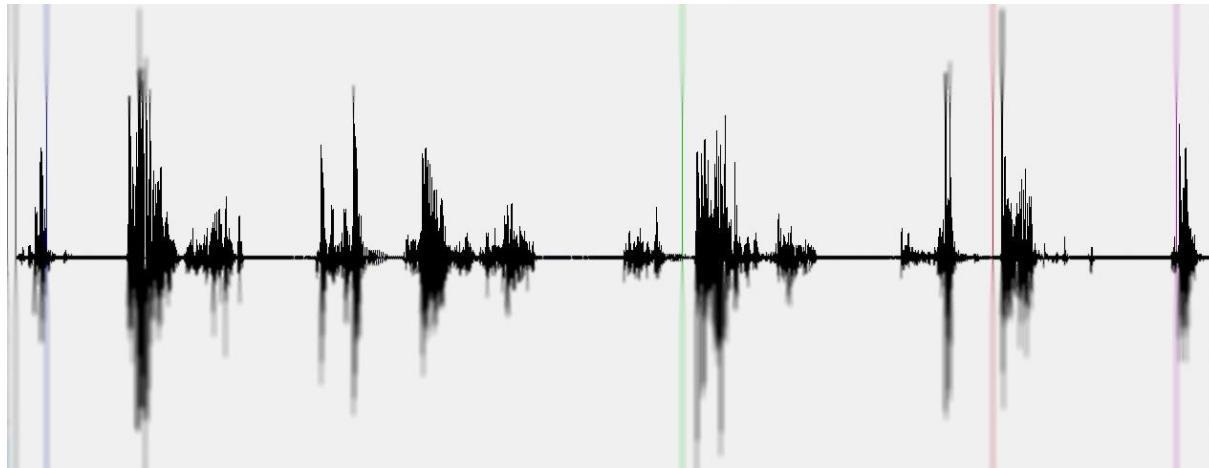


ZIMO *INSTRUCTION MANUAL*

ZIMO Sound Creator

Sound Creator

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As of July 2026: The **ZIMO Sound Creator** replaces the previous **ZSP** application. It is still available for download as a single installation package. During installation, you can choose whether to install only the **ZIMO Sound Creator**, only the **ZIMO Sound Editor**, or both programmes. The functionality and appearance remain largely unchanged; however, both programmes have been enhanced with new features, including support for the **ZIMO Stereo Decoder**. All existing **ZIMO sound projects** can still be opened and edited as usual.

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1 - Introduction

The **ZIMO Sound Creator** is a tool for creating sound projects for ZIMO decoders. It is primarily aimed at professional sound providers and users with a basic knowledge of editing sound samples. It is used to build sound projects from scratch, from driving and operational sounds right through to the individual sounds of the function keys. If you simply wish to edit sound projects from the ZIMO Sound Database, you might find the **ZIMO Sound Editor** more useful.

With the advanced tools in ZIMO Sound Creator, driving sounds can be previewed before they are loaded onto the decoder. Editing scripts, updating or performing a sound load on decoders, and updating the ZIMO KLUG device is also possible and does not differ significantly from the corresponding functions in the ZIMO Sound Editor.

2 - Hardware requirements

PC running on Windows XP or later; update devices: MXDECUP, MX31ZL, MXULF or KLUG.

3 - Connecting the hardware

With MXDECUP

Connect the supplied mains adaptor to the mains and the MXDECUP.
Connect the MXDECUP to the PC via a serial cable (or a USB-to-serial converter).
Connect the programming track or decoder to the MXDECUP's track output.

The MXDECUP enables decoder updates and sound load via the track to **MX decoders**, as well as CV programming. The online DCC controller is not supported.

With MX31ZL

Connect the MX31ZL using the supplied power supply and cable.
Connect the MX31ZL to the PC's USB port using the supplied cable.
Connect the programming track or decoder to the MX31ZL's track output.

Note: When you first connect the MX31ZL to the PC, it will ask you for a driver. Select the file "ZIMO_Interface.inf" from the ZIMO folder (usually C:\Program Files (x86)\ZIMO\driver\ZIMO_Interface).

The MX31ZL enables decoder updates and sound load via the track to **MX decoders**, as well as CV programming. The online DCC controller is not supported.

With MXULF

Connect the MXULF to a power supply.
Connect the MXULF to the PC via a USB cable. Connect the programming track to the MXULF's track output, or connect the decoder to the MXULF via an MSTAP/MSTAPG track cable or SUSI cable. Large scale decoders with a SUSI interface (e.g. MS950/MS990) can be connected directly to the MXULF using a SUSI cable.

The MXULF enables decoder updates (via track) and sound load via SUSI and track to **MS/FS** and **MX decoders**, as well as CV programming. It also allows CV sets to be loaded via track to **MN** decoders.

With KLUG

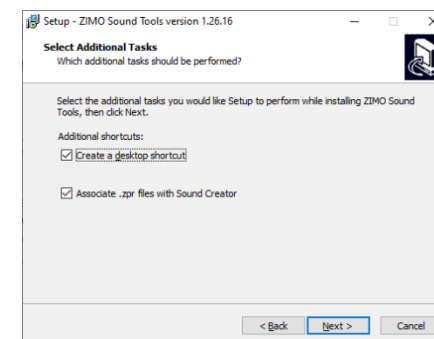
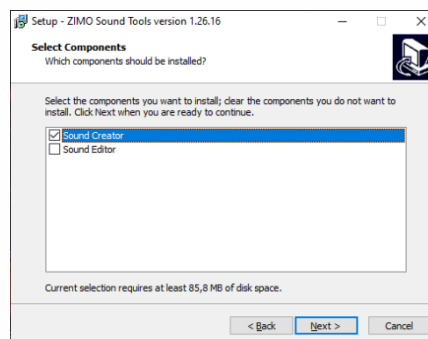
Connect the KLUG to a PC via a USB-C cable (the PC must have at least a USB 3.0 socket). Connect the decoder directly to the KLUG, the programming track to the KLUG's track output, or the decoder to the MSTAP/MSTAPG via a track cable or SUSI cable. Large scale decoders with a SUSI interface (e.g. MS950/MS990) can be connected directly to the KLUG using a SUSI cable.

The KLUG enables decoder updates (via track) and sound load via SUSI and track to **MS/FS** and **MX decoders**, as well as CV programming. It also allows CV sets to be loaded via track to **MN** decoders.

4 - Installation: ZIMO Sound Creator

Download the **ZIMO Sound Tools** from the ZIMO homepage [HERE](#).

Run the downloaded installation file and follow the instructions. You can choose whether to install just the ZIMO Sound Creator, the ZIMO Sound Editor, or both programmes.



Creating desktop icons is useful for easier access; by associating the two file formats .zpr and .zpp, these will open automatically in the respective tool when double-clicked.

5 - Project - Menu item

5.1 - New

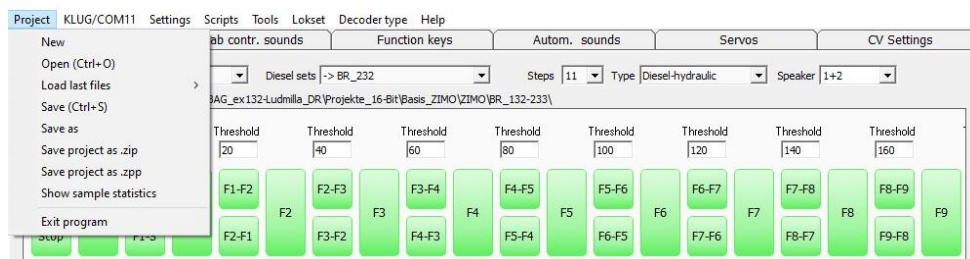
This starts the creation of a completely new sound project. You must first select a location to save this new sound project and also select a file name. Next, you can specify which ZIMO sound decoder types the project is intended for. The maximum of available memory will change accordingly (MS/FS with 128Mbit, MX with 32Mbit, or older MX models with 16Mbit flash). The corresponding default CVs for each decoder type are automatically adjusted. When adding sound samples, there are no restrictions on quality, regardless of which decoder type has been selected – for MX decoders, the quality is automatically reduced when a .zpp file is created at the end of the editing process. You then select the type of project: for a steam locomotive, or a diesel or electric locomotive. The structure of the sequence is fundamentally different for these two types.

5.2 - Open

The ZIMO Sound Creator also installs the steam and diesel collections in both 8-bit and 16-bit. These can be found in the folder ...\\Documents\\ZIMO\\Projects. Alternatively, you can download and open the ZIP archive directly from the ZIMO Sound Database. Unless a different default path for sound projects has been set under Settings - Options, the path ...\\Documents\\ZIMO\\Projects is also used for the downloaded ZIP archives.

Each project consists of a .zpr project file and a number of WAV files, which must be located in the same folder as the project file or in a subfolder of it.

To load an existing sound project for editing, click on 'Project' - 'Open'. Then select the folder containing the project, select the project file (.zpr) and click 'Open'. If the WAV files are not in the same subfolder as when the sound project was created, they will not be found and will be listed as missing.



Under 'Load recent files', you can select from a list of the most recently opened .zpr files.

5.3 - Load last files

Displays the most recently opened/edited .zpr files.

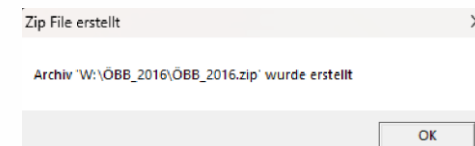
5.4 - Save / Save As

To save the project under the same name, click "Save".

To save the project under a new name, click "Save as". If you select a folder other than the current one, all WAV files associated with the project, along with their corresponding subfolders, will be copied to the new location.

5.5 - Save project as .zip

The project is packed as a ZIP file together with all the necessary files. The ZIP file is saved in the same folder from which the project was opened. Once the export is complete, the process is confirmed in a separate window. The generated ZIP file can then be easily sent by email, for example.



5.6 - Save project as .zpp

A .zpp file, in which all samples used are fully integrated, is created from the open .zpr project. Sound projects from the ZIMO Sound Database are usually in .zpp format and can be edited using the ZIMO Sound Editor. This format is also required if a sound project is to be loaded onto a decoder using MXULF and a USB stick. Loading from the Sound Creator directly converts the .zpr file into a .zpp file.

A separate programme is required to encrypt sound projects, i.e. to create encrypted sound projects. This is made available to certified ZIMO sound providers only.

5.7 - Show sample statistics

The overview shows the WAV audio files used in the project, sorted by categories or classes such as driving sound, e-motor sound, etc. Both the total number of WAV files used and the storage space occupied are displayed. By clicking on individual classes, only the sound files in the respective category are displayed.

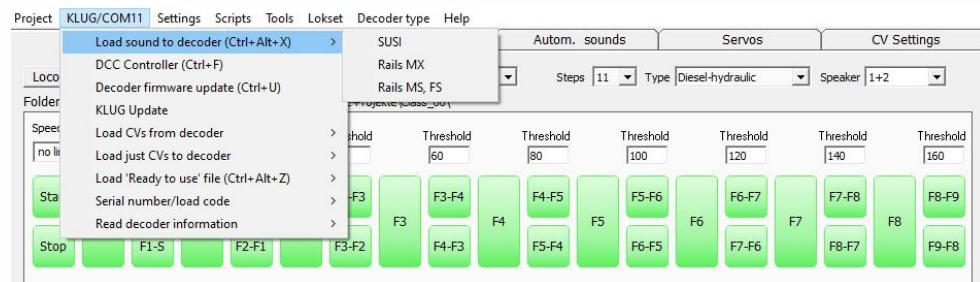
Sample Statistik						
Class: Rail guard whistle	Cnt: 1	Datasize: 180 kB	1%			
Class: Horn	Cnt: 5	Datasize: 938 kB	6%			
Class: Undefined	Cnt: 12	Datasize: 4493 kB	27%			
Class: Brakes squeal	Cnt: 1	Datasize: 369 kB	2%			
Class: E-motor sound	Cnt: 1	Datasize: 233 kB	2%			
Class: Turbocharger	Cnt: 1	Datasize: 126 kB	1%			
Class: Electric brake	Cnt: 1	Datasize: 402 kB	2%			
Class: Factory Sound	Cnt: 3	Datasize: 23 kB	0%			
Class: Drive Sound	Cnt: 48	Datasize: 5759 kB	35%			
Total: Count: 73 Memory: 12646 kB / 16384 kB						
Size kB	Num.	kHz	Bit	Used	Name	File name
292 kB	52	22	16	✓	E-Motor_low_fade	E-Motor_low_fac
172 kB	46	22	16	✓	Cl_66_Brake-release_02	Cl_66_Brake-rele
136 kB	39	22	16	✓	Cl_66_Horn-low short 01	Cl_66_Horn-low

6 - KLUG/- MXULF/... /COM - Menu item

The name of this menu depends on the device found via **'Settings - Search update device'**.

Various actions are available in this menu. The range of functions may vary depending on the selected update device or the sound project currently open.

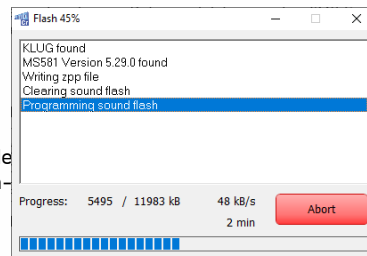
6.1 - Load sound to decoder



This transfers the opened project in ZIMO Sound Creator to the connected decoder.

If the decoder is to be loaded via the **SUSI interface**, select the "SUSI" option.

If loading is via the **track**, select 'Rails MX' or 'Rails MS, FS' – depending on the decoder used. If the type of decoder used is unknown, it can be determined using the **'Read decoder information'** function.



8-bit projects (for MX decoders) can usually also be loaded onto MS decoders. Diesel-mechanical projects are an exception. However, the decoder type should first be switched to MS/FS decoders so that any unchanged CVs are set to the default values of the MS family. In addition, the CVs for driving behaviour and lighting settings should be checked and adjusted if necessary.

16-bit projects (for MS and FS decoders) can only be loaded onto MX decoders in exceptional cases (e.g. with a maximum project size of 4 MB following a reduction in the sample rate, and with scripts adjusted accordingly and limited to a maximum of 8). However, this is generally not recommended. Although the ZIMO Sound Editor automatically converts samples from 16-bit to 8-bit and from 44 kHz to 22 kHz when the decoder type is switched to MX, restrictions or malfunctions are to be expected due to the lack of full compatibility between MX and MS decoders.

The loading process is started in a separate window. Once the process is complete, you may 'Close' the window.

Via USB stick and MXULF

To load a sound project into the decoder via a USB stick, you must first create a .zpp file from the .zpr file. In order to do so, select 'Project' - 'Save project as .zpp' from the menu and copy the .zpp file to the USB stick.

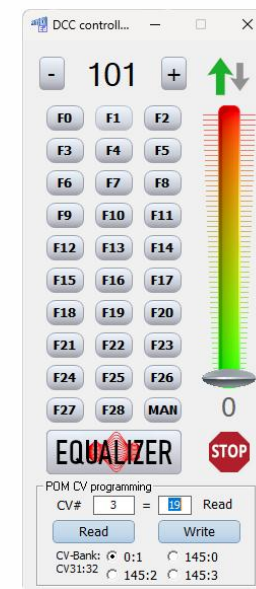
For encrypted 'Coded' projects, the ZIMO Sound Creator is not required. The relevant .zpp file is downloaded from the ZIMO Sound Database and saved to the USB stick or loaded. However, you can load a coded project with the ZIMO Sound Creator with 'Load 'Ready to use' file'.

6.2 - DCC Controller

When connected via MXULF or KLUG and track, you can launch a software controller to test the sounds and functions in the decoder. The controller also offers the option to apply various audio filters to MS and FS decoders and to transfer them to the decoder or to the .zpr file. When connected via MXULF, individual CVs in the decoder can be rewritten via POM CV, and with KLUG they can be written to and read from the decoder.

Testing functions

The controller starts with the main address (CV #1) set in the open project. This can be changed either by using the plus and minus buttons to increase or decrease the value by 1, or by typing the address directly. The arrows correspond to the desired direction of travel: green for forwards and red for backwards. The control on the right is used to set the speed (internal drive levels 0-126), whilst the F0-F28 and MAN buttons correspond to the functions of the project, where available. Pressing the STOP button immediately sets the speed to zero.



Audio filter

The **audio filter** (Equalizer button, also accessible via the Tools/Audio Filter menu item) allows users of **MS and FS decoders** to adjust the overall sound of a sound project to suit the specific characteristics of the model. The sound of a sound project is influenced not only by the type and size of the loudspeaker, but also by its position within the model's casing, the material of the casing, how the loudspeaker is mounted, the volume of the sound chamber and other factors. Of the 7 different filter types available (plus the 'Gain'), up to **6 filters** can be applied **simultaneously**. Changes take effect immediately on the decoder and remain stored on the decoder when the audio filter window is closed, until a hard reset is performed or a new sound project is loaded. The configured filters can also be transferred to the open .zpr project, saved externally as a *.flt file and imported elsewhere, or read from a decoder when connected via KLUG.

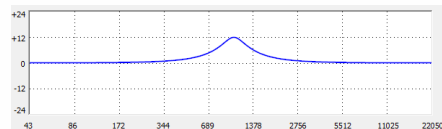
Under **'Filter Settings'**, configurations can be saved and loaded. There are also four sample files for common ZIMO speakers provided as a reference. The configured filters are saved as *.flt files and can also be applied to other MS decoders. Selecting **'Reset'** removes all currently configured filters.

The **'Transfer to Project'** function transfers the settings to the currently open .zpr project. They can then be saved together with the project and transferred to the decoder.

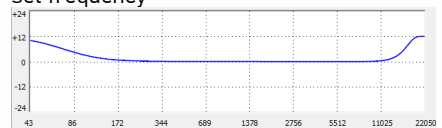
The **'Retrieve from project'** function reads the corresponding CV values set in the project to the audio filter window, enabling a clearer display and more convenient editing.

Available filter types are:

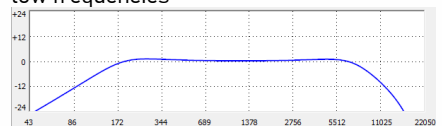
Peak: amplifies or attenuates the selected frequency



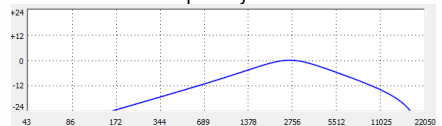
High-Shelf and Low-Shelf: boosts or attenuates the frequencies above/below the set frequency



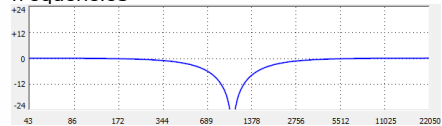
Low-pass and high-pass: attenuates high or low frequencies



Band-pass: attenuates frequencies above and below the set frequency



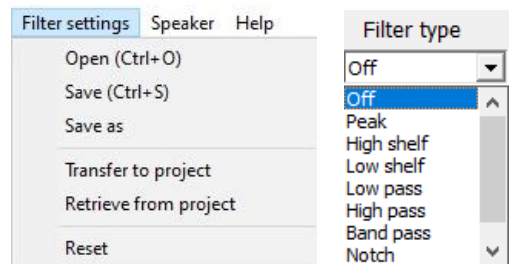
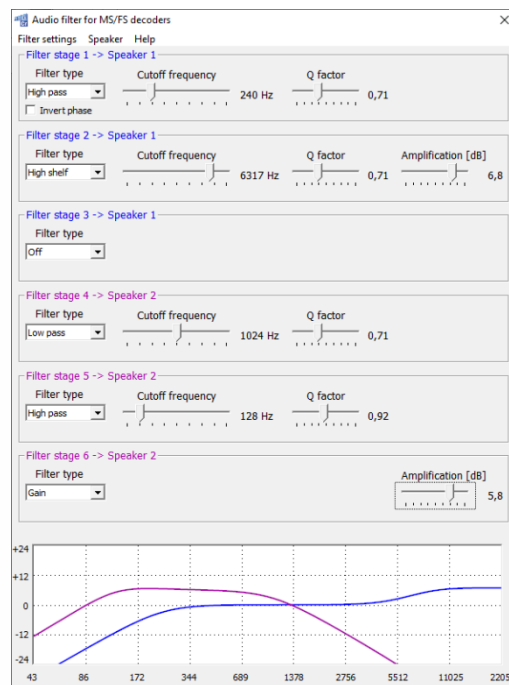
Notch: attenuates a very narrow range of frequencies



Gain: reduces or increases the overall volume



The **cutoff frequency** of a filter can be set within the range of **64 Hz to 16 kHz**.



The **filter quality (Q) factor** determines the slope of the filter response at the cutoff frequency.

The **gain** can be set within the range from **-12 dB to +12 dB**.

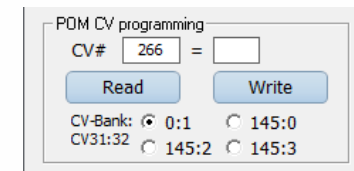
Up to six different filter types can be applied simultaneously.

The corresponding values are stored in the MS decoder **CV pages CV31 = 145** and **CV32 = 2** (#257-#280). Once a satisfactory result has been achieved, these values can be transferred to the open project. There, they appear at the end of the CV list.

From MS decoder firmware version V5.29.0 and ZIMO Sound Creator V2.00 onwards, different filters can be applied to individual 'speakers' or channels, regardless of the decoder type within the MS and FS families. Even with decoders that have only one speaker output, this has the advantage that sounds assigned to specific channels can be filtered differently. A practical example: in a sound project, the diesel engine and compressor have very low frequencies. In the model, this causes the speaker to scratch or crackle, as it cannot reproduce these sounds properly. If subjected to this continuously, it can also cause damage to the speaker. If, in ZIMO Sound Creator, you assign the diesel engine sounds and the compressor to speaker 2 and apply a high-pass filter to it, the low frequencies can be reduced, the sound experience improved and the speaker protected from possible damage. From ZIMO Sound Creator version 2.00 onwards, the respective assignment buttons can be found under 'Samples' for steam or diesel sequences, 'Function Sounds' for the sounds on the individual F keys, and 'Autom. Sounds' for the automatic sounds during driving and also in the scripts.

POM CV programming - Controller

When a **KLUG** is connected to the decoder via the track, individual CVs can be read or reprogrammed directly. Enter the desired CV in the field on the left and press the **'Read'** button to display the value on the right. If you change the value in the field on the right, it can be programmed into the decoder by pressing **'Write'**. With an **MXULF** connected via the track, CVs can only be written, but not read.



All operations appear in the 'CV Changes' window, which opens automatically. Ticking the box next to 'Set CV value in project too' transfers the most recently changed value to the .zpr project, along with any further changes, as long as the box remains ticked.

Central station

The smaller 'Control Centre' window below the DCC controller contains further programming and testing options. Under 'Special Functions', you can perform a hard reset of the connected **MX decoder**. If something is not working with the controller or the connection to the decoder, you can open the debug log, copy the log listed there and send it to ZIMO by email.

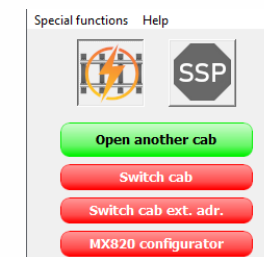
Under 'Help', you will find a list of the controller's shortcuts.



By clicking on this icon, you can disconnect from the decoder or the test track and then reconnect without having to close the entire DCC controller.

SSP (BCS) forces a 'collective stop'. The connection to the decoder or the test track remains active; only drive level is set to zero.

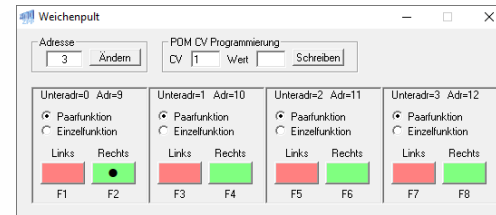
Open another cab



Additional controllers can be opened to test several decoders with different main addresses simultaneously. This is particularly useful for double-locomotive sound projects or, for example, when testing the interaction between sound and function sound decoders in multiple units.

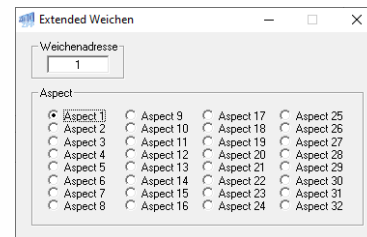
Switch cab

Here, the functions of a **points decoder** can be tested, the decoder address or individual CVs can be written to it. A detailed description of the MX820 points decoder can be found on the [ZIMO website](http://www.zimo.at). The connection must be made via the track. Unfortunately, for now this is only available in German.



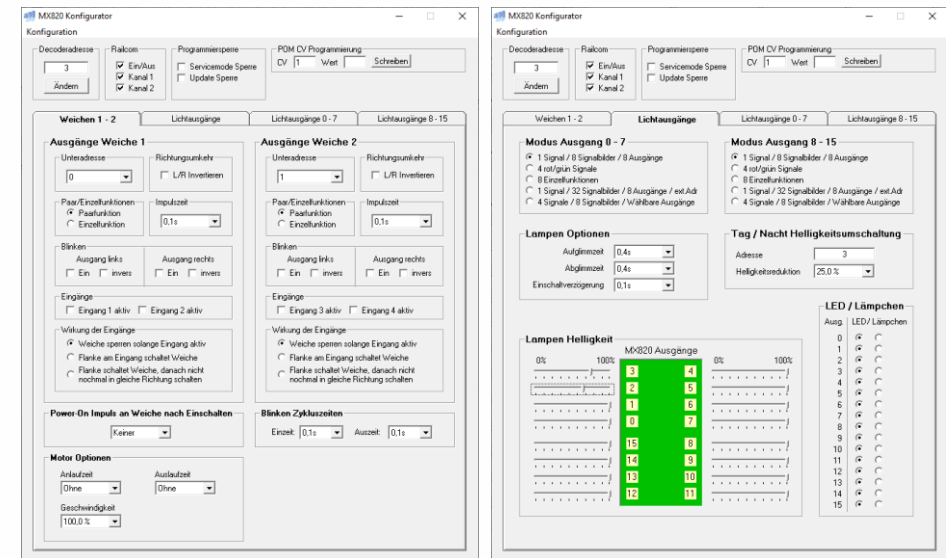
Switch cab ext. adr.

This is another way of testing the signal functions set in the MX820 configurator using MXULF/KLUG. By clicking on the buttons, you can test the functions of the setting '1 Signal / 32 signal aspects' under 'Light Outputs' in the MX820 Configurator; see the next point.



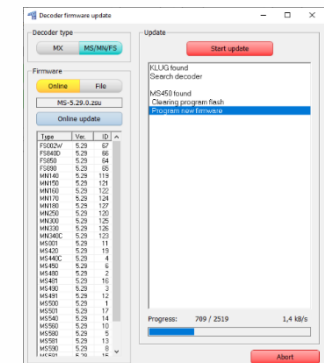
MX820 configurator

Provided the **MX820 accessory decoder** is connected via track, all settings take effect immediately on the decoder and can be tested and checked straight away with this configurator. Depending on the version of the MX820, various functions are available which can be programmed here. The decoder can be used for points control, signal control or a combination of both. Individual signal aspects can be set up here and tested simultaneously. All settings are saved on the decoder and do not need to be confirmed separately. Further details on the operation of the MS820 accessory decoders can be found in the separate [manual](#).



6.3 - Decoder firmware update

This function allows decoders to be **updated** with a new firmware version (in the case of MS/MN/FS also several of the same type at once). A new window opens in which you can select the relevant ZIMO decoder family (**MX** or **MS/MN/FS**). Here, you can either select an update file saved on your PC or use the 'Online' option to access the latest official firmware. Click 'Start Update' to begin the update process. **Do not** disconnect the decoder during the update process!



6.4 - KLUG Update

If the KLUG has been selected via **Settings - Search update device**, the 'KLUG Update' option will appear here. You can choose whether to update the KLUG using a locally stored update file or online. In the latter case, the latest available version will be used automatically. Instructions on how to do this will open:

1. Disconnect KLUG from USB
2. Press and hold the button on the KLUG
3. Connect the KLUG to USB
4. Release the button
5. Start the update.



The process takes just a few seconds. It is not possible to update the MXULF online using this method. A detailed description of the KLUG is provided in the separate [manual](#) at www.zimo.at.

6.5 – Load CVs from decoder

The CVs currently set on the decoder are transferred to the open .zpr file via this option, overwriting all existing settings. Only one decoder may be connected for this purpose. This is only useful if the open file is either an 'empty' ZIMO Sound Creator file, or if the exact same sound project is already on the decoder and you wish to save the model-specific CV changes from the decoder.

Here and in the following menu options, you can choose – depending on the selected update device – whether the action should be carried out via SUSI or via the track. If the decoder has a SUSI interface, the process is much faster.

6.6 – Load just CVs to decoder

This imports the CVs from the open .zpr project onto the decoder and overwrites any existing CV settings.

6.7 – Load 'Ready to use' file

This allows you to open any .zpp file and load it onto a connected decoder. This saves you having to open the file with the ZIMO Sound Editor and allows you to load it directly via the Sound Creator. As with 'Load sound to decoder' above, you can select the 'SUSI' or 'Track' connection and the relevant decoder family here.

6.8 – Serial number / load code

This menu option allows you to read a decoder's **serial number** and programme a **load code**. **Only one decoder** may be connected at a time.

The **"Read current values"** function reads both the serial number and any existing load code from the decoder and displays them.

A load code can be purchased via the **ZIMO Load Code Shop** at www.zimo.at/shop, or alternatively, as before, by emailing the decoder's serial number and the desired sound provider to office@zimo.at or by contacting the sound provider directly.

The serial number can be copied to the clipboard using the **"Copy"** button and pasted elsewhere.

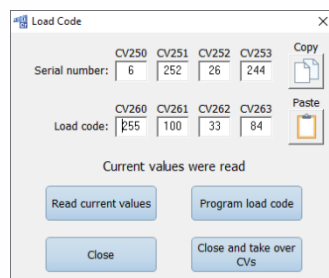
A **load code** sent by email in the format xxx.xxx.xxx.xxx can be copied and pasted into the window using the **'Paste'** button. Alternatively, the values can be entered manually.

The **"Load code"** function writes the relevant values for **CVs #260–263** to the decoder. This enables all associated sound projects from the respective sound provider to be loaded onto this decoder.

In all cases: PLEASE READ AND ENTER THE DECODER ID **CAREFULLY!**

Sound projects and load codes can only be used for sound decoders, i.e. MX and MS type sound decoders or FS function sound decoders – under no circumstances will these work for MX non-sound decoders or MN and FN type decoders.

Typing errors or mixed up digits will result in incorrect IDs and thus an incorrect load code that cannot be used. However, as this is still a valid load code and this information is received immediately after the purchase and has therefore been 'used', there is **NO RIGHT OF RETURN**.



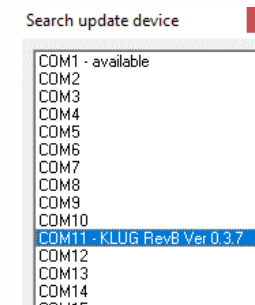
6.9 – Read decoder information

This function reads out the **decoder type**, the **current firmware version**, the **serial number**, any **load code** used on the connected decoder as well as the **loco address**. The 'Change Address' function allows to change the **loco address** directly and quickly (including 'long addresses' greater than 127). Only one decoder may be connected at a time.

7 – Settings – Menu item

7.1 – Search update device

If you wish to program decoders via PC using MXULF, KLUG or other devices, you must select an update device the first time you open ZIMO Sound Creator. Each time you reopen the programme, the last selected device is used automatically. Only one update device can be selected at a time, but this can be easily changed by performing a new search. It is also possible to select the device manually once the search has been completed.

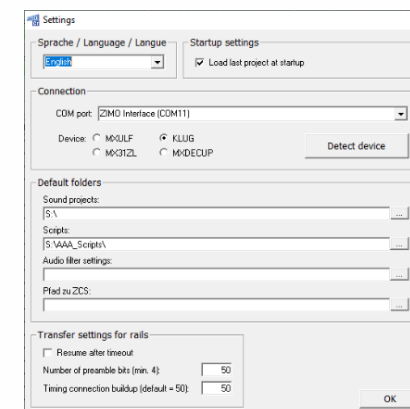


7.2 – Options

The **'Connection'** section displays the currently selected interface and the associated **update device**. You can search for and select a new update device using the **'Detect device'** button.

Under **'Default Folders'**, you can specify folders for various subject areas. For example, you could create a folder for scripts that can be used across multiple projects (e.g. the 'Timer for driver's cab light switch-off' script from the ZIMO sample scripts can be used in a large number of sound projects).

Furthermore, the **language** can be set in this window. The options currently available are German, English and French. You can also specify whether the last project opened should be loaded when the programme starts, or whether a new 'blank' project should be opened each time.



7.3 – Select soundcard

If you wish to listen to individual samples in a ZIMO Sound Creator project, preview the steam chuffs, or check the sequence of scripts with sounds, you can configure a sound driver here. This is very useful, as it allows you to adjust the volume levels relative to one another in advance. The sound buffer can be set to a larger size if audible interference occurs during playback (particularly in the Loop window).

7.4 - Author

The author and an email contact for the sound projects can be entered here.

8 - Scripts – Menu item

To program sequences and dependencies, ZIMO Sound Tools offer the option of working with **'Scripts'**. Scripts can be seen as programmed sequences. However, no programming knowledge is required to create them, as the Sound Tool allows you to define the desired sequences in an input mask. For each sound project, it is possible to create (or import) up to 16 scripts for MS decoders running with MS-FW 4.207 or later, and up to 8 scripts for MX decoders running on MX-FW 39.0 or later. However, MX decoders are subject to certain limitations compared to MS decoders; for example, only a total of 6 independently playable sound channels are available, some of which may already be required by the automatic sounds.

The following applies to both decoder families: up to 256 states (commands or lines) can be programmed per script. Individual scripts on the decoder can be deactivated via the corresponding bits of CVs #837 and #843 (CV #837 bits 0–7 for scripts 1–8, CV #843 bits 0–7 for scripts 9–16) or in the ZIMO Sound Creator in the 'Overview' window under 'Active'.

Many values and parameters can be set as script CVs, which can later be changed in the decoder without having to reload the entire sound project. These CVs are #980 to #1019. Common applications include sample volumes, timer durations or drive steps.

Of course, the permitted values for the individual CVs must be taken into consideration – please refer to the decoder manuals for MX and MS decoders.

Detailed instructions for the scripts can be found at https://www.zimo.at/web2010/documents/ZSP_ZPP_scripts_EN.pdf or directly via the menu item 'Help – Open script manual'.

8.1 - Overview

Here you will find a list of the scripts already included in the project. You can add new scripts, import them from other locations, or export scripts from this list. You can also edit the scripts here (open by double-clicking), enable or disable them (tick the 'Active' box), and rename them (with the script selected, press the F2 key to type the script's name).

8.2 - Add

This option corresponds to the 'Add' option in the overview. A new empty script is added, which can then be edited.

9 - Tools – Menu item

Here you'll find useful tools that provide information and simple configuration options.

9.1 - Function Mapping

This window summarises all the setting options for function outputs. The settings shown here graphically are written to the project as CV values. A detailed description of the CVs can be found in the respective decoder manuals. The setting options under NMRA Mapping and Advanced Mapping can also be combined.

Function Outputs

All function outputs used in the project are listed, along with their respective effects and directions of travel.

You can assign **freely selectable names** of the function outputs. These names then appear in all relevant windows and menu items within the .zpr project.

The **effects** can be selected and changed via the drop-down menu. Together with the **direction of travel** (Fw for forwards and Bw for backwards), these infos are assigned as a value to the function output.

The corresponding settings are stored in the following CVs:

- **CVs #125 to #132** (F0f, F0r, F01 to F06)
- **CVs #159 and #160** (F07, F08)
- **CVs #195 to #200** (F09 to F014)
- **CVs #205 to #207** (F015 to F017)

NMRA Mapping

Function mapping according to **the NMRA standard** provides a simple way of assigning one or more function outputs directly to function keys. These can be enabled or disabled here by clicking on them.

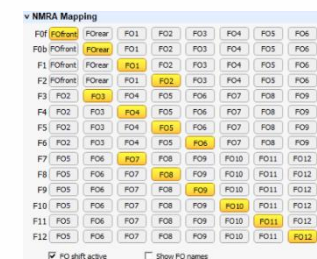
An **8-bit register** is available for each function key **from F0 to F12**, allowing up to eight outputs to be addressed. The assignment is determined by the value in **CV #61**, also known as the 'left shift'.

The setting can be adjusted here using the 'Shift active' tick box.

- **CV #61 = 0** (with the tick box selected) corresponds to the original **NMRA mapping**.
- **CV #61 = 97** (with the tick removed) cancels the **left shift**, so that lower function outputs can also be accessed even with higher function keys.

In the original **NMRA mapping**, only the headlights are designated as direction-dependent functions. The settings correspond to **CVs #33 to #46**.

The 'Show FO names' option allows the names assigned under the 'function outputs' menu item to be shown or hidden.



Dimming groups

There are five groups available, in which the dimming value can be adjusted individually.

If a general dimming setting for the function outputs has already been set in **CV #60**, the dimming configured here is applied in addition to that.

The **"Suppress effect"** option deactivates the output's lighting effect as soon as the output is activated with this dimming group.

In addition, it is possible to set function outputs assigned to a group to flash normally or in reverse. The **flashing times** are set via **CV #117**.

The settings for the dimming value groups are stored in **CVs #508 to #512**.

Advanced Mapping Groups

There are 17 mapping groups available, each of them can manage up to two function outputs for each direction of travel. If more than two function outputs are to be controlled via a function key, additional groups can be used for this purpose.

First, a **function key (F0–F28)** is selected. Usually, the option 'When F-key ON' is chosen. In certain cases, however, it may be useful to invert the function and set it to 'OFF'.

Under **'Master Key'**, a **dependency** with any other function key can be defined. If the option 'Just on if M-key (Master) on' is activated, this group is only working when the selected master key is active. The outputs configured under the master key can also be switched off using 'Yes' under 'Suppress outputs of M-key', depending on the direction of travel.

The groups are arranged in **order of priority**, with groups higher up in the list having higher priority. The arrow buttons can be used to move the position of individual groups up or down.

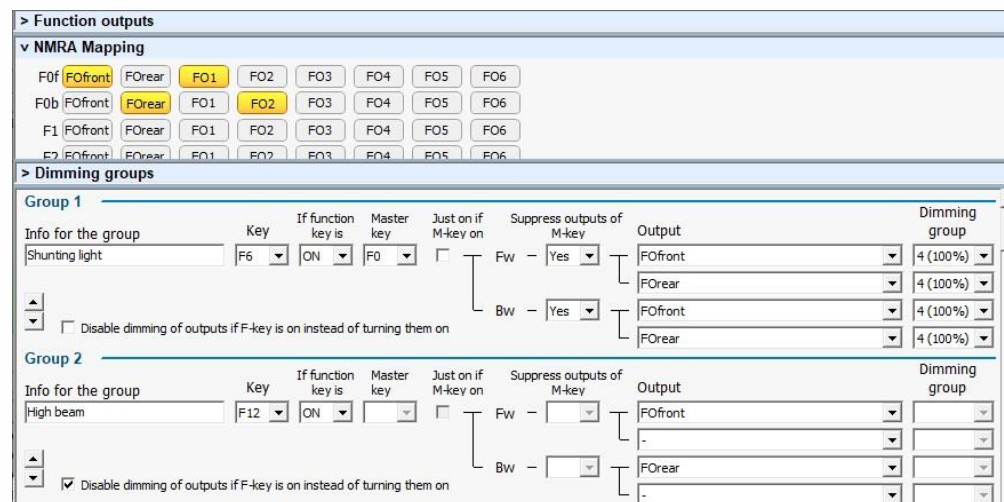
If function outputs are dimmed globally via **CV #60** and/or via a **dimming group**, and, for example, you wish to switch on the high beam, you can activate the option 'Disable dimming of outputs if F-key is on instead of turning them on'. This **cancels** any existing **dimming**.

A typical example of **functions with mixed mapping**:

Via the NMRA mapping, the F0 key is configured to control function outputs F0f (white light, cab 1) and F01 (red light, cab 2) when travelling forwards, and F00r (white light, cab 2) and F02 (red light, cab 1) when travelling backwards.

In addition, the Advanced mapping is used to switch on the shunting lights via the F6 key (also used as shunting key function), i.e. white lights on both sides with the red rear lights switched off.

The dimming value has been set to 120 in CV #60. The F12 key is also intended to switch on a high beam, which affects only the white lights.



9.2 – Audio filter

This window can only be opened if the project being edited is for an MS decoder; filters cannot be used with MX decoders. It can also be accessed via the **'Equalizer'** menu item on the **DCC controller**. The controller provides a direct connection to the connected decoder, so that changes to the filters can be heard immediately. Using the controller is particularly useful if the **decoder and loudspeakers are already installed in the model**, as adjustments can then be made under real operating conditions.

If the **audio filters** are opened via the window menu, no connection to a decoder is required. In this mode, filter settings can be prepared or modified within the ZIMO Sound Creator project, or previously saved filter configurations can be loaded. This also includes settings prepared by ZIMO for various types of loudspeakers.

This approach is particularly useful when several **identical models** are to be configured with the same settings.

A detailed description can be found in the **'DCC controller'** chapter.

9.3 – Connection docu

In this window, individual **labels** can be assigned to the various function outputs, servo connections, reed inputs or fan outputs. This allows the respective connections to be clearly assigned and more easily identified.

To assign a name, double-click on the empty space next to the output. You can create your own new columns by right-clicking to comprehensively document the connections used in the project. It is possible to copy and paste sections using Ctrl+C and Ctrl+V in conjunction with spreadsheet programmes.

If 'Fixed Columns' are defined, these will be displayed in all projects.

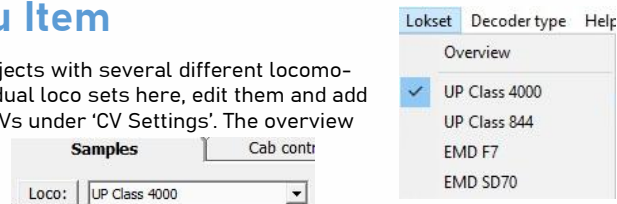
Port	Name	Dim	F key
F0front	White f	60%	F0
F0rear	White r	60%	F0
F01	Red r	40%	F0
F02	Red f	40%	F0
F03			
F04	Cab light f	50%	F12
F05	Cab light r	50%	F12
F06			
F07			
F08			

9.4 - Function key docu

In this window, you can assign individual **labels** to the function keys. This is particularly helpful when a function is not clearly to identify, for example with scripts, lighting functions or sounds with ambiguous names.

10 - Lokset - Menu Item

In the case of Collections or other projects with several different locomotive sounds, you can access the individual loco sets here, edit them and add new ones. See also the loco specific CVs under 'CV Settings'. The overview window can also be opened by clicking on 'Loco' in the Samples tab.



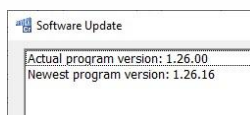
11 - Decoder type - Menu item

This is where you select the decoder type for which the current project is meant to be edited. Just as with the 'Project - New' menu option, you can select MS (which also includes FS decoders) with 128 Mbit, MX with 32 Mbit, or older MX with 16 Mbit of flash memory. Depending on the type, the default CV settings in the 'CV Settings' tab change and the maximum memory size is displayed in the bottom right-hand corner of the 'Samples' tab. You should also take into account the differences in how the CVs of the two decoder families behave (driving characteristics, dimming values, etc.). The decoder type can also be changed whilst editing. Samples in 16-bit and 44 kHz are automatically converted to 8-bit and 22 kHz when MX is selected.

12 - Help - Menu item

12.1 - Online-Update

This allows you to perform an online update of the ZIMO Sound Creator. Provided the PC is connected to the internet, the programme will search for the latest available version and offer it for **update**.



12.2 - Open Sound Creator manual

Here you can open the current **ZIMO Sound Creator manual** in .pdf format.

12.3 - Open Script manual

Here you can open the latest **Script manual** in .pdf format.

12.4 - Changelog

This window lists the most important **changes** in the latest versions of ZIMO Sound Creator.

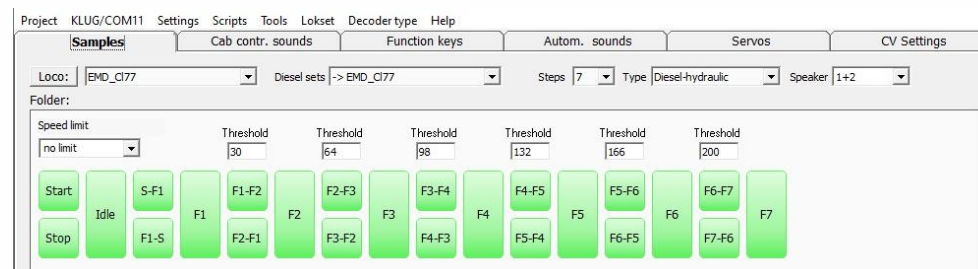
12.5 - Log

The '**Log**' section records loading processes, amongst other things. In the event of recurring errors, the contents of this log can be copied and pasted into an email to ZIMO Support, which helps in tracing the faulty events.

12.6 - Info

This opens a window containing **information** about the current version of ZIMO Sound Creator.

13 - 'Samples' tab



13.1 - Defining the basic parameters

Selecting the loco type (steam, diesel)

The general categories '**steam loco**' and '**diesel loco**' are available to choose from; electric locomotives are also defined as diesel locomotives here, as the sequences in the ZIMO Sound Creator are practically the same. For diesel locomotives, the diesel engine's drive levels are added to the sequence; for electric locomotives, these are usually different fan speeds. The locomotive type is selected when **creating a new sound project**.

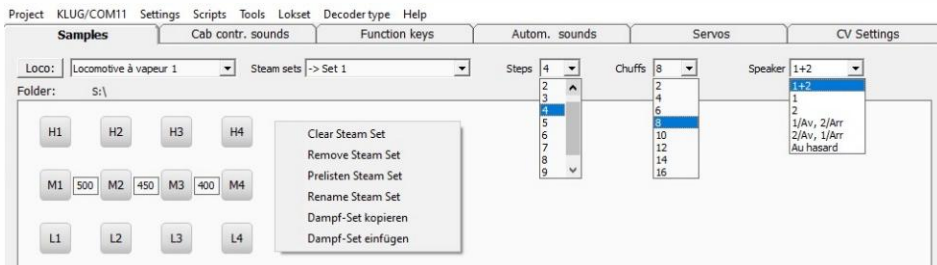
Selecting loco sets

Up to 32 locosets can be defined per locomotive type (steam or diesel). This can be used to create multiple variants of a sound project, which can be switched later via CV #265, or even during operation using a key defined in CV #345, to switch to other operating modes (heavy load operation, solo driving, etc.).

Set name

Each set can be renamed by right-clicking in the sound sequence field and selecting 'Rename Steam Set' or 'Rename Diesel Set'.

Number of speed steps for steam locomotives



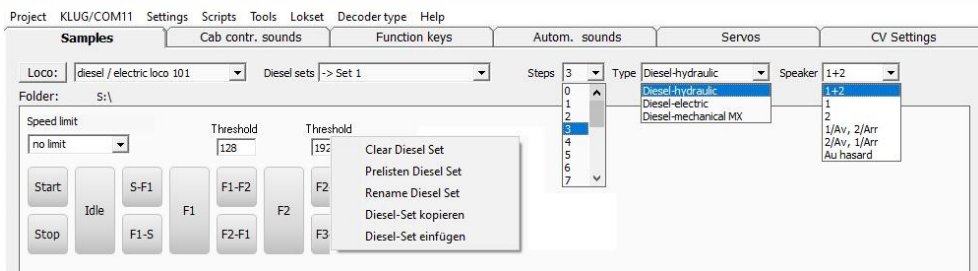
Different samples can be used for different speed ranges. If more than one speed step is used, the thresholds must be specified between them. These indicate the time in milliseconds between the triggering of two steam chuffs. If the value falls below this time (the locomotive is travelling faster), the system switches to the samples to the right side of the threshold. The chuff samples should become progressively shorter towards the right side.

Number of steam chuffs per wheel rotation for steam locomotives

You can select 2, 4, 6, 8, 10, 12, 14 or 16 chuffs per wheel rotation. An equal number of different samples must be available. The file names of the individual sample files must end with *_1, *_2, *_3, etc. This ensures that they are arranged correctly by the ZIMO Sound Creator when added to the project.

The load levels for steam locomotives are also represented by different samples. **H** corresponds to the powerful steam chuffs during acceleration, **M** corresponds to steady driving, and **L** corresponds to the sound made during deceleration.

Number of speed steps for diesel locomotives



The locomotive's speed range can be divided into up to 20 speed steps. Three samples are required for each step: two transition samples to the lower step (ascending and descending) and one sample for the constant drive level.

Subtypes of diesel locomotive

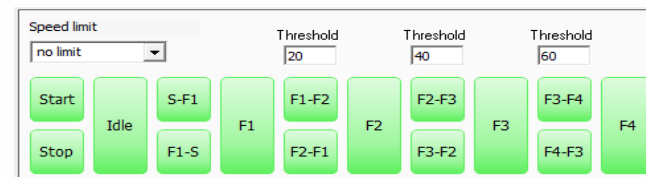
Under 'Type', the specific type of diesel locomotive can be specified in more detail. This can also be changed once a sequence has already been set up. For diesel-hydraulic and diesel-electric locomotives, the sequence samples can remain the same. When switching to or from diesel-mechanical, the samples in the sequence must be adjusted.

- **Diesel-hydraulic:** the sequence of sound samples depends on the target speed (the speed set on the controller).
- **Diesel-electric:** the sequence of sound samples depends on the current driving speed.
- **Diesel-mechanical:** Special sequence for locomotives with mechanical transmission; currently only available for MX decoders.

From version V2.00 of the ZIMO Sound Creator onwards, it is possible to assign the entire sequence of a steam or diesel project to a specific speaker. This is particularly useful for the ZIMO Stereo decoders MS420, MS950 and MS990, but mono decoders can also benefit from this, as described above under 'DCC Controller' and 'Filter'.

13.2 - Creating a diesel-mechanical locomotive

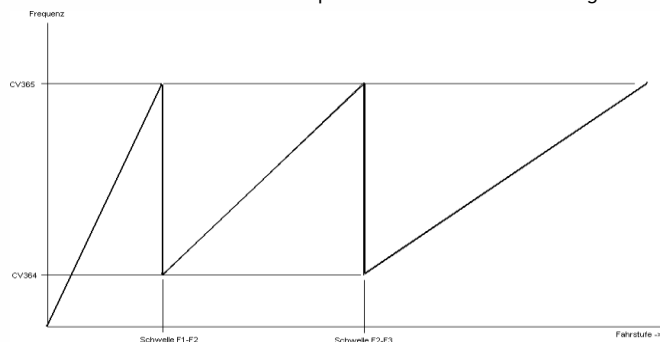
With a fixed number of gears and synthetic speed boost



The following steps should be followed:

- Set 'Type' to 'Diesel-electric'
- The 'Start' sample involves starting the diesel engine
- The 'Stop' sample involves turning off the diesel engine
- The 'Idle' sample contains an approx. 2-second sample of the diesel engine idling
- The "S-F1" sample contains the sound of changing gear and pulling away
- Samples "F1", "F2"... contain the respective lowest engine speed of the diesel engine while driving
- Samples "F1-F2", "F2-F3"... contain the transition from F1, revved up to maximum speed, to F2 at the lowest speed, and possibly a gear-changing sound, i.e. upshifting to the next gear.
Samples 'F2-F1', 'F3-F2'... can be designed in two ways:
- CV158 Bit1=0: in this case, the vehicle is downshifted whilst braking, i.e. the engine brake is used. In this instance, the sample must feature a rise in revs from low to high.

- CV158 Bit1=1: in this case, the system shifts to neutral during deceleration. In this case, the sample may contain the same sound as "F2", possibly slightly shortened to improve the response time.
- Sample 'F1-S' contains the transition from 'F1' to 'Idle'
- CV364 contains the speed to which the diesel engine drops back when changing to the upshift gear
- CV365 contains the maximum speed to which the diesel engine can rev



Speed limit	Factor	Threshold	Factor
no limit	12	150	12

Start motor

Idle motor sound

Stop

Insert gear

Acceler-ation

Abort acceleration

Drive motor sound

Insert gear

Acceler-ation

Abort acceleration

With realistic acceleration sound

Please note: as things stand (ZIMO Sound Creator V2.00), this sequence is only possible with MX decoders, not MS decoders.

This sequence has the advantage of producing a realistic sound of a diesel engine with a mechanical gearbox during acceleration. The disadvantage here is that the number of gears depends on the length of the 'acceleration' samples and the acceleration value set in CV3. The following settings must be made:

- Set 'Type' to 'Diesel-mechanical'.
- The 'Start motor', 'Idle motor sound' and 'Stop' samples contain sounds as described above.
- The 'Insert gear' sample contains a short sound (<1s) of the gear being engaged.
- The 'Acceleration' sample contains a real recording of the locomotive's acceleration sound. The last 0.5s of the sample must fade out (volume decreases to 0).
- The 'Factor' value above the 'Acceleration' sample determines how quickly the frequency of the 'Engine' sample is artificially boosted. As a guideline, multiply the length of the 'Accel' sample in seconds by 3. If there is a frequency jump during the transition from

the acceleration sound to the constant engine sound, this can be corrected using this value.

- The 'Drive motor sound' sample contains the constant driving noise of the engine at its lowest operating speed. It should be approximately 2 seconds long and must be playable in a loop without any crackling.
- The 'Abort' sample contains the sound of upshifting a gear and must have a fade-in (slow fade-in) during the first 0.5 seconds. At the end, it must match the 'Stand' sample.

13.3 - Adding samples (.wav files) to the project

The 'Files' window on the left displays all the folders and samples in WAV format that are located in the same folder as the open project you are working on. Double-click a folder to open it; double-click the folder icon with the dots to return.

Files:	U. User Samples:	Name	Class	khz/Bit	Size kB
...	✓ Air_release_01.wav	Air_release_01	Undefined	22/16	156
Conductors-whistle.wav	✓ Beep_01.wav	Beep_01	Undefined	22/16	34
✓ Cornering_squeal_01.wav	✓ Brake_squeal_01.wav	Brake_squeal_01	Brakes squeal	22/16	365
✓ Coupling_02.wav	✓ Cl_66_Air-fan_04.wav	Cl_66_Air-fan_04	Undefined	22/16	626
	✓ Cl_66_Auxiliary-compressor_01.wav	Cl_66_Auxiliary-compressor_01	Undefined	22/16	585
	✓ Cl_66_Brake-fan_01.wav	Cl_66_Brake-fan_01	Electric brake	22/16	401
	✓ Cl_66_Brake-release_02.wav	Cl_66_Brake-release_02	Undefined	22/16	173

To add a sample to the project, select it with the left mouse button and then, while holding the left mouse button, drag it into the right-hand window or into the sequence at the top ('drag & drop'). If a sample is dragged into the 'User Samples' field on the right, the window for the sample's 'Presets' opens. Depending on how it is to be used in the sound project, the appropriate preset must be selected here; a list of the individual presets can be found below. In addition, a **loop** range or event marker can then be anchored within the sample here. However, presets, loop ranges and event markers can also be set up or changed later by right-clicking a sample and selecting the relevant menu. Samples can also be **removed** from the User Sounds in this way.

✓ Beep_01.wav	Beep_01
✓ Brake_squeal_01.wav	Brake_squeal_01
✓ Cl_66_Air-fan_04.wav	Cl_66_Air-fan_04
✓ Cl_66_Auxiliary-compressor_01.wav	Cl_66_Auxiliary-compressor_01
✓ Cl_66_Brake-fan_01.wav	Cl_66_Brake-fan_01
✓ Cl_66_Brake-release_02.wav	Cl_66_Brake-release_02

Adding chuff samples to steam locomotives

For each speed setting (1 to 10), the three fields **H**, **M** and **L** are available. Samples must always be assigned to the M box; the H and L box are optional – if these are not equipped with separate samples, the ones in H will be used for all load levels. If different samples are used in H and M, but none are assigned to L, those from M will be used for L. The (correctly named) samples are dragged onto the respective box.

When samples are assigned to a box, its colour changes from grey to green. H and L fields that differ from the M box are additionally displayed in red and purple.

The assigned samples are then displayed in the individual chuff boxes. Depending on the prototype, you should decide in advance how many chuffs you wish to use. The samples must be named accordingly, with consecutive suffixes. This means you do not have to add the chuffs individually; they are automatically assigned correctly as soon as you drag the first one onto a box. If a sample was already assigned to the box, it is replaced by the new one. If you hover the mouse pointer over one of the chuff boxes, the currently assigned samples are shown.

H1	H2	H3
M1	M2	M3
L1	L2	L3

BR50_1.6_01.wav

BR50_1.6_02.wav

BR50_1.6_03.wav

BR50_1.6_04.wav

BR50_1.6_05.wav

BR50_1.6_06.wav

BR50_1.6_07.wav

BR50_1.6_08.wav

Adding driving sounds for diesel locomotives

- 'Start' field: Engine start-up sound
- 'Idle' field: Stationary noise of the diesel engine (must form a loop)
- 'Stop' field: Shutdown of the diesel engine
- 'S-F1' field: Transition from stationary noise to the first drive level
- 'F1' field: Engine noise in the first drive level (must form a loop)
- Field 'F1-S': Transition from the first drive level to stationary noise
- 3 additional samples are required for each additional drive level

Adding driving sounds for electric locomotives

- 'Start' field: Startup of the electric locomotive
- 'Idle' field: Stationary noise of the electric locomotive (must form a loop)
- 'Stop' field: Shutdown of the electric locomotive
- 'S-F1' field: Start-up of the traction motor fans
- 'F1' field: Fan noise (must form a loop)
- Field 'F1-S': Traction motor fans switch off
- 3 additional samples are required for each extra fan speed

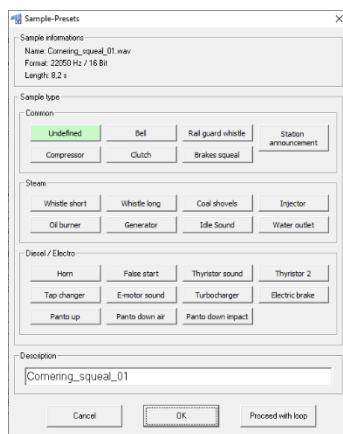
Adding automatic sounds and other sounds

Some samples must have a specific preset in order to be played correctly in the sequence. This preset is either set up when a sample is added to the project, or changed via a right-click – Presets.

The following driving sounds must have a preset assigned to them:

- Idle (for steam locomotives) corresponds to the stationary noise
- Brakes squeal (is only played during deceleration within the defined range of CVs #287 and #288 and stops automatically when the locomotive comes to a standstill).
- Water outlet (of the cylinder of a steam locomotive)
- False start (played once in diesel projects when the F key assigned to this sound is pressed first, followed by the driving sound being activated)
- Thyristor sound
- E-motor sound
- Tap changer (switch gear)
- Turbocharger

In the 'Sample Presets' window that opens, the appropriate 'Sample Type' must be selected. The 'Description' field can be used as required.

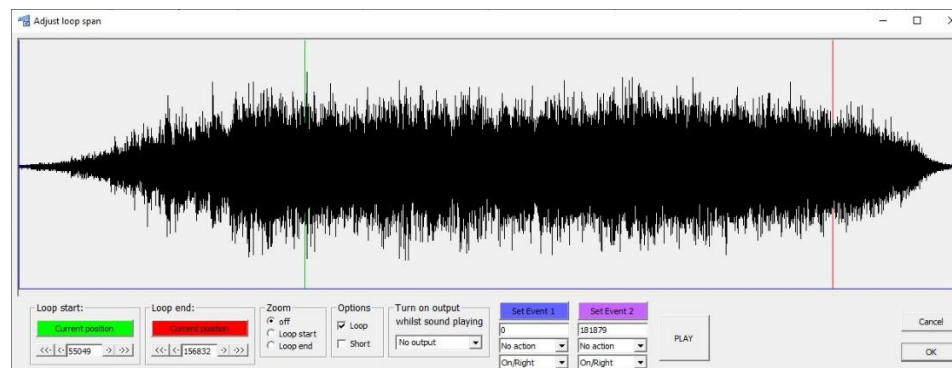


Adding other sounds

All other sounds (whistles, pumps, station announcements, etc.) are also assigned to the 'User Samples' window.

Selecting a 'Preset' for these samples is not mandatory, but it makes it easier to change a sound using the CV300 procedure (see decoder operating instructions) and when further editing the project.

13.4 - Defining a sample's loop markers



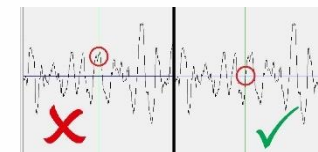
For sounds that are to be played continuously (looped), loop markers must be defined. This can be done directly when adding a new sample. As an example, the cornering squeal: it has an opening section that is played once when the sound is switched on, a middle section that plays for as long as the function key on the controller is held down, and a (preferably short) closing section that plays after the function key is released.

To define the loop markers for a sound that has already been assigned to the project, first select it with the left mouse button, then open the drop-down menu with the right mouse button and click on 'Change loop markers'.

To define the start and end of the loop range, click with the left mouse button on the desired point in the sample. A black line will then be drawn. Now press the 'Current position' button for 'Loop start' or 'Loop End', whereupon the line will turn green or red.

If the sound is to be played back in a loop in the decoder, the 'Loop' selection box must be ticked under Options.

If you want the sound to jump instantly to the end marker when the function key is released, the 'Short' checkbox must be ticked. 'Short' can be used in addition to 'Loop' or on its own.



The 'Play' button allows you to check the result straight away and make changes even while the sound is playing.

The 'Zoom' function can be used to position the start and end markers as close as possible to a zero-crossing point in the sound to prevent crackling. The arrow keys can be used to fine-tune the markers even further. The outer arrows jump to the next zero crossing.

Assigning a function output to a sample

In the 'Turn on output whilst sound is playing' selection field, you can select a function output which is turned on whenever this sound is currently playing. This output can also be adjusted later via CV. This can be used, for example, to control a red LED in the fire chamber whenever the coal shovelling sound is played. When the sound has finished playing, the output turns off.

For steam locomotives with pulsed smoke, there is also a special 'Smoke Fan' function to select, which causes more smoke to emerge from the funnel, for example, when the 'blower' sound is played.

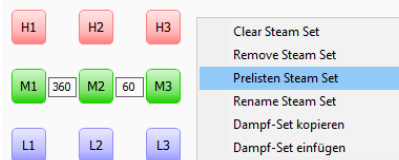
Furthermore, Set Event 1 Pos. (violet) and Set Event 2 Pos. (purple) can be used to set triggers that turn the function outputs on (or off). Events 1-16 can also be set, which can be queried and used elsewhere in the sound project or control servos.

Setting the 'start-up plume' for diesel locomotives with a smoke generator

Particularly with large-scale diesel locomotive models fitted with a smoke generator and fan, it is possible to control the system to produce a 'start-up plume'. The moment this start-up plume occurs is defined by setting the 'Loop end mark' in the Start sample. The fan motor for smoke emission is then activated at full speed at this mark.

13.5 – Removing a sample or a steam or diesel set

To remove user samples, select them with the left mouse button, open the drop-down menu with the right mouse button and select 'Remove sample'.



Chuff-samples cannot be removed individually; instead, you can only delete an entire speed step or replace it with new samples. To delete the samples from the entire current chuff set, right-click anywhere in the area between the chuff boxes and select 'Clear steam set' from the drop-down menu. In diesel projects, you can delete each sample individually, or delete the entire diesel set by right-clicking. In both cases – steam and diesel – you can copy the current set and paste it into another empty set. The name of a set is also copied and can be changed afterwards.

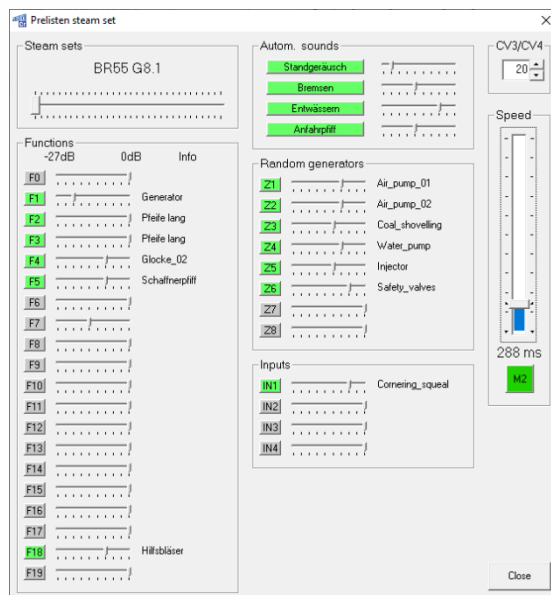
13.6 – Pre-listen a steam set

Completed steam sets can be pre-listened. To do this, right-click on the area between the steam or diesel boxes and select 'Prelisten Steam Set' from the pop-up menu.

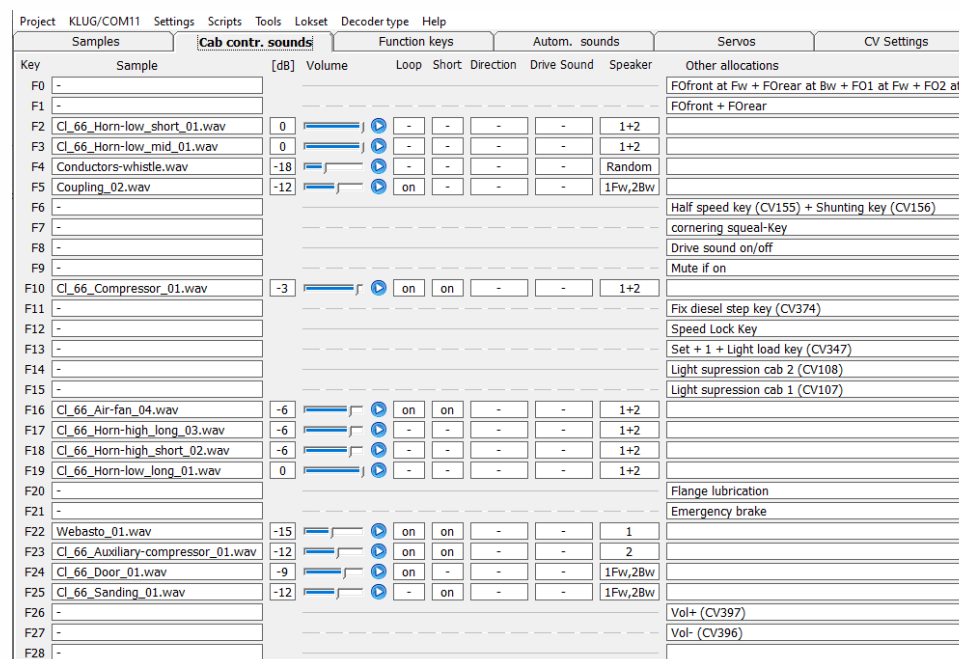
In the new window that opens, use the slider in the top-left corner to select one of the 32 steam sets and then preview it. However, each box under 'Samples' must contain sounds! If any boxes are empty, this may lead to unexpected behaviour during playback, including the ZIMO Sound Creator might be crashing.

For sounds that have already been assigned, the volume can be adjusted under 'Functions' to balance the sounds against one another.

Previewing the driving sound is currently only possible with steam sets.



14 – 'Cab contr. sounds' tab



In this window, samples can be assigned to the function keys F0 to F28. In addition, the volume of each sample can be adjusted using the slider. The blue button allows you to listen to the sample. However, any loops that have been set up are not taken into account during playback.

The individual options determine whether a sound is looped – i.e. played back endlessly – while the function key is active, or 'shortened' – i.e. cut short – when the function key is released.

Note on Loop and Short: If you have set loop markers immediately after dragging a sample from the files into the User Samples, the information for Loop and Short is automatically set under 'Function Sounds' when the sample is assigned to a key. However, if you set the loop markers later, this information is not automatically applied. You will then need to do this manually if required, or reassign the sample to a key.

Using "Direction", you can specify whether a sound is played only when travelling forwards or backwards, or in both directions (default).

Under 'Drive Sound', you can specify whether a sound can always be played on an F key, or whether the drive sound must be active for this to happen.

Under 'Speaker', you can select which speaker output a sound should be played. This is particularly useful with the ZIMO MS420, MS950 and MS990 stereo decoders, but can also be used with 'mono' decoders to apply different filters where necessary.

Under 'Other allocations', all other elements assigned to the function keys – such as function outputs, scripts and sequence functions – are displayed.

15 - 'Function keys' tab

Here, you can add further functions or easily move existing ones to different function keys.

When you open a new, 'empty' project, the basic function keys can be created here using drag and drop. Functions that are not required can be dragged into the 'Unused Features' window, and vice versa.

16 - 'Autom. sounds' tab

16.1 - Sample assignment to the random generators

Up to **8 random generators** are available here, each of which can be assigned a sample. Each random generator has additional parameters such as volume, min. interval, max. interval, the duration of the sound when it is triggered ('Loop time'. If set to 0, it is played only once) and whether the sound is triggered only while driving, only when stationary or at any times. In addition, each random generator can be assigned individually to a speaker output. The random generators are only played when the drive sound is ON. When the drive sound is switched on, the timer for the minimum interval starts.

Special use: 'Air pump after stopping': by ticking the box in the top left-hand corner, random generator Z1 is played after the locomotive comes to a standstill, rather than the usual random according to minimum and maximum intervals. For steam locomotives, the fast running air pump sound is a good choice here. To prevent this from playing after every short driving session, a value in seconds should also be specified under 'Minimum break', indicating the time after which the sound should be played again. Ticking the box corresponds to CV #154 Bit 4.

16.2 - Sample assignment to the switch inputs IN1 to IN4

In the 'Sample assignment to switch inputs IN1 to IN4' group, sounds can be assigned to a switch input. The current MS large scale sound decoders have 4 inputs for reed switches. The current MS OO sound decoders have 1 or 2 inputs, depending on the decoder type.

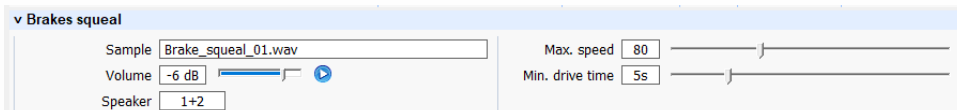
Please note, that one of the inputs could be used to trigger the wheel-synchronised chuffs (if CV #268=0) and then cannot be used to trigger a sound.

16.3 – Selection and description of autom. sounds

Automatic sounds refer to the sounds that are **automatically** played by the decoder during specific driving behaviours. Some of these must meet certain criteria in order to be used as such.

Each of these sounds can be assigned individually to a speaker output. The respective functions are as follows:

Autom. sound 'Brakes squeal'

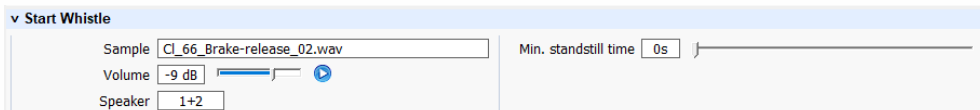


The noise made when braking, applicable to all locomotive types. The sample may be longer than necessary, as it is faded out or cut short when the locomotive comes to a standstill or when braking ceases. A loop section should be set up, and the end marker should be positioned as close as possible to the end of the sample. If the sample continues to play for a very long time beyond the end marker, the brakes squeal will still be audible even after the vehicle has come to a standstill! The sample must have the 'Brakes Squeal' preset.

The value specified in 'Max. speed' describes the drive level below which the sound should be audible. This corresponds to the value in CV #287.

The 'Min. drive time' is the length of time a vehicle must have been driving before the brakes squeal can be heard again. This corresponds to CV #288 (time scale in 0.1 s).

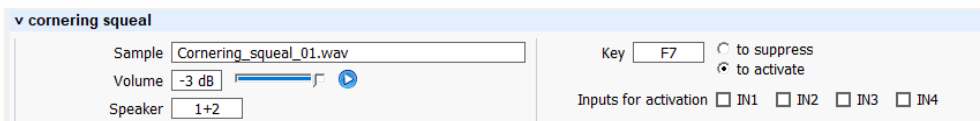
'Start whistle' sound



A **start whistle** is a sound that is played the moment the target speed exceeds 0. This can be an actual start whistle from a steam locomotive, or, for example, the release of the brakes on diesel locos or electric multiple units. The minimum standstill time corresponds to CV #274 (unit 0.1 s), which is the minimum length of time the locomotive must have been stationary beforehand for the sound to play when it starts moving. The sample does not need to be assigned to any specific preset.

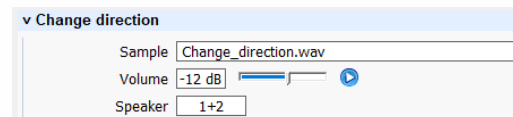
Additionally: CV #154 Bit 7: 1 = Delay departure until 'start whistle' has finished playing.

'Cornering squeal' sound



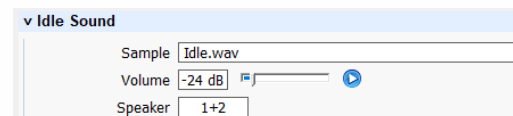
The **cornering squeal** can either be assigned to a function key (via CV #308 for MX and MS/FS decoders or under "Function keys"), or, for MS/FS decoders, optionally activated via an input (IN1-IN4). In general, 'To activate' should be selected (corresponds to CV #307 bit 7 = 1). If, for MS/FS decoders, the cornering squeal is set up via an input (bits 0-3 in CV #307), 'To suppress' can be selected so that the cornering squeal can be suppressed by pressing the F key.

'Change direction' sound



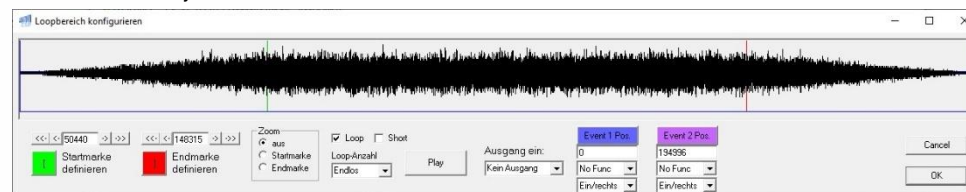
When the drive sound is ON, the **direction change sound** is played once whenever the direction of travel changes. The sample does not need to be assigned to any specific property.

'Idle' sound (for steam locomotives)

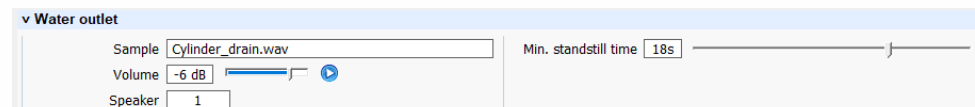


This corresponds to the stationary noise of a steam locomotive and is only available for steam locomotive types. For a more enjoyable sound experience, the sample should be at least 2 seconds long

and must have the preset 'Idle sound'. It is played in an endless loop as long as the drive sound is on. To achieve a smooth start and end, you can add a fade-in and a fade-out and then set the loop markers correctly at the middle section.



'Water outlet' sound



Automatic **cylinder drain** on a steam locomotive. Optionally, the drain can also be switched on and off manually using an F key (CV #312, the value corresponds to the F key 1-28, 29 for F 0 and 30 for MAN). If the drain is activated whilst the locomotive is driving, the sample is modulated in time with the chuffs. The sample must have the preset 'Water outlet' and it is recommended that a loop range and fade-in and fade-out be set up.

The minimum standstill time for the locomotive before the draining sound is heard again corresponds to CV #274, the time scale is 0.1 s.

Additionally: CV #272: Duration of the automatic water outlet sound in 0.1s when starting off.

Thyristor' sound

Thyristor

Sample: 2. Sample from notch: ☐ Do not raise the pitch of the 2. sample

Speaker:

☒ Thyristor sound may start before driving off ☒ Thyristor sound may get louder when braking

Pitch at mid speed: Volume during braking:

Mid. speed: Volume const. speed:

Max. pitch: Volume during acceleration:

Max. Speed: Volume reduction from:

Pitch step effect: Volume reduction, steepness:

Thyristor sounds make up a large part of the driving sound of respective electric locomotives. However, it is not strictly necessary to configure an actual Thyristor here. The autom. function can also be used for other purposes. The sample must have the 'Thyristor sound' preset and must form a loop in itself.

The settings are displayed graphically and are reflected through the following CVs: 'Thyristor sound may start before driving off' corresponds to CV #394 Bit 7 (the sound starts at target speed >0 despite any starting delay in CV #273), 'Thyristor sound may get louder when braking' CV #158 Bit 6 (for MX decoders), 'Pitch at mid. speed' CV #290 (pitch at the drive level specified in CV #292), "Mid. speed" CV #292 (speed at which the pitch set in CV #290 is reached), "Pitch max. speed" CV #291 (pitch at the drive level specified in CV #838), "Thyristor speed for max. pitch" CV #838, "Pitch step effect" CV #289 (if >0, the sound can be played in steps within the range between the mid. and max. drive levels), "Volume during braking" CV #295, "Volume const. speed" CV #293, "Volume during acceleration" CV #294, "Volume reduction from (driving speed)" CV #357 (fades out from the speed specified here), "Volume reduction steepness" (rate of fade) CV #358.

If a second Thyristor sample is configured, it replaces the first sample from the specified speed level upwards. The pitch is either raised to the same extent as the first sample, or the sample is played at a constant pitch ('Do not raise the pitch' corresponds to CV #393 bit 4).

Tap changer (switch gear)' sound

Tap changer

Sample: High speed tap changer:

Volume: ☐ Add

Speaker:

Number of shift steps: ☒ Use samples in sequence instead of always starting with the first sample

Do not play after departure for: ☒ Skip start and end part when performing an upshift

Sample im Loop abspielen für:

Pause at upshifting:

Sequence for simulating the **tap changer (switch gear)** of an old-style electric locomotive. The sample should contain the sound of a gear change and must have the preset "Tap changer (switch gear)". The settings correspond to the following CVs: "Number of shift steps" (evenly spread across the maximum speed range) CV #363, 'Do not play after departure for' [0.1s] CV #350, 'Pause during upshift gear' between individual gear steps CV #361. The sample may have a loop set up, the duration of which can be adjusted using 'Tap changer loop time' [0.1s] (corresponds to CV #359).

High speed tap changer

Schaltwerk-Set:

1	BR111_W29L_Start_01.wav
2	BR111_W29L_S1.wav
3	BR111_W29L_S2.wav
4	BR111_W29L_S3.wav
5	BR111_W29L_S4.wav
6	BR111_W29L_S5.wav
7	BR111_W29L_S6.wav
8	BR111_W29L_S7.wav
9	BR111_W29L_S8.wav
10	
11	
12	
13	
14	
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16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
End	BR111_W29L_End_01.wav

High-speed tap changer: Up to 32 high-speed tap changer sets (HG) can be configured here. Up to 33 separate gearshift samples can be configured per HG set. The first sample can be a gear-shifting sound, which is played each time a gear change is performed; if bit 2 of CV #393 is set, the samples are played one after another rather than always starting with the first one. The **end** sample can also be configured – it is played last after each gear change.

Additionally, CV #360: Time taken for the tap changer (switch gear) to engage after departure [0.1 s] (simulates the release of the electric motor brake, if fitted)

'E-Motor' sound

v E-motor sound

Sample:

Speaker:

Fade in above notch:

Pitch slope with speed:

Maximum pitch:

Volume during braking:

Volume const. speed:

Volume during acceleration:

Volume Increase per notch:

This sequence is optimised to simulate the **electric motor** of an electric or diesel-electric locomotive. However, other sounds can also be used here. The sample is played as a loop within the specified CV range and must have the preset 'E-Motor Sound'. A loop range can be set up, but it's optional. The sections before and after the loop markers are played once. This function can also be used in a steam locomotive project.

The following parameters are available: 'Fade in above notch' corresponds to CV #297 (minimum drive level at which the electric motor is audible. Unlike the thyristor sound, the electric motor sound can be activated while the locomotive is already moving), 'Pitch slope with speed' CV #299 (rise in pitch as speed increases [0=no rise, 100=maximum rise of +100%; further modulation with CV #844]), "Maximum pitch" CV #844, "Volume during braking" CV #373 (0=no function, 1=minimum volume, 100= original volume of the sample, 255=maximum volume [+200%]), "Volume const. speed" CV #296 (100 corresponds to the original volume of the sample), "Volume during acceleration" CV #372 (0= no function, 1=min., 100 = original volume of the sample, 255 = max.), "Volume increase per notch" CV #298 (increase in volume as speed rises [1 = slow, 255 = fast]).

For MS/FS: CV #844: Maximum pitch of the electric motor (extension to CV #299; =0 corresponds to no additional pitch increase on top of CV #299; =255 corresponds to a max. increase of 355%).

'Electric Brake' sound (dynamic brake)

v Electric brake

Sample:

Volume:

Speaker:

Key: to activate manually

Min. deceleration: to play electric brake sound

Lower speed limit:

Upper speed limit:

The autom. sound of the **electric brake** corresponds to the sound of a fan cooling the braking resistors on the prototype, for example. The sound is played within the configured parameters. The Key specified here corresponds to the value in CV #380; the "Min. deceleration" or number of drive steps, which must be decelerated for the sound to be triggered, corresponds to CV #384; the Lower and Upper speed limits correspond to CVs #381 and #382.

For MX decoders, there are also further possible parameters in CV #383 (Pitch: increase in frequency with increasing speed [0=none, 1-255= dependency increased]), CV #385 (0=none, 1-255=triggered by negative motor load), CV #386 (increase playback time: Bits 0-2: Extension of the additional duration of the electric brake by 0-7 seconds to prevent any interruption in the braking sound between drive levels. Bit 3 = 0: sound fades out at the end; Bit 3 = 1: sound ends with the end of sample) and CV #348 Bit 5 (the solo driving key suppresses the electric brake).

'Turbocharger' sound

v Turbocharger

Sample:

Volume:

Speaker:

Influence of speed:

Influence of acceleration:

Solo drive key reduces the effect:

Minimum load to play:

Minimum diesel level:

Rate of ascent:

Rate of descent:

This sequence is designed to simulate the sound of a diesel locomotive's turbocharger. The sample should form a loop in itself or have loop markers set up, and it must have the 'Turbocharger' preset.

CV #366: maximum volume of the turbocharger sound. The influence of speed (on pitch) corresponds to the value in CV #367; the influence of acceleration is CV #368 [pitch depends on the difference between the target and current speed (accelerating/braking)]; the "solo drive key reduces the effect" of CV #834; minimum load is CV #369 [Minimum load (difference between current and target speed) required for the turbocharger to be audible at all], minimum diesel level CV #829 [Diesel step (in the sequence) at which the turbocharger should become audible], Rate of ascent (of pitch) CV #370, Rate of descent (of pitch once the speed level is reached) CV #371.

17 - 'Servos' tab

Servos

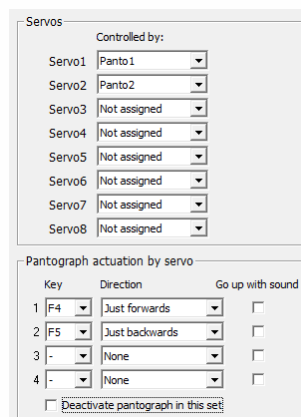
Controlled by:

Servo1	F1
Servo2	Not assigned
Servo3	F1
Servo4	F2
Servo5	F3
Servo6	F4
Servo7	F5
Servo8	F6
Servo9	F7
Servo10	Not assigned
Servo11	Not assigned
Servo12	Not assigned
Servo13	Not assigned
Servo14	Not assigned
Servo15	Not assigned
Servo16	Not assigned

Most ZIMO decoders have servo outputs. Large-scale decoders have up to 8 outputs. H0 decoders have up to 2 outputs which can be used as an alternative to SUSI. Up to 8 servo functions can be set up on MS decoders and up to 4 on MX decoders. These can be controlled via keys F1 to F28, via Panto1 to Panto4 control, various drive levels in the sequence, or via Event 1 to 16.

Controlling pantograph actuation by servo

Up to 4 servo outputs can be used to control pantographs. To do this, for example, the 'Servo1' output must be defined as the 'Panto1' function, and then an F key and, if desired, the direction of travel must be set under 'Pantograph actuation by servo'. If the "Go up with sound" option is enabled, the pantograph will raise at the right moment when the "Startup" sound (diesel step) is played and lower again when the "Shutdown" sound (diesel step) is played. The exact point within the sequence sound at which the pantograph raises or lowers is set under the "Samples" tab and "Change loop markers". To do this, right-click on the 'Start' or 'Stop' box. There in the waveform of the sample, mark the point where the pantograph should raise or lower, click 'Loop end' and close the window by clicking 'OK'.



Under CV settings, you'll find a brief description for some CVs, which explains their function. For more detailed information, have a look at the MX or MS decoder manuals. This is particularly helpful when the individual bits of a CV are relevant.

A 'Extended address' (greater than 127) can be easily determined here by entering the desired address under 'Loco Address' – the corresponding CV values (CVs #3, #17, #18, #29) are calculated automatically by the Creator.

The CV Filter makes it easier to search for a CV. For example, entering 'Thyristor' in the text field will find all CVs related to the Thyristor sound configuration.

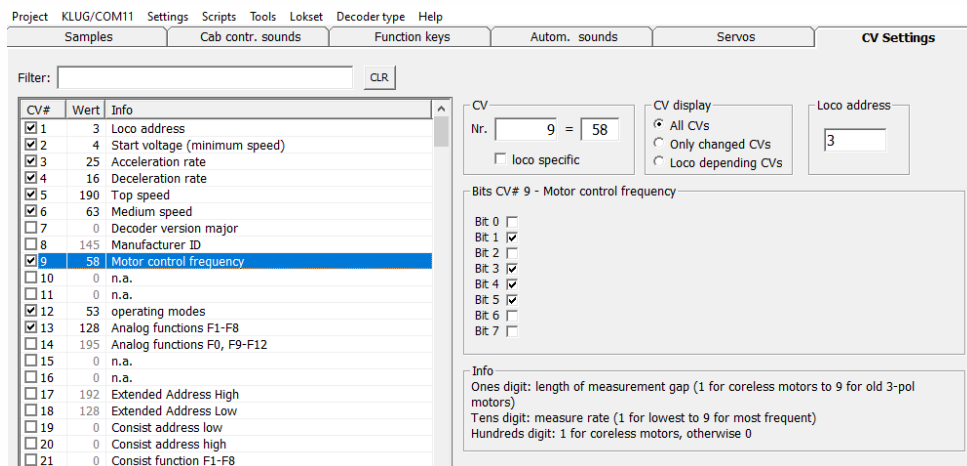
If a sound project contains **several loco sets**, you can select a specific set via the '**Loco Set**' menu option and view the corresponding CVs.

By enabling the '**Loco specific**' option, the CV settings can be configured separately for each loco set

Via 'CV Display', you can select which CVs are shown. Modified CVs are shown in black and the default values for the selected decoder type are shown in grey. CVs displayed in red are those that may have different values across multiple loco sets.

18 - 'CV Settings' tab

Here you can configure all functions that could not yet be defined elsewhere in the ZIMO Sound Creator. The CV ranges CV#269–286 and CV#315–342 can be defined individually for each loco set (by ticking 'Loco specific'); the remaining CVs are global and apply to all loco sets.



If a sound project is only on the decoder and there is no .zpr file available, the CVs can be conveniently configured using the 'ZCS' tool by Matthias Manhart, which can be downloaded from:

[ZCS – ZIMO CV Setting Tool](#).

Please refer to the **ONLINE help** provided there!



ZIMO Elektronik GmbH