IntelliSound 4- Module 32 500 and 32 504
The Sound module for all Locomotive decoders with SUSI Interface

Characteristics

• Intelligent Sound control with 320 second Sound buffer
• Efficient output final stage for 8 Ohm loudspeaker
• Generates the operating sounds of the locomotive, brake squeal and random noises while stationary e.g. auxiliary aggregates, coal shovelling etc.
• Simultaneous rendition of 4 independent sound channels
• 2 sound dependant function outputs for fire box, smoke generator, and others
• Suitable for all DS3, DS4 and DSU Sounds
• Custom locomotive sounds and other sounds can be provided with the IntelliSound Creator and installed with SUSIkomm
• 12 additional adjustable sounds like e.g. whistle, bell, horn, uncoupling sound, door warning signal, or own custom sounds
• Function Mapping to f 28
• Switchable random sounds
• Realistic rendition of tramcar transmission, switch step in an E-Loco (only DS4), with adjustable switching time
• Sound adjusts with engine loading like up hill and down hill
• With smart start function: The Sound module stops the locomotive decoder, when starting until the vehicle’s engine synchronise with the sound.
• Separate adjustable volume for almost all sound events (only DS4)
• Muting with fade in and out function
• Adjustable alternative volume e.g. for Night operation
• Input for Hall sensor e.g. for wheel synchronous chuffs in steam locomotives, or curve squeaking in electro and diesel locomotives
• Analogue operation with start-up and shut-down noises, when used with a suitable decoder
• Up to three modules can be connected to a locomotive decoder e.g. for multi-engine locomotives
• With solder pads for Energy buffer 71800 for interruption free sound
• Replaceable locomotive sounds, in addition diverse Sounds are available on the Internet. (www.uhlenbrock.de)

Description

IntelliSound 4 Modules plug into the SUSI interface of locomotive decoders which are marked with the corresponding logo. The sound modules deliver faithful sounds like those in the prototype locomotives. With the intelligent Sound control the reproduced sounds are matched to particular operating situation, for example up hill and down hill.

When the locomotive starts the Sound module stops the motor (via the locomotive decoder) until the vehicle’s sound is synchronised. So the engine howls e.g. with a diesel locomotive before it moves. If the loco is pulled up the brake squealing sounds. When stationary different random sounds are heard e.g. compressor, auxiliary generator and coal shovelling. The random sounds are switchable by special function key. With diesel locomotives the motor start-up and motor run down sounds can be heard. With Railcars or and with E-Locos the notchings sounds of the situation are played. The module’s two special function outputs are controlled directly by the sounds. So it is possible to have the fire box light flickering automatically while “coal shovelling” is heard or glowing of brake discs simulated. With the 4 channel technology the running sounds of the locomotive and 3 additional locomotive specific sounds can be controlled by function key. These are depending on loco type, whistle, horn, bell, door warning or self recorded sounds. The auxiliary sounds can be varied in length, - short on pulse results e.g. a short whistle, a longer on pulse results in a longer whistle. These auxiliary sounds are called up with function keys 10 - 128. The reproduction of steam locomotive running sounds can wheel-synchronous or be controlled by speed step.

If the locomotive drives out of view on the layout i.e. into the shadow station, then ‘audio muting’ with a function key, can be used to slowly fade out the entire sound of the locomotive and when it re-emerges to slowly fade the sound back in. Almost all sounds can have their volume independently set with CV programming.

In combination with a corresponding suitable locomotive decoder the IntelliSound 4 module can even be in analogue mode with start-up and shutdown sounds.

‘Own’ sounds are provided with the auxiliary software “IntelliSound-Creator”. Here entire locomotive sounds and self-recorded sounds can be created. The software is available from the website, www.uhlenbrock.de.

For loading all sounds the USB Sound loading adapter 31050 is required. The SUSIkomm Software is required for transferring the sounds into the IntelliSound 4 Modules and is supplied with the loading adapter or can be downloaded free of charge from our Internet site www.uhlenbrock.de. For transferring DS3 and DSU sounds Software version 3.0 is sufficient. For transferring DS4 sounds version 4.0 and above of the software is required.

DS3 sounds continue to be available for download, free of charge. The new DS4 sounds can be obtained as they become available. The latest information regarding this is available from our internet site www.uhlenbrock.de.

Installing a Sound Module

SUSI interface

Insert the SUSI plug into the SUSI socket of your decoder. The sound module is supplied with power and data from the decoder.

Loudspeaker

To the unconnected black wires from the IntelliSound 4 module you can connect 8 Ohm loudspeakers from our assortment. Every loudspeaker requires a resonance shell. Sometimes the locomotive housing or wagon chassis can be used as a resonance shell. If this is not possible we offer a number of speakers with resonance shell. As a general rule: “The larger the loudspeaker, the fuller the sound”.

If a speaker with a resonance shell is used then it must be glued to the housing completely air tight. Also seal the cable outlet and mounting holes on the speaker.

The loudspeaker is then installed in the vehicle in such a way as to have the largest possible opening to the outside of the vehicle.

Due to the increased power output it may be necessary to reduce the volume with CV programming when smaller speakers are used.

Additional Connections

On the underside of the module there are solder pads for connecting auxiliary functions such as fire box, smoke generator and wheel pulses for synchronous smoke (see the sketch below).

Sound dependent Auxiliary Functions

Outputs SA1 and SA2 can be used to control loads that are sound dependent.

In a steam locomotive a smoke generator can be connected to SA1 and a light in the fire box connected to SA2. In electro-locomotives or trams two lights can be connected. A simulator for glowing brake discs can be connected to SA1 or a brake light and pantograph disconnection arc is available on SA2.

On diesel locomotives only output SA1 is used for glowing brake discs.

With the mentioned loads the other pole is connected to the +20V of the locomotive decoder, or added to the red SUSI wire on the solder pad on the sound module. With LEDs please take care with the correct current limiting resistor and the polarity.

External input for e.g. Wheel rotation pulses

For production of wheel synchronous smoke puffs on a steam locotive or curve squeaking on an electro locomotive or diesel the sound module has a sensor input. As sensor a reed contact or a Hall sensor can be used in conjunction with a magnet on one of the locomotive wheels (bogie for curve squealing) or a light gate with the appropriate markings on one of the locomotive wheels.
Connecting an Energy buffer 71800
For interruption-free sound enjoyment an Energy buffer 71800 can be connected to the sound module as shown in the diagram.

Fastening the Sound module into the Vehicle
Using the double sided adhesive pad provided, affix the decoder to the desired location in the locomotive. The adhesive pad protects the decoder from coming in contact with conducting surfaces and holds it in place.

Please note that according to the EMV laws the component may only be operated in vehicles that carry the CE symbol.

Start-up
Double check the correct installation with a continuity tester or an Ohmmeter.
When placing the device make sure it does not come into contact with any conducting surfaces in the vehicle. Also ensure that a shot circuit cannot occur when the locomotive is close, and that the wire is not cinched.

A short circuit can destroy the component and eventually the locomotive electronics!

Switching the Sound on and off
Individual sounds can be turned on and off with special function keys on the digital center. Assignment of sounds to the function key is done with CV's 903 to 931. When delivered the sounds are assigned as shown in the Table.

<table>
<thead>
<tr>
<th>Sound number</th>
<th>Type of Sound</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bell, whistle or horn</td>
<td>Special function 1</td>
</tr>
<tr>
<td>2</td>
<td>Whistle or horn</td>
<td>Special function 2</td>
</tr>
<tr>
<td>3</td>
<td>Running sounds</td>
<td>Special function 11</td>
</tr>
<tr>
<td>4</td>
<td>Uncoupling and door warning</td>
<td>Special function 13</td>
</tr>
<tr>
<td>5</td>
<td>Mute function</td>
<td>Special function 18</td>
</tr>
</tbody>
</table>

If the locomotive travels out of the visible range of the layout, e.g. into the shadow station, then by switching the mute function (f8 "on", factory setting) the entire sound is faded out. Internally the module keeps rendering the sound according the diving situation. If the mute is switched off again then the sound is faded back in and can be heard again in keeping with the current running situation.

Volume
The overall volume can be changed with CV 902. In CV 908B an alternative volume (e.g. for night operation) can be setup, and can then be switched with a special function key programmed into CV 914A. The volume the auxiliary sounds can be adjusted in Bank B (see CV-Table).

Setting the dynamic Characteristics of the Sound
Some sound characteristics change according to current running state of the vehicle and can be adapted to the type of locomotive being used. The settings affect load regulation (up/down hill), the speed step at which the brake squealing cuts in and the speed step at which the cooling fan cuts in for electric locomotives.

CV 937 changes the sensitivity to load regulation. If this is set to a value of 1 then the sound reacts to the load change rapidly. A value of 8 results in a slower reaction. Using CV 938 you can set the speed step at which the sound changes with uphill (load increase) running and with CV 939 the speed step at which the sound changes when running down hill (load reduction). All values depend on the decoder and the locomotive being used and must be determined by test runs.

CV 936 specifies the speed step at which the brake squealing cuts in when the speed of the locomotive is reduced.

CV 934 specifies the speed step at which an electric locomotive turns on the sound for the cooling fan.

The repetition rate of the chuffs in steam locomotive sound can be adjusted. CV 938 sets the time between 2 chuffs at the top speed and CV 939 set the time between 2 chuffs at the lowest speed. The higher the value is in the respective CV the longer the time between the chuffs. CV 937 specifies the that the idle sound is heard during idle running.

All factory default values for Uhlenbrock Locomotive decoders are usable with H0 Locomotives, but can be changed to suit other locomotives without problems.

Loading new Sounds into the Module
If a new sound is to be loaded into the module then it must be separated from the locomotive decoder and the connected to the IntelliSound Loading Adapter with the SUSI plug.

The operating steps to load the sounds are outlined in the instructions for IntelliSound Loading Adapter.

A large selection of free DS3- Sounds can be found on our Internet site "www.uhlenbrock.de".

Loading DS4 and own Sounds into the Module
With the "IntelliSound-Creator" Software you become the sound engineer. With this Software you can create your own locomotive and auxiliary sounds. These, as the DS4 sounds, can then be uploaded into the IntelliSound 4 modules with the SUSIkom Software (from Version 4.0).

Operating several Sound or Function modules on a Loco Decoder
When several (up to three) Sound or Special function modules are operated with a decoder with SUSI interface then each module can be assigned an CV address range in CV 897 so that all module can be programmed independently of each other. Firstly each module is individually connected to the locomotive decoder. Each module can now have its own address range assigned in CV 897 (1, 2 or 3, see CV Table). If after that all the modules are connected together they can be addressed and programmed using their own CV address range. The changed CV addresses depending on the CV address range are specified in the list of CV's. Please note the explanation in the previous sections refer to address range 1. When changing the address range you must remember to use the CV addresses for the 2nd and 3rd address range from the list of CV's.

Programming
In the factory default state all decoder options are changed using configuration variables (CVs) according to the DCC standard. The sound module can be programmed with SUSIkom software and Sound Loading Adapter, or via the locomotive decoder. The decoders can be programmed by an Intellibox, DCC Centre and Motorola Centre.

With other makes of locomotive decoder follow the instructions for that decoder.

Programming with the Intellibox
Irrespective of the format to be driven later, we recommend that the decoder be programmed via the programming menu for DCC decoders. For the exact process please read the appropriate chapter in the Intellibox manual.

Programming with DCC devices
Use the programming menu in your DCC Centre to program the decoder CVs in either register, direct CV or page programming mode. It is also possible to program the decoder on the main line using a DCC Centre. Refer to the manual of your control centre for full instructions on the process.

Programming with a Märklin Center

With a Märklin center all CVs can be programmed, but not read.
1. Switch Center off and on.
2. Select the address of the decoder and switch the light on.
3. Operate the direction change-over 5 times in quick succession with the stationary locomotive (speed step 0), until the light turns off.
4. Set the speed controller to "zero". The rear light now flashes slowly 4 times.
5. Enter the number of the CV that is to be programmed.
6. Briefly operate the direction change-over. The rear light flashes fast 4 times.
7. Enter the desired value for CV e.g. a locomotive address.
8. Briefly operate the direction change-over. The rear light flashes slowly 4 times.

If further CV's are to be programmed repeat points 5-8.

If programming is to be terminated switch the center to "STOP" or set the address to "80" and briefly operate the direction change-over.

Since a Motorola digital center from Märklin only accepts inputs of 01 to 80, the value "0" must be entered by entering the address as "80".

Page-Register for inputting CV-Numbers greater than 79

CV addresses larger than 79 can only be programmed with the help of the page register, CV66. If CV66 has a value higher than 0, then the contents of CV66 times 64 will be added to every address entered. The entered value must lie in the range 1 to 64. When leaving Motorola programming mode the page register (CV66) is automatically reset to zero.

Example

If CV82 is to be programmed with a value of 15, then CV66 must first be programmed with a value of 1. Subsequently, CV18 can be programmed with a value of 15. The decoder places the value 15 into CV82, which is derived from multiplying the contents of the CV66 (in example 1) by 64 (thus 64) and then adding the entered CV address (18).

Offset-Register for entering CV values greater than 79

CV values larger than 79 can be programmed only with the help of the offset register. The offset register is CV65. If CV66 contains a value > 0, then all following programmed values are calculated by multiplying the contents of CV65 by 4 and adding the result to the entered value. When leaving Motorola programming mode the offset register (CV65) is automatically reset to zero.

Example

CV49 is to be programmed with a value of 157, then CV66 must first be programmed with the value of 25. Subsequently, CV49 can be programmed with a value of 57. The decoder places the value 4 * 25 + 57 into CV49.

Note: When programming CV65 and CV66 the contents of the offset and page registers have no effect.

Example

After programming CV65 and CV66 the contents of CV66 must first be programmed with the value of 1. Subsequently, CV18 can be programmed with a value of 15. The decoder places the value 15 into CV82, which is derived from multiplying the contents of the CV66 by 4 and adding the result to the entered value. When leaving Motorola programming mode the offset register (CV65) is automatically reset to zero.

Programming with a Mobile Station 1 (60652) (for Dec. 76560 and 76420 from Version 25)

The programming menu is located under the Lok menu of the Mobile Station only for certain locomotives. A locomotive which has a programmable decoder must be selected from the database.

Proceed as follows:
1. Before programming remove all locomotives except the one to be programmed from the track!
2. Set a new locomotive and select part No. 36330. Locomotive Ee 3/3 is shown on the display.
3. Press the "MENU/ESC" key and select the "CHANGE LOCO" icon. Here you will find Register Programming as the last item, with "REG" designation. Use this function to change the CV's of the decoder. You can write CV's with this function.
4. Enter the CV number and confirm with the reversing button.
5. Subsequently enter the value for the CV and confirm with the reversing button.

The Mobile Station now programs the CV with the desired value.

Programming with a Mobile Station 2 (60653)

Use the DCC programming menu in the Mobile Station 2.

Table of CVs (Configuration Variables) for the Sound module

<table>
<thead>
<tr>
<th>CV Address</th>
<th>CV Address</th>
<th>Description</th>
<th>Value Range</th>
<th>Factory default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range 1</td>
<td>Range 2</td>
<td>897</td>
<td>1-3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>897</td>
<td>897</td>
<td>900 to 939</td>
<td>1,3</td>
</tr>
<tr>
<td></td>
<td>901</td>
<td>941</td>
<td>989</td>
<td>1,3</td>
</tr>
<tr>
<td></td>
<td>902</td>
<td>942</td>
<td>989</td>
<td>1,3</td>
</tr>
<tr>
<td></td>
<td>903</td>
<td>943</td>
<td>983</td>
<td>1,3</td>
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<td></td>
<td>904</td>
<td>941</td>
<td>981</td>
<td>1,3</td>
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<td></td>
<td>905</td>
<td>942</td>
<td>982</td>
<td>1,3</td>
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<tr>
<td></td>
<td>906</td>
<td>943</td>
<td>983</td>
<td>1,3</td>
</tr>
</tbody>
</table>

**SUSI Address range**

- 1 = from 900 to 939
- 2 = from 940 to 979
- 3 = from 980 to 1019

**Manufacturer ID**

- varies.

**Sound Volume**

- 50-200
- 192

**Function activated Sound Number x (x = value of CV)**

- 0 = no Sound is activated
- 1 = Whistle or Horn 2
- 2 = Bell or Horn 1
- 3 = operating noises of the locomotive
- 4 = uncoupling or door alarms
- 5 = conductor whistle short
- 6 = station announcement
- 7 = All sounds On/Off
- 8 = Departure announcement
- 9 = conductor whistle long
- 10 = Injector / compressed air
- 11 = Coal shovelling / door closing
- 12 = Pump / compressor
- 13 = Warning whistle
- 14 = Blow off / not used
- 15 = Vibrator / not used
- 16 = Shunting notice
- 17 = Announcement 2
- 18 = Braking air
- 19 = Varies / not for all modules
- 20 = Brake squealing manual
- 21 = Smoke generator always at maximum
- 22 = Smoke generator always off
- 23 = Braking sounds off by function
- 24 = Exhaust manual (E-Loco) by function
- 25 = Starting hiss manual (steam loco)
- 26 = Custom sound (only DSU)
- 27 = Custom sound (only DSU)
- 28 = Custom sound (only DSU)
<table>
<thead>
<tr>
<th>CV Address Range 1</th>
<th>CV Address Range 2</th>
<th>CV Address Range 3</th>
<th>Description</th>
<th>Value Range</th>
<th>Factory default</th>
</tr>
</thead>
<tbody>
<tr>
<td>904</td>
<td>944</td>
<td>984</td>
<td>f1 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>3</td>
</tr>
<tr>
<td>905</td>
<td>945</td>
<td>985</td>
<td>f2 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>2</td>
</tr>
<tr>
<td>906</td>
<td>946</td>
<td>986</td>
<td>f3 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>4</td>
</tr>
<tr>
<td>907</td>
<td>947</td>
<td>987</td>
<td>f4 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>1</td>
</tr>
<tr>
<td>908</td>
<td>948</td>
<td>988</td>
<td>f5 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>16</td>
</tr>
<tr>
<td>909</td>
<td>949</td>
<td>989</td>
<td>f6 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>6</td>
</tr>
<tr>
<td>910</td>
<td>950</td>
<td>990</td>
<td>f7 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>911</td>
<td>951</td>
<td>991</td>
<td>f8 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>8</td>
</tr>
<tr>
<td>912</td>
<td>952</td>
<td>992</td>
<td>f9 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>5</td>
</tr>
<tr>
<td>913</td>
<td>953</td>
<td>993</td>
<td>f10 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>914</td>
<td>954</td>
<td>994</td>
<td>f11 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>15</td>
</tr>
<tr>
<td>915</td>
<td>955</td>
<td>995</td>
<td>f12 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>916</td>
<td>956</td>
<td>996</td>
<td>f13 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>11</td>
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<tr>
<td>917</td>
<td>957</td>
<td>997</td>
<td>f14 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>14</td>
</tr>
<tr>
<td>918</td>
<td>958</td>
<td>998</td>
<td>f15 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>919</td>
<td>959</td>
<td>999</td>
<td>f16 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>12</td>
</tr>
<tr>
<td>920</td>
<td>960</td>
<td>1000</td>
<td>f17 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>9</td>
</tr>
<tr>
<td>921</td>
<td>961</td>
<td>1001</td>
<td>f18 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>922</td>
<td>962</td>
<td>1002</td>
<td>f19 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>923</td>
<td>963</td>
<td>1003</td>
<td>f20 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>924</td>
<td>964</td>
<td>1004</td>
<td>f21 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>925</td>
<td>965</td>
<td>1005</td>
<td>f22 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>926</td>
<td>966</td>
<td>1006</td>
<td>f23 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>927</td>
<td>967</td>
<td>1007</td>
<td>f24 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>928</td>
<td>968</td>
<td>1008</td>
<td>f25 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>929</td>
<td>969</td>
<td>1009</td>
<td>f26 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>930</td>
<td>970</td>
<td>1010</td>
<td>f27 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>931</td>
<td>971</td>
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<td>f28 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>932</td>
<td>972</td>
<td>1012</td>
<td>f29 activated Sound Number x value of x according to CV903/943/983</td>
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<td>0</td>
</tr>
<tr>
<td>933</td>
<td>973</td>
<td>1013</td>
<td>f30 activated Sound Number x value of x according to CV903/943/983</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>934</td>
<td>974</td>
<td>1014</td>
<td>Trigger level for electrical exhaust on an E-loc o 0 = immediately upon starting, 255 off = no exhaust noise</td>
<td>as above</td>
<td>0</td>
</tr>
<tr>
<td>935</td>
<td>975</td>
<td>1015</td>
<td>Configuration</td>
<td>Value</td>
<td>0-223</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 0 = 0  Chuff is only controlled by wheel sensor 0</td>
<td>0</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 0 = 1 Chuff of a steam loco is controlled automatically and by wheel sensor 1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 1 = 1 Pause before repeating whistle 2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 2 = 1 Haive chuffs 4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 3 = 1 Brake squeal by speed step 0 = off 8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 4 = 0 Flickering fire box 16</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 5 = 0 Fire box output when fireman shovels off automatically at power on 64</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit 6 = 1 Change fader time to 8 seconds and on 128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>976</td>
<td>1016</td>
<td>Level for Brake squealing 255 = no brake squealing</td>
<td>as above</td>
<td>10-255</td>
</tr>
<tr>
<td>937</td>
<td>977</td>
<td>1017</td>
<td>Idle time in seconds 0 = idle off 255 = idle always on</td>
<td>0-255</td>
<td>80</td>
</tr>
<tr>
<td>938</td>
<td>978</td>
<td>1018</td>
<td>Time between two chuffs at maximum locomotive switches speed without contact 0-100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>979</td>
<td>1019</td>
<td>Time between two chuffs at minimum locomotive speed without contact 0-255</td>
<td>0</td>
<td>245</td>
</tr>
<tr>
<td>1021</td>
<td>1061</td>
<td>1101</td>
<td>Setting that determines which bank A-C is programmed</td>
<td>as above</td>
<td>0, 1, 2, 3</td>
</tr>
</tbody>
</table>

The following expert CVs (Bank A) can only be programmed when CV 1021 is set to 1. Set CV 1021 back to 0 when programming is completed!

900A 940A 980A Hardware Version (Product ID)
901A 941A 981A Additional Hardware/Software information
903A 943A 983A Relative volume for custom sound – number 200 25-255 128
904A 944A 984A Relative volume for custom sound – number 201 25-255 128
905A 945A 985A Relative volume for custom sound – number 202 25-255 128
906A 946A 986A Relative volume for custom sound – number 203 25-255 128
The following settings are for automatically triggered sounds when driving off

- **933A**: 973A 1013A Delay time for automatic triggering of sound number 16 (Short whistle) 0-255 255
- **934A**: 974A 1014A Duration of automatic sound function 99 (Start hiss) 0 = starting at 1 second, 255 = never 0-255 90

The following settings are for dynamically triggered sounds

- **935A**: 975A 1015A Recognition “faster” 120-138 131
- **936A**: 976A 1016A Recognition “slower” 120-138 125
- **937A**: 977A 1017A Sensitivity to load changes 1 = react very fast to load changes, 255 = react very slowly 1-6 6

The following expert CVs (Bank B) are only programmable if CV 1021 is set to 3. Set CV 1021 back to 0 when programming of bank B is completed!

**The following settings are for sound parameters.**

- **900B**: 940B 980B Volume for chuffs (only steam locos) 0-255 255
- **901B**: 941B 981B Volume for sound number 1 0-255 255
- **902B**: 942B 982B Volume for sound number 2 0-255 255
- **903B**: 943B 983B Volume for sound number 3 0-255 255
- **904B**: 944B 984B Volume for sound number 4 0-255 255
- **905B**: 945B 985B Volume for sound number 5 0-255 255
- **906B**: 946B 986B Volume for sound number 6 0-255 255
- **907B**: 947B 987B Volume for sound number 7 0-255 255
- **908B**: 948B 988B Volume for sound number 8 0-255 255
- **909B**: 949B 989B Volume for sound number 9 0-255 255
- **910B**: 950B 990B Volume for sound number 10 0-255 255
- **911B**: 951B 991B Volume for sound number 11 0-255 255
- **912B**: 952B 992B Volume for sound number 12 0-255 255
- **913B**: 953B 993B Volume for sound number 13 0-255 255
- **914B**: 954B 994B Volume for sound number 14 0-255 255
- **915B**: 955B 995B Volume for sound number 15 0-255 255
- **916B**: 956B 996B Volume for sound number 16 0-255 255
- **917B**: 957B 997B Volume for sound number 17 0-255 255
- **918B**: 958B 998B Volume for sound number 18 0-255 255
- **919B**: 959B 999B Volume for sound number 19 0-255 255
- **920B**: 960B 1000B Volume for sound number 20 0-255 255
- **921B**: 961B 1001B Volume for sound number 21 0-255 255
- **922B**: 962B 1002B Volume for sound number 22 0-255 255
- **923B**: 963B 1003B Volume for sound number 23 0-255 255
- **924B**: 964B 1004B Volume for sound number 24 0-255 255
- **925B**: 965B 1005B Volume for sound number 25 0-255 255
- **933B**: 973B 1013B Volume of curve squealing 0-255 255
- **938B**: 978B 1016B Volume for switching 0-255 128
- **937B**: 977B 1017B Volume for brake squealing 0-255 255
- **938B**: 978B 1018B Volume for direction change 0-255 128

**The following expert CVs (Bank C) are only programmable if CV 1021 is set to 3. Set CV 1021 back to 0 when programming of bank C is completed!**

**The following settings are for sound parameters.**

- **900C**: 940C 980C Diesel notch after idle 20-127 40
- **901C**: 941C 981C Speed step for next highest gear 20-127 30
- **902C**: 942C 982C Speed step for next highest gear 20-127 60
- **903C**: 943C 983C Speed step for next highest gear 20-127 90
- **904C**: 944C 984C Speed step for next highest gear 20-127 127
- **905C**: 945C 985C Speed step for next highest gear 20-127 127
- **906C**: 946C 986C Speed step for next highest gear 20-127 127
- **907C**: 947C 987C Speed step for next highest gear 20-127 127
- **908C**: 948C 988C Speed step for next highest gear 20-127 127
CV Address Range 1 | CV Address Range 2 | CV Address Range 3 | Description | Value Range | Factory default
---|---|---|---|---|---
909C | 949C | 989C | Speed step for next highest gear | 20-127 | 127
910C | 950C | 990C | Speed step for next highest gear | 20-127 | 127
911C | 951C | 991C | Speed step for next highest gear | 20-127 | 127
912C | 952C | 992C | Speed step for next highest gear | 20-127 | 127
913C | 953C | 993C | Speed step for next highest gear | 20-127 | 127

Technical Data

Sound channels for reproduction: 4
Maximum duration of stored sounds: 320 seconds
Power usage: up to 160 mA
Dimensions: 17.8 x 11.0 x 4.7 mm

Guarantee declaration
Each component is tested for its complete functionality before distribution. If a fault should arise within the guarantee period area of 2 years, we will repair the component free of charge upon production of proof of purchase. The warranty claim is void if the damage was caused by inappropriate treatment.

Please note that, according to EMV law, the component may only be installed in vehicles which carry the CE logo.

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Service: In the event of a defect or failure send the unit together with the invoice and a short description of the fault back to us for repair.