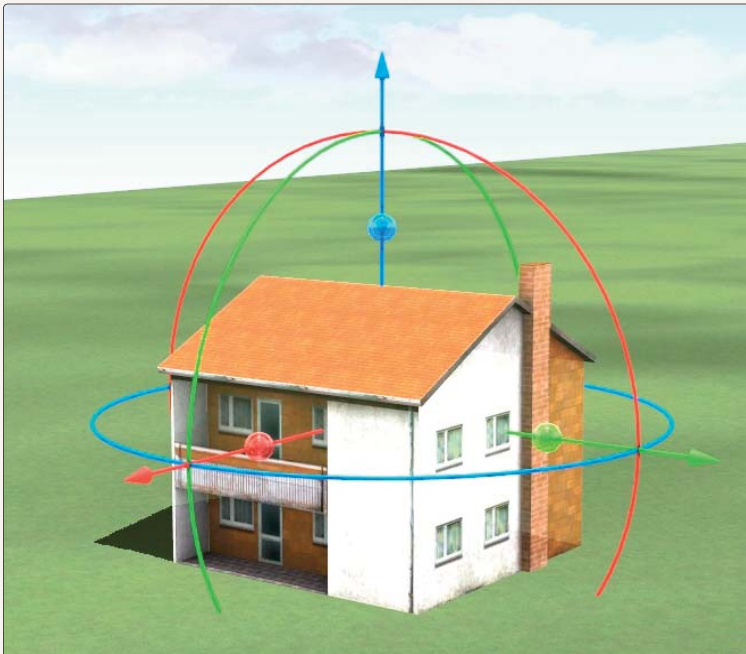
Der Gizmo beim Platzieren einer Immobilie in der 3D-Ansicht

You can 'grab' the gizmo's coloured elements with the left mouse button and realign your model. The gizmo's three arrows are for the precise positioning of a model along an axis. Models can be rotated using the rings. And the beads (in the middle of each arrow) are used to scale each axis. If you would like to enlarge or shrink a model as a whole, please use the blue bead while holding down the [Ctrl] key.

Attention:
You can temporarily deactivate the gizmo by holding down the [Shift] key

Tracks have two gizmos – one complete at the start of the track, and one without rings at the end.
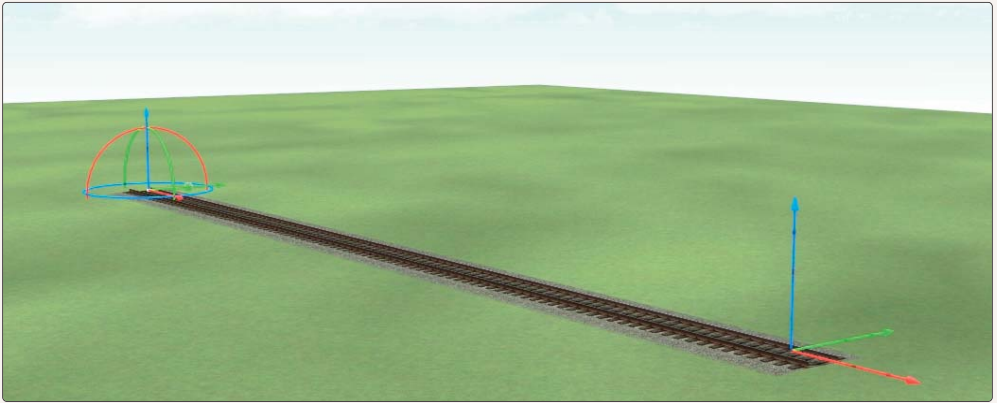
Gizmo-Einsatz beim Platzieren eines Gleises in der 3D-Ansicht

2.4 Navigating with the mouse in the 2D window

There are several options for navigating in the 2D window. Firstly, you can scroll the section of the screen using the familiar scrollbars (at the bottom and right).

The second option is to move the section of the screen directly by clicking and holding the right mouse button.

Thirdly, you can use the mouse wheel. If the mouse pointer is located at the edge of the planning window, you will move the map section. If it is in the middle of the map, you will zoom in or out of the display. The point under the mouse pointer will remain in place.

3. Camera management

3.1 Operation and controls

Handling the camera is a fundamental part of model train building with EEP. You will see whatever appears in 3D view from the angle of the camera that you control using the mouse and/or keyboard. Depending on the camera mode, you can move the camera freely and explore the layout under your own steam, or couple the camera to a train and enjoy the railway landscape from the perspective of a passenger or the driver.

3.1.1 Positioning and aligning cameras

Generally, you can position a camera in any area of the layout and move it in all directions. The angle, which is marked by green lines, can be adjusted in both the 2D view and the overview window of the 3D view. The thinner vertical line shows the height and the other, slightly thicker, line shows the direction and distance the layout or object is being viewed from. Additionally, the focal width of the camera is shown by two dashed lines.

3.1.1.1 Positioning and aligning cameras in the 2D view

To set the position and angle of the camera, click on the Set camera button in the tool bar. Once the function is active, a small camera will appear on the mouse pointer. That's the signal that the camera can be placed:

• Click – without releasing the mouse button – on the point where the camera should be placed,
• Hold down the left mouse button and drag the pointer in the direction you want to look,
• Release the mouse button to fix the camera angle. EEP will instantly switch to 3D view.

As you will note, the vertical line will remain constant, while the direction and length of the second line will change: if the line is short, you are looking in the immediate vicinity; if the line is long, you are looking into the distance.
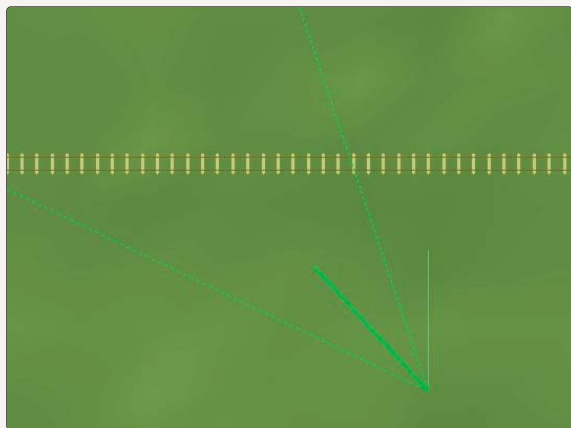
By default, the camera is placed approx. 5 m above the layout surface, irrespective of the actual height of the terrain. However, you can also view the layout from a higher or lower position:

• Click on the Set camera button and position the mouse pointer over the desire camera location.
• Now hold the [Ctrl] key and the left mouse button and move the mouse up and down to change the height of the camera position.

- Now release the [Ctrl] key and drag the mouse to set the desired camera angle while still holding down the left mouse button.
- Now release the mouse button too to set the camera and to switch to the 3D mode.

3.1.1.2 Positioning and aligning cameras in the overview window of the 3D view

You can also set the camera in the overview window in the same way as described in the previous section for the planning window. You will find the button for setting the camera in the tool bar at the top.

Alternatively, you can simply hold down the [Ctrl] key and right-click a point in the overview window. The camera will then be set beneath this point, facing due north. And if you hold the [Shift] key instead, the camera will remain in its position and aim in the direction you clicked.

3.1.2 Saving the camera position

Particularly interesting camera angles deserve to be kept. By clicking this button, you can save your current camera position. Once this function is activated, a dialogue window will appear where you can enter the name you want to save the camera position under.

Each layout has storage spaces for 80 static and 80 dynamic camera positions. To view saved positions, please open the list on the right next to this button.

Good to know: The static camera remains fixed without the camera angle changing. The dynamic camera, on the other hand, follows the rolling stock selected in the control dialogue from its position.

3.1.3 The mobile camera

In addition to the static and dynamic cameras a mobile camera is also available in *EEP 13*. Mobile – what does that mean? While the static camera is bound to a location and the dynamic camera to rolling stock, the mobile camera goes its own way. Literally! You can give this camera its own path.

- Click on the 3D object editor button in the control dialogue in the two-part window view to switch on the 3D editor mode.
- Before a mobile camera can take action, you need to set the route the camera will take.

To do this, click:
- **the Tracks (splines)** model category in the right column of the selection dialogue,
- then the **Auxiliary splines category** and the **'Camera and dolly track'** option
- and then the type **System track for the mobile camera** in the model selection.

After making this selection, go to the 3D window to determine the path of the mobile camera section by section using the mouse. This special system track is only visible in editing mode.
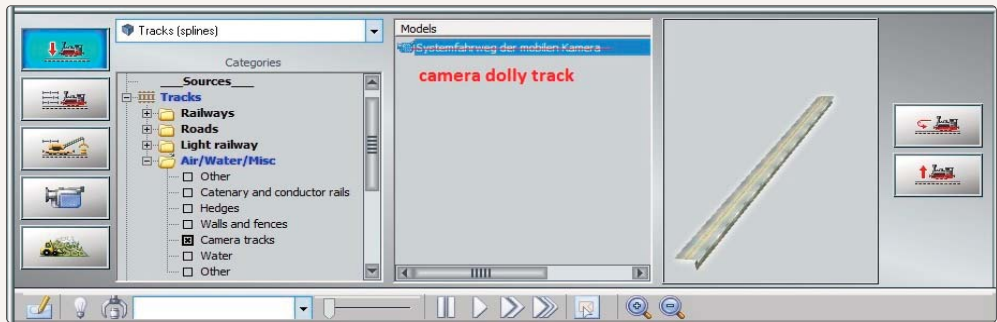
Auswählen des Systemfahrweges der mobilen Kamera

Good to know:
The mobile camera track is laid and edited in exactly the same way as any other track. How this is done is described in detail in the example of the track editor in Chapter 4, section 4.6.1.

If you would like to go back and make changes to a system track for the mobile camera, first select the respective section of the track as usual by left-clicking it, and right-click to open the object menu. In addition to various editing options, such as **Move, Rotate, Add track and Delete,** you will also find the **Object properties dialogue** window here allowing you to set the start position and path precisely. The track can also be extended directly by double-clicking on the green end point. You can place a camera on the dolly track by selecting the camera from the **object menu** and clicking the desired location on the track.

Once a mobile camera has been placed on the track, a camera icon will appear there. Right-clicking on this camera will take you to **Object properties.** With **'Test camera settings'** in the top-right, you can set up the camera.

Click on an object while doing this and the camera will remain focused on this object throughout its journey.

Please enter the speed in the left table.

And slightly below that you can enter a name for the camera.
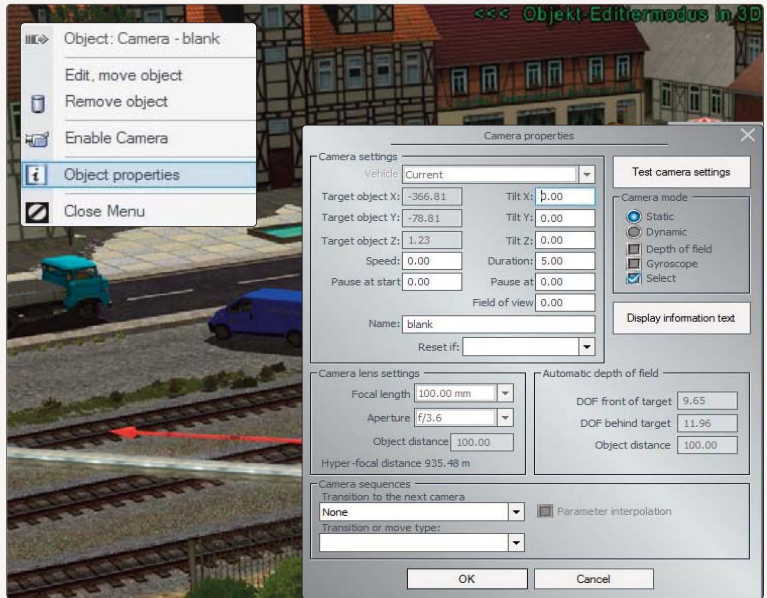
EEP bietet für Kameras vielfältige Einstellmöglichkeiten

The static camera is fixed to motionless elements. The dynamic camera, on the other hand, follows the selected rolling stock. The gyroscope keeps the camera balanced on inclined corners. *'Display information text'* allows you to enter a text that is shown during the camera's journey.

Das Zielobjekt wird durch einen grünen Pfeil markiert

If you switch on *the depth of field option,* the virtual EEP camera will take on the properties of a real SLR camera to some extent. This means that the aperture and exposure affect the distance over which the camera image remains in sharp focus. At a small depth of field, the camera must be focused precisely on the target object. At the bottom of the menu, you will find a list box of transition effects for changing from this camera to the next.

3.2 Camera management in the 3D window

Clicking on the camera icon in the control dialogue of the 3D window opens the camera menu (not to be confused with the Camera menu in the menu bar!) which displays something like a control centre for camera controls.

Unterschiedliche Optionen für die Kameraführung

1 Free camera movement to navigate the layout without restrictions
2 Linked camera, if you want to link the camera to the active rolling stock
3 Tracking mode to follow the train with dynamic cameras
4 Timer camera to pass rolling stock from camera to camera once it is in motion

3.2.1 The free camera
In the free camera mode, you can navigate the 3D view freely and without restrictions – using the mouse and keyboard:

Mouse:
Position the mouse in the centre of the 3D view. If you hold down the right mouse button, you can move forward by pushing the mouse up. Travel backwards by moving the mouse down. And for corners, steer the camera left or right at the same time. The closer you move the mouse to the edge of the screen, the faster you will move. By holding down the scroll wheel, you can circle the point under the mouse pointer. With the mouse pointer on the edge of the screen, you can pivot the camera by turning the scroll wheel. And if the mouse pointer is in the centre of the screen, you can zoom using the scroll wheel. It will target the position of the mouse pointer.

Keyboard:
In addition to the mouse controls, you can adjust the camera in 3D view using the keyboard:

- Use the arrow keys to pivot the camera up, down, left and right.
- Use the arrow keys while holding the [Ctrl] key to move the camera.
- Hold the [Shift] key to circle the camera around the centre of the picture.
- Press the [Page Up] and [Page Down] keys to raise or lower the camera.
- Press the space bar to move the camera forwards in the 3D view.
- Press the [R] key to move the camera backwards.

3.2.2 The linked camera

This mode links the camera to the rolling stock selected in the control dialogue. During the journey, the camera will remain in the same, relative position to the vehicle. First, choose a starting position using the buttons in the control dialogue, and then use the mouse or keyboard to make precision adjustments.

Diese Kamera bleibt in unterschiedlichen Perspektiven beim ausgewählten Rollmaterial

Alternatively, you can also access the starting position using the numbers 1 to 0 on the alphabetic keyboard. The numbers 1 to 6 correspond to the 6 buttons in the control dialogue. You can circle the vehicle using the arrow keys or by holding the right mouse button. You can adjust the distance to the vehicle using the space bar and *[R]* key or the scroll wheel. Number 7 automatically activates the dynamic camera that is closest to the selected vehicle. If the vehicle is in motion, EEP will automatically switch to the closest dynamic camera. The number 8 and 0 switch to the cabin views. The two views may differ in some locomotives. The driver for instance may be visible in one, but not in the other. Leave the cabin view by pressing the *[F9]* key. The camera will then stay in its current position. By pressing the button again, you will re-activate the on-board camera.

3.2.3 Tracking mode
The dynamic cameras are always pointing at the currently selected rolling stock from their fixed positions. If the vehicle moves, the camera will follow it. Place several cameras in attractive locations and you will always have a good view of your train ([7] key).

3.2.4 The timer camera
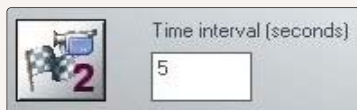
The timer camera ensures that the view jumps to the following camera at the set interval. Its alignment always remains the same.

Die Zeitangabe entscheidet nach welcher Periode das Bild umgeschaltet wird.

3.2.5 Activate camera contacts
Each saved camera (static, dynamic or mobile) can be accessed via a contact. The 'Activate camera contacts' must be switched on in the 'Cameras' menu. The keyboard shortcut for this option is [F10].

How does it work?

Suppose you have an oval of track that a train will travel along. Set contacts at the highlighted positions where the camera should change to automate the camera management during automatic operation. When the train drives over a contact, the camera moves to the predetermined camera location and shows the scenario from the point of view of the saved camera.

How are contacts set in 2D view?

Contact for: Camera
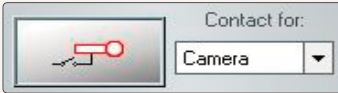
Auswahlbox für die Kontaktpunktreferenz

- Activate the signal system editor in the **2D view.**
- Select the camera contact type in the signal editor selection menu and then click on the button with **the signal arm.**
- Now move the mouse cursor to the section of track in the layout plan that you want to assign the contact to.
- Click on a track where the camera should be activated when the train touches the contact.

> **Good to know:**
> You can work more easily, faster and more intuitively in the 3D editor mode: select the desired track location with the left mouse button, right-click to open the context menu, select the **contact for the camera** and set its position by left-clicking the track again.

The green icon (show in 3D in the 3D mode) that now appears shows that the camera contact has been placed. The two triangles represent the direction in which a train must pass the contact and thus trigger the camera change. You can move the contact along the track by use of the red and yellow arrow from the gizmo. To assign a saved camera to a contact
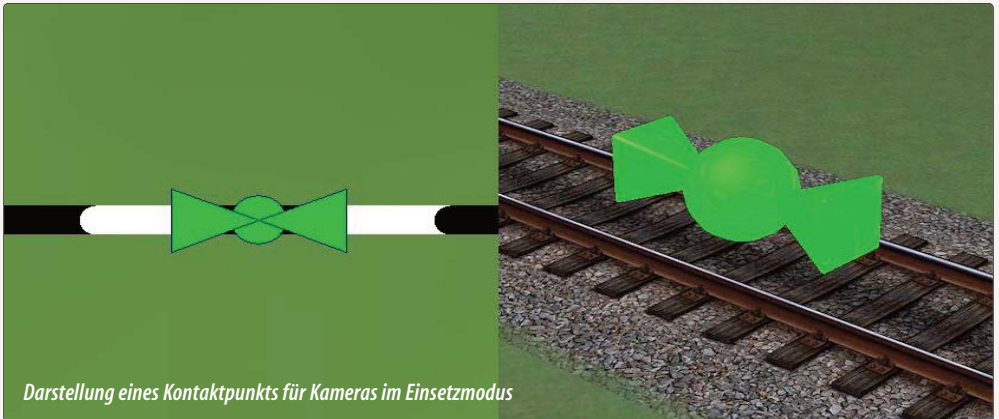
Darstellung eines Kontaktpunkts für Kameras im Einsetzmodus

and to define the required settings, right-click the selected contact. In the following dialogue, you can configure the camera contact by defining the train passing, route, vehicle, contact trigger conditions and camera control.

Camera contacts are configured using the following parameters:

– **Direction:** Here you set the direction from which the train must come to trigger the contact.
– **End of train:** If you select this option, the contact will only be triggered once the entire train has passed by.
– **Every:** Enter a 2 here instead of a 1 and the contact will trigger the camera change with every second train that passes.
– **Counter:** This field shows the current status of the 'Every' counter. If the value is 1 lower than the 'Every' value, the next train will trigger the contact.
– **Delay operation:** Determine the number of seconds after which the contact is triggered.
– **For route:** Here you can choose if the contact is only triggered by vehicles assigned to a specific route.
– **Vehicle contact:** Here you can decide if the contact is only triggered by a specific vehicle.
– **Filter name:** If you have selected the 'All' option in the vehicle field, you can determine that only vehicles whose names begin with the text you have entered trigger the contact.
– **If signal/turnout:** You can use this option to link the triggering of a contact to a specific signal or switch point. If the position is different at the moment the contact is triggered, the contact is ignored.
– **Select camera:** Here you select the first camera that should be activated when the train passes over the contact.
– **Follow-up camera:** Here you select which camera to switch to following the duration of the time set in the field.

– **Perspectives:** If you haven't selected a camera for 'Select camera' and 'Follow-up camera', you can instead select the perspectives to switch to the linked, i.e. passenger views.
– **Do not interrupt:** If this option is activated, no other camera can be switched to by contacts until the time expires.

Einstellungsoptionen für Kamera-Kontaktpunkte

4. Building and designing layouts

4.1 Exploring and getting to know EEP

Perhaps you would like to get an idea of what finished, automated layout can look like before constructing your first layout? Then open one of the layouts included. Following installation, you will find the **'Demo'** button in the launch menu. This loads a layout of the same name from the layouts folder. A fully automated version of the layout **'In Vino Veritas'** with many camera journeys. EEP automatically switches to full screen mode when this layout is loaded. Sit back and enjoy the varied rail traffic to the left and right of a large river bend.

Once you have saved the first layout of your own, the **'Demo'** button will disappear and be replaced by the **'Previous layout'** button. It can still be found in the layouts folder, however. If you would like to leave the full screen mode of this scenario, please press the [Esc] key.

In the layouts folder, you will find other layouts that will give you an idea of what EEP has to offer. Please read the layout description that opens after loading. It contains important information about operations.

You can turn off the automatic camera change during layout operations at any time. This is done either in the 'Cameras' menu or using the [F10] key. Then you have the chance to move freely across the layout or to access the various cameras

Maximiertes Fenster mit zugeschalteter Menüleiste

you have saved from the menu. This does not interrupt current operations. Enable the option again to leave camera control to the contacts. The biggest attraction of EEP is, of course, building your own layouts. And we will now familiarise you with that.

4.2 Setting up a new layout

Building a new layout starts with the File menu command 'New'. When you execute this command, a dialogue window appears in which you must first set the length and width of the layout as well as the density of the grid in knots. The higher the grid density, the more precisely mountains can be formed and textures sprayed, but also the higher the demand on your system and computing performance. With limited processing capacity in mind, the grid density should not be set too high. 150 grid nodes are recommended for your first attempts. Based on this guideline, you can test your computer's reactions and computing speed.

Attention: The grid density is dependent on the size of the layout and can therefore only be set relative to its width and length. The minimum and maximum values you can choose are indicated. The highest value is 800,000 grid nodes. As a calculation example, let's suppose we have a 5 x 1 km layout with the recommended number of 150 grid nodes:

5 km x 150 grid nodes	=	750 grid nodes in length
1 km x 150 grid nodes	=	150 grid nodes in width
750 x 150 grid nodes	=	112,500 grid nodes across the surface

This size is far enough beneath the permitted limit to ensure good performance on most computers. Your layout will look far more interesting if you lay tracks not only on flat surfaces, but follow the contours of a fully formed and textured surface. You can change this landscape at any time, adapting it to your new requirements.
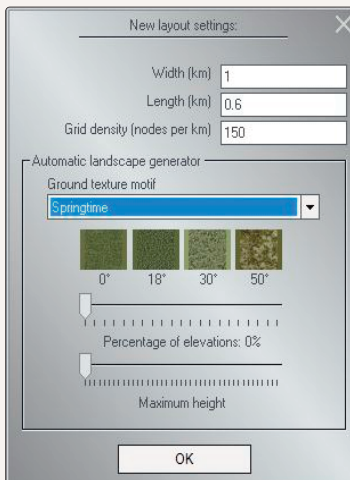
You can provide the surface with a texture motif from the start. These motifs are combinations of four textures that are applied to surface depending on the angle of inclination and provide a good foundation for later texturing. Furthermore, you can start with a randomly formed landscape. It is recommended to use a high value for the *'Percentage of elevations'* and a low one for the *'Maximum height'.* This initial form is not binding and can be changed as desired.

Im Anlagendialog werden die Grundeinstellungen zu Anlagengröße, Bodenbeschaffenheit und Rasterpunktdichte vorgenommen

Automatisch erzeugte Landschaft im 3D-Editor

4.3 Modelling the landscape

There are two editors available for editing the landscape – the *2D surface editor* and the *3D terrain editor.* Each editor has different benefits and both complement each other well.

4.3.1 Relief and surface design with the 2D editor

With the surface editor, you can design your railway landscape in 2D view. Therefore, you work in the drawing mode and switch to 3D view after each step to check the results. The editor appears when you open the editors list in 2D view and
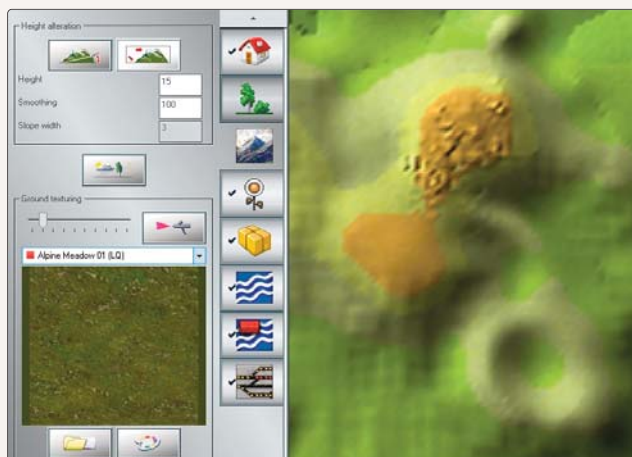
select the 'Surface design' option. Once the *surface editor* is open, the palette of *relief and surface design tools* will be shown in the left of the 2D window.

Zur Gestaltung der Oberfläche stehen Werkzeuge zur Verfügungen, mit denen man Erhebungen erzeugen und die Landschaft texturieren kann.

With these surface editor tools, you can edit the surface of the EEP landscape.

 ⟶ Draw and model mountains

 ⟶ Draw and build slopes

 ⟶ Set up and define local weather zones

Höhe	15
Glättung	4
Rampenbreite	3

⟶ Set parameters for height, edge smoothing, and slope width

 ⟶ Activate spray gun for texturing at the desired intensity

Modelling mountains and slopes:
Learning to handle the surface editor tools requires practice. To get to know the required techniques, start by building a simple mountain:

• Switch on the *surface editor* set the *Height* and *Smoothing.* The Height parameter measures the height above or depth below sea level – depending on whether the value entered is positive or negative. Smoothing refers to the edges, i.e. the gradations of the height profile. The higher the number (a value between 1 and 100), the further the mountain's foothills run (to a sufficient extent).

• Once you have set the parameters, click on the button that activates the mountain drawing tool. You are now in drawing mode.

• Now move the mouse to the drawing areas and draw a close contour while holding down the left mouse button. Release the mouse button when the contour is closed.

• Now draw a second contour that completely encloses the first one: the first determines the surface and height of the mountain plateau, while the second one determines the size of the foot of the elevation. The closer together the contours are, the steeper the mountainside will be.

• Repeat this process a few more times until you are familiar with the procedure, and then switch to the *3D view* to admire your work in full 3D.

The results in the 3D window probably won't knock your socks off just yet – the plateaus will look too bizarre and harsh with their sharp edges. But that can all be changed with a bit of patience and flair. Through interpolation, i.e. repeated drawing of the mountains and valleys with the same height parameters and similar co-ordinates, you can smooth the edges and generate a more realistic landscape with soft contours.
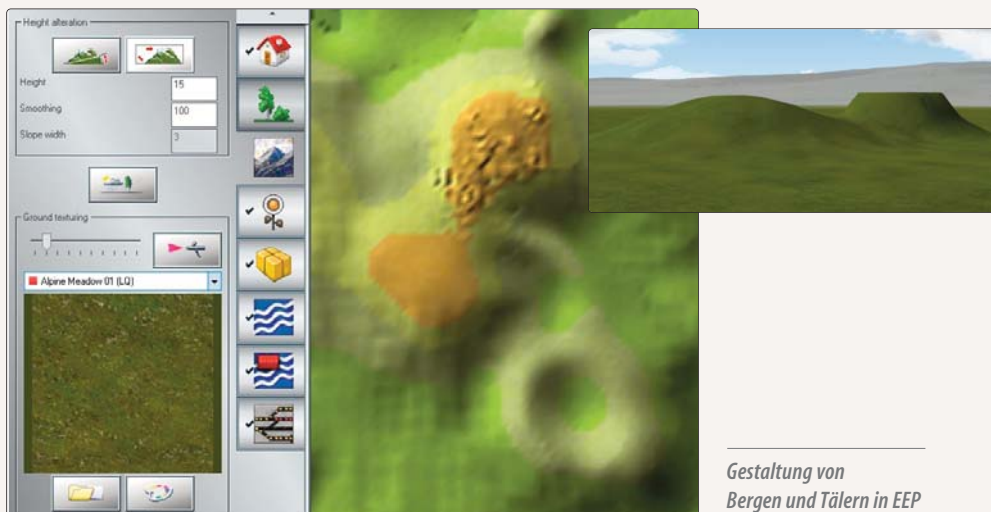
You can see exactly how this is done from the example in the figure: draw the plateau of a second mountain next to the first one. And then draw the foot of the second mountain large enough so that it encloses the first mountain. The set Smoothing value now also affects the existing mountain. Its peak becomes round and the hillside flatter.

The second tool available for relief design in the surface editor activates the slope feature. Slopes are built to connect levels of different heights. In a model railway layout, you often cannot get around building railway embankments, and this is where the slope tool comes in useful.

Glättung von Höhenunterschieden im Gelände

The construction principle is similar to that of designing mountains and valleys, only this time you don't have to set the Height and Smoothing parameters, but rather Slope width. The height values are determined by the start and end points of the slope and are used as base values for the course of the slope.

Once you have set the width of the slope, it is time to draw:

- Click on the ruler in the control bar to show the crosshairs – this ensures precision and facilitates drawing, but is not absolutely necessary for terrain design.
- Then activate the *slope tool,* point the mouse cursor at the point on the layout plan where the slope should start, click and hold the left mouse button, and then drag a connecting line to the point where the slope should end.

- Release the mouse button to review the finished slope in the 3D window. Slopes can also take a sweeping course. If, for example, you would like to model a landscape with a river snaking through the hollow of the valley between the hills, you can also realise this with the slope function, only this time you will connect the different levels with curved lines.

Designing surfaces

Whether it's a mountain, valley or slope, while the surfaces are bare – without meadows or forests, fields or rocks covering the ground – the landscape will appear unreal and abstract. To generate a realistic appearance, the bare surfaces need to be given textures that impart the flair and atmosphere of a natural landscape.

You will find a range of ground textures in the surface editor's texture catalogue which you can select, edit and apply. The process is simple:

- Select the desired texture from the *texture catalogue* with the help of the preview.
- Click on the *colour palette* to adapt the tint colour and, if necessary, correct the scale, orientation or rotation.
- Adjust the *spray jet:* the bigger the jet, the bigger the area you can spray.
- Click on the icon that activates the spray gun, and drag the mouse over the area that you want to cover with the selected texture while holding the mouse button.

The sprayed textures are depicted in the layout plan as coloured rectangles in the selected base colour, which create a natural appearance thanks to the randomly generated shading. This does not mean, however, that you have to accept the texture with all of the pre-defined settings. Experiment a bit to find out which colour nuance, scale and orientation achieves the best effect.

The *Fill layout with a texture* function in the *Edit menu* gives you the option of applying a new texture and/or colour to the entire layout in a single click:
- Activate the *2D editor* for surface design

- In the *texture settings menu,* select the desired ground texture and – if desired – a different background colour (by clicking on the *Surface texture* tinting button)

- Then click on the *Surface texture option* in the *Edit menu* and then on the *Fill layout with a texture* in the sub-menu that opens.

That's it. After a short processing time, your layout will appear with its new look.

To be on the safe side: save a layout you are still building under a new name, preferably after each step of development, so that you can trace the editing stages and, if necessary, access older versions! To play it safe, it is recommended that you enable the auto save option in the programme settings and to set the interval at which your work is automatically saved. You will find the saved work steps in the folder *Ressourcen/ Anlagen/AutoSave.*

A path (that differs from the default) to an existing folder can be selected in the dialogue window of the programme settings to act as the new save locations for your layouts. This folder can be created on an external drive, which is especially advantageous if you installed *EEP 13* on an SSD hard disk (Solid State Drive), which (these days at least) have a relatively low storage capacity.

4.3.2 Relief and surface design with the 3D editor

The 3D editor is accessed in the 3D view by clicking on the button with the little digger in the bottom-left corner of the control dialogue. Once the editor has been switched on, a flashing message that the 3D surface creation mode is active will appear in the 3D window. Train traffic and automated vehicle controls will be paused while you are in this mode. This allows you to work in the 3D editor undisturbed.
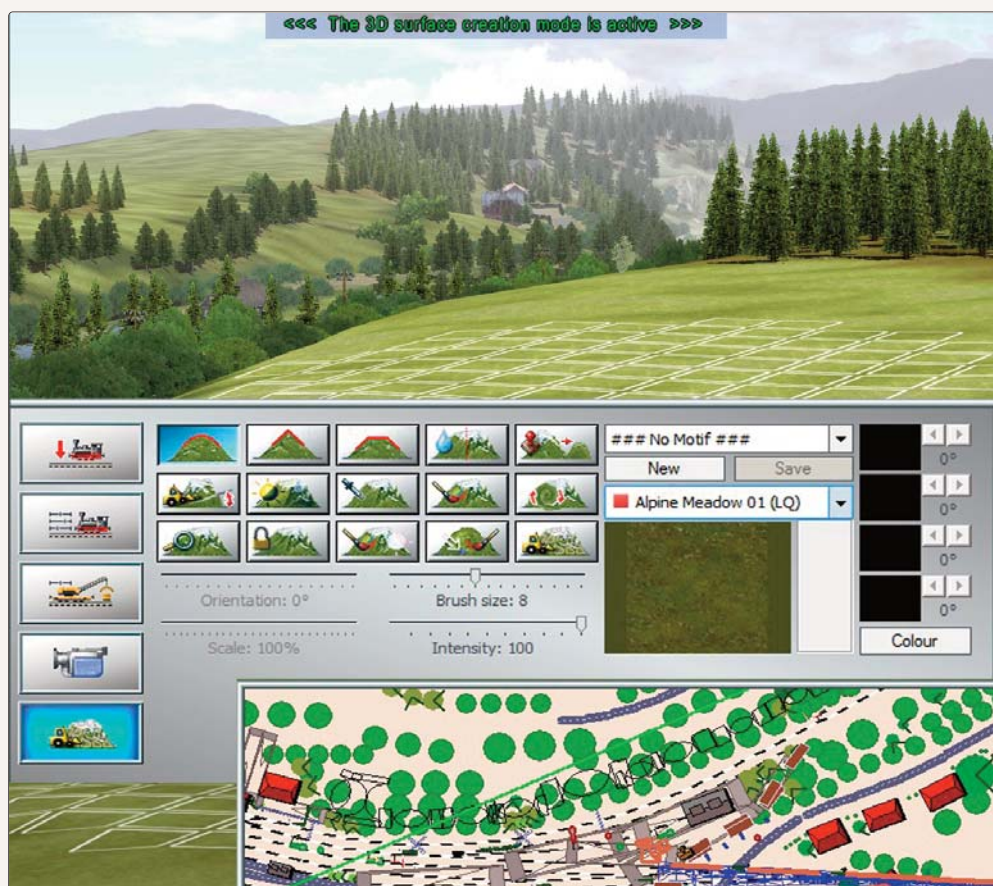
Auch in der 3D-Ansicht kann die Landschaft bearbeitet werden

The *3D editor* provides everything you need for the surface design of your layout. In addition to a huge range of ground textures, you will also find a multitude of tools which you can use to sculpt the relief and the landscape surface. Many have been constructed so that you can perform two actions with opposite effect with the same tool. To achieve the opposite effect, you must use the tool by holding down the left mouse button and the [Ctrl] key (on the left side of the keyboard) at the same time.

Werkzeugdialog für die Bearbeitung der Landschaft im 3D-Fenster
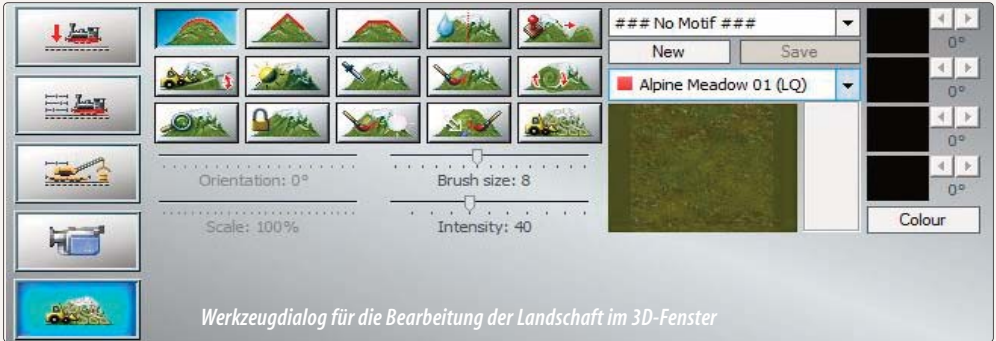
Try out the alternative application of these tools:
- Click on the first tool, which is designed for modelling mountains and hills, and move the mouse cursor to the surface in the 3D window that you would like to edit. A field made up of white squares will now appear there. You will generate your mountain within these markings.
- Now enable the same tool again and simultaneously hold down the mouse button and the left *[Ctrl]* key. As you will immediately notice, a field of green squares will now be shown in the 3D window. The green colour indicates that, instead of an elevation, a depression will be generated.

Linke Maustaste:
Gelände erhöhen,
linke [Strg]- und linke
Maustaste: Gelände senken

You can alter the landscape as you desire using the tools of the 3D terrain editor.

→ Create elevation or depression (left [Ctrl] key) with soft apex

→ Create elevation or depression (left [Ctrl] key) with pointed apex

→ Build flattened plateau or depression (left [Ctrl] key)

→ Smooth unevenness or increase erosion effect (left [Ctrl] key)

→ Take height sample (with left [Ctrl] key held down) and apply this height to other regions

→ Create slope

→ Increase or decrease (left [Ctrl] key) brightness of ground texture

→ Take ground texture sample with the pipette (if no texture motif is selected)

→ Apply selected ground texture to surface (if no texture motif is selected)

You can change the scale of a ground texture. The slider for this ranges from 10% to 1000%, i.e. from one tenth to ten times the original size. If moved to the far right, it will activate random mode, which will automatically vary the size between these two base values during the application. This is effective against recognisable repetition of the texture effect.

Oberfläche mit der gewählten Bodentextur überziehen (wenn kein Texturmotiv gewählt ist)

Take a look at the video about this feature: ***www.eep11.com/tutorials***

→ Rotate orientation of the ground texture / straighten a rotated ground texture

→ Change scale of the texture / reset scale to original value of 100%

→ Lock landscape surface against changes or unlock (left [Ctrl] key)

→ Create shine effects by mirrored (specular) light on surface that can reflect
incident light (e.g. water)

→ Switch selected ground texture regardless of the set size of the spraying tool. This is
important for changing one specific ground texture for another texture. After activating
this tool, a white arrow appears first which you use to select the surface texture you
wish to replace. You can select a different texture for replacement at any time by
holding the [Ctrl] key.

→ Opening the automatic surface generator

The automatic surface generator works in two ways:

1. It only changes the landscape surface in the marked area. For this, the desired areas of the layout's landscape surface must be marked in advance.
2. It changes the landscape surface of the entire layout, excluding those areas that have previously been marked (locked) against change.
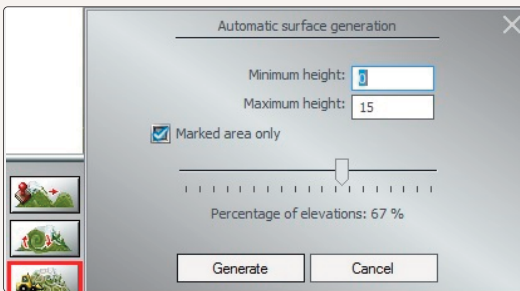
Die automatische Oberflächengenerierung sollte auf einen begrenzten Bereich eingeschränkt sein

There are various sliders belonging to the tools that are used to texture the landscape surfaces. Use these sliders to:

• set the angle for the orientation of the ground texture (on a scale of -45° to +45°) when the ground texture orientation tool is active,

- scale the editing area, which can alternatively be done using the Comma [,] and Point [.] keys,
- enlarge or shrink the applied ground texture (on a scale from 10% to 400%) when the scaling tool is active,
- set the size of the brush,
- set the intensity of the shading used to darken the ground texture in a random pattern. Smaller values achieve the best results here.

In addition to ground textures in all categories imaginable, there are also ten pre-defined texture motifs available in the 3D terrain editor that you can select, edit and add new motifs to. Ground texture or texture motif? It's your choice, but you have to choose one of the two. You can only apply individual textures if a motif is not selected.

If you prefer to apply single ground textures, you must select the option *### No Motif ###* from the menu before choosing the category and texture. If the tint doesn't appeal to you, click on the Colour button to define or select the desired shade in the displayed colour palette.

Eine einfache Bodentextur benötigt kein Motiv

The graphics engine allows for a technology known as parallax bump mapping. By using so-called bump mapping textures, a relative displacement (parallax) of parts of a ground texture in relation to the observer is calculated to achieve a more intense three-dimensional effect. If you view a layout surface sprayed with a bump map from close proximity, you will notice the fine height differences and grains emphasised by light and shadow. Grooves between paving slabs, individual stones on a country lane, ice floes on a frozen river and cobbles on a cobblestone road – these all appear in a vividness that can only be realised with bump mapping textures.

Each of the ground textures in the selection window are marked with a red square or a blue cube. The red squares denote two-dimensional ground textures, while the blue cubes indicate three-dimensional bump mapping textures, which can achieve a more intense and vivid layout surface. A more natural surface appearance can be achieved by working with texture motifs.

Remember:

One texture motif comprises four ground textures that vary in their mix and shading, and thus simulate an almost natural appearance. The texture that is sprayed is determined by the angle of the landscape surface's inclination, which must be set for each of the four textures. As the relief and surface design are linked, the pre-set textures are applied while modelling the relief.

In this way, you can model steep mountains and undulating hills and slopes that are covered with the correct texture in one step. You can see how a texture set varies in detail if you select a texture motif: once a motif has been selected, the four different textures appear in the small preview windows on the right which you can modify using the colour palette, if desired. Additionally, a landscape surface activation angle is displayed for each texture, which can also be adjusted using the assigned controls. To expand the scope of design, you can expand the range of motifs by compiling new texture motifs.

The process is simple:

- Click on the New button in the dialogue in the 3D editor and enter a name for the new motif.

- Select a ground texture in the texture menu, which will now appear in the preview windows and which you can tint if desired and insert into the new motif.

- To assign the texture to its position in the texture motif, right-click on the texture in the preview window. A new menu will appear.

- Move the mouse cursor to the option that assigns the texture to the desired place in the motive. The order does not matter as the application is not decided by the position. Which of the four textures is used is determined solely by the angle of the landscape surface.

- Once the texture has been placed and appears in one of the four texture boxes, you can set the landscape surface angle that determines when the texture is applied using the assigned control buttons. If you enter 0° for the first texture, for example, the texture will be sprayed when the surface is even.
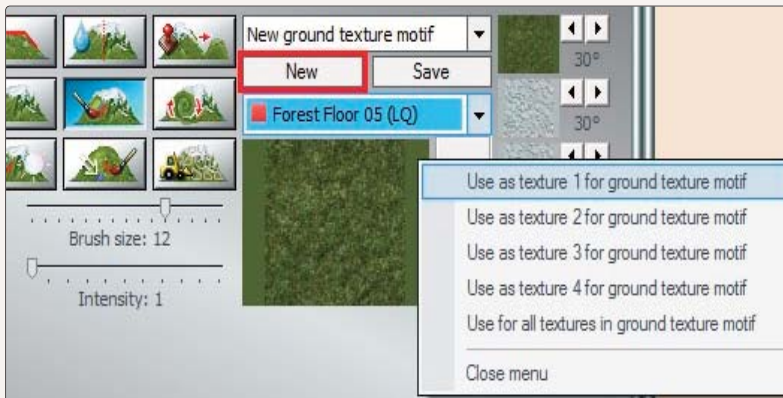
Gestaltungsspielraum zur Erzeugung eigener Bodentexturen

- Then select and assign the remaining three ground textures to the boxes of the texture motif, and assign different angles of inclination to them.

- Store your new texture motif after reviewing the result in 3D view by clicking on the Save button. If the angle is set to zero for all four textures, a random generator will activate automatically, which mixes all four textures randomly so that the landscape surface does not appear lifeless and monotonous.

Block function for copying and saving the landscape surface:

In response to many requests from EEP users, a block function has been implemented in the surface design 3D editor, which can copy and save the area of the landscape surface you have selected. This not only allows the reproduction of a segment of the landscape surface within the open layout, but also allows the use of a saved block in other layouts. The copied and saved blocks of the landscape surface contain all the information about the textures used (so-called spray textures) and can also be rotated by 90°, as well as scaled in size by +/- 25%. Thus, you have practically all the tools you need for copying and editing well-modelled 'landscape spots', such as mountains and lakes.

To mark a block in the 3D editor, the button for marking and locking the landscape surface first needs to be pressed, and then the desired section of the landscape surface must be marked by pressing and holding the left mouse button. The marked area of the layout surface will be tagged with little yellow crosses, which also symbolises the content of the block.

So können Sie bestimmte Areale von einer weiteren Bearbeitung ausschließen. Mit gehaltener linker Strg-Taste kann die Sperrung wieder aufgehoben werden.

The marking does not need to be completed in one step as the placed marking will remain on the landscape surface when you release the left mouse button. In this way, you can mark very selectively and precisely, especially as the size of the marking tool can be altered with the brush size slider. If you have marked slightly too much of the surface, this is not a problem: by holding the [Ctrl] key on your computer keyboard, you can undo the unwanted marks, or you can also use the Undo/Redo functions.

Once an area has been marked, right-click it and choose Copy from the context menu. The mouse cursor must be located within the marked area, otherwise it will not be possible to copy the marked area.
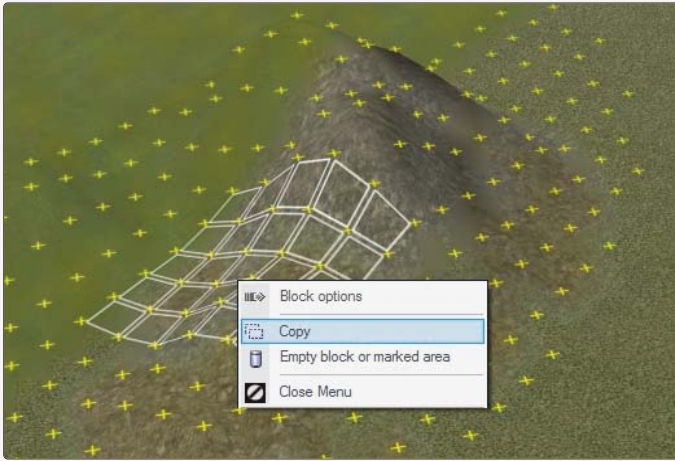
Mit einem Rechtsklick auf das markierte Areal wird ein Kopieren möglich.

Once the marked area has been copied, you can move the mouse cursor in any direction, whereupon a 'mould' of the copied section of the landscape will immediately appear under the mouse cursor. The – initially empty – shell of the landscape can be moved to another position until you press the left mouse button, which immediately inserts the copied fragment. Before inserting the copied landscape section, you can perform other operations via the right mouse button menu, such as rotate the copied area 90° clockwise or anti-clockwise, or scale (enlarge or shrink) it in 25% steps. This approach to copying the landscape is recommended mainly if the copied section is being placed (inserted) in close proximity.

For greater distances and, of course, when reusing the copied area in other layouts, it is also recommended to save the copied area as a block.

Saving the copied area as a landscape surface block (*.bl1):

If the copied section of the landscape surface is not being inserted immediately, it can be saved as a block for future use. To do so, move the mouse cursor to the programme bar and select the option *'Save block'* from the File menu to open the dialogue window for saving the block file. Of course, you can also use the icon buttons in the block sections for this.
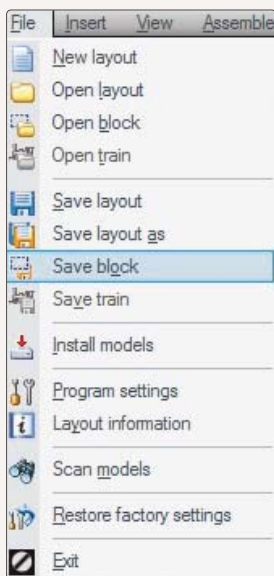
Landscape surface blocks with the file extension '*.bl1' are saved by default in the sub-folder *'Resourcen/Blocks/Terrain',* and can also be accessed from there. You can also save block files in any location on your hard disk. Of course, the saved blocks can be loaded via the File menu or the button for opening blocks, which however requires there to be currently no copied area of the landscape surface in the memory. If there is, right-click and select the Empty block or marked area command from the menu.

*Kopieren und speichern von Landschafts-
blöcken über das Datei-Menü*

Good to know: A freshly loaded block or a copied area of landscape surface that you wish to insert adapts automatically to the height of the terrain, even if the option Match *object position height to surface* is not active!

Tip: The content of a block is dependent on the grid density of the layout and – if possible – is automatically adapted. If you use dramatically different grid densities in your layouts, e.g. 150 grid nodes per km in one layout and 500 in another, it may still be necessary to scale loaded blocks. The dimensions of the loaded block can be scaled to twice or half its original size via the menu that appears when you right-click if you click Increase/Decrease by 25% multiple times. You can achieve great results when copying and inserting landscape surface blocks if the layouts have roughly the same or, ideally, identical grid densities.

4.4 Defining environmental and weather conditions

The natural appearance of a landscape is never constant, but it changes with the light conditions, the weather, the time of day, and the seasons. Therefore, these influences should also be taken into consideration in your railway landscape on screen. The global settings for the light and weather conditions are set in the View dialogue, which can be opened by clicking on the corresponding button in the tool bar.
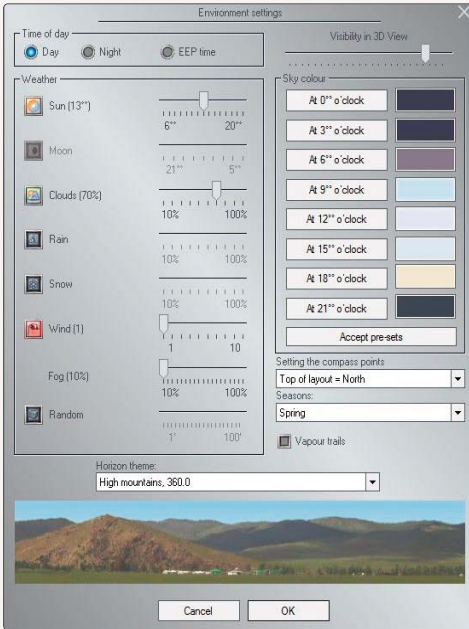
Hier legen Sie die Einstellungen zur Umwelt fest

First select Day or Night or EEP time in the *View dialogue.* If you choose *EEP time,* the day and night cycle will be controlled by the system time. Additionally, you can regulate the intensity of the rain, snow, sun, moon and wind using the individual sliders. If you would like the weather to *change randomly,* the corresponding option must be activated.

Clouds are not just clouds, so the *Clouds option* in the *View dialogue* can now be selected and set at different levels: if the option is not enabled, the sky will appear cloudless. If the option is enabled with a mouse click and a check is placed in the box, there will be light cloud cover. A second click in the check box increases the effect: to signify this, the check box turns grey, while the clouds gather and the sky darkens. A second click also increases the strength of the sun, with the effect of the sun never being completely obscured, even with heavy cloud cover.

Ein bewölkter Tag am See

There is another slider in the environment settings dialogue window for fog. Unlike the distant haze that is intended to conceal the transition to the horizon and is mathematically derived from a power function, the fog is a *'linear phenomenon'*. The fog can be set globally for the entire layout or in individual weather zones, which allows fog banks to be implemented very precisely. What was previously only implemented via visibility (i.e. the haze), can now be implemented as local fog – completely irrespective of the actual visual range, which can also be set individually in the weather zones.
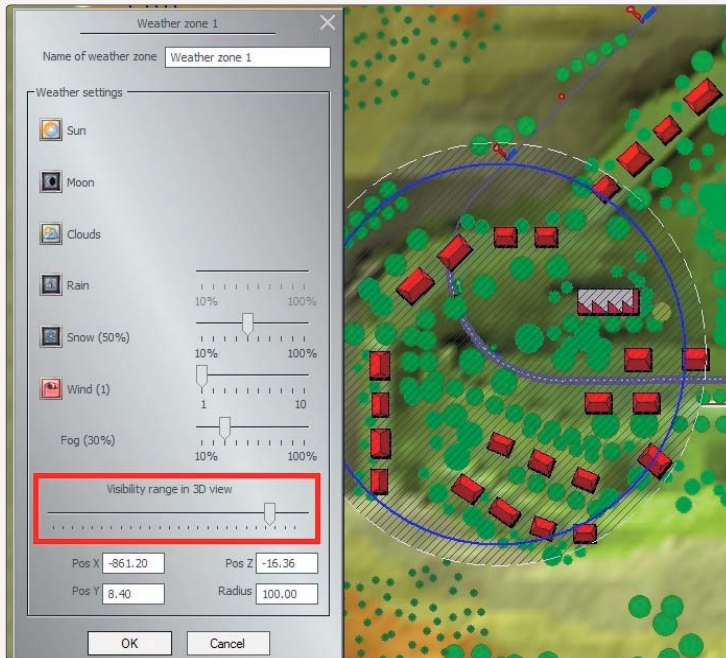
Schieberegler für den Nebel in einer Wetterzone

Good to know: Logically, it can only rain if there are clouds and the corresponding setting is active. At a rain intensity of more than 50%, a real thunderstorm might break occasionally above your railway landscape. The more intense the rain, the more often you'll have thunder and lightning.

Tip: The *Snow weather* option has been expanded with a *Sleet variant.* If you would like to activate this weather option, click the *Snow option* a second time. The check box will then appear in grey and the show flakes will be transformed into sleet pellets.

Independent of the weather, you can define the sky colour for the day and night time. For example, to set the sky colour for at daybreak or sunset, all you need to do is to click the button for the corresponding time of day, and select the desired shade in the colour palette that then appears. The different gradations of sky colour allow your layout

to appear in different lights over the course of time – both when the time is changed manually and with the automatic passing of the EEP time *(Extras menu -> Time properties).* The settings are saved with the layout data so that the character of each layout is emphasised by the special lighting and colours. In addition to the time of day and the light and weather effect, the visibility in the 3D view can also be set and a horizon theme can be selected as the backdrop.

You can set the season under *Seasons* in the settings dialogue. This setting, however, does not affect the landscape's appearance in general, but only dawn and dusk and the position of the sun, which varies with the changes of the seasons. Setting the compass points allows the perceived orbit of the sun and moon to be rotated by 90°, 180° or 270°. This does not affect the orientation of the layout.

Setting up local weather zones:
The settings made for the light and weather conditions in the View dialogue apply globally to the layout for which they have been defined and saved. Irrespective of these, however, you can create different weather zones in the same layout. This will cause the weather conditions – depending on the local setting – to change as the camera and observer travel through different weather zones. Thus, rain can turn to snow at high altitudes, and snow into rain in the lowlands, just to name one possibility.

The zones, each defined by its own weather settings, are drawn in the 2D view by clicking on the button in the surface editor:

• Click on the button that activates the mode for creating local weather zones.
• Switch to the layout plan using the mouse cursor, which is now in the shape of a cloud, and define the various weather zones by clicking and holding the mouse button. Draw the weather zone, which are displayed in the form or blue circles and which can be scaled and moved if required, overlapping if possible so that the transitions between the weather zones is gentle and doesn't happen abruptly.
• Left-click weather zones you would like to delete and then press the [Del] key.

Even though the weather zones are depicted as circles in the 2D window, they are actually three-dimensional balls whose centres are defined by the co-ordinates X, Y and Z (for the height). If you create weather zones in a mountainous landscape, you must keep an eye on the heights at the centre of the individual weather zones as these only adapt to the height of the terrain when they are first inserted. If a weather zone is moved, the height at its centre needs to be manually adjusted to match the terrain.

Attention:
When moving the camera in one or multiple weather zones, the maximum value for the respective weather conditions is achieved when reaching 50% of the weather zone's diameter. As a consequence, the weather changes abruptly if a new camera is positioned at the centre of a weather zone!
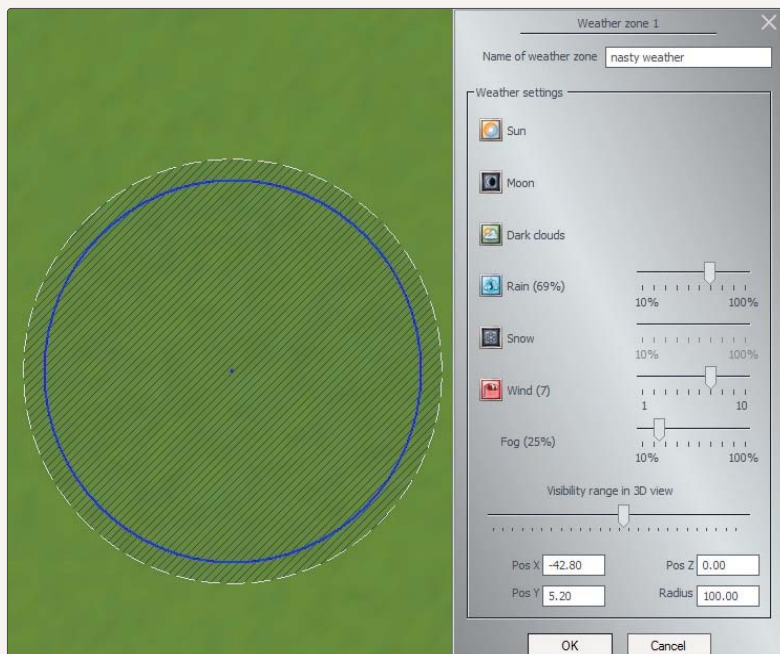
The weather settings in the local weather zones are defined in the corresponding dialogue which appears when you right-click on the associated circle in the planning window. You can set the intensity of rain, snow and wind and the Visibility in 3D View for each weather zone, and decide whether the sun, moon, stars and clouds should be visible. As the setting also includes visibility and wind force, depending on the terrain, fog banks can be formed in narrow valleys and blasts of wind on open terrain.

4.5 Inserting landscape elements and structures

Once you have modelled the relief and the surface of the layout, the detailed work begins. Now it is time to populate the empty landscape, to plant trees and to place houses. Whether you require landscape elements or real estate, both are provided for: there is an editor for each with a wide range of models.

Placing landscape elements:
Unlike the relief and surface modelling editors, the editor for landscape elements does not have a tool palette, but instead comes with a large catalogue that is subdivided by category and genus. Whether you're looking for flora, fauna or soundscapes, here you will find everything you need to bring your railway landscape to life. How do you get objects out of the catalogue and into the layout?

Inserting them is just as easy as selecting them:

- Open the landscape elements editor in the 2D view and open the catalogue of the same name.
- Choose the category and the genus, peruse the models that are now listed in the selection area below, and make your selection with the help of the preview feature.
- Switch to the layout plan using the mouse cursor and place the selected object with a simple click of the mouse.
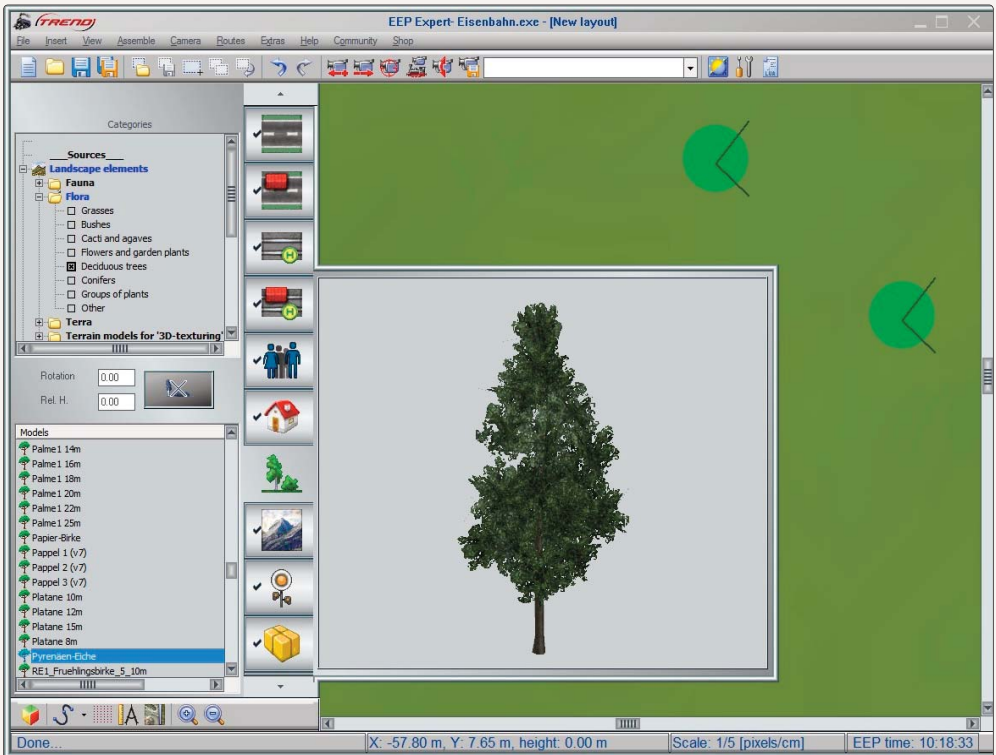
Placing landscape elements in the planning window

Selected models are usually displayed in animated 3D in the preview window. If you would like to stop the automatic rotation, click on the 3D area in the preview window and press the [Insert] key. In this state, the preview object can be put in the desired position by clicking and holding the right mouse button. The distance can also be set in the model preview by rolling the scroll wheel forwards or backwards. To turn the automatic rotation back on, press the *[Insert] key* again.
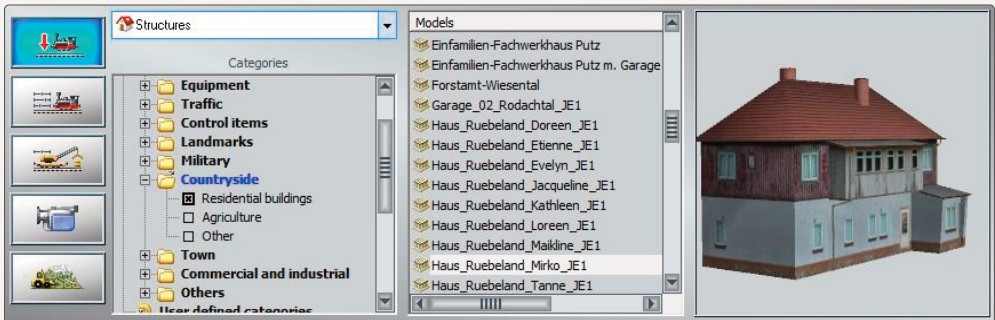
Steuerdialog zum Einsetzen von Immobilien im 3D-Fenster

No matter whether you're placing a tuft of grass or a cow in a landscape, the procedure is the same. Just like flora and fauna objects, soundscapes can also be inserted into the layout plan which, though not visible in 3D view, can be perceived acoustically – provided your computer has a sound card.

To make the scenarios as natural and vibrant as possible, a special model named **'Falling leaves (with 50 m range)'** is available, which simulates leaves floating in the wind. This model, which is displayed as a cube in the preview window, but which appears as falling leaves in the layout, can be placed both in 2D and 3D modes. The simulation of falling leaves is generated in an imaginary cylinder 20 m high with a radius of 50 m. Falling leaves are shown within this area, which appears in the form of a hatched green circle in the planning window, at irregular intervals, with the fall direction, amount and fall speed depending on the strength of the wind. Of course, you can then only see the leaves fall when the camera is located within the model's 50-m-wide radius.

The placement of natural and landscape objects does not require a great degree of precision. While a model is selected, it can be moved at will to the desired position, not only in the drawing mode in the 2D view, but also 'live' in 3D view if the 3D editor is active. Give it a try:

- Switch to the 3D editor and select the model with the left mouse button. The gizmo (see Chapter 2.3) will be activated and you can use it to move, rotate and scale the model. If you would like to move the model freely in all directions, hold down the [Shift] key to temporarily deactivate the gizmo. Four white arrows around the model show you that you can now position it freely. To change its altitude, please hold down the [Ctrl] key as well. When moving an object – whether freely or with the gizmo – please pay attention to the **'Match object position height to surface'** in the Insert menu. If this is active, the model will follow the contours of the ground, and it will be reset to ground height as soon as you move it.

You can also position and rotate selected models in the ***drawing mode*** of the 2D view – most easily with the mouse or, if you need to be precise, in the dialogue window opened by right-clicking on the selected object in order to determine the position, rotation and if necessary also the scale exactly by entering the corresponding parameters.
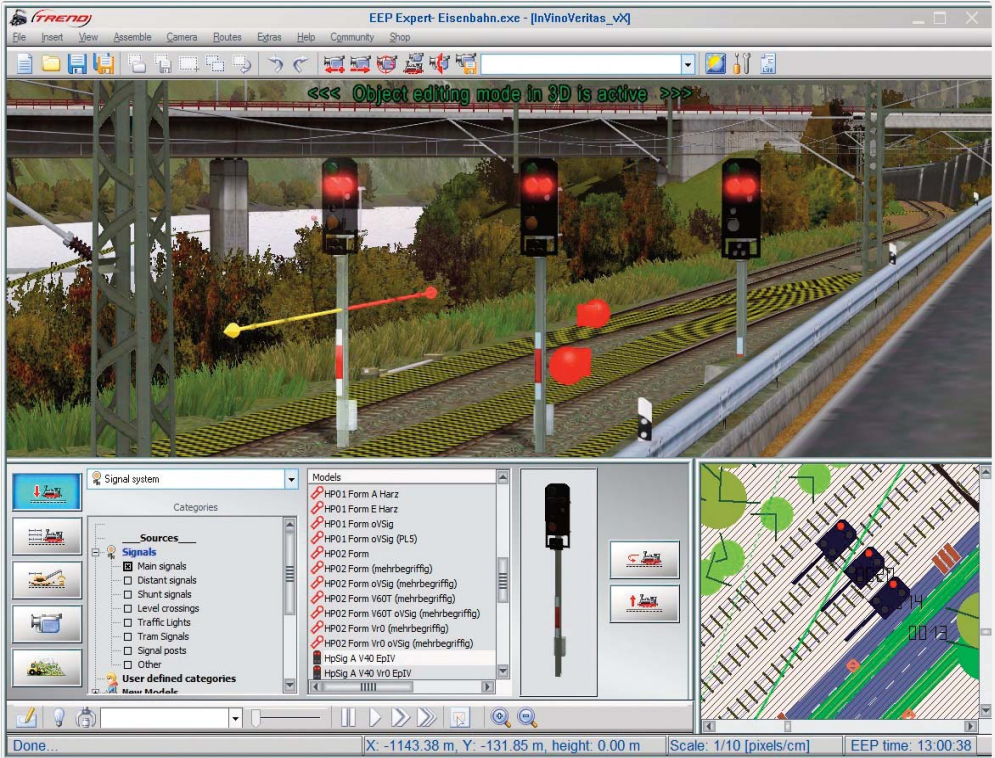
Sowohl in der 3D-Ansicht als auch im Radarfenster lassen sich Immobilien genau justieren
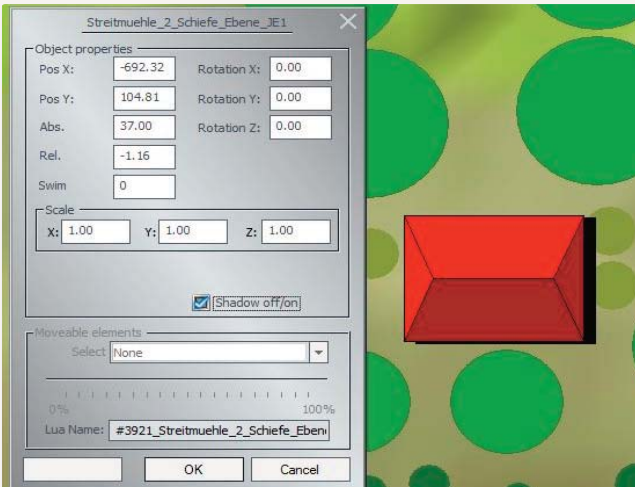
*Dialog zur Positionierung
von Objekten in der 2D-Ansicht*

Inserting blocks:

Of course, you don't have to place every tuft of grass and each tree separately to plant greenery on your layout. With the help of the block function, the effort can be streamlined. A forest, for example, can be created faster if the trees aren't inserted individually, but rather in blocks, as blocks are handled as objects that, just like any other object, can be saved, copied and inserted again.
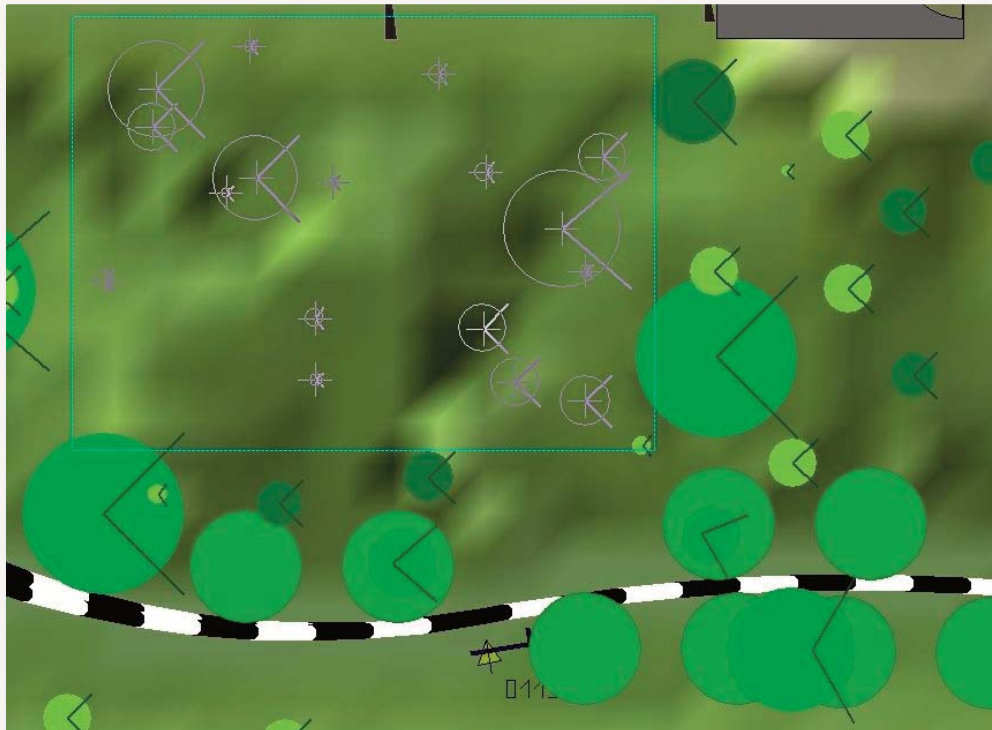
Selected block in the 2D plan

The process is simple:

- Place and arrange the bushes and trees that will make up your forest in the layout plan so that they can be grouped.
- Choose the tool that selects blocks from the tool bar and draw a selection box around the entire group by clicking and holding the left mouse button.
- Release the mouse button. The objects within the selection are now treated as a block which you can now copy and paste in other locations.
- A forest can be built much faster by repeatedly copying, moving and rotating small blocks.
- You can save selected blocks for later use. Select this option either from the *File menu* or via the corresponding icon in the tool bar.

➡ **Good to know:** While holding the *[Ctrl]* key, you can remove individual models from the selected block before saving or copying it.

Inserting and saving blocks:
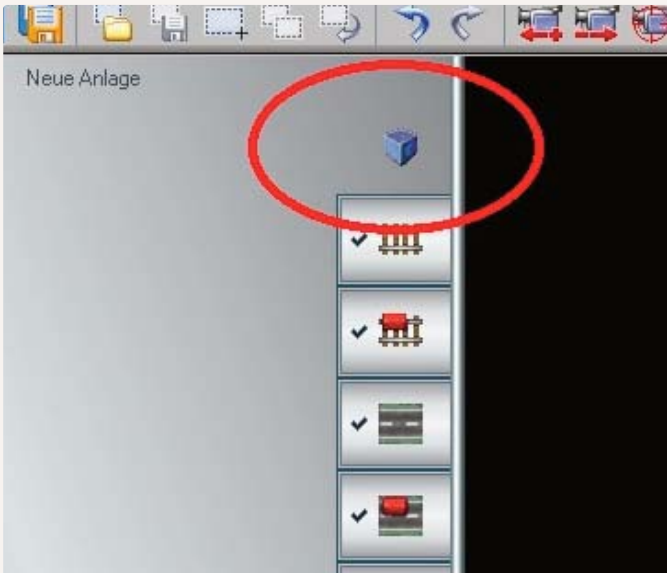
The selection of blocks depends on the editor. If you are in the landscape editor, you will only be able to select landscape elements; in the structures editor, only buildings and furnishings; in the track editor, only tracks. Choose the blue cube as the mode to select a block that contains models from all categories (except signals, contacts and rolling stock). In this way, you can select and save, for example, your entire station along with its tracks, accesses, platforms, etc. and insert them later in a different location.

Lasso-Funktion im 2D-Plan

You are not limited to rectangular frames with the block tool. Hold down the [Shift] key to draw a closed free-hand shape around all the elements you would like to copy.

Inserting structures:

Just as with natural and landscape elements, you can populate your layout with architectural objects, which you will find in the structures editor. The structures catalogue is more diverse than the *landscape editor* catalogue, but otherwise structured the same way.

Among other things, EEP also has clocks with indi-vidual hands and smooth movement of the second hand (even with a spring-change on the minute hand). For these clocks, which can be found in the folder Verkehr\Bahnsteigsysteme\ in the structures editor catalogue, the rigid mechanism of a com-puter timer, which only shows the time in increments of a second, has been replaced with an algorithm that converts the current frame rate with respect to the time elapsed, which allows for the smooth movement of the second hand and the so-called minute jump.

Uhren mit Zeitansage

You will find not only buildings in the folders of the structures editor, but also walls, doors and furnishings of all kinds. Model selection and placement in the layout plan is done exactly the same as landscape elements. Whether landscape elements or structures, placement and editing in construction mode may be easy, clear and precise, but it only ever dis-plays the objects in the abstract planning or drawing view. Thus, the 3D editor offers much better options.

Attention:

Additionally purchased models are automatically added to the New models / Recently installed category. The Scan models File command sorts them into their appropriate categories.

Inserting and editing landscape objects and structures with the 3D object editor:
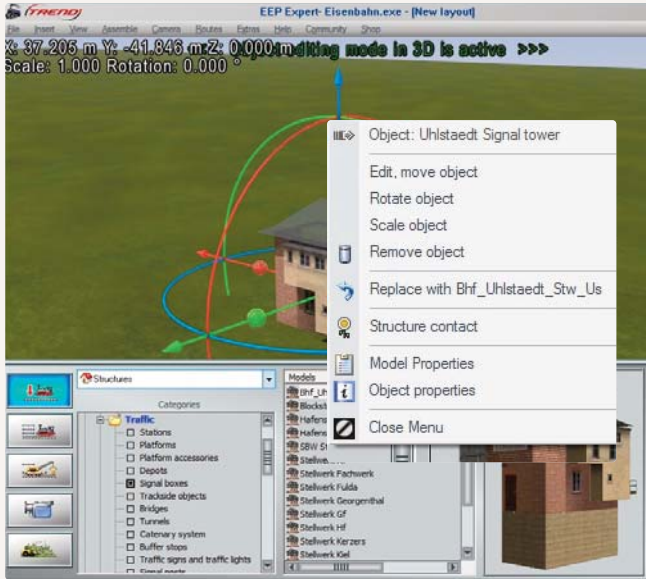
The 3D editor is accessed by clicking on the button shown in the control dialogue. The flashing note in the 3D window signals that the 3D editor mode is active. As not only objects that have already been placed can be edited in this mode, but also new objects added and edited, the list boxes for the individual editors are shown in the control dialogue so that you can select your models in the 3D view, inspect them in the preview window and place them in your layout.

*Einsetz- und Eigenschaftendialog
in der 3D-Ansicht*

The features for editing objects in 3D mode can be accessed via the context menu or object menu – just like in 2D mode – which can be opened as usual by right-clicking on the selected object. The commands in this menu allow you to move, scale, rotate or even delete your model in the 3D view. If you want to specify the *object's position, select the Model Properties option* in the object menu and enter the values that define the position, *rotation and scale* in the following dialogue. However you rotate or turn an object selected for editing, it will automatically adapt to the surface and level of the landscape. Occasionally, however, it may be useful to correct the height or depth. To do this,

hold down the left mouse button and [Ctrl] key simultaneously and drag the selected object vertically up or down.

*Verschieben von Objekten mit gehaltener
linker Maustaste, Höhe mit zusätzlich
gedruckter Strg-Taste*

Illuminating structures:

Even if landscape objects and structures are selected, placed and edited in the same way, there are still differences due to the different properties and which are evident in both the functionality and appearance. An example of the special object properties of structures is the illumination feature which ensure that the light don't need to go out when night falls over your layout. As with the landscape elements, there is also an object dialogue for structures which you can open by right-clicking on the selected object in the 2D window. Not only can you enter the parameters to determine the position there, but also play around with light and smoke: if you choose the Light on option, it becomes bright; if you opt for Light off, it stays dark.

The same goes for smoke. If you enable the Smoke option, the chimney will smoke, provided the structure has a chimney. The illumination function is also expanded by a feature that allows the lights in a structure to be turned on and off auto-

matically at random. The automatic switching, which occurs at arbitrary intervals of 30 to 60 seconds, is subject to a random generator which – like manual lighting – needs to be enabled for each structure individually in the object dialogue. To turn the random generator on, you need to click the option Lights on/off/auto several times. Automatic light switching is active when an X appears in the option box instead of a tick.
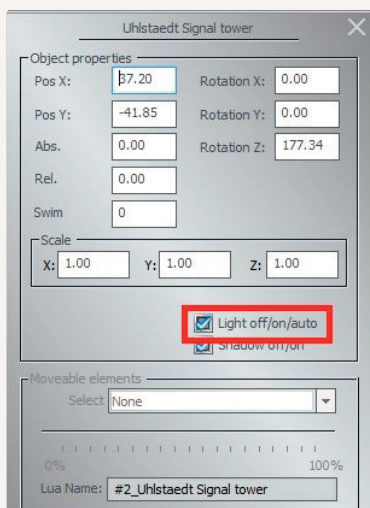
Für die Lichteinstellung gibt es drei Zustände: ein, aus, automatisch

Fire in structures:

Even more spectacular than the randomly control lighting effect is the outbreak of fire, which you can switch on manually

or via a contact. This feature, which could first be admired in the Knuffingen model train layout, is however only available in the functional models that have been specifically designed for this purpose and which can be selected and placed using the structures editor.

Feuerwehreinsatz in EEP – neue Feuerwehr-Modelle gibt es im Shop unter www.eep.eu; sinnigerweise von Hans Brand

If you would like to trigger the fire in one of these buildings manually, select the structure in the 2D window, right-click to open the properties dialogue from the menu, and switch on the Fire on/off option. With this option enabled, the building will be ablaze in just a matter of seconds. If you remove the tick that activated this feature, the fire will be extinguished just as quickly.

To simulate a complex firefighting operation, the fire can also be controlled automatically using contacts. In contrast with the manual controls, the automatic controls are assigned to the signal control editor via contacts, so you will need to switch from the structures editor to signal control. Here, select the structure contact in the contacts list, then switch to the planning window and place the desired number of contacts for the automatic control of the operation on the designated traffic route using the left mouse button.
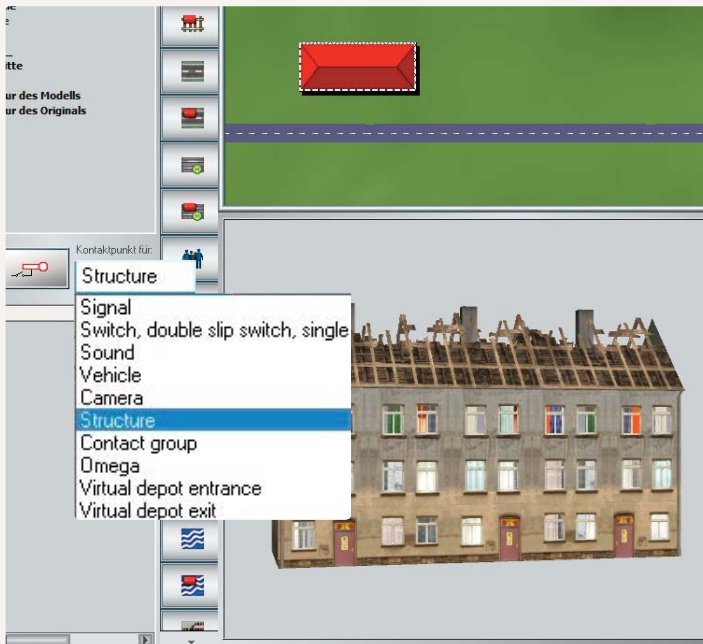
Once the contacts that control the sequence of events have been placed, right-click on the contacts in order to open the control dialogue for each contact. From there, select the rolling stock that trigger the fire and set the intensity of fire and smoke, and if necessary the setting relating to individual axes, the direction of travel and the route.

Auch Kontaktpunkte für Immobilien werden im Signaleditor gesetzt

The more contacts you set, the more fire vehicles can be involved, and so multiple blazes can also be fought simultaneously on a certain time delay. The fire is finally extinguished the way it was started: via a contact, only this time you have to set the fire intensity to zero in the properties dialogue. Of course, vehicles with extinguishing water and water cannons need to be deployed to extinguish major fires. This is mentioned here only for the sake of completeness, and is dealt with in detail in the context of signal control, which is documented in its own chapter.

Structure contact - Build. 3lev. grey Fire_03_SB1

Trigger when train passing:
- ☑ [Direction one]
- ☑ Direction two
- ☐ End of train
- ☒ Lights on/off

Delay operation: 0
Offset trigger spot: 0
Counter: 0   Every: 1

For route: Any

For train: Any   Filter name:

If signal/turnout #   is

Lua function:

Moveable structure elements
Moveable: None   Action: Stop   Number:

Fire, light and smoke settings
Fire   Smoke
0%   100%   0%   100%
☒ Light on/off

Tip text   OK   Cancel

Durch Rechtsklick auf den Kontaktpunkt öffnen Sie den Einstellungsdialog

Structures with moveable axes:
The architectural objects with extended functionality also include structures with moving parts such as cranes, wind turbines of mill, to list just a few examples. The respective objects can be selected in the structures editor in the 2D view and moved manually in the 3D view. In doing so, both the type and the intensity of the movement is controlled using a combination of the mouse and keyboard.

The movements that can be produced are:
→ First left-click – a short movement or a movement to the next pre-defined angle (turntables)
→ Second left-click – a stop
→ Left-click + *[Shift]* – a continuous movement to the possible end
→ Left-click + *[Ctrl]* – a reversal of the continuous movement to the next pre-defined angle
→ Right-click + *[Shift]* – an acceleration
→ Right-click + *[Ctrl]* – a slowdown of the movement

Once set in motion, the movements triggered this way are preserved, even if the layout is closed and re-opened again later. All moving parts in interactive structures can be controlled via contacts embedded in the tracks to switch the movements of the axes on and off, or to move the axes to a position pre-defined by the user. In this way, engine shed gates can be automatically opened and closed by an approaching locomotive, for example. The position of the turntable can now also be controlled so that it automatically adjusts itself to the position of the locomotive. And the moving parts in other structures, such as the loader of a coaling facility or the filling pipe of a water crane, can also be controlled automatically using contacts.

Ein Rechtsklick auf den Kontaktpunkt in der 3D-Ansicht führt über das Auswahlmenü zu den Objekteigenschaften

As with fire in structures, the automatic control of moveable axes is also handled via the signal control. In order to place the contacts on the desired track, the structure contact must once again be active in the signal control editor and the respective structure selected in the layout plan. Once all contacts have been set, open the configuration menu for each contact as usual to configure the vehicle, the corresponding axis and its movement in the Action menu.

4.5.1 Shadows for landscape elements and structures

The shadow of each structure and landscape element can be set individually. As shadows require additional processing effort, it can be advantageous to disable shadows in invisible areas, such as in the middle of forests. Use the block tool to modify the shadows of entire groups of models.
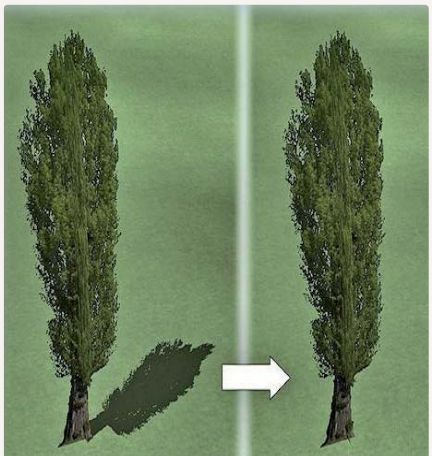
## 4.5.2 Random variation when placing landscape elements and structures (new in EEP 13 Expert)

Landscape elements are often built in large number and only the size and orientation vary. EEP now supports you by automatically varying the scale and rotation with each click. The button highlighted in red in the picture on the right opens a menu where you can activate this option and specify the limit values for the variations.
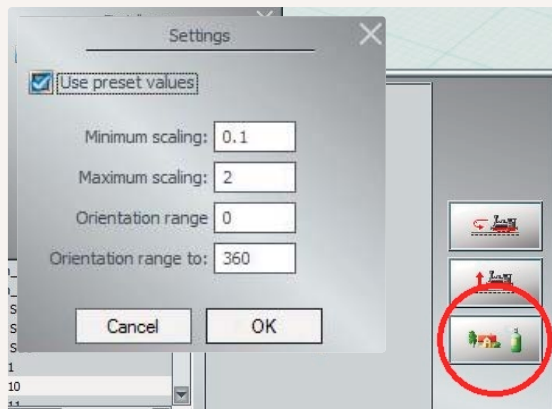
4.6. Building traffic networks

The core of a model railway is its rail system. Everything else a layout has to offer and show is secondary to its traffic system. Building a functioning traffic network with differentiated tracks is the task that we will now tackle and master. The track layer editors are selected in the 2D view via the buttons in the vertical tab bar.

Rail track editor: This part of the route editor allows you to lay railway track on your layout.

Road editor: This editor provides you with various styles of country and city roads.

Light railway track editor: In this editor you will find special track styles for trams, as well as a side conductor rail as used in the 'S-Bahn' commuter train systems in Berlin and Hamburg, a track for a monorail and a suspension rope for a funicular railway.

Auxiliary splines: In this editor you will find all the models that cannot be assigned to the other three categories. These are waterways, such as streams and rivers, invisible routes of air traffic and the dolly track for the mobile camera. You will also find models that are not track or routes here but which can be laid the same way: telegraph lines, hedges, fences, etc.

The traffic system of an EEP layout is essentially based on flexible segments that can be freely laid, moved into and out of position, shaped and combined with each other in their editors – this applies to all four of the editors introduced here. The different editors only vary slightly in their functionality and structure. Whether you're laying tracks or roads, the procedure is always the same. And it's all about the tracks in a model railway, we'll restrict ourselves to the construction of a track system with the example of the track editor.

Important:
Please note that only one editor can be active at once. The strict separation and division if the traffic system into four editors simplifies the overview and protects against accidental improper use.

4.6.1 Laying tracks

Before you start building a rail system, you should familiarise yourself with the features and tools.

In the tool palette of the track editor you will find:

- a track style selection menu,
- buttons for laying and deleting track sections and turnouts,
- an input field to determine the track height, as well as a tool that adapts the landscape surface to the height of the track, and
- a button with radio buttons for duplicating track sections.

The second tool dialogue contains a selection catalogue for trackside objects.

To construct a track system, first select a track style from the selection menu. Dark or light track, only sleepers, various tunnels, light rail, narrow-gauge railway or transrapid? It's your choice. Once you have made your decision, the actual work can begin:
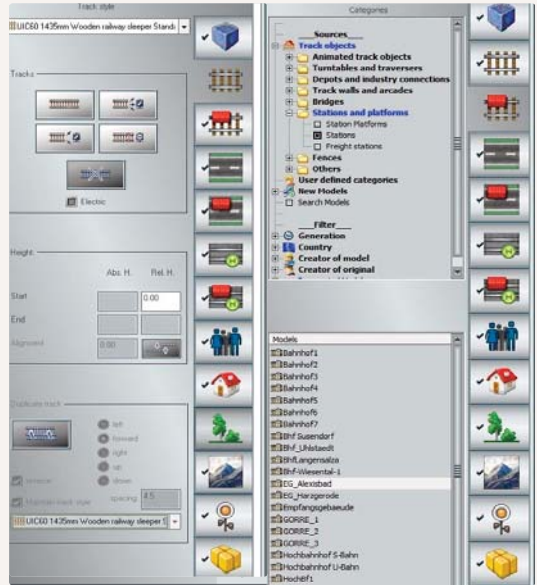
Die Werkzeugdialoge zum Gleiseditor

• Click on the button in the editor field to enable the track-laying function.
• Move the mouse to the layout plan and click to place the first section of track.

Positioning the first piece of track is that quick and easy. The thin red arrows at the ends of the section of track indicate the directions for further track connections. The green triangle at the start and the green dot at the end mark the ends and show the direction. The direction is important if a contact is placed on a section of track which then needs to be configured. The green symbols are shown again when the segment is selected for editing.
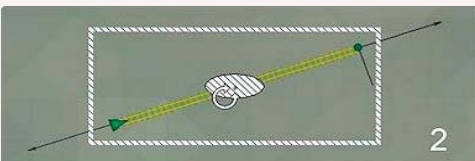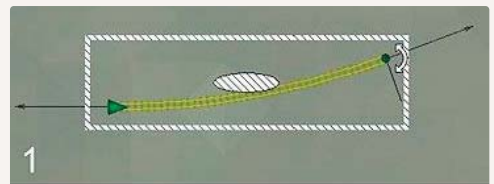
Gleis biegen

Gleis drehen
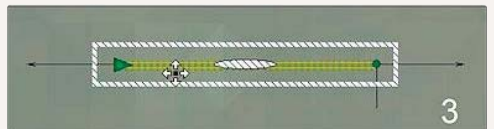
Gleis verschieben

Editing tracks:

If a segment of track has been selected, it can be edited just like any other object. Depending on the form the mouse cursor takes, you can now move, rotate, curve, compress and stretch the track – either intuitively with the mouse or precisely in the config-uration menu. To define the exact length of a track segment, right-click on the selected track. This opens the configuration menu, where you can set the track parameters:

- The start position is determined by the start co-ordinates, the absolute and the relative height and the angle that determines the position of the track on the layout.
- The Characteristics area specifies the curvature if the track, which is dependent on the angle and length of the track. Accordingly, you can enter either the angle and the track length or, alternati-vely, the angle and the curve radius or the length and the curve radius. In the same area, you can also set the gradient – either as a percentage or in me-tres.

Per Rechtsklick auf ein markiertes Gleis öffnet sich der Eigenschaftendialog für präzise Eintragungen

- Finally, the cant defines the elevation of the outer rail and the depression of the inner rail of a curve. Unlike on straight stretches, where both rails of the track are at the same height, the outer rail can lie above the inner rail on a curve to counteract the centrifugal force. The value for the elevation is entered in millimetres.

Connecting tracks:

What's next? Just as you laid the first piece of track, continue connecting piece after piece. It is automatically snapped in place and the orientation also adapts automatically when the start of the track (green triangle) approaches the end of a track. If a piece of track has a connection at both ends, its colour will change from yellow to blue.

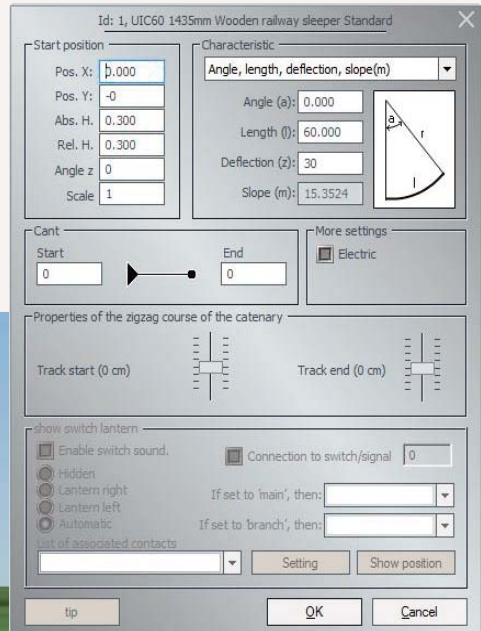**Tip:** Tracks are quicker and easier to lay in the new 3D editor mode.

Attention:
The first and last pieces of track on a 'stretch' will remain yellow as they have unconnected ends.

You can lay continuing and parallel tracks faster using the 'Duplicate track' feature:

- Set the direction in the ***Duplicate track*** editor field. For continuing track, choose the ***'forward'*** option; for parallel tracks, choose ***left, right, up or down.***

- If you wish to lay the next track against the original laying direction, not at the end but at the beginning (green triangle) of the first track, enable the 'reverse' option.

- Optionally, you can choose a different track style or even another traffic system for the copy by disabling ***'Maintain track style'.***

- If you have previously selected a group of tracks using the block tool, all tracks in the group will be copied according to your specifications.

- Click the button to generate the desired copy.

Vertical bends in tracks
A piece of track can be bent for a smooth transition from a flat stretch to an inclination. For this, the deflection must be entered in degrees in the ***"Characteristics"*** section of the object properties. The deflection will be added to the angle of inclination.

Die vertikale Biegung eines Gleises im 3D-Editor der Fahrwegmodule (Splines)

EEP can calculate the connection of two separated track ends for you automatically.

- First activate the 2D track editor and select the Close gap command in the Edit menu. The open, unconnected track ends will be marked with blue chevrons (triangles).
- Now click on the highlighted ends that you would like to connect.
- EEP creates a block containing the required connecting track. You can accept the block by clicking outside of the frame, or discard it by pressing the [Del] key.

This only works, however, if the tracks have been laid in a way that a connection is both possible and plausible.
The gap in the track cannot be closed automatically if the spacing between the tracks is too small or if there is a bend of more than 180°. Any height differences, however, can be taken into account and evened out.

The virtual connection of tracks is also possible. At **virtual connections,** vehicles jump from one end of the track to the other. With this trick, you can avoid the tedious work of connecting one end of a route to a lower and far-off hidden depot via a huge spiral of track. If you prefer!

- Select the Virtual connection of tracks option in the Edit menu; all unconnected track ends will then be marked with blue chevrons (triangles).
- Now click on the highlighted ends that you would like to connect. A virtual connection counts as a connection, and so previously yellow track ends now become blue.

Electrifying tracks:
#Electrified trains have been around for about a hundred years, so of course EEP model railway layouts shouldn't only be powered by steam and diesel. If you enable the somewhat inconspicuous Electric option, all the tracks you lay will automatically be equipped with overhead power lines.

If you would like to go back and electrify a piece of track you have already laid, enable the corresponding option in the configuration menu of the piece of track, which is opened as usual by right-clicking on the selected track. The following figure at the top of page 71 shows both variants.

A piece of electrified track is depicted with a line running down the centre of the track in the layout plan signifying the overhead line, as well as with white circles marking appropriate positions for overhead line masts.

You can also use the electrification feature if you wish to lay telegraph lines of overhead power cables. However, the **editor for auxiliary splines** and air routes is used for this rather than the track editor. With this switched on, select the telegraph line track style and enable the **Electric** option.

Only by enabling this option do the overhead lines of the invisible telegraph lines style also become visible. Catenaries on electrified routes can also be laid in a zigzag course quickly and easily. With a course like this, the catenary wire doesn't

Elektrifizierte Strecke

run centrally, but with a lateral displacement to the centre of the track, preventing unilateral wear to the panto-graphs. You can now determine how far the catenary wire is offset in relation to the start and end of the track easily yet precisely using the slider in the track's properties dialogue. You will find matching masts in the structures editor in the folder *Immobilien\Verkehr\Oberleitung.*
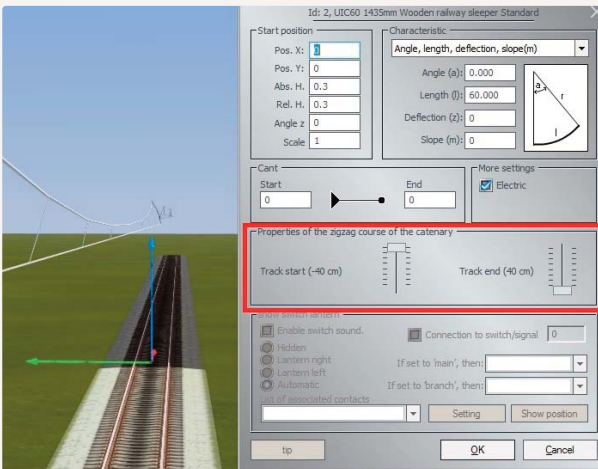
Stromleitungen finden Sie im Editor Wasserwege
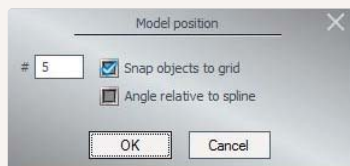
Inserting splines:

Placing overhead masts along an electrified route is relatively quick and easy if you use the spline function. This function allows multiple catenary masts to be distributed evenly along a stretch of track and to be positioned and docked in one go. In doing so, objects placed on the spline curve do not need to be oriented to the height of the layout surface, but can be adjusted to the height of the track. This allows even tracks that don't lie flat on the layout surface to be equipped with catenary masts much more easily. You can allow objects to be adjusted to the height of the track by disabling the 'Match object position height to surface' option in the Insert menu.

How does it all work? Give it a try:

- Select *Spline propertie*s in the *Extras menu.*
- In the following properties dialogue, check the boxes: *snap objects to grid and Angle relative to spline.*
- Now click on the spline tool in the control bar to enable the spline function.
  A spline line will then appear in the planning window.
- Now place the mouse cursor directly over the track you wish to add masts to.
- Press the right [Shift] key and click the mouse. That's it.

What happens?

The spline line is instantly placed on the target track and takes the exact same course. Now all you need to do is select the right mast in the *structures editor.*

The rest takes care of itself: When you click to place the mast in the layout plan, the masts are distributed exactly and evenly along the track. Not only individual tracks but entire sections of track can be equipped with catenary masts this way. To extend the snap-to-grid spline function to several tracks, you also have to hold the right [Ctrl] in addition to the right [Shift] key. Whilst holding both keys at the same time, you can select the tracks to which the structures will be docked one by one.

The spline function can be used manually as well as automatically, of course. If you would like to distribute objects manually along a spline curve, disable the Snap objects to grid option in the *Spline properties* dialogue in order to determine the number of objects placed at the same time yourself. Objects will now no longer be positioned automatically, but will now be placed in manually determined locations along the curve.

The *Angle relative to spline option* should be switched on if you want to distribute overhead masts, lanterns or similar objects. If this option is disabled, all inserted objects will face the same direction; if it is active, however, the angle of the objects will follow the spline curve.

Once you have made the spline settings, click on the spline tool in the control bar to enable the spline function. The spline curve that is now shown is initially a straight line with round and square markings. The squares indicate the positions at which the objects are inserted. If the *Snap objects to grid* option has been enabled, the square and round markings will be identical in number and position; if it has been disabled, the squares will be distributed evenly along the specified line.

You can change the position and the shape of the spline line by clicking and holding the round markings and dragging them to the desired positions. If you click on the curve whilst holding down the [Ctrl] key, you can add new points as you wish and remove existing points. The more points a curve has, the better it can be made into the desired shape. Once the squares are in the desired positions, objects can be selected and inserted as usual with a click of the mouse. If the objects are facing the wrong direction, you can correct their orientation manually by double-clicking on them one by one to turn them to face in the correct direction.

Inserting switches:
For a network with branching tracks, you need switches, which are quick to build and place with the track editor's ready-made components.

- First select a track style for your project. Then click on one of the two buttons to decide between a two or three-way switch.
- Move the mouse to the planning window and click to place the switch point, possibly at the end of an existing track. The switch point, depicted by a bar with a black square, is then placed.
- Now click on the button in the track editor to set and connect the first switch branch in the planning window. Once the first branch is snapped in place, connect the second (and, if required, third) branch in the same manner. As the second switch branch generally needs to be curved, first lay this piece of track next to the building site.
- Then open the configuration menu for this piece of track. Choose the characteristics option you would like to work with. Usually, this is the third option, Length + curve radius.
- Once you have entered the values, confirm by clicking OK and dock the curve piece of track with the switch point.

Once all branches of the turnout have been connected, a green arrow and a four-digit number will appear next to the switch point in the planning window. The arrow denotes the switch lantern in the planning and overview windows, which shows the current setting of the switch and thus the passable direction. You will see the switch

lantern here in the 3D view. In this view, you can operate both switches and signals by clicking on them whilst holding the *[Shift]* key. You will be able to recognise areas where you can operate switches as the mouse pointer will turn into a hand with an outstretched index finger.
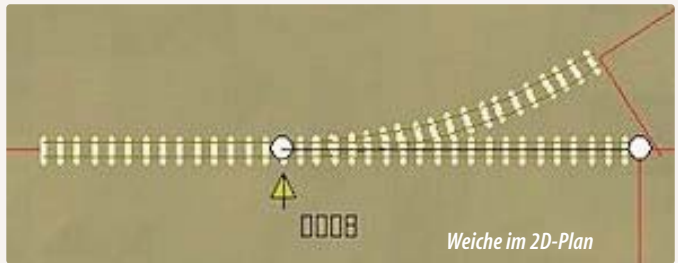
If you would like to set the position of the switch lantern, which can be changed for each switch individually, switch back to the 2D view and right-click on the switch point to open the configuration menu.

Here you will be able to decide whether the switch lantern is positioned to the left or right of the track, or whether it should be made invisible. If you choose the option 'Automatic', the software will decide

Weiche im 2D-Plan

Weiche im 3D-Fenster
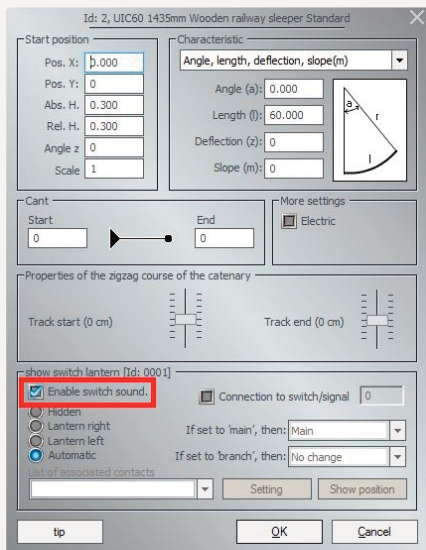
the position of the switch lantern. The position of the lantern to the left or right of the track is determined by the laying order of the branches of the switch and their angles. If you enable the Connection to switch/signal option, you can create a logical connection with another switch or a signal by specifying its ID. In *EEP 13* you can also turn a switch's sound effect on or off.

Weicheneinstellungen im Gleisdialog

Attention:

If you choose the Hidden option, e.g. for a modern rail system with electronic switch points, no control element will be visible in the 3D view. As a consequence, the switch can only be set manually in the planning and overview window. Regardless of this, the switch can also be controlled automatically by one or more contacts, of course.
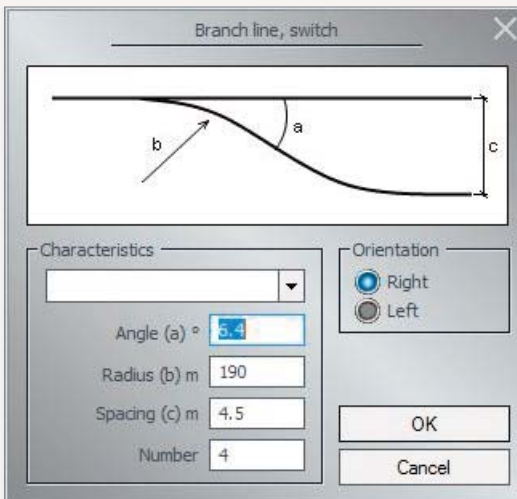
Inserting track combinations:

Of course, constructing each switch individually takes a lot of time. You can save yourself this effort by using the track combinations supplied, which you can select from the *Edit menu* and place in your layout with a simple click of the mouse. The selection is made up of freely changeable combinations of the following types:

- Branch line
- Scissors crossover
- Crossover
- Track harp
- Arc
- Double bend

Additionally, there are ready-made standard combinations for the types branch line, double slip switch, crossover and scissors crossover, which cannot be modified individually. How to set these track combinations can be most easily understood from the example of a branch line:

- Select the Track combination option from the *Edit menu,* and then the branch line type from the *sub-menu.* The branch line configuration menu will then appear.
- Set *the angle* and *the radius* of the branch line here, as well as the spacing to the parallel track.
- Then set the direction of the curved switch branch and click on *OK* to create a ready-to-use branch line.

Choosing a standard combination bypasses the dialogue. However, the downside is that the parameters of default combinations cannot be adjusted. Track combinations apply with *OK* appear as blocks in the layout plan and can still be *rotated* and *moved while* selected. Once it is in the right position, double-clicking outside of the selection sets it.

Dialog zur Abzweigung, über den Menüpunkt Bearbeiten unter Gleiskombination aufrufbar

If you want to connect a branch line or another track combination to a track you have already laid, it can simply be docked and snapped in place:

- Drag the selected block with the track combination whilst holding the left mouse button and left [Shift] key towards the laid track. Once the block's connecting track end is in the immediate vicinity of the laid track, the block will automatically dock.

- Now double-click outside the selected area to dock the track combination seamlessly onto the existing track.

Double slip switches:

The double slip switches ('DS' for short) receive special treatment amongst the track combinations. Even though these are track objects that are inserted completely into the track layout, a DS can be set like any other switch, both manually and automatically using contacts. As with its real-life counterpart, the double slip switch in EEP also has a special DS lantern that shows the current switch setting. The setting of the DS lantern can be controlled in the 3D window as well as in the planning or overview windows. A single left-click on the DS lantern – whilst also holding the [Shift] key in the 3D window – or on the corresponding button in the planning window cycles the DS through one of four possible positions. The
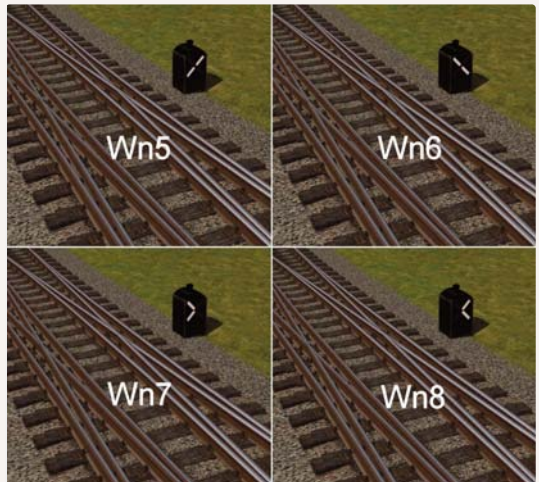
figures show how the DS signals are displayed in the 3D and planning windows, and how the DS can be set using contacts in the dialogue window. **EEP 13** also includes double slip switches. You can find these in the track editor by clicking on the button and on the **Animated track** objects in the **Track objects** catalogue. The number in the name of the double slip switches provide information on the track geometry, i.e. about the radius, the grade expressed as a ratio, and (in brackets) the track spacing for the parallel tracks where double slip switches can be used.

DS track geometry

Radius: Even in the time of the state railway, the radius determined the maximum speed, with the radius originally being measured from the outer rail, and later in the centre of the track by the German State Railways (DRG) – 'Deutsche Bundesbahn' (DB) and 'Deutsche Reichsbahn' (DR). The following standard radii have been defined:

Radius of 190 m = 40 km/h   Radius of   760 m = 80 km/h (introduced by the DB at the start 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 the DB in the 1960s)

Grade: The grade of a double slip switch is the tangent of the switch angle and is expressed as a ratio. The following grades were used by the DRG (and later):

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 included DS models

DS 190 1:9 ⟶ The straights are each 40.36 m long and are 2.25 m apart at the end (parallel spacing 4.5 m), switch radius 190 m, grade 1:9 (approximately equal to 6.4°).

DS 190 1:6.6 ⟶ The straights are each 47.20 m long and are 3.50 m apart at the end (parallel spacing 7.0 m), switch radius 190 m with intermediate straights of 6 m, grade 1:6.6 (approximately equal to 8.6°).

DS 300 1:9 ⟶ The straights are each 40.36 m long and are 2.25 m apart at the end (parallel spacing 4.5 m), switch radius 300 m, grade 1:9 (approximately equal to 6.4°).

DS 500 1:9 ⟶ The straights are each 62.89 m long and are 3.50 m apart at the end (parallel spacing 7.0 m), switch radius 500 m, grade 1:9 (approximately equal to 6.4°).

Pay attention to the position of the DS when building automatic switches as the switch signal is read from left to right. At the location of a DS cannot simply be set like a simple switch (to the left or right of the track), you will find some DS models in the catalogue with the switch lantern on the left side of the tracks, labelled 'L'.

Nevertheless, 'normal' DS models can, of course, be rotated through 180° to change the position of the switch lantern from right to left. When controlling rotated models via contacts, you must, however, bear in mind that the leading direction has been reversed, so that is now from right to left. As track geometry is the same for both normal left and right DS models, only the position of the switch lantern changes from right to left in the 3D view. The included double slip switches have been implemented as track objects for technical reasons and consist of a total of eight connected track pieces: four switch points and four connecting tracks. If one of these eight track pieces is deleted, the DS track combination is removed and the entire track object is deleted. The following must be considered when placing and connecting a DS to the existing track network:

When a DS is places on the layout, the inner track pieces are selected first (the selection box surrounds the inner tracks). In this state, the DS can be moved and rotated, but it cannot be connected to another piece of track (snapped), as you are dealing with the inner tracks, which are internally connected to the outer tracks.

To connect a double slip switch to another piece of track, left-click an empty area of the layout not far from the DS, but outside of the selection box, to first deselect the inner piece of track. Then select one of the yellow outer track pieces that form the four ends of the DS. If you now click and hold the left mouse button and [Shift] key and approach another track, the DS will first be automatically rotated and, when you release the left mouse button, connected (docked) to the track. Of course, you can also connect multiple DS's together and integrate them into existing rail networks.

End tracks:

The group of track modules ends with end tracks. End tracks finish with a buffer stop, which prevents more tracks from being added. A buffer stop knocks back rolling stock as they approach the buffers. End tracks are marked as such in the layout plan with a crossbar to distinguish them from other tracks and to mark them as the end of the stretch of track. End tracks are laid just like other tracks, only this time click on the buffer stop button to place an end track with a buffer stop in the layout plan.

Endgleis in der 3D-Ansicht
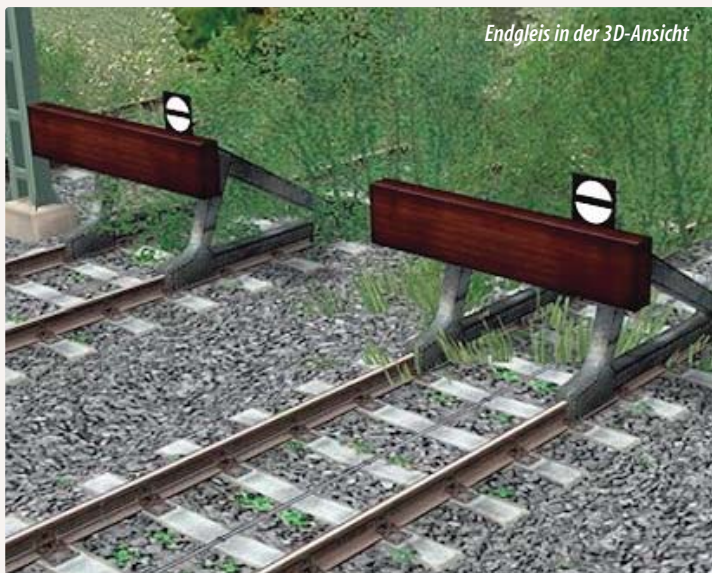
Laying tracks in the 3D editor for routes:

The *3D object editor* isn't only used for landscape elements and structures, but you can also use the 3D mode to insert and edit tracks and other routes. This is generally intuitive, but should still be explained briefly.

After switching to the *3D object editor* in the control dialogue and selecting a track segment, you can place it by clicking in the layout's 3D window. The green arrow indicates the start of the track, while the green dot shows the end of the inserted segment. If you right-click the selected track, the object menu will open with the available editing functions. Once you select an option, animated arrows will appear indicating how the piece of track can be edited, i.e. moved, scaled or rotated. If, for example, you would like to bend a track to lay a curve, move the mouse cursor to the arrow or the dot marking the start or end of the track, and move it in the desired direction.

Dialog zur Platzierung von Gleisen im 3D-Fenster

Object: UIC60 1435mm Wooden railway sleeper

Edit, move object
Rotate object
Scale object
Add track at end point
Add track at starting point
Remove object
Auto Alignment

Convert to 2-way switch
Convert to 3-way switch
Convert to end track

Vehicle contact
Camera contact
Sound contact
Contact group
Contact for virtual depot entrance
Contact for virtual depot exit

Model Properties
Object properties

Close Menu

Tracks (splines)

Categories

___Sources___
Tracks
  Railways
    ☒ Tracks
    ☐ Station Platforms
    ☐ Tunnels
    ☐ Catenary and conductor rails
    ☐ Other
  ⊞ Roads
  ⊞ Light railway
  ⊞ Air/Water/Misc
User defined categories

Models

Nur Schwellen
Nur Schwellen (v7)
SBB-Normalspur
Schmalspur 1000mm
Schmalspur 1000mm (v7)
Schmalspur 600mm
Schmalspur 600mm (v7)
UIC60 1435mm Betonschwelle ABS 3D
UIC60 1435mm Betonschwelle ABS LZB 3D
UIC60 1435mm Holzschwelle 3D
UIC60 1435mm Holzschwelle LZB 3D
UIC60 1435mm Holzschwelle Standard
UIC60 1435mm Oberleitung Standard
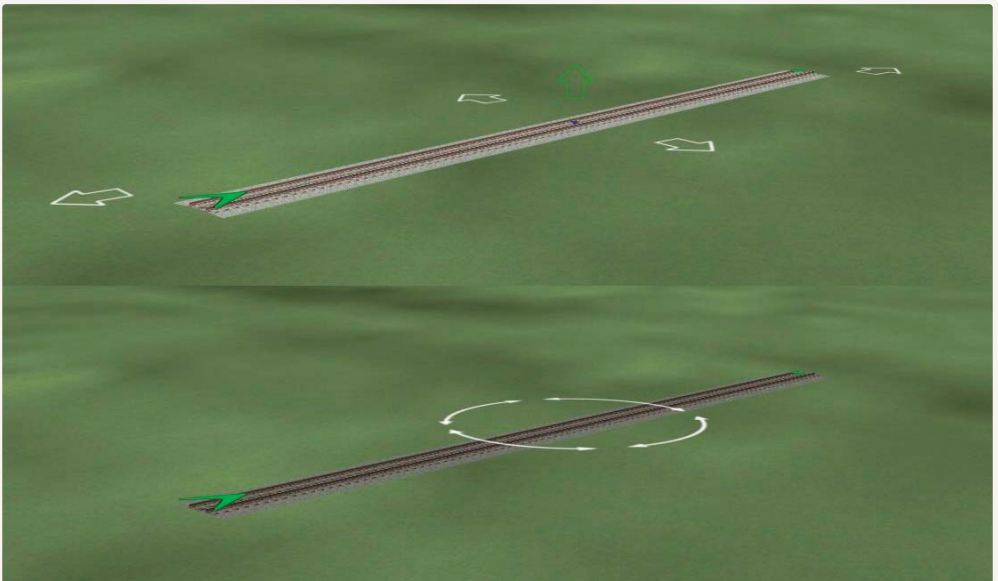
Furthermore, tracks can also be copied, connected and – if you hold the *[Ctrl]* key – raised or lowered via the object menu. For the latter, however, the **Match object position** height to surface option must be disabled in the **Insert menu.**

Important:
Unlike in the 2D editor, which has one button each for a switch point, a two-branch switch or an end track with buffer stop, the 3D editor only shows normal track pieces. However, tracks that have already been laid can be converted into switches or end pieces with buffer stops via the object menu, and switches and buffer stops can also be converted back into normal track segments.

Auto alignment of a copied track is optional:
An option (in the menu accessed by the right mouse button) has been implemented in EEP to automatically align a copied or connected track which can be turned on or off as required. Previously, all copied and newly connected tracks automatically assumed the orientation of the previous track they were connected to in the 3D editor, which can still be handled this way. However, depending on your construction needs, you can now also turn off this behaviour via the menu accessed with the right mouse button, allowing for completely free editing and orientation (height of the track end). Selecting the option again places a tick and activates Auto Alignment.

Automatisches Ausrichten von Gleisen
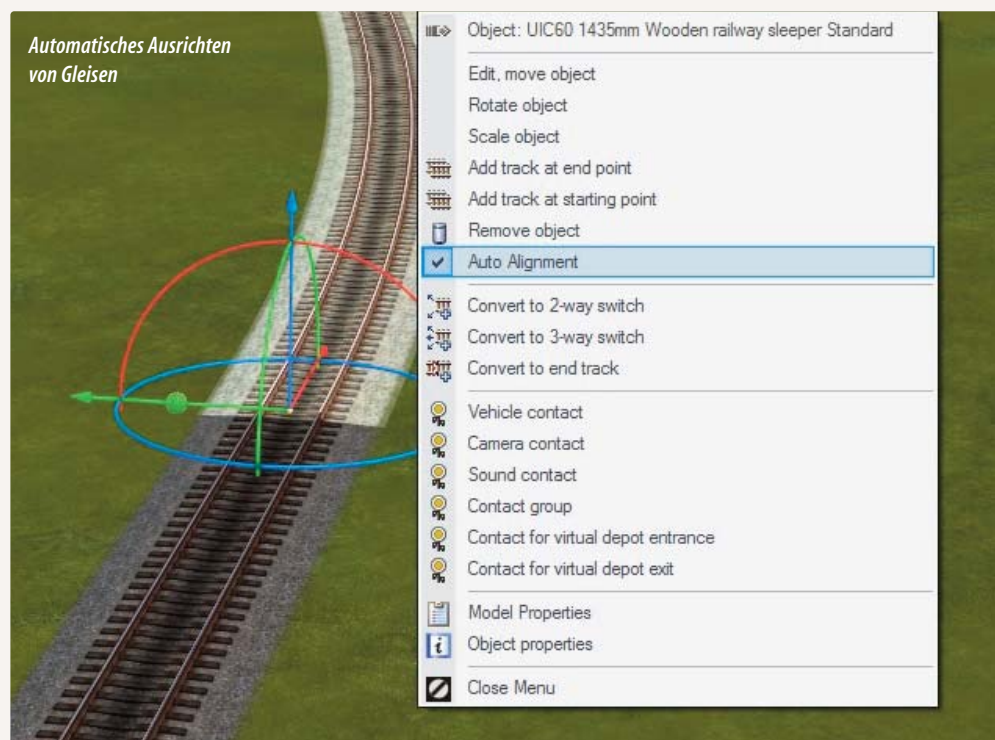
4.6.2 Inserting track objects

Track objects or trackside objects are generally made up of one or more track segments connected to a structure. Bridges, stations and turntables, for example, are all listed under this umbrella term in the EEP model catalogue.

Track objects mainly differ from normal tracks due to their static construction, which unavoidably means that the dimensions of the corresponding models cannot be changed, but that they can only be completely deleted. If, for example, you deleted a track segment from a two-track bridge, the entire bridge model will be deleted.

To install a track object, the corresponding route editor first needs to be activated and the desired track style must be selected. In this case, this is of course the track editor. Click on the model catalogue to view a list of the available track objects. Here you will find the folder for the bridges, stations and turntables categories, as well as a collective folder with all the *other trackside objects.*

Beim Einsetzen von Brücken wird der ausgewählte Gleisstil übernommen

Once you have chosen a model, you can place the track object in the planning window, like any other object. An exact positioning can be achieved in the object dialogue, which can be opened as usual by right-clicking on the selected track object. If, for example, you want to make a bridge slope, enter the desired angle of rotation in the Rotation X field, and the bridge will be given an uphill or downhill gradient. It is not possible to create slopes on track objects via the height parameters in the editor field. As this input field is for tracks and not for trackside objects, the height values at the start and end are always the same.

Turntables and traversers:
Originally, turntables were round platforms with rails mounted on them that allow for a change of direction of rolling stock in a tight area. For newer, larger turntables that are also no longer turned manually, the cover of the turntable pit, which gave it its name, has been dispensed with. When building a turntable, it is recommended to choose a flat area of terrain with enough space for additional structures.
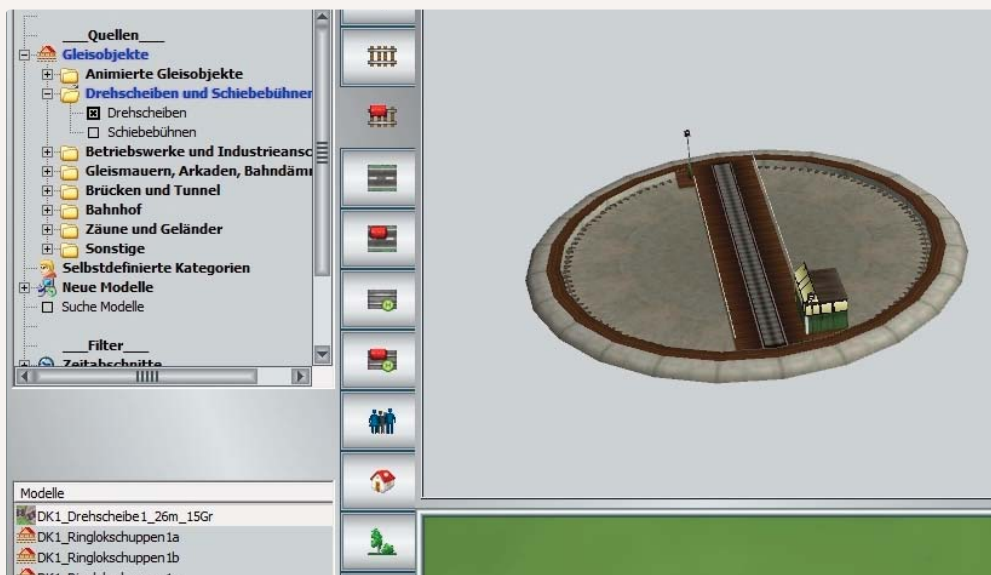
Choosing the right turntable

Depending on its construction, a turntable can have multiple track connections arranged around it and which can be connected to other tracks. It can, however, also be limited to a single turntable track, which the other track segments can be docked to with a rotating motion in the 3D window. Connections can be added either as tracks or as track objects – e.g. in the form of a roundhouse. Due to their importance, turntables have their own category

Eingesetzte Drehscheibe in der 3D-Ansicht

in the track objects catalogue, so the selection is relatively large. Once you have selected a turntable and placed it in the layout plan, a track with prepared connection points will appear there. Even at this stage, the turntable can be operated in the 3D view. In the case of models without prepared track connections, tracks can be arranged individually in the 3D view (for example with radial clearances of 40° or 60°). To do this, all you have to do is click on the turntable and wait until the desired position has been reached. Then switch back to 2D view to connect the connecting tracks to the turntable track. Repeat this process until the track connections are complete.

Turntables can only be moved in the 3D view! A simple left-click on the turntable platform is enough to set it in motion and to rotate it until it reaches its next connection point. As with their real-life counterparts, there are also turntables in EEP with different angular dimensions, such as 7.5°, 10°, 15° and even 20°. Please note that not every model of locomotive shed can be attached to every turntable – exactly because of the different angular dimensions. When choosing a shed, the first criterion is generally the length of the turntable – depending on which locomotives are to be handled by the turntable. Once the turntable model is in place, suitable engine shed models can be selected. When doing so, it is advisable to take note of the construction abbreviation. For example, 'Turntable 26m 15°_DK1' can be docked directly with the models 'Roundhouse 1tr-15°_left wall_DK1', 'Roundhouse 1tr-15°_no walls_DK1' and 'Roundhouse 1tr-15°_right wall_DK1'. The 'Turntable 26m 15°_DK1' model is a turntable without prepared track connections. This means you will need to switch to the 3D window after each connection to a track segment or trackside object (roundhouse), to turn the turntable to the next pre-defined angle before more track objects can be docked in the 2D window.

Attention:
For newer models, the constructor's initials are found at the end of the name.

Traversers:
Similar to turntables, traversers are also set to allow rolling stock to quickly change position in tight areas. The change of position here refers to connected parallel tracks. It is especially recommended to use a traverser for engine sheds or maintenance buildings that lie parallel to the main track.

In EEP, a traverser consists of a mobile track laid between rails arranged in parallel. The mobile track, which is embedded on a moveable platform, is moved along a sink to connect the track arranged on the opposite side. Traversers, which can be found in the relevant category, are placed like any other track object. Parallel tracks can be connected to the mobile track of the traverser as entryways and exits, as can trackside object, such as engine sheds. The mobile track is placed in the 3D view, as the traverser can only be operated in this view. Once the mobile track has reach its new position, you can switch back to the 2D view to dock further track segments.

In order to move a locomotive or other rolling stock to a parallel track, the locomotive must first be driven onto the traverser. Once the locomotive is in the correct position, you can click on the mobile track of the traverser to initiate the movement to the next position.
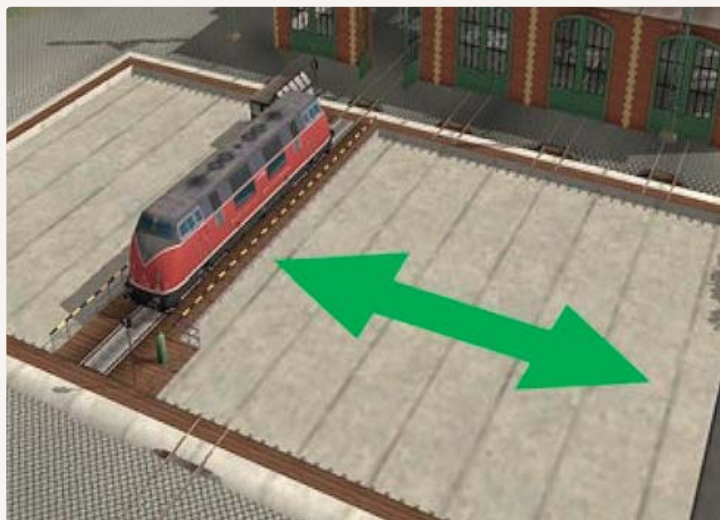
Eingesetzte Schiebebühne in der 3D-Ansicht

As with turntables, traversers can only be set in motion in the 3D view! Once again, hold the [Shift] key to move the traverser in a continuous motion, with the platform stopping automatically on the outer left or right side. You can stop the movement by clicking on the mobile track again, or change the direction by clicking whilst pressing the [Ctrl] key.

4.6.3 Automated road traffic crossings

Build your road traffic in *EEP 13* Expert with simple means. This version of the programme introduces two new road styles, as well as ready-made, fully automated crossings and branches. No further control elements or contacts are required to operate them. *EEP 13* takes full control of the crossings and branches for you.

4.6.4. Advanced copying of routes

From programme version *EEP 13* Expert onwards, the copying of routes from another area is possible. Thus, for example, you can build a road next to a track you have laid at a click of the mouse. Choose the desired style in the editor and it will then be available for immediate selection.

4.6.5 Tracks and landscape

Generally, the track you lay adapts to the level of the layout surface. The standard track always lies at a relative height of 0.60 m above the ground. You can create a climb or fall using slopes. If a slope rises from 1 to 3 m, for example, the track will adapt to this climb so that the track height of 1.60 m at the start rises to 3.60 m at the end.
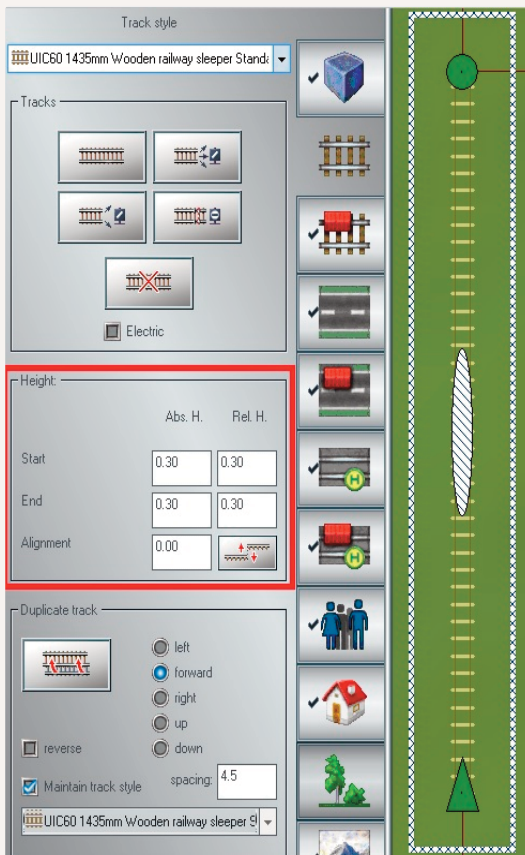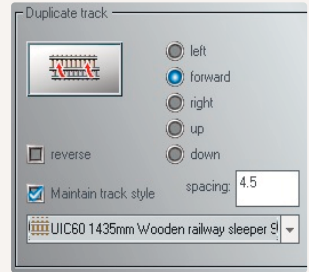
To move a track that has to be selected to a different level above or below the landscape surface, the height parameters need to be adjusted in the input field provided for this purpose. There is a difference between the absolute and relative heights here. The absolute height refers to the height of a model (track) in relation to the original, unchanged layout surface (in the real world, the height above sea level – normally zero). The relative height is the height different between the model (track) and the landscape surface.

If, for example, a track is to be laid on a plateau 5 m above the layout surface, the absolute height is 5.60 m, while the relative height, i.e. the height of the track above the visible, elevated layout surface remains constant at 0.60 m. If the track runs horizontally, the height value at the start and end will remain the same. If, however, the track climbs, the values will change. By entering different values at the start and end of the track, you can lay tracks with a tilt for entries and exits. The angle of the climb depends on the length of the track and the height difference between the start and end of the track.

Höhenanpassung des Gleises in der 2D-Ansicht

You can also modify the pre-defined track height in order to lay tracks at a lower level from the start. If, for example, you reduce the relative track height by 0.30 m from the default 0.60 m, you can lay tracks at a height of 0.30 m. This may spare you the later adjustment of some EEP stations.

You can customise the default setting for the track height when no piece of track, road or waterway is selected. Only one field in the input for the height parameters is active, where you can now enter the desired height difference. If you then lay a new track, road, etc., the custom height setting will be used so tracks can now be laid higher or lower than originally.

The custom track height is also applied to saved track blocks – provided the *'Match object position height to surface'* option is switched off in the Insert menu. You can also assign a custom track height to track combinations. In doing so, however, you should take into account that objects are automatically laid at a height of 0.0 m when the 'Match object position height to surface' option is switched off. This is due to the fact that there are many splines with different standard heights, which first need to be reset to the height of 0.0 m to guarantee the functioning of roads, waterways and tram tracks. So, if you would like to lay a track combination such as a parallel connection with the 'Dark track' style at a height of 0.30 m, the 'Match object position height to surface' option should first be deactivated and a relative height of (+) 0.30 m needs to be entered as the function of the track combinations lowers all track styles to the same level of 0.0 m.
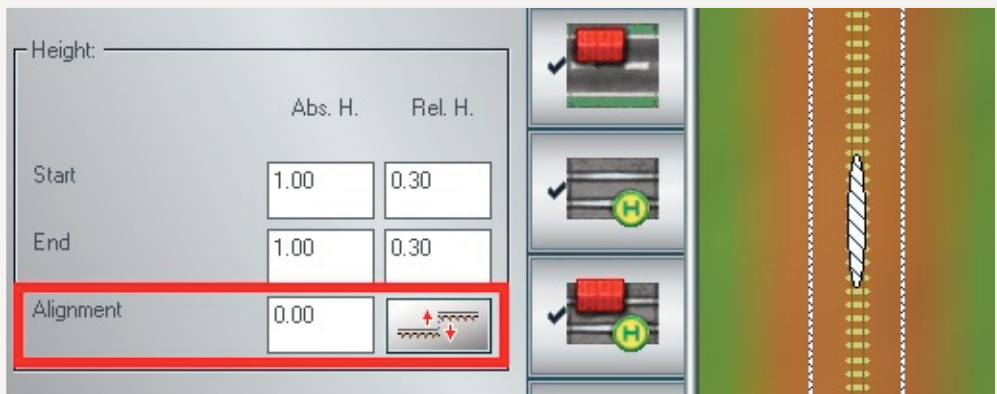
Mit dem Abgleichfaktor kann die Einbettung in den Untergrund verändert werden

Using the so-called alignment factor, you can now determine how deeply each track module should be embedded into the layout surface (if you are adjusting the landscape surface to the track). The alignment factor (shown in centimetres) can be custom set in a range from -10 m to +10 m. This makes a later adjustment of the landscape surface in the 3D terrain editor unnecessary. The alignment of the embedding height usually takes place afterwards, i.e. after a track module has been laid and the landscape surface is adjusted to the track height.

Building railway embankments:

Generally, tracks adapt to the level of the landscape surface. However, there is also the option to adapt the landscape surface to the track height instead. This is recommended when creating embankments. Click on the button to adapt the landscape to the height co-ordinates of the tracks. By activating this adjustment function, the landscape directly beneath the selected track will be adapted to the height of the track.

If the track lies above the surface, an embankment will be automatically raised. If the selected piece of track lies below the surface, a trench will be automatically created that adapts to the height differences of the track. As a newly docked track automatically assumes the height of the adjacent track, smooth ramps are created this way without having to form them. Conversely, to adapt a track to the landscape, you have to enter the relative height at the start or end of the track and add the height of the embankment to it. Height difference in the 2D view and the 3D image. The bend is missing here, of course.

Bildunterschrift ????????
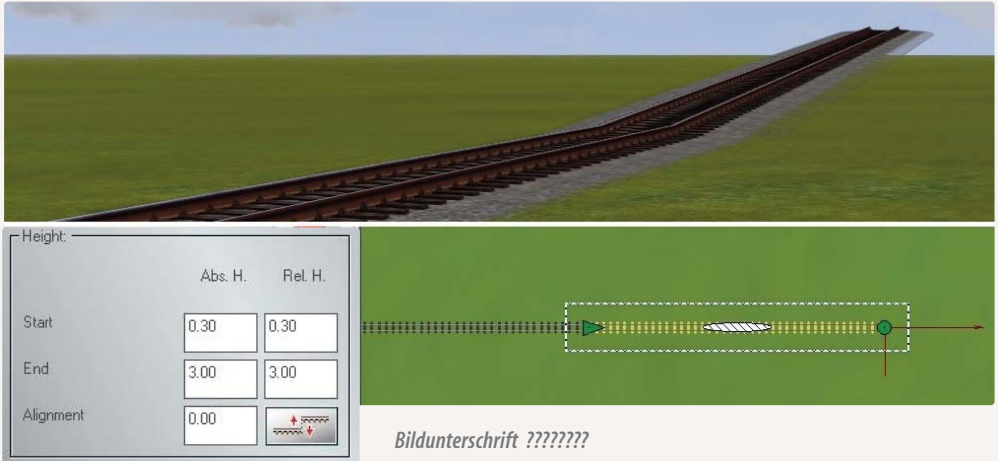
![Attention icon]

Attention:
Decisive for the possible width of slopes and their appearance is the number of grid nodes you set before you start building a new layout.

The step-by-step process of building an embankment is demonstrated in the following example:

• Lay a track with a relative height of 0.60 m at its start and end.

• Connect another track to it and now set a height value of 1.60 m at the end of the track. The track will now climb.

• Then attach three further tracks that automatically adopt the same inclination using the duplication function. The final track now ends at a height of 4.60 m.

• Now select the individual rising tracks one after the other, and each time click on the button to activate the Alignment function and to adapt the landscape surface to the height of the track.

There are also styles of track that already come with an embankment, e.g. 'Gleis1435_Bahndamm_...'.
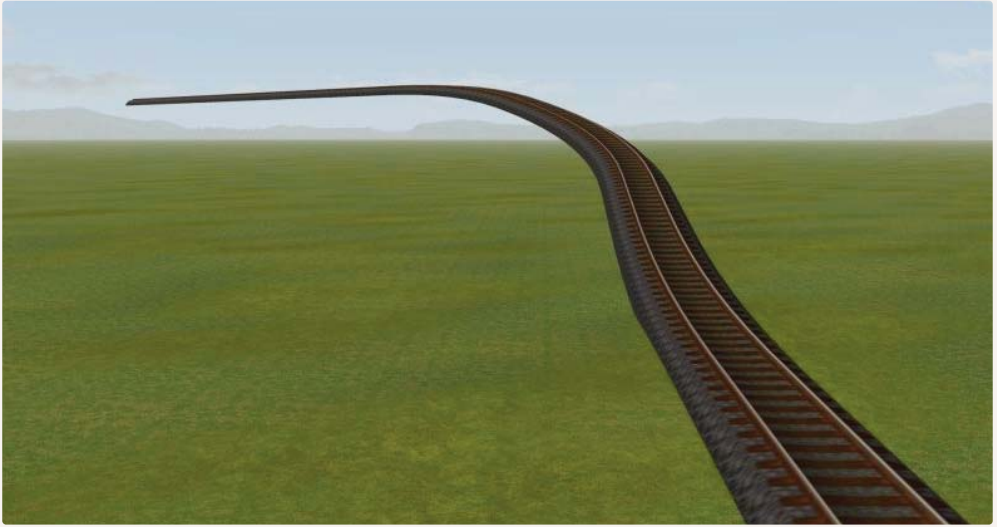
Steigung in der 3D-Ansicht (noch ohne Böschung oder Stützpfeiler)

4.6.6 Agriculture

This is new to EEP. To use this feature, you require various elements. On the one hand, this includes the actual fields which can be found in the track objects of the Roads insertion mode, and on the other hand, the relevant vehicles which are sorted into the Street – Agricultural vehicles category of rolling stock.

Das neue Features in der 3D-Ansicht:
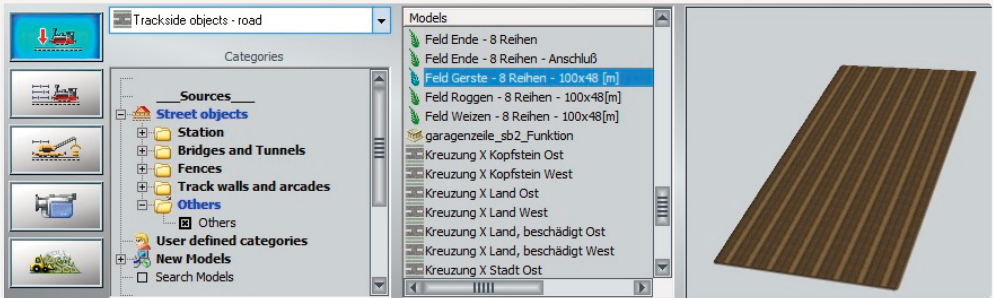
Modellauswahl für animierte Felder

A field always consists of at least three components. These are the actual field and the overflows. It can also be placed precisely via the corresponding dialogue. Once you have placed all the components in your layout, you can turn to inserting vehicles. For this, switch to the corresponding editor and choose a vehicle. Now when you drive over your newly created field with your tractor or combine harvester, your field will be worked automatically, so it is not necessary to set individual contact points for these functions.
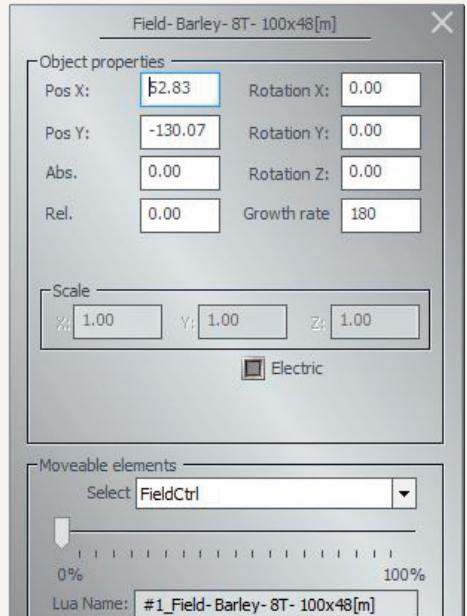
Positionierungsdialog für Felder
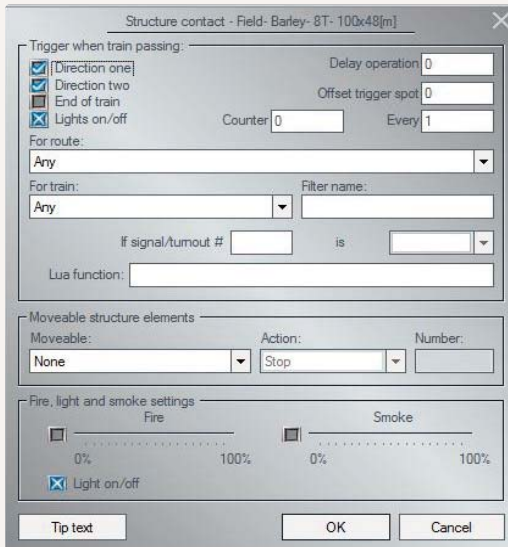
Once the entire field has been worked, you can repeat the process if desired. To do so, proceed as follows: Select the field and then click the right mouse button. You can now use the slider to change the setting.

Kontaktpunktdialog für Felder

You can also manipulate the *'growth rate'.* This value specifies the time it takes for a field to return to its original state after being worked. This time is set to 180 seconds by default. You can change this time as you wish. You can also control the growth via a structure contact, of course. Please refer to the corresponding chapter of this manual for instructions on how to set a contact.

4.6.7 Animated water effects and floating objects

This new feature allows for some impressive sceneries involving rivers and lakes. The following options are available:

- Impressive wave animation on water surfaces
- Adjustable environmental reflections on the water surface
- Realistic behaviour of objects floating in the water
- Adjustable visible water depths (cloudiness)

Additionally, a new spline, new landscape elements and new structures have made their way into EEP.
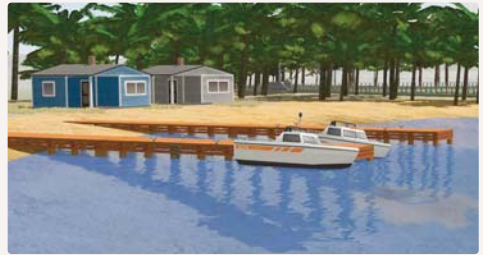
Adjusting the height values of new splines

As you can see in the following image, setting the height values of the new splines is not done directly on the models themselves, but in *'layout information'.*

Setting the floating behaviour of rolling stock

If you would like to adjust the behaviour of your rolling stock on the spline, please go to the ***model's properties.*** Here you will find the ***'Swim factor'*** input field. A value of 0 allows your model to glide over the spline without any rolling movement. A value of 100, on the other hand, has your model bobbing on the waves. Please adjust these values individually.
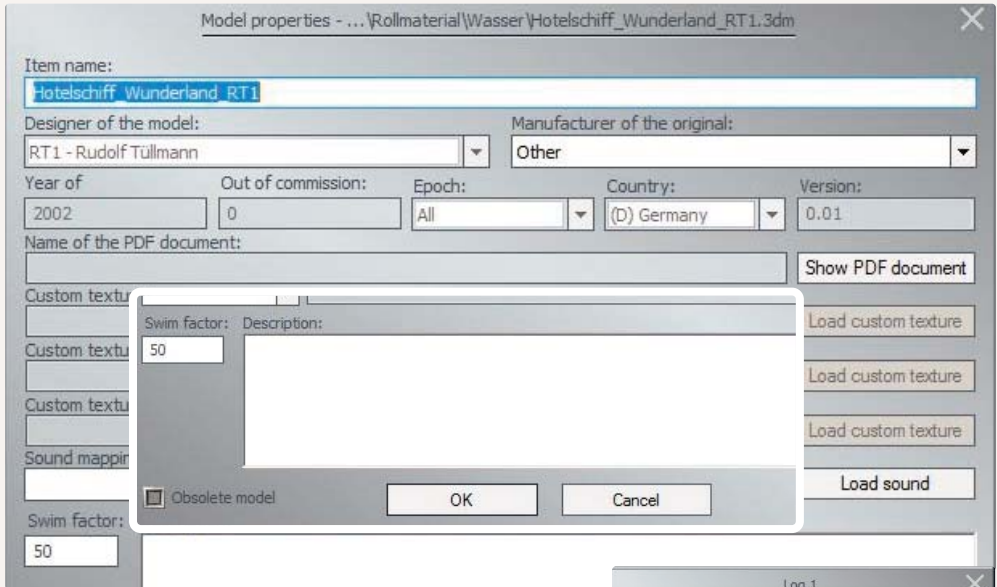

Setting the floating behaviour of structures/landscape elements

The same applies if you would like to adjust the floating behaviour of your structures or landscape elements on the spline. Please open the object's properties in this case. As with rolling stock, you will find a ***'Swim factor'*** input field. A value of 0 makes your model lie motionless in the water. A value of 100, on the other hand, has your model bobbing on the waves. Please adjust these values individually.
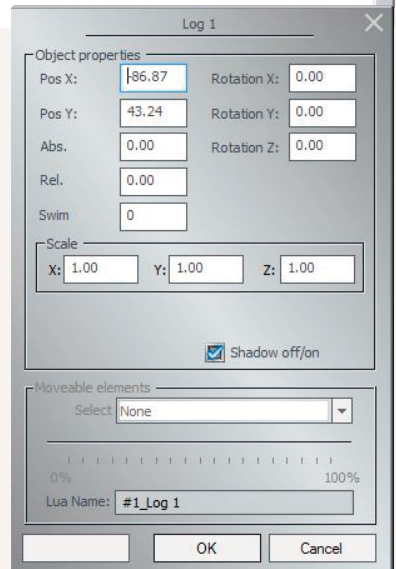
Reflection settings

You can set the radius for reflections in the programme settings. To demonstrate the difference, we have provided two images below.

Reflections in a radius of 500 metres
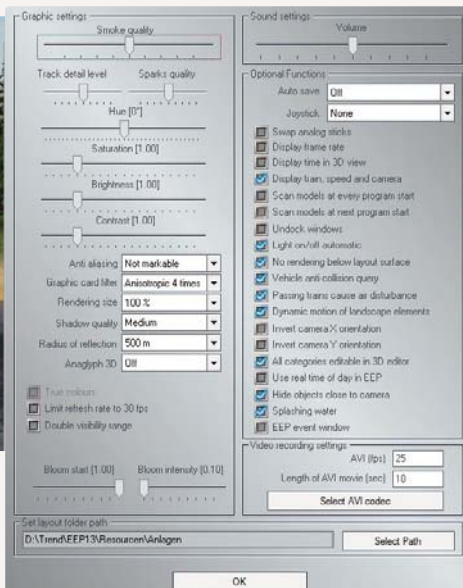
Reflections in a radius of 0 metres
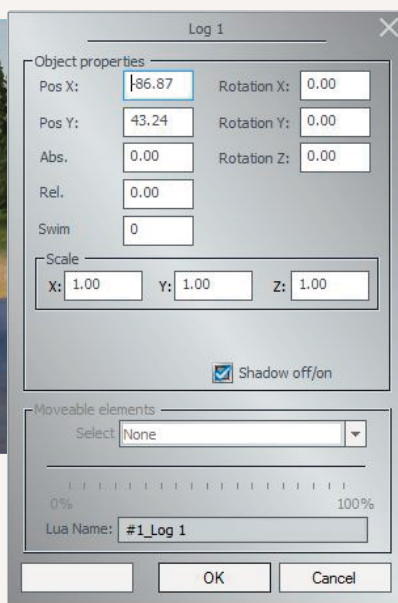
Setting the visible depth of water
You can specify the depth to which your water should appear transparent in the model's properties. The following images illustrate this effect.

Visible depth up to 20 metres
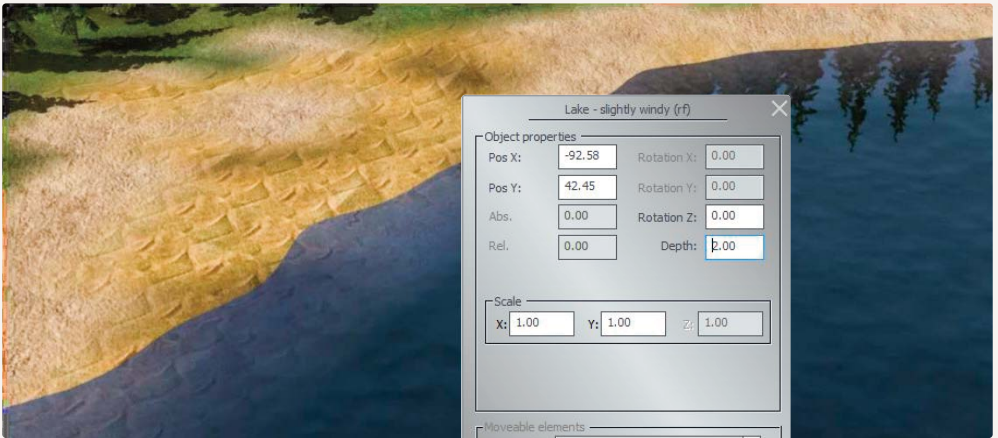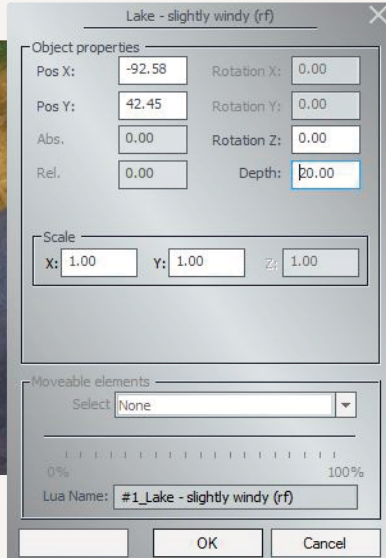
Visible depth up to 2 metres
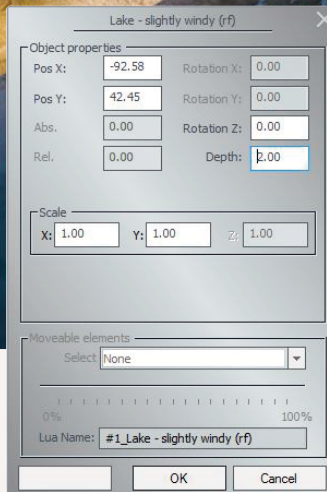
You can see the difference. In the first image, you can see right to the bottom of the lake. In the second image, you cannot.

To round it all off, we have also included the 'Wasser Demo' layout which shows you the features and the individual models once again in detail.

4.6.8 Other track layers

Beside the track systems for rail traffic, there are also roads, tram tracks, airways and waterways. As these traffic routes are handled just like tracks, you can also incorporate road, tram, water and/or air traffic into your transport system. The styles of transport systems can be combined together so that the outer appearance of the track system and the ballast bed can be changed section by section. A combination of different route systems, however, is not possible as they are fundamentally edited independently of each other. Each route system has its own editor in the planning window.

Track modules can now be exchanged within a track system – taking into account the signals and contacts.

- Open the *respective track editor* (tracks, tram tracks, roads, waterways) and activate the 3D editor,
- select the track style that should be applied to the module you are changing,
- right-click on the track module you are changing to open its object menu,
- click on the command in the object menu that changes the track style.
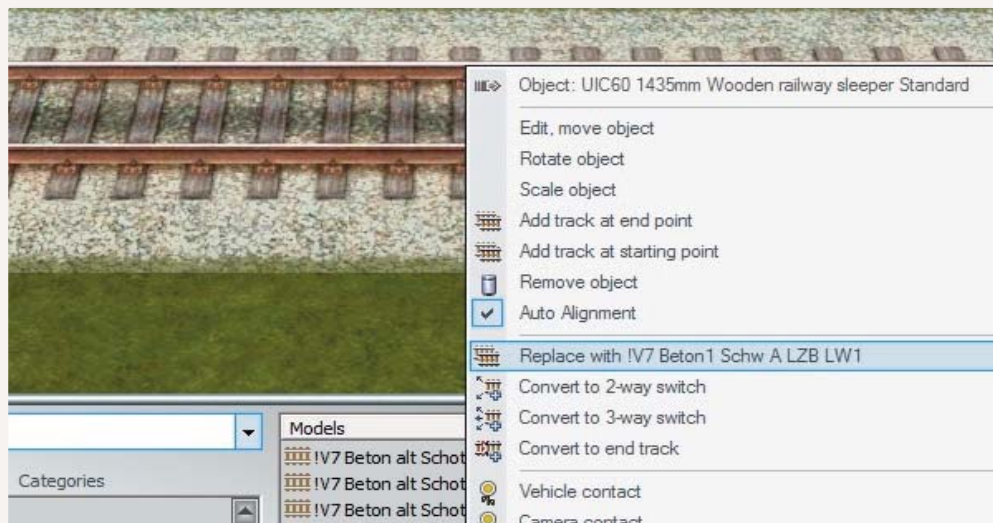
Austausch eines Gleisstils gegen einen anderen in der 3D-Ansicht

Waterways and airways are invisible in 3D view and allow for the operation of vehicles that are not connected to a track or road. This can be used to recreate air travel or maritime traffic on rivers and lakes. The invisible road style can be used for road vehicles as it can be connected to the visible country road and city road styles. Thus, a lorry can drive on an invisible road located within a tarmacked industrial site and later join regular traffic on visible roads.

4.7 Omegas (animated characters)

The Omega feature adds moving characters to EEP. They can populate roads, squares and train station platforms and behave rationally. Everything can be adjusted: spawn location, whereabouts, despawn location, group size and composition, dispersal area, direction and intensity of movement. To set a group of omegas, click the corresponding button in the tab bar of the 2D view to open the Omega dialogue window.

New:
At the request of many EEP users, all the elements for controlling omegas are now also available in the 3D mode. This results in considerably greater clarity. The functions still have to be created in the 2D mode, but the fine-tuning can be done in the 3D window. In this way, you see the results of the change instantly.

To help clarify how to deal with omegas, we have created various example scenarios (as layouts) in the 'Tutorials' folder. These are:

• Tutorial_24_Omegas.anl3
• Tutorial_25_Omegas_2.anl3
• Tutorial_41_Omegas_3.anl3
• Tutorial_42_Omegas_4.anl3

You will find further information in a short introductory video at
www.eep11.com/tutorials
This shows the basic functions.

Werkzeugdialog zum Einsetzen von Omegas (animierten Figuren)

With the button in the top-left (1), you can insert a crowd into your layout. After pressing this button, click on the area in the plan where you would like to place the omegas. A symbol with a grid structure with arrows and circles will appear in the plan. These symbols will be explained in greater detail later as they contain several sensitive areas that open dialogue boxes for fine tuning. Once it has been inserted, the crowd will appear in the white box (red, yellow, blue crowd, etc.).

If you would like to remove a crowd, select the crowd in this box and press the delete button (2).

You can now add additional sources (3) for an existing crowd and even sinks (4) – areas where omegas disappear again.

Points of attraction (5) can also be placed, or points that omegas avoid (6). With the buttons labelled 7 and 8, you can create fields in the plan which generally or partially limit omegas' direction of movement.

A delay in the movement intensity can also be achieved (9 and 10). Use walls to block off certain areas of the layout to omegas, which are generally impermeable (11) or only impermeable to adjustable dimensions (12).

Omegas normally move directly on the layout surface. To make platforms and stairs accessible to them too, plateaus can be placed. These can be un-limited (13) or limited in their dimensions in relation to the freedom of movement of the omegas (14). Finally, at the very bottom of the omega dialogue box, there is the function that encloses the area in which the crowd should remain, like a cage. If you hover the mouse pointer over the individual tool buttons, its function will be displayed after a short time.

Once a crowd has been placed in the layout (press button and left-click in the plan), the individual influencing tools will become active (2 to 15). Before setting up special intentions and limitations, you can set the composition of the crowd, their exact spawn and the extent to which they spread out.

Good to know:
All control objects for omegas inserted into the plan can be selected by right-clicking them. They can then be scaled, moved and rotated using the symbols shown. A right-click opens the dialogue box. The symbols concerning omegas are only visible if the Omega tab is selected.

Sources
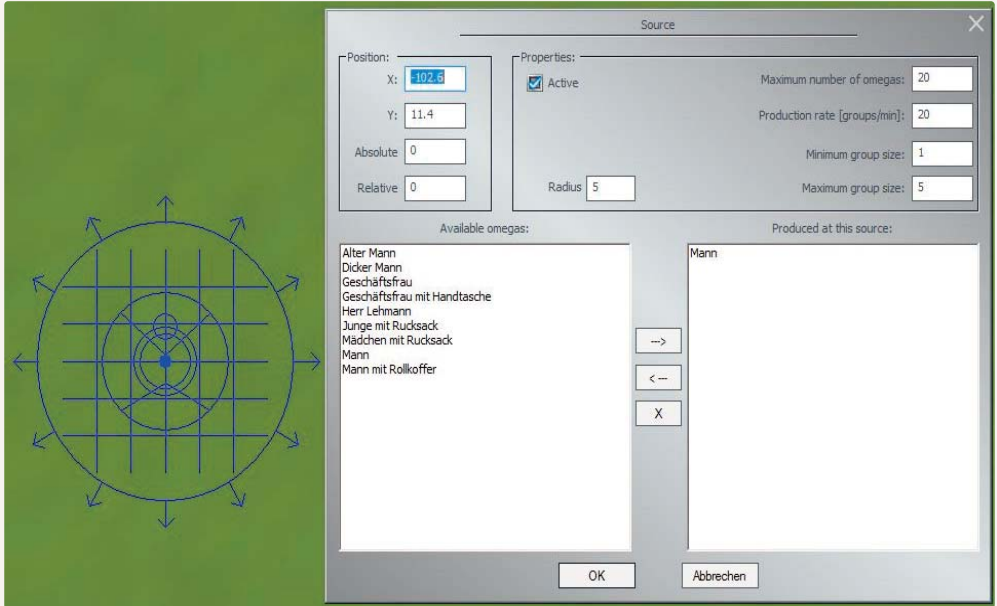

Omega Source dialogue: The omegas are created here

This dialogue opens when you right-click within the area of the omega symbols. The height values are of particular importance if you want to simulate omegas exiting trains that have just arrived. To open the dialogue window shown above, first left-click in the centre of the crowd symbols in the planning window, and then right-click within the white marking. If you perform the left-right click combination, you will open two other dialogue windows with input options.
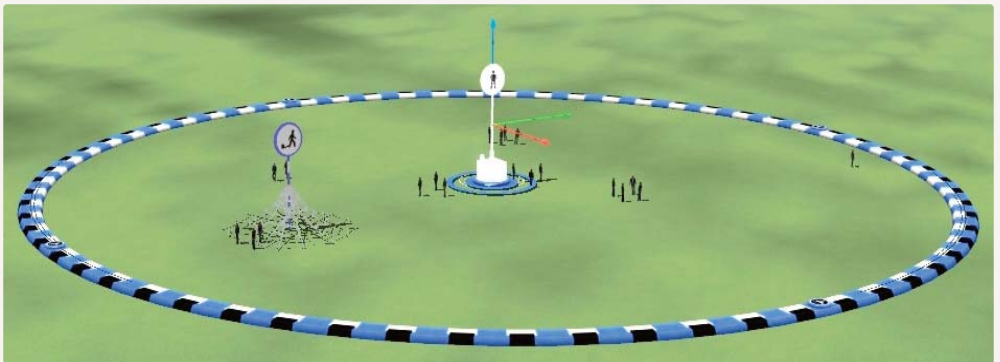
The Source dialogue in the 3D view

Crowds

This dialogue opens when you right-click the outer area of the omega symbols. The middle setting concerns the basic type of movement the crowd performs and at the same time corresponds to the Delay dialogue box (9, 10) or the generation of fields for the movement intention.
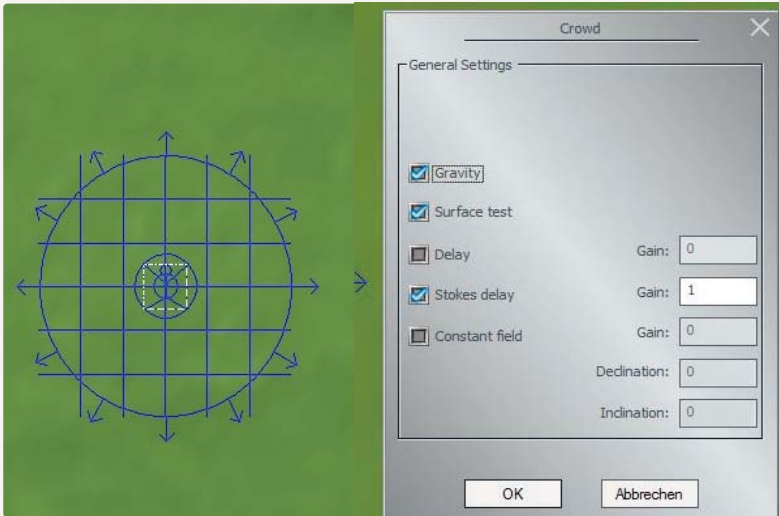
Massen-Dialog:
Hier kann die Popula-
tion festgelegt werden

Sinks

This dialogue opens when you right-click the outer area of the omega symbols. The outer circle with the directional arrows, on the other hand, represents the invisible limits. Once an omega oversteps this boundary, it disappears. The dimensions of this area, in which the omegas can roam, can be set via the radius.
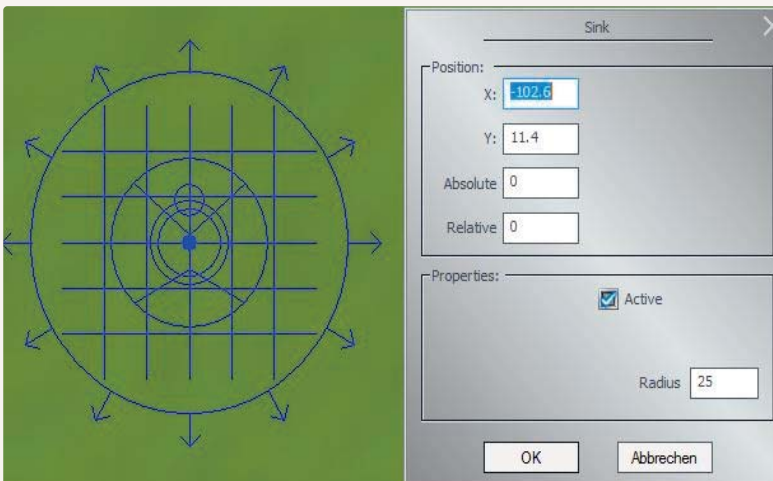
Senken-Dialog:
Hier verschwinden die
Omegas wieder

If you want the omegas to leave the layout at one or several locations, these neuralgic points should be marked by so-called sinks (4). If, on the other hand, omegas are to be generated at other points, additional sources should be set up (3). All the influencing elements can be moved as desired, even those shown when inserting the crowd.

Attractors and repulsors

These are elements that draw in or repel omegas. An attractor is a type of magnet that attracts EEP characters. It can, for example, be placed behind a door through which you want omegas to enter a building. Combined with a sink, the omegas disappear at this point.

Attractor in the 3D view

A repulsor has the opposite effect. It repels omegas. With its help, you can protect objects that omegas shouldn't walk through, for example.

Repulsor in the 3D view

Simply place the repulsor over the element you wish to protect and your characters will immediately avoid it and try to go around it.

Fields
In the context of omegas, fields represent energy fields that act on the characters and set them in motion. They can be created as constant fields of action or as limited fields with a local effect.
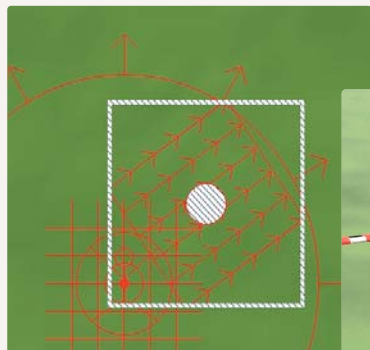
Ein begrenztes Feld in der 2D-Ansicht
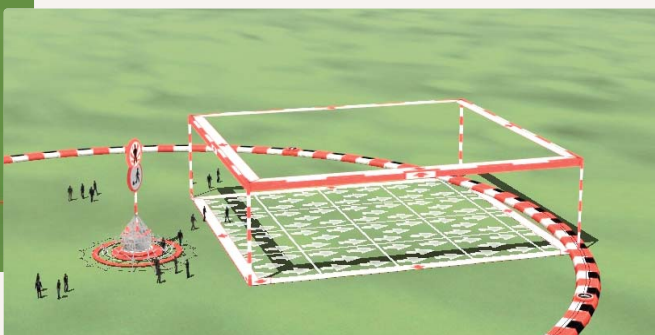
Ein begrenztes Feld in der 3D-Ansicht

Delays
The Delay option refers to the movement dynamic of the omegas, i.e. the speed at which they move. The lower you set the delay, the faster the characters move.
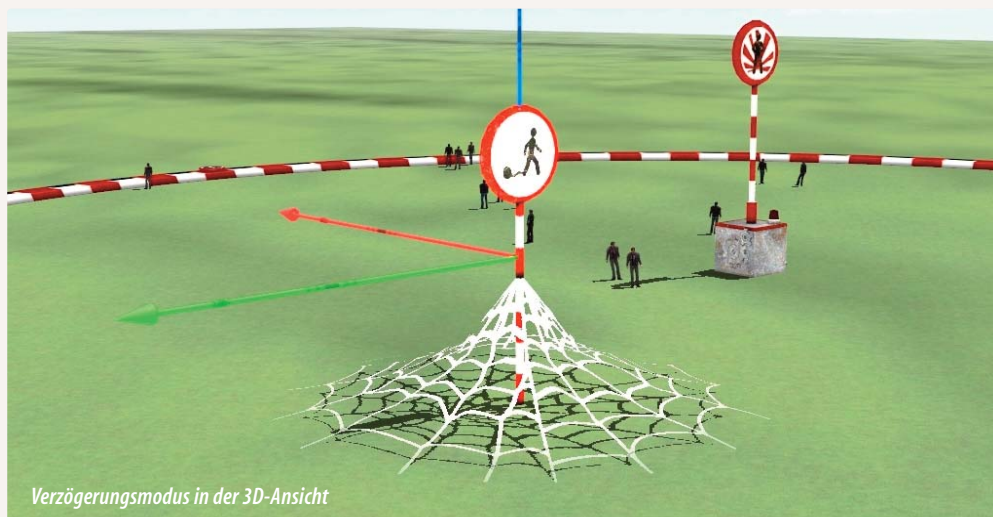
Verzögerungsmodus in der 3D-Ansicht

Walls
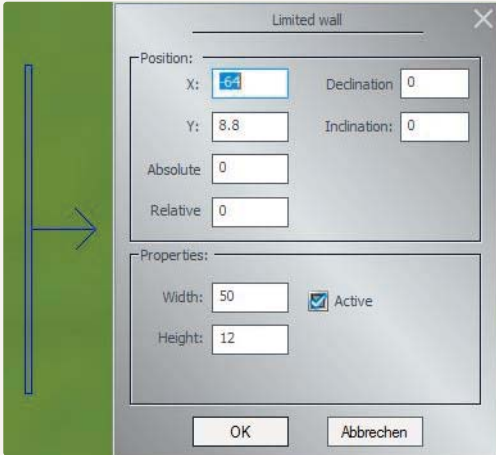
Walls (11 and 12) are important tools for controlling omegas. These can be passed through from one side only (note arrow). While unlimited walls (11) stretch to the edge of the layout, a limited wall (12) can vary in its dimensions. Thus, you can use them to ensure that omegas pass through certain entrances or passages. Once again, the exact position and rotation can be set in the object's properties menu.

Bei begrenzten Mauern lassen sich die Dimensionen exakt eintragen
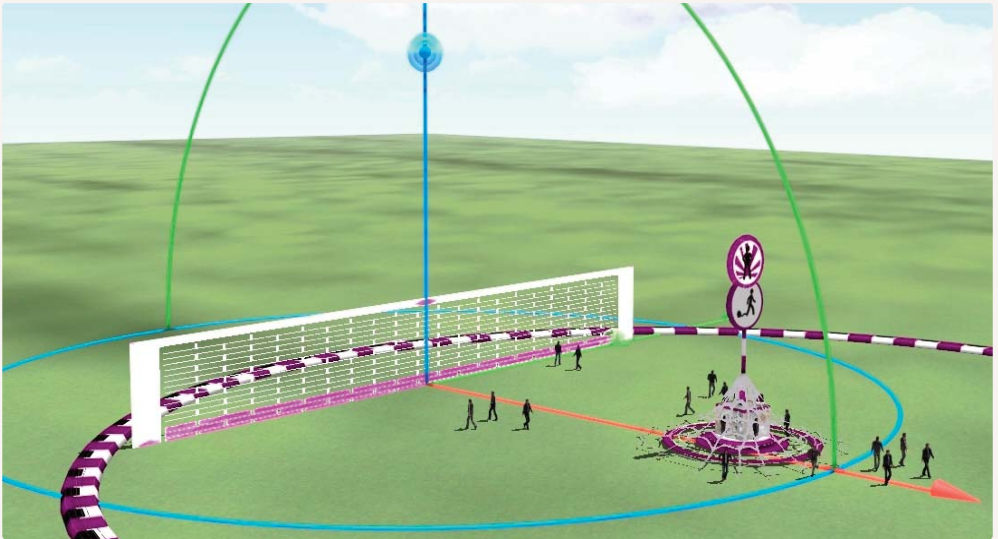
Limited wall in the 3D view

Platforms

Slightly more demanding is the placement of plateaus and ramps (13 and 14). A plateau doesn't only need to be adjusted to the desired height in order to make platform models accessible to omegas, for example, the crowd also needs to be brought to the right height. If you would like omegas to spawn at the height of the platform, for example, to come out of a lift, the insertion height needs to be entered at the source via the dialogue box. With a

Dialog zur Positionierung einer begrenzten Plattform

continuous plateau (13) omegas cannot fall over the edge, which they could with a limited one (14). It is therefore always recommended to block off areas that omegas shouldn't enter using walls. Cages (15) can also keep omegas in check.
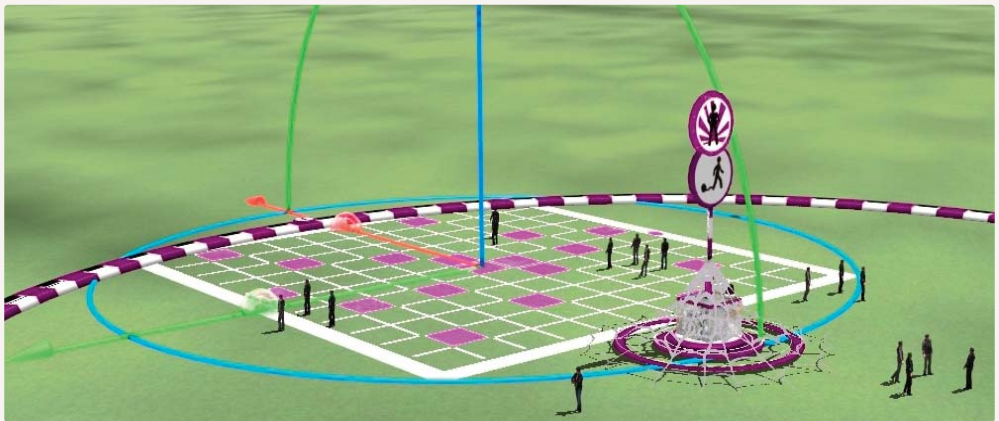
Limited platform in the 3D view

Attention:

Bear in mind that omegas will also need to be able to reach the area above a plateau in order to move around on it. Either the source needs to be located above it or a slope needs to be built.

If omegas should not only more around on an elevated plateau, but also use a slope or even steps, limited plateaus must be placed on the respective models. The tops of models (steps, slopes) and plateaus should be covered by moving and scaling. You estimate the average height (e.g. at the middle of the slope) and enter the value under **Height** in the dialogue box of the plateau. Now you estimate the angle of the climb and enter it into the **Inclination** box. Of course, you can calculate these values exactly using trigonometric formula. Bear in mind that plateaus are only impenetrable for omegas from above.

Cages
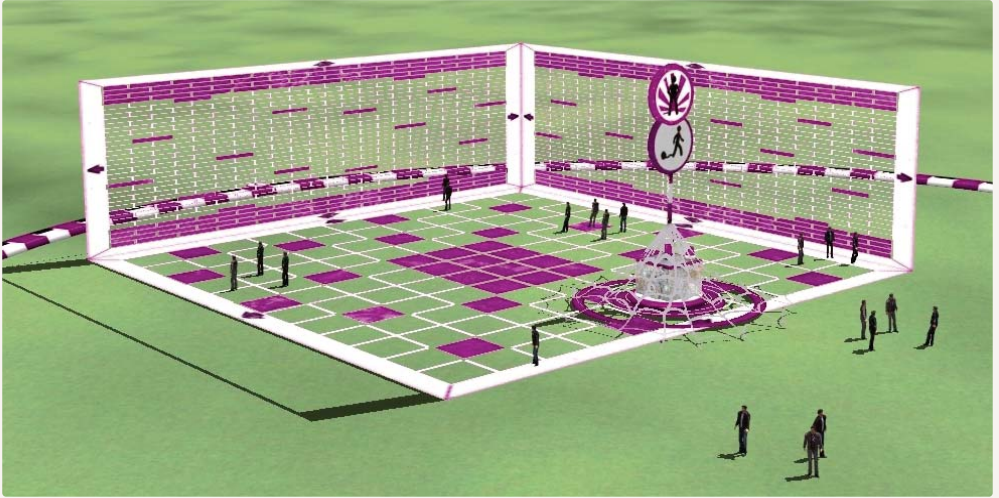
Cage in the 3D view

Cages, which also keep omegas in check, are another part of the animated characters content. You can trap your characters, with these elements. The omegas can be released by placing a contact. In this way, characters can be stopped at traffic lights and continue walking when the signal comes.

Good to know:
All control objects for omegas inserted into the plan can be selected by right-clicking them. They can then be scaled, moved and rotated using the symbols shown. A right-click opens the dialogue box. The symbols concerning omegas are only visible if the Omega tab is selected.

Tip:
If you want the omegas to walk instead of running, you need to set a delay.

4.8 Backgrounds

To give you even more options when designing your layout, we have developed a new type of backdrop element. These are models that you can not only place within your layout's boundaries, but also in the area beyond.

We already supply a large number of models for this purpose. Take a look at the following images and be inspired by the new possibilities. You can, of course, scale these backgrounds and place them at varying distances. This will give your layout an impressive sense of depth.
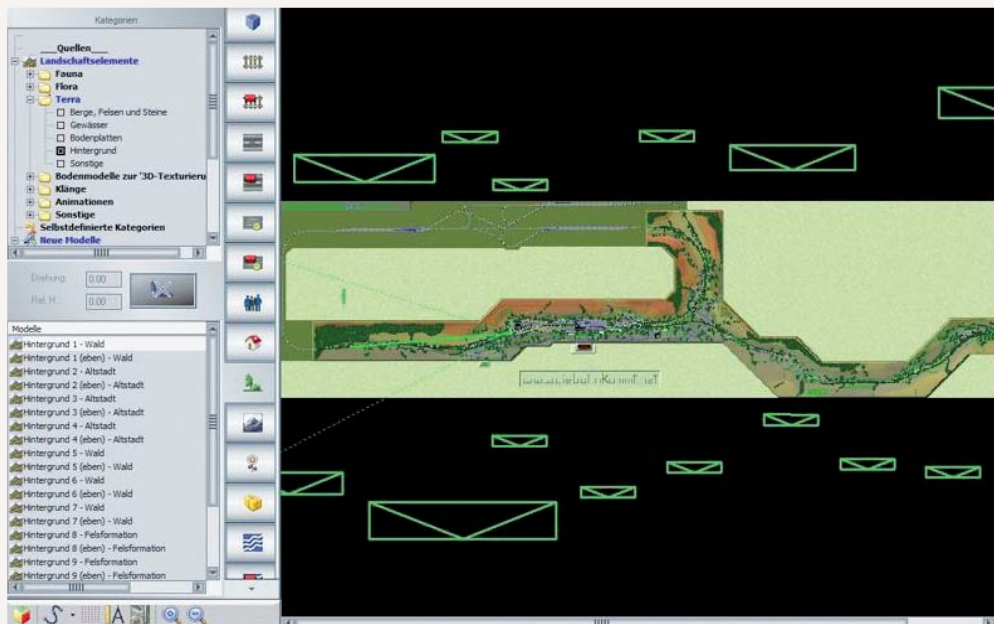
There are two different versions of each background model available. One flat background, and one curved version. You can choose between them depending on their application.

You will find the new backgrounds in the following area: **Landscape elements – Terra – Hills**

4.9. New sky effects (vapour trails and rainbows)

Two new elements have been added to the programme to make the sky look a touch more realistic: **vapour trails and rainbows.**

The optimum conditions for a rainbow are:

• Clouds – maximum 50%
• Rain – maximum 14%

Vapour trails are set in the **Environment settings dialogue box** by placing or removing a tick in the corresponding box.
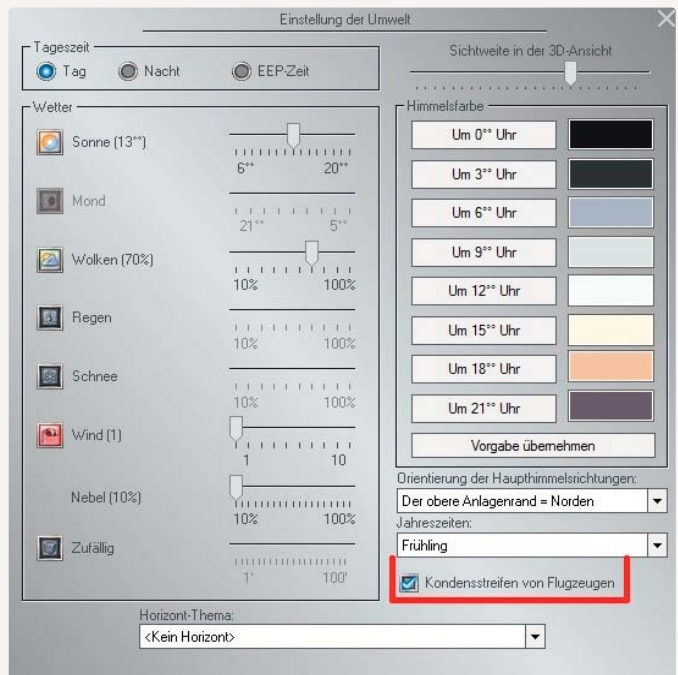
5. Putting layouts into operation

After modelling the landscape and setting up a track system for rail travel, the layout is surely far from finished, but ready for a first test run.

While your field of action has thus far been the layout plan in the 2D window, you will now move almost exclusively in the 3D window. In this window, your railway landscape not only appears in realistic 3D, but also develops vitality and dynamism. In the 3D window, you can go on a journey of discovery, insert vehicles, build train consists, follow and control rail operations – in short, here you will experience an EEP world full of life and activity.

However, before we turn to operations, we should make, check and change some settings that affect the appearance of the landscape, amongst other things. Open the *Layout Information* option from the *File menu.*

*Wenn es die Leistungsstärke Ihres Rechners erlaubt, sollten die Punkte **Terrain LOD** und **Terrainkachelung reduzieren** deaktiviert sein*

You will find useful information about the layout's status and can create a description text which is shown when you open the layout, as well as under *System overview* (top button of the tab bar) in the 2D window. You also define some parameters for the operation of your layout here. In addition to switching to left-hand traffic, you can choose if electric locomotives will require electrified tracks to operate.

5.1 Inserting and placing rolling stock

Your layout has been created and the tracks have been laid, and now it is time to insert rolling stock. This is done in the 3D window using the Control dialogue. This is the control centre for everything that happens in 3D mode – the camera, the terrain edition which only becomes active in 3D mode, and last but not least rail operations, of course.

Rail operations can only be started when at least one track has been laid upon which rolling stock can be placed. Similarly, traffic can only start to roll once the rolling stock on the track has its own engine.

Placing rolling stock

Switch to the 3D window and open the control centre. To select a locomotive or later another vehicle, click on the button in the control dialogue. This will switch you to the mode in which rolling stock can be inserted and placed. When this mode is active, the vehicle catalogue opens: The middle section shows the categories and their folders, the models are listed to the left of that, and the selected model appears in the preview window on the right.
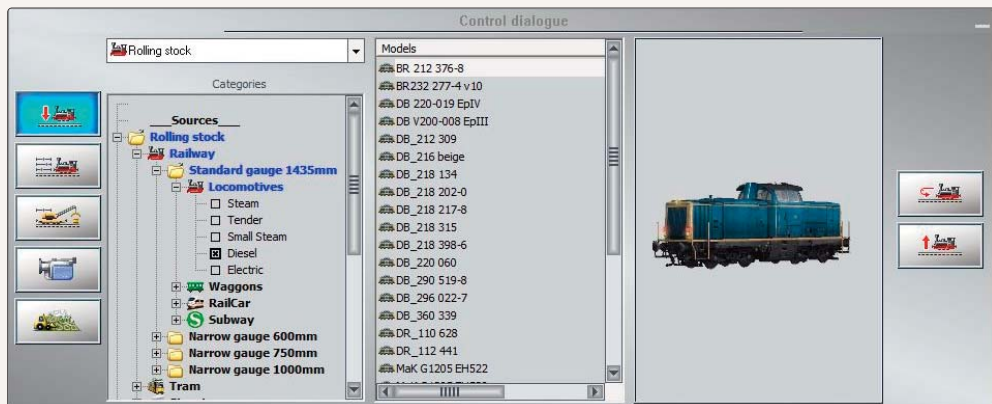

Selecting rolling stock

To select a locomotive, click the category Rolling stock, then the Railway folder, track gauge and finally Locomotives where you can now make your selection. When you click an item in the list, inspect the model from all viewing angles using the preview window. Once you have chosen a model, switch to the ***overview window*** where the mouse cursor will now turn into a mini locomotive, and click on the track where you want to place the rolling stock. A dialogue will then appear allowing you to give the model a unique and easy-to-identify name.
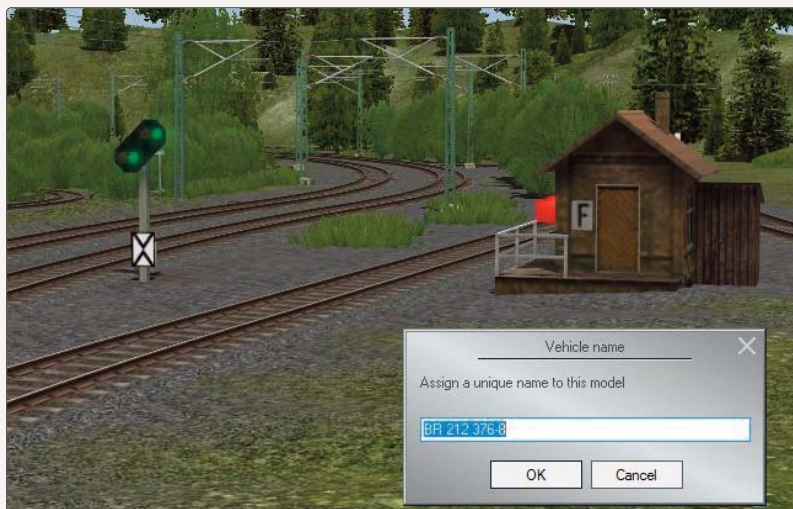
Vor dem Einsetzen des Rollmaterials können Sie einen individuellen Namen vergeben.
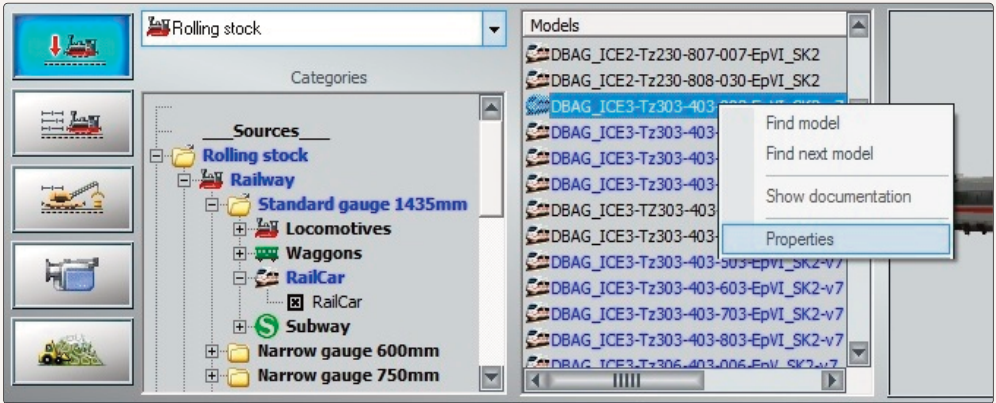
Under Properties, you will find some texture replacement options.

There are many models available in EEP 13 that can be equipped with one or up to three exchange textures. In cases where two or even three exchange textures can be selected, a 2 or a 3 is added to the name. The models specially designed for exchange purposes can be identified by the blue text in the selection menu. To perform a texture replacement, right-click the relevant model in the list box and choose the Properties option.

Click on the **Load custom texture** button to open the file selection **dialogue,** where you can select directory levels and the exchange texture file type. Graphics in TGA, PNG, BMP or JPG format can be used as exchange textures, which can first be edited in an image-editing programme of your choice, if desired. The formats *.tga and *.png are preferred as they have an alpha channel, which allows transparent texture content to be implemented. EEP will automatically convert the original format into the *.dds DirectX graphics format. During the conversion, MIP map levels are generated and a suitable texture compression algorithm (DXT5 or DXT3) is used.

Various locomotives and carriages equipped with interior fittings promise a special travel experience. Enjoy a journey of discovery through your layout in a driver's cab recreated in three dimensions, or make yourself comfortable in a passenger carriage and experience your model rail landscape from the inside of a moving train. Such views can be achieved if you choose a functional model and select the appropriate on-board camera with the number keys *[8]* or *[0]*.

As multiple rolling stock of the same type – such as wagons or carriages – are often inserted, but their names can only be used once, reference numbers are automatically added to the names of duplicates. If a track is already occupied, you should select another section of track for your locomotive or wagon, or move the vehicle that is already there.

Locomotives and wagons can be moved easily with the mouse:

• Point the mouse at the rolling stock you wish to move.
• Once the mouse cursor is located over the rolling stock and changes to a hand with an outstretched index finger, press the mouse button and [Ctrl] key at the same time and drag the vehicle along the track.

• In this way, you can easily move locomotives and wagons to sidings, freeing up occupied tracks for other rolling stock.
• Rolling stock placed on a track automatically assumes the orientation of the track. However, sometimes it is necessary to rotate a vehicle and change the direction of travel. This can also be achieved easily:

 – Click on the vehicle you wish to rotate in the 3D view.
 – Click on the Place models button in the control dialogue. This activates the mode in which rolling stock can be placed, rotated and removed.
 – Now click on the Turn vehicle or train in opposite direction button, which is only available in this mode and which triggers the desired rotation.

Attention:
Firstly, rolling stock should only be rotated if not coupled with other rolling stock, otherwise the entire train consist will be turned around. Secondly, there should be sufficient space to avoid collisions or unwanted coupling with other rolling stock.

Rolling stock can also be deleted just as easily as turned around in the 3D view:
• Click to select the rolling stock you would like to delete – this can be done in the *selection menu* and *overview window* as well as in the *3D view.*

• Then click on the **Remove train** from layout button in the **control dialogue** to take the listed train consist off the tracks. This button is also only visible in 3D edit mode. Like with changing the direction of travel, rolling stock you wish to remove should not be coupled with other rolling stock otherwise the entire train consist will disappear.

Model replacement function for all model types
By popular demand from EEP users, a replacement function for models in all layers has been implemented, allowing not only track styles, but rather all model types – e.g. structures, landscape objects, rolling stock, signals, etc. – found in the same layer to be replaced in the 3D editor. To replace a model, first select the model you wish to insert from the model list (using the left mouse button), and then click on the model you wish to replace in the 3D window of the editor. The selection of the model you wish to replace will be indicated with constant flashing.
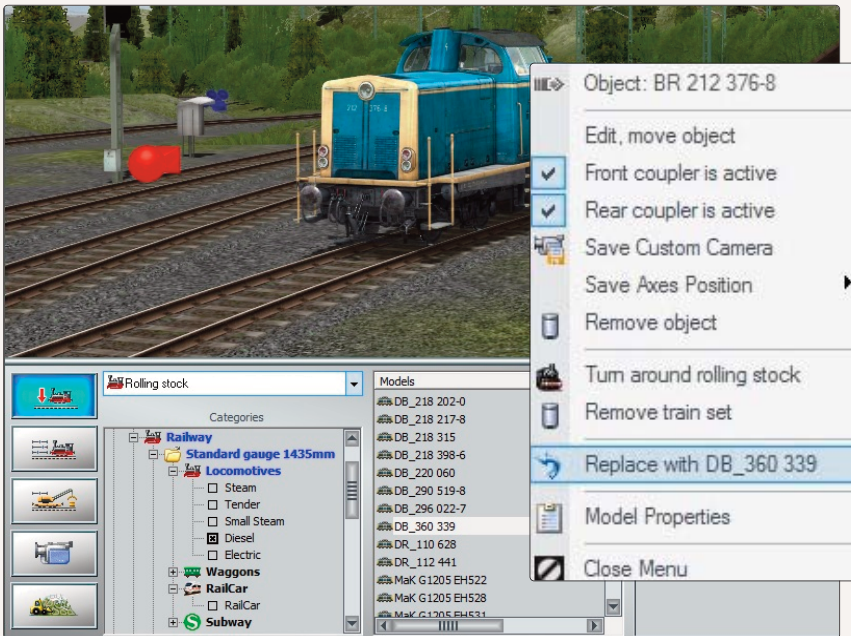
Tausch des Modells gegen das Modell in der Auswahlliste

The actual replacement is now completed by right-clicking the model and selecting the Replace command from the menu. When replacing a wagon within a coupled train composition, different lengths are taken into account and the entire train composition is shortened or extended to the optimum length.

Important note:
Models can only be replaced within the same layer.

5.2 Controlling rolling stock

The locomotive you have just placed on the tracks now needs to be set in motion. The instruments for controlling train operations appear when you click on the next button down and switch from editing mode to vehicle control. Once the button has been activated, the model catalogue will disappear to make way for the control panel. All traffic operations on tracks, rails and roads, and on invisible air and waterways are controlled via this panel.
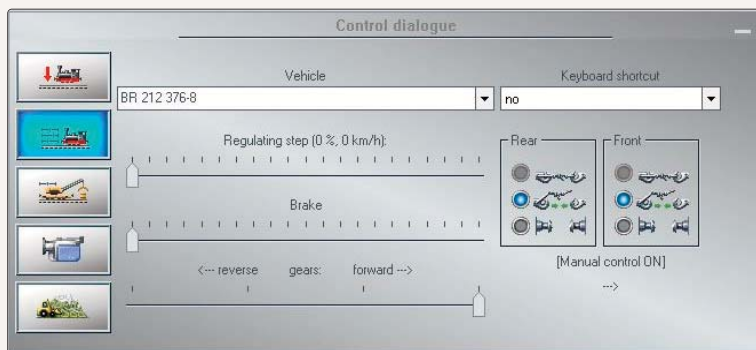

Im Steuerdialog können Sie zwischen der Fahrzeug- und der Zug-geschwindigkeits-einstellung wählen.

EEP differentiates between two types of vehicle control: manual and automatic control. In manual mode, you can control each rolling stock yourself.

Attention:
In this mode, rolling stock will react neither to pre-set contacts nor signals! In automatic mode, however, all traffic runs dependent on signals, without you being able to intervene to control the process. The vehicles are remote controlled as per the direction and times you have specified in the timetable.
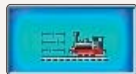
The operation button switches between the vehicle and train speed modes.

You can toggle operating modes using the vehicle control panel. To do so, click on the button that now becomes a toggle switch to turn manual or automatic control on or off.

5.2.1 Manual control

For manual control, the following keyboard commands (hotkeys) are available in EEP, which above all facilitate manual manoeuvring.

A =   Drive backwards

D =   Drive forwards

S = Stop / Brake (Pressing this button engages the brakes of the selected vehicle)

J = Train brake (During manual control, you can turn on or off the brakes for the entire train with this button – press several times if necessary)

H =   Horn / Bell / Warning signal

K =   State of rear coupler (Affect the state of the rear coupler and alternate it by pressing the button repeatedly)

L =   State of front coupler (Affect and change the state of the front coupler)

F =   Position of a switch (Control the next switch – within a distance of up to 500 m – by pressing the key; multiple times if necessary)

G =   Position of signals (Change the aspect of the next main signal within a distance of up to 500 m. Multi-aspect signals are switched by repeatedly pressing the G key)
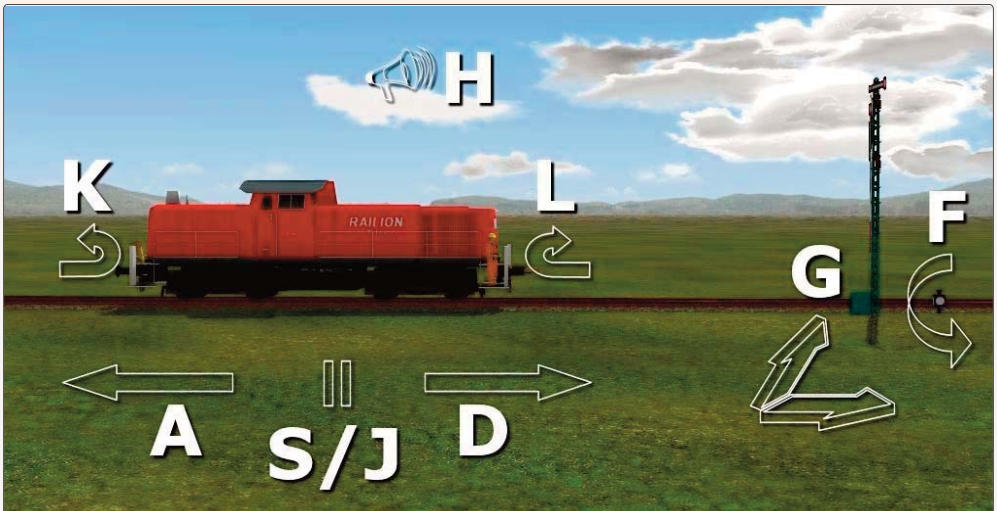
Hotkeys for controlling rolling stock

5.2.2 Gamepad controls

EEP 13 allows you the comfort of controlling your rolling stock with a gamepad. If you would like to use a gamepad, please first select it in the *EEP programme settings.*

Gamepad controls are the same no matter which model you use, even if, for example, the left stick is located above the D-pad, like on an Xbox controller, or below it, like on a PlayStation controller.

Important note:

If you would like to swap the functions of the two analogue sticks, please place a tick in the highlighted box.
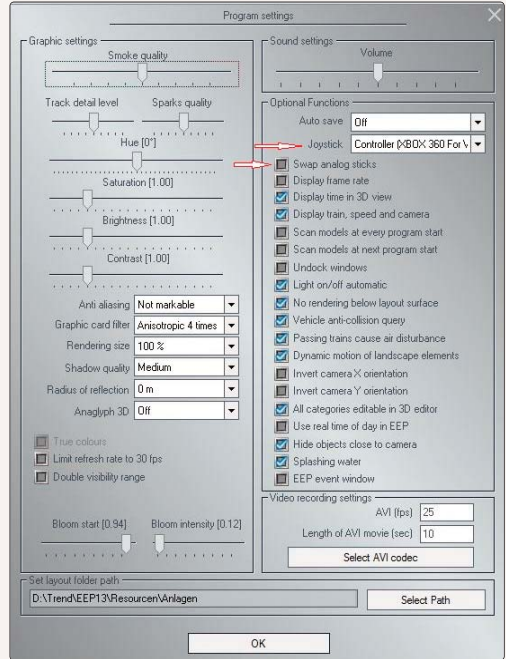
The gamepad controls are arranged as follows:

Schultertaste oben: Kupplung hinten

Schultertaste unten: Fahrstufe verringern

Mitfahr-Kamera

Pause an / aus

Schultertaste unten: Fahrstufe erhöhen

Schultertaste oben: Kupplung vorne

Kamera drehen

Weiche

Signal

Notbremse

Kamera Perspektive

Waggon

Zug

Kamera positionieren

The individual control elements of the control perform the following functions.

Right stick
If the on-board camera is switched on, you can move towards or away from the vehicle using the right stick. Otherwise, you can use the right stick to move around your layout.

D-pad
The D-pad has two functions:
the vertical axis selects a train consist; the horizontal axis allows you to move from one carriage to the next within the selected train composition.

View button
The view button switches a rolling stock's on-board camera on and off.

Menu button
The menu button pauses and unpauses EEP.

Left stick
If the on-board camera is switched on, you can circle around the vehicle using the left stick. Otherwise, the left stick will rotate the camera around its own axis.

A button
The A button is the system's emergency brake, so to speak. Press it to set the speed of the currently selected rolling stock to zero.

B button
The B button changes the aspect of the next main signal within a distance of up to 500 m. Multi-aspect signals are switched by repeatedly pressing the B button.

X button
The X button steps though the camera positions when viewing a model, according to camera positions 1–9.

Y button

The Y button controls the next switch – within a distance of up to 500 m – by pressing the key multiple times if necessary.

Shoulder buttons

Triggers

The triggers control the accelerator. The more you push the triggers, the faster the speed changes.

Bumpers

The bumpers are used for coupling. You can select the carriage or wagon in a train composition using the D-pad whose coupling you wish to engage or disengage.

On-board camera

a. On

If the on-board camera is switched on, you can circle around the rolling stock using the left stick. You can zoom in to or out of the rolling stock using the right stick.

b. Off

If the on-board camera is switched off, you can rotate the camera using the left stick, and move around the layout using the right stick.

Note

Switching on the individual functions of the controller does not affect the type of control of a train (manual – automatic).

5.2.3 Manual control

When manual control is switched on, you have supreme authority over your rolling stock. Even if a locomotive in automatic mode is standing at a stop signal, if it is started in manual mode, it will move in spite of the 'stop' signal.

To set a locomotive in motion on the tracks, you must first select it in the vehicle list in the control panel or click on it in the 3D view. It is faster, however, if you assign a hotkey to your locomotives and wagons on the tracks via the keyboard *shortcut list.* Instead of searching for a locomotive with the less than catchy name DB E10 299 bl;002, for

example, simply press the selected key combination and the camera will jump to the locomotive you're looking for and will immediately switch to the linked camera mode.

The locomotive is set in motion using the *accelerator control* which regulates the driving force and controls the speed. Analogue to this, you use the *brake control* to throttle the speed and brake the rolling stock. And finally, you use the *control for the gears* to set the direction of travel and to adjust the power transmission of the engine.

5.2.4 Automatic control

Automatic control of rail operations is only possible for rolling stock with their own engines. In automatic mode, rolling stock is controlled via pre-set contacts and signals, without you being directly involved. You yourself only define the settings and leave the execution to the programme which controls the drive, speed and braking of the individual vehicles along with the overall process.

Automatic control can be switched on in two ways – either by clicking on the toggle switch in vehicle control, or by clicking on any rolling stock whilst holding the [Shift] key in the 3D window.
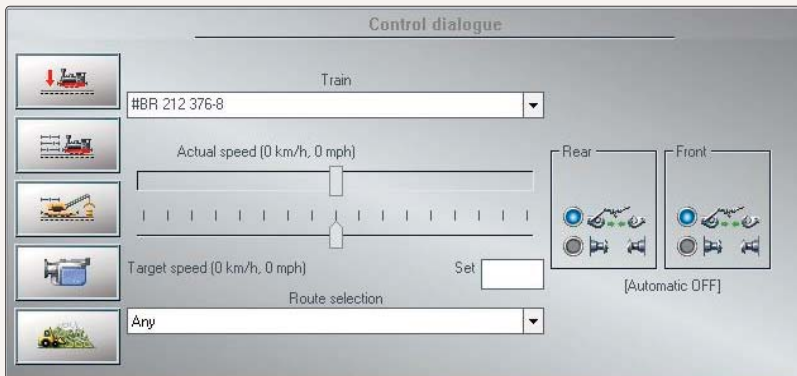
Das Bild zeigt den Geschwindigkeitsmodus bei der Steuerung von Rollmaterial

If *automatic control* is switched on, the control panel changes. While you can control a train's speed using the accelerator and brake controls in *manual control mode,* you only set the target speed in *automatic mode,* and the programme takes control.

To set your locomotive rolling in *automatic mode,* slide the control for the target speed to the desired position or set the speed by entering a value in kilometres per hour (km/h). The locomotive will then start up and hold the pre-set

speed for as long as the signals allow it. The programme compensates for fluctuations that result from the route through the use of gears, the accelerator and brake. The route the journey takes, where and when the locomotive stops, continues and finally arrives at its destination is determined by the timetable you can create for each vehicle in the traffic system. We will deal with this topic in the next chapter.

How can you stop a moving train in automatic mode? You can return the slider to the middle position. It is simpler, however, to right-click on this slider. All sliders in EEP can be reset by right-clicking on them.

You can also assign certain routes to your trains in *automatic mode.* This topic is also part of the contents of the next chapter and will be dealt with there.

5.2.5 Custom rolling stock camera

This feature has also been implemented due to strong user demand. The individual camera positions that can be defined for each vehicle (rolling stock) are saved directly in the layout file.

To save a *custom camera,* a vehicle must first be selected in the 3D editor. While it is selected and flashing, you can set the camera position using the arrow keys, the [R] key and the space bar on your computer keyboard. Right-click to open the menu and select the option *Save Custom Camera.* Camera settings you have defined and saved can be accessed via the *[9]* key on the computer keyboard or via contacts. The corresponding entry in the Contacts dialogue menu is *Custom defined view.*
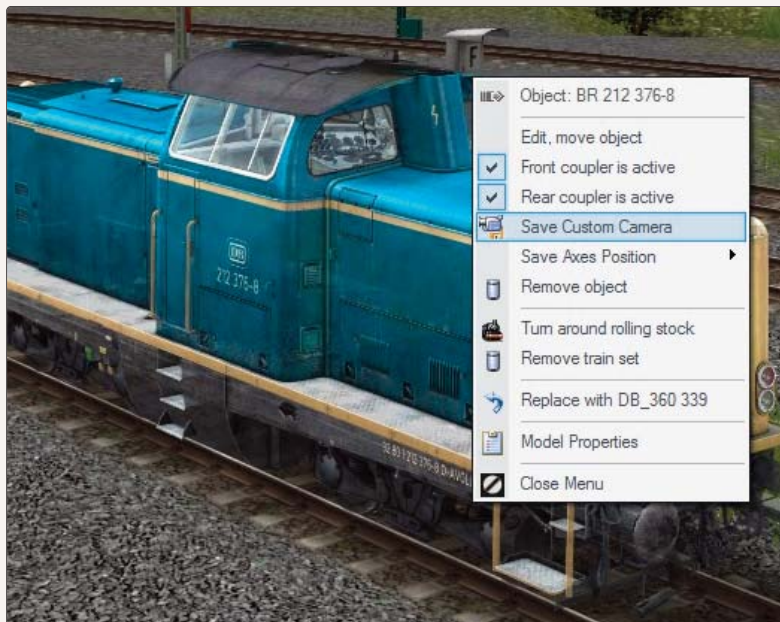
Einstellung der Sicht der benutzerdefinierten Kamera mit den Pfeil-Tasten.

5.2.6 Properties Explorer

The *Properties Explorer* is an additional programme to *EEP 13,* which you can use to change the driving properties of all rolling stock in a simple way. This function is started via *Extras -> Properties Explorer.*
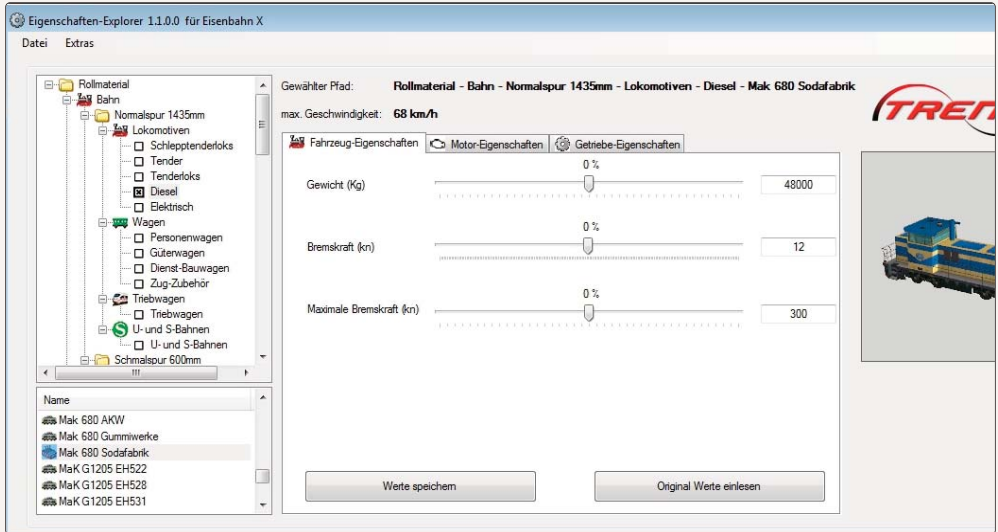
The main window of the Properties Explorer

Here you see the programme's interface. On the left-hand side at the top, you see the rolling stock list as you already know it from EEP 13. In the window below that, you will find all the models in the selected category. In the top-centre section, you can see the complete path to your selected model. You will also see the current maximum speed there.

Good to know:

The maximum speed is calculated based on various parameters. Amongst other things, your computer's performance and the frame rate are taken into account. Furthermore, the weather in EEP also plays a role. Finally, it should be noted that slopes along a stretch also affect the speed. Consequently, the 'maximum speed' calculated by the Properties Explorer cannot always be reproduced in EEP.

Now select the model for which you would like to define new driving properties. You will find a preview of this model in the window on the right. In the middle section, you will now see the current parameters. All or only some tabs will now be available, depending on the model. For models with motors and gears, all tabs will be active. If you have selected a trailer, for example, only the 'Vehicle properties' tab will be active because a trailer, of course, has neither a motor nor gears. You can set the individual values by moving the sliders. In doing so, any potential changes to the maximum speed are shown.

Once you have finished making changes to the settings, save the values. The changes apply immediately to this model whenever you place it in one of your layouts. An already open layout which contains this model must be reloaded for the changes to take effect. If you are not satisfied with the results of the changes, you can restore the original values at any time.

To do this, load the relevant model again in the Properties Explorer and click on the *Read original values button.* Don't forget to save your changes when you are finished, otherwise the values will not be applied.

5.3 Assembling trains

Locomotives, carriages and wagons are equipped so that they can be coupled and assembled into a train consist. Coupling is basically done in the same way as with real model railways: a rolling stock is slowly driven or pushed towards another one. If the couplers of both vehicles are engaged, they will automatically connect upon contact.

When a rolling stock is placed, the couplers at the front and rear are automatically active so that other rolling stock can couple. Coupling is controlled via the corresponding icons in the *control dialogue* which display and activate the current status:

Diese Symbole veranschaulichen die drei Kopplungszustände von Rollmaterialien
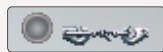
 Top: Rolling stock is connected to the coupler (front or rear). The display is active (grey selection button) until the two rolling stock are separated.

 Middle: The coupler is active when this button is illuminated. Another rolling stock can be connected.

 Bottom: The coupler is deactivated when this button is active. The coupled rolling stock has been disconnected.

With EEP 13, it is now possible to couple locomotives and carriages 'gently', like their real-life counterparts. To do so, please proceed as follows: First activate the 'Gentle coupling' option in the layout information. The reason for this is that previous layouts purchased from the shop would not work if they have been built so that a coupling locomotive shunts the carriages to the next contact.

Current layout information	
Current layout properties	**Operating parameters**

Name of the layout: `new layout`

Format: ANL3 / Version 9.00 / ENG
Width: 1.00 km
Length: 0.80 km
Height: -4.08 to 45.00 m
Grid nodes per km 250Node/km
Length of rail tracks: 40.293 km (#1054)
Length of roads: 5.042 km (#105)
Length of tram tracks: 0.000 km (#0)
Length of auxiliary tracks: 4.664 km (#79)
Number of all models: 3745
Number of rolling stock: 79
Number of structures & nature items: 3576
Number of signals: 90
Number of goods: 0

Vmax. factor (rail tracks) `0.00`
Vmax. factor (roads): `0.00`
Vmax. factor (tram tracks): `0.00`
Vmax. factor (auxiliary tracks): `0.00`
Water level: `0.00`

☐ EEP6 camera angle
☐ 3D full screen mode
☑ force open switches
☐ Left-hand traffic for automobiles
☐ E-loco requires catenary
☐ Terrain LOD
☐ Reduce terrain tiling
☑ **Gentle coupling**

If this function is activated, a locomotive will automatically slow down if:

- the couplers of the locomotive and carriage are 'engaged',
- the locomotive is travelling in automatic mode,
- the locomotive comes within a certain distance of the carriage.

We explain the possibilities of this feature in Tutorial 57 – gentle coupling.

Not only individual locomotives and carriages can be coupled and uncoupled, but also entire train consists. This allows typical operations such as 'portion working' and 'running around' to be controlled automatically. You will find more on this in the following chapter. Once you have assembled a train, it is recommended that you save it using the Save train command in the File menu under its own name so that the train can be used again in other places or in other layouts. In EEP, you can insert not only individual locomotives and carriages, but also coupled rolling stock and even train consists in the 3D view –

provided that the track segment in question allows it. You can also remove not only entire trains in 3D mode, but also individual carriages without having to go to the trouble of uncoupling the train composition. Simply click to select the carriage you would like to remove, and then click on the Remove object command in the object menu. To close the resulting gap in the train, click on the preceding or following carriage, select the **Move object option** in the Object menu, and move the carriage far enough forwards or backwards so that it can couple with the next carriage. Furthermore, trains' direction of travel can also be changed in the 3D view: click on any carriage in the train composition and select the Turn vehicle or train in opposite direction option from the Object menu, and **the entire train** will be turned around.
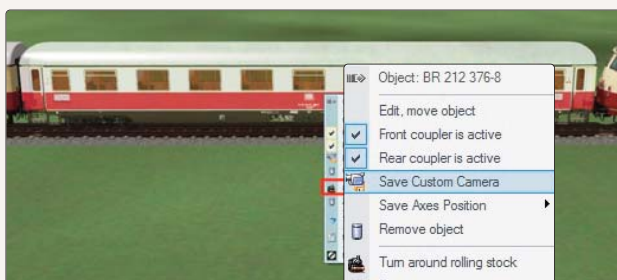
Im Auswahldialog finden Sie den Punkt „Rollmaterial wenden".

5.4 Animated driver's cabins

From EEP 10 onwards, you can actively drive locomotives and railcars. For this, you enter the 'cockpit' of the locomotive, like in a train driving simulator, and take the place of the train driver. Go to the Camera section in the control dialogue in the 3D view and activate the on-board camera.

If you now press the 8 or 0 key on your keyboard, you will be transported immediately to the driver's cabin, as long as the selected locomotive has an animated cab.

The basic version of EEP contains animated driver's cabins for the following locomotives:
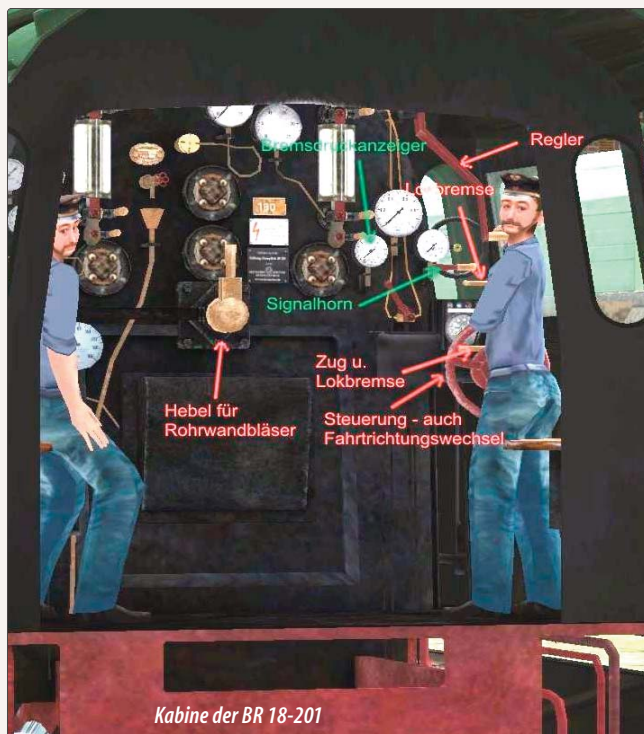
Kabine der BR 18-201

Kabinenansicht der BR 232 (Ludmilla)

- BR 18-201   • DB 110   • VT 11.5 TEE
- ICE 3 BR 407   • BR 232 (Ludmilla)

You now have all the relevant control elements in front of you, which can be selected using the mouse pointer and put in the desired place by moving the mouse. For ease of control, the individual elements have tooltips which are shown when the mouse hovers over the sensitive areas.

5.5 Vehicle physics for road vehicles

In general, the handling of rolling stock depends on the vehicle properties that were taken into account during the construction of the true-to-life models. These properties include the net weight, drive, brake power and friction, which are different for each rolling stock and the combination of which determine the vehicle's properties and handling. This applies to all vehicles that can be inserted in an EEP layout. All road vehicles lean into curves more or less depending on the speed and the curve radius. They also lean forwards when braking and back when setting off. This new behaviour is now an integral part of EEP.

Furthermore, there is also a whole range of models in EEP equipped with special features which also expand the functionality of your layout as a whole.

5.5.1 Fictitious forces in models

There are various models in EEP 13's model portfolio for which fictitious forces, such as centrifugal force, have been implemented. The models constructed in accordance with the rules of Newton's axiom include helicopters and a mountain cable car.

During operation, these models are characterised by the fact that they are subject to the force of gravity: they sway to the side due to radial acceleration, and they swing back and forth when accelerating and braking due to constraint force (mass inertia). In doing so – regardless of the rise or fall of the track – they remain constant in their inclination and stable in their horizontal operating position.

5.5.2 Vehicles with brake lights and signal lights

There is also a series of car models and trams with stop lights and indicators. These vehicles' stop lights turn on when their brakes are in use or when they come to a standstill.

The flashing light function is active when a vehicle equipped with them is travelling along a route with a switch point. The signal lights only indicate the turning direction on the section of track before the switch or crossing. Therefore, when building crossings, you should ensure that the switch points are long enough (e.g. 50 m) or that the speed of the vehicles is reduced accordingly by contacts.

5.5.3 Vehicles with fire fighting water

Firefighting vehicles equipped with water cannons and fire fighting water also number amongst the vehicles with expanded functionality. The *fire fighting water function* is similar to the fire in structures function, which you are already familiar with.

The water jet can be activated and controlled manually and automatically via vehicle contacts. The manual metering of the water pressure can be controlled via the axis selection menu and the accompanying slider. With automatic control, several vehicle contacts are usually placed on the track, which first control the position of the water cannon and then the desired water pressure. The contacts for setting the movable axes and the fire water can be placed on all types of traffic routes.

5.5.4 Steam, smoke and acoustic signals

Even good old steam engines do not need to hide behind futuristic electric locomotives in EEP, at least not in terms of functionality. To increase its nostalgic charm, the steam has some extra special qualities. After all, not all steam is the same. Thus, it is given off in different ways:

• from drainage valves
• from the jet pump when taking in water from the tender
• from boiler safety valves
• when operating a locomotive's whistle

For train consists with passenger carriages, steam heating can also be simulated – on the last carriage, where the heating valve is always slightly open. With the expansion of the steam options, accentuated by the characteristic hissing, the addition of a train whistle was obvious. To sound off that unique rolling stock warning signal, you only have to press the *[H]* key. Whether the horns of cars and lorries, the signal horns of electric locomotives or the steam whistles of steam engines sound depends on the type of rolling stock. In general, however, all warning signals are either sounded manually using the *[H]* key or automatically via vehicle contacts.

It is also possible to assign individual sounds to motorised rolling stock (locomotives, cars, trams, etc.). To do so, proceed as follows:

Choose the type of sound that should be made via the *'Sound mapping'* button on the left side of the window. The following options are supported: starting, brakes, steam outlet, curves-slip noise, engine running, rolling sound and warning signal (horn, bell, whistle). Select a specific sound under the *'Load sound'* button on the right-hand side and assign it to your model.
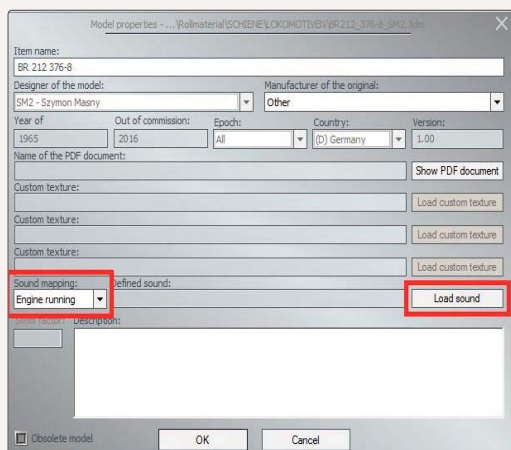
5.5.5. Loading feature for vehicles with movable axes

Steuerdialog für die Achsensteuerung
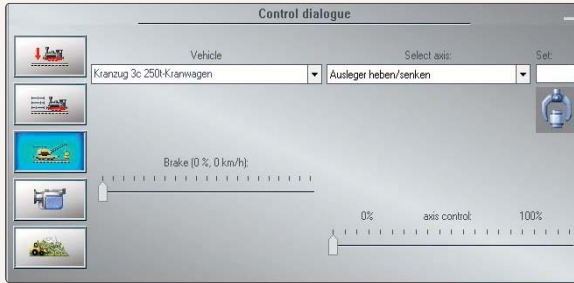
Whether a vehicle is equipped with movable axes is shown in the list of moving parts in the control bar which can be viewed by clicking on a model in the 3D view.

You can select the desired model here in the *'Vehicle'* box. The 'Select axis' box will then update immediately and will now contain all the functional axes of the model. Select one of the axes and set the desired position using the *'Axis control'* slider. Alternatively, you can also enter the value directly in the *'Position'* field. If your axes are in

the desired position and, for example, you would like to hang goods on a crane hook, now press the **Load button** (in the corresponding dialogue box on the right). Your goods have now created a connection with the crane. And you can now move them.

The figure shows a crane wagon loading a crate. You can select the axes controlling the jib and the hook from the list (if the crane is activated) and move them using the slider. If, for example, you direct the crane's hook towards the crate using the axis control, you can pick up the goods with a click on the *Hook* button. The goods can also be released from the hook by another click on this button.

You also have the option of saving different axis settings of a model in groups. To do this, switch to the Insert dialogue and right-click on the axis model. Now click Save Axes Position in the dialogue window that appears and save the current positions in one of the groups. There are a total of 16 groups available.

*Speicherung der
Achsenstellungen in Gruppe*
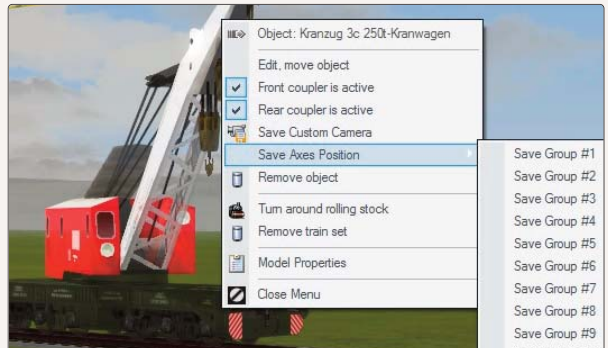
Once you have set up all the groups you require, you can run the animation by triggering contacts. The corresponding dialogue box is shown here.

Select the group of axis positions you'd like to run when the contact is activated via the Group settings drop-down menu. Each time the contact is activated, the desired movement of the model axes will be automatically triggered,

You will find further information about setting contacts in Chapter 6.2.

To breathe more life into loading scenes, you can now add animations that simulate the loading of coal, ballast, sand and other bulk cargo that produces dust. The animations, supported by various structures and rolling stock, can be triggered manually with the axis control slider or automatically via contacts.

Einstellungsgruppen für die Achsenstellungen

5.5.6. Other animation models

EEP also has a range of models with animated textures, such as advertising spaces, escalators and conveyor belts. While animated advertising pillars with changing adverts have been designed to move constantly, conveyor belts and similar models can be switched on and off specifically using contacts.

5.6 Displaying text

You can make your home-made EEP 13 layouts available to other EEP users.
To make exploring your new virtual world easier for them and to draw their attention to specific events, the automatic display of texts has been incorporated into EEP. Texts can be displayed in two ways:

• via mobile cameras saved with the layout with the text only being displayed when a mobile camera is active
• via so-called information models, which allow text to be shown in specific locations
• via tip texts for objects and contacts

5.6.1 Text display with mobile cameras

The settings for text display can be changed in the 3D editor by opening a mobile camera's properties dialogue window and clicking on the Display information text button.
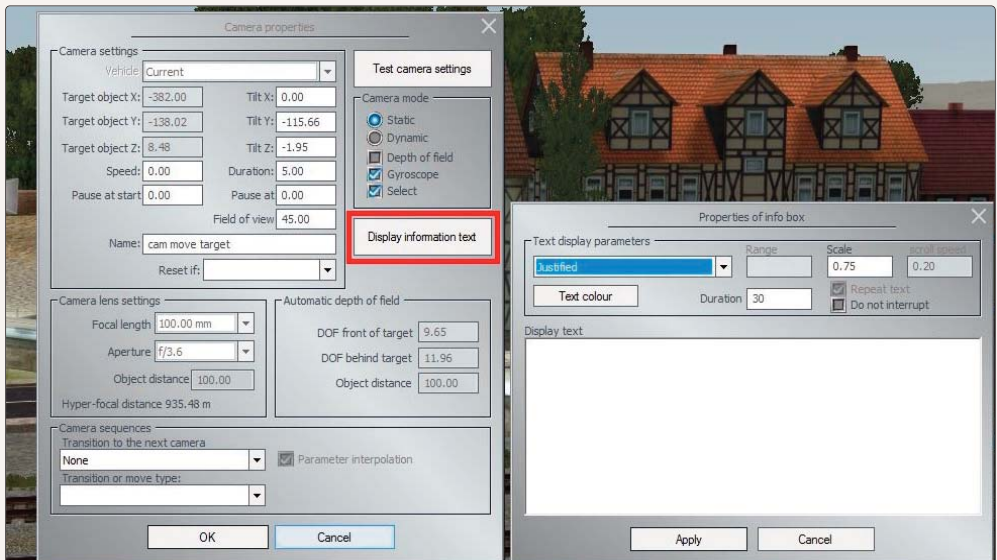
The following text display parameter options are available:

Text alignment: justified, centred, left-aligned, right-aligned, scroll.

Text scaling: size of the characters from 0.50 (for half-size, i.e. 50%) to 2.0 (for double the size, i.e. 200%)

Scroll speed: the speed at which the text moves (only when the alignment has been set to scroll). The value is calculated by the width of the screen over time (0.2 means a scroll speed of 0.2 screen widths per second).

Text colour: opens another window with the colour selection for the text.

Duration: display duration of the text in seconds.

Repeat text: repetition of the text (only if scroll is enabled).

Do not interrupt: lock for displayed text when switching to another mobile camera with no text display. If this option is enabled, the text will be displayed until the end of the pre-defined time, even when images from another mobile camera are being shown.

Display text: enter the text you would like to display in the input box. A maximum of 1000 characters can be used.

5.6.2 Text display via so-called 'information models'

The information models can be found in the structures selection menu under: Structures > *Control items* > *Information models*
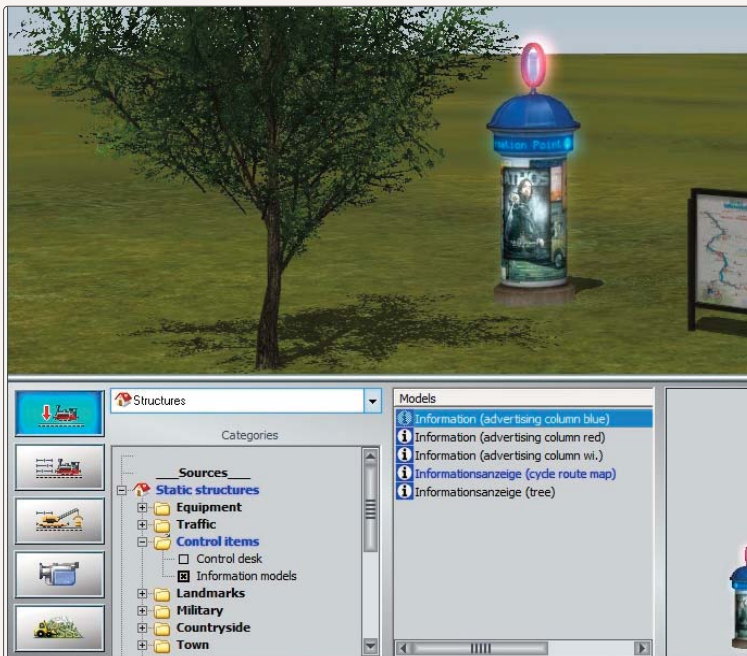
Specially constructed models with the ability to display text in the 3D view are sorted into this category. This can be any type of object; from a small direction sign by the roadside to a signal box or a stately cathedral. The advantage of this display type is that the text is shown depending on the location of the model rather than the camera. Consequently, this text is displayed whenever you enter the sphere of influence as defined in the model's properties. The range of such models can

be set between 10 m and 500 m, which can be done either in the model's Properties dialogue window by entering the value (in metres), or by dragging (shrinking/enlarging) the hatched circle symbolising the sphere of influence in the 2D planning window.

The following text display parameters are available in information models' properties dialogue window:

Text alignment: justified, centred, left-aligned, right-aligned, scroll.

Text scaling: size of the characters from 0.50 (for half-size, i.e. 50%) to 2.0 (for double the size, i.e. 200%)

Scroll speed: the speed at which the text moves (only when the alignment has been set to scroll).
The value is calculated by the width of the screen over time (0.2 means a scroll speed of 0.2 screen widths per second).

Text colour: opens another window with the colour selection for the text.

Duration: display duration of the text in seconds.

Speech bubble: small speech bubbles appear above the model (similar to the principle of smoke signals), attracting the viewer's attention.

Display text: enter the text you would like to display in the input box. A maximum of 1000 characters can be used.

Edition des Aktionsradius der Informationsmodelle im 2D-Planfenster

The display text can also be accessed by right-clicking in the 2D planning window.

An information model drawing attention to itself in 3D

5.6.3 Tip texts for objects and contacts

Another new feature in EEP 13 is that a tip text (a small speech bubble) can be assigned to any object or contact. The background colour for the text can be chosen freely from the colour palette. The text bubble appears above the object in 3D. Texts can be changed via the Lua function, and can be switched on and off. The corresponding Lua functions are:

EEPShowInfoSignal(ID,_Status)	turns the tip text for Signal ID on or off.
	-- _Status true/false for on/off
EEPChangeInfoSignal(ID,"new text")	changes the text for Signal ID
Lua function for switches:	EEPChangeInfoSwitch(ID,"text")
	EEPShowInfoSwitch(ID,_Status)
Lua function for structures and	EEPChangeInfoStructure("Lua_Name","text")
landscape elements:	EEPShowInfoStructure("Lua_Name",_Status)
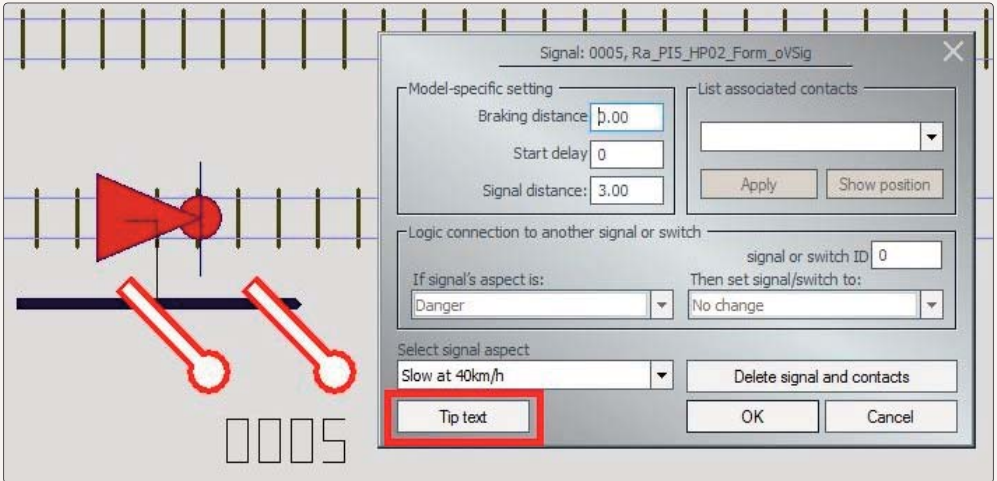
Important note

Contacts do not have IDs. Therefore, tip texts for contacts cannot be changed via Lua. Tip texts for contacts are only visible in Edit mode.
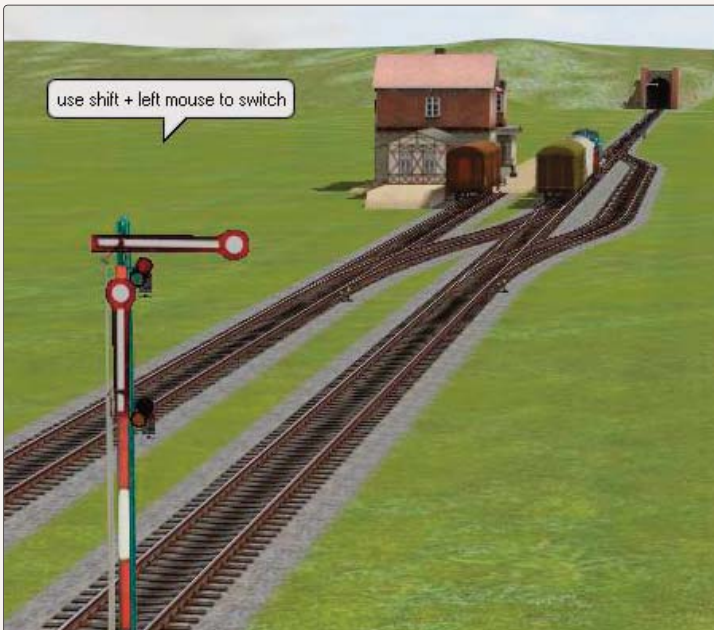
You will find an example of the use of tip texts in the 'Tutorial 57 - Gentle coupling' layout.

6. Signal control

Anything that happens automatically in an EEP layout is controlled via the signal system. Whether it's a camera pan, a fire brigade deployment, automatic rail operations or the loading of goods, there's no getting around signal control. That which has already been anticipated in previous chapters, but which has often only been hinted at, will now be dealt with systematically in this chapter.

Signals are set to control rail operations and to automate traffic flows. They usually comprise a main signal and an approach signal and, due to their position, cause vehicles in automatic operating mode to stop or continue moving. Thus, barriers and level crossing, which are not generally referred to as signals in normal speech, also fall into this category.

Just as traffic flows are regulated by signals, vehicles can also influence signal positions. All automated processes in an EEP layout, whether relating to signals, switches, vehicles, structures, the camera or even specific soundscapes, are controlled by contacts which can be set and defined in the signal control editor. Signal control is therefore actually the control centre for all automatic processes in your layout.

Attention: In the *Help menu,* you'll find the entire 'Deutsche Bahn' signal book (in German) in PDF format to download, study and print. It may be of help when you struggle with various acronyms in the signal's names!

6.1 Setting up signals
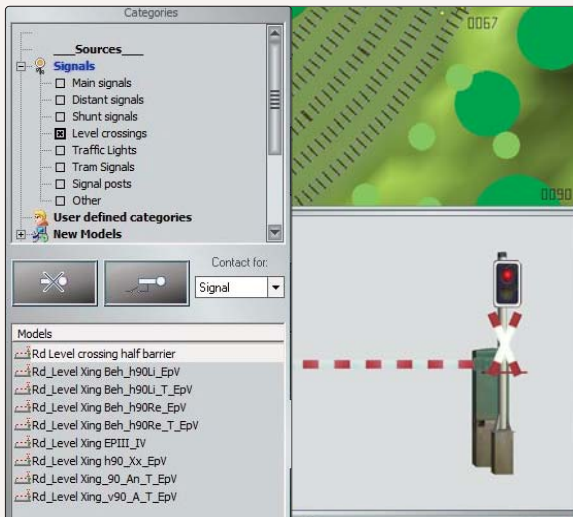
Controlling signals is done in the *signal system editor,* which can be accessed via the list of editors in the 2D window. The signal editor manages the model catalogue and is responsible for assigning contacts. The editor is divided as follows: the buttons for the contact tools along with the corresponding list box can be found between the categories and folders at the top, and the models at the bottom.

Die Kategorie wird per Doppelklick ausgewählt

Placing signals:

Signals are selected and placed just like other models. If you select a signal using the preview, you can set the signal on the desired section of track with a simple click of the mouse. As all signals are linked to tracks by their nature and purpose, they can only be placed by the trackside.

*Signale in der
2D- und 3D-Ansicht*
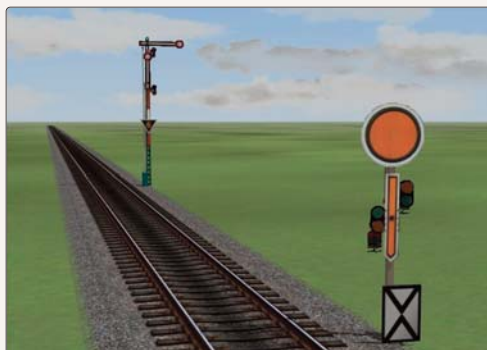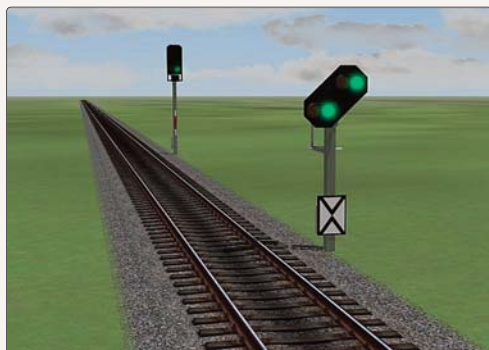
Approach signals and main signals are denoted by two icons in the layout plan. The signal arm indicates the main signal, whereas the approach signal is signified by a disk. Both symbols can be selected with the mouse in the layout plan and in the overview window, and can be moved along the track by holding down the mouse button. If you drag the approach signal beyond the main signal, both objects will be rotated through 180° and automatically placed on the other side of the track which results in the signals applying to traffic travelling in the opposite direction.

To set a signal either in the planning window, overview window or 3D window, you only need to click on the signal whilst holding the *[Shift]* key.

Signals are automatically set to the right of the track in the direction of travel. Since EEP 9, however, you can also set signals against the direction of travel by clicking on the left half of the track in the 3D window to select the position. This spares you having to then move the approach signal. In doing so, you should zoom the camera as close as possible into the track in the 3D view so that you can differentiate between the left and right halves of the track. As with the position, you can also set the distance between the signal and the train stop position in the 3D view, whereas up until now you had to decide the distance from the signal at which the train came to standstill in a relatively abstract manner in the planning view. In the dialogue which can be opened via the object menu of the selected signal, you can set the braking distance and also decide a start delay in seconds. The latter is useful at level crossings to hold cars back until the barrier is fully risen.

6.2 Setting contacts

6.2.1 Signal contacts

For a signal to be able to fulfil its function automatically, contacts must be assigned to it. A contact is just as simple to place as a signal:

- Activate the signal you would like to assign a contact to by clicking on it.
- Select the Signal contact from the 'Contact for' list in the signal editor and then click on the button (see top-right) that activates the contact tool.
- Now click on the section of track where you would like to set the contact in the layout plan.

As with the signal, you can also go back and move a contact that hasn't been placed properly.

Contacts can also be set and edited in the 3D view. To do so, first select the signal in question in the 3D editor, right-click to open the object menu and then select the Set contact option. You can place the contact with another left-click on *the track module's position.*
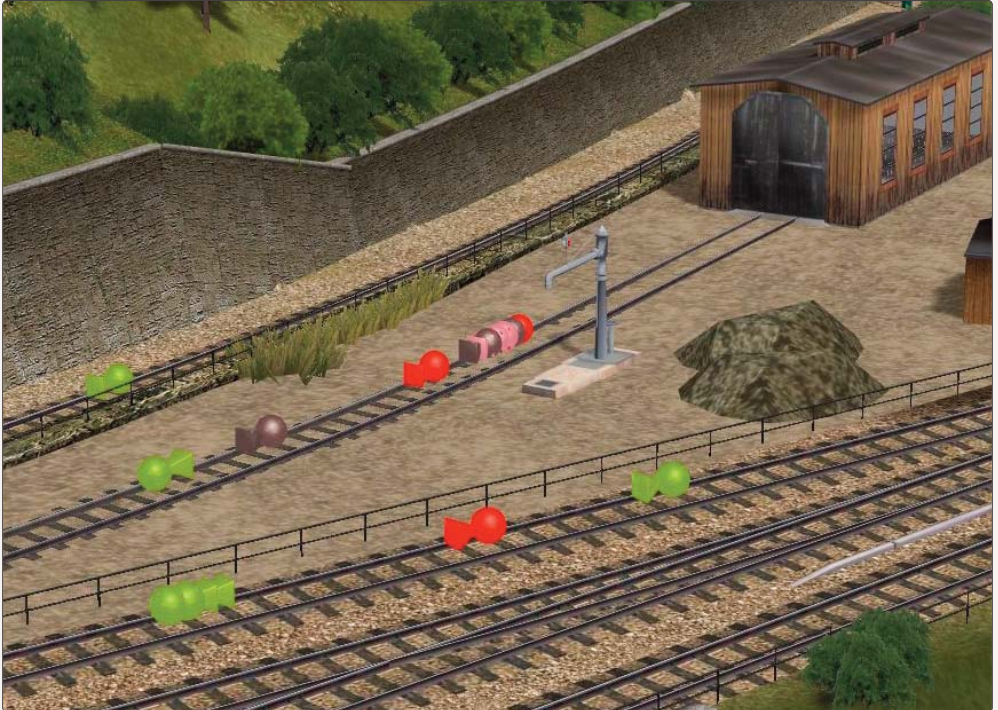
Contacts are quick to set. The configuration takes a little more consideration. This determines how and when the action linked to the contact is triggered. The settings have to be set for each contact individually and are defined in the configuration menu, which can be opened by right-clicking on the active contact.

In the Signal contact configuration menu, you can set:

- the **direction** from which the train needs to come to trigger the contact
- when the contact responds
  - on **each passing** train (or only with each 2nd, 3rd, etc.)
  - the **delay** (in seconds)
  - at **the end of the train**
- the **vehicle/route** that triggers the contact
- the state of another signal or switch **(if signal/turnout #)** as a mandatory condition for the contact to take effect.
- the **effect,** i.e. the position the signal should take when the contact is passed.

The contacts, which you can configure in the menu, can be triggered according to your setting or even randomly, which of course can provide some surprises. To switch on the internal random generator responsible for this, you must set it that no passing train triggers the contact. Why? Because triggering the contact should be left to chance. You can do this by entering a zero (0) in the input box.

Contact offset trigger spots:

By popular request from EEP users, the so-called **'Offset trigger spot'** has been added to the Contacts dialogue window. This is an additional distance (measured from the contact in metres) that the rolling stock need to cover before the actual action of the contact is triggered.

Die Aktivierungsdistanz bei Kontaktpunkten
(hier für Fahrzeuge)

The If signal/turnout # function provides the possibility of connecting contacts for controlling signals (and also switches, vehicle, structures, sounds and camera) to the logical 'if' condition according to the 'true' or 'false' criterion. That means that action linked to the contact can only take place if the condition is met. If the condition is not met, the contact will not trigger the action.

Good to know:

Please note that logical conditions can only be set for objects with an ID number. This includes all signals, switches and all double and single slip switches whose sequential numbers are shown in the planning and overview windows. You may omit the leading zeros when entering these IDs.

You now know the theory behind placing signals and controlling them via contacts. Practice will give you a concrete grasp of how it works.

To gain some experience, first create a simple switch system:

• Lay a simple oval of track in the track editor.
• Switch to the signal *system editor* and select a signal to place at an appropriate position on the track in the layout plan.
• Select the signal and choose the Signal contact from the *'Contact for'* list in the *signal editor.*
• Now click on the button to activate the contact tool and place two contacts in the layout plan – one between the approach and main signals, and one after the main signal.

The first step is now complete. In the second step, you can determine the actions you would like to link to the two contacts:

- First select the contact positioned between the approach and main signals.
- Now right-click on the selected contact to open the configuration menu.
- Select Direction one and enter the number 20 in the Delay operation and select the effect Clear. You can skip the remaining settings.

Zwei Kontaktpunkte für Signal 001

Configure the second contact behind the signal in a similar manner.
- Select **Direction 1** again and then the option **End of vehicle,** and choose the effect **Danger** for the second contact.

That's it. If you now set the signal to Danger by clicking on it whilst holding the [Shift] key, the signal is ready to control.

What happens? When a train in automatic mode approaches the signal showing 'Danger' from the specified direction, it will brake at the approach signal and come to a stop at the main signal. After the pre-set delay of 20 seconds, the signal will switch to 'Clear' and the train will drive on. When the last carriage has passed the second contact, the signal will switch back to 'Danger' until the next train approaches, and the process repeats. In this way, you can create an automated stop at a station with two contacts. If you have experience of real model railways, you will recognise the similarities with the implementation of this little control task.

Level crossings:
Like signals, level crossings can be controlled fully automatically via contacts. A level crossing in an EEP layout has two barriers that need to be placed individually for each direction of travel. It is important that the level crossing is not placed too close to the crossing point between the track and road, otherwise you risk the level crossing being placed on the track

and not on the road. You can avoid this by moving the level crossing to the right place afterwards. For a level crossing, the approach signal of the second barrier or traffic lights must be moved beyond the main signal in order to secure road traffic coming from the opposite direction.

The automatic control contacts need to be set and configured separately for both barriers and stop lights. The contacts should only ever be active for one direction of travel. So a fully automatic, one-lane railway level crossing secured on both sides requires the eight contacts to be placed, ensuring that the barriers close when trains approach and open again once they've passed.

Track blocks:
The contact control mechanism also allows track blocks to be set up. These are track sections divided into several block segments. This division is to ensure that the individual sections of track can only ever be occupied by a single train. This is realised using signals controlled by contacts. Imagine the process as follows:

When a train enters block B after passing through block A, it passes over a contact and switches signal A at the end of block A to 'Danger', so that a following train cannot enter block B. As the first train now leaves block B and enters block C, it passes over another contact for signal A. This contact sets signal A to 'Clear', while another contact switches signal B to 'Danger', and so on and so forth.
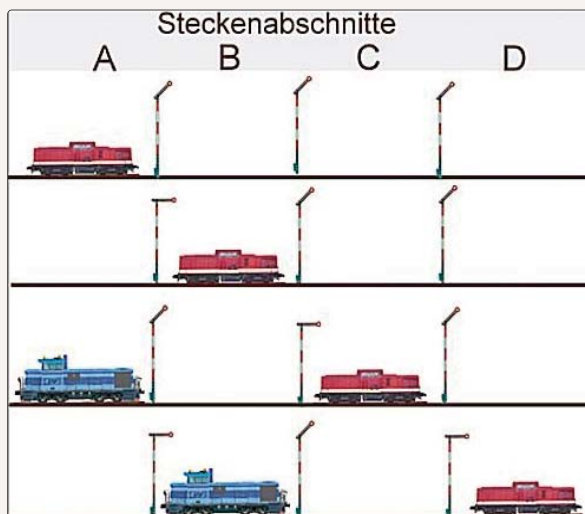
By planning and constructing a carefully thought-out signal system with track block safety, collisions can be avoided.

Schema der Blockstreckensicherung

6.2.2 Switch contacts

As with signals, switches can be controlled automatically using contacts. With the skilled combination of switch and signal control, rail traffic at terminal loops, track ladders, stations and virtual depots can be regulated and controlled fully automatically. To set a switch contact, you first need to select the switch point in the layout plan by clicking on the track immediately in front of the switch lantern, marked by a triangular direction arrow. Then select the switch contact from the list in the signal editor and click on the button to place the contact on the selected track.

Attention:
The correct selection of the switch point is particularly important if a switch branch is also the drive for a follow-up switch, as might be the case in track harps or at stations.

The settings in the switch contact dialogue window are much the same as for signals. The only difference is the setting in the Effect box. This determines when and where the switch is triggered – with the settings

• *Main* (straight)
• *Branch* (turnout)
• *Next branch* (alternative turnout)

The *Next branch setting* comes into consideration for three-way switches; the option *Next causes the switch* to change to a different position each time the contact is passed.
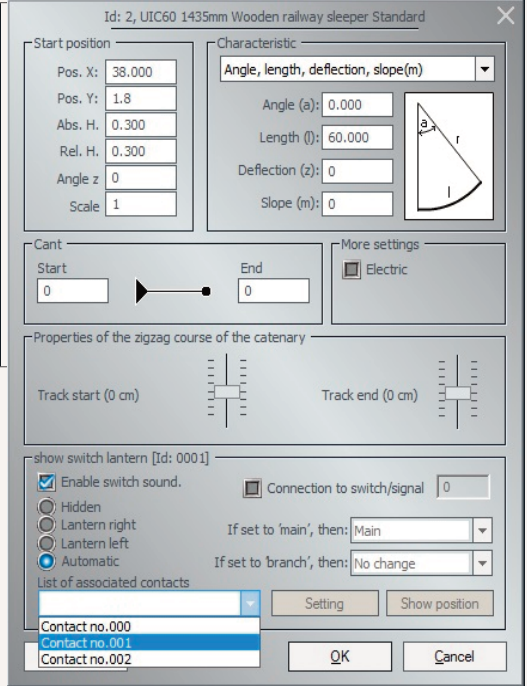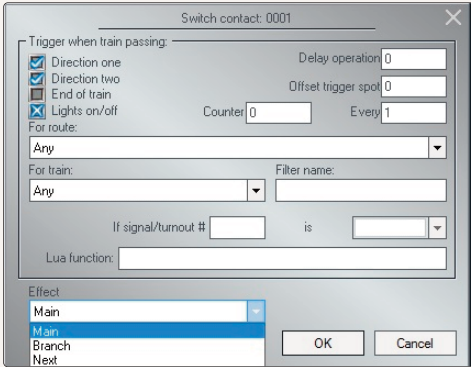
A list with all the contacts assigned to a switch provides you with quick access and direct editing. You will find this list in the Properties dialogue windows, which can be opened by right-clicking on the corresponding switch point in the 2D track editor or the 3D editor for routes. If one or more contacts are assigned to a switch point, they will be shown in the list. After selecting a contact, click on the Setting **button to start** editing the contact.

6.2.3 Sound contacts
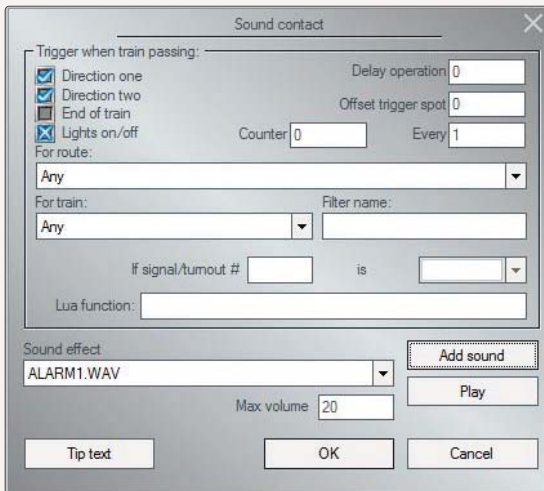
With sounds contacts, you can assign characteristic sounds in the form of *.wav files to vehicles and structures, such as locomotive horns, the ringing bell of a tram, the wailing sirens of fire alarms or loudspeaker announcements on platforms. This allows upcoming events to be heard before they appear – provided, of course, your speakers are turned on!

To insert a sound contact for a train horn or whistle into a track, first select the section where you would like to place the contact. Then select the sound type contact from the list in the signal editor and click on the

button to place the contact. Now, when a train passes the contact, the *.wav file of the selected sound plays automatically.

The file can be selected in the contact dialogue box, where you can also make other settings. Clicking on the Add *sound option* will open the folder of available sounds which can be selected at will and played back at an adjustable volume. Other *.wav files stored on your hard disk can also be used.

6.2.4 Vehicle contacts

The automatic control of vehicles via contacts is a crucial feature for all EEP users, and perhaps the most important for model railway construction on a PC. Vehicles play a key role in the automation of an EEP layout as it is these that trigger actions by driving over the connected contacts. Just as vehicles set automated processes in motion, they themselves can also be set in motion by pre-defined automatisms. This is implemented – like signals, switches, structures, sounds and cameras – by contacts assigned to the respective vehicles in order to automate certain processes. To place a vehicle contact on a route, switch to the *signal editor* as usual, select the location on the layout plan where you would like to place the contact, select the Vehicle type from the contact lists and click on the button (see right) to place and configure the contact.

In the contacts dialogue for vehicles, first define the general settings that apply to all contacts. These *relate to triggering* when a train passes, to *vehicles* and to *the route.* Once the general settings have been made, you can set the special options that are relevant for the automatic control of vehicles:

• the *coupler control* for train compositions
• the *controls for loading/unloading* vehicles
• *speed memorise/recall*
• the *control of movable axes*

Furthermore, you can define a logical condition that must be fulfilled so that the contact actually switches.

A direct logical connection can also be created to another signal or switch via the signals dialogue window – simply and directly, without the aid of contacts. In this way, logical connections to an '*if*' condition can be created, as is the case for switches and signals, but without contacts. This reduces the number of contacts required and simplifies the set-up. The direct switch connection between signals allows, for example, the two barriers of a level crossing to be linked. This halves the number of contacts required for automatic control.

To create a direct logical connection to a signal, rightclick on the respective signal to open the ***object dialogue*** window, and enter the ID number (without the leading zeros) of the other switch/signal that you want to "slave" to this signal. Then select the signal aspect in the menu on the left that defines the 'if' condition requirement. Then select the appropriate setting for the "slaved" signal on the right. Repeat this for all possible aspects of the master signal.
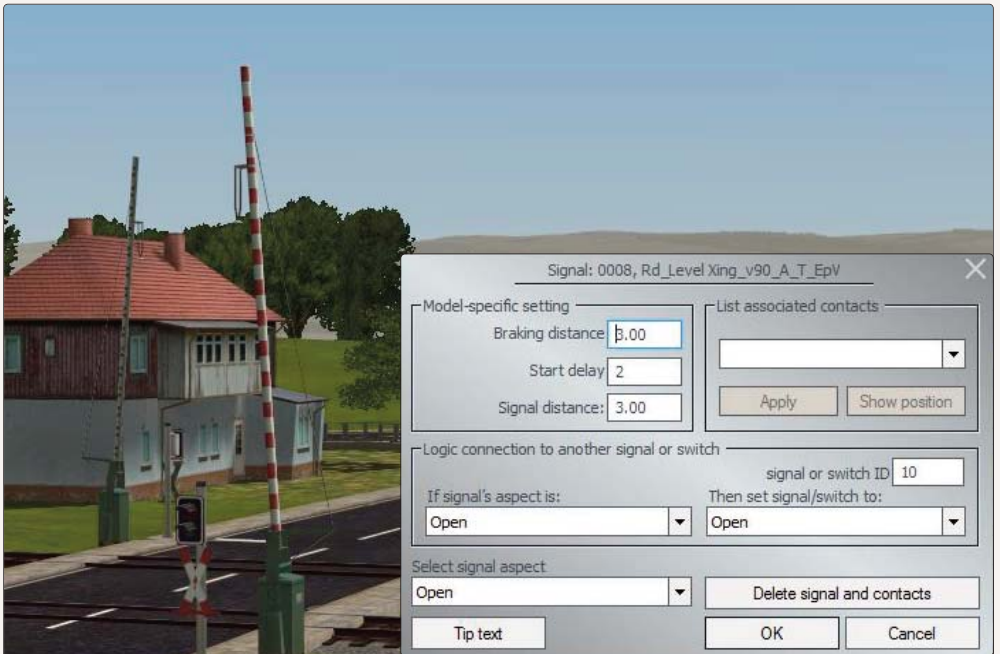
The *coupler control* – which has already been covered in the previous chapter – also applies to train consists so that entire train sets can be coupled and uncoupled. In this way, typical railway operations such as 'portion working' and 'running around' can be controlled automatically.

'Portion working' refers to the scheduled splitting of a train into two or more partial trains, one of which continues or ends on a different route. Railway workers use the phrase 'running around' to describe a train's change of direction of travel at a terminal station where the train's locomotive (or another one) is attached to the other end of the train before travelling back along the same stretch of track.

The *coupler control option* decides how many units should be uncoupled at the front or back when passing over a vehicle contact. What's more, you can also give the separated section a new train name so that it can be integrated into existing routes and timetables. With the Release *coupler – Front coupler / Rear coupler option,* the front or rear section of the train is given a new name.

The new name corresponds to the name specified in the contact or, if a name isn't specified here, the old name followed by a sequential number, counting upwards if one already exists.

In the *speed control section,* you may either define a maximum or minimum speed or set a fixed speed for the passing train. If you select the *Reverse direction* option, the train will continue its journey in the opposite direction when it passes over the contact. An elegant solution for shunting and turning. Please note that, in the case of a train's reversal of direction, the contact must only be triggered in one direction and not both!

Controlling vehicles also includes *Load/unload controls* when transporting *freight and the control of movable axes.* These control mechanisms, which you have been familiarised with through the examples of various functional models, can also be automated using contacts. There are a few further options for the control of vehicles using contacts. Initially a train passing a vehicle contact affects its own speed. But you may define another train to be affected instead, thereby remote controlling one train when another triggers the contact. This type of contact control is especially recommended for larger loading and unloading scenes where an often very high number of

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contacts can be distributed across a long stretch, which improves both the overview and the differentiation of control pulses. Equally, any other action supported by the targeted train can be controlled remotely in this fashion. At least two vehicles are involved in remote control (one to trigger the action, and one to react to it). For this reason, the Apply to vehicle/train option has been added to the vehicle contact dialogue window where the *target vehicle or the train* composition can be specified.

Furthermore, contact control for vehicles has been expanded with the new option *to switch signal lights on and off* in the contacts dialogue. If a tick is placed in the box, the respective signal light (left, right or both) is switched on, and if unticked, it is switched off. A cross in the place of a tick means that EEP takes control of the signal light. Depending on the construction of the respective model, the *'Produce dust'* option activates a cloud of dust (e.g. behind the wheels) like that which you would see on dirt roads.

6.2.5 Copying contacts in 3D

It is possible to copy contacts in the 3D editor to speed up the construction and editing of recurring control sequences. The actual copying process is performed as follows: first left-click on the contact you would like to copy to select it (it will start to flash) and then right-click it to open the edit menu. Now select the *Copy contact option.*

The mouse pointer will now be accompanied by the characteristic **'Set contact'** icon and clicking on a suitable place will set a copy of the contact along with all of its properties on the route.

Kopieren eines Kontakt-punktes im 3D-Editor über das Menü der rechten Maustaste
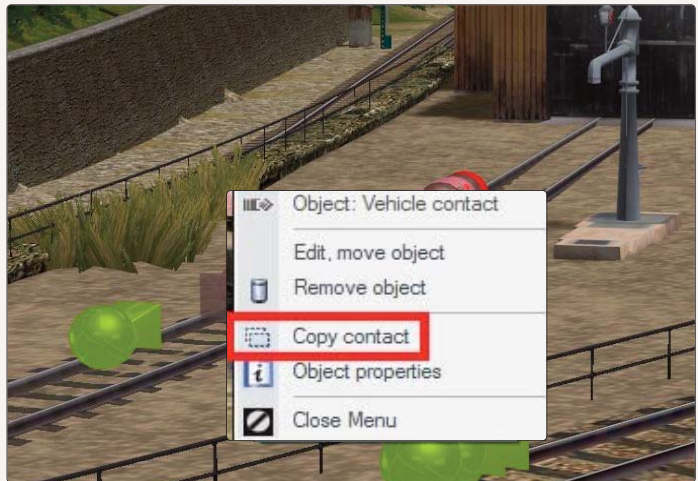
6.2.6 Virtual depot
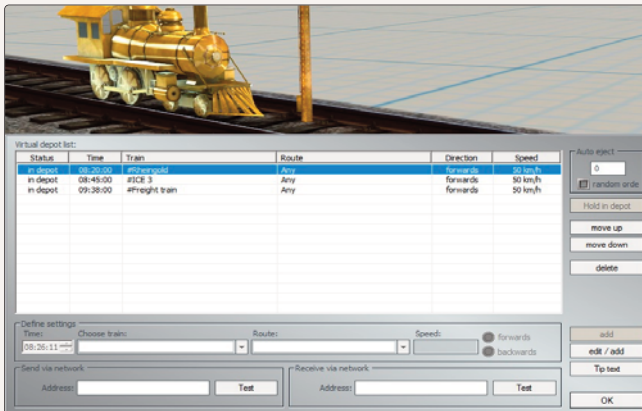
To facilitate the construction of virtual depots, two new contacts have been added to the signal editor. You can use them to make trains appear at a certain time or on a fixed cycle anywhere in your layout. Of course, you can also send these trains back to your virtual depot from any other position.

6.3 Routes and timetables

Automatic rail operations where a fixed schedule is desired are controlled by a timetable. Using routes you can ensure, for example, that:

- regional trains stop at a station, while the ICE (InterCity Express) continues its journey without stopping,
- regional and long-distance trains take different routes,
- freight trains can bypass stations,
- trams and busses don't drive on the same roads,
- buses turn off into and stop in lay-bys, while cars and other vehicles continue driving.

To automatically set up these and similar traffic rules, the sequences need to be pre-programmed. This requires routes to be defined. If certain pre-programmed sequences should also start regularly at specific EEP times, timetables also need to be created.

6.3.1. Defining routes
To run rolling stock in accordance with a fixed timetable, you first need to set the routes.

Please be advised:
Routes are simply filtering arguments for contacts. You build a list of route names and then assign the appropriate routes to your trains and vehicles. In consequence, you can then guide your traffic according to those routes by setting up contacts which only respond to vehicles which have a specific route assigned to them.

There is a separate menu for the definition of routes in the menu bar, which can be opened in both 2D and 3D views:

- Select the Route edit option in the *Routes menu* and then the *option New route* in the following dialogue window.
- Enter your route's name in the Name *route box* and click on *Add.*
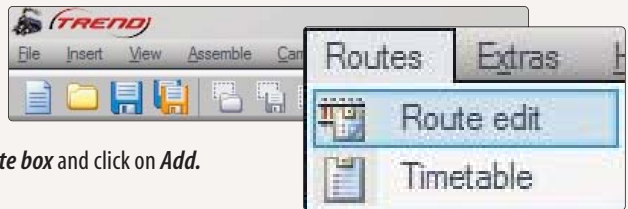
This will add your entry to the list of routes and delete it from the input box so you can define other routes and add them to the list in the same manner. Once all routes have been entered, you can close the dialogue box with OK. To change or remove an entry, select the route in the list. The Add option will automatically become Edit. In this mode, you can change and remove existing entries.

Once you have defined routes, set up the relevant switches, inserted vehicles and assigned routes to these vehicles, you can now start the automatic traffic operations.
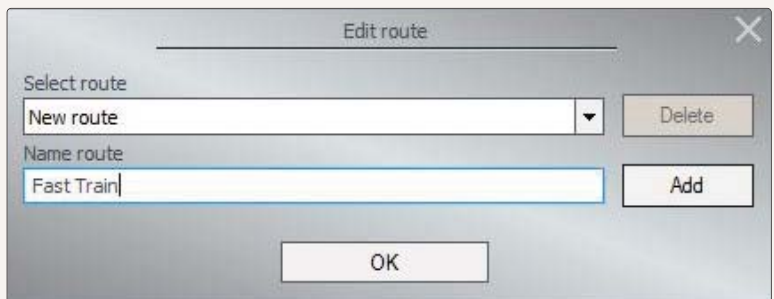
6.3.2 Generating timetables

As has already been mentioned, setting up timetables is only necessary if you want to start automatic sequences at a specific time.

Important:
Only once you have defined routes, inserted vehicles and assigned routes to these vehicles can you create a timetable.

To create a timetable, proceed as follows:

- Click on the *Timetable option* in the *Routes menu.*
- In the following dialogue window, select the vehicle you would like to create a timetable for and click on the *Add* button. An input box with the text *'New timetable #1'* will appear.
- Overwrite this text with an identifiable name.

Once the timetable has been created, you next need to select the time and route, and then define the signal and effect. This will assign the desired control effect to the selected route at the specified time. Specifically, proceed as follows:

- First, specify the signal – in our example, the signal with the ID 0010 – and select the effect *Clear.*
- Specify the time at which the signal should be set to *Clear* – here, EEP time 08:01:01.
- Select and activate the route. This means that the contacts placed on the stretch will only react to vehicles that are assigned to this route.
- Finally, click on Add in the bottom-right of the *dialogue window.* This will apply the first timetable entry.

In this way, you can compile the entire timetable – entry by entry – for automated traffic on your layout.

As timetables usually consist of recurring actions, differing only by the time at which the action takes place, there is a copy function. This allows you to create complex timetables without having to enter recurring actions again and again.

When inserting a copied timetable action, an additional timeframe of 10 seconds is automatically added to it so that the copy can be differentiated from the original timetable action. The copied timetable entries can be individually adapted in terms of the trigger time, route, signal ID and the desired effect. The copied entries can be used in multiple timetables in the layout.

EEP's own timetable has received some functional enhancements since EEP 12 Expert. Whereas it was previously only possible to control signals via a timetable, switches can now also be set. Existing timetables can be saved to a file and, of course, used in other layouts so that you don't have to create a completely new timetable for each layout.
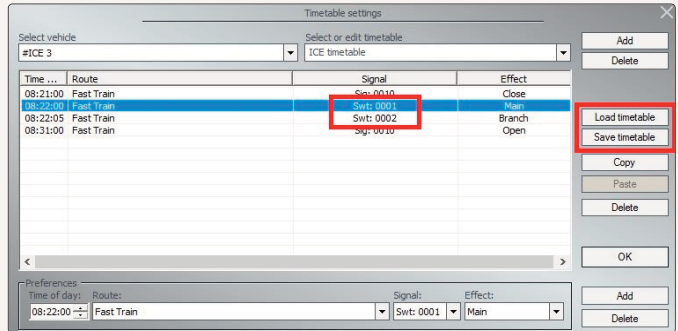
6.4 Pre-set routes

The pre-set route feature allows you to activate routes in just two clicks. All the switches and signals belonging to the pre-set route are put in their correct places so that the route can be travelled. When activated, pre-set routes are automatically checked for potential conflicts and rejected in the event of a conflict. The beginning and end of a pre-set route are marked by a start and finish signal. The 3D pendants of these special signals can be hidden under *'View 3D window'* in the *'View'* menu.

2D und 3D Ansicht des Startsignal

2D und 3D Ansicht des Zielsignal
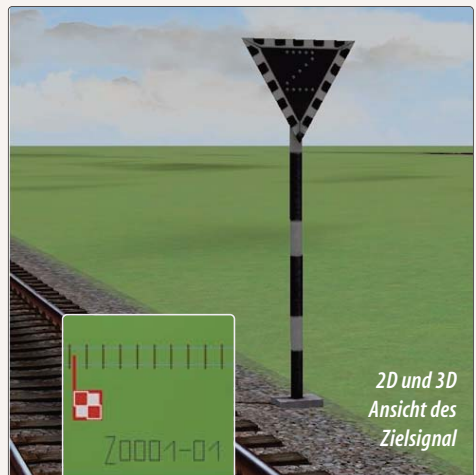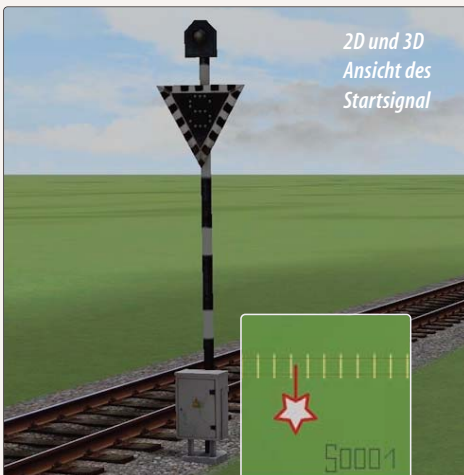
Before you get to the actual construction of this function, please note the following basic information. Pre-set routes are available to automate sequences relating to traffic operations in EEP.

An internal check is carried out to find out if, for example, another active pre-set route has control over the same track in part or whole. If this is the case, you will be unable to activate the new pre-set route conflicting with it. It is also checked whether other rolling stock is located within the pre-set route being activated. Only if the entire stretch is free can your wish to activate the pre-set route be fulfilled.

You will also receive audible feedback. Now proceed as follows: First, switch to the *Control tracks editor.*
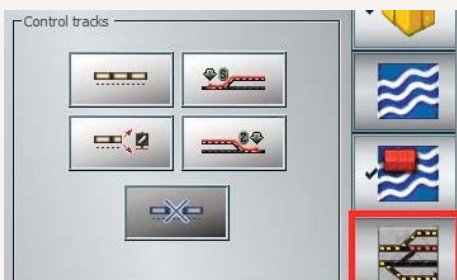
On the right, you will find two icons used for building pre-set routes. The top icon is the start signal, and the bottom one is the finish signal. Now place a start and a finish signal in your layout.

ATTENTION
Ensure that both signals are positioned to the right of the track in the direction of travel.
If this is not the case, you won't be able to create a pre-set route.

If a start or finish signal is standing on the wrong side of the track, move the mouse pointer to the edge of the signal. It will turn into a circle. Click this position exactly and the signal will jump to the opposite side. Click on the star of the start signal – it is marked by a frame – and then click on the flag of the finish signal to connect them to form a pre-set route. Switches located between the start and end first need to be brought into positions that establish a continuous connection from start to finish.

In the first example, a very simple pre-set route has been built. Now we come to another example, which is somewhat more complex in structure. The entire scope of this tool will be presented. Now we will build pre-set routes from a single start signal to multiple finish signals. As you will see, even this isn't at all difficult. In this example, we will also cover the signals that you can insert into your pre-set route. As you can see from the picture, all the semaphore signals as well as the start and finish signals have been placed. I will also discuss the display in the overview window, which you can use to control your placed pre-set routes.

Depiction of the scene in the overview window

Now we select in the following order: the first pre-set route should be set from the start signal to the finish signal, which can be seen at the very bottom of the picture. After that, select the signal positioned directly above it, and so on. First ensure that you are in 2D mode. Now position the switches that lead to the target track. In this example, the semaphore signal on the left of the picture should also be set to 'Clear'. All other semaphore signals should show *'Danger'.* Set them accordingly. Once you have made these settings, click on the pre-set route's start and finish signal one after the other.

Now select your pre-set route, if it isn't selected already. Hold down the [Ctrl] key and click on the signal you would like to add to this pre-set route. Do the same for any additional signals you would like to add. In this way, you can add as many signals or switches to your pre-set route as you like. Do exactly the same for the next pre-set route. Set the switches and signals and repeat the process.

Control during rail operations:
You can take control during ongoing rail operations either directly in the 3D area or in the overview window. Click on the start signal and then on the finish signal while holding down the [Shift] key. If everything is in order, your pre-set route will be activated. If the pre-set route is occupied, because either another pre-set route has been activated or rolling stock is occupying the pre-set route, you will receive a message in the 3D window.

Activation via contacts:

Of course, your pre-set routes can also be activated via contacts. To achieve this, set a contact for the pre-set route's start signal. You can now enter which pre-set route should be triggered in the *Effect* box. You can also remove the pre-set route at this point.

Tip:
You should take a look at the videos we have made available regarding the working of pre-set routes: *www.eep11.com/tutorials*

6.5 Lua

The integration of the Lua scripting language is a milestone in the development of EEP. Lua and its features provide you with very powerful tools to wire up your layouts in a very clear manner. Lua can save you additional control tracks. You will find comprehensive instructions on this topic under the *Lua manual* option in the Help menu. In this document, the Lua language is explained to you in a basic way using the tutorial layouts provided. Integrated wizards help newcomers to build simple scripts.

6.5.1 Lua wizard

General information

With the Lua wizard, we have created a simplified way for you to make Lua scripts. Using this additional programme is very simple. Further wizards will be released at a later date, and will be available via the TREND shop.

The user interface of the wizard is available in the EEP 13 bar after launch. Please note that the wizard is only available if it has been started by clicking the *Wizard option* in the *Extras menu.*

Once you have launched the wizard, a menu will guide you through the task. Simply follow the specified steps to reach your objective. Once you have completed all the steps, a window

will appear where you will see your new, complete script. Press the button to copy the new script to the clipboard. Now all you have to do is replace the old script with the new one. To do so, proceed as follows:

– Open the script window in EEP 13
– Right-click on the script
– Now choose the Select all option
– Right-click in the script window again
– Now select the Insert option
– Click on the 'Reload script' button
– Close the EEP Lua Script Editor

Wizards in EEP 13
There are various wizards available to you in the basic version of EEP 13: the timetable wizard, a wizard for controlling level crossings, wizards for the vehicle and structure control features, and one for *'track occupied'* queries.

Timetable wizard

You can create your own timetable with this wizard. You can make changes or additions to this timetable at any time. Simply open the wizard again if you would like to make changes or additions.
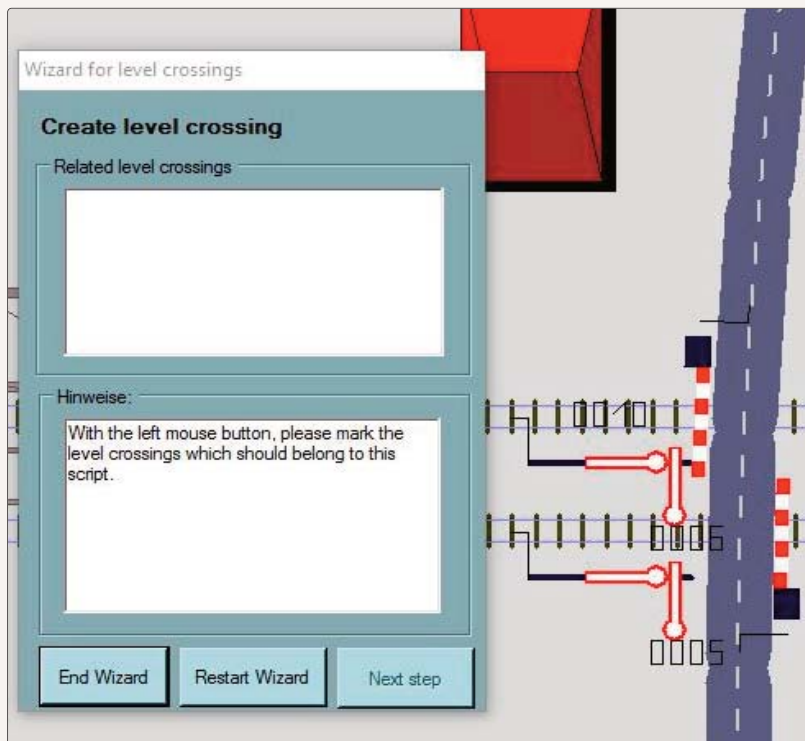
Create level crossing

This wizard gives you a multi-track level crossing that doesn't use any control tracks. The script is invoked in a vehicle contact and you simply enter the corresponding function in the Lua function field of the contact.

Tip:
You will also find comprehensive tutorial videos on Lua and the wizards at *www.eep12.com/tutorials*

7. The EEP Control Panel Editor

This feature of EEP allows you to create a control panel for your layout and to completely control your layout via this control panel, just like a signal box in its real-life equivalent.

New **features to** *EEP 13* include diagonally arranged **buffer stops** in the track section, and *'camera buttons'* in the Other section which you can use to switch to any saved camera position on your layout.
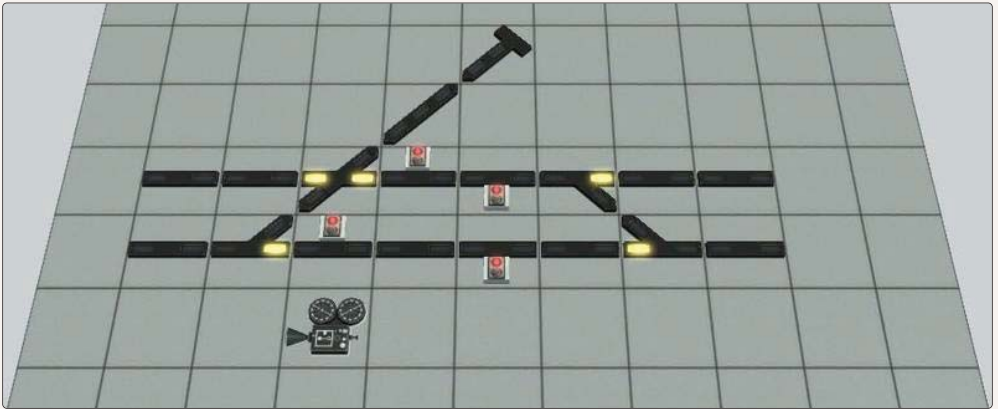
First, however, we would like to give you an overview of the structure and functions of the Control Panel Editor.

7.1 The main window

First, we'll introduce the main window of the Control Panel Editor and the elements it contains. This main window is divided into three sections:
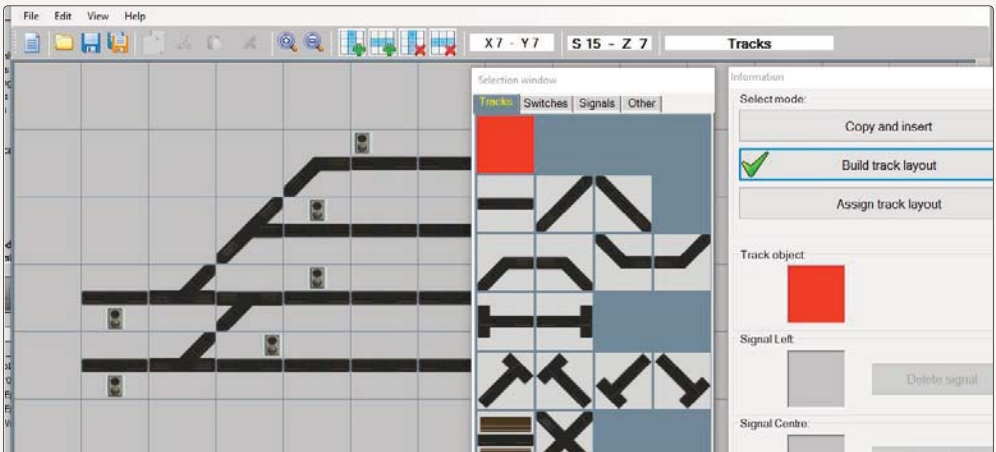
1. The workspace

The workspace is the actual work centre of the Control Panel Editor. When the programme is started, this area is automatically made up of ten columns and five rows. If this size is not sufficient, you can add further columns using the *'Add table column'* function. The same goes for rows.

2. The Selection window

The Selection window has the four following options: the *'Tracks', 'Switches'* and *'Signals'* selection windows, and the *'Other'* selection window, which is new to *EEP 13*.

These four options are used to display the different Control Panel Editor model types clearly and to make them available for later insertion.
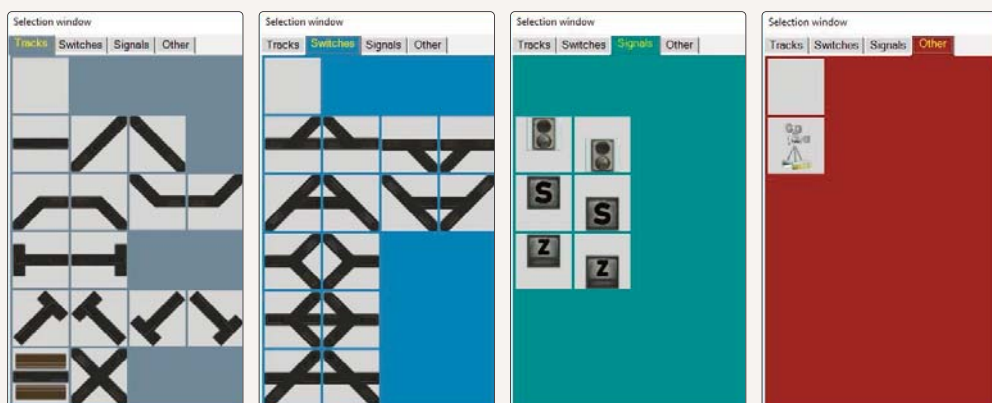
3. The Information window

The Information window helps you to keep track of your project. This Information window has three different modes, which we would first like to describe briefly before we explain them to you in two separate sections.
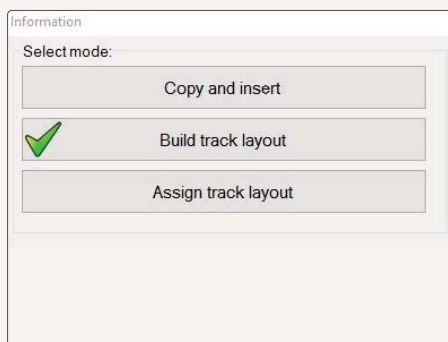
Mode 1: Build track layout

This mode is opened when the programme is started, meaning you are always in the mode for setting up your control panel.
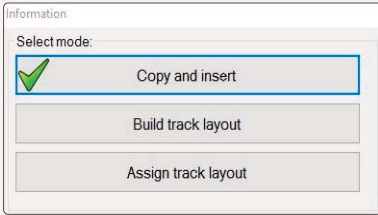
Mode 2: Copy and insert

If you have ready-built elements, you can copy these elements in your control panel and insert them elsewhere. Furthermore, it is also possible to cut elements from the existing control panel and to insert them again elsewhere.

The following icons are available in **'Copy and insert'** mode. Alternatively, you can also use the right mouse button of the **'Edit'** menu.

Explanation of the elements from left to right:

Copy the selected elements

Cut the selected elements

Insert copied or cut elements

Delete the selected elements

You can select several elements at once. To do so, proceed as follows: you can only copy rectangular sections of the desk layout. Select an element to mark one corner, then hold down [Shift] and select the element in the opposite corner. The selected square segment is highlighted. Press the 'Copy' button to transfer it to the clipboard. Select the top-left corner of the target area. Press 'Insert' to insert the copied section here.
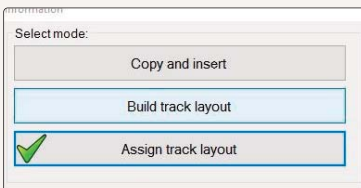
Mode 3: Assign track layout

In this mode, the individual elements of the track layout you have created are assigned to your EEP layout.

7.2 Build track layout

This mode is the first major step in creating your control panel. Here you can build and, of course, overwrite exactly as you like. Very important: This is where you create an image of your layout. The mapping to the actual layout is done later and in another mode. Place icons, add rows and columns as required and delete them when you find that you have too many. It is advisable to begin small. You can always extend your panel when necessary.
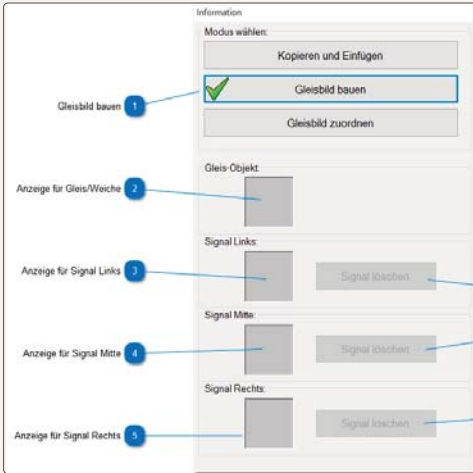
You can deploy multiple control panels in *EEP 13*, so your entire layout doesn't have to be represented in a single control panel.

1. Lay track or switch

If you would like to lay a track or a switch, select the corresponding element from the selection window and place it on the appropriate tile.
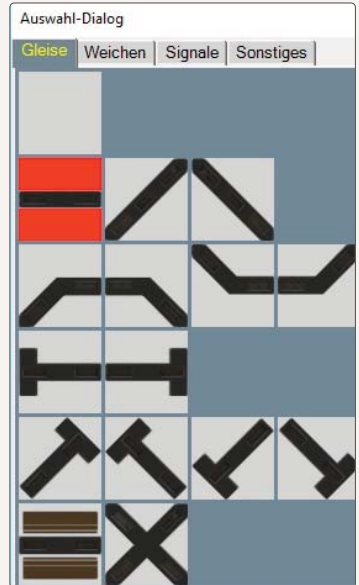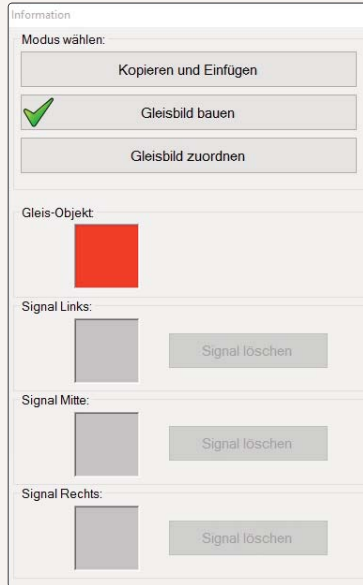
2. Place signal

If you would like to place a signal, however, you should proceed slightly different: first, select the corresponding element in the selection window shown. In the first row, you will find two different elements that represent all types

of signals. The only difference is in the arrangement in the control panel. The left element stands for a signal that is displayed in the top half of the tile, and the right symbol is shown in the bottom half.

In the second row, you'll find the two symbols for pre-set route's start symbols. Once again, one for the top and one for the bottom position.

In the third row, you'll find pre-set route's finish symbols.

Select the correct position in the information window, as already described, and then select the desired symbol in the selection window. Now click on the tile that you want to hold the signal button. If you realise that a button's position is inappropriate, you can delete it. First select the desired position (left, middle, right). If it contains a signal, you can delete it. Otherwise, the button will remain greyed out.

Signal löschen
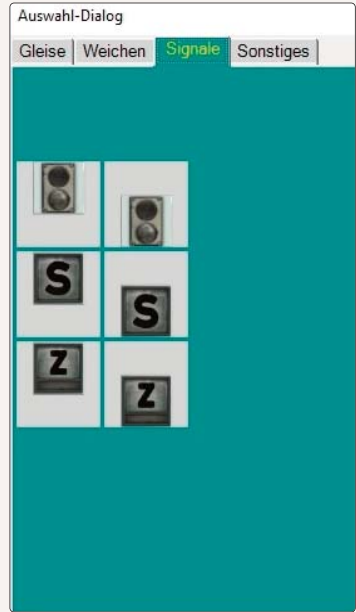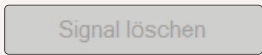
3. Insert camera

If you would like to insert a camera, select the camera from the *'Other'* selection window. You can then click on the tile where you would like to insert the camera.
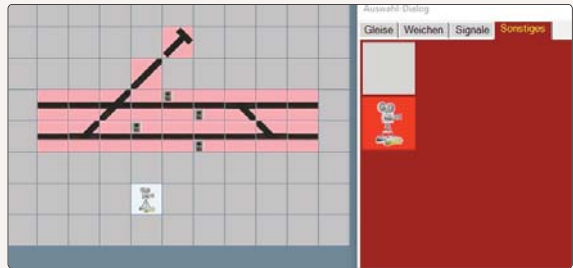
7.3 Assign track layout

This is the section where assignments can be made to the EEP layout. It is the most exciting section, but it also demands the greatest attention from you. However, you are now not far from completing your control panel.

This mode receives a green tick once it has been activated. In addition, the colour of a selected tile in the workspace also changes. This also turns green.
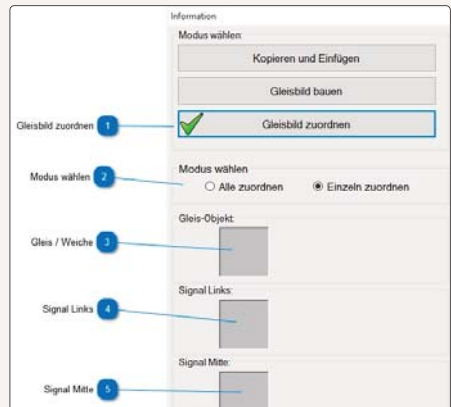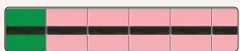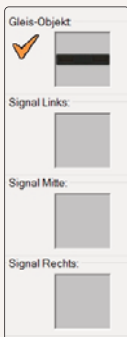
The selected element will also appear in the information window. In our example, only a track has been laid, but no signals. You therefore see the following image.

An orange tick can be seen in front of the object. This shows that it has not yet been assigned. Now click on the image next to the tick.

Once you have done everything, a green tick will appear before each element. Additionally, the colour in the workspace will also change from pink to grey. This shows that all elements have been assigned and that your control panel is complete.

The display in the workspace will then look like this:

If you have multiple elements on a tile in your workspace (track, signals), you can assign them in one go. To do so, select the 'Assign all' option. Then left-click on the various icons to assign them.
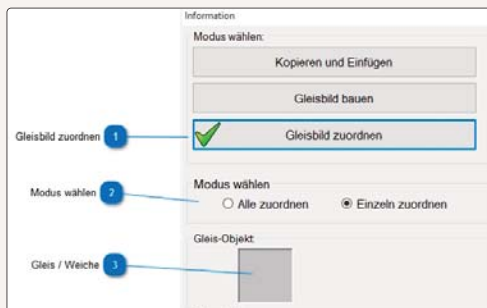
Selection window

Here you can see an overview of the window to assign the individual elements of the control panel to the EEP elements. As this is very important for the correct functioning of your control panel later on, here once again are the elements in detail:
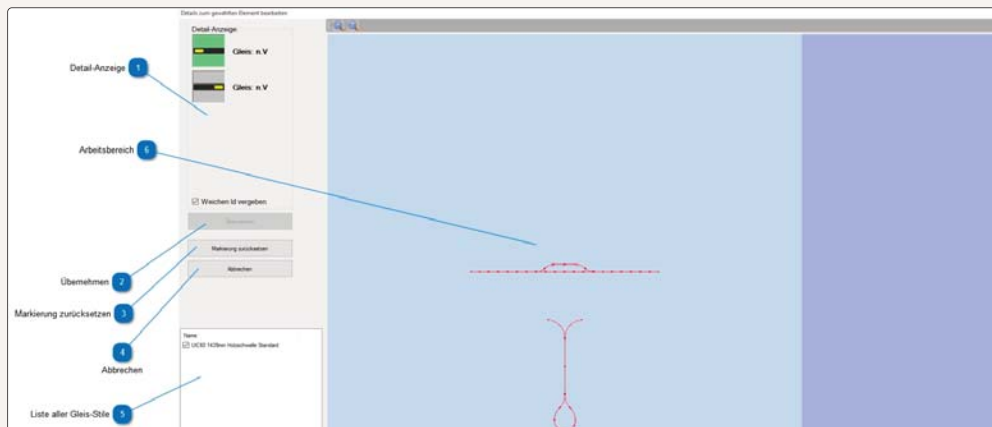
In the detail view, you will see the individual elements that currently need to be assigned. Please pay close attention to the order of the diodes.

Important:
If you remove the tick for the switch ID, this specifies that this switch element can later only be viewed in EEP's control desk, but not operated.

| Übernehmen | Once you have finished assigning elements, apply them by clicking this button. |

| Markierung zurücksetzen | If you have selected the wrong track or signal, clicking this button will reset everything and the assignment will start again from the beginning. |

| Abbrechen | Clicking this button closes the dialogue window without making any changes to the selected element in the workspace. |

In this box you see the list of all the track styles included in the layout. They can be hidden by removing the tick, which in some cases makes things much clearer. If, for example, track objects or platform splines are listed here, you would surely never want to assign them to a control panel.

Finally, in the workspace you'll see the track network of the layout most recently loaded in EEP.

There are two ways of enlarging the display. Either click the area you would like to enlarge whilst holding down the *[Ctrl]* key, or else use the **Zoom in button.** Zooming out works in a similar way. Click on a section of the display whilst holding the *[Ctrl]* and *[Shift]* keys and it will zoom out. In both cases, it attempts to centre the display around the position of the mouse pointer at the time of the click. An element can be selected by clicking on it or by dragging a selection box around it whilst holding the left mouse button. During the assignment, saved camera positions are shown as green and blue circles.

The layout shown here can be found in Tutorial 56 in EEP.

8. Settings and support

8.1 Programme settings

The programme settings relate to the functioning of the programme and the quality of the display. The individual options, which can be activated, deactivated and/or adjusted, affect the appearance and so the overall experience of the virtual railway world, but they also make considerable demands on the processing power of your computer. If you would like to exploit the impressive capabilities of computer graphics to the very max, this may result in a disproportionate processing effort and a drop in performance. Therefore, it is important to balance and keep an eye on both the on-screen display and the general performance. Checking and adjusting the **programme settings** is performed in the configuration menu of the same name, which can be opened via the File menu or via the button with the tools in the top tool bar.
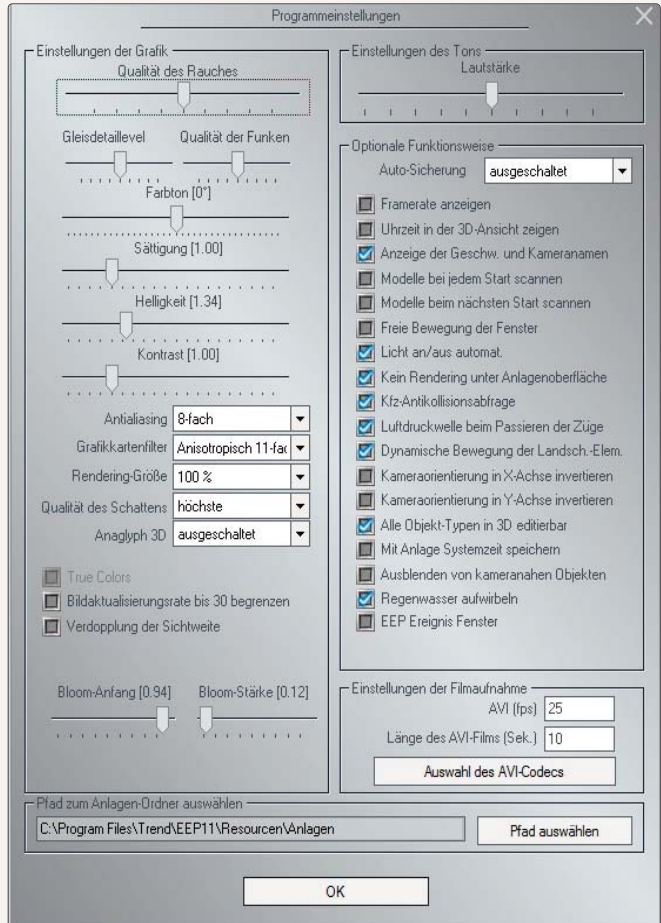
The graphics settings take up most of the space in the programme setting menu. Many options have been added, especially in the graphics section.

Smoke quality
The more smoke particles are emitted, the more impressive the billow of smoke appears, but the higher the demand <<
on the processor.

Track detail level
The further to the right you move the slider, the more detailed and accurately track curves are drawn, but this puts a greater burden on your graphics card.

Sparks quality
A range of vehicles generate sparks – at the wheels, on the overhead lines or from the smokebox (of steam engines). This can be adjusted gradually using a slider.

Display
The four basic components of *colour effect* and *colour perception* can be adjusted individually using the Hue, Saturation, Brightness and Contrast sliders. Hue is the property responsible for distinguishing basic colours such as red, green, blue and yellow, while Saturation relates to the quality and intensity of the colour effect.

Good to know:
The settings here determine the definitive appearance of the layout, regardless of your monitor's current settings. If a slider is active, you can reset an altered setting at any time by pressing the [Home] key.

Anti-aliasing
This function, which is activated via the corresponding option for your graphic card and can be switched on in various gradations in EEP, compensates for annoying 'jaggies' by blending the colours of adjacent pixels.

Graphics card filter
This option refers to texture filtering, which can either be deactivated or activated at selectable quality.

Rendering size
Rendering effort can be reduced by up to 50% through scaling.

Shadow quality
Shadows can either be deactivated or activated at low, medium or high quality.

Anaglyph 3D
The 3D distortion can be set here, which requires red/cyan glasses. As the image needs to be rendered twice, this can have a negative effect on performance.

Limit refresh rate to 30 fps
This recommended setting limits the image refresh rate to 30 frames per second, but guarantees smooth-moving images.

Double visibility range

Activating this option allows the maximum visibility range in the 3D view to be doubled, which however may cause significant drops in the frame rate.

Bloom start / Bloom intensity

This lighting effect produces scattered light with blurred contours, like a glow or an aura. The intensity and the position of the effect in relation to the depth of space can be set using sliders.

Sound settings (Volume)

You can set the volume for the playback of sounds using a slider. The following settings relate to the optimal functioning of the programme and can be activated or deactivated as desired:

Auto save

If this option is enabled, your layouts will be automatically saved at a fixed time interval. For this purpose, a sub-folder will be created in the Layouts folder where automatically saved layouts are stored. The number of saves depends on the size of your hard disk. If you save larger layouts regularly, it is recommended that you deleted unrequired interim saves to free up space on your hard disk.

Display frame rate

The frame rate is the number of images shown per second on the screen. If the 'Display frame rate' option is active, a counter will be displayed in the top-left corner of the 3D window showing the current number of frames per second that can be displayed. A relatively fluid image is produced 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 graphic card – seems fitful due to the jerky movements.

Good to know:
Juddering indicates that the number of models in the area of the layout is too high for the computer to calculate the optimum number of frames. You can avoid this by reducing the number of models being calculated. Delete any performance-heavy objects, avoid large collections of models in a small area, thin out simulated forests, and you'll already have a much smoother picture!

Display time in 3D view

This displays the current EEP time in the top-right of the 3D window, which you can set in the Extras menu under the Time Properties option.

Display train, speed and camera

Activating or deactivating this option shows or hides the camera name, the current speed and – new to *EEP 13* – the name of the active train.

Scan models at every programme start
If this setting is activated, the models will be automatically scanned each time the programme is started. Basically, additional models purchased from our online shop or which have been downloaded for free need to be *'scanned'* (registered) before use. Without scanning, they are installed in the model list but cannot be found in the corresponding category.

Good to know:
You do not need to restart EEP every time after installing additional models! Directly after installation, you can run the Scan models command from the File menu. Following the scan, the new models will be available in EEP.

Scan models at next programme start
Have you only just purchased and installed new models, but not run the 'Scan models' command? Then you can choose this option so that EEP performs the scan automatically the next time it is launched.

Undock windows
You have the option of moving the control dialogue windows and the overview window freely on your screen, or to move them to a second monitor, if available.

Turn lights on/off with daylight
If you place a tick in this box, the lights of any rolling stock equipped with lights will switch on automatically when night falls in EEP, and switch off again when day breaks. This feature only works if you run your layout on EEP time.

No rendering below layout surface
If this option is active, objects located beneath the surface of the layout, and therefore invisible to the user, are not rendered. This setting reduces the processing burden and improves performance. However, please bear in mind that tunnel walls are also located beneath the surface.

Vehicle anti-collision query
Activating this option significantly reduces the risk of collisions in queues of road vehicles.

Passing trains cause air disturbance
Activating this setting causes the camera view of the observer to be affected by air pressure waves of passing vehicles.

Dynamic motion of landscape elements
This setting completes the simulation of the air pressure wave so that air pressure waves of passing vehicles temporarily deforms the geometry of landscape objects, giving the optical impression of a gust of wind.

Invert camera X orientation
This option switches the camera's horizontal axis when using the mouse, keyboard or gamepad.

Invert camera Y orientation
This option switches the camera's vertical axis when using the mouse, keyboard or gamepad.

All categories editable in 3D editor
If this option is activated, all objects can be edited in the 3D editor – regardless of the category – allowing landscape objects, structures, routes and rolling stock to be edited at the same time. If this object is switched off, editing is restricted to the object type of the selected category.

Use real time of day in EEP
If this setting is activated, the EEP time of day will be matched to your computer's time setting when saving a layout. This allows time stages to be documented when building a layout and the respective lighting conditions can be adapted automatically. Alternatively, you can set the EEP time in the Menu *Extras -> Time settings.*

Hide objects close to camera
This option can be used to make disruptive landscape objects – e.g. bushes and trees blocking your view of a passing train – appear transparent. This does not affect the object itself, however, but only its appearance on camera.

Splashing water
If this option is activated, the wheels of travelling cars and other road vehicles will spray rainwater – provided the intensity of rainfall is set to at least 40%. Unlike dust clouds, which are triggered for road vehicles by contacts but are limited to certain segments of road, the rainwater function is set or disabled globally for the entire layout.

Videos
EEP allows you to make small videos of your layout. The settings for recording videos can also be found in the Programme settings window.

AVI (fps)
A frame rate of 30 fps is recommended for the distribution of videos on internet platforms.

Length of AVI movie (sec)
The length of the movie in seconds should be set whilst taking into account the computer's processing power and storage space.

Select AVI codec
Clicking on this button will open a small dialogue window in which you can select the compression programme. Generally, several codecs will be available – depending on which programmes are installed. You will achieve the best

possible output by selecting the Full frames (uncompressed) option. However, videos in this format require several gigabytes of hard disk space, depending on the length of the video. Uncompressed videos are advisable as the source material, especially if they are being written to CD or DVD. Once you have set the frame rate, the length and the compression, you can close the Programme settings dialogue window and start recording your video by pressing the keyboard shortcut [Ctrl] + [F12]. The finished film will be saved in your EEP installation folder.

ATTENTION
Recordings in tracking mode are interrupted following the first camera change for technical reasons. Screenshots can be taken in the 3D view by pressing the [F12] key, and they are stored in the EEP directory in BMP format.

Good to know:
EEP 9 users may possible miss the option for the need of track electrification for electric locomotives. With EEP 10, the option has been moved from the program settings to the layout information. This option makes operations on your layout even more realistic. In order to set electric vehicles in motion, the tracks must be equipped with an overhead power line or an electrified track, and the pantographs must be raised

8.2. Hotkey table

Please ensure that you are always working in the corresponding window when using these keys, e.g. mouse pointer over the 3D view when switching camera angles.

Mouse navigation

Scroll in the planning window or 3D view	➞	Roll scroll wheel at edge of screen
Zoom in the planning window or 3D view	➞	Roll scroll wheel in centre of screen
Category selection: Source/Filter	➞	Double-click
Select objects	➞	Left-click (Note mode, tab bar, control dialogue)
Open dialogue boxes	➞	Right-click on selected object

General

F1　**Help**

Alt + **Letter**　**Select menu option**

Alt + **F4**　**Send application to background**

Alt + **Esc**　**Quit application / Exit EEP**

Planfenster

⬅️ ➡️ ⬆️ ⬇️ Scroll

Entf **Delete selected object**

F5 **Switch to 3D view**

Num + − **Reduce scale**

Num + + **Increase scale**

3D window

F4 **Full-screen mode**

F5 **Switch to planning window**

F7 **Control elements and planning window**

F8 **Maximise window**

F9 **Tracking shot in/out**

F12 **Screenshot of 3D view**

Strg + F12 **Create AVI films**

Esc **Return to windowed view from full screen**

⬅️ ➡️ **Pan camera left/right**

⬆️ ⬇️ **Pan camera up/down**

Strg + ⬅️ ➡️ **Move camera left/right**

Strg + ⬆️ ⬇️ **Move camera forwards/backwards**

| Leertaste | or | + | Move camera forwards |

| R | or | – | Move camera backwards |

| Bild ↑ | Raise camera position |

| Bild ↓ | Lower camera position |

| Pos 1 | Centre camera on origin |

| F10 | Camera control via contacts on/off |

| 1 | On-board camera view from left |

| 2 | On-board camera view from right |

| 3 | On-board camera view top-left |

| 4 | On-board camera view top-right |

| 5 | On-board camera view forward |

| 6 | On-board camera view backwards |

| 7 | Switch to tracking camera |

| 8 | or | 0 | Switch to cabin view |

| 9 | User-defined camera |

| D | Automatic mode: Increase target speed forwards |

| A | Automatic mode: Increase target speed backwards |

| S | Automatic mode: Target speed 0 |

| H | Akustisches Signal |

| K | Kupplungshaken hinten |

| L | Kupplungszustand vorne |

| J | Zugbremse |

| F | Schaltzustand von Weichen |

| G | Schaltzustand von Signalen |

| Pause | Pause |

In editor mode, object properties in the test camera settings (3D window)

Key	Action
F	Reduce focal length
G	Increase focal length
J	Reduce aperture
K	Increase aperture

Control dialogue

Key	Action
←	Scroll left
→	Scroll right
↑ or Bild ↑	Scroll up
↓ oder Bild ↓	Scroll down
Alt + Buch-stabe	als Hotkey zur Anwahl von Rollmaterial definieren

Overview window

Key	Action
←	Scroll left
→	Scroll right
↓	Scroll up
↑	Scroll down
G	Insert most recently inserted cargo again
Num ⇩ −	Reduce scale
Num ⇩ +	Increase scale
O	Display the frame rate as a graph, hide graph
+	Increase scale of the graph
−	Decrease scale of the graph

Technical support

EEP has been subjected to many different, extensive tests on many different hardware configurations, so generally no problems should occur. However, it is not possible to test all configurations. Before calling our technical support team, please have the following details about your hardware ready:

- **Which operating system are you using?**
- **What kind of processor do you have and how much main memory (RAM) is your computer equipped with?**
- **Which version of DirectX is installed on your computer?**
- **What kind of graphics and sound cards are installed in your computer?**
- **What version drivers are you using for your graphics and sound cards?**

If you do not have the above information available, the DirectX 9.x diagnosis programme could be helpful. Click on Start – Run and enter the command line 'DXDIAG'. The diagnosis programme will provide exact details about your computer under the System menu option. If you write us an email, please include the DxDiag.txt file as a packed attachment. To obtain this file, open the DirectX diagnosis programme and click on the *Save All Information button.*

Please also check the following webpages for specific information that might help you to solve the issue yourself.

FAQ section:	*hilfe.eepshopping.de*	EEP-Shop:	*www.eep.eu*
		Product homepage:	*www.eep13.com*

If you cannot find a solution, please contact our support team.
By phone: EEP application support (Monday to Friday, 10 am to 6 pm):
Telephone +49 (0)900 1229999 (€ 0.99 per minute from a German landline)

Online community
Mein EEP-Forum (MEF): *www.eepforum.de*
Here you will find a specialist forum where questions are answered and many problems are solved. Here you can discuss with other EEP users and be part of the interesting EEP world. The latest news and information about the programme are published here first hand.

EEP on Facebook: www.facebook.com/EEP.Eisenbahnsimulation

Robert Hierl, Roland Ettig, Roland Podak, Rolf Lehmer, Rolf Westphalen, Roman Iwer, Rudolf Fey, Rudolf Tüllmann, Sascha Böhnke, Stefan Bock, Siegfried Lemke, Stefan Gothe, Stefan Hoppe, StefanKöhler-Sauerstein, Stefan Mewes, Steffen Mauder, Sven-Eike Bauer, Sven Funke, Sven Teichmann, Thomas Schlobinski, Thomas Voigt, Thomas Wiedemann, Thomas Wünschel, Ulrich Dellwig, Ulrich Nolle, Ulrich Thul, Ute Konzack, Uwe Brinkmann, Volker Lemm, Volkhard Ramsenthaler, Werner Sambil, Wilfried Friebe, Wilfried Rick, Wim Hoogers, Wolf-Haymo Bogg, Wolfgang Beck, Wolfgang Faber, Wolfgang Kestner, Wolfgang Schult, Wolfgang Strodtmann, Wolfgang Szelinski, Detlev Ruzanski, Hans-Peter Goedel, Friedel Märtens, Karl-Heinz Voermann, Werner Keil

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