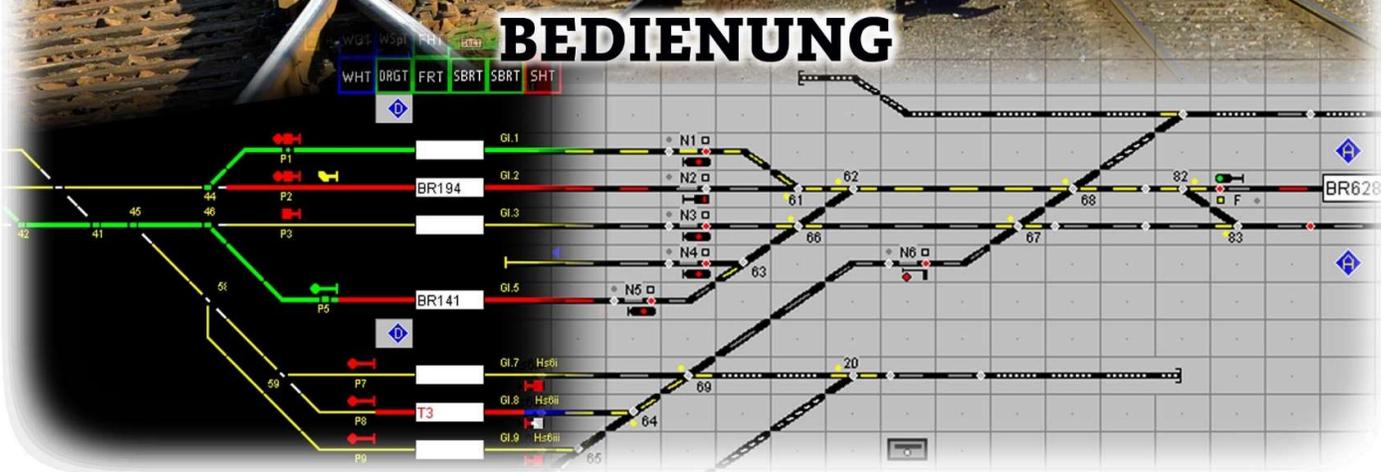# Modell Stellwerk 10

Vorbildorientierte Steuerung für digitale Modellbahnen

Handbuch Teil 2
Bedienung

Model switchboard
Version 10
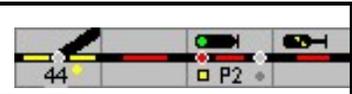

Manual model control box part 2
service
Edition from 01/01/2021

Changes from the previous version of this manual are indicated by a margin marked.

Manual model control box part 2

Table of Contents

1   introduction

In the first part of the manual, the settings of the program as well as the configuration, i.e. the planning of your own system, were described. The second part of the manual describes the manual operation of the model railway system and the possibilities that ModellStellwerk offers to automate operational processes.

2 Program interface

In terms of function and operation, the model signal box was largely adapted to the SpDrS60 track plan signal box. The installation CD contains a description of how this type of interlocking is operated with the DB.

From version 8, the Swiss interlocking technologies Domino'67 and ILTIS are also implemented. Operation is also described in this document.

Attention: the Swiss versions must be activated separately using a license file.

The operations required to control the model railway system are described below. The prerequisite for this operation is that the signal box for the model railway system has been created as described in Part 1 of the manual.

After the model railway layout has been planned or the layout file that has already been planned and saved has been read in again, the model railway can be controlled. To do this, the Settings the interface and the digital system are set correctly.

With this button (Go mode) the model control unit connects to the control center (s) and the operation of the model railroad is started. The model control unit is started in the same state as the last time the control was exited (play position).

However, the system can be started from the main menu at any time in the basic setting With Control - magic wand, here you can choose which program parts have to be started in the basic position:

With this button the connection to the digital centers can be established or interrupted again.

Via the Windows command line, ModellStellwerk can also be started directly with the name of a path file (* .pcw) as an argument. However, this can also be specified in a link (see Windows manual). The following start options can be specified:

Name of a railway file (* .pcw)
Name of a macro file (* .prg)
Name of a timetable file (* .drg)
Name of a file with train compositions (* .zug) Name of
a file with the interlocking layout (* .stw)
- M [starting method, -MS = start in stop, -MG = start in go, -ME = start in edit]
- L [bit-wise enumeration of logging options]

If no switchboard window is open yet, it will be opened now. Then, depending on the option selected in the settings, the turnouts are reset to their previous positions and the feedback contacts are read in. Occupied tracks are illuminated in red in the track diagram (track occupied). Now the model railroad operation controlled by the model switchboard can be started.

2.1 buttons

The buttons can be used to open additional windows for

	Track diagram	Opens a window with the loaded track diagram; several switchboard windows can be opened. In design mode, the menu with the editing tools opens.
	Locomotive control	Opens the window for the locomotive control, several windows can be opened
	Open train window	Opens the window for the compilation and control of the automatically moving trains
	Open the locomotive list	Opens the window for selecting or controlling multiple locomotives
	Signal box window	Opens the switchboard window
	Clock	Opens and closes the window for displaying the clock (model time)
	turntable	Opens and closes the window for operating a turntable
	Open the message monitor	Opens and closes the window with the status of the feedback devices
	Messages	Opens and closes the window with the operating messages and errors

Other buttons

	zoom	Opens the zoom window. The current track diagram can be enlarged or reduced in the zoom window, between 10% and 200%. The zoom factor is saved with the score.
		Quick operation for a locomotive. Is only shown if it is activated in the settings ("switch on fast locomotive control"). The locomotive is selected by double-clicking on an occupied track in the track diagram. [>] changes direction, [F] is the first function.
		A locomotive address is entered in the settings. If a locomotive with this address is controlled on the central unit, the locomotive that is currently selected in the fast locomotive control is controlled on the layout. To do this, however, the "Follow locomotive control on the control center" must be switched on.

All open windows are listed in the main menu under window so that you can easily switch to the correct window.

2.2 short cuts

The following buttons help to operate the train:

(Ctrl) (G)   opens a new switchboard.

(Ctrl) (L)   opens a new locomotive window

(Alt) (M)   writes a marker in the logging (only if logging is active)

(Alt) (C)   opens the command input (for testing, not further documented)

(F11) hides the control panel and the status bar, so that more space is available on the screen for the display of the track diagram.

(ESC) Emergency stop

2.3 Model control unit   Digital center

If the model railway system is controlled with a digital center that has control elements (Intellibox, CS, ...) or can be connected to the handheld controller, then switches can also be set with this control panel. The changes are also displayed in ModellStellwerk.

Danger: However, if a turnout is changed that is set by the model switchboard in a route, the route is canceled again and the start signal at the beginning of the route is set to "Stop".

2.4 Emergency stop (ESC)

If something unexpected happens on the system, the (ESC) -Button to perform an emergency stop. If the model railway system is controlled via the Märklin interface, a STOP command is sent. If the system is controlled via other central units, an emergency stop is carried out: Motorola locomotives get speed "0", DCC locomotives are sent speed step 1 (= emergency stop) via a "broadcast" command. The locomotives stop, but the functions remain switched on and the turnouts can still be operated.

Another press on (ESC) or a click on GO cancels the emergency stop and the locomotives continue to run. All traction vehicles accelerate to the previously set speed (depending on the control center, only with DCC).

2.5 Zoom function

With the button   the zoom window opens. The current
The track diagram can be enlarged or reduced between 10% and 200%. The zoom factor is saved in the game. Another click ends the entry.

Attention: the previously set factor is only taken into account with the Go mode

2.6 Two-button operation, touchscreens and GBS

The functions in the original SpDrS60 and Domino'67 tables are always operated with two buttons in large-scale operations; if both keys are pressed at the same time the function is triggered. This is of course not possible when using the mouse on a computer. ModellStellwerk is programmed in such a way that the selected function is triggered if the two associated buttons are pressed within 5 seconds.

Touch screen

It is also possible to operate the switchboard with a touchscreen. Windows then imitates the mouse, so that when you touch it, the same functions are performed as when you click with the mouse. Here, too, the required keys are then printed one after the other.
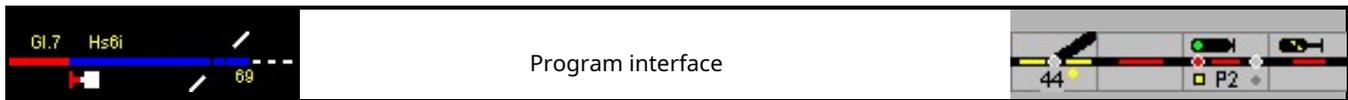
ModellStellwerk can also work in real two-button operation. The selected function is triggered when the two buttons on the touchscreen are really printed at the same time. This function ('MultiTouch') can generally be switched on in the settings or via the tab of the switchboard window. If multitouch is switched on, operation with the mouse is no longer possible.

MultiTouch only works if the screen is suitable for it. The information window shows whether the screen is suitable.

Track diagram control panel

The operation can also take place with external buttons. These buttons, for example on a track diagram control panel, are read in as feedback contacts. The feedback contacts are entered for all control elements. If 'MultiTouch' is switched on in the settings or in an interlocking definition, the buttons are pressed simultaneously to trigger a function.

3 Illumination of symbols

The symbols have been described in the model control panel manual - Part 1. In the following, only the symbols are shown that can have different illuminations depending on the operational situation. A major difference in the representation of the ESTW / ILTIS in relation to the RSTW is the possibility of being able to differentiate between further different operational states by means of corresponding color illumination. The differences in detail can be seen in the following table.

3.1 Tracks

SpDr / D'67	ESTW / ILTIS	description
		Track is free, no further use
		The track is free, but fixed in a train route
		The track is free, but is set in a shunting route (illumination in the track plan signal box does not differ from a set train route!)
		Track is occupied - track can be set in a train route as well as in a shunting route, but the train or car can also be on a track section.
		Manually operated feedback contact switched off (track free), track not set in the route
		Manually operated feedback contact switched off (track free), track set in train route
		Manually operated feedback contact switched off (track free), track set in shunting route

		Manually operated feedback contact switched on (track occupied)

		Symbol for tracks without track vacancy detection (unmonitored track). Trains are not illuminated on these tracks. Even in the prototype there are unsupervised tracks, these are often with track barriers or corresponding edge protection devices connected to the monitored tracks.

3.2 switches
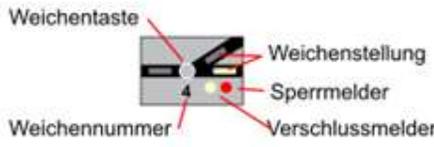
Weichentaste — Weichenstellung
Sperrmelder
Weichennummer — Verschlussmelder

Weichenstellung
Sperrmelder
Verschlussmelder
Weichennummer
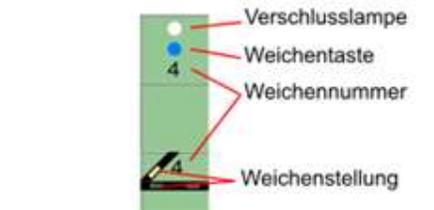
Verschlusslampe
Weichentaste
Weichennummer
Weichenstellung

Weichennummer
Weichenstellung
Verschlussmelder

Die Markierung (Balken/Winkel) zeigt die mögliche Weichenstellung an

Der Punkt zeigt die Gleisverbindung an, die nicht möglich ist

The exits at crossings, single and double cross turnouts are designated with lower case letters: a, b, c and d.

		Double cross switch with driving position a to c (ac)
		Double cross switch with driving position b to c (bc)
		Single cross switch with travel position b to c (bc)
		Single cross switch with travel position b to d (bd)

SpDr / D'67	ESTW / ILTIS	description
		Turnout in the basic position, ie neither in the train route nor in the shunting route - position indicators are switched off, either in "Configuration - Design", or by pressing the "on" or "off" button (see below)
		With the ESTW / ILTIS, the point position indicators are always illuminated.
		Turnout with switched on position indicator (configuration or setting table on) in left position (here: curved)
		Turnout with switched on position indicator in the right position (here: straight)
		Domino with keypad
		Turnout set in the train route (route indicator lights up), but the track section associated with the turnout has not yet been used. Locking indicator lights up
		Domino: Lock indicator in the switch button
		Turnout set in the shunting route (route indicator lights up), but the track section associated with the turnout has not yet been used. Locking indicator lights up
		Domino: Lock indicator in the switch button
		Switch occupied and locked
		Domino: Lock indicator in the switch button
		ILTIS: Lock indicator - blue point - only when occupied programmatically not yet possible
		Switch blocked against changeover (switch blocking indicator illuminated in red).
		Note: In the prototype ESTW, the illumination is implemented in such a way that the turnout designation is highlighted in red. For programming reasons, this is unfortunately not possible in ModellStellwerk.
		Domino: Lock indicator in the switch button

		Turnout in the D-way or locked as flank protection
		In the prototype ESTW only the locking indicator is displayed in green, the position of the switch is evident from the position indicator illuminated in yellow (in the example, the position indicator should be lighted yellow and thin - this cannot currently be implemented for programming reasons).
		Domino: Lock indicator in the switch button
		ILTIS: Protective lock also with side protection - orange point has priority over blue point
		Three-way soft position on the left
		Three-way soft position straight
		Three-way position on the right
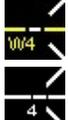
SpDrS60 domino	ESTW ILTIS	Simple cross turnouts
		Single cross turnouts 5 with position ac, no route set, not locked.
		The position ac is 8 for the simple cross switch Not possible - marking is missing
		Single cross turnouts 5 with position ac, no route set, not locked.
		The position ac is 8 for the simple cross switch Not possible - point as marking
		Simple cross turnouts 5 and 8 with position - bc, no route set, not locked.

		Simple cross turnouts 5 and 8 with position - ad, no route set, not locked.
		The position bd is 5 for the simple cross turnout Not possible - marking is missing no route set, not locked. The position bd of the simple cross switch 8, no route set, not locked The position bd is not possible with the simple cross switch 5 - point as marking The position bd of the simple cross switch 8, no route set, not locked

SpDrS60 domino	ESTW ILTIS	Double cross turnouts
		Double crossing switch with position ac, no route set, not locked Double crossing switch with position bc, no route set, not locked Double crossing switch with position ad, no route set, not locked Double crossing switch with position bc, no route set, not locked
		Train route set, DKW locked. SpDrS: white detector, ESTW: short green / blue bar Domino: white indicator in the switch button symbol, ILTIS: blue point outside the route
		Domino: switch button with lock indicator
		Double crossing switch with position bd,
		Double crossing switch with position bd,

		Double crossing switch with position bc,
		Double crossing switch with position ac.

SpDrS60 domino	ESTW ILTIS	Crossing
		Crossing (no route set)
		Crossing in the driveway in the direction of bc locked
		Crossing in the driveway in the direction of ad closed
		Double cross point blocked Domino / ILTIS, the lock must be switched on

3.3 Shape signals (wing signals)

As a rule, these illuminations do not exist in the prototype, since the lane plan signal boxes only control light signals. However, in some cases there is a display of a shape signal on the setting table, but the shape signal is then set mechanically via signal setting levers and is not illuminated on the setting table. These symbols can be used to simulate a corresponding prototype situation in Modellstellwerk.

		Main shape signal with blocking signal (Hp0 - Sh0)
		Main form signal with blocking signal (Hp1 - Sh1)
		Main form signal with blocking signal (Hp2 - Sh1)
		Main shape signal with blocking signal (Hp0 - Sh1)

		Form main signal (Hp0)
		Form main signal (Hp1)
		Form main signal (Hp2)
		Form blocking signal (Sh0)
		Form blocking signal (Sh1)
		Form pre-signal (Vr0)
		Form signal (Vr1)
		Form pre-signal (Vr2)

3.4 Light signals

Each signal is additionally equipped with a track, the colored illumination of the track corresponds to the illustration in chapter 3.1
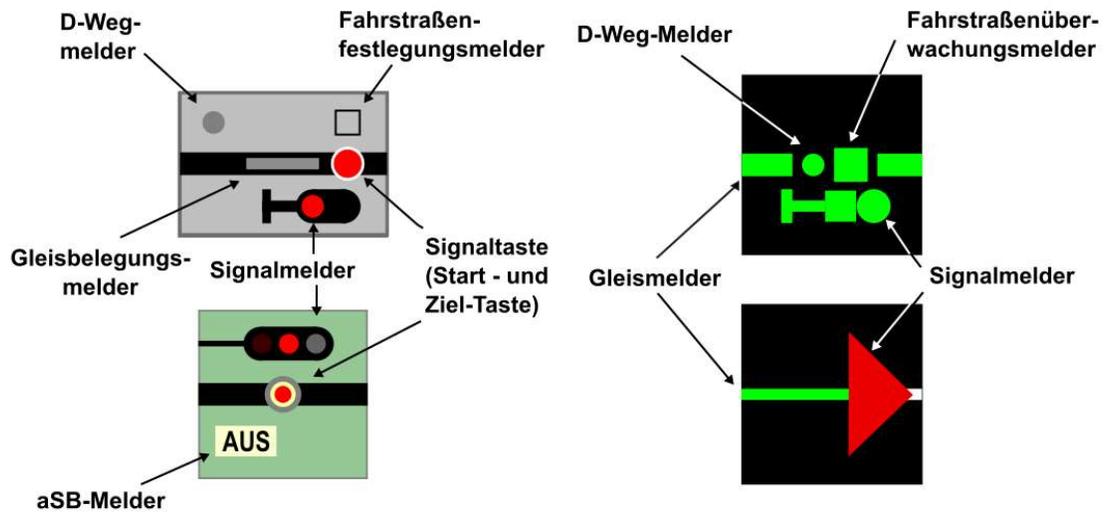
With Domino or ILTIS, the routes are defined when the track elements are illuminated.

The most important detectors of a signal:

SpDr / D'67	ESTW / ILTIS	description
		Signal shows Hp0 / Halt, no route set

		signal shows Hp1 / FB1 (or. Hp2 / Fb2 - Qb6! In the real interlocking there is no difference in illumination between Hp1 and Hp2 in the expertmode Hp2 / Fb2 - FB6 is also illuminated prototypically green). This display cannot occur in the prototype, as a signal can only display a journey term if a route is set (route setting indicator would then light up). Illumination is only possible if signals are set in motion manually, ie without a set route. Incidentally, in the prototype, no signals are set in motion with track plan signal boxes, the travel position is the result when a route is set and all route conditions are met (route clear, D-route clear, all route, slip-through and side protection switches in the correct position and locked ...). This display is only possible if the signal is clicked and SGT / SH is pressed in the operating line.
		The signal shows Hp2 / Fb2 - special adaptation for model railways - the same applies to the travel position for Hp1! Is only shown if the 'Expert' mode is not switched on. All signal aspects can be displayed in Domino if you select Extra - Settings - Design - SBB signals drawn and the expert mode is switched off.
		The signal shows Hp1, the route is set, the route setting indicator lights up. in theStrict mode Hp2 is displayed identically to Hp1. With Domino, the track is not illuminated in main signal fields.
		Main signal shows Hp2 / Fb2 - (model railway compromise - not in the expertMode) In ILTIS, Fb2 - Fb6 is not displayed separately
		Main signal shows Hp1 or Hp2 (expertMode), The track is occupied, the route is set, the route setting indicator (route monitoring indicator) lights up.
		Main signal shows yellow (Hp2 / Fb2 - Fb6) (in the expertmode the signal is illuminated in green!), the track is occupied, the route is set, The route setting indicator (Route monitoring detector) lights up.
		Main blocking signal shows Hp0 / Sh1, no set route (illumination in the expertmode not possible)
		Main blocking signal shows Hp0 / Sh1, shunting route set
		Main blocking signal shows Hp1, route set, route setting indicator (route monitoring indicator) lights up.

N5 □	N5	Destination signal of a route with a set D-way (D-way indicator lights up).
		Domino: In connection with FB2 at the main signal, entry into an occupied track is permitted.
▷ N3 □		If the main signal is disturbed, you can press the substitute signal group button ErSGT 0 and the signal button switched on the substitute signal ZS1 become. Domino: Auxiliary signal that allows the driver to pass by in sight if the main signal is disturbed
N2 □ / 2A	N2 / 2B	Blocking signal shows Sh0, no shunting route set. Dwarf signal shows stop
N2 □ / 2A	N2 / 2B	Lock signal shows Sh1, shunting route set, track not yet occupied. Dwarf signal shows driving with caution or driving in expert mode in a train route
2A	2B	Dwarf signal indicates driving with caution - expert mode off in a shunting route
N2 □ / 2A	N2 / 2B	As above, but track occupied Domino: Dwarf signal shows driving with caution - expert mode from ILTIS Dwarf signal shows driving - expert mode on
1X □ / 2A / 2A	1X / 2B / 2B	Blocking signals that are in the route of train routes indicate the signal aspect Sh1 Domino / ILTIS: here the position depends on conditions, whether driving with caution or driving is displayed.
		Train start / train destination button Domino - blue buttons for driving direction from right to left, gray buttons for driving direction from left to right

		Pull start button activated Domino - blue buttons for direction of travel from right to left, rough buttons for direction of travel from left to right
		When ILTIS requests the operator to set a route, if a route is planned from this signal and the automatic signal mode is installed.
		Maneuvering start / maneuvering destination button Domino - blue buttons for driving direction from right to left, gray buttons for driving direction from left to right
		Shunting start button activated Domino - blue buttons drive direction from the right to the left, gray buttons for direction of travel from left to right
		Start signal button pressed
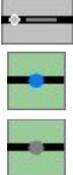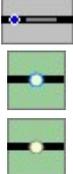
3.5 Special symbols (extra)

SpDr D'67	ESTW ILTIS	description
		Manually operated feedback contact switched off, track free
		Manually operated feedback contact switched on, track occupied
		Permission to the left
		Permission to the right
		No permission set This illumination does not exist in the prototype, in the model control unit this illumination is required for reasons within the program (basic position)
		Level crossing in basic position, ie level crossing is open
		Level crossing closed and monitored
		Track blocked (only shadow station control): Blocking can be done both in the entry track in the shadow yard (shadow yard blocked) and in one of the Hidden yard tracks can be configured Domino / ILTIS track closed - station track and shadow station
		Hidden yard track can be used Domino / ILTIS - track closed - station track and shadow station

4th   Train routes

Setting, defining and securing routes is one of the main functions of ModellStellwerk. In the track plan pushbutton interlockings, the trains are not directed to their destination by setting individual points and signals, but via defined routes.

In the model interlocking, the train / shunting trips with routes - defined or dynamic - set and fixed. To do this, the defined starting point is first in the track diagram Route and then, within 5 seconds, click on the destination of the route (in the example of the SpDrS60,   the keys are pressed simultaneously, of course this cannot be done with the mouse). Depending on the configuration of the route, the start and destination can be signals or buttons (control panels). A pressed button is displayed in blue for 5 seconds in the RSTW or a light wreath in the ESTW and ILTIS with a frame around the element concerned. If a route has been defined, the buttons are again colored red or gray or blue / brown, with ESTW / ILTIS the frame is hidden again. If the route could not be set and determined with Domino, the buttons for start and finish signals flash; the route has been saved.

ModellStellwerk differentiates between shunting routes and train routes. Train routes always lead from signal to signal, whereby train destinations (buttons) on the route or in the stump track are also possible as signals. A setting of the train route is only possible if both the start and the target element allow train routes and this train route is configured or dynamic route formation is switched on.

Train roads in the prototype always have flank protection and D-way in order to be able to guarantee the greatest possible safety when train journeys. These can also be implemented in the model control room.

After pressing the start and destination signal / the destination button, the route test begins with the clearance test of the route. Blocks and switches must not be occupied and must not be reserved for other routes. The guideway elements, flank protection and D-way turnouts (if configured) are brought into the correct position and fixed. Only if the conditions are met will the start signal of the route display the projected signal aspect, the route setting indicator on the start signal (only SpDrS60 and ESTW) lights up. With Domino or ILTIS, the routes are defined when the track elements are illuminated

4.1   Direction of travel in routes

If a route is set, the direction of travel is set in all blocks of the route, with the exception of the start block, in accordance with the direction of travel specified when the route was planned or the dynamic route was specified during the dynamic generation. In the start block, the direction of travel is determined by the travel position of the signal, and changed if necessary. The direction of travel in the block is set so that it points in the direction of the signal that is pointing.

In the settings you can specify, if the direction of travel in the block is changed in this way, that the direction of travel of the locomotive must also be changed and that the locomotive also departs when the travel position is set (field "Departure after change of direction").

4.2   Examples of train journeys

For a better understanding, the procedures for operating and illuminating routes are shown below. The illumination of the track plan signal box is displayed.

4.2.1 Exit from the train station on platform 2

In the initial state, the starting track in front of signal N2 is occupied, the train from track 2 should exit onto the route to the right, but the exit is not yet set.

Start button
(Start signal)

Target button
(Route key)
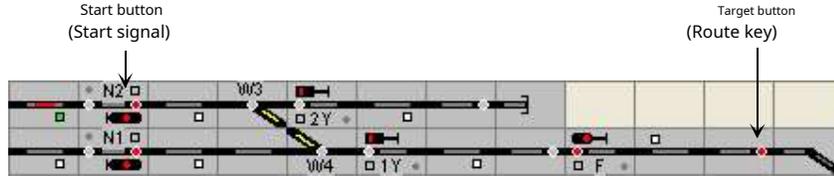
To set the train route for the exit, the start signal (start button) must first be operated, then the destination signal or, as here, the route button (red for train routes). This operation initiates the setting of the train route.
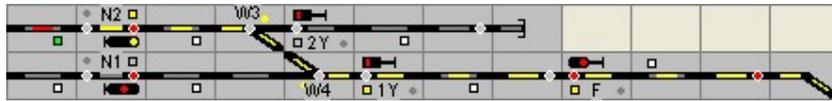
The exit from N2 to the route is set, the route is illuminated in yellow, all route switches (and, if applicable, side protection switches - but not available here) are locked (locking indicator lights up yellow), the signal shows the travel concept due to the route over switches in the branching line Hp2 -   ride with
Speed   limit - on.

The example was not in the Expert mode This is why the signal shows the signal aspect Hp2 in yellow, contrary to the original - in expert mode, the signal is illuminated in green, as with the larger model, regardless of the respective driving aspect.
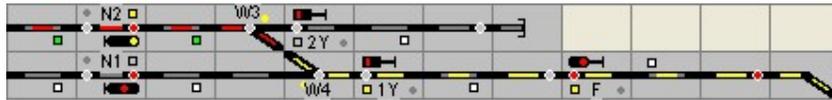
Train pulls out and is on switch 3,
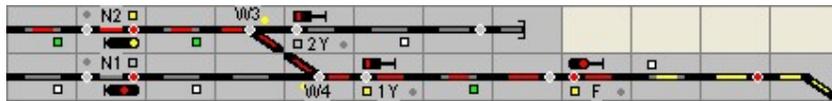
occupies switch 4 and moves out in the direction of the line.

In the meantime, the last car of the train has also cleared the starting track (no red illumination in the starting section), the start signal N2 stops (project planning: stop case with
Clearing the starting track).
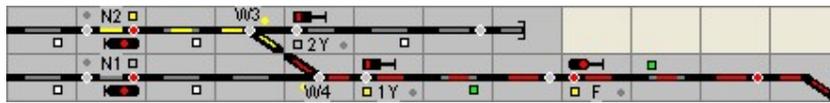
The train has occupied the route, the area of switch 3 is cleared again

The train is completely on the line, the route was through the
Signal box technology dissolved again.

4.2.2 Train journey from signal F to track 2

Target button
(Exit signal)

Start button
(Entry signal)
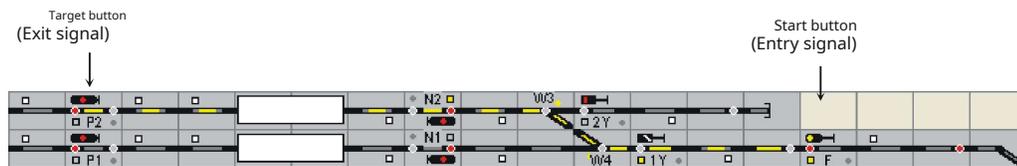
Entering the train station from the route is handled in a similar way, the route setting is made by pressing the "entry signal" and "exit signal" buttons. In the example, the train journey is set from entry signal F to exit signal P2. The blocking signal 1Y located in the route is automatically set in motion (signal as part of the route)

4.2.3 Route with slip path

Route of entry signal A in track 5 (signal N5) set. Slip path goes over the switch 63 (left position), DKW 66 and DKW 67, recognizable by the yellow locking indicators and the D-way indicator at the signal N5. The point position indicators are switched off on the table shown, so the position of the other points on the table cannot be recognized!
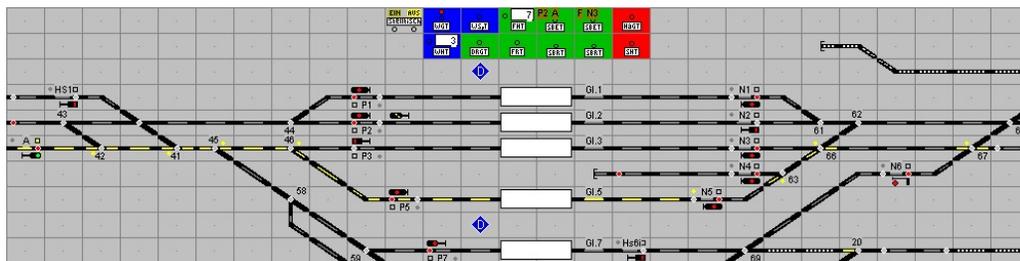
In contrast to this, the position indicators of the turnouts were switched on in the following picture. The D-way can only be recognized by the locked switches (63, 66 and 67) and by the D-way indicator on the N5 signal.
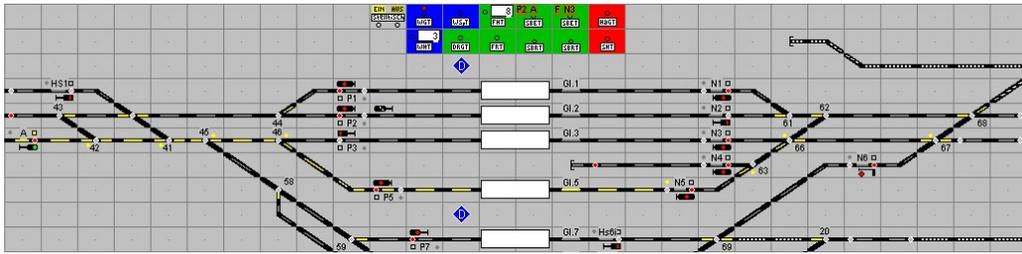
The route is resolved, but the D-way has not yet been resolved (the D-way indicator on the signal and the locking indicator are still on).
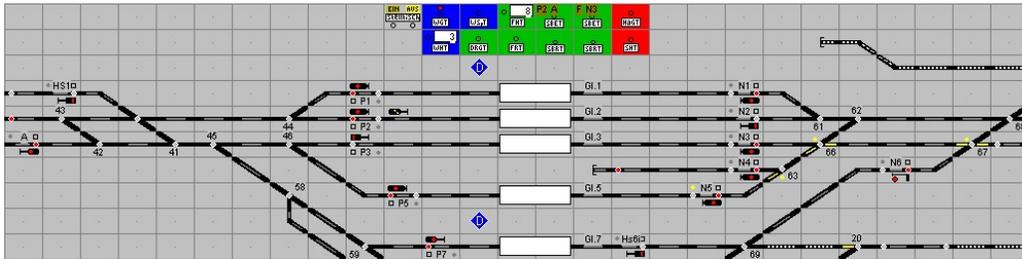
4.3 Setting of train routes

A train route is set by operating the start element and
Target element of the train route

SpDrS		When you press the button on the start element (signal or button), a hand is displayed. After pressing a valid destination button (signal or button), the route is set, the button for the start signal is displayed in red again.
ESTW		When the start element is operated (signal or train start without signal), it is framed for identification shown. With service one permissible Target element (signal or train destination without signal) the Route set, illuminated accordingly, the frame is deleted.
domino	or	When the button of the start element (signal or button) is operated, it is colored white. After pressing a valid destination button (signal or button), the route is set, the button for the start signal is shown again with a red dot.
ILTIS		When the start element is operated (signal or train start without signal), it is framed for identification shown. With service one permissible Target element (signal or train destination without signal) the Route set, illuminated accordingly, the frame is deleted.
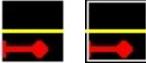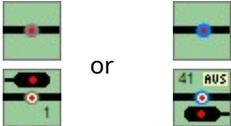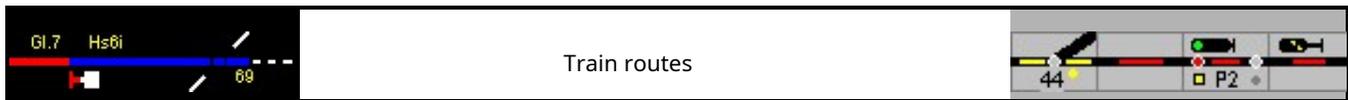
With Domino'67 and ILTIS, an exit train route in expert mode can only be set prototypically if the block in front of the signal is occupied or a route is set to the start signal. This test is only carried out if the block is a "station block" before the start signal and the expert mode is switched on.

If a route is set on the route from a station, the direction of travel on the route is checked. If the route is defined as a central block, if all conditions are met, the direction of travel is set on the route in all blocks up to the next switch. All signals on the route are also controlled in the driving position. However, if the route is defined as a route block, the direction of travel must first be set correctly by submitting / requesting permission. If the conditions on the route are not met, the route is not set.

4.4 Route memory

With the Swiss interlockings Domino'67 and ILTIS it is possible to save a route. If a route is set and the route cannot enter because not all conditions are met - e.g. because a switch is locked in another route or a track is occupied - the route is saved. Flash for dominoes

Start and finish button, with ILTIS the signal symbols are framed in gray and the Route marked with a dotted green - train route - or blue - shunting route - line. If the conditions can be met, the route runs automatically.

A saved route can be deleted before it is approached. In the Domino'67

first press the memory clear button (SPL) and then the destination key. In ILTIS the memory can be deleted from the context menu at the destination signal (SLZ / SLR - delete memory train / shunting route in expert mode - or "delete memory").

4.5 Occupied track

Train journeys cannot simply end on an occupied track. However, it is possible to set a route to an occupied track. With the DB interlocking types, the route is entered, the points are switched and locked, but the route is not determined. The signal remains on hold. You can now approach the substitute signal. The route can be withdrawn with the FRT.

The route is saved for the SBB interlocking types. Then the route can

can be set with the 'occupied track' button (BG,) and the button on the target signal. The signal shows FB 2 or 40 km with signal type N and the 'busy signal'. An exit signal should be switched to dark.

4.6 Dissolving train routes

After driving on the train route and reaching the projected dissolution criterion, the train route is automatically dismantled and all route elements can be used for further train journeys. Depending on the project planning, the train route is resolved when all blocks are free again or when the projected destination has been reached. If the route is cleared by an automatically moving train, it is only cleared when the destination is reached if the block is long enough for the train. If the train does not fit into the block, the route will only be closed when all blocks are free.

With a so-called auxiliary action, the route auxiliary resolution, an erroneously set train route can be disbanded again without a train journey being carried out.

4.6.1 Stop of the start signal

If, when configuring the starting block of a route, it is not specified that the signal is only switched to the stop position after leaving the block, the signal falls into the stop position as soon as one of the blocks or turnouts in the route is reported as being occupied.

If the signal stops, the train number is also deleted at SBB interlockings.

4.6.2 Stopping the start signal of the train route

Exemplary must be in the Experts-mode the start signal of the train route can be stopped with the stop group button before the route can be closed.

Signal box	First button / menu selection		Second button
SpDrS	HAGT Holding group button		Signal button
ESTW	Menu: HAGT		
Domino '67	Emergency stop signal - SNH		Signal button
ILTIS	Menu: NHZ - emergency stop train journey NHR - emergency stop shunting		

If the block is occupied, the locomotive is stopped immediately in the event of an emergency stop signal.

4.6.3 Dissolving train routes

The route is resolved by operating the SpDrS route auxiliary button FHT / ESTW: Route auxiliary resolution FHA and then using the start and destination buttons of the route to be resolved. The route is then released again and the route auxiliary button is reset again. Alternatively, a route can be released if the start and destination buttons are clicked one after the other while the

(Shift) -Button is pressed.

The dissolving of train routes is an operator action that has to be counted. The dispatcher has the reason for the operation in the fault book with the respective number of the counter document.

Signal box	First button / menu selection		Second button / command	Third button
SpDr	Route auxiliary button		Start signal	Target signal
SpDr (alternative) route auxiliary button			Switch button	
ESTW	Menu: at the target signal		FHA	
Domino '67	Emergency resolution - NAUFL.		Target signal	
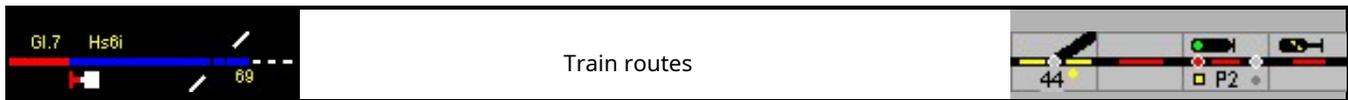
ILTIS	Menu: at the target signal	NAZ

Alternatively: (Shift) -Begin (Shift) -aim

4.6.4 Dissolution of the slip path

The slip path is also determined together with the route, provided this has been configured. When the route is resolved, the slip path becomes after
Configuration automatically resolved or not resolved. In the last   Case must
Slip path can be resolved manually

Signal box	First button / menu		Second button		third button
SpDrS	Slip back take group key	DRGT	Route back key	FRT	Target signal
ESTW	Menu: DA at the target signal, if it is not automatically resolved				
Domino '67	Domino: the slip path is always resolved with the driveway				
ILTIS	ILTIS: the slip path is always resolved with the driveway.				

Note: In the track plan signal boxes, the D-way had to be resolved by hand in the past; an automatic D-way resolution was only implemented in the interlockings built later or partly by retrofitting older interlockings.

The automatic D-way resolution is implemented as standard in the ESTW.

4.6.5 Further options for route setting

Under Extra - Settings - Processing - Automatic departure after driving position can you can choose whether and after what time a locomotive or a train leaves after a route has been set and the signal is driving.

Not	No automatic departure
With the ALT key	Automatic departure if the ALT key was pressed when setting the route (click on the start and destination button)
always	Automatic departure for train and shunting journeys
Always on train journeys	Automatic departure only for train routes

The time until departure can be set in seconds under 'Basic departure break'.

The speed to which the train / locomotive is accelerated depends on the signal position, the specifications in the block definition and the train or shunting run.

This possibility of automatic departure is offered for routes. There are no routes in the route block, here the train will always depart automatically according to the position of the signal. To do this, however, 'Section block' or 'Central block' must be entered as the block type.

If the train was stopped at a red signal by the model switchboard, then the train will accelerate again to its original speed after the signal is set to run with these options.

5   Shunting routes

In contrast to train routes, shunting routes have lower requirements for safety technology. Shunting routes are usually used without flank protection, have no D-route and can also lead to occupied (target) tracks. A required flank protection can be set up in the route form.

5.1   Examples of shunting trips

The setting of shunting routes is carried out in the same way as the train routes, it is only to be noted here that shunting routes are operated by buttons and or signals that can signal shunting runs.

SpDrS			gray buttons
ESTW			Click on the symbol
domino		or	Gray / blue button for direction
ILTIS			Click on the symbol

5.2   Setting of shunting routes

A shunting route is selected if a shunting signal or a button is "pressed", ie clicked with the left mouse button, either as a starting point or as a destination, in other cases a train route is defined. A shunting route at an exit signal (SpDrS) can be defined if the (Ctrl) -

Button is pressed. If one of the two buttons can only be used to set up shunting trips, a shunting route is set automatically.

5.2.1 Shunting from track 2 to the protection section

Start button
(Start signal)

Target button
(Shunting destination)
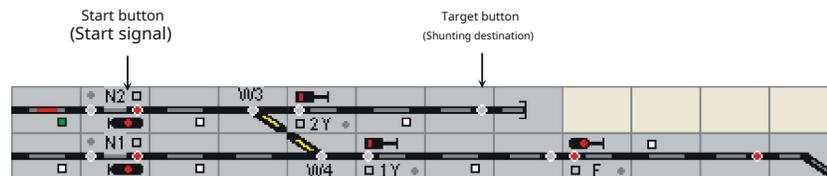
Our train is back on track 2 in front of the N2 signal. The signal N2 is implemented as the main blocking signal and can therefore also signal maneuvering trips. The shunting target is located in the guard rail section (buffer stop). Guard tracks are set up on the prototype in order to be able to offer the continuous main track side protection.
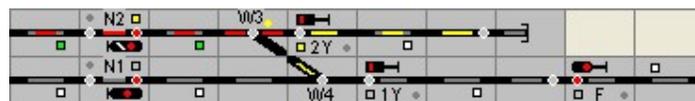
Maneuvering to the protection section is set, the signal N2 signals with the signal aspect Hp0 / Sh1 the permission for the maneuvering, the maneuvering unit has already driven through the switch area of   switch 3

Meanwhile the target track is occupied, the signal N2 has already been stopped (stop when the target section is reached)

The starting track is cleared

The shunting unit has fully arrived at the target track, the shunting route has been disbanded again

5.2.2 Shunting from the protective section in track 2
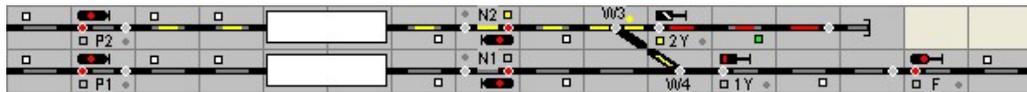
Protective section occupied, shunting in track 2 stopped, signal 2Y shows Sh1
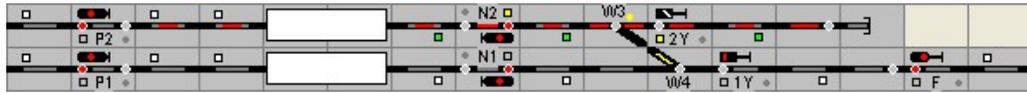
The shunting unit has occupied track 2
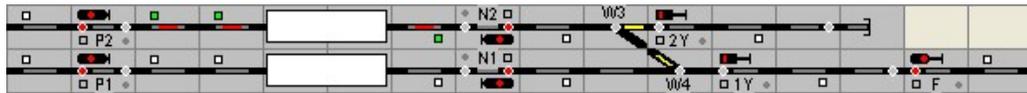
The shunting unit has completely reached track 2, signal 2Y has stopped again, the shunting route has been disbanded again.

5.3 Dissolution of shunting routes

5.3.1 Dissolving shunting routes

The start signal of a shunting route (in contrast to train routes) must be prototypically before the shunting route is closed Not be stopped!

The route is resolved by operating the route return button FRT / Bauf (ESTW: route resolution FA) and then using the start and destination buttons of the route to be resolved. The route is then released again and the route auxiliary button is reset again. Alternatively, a driveway

can be released when the start and destination buttons are clicked one after the other while the (Shift) -Button is pressed.

Signal box	First button / menu selection	Second button	Third button
SpDr	FRT	begin	aim
ESTW	Menu: FA at destination	-	
Domino '67	Company liquidation - BAUF	Target signal	-
ILTIS	Menu: BAR at the destination	-	

Alternatively: (Shift) -Begin (Shift) -aim

6th   Single element controls

Although the train journeys usually take place on fixed routes, it is also possible to set points and signals individually in the track diagram. In the prototype, this is also possible for turnouts, but not for main signals and shunting signals in routes!

In certain designs of pushbutton interlockings that have not yet implemented shunting routes, shunting signals can be set in motion with the SGT button.

6.1   Explanations

The designations for largely identical functions are sometimes designated differently in the track plan signal box than in ESTW / ILTIS. This is primarily due to the fact that the track plan signal box speaks of "buttons" which, of course, do not exist with ESTW / ILTIS.

If the expert mode is switched on, only the short names are displayed in the menus, in SpDrS and Domino the menu commands are only available for the special functions of the model interlocking.

If the option - Extra - Settings - Processing - Automatically switch off auxiliary keys - is activated, it is switched off again after each use of this function. If this function is not activated, the desired functions can be carried out on several elements one after the other. Pressing the control panel again switches the function off again. This option corresponds to the function of the buttons in the operating line.

6.2   Single operations switch

6.2.1 General information on points

If a turnout is locked in a route, the turnout can no longer be set. It is only possible to set the turnout again when the route has been closed. A locked turnout is indicated by the lighting of the lock indicator.
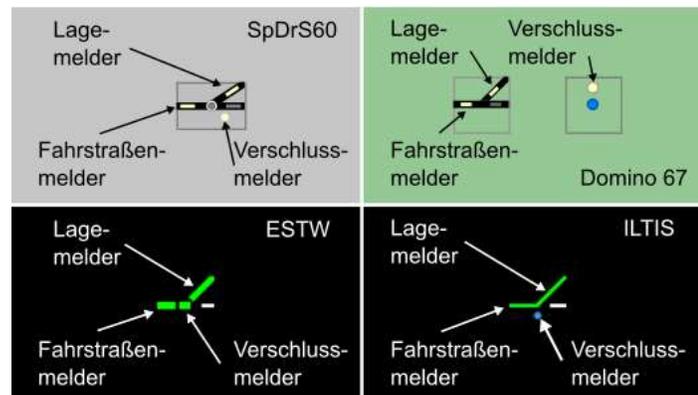
The illuminated switch position indicator shows the set switch position.

The switch position indicator only lights up:
1. if the switch is part of a route,
2. if the switch is defined as a flank protection switch,
3. when the turnout is locked,
4. when the switch button is pressed or
5. when the permanent illumination is switched on.

The permanent illumination of the point position indicator can be done via the setting table button or in Properties - design - always show position indicator be switched on.

With the ESTW / ILTIS, the point position indicators are always illuminated.

SpDr / D'67	ESTW / ILTIS	description
	-	The table illumination is switched on, ie the point position indicators are always displayed
	-	The setting table illumination is switched off, ie the switch position indicators are not displayed when the switches are not used

The route position indicator lights up when the turnout is part of a route. When a turnout is blocked, the red turnout blocking indicator (SpDrS) lights up. If a turnout is occupied by a train (and this is specified in the definition of the turnout data), the direction indicator and the route indicator light up red.

The function is only active if under - Extra - Settings - Design - Setting the course always show - is not marked.

Alternatively, the turnout location is illuminated with a click on the turnout button.

6.2.2 Individual switch conversion

Signal box	First button / menu selection		Second button	
SpDrS	WGT		Switch button	
ESTW	Context menu: at the turnout	WU		
Domino '67	control		Switch button	
ILTIS	Context menu: at the turnout	WU		

If the expert mode is switched off, turnouts can also be switched with a double click; ESTW / ILTIS always offers this option.

A turnout only changes its position in the track diagram when the command has been successfully sent to the control center or, in the case of turnouts with feedback of the position, the position message has been received. If several turnouts are to be set at the same time, e.g. during initialization, or in a route, then it takes a certain time until the turnouts are switched on the layout. The number of turnouts that have to be set is shown in the status bar.

As long as the turnout on the system has not been changed or the new position has not been reported back (motorized turnouts), the turnout position indicator flashes.

With the right mouse button a turnout can be switched to the basic position (reset), a possibly existing interlock is then also canceled.

6.2.3 Crossings, single and double cross points

Crossings offer two driving options and a neutral position in which they are not illuminated.

Single and double cross turnouts

 ac ad bc bd

A crossing switch can have 4 positions in the track diagram, even if it only has one drive. With the individual switch changeover, all 4 positions are passed through.

There is an intersection switch selection button on the table (screen) 'KWT'set up - only available with SpDrS, with this button the drive for the individual changeover - 'down' (left Side), 'cd' (right side) can be selected.

Signal box	First key		Second button	Cross switch	Result
SpDrS	KWT				

If the 'Expert mode' is switched on, the second button is for the KWT is toggled   ng required. with a 'double click'.

For ESTW and in the Swiss interlockings, Domino and when controlling via ILTIS, crossings are always set up with 2 normal switch symbols (Domino with 2 switch buttons).

Attention: The control of an EKW with two external buttons is possible to a certain extent; programmed routes work - the dynamic route setting is allowedNot be released.

6.2.4 Locking switches to prevent them from being changed

It is possible to use the mouse in the switchboard to lock turnouts against switching. If a turnout is blocked, it can neither be changed with the mouse nor by setting a different route, not even in automatic mode. This turnout can still be used in routes as long as the requested position of the turnout is available. When the turnouts are blocked, the turnout blocking indicator is illuminated in red.

The changeover lock can be removed again with the same operation.

Signal box	First button / menu selection		Second button		Result
SpDrS	WSpT	WS.T	Switch button	(image)	(image)
ESTW	Context menu: at the turnout	WUS WUE	-		(image)
Domino '67	Turnout final WEV	WEV	Switch button	(image)	(image)
ILTIS	Context menu: at the turnout	WVE WVAU	-		(image)

6.2.5 Converting an occupied turnout

In contrast to the WGT, the turnout auxiliary key operation also has one as busy reported turnouts are changed. In the example, these operations are so-called countable actions and are registered. This counter is also implemented in the model switchboard and, if the switchboard illumination is selected -Extra - Settings - Design - from Siemens (large) and SpDrS60 (photo) also shown. The number of
Auxiliary acts are counted.

Signal box	First button / menu selection		Second button	
SpDr	Turnout auxiliary key - WHT	WHT	Switch button	(image)
ESTW	Menu: Soft	WHU	) °	
Domino '67	Isolation bypass for switches	ISO.UMG. WEICHE	Switch button	(image)
ILTIS	Menu: Soft	WIUM	) °	

) ° In this case, a note is displayed in the original which must be confirmed.

6.3 Individual operation signals

6.3.1 Stop signals

These buttons work for the main signals. These buttons can be used to stop a signal showing the journey. The stop position of the signal is prototypically necessary to
To be able to dissolve train routes

Signal box	First button / menu selection		Second key / command	
SpDrS	Holding group key - HaGT		Signal button	
ESTW	Menu: Put the signal on hold		HAGT	
Domino '67	Emergency stop signal - SNH		Signal button	
ILTIS	Menu: Emergency stop train journey		NHZ	
	Menu: Emergency stop shunting		NHR	
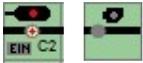
6.3.2 Switching signal aspects

With this external button, blocking and cover signals (only SpDrS) can be switched without setting a route. In the prototype, this button and function is only available for individually set up signals that are not dependent on the route. After the position of travel the train drives
does not turn off automatically.

For all other types of interlockings, this   Button a locking signal / dwarf signal in
Are brought to a stop position.

Signal box	First button / menu selection		Second key / command	
SpDr	Signal group key SGT		Signal button	
ESTW	Menu: Lock signal		SHT	
Domino '67	Lock signal auxiliary key SH		Signal button	
ILTIS	Menu: dwarf signal		NHR	

Individual operation of all SGT / SH buttons in the   Signal types in all interlocking types with the
operating line is possible for test purposes.

The SGT / SH key is used for this   /   and then the signal button. The
SGT / SH button remains until it is switched off again. In addition to stop and travel, only the
other commands that are stored with an address are output.

6.3.3 Setting the level crossing

Automatic - The level crossing is switched on with the driveway; if the barrier is closed, the route is set and locked. After the set
If the route is cleared, the level crossing is opened automatically.

Close manually: External buttons or menu

Signal box	First button / menu selection		Second button		Result
SpDrS 60	Power button		Track button		
ESTW	Switch on UE transition				
Domino '67	Close the barrier		Track button		
ILTIS	BZU - close barrier				

Open manually

Signal box	First button / menu selection		Second button		Result
SpDrS 60	Auxiliary resolution button		Track button		
ESTW	Switch off UHA transition as an alternative				
Domino '67	Open barrier		Track button		
ILTIS	BVAU - open barrier, remove lock				

Permanently close and open level crossing - only SpDr60 and ESTW

Signal box	First button / menu selection		Second button		Result
SpDrS 60	Permanent switch-on button		Track button		
ESTW	UDE - switch on transition to permanent switch-on				
SpDrS 60	Permanent switch-off button		Track button		
ESTW	UDA - switch on transition to permanent switch-off				

6.3.4 Other operations

		This key can be used to switch Windows, menu and operating lines off and on again. 1. Windows line 2. and menu and operating line 3. all back on
		Axle counting reset button (axle counting reset) inactive
		Axle counting reset button active With the command sequence AzGrT - block an occupied track vacancy detection section can be reported as vacant. Expert mode marked: ESTW: AZG / ILTIS: AZ on the block This command does not make any sense in the case of contact routes; it is actually only useful for track vacancy reports based on momentary contacts. Note on the prototype: The axle counting basic setting is an operating action that must be counted; the reason for the basic setting must be documented with the respective number in the fault log.

6.4 Auxiliary keys in the operating line

ModellStellwerk has predefined buttons for special operating actions (auxiliary actions) in the operating line.

SpDrS and ESTW,   Domino and ILTIS.

These have largely the same functions as the buttons that can be configured in the table (RSTW) or on the monitor screen (ESTW).

Exception: The WGT / SGT and SGT / SH buttons remain active after operation; pressing this button again deactivates the function.

The FHT / NAUFL. Button is deactivated again after an operation, ie it must be activated again before a new FHT / NAUFL. Operation.

The other functions of these 3 buttons are analogous to the functions of the respective buttons described above. With SGT / SH, however, all signal positions can be used to be selected; Always stop and drive, the rest of them are stored as far   them with an address as possible.
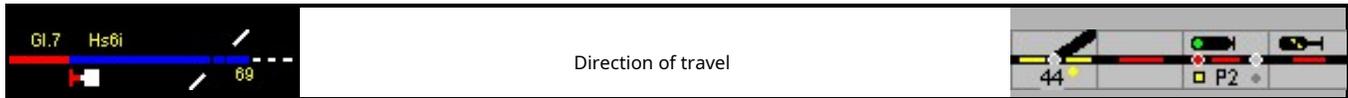
7th   Direction of travel

7.1   Generally

In model control systems, it is important that the direction of travel is set in each occupied block so that the software knows which signal must be considered for stopping and which feedback devices are responsible for braking and stopping.

The direction of travel is automatically recognized in the software:

1. if the block is only accessible in one direction,
2. if a route is set,
3. when the train is reported,
4. when the occupancy detector switches on and,
5. when a signal in the block is switched to drive.

In addition, the direction of travel can be set in the block from the context menu.
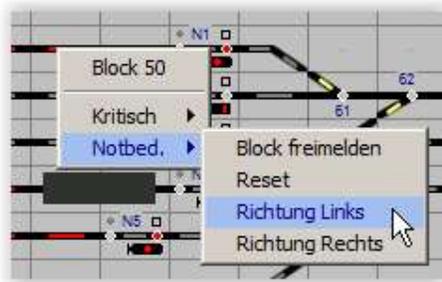
The direction of travel in the block can optionally be displayed in the train number field:
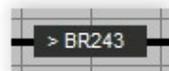
Alternatively, the direction of travel is shown with the permission symbol, this symbol is used on the route between 2 train stations, but can also be used in train station blocks, but this does not correspond to the original.

If the direction of travel is changed in the block, the direction of travel of the locomotive does not change, if the direction of travel of the locomotive changes, the direction of travel in the block also changes.

7.2   The distance

If a train is to travel from one station to another station, the route between these stations must be free, no route should be set in the opposite direction and the 'permission' for travel in the desired direction must have been 'given';
ie the setting of the direction of travel must match.

There are 2 ways to determine the direction of travel.

Model interlocking offers two techniques to plan a route between two train stations:

1. Central block - the basic position of the block signals is stop - and
2. Distance block - the basic position of the block signals is drive.
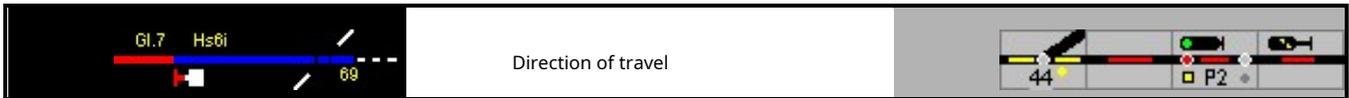
7.2.1 Central block

In the central block, the direction of travel of the route is automatically determined when a route is set on the route and the conditions are met. If the blocks between the stations are set up as a "central block", the permit is automatically changed when the route is set, but only if these blocks are not occupied and no route is set on the route.

If a route is set, then all blocks up to the next train station change direction and the block signals in the direction of travel switch to 'drive'. The forwarding runs until the next turnout, until the next occupied block or until a block is not defined as a 'central block'.

With SBB interlockings, the direction of travel is always set automatically in large-scale operations. Central block should always be selected as the block type.

SpDr / Domino '67	ESTW / ILTIS	description
		Permission to the left
		Permission to the right
		No permission set - this illumination does not exist on the prototype, in ModellStellwerk this illumination is required for reasons within the program and can only be seen when the program is started.

7.2.2 Track block

The section block is only available for relay interlockings. All track tracks between 2 stations are either fixed in one direction, ie can only be used in one direction, or are tracks that require a permit. Permission-dependent means that either the interlocking to the left of the route or the interlocking to the right of the route is permitted to send trains on the route. If a train is to travel the route in a different direction, permission must first be given to the station from which the train is to leave the route. This is a technical interlock to avoid train collisions

DB: The dispatcher (Fdl) from station A offers the train to his neighbor. If the route is free and no train schedule is set, the operator of neighboring station B gives permission; to do this, he presses the EaGT button and the track button.

In Switzerland, this reporting procedure is only provided for in the event of a malfunction. The train traffic controller (Zvl) from station A requests the 'free train' (SBB). If the route is free and no train journey is set, the Zvl from station B agrees to the request. For program reasons, the DB method is also implemented in Domino in the model signal box. To do this, the Zvl in station B presses the 'Release track track' button and the track button.

Now the courier / Zvl in station A can set the exit.
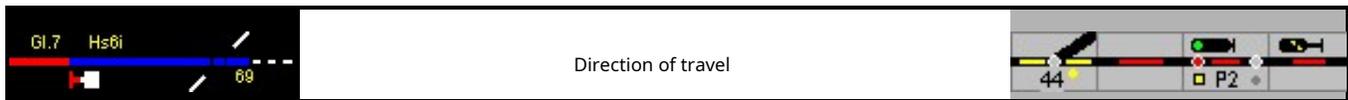
Signal box	First button / menu selection		Second button	
SpDrS	Permit issuance button		Permission button	
ESTW	nv			
Domino '67	Agree to free rein		Track button	
ILTIS	nv			
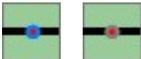
The direction of travel is always set in the direction of the EaGT button (calculated horizontally) (DB) or determined by the color of the track button (SBB).

Expert mode: The permission / direction of travel can only be changed if all blocks on the route are free and no exit route is set. If the permission changes, all signals in the direction of travel are set to 'drive' and the signals in the opposite direction are switched to 'stop'. In all blocks of the route, the permission fields show the same direction of travel.

If the expert mode is switched off, the direction of travel can always be changed and it can also be selected in both directions. The permission fields in the blocks must all be switched individually.

7.2.3 Hold on to the free path

The Railway operations - even in large-scale operations - do not always run according to the timetable, the sequence of trains then has to be rearranged and the automatic system of the central block can be switched off. With Domino and ILTIS, the commands 'Hold free path' and 'Release free path' are provided for this purpose; in the case of SpDrS and ESTW, agreements with the FdL must regulate the sequence of moves.

So that the command can be executed, the outgoing direction must be set beforehand by a train ride or by the command 'Request free path' - see below
Route block.

Signal box	First button / menu selection		Second button		Result
domino	Hold on to the clear path		Track button		
ILTIS	Hold on to the clear path	FBH			
domino	Release a free path		Track button		
ILTIS	Release a free path	FBF			

8th   Self-setting

Ever larger setting areas require the dispatcher / train traffic controller to be relieved of repetitive simple tasks. This can be, for example, the automatic setting of a route.

The self-setting operation (SSB) / automatic signal operation (aSB) is a technical device that was implemented for the first time in the track plan signal boxes and can set a specific train route based on a defined signal. This means that, depending on the design, a partially or fully automatic sequence of train operations is possible even without the constant involvement of a dispatcher.

With the self-positioning 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 train station are included in the self-service operation. When the self-setting mode is switched on, the occupation of the block route registered by the track vacancy detection system causes the entry train route to enter automatically before the entry signal and, if necessary, subsequently, e.g. B. for a passing train, also the automatic entry of the exit train route.

SBET (self-setting mode switch-on button) and SBRT (self-setting mode reset button) can switch self-setting mode on or off for a maximum of 3 signals each. The self-setting mode is switched on or off when this key is pressed first and then the respective signal during operation. These buttons are positioned in the switchboard. If the SSB is switched on, the signal number is highlighted in yellow.

In order for the SSB / aSB to be active,

1. Enter the destination of a route for self-setting mode in the signal data (see manual part 1),

2. the SSB / aSB on the signal and

3. Train tracking must be switched on.

Example:
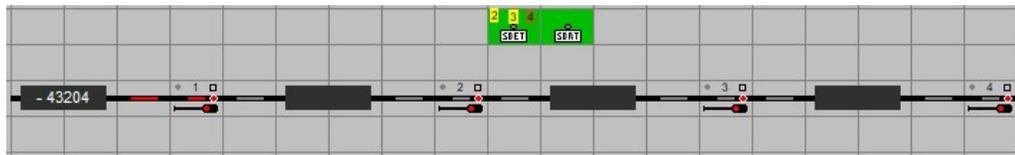
The SSB for signals 2 and 3 is switched on, in the 1st block there is a train in front of the signal.

If the route from Signal 1 to Signal 2 has entered and is set, the occupancy of the 1st block section through the active SSB / aSB also the route from signal 2 to 3.

If the 2nd block section is occupied, the route from signal 3 to 4 comes in.
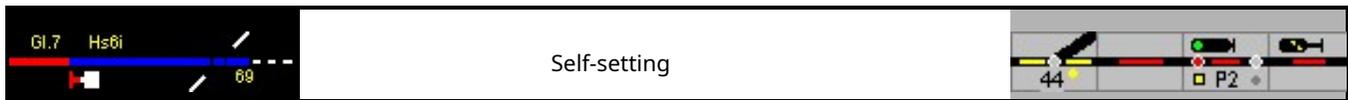
If the self-setting mode (SpDrS) is switched on, this is indicated for a maximum of 3 signals by a yellow square in the SBET keypad. In the figure, the self-setting mode is switched on for the first signal. With Domino, the automatic signal mode is displayed in the signal symbol itself. The ASE and ASA buttons can be used for more than 3 signals.

With ESTW, the signal number is shown in color when the self-setting mode is switched on, depending on the signal position (red / green). The symbol changes in ILTIS - filled / unfilled triangle.

The specified route is defined when the block at the end of which the signal is located (under "Stop for signal" in the definition of the blocks) is occupied. The SSB can only function if it is known in the block which of the two signals the train is approaching and which signal the route must be set from. The direction of travel in the block must therefore be known. As soon as the direction of travel in the starting block is known, the route is set. Normally, during operation, the direction of travel with the train number is passed on from the previous block, and at this point, before the train occupies the block, the route is set.

The route is of course only determined if the points can be set and the blocks are free.

On a signal with SSB / aSB, trains in automatic mode will optionally only select one route if the self-setting mode is switched on. The rules of automatic mode are then followed here, not the route specified in self-setting mode
(Can be set in the options - 'AutoZug always runs at SSB').

8.1 Switch on self-setting mode

Signal box	First button / menu selection		Second button		Result	
SpDrS	Self-setting Power button - SBET For signal A1 on and A2 off		Signal button			
ESTW	Menu: Self-setting mode on - SBE					
Domino '67	More automatic Signal mode on - ASE		Signal button			
ILTIS	Menu: Self-setting mode on - ABE					

8.2 Switch off self-setting mode

Signal box	First button / menu selection		Second button		Result
SpDrS	Self-setting reset button - SBRT	SBRT	Signal button	N2	A1 A2 SBET
ESTW	Menu: Self-setting mode off - SBA	A1			A1 · A1
Domino '67	More automatic Signal mode off - ASA	ASA	Signal button	EIN	AUS A1
ILTIS	Menu: Self-setting mode off - ABA	A1			A1

If the SSB / aSB is switched on for a signal, a train in the block in front of it will trigger a 'push' which will set the planned route if the criteria for it are met.

If the route cannot be set: SpDr / ESTW: The

trigger is lost.

Domino: The route and the trigger are saved in   A126 A226 D234   Display panel
            the signal number lights up. If all requirements are met, the road will be closed.

            If an alternative route is to be set or if the train ends in this block, the trigger
            and thus also the saved route must be deleted.

ILTIS: The route and the trigger are saved, the signal is with

            a green circle   or   marked. Are all prerequisites
            tongues fulfilled, the road is closed.

            If an alternative route is to be set or if the train ends in this block, then the
            trigger and thus also the saved one must be initiated
            Route to be deleted.

8.3 Delete kick-off

Signal box	First button / menu selection		Second button	Result	
SpDr	Impetus is lost				
ESTW	Impetus is lost				
Domino '67	Delete operate signal	SIG. BED. LÖSCHEN	signal AUS A1	A126 A226 D234	A126 A226 D234
ILTIS	Menu: operate signal delete - SBL				

8.4 Protective caps

Protective caps are used where erroneous operation must be avoided. To the left or right of the

external buttons there is a shelf for the protective caps:

A maximum of 6 protective caps can be placed on buttons from this shelf. If a button on a signal, turnout or track has a protective cap, it can

can no longer be served.

You put a protective cap on by pulling a cap onto the respective symbol from the shelf. The cap is removed again when the cap is in the tray
withdraw.
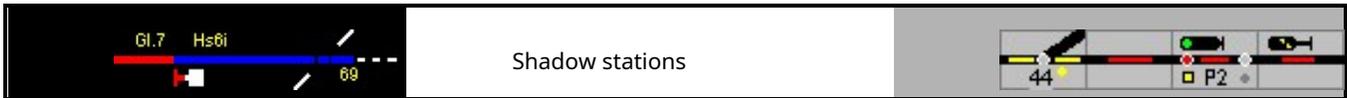
9   Shadow stations

Tracks in a shadow station can be switched off (ie blocked). No trains will then be directed to this track and no trains will depart from this track.

A barrier can be configured in the entry block and in the shadow station tracks.

SpDr / ESTW / Description		
D'67	ILTIS	
		Track not blocked
		Track blocked

If the entry block is blocked in this way, the automatic staging area for this station is switched off. |

A shadow station can be operated via a popup menu. The menu is opened by left-clicking the station button at the shadow station:

This button is linked to the station via the number in the list next to the button and can thus operate the station. The menu can also be used to switch the control process on and off.

The shadow station entrance becomes active when the entrance block is occupied and the train number in the entrance block is known.

Menu for controlling the shadow station

```
Schattenbahnhof 1
✓  Eingeschaltet
●  In Reihenfolge
   Beliebig
   Nicht ausfahren
   Durchfahren

   Jetzt abfahren
```
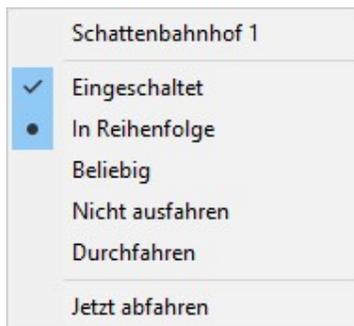
See also manual part 1 - 8.2.2.2

Important: If you are not working with train tracking, train tracking must also be switched off in the shadow station control.

10 Train number reporting

An occupied block is illuminated in red in the track diagram. If train tracking is active, a train number can be entered for the train in the occupied block. This train or locomotive number is now updated in the track diagram as the train drives on the layout.

A train number is entered by clicking on the train number field

10.1 Entering the train number

The following options are available for this:

1. Click in the train number field, then enter the train or locomotive name. To [Input] Searches for the ModellStellwerk in the list of defined trains and locomotives to see whether this name is defined: The letters entered are compared with the defined train and locomotive names. Train names are the names of the trains from the train list of the fully automatic operation. If all letters entered match the beginning of a train name, then this train is set in the block. If not, the letters entered are compared with the names of the locomotives. If a locomotive is found, this locomotive is placed in the block. If no locomotive is found either, this name is recorded as a "foreign" locomotive,

2. From an open locomotive or train window, drag the locomotive or train name with the mouse into the train number field,

3. Click on the train number field, then enter a (L) followed by the internal number of the locomotive.

Names of well-known locomotives and trains are shown in different colors. The color also depends on the background color. The name is only shown if the block is occupied. In the settings, the display can be used for debugging purposes
switched on permanently.

Train type	Background color dark	Background color light
Locomotive	White	black
Train from driving plan or auto matic operation	Light green (ESTW / ILTIS) Set color (RSTW, D67)	- (ESTW / ILTIS) Set color (RSTW, D67)
address	blue	blue
Unknown	gray	gray

If a block is shown as occupied in the track diagram, but it is not because, for example, a locomotive has been fetched from the track or a block is illuminated as not occupied but is occupied because, for example, a locomotive has been placed on the track, the occupancy message can be changed when with the right Mouse button is clicked on this block and in the context menu under emergency operation 'report block occupied' or 'report block free' is selected.

When changing from the GO mode, the train / locomotive numbers are saved separately. If the blocks are reset, e.g. if the operation is from the basic position (initialization), then the locomotive numbers can again withExtra - restore train number copied back into the blocks. This is only possible if the blocks are occupied, illuminated in red, and the model switchboard has not been closed.

Signal box	Expert mode on	Expert mode off
SpDr	BR181	BR181
ESTW	BR181	BR181
Domino '67	10015	10015
ILTIS	10015	10015

10.2 Train indicator menu

The move indicator menu is opened with the right mouse button.

This menu shows the menu items of a block. As an extra, a locomotive window can be opened to operate the locomotive that is currently in the block, and the train can be stopped in the block (train emergency stop).

11   Feedback contacts

In the track diagram, the feedback contacts can be switched with the mouse when the symbol is clicked. When pressed, the contact is switched on, when released it is switched off again. A contact remains switched on if you pull the mouse away from the symbol before releasing it.

During the control it makes no difference for ModellStellwerk whether a contact has been switched on by the train or the mouse. However, a contact that is switched on by a train cannot be switched off with the mouse.

		Manually operated feedback contact switched off, track free
		Manually operated feedback contact switched on, track occupied

This manually   Operable feedback contacts can be used for the simulation of Contacts / contact paths can be used on the system. If you want to (or can) do without this option, then these manually operated contacts are not required.

11.1 Message monitor
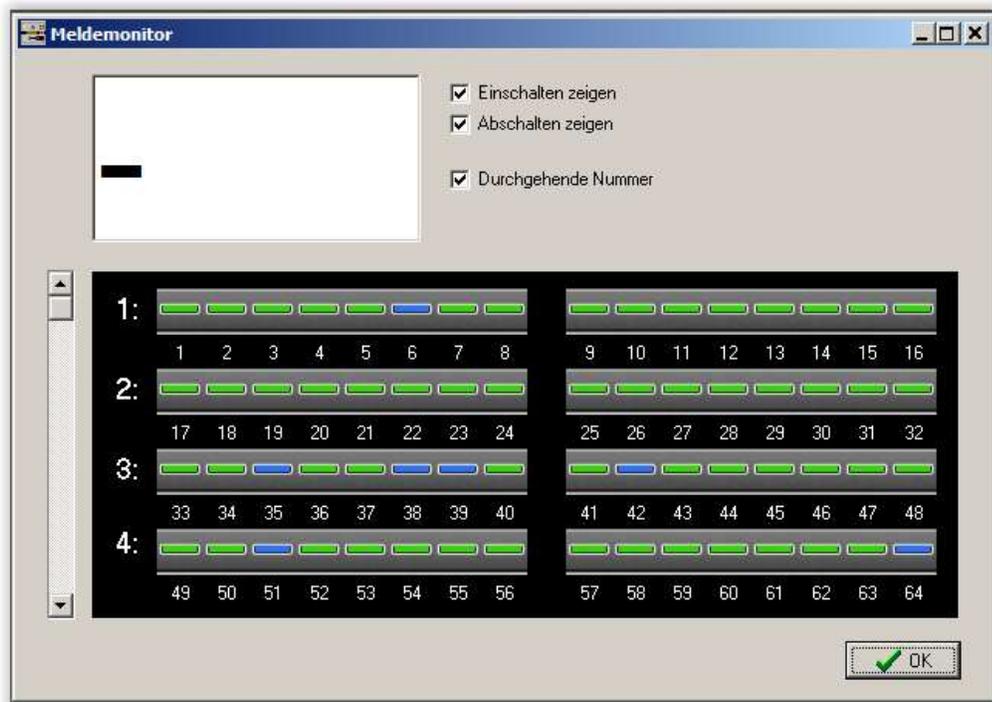
The message monitor shows the status of the feedback contacts during operation. When the signal contact was switched last, the activation and / or deactivation of the contacts can be displayed. The window is scalable in height.

green   the signal contact is free

red   the signal contact is switched on / occupied by a vehicle

yellow   A debounce time has been set on the detector that
has not yet expired - Manual 1 - 6.4

blue   Detectors operated with the mouse (feedback contacts) and.
the detectors that are switched directly with the mouse in the message
monitor. They switch the system like the contacts triggered by the trains.

Gray   the signal contact is not available ..
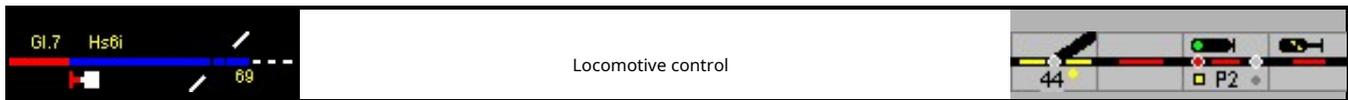
12th   Locomotive control

When switching to GO mode, all locomotives are stopped, the direction and functions are retained. However, only those locomotives are stopped that are listed in the main list; this is set in the locomotive data.

12.1 Automatic control

Locomotives and trains can be controlled with routes. If the train is known in a block, the locomotive will react to the signal positions. If a route is set and the signal is in the running position, the locomotive will automatically depart. Likewise, the locomotive is stopped in front of the stop signal and the speed in the blocks is maintained.

12.1.1 Departure

The behavior for the automatic shutdown can be selected in the settings:

> Not: The locomotive will not leave after the position has been set; the locomotive must then be controlled in the locomotive window (see manual control 13.2).

With the <alt> key: The locomotive will only drive off automatically if the <alt> key is pressed when setting the route.

Always on train journeys: The locomotive always departs automatically when a train route is set

> Always: The locomotive always drives off automatically on train and shunting routes

The locomotive waits a certain time after it has been set to run before it leaves ("departure break"). This pause can generally be set in the settings, but can also be set individually for each block (manual 1, 6.4.4.11).

The selected speed depends on the signal position, the set block speed and the maximum speed of the locomotive or train.

Trains (with the specified length) only accelerate when the whole train is in the block.

12.1.2 Brakes

The locomotives are braked automatically by the software:

> in front of stop-indicating signals,
> in front of signals that signal slow travel, in
> blocks at low speed, in fully automatic mode.

The braking behavior depends on the block settings and whether the locomotive is calibrated. The block length must be entered for gentle braking. See also the description of "braking behavior" on the website.

Block with only one detector, stopping point in cm

A non-calibrated locomotive will brake to a standstill with the braking behavior set for the locomotive when the block reports that it is occupied.

A calibrated locomotive will brake when the occupancy is reported so that it stops at the specified stopping point.

If the locomotive has to brake too slowly for this, the braking point is shifted so that it does not brake slower than 1.5 cm / s_2

Block with occupancy indicator and stop indicator

A non-calibrated locomotive will brake with the braking behavior set for the locomotive when the block reports that it is occupied. When it reaches the stop indicator, it will stop.

A calibrated locomotive will brake when the occupancy is reported so that it has reached crawling speed 30 cm before the end of the block (entered block length - 30 cm). When it reaches the stop indicator, it will stop.

Block with occupancy indicator, brake indicator and stop indicator

A non-calibrated locomotive will brake with the braking behavior set for the locomotive when it reaches the brake indicator. When it reaches the stop indicator, it will stop.

A calibrated locomotive will brake when it reaches the brake indicator so that it has reached crawling speed 30 cm before the end of the block (entered block length - 30 cm). When it reaches the stop indicator, it will stop

Breakpoint

A passenger train can stop on the left, in the middle or on the right in a block. The length of the block, the position at which the train should stop and the length of the train are used for the calculation. Freight trains always stop in front of the signal (manual part 1, 6.4.4.6 stopping point)

If it is a short block, the locomotive is braked in the previous block so that it can stop in time.

12.2 Hand control

The locomotives are controlled via the locomotive window.

The speed of the locomotive can be adjusted with the slide bar, with [V] and [R] the direction of travel is changed. The number of speed steps and the functions shown are determined by the defined locomotive data.

When the locomotive window is active, the speed can alternatively be set with the cursor keys (/) or can be changed with the mouse wheel.

The direction of travel is changed by pressing the space bar or by tilting the mouse wheel.

The (Input)-Button controls the function (F0). The button's (F1) - (F8) control the functions. All functions are achieved:

without button: functions 1 - 8, with (Shift)

Key: Functions 9 - 16, with (Old) Key:

functions 17 - 25, with (Shift) + (Alt) Button:

functions 26 - 31.

Another locomotive can be in the locomotive window

the buttons (PgUp) and (PgDn),

by entering the locomotive number or

can be selected by dragging a locomotive from an occupied block or from another locomotive window.

If in Extra - Settings - Processing If the 'Locomotive selection also for control' is marked, locomotives can be controlled from the locomotive list.

The window shows the locomotive name or, if the locomotive is attached to a train and the train is active, the train name.
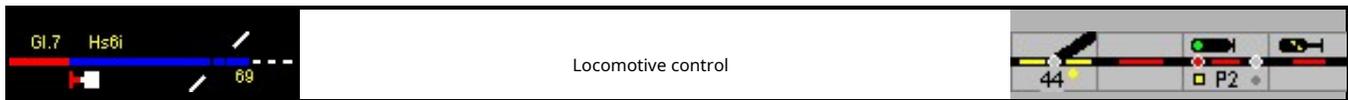
Tip: if you also want to see the locomotive name in train operation, you can enter this as the function name (default setting is light).

By double-clicking on the locomotive window, the locomotive can be edited, even during operation.

	Settings menu for locomotive control and locomotive data processing
Manual operation	Switching the manual mode on and off. If the locomotive is running in manual mode, the speed will not be increased to a block speed if the locomotive is running slowly. During the calibration on the main track, it is recommended to switch on manual mode.
Main list	In the locomotive list only those locomotives are listed for which 'main list' is marked in the locomotive data.
calibration	Switching the automatic calibration on and off for this locomotive. If the calibration is switched off, the speed step table is no longer automatically updated when driving on the measuring section.
Multi-traction	Here you can set up pre-tensioning or multiple traction for up to 4 locomotives. The locomotives can also be added by dragging them from a block or another locomotive window if the (Ctrl) - Button is pressed.
To edit	The locomotive data window opens

12.2.1 Locomotive selection

 This button opens the locomotive list with the defined locomotives.
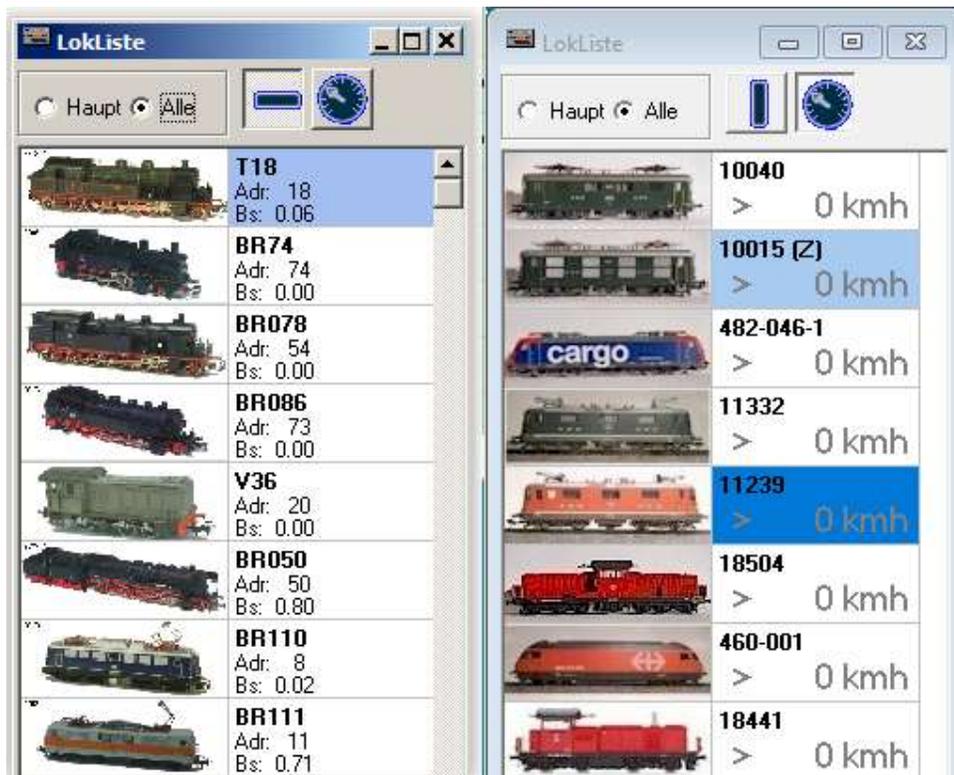
The list (left) shows all registered locomotives with a picture and also name, decoder address and the operating hours.

If the speed display (top right) is pressed, the figure, name, direction of travel (in the block) and the set speed in km / h are shown (right).

With (Z) it is indicated that the locomotive is permanently assigned to a train, the locomotive is also highlighted in blue,

By clicking on the respective image of a locomotive, this locomotive is shown in the last used locomotive window for control.

 If this button is pressed, the selected locomotive can be controlled in the locomotive list with the cursor keys, mouse buttons and the scroll wheel.
The selected locomotive can then be transferred to the last used locomotive window with a double click

12.2.2 Drag & Drop

Drag & Drop is a way of dragging data from one place to another in Windows applications. In ModellStellwerk drag & drop is used to drag locomotive numbers between the track diagram, locomotive window and train window. For example, a locomotive can easily be controlled in a block. First you click on the block (not in the train number field!). Then move the cursor from the block to the locomotive window with the mouse button pressed
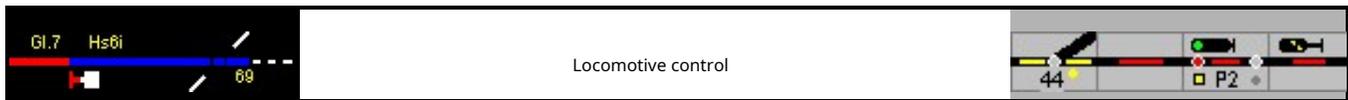
drag and release the mouse button. The locomotive from the block is now open in the locomotive window and can be controlled.

BR110	Conversely, a locomotive can be entered in a block from the locomotive window. The locomotive has to be dragged into the train number field.
	Drag & Drop can also be used to compose a double traction. To do this, hold down (Ctrl) - Button to add a locomotive from the track diagram or from another locomotive window to the locomotive window. The added locomotive is now added to the operation of the locomotive; both locomotives are now controlled from one window at the same time.
	The locomotive of a train that runs fully automatically or according to the timetable can be dragged from the timetable into the locomotive window in order to change the speed of the locomotive or to switch the functions.

12.2.3 Multiple traction

A locomotive window can be used to control several coupled locomotives. So up to 5 locomotives in multiple traction can be controlled like one locomotive at the same time. The multiple traction can be set up in two ways.

Another locomotive can be added to a locomotive if the 2nd locomotive is dragged into the locomotive window and the (Ctrl) -Button is pressed (drag & drop).

	Locomotives can also be entered manually if 'Multi-traction' is selected in the menu in the locomotive window

In the four fields 1 to 4 locomotives are entered, which should run with the locomotive in the locomotive window in the opening credits. Locomotives from the multiple traction are driven by the [Clear]-button away

The function keys (F0) - (F8) affect only the first locomotive when controlling in multiple traction. Functions of the other locomotives must be switched in the window of the respective locomotive

Danger   The multiple traction is a property of a locomotive, Not from the locomotive window. If a second window is opened for operating the locomotive, it will also run in multiple units!

Danger   The multiple traction can only work properly if the mass simulation of the locomotives involved is greater than 0, and is preferably the same.
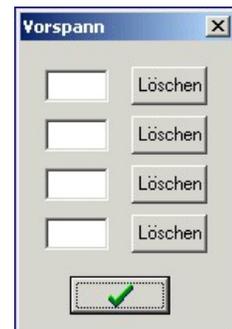
A note: There is another possibility to set up the multiple traction. In addition to the locomotive address under CV 1 or CV 17 and 18, a composite address (Consist Address) can be entered in CV 19. The locomotive can thus be addressed both on its normal address and on the network address. If this network address is assigned to another locomotive, both locomotives can be controlled together.

During operation, the locomotive and the vehicle must be assigned the network address in the locomotive window.

The locomotives must be calibrated and have a comparable speed step profile.

With this solution it is advantageous that the functions F0 to F15 can be individually activated for all vehicles via CV 21 and 22. But then you should also trigger the same functions! In addition to the multiple traction, this network address also offers, for example, trains with control cars, railcars with detachable sidecars or cars with their own decoders for lighting control, the joint switching on of the front / interior lighting, etc.

Details can be found in the decoder descriptions.

13th   Train tracking

ModellStellwerk has a unique train tracking algorithm. This train tracking enables model switchgear on the basis of the track diagram, the occupied and vacant reports of the blocks and the position of the signals - usually provided by routes
- to follow the trains on the model railway. The position of a train only has to be entered once. After that, ModellStellwerk always knows the position of the train. Since ModellStellwerk now knows where each train is, the program can brake and stop the trains depending on the signal position without the need for brake modules or power interruptions. Train tracking also works for manually controlled trains!

Train tracking also works for undefined locomotives and analogue controlled locomotives, but ModellStellwerk cannot brake and stop these locomotives because the controller does not know the decoder addresses. However, the name of the locomotive is displayed in the switchboard and is advanced when the name has been entered in the train number field.

Note: Train tracking only works if blocks are defined in the track diagram and these blocks have track occupancy reports. However, it is not necessary that all blocks receive a track occupancy report; only the blocks in which trains have to stop require track occupancy reports.

13.1 How does train tracking work?
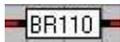
If the model railroad is operated for the first time with a model switchboard, the name / number of the train or the locomotive can be entered in the specific symbol in the track diagram, the train number field: If the signal in the block is now set to "Run" and is the The direction of travel is known, then ModellStellwerk will search for the next block in this direction that has a track occupancy message. The train name is transferred to this block and, if available, displayed in the train number field as well as the direction of travel.

The direction of travel in the starting block can be determined by ModellStellwerk in three / four ways:

1. the block is only driven in one direction,
2. It has been transferred from a previous block and is known
3. Indirectly specified by the entries in a route or
4. It is determined by a switching contact.

If the direction of travel is not yet known, the train number may not be passed on until the train has left the block.

If the train has arrived in the next block with a track occupancy signal, this process is repeated: the train number is passed on to the next block as soon as the signal in the block is / is set to "travel". If this block has no signal, the number is passed on when the train reports that the block is occupied.

When tracking trains, the locomotive number is also passed on to blocks, but the occupancy message has no signal.

As soon as ModellStellwerk knows which train has arrived in the block and thus which decoder address has to be addressed, the train can be braked and stopped. So no power interruptions are needed to stop the train. If the switching tracks also react to wagons, a pushed train with a control car can also stop right in front of the signal!

The following paragraphs describe the essential aspects that must be taken into account when using train tracking.

13.2 blocks

The blocks in which the trains are to be stopped have to Have track occupancy report. The signals must be entered. In addition, ModellStellwerk must know in which direction the train is going. This can be entered when defining the block (only travels in one direction), is determined by entries in the routes or is determined with intelligent evaluation of the feedback. The direction of travel is also passed on with the passing on of the train number.

13.3 Track diagram

You have to pay close attention to the fact that blocks have no "holes" in the track diagram: all track elements must connect to one another, there must be no branches in a block; a block always has exactly 2 end positions. A block that is not connected to a turnout or another block must be entered as a dead end.

13.4 Connections
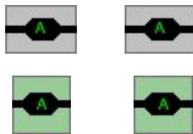
For reasons of space or to improve clarity, it may be necessary to divide a block. Connecting elements with the same number / the same letter at the ends of the track sections to be connected ensure the block unit.

When setting up, a number is requested, which is displayed on the screen starting with A for the number 1.

Connections can be used not only for a connection within a block but also for a connection between two blocks.
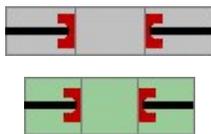
Connections can also be made with the tunnel symbols. A tunnel can be placed in a block or can be used to connect 2 blocks together. In this case, the tunnel entrances must be exactly opposite one another, vertically, horizontally or diagonally. There can also be other symbols between two tunnel entrances, e.g. crossing tracks. When tracking trains, ModellStellwerk will, if it detects a tunnel entrance, continue to search in the direction in which this tunnel entrance points and find the next entrance (in this case exit).

13.4.1 Show locomotive or train number in the track diagram
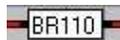
Locomotive or train numbers are shown in the track diagram in the train number fields. These are twice as wide as normal symbols and can represent the first 5 characters of the small symbols, the first 10 characters of the large and photo-realistic symbols, and the first 8 characters of the locomotive name for ESTW / ILTIS.

These symbols are positioned like the other symbols in the switchboard.

When starting the program in the basic position or when a new train is placed on the track, the train or locomotive number must be entered. This can be done in the following ways:

1. After clicking on the train number field, the train or locomotive name can be entered. After this entry, ModellStellwerk checks whether this name has already been defined: the entered name is compared with the already known train and locomotive names. Train names are the names of the trains that run according to the timetable. If the entered

Name matches the beginning of a train name, then this train is set in the block. If there is no match with the train name, the name is compared with the locomotives that have already been defined. If a locomotive is now found, this locomotive is placed in the block. If no locomotive is found either, this entered name is recorded as a "foreign" locomotive,

2. by dragging a locomotive or train name from an open locomotive or timetable window onto the train number field,
3. After clicking on the train number symbol, an L and then the internal number of the locomotive can be entered or
4. automatically by the RailCom train number reporting system from Tams - see the relevant section.

Names of known trains are shown in blue, names of known locomotives are shown in black, names of trains from the timetable are shown in green and unknown locomotives are shown in red. However, the name is only shown when the block is occupied.

13.5 Routes

When a route is defined, ModellStellwerk searches for a known locomotive number in the start block of the route. If a number is found, it is copied into all blocks of this route. For this it is important that these blocks are not occupied by other trains. If there is still no move in the starting block, then the number is not passed on yet.

13.6 Stopping automatically before a signal

A signal at the end of the block can be defined in each block. If a train now enters a block, the position of the signal is taken into account. If the signal is on "Halt", the train will brake to its "30km / h speed" after passing the brake contact. After the stop section has been occupied, the train will stop if the signal indicates a stop or it will brake to the projected speed.

If the following signal is set to "Run", the train will continue to travel at the set speed.

However, if the train is stationary and the signal is set to "running", the train will start again. If the signal is set to "Slow", the train will accelerate to the projected speed as long as the speed limitation applies and then accelerate again to the previously set speed.

The braking point depends on a number of settings and properties.

13.6.1 Blocks without a brake indicator or brake point

With occupancy and stop indicator

When a locomotive has been calibrated and the length of the block has been entered, the train is braked when the block is occupied so that the locomotive has reached crawling speed 30 cm before the end of the block, stop quickly when the stop indicator is occupied.

If the locomotive is not calibrated or the block length is not entered, it is braked when the block is occupied with the delay set in the locomotive properties to creep speed, and stopped when the stopping section is occupied.

Receipt detector only

If the block has only one detector, the locomotive is braked so that it comes to a stop at the   30 cm in front end of the block.

A non-calibrated locomotive is braked to a standstill when it is occupied.

13.6.2 Blocks with a brake indicator or brake point

In the case of blocks with a brake indicator, the braking behavior described above is only initiated when the brake indicator is occupied. However, if the braking point is specified in cm, then this only works for calibrated locomotives, non-calibrated locomotives are driven on Blocks already braked.

14th Automatic mode

When the automatic mode is switched on, ModellStellwerk can control up to 64 trains fully automatically on the model railway layout. The prerequisites for automatic operation are dynamic or manually set up routes, set up blocks and defined locomotives as well as functioning train tracking.

The trains are put together in operation.

The button opens the window for entering, editing and operating the automatically moving trains. The window can be opened in edit mode and in GO mode.

Trains are saved in a separate * .zug type file. The trains can be read in and saved in the File menu. As soon as a file name is known, the current configuration of the trains (composition and operating status) is saved in this file every time you switch from GO mode.
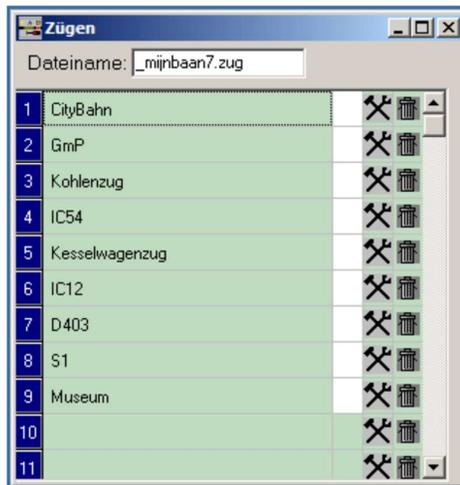
In this window each line contains a move.

	These buttons show the operational status of the train
(white)	inactive
(green)	active and drives
(yellow)	Train is waiting for a route because it is not yet available or because the waiting time for a planned stop is still running. The time is written in the button.
(red)	no valid route can be found (in the current version this button also lights up red if the train is running in block mode without routes). An error code is shown in the button 2 no route available 3 No route found for trains 4 No route with overhead line found 5 Train too long for possible destinations 6 Entry into the possible blocks is not permitted 7 The train cannot turn and has to turn at the finish
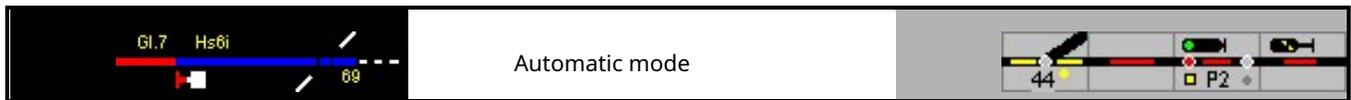
✕	The button opens the editing window for the train with a double click
🗑	Button removes the train
ℹ	Shows in which block the train is located

14.1 Put trains together

Surname: the name of the train is entered here, this name is shown in the switchboard

Locomotive: Specification of the locomotive of the train, with [Select locomotive] the locomotives can be selected from the list of defined locomotives.

Length: the length of the train is to be given here.

Train type: Automatically moving trains are grouped into train types. In the block data, it is then specified for each type of train how a train must behave in the block. There are 16 train types (ICE, IC, Regional-Express, Regional-Bahn1, Regional-Bahn2, S-Bahn, Güterzug1 and Güterzug2). The names of the train types can be changed in the settings.

Top speed: Maximum speed of the train. The train will never travel faster than this speed in automatic mode.

Can turn: Here it is indicated whether this train has the possibility to change the direction of travel (railcar or push-pull train)

Always register as a train: When RailCom detects a locomotive, it is registered in the model control room. ModellStellwerk will then show and control the locomotive in the block. But if the locomotive pulls a train, it is not the locomotive that is registered in the block, but the train. But this is only the case when the train is active (button is green). If the check mark is set here, a locomotive is always registered as a train, even if the train is not active (at rest).

The data can be changed at any time, even during operation. The data is automatically saved when changing from Go mode.

14.2 Trains run

Before a train can run automatically, the name of the train must be entered in the block (see 13.4.1).
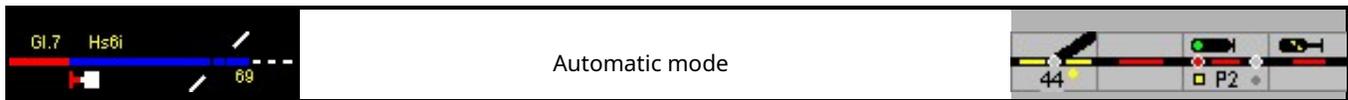
In the first part of the manual, when planning the blocks, it is described how the respective train types select the routes.

Button starts or ends automatic mode

Every train that is actively switched will always search for a permitted route in every block and then set it. If no route is available, a new attempt is made every 5 seconds to set a new route. If no permitted route is defined for this train type from this block, the operating status is shown in red with error code 2.

Before a train is activated, it must be ensured that the direction of travel of the locomotive matches the direction of travel in the block, otherwise there is a risk that the train will leave in the wrong direction (without a route).

It is possible at any time to take over the operation of an automatically moving train. If, for example, no route is available for a longer period of time, a different route can be set. After driving through this route, the train will automatically resume automatic operation.

If the button for the operating status is switched to inactive (white), the train runs until the next stop signal and then stops. After setting a route, the train will continue to run until the next signal. Automatically moving trains can also be controlled with the control panel; when the next block is reached, the speed is set again according to the permissible block speed. Trains can also be stopped in this way.

If the automatic mode is switched off, the trains (or the train) will run until the next stop signal and then stop (because no more routes are set).

On a signal with self-setting mode SSB / aSB, trains in automatic mode will optionally only select one route if self-setting mode / aSB is switched on. The rules of automatic mode are followed here, not the route specified in self-setting mode (can be set in the options).

14.2.1 Self-setting mode

You can choose in the settings ("Autozug always runs with SSB") whether the self-setting mode for signals (see Chapter 8) switches the automatic mode on or off at this signal. If this setting is not checked, automatic operation will not take place on a signal with self-setting mode switched off. If the self-setting mode is switched on, the automatic mode works on this signal.

If the setting is checked, the automatic mode is automatically switched on for all signals.

15th Sounds

ModellStellwerk can play sound files at different events. The sound files, Windows WAV files, are entered in the sound input window.
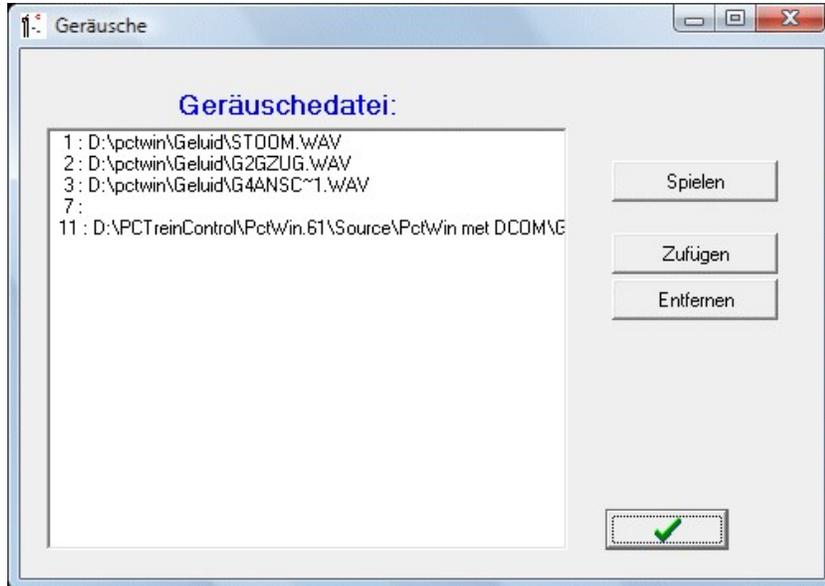
This window is opened from the Edit menu or with the button. In this window every sound is given an internal number. This number can be entered in blocks and routes to reproduce the sound of different events.

In macro programs, sound files can be saved with the PLAY command be reproduced. The internal number of the sound must be specified for this. Sounds can be added to this list or, after selecting a line, they can be removed again. With the button [play] the sound that was selected in the list is played.

In the main window, the last played sound can be opened again with the button. be reproduced.
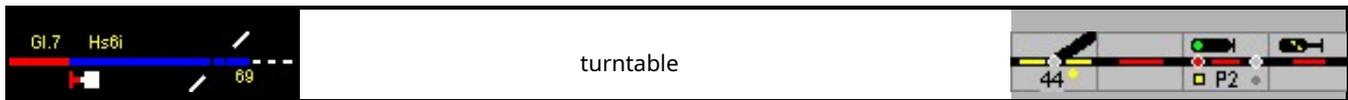
16   turntable

The turntable from the Märklin digital system, catalog number 7687, can also be controlled with the model control unit. The turntable can turn one step to the left or right, turn directly to a selected track or turn the locomotive by 180 °.

The button displays the turntable control in a separate window

The built-in tracks can be configured in edit mode, the turntable is operated in operating mode. The tracks of the turntable are numbered clockwise on the turntable itself and also in the turntable window. Track 1 is the right horizontal track in the window.

In order to be able to control the turntable in the Edits I system, the correct system must have been selected.

16.1 Edit

When ModellStellwerk is in edit mode, you can use the mouse to indicate the tracks that lead to the turntable. Possible tracks are shown in black, the selected tracks are shown in red. The system and the decoder address are also selected here
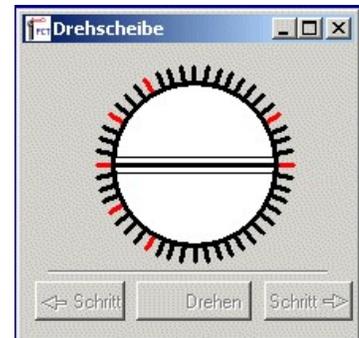
16.2 Operation

There are 4 functions available for controlling the turntable: step to the left, step to the right, turn by 180 ° and track selection. The turntable stage in the window shows the current position of the turntable. After starting the program it is possible that the display is not correct. In this case you can turn the turntable once to a certain track in order to synchronize the display in the model switchboard with the position on the model railway layout.

You can select a track directly, with the left mouse button then turns the 'front' of the stage to this track, with the right mouse button rotates the 'back' of the stage to this track.
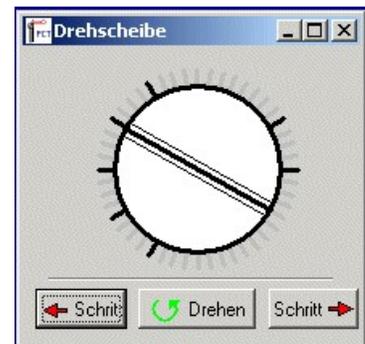
No new commands can be entered while the turntable is turning.

17th   Macros

ModellStellwerk offers the possibility of defining up to 200 macro programs. Macros can be called by:

The occupancy of a track section - when the detector is switched on,

'Start macro with detector' is marked in the macro window. The number of the detector and the macro are fixed. If the macro is to be started by a detector, this must be marked in the macro form - top right. The macro is started once when the detector is switched on; when switched on again only if the macro was finished. If the macro ends and the detector is still active, the macro will not restart.

a macro key.
To call it up with a macro key, the symbol must be set up on the table. Right-click on the icon and click on Edit to display the auxiliary button window. Under Type, select 'Macro key' and then enter the number of the macro.

As an action in a block.
It is to be selected under action 'Start macro' and the macro number to be entered under Value It can play sounds, switch functions, call further macros and this depends on the event (entry, braking, departure, ...) and per train / train type / locomotive type / Locomotive

when a route is set and the signal starts moving.
To do this, the number of the macro must be entered in the signal window.

Each macro can contain a command in a maximum of 30 lines.

Before macro programs are defined, the feedback decoder must have been defined, ie in the main menu is under Edit - feedback contacts indicate how many feedback decoders are connected.

A maximum of 200 macros can be defined in ModellStellwerk, whereby each macro can consist of up to 30 command lines. However, a macro can start other macros so that longer macros are possible. Macros can be used to set points and signals, set and define routes and control locomotives. This makes it possible to (partly) control the train automatically as desired.

With the main menu selection Automatic macros a macro can be entered or changed. In the configuration window you can specify whether the macros should be executed.

Macros can be reset, started and held in GO mode.

Macro processing switched on

If macro programs have been defined, the effect of the macros can be switched on and off with the button. When the button is pressed, the macros are processed

Macro processing switched off

If the macros are switched off and restarted by pressing the key again, they are first reset, ie they start again with the first line when processing.

With these buttons a specific macro is started from the control surface.

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ESTW and ILTIS

17.1 Define macro programs

A macro program is made up of up to 30 lines, with one command in each line. A command is followed / followed by no, one, two or three parameters. The parameters are in brackets and there is always a comma between the parameters. Unless otherwise specified in the command, the maximum value of a parameter is 255. Commands can be written in both upper and lower case in the macro. The possible commands are described below.

You can scroll through the macro with the cursor keys. When you press the CHECK button and the OK button, the macro is checked and saved. If the syntax of a macro is incorrect, an error message is issued. Functional errors
in macros can of course not be recognized!

Example of a macro.

This macro is started when detector 5 switches on. This macro lets locomotive 4 run around, ie automatically drive to the other end of the train and recouple there.

17.2 Saving and reading macro programs

The defined macros can be selected from the main menu Read file macros open and with Save file macros saved again. All macros are saved together in one file.

Under Settings - General a macro file can be entered. She will then with of the system file is loaded and started.

17.3 Program commands

Below is a list of possible macro commands and their meaning. Parameters are set in brackets and separated by commas, possibly with spaces.

E.g .: lok (3, 10) lets the locomotive with the internal number 3 run with speed step 10.

The parameters are all 16 bits, but the validity depends on the parameter type.

The macros are saved in plain text in a file and can (also) be changed with any editor. The files must be saved and loaded separately; they are not loaded with the system program

Variables (see 17.4) can also be entered as parameters.

switch (internal number, position)

Represents a solenoid <number> (turnout or a signal ...), position has the value 1 to 99

switch (internal number, position, lock)

Provides a magnetic article <number>, position has the value 1 to 99, turnout is locked switch

(internal number, position, unlock)

Locking of a turnout is removed (turnout is not set). The value of the 'Position' parameter is not important here.

example

switch (5, 2)   Sets point 5 turning.

switch (12, 3)   Sets signal 12 slowly (Hp2) - third position. Set soft 3,

switch (3, 1, lock)   straight and then lock it.

switch (3, 1, unlock) Release the lock of turnout 3. The entry for

the position can have the following values:

Switch:
Just	1
Branch	2

DKW - 2 drives
Just	1 (bc)
Left	2 (bd)
Right	3 (ac)
Diagonal	4 (ad)

Main signal:
Hp0 / halt	1
Hp1 / FB 1	2
Hp2 / FB 2	3
FB 3	4th
FB 5	5
FB 6	6 short driveway
Busy	(8) 7 occupied track (DB) or auxiliary signal (SBB)

Advance signals:
Vr0 / expect stop	warning	1
Vr1 / FB1 * 2		

Vr2 / FB2 *	3
FB3 *	4th
FB5 *	5
Lock / dwarf signals	
Sh0 / halt	1
Sh1 / trip	2
Attention	3 for signals based on the Swiss model

lok (internal locomotive number, speed step)

Makes a locomotive <number> run at the specified speed <speed>; <speed stage> is the command for the central unit - values 0 - 127. If a mass inertia has been defined for the locomotive, the target speed will be reached slowly.

It is essential to consider how many speed steps the locomotive decoder is set to. If the locomotive decoder is set to 28 speed steps, then no higher numbers than 28 may be entered for the speed step parameter.

Example:

loc (3, 8)   lets locomotive 3 run with speed step 8

The function command is used for the functions; the dir command is used to change direction.

lokkmh (internal locomotive number, speed step)

like lok (), only specification of the speed in kmh

dir (internal locomotive number)

Changes the direction of travel of a locomotive.

function (internal locomotive number, functions):

Sets the functions of a locomotive. 'Functions' is the sum of the following values   - each bit switches a function:

1 = switch on function 0 (light) 2 =
switch on function 1
4 = switch on function 2 8 =
switch on function 3 16 =
switch on function 4
. . . . etc.
32768 = Switch on function 15
Switching the functions on / off depends on the bits that have been set / deleted

0000 0000 0000 0000
function (number, 0)   clears all functions

0000 0000 0000 0001
function (number, 1)   turns on the light

0000 0000 0000 0010
function (number, 2)   switches function 2 on, the light off

7 =   Functions 0, 1 and 2 are switched on
6 =   Functions 1 and 2 are switched on, if 7 has been given a previous command, this means that function 0 is switched off!

functionnr (internal locomotive number, function, on):

Switches the specified function on (on = 'on') or off (on = 'off'), function has the value 0 to 31)

lokspeedslow (internal locomotive number):

Lets a locomotive continue to run at the "slow" (30kmh) speed.

lokspeedsfast (internal locomotive number):

Lets a locomotive continue to run at the "fast" (120kmh) speed.

route (internal route number, on / off):

Sets the switches and signals of a route and defines them (on) or releases a defined route again (off). Allows the train to depart even if the setting "Automatic departure according to travel position" is set accordingly.

Example:

route (5, on)   Sets route 5 and defines it. Releases route 5
route (5, off)   again.

contact (contact number, on):

Wait before executing the macro until the detector is switched on. Then runs
the macro continues.

example

The example shows a macro that allows locomotive 2 to run slowly and stops locomotive 2 after passing signal contact 5.

01 loc (2, 4)
02 contact (5, on)
03 loc (2, 0)

contact (contact number, off)

Waits (pause) before executing the macro until the signal contact is switched off. The macro then continues.

pause (seconds)

Waits (pause) with the execution of the macro until the specified time - in seconds - has expired. The macro then continues.

If the macro waits with this command and the system is switched to STOP, and then back to GO, then the waiting time will start again.

example

This macro causes locomotive 2 to stop (e.g. at the station) and continue after 15 seconds.

01 loc (2, 0)
02 break (15))
03 loc (2, 8)

pause (milliseconds)

Like pause (), but time in milliseconds. For very short times <100 ms, the
Time calculation not accurate.

ifcontact (contact, macro line)

> Leaves the macro   continue with another line if the signal contact
> is switched on.

> Example:

> 01 ifcontact (5, 7)   lets the macro continue with line 7 if signal contact 5 is switched on,
> otherwise the macro continues with line 2.

setcontact (contact, [0 | 1])
> Switches a user contact on or off.

goto (macro line)

> Lets the macro continue with another line (jump command).

> Example:

> 01 goto (5) lets the macro continue with line 5.

evil

> Plays the Windows sound "SYSTEMASTERISK".

stop

> Emergency stop

ifswitch (internal solenoid part number, position, macro line)

> The execution of the macro depends on the position of the turnout. If the position of the
> turnout corresponds to the second parameter, the macro is continued with line <macro
> line>. Position can have the values   1 to 99, see switch () command.

> example

> In this example, signal 3 is put on hold when switch 2 is turning, otherwise signal 4 is put
> on hold

> 01 ifswitch (2, 2, 4)
> 02 switch (4, 1)
> 03 end
> 04 switch (3, 1)

> In the example mentioned, it is important to specify "end", as otherwise the command with line
> 4 would still be executed.

ifroute (internal route number, position, line)

> The execution of the macro takes place depending on the set route. If the position
> corresponds to the second parameter, the macro is continued with line <line>. Position
> can have the values   on or off.

> Example:

> In this example, signal 3 is put on hold when road 5 is inserted, otherwise signal 4 is put
> on hold

> 01 ifroute (5, on, 4)
> 02 switch (4, r)
> 03 end
> 04 switch (3, r)

In the example mentioned, it is important to specify "end", as otherwise the command with line 4 would still be executed.

ifblock (internal block number, macro line)

Lets the macro continue running with line <macro line> if the block is occupied.

iflok (internal block number, internal locomotive number, macro line)

Lets the macro continue with line <macro line> if the block is occupied by locomotive <locomotive number>.

iftrain (internal block number, internal train number, macro line)

Lets the macro continue running with line <macro line> if the block is occupied by train <train number>.

iftraintype (internal block number, class, macro line)

Lets the macro continue running with the line <macro line> if the block is occupied by a move of the type <genus>.

Train type	genus
ICE	2
IC	3
Regional Express	4th
Regional train 1	5
Regional train 2	6th
Train	7th
Freight train 1	8th
Freight train 2	9
Interregio	10
GmP	11
Freight train 3	12th
Freight train 4	13th
Locomotive	14th
Museum train	15th
Measuring train	16
Sprinter / construction train	17th

example
Iftraintype (4, 3, 10)   if the IC occupies block 4, it will jump to line 10; for all other trains the route stored at SSB / aSB is set. The route set via the macro has priority.

start (macro number)

Starts the macro with number <macro number>. Number can have a value from 1 to 99

block (internal block number, on / off)

Reports a block occupied or free. The block is colored in the track diagram. If the message is clear (off), there is no train tracking, the locomotive 'disappears' from the track plan.

on (on) or off (off)

end

Terminates the macro. An end is not required at the end of a macro; it is there Macro ended automatically.

play (Number)

Plays an already loaded sound file, the number is the number of the file.

iftraintype (internal block number, type of train, macro line)

Lets the macro continue running with line <macro line> if the block is occupied by a train of the train type <train type>.

timetable (Timetable)

Starts the timetable <Timetable>.

17.4 Variables

The macro module from ModellStellwerk knows 26 program variables. These variables can contain values   between 0 and 32786. Every variable is available to all macros. If, for example, a value is assigned to a variable in macro 1, this value can be read again in macro 2. So the variables are all global. A variable is designated with a letter from A to Z.

Variables can also be entered as parameters in the other commands.

The commands for the variables are listed below.

let (var, value)

Assigns a value to one of 26 variables.

let (var, value1, value2)

Assigns any value between Value1 and Value2 to one of 26 variables

inc (var)

Increases the value of the variable by 1.

dec (var)

Subtracts 1 from the value of the variable.

add (var, value)

Increases the value of the variable by value.

sub (var, value)

Subtracts value from the value of the variable.

ifvar (var, value, line)

Checks the value of a variable. If this is equal to <value>, the execution of the macro is continued in line <line>.

ifvarg (var, value, line)

Checks the value of a variable. If this is greater than <value>, the execution of the macro is continued in line <line>.

NEW: The variables can also be used as parameters in the program commands, e.g.

Let (A, 10)

Inc (A)

Locomotive (A, 16)

Lets the locomotive 11 run at speed step 16

17.5 Commands for train tracking

The following commands can only be used when train tracking is activated.

blockspeed (Internal block number, speed step)

Gives the locomotive in the block the specified speed step.

blockspeedkmh (Internal block number, speed)

Gives the locomotive in the block the specified speed in km / h.

blockspeedprev (Internal block number)

Lets the locomotive in the block using one of the commands blockspeed, blockspeedslow or blockspeedsfast stopped driving at the previous speed.

blockspeedslow (Internal block number)

Lets the locomotive continue to run in the block at the speed defined for this locomotive under "30kmh".

blockspeedfast (Internal block number)

Lets the locomotive continue to run in the block at the speed defined for this locomotive under "120kmh".

blockdir (internal block number)

Changes the direction of travel of a locomotive in a block.

blockmove (from, to)

Helps train tracking by moving a locomotive number from block <from> to block <to>. This command can be helpful under special conditions in order to announce the locomotive number more quickly in a block.

blockmoveauto (from, direction)

Helps train tracking by moving a locomotive number from block <from> to the next block in <direction>. Direction = 0: to the right, direction = 1 to the left.

18th   Timetable

The timetable from ModellStellwerk is used to let trains run automatically on the model railway layout. The timetable consists of a clock and a maximum of 64 timetable tables. Each table allows a train to run time-controlled on the model railroad. This means that the timetable in the model switchboard essentially corresponds to the train control system used in the prototype, which takes over the timely setting of the routes based on the train number.

The timetable runs completely independently, but in combination with other parts of the program. While the schedule is running, additional trains can be controlled manually, the block protection, the shadow stations and the macro programs work.

The clock is the basis for the running of the timetables. When a certain point in time or a certain time is reached, the orders from the schedule tables are carried out. The clock shows the time in hours and minutes. How fast the clock runs (real time at model railway time) is entered in the settings.

The schedule tables indicate the orders for a specific train, ie each schedule table has a locomotive number (and thus a decoder address) and a list with a maximum of 32 commands. Several tables can be defined for a particular locomotive, e.g. one for the outward journey and one for the return journey. However, it must be ensured that both tables then do not run at the same time.

Each table line optionally has a point in time and a command. If the time has been entered, the command will only be processed as soon as this time has been reached. Ifno Time is specified, the command is processed immediately.

ModellStellwerk's timetable is mainly based on blocks, the commands are usually in the form of waiting until the train has entered a certain block and then receives a speed command. The distance to be covered is given in blocks and not with train stations as in the prototype operation. There are also commands to give a locomotive a certain speed, to set points and routes, to enter pauses and to wait for connection. Each timetable table can also be repeated. If a train is to travel the same route several times, only one table has to be defined.

Since the timetable is based on blocks, train tracking should be used in timetable operation. However, a timetable can also be created and processed with simple commands without train tracking.

While the schedule is running, some reactions from ModellStellwerk are different than in manual mode. For example, routes are only set when all blocks of the route are free. As long as this requirement is not met, the schedule waits for further processing. Trains that run according to the timetable react to signal settings and stop when the signals are red.

The timetable can be found in the (Extra - Settings - Processing - Timetable) in and out-be switched.

The timetable window can be opened with the button in the operating line. The timetable can be edited here. If no timetables are running, the clock will also stop. However, the timetable can also run if the clock is not visible.

18.1 The clock

The clock determines the time after which the timetable expires. It is displayed in a separate window that is opened when the button is activated on the main screen. The clock has a 24-hour display.

Under (Extras - Settings - Processing - sec. Per minute) indicates how fast the
Clock is running. It must be stated how many real seconds pass in a model minute, values   from 1 to 256 are permissible. This means that the model clock can run faster or slower than real time (between 60 times faster and approx. 4 times slower).

The clock is set by double-clicking on the clock. Enter the new time in the yellow field, 2 digits for the hours and 2 digits for the minutes. A separation is not necessary, the entry 0945 becomes 9:45 am.

If the clock is set while the timetables are running, the current commands of the timetables will continue to run normally without any time information, but if the timetable contains time information, these will only be executed when this new time has been reached.

If a schedule is repeated and the schedule does not run when the clock is set, then the next time at which the schedule starts again is searched first. For example, if a schedule starts at 10:00 a.m. and is to be repeated every 10 minutes and the clock is set to 11:12 a.m., the schedule does not start again until 11:20 a.m.

18.2 timetable tables

A table with commands is defined for each train that is to run according to the timetable. It is also possible to define several tables for a train, e.g. one for the outward journey and one for the return journey. However, it is important to ensure that the times do not overlap. A schedule table has several fixed dates and a list of commands. The timetable window can be opened in the main menu with (Automatic - timetable) be opened. The timetable window has the general data on the left and a memo field with commands on the right.
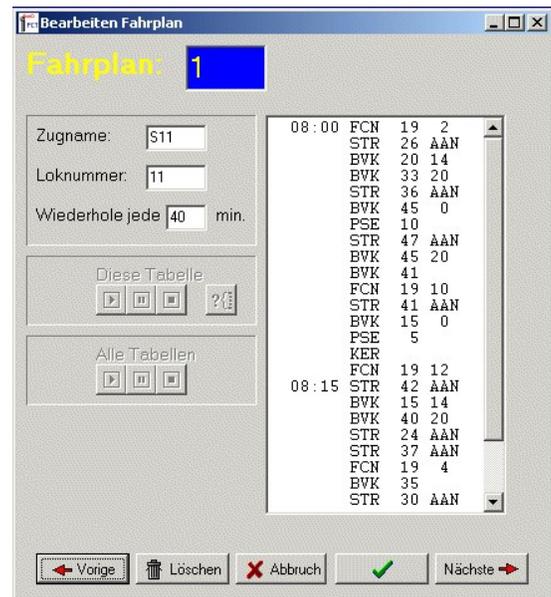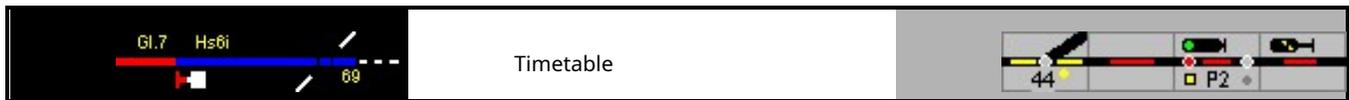
18.2.1 General fields

Train name

Enter the name of the train in this field. This name is shown in the track diagram when tracking trains.

Locomotive number

The internal locomotive number of the locomotive that drives this train must be entered in this field. Based on this number, ModellStellwerk knows which decoder address has to be controlled for this train to run.

Repeat each

> In this field you can specify that the commands in the table must be repeated periodically. If a number greater than 0 is entered here, the train will drive according to the table - every time the specified number of minutes have passed. This is repeated until the operation is terminated. Make sure that the train is in the starting block when it is supposed to run again. If a zero is entered here, the entries in the table are only executed once.

18.2.2 Commands

In the right memo field, you can enter a list of commands that the train should carry out in its timetable. There are 32 lines with one command each. A command consists of (optional) a point in time, the command and the parameters of the respective command. The time in a line is specified in hours and minutes, separated by a colon ":", and indicates when the command should be executed. If the point in time has not yet been reached, it will wait. The point in time can be omitted, the command is then executed directly.

The possible schedule commands are described below.

> <name> = name of the parameter, required [<name>]

> = name of the parameter, not required

Block (define speed in block)

> BVK <block number> [<speed step>]

> Waits until the train has arrived in the specified block and then lets it continue with the specified speed step. The speed step can be omitted. When the schedule is running, it is then waited until the train has arrived in the block, the speed level does not change. The speed step has no effect on the functions of the locomotive.

> If the train receives the order to stop (speed step 0) and the block has a stop section, the train will brake when entering and only stop when the stop section is reached.

Set the route

> STR <route number> <AAN | UIT>

> Sets a route (AAN = on) or releases it again (UIT = off). If a route cannot be set because, for example, a turnout is locked or a block is occupied, the schedule will wait until the route can be determined. It is therefore important that the train has the opportunity to stop by means of a signal in front of the route.

Turnout (or set signals)

> WSL <switch number> <L | G | R | V>

> Sets a turnout to the left, straight, right or releases the definition again. If a turnout is locked, the schedule will wait until the turnout is free again. Contrary to the original, this command can also be used for signals.

> Even if it is possible to set points by processing a schedule, this command should be dispensed with if at all possible and the route commands should be used instead.
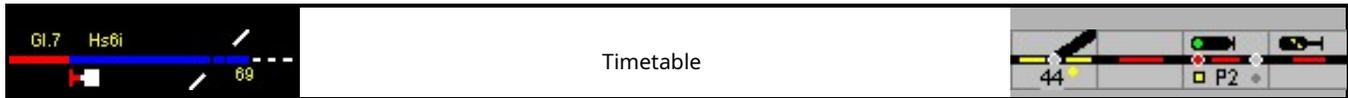
Annotation: The train routing in the DB AG signal boxes is also based on the projected routes

Wait for connection

ASL <block> <locomotive number>

Wait until the locomotive <locomotive number> has arrived in the block <block> (the train does not have to come to a standstill, however). This command can be used to wait for a connection between the train in this table and another train. The train from the timetable then waits on the platform until the locomotive of the other train has arrived at the platform.

Break

PSE <Time in real seconds>

The processing of the schedule waits until the specified time has passed. This command can be used to stop a late train in a station.

Change of direction

KER

Changes the direction of travel of the locomotive. After the switchover command, there is an automatic wait of 2 seconds so that the command is safely delivered to the locomotive. Danger: this command is executed immediately, even if the train has not yet come to a standstill.

Locomotive (speed control)

LOK <speed>

Lets the locomotive from the table run with the specified speed step, regardless of the block in which the locomotive is located. This command can be used to let a train run according to the timetable without train tracking.

LLS

Lets the locomotive from the table run with the speed step that is specified for the locomotive as "slow 30 km / h", regardless of the block in which the locomotive is located

LHS

Lets the locomotive from the table run with the speed step that is specified for the locomotive as "fast 120 km / h", regardless of the block in which the locomotive is located

Functional model

FCN <loc number> <function>

Switches the functions of a locomotive or a car with a function decoder. With this command, for example, the lighting can be switched on when the train enters a tunnel. Any vehicle address can be specified for the locomotive number, for example a car with a driver's cab. The functions to be switched each have their own value: 1 for F0, 2 for F1, 4 for F2, 8 for F3 and 16 for F4. Several functions can be switched at the same time by adding the individual values: eg function = 10 switches F1 and F3 on and F0, F2 and F4 off.

This command influences all functions at the same time - each bit for a function. If it is set, the function is switched on, if it is deleted, the
Function switched off.

Example:

0000 0000 0000 1001 = 17 switches on the light and the direct control, all other functions are deleted

Busy

BZT <block>

Wait before the schedule expires until the specified block is occupied by any train. This command can also be used for trains that run according to the timetable without train tracking.

macro

PRG <Macro number>

Starts the macro with the number <macro number>.

18.3 Save and read

The defined timetables are displayed with the main menu selection - File - save timetable - saved in a file. The timetables are reloaded withRead timetable file from the main menu. Schedules can also be read if the name of the schedule file is specified as a command line parameter when the program is started (e.g.MODELSTELLWERK BAHN.PCW SCHEDULE.DRG)

18.4 Operation with a timetable

Schedules are started automatically when the operation is started, both when Start with Control - Go play position - as well as with Taxes - Go basic position. The course of the Timetables can be switched on and off in the configuration window.

In the main window, the timetables can be edited in the timetable window that is opened with the button. The schedule can also be started and stopped in the schedule window

The timetable to be viewed must be selected.

The selected schedule or all schedules can be started, interrupted, stopped or reset using the buttons.

The commands of the schedule whose line is currently being executed are marked with a ">" in the memo field. You can jump to this line by double-clicking on another line.

The button can be used to search for the line to be executed depending on the position of the train in the track plan.

When starting from the initial position, the schedule is restarted, the clock starts at 00:00. If the operation is started from the game status, the schedule is continued from the previous game status.

If a train runs according to the timetable, it will take into account the signals on the model railway. If a signal is on stop, the train will not continue or depart, even if it should do so according to the timetable. While driving according to the timetable, the train can also be controlled manually, the speed then remains the same until the train according to the timetable with another Speed should go.
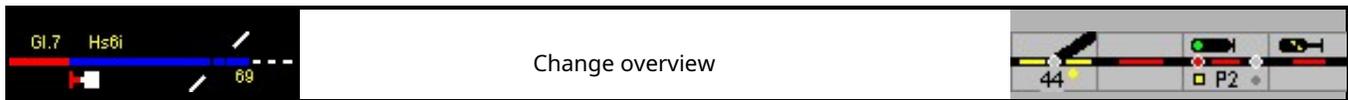
19th   Change overview

The changes in the different versions of ModellStellwerk can be found in the file version.pdf which is installed in theModellStellwerk folder. From this overview you will also find the operation of functions that were added after the publication of this manual.