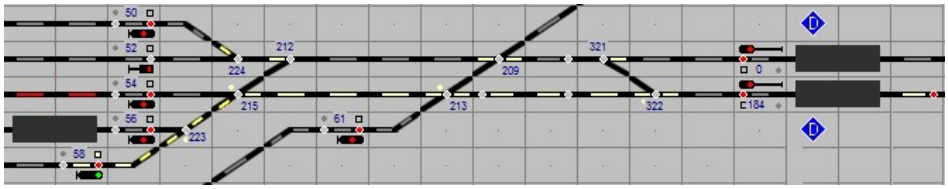
7th Routes

To secure train traffic, train and shunting routes are used on the railways. A route is a series of track sections (blocks), switches and signals that together form a safe route from start to finish. When all turnouts are in the correct position and all blocks are free, the route is determined and the start signal goes into "run". If the train reaches the destination of the route, the route can be closed again. Various criteria are available for this.



ModellStellwerk knows 2 types of routes: dynamic routes and projected routes.

A dynamic route can contain a maximum of 60 elements, blocks, switches, signals. The number of dynamic routes is unlimited.

Up to 512 routes can be configured in the model interlocking; each route can have a maximum of 32 turnouts, signals / buttons and blocks. Configured routes can be generated automatically for each signal and then edited.

7.1 Dynamic routes

In operation, i.e. in GO mode, ModellStellwerk can automatically generate a required route from the start signal / button to the next destination signal / button; these routes are not planned in advance. Using the track plan, the blocks, switches and signals that make up the route are searched for. The prerequisite for this is that the track plan is drawn correctly and the blocks are specified in the track plan. It is particularly important to ensure that the blocks have no gaps and that the signals and buttons are drawn in the correct direction. Only turnouts and signals that have a number are taken into account.

A dynamic route is generated internally like a configured route. Train and shunting routes differ; the latter are set up without edge protection and can also be set when blocks are occupied. With both the direction of travel is set for the automatic functions. A slip path cannot yet be generated automatically for the train routes; the permissible speed in the event of a distracting switch position is taken into account; for DB with Hp2, for SBB with FB2 - FB5 as specified in the switch window (40, 60 or 90 km / h).

If the destination block is defined as a station block, a dynamic route is released again if:

Start and finish signal in the blocks,

the locomotive or train number is entered in the train number field of the star

block, train tracking is switched on in the settings,

all blocks except the starting block are free and the train

has occupied the destination block.

If the destination block is a route or central block, the route is released when the start block is released.

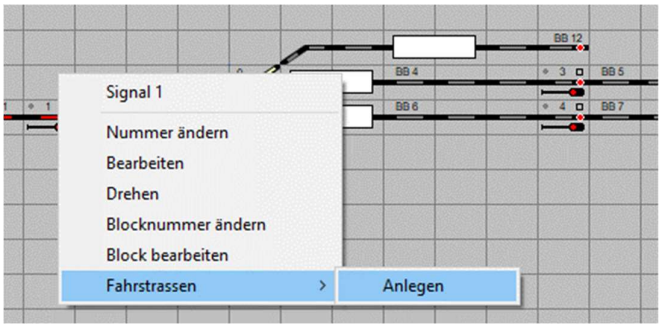
Dynamic routes work for manual routes (start - finish button press), also in automatic mode.

The generation of dynamic routes must be activated in the settings.

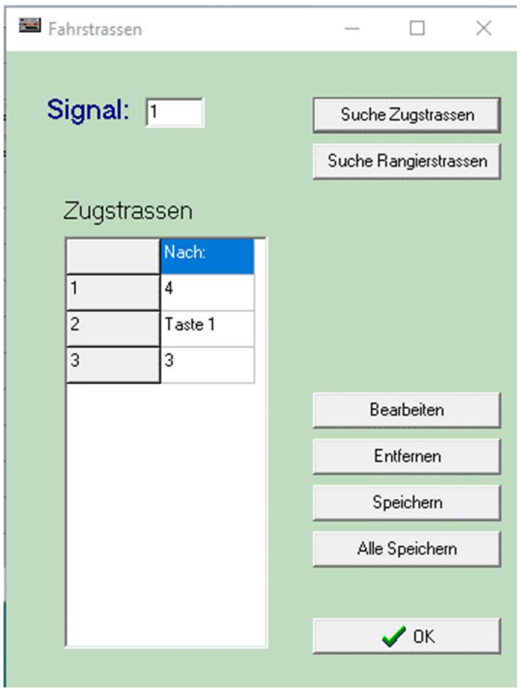
If a dynamic route does not meet your requirements, you can project a route. When setting, the appropriate route is first searched for in the list of configured routes; if there is no configured route, a dynamic route is generated.

7.2 Configure routes - create them automatically

In the edit mode you can automatically compile all the routes that start at this element from the context menu (click with the right mouse button) for the track display element (signal / button) at the beginning of a route.



If you click on "Create", the possible routes are automatically created in a window.



After clicking on the field, for example, 'Search Train routes' In this picture, three possible routes to signals 3 and 4 and the button in station block 12 are displayed.

You can now select individual objects under 'To' and edit, delete or save them.

Edit: the route window is opened for further editing.

The prerequisite for the correct functioning of the automatic function is that the track plan has been created, that the blocks are specified in the track plan and the switches, signals and buttons are set up, i.e. they have an internal number ..

For the route setup, all possible routes are run from the starting point in the direction of the symbol and the elements on the route, switches, blocks and blocking signals are entered in the correct position in the route window. Edge protection switches are also saved. A route ends at the following main or

Shunting signal or at the next train / shunting route button (red button  ,

blue_red / gray-red button  , gray button  , blue / gray button ).

A maximum of 64 items can be saved.

Danger: When saving, no attention is paid to duplicates; So it can be that there are several routes from one signal to another, with the same turnouts and blocks. You should absolutely avoid this, because changes are only saved in the route window that you are editing.

7.3 Edit routes

The definition of routes takes place in the route window. If the program is in 'Edit' mode, the route window

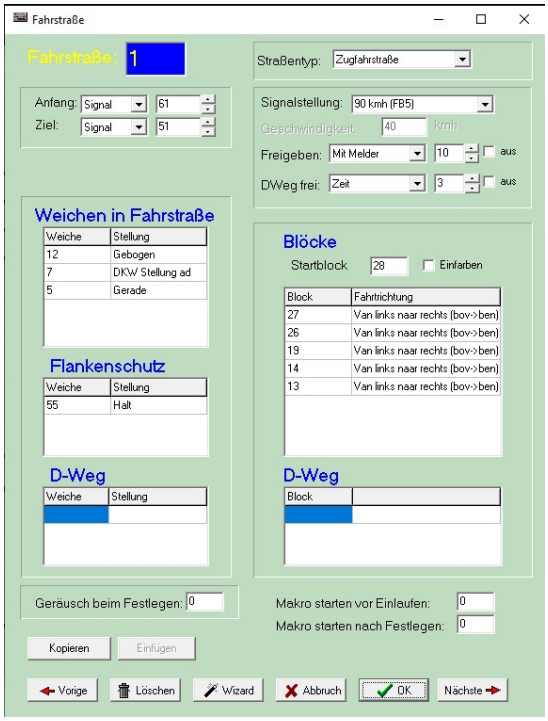
from the main menu - Edit - Routes,

using the button  and by clicking on the start and finish signals or the destination key.

If no route has yet been defined between the start and the destination, a query is displayed as to whether this route should be created. Otherwise the route window will be displayed with the current data.

The route data can now be entered or edited manually. Once the start, destination, route type, occasionally speed, released and start block have been entered and checked, you can use theRoute assistants the other data are "clicked together" in the track diagram.

	The route assistant is started with this button.



The window in which the data is entered consists of two parts. In the upper part the general data such as start and finish signal or destination button, type of route etc. are entered. In the lower part, the turnouts of the route are configured on the left and the blocks on the right. A route exists if the start and destination are entered.

The data of a route can be copied with <strg> <c> and <strg> <v>.

7.3.1 Road type

The type of route is selected in the input field:

Train routes have extensive measures to secure train traffic. A basic requirement for the setting of a train route is that all track sections including the switches are free. As part of the setting, in addition to protecting the route, all flank protection switches are set in the repellent position and an optional protective space behind the target signal, the so-called slip path, is set. When the train route is defined, the start signal goes into the driving position and shows the signal aspect Hp1 or Hp2 or the driving aspect FB1 - FB6.

Shunting routes were introduced with the development of the track plan interlockings and thus replaced free shunting using individually adjustable points. In contrast to train routes, shunting routes have reduced security measures, ie a shunting route can also be set in occupied tracks, in order, for example, to be able to lead cars to another train. Since shunting trips are carried out at a maximum of 30 km / h, there is no need for side protection depending on the interlocking and slip paths. The driver is signaled that he is allowed to maneuver with the signal aspect Sh1 (DB) or the driving terms drive with caution or drive (SBB).

7.3.2 Start and finish

In the fields begin and aim it is determined whether the start or the finish is a signal or a key and the number of the signal or the key is also entered. If the start and destination buttons are pressed one after the other within 5 seconds, the route is set and determined and the signal will show the driving concept after the setting has been made. Signals or buttons can also be used for several different routes.

7.3.3 Signal position and speed

A route is secured and released by a signal. This signal is at the starting point of the route. Once the route has been defined, this signal is set to "Run" as entered under "Signal position", at the latest when the route is closed, this signal is set to "Stop" again.

If the permissible speed is to deviate from the one specified by the 'Signal position', a different value can be entered under 'Speed', except for Hp1 and FB1. When train tracking is activated, the train will travel along the route at the set speed. The trains will adopt this speed according to the configured speed step profile.

7.3.4 Share

In this field you enter the criterion with which the route is broken up. There are four options:

with one detector,

when all blocks in the route are free again (block sections should be broken up),

when a certain block has been reached (this is the case when the train has reached the stopping section, for example when entering a station), or

after a certain amount of time.

In the first and third case, the number of the signaling contact or block is specified, in the first case it can also be specified whether the route is released when the contact is switched on or off. In the latter case, the time must be specified in seconds, after which the route is canceled.

If the route is dissolved, the blocks appear again in their normal color (basic position) and the signal is now set to "Stop" at the latest. In the block window of the start block, you can specify that the start signal is set to stop after the block has been cleared. To secure train traffic, a route may only be closed when all switches have been left by the train.

Technically, the clearing of a turnout on model railways is not an easy issue to solve. There are two possible solutions:

The contact for the dissolution of the route must be far enough away from the points so that there are no more vehicles on the point.

The turnout is integrated into the vacancy report, ie the turnout is reported as occupied with a certain vacancy reporting section. With this solution, a route can be closed when the target section is occupied.

7.3.5 Switches in the route

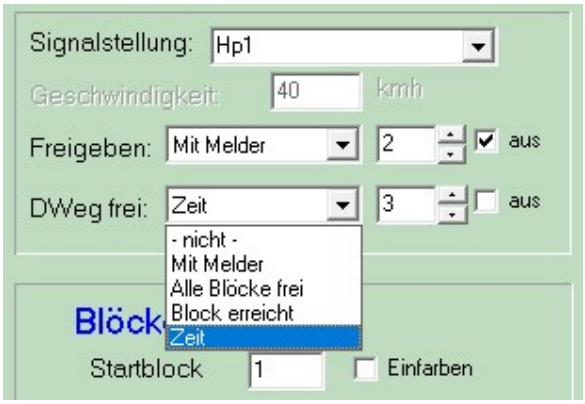
A route is made up of switches, signals, level crossings and blocks with and without detectors. The turnouts and signals can be entered here with their necessary position. The turnouts and signals selected for the route must already be defined, seePoints and signals. in The Field position the turnout required for the route is defined. Each turnout of the route (route turnout) is locked, ie can no longer be changed and can no longer be used by other routes, so that another route, which also has this turnout, cannot be set. With Domino / ILTIS, routes called up in this way are saved. A saved route can be deleted.

Danger: Start and finish signals will be Not added to the list.

7.3.6 Flank protection

All projected edge protection turnouts are set in the specified position, but can be added to other routes if the turnout is used in the locked position. A flank protection switch for route 1 can be a route switch for route 2. With SBB interlockings, dwarf signals can also be configured as edge protection.

7.3.7 D-way



The slip-through path (D-path) is an additional safety section behind the destination signal of the route in the event that a train does not stop at the signal in time. D-paths are generally built into entry routes. A D-way has switches and blocks. The blocks are illuminated. If a D-way block is occupied, the D-way does not enter.

If a route with D-way is set, the train can enter at normal speed, if no D-way is set, the entry takes place at reduced speed (the entry signal then shows the term Hp2 - SpDr60 / ESTW). If no D-path is configured, the train will enter at normal speed.

If the D-path has also entered, the D-path indicator lights up on the target signal (SpDr60 / ESTW).

SpDrS / ESTW: The D-way is not canceled if the route is canceled. It must be canceled manually by successively pressing the DRGT (slip reset group button), the FHT (route auxiliary button) and the signal button for the destination signal of the route. A time-dependent, automatic resolution can be set for converted track plan interlockings - this is common with ESTW interlockings.

Domino / ILTIS: The D-way is resolved with the route.

The D-way can become part of a following route, and is thus dissolved with this street, or it can be dissolved separately

In Configuration - processing It can be set that the D-paths are automatically resolved when the route is resolved

7.3.8 Pick up blocks in routes

Routes consist not only of switches and signals, but also of blocks. These blocks are used to illuminate the route in the track diagram. If these blocks are equipped with a track vacancy detection, the occupied blocks are illuminated in red.

Blocks are entered in the right column. One block is entered per line. The specified blocks are illuminated when they are specified. For the illumination of a set route, the blocks do not have to be equipped with a track vacancy detection. However, no assignment can then be displayed!

In the case of train routes, a check is carried out before determining whether all the blocks requested for the route are free. If this is not the case, a warning message is issued (SpDr60 / ESTW); for this, however, the blocks must be equipped with track vacancy detection.

Attention: if the expert mode is switched off, the route starts running after the warning message has been confirmed. In expert mode, the signal does not go into motion even after the warning message has been confirmed. With Domino / ILTIS the called route is saved; it can be deleted.

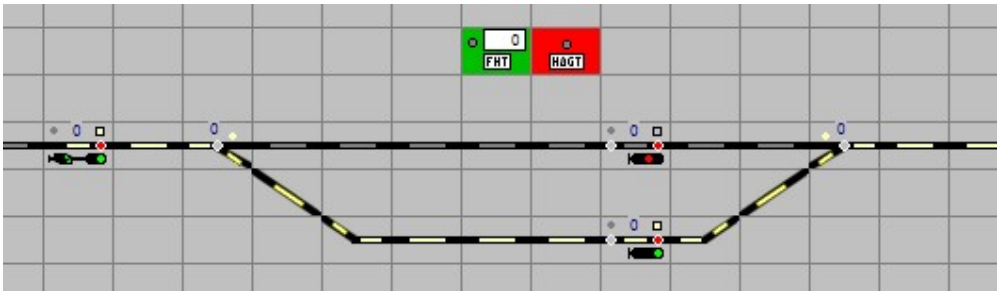
In contrast to train routes, shunting runs can also lead to occupied tracks in a prototypical manner.

The direction should be specified in the direction of travel column: this supports the automatic train control.

The block at the beginning of the route (section before the start signal) is automatically allocated based on the signal number. This block never has occupancy control, but you can specify whether this block should be illuminated when it is specified.

7.3.9 Distant signal

A route can link the distant signal at the start main signal with a destination main signal at the end of the route. If the route is set, the distant signal shows the position of the following main signal. To do this, when configuring the distant signal in the "Edit turnouts and signals " in The Field "Stands by " enter the number of the main signal at the beginning of the route (start signal). The rest is automatic.



See also example [Bsp001 - Vorsignal-FS.pcw]

7.4 Noise and macro

When setting a route, a sound file can be played. The number of the sound file is entered here.

Macros can be started before setting and after defining. The number of the macros is entered here, 0 if no macro is to be started. Two macros can be started, one after the specifications have been checked and before the turnouts run in, and one after the start signal is set to run.

7.5 Route assistant (wizard)

The route assistant is started with the button. Once the start, destination, route type, speed, released and starting block have been entered and checked, the wizard can be used to define the route step by step in the track diagram with the mouse. The individual definition steps are indicated in the window, after completion the next step can be selected with the "arrow buttons" (previous / next).

One after the other is indicated by mouse clicks in the track diagram:

1. the signal with which the route is secured,
2. the route turnouts and signals with the required position for the route. When setting, the turnouts are always switched first, and only then the Signals - usually from the finish to the start.
3. the flank protection switches and signals in the required position,
4. the switches in the slip path in the required position,
5. the blocks of the route,
6. as well as the blocks in the D-way

The wizard is closed by pressing the OK button.

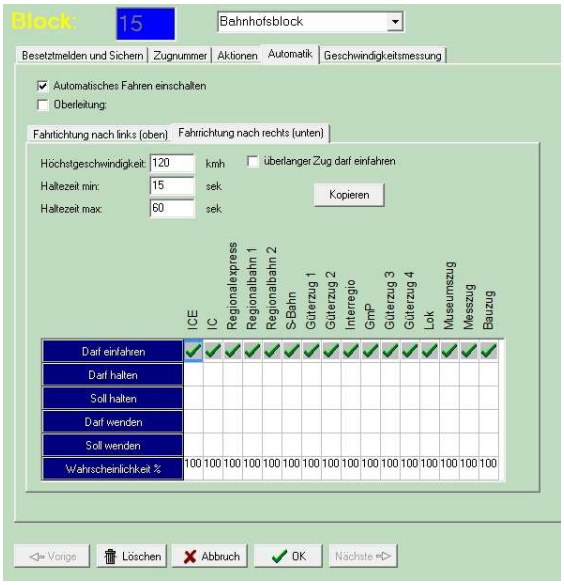
In the route window, the entries can be checked and changed if necessary.

The definition is saved with OK.

A note: In expert mode, a route can only be set if the block is occupied before the start signal or a train or shunting route is set for this start signal.

8th Automatic mode

8.1 Fully automatic operation



For each block, the block properties for automatic operation can be expanded in the Automatic subwindow. All properties must be entered for each direction of travel. In automatic mode, they are used to determine whether a train is allowed to enter a block and which actions must or may be carried out in the block. For each block it is indicated whether the automatic mode is switched on. If the automatic mode is switched off, an automatically moving train will not continue here and control must be taken over by hand.

The fully automatic operation works with Trains, these must be created separately. See the manual part 2, chapter 14.

Switch on automatic driving

For each block it can be specified whether the automatic mode is switched on or off. If the automatic mode is switched off, an automatically driving locomotive will not continue to drive here and the train must be controlled manually.

Overhead line

Electric trains (according to the definition for locomotives) will only enter the block automatically if the block is equipped with overhead lines, ie the box is checked.

All other information applies per direction of travel.

Top speed

Maximum speed in km / h that is specified for this block.

Hold time

If a train is allowed to stop or has to stop in a block, any waiting time within this framework is calculated by the program based on the minimum and maximum possible time.

The following information applies per direction of travel and per train type; each column applies to a specific train type (trains are assigned a train type). The train types are:

ICE,
IC,
RegionalExpress,
RegionalBahn1,
RegionalBahn2,
Train,
Freight train 1
Freight train2.
Interregio
GmP
Freight train 3
Freight train 4
Locomotive
Museum train
Measuring train
Construction train

The names of the train types can only be adjusted in the settings!

May drive in

Here it is checked whether trains of a certain train type are allowed to enter this block. If this parameter is not set,all further settings have no effect!

May stop

Here it is checked whether trains of a certain train type are allowed to stop in this block. The train will wait the time specified under stopping time before continuing. The probability that the train will stop is 50%.

Must stop

Here you can check whether trains of a certain type of train have to stop in this block. If the parameters May stop and must stop are set at the same time, the trains in the block will stop.

May turn

Here it is checked whether trains of a certain train type are allowed to change the direction of travel in this block. However, trains will only turn if this option is entered in the properties of the train. The probability of trains turning is specified in Settings - Processing.

Must turn

Here it is checked whether trains of a certain type of train turn in this block, ie have to change the direction of travel. Trains will only turn around if the possibility is entered in the properties of the train (manual part 2, assembling trains - 14.1).

probability

The probability that the train will enter this block is specified here. With this information it is possible to specify in a station ('distribution') which track the train will enter. If, for example, 75% is specified for the IC on the main track and 25% on the side track, then the IC will drive 3 times as often to the main track as to the side track. If the distribution is 99% against 1%, then the train will (almost) always enter the main track, only if this track is occupied it will enter the siding.

8.2 Automatic shadow stations

In many model railway systems, shadow stations are set up to park trains. ModellStellwerk supports the operation of shadow stations with corresponding automatic functions.

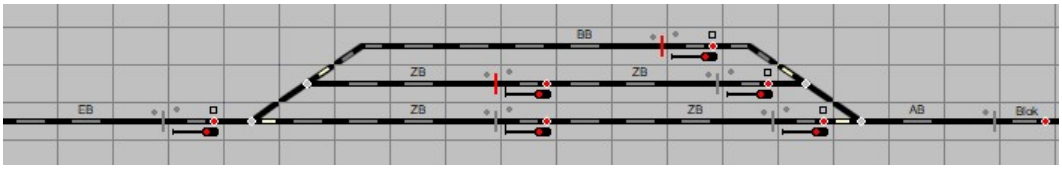
But if you drive in fully automatic mode, think about whether you really need a shadow station control, the fully automatic can also take over the functions.

The definition of shadow stations is done from the main menu with Automatic - Shadow stations.

Up to 8 shadow stations can be configured in the model control room. A shadow station consists of an entry block and 2 to 50 station tracks, each with an exit signal. Several blocks can be configured one after the other in a shadow station track; the signals do not have to be physically present. The entry block, the exit block and all blocks must be equipped with a track occupancy message; the length of the blocks must be entered in the block window.

Routes must be set up for the direction of travel and control. These routes, from the entry block to every 1st station block and from each last station block to the exit block / free route, can be configured in advance, but dynamic routes can also be used for this.

In the case of the station tracks, the entry and exit blocks are indicated separately. This makes it possible to define several central or route blocks in one track and thus to set up several trains one behind the other on one track. The advance of the trains is then controlled in block mode (see 6.4.4.1).



EB - entry block, BB - station block, ZB - central block, AB - exit block

Three routes each have to be set up for entry and exit, or dynamic routes must be switched on.

 Track free,  Track occupied.

If trains of different lengths are used on the layout, the capacity of the shadow station can be optimized by projecting short blocks. It must be ensured that the occupied blocks are occupied.

A train entering the entry block is automatically directed to a vacant station track. If no block is free, the train waits in front of the entry signal until a track becomes free. The train also stops in front of the (red!) Entry signal if the route cannot be determined because, for example, a switch is still closed or a track is occupied. The train will try to set the route one block before the entry block so as not to first brake before the entry signal.

When a "train" enters the station from automatic mode, it will only enter one of the tracks that is long enough for the train. If there is no suitable track, the train will behave as described in 8.2.2.6. If the station has tracks that consist of one block and tracks with several blocks, an attempt is first made to direct the train onto a track with one block. If such tracks are not free, the train will, if possible, enter a track with several blocks, but only if the whole track is free.

When the train arrives at the block and has stopped, another train can leave. The automatic hidden yard can be configured in such a way that trains exit automatically in a fixed or random order or whether the operator lets the trains exit the hidden yard manually.

If the arrival block is occupied and the route is cleared, another train can enter the shadow yard.

If the shadow station is fully occupied, a train standing in front of the entrance signal can only enter when a train has left the station and its exit route has been released.

A train will leave the shadow yard as soon as the entry block is occupied and a (adjustable) time has expired. However, it can be desirable not to let a train depart until the arriving train has stopped. This behavior is to be configured by configuring in all routes for the entry with D-path and enabling this route with 'Block reached'. When the arriving train has stopped, the route is released and the D-way is disbanded. Only then can the route be set for the exit.

If necessary, it is always possible to manually set an exit from the shadow station.

Tip: The automatic shadow station can also be used for normal train stations!

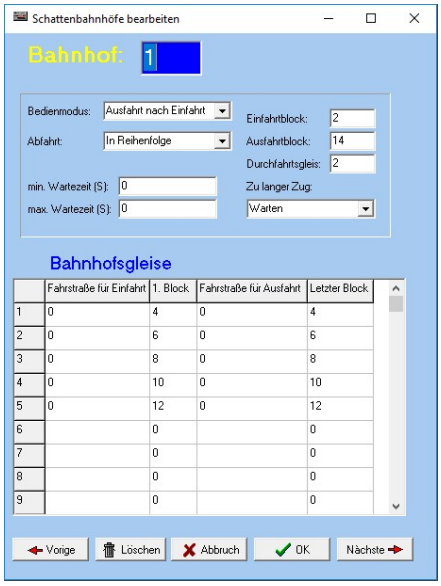
8.2.1 Symbols in the switchboard

The automatic hidden yard can be influenced in different ways by configuring blocking symbols (track blocks) in the approach track and in the station tracks. If the entry track is blocked by clicking the symbol, no more trains can enter the shadow yard. If the first block is blocked on a station track, no train can enter this track, if the last block on the station track is blocked, no train will leave this track. The automatic hidden yard can be switched off in the settings.

In expert mode, the lock is operated together with the route lock button StSpT. A track can only be blocked if it is not occupied and is not part of a set route.

Station button. Shows the menu for operating the shadow station. The number of the shadow station is entered in the list of this outside button.

8.2.2 Enter data



8.2.2.1 Operating mode

How the trains control each other can be selected in the list field:

Exit after entrance	Train only leaves when a train has entered
Entrance after exit	Train departs when a train enters the entry block. Train
Timed	departs after a certain time interval.

8.2.2.2 Departure

In the list field you can select how the trains leave the shadow station:

In order	Trains depart from platform 1, then platform 2, then platform
Any	3, etc. After entering, any train will depart.
Manually	Trains do not leave automatically, the exit must be set manually.
Passage	An arriving train will continue without stopping and will not allow any other trains to depart.

In all cases, the search for trains is only carried out on occupied tracks.

The departure can also be changed in the GO mode in the shadow station menu.

8.2.2.3 waiting period

In these fields (min and max) you have to enter the time that you have to wait after a train arrives before the next train leaves. The time is given in seconds.

8.2.2.4 Entry block

The number of the block that serves as the entrance to the staging area must be entered in this field. This block must be equipped with a track occupancy message.

When the block in front of (!) The entry block is occupied, an attempt is made to activate the shadow station control and direct the train to a free track. If this does not work, however, it will be tried again when the entry block is occupied.

8.2.2.5 Exit block

The number of the block in which the trains are to be entered must be entered in this field from the staging yard onto the line move out. This (line) block must also be equipped with track vacancy detection. The next train can only leave the shadow yard when the exit block is reported free again and the route has been closed.

8.2.2.6 Too long train

Here it is specified how a train from fully automatic mode must behave if there is no track with sufficient length.

8.2.2.7 Station tracks

1st block, last block

In these columns, the first and last associated block must be entered for each station track. These blocks must also have a track occupancy message. A track can be divided into several blocks. If this is the case, different blocks are entered for the 1st and the 'last'; if this is not the case, both blocks are the same. If a track is divided into several blocks, then these are defined as a 'track block' and the signals then automatically save the different sections; Trains advance automatically.

If a train from automatic mode has to enter a track, a suitable track is searched for, if a track is divided into several blocks, their lengths are combined.

Driveway for the entrance

In this column, the route from the entry block to the 1st block is entered for each station track. If 0 is entered here, a dynamic route is used with the aim of: Signal at the end of the 1st block in this track.

Route for the exit

In this column, the route leading from the last block to the exit block is entered for each station track. The route for the exit must be configured in such a way that the exit signal is put to a halt when the station block is cleared ('Stop only after leaving' must be marked in the block window). If this is not done, a possibly arriving train will leave again immediately!

A selected train will only leave the shadow yard when the route can be determined. This is only possible when all turnouts in the route are no longer occupied or locked (attention: D-way!) And the exit block is free.

If '0' is entered as the route, a dynamic route is used.

8.3 Self-setting

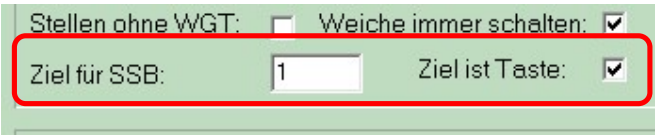
Ever larger parking areas in the prototype require the dispatcher (Fdl) / train traffic manager (ZVL) to be relieved of repetitive simple tasks. This can be, for example, the automatic setting of a route.

The self-setting operation (SSB), at the SBB "Automatic Signal Operation" (aSB), is a technical device that was implemented for the first time in the lane plan signal boxes and can set a planned train route on a signal. As a result, depending on the design, a partially or fully automatic sequence of the train operation is possible even without constant involvement of an operator.

With the self-setting mode, the train-controlled setting of a train route from a track on the free route into a specific station track or from a station track onto the free route can take place. As a rule, only the continuous main tracks of a station are included in the self-parking operation. When the self-setting mode is switched on, when the block section in front of the block is occupied with the entry signal, the trigger point, the entry route is set; If necessary, the exit train route for a passing train is then also set if the block is occupied before the entry signal. This technology is set up in the model signal box.

8.3.1 Setting up the signals for SSB / aSB

For each signal for which the SSB / aSB is to be set up, a target must be specified in the solenoid data. For each signal (prototypical) only one route for self-setting is possible!



'Target for SSB' is the internal number of the target signal or the target track key.

'Goal is button' is to be marked on a track button (e.g. main track or stump track).

If no destination is entered, it is not possible to switch the SSB / aSB on.

SpDr60

The self-setting mode function is served by the SBET (self-setting mode switch-on button) and SBRT (self-setting mode reset button). If the self-setting mode is switched on, this is indicated for each of the 3 possible signals with the number highlighted in yellow in the SBET (see also manual part 2).

For SSB are  Main and  To configure the main blocking signal, in addition

SBET - self-setting mode, switch-on buttons and

Set up SBRT - self-setting reset button (several times if necessary).

3 signals can be connected to the SBET field; Numbers are displayed in the field. With a right click on the field 'Edit' can be selected.

example 

Type: Self-setting mode switch button '

Signals: a maximum of three internal numbers of the signals and terminate with return.

Since only 3 signals can be switched on and displayed with each field, this must be set up several times if necessary.

Type: Self-setting mode switch-off button '

Signal: '*' for all signals

ESTW

For SSB are 

Main and 

To configure the main blocking signal, in addition

(optional) SBE - self-setting mode on (several times if necessary) to display whether the SSB is switched on or off for the relevant signal.

(optional) SBA - self-setting operation to be set up.

The commands are entered via the signal menu. If the SSB is switched on, the signal number is displayed in red, if the signal is moving it is displayed in green.

domino

With Domino, the self-setting mode, here called automatic signal mode (aSB), is displayed in the signal symbol itself. Switch on with the ASE button, switch off with the ASA button and the respective signal button. If the aSB is switched on and the route cannot be set, the request to operate the signal is shown in the trigger display field. The initiation or the display can be deleted with the "Delete initiation" button.

It is this 

Configure signal symbol;

ON / OFF of the aSB is displayed in the signal field. To

ASE - 'automatic self-setting mode on',

ASA - automatic self-setting mode off,

Operator request: field in which an initiation is displayed (multiple possible) and

Delete signal operation: Keypad 'Delete trigger'.

As with SpDr60, the trigger display field is connected to the signals; several fields can be set up.

Type: Operator request

Signals: internal signal numbers

3 signals can be connected to each display field, additional fields are possible

Type: Delete signal operation

Signals: '*' for all signals

ILTIS

For ILTIS this is  Project signal field (under track elements - signals and Keys). The 'automatic self-setting mode' is switched on and off via menu commands ABE / ABA.

If a route cannot be set or cannot yet be set

This with a green ring  around the signal symbol, with 'operate signal delete / SBL the trigger can be deleted.

8.4 permission

So that the dispatcher in station A can dispatch a train to station B,

the route must be clear. If there are several blocks between the stations, the route must be free at least up to the second block,

no train journey in the opposite direction may be set and he must

have permission.

Permission is the authorization to use the route between A and B for a train journey. Only one of the stations can have permission. If the dispatcher in station A does not have permission, he requests it from his colleague in station B; the latter must agree to the issuance of the permit.

The currently permitted direction of travel is displayed on the table or on the screen in each track that leads to the route in the corresponding permission field / block mirror.

In ModellStellwerk, the permission is implemented as the direction of travel. In the train stations, the direction of travel is automatically specified by the routes; on a route between train stations, the permit can be issued automatically or manually.

Automatically

The blocks between the two stations are to be set up as a "central block". When setting a route to the free route, the direction of travel and thus the permit are automatically set. The first block of the route must be specified as the last block of the route. If a route is now set, it is first checked whether the permission has been set correctly on the entire route - i.e. in all blocks - up to the next switch. If this is the case and the other conditions are met, the route is set. If the permission is set in the other direction, it is checked whether the whole route is free. If this is the case, the permit is changed and the route is set.

Manual delivery

If the block is set up as a 'route block', the permission is not automatically changed when a route is set. The route can only be set if the permission has already been set in the correct direction.

In expert mode, the permission is changed with the permission release button (EaGT, outside button) of the destination station and the EaT button in the track / permission field. This is only possible if the route / the block or the blocks between the stations are not occupied and no route has been set. (DB) The permission is always set in the direction of the EaGT external button

If the expert mode is not switched on, the permission can be set in both directions with a button in the permission field.

(SBB) If a route block has been set up at Domino, the permission is changed with 'request free lane' in conjunction with the route button. Here the permission from the station is set, the track button determines the direction of the permission, gray to the right, blue to the left.

In the case of ESTW and ILTIS, only the central block is usually set up and the permission is set automatically.

The automatic mode also follows the rules described here above, the permit is only automatically changed using routes if the blocks are of the "central block" type. If the blocks are set up as a "route block", it can happen that the permission is set incorrectly; then the train will not leave automatically.

9 Railroad Crossing

In the case of model signal boxes, level crossings are largely integrated into functions and processes in line with the model. Level crossings are created as magnetic items, but have extra properties that make it possible:

To open and close level crossings with routes,
Open and close level crossings with contacts, depending on the direction of travel, multi-track level crossings to be operated,
Level crossings can be operated with prototypical auxiliary buttons. Report whether the barrier is closed

Like switches or signals in station blocks, they can be planned with one or more tracks. In self-block sections, the level crossing must be controlled via switching contacts.

As in the model, there is a difference between German and Swiss signal boxes. With SpDr60 and ESTW, only the corresponding track symbol needs to be entered for the level crossing; there is the difference between main and siding.

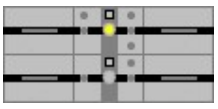
Danger: Even if the level crossing is counted as a solenoid, it must be assigned a block number within a block. The block check routine does not recognize the absence.

9.1 Railway crossing symbols

The symbols for single or multi-track level crossings can be found in the "Extra" tab.

Track symbols for SpDrS60 and ESTW:

		Railroad Crossing
		1st track, active The closing and opening of the level crossing is controlled by routes or commands.
		further tracks, active
		Level crossing - static representation without function

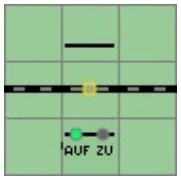


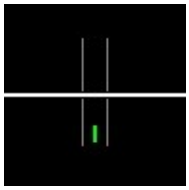
Track symbols for Domino'67 and Polecat

For Domino or ILTIS, a symbol below the track symbol is required for the display and above one as a termination.

		Railroad Crossing:
	nv	Upper degree without any further function

		Track element for 1st and further tracks, active
		Control and display element





External buttons SpDrS60

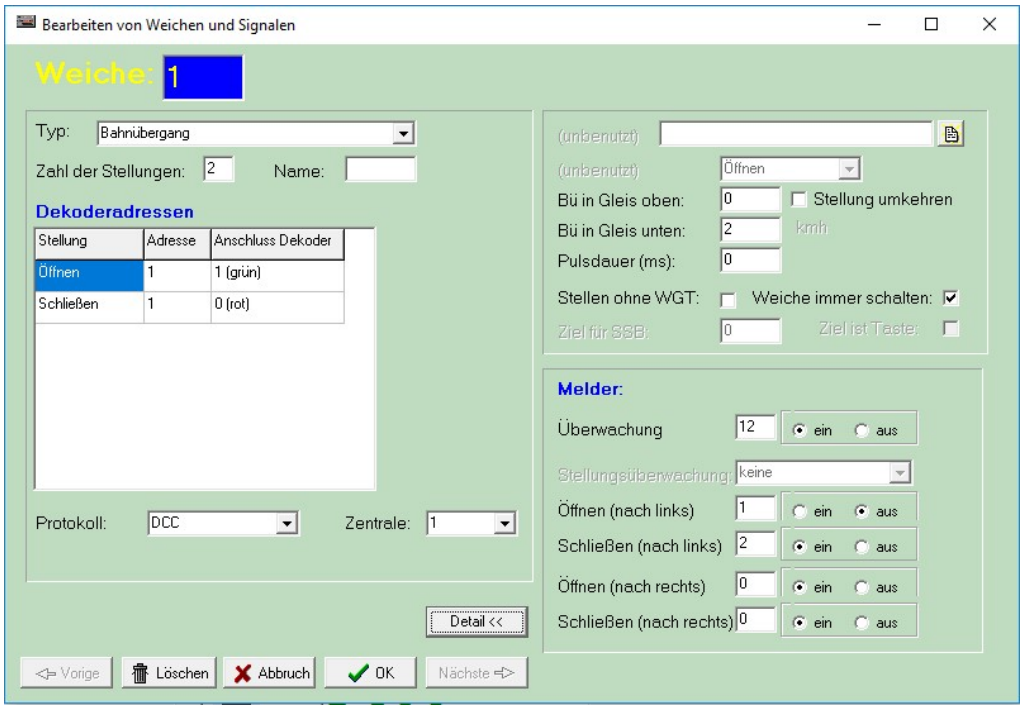
SpDr	ESTW menu	description
		Railroad Crossing
	UE	Level crossing switch button
	UF	Level crossing clearance notification button - without function The free notification takes place automatically.
	UHA	Auxiliary resolution (opening) of level crossings Switch off transition as an aid
	UDE / UDA	Permanent switch-on button, permanent switch-off button for level crossings.

In SpDr 60 it is switched on with the ET button, switched off by the train (automatically) or with the HAT button. The level crossing is operated manually in SpDr 60 / ESTW with the permanent switch-on button DET / the command UDE; it remains closed until the permanent switch-on / delete key DELT / the command UDA opens it.

External buttons Domino'67

D`67	ILTIS menu	description
		Barriers
	BZU	Shut down
	BVAU	Open, unlock only allowed if the barrier was closed manually
	BNOF	Emergency opening of the barrier, e.g. after deleting a route or Stopping the cover signals

9.2 Control



Each symbol is assigned its own number. The coupling of the modules is set up via the entries 'Level crossing in track top / bottom'. The address for the solenoid is entered in a symbol - track or display symbol.

The external buttons for manual operation are set up in the group buttons on the SpDr 60 and near the level crossing on the Domino; the buttons can be assigned to this under 'edit'.

In order to adapt the closing and opening of the barrier to the local conditions, the ‚Duration ' can be set. After the 'positioning time' has elapsed, a route is closed with a delay and the signal is set.

9.3 Activate the level crossing

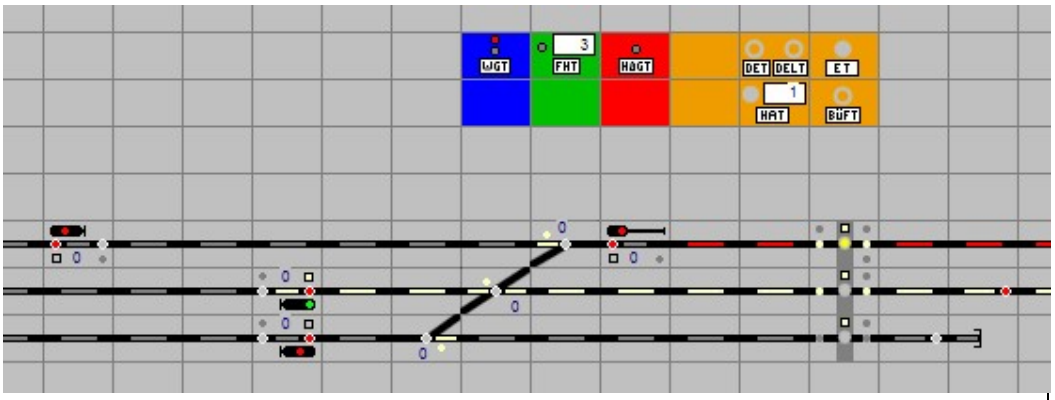
A level crossing can be activated depending on the direction of travel with a route or with signal contacts. If a level crossing is included in a route, it will close when the route is closed and open again when the route is closed.

Under "Detector", one detector for closing and one detector for opening can be specified for both directions of travel. Routes and detectors are linked with "or", if the level crossing is included in an active route, or if it is closed with detectors, it will be closed. In both cases, the direction of travel must be specified for the correct function. If the level crossing is switched on and off by the detectors, the block direction must be set to the right or left, if a route controls the level crossing, the direction must be entered in the block list.

Monitoring:
The signal covering the level crossing may only be set to travel after it has been closed. This can be monitored by a detector.
A feedback contact can be used to check that the barrier is closed. In this case, the BÜFM will only light up when the detector reports that the barriers are closed. Only then will the route be determined and the signal will start moving. The detector is entered in the Monitoring field; 0 means here that there is no monitoring.

Special feature: With Domino, the track button and display flash until the barrier is closed, when opening only the display. The detector must therefore also be entered in the display symbol.

9.4 Multi-track level crossing.



If a level crossing has more than one track, a separate level crossing is created as a solenoid for each track. This allows the level crossing to be closed and opened separately for each track with a route or with detectors. The level crossings are linked when defining the solenoid accessory. The solenoid article numbers of the other level crossings in the parallel tracks are specified in the input fields “BÜ in track above” and “BÜ in track below”.

If the position of the barriers is reported back with feedback, the feedback must be entered in all level crossings.

The level crossing will then remain closed until all level crossings are cleared again.

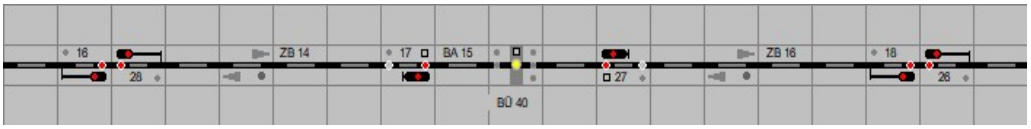
See also example [Bsp002 - Bahnübergang.pcw]

9.5 Level crossings in self / central block:

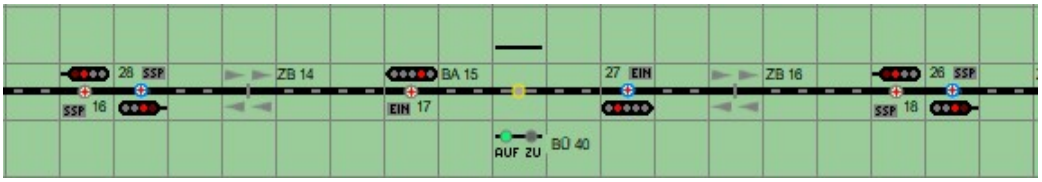
Level crossings must be secured for train movements; cover signals are used for this. The security is monitored by the technology, the dispatcher or the train driver. The BÜ monitoring signal (DB) or the control light for the level crossing system (SBB) signal to the train driver that it is working properly.

In the model signal box, a separate station block is planned for the section with the level crossing. The block / level crossing is protected by a main signal with SSB / aSB. Until the next signal, a route must be set up in which the block with the level crossing must not be entered. This prevents the section from being illuminated in white when the route is set. A block mirror is controlled in the station block if necessary.

The fact that a station block is inserted into the self-block section does not impair its functionality.



SpDr 60 route

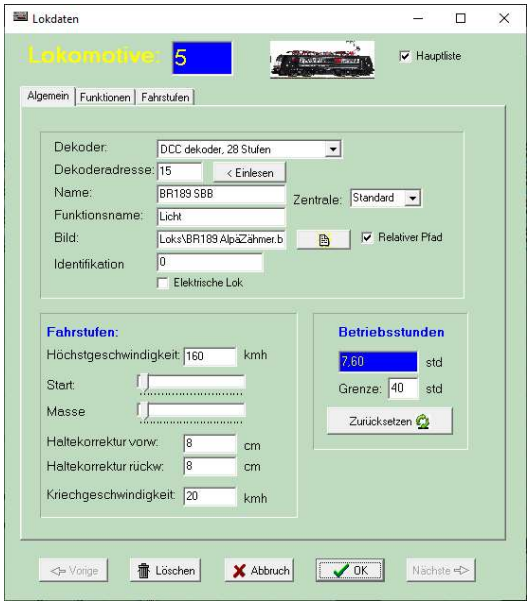


Domino route

10 Locomotives and functional models

Locomotives and functional models must first be configured before they can be controlled. The configuration takes place in the locomotive window with the main menu selection
Edit - Locomotives is opened.

10.1 Enter data



Up to 250 locomotives can be entered in the model switchboard, with each locomotive being given an internal number between 1 and 250. This number is independent of the decoder address.

Danger: The internal number (here 5) is also used when operating and editing the Timetables and used in the macro programs.

10.1.1 Decoder

First of all, the decoder built into the model is specified, whereby the other properties depend on the type of decoder.

The number of speed steps is automatically adapted to the decoder during operation.

The selection is determined by the number of speed steps with which the decoder is controlled and whether the decoder has additional functions. In addition to the type, the other properties of the decoder must be entered. The possibilities themselves depend on the type of decoder.

10.1.2 Decoder address

The decoder address of the locomotive is entered in this field. For Motorola (Märklin) the value is always between 1 and 80, for DCC the value can be between 1 and 9999, depending on the decoder. For Selectrix the address is between 1-111. With Selectrix central units, the locomotives are only controlled via Sx0.

With the button - Read in - the Mfx-ID is read in for the control of Mfx locomotives. Instead of a decoder address, Mfx uses an ID issued by the control center that is not selected by the user for the control. This ID must be entered as an address. Connect the software to the control center so that the locomotive control is tracked on the control center; the locomotive is selected on the control center, the button is pressed. If you now change the direction of the locomotive on the control center, the feedback to the model switchboard is used to read out the ID. The address is only accepted if the model switchboard is in edit mode.

10.1.3 Name

A name must be entered for each locomotive and each functional model. This name is displayed in the locomotive window during operation (the internal number is not displayed during operation, but is used for selection). The name has a maximum of 20 letters. The first 5 characters (for the small symbols) or the first 10 characters (for the large symbols and photos) are displayed in the train number fields in the switchboard. The number of characters also depends on the character set used and its font size.

If the system is controlled with the Ecos or CS1, the locomotive name is used for the synchronization between the control center and the model signal box. You can only control a locomotive if the name in the model switchboard matches the name in the Ecos locomotive database (CS1). In the (Central) menu you can synchronize the locomotive database of the Ecos and the model signal box.

10.1.4 Central

The central unit with which the locomotives are controlled must be specified here.

10.1.5 Function name

The name of the function that is to be displayed in the locomotive window is specified in this field. This name has a maximum of 10 letters. The name has no important meaning; however, it is easier to recognize the additional function from the name. Examples are: light, whistle, smoke, etc.

10.1.6 Electric locomotive

Here it is indicated whether it is an electrically operated locomotive. In automatic mode, an electric locomotive is only driven on electrified blocks; this can be set in the block.

10.1.7 Image

In this field you can enter the name of a graphic file with the image of the locomotive in JPG, GIF or BMP format that is to be displayed in the locomotive window. The bitmap must have a size of 40 x 110 pixels (height x width).

The button opens the dialog window for file selection. The file name can be chosen relative to the current path or absolute.

Annotation: Bitmap graphics (* .bmp) are not displayed correctly in the web interface, therefore preferably use GIF or JPG files.

10.1.8 Next address for functions 5 to 8

By ticking the box, the next address (following the number given under decoder address) is activated for functions F5 - F8. Use this for Mfx decoders with more than 4 functions or LokSound / LokPilot decoders on Motorola systems. The decoders must be set accordingly.

10.1.9 Velocities

Top speed

The maximum speed of the locomotive in km / h is entered in this field. It is used in automatic driving, a locomotive will never go faster than its maximum speed.

This maximum speed does not apply to the manual control of the trains directly with the digital center; the specified maximum speed is effective when the trains are controlled with the speed controllers of the model switchboard.

begin

The speed step at which the locomotive starts to drive is entered in this field. Lower speed steps are skipped when operating via the model interlocking.

In order to obtain a large control range, the minimum speed in the locomotive decoder should, if possible, be set so that the locomotive is already running at speed step 1.

Hold correction

If the calculated braking points for individual traction vehicles are not correct in practice, eg because of isolated axes, a correction factor of +/- x cm can be entered here. The correction factor depends on the direction of travel.

Crawl speed

The speed at which the locomotive approaches a signal indicating a stop.

Speed step profile

This button opens a separate window in which the speed levels of the locomotive decoders can be assigned the respective speed using a slide bar. For decoders with 14 speed steps a speed is given for each speed step, for decoders with 28 or 32 speed steps the speed is given for every second speed step. When driving, the speed step is selected that was first assigned a speed that is equal to or greater than the desired speed. One speed step can be set as the maximum speed by also setting the following speed steps to the maximum speed.

In order to obtain the largest possible control range for sensitive driving, the locomotive decoders should, if possible, be set so that the desired maximum speed is reached with the highest speed level.

The Detail button opens a window in which the speed can be specified for each speed step.

If “Automatic calibration” is activated, the measured speed is determined each time a speed measuring section is traveled and if it deviates from the value set here, it is corrected accordingly. The Calibrated column records the speed that was calibrated by the model signal box. The speeds not yet marked as calibrated are approximated by the calibrated measured values.

A locomotive is calibrated for a model signal box if at least one speed value has been calibrated.

10.1.10 Inertia

Model interlocking can assign locomotives a certain moment of inertia, which ensures that changes in speed are carried out slowly. The locomotives start up slowly and brake accordingly slowly. A value between 0 and 10 can be entered:

0 = no mass simulation, ie the vehicle reacts directly to the setting of the speed (may depend on the centrifugal masses built into the vehicle or the vehicle's internal acceleration and braking deceleration).

1 = Simulation of a small vehicle mass combined with a rapid change in speed

10 = Simulation of a large vehicle mass combined with a slow change in speed.

Current locomotive decoders offer the possibility of setting the inertia in the locomotive decoder directly. In order to achieve optimal results in connection with the model interlocking, the inertia (braking deceleration and acceleration deceleration) should be set in such a way that changes in speed are not abrupt, but rather smoothly, but without great deceleration. The typical locomotive delay is then set in the model signal box. The delay in the locomotive decoder must not be too large, because the model signal box cannot directly control the speed of the locomotive, especially when braking and stopping, which can lead to a locomotive running over a stopping point.

10.1.11 Operating hours

How long the locomotive has been running is shown under operating hours. When the specified limit is exceeded, the number is displayed in red. You can reset the counter with the button. The operating hours counter is also shown in the locomotive selection window (see operation).

10.1.12 Main list

With  The locomotive list can be opened in the operating line. To have quick access
To guarantee locomotives that are used more often, these can also be transferred to the 'main list'. The 'main list' field must be marked for this.

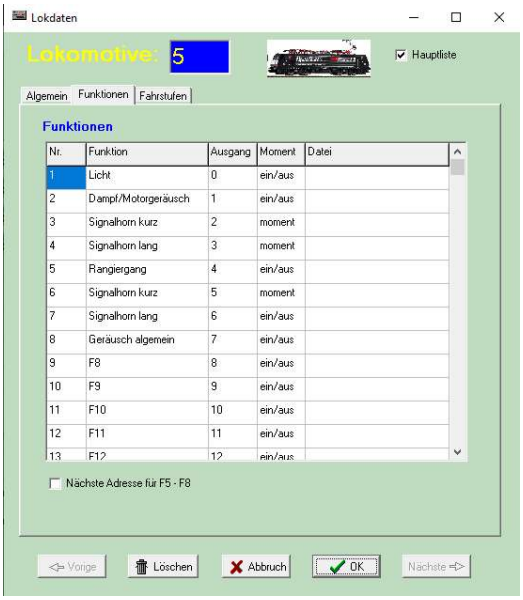
The speed steps / speed of all locomotives is set to 0 when changing to the GO.

Attention: If a command has to be sent to all defined locomotives when starting, the control of the locomotives can no longer be guaranteed with more than 32 locomotives. The reason for this is that some central units can only control a certain number of locomotives directly (e.g. IB-COM: 32).

Complement:

The background is the transmission protocol for the locomotive and accessory commands. It is therefore advisable to separate the bus systems for the locomotives or the accessories for larger systems. Model interlocking offers up to four outputs for this, which can also be operated with different protocols.

10.2 Functions



In the table (functions) the locomotive can be assigned up to 32 functions. Only the functions that are defined here are shown in the locomotive window for operation. The functionality is specified for each function and the output of the locomotive decoder with which this functionality is switched. The functionality is therefore independent of the decoder output between different locomotives. This makes it possible, for example in the actions of a block, to call up a function that is connected to different decoder outputs in different locomotives.

In the column moment it can be defined whether the function is a permanent contact (on / off, e.g. light) or momentary contact (e.g. whistle). If you enter a number here, the function will be switched off again after the time entered, in 0.1 second steps after it has been switched on.

A bitmap file containing the symbol to be shown can be entered in the "File" column. The bitmap has the dimensions 16x16 or 32x32 pixels.

10.3 Calibration of locomotives

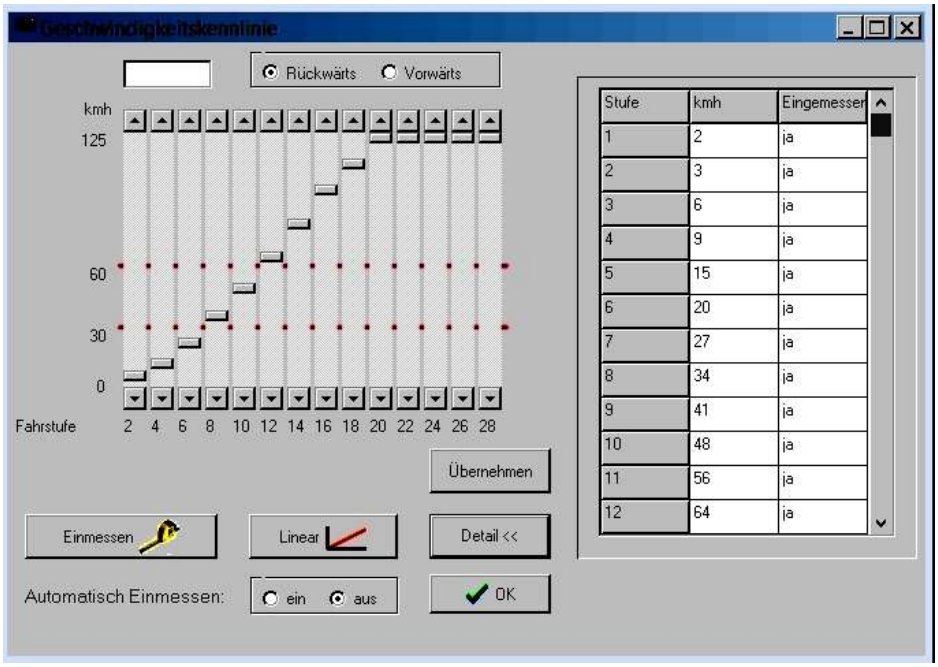
10.3.1 Calibration of a locomotive

So that ModellStellwerk can optimally control, accelerate, decelerate and stop the locomotives, the software has to know the speed at every speed step, and that for both directions because not all locomotives can move forward as fast as they can backward. Each locomotive has two tables that contain the relationships between speed step and speed for the directions of travel.

When upgrading from an older version, the data is only stored in a table; with 'Apply' they are copied into the second table. Existing data will be overwritten upon request.

You can access this table in the properties of the locomotive with the key


A window with the speed characteristic is opened. Here the speed can be changed for each speed step. The characteristic curve is dependent on the direction of travel.



You can also edit the characteristics in table form with the [Detail] key.

In the table in the "Calibrated" column you can specify with 'yes' whether a speed step has been calibrated.

Important:

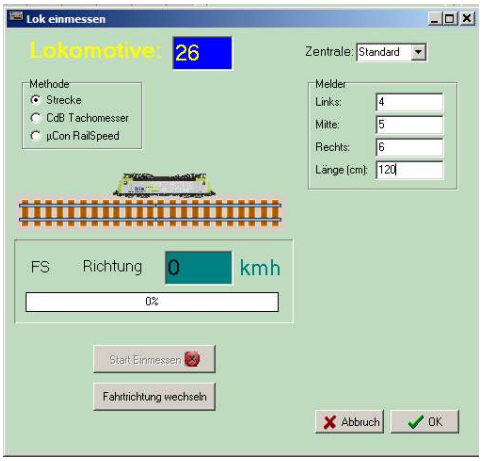
The locomotive is considered to have been calibrated if 'yes' is entered here in at least one line. Only a calibrated locomotive is gently braked in the blocks.

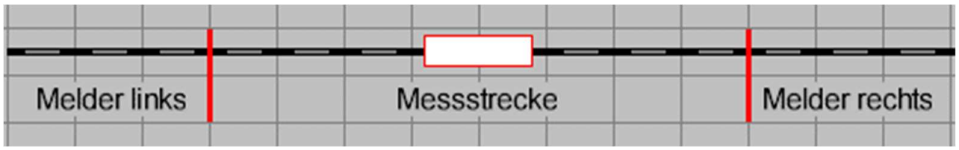
It turned out that a locomotive can brake with quite a precision when 3 speed steps, in the lower, middle and upper range, are measured. However, the prerequisite is that the locomotive decoder has a linear speed characteristic.

10.3.2 Calibrating with a measuring section

With the key 

the window for automatic calibration of the Open locomotive. The method selects how the locomotive is to be calibrated. When calibrating a route, the locomotive is then automatically moved back and forth on a specially prepared section of the route and calibrated. The calibration can only take place when the system is in GO mode. Editing of the locomotive data can take place after a double click on the locomotive window.



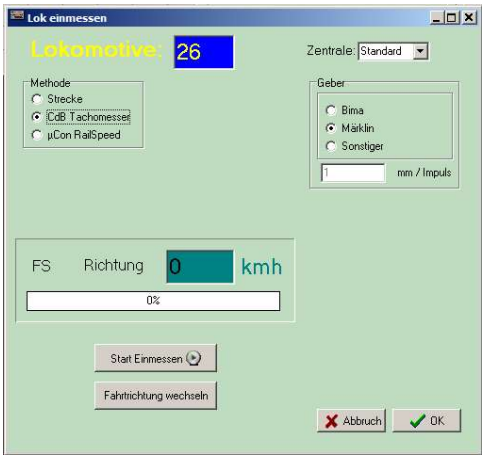


The measuring section has 3 sections / feedback contacts. The speed measurement is started with the locomotive on the measuring section; the measurement runs until one of the other contacts switches, depending on the direction of travel. The specified length is the distance between switching on and off. Make sure there is sufficient discharge on both sides of the measuring section.

To calibrate the locomotive is placed on the middle section of the route. The calibration is started and possibly interrupted with the [Start calibration] key. ModellStellwerk will drive the locomotive back and forth for all speed levels and save the determined speeds in the locomotive table.

If the locomotive is calibrated on the layout, then the train tracking must first be switched off because otherwise it can happen that the locomotive is stopped before a signal.

10.3.3 Calibration on the roller dynamometer

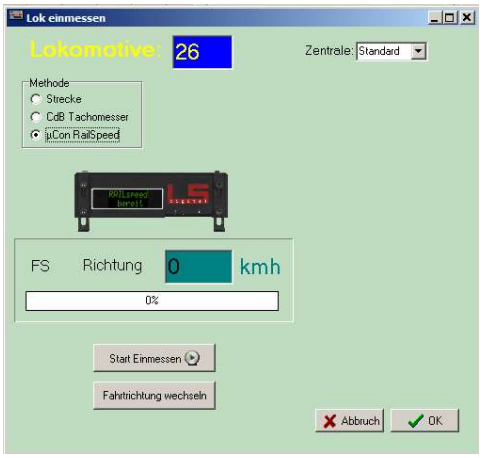


The selection "CdB speedometer" shows the input fields for calibration with the speedometer from CAN Digital Bahn.

For the central unit, select the central unit to which the speedometer is connected. On the right, select the encoder on the roller dynamometer.

10.3.4 Calibrating with RailSpeed

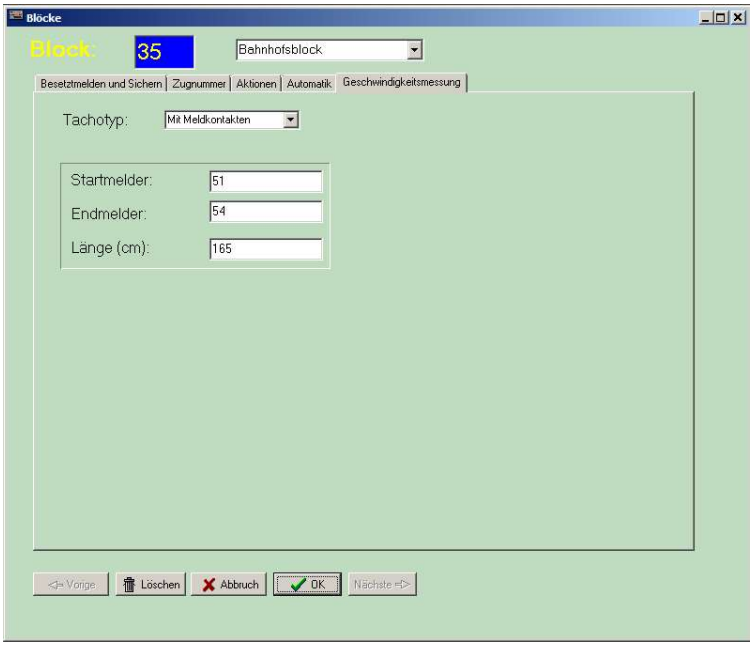
The selection "µCon RailSpeed" shows the input fields for calibration with the RailSpeed from LS Digital.



For calibration with the RailSpeed, a µCon Master must first be set up as the central unit (under Settings). This center is then selected in this window under “Central”. It is not necessary to enter the address of the Railspeed, the calibration can take place at any Railspeed on the layout.

The locomotive is positioned so that it first passes the RailSpeed forwards. After pressing the [Start calibration] button, the locomotive will pass the RailSpeed in both directions with all even speed steps (with 28 FS). The speeds for the uneven speed steps are automatically calculated (interpolated). Make sure there is enough space for the locomotive to exit on both sides of the Railspeed line.

10.3.5 Calibrating on the main track



A red rectangle, similar to the train number display, can be used in the track plan to display the speed.

Note: The speed is only shown if the block is occupied:

If the locomotive in the block is known during the measurement and the speed is not changed while driving, this measurement is automatically used to calibrate the locomotive. "Automatic calibration" (see 10.3.1) must then be switched on for the locomotive.

It is advisable to switch off this setting when the locomotives are correctly calibrated.

Speedometer type with signaling contacts

For a precise measurement process it is necessary that the detectors required for this and the length of the distance between the blocks are entered in the respective field. The number of speed measurement sections on the system is unlimited.

Tacho type with µCon RailSpeed

The address of the µCon RailSpeed is entered in the window.

Tip: In order to achieve precise measured values, the measuring distances should not be too short should be chosen and planned on straight stretches if possible. The speed, especially in tight corners, is often lower than on the straights

Route sections and can lead to an incorrect calculation of the braking distance, ie the train continues to travel than planned.

Tip: Before using a traction vehicle, it makes sense to use one with a model signal box controlled system that the driving characteristics are adjusted accordingly.

10.3.6 Setting the vehicle decoder

The vast majority of the currently commercially available vehicle decoders offer the option of setting the starting voltage as well as the maximum speed and the speed at half the "running voltage".

Step 1: Set the minimum speed and acceleration / braking delay in the locomotive decoder so that the vehicle runs smoothly and without jerking.

Step 2: Set the maximum speed for the vehicle - either the maximum speed that the locomotive can run on the layout or the converted maximum speed. The
Speed measurement in model interlocking can be used.

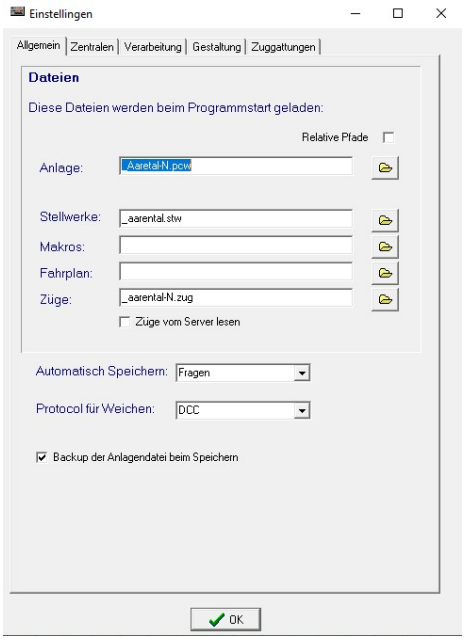
Step 3: Set the middle speed according to personal preference - either linear or for more sensitive maneuvering with a finer gradation in the lower speed range.

It is advisable to only set the mass simulation in the locomotive decoder to a low level. If the value is set too high, the model switchboard has less influence on the braking process and cannot stop the locomotive precisely.

11 Settings

With the button or with the menu Extra settings the window opens in which the configuration and properties of the model interlocking are specified. In the configuration window, the basic settings for connection, processing and design can be specified on 5 pages.

11.1 Generally



The files that are to be loaded automatically when the program starts are entered in this window.

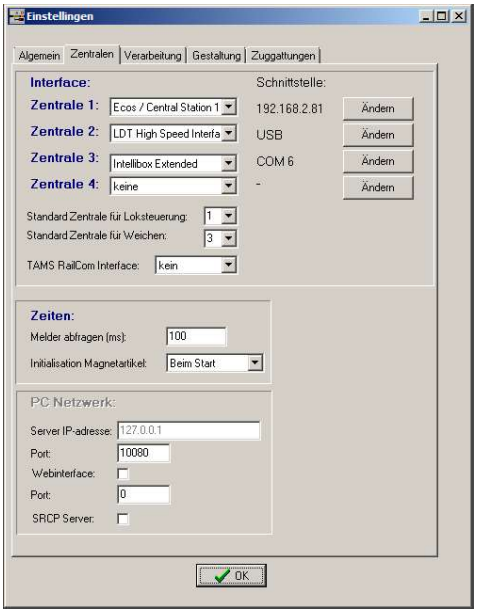
Save automatically

The selection indicates how and whether, when the model interlocking is closed or when another system is opened, the currently open system - with all files to be taken into account when saving - is automatically saved or not.

Backup of the system file when saving

If this option is checked, a copy of the system file is saved in the "Backup" subfolder each time before saving

11.2 Central



11.2.1 Headquarters 1 - 4

Model signal box can control up to 4 control centers at the same time. The connected digital systems are selected in the fields Central 1 to 4, whereby different central units can also be operated in parallel. This choice determines, among other things, the possibilities of all parts of the program. It also defines the options for the data transfer rate (baud rate). If the model railroad is to be operated via several PCs, then the entry PC network is selected for the PCs that are not directly connected to the digital center (s).

When you select a central unit, the window for setting the connection properties opens.

11.2.2 Standard center for locomotive control

The central unit that is used for locomotive control must be specified here if no central unit was selected for an individual locomotive.

11.2.3 Standard center for point control

The central unit that is used to control the turnouts must be specified here if no central unit has been selected for an individual turnout.

11.2.4 Tam's Railcom Interface

The computer interface to which the Railcom RC-Link from Tams is connected must be specified here.

If the RC-Link isn't in use, this is it no to choose.

11.2.5 Querying the detector

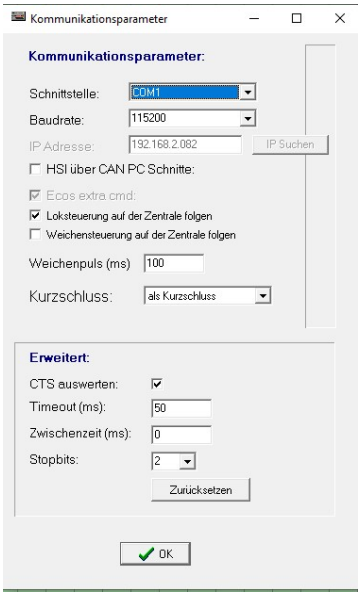
in The Field Query cycle indicates how often the feedback modules and the events at the control center have to be queried if the control center does not report them automatically. A recommended time is 200 ms (5 times a second).

11.2.6 Initialization of solenoid accessories

As part of the initialization, the model switchboard is synchronized with the connected system, ie all solenoid items receive a control command and are switched to the position that the model switchboard knows. Since the initialization takes some time during which the system cannot be operated, it is possible not to go through the initialization phase every time operation is started. It can be set whether the
Turnouts / solenoids are initialized each time the GO mode is started (setting always)
or whether the turnouts are only initialized when operation is started for the first time (setting at program start).

11.2.7 Change headquarters

To set the communication parameters from the model interlocking to the digital center, press the button. 



The interface used on the PC (COM1 - COM8, USB, ...) to which the control panel is connected must be specified here; only the existing interfaces are available for selection. If as an interface no is selected, no commands are sent from the PC to the digital center. In this way, the model signal box can also be tested or configured on a second PC without a model railroad connection.

If a Tams central unit is to be addressed via the USB interface, the drivers for Tams supplied with the central unit must be installed. This means that the control center can then simply be addressed via a serial interface. However, the set baud rate is not used. The interface via which the connection to the Tams headquarters is established can be determined in the "Device Manager" in Windows.

11.2.7.1 Baud rate

The interface speed must be specified here. The options depend on the system chosen. Please note that the selected speeds in the model interlocking and the digital center are set identically. Since the baud rate for the CC cuts is fixed by CdB-digital-Bahn, it is not queried.

11.2.7.2 IP address

Enter the IP address of your Ecos or CS1 control center here. This entry must match the address in the Ecos.

11.2.7.3 Ecos Extra Cmd

If this checkmark is set, the turnouts are controlled via their Ecos-ID. It is then possible to control more than 4 positions and the model switchboard receives feedback on the switch positions from the digital center.

11.2.7.4 HSI over CAN PC cuts

When using the CAN PC cuts from CdB CAN-digital-Bahn, this option must be set to read out the S88 feedback. It is then possible to read out up to 32767 feedback modules. However, the model interlocking can only process the first 130 detectors with 16 contacts each (i.e. 2080 contacts). The maximum is 260 decoders with 8 contacts each = 2080, distributed over (max.) 2 central units.

11.2.7.5 Follow the locomotive control on the control center

This option can be selected if changes to the rotary control of the digital center are to be passed on to the model interlocking. This is a prerequisite if trains are controlled directly by the controllers of the digital center, but the model switchboard is still supposed to influence the trains in a signal-dependent manner.

ATTENTION: With the Roco Z21 only the first 16 locomotives can be followed on the central unit.

11.2.7.6 Follow the point control on the control center

In the same way as the locomotive control, this option can be selected if, for example, points are set with the digital center and this should be passed on to the model signal box. The illumination in the track diagram is then also changed.

11.2.7.7 Query the detector

Only for Lenz headquarters:

Select the time at which the feedback is queried when switching to GO mode:

do not query	(Detectors report spontaneously),
before GO	(comparison with the score),
according to GO	(voltage on the track).

11.2.7.8 CTS

The specification of the communication parameters can be changed here. If the CTS is not observed, the commands are sent with pauses. The mean time is the pause between two commands for the interface.

11.2.7.9 Timeout (ms)

Allowed time between 2 characters.

11.2.7.10 Switch pulse

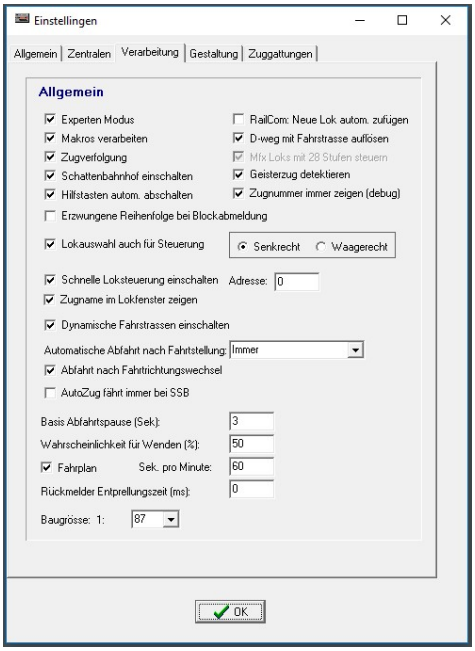
Enter the time in milliseconds with which the coils of the turnout drives are to be controlled. However, this time is only effective if the turnout decoder does not generate its own pulse time (see alsoPoints and signals). A time must be entered here with which the turnouts switch reliably; 200 ms is usually sufficient for new turnouts. If turnouts do not switch reliably, this value can be increased accordingly.

11.2.7.11 Short circuit

Here it is specified how a short-circuit message from the control center must be processed.

Danger: not all control panels can report a short circuit as a short circuit, they report it then STOP

11.3 processing



11.3.1 Expert mode

If this option is selected, the way of working of Modellstellwerk corresponds more closely to the original. This is discussed in more detail in the second part of the manual.

11.3.2 Process macros

When macro programs have been created and loaded, the function of the macros activated or deactivated. This can be done in the operating line with the button shown

Done button. The status bar shows whether macros are being executed or not.

11.3.3 Train tracking

Train tracking can also be switched on and off here. If train tracking is activated, it is checked when operation is started whether all blocks are correct,
ie were defined with only 2 end points.

So if train tracking should not be used (yet) and the blocks have not (yet) been drawn and set up correctly, train tracking can be switched off here.

11.3.4 Switch on the shadow station

The function of shadow stations can be used with Process stations can be switched on / off.

11.3.5 Automatically switch off auxiliary keys

The auxiliary keys do not remain pressed, but must be pressed again before each operation.

11.3.6 Forced order when logging off from the block

This option helps with dirty tracks: A block can only be reported as free if the stopping section has been driven on in the direction of travel. If another track vacancy reporting section in the block is reported more quickly, the block remains occupied and the internal processing of the trains (such as automatic stopping etc.) continues as if the false vacancy report had not been made. The entire block remains occupied and is therefore still illuminated in red

11.3.7 Locomotive selection also for control

Here it is determined whether the locomotive selection is also used for control. If the locomotive window is active, this locomotive can also be controlled with the cursor keys. A locomotive for the locomotive window is selected by double-clicking on the locomotive in the locomotive list. Furthermore, it must be determined whether the cursor keys up / down or left / right are used for control.

11.3.8 Fast locomotive control

Activates the control element in the operating line on the right for quick access to a locomotive. A locomotive can also be dragged and dropped from the locomotive window into this element.

A digital address can be entered under Address. If the locomotive with this address is selected on the central unit, the locomotive that is currently assigned to this controller is controlled (regardless of the real address of this locomotive).

11.3.9 Show train name in the locomotive window

If a locomotive is assigned to a train, the train name is displayed in the train number window instead of the locomotive name.

11.3.10 Switch on dynamic routes

Here you can switch the automatic generation of routes on or off.

11.3.11 Automatic departure after driving position

Here you can determine whether a locomotive should automatically depart after the route and the position of the signal have been determined.

Not	manual operation only
With the ALT key	then the locomotive will stop when the (Old)-Button was pressed
always	the locomotive will always stop automatically, if 'Departure after change of direction' is also marked, it will then also automatically depart
Always on the train ride	Trains will depart automatically, but locomotives will not

11.3.12 Departure after changing direction

If the direction of travel is changed in a block by the travel position of the signal (route in the opposite direction), this setting allows the locomotive to automatically change direction and drive off.

11.3.13 Autozug always runs with SSB / aSB

Not marked: When the SSB / aSB is switched off, a train stops in automatic mode in front of the stop signal

Marked: Regardless of whether SSB / aSB is switched on or off, a train in automatic mode will continue its journey.

11.3.14 RailCom - add new locomotive automatically

If a RailCom detector reads out a locomotive whose address is not yet known in the model interlocking, the locomotive is added to the locomotive list (database) of the model interlocking as a new locomotive.

11.3.15 Dissolve D-way with route

Here it is specified whether the D-way of a route is resolved with the route, or remains set according to the prototype and has to be resolved separately. The resolution of the slip path can be set up as a function of time (see item 7.3.7). With ESTW, Domino and ILTIS, a D-way is always resolved with the route.

Note: No D-way has to be planned in the model signal box if this seems too cumbersome for the operation of the model railroad.

Note on the prototype: The technology of the lane plan signal boxes has continuously developed and with it the functionality. In the newer track plan signal boxes, an automatic slip path resolution is already built in (after a certain time - depending on the permissible speed and the length of the target track). In many older track plan signal boxes, the automatic D-way resolution was retrofitted, especially if these were remotely controlled by electronic interlockings and the functionality of the track plan signal boxes had to be largely adapted to the electronic signal boxes.

11.3.16 Detecting the ghost train

This option provides additional security in automatic mode. If a stopping section in a block is driven on and the train number in this block is not yet known, then it is assumed that this train has entered this block by mistake and an emergency stop is carried out

11.3.17 Always show train number (Debug)

The train number is only displayed in occupied blocks in the model interlocking. If this point is marked, the train / locomotive number passed on with the route is also displayed in the following block.

11.3.18 basic departure break

This is the basic value for the stopping time of locomotives and trains before they leave when the signal is running. An additional delay can be specified per block.

3/11/19 probability of turning

The probability with which automatically moving trains turn is entered here (see also Section 8.1.).

11.3.20 Timetable

With Timetable indicates whether the schedule is running when operation is started. in The Field Sec. per minuteindicates how fast the model clock should run. Each time the entered number of seconds has elapsed, the clock advances one minute. In this way, it can be determined how fast the clock and thus also the timetable run down.

In network operation, the clocks of the clients are automatically synchronized with the clock of the server computer (main slave clock principle).

11.3.21 Feedback debounce time.

Short-term disruptions in power consumption due to unclean rails or wheels can generate short free signals. If this leads to problems, the time until the blocks are reported free can be extended here. This time is considered the general debounce time; it is also possible to specify a debounce time for individual detectors.

11.4 layout

Generally

Layout: The icons can be displayed on the screen as

Lorenz lane plan signal boxes (small),
Track plan signal box type Siemens (large),
Track plan signal box photorealistic based on the Siemens model SpDrS60, -
Electronic interlocking of the DB - ESTW,
Track plan signal box type Domino 67 from Integra-Siemens or control program ILTIS for signal boxes type Domino 67 or eStw (CH)
being represented.

Always show turnout: Normally, the position indicators of the turnouts are only displayed if they are set and defined in the course of a route. With the table illumination, the display of all position indicators can be switched on. If this setting is marked, all position indicators are always displayed.

SBB Signals drawn: The representation of the signals corresponds to the signal image of the outdoor systems.

ESTW buttons show: In expert mode, after the selection, for example of the start and finish signal for a route, the command is output in text form and must be acknowledged by the FdL. The buttons for this prototypical command processing are still implemented in the model interlockingNot activated.

Show direction of travel: In the train number field, the direction that the program controls can be displayed with <>. The direction should be synchronized with the program for a newly installed locomotive.

Table: You can choose from:

Top left

Centered

Customize window

Zoom the track diagram

Multi-touch operation: The operation with the new screens is switched on here.

Turnouts and signal number

Turnout number: Indication of whether the name (e.g. P1 for an exit signal), the (model interlocking) internal number, the digital address of the solenoid or no signal or turnout number is displayed in the track diagram for turnouts and signals.

Font: The font, size and color as well as the background color of the text can be defined. The recommended font size is 6pt or 7pt.

Background: For SpDr and Domino, it is recommended to use the table colors of the models as a guide - silver gray / light green., For ESTW / ILTIS black is correct.

Note: The background color for the texts should correspond to white or the color of the table (silver-gray), the font color black.

With ESTW / ILTIS, the background color should be black and the font color white or yellow. Unfortunately, it is not possible to make changes to the element designations that correspond to the original, depending on the dynamic state of the system.

Train number: A size of approx. 8 pt is recommended for the locomotive and train number; SpDrS and Domino in black, ESTW and ILTIS in white or yellow as above. In automatic and timetable mode, when displaying addresses or unknown vehicles, the program uses pre-assigned colors - see Part 2, 13.4

11.5 Train types

Nr.	Name	Personenzug
1	ICE	ja
2	IC	ja
3	Regionalexpress	ja
4	Regionalbahn 1	ja
5	Regionalbahn 2	ja
6	S-Bahn	ja
7	Güterzug 1	
8	Güterzug 2	
9	Interregio	ja
10	Gmp	ja
11	Güterzug 3	
12	Güterzug 4	
13	Lok	
14	Museumszug	ja
15	Messzug	
16	Sprinter	

In this window you can change the names of the train types. For each type of train it is indicated whether it is a passenger train. This information is used for automatic braking (see Chapter 6.4.4.6).

12th Notes for system planning

Below is some information for prototypical system planning. In this context, only standards are presented that can be seen in the most varied of modifications in the original. Due to the existing topology, there are also a number of exceptions. Only the main features of the signaling can be shown here.

12.1 Signals

At this point just a small overview of the signals - signal types, signal aspects - as far as they are planned for controlling a system. Further information can be found in the railway literature and on the Internet.

Signals are used on the railways to control and safeguard operations. The requirements in train and shunting operations result in a large number of different signal types and not every signal has to be able to show all signal aspects. If a train station entrance does not require an entrance at reduced speed, this does not have to be signaled. The main signal then does not need to display the driving concept Hp2 / FB2 for 40 km / h.

12.1.1 Signal types

Main signals control and secure train traffic. Shunting

signals control and secure shunting operations

Additional signals - as the term describes it, they complement the commands of the main and Shunting signals. They are used less often on a model railway.

12.1.2 Signal terms and their meaning

Signal aspect		description
DB	SBB	
Main signal		
Hp0	Stop	Stop for train rides
Hp1	FB1	Drive freely at line speed, reduced speeds can be signaled with speed indicators (> = 80 km / h)
Hp2		Drive freely at a maximum of 40 km / h, deviating speeds can be signaled with speed indicators Zs3 with the numbers 2, 3, 5 and 6 (20, 30, 50 and 60 km / h).
	FB2	Free travel at a maximum of 40km / h
	FB3	Free travel at a maximum of 60km / h
	FB5	Free travel at a maximum of 90km / h
	FB6	Free travel at a maximum of 40km / h
	FB2 + ZS °	Occupied track, free travel at a maximum of 40 km / h - an obstacle is to be expected on the following track section. ° additional signal
Shunting signal		
Sh0		Halt (for train and shunting trips) - in the current signal book the designation for this signal aspect is Hp0
Sh1		Shunting ban lifted
Hp0 / Sh1		Stop for train journeys, no maneuvering ban lifted Stop
	Stop	in front of the signal
	ride with Attention	Journey or continuation of the journey. Immediately after the dwarf signal, an obstacle must be expected.
	journey	Journey or continuation of the journey
Additional signal		
ZS1		Substitute signal - travel on sight when the signal is disturbed - cannot be displayed with most standard model railway signals. A signal is equipped with either Zs1 or Zs7, both aspects of a signal are not permitted!
	Auxiliary signal	Consent to drive past the stop showing or unlit main signal and drive on sight
ZS7		Caution signal - travel on sight if the signal is disturbed - cannot be used with most standard model railway signals being represented.

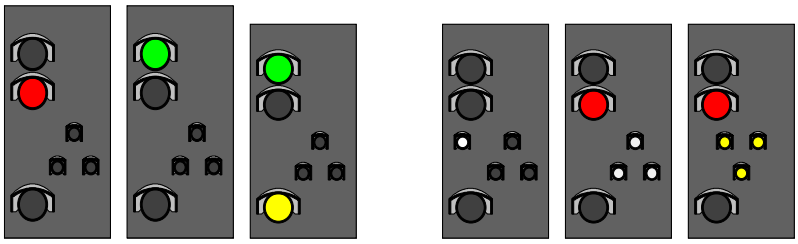
Additional signal		
Ke		Identification light - it signals that the signal is operationally switched off and not defective - this signal aspect can also not be displayed with most standard model railway signals. Background to the prototype: A dark signal represents an invalid signal aspect, the driver is not allowed to drive past it! Operationally completely blanked signals are in use on the new DB lines, but the blanking only occurs when an LZB-guided vehicle is approaching that has a corresponding driver's cab signaling.

12.1.3 Signal display

Main signal DB

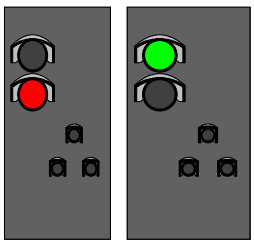
Use as an entry signal or exit signal if signaled maneuvering drives can be dispensed with.

The signal aspects of a main signal are Hp0, Hp1, Hp2, (Ke, Zs1, Zs7)



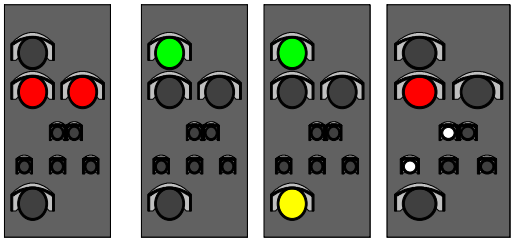
Hp0 Hp1 Hp2 Ke Zs1 Zs7

Block signal DB - block signals correspond to the main signals but cannot indicate the term Hp2.
The signal aspects of a main signal are Hp0, Hp1, (Zs1, Zs7)



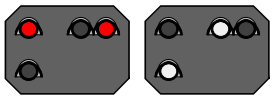
Hp0 Hp1

Main / blocking signal DB - possible signal positions: Hp00, Hp1, Hp2, Hp0 / Sh1, (Ke, Zs1, Zs7)



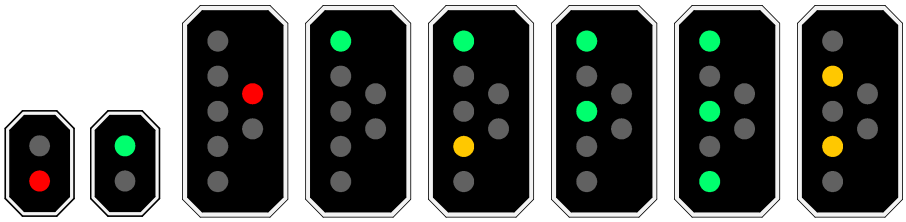
Hp0 (Hp00) Hp1 Hp2 Hp0 / Sh1

Blocking signals (so-called ballast dwarfs) DB - Possible signal positions: Sh0, Sh1



Sh0 Sh1

Main signals L SBB



Stop FB1 Stop FB1 FB2 FB3 FB5 FB6

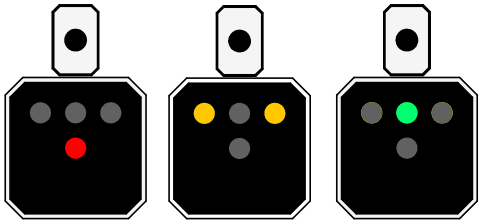
There are signal screens with 2, 3, 4 or 5 lights and double-width screens with a maximum of 7 lights; the 7th light is emergency

red. Main signals N SBB

now with speed indicator

Stop Speed announcement Speed execution

Block signals

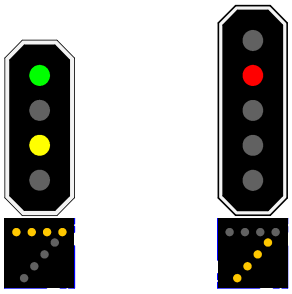


Stop warning Free ride can not yet from Modellstellwerk can be controlled.

Dwarf signals

Stop Attention journey

Additional signals



Occupied track Auxiliary signal

12.2 Construction of train stations based on the prototype

Some examples of typical exemplary situations are shown below. Typical because there are such constellations, but no generalization is possible for all train stations. Since most of the railway's operating points were planned depending on the tasks of the operating points, and this planning was partly 100 years ago, the most varied of philosophies were applied in the planning. These old philosophies have persisted up to the present day, each of the many changes made was only minor, so that the core structures have been preserved to this day. Freight tracks have been dismantled, points connections have been upgraded for higher speeds, and the signaling has been adapted, but the basic topology has been preserved to this day in many cases (in principle, the train travels on paved dirt roads at many points in the network). With the major data center programs of the last 20 years, the resumption of passenger traffic on lines that have been closed or closed for passenger traffic, as well as the new lines for high-speed and local traffic, other requirements came into play. In order to enable the most efficient operation possible, the railway systems were reduced to the absolutely necessary minimum, every point saved saves costs in acquisition and maintenance. Resumption of passenger traffic on disused or closed lines for passenger traffic as well as the new lines for high-speed and local traffic came into play. In order to enable the most efficient operation possible, the railway systems were reduced to the absolutely necessary minimum, every point saved saves costs in acquisition and maintenance. Resumption of passenger traffic on disused or closed lines for passenger traffic as well as the new lines for high-speed and local traffic came into play. In order to enable the most efficient operation possible, the railway systems were reduced to the absolutely necessary minimum, every point saved saves costs in acquisition and maintenance.

All the examples shown below are based on specific train stations of the prototype. In some cases, the exemplary situation in the examples has been simplified somewhat, but it corresponds to the current trend of reducing the railway facilities to the absolutely necessary minimum and further reducing industry and freight connections.

The first examples relate to the train stations, the following examples to the route between 2 train stations

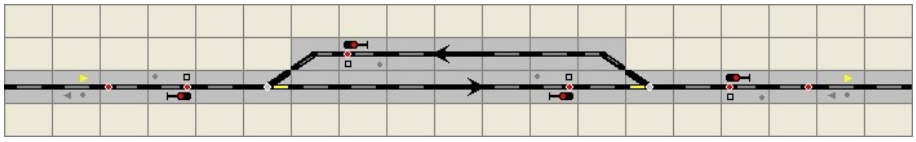
12.2.1 Train stations

Simple crossing station on a single-track route

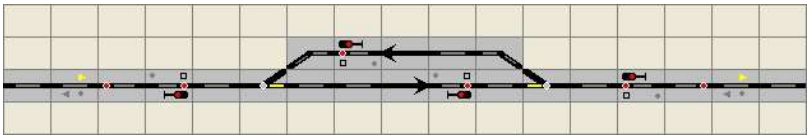
The train station sketched below can be found in this way or similar on many routes. The signaling equipment is reduced to the absolute minimum, in some cases so-called fallback switches were installed for the switches, so that not even switch drives had to be installed on the switches. Of course, this has consequences for operational management, because trains can cross in the station, but not overtake, as each of the two station tracks can only be used in the specified direction. Signaled shunting trips were also dispensed with, as these would only have cost additional money and were no longer necessary due to the fact that the railway had withdrawn from the area in many places.

The first sketch shows this crossing station, but with an additional possibility, required for a simulation, to be able to operate not only track sections, but also individual contacts in the track. In the example, train number fields that should be available, but are not absolutely necessary for understanding, were not implemented.

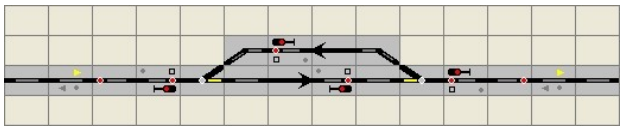
4 routes are required for this station, each from the entry signals to the exit signals and from the exit signals to the route button (for setting a trip from the station to the route). Depending on the local conditions (length of the tracks and the speeds traveled), the exit switch becomes part of the entry train route as a D-way. This means that simultaneous entrances to the station are not possible, but when one train arrives, the opposing train would have to wait at the entrance signal until the D-route of the first route has been resolved.



Another reduction could look like this:

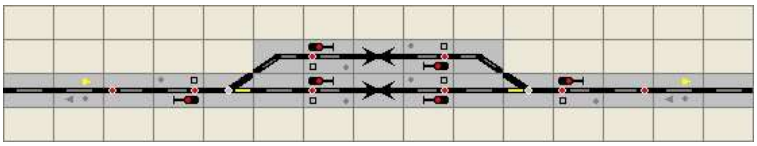


With this design, the limit of what is feasible has probably been reached, the station cannot be represented smaller on the table with the necessary information



Junction station 2 on a single-track line

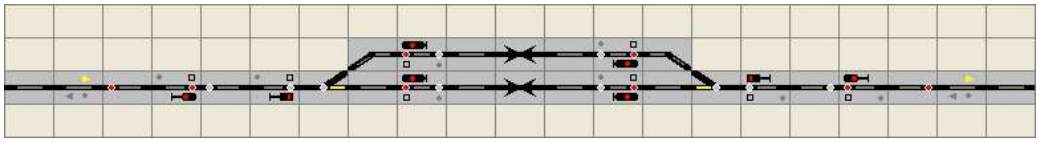
The difference between the second crossing station and the first station is the somewhat more extensive security technology that allows both station tracks to be used in both directions. This means that slow trains can also be overtaken operationally by faster trains.



Crossing station 3 with shunting option

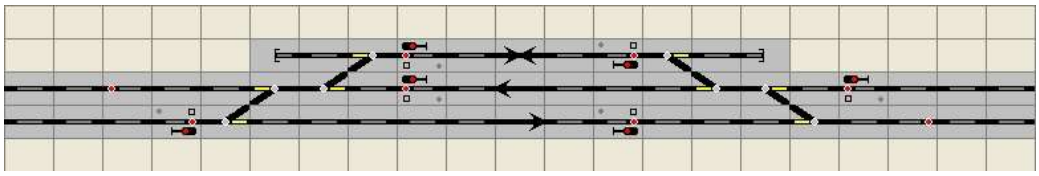
In this version, the station offers the possibility of maneuvering and therefore has different signaling equipment. The exit signals, previously the main signals, have been replaced by main blocking signals, and two blocking signals have also been placed in front of the turnouts

and shunting destinations before the entry signals, so that shunting routes out of the station tracks are possible.



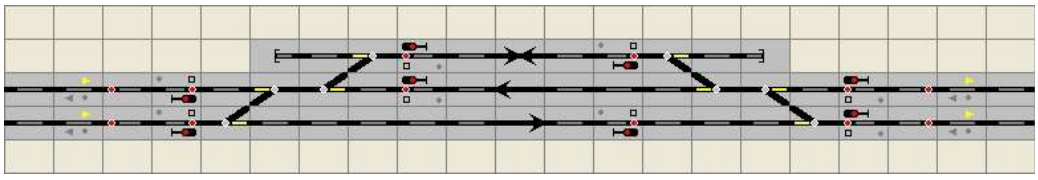
Through station on a double-track line

This sketch shows a small train station on a double-track line. At this station, the through tracks are only used in one-way traffic, only the passing track can be used in both directions. On the double-track line, there is also only one-way traffic, ie there is only an exit button on the right-hand track. The overtaking track is provided with so-called safety switches, which means that operations can be carried out more smoothly if the D-route leads to the butt track at the entrance. In order to avoid the handicap of having to cross the other track when entering the passing track from the left, the passing track can also be placed between the two main tracks.



Through station 2 on a double-track line (with track changing operation - GWB)

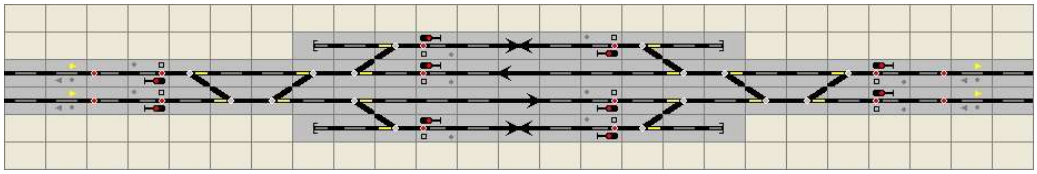
The only difference to the previous station is the signaling equipment on the main tracks, which can be used in both directions. An interesting operational situation is driving from the left on the left track. To continue to the right on the right-hand track, the train must drive over the overtaking track, as the through track can only be used in the opposite direction. The problem with trains from the left onto the passing track with the crossing of the other track has not been resolved. But here, too, there is the option of moving the passing track between the two main tracks.



Through station 3 on a double-track line (with GWB)

The following track diagram shows a typical train station constellation with a high degree of flexibility. It is a constellation that can be found on main discharge routes and offers extensive travel options. The problems with crossing the other track mentioned in the previous examples have been eliminated in this constellation. The two switch connections at the station heads also allow efficient operations

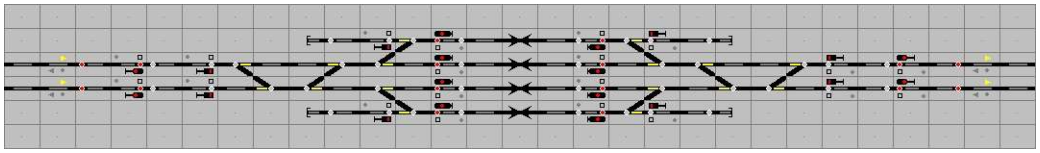
and offer high flexibility. Only the one-way traffic in the through tracks limits the possibilities of the station somewhat.



Through station 4 on a double-track line (with GWB)

The small drawback of station 3 has been circumvented in this example by the maximum possible signaling equipment. In addition, extensive maneuvering options have been provided, which also include the area of the protective switches. In the example, there are also sidings here in some cases (industrial customers, etc.). In addition, blocking signals could be set up between the switches of the switch trapezoid.

However, by far not every through station is equipped with such extensive travel options and signaling.



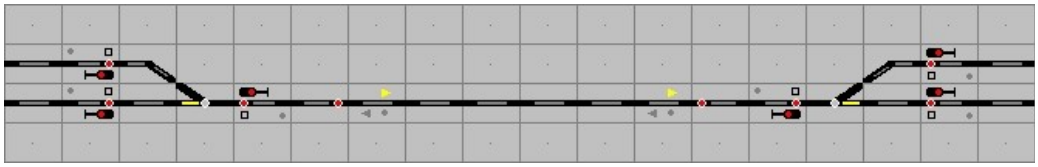
12.2.2 Main tracks between 2 stations

There are also certain specifications for the connection of a railway line between 2 train stations, some examples are shown below.

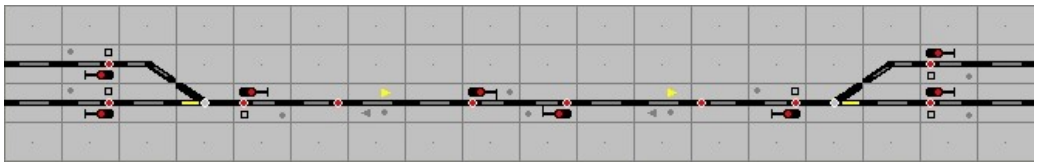
Single-track route without block subdivision

For journeys from station to station, train journeys are secured using the so-called route block. Since in the past each train station had its own dispatcher in the model, special rules had to be observed for the journey from train station to train station so that no train collisions could occur on the route between the train stations. For this reason, technical safeguards have been provided in the signal boxes so that a route from the exit signal to the route to the next station is only possible if the so-called direction of the route is correctly set. Therefore, the direction must be set in the correct position before a trip

become.

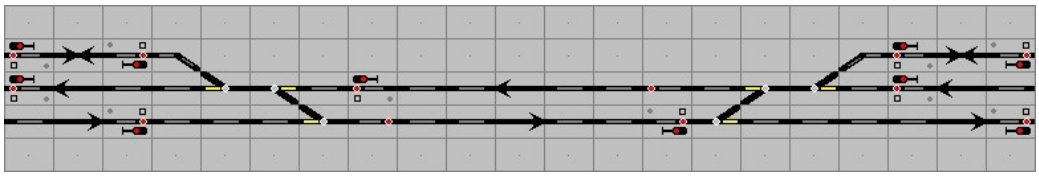


Single-track line with block division (block signals)



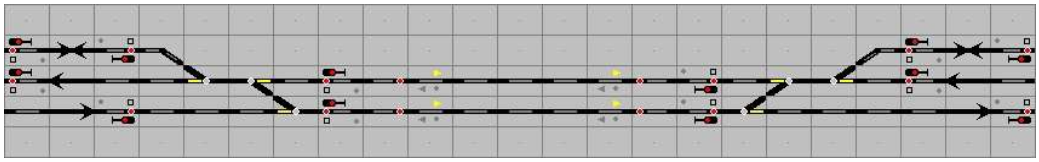
Two-track route with one-way traffic

Example of setting up a double-track line with one-way traffic on the line. Each track can only be used in the direction shown.



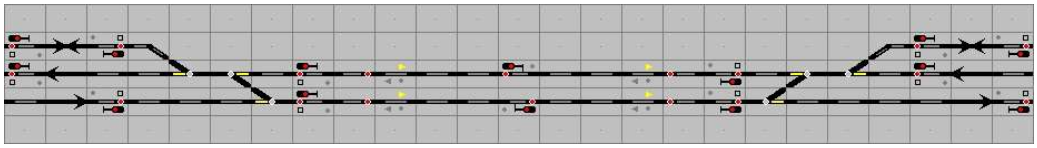
Two-track line with GWB

The same situation, but the tracks can be used in both directions.



Two-track line with GWB and block division on the line

In order to achieve a higher train sequence, the German railways subdivide the block route between the stations if necessary (especially on main discharge routes). This subdivision is normally only made in the control direction; for travel in the opposite direction, the two blocks are treated as one section. In many cases, there is not only one block signal; block signals are often set up every 1 to 1.5 km. This is the only way to achieve a dense sequence of trains.



12.3 Track / signal numbers

All track sections, switches and signals in the station or on the route have a designation / number. The following section explains which designations / numbers are used for the most important cases.

The designation, which is regulated differently for the railways, has been subject to several changes in the course of the last few years, among other things with the introduction of electronic interlockings, reunification in Germany and the introduction of the operating center concept. Therefore there will always be exceptions to the stipulations mentioned here.

In ModellStellwerk these numbers can simply be entered for the tracks during the project planning. In the case of turnouts and signals, there is also the option of entering a name in addition to the number specified in the program for internal processing. This can then be displayed in the track plan - Extra - Settings - Design - Turnout and signal number.

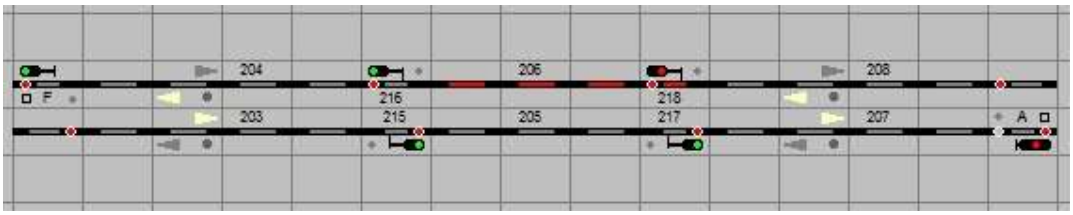
12.3.1 German signal boxes

In the following illustrations and sketches, the signals for a fictitious train station are shown and labeled accordingly. In sketch 1 without track changing operation, in sketch 2 with track changing operation.

12.3.1.1 Tracks

The kilometer division of a route begins at station A with kilometer '0'. All numbering refer to this classification.

The track sections, the blocks, are given 3-digit numbers; In the case of 2-track lines, odd numbers increasing with the kilometer, even in the opposite direction. Leading 0 are not shown.



Numbering of the tracks and signals of a double-track block section - kilometering:

This numbering is interrupted by the stations. The track directly at the station building has the number 1, the next number 2, etc. The track sections between the entrance signal and these platform tracks are given numbers that increase with the kilometer in the hundreds or tens and maintain the unit value of the platform track at the same height. If, for example, 4 track sections can be displayed between the entry signal and the platform track 3 through the routes, these are given the serial numbers 103, 203, 303 and 403 or 13, 23, 33 and 43. On the other side of the station with the increasing kilometer values of the route follow roughly

603, 703 and 803 or 63, 73 and 83. Gaps in the numbering are permitted.

12.3.1.2 Entry signals

The entry signals are used to signal journeys from the free route into a train station.

Entry signals in ascending route kilometers are given the letters AE. The entry signals from the opposite direction are given the letters FK. The designation A is used for the entry signal of the control track, in the left track of a double-track line, the signal on the opposite track is given the designation AA, provided that track changing operation is set up there. The track change operation offers the possibility of being able to carry out signaled journeys on a double-track line on both the right and the left track. The signals of a second line leading into the station then receive the signal B or BB etc.

Since several train stations are usually controlled by one signal box in the modern generation of signal boxes, the names had to be adapted. For reasons of confusion, it is essential that the signal designations are unambiguous when communicating between the driver, shunting personnel and dispatcher. In these cases, the signal designation is preceded by the BZ code (control center). Entry signal A in station 1 becomes 23A, for example, entry signal A in station 2 becomes 24A, for example) The BZ codes have a maximum of two digits.

12.3.1.3 Intermediate signals

If intermediate signals are required due to the size of the station, these are given the letters ZR, ZS, ZT along with the kilometer rating and, in the opposite direction, the letters ZU, ZV and ZW followed by the track number. RST and UVW show that these signals are approximately at the same height (kilometers). These intermediate signals can be necessary if the passenger and freight stations are in a row.

Exit signals are given the letter N in the direction of the ascending route kilometrage, followed by the track number, the exit signals in the opposite direction are given the designation P followed by the track number. Thus, an entry signal A is always followed by an exit signal Nx.

12.3.1.4 Block signals

Block signals are usually only denoted by a number, in the direction of the ascending route kilometrage (like direction A or Nx) odd numbers are used (1, 3, 5, ...), in the direction of descending kilometrage (direction like F or Px) then the even numbers (2, 4, 6, ...). It should be noted that the counting is forward in one direction and backward in the other direction (signal 1 is close to signal F, signal 3 is close to signal 2, signal 5 is close to signal 4, etc.

12.3.1.5 Advance signals

The naming of the distant signals is simple: they have the same name as the associated main signal, but only as a lower case letter. The distant signal to signal "A" is called "a", to signal "P3" is called "p3". If a distant signal is valid for several main signals, this is marked accordingly, such as "p3-5". In contrast to the main signals, the designation is usually only attached to the pre-signals for light signals.

Distant signal repeaters, which are arranged between the distant signal and the main signal due to an insufficient view of the main signal, also usually do not have a label on the signal itself.

12.3.1.6 Maneuvering or blocking signals

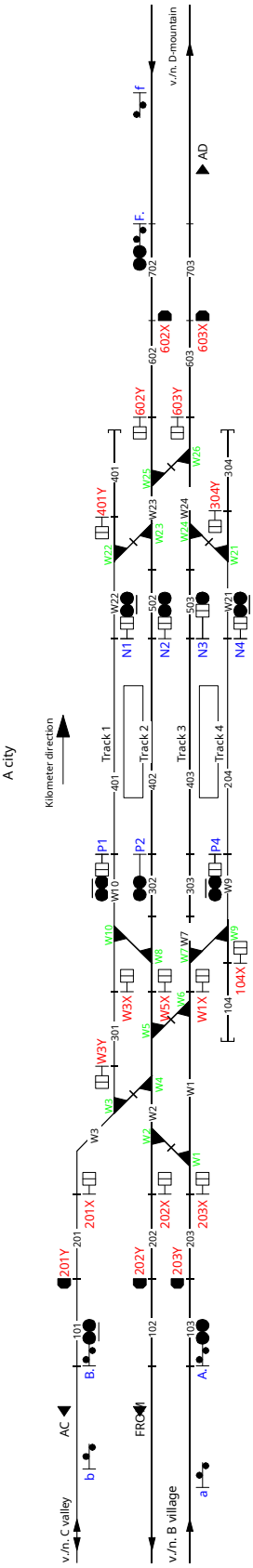
Shunting signals are usually referred to as the track they are on, ie "2" for a shunting signal on track 2. If there are several shunting signals on a track, the number in the kilometer direction is supplemented with superscript Roman numerals. So there are the signals "2I","2 II". Form blocking signals also have the term "Hs" in front of the designation, for example "Hs 1", "Hs 2" II".

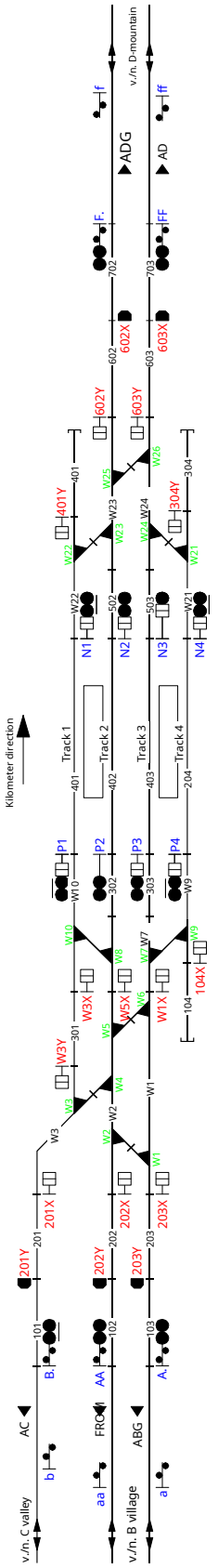
In the case of light blocking signals, the following switch is occasionally used as the name for the signal, ie signal "W35" covers switch 35.

This nomenclature had to be supplemented or adapted again in the ESTW. The blocking signals are referred to as the track in which they are located. Is the track called
202, this is the name of the blocking signal in the ascending direction of the kilometrage 202X, there is another blocking signal in the other direction on the same track (descending

Kilometrage), this is referred to as 202Y. If there is a blocking signal in a free reporting section with which a turnout is also reported free, the designation of the blocking signal can take the designation W210X or Y, for example.


Gl.7
Hs6i
69
44
P2


A city
Kilometer direction
Track 1
Track 2
Track 3
Track 4
v./n. C valley
AC
FROM
v./n. B village
v./n. D-mountain
AD
P1
P2
P4
N1
N2
N3
N4
W3Y
W1X
W3X
W5X
104X
201Y
202Y
203Y
201X
202X
203X
602Y
603Y
602X
603X
401Y
304Y
B.
A.
F.
f
a
b


A city
Kilometer direction
Track 1
Track 2
Track 3
Track 4
v./n. C valley
AC
FROM
ABG
v./n. B village
v./n. D-mountain
ADG
AD
P1
P2
P3
P4
N1
N2
N3
N4
W3Y
W1X
W3X
W5X
104X
201Y
202Y
203Y
201X
202X
203X
602Y
603Y
602X
603X
401Y
304Y
B.
AA
A.
F.
FF
f
ff
aa
a
b

12.3.2 Swiss signal boxes

Here, too, the numbering of the track sections, switches and signals is linked to the kilometrage and thus forms a consistent basis.

12.3.2.1 Tracks

Track sections, the blocks, are given 3-digit numbers; increasing with the kilometer. In the case of 2-track lines, the left odd and the opposite direction get even hundreds.

Example: 2-track line with a central block - the train is in section 114 - kilometrage

This numbering is interrupted by the stations. The track directly at the station building has number 1, the next one has number 2, etc. The track sections between the entrance signal and these platform tracks are given numbers that increase in tens with the kilometrage, supplemented by the unit value of the station track in the extension. If, for example, 4 track sections can be displayed between the entry signal and the platform track 3 through the routes, then these are given the serial numbers 13, 23, 33 and 43. On the other side of the station with the increasing kilometer values of the route follow about 63, 73 and 83. Gaps in the numbering are permitted. If this numbering is not sufficient, designations in the hundreds can also be used.

12.3.2.2 Signals

The signals are designated in groups for each station with the kilometer rating and with letters regardless of the direction of travel. This is supplemented by the number of the track section that is in front of the signal. On the side with the lower mileage, there will always be an entrance signal with the letter A; the entrance signal from the opposite side will have at least the letter D. If there are intermediate signals in large train stations, this can be E, F, etc. If several stations are controlled from a signal box or an operations center, the station name (three-digit abbreviation) is placed in front.

12.3.2.3 Intermediate signals

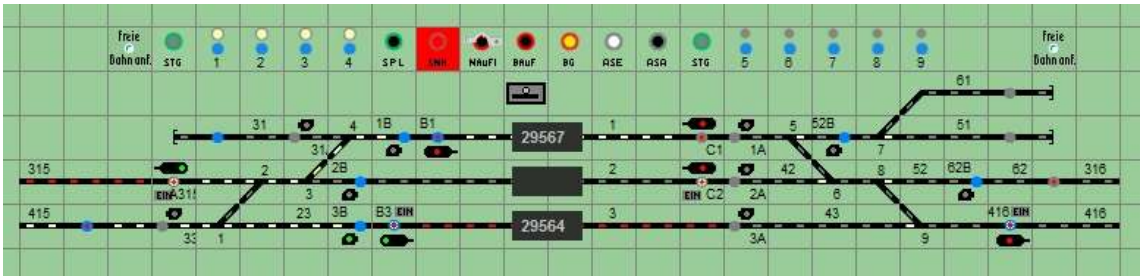
If intermediate signals (groups) are required due to the size of the station, these are inserted with the kilometering in the row of letters regardless of the direction of travel. Intermediate signals can also take on a distant signal function. Instead of the distant signal aspect warning (FB2), the main signal shows a short drive (FB6).

12.3.2.4 Block signals

Block signals are designated in increasing kilometers with the letter P and the number of the track section in front of the signal in the direction of travel. In the opposite direction they get the letter S.

12.3.2.5 Dwarf signals

With increasing kilometers, the dwarf signals get the letter A and the number of the track section in front of it; in the opposite direction the
Letter B.



Domino: Small, fictitious train station with an example of numbering - kilometering.

And here in the illustration for ILTIS.