

english

Short Tutorial

Software Version 2.0 and Higher

Central Station 3

märklin
digital



Table of Contents

Basics and Initial Operation	
Connections and Expansions	3
Setup and Connecting	4
Operation	5
Screen Display	6
First Steps and Preparation	7
Quick Start – Controlling Locomotives	8
Registering mfx Locomotives and Setup of Locomotive Controllers	9
Switching Functions and Calling up a Cab	10
Adding Locomotives Manually (DCC, MM)	11
Adjusting Locomotive Characteristics and Functions	12
Quick Start – Switching Items	13
Adding Article and Selecting the Type	14
Editing Items and Creating Contacts	15
Quick Start – Setting up a Track Diagram	16
Creating Panels / Control Desks and Placing Items	17
Drawing Routes and Adding Signals	18
Quick Start – Automating	19
Creating Events, Recording Actions	20
Setting up Procedures, Using Feedback	21
System Functions	22
Setting up the CS3	23
Managing Devices	24
Data Protection and Updating	25
Web Interface and Remote Control	26
Service – Practical Advice	27
Changing or Connecting from 6021, MS2, CS2	28
Locomotives – Address Control, M.U. Operation	30
Filtering, Sorting, and Searching Locomotive a List	31
Locomotive Images, Locomotive Card, and Webcam	32
Filtering and Item List, Setting up a Turntable	33
Track Diagram – Selection, Areas, and Views	34
CS3 Screen Server	36
Troubleshooting	37
Appendix	38
Glossary of Symbols	39
Function Pictograms	40
Digital Systems – Protocols	41
System Architecture: CS3 and CS3 plus	42

Introduction

With this practical short tutorial, you can set up your CS3 system in no time as well as control locomotives and the entire layout easily and comfortably. The connection and operating options are presented first and then come the most important basic functions.

The Central Station 3 is a digital controller for operating model railroads with Märklin Digital, Märklin Systems, Märklin MM, or DCC (more about the protocols can be found on page 41). It offers model railroaders not only current digital technology but also a user interface that enables intuitive control thanks to a modern touchscreen – simply by fingertip.

In addition, the Central Station 3 offers additional functions with the update to Software Version 2.0, such as creating control desks. Even control using other end devices such as computers, Tablets, or Smart-phones is possible with the browser oriented web interface. The free update can be downloaded easily from the Märklin firm's (www.maerklin.de) internet page (See page 25 for details), or it can be installed by your specialty dealer or by the Märklin Service Department.

Märklin offers two versions of the Central Station 3: the Central Station 3 plus (item number 60216) and the Central Station 3 (item number 60226). Important: The operation of both controllers is identical. The manual before you is therefore applicable for both versions, which differ in their hardware basically as follows: The Central Station 3 plus has its own S88 connection and thereby has a direct connection option for the 60881 and 60882 feedback module. On the Central Station 3, the S88 feedback modules have to be connected using the Link S88 (60883) (See page 3).

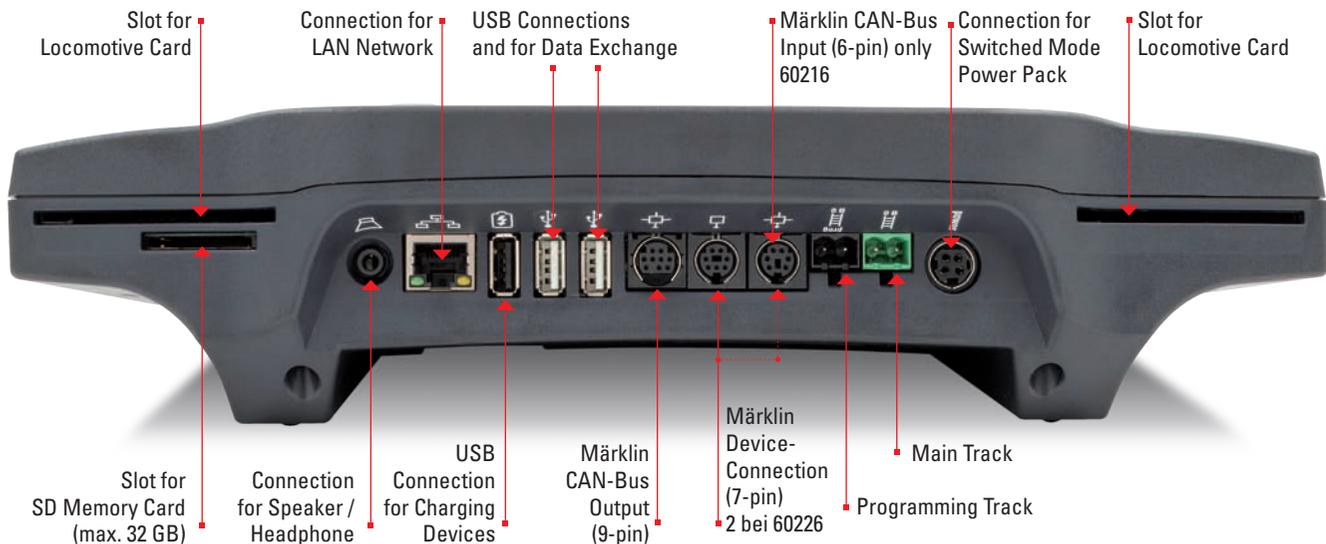
In addition, each Central Station 3 has two built-in locomotive card readers (for storing locomotive data on a locomotive card or for fast call up of the locomotive by plugging the locomotive card into a reader), an SD card slot for memory expansion as well as a built-in speaker for playback of typical model railroad sounds, including the option to connect an external speaker.

A powerful booster is built in to power a layout with locomotive operating voltage and switching voltage for accessory items. In addition, the CS3 has two built in USB connections (for example for a mouse, keyboard, or USB stick), a USB charging socket, a network connection for communication with a router, connections for two Mobile Stations as well as connections for the Märklin bus system.

The CS3 can be used in multiples, that means additional Central Station 3 plus (60216) units can be operated together on a layout by using the optional Cable (60123) along with a network connection for each Central Station 3 plus. Additional locomotive controllers, additional Layouts and Keyboards expand the operation of the layout (see page 42).

The Central Station 3 is not a toy. Make sure that this device is used by children only a controller for model trains. We hope you have a lot of fun using the Central Station on your model railroad layout. Additional information can be found in the Märklin Magazin and at www.maerklin.de

Connections and Expansions



Expansions: This is the way to connect devices to the CS3



This is what the connection symbols mean:

-  Voltage Supply: Only to be used with switched mode power packs: Märklin 60 watt (60041 or 60061, H0), Märklin 100 watt (60101, 1 Gauge), or LGB 100 watt (51095).
-  Track Connection (max. 5 amps)
-  Programming Track Connection (max. 1.5 amps); Hookup plan the same as for track connection
-  Märklin CAN-Bus Input (6-pin; only 60216)
-  Märklin Device Connection (7-pin) for Booster (60175/60174), Adapter 6021 (60128), Link S88 (60833), or Terminal (60145).
-  Märklin CAN-Bus Output (9-pin)
-  USB: Connection for PC Mouse, Keyboard, Memory, Hub, ...
-  USB: Only for charging (max. 1 amp)
-  LAN, Direct Connection to a Router
-  Line Out, Connection for an Active Speaker
-  S88 Connection on the Underside of the Device for 60881/60882 S88 Decoder, (only on 60216)

The CS3 plus (60216) also has a direct S88 connection on the underside:



Limitations of the 60226 Central Station:

Since the Central Station 3 (60226) does not have a Märklin CAN Bus input, it cannot be used in master/slave operation as a slave. Instead of the Märklin CAN Bus input, this unit has a second connection for a Märklin device. The S88 connection on the underside of this unit is not present. Feedback modules can thus only be connected using the Link S88 (60883) (See page 42).

Important: Pressing on the STOP button for a long time (up to 10 seconds) allows you to force the CS3 to shut down. Pressing a second time on the STOP button causes the Central Station 3 to start up again.

Setting up and Connecting

The following components are required to get started:

Central Station 3 (60216 or 60226), 60041 or 60061 switched mode power pack (60 VA; for Märklin H0, Trix H0, and Minitrix; 60042 for UK; 60045 for USA), or 60101 or 51095 switched mode power packs (100 VA; for Märklin 1 Gauge or LGB), track connection wires, track layout, locomotives and cars and/or solenoid items. Only the switched mode power packs listed can be used with the CS3. Transformers are no longer permitted.

Initial Operation

For initial operation, it is enough to connect the track and the switched mode power pack to the Central Station.

1. Connect layout track and if present programming track to the Central Station (See right side).
2. Connect Central Station to the switched mode power pack.
3. Connect switched mode power pack to your household current.

We recommend that you use a power strip that can be turned on and off. All of the switched mode power packs for the model railroad layout should be plugged into it. However, the master controller should be turned on first and then the other components.

4. The Central Station 3 starts automatically (Pressing on the STOP button for the CS3 can also help).
5. The CS3 must be shut down to turn it off (See page 23) and then you must separate all power supply units from the household current, which is easily done with a power strip that can be turned on and off.



Connections to a Layout

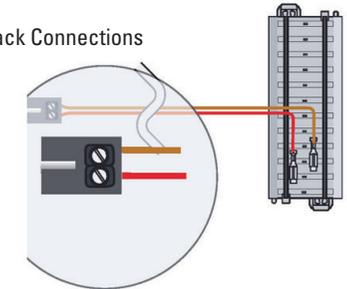


Any section of track can be used as a feeder track to supply power to a layout. The Central Station 3 is connected to the track with two connections that are identified as follows:

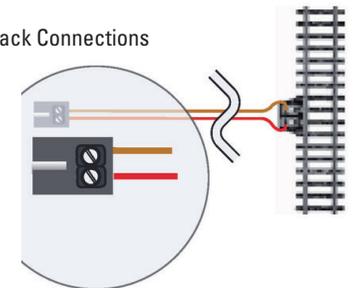
B = track current (red marking). This connection is the hot wire for supplying power to locomotives by means of the rails.

0 = ground/return wire (brown or blue for LGB). This connection is the ground return for running locomotives.

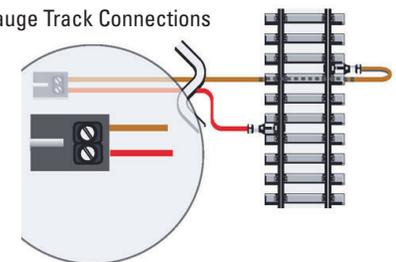
C Track Connections



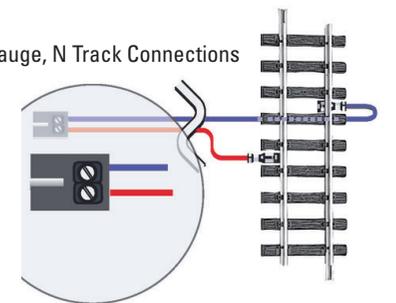
K Track Connections



1 Gauge Track Connections



G Gauge, N Track Connections



Connections to a Programming Track



The programming track may not have any direct electrical contact with the layout and no other users (examples: lighting, turnout decoders, lighted track bumpers, etc.) may be connected to it. The programming track required to read, program, and edit locomotives and powered units in the DCC or Motorola (MM2) formats. No programming track is needed for registering mfx locomotives.

Pay attention to the correct polarity to avoid malfunctions:
Red = track current (B), Brown/Blue = ground return (0)

Operation

Screen, Control Knobs, and Stop Button

The Central Station 3 is very user friendly. The most important element is the central screen in the middle of the unit, which is quite easy to use, as you will see in the next few pages.

There are two high quality control knobs positioned at the lower edge of the CS3. These knobs can be turned precisely in both directions by means of the resistance rings mounted on the sides or the finger-sized depression on the top, such as to control the operating speed. In addition, there is a pressure contact built in, which carries out an emergency stop for locomotives in operation when you press down on it. It also reverses the direction of travel for the locomotive in question.

When the entire layout is to come to a halt, all you have to do is press on the large STOP button between the control knobs. When the Stop mode is activate, the button lights up with red LEDs and then the supply of track current to the layout is interrupted. **Caution:** Even when the current to the track is interrupted, the locomotives that were running will still coast a bit.

The central STOP button serves as „Emergency Off“ – in critical situations probably the most important function on the Central Station 3, used to turn off voltage to the track.



The control knobs are used to control the speed of locomotives (placed in the side locomotive controllers). Pressing on a control knob changes the direction of travel for the locomotive being controlled.

Instead of operating the touchscreen with your fingers, we recommend using a computer mouse plugged into the USB socket. Advantage: The mouse cursor inserted on the screen enables precise operation without your hand blocking the view.

Important: Pressing on the STOP button for a long time (up to 10 sec.) can force the CS3 to shut down. Pressing on the STOP button again will cause the Central Station to start up again.

Clicking and Wiping: Working with the Touchscreen



Thanks to the touch-sensitive screen, all you need is finger contact to operate this device. Different finger gestures are possible like on a Smartphone or Tablet:



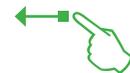
Clicking: Touch the touchscreen briefly with the tip of your finger and then raise your finger again. This gesture is used to select an object or activate a button / symbol.



Pressing: Touch the touchscreen with the tip of your finger and keep it there for several seconds. This gesture is used to activate a text field.



Scrolling (Browsing), Stroking, Wiping: Stroke with your finger up or down, to the left or right, to see for example objects outside of the visible area or to display other options in a list.



Dragging (Drag-&Drop): You can move an object or change the position of a track diagram by dragging. Lay your finger on an object to be moved and then drag it to the desired position where you then release your finger from the display..

Zoom Functions:

Zooming in by pulling your fingers apart from each other: Lay two fingers on the touchscreen and move them apart from each other. This action allows you to have a closer look at track diagrams.

Zooming out by dragging your fingers together: Lay two fingers spread apart on the touchscreen and move them towards each other. This action allows you to make track diagrams smaller and more content is visible.

Note: Starting at a certain size, lettering and texts in a track diagram are no longer shown.



Screen Display

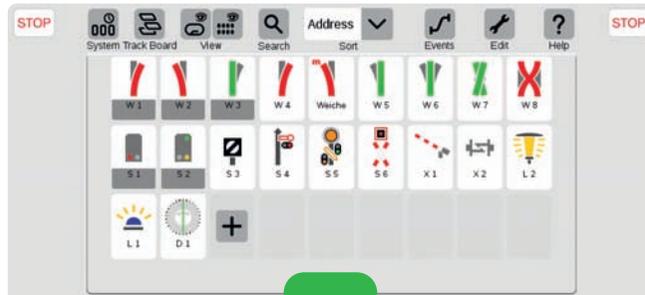
Structure of the User Interface

The track diagram is always shown in the background of the CS3 screen. Windows can be inserted over it from all four directions. The farther the windows are dragged across the track diagram from a particular edge of the screen, the larger they become and the more they cover the track diagram. The locomotive controllers on the sides can be inserted from the left and right edge of the screen by using the locomotive symbol in the red circle. The menu bar with the item list slides down from the upper edge of the screen and across the track diagram, while the locomotive list from below can be inserted above. If not all elements can be shown in a window, gray bars for each content page will appear on the lower edge of the window.



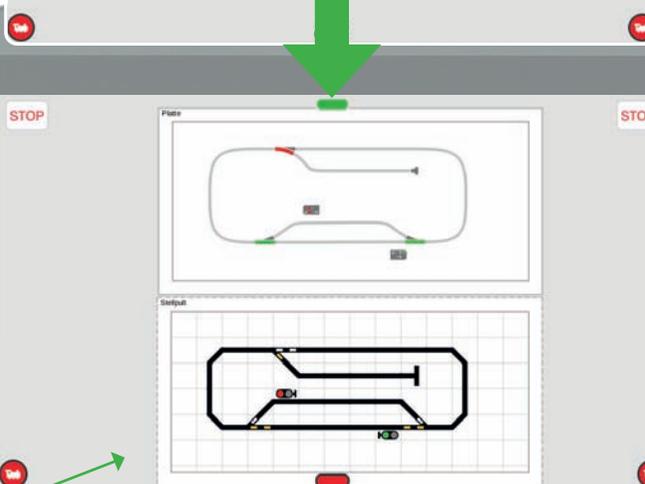
Track Diagram:

The panels and control desks that have been set up are shown in the background of the display. The track diagrams serve as a visual depiction of the layout – entirely or partially. Clicking next to the current position of the item for signals, turnouts, and other items allows you to switch these items. The view of different track diagrams can be reduced or enlarged. In addition, track diagrams can be displayed next to or above one another (See page 16 and further).



Menu Bar and Item List:

Dragging the green horizontal bar down from the upper edge of the screen inserts first the menu and then more and more of the item overview. Items and track diagrams can be set up easily with the edit symbol. Using System, you access the wizards and the event symbol enables automation – such as by recording operating steps. The question mark takes you directly to the appropriate help page. The item list is shown under it, in which all of the elements of the layout are set up (examples: turnouts, signals, contacts, etc.) (See page 13 and further).



Locomotive Controllers:

Locomotives can be dragged out of the locomotive list into the locomotive controllers on the sides where they can be controlled with the two rotary control knobs. The locomotive controllers get increasingly larger by dragging the red circles with the locomotive symbol from the edge into the middle of the screen and you can display additional functions such as the speedometer (see left) or even the cab (See page 10).



Locomotive List:

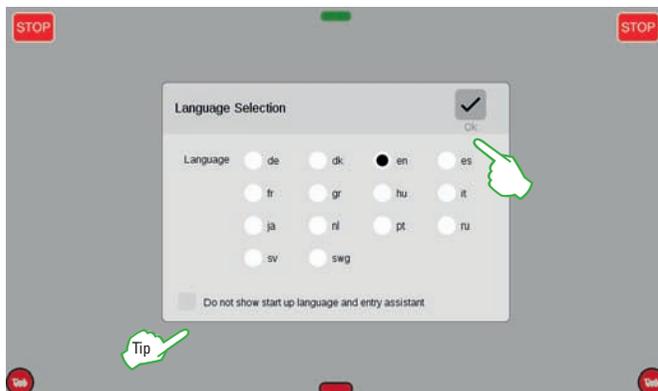
Pull the locomotive list up with the red horizontal bar from the lower edge of the screen. The locomotives and powered units are managed in the locomotive list. In addition to various view filters, locomotives can also be custom configured here – with their own images and names. In addition, locomotives can also be controlled directly (see on page 8 and further).

Note: By clicking on the window pullup symbols (green and red horizontal bars as well as the red circles with a locomotive symbol), the corresponding windows can be turned on or off.

First Steps

Selecting a Language

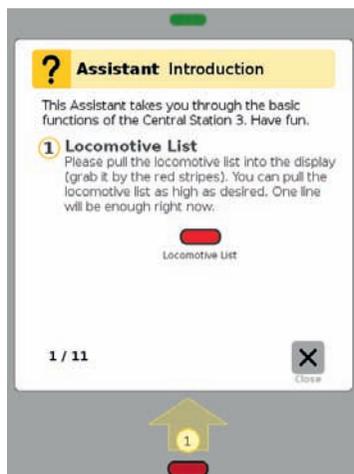
After turning it on, the CS3 greets you with the language selection dialog (right image). Here you can set the language for the user interface. The German language is already preselected. Confirm your selection by pressing your fingertip on „Ok“. **Note:** The language can be changed at any time in the system settings (See page 23).



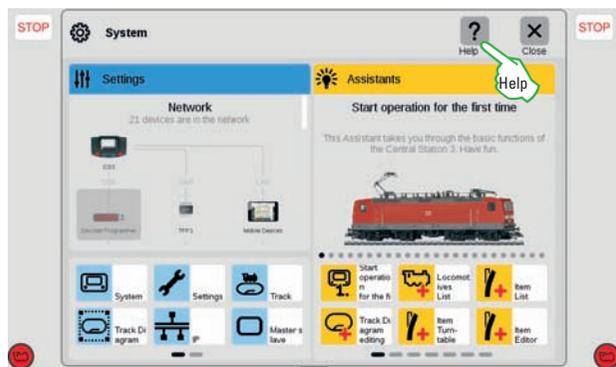
Introduction Wizard

Then the introduction wizard will appear (right image) who will present the basic operating steps for the CS3 user interface with the help of several short exercises. **Note:** The wizard can be called up at any time in the system settings (See image below and page 23).

Tip: At any event, work with the introduction wizard at the beginning. Activate the option „Do not show the language dialog and introduction wizard anymore“ in the language selection window so that they no longer start automatically for subsequent startups. You can cancel this decision at any time in the system settings (See page 23).



Help: The help symbol „?“ above is turned on in most of the views. You get detailed help for the current subject area by clicking on this symbol.

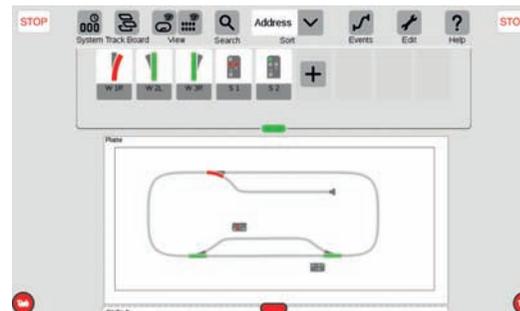


Note: A red dot by the CS3-Symbol  and the System-Symbol  refers to an available update for the CS3 – see page 25.

Preparation

Removing an Example by Removing Factory Settings

As delivered, the CS3 has a starter set created for demonstration purposes and for the wizard – it includes an item list with several solenoid items and a track diagram control board (See image).



If you don't need the track diagram and the items, you should in any event delete the items. The item list will thereby remain manageable and you prevent unnecessary conflicts with addresses that are already in use.

Tip: The current settings for the CS3 are stored in memory with data backup and can be restored at any time (See page 25).

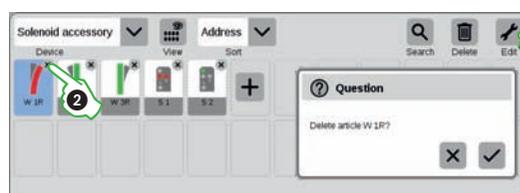
We recommend deleting the pre-installed examples so that you have a better overview of your layout on the Central Station 3. The easiest way to do this is to install an empty configuration that is present on the CS3 from the factory. To do this, proceed as described on page 25 for restoring data, only select the file „leer.zip“ (see image) in the CS3 backup folder.



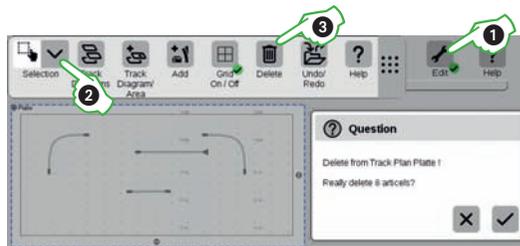
Note: The current configuration is replaced by installing the file „leer.zip“. Locomotives, items, and track diagrams already set up will no longer be present.

Manually Deleting Sample Objects

The pre-installed sample elements can also be removed individually with the following steps:



To remove items, first click in the symbol bar for the item list on the tool symbol („Edit“) ① and select „Edit Item List“. You delete an item by clicking each time on the „X“ in the right upper corner of the symbols ② or on the trashcan symbol („Delete“).



Click again on the tool symbol ① and then select „Edit Track Diagram“ to clean up the track diagram. Now another symbol bar is turned on. You can activate the area election ② here. In the track diagram, mark the items to be removed and click on the trashcan symbol („Delete“) ③. You change the name of the panel by clicking on the description in the upper left corner.

Quick Start – Controlling Locomotives

So easy

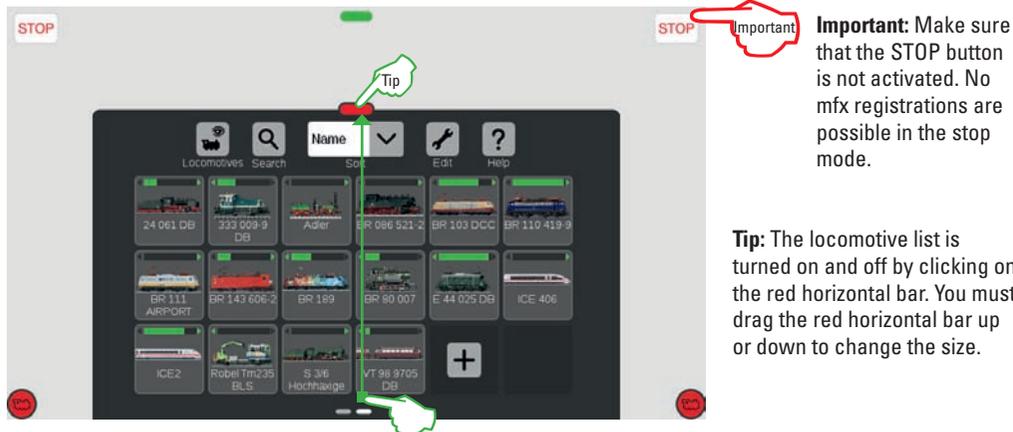
- ... registering mfx locomotives and setting up locomotive controllers
- ... switching locomotive functions and calling up a cab
- ... adding locomotives manually (MM, DCC)
- ... adjusting locomotive settings and functions



Registering Locomotives

Locomotive List: Overview of the Locomotives

Locomotives are managed on the CS3 in the locomotive list. They are set up, configured, and controlled there. Drag the red horizontal bar up from below (See page 6 to turn on the locomotive list. Gray bars will appear on the lower edge for additional pages if not all locomotives can be shown in the window.

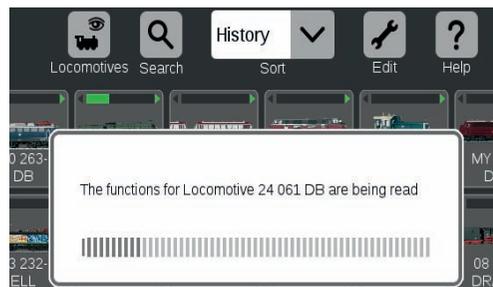


In the beginning, we recommend first registering all locomotives with mfx decoders (See below). Adding and setting up locomotives manually with the DCC or MM protocol is on page 11.

Registering mfx Locomotives

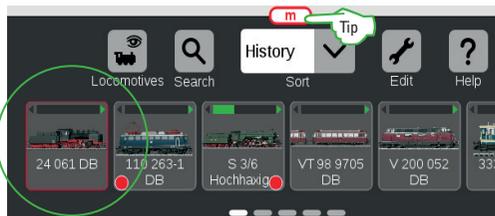


Positioning: Place the mfx locomotive completely on the track. mfx locomotives can be registered on the main as well as on the programming track.



Reading: After a few seconds, the CS3 will begin automatically to read the decoder data, if the stop mode is not active.

The newly set up mfx locomotive will appear outlined in red in the locomotive list. **Tip:** A red „m“ in the horizontal bar for the locomotive list refers to the new registration for an mfx locomotive.

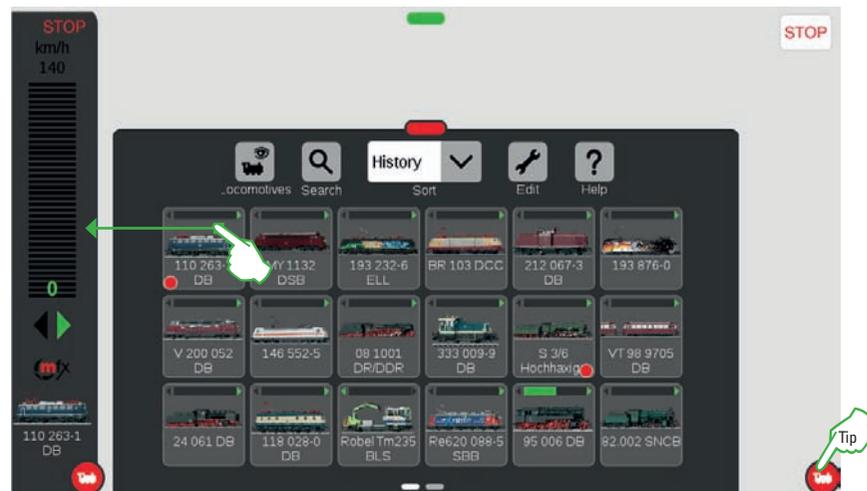


Note: Several mfx locomotives can be registered at the same time. We recommend adding them one after the other. In our experience, it goes faster.

Locomotive Controllers

Dragging Locomotives into the Locomotive Controller

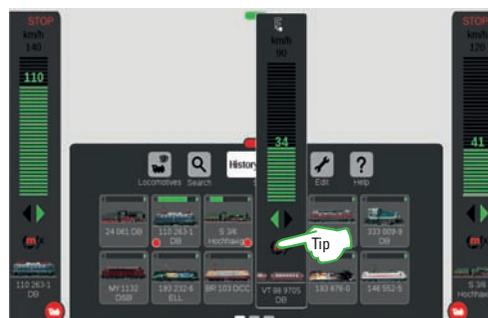
To select a locomotive, drag it with your finger from the locomotive list to the left or right edge of the screen. Lift your finger from the display above the automatically activated locomotive controller. The locomotive selected, the protocol, the green direction arrow, the speed controller, the speed, and the STOP operating element at the upper edge of the screen will now be displayed in the locomotive controller.



A small red dot in the locomotive list indicates the two locomotives active in the locomotive controllers. In addition, the green direction arrow and the speed controller for each locomotive are shown.

Tip: The locomotive controllers on the sides are turned on and off by clicking on the red circles with a locomotive symbol.

Quick Access to the Locomotive Controller



Practical Tip for Quick Access: The option „Popup Locomotive Controller“ must have been previously activated in the system settings, see page 23. Then all you have to do is click in the locomotive list on any locomotive symbol and a locomotive controller window will open up (image above). Close the locomotive controller window by clicking to the left or right of it.

Locomotive Controller Desk

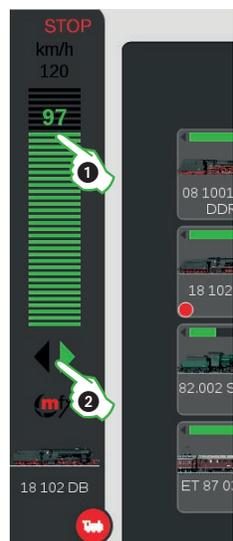


If you drag the red horizontal bar to the top, the Locomotive List will change to a Locomotive Controller Desk, where you can control several Locomotives.

Tip: Gray bars will appear on the lower edge for additional pages if not all locomotives can be shown in the window.

Running Locomotives and Switching Functions

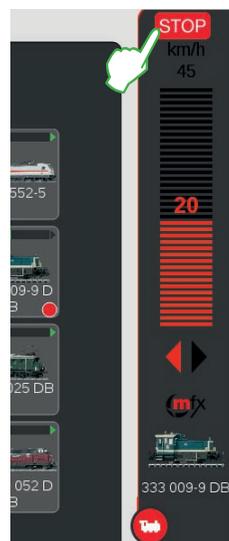
Locomotive Controller and Control Knob



Your fingertip on the speed bar ① sets the speed. Alternatively, lay your finger on the bar and move it up or down. Clicking on the direction arrow ② or pressing on the control knob will change the direction of travel. You control locomotives with the control knob even when the locomotive controller is turned off on the screen.



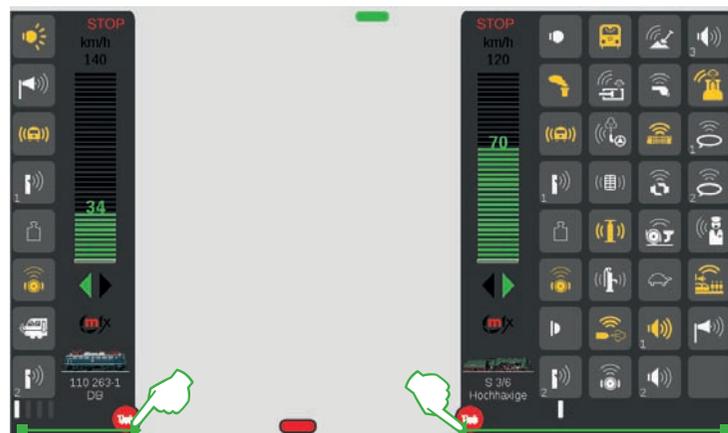
Emergency Stop / Stop Mode



When the speed bars and the direction arrows show red, the Stop mode is activated and the track voltage is thereby turned off. To cancel the Stop mode, press the STOP button or click on the STOP symbol at the upper end of the locomotive controllers. The speed can also be changed in the Stop mode.



Turning on and Switching Functions



To turn on the function overview, drag the red circle with the white locomotive in the direction of the middle of the screen: The locomotive functions will become visible, eight functions per column. If you bring up more of the list, up to 32 functions can be displayed at the same time.

The functions are switched by clicking on the function symbols and yellow is displayed when they are active. An overview of all the functions can be seen on page 40.



Practical Tip: On the popup locomotive controller (must be activated in the system settings, see page 23), you turn the locomotive functions on by clicking on the letter „F“ at the upper end of the locomotive controller.

Speedometer and Cab

Turning on the Speedometer



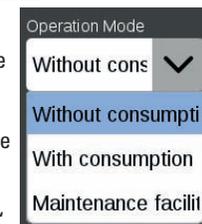
If you drag the red dot with the small white locomotive further in the direction of the middle of the screen, a speedometer view will appear after the locomotive functions. The desired speed or direction of travel (triangle) is controlled with your fingertip on those items.

Cab and World of Operation



The cab appears when you pull up a locomotive controller on the side completely to the other edge of the display. The layout is prescribed for mfx+ locomotives and can be selected for all other locomotives in the settings (see page 12).

World of Operation Mode: On locomotives with an mfx+ decoder, you can set the desired World of Operation Mode using the drop-down menu „Operation Mode“ in the locomotive settings on the tab „Setup“ (see page 12). „Without Consumption“ is preset (cab, without simulation of operating supplies consumption). Alternatively, there are the options „With Consumption“ (cab with simulation of operating supplies consumption) and „Maintenance Facility Refueling“ (simulation of operating supplies consumption plus refueling in the maintenance facility by means of feedback contacts). Details about the various cabs can be found at www.maerklin.de in the service area under „World of Operation Instructions“.



Adding Locomotives Manually

This is how you add locomotives with the MM or DCC protocol:

You set up locomotives by clicking on the plus symbol at the end of the locomotive list ①. Alternatively click on the tool symbol („Edit“) ② in the locomotive list and select „Add Locomotive“ ③ in the menu that is turned on.



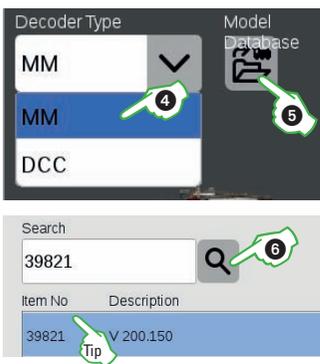
The locomotive settings are turned on (image below). The necessary control data are set up in the active „Info“ tab. First, select the type of decoder in the locomotive (DCC or MM).



The tab „Info“ is active.

You can choose between MM and DCC in the drop-down menu „Decoder Type“.

Taking Locomotive Settings from the MM Database



A Märklin locomotive with an MM decoder can be set up very easily in the CS3 with the help of the built-in locomotive database. First, select the option „MM“ (4) on the left upper edge of the tab „Info“ in the field „Decoder Type“. Then click directly next to it on the symbol labeled as „Model Database“ (5). A search template will open up.

In the search dialog click on the magnifier symbol (6) and thereby turn on a keyboard. Enter the item number of the locomotive name on this keyboard: The system will immediately begin the search. Each additional character entered makes the search results more precise (live search). Then select the discovered locomotive and confirm with „OK“.

Tip: It is best to search by item number since it is unambiguous.

Reading the Address for the Locomotive Decoder

When you have closed the locomotive settings with „OK“ and have opened them up again, the Option „Read“ will appear for MM and DCC locomotives instead of the „Database“ button. Click on it and the CS3 will take the address set in the locomotive decoder if the locomotive is standing on the programming track and the Stop mode is not activated.

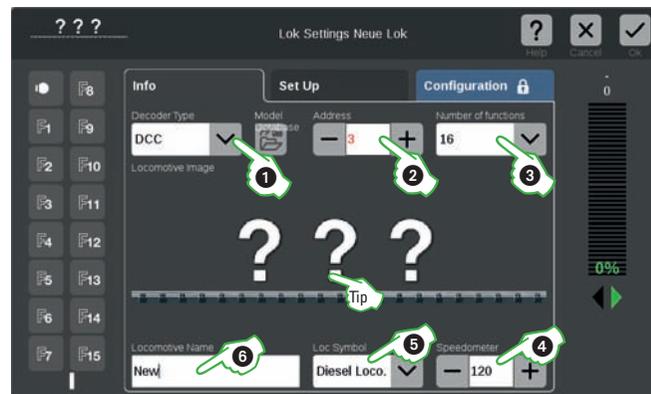


Note: On some locomotives such as Delta, reading does not work. The address must then be set manually.

Changing Locomotive Settings and Images

Defining Locomotive Settings Manually:

In addition to the decoder type ①, set the appropriate locomotive address (see locomotive instructions) in the field „Locomotive Address“ ② by clicking on „Minus“ or „Plus“ or directly using the value field. **Important:** When the address is shown in red, it is already assigned. Then you should change it until the color changes to black. You define the number of locomotive functions displayed in the field of the same name ③. Define the maximum speed in the field „Speedometer“. This is shown in the locomotive controller ④. Next to it, select the locomotive symbol (5). Finally, enter in the field „Locomotive Name“ (6) an unambiguous designation for the locomotive. As delivered from the factory, the CS3 already has a large quantity of locomotive images. It will search automatically for an appropriate image and insert into the locomotive’s settings. **Tip:** In the event, the CS3 cannot assign an appropriate image or you want another locomotive image, in certain circumstances it is worth looking directly at the locomotive image database.



Locomotive Image Database

Clicking on the locomotive image or the three question marks (see image below) will open up the locomotive image database (see image to the right). The easiest way to do it is to enter the item number in the search template, but you can also type in the locomotive’s name and select from the alternatives that are offered. At the end, confirm with the „OK“ check mark.



Tip: In addition to the internal CS3 locomotive image database, you can also go to external media such as a USB stick and select your own locomotive images (see image below).

Using Your Own Locomotive Images

You can also expand the CS3 locomotive image database with your own locomotive images. The easiest way to do this is to use the web user interface for the CS3. Details about this can be found on page 32. Alternatively, you can store the desired locomotive images on a USB stick and then select them in the locomotive image database.



Editing Locomotive Characteristics

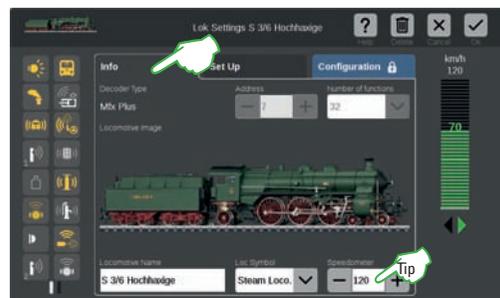
Changing to the Editing Mode

You activate the editing mode with your fingertip on the tool symbol ① and then on „Edit Locomotives“ ②. A check mark on a green background will then appear as an indicator at the foot of the tool symbol and all locomotives will have a dotted line around them.

Caution: A locomotive is deleted by clicking on the „X“.

You can edit locomotives in the editing mode: To do this, click on the desired locomotive ③ and the locomotive settings will be displayed:

„Info“ Tab: Changing Main Data



You now see the locomotive settings with the selected tab „Info“ that is explained with the locomotive settings on page 11.

Note: With mfx locomotives, you can also change here – if desired – the name, the symbol, and the maximum speed displayed on the locomotive controller.

Tip: When you enter the value „10“ on the speedometer, the speed is no longer shown in km/h but in percent. This should be entered for displaying speed levels (126 for mfx, 14 for MM, and for DCC: 14, 28, or 126).

„Setup“ Tab: Changing Important Locomotive Settings and Functions

Click on the tab „Setup“ in the locomotive settings to adjust locomotive parameters.

Setup of locomotive functions.

Set operation mode (on mfx+decoders), otherwise select cab view.

Transfer locomotive data to a locomotive card.

Reset locomotive to factory default setting.

Update mfx locomotive decoders.

Define acceleration and braking delay.

Set minimum and maximum speed.

Set volume.

Important: Changes are stored immediately in the locomotive decoder. Locomotives with MM and DCC decoders must be standing on the programming track for editing..

Configuring Locomotive Functions

Setting up Functions



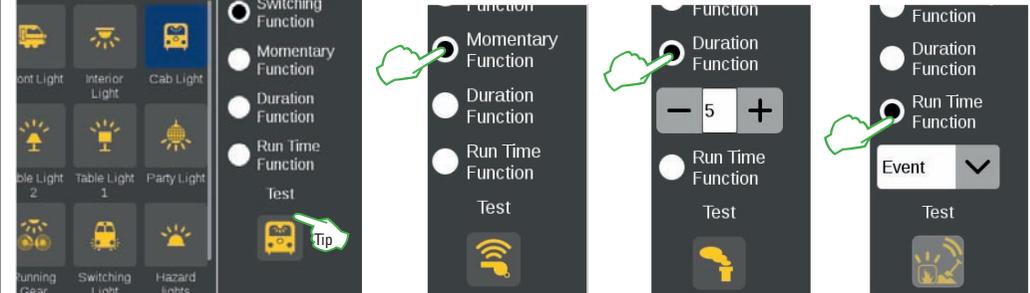
Click on the locomotive settings in the tab „Setup“ on a function field on the left side, example „F4“ ①, to assign a function to a locomotive. The function overview will now appear in the middle grouped by themes.

Divided on the tabs into „Light“, „Sound“, „Mechanic“, and „Common Icon“, numerous different function symbols are available here to select. In the example click on the tab „Mechanical“ ② and select the smoke generator symbol ③. The CS3 now replaces the „F4“ placeholder symbol with the icon for the newly selected action ①.

Note: An overview of all function symbols can be found on page 40.

Selecting and Testing the Type of Function

You can also define the way in which the function selected is to be switched: If you want to be able to turn the action on and off, select „Switching Function“. „Momentary Function“ activates the command for the duration of pressing your finger on the function. The „Duration Function“ is started by calling it up and turns itself off again after a defined time between 0 and 100 seconds. The „Run Time Function“ gives you the option of access to function processes you define yourself (see chapter on „Events“ starting on page 19).



Tip: Click on the „Test“ elements arranged below in order to test the newly set up function field.

Quick Start – Switching Items

So easy....

... setting up items in the CS3

... switching solenoid items

... setting up contacts



Setting up Articles

Item List: Overview of All Items

Before you can use the CS3 to switch elements on the layout such as turnouts, signals, building lighting, S88 units, etc., they have to be set up as items. They are shown in the item list and this list appears by dragging the green horizontal bar down from above (see page 6).

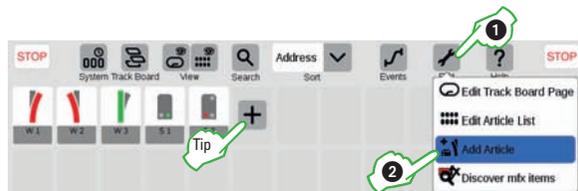
Tip: The item list is turned on and off quickly by clicking on the green horizontal bar.



As delivered from the factory, there are already items set up (see image to the left). You should delete these items so that the item list remains manageable and to avoid conflicts – as described on page 7.

Adding Items Manually

To set up a new item, click on the tool symbol („Edit“) ① and open a drop-down menu with it in which you select „Add Article“ ②.



Another drop-down menu is shown. There select the desired type of item such as „Turnouts“ ③. The item editing window will then open (see right side).



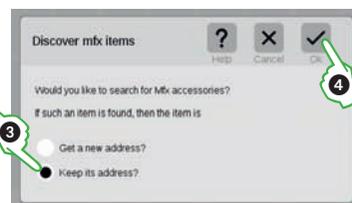
Tip: You can also add new items using the plus symbol in the item list.

Adding mfx Items

Accessory decoders with mfx capabilities that are connected to the layout are not automatically found by the CS3 – in contrast to locomotives. They must be actively found. You start this function by clicking on the tool symbol for the item list („Edit“) ① and then search in the drop-down menu for „Discover mfx Items“ ②.

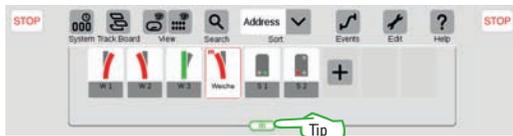


The CS3 will then ask whether the items found are to be given a new address or to keep their address ③. We recommend the latter on existing layouts with addresses that have already been set. Then confirm with „OK“ ④. **Note:** We recommend setting a protocol and an address on mfx items with dip switches so that they can be identified better.



The mfx items are taken into the item list. The item must still be adjusted manually in the editing window in the case of turnout decoders or multiple item decoders (see right side).

Tip: An „m“ in the horizontal bar for the item list refers to the new registration for an mfx item.



Selecting the Type of Item

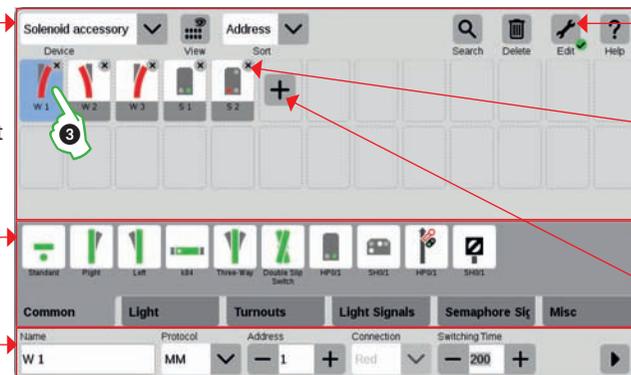
Editing Items

The item editing window opens directly when adding a new item. Click on the tool symbol („Edit“) ① and then on „Edit Article List“ ② in order to edit existing items.



The details for all items can be set in the item editing window:

The upper half shows the item list with filter and search options. The items to be edited must be selected by clicking such as a turnout „W 1“ ③.



„Edit“ closes the window.

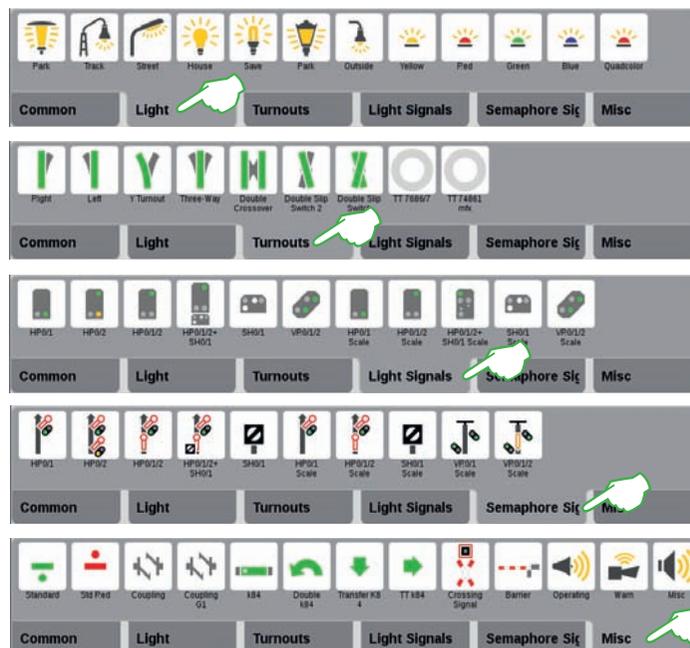
Caution: A fingertip on the „X“ deletes the item.

Sets up a new item.

The type of item is selected here from several tabs (see below).

Configuration of the item (see next page).

Defining the Type of Item



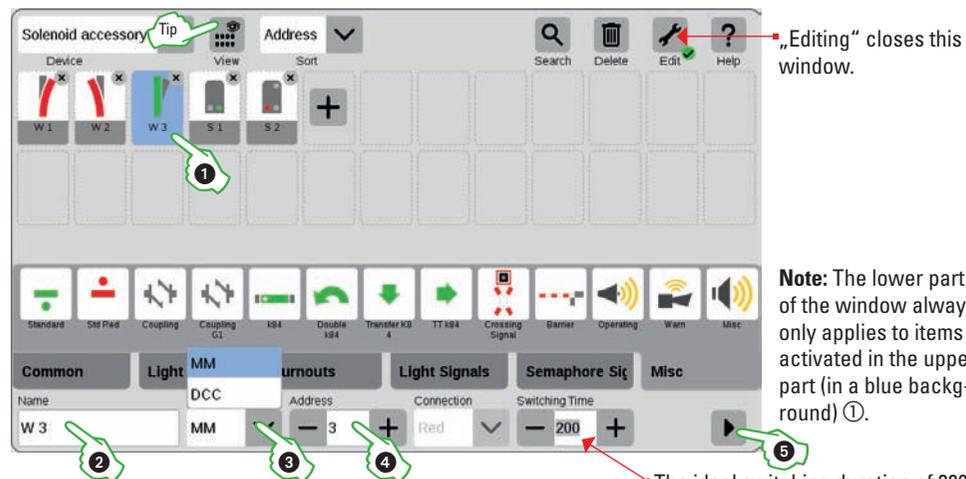
Each item can be easily defined in the CS3: To do this, the desired item must first be activated (image above ③). The various tabs (Common, Light, Turnouts, Light Signals, Semaphore Signals, and Misc.) can then be selected by clicking on the available types of items.

Note: Each selection is stored immediately and the window is closed by „Edit“ (see image above).

Configuring Items

Adjusting Settings for the Items

In addition to the selection of the type of item (see previous page), all of the settings (name, protocol, address, connection, and switching duration) can be done in the item editing window:



„Editing“ closes this window.

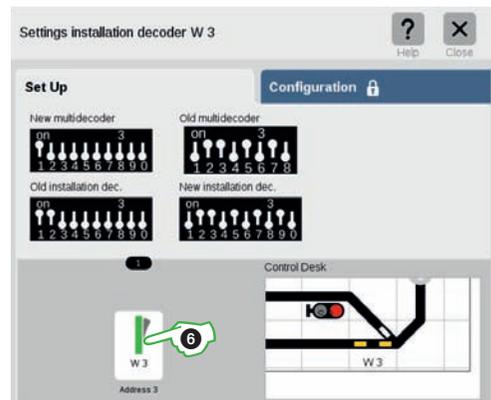
Note: The lower part of the window always only applies to items activated in the upper part (in a blue background) ①.

Each item requires an unambiguous designation ② that ideally also describes the position/function.

The ideal switching duration of 200 milliseconds should only be changed in exceptional situations.

Two switching protocols (MM and DCC) are available to select (3) – see page 41. In the field „Address“ ④, you set the appropriate address for the decoder by clicking on minus or plus or directly using the values field. If the address appears in red, it is already assigned. Keep clicking on „Plus“ until the color changes to black. **Tip:** Unoccupied or unassigned addresses can be shown using the view filter in the menu list.

Testing Settings for the Items



The tab „Setup“ opens by means of the black arrow point ⑤, and the correct dipswitch settings for different types of decoders can be shown on it as a help for the selected item address. Below it, the switching function for the item can be tested by clicking ⑥ and it is then shown in the track diagram next to it – if installed.



The tab „Configuration“ is only intended for experts and is not relevant for normal operation.

Setting up Contacts

Adding S88 Contacts

S88 is a feedback system in model railroad layouts converted to digital. It is used so that contacts, for example, in a part of the track can report back as „occupied“. Feedback is particularly important for automated procedures.

Click in the item list on the tool symbol („Edit“) ① to set up S88 contacts in the CS3. This will open up a drop-down menu. There, select „Add Article“ ②. In the following menu, click on „S88 Contacts“ ③.



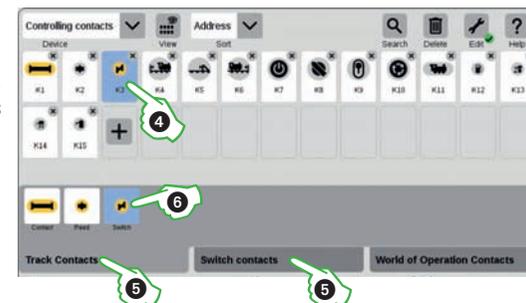
The editing window familiar from the items will open where you set up the details for the new S88 contact.



Tip: You can change between solenoid items and contacts using the selection menu. This is how you open the editing window for the item settings.

Selecting the Type of Contact

In the editing window, you must first activate the desired contact ④. Then select the type of feedback contact that has been installed from the various tabs (track contacts or switch contacts) ⑤ by clicking on an available variation ⑥.



Note: Additional types of contacts are available for the mfx+ World of Operation mode such as diesel fueling station, coalbunker, sand bunker, and water standpipe.

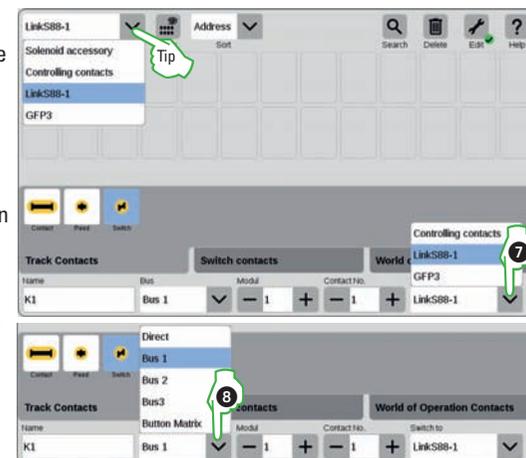
Configuring a Contact

The most important thing is to set the connection path correctly for the contact. To do this, select in the field „Transfer to“ ⑦ from the devices known to the CS3 (see page 24). Among them are control contacts that are virtual on/off switches set up in the CS3.

Tip: You can change between devices using the device selection menu. You give each contact an unambiguous name and select the type of connection (Bus). You can connect feedback contacts in the following ways when using the Link S88 ⑧:

- directly to the Link S88
- to other S88 modules connected to the Link S88 (via Bus 1, Bus 2, or Bus 3)
- by means of a button matrix

In addition, enter the number of the S88 module (1-32) and the number of the switching contact at the module.



Quick Start – Setting up a Track Diagram

So easy....

- ... setting up panels / control desks
- ... positioning track items
- ... drawing rail lines
- ... adding signals



Setting up Panels / Control Desks

In this section, you will become familiar with all of the necessary steps for setting up a track diagram in the CS3. A layout can be displayed entirely or in parts using track diagrams. There are two ways to display: panels and control desks. The former can show the track routing in a realistic manner because items can be arranged any way you like. By contrast, control desks show a symbolic display of the track routing using German Federal Railroad (DB) signal tower control desks as a prototype. This method only allows placement of items in a grid with 45 degree angles.

„Edit Track“ Mode

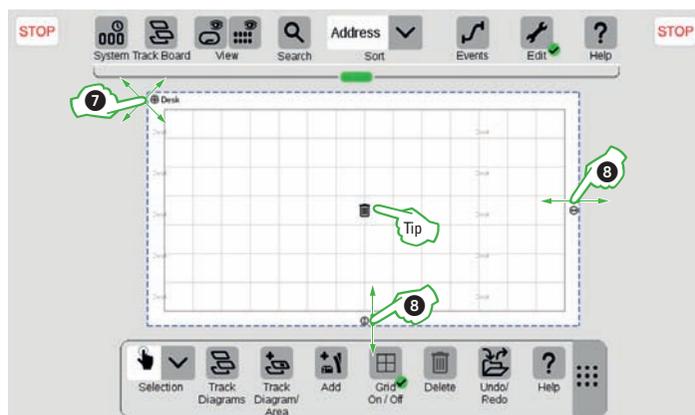
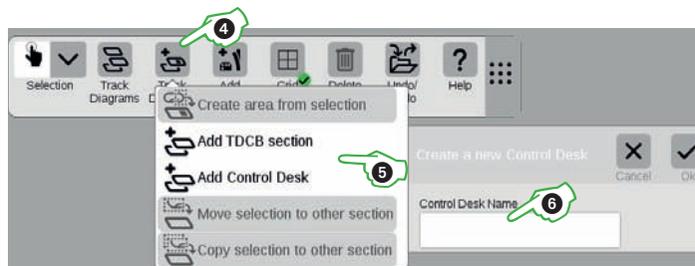
Changes in track diagrams can only be done in the editing mode. To activate it, click in the menu for the item list on the tool symbol „Edit“ ① and then on „Edit Track Board Page“ ②. You will recognize the activated track diagram editing mode from an additional symbol bar and the green dot on the tool symbol „Edit“ ③. You end the editing mode by clicking on this symbol again.”



Tip: You can move the additional symbol bar when you drag the 9-point symbol by its right end with your finger to the desired position.

Adding a Panel / Control Desk

In the track diagram symbol bar, click first on „Track Diagram / Area“ ④ and in the drop-down menu click on „Add Panel or Control Desk“ ⑤. In the dialog window that is turned on, give the new track diagram an unambiguous name ⑥ and confirm with „OK“. Later the name can be changed by clicking on the name in the left upper corner of the drawing area. The position of the drawing area versus other track diagrams can be changed using the four-arrow symbol ⑦. The size of the drawing area can be changed with the lower and right arrow symbols ⑧.

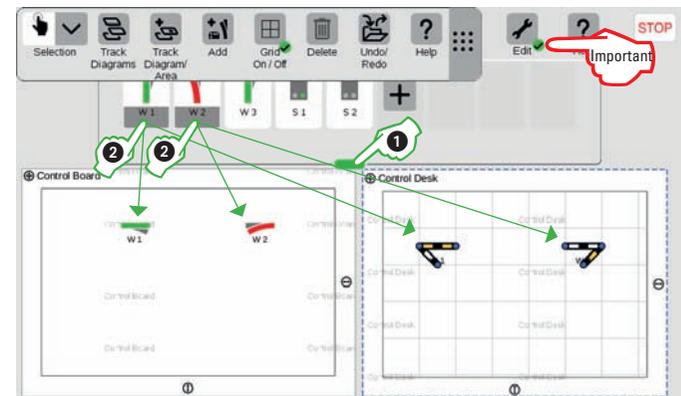


Tip: This panel can be deleted by putting your fingertip on the trashcan symbol in the center of the panel – but only if it is empty.

Positioning Items

Drawing Items on a Track Diagram

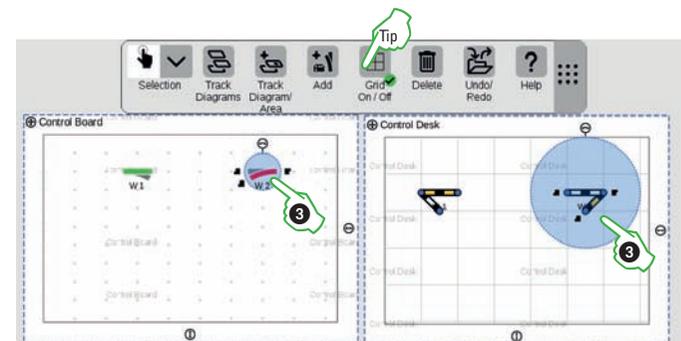
The item list must be turned on ① to place solenoid items on a track diagram that has been set up. Then drag the desired solenoid items out of it with your finger to the panel or control desk and release your finger – such as W1 and W2 ②.



Important: The track diagram editing mode must continue to be activated for these steps (green check mark on the tool symbol). **Note:** Placed items are given a colored marking in the item list ②.

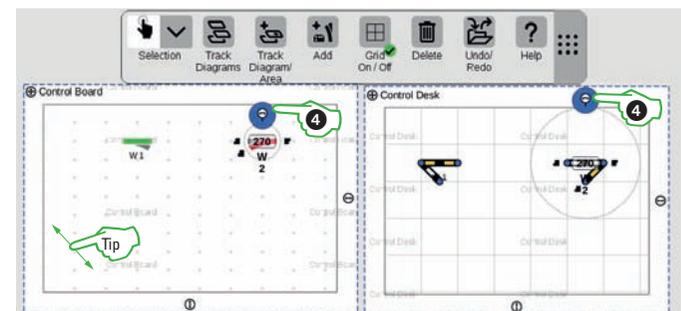
Positioning Items

Elements can be moved in the track diagram by first selecting them by means of clicking (visible at the blue circle) ③ and then by keeping your finger on them. **Tip:** Items can be arranged more easily on panels in a structured manner using the activated grid. Custom grid settings are done in the system (see page 23).



Rotating Items

To rotate an item, it must first be selected by clicking on it ③. Then click on the rotation symbol ④ and release your finger from the display. Instead of the item, the rotation symbol will be framed in blue. Now you can go back and forth on the display with your finger. The item will rotate according to the movement of your finger. Parallel to this, the current angle on the item will be shown.



As soon as you lift your finger from the display, the rotation mode will end and the item is accordingly placed in the defined grid setting (see page 23). On control desks always at 45 degree angles.

Tip: The farther you remove your finger on the display from the turnout, the slower the rotation is done: The desired angle is so much easier to set this way.

Drawing Track Lines

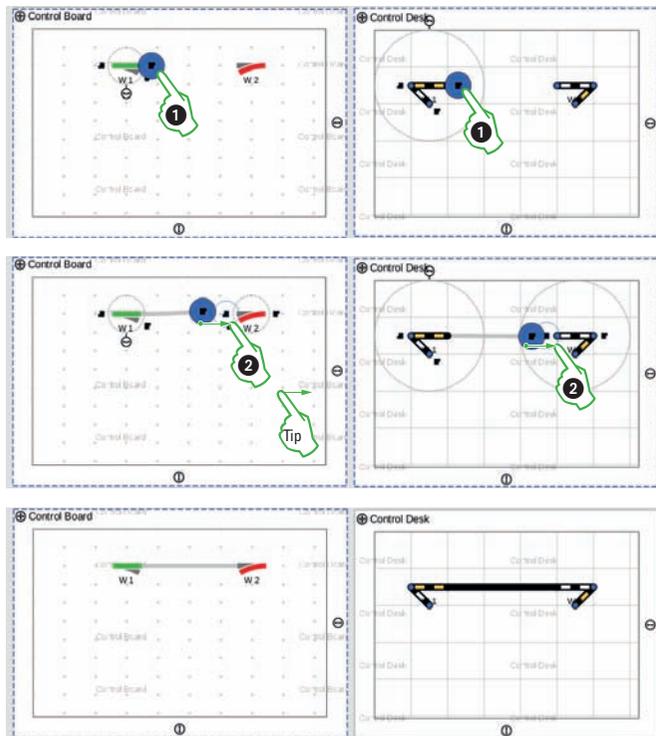
Connecting Items in the Track Diagram

When you select an item in the track diagram by clicking on it, you will also see rail line connectors next to the rotation symbol by which the two elements can be connected to each other. If you click on a rail line connector, it is marked in blue ①.

Drag this rail line connector marked in blue near another element. There, possible connection locations will be shown in a blue circle ②. **Tip:** You can do the drag motion to any spot on the display so that you have an open view of the connection location.

As soon as the two connection locations overlap, release your finger from the display. The CS3 makes a rail line connection between the connection locations.

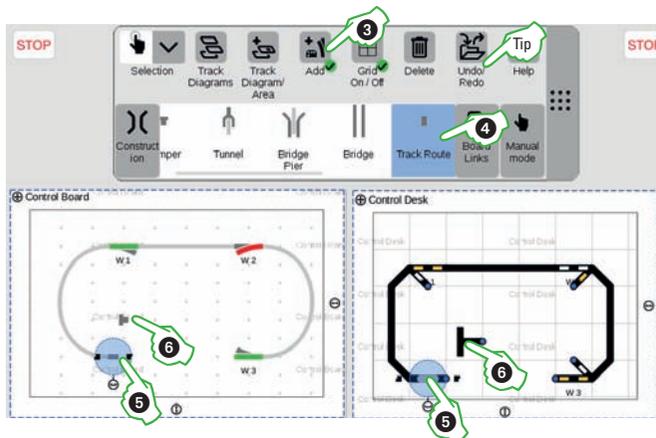
Note: When your finger stays on a location, a track line item will be set up there.



Designing a Track Line

In order to set up a visually appealing track diagram, there are track route items as design elements. A drop-down menu opens by means of the „Add“ button ③ in the track diagram symbol bar. To the right of „Track Laying“, you can select various items by wiping your finger – such as track route ④. After clicking, this can be dragged like items from the item list into the track diagram and placed, rotated, and connected there ⑤.

Note: You add other track laying items such as tunnels, bridges, or track bumpers ⑥ using the same principle.



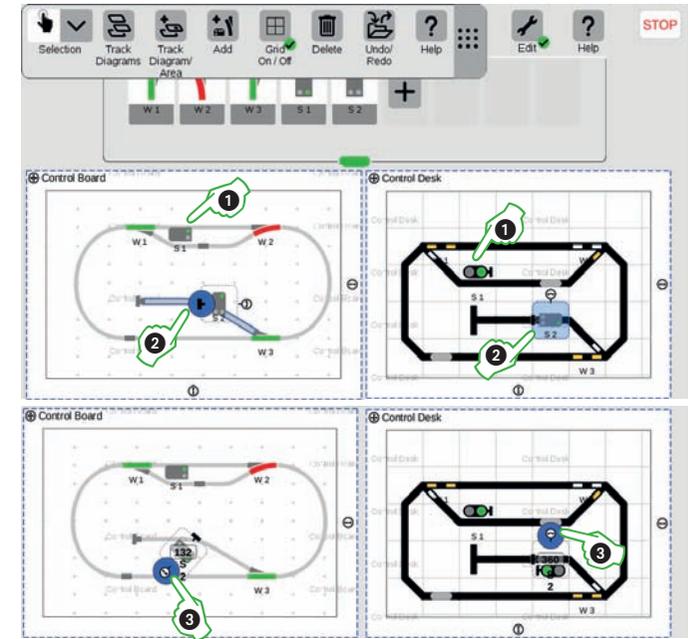
Tip: With the „Undo/Redo“ button, you can undo changes or repeat them.

Docking and Switching Signals

Adding Signals

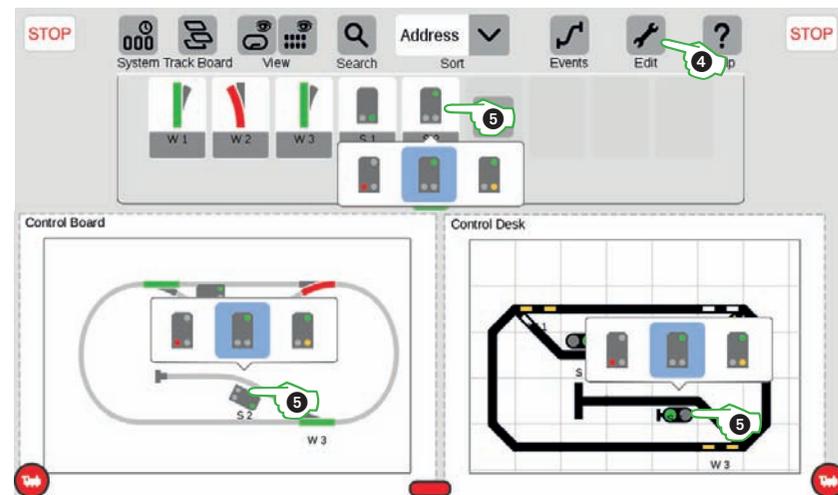
First drag a signal from the item list to the track diagram and release it. Then select the signal by clicking on it and drag it to the desired part of the track line where you release your finger from the display. The signal docks automatically at the desired track ①. If the track is to be changed, another section of the track line can be selected using the docking symbol ②.

If the signals are docked at the right section of the track line, they can be rotated with the rotation symbol ③ in order to change the side of the track on which they are placed. **Note:** Using this principle, contacts, lighting along the rail line, and texts in the track diagram can also be built in.



Using a Track Diagram Control Board

To finish, you end the editing mode by clicking on the tool symbol ④. This turns off the track route items.



You can switch all items directly on your track diagram control boards: Simply click on the appropriate symbol for that item. If several switching states should be possible, a selection will appear ⑤.

Quick Start – Automating

So easy....

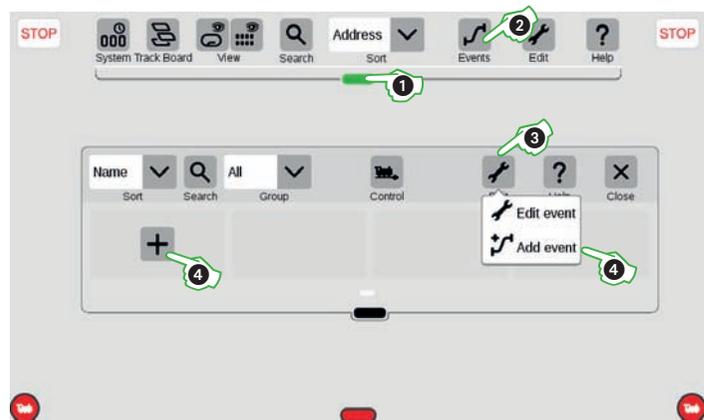
- ... setting up events
- ... recording actions
- ... setting up procedures
- ... using feedback



Creating Events

It Is So Easy to Start Programming

Automating processes is for many model railroaders the crowning point of their hobby. On the CS3, routes, locomotive processes, and the automatic control of entire layouts are designated as events. Thanks to drag & drop, the individual elements only have to be dragged into the process bar, or if you would like it even easier, simply record the control commands for the automation.



Events can be found in the menu for the item list, which you drag down from above at the green horizontal bar ①. To set up events or to edit existing ones, click on the symbol „Events“ ②. A new window will open. You add a new event using the menu item „Edit“ ③ and „Add Event“ ④ or using the „+“ character in the list.

An Overview of the Main Menu for Process Control

Starts the event

Sorts, searches, and filters events

Here you control the events: With „Block“, no new ones are started, „Terminate“ ends events that are running, and „Stop“ pauses processes.

Tip

Important: Help for events.

Arrow point opens the following event editing window:

Start process.

Alternative to manual entry: Record the processes in the operation.

Tip: Windows can be moved by touching with your finger in the open area of the header.

Each process can be highlighted visually with a photo.

Individual assignment of names for routes, processes, etc.

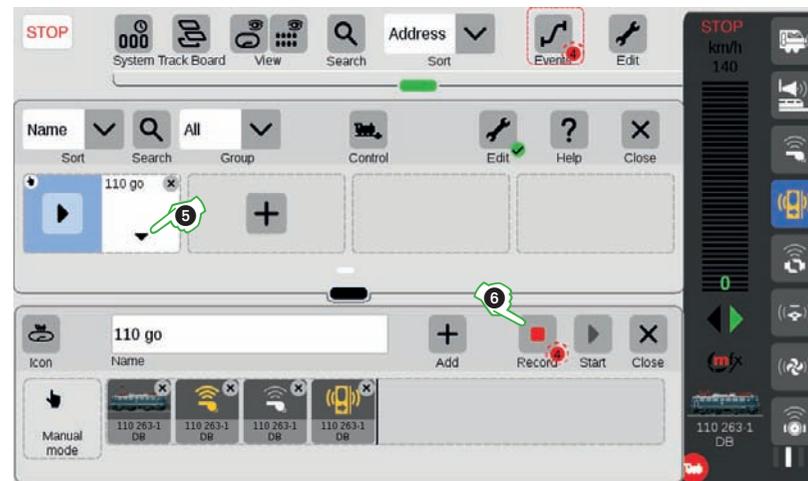
Option to build in sound files or text easily.

Recording Actions

Using the Recording Function

The easiest option for setting up events is to use the recording function. When doing this the CS3 operation is recorded.

Note: The recording function stores each control command. These can then be edited.



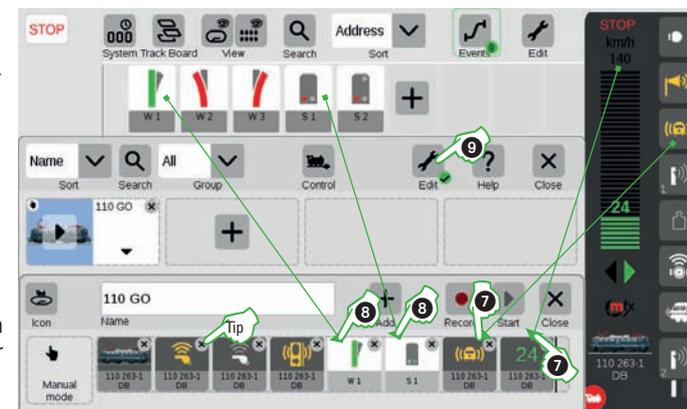
After „Add Event“, the event editing window automatically opens (alternatively using your fingertip on the arrow point) ⑤. The recording procedure is started using your fingertip on the symbol „Record“ ⑥. A red dot signals that recording is running. We recommend dragging unnecessary windows to the side so that the control commands can be carried out – such as in the image above at which the locomotive functions for locomotive 110 activate the conductor’s whistle and close doors. After all desired actions have been carried out, the recording can be ended (again click on the „Record“ symbol ④).

Integrating Event Commands

Instead of the recording function, all of the control commands can be dragged directly into the event element list (drag & drop) – for example on the 110 locomotive, the speed 24 and the electric locomotive running sounds ⑦.

Like locomotive commands, solenoid items or contacts can be dragged from the item list or directly from the track diagram into the event element list – for example Turnout W1 and Signal S1 ⑧.

Step-by-step, an event can be assembled using drag & drop. Each individual element (locomotive function, signal and turnout settings, etc.) can be selected with your finger and dragged to another position in order to change the sequence.

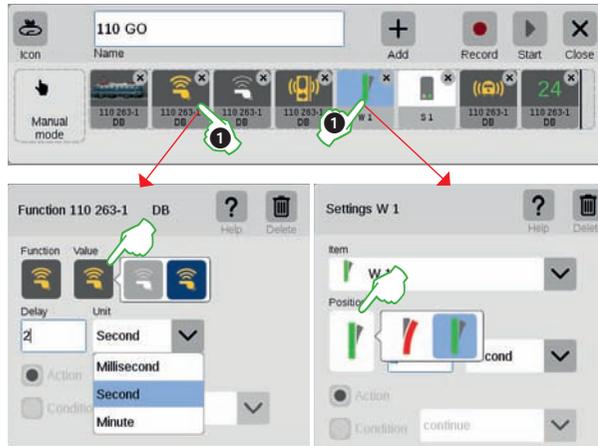


Tip: You delete an event by clicking on the „X“ in the right upper corner of the element.
Note: The editing mode must be ended to start an event (edit symbol ⑨).

Editing Event Steps

Adjusting the Process Function

In the event editing mode, each element in the element list can be edited. When you click on the corresponding element ①, a new window opens (see images).



The value to be carried out can be set on each event element – such as activating (yellow) the conductor's whistle or setting (green) Turnout W1 to the main. In order to coordinate actions with each other in terms of time, there is the option of entering the time span in the field „Delay“ of when the next event is to be activated.

Starting Events

The editing mode must be ended by clicking on the „Edit“ symbol ② in order to carry out an event. Then the entire process can be played back in the event overview ③ or in the event using the „Start“ symbol ④.

Note: The red arrow in the event element list indicates which action is being carried out just now, and the number in the green dot indicates the steps still to be carried out.



Process Control

The process of the events can be controlled with Control ⑤. During this, events that are running can either be terminated or only paused. With „Blocking Events“, they are brought to an end, but no new ones are started.

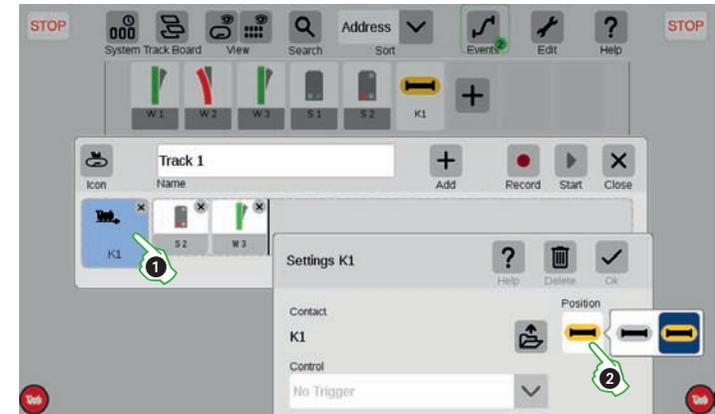
Tip: An image as a recognition feature can be assigned next to the name of each event for better identification.



Automation

Event Control Using Feedback Contacts

If contacts are to be used as activators for routes or automated processes, you can do the following: Drag the contact into the activator field on the left edge of the element list – such as K1 ①. Then click on this contact symbol and define the activation Position ②. The event process is then started when the contact reports the defined setting.



Feedback Contacts as Conditions

Other feedback contacts can be incorporated in turn in the event process itself (such as K2 ③) by dragging them into the event element list. In the conditions, the condition ④ can also be used in addition to the setting. The other event process is paused in the event of „wait“ until this contact reports the defined setting. In the event of the condition „continue“, the event is terminated if there is an incorrect setting.



Linking Events

The linking of any events such as routes and processes also works among each other. To do this, set up a new event using „Edit“ and drag the appropriate events into the element list ⑤. Each individual event in this procedure can be custom adjusted by pressing (keep your finger on the event longer). However, events are executed in parallel if the check mark by „Delay“ is not activated ⑥, which is indicated by a „W“ in the event symbol.



System Functions

So easy....

... setting up the CS3

... managing devices

... data protection

... updating

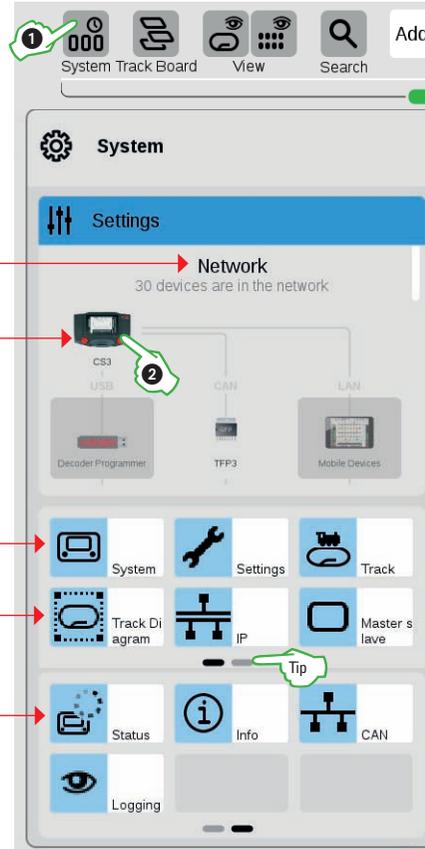
... web interface



System Settings

Calling up the System Menu

You get to the entry page for the system settings (image to the right) by clicking in the item list's menu bar to the left on the button „System“ ①. There you will see the overview of the devices. You open their settings with your fingertip on the individual components there.



Network: overview of the connected devices (see page 24).

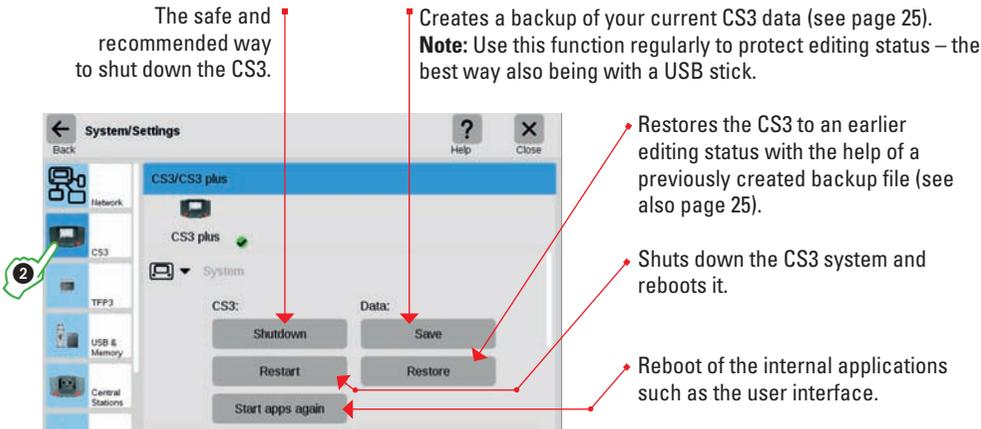
Open the CS3 settings.

Quick access to the areas for the CS3 system settings.

Tip: You get to the other pages using the gray horizontal bars on the lower edge.

System for the Central Station 3

To open the CS3 system settings, click in the network overview or in the menu column on the left edge on the CS3 symbol ②.



The safe and recommended way to shut down the CS3.

Creates a backup of your current CS3 data (see page 25). **Note:** Use this function regularly to protect editing status – the best way also being with a USB stick.

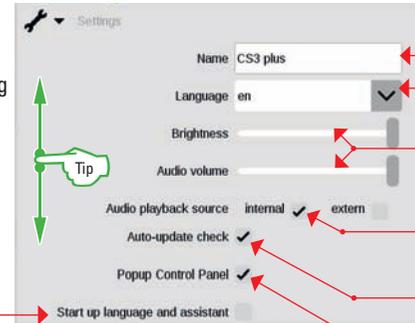
Restores the CS3 to an earlier editing status with the help of a previously created backup file (see also page 25).

Shuts down the CS3 system and reboots it.

Reboot of the internal applications such as the user interface.

Access to the CS3 Settings

Tip: The lower elements can be reached by wiping your finger up in the middle of the display.



Enter the designation for this CS3.

Changes the language of the control interface.

Adjusts the screen brightness or volume with a slide control.

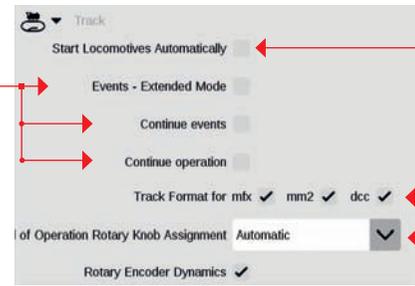
Selection between a built-in and an external speaker.

With the check mark set, checks the CS3 regularly for available updates.

Turns the locomotive window in the locomotive list on and off (see page 9).

Activates the window when the CS3 starts.

Calling up Track Settings



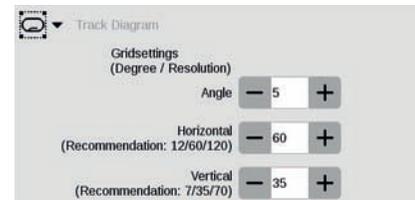
After a reboot, sets all locomotives and/or events automatically back to the last known status.

The full range of events should only be activated as needed.

Here, you can turn off protocols not being used (see page 41).

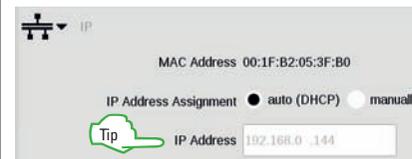
In the drop-down menu, you define the assignment of the rotary control knobs in the World of Operation mode.

Defining the Track Diagram Grid



When you are creating track diagrams, a grid can be set to facilitate the placement of elements. The grid calculates based on the 30° turnout angle being used. The rotation of the turnouts should be done in this grid. It also conforms to the desired parallel spacing in the track diagram. The grid can be deactivated/activated in the track diagram (see page 17).

Looking at IP Settings



This option is available when you connect your CS3 with a LAN cable to your router (regardless of with or without Internet access). You have the choice here whether the CS3 is to provide itself automatically with the necessary network address from the router or whether you enter the data manually. In most cases, „auto“ is the right setting.

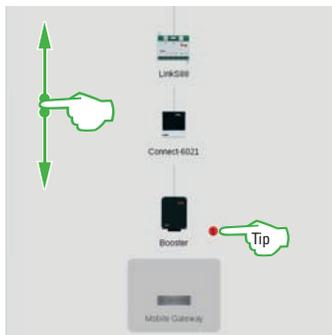
Tip: With the IP address, you open the CS3 web interface on a terminal in the same network (see page 26).

Managing Devices

Network: Overview of Connected Devices

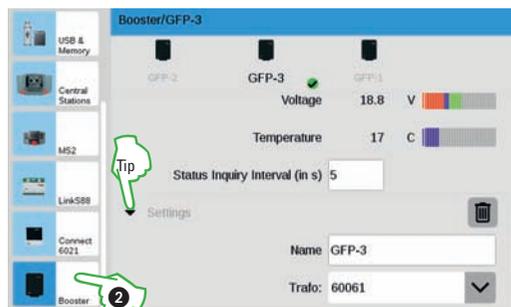


The network overview ① gives information about all devices connected to the CS3. You reach their settings by your fingertip directly in the overview or using the device classes in the menu on the left edge. Wiping your finger up takes you to the lower sections of the page (image below). Inactive devices are shown grayed out.



Tip: A red dot on a device refers to an available update (see page 25).

Konfigurieren von Booster-Anschlüssen



In the Booster settings ②, you can change the interval between two status queries. Standard: every five seconds. In addition, you can custom adjust the designation of the Booster as well as the transformer being used and the desired mix mode. Wipe with your finger to the upper edge of the screen to see the lower part of the page. **Tip:** Clicking on the arrow point opens the corresponding menu item.

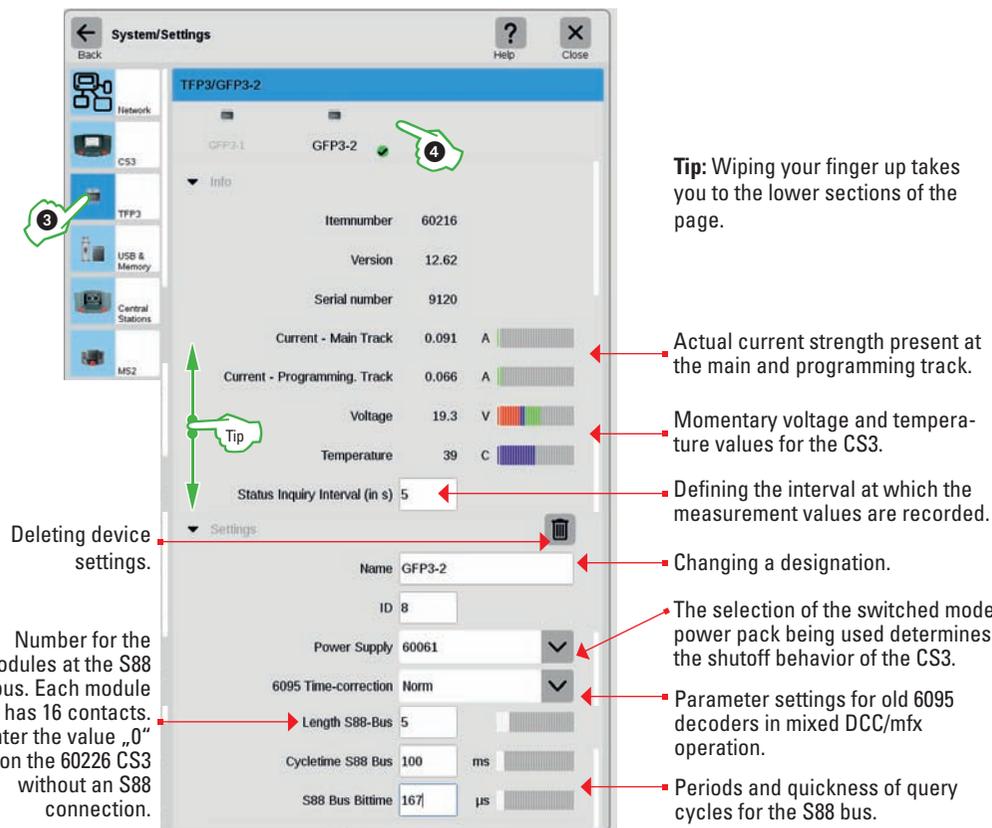
Deleting Device Settings No Longer Needed



The CS3 remembers the settings for each device that has been connected to it. The advantage: You can separate all devices from the CS3 without losing their settings. You can however delete these settings with the trashcan icon if necessary. This icon can be found in the system settings in the section „Settings“ for each device. You remove the device data with your fingertip on this icon. The device will no longer be shown in the system settings.

GFP3

You get information about current measurement data for the layout and the CS3 using the TFP3 (Track Format Processor 3) ③. With several devices, each can be custom selected and configured in the header ④.

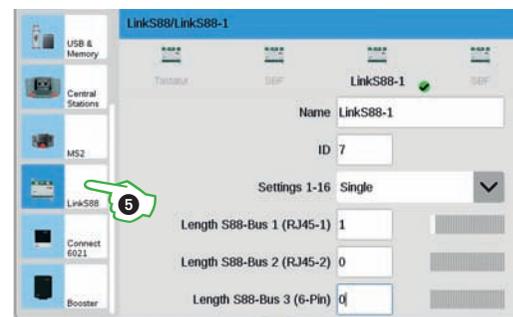


Tip: Wiping your finger up takes you to the lower sections of the page.

Deleting device settings.

Number for the modules at the S88 bus. Each module has 16 contacts. Enter the value „0“ on the 60226 CS3 without an S88 connection.

Link S88



In the settings for the Link S88 ⑤, you have the option of changing the name. The CS3 assigns the ID automatically. If you are replacing a defective Link S88, write down the ID before deleting the old unit with the help of the trashcan icon. Then take this ID for the new unit.

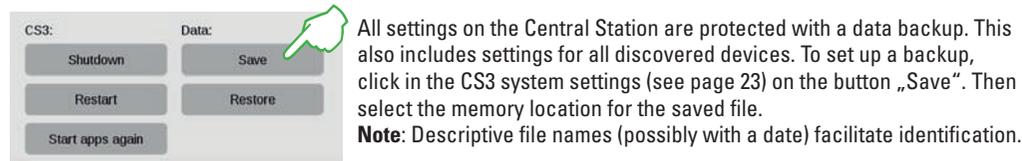
Important: Set for length the number of S88 decoders connected to the Link S88 at each connection (bus) correctly. Otherwise, these cannot be recognized by the CS3.

Data Backup/Restoration

Backup: Creating Data Backups

The CS3 stores entries and adjustments constantly on its own within a few seconds. Your data are therefore safe even in the event of a power loss.

Note: Regular backups, even on USB sticks, are however very advisable. For example, doing this makes it very easy possibly to reverse more extensive changes by restoring an earlier editing level.



All settings on the Central Station are protected with a data backup. This also includes settings for all discovered devices. To set up a backup, click in the CS3 system settings (see page 23) on the button „Save“. Then select the memory location for the saved file.

Note: Descriptive file names (possibly with a date) facilitate identification.

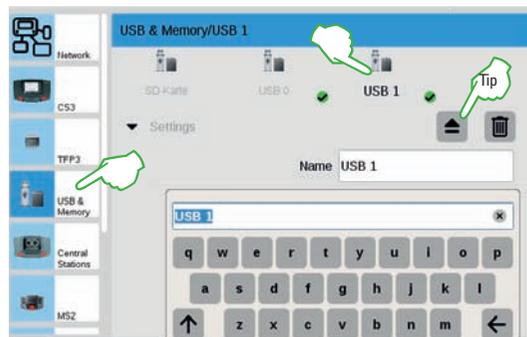
Recovery: Restoring a Backup



The settings for the CS3 contained in the data backup are restored with a restoration. To do this, click in the CS3 system settings „Restore“ and select the backup file.

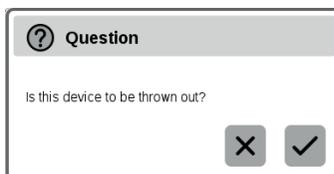
Note: When doing a restoration for an outside configuration or a swap of the Central Station, the restoration does not lead to a working environment since the device configurations are mostly incorrect. The basic approach is that you should check the settings again.

Managing the USB Connection & Memory



In this menu, you will see the storage media. You change between devices with a fingertip on the header. Click on the name field to assign a descriptive name.

Tip: To avoid data loss on your USB stick, use the ejection option before unplugging the USB stick.



Note: The Central Station 3 has three USB connections of which two can be used for data exchange while one is only used for charging.

SD Card: Expanding the Internal Memory



With an SD card (SDHC), you can expand the internal memory (4 GB) by up to 32 GB of memory. All you have to do is plug the card in the card slot. You do not have to do any other settings.

Note: Märklin does not recommend using SD cards as removable media. They should be used only for the purpose described here of expanding memory. You should prefer USB sticks to copy files such as locomotive images to the CS3.

Updating the CS3

This is how you get to the latest level: Updating CS3 Software

Märklin continues to develop the software for the CS3. As soon as a more current version is available, a red dot at the foot of the „System“ symbol ① signals this in the item list which you can drag down from above at the green horizontal bar.

Note: The CS3 searches only for updates when the Auto-Update Check is activated (see page 23).

Important: If your CS3 is not connected to the Internet, you can also carry out updates using a USB stick (see below).

To update the CS3 software, click on the „System“ symbol ①. The red dot will lead you through the system settings. In each case, click on the CS3 symbols with the red dot ②.

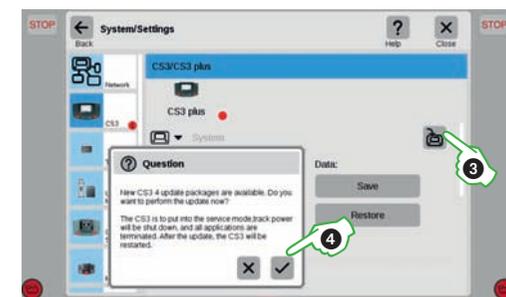
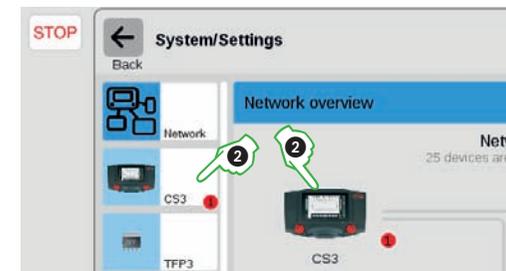
When you see the update button ③ in the CS3 settings on System, activate it using your fingertip. Now the CS3 will ask whether you want to carry out the update. Confirm by clicking on the check mark ④. Detail information will appear for the update – confirm in the upper right with your fingertip on „Start“. The CS3 will then carry out the update. At the end, confirm in the upper right with „OK“.

Note: Before doing an update, we recommend doing a data backup (see left side) and all additional devices (MS2, Terminal, S88, etc.) should be disconnected from the CS3.

Important: When the red dot does not appear by the CS3 but for another device, this means an update is available for this device. Do as with the CS3 update and start the update of the device.

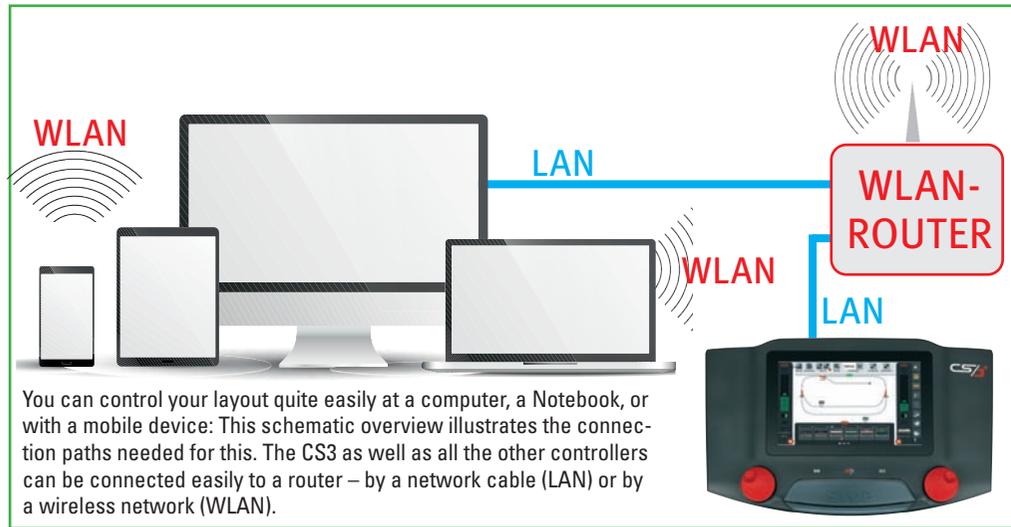
Update Using a USB Stick

In the event the CS3 is not connected to the Internet, you can also install an update for the newest software version with the help of a USB stick. Download on a computer the current image file from the Märklin website (www.maerklin.de/en/service/downloads/cs3-updates/) in the Internet and store this in the main directory of a USB stick. After you have plugged the USB stick into the CS3, wait a moment. The CS3 will automatically recognize the new software version on the USB stick and signal this with a small red dot on the „System“ icon. The remaining steps are the same as for updating using the network – see above.



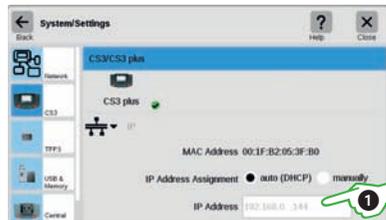
Calling up the Web Interface

Starting the CS3 Web Interface

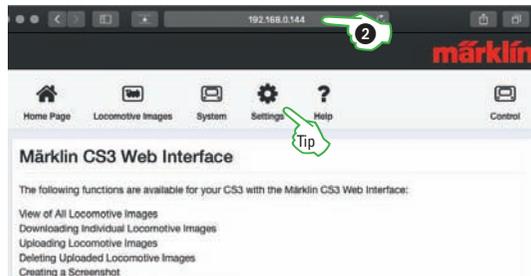


A requirement for the use of the Web interface is Software Version 1.3.3., which must at least be installed on the CS3. The CS3 is connected to a router by a LAN cable. Since no particular requirements are made of the router, other older devices can also be used. In the first step, switch the router on and after that the CS3. When it is turned on, the CS3 registers itself automatically on the router and it is assigned an IP address. Using this IP address, the other devices can be connected to the CS3.

Important: To do this, the CS3 must be connected to a computer/controller by means of a network router.
Note: Internet access is not necessary.



To start the Web interface, you must first find out what the IP address is for your CS3. To do this, call up the CS3 system settings (see also page 23) and there open the section „IP“. In the standard setting, the CS3 automatically gets an IP address assigned to it from the router connected to it. This is shown in the field „IP Address“ ①.

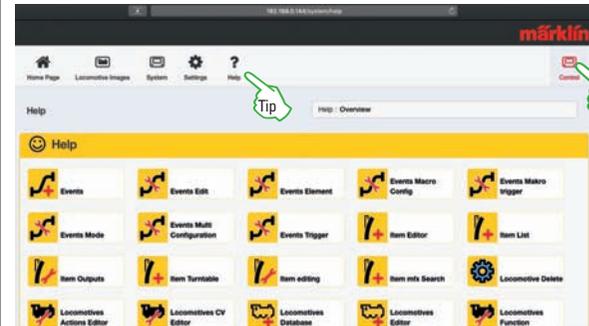


Start an accessible Web browser on your devices in the same network such as Firefox, Internet Explorer, Edge, Safari, or Chrome. In the address line, enter the IP address for the CS3 (in our example „192.168.0.38“) ②, not as otherwise usual the address for a Web page, and press the entry button. The start page for the CS3 Web interface (image to the left) will open. Before you can use the software, you must agree to the terms of use and safety information.

Tip: The language can be adjusted on „This Device“ using the button „Settings“.

Remote Control Using the Web

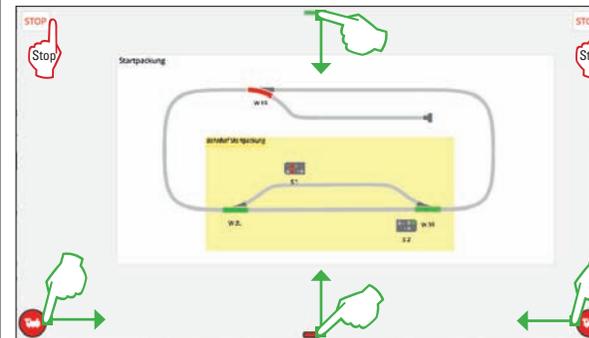
Controlling with the CS3 Web Interface



On the Web interface, click in the upper right corner on the button „Control“.

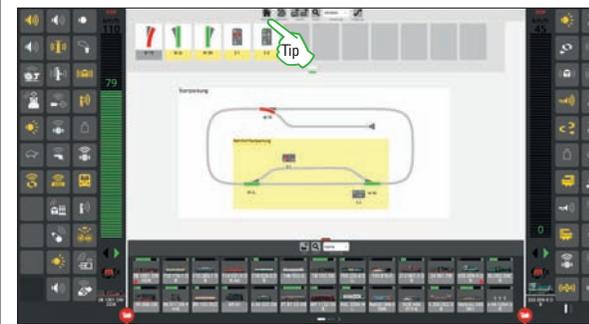
Note: You can also open the control in a new tab or window thereby making several instances possible.

Tip: When you call up help in the Web interface, you can try out the help note directly on the CS3 or print it out.



Operation such as on the CS3 (see page 6): The track diagram is in the background, the locomotive controllers are to the right and left. They can be dropped down and closed. The locomotive list can be opened on the lower edge, and the item list that can be opened is on the upper edge.

You can immediately control the CS3, either by device with a mouse or with finger motions such as on the CS3. Clicking on a Stop symbol is enough for an emergency stop.



Custom display: The view of each window for the Web control interface can be selected in different ways. For example, you can display the track diagram once and keep the locomotive control in view in another window or device. The locomotive controllers on the sides must be positioned here independently of each other in each control interface.

Tip: You can get back to the Web control interface using the house symbol „Start Page“.

Important: All direct control tasks involving locomotive operation, switching items as well as the track diagram, and the activation of events can be carried out by each of the control devices. These changes appear here automatically and at the same time on all other control devices. In addition, the software continues to be developed so that even new items or locomotives can be set up and new track diagrams can be created.

Note: The number of „secondary control devices“ is not limited by the CS3. You can open any number of instances of the Web interface, once per Web browser window. It does not matter if they run on different devices or all on the same device, but they must be in the same network.

Practical Advice...

- ... converting from 6021, MS2, CS2
- ... managing locomotives
- ... managing items
- ... managing track diagrams
- ... screen server
- ... troubleshooting



Using the Mobile Station 2

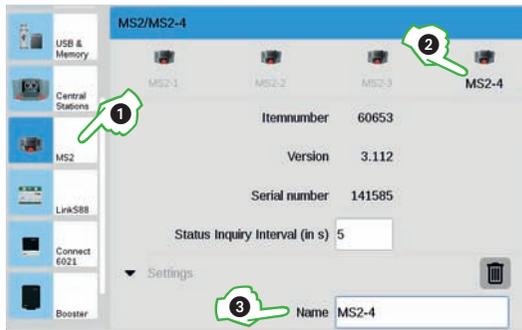
Connecting the MS2 to the CS3

The CS3 has two connections on its front for one each Mobile Station 2 (see page 3). All you have to do is plug the MS2 in and you can also control things with an MS2. In this situation, the CS3 is the central controller (Master) and predefines locomotives and solenoid items. All MS2 units connected to this CS3 can then make use of these locomotives and solenoid items. However, the locomotive places on the MS2 can be occupied individually. All locomotive controllers are equal when you are running locomotives and switching items. The commands are processed in the sequence they are received. **Important:** A track box may not be used in the CS3 system.

Note: Other Mobile Stations can be connected to the CS3 using a Terminal and connecting cable (see page 42).

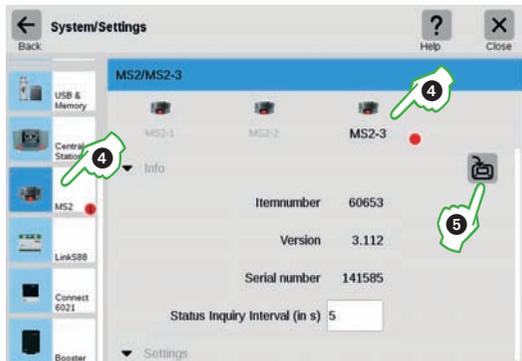


MS2 Settings



In the CS3 system settings, click in the device list on MS2 ①. There, you will find all of the MS2 units known to the CS3 in the header for selection ②. You can assign a custom designation ③ for each device. In addition, the interval can be adjusted of how frequently the device status is to be queried. The standard setting of five seconds is however in most cases optimal.

Updating the Mobile Station 2



In order to update the MS2 software, the MS2 is connected to a CS3 with the current level of Software. The first update reports on the MS2 are to be ignored. Instead, it takes a moment until the CS3 shows the new MS2 update with a red dot in the system settings ④. Then click on the symbols with the red dot until the update button ⑤ can be seen. This will initiate the MS2 update on the CS3 and transfer the current software to the MS2 when agreement is given there.

Note: When updating the CS3, we recommend unplugging all devices (MS2 also).

Upgrading from the 6021 Control Unit

From the 6021 Control Unit to the CS3

There are two options when changing from a 6021 Control Unit to the CS3:

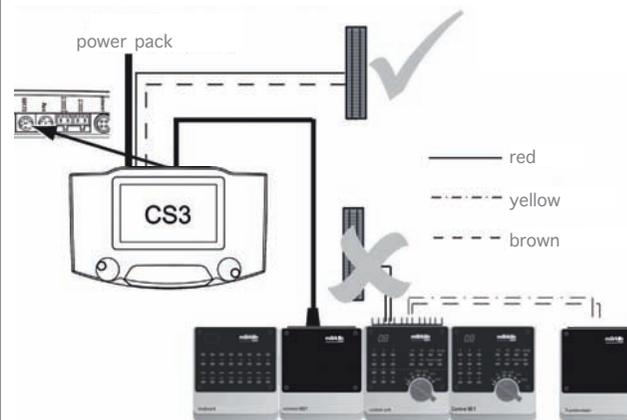
You replace your 6021 Control Unit with the CS3. The locomotive and solenoid item decoders previously in use can be controlled by the CS3 with no problem – they only have to be set up in the CS3.

Alternatively, you can integrate the 6021 Control Unit and most of the operating devices connected to it into the entire CS3 system by means of a Connect 6021.

If a 6015 or 6017 Booster was connected to the Control Unit, it must be replaced – such as with the 60175 Booster.

If automatic circuits were done on the 6021 Control Unit using the Memory, the feedback modules can continue to be used.

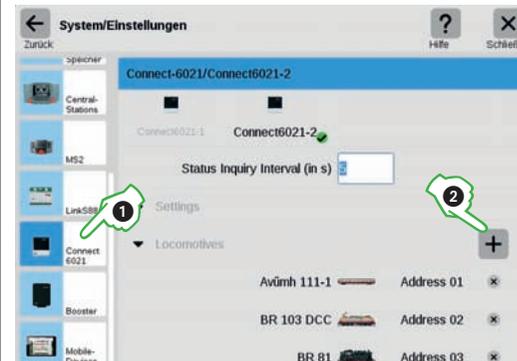
However, if the feedback is not visible on the CS3, the feedback modules should be connected to the CS3 using a Link S88.



Important: Only one 6021 Control Unit can be used in the entire system. No users may be connected at the output of the Control Unit. Other operating units such as the 6040 Keyboard, the 6043 Memory, and the 6036 or 6035 locomotive controllers can be connected.

Note: Details for the setup of the digital CS3 system architecture can be found on page 42.

Integrating the Connect 6021 Control Units



In the CS3 system settings, click in the device list on Connect 6021 ①. In the information and settings segments, adjust the names and if necessary the status query interval too.

Important: On the Connect 6021, locomotives must be assigned manually. To do this, click in the „Locomotives“ segment on the plus sign ② to add locomotives. In the selection window that is turned on, select the appropriate locomotives with your fingertip. Locomotives added will appear after that on the lowest spot (image to the left).

Adding the CS2

From the Central Station 2 to the CS3

Anyone operating his layout and extensive circuits with a Central Station 2 can replace this with a CS3. Yet both Central Stations can also be used together thus allowing an additional control option at another location on the layout, such as for other operators.

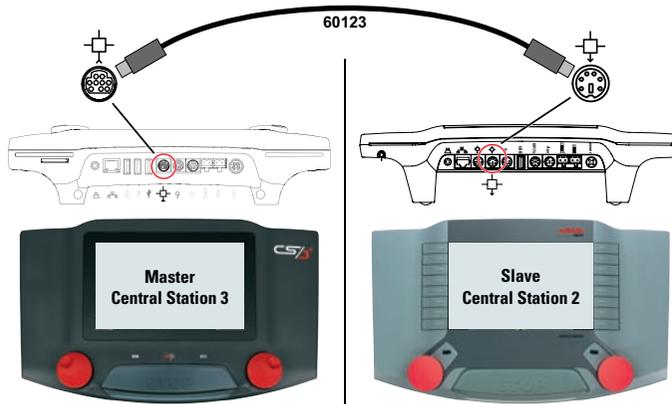
If you own a CS2, item number 60215, all you have to do is add the CS3 (item number 60226) and a switched mode power pack (item number 60061/60065/60045). The power output of this CS3 can be used to supply power to an area of your layout. Only the center conductor must be insulated between the areas powered by a CS2, CS3, or a Booster. The installation of rocker insulators is not necessary. You do not need to change anything to the feedback modules connected to the CS2. If you want to add additional feedback modules, you can expand the previous feedback module chains or connect a feedback module Link S88 (item number 60883) to the CS3. The advantage of this system compared to the earlier 6088 or 60880 feedback modules is the higher voltage level of 12 volts (previously 5 volts), which results in lesser sensitivity to surge currents.

On the other hand, if you have a CS2 with item numbers 60213 or 60214, you must add the CS3 plus (item number 60216). The S88 AC or S88 DC feedback modules can be connected directly to the CS3 plus. The Link S88 feedback module as the first feedback module is not necessary.

The two Central Stations must be connected to one another. This is done with a 60123 connecting cable. If this is too short, the 60126 extension cable can help.

Important: In addition to the connecting cable, both Central Stations should be connected with LAN cables to a common router – Internet access is not needed.

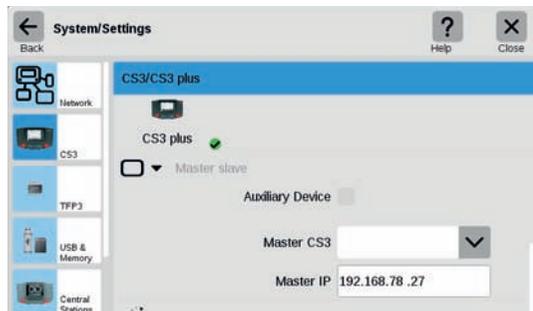
Note: Details about the setup of the digital CS3 system architecture can be found on page 41.



Master-Slave Settings

The moment you are using more than a CS3, this section takes on importance in the CS3 system settings: Here, you set which CS3 is the main device (Master) and whether this device is a secondary one.

Note: In the event you replace a device, make a note of its ID before deleting the old device with the help of the trashcan icon. Then take this ID for the new device.



Taking CS2 Data into the CS3

Importing Existing Data from the Central Station 2

If you have already been controlling your layout with the Central Station 2, then you can take your valuable data from there in a few steps into the CS3. All you need for this is a USB stick with the backup of your CS2 data.

Note: Complete information about creating a backup of your CS2 data can be found in the operating instructions for your CS2.

Important: In the first step, plug the USB stick with the CS2 backup into one of the two USB data sockets on the back of the CS3.

On the CS3, click in the item list (drag the green horizontal bar down) all the way to the left on the „System“ button ①. In the system overview, click in the lower left on „System“ ②.

This takes you directly into the system settings for the CS3. There, click on the button „Restore“ ③.

Now, the CS3 will ask whether you are really sure.

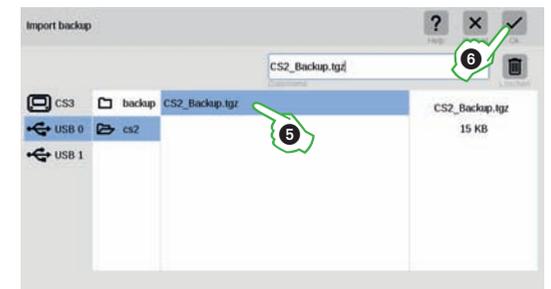
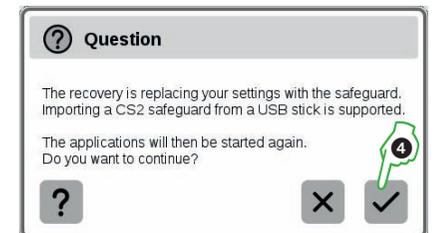
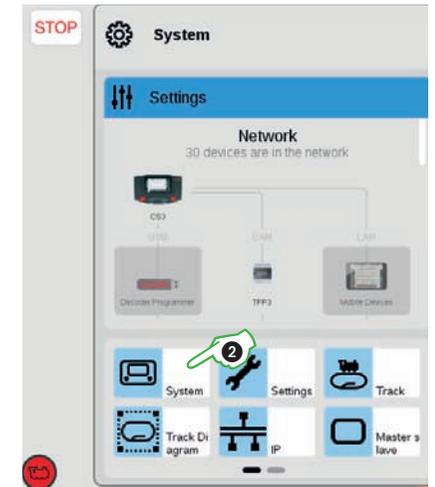
Note: When installing an outside configuration, the current one will be replaced. A fundamental thing to remember is to carry out a data backup of the restoration (see page 25).

The import of a CS2 backup is started with your fingertip on the checkmark ④.

In the file selection dialog, click on the correct „USB“ drive and on the folder in which the CS2 backup is located. Select the desired backup file ⑤.

Now confirm the data transfer with „OK“ ⑥. After a few moments, you will see the start screen for the CS3.

Important: Layouts for the CS2 are also imported into the CS3. The system for track diagrams in the CS3 is however completely different from that for the CS2. After the import, the track diagrams must therefore be adjusted on the CS3.



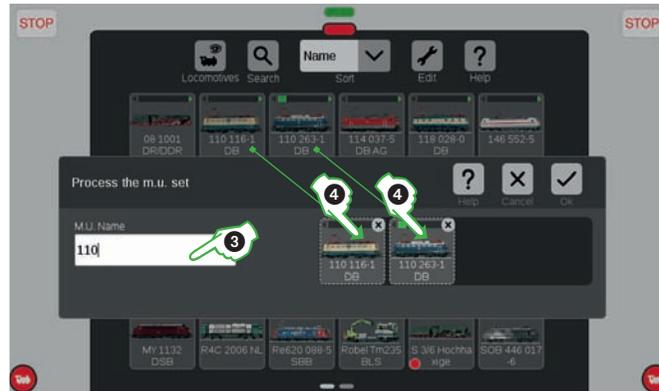
Locomotive Control with M.U. and Address

Putting Locomotives in an M.U. Combination



You set up a double or m.u. combination with the menu item „Create M.U. Set“ ②. To do this, open the drop-down menu with your fingertip on the tool symbol („Edit“) ① in the locomotive list. In the entry template that is then turned on (see image below), you can give the new m.u. set a name ③.

To create the m.u. set, move the desired locomotives by wiping your finger from the locomotive list across into the entry template ④. Confirm this by clicking on „OK“ – and the new m.u. set will appear in the locomotive list.



Finding Lost mfx Locomotives



In rare cases, it can happen that an mfx locomotive is no longer shown in the locomotive list. The following procedure is helpful in which all existing data are checked and the system is investigated for missing mfx locomotives.

You start this function in the locomotive list using the button „Edit“ ① and then with your fingertip on „Rediscover Lost mfx Locomotives“ ②.



Running a Locomotive with Address Control



To control and run a locomotive using its address, click in the locomotive list on the tool symbol („Edit“) ① and in the drop-down menu that opens select „Add direct address drive“ ②.

On the numeric keypad that is turned on, enter the address of the locomotive and select the protocol of the decoder being used. The address entered is automatically taken in the locomotive controller (in the example to the right the address 23) – now you can run the locomotive directly.

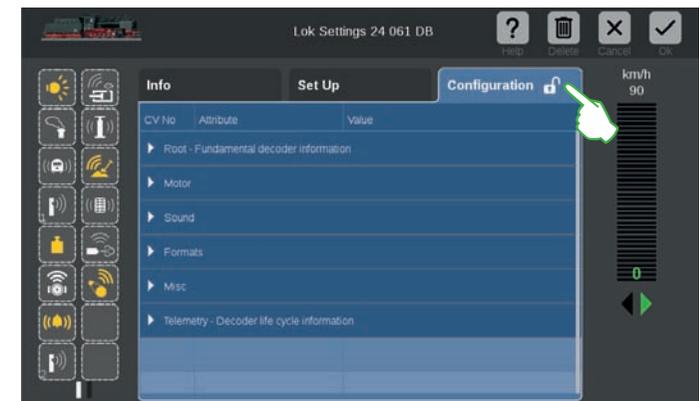
Tip: You can change the address and protocol for such an address drive locomotive at any time: Simply click on the address setting and the keypad will then appear again.



Only for Experts: Configuring mfx Locomotives

All detail settings for the locomotive decoder are loaded the moment you open the tab „Configure“ in the locomotive settings for an mfx locomotive.

Important: The blue areas are intended only for experts. Please only change something when you know what you are doing. In normal operation, you must not do any adjustments in this area.

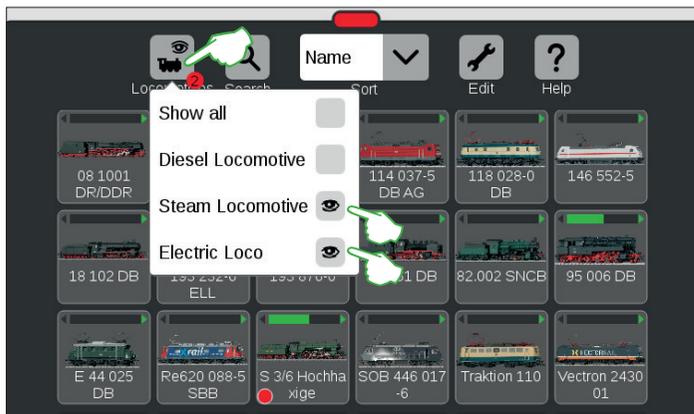


Filtering, Sorting, and Searching a Locomotive List

Displaying Locomotives Independently of the Type of Drive



The locomotive list can be filtered by the type of drive in order to give you a greater overview. Click on the button with the locomotive symbol „View“ in the symbol bar to get numerous filtering options displayed. In the standard setting, the option „Show All“ is marked. You can get a marvelous overview of your locomotives with your fingertip on the individual types of drives (diesel locomotive, steam locomotive, and electric locomotive). You end the filtering mode by selecting „Show All“.

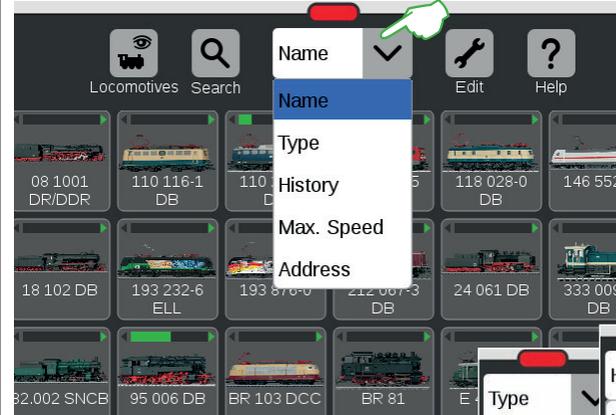


For example, your fingertip on „Steam Locomotive“ and „Electric Locomotive“ shows the corresponding locomotives with steam and electric drive. The others are turned off. The small red dot refers to active filters. The number shown in it refers to the number of criteria.

Important: „Show All“ must be deactivated in order to show individual types of drives.

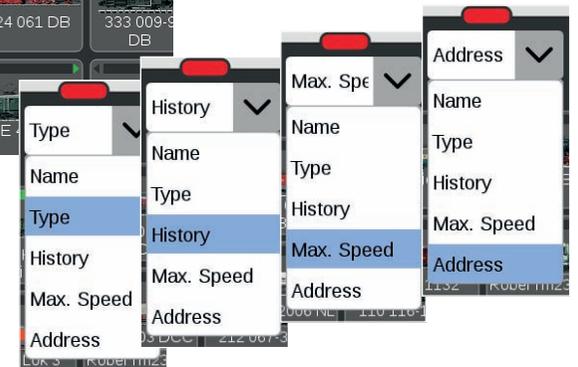
Note: After selecting a drive (such as steam locomotive / electric locomotive), you can quickly turn on the entire locomotive list again with „Show All“.

Sorting Options in the Locomotive List



You can get more of an overview in the locomotive list by sorting locomotives using the drop-down menu on the upper edge of the locomotive list. Simply click on it and the menu opens. You can sort by locomotive names by clicking on „Name“. The locomotives are then sorted alphabetically (image to the left).

Clicking on „Type“ sorts the locomotive list by the type of locomotive in the sequence steam, diesel, electric, other. If you select „History“, then the last locomotives used are shown first. „Max. Speed“ sorts the locomotive list by the maximum speed indicated in the settings under „Speedometer“ (see page 12). When „Address“ is selected, the sorting is done by locomotive address.



Searching for Specific Locomotives / Live Search

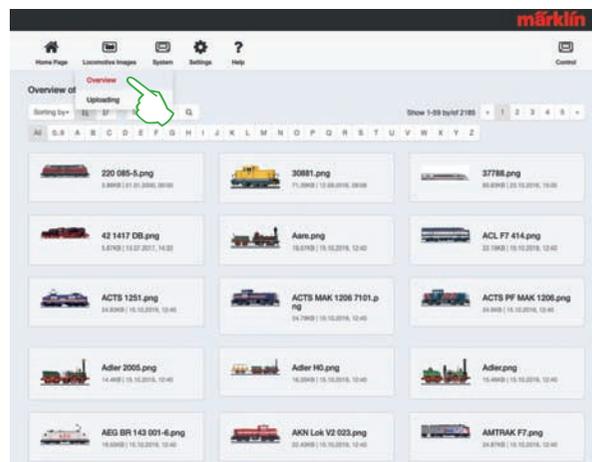


With the help of the search function, you can search specifically by the name or part of the name for individual or several locomotives. Click on the magnifier symbol („Search“) and enter the search term on the keypad that is turned on. The CS3 searches directly in each case by the entry of each character (Live Search). A small red dot refers to the active search. The number shown in the dot refers to the number of characters entered.

Note: You end the search mode by deleting the search term with the backspace key or with the „x“ in the entry field and then clicking on the confirmation check mark for the keypad.

Locomotive Images

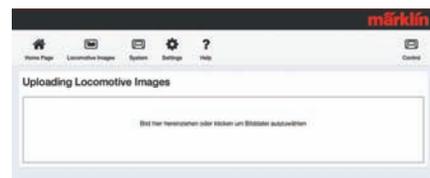
Overview of Locomotive Images in the Web Browser



You can easily access the locomotive images database in the CS3 using the Web interface (see page 26). Simply select in the symbol bar „Locomotive Images“ and go in the drop-down menu at „Overview“ (see image). You can sort the view of all locomotive images by name, date, and size or simply filter them by initial letter. Alternatively, the search will quickly show the desired locomotive images.

Importing Locomotive Images by Web Browser

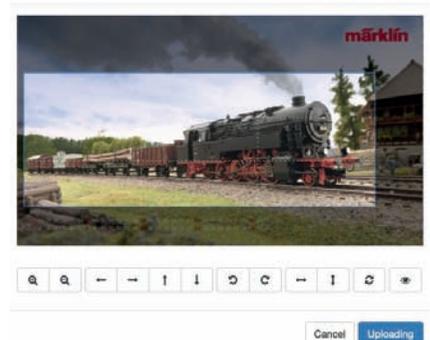
The CS3 comes from the factory with a large quantity of locomotive images that might satisfy the requirements of many model railroaders in most cases. Beyond that, you can also import your own locomotive images into the CS3 image database (see page 11). The easiest way is to use the Web interface for the CS3 that can be called up using any Web browser (see page 26).



Move the mouse cursor over the button „Locomotive Images“ and click on the option „Upload“ that is turned on. You can now easily move a locomotive image into the field intended for it (image to the left). Alternatively, click on the field in order to select the image file.

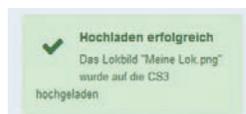
Important: The file may only be a maximum of 5 MB large. The image format or the image size plays no role here.

Lokbild bearbeiten und Hochladen



If you have moved the image into the field or have selected your desired image, the image is opened in an image editor that offers numerous options for image editing. You can move your subject, change its size, rotate it, and flip it. All the way to the right, there is the option „Preview“ which you can use to check the adjusted subject again. At the end, click on „Upload“. The locomotive image will now be stored under its file name in the image database.

A green colored overlay lets you know about the successful upload of the locomotive image.



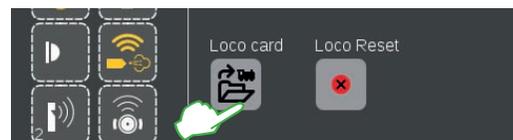
Locomotive Card and Webcam

A Special Case for the Locomotive Card: Reading and Saving Locomotive Data

You can take locomotive data into the locomotive list from existing locomotive cards or write new data on a locomotive card.

Read: Plug the locomotive card into one of the two card readers as shown. The data are taken into the locomotive list and the locomotive is immediately taken into the locomotive controller on the side in which the card is plugged.

Important: Make sure that the chip on the card is pointing down.



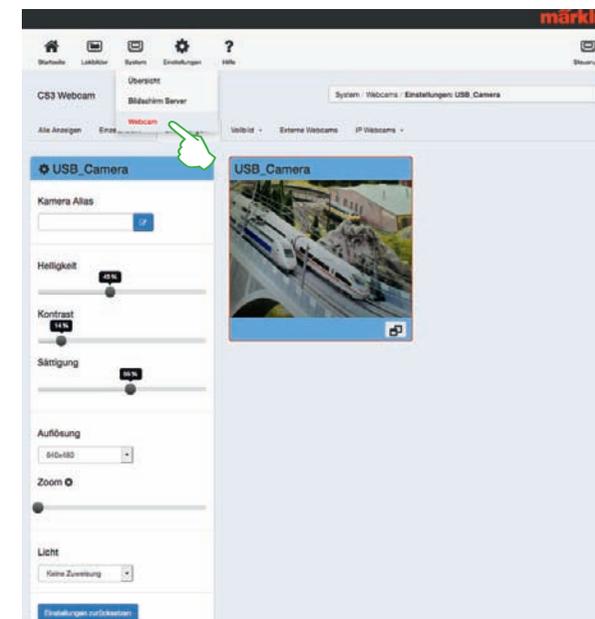
Write: Plug the locomotive card into the right card reader as shown. Click in the locomotive settings in the tab „Setup“ on the symbol „Locomotive Card“: The CS3 writes the locomotive data onto the locomotive card.



Webcam

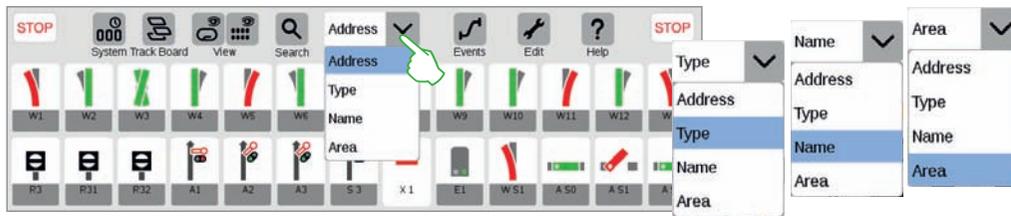
Video monitoring of the layout: The CS3 can give live stream monitoring of train operations by means of USB cameras or IP cameras. The presentation is done in the Web interface under menu item „System“ in the selection window „Webcam“. Simply connect the USB camera to the CS3 and adjust the settings as needed (image to the right).

Note: Due to the high microprocessor load for the CS3, the quantity of USB cameras is limited to one active unit. Several cameras can be connected. Several IP cameras can be used, since they do not burden the CS3 to the same extent. The USB Webcam must support the „USB Video Device Class“ (short: UVC) Standard as well as the Motion JPEG Format (short: MJPEG).



Filtering, Sorting, and Searching an Item List

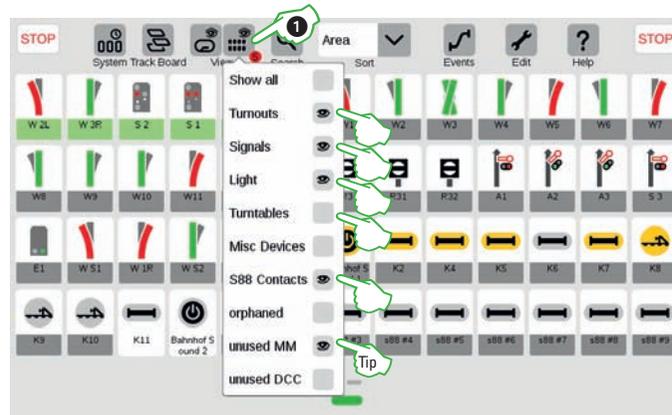
Sorting an Item List



You can sort solenoid items by various criteria using the drop-down menu on the upper edge of the item list: by the assigned address, the type of item, the item designation for each item („Name“), or which area it belongs to on the track diagram control board.

Filtering an Item List

The item list can be reduced with „Filter“. To do this, click on the upper edge of the item list on the appropriate symbol ①. A drop-down menu will then appear with different criteria by which the item list can be filtered. A combination of several filters is also possible. A small red dot refers to active filters. The number shown inside this dot corresponds to the number of criteria. You end the filter mode by selecting „Show All“.



Tip: Unoccupied addresses can also be shown using the filter. This makes it easy to assign them.

Searching for Items

With the search function, you can search for individual or several solenoid items specifically by the name or by parts of the name. Click on the magnifier symbol („Search“) and enter the search term on the keypad that is turned on. The CS3 will search in each case by the entry of each character (Live Search). A small red dot refers to the active search. The number shown inside this dot corresponds to the number of characters entered.



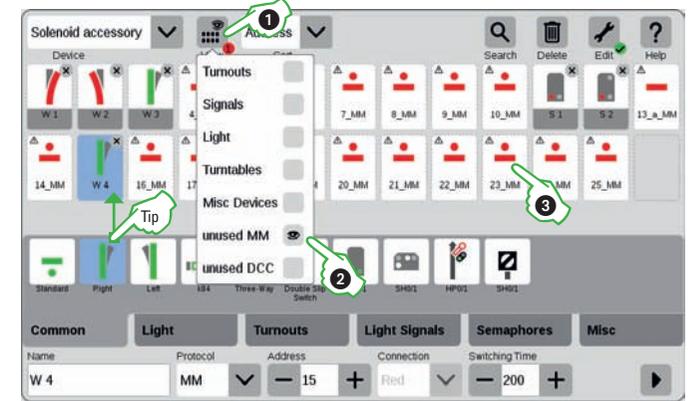
Tip: You end the search mode by deleting the search term with the backspace key or with the „x“ in the entry field and then click on the confirmation check mark for the keypad.

Open Addresses and Setting up a Turntable

Showing Unoccupied Addresses

Unused addresses ② can also be shown in the item list using the view filter function ① whereby items can be operated without them having to be set up previously. Here, unoccupied open addresses are shown in the overview as red/green switches with a warning triangle in the upper left corner ③.

Tip: The open addresses can be occupied easily with items using drag & drop. To do this, drag the desired item symbol on to the address placeholder.

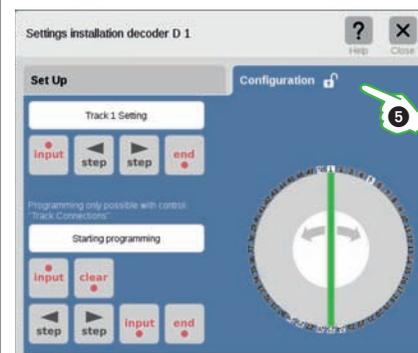


Configuring Turntables

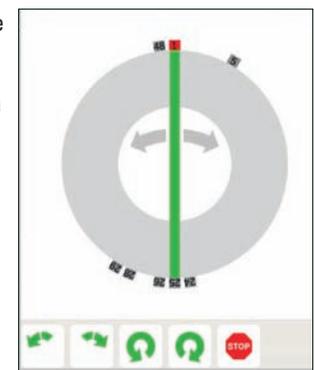
The turntable (item number 7286) can be set up as easily as solenoid items: Click in the item list on the tool symbol („Edit“) ① and select „Add Article“ in the following drop-down menu ②. Then, click on „Turntables“ ③. The CS3 can control turntables in two ways ④: Settings 1-24: In this mode, all track settings can be approached that are connected in the track diagram. Extensive programming of the turntable decoder is not required.

Track connections: The programming of the turntable decoder defines which settings the turntable can approach.

Note: The track diagram must correspond to the real turntable.



Then, the programming of the turntable decoder must be done in the item settings under „Configuration“ ⑤ with a particular process sequence of Stop-Go and operation buttons. The exact position of Track 1 can be set up with the Track 1 adjustment. When the programming is done correctly, the turntable can be operated easily using a popup window (image to the right).“



Track Diagram: Selecting Items and Areas

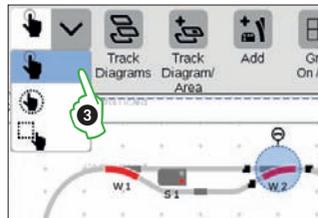
Selecting Individual and Several Items



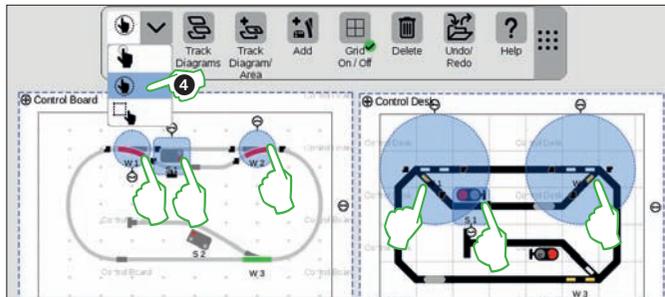
For various actions, it is first necessary to select one or several items. The first step for this is always to activate the editing mode by clicking on the tool symbol in the item lists symbol bar ① and select „Edit Track Diagram“ ②.

Individual Items are selected by clicking briefly on them: A light blue

circle signals the selection. The double arrow for the rotation mode and the docking spots for the connection mode become visible. This option is preset ③ in the drop-down menu „Selection“ in the upper left of the editing symbol bar.

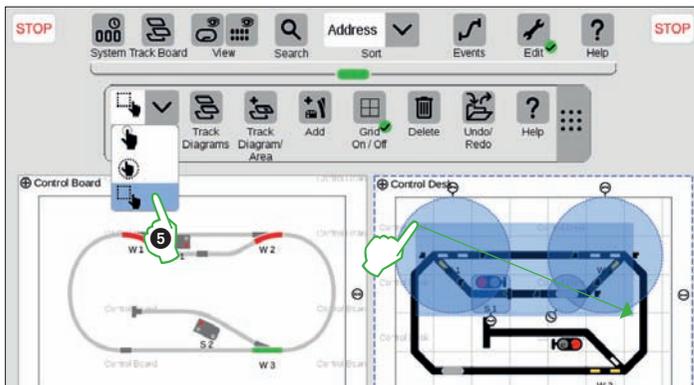


Several Items are selected by clicking in the editing symbol bar all the way to the left on the button „Selection“ and selecting the second option in the drop-down menu, the hand with a circle around it ④. Then, click by row on all objects that you would like to include (image to the right).



Selecting Areas

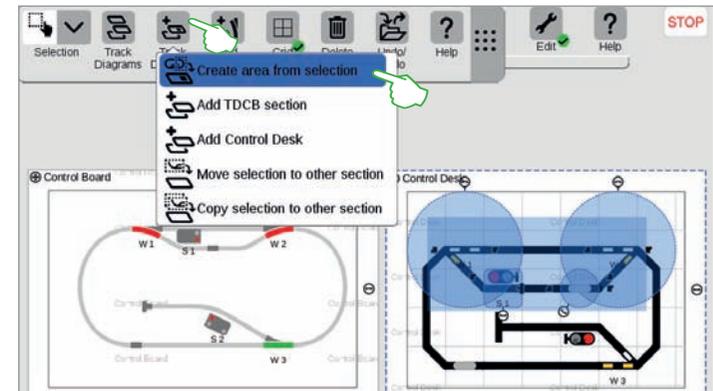
You can mark an entire panel or any part of it with selecting areas. To do this, click on the „Selection“ button in the upper left in the editing symbol bar. In the drop-down menu, select the option at the lowest level that is shown with a square ⑤. Now, click on the corner dot of the area that you would like to select, drag your finger to the opposite corner dot, and release your finger from the display.



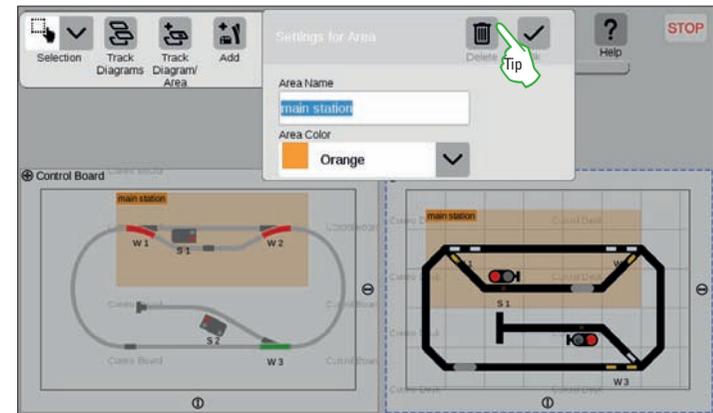
Creating Areas

Creating an Area by Selection

As soon as you have selected several items or an area, previously grayed out options can be activated in the drop-down menu of the button „Track Diagram / Area“: „Creating Area from Selection“, „Moving Selection to other section“, and „Copy Selection to section“. Here, an area is an area of a track diagram with its own designation and color.

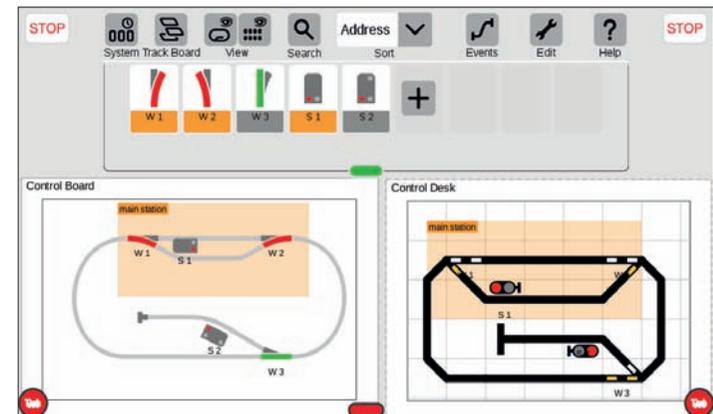


To create an area, you have to have selected a space or area. In this example, we are creating an area out of the flat station that has been selected. To do this, use your fingertip to open the corresponding drop-down menu on the button „Track Diagram / Area“ and select there „Create Area from Selection“. In the entry template that is turned on, give the area a name, select its color, and confirm with „OK“.



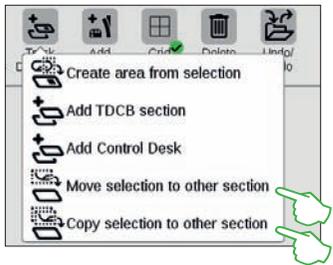
After that, the section selected is marked continuously in the color selected. In the item list, all items for an area are also easy to recognize by their color.

Tip: Deleting an area is also very easy: In the track diagram editing mode that has been activated, click on the area name in the left upper corner of the area. In the window that is turned on after that, select the option „Delete“.

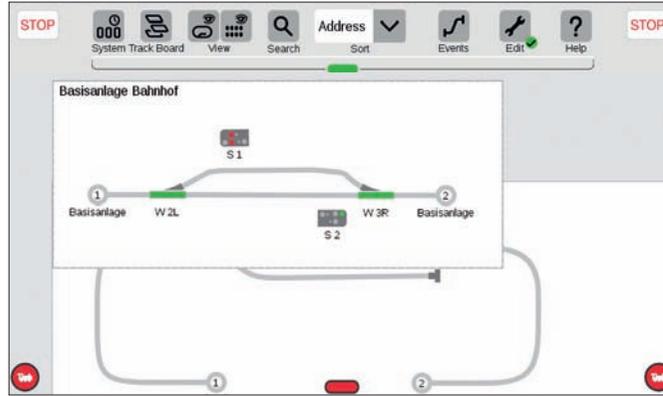
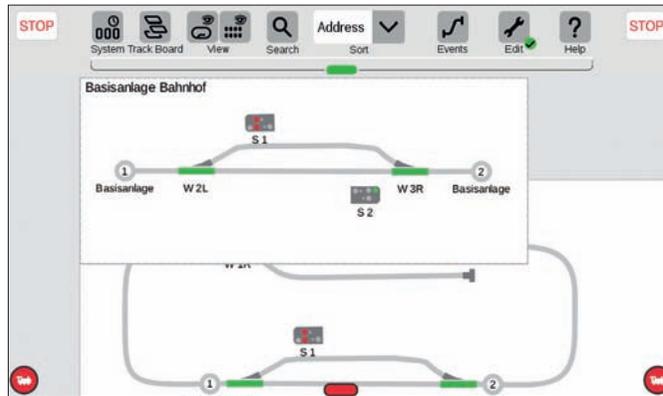


Track Diagram: Selection and Views

Copying and Moving a Selection



You can get a larger overview on complex layouts with the function for copying (image to the upper right) or moving (image in the middle to the right) a selection to a new track diagram. The new track diagram was named „Basic Station Layout“ and it consists of the lower area of the route. The layout is thereby divided into two track diagrams, but they remained logically linked with each other – nothing changes in the function. The transitions between both track diagrams are symbolized here by the two digits „1“ and „2“. Clicking on the digits will take you to the other side of the connection.

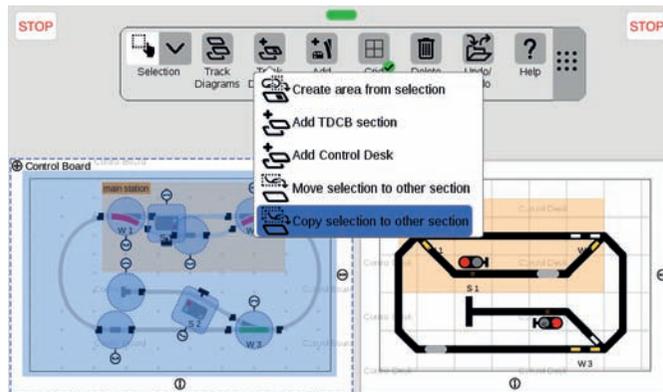


Changing the Type of Track Diagram

Panels can be changed to control desks and vice versa with the option to copy areas or entire track diagrams. To do this, you must mark the desired area and select the desired type of track diagram when inserting the area or track diagram.

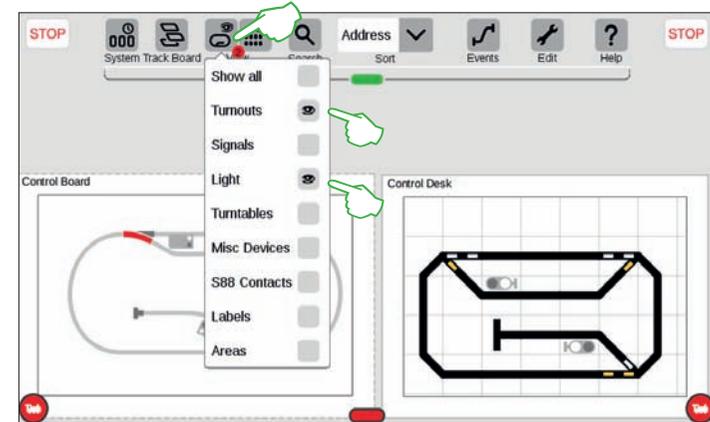
Note: Since panels and control desks have a different placement logic, you must do some manual adjusting.

Important: When identical items are used on different track diagrams, the connections must also be identical.



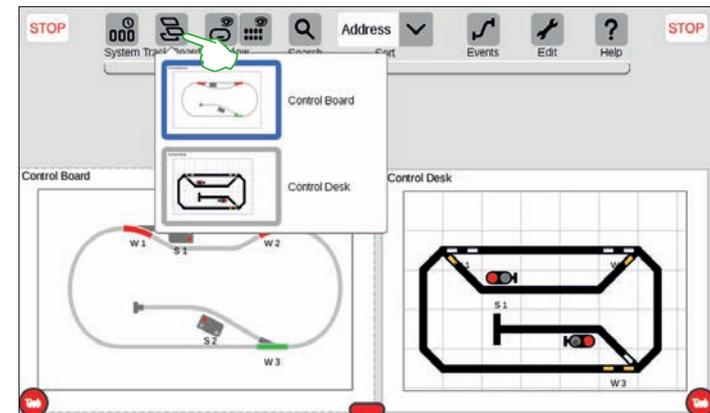
Track Diagram View Filter

Click on the button „View“ in the item list menu bar to get a display of numerous filtering options. The option „Show All“ is marked in the standard setting. Using your fingertip on the individual item categories, you can get a marvelous overview of your track diagrams, since the other elements are grayed out. A small red dot refers to active filters. The number in the dot corresponds to the number of criteria. Selecting „Show All“ ends the filtering mode.



Changing an Active Track Diagram

The button „Track Diagrams“ is very useful the moment you are managing track diagrams on several panels or control desks. This is in order to switch back and forth between panels and control desks. Click on the button „Track Diagrams“ to change the active track diagram and then click on the desired panel or control desk: The track diagram selected is now in the foreground. **Note:** Click twice on the active track diagram to show it in a large format.

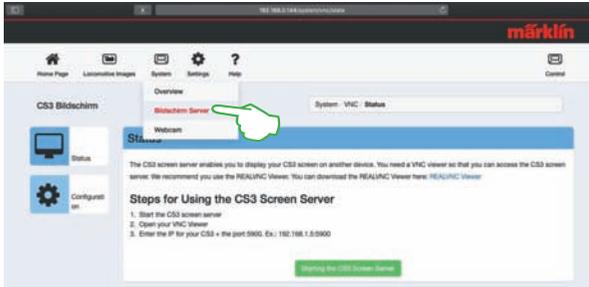


CS3 Screen Server

Remote Control of the CS3 Using the Screen Server

You can operate your CS3 from all kinds of devices – from a PC and a Mac to wireless control with a Tablet or Smartphone using Android and iOS. The CS3 screen server makes this flexibility possible. It prepares the user interface for the CS3 using the network – with all functions.

To start the CS3 screen server, you must first call up the user interface for the CS3. To do this, you can use any Web browser. It is described in detail on page 26 how you get to the Web interface.

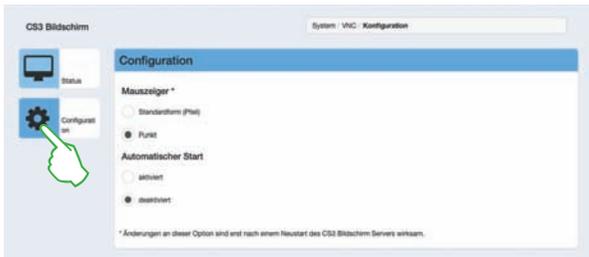


On the start page for the Web interface, move the mouse cursor in the upper area of the page on the menu item „System“. After that, a drop-down menu is turned on in which you click on „Screen Server“ (image to the left).

Now, start the CS3 screen server by clicking on the button „Start CS3 Screen Server“ on the lower edge of the page. The following message in green is turned on in the lower right corner of the screen:

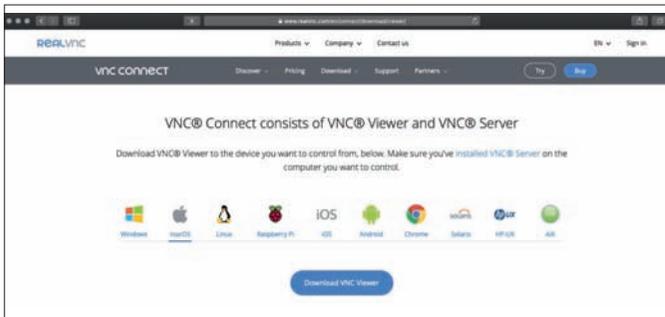


Details about the screen server can be set (image to the left) in the Web interface under „Configuration“.



Downloading Reader Software

You need a VNC viewer (Virtual Network Computing) in order to access the now active CS3 screen server from your control device. Märklin recommends using the RealVNC viewer. You can download it at <http://www.realvnc.com/download/viewer/> for all available platforms (image below).



On the Web page, select the appropriate platform with a click of your mouse. Directly under the blue download button are additional selection options available to you – depending on the platform in question. For Windows, for example, you can choose between a 32-bit and a 64-bit version of the program.

Starting Reader Software

The installation of the RealVNC viewer differs considerably in terms of the system among the various platforms. Please therefore understand that we cannot go into detail for the various installation processes. Instead, consult appropriate support literature for your platform.



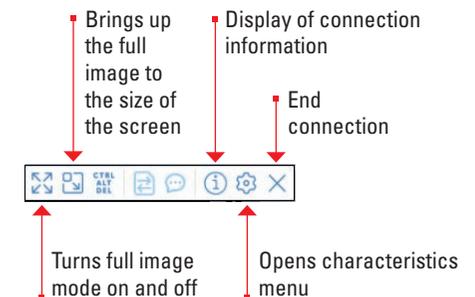
After the program starts, the RealVNC viewer expects you to enter the IP address for the CS3 screen server. It is the same IP address that you used previously to call up the Web interface for your CS3 (see page 36). In addition, you must add Port 5900 to this IP. If for example, your IP address is „192.168.0.38“, enter in the RealVNC viewer „192.168.0.38:5900“. Then, confirm your entry. In the image to the left, you see the RealVNC viewer for Mac as an example.



Directly after entering and confirming the correct IP address and port, the programming window will show the current content of your CS3 display: You can control the CS3 directly, depending on the device, with your mouse or with finger movements such as on the CS3.

A symbol bar is turned on at the upper edge of the program window, which you can use to select among various display modes as well as to do detail settings. To the left, you see the symbol bar.

Important: On the Smartphone and Tablet, the RealVNC viewer differs from the usual touch operation: You change the position of the mouse cursor with your finger and you can thus control more exactly. Your fingertip then activates as usual the action – at the position of the mouse cursor.



Troubleshooting

Problem	Possible Causes	Solution
CS3 does not start	No power supply CS3 not disconnected from household current after being shut down	Plug in power cord(s) Disconnect connection to the household current and then reconnect.
CS3 no longer works correctly after an update	Not all devices have been updated	In the menu item „System“ by devices with a red dot at the device symbol, do an update (see page 25)
Locomotive does not register	Depending on the locomotive decoder: mfx: The mfx locomotive is already in the locomotive list No current in the programming track and the layout Problems with the automatic registration of mfx locomotives MM, DCC: Locomotives don't automatically register The locomotive parameters such as data format, address, etc. do not agree	Use entry in the locomotive list Press Stop button so that the operating current is turned on Use function „Find mfx Locomotives Again“ (see page 30) Set up locomotive manually (see page 11) Correct entry in the locomotive list, program address in the decoder
Locomotive does not react to commands	Locomotive is standing in an area with no current Not all running or switching functions can be used	Turn on operating current Have model checked by a specialist technician
Item with an mfx decoder does not register	mfx item not actively sought	Do a search by mfx item (see page 14)

Problem	Possible Causes	Solution
All running commands must be reentered after each reboot	Check mark by „Start up Locomotives Automatically“ not set in the system setting under CS2 – Track (see page 23)	Adjust settings. Important: Locomotives without running commands receive stored functions first assigned when a running command is entered.
Decoders such as m83, m84, or installation decoders do not work	Incorrectly set parameters Connection interruption No reason can be recognized	Correct the item settings. Check decoder connections and separate power supply. Change decoder to the address of a working decoder. If it still does not react, a defect is probable.
Function problems with feedback decoders	Incorrectly set bus length Incorrectly set assignment Different reference potential	Correct the system settings at the GFP3, Link S88, or otherwise the bus length set in a system. Check and correct the parameters in the item settings for the contacts. Make a connection between the first feedback module and the ground connection (0) for the power supply system.
Track diagrams cannot be	Screen section shifted	Quickly click twice one after the other in the track diagram or the menu item „Track Diagrams“ (see page 35) so that the view is centered.

The answers to frequently asked questions can also be found at www.maerklin.de/en/service/customer-service or in the Märklin Magazin (www.maerklin.de/en/experience/maerklin-magazin).

Appendix

At a Glance....

- ... Glossary of Symbols
- ... Function Pictograms
- ... Digital Systems – Protocols
- ... System Architecture



Glossary

Central Station 3 Symbols

The most important symbols at a glance – this is what this page offers you. So that you see, what the symbols mean and on which page the functions are explained.

General Symbols

 Help Page 7	 Search Page 11, 31, 32, 33
 Emergency Stop Page 5, 9, 10	 Emergency Stop active Page 5, 9, 10
 Locomotive controller (empty) Page 6, 9	 Locomotive controller (full) Page 6, 9
 Add, supplement	 Edit
 Drop-down menu	 Close
 Selection, filter active	 Mode active
 Confirm entry	 Delete entry
 Load	 Save
 Delete	 Restore changes

System Control Symbols

 System Page 7, 23, 29	 Central Station 3 Page 7, 23, 26, 29
 Update Page 7, 25, 28	 Wizards Page 7

Item List Symbols

 Editing item list Page 14	 Adding items Page 14, 15, 18, 33
 Item view Page 15, 33	 Searching for mfx items Page 14

Locomotive List Symbols

 Locomotive view Page 31	 Showing functions Page 10
 Adding a locomotive Page 11	 Loading locomotive data Page 11, 32
 Reading a locomotive Page 11	 Control by address Page 30
 Loading from the track	 Writing on the track
 Creating M.U. sets Page 30	 Finding an mfx locomotive Page 30
 Resetting a locomotive Page 12	 Updating a locomotive Page 12

Track Diagram Symbols

 Track diagram Page 35	 Editing a track diagram Page 17
 Adding a panel / control desk Page 17	 Creating an area Page 34
 Track diagram view Page 35	 Grid Page 17
 Single selection Page 34	 Multiple selections Page 34
 Area selection Page 34	 Creating an area selection Page 34
 Moving a selection Page 35	 Copying a selection Page 35
 Rotation mode Page 17	 Connection mode Page 18

Event Symbols

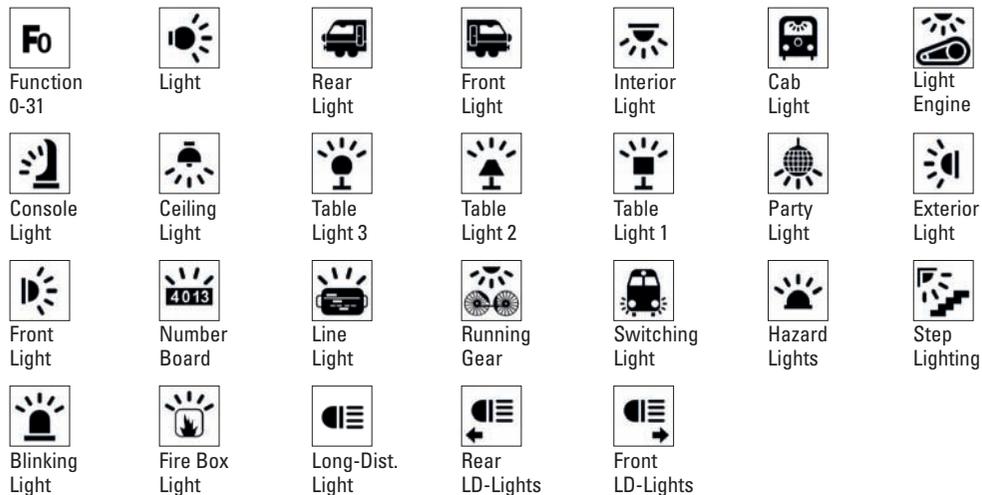
 Event Page 20	 Adding an event Page 20
 Starting recording Page 20	 Stopping recording Page 20, 21

Symbols

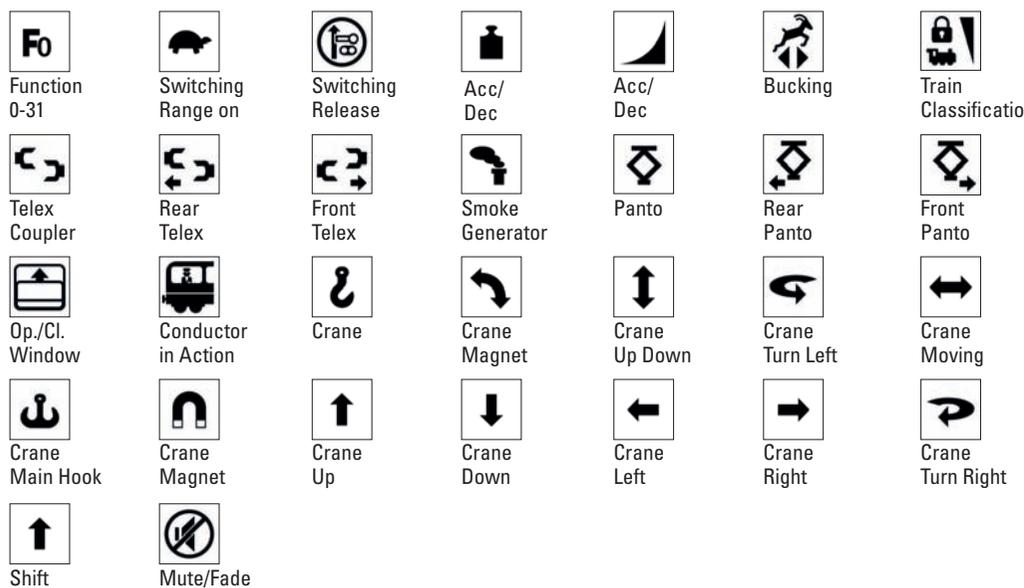
Available Function Pictograms

All of the pictograms available on the CS3 at a single glance – this is what this page offers you. These are the same function symbols from which you can select when setting up the functions in the locomotive settings (see page 12) – divided into the sections Light, Mechanical, and Sound.

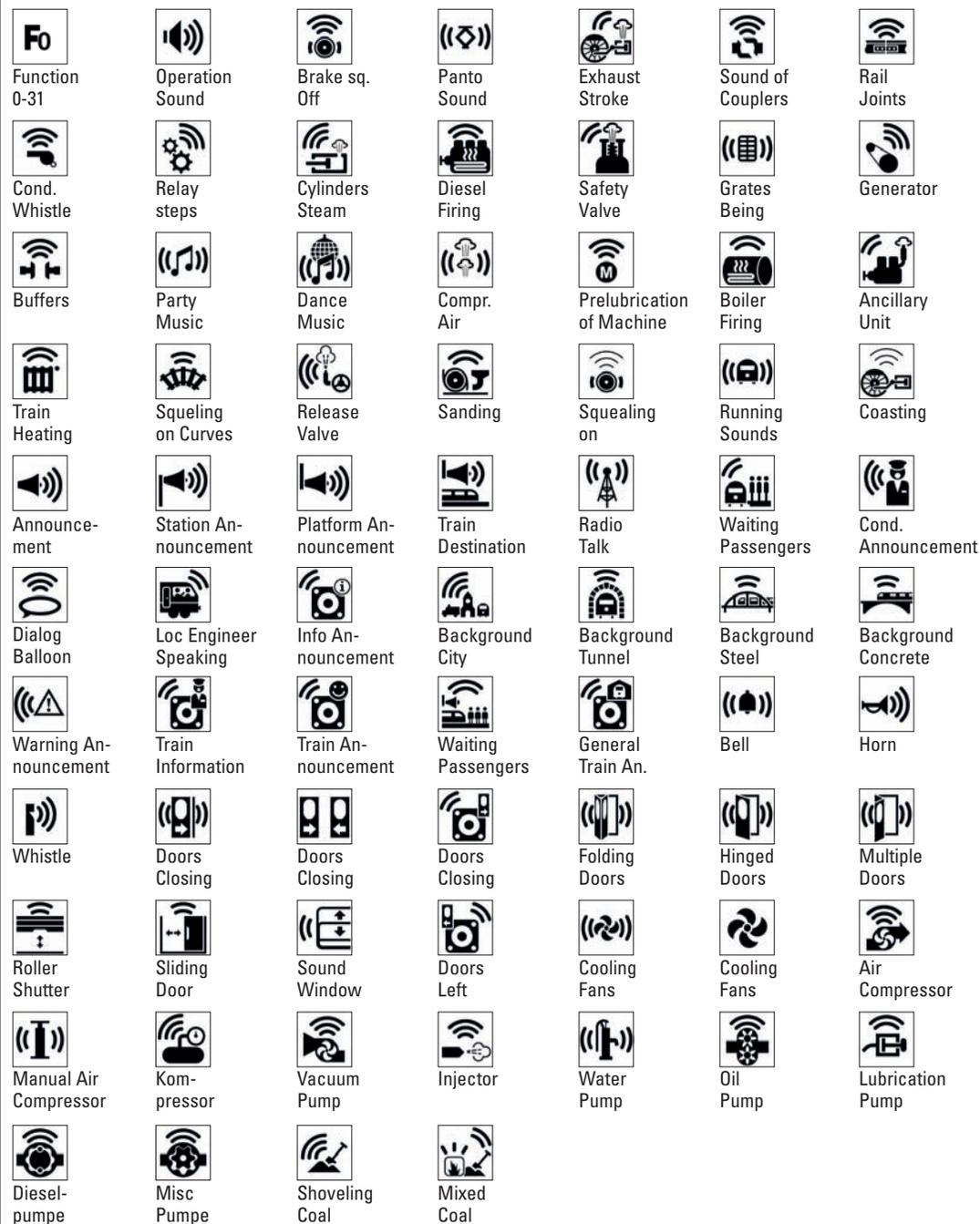
Light



Mechanical



Sound



An Overview of the Different Digital Systems

With digital control of model trains, protocols such as a language are used to swap commands between components. The Central Station 3 controls the following formats:

MM

Märklin introduced the digital system „MM“ in 1984. For the first time, it allowed you to run up to 80 locomotives at a time on a layout. A protocol served to transfer data. This protocol had been developed by Motorola (T). Accordingly, MM stands for „Märklin Motorola (TM)“. This system was still relatively simple in its setup. The number of functions was manageable: There was only one function, which was mostly used for a locomotive’s headlights.

As early as 1993, the reworked MM (MM2) came out on the market with an appropriate controller (6021). Four more functions were added to the capabilities of MM. Motor control was introduced and it was expanded from 14 to 28 speed levels. MM2 (often also called fx) can manage up to 250 locomotive addresses.

MM is the classic digital system for Märklin H0. Starting in 1993, MM continued by also conquering 1 Gauge.

Note: The decoder address must be set separately for each protocol (MM, DCC).



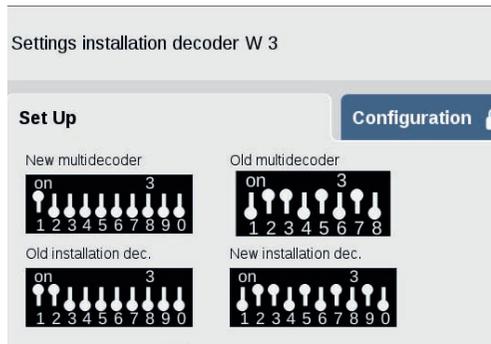
1984: Märklin Digital with the 6035 locomotive controller and the 6020 central control unit.

DCC

In the Nineties, the DCC system (Digital Command Control) came out on the market. It was based on developments of the firm Lenz for the Märklin digital system at the end of the Eighties. DCC was defined in its characteristics in the USA by the NMRA. The standardization, however, encompassed only the protocol so that the characteristics of DCC decoders or locomotive controllers vary widely. Often there is a criticized incompatibility of various combinations of devices.

Aside from that, DCC offers the user extensive possibilities for adjusting locomotives and powered units to individual needs – starting with the ability to program a maximum of over 10,000 different addresses. However, it is not always easy to do the desired settings.

DCC has been able to establish itself in the two-rail market such as at Trix.



Means of communication: The decoders are directly given commands by means of addresses.

Important: The system with the most possibilities is the highest ranked digital protocol. The sequence of digital protocols is in declining value:

Priority 1: mfx – Priority 2: DCC – Priority 3: MM

When more digital protocols are recognized, the decoder selects the highest ranked protocol.

Note: Protocols that are not needed should be deactivated to avoid malfunctions (see page 23).



In 2004, a new digital system by the name of „mfx“ was introduced by Märklin. It was a completely new system with new characteristics: As with DCC, the decoders can also be programmed under mfx without having to open the locomotive. The settings in the decoders are done using so-called CVs (Control Variables).

The most important new thing about mfx is automatic registration in the style of Plug & Play: When a locomotive with an mfx decoder is placed on the track, it registers itself on the CS3 with an unambiguous ID.

Note: The locomotive address on mfx is no longer necessary and thereby no longer needs to be changed or adjusted.

mfx is the current system at Märklin and is used for all gauges (H0, 1, G) and for all track systems in use there.



Plug & Play: Locomotives with mfx decoders automatically register themselves on the CS3.



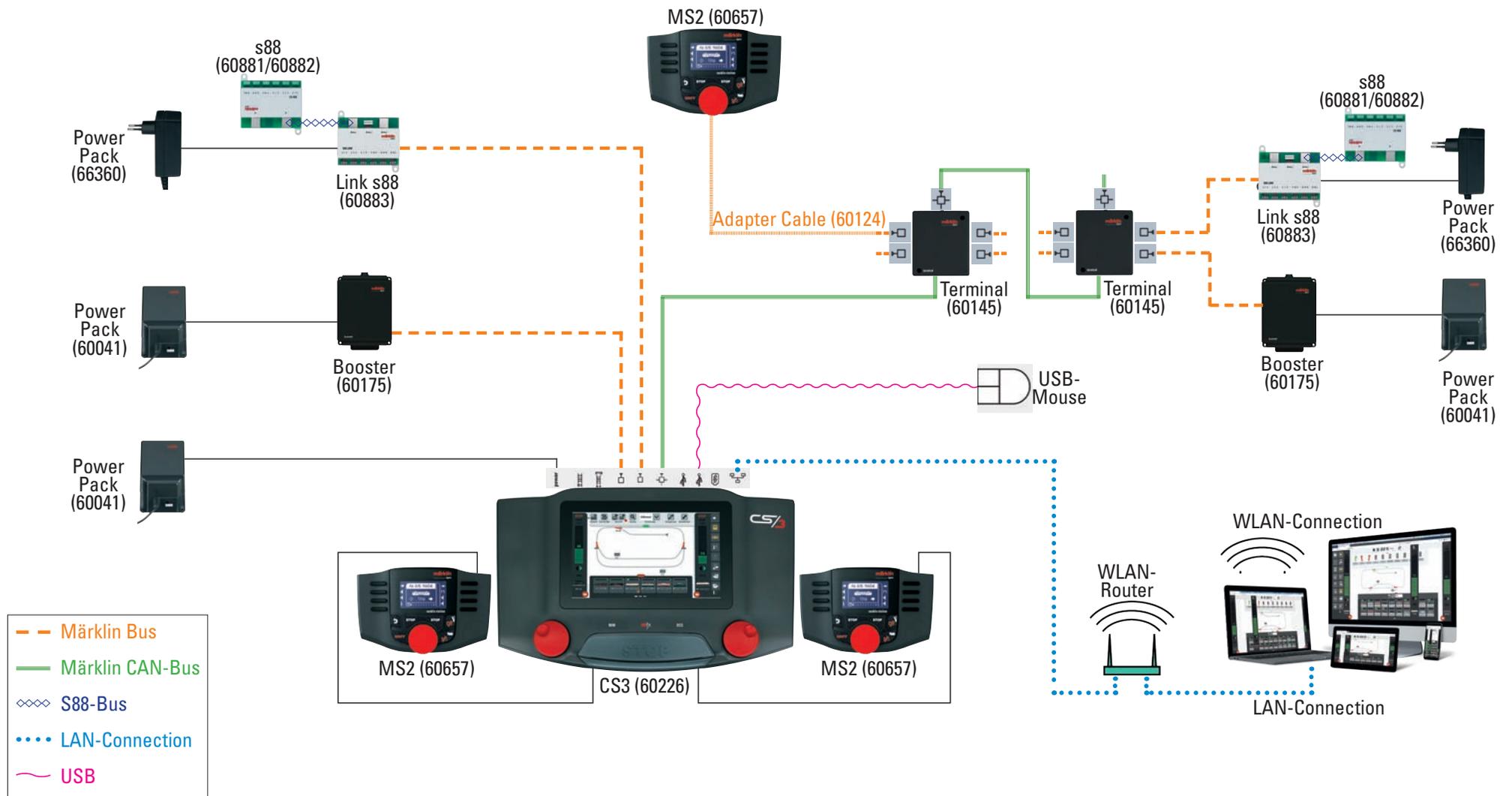
In 2013, Märklin expanded the existing basic mfx protocol by adding more application options: The „mfx+“ format was born. It allows you to run and control locomotives in the so-called „World of Operation Mode“. This means it is possible to operate a locomotive equipped with an mfx+ decoder not only with the usual locomotive controller but also to change in the CS3 into the cab mode and thus operate the locomotive using the fixtures that are usual in the prototype. Meanwhile, the cab for each locomotive can be turned on in the CS3.

Basically, an mfx+ decoder behaves like an mfx decoder. However, the user can also select among three modes with mfx+: „Without Consumption“, „With Consumption“, and „Refueling at Maintenance Facility“, which provides additional realistic operating fun.



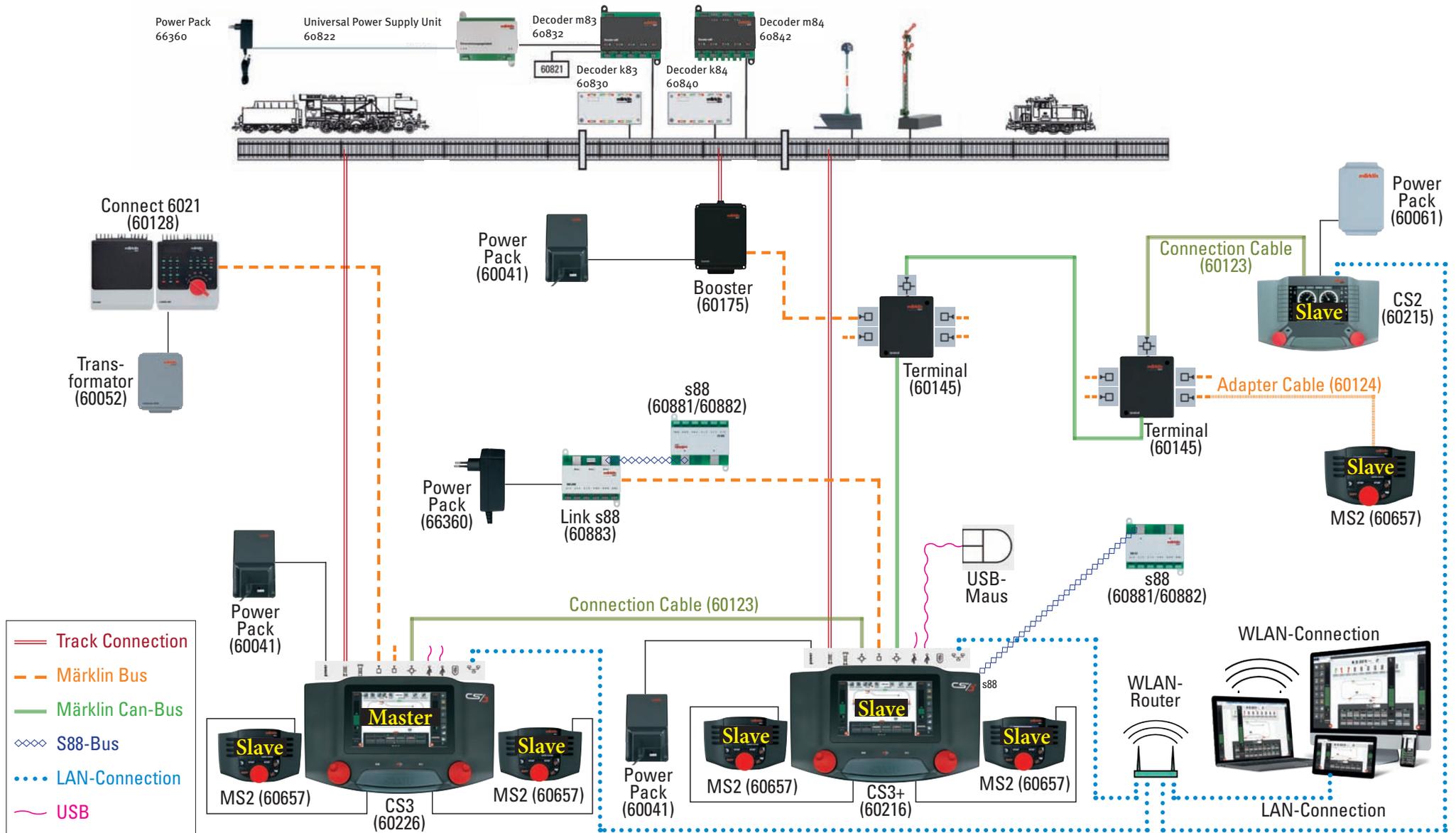
Engineer experience: In the virtual cab, all locomotives can be controlled prototypically on the CS3 – even dependent on the fuel supplies (World of Operation).

CS3 System Architecture



This schematic representation shows a sample of the system architecture for Märklin Digital with current devices. Since Märklin always pays attention to compatibility, older digital components can of course also be integrated here. The operating instructions for each device will give you exact information about the connections for that device.

Märklin Digital System Architecture



This schematic representation shows a sample of the system architecture for Märklin Digital with current devices. Since Märklin always pays attention to compatibility, older digital components can of course also be integrated here. The operating instructions for each device will give you exact information about the connections for that device.