Uhlenbrock Elektronik

IntelliSound Module 32 100

The Auxiliary Sound module for all locomotive decoders with SUSI connector

Features

- An intelligent sound control with 40 seconds of original digitized sound which matches the particular driving conditions (i.e. speed etc.)
- Generates the operating (motor) sounds of the locomotive, brake screeching, incidental noise (Auxiliary devices (e.g. air pump), coal shoveling etc)
- 3 additional adjustable sounds like whistle, bell, uncoupling or door alarms
- Sound changes according to motor operation such as up or down hill; the reaction according to he work load can be adjusted to suit the locomotive
- With Smart-start function: the sound module stops the locomotive decoder until the synchronization of the motor sound and motion is completed
- Adjustable volume and mute switching: the Sound can switch on and off with a function key, e.g. entering and leaving a shadow station.
- Input for a wheel revolution sensor (Reed contact, Hall effect sensor) for smoke chuff synchronization with wheel rotation of steam locomotives
- Efficient digital output stage, output via 3 independent sound channels
- Up to three modules can be connected to a locomotive decoder, e.g. for locomotives with multiple motors
- Supplied with speaker and sound capsule
- Locomotive sound reprogrammable; diverse selection of sounds are available on the Internet (www.uhlenbrock.de)

Description

The sound modules are add-on modules for locomotive decoders which are fitted with a SUSI connector marked with the appropriate logo. The sound modules deliver authentic sounds that are true to real locomotives. Using an intelligent sound control the sounds are matched to the various operating conditions of the locomotive, for example, up and downhill running. Should the locomotive be started, the sound module will stop the motor via the locomotive decoder until the starting motion is synchronized to the sound. For example, with a diesel locomotive the motor winds up before the loco begins to move. When the locomotive is stopped, screeching brakes will sound. While stationary, various sounds will be played randomly (Air compressor, auxiliary devices, coal shoveling). Diesel locomotives have the motor start and shutdown sounds, when the Diesel sound is turned on and off. Additional to the running sounds of the locomotive 3 special sounds can be activated using function keys. These depend on the type of locomotive and are whistle, horn, bell, door alarms or sounds of uncoupling.

When the locomotive goes to a part of the layout where it can't be seen, e.g. into the shadow station, the complete locomotive sound can be faded out using a special function key. A further operation of the special function key and the sound will slowly be faded back up, matching the driving conditions of the locomotive.

Installation of a Sound module

SUSI-Connector

Insert the plug with the red, blue, grey and black wires into the corresponding socket on your decoder. The decoder supplies the sound module with both power and data.
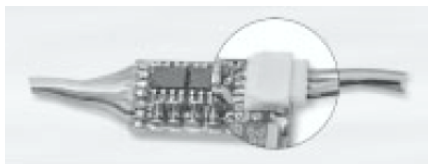
Loud Speaker

Every speaker requires a resonator. Sometimes the locomotive or wagon body can be used as a resonator. If this is not possible the supplied resonator can be used.

If the resonator is used then it must be 'glued' to the speaker so it is airtight. Also seal the cable hole and the mounting holes on the speaker.

The speaker is then mounted in the vehicle so that the sound can exit to the outside via as big an opening as possible.

Fastening the sound decoder in 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 contacting conducting surfaces and holds it in place.

Wheel Rotation Sensor

In order to synchronize the steam engine chuffs to the wheel rotation, the sound module has an input for a wheel rotation sensor. A reed contact or a hall effect sensor can be used together with a magnet attached to one of the wheels, or with a light barrier sensor on one of the wheels.

The reed switch, Hall sensor or light barrier are connected to the solder pads as show in the diagram below.
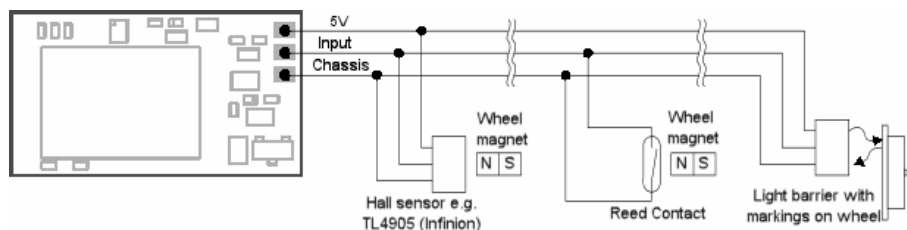
Start-up

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 short circuit cannot occur when the locomotive is close, and that the wire is not cinched.

> **A short circuit with the Motor, lighting, third rail pickup and wheels can destroy the device and eventually the locomotive's Electronics!**

Switching the sound on and off

The decoder has 4 different switchable sounds and a mute function:

Sound number	Type of sound	Factory default
1	Bell, whistle or horn	Function f4
2	Whistle or horn	Function f2
3	Running noises of the locomotive	Function f1
4	Uncoupling or door alarm	Function f3
5	Mute function	Function f8

The individual sounds can be switched on and off with the special function keys of the digital controller. The mapping of the sounds and the special function keys can be changed via CV's 903 to 915. The factory default settings are shown in the above table.

Additionally sound number 5 can be used as a mute function and mapped to a function key. If the locomotive drives into a section of the layout where it is not visible, e.g. into the shadow station, the sound can be muted using this special function key (f8 by default) and the total sound will be faded out. Internally the sound will continue to be matched to the running state. When the sound is eventually switched back on using the function key it will be faded up and immediately match the running state.

Volume

The volume of the sound can be adjusted with CV 902. The factory default setting is to maximum volume.

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 925 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 921 you can set the speed step at which the sound changes with up hill (load increase) running and with CV 922 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 923 specifies the speed step at which an electric locomotive turns on the sound for the cooling fan.

CV 924 specifies the speed step at which the brake squealing cuts in when the speed of the locomotive is reduced.

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.

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

Operation of Sound or Special function modules on a Sound decoder

The Sound decoder can have two further sound or special function modules connected via the SUSI connector. In this case every module can be assigned its own CV-range via CV 897 so that all modules can be independently programmed. For this you firstly assign an address of 3 to the attached module in CV 897 and then external modules are assigned an address in range 1 and/ or 2. If after that all the modules are connected together, then each one can be programmed in its own address range. The changed CV addresses and address ranges are shown in the list of CVs. Please note that the explanations in the preceding sections refer to the address range 1. If the address range is changed you must use the appropriate CV addresses for address range 2. or 3. from the list of the CVs.

Programming

In the factory default state all decoder options are changed using configuration variables (CVs) according to the DCC standard. 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 the CV e.g. a locomotive address.
8. Briefly operate the direction change-over. The rear light flashes slowly 4 times.

If further CVs 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 CV65 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 CV65 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.

Table of CVs (Configuration Variables) for the Sound module

CV Address Range 1	CV Address Range 2	CV Address Range 3	Description	Value Range	Factory default
897	897	897	**SUSI Address range** 1 = from 900 to 939 2 = from 940 to 979 3 = from 980 to 1019	1-3	1
900	940	980	**Manufacturer ID**	-	85
901	941	981	**Software version**	-	varies.
902	942	982	**Sound Volume**	0-255	255
903	943	983	**function activated Sound Number x** (x = value of CV) x = 0 no Sound is activated x = 1 Bell or Horn 1 x = 2 Whistle or Horn 2 x = 3 operating noises of the locomotive x = 4 uncoupling or door alarms x = 8 All sounds On/Off	0-8	0
904	944	984	**f1 activated Sound Number x** value of x according to CV903/943/983	0-8	3
905	945	985	**f2 activated Sound Number x** value of x according to CV903/943/983	0-8	2
906	946	986	**f3 activated Sound Number x** value of x according to CV903/943/983	0-8	4
907	947	987	**f4 activated Sound Number x** value of x according to CV903/943/983	0-8	1
908	948	988	**f5 activated Sound Number x** value of x according to CV903/943/983	0-8	0
909	949	989	**f6 activated Sound Number x** value of x according to CV903/943/983	0-8	0
910	950	990	**f7 activated Sound Number x** value of x according to CV903/943/983	0-8	0
911	951	991	**f8 activated Sound Number x** value of x according to CV903/943/983	0-8	8
912	952	992	**f9 activated Sound Number x** value of x according to CV903/943/983	0-8	0
913	953	993	**f10 activated Sound Number x** value of x according to CV903/943/983	0-8	0
914	954	994	**f11 activated Sound Number x** value of x according to CV903/943/983	0-8	0
915	955	995	**f12 activated Sound Number x** value of x according to CV903/943/983	0-8	0

920	960	1000	**Configuration** Value
			Bit 0 = 0 The chuff is only controlled by the 0
			            wheel sensor
			Bit 0 = 1 The chuff of a steam locomotive is
			            controlled by decoder data, and is also 1 *
			            synchronized by the wheel sensor
			Bit 7 = 0 The end step is always on 0
			Bit 7 = 1 The end step is off when sound is off 128 *
				0, 1,
				128,
				129
					129

921	961	1001	**Trigger level with motor load increase** 128 = Tone change with load increase is off	0-128	5
922	962	1002	**Trigger level with motor load decrease** 128 = Tone change with load decrease is off	0-128	5
923	963	1003	**Trigger level for cooling fan in an Electric locomotive** 255 = no Cooling fan sound	0-255	128
924	964	1004	**Level for Brake screeching** 255 = no brake screeching	0-255	27
925	965	1005	**Sensitivity to load change** 1 = reacts rapidly to 8 = reacts slowly	1-8	4
938	978	1018	**Time between two chuffs** at maximum speed	0-255	0
939	979	1019	**Time between two chuffs at speed step 1** at maximum speed	0-255	255

Loading New Sounds into the Decoder

If the module's sound is to be changed it must be disconnected from the locomotive decoder and connect the IntelliSound Module with the IntelliSound Loading adapters (Part No. 31 010).

Follow the instruction on changing the sounds in the manual of the IntelliSound Loading adapter.

A large selection of sounds can be found on our internet site "www.uhlenbrock.de".

Technical Data

Sound channels for replay:	3
Max. duration of stored sound:	40 seconds
Power consumption:	max. 0.1A
Size:	10.8 x 20.8 x 5 mm

Factory settings

The decoder is preset to address 03, and 28 speed set operation and can be operated and programmed in DCC and Motorola Data format. It automatically switches between both formats. Additionally the decoder can be used in a DC or AC (Märklin system) on conventional two- or three rail operations.

The sound is configured as follows:

Special function f1 switches sound No. 3 (running sounds of the Locomotive)

Special function f2 switches sound No. 2 (Signal tone 2)

Special function f3 switches sound No. 4 (uncoupling noise or door alarm)

Special function f4 switches sound No. 1 (Signal tone 1)

Special function f8 switches sound No. 8 (Muting function)

Maximum volume

www.uhlenbrock.de

Visit our website for up-to-date information about the Intellibox, a Price or Dealer list or to download various publications.

Guarantee declaration

Each component is tested for its complete functionality before distribution. If a fault should arise within the guarantee period 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 regulations, the component may only be installed in vehicles which carry the CE logo.

The trade names mentioned are registered trade marks of the respective companies.