

927	967	1007	f24 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
928	968	1008	f25 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	200
929	969	1009	f26 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	201
930	970	1010	f27 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	202
931	971	1011	f28 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	203
934	974	1014	Threshold for electric fan of electric locos 255 = no fan noise	0 - 255	200
935	975	1015	Configuration Value Bit 0 = 0 Chuff steam loco only by reed switch Bit 0 = 1 Chuff steam loco automatic and by reed switch Bit 1 = 1 Pause before repeat of whistle 2 Bit 2 = 1 Chuffs halved 4 Bit 4 = 0 Fire box flickering Bit 4 = 1 Output Fire box while fireman shoveling 16 Bit 6 = 1 Change fader time to 8 seconds and automatically on at power on 64 Bit 7 = 0 The end step is always on Bit 7 = 1 The end step is off when the sound off 128	0 - 195	129
936	976	1016	Threshold for brake squeal sound 255 = no brake squeal	10 - 255	80
937	977	1017	Idle running in Seconds 0 = idle running off 255 = idle running constantly on	0 - 255	15
938	978	1018	Time between chuffs at maximum loco speed without contact	0 - 100	1
939	979	1019	Time between chuffs at minimum loco speed without contact	50 - 255	230
1021	1061	1101	Setting of the Bank to program for all following settings = 1 (Bank A)	0, 1	0
Following Expert CVs (Bank A) only are programmable when CV 1021 is set to 1.					
After Programming Bank A set CV 1021 to 0 !					
900 A	940 A	980 A	Hardware version (Product ID)	-	-
901 A	941 A	981 A	Additional information for hardware / software version	-	255
903 A	943 A	983 A	relative sound volume for custom sound no. 200	25 - 255	128
904 A	944 A	984 A	relative sound volume for custom sound no. 201	25 - 255	128
905 A	945 A	985 A	relative sound volume for individual sound no. 202	25 - 255	128
906 A	946 A	986 A	relative sound volume for individual sound no. 203	25 - 255	128
922 A	962 A	1002 A	speed step for curve squeal sound starting	0 - 127	16
923 A	963 A	1003 A	speed step for curve squeal sound ending	0 - 127	48
924 A	964 A	1004 A	Special function of externe input for electric and diesel locos for curve squeal sound can be switvhed off Values = 0-28 functions f0 - f28 Value = 31 curve squeal sound constantly activ	0 - 28 31	31
925 A	965 A	1005 A	Special function for switching off the dead time in CV 926 A Values 0-28 functions f0 - f28 Value = 31 no switch off	0 - 28 31	31
926 A	966 A	1006 A	Delay for taking off in steps of 32ms (30 = 1 sec, 254 = 8,13 sec. 0 = no, 255 = off (dead time than sound is controlled)	0 - 254	255
927 A	967 A	1007 A	For steam locos: load time acceleration triggered	5 - 20	5
928 A	968 A	1008 A	For steam locos: load time increase in load triggered	5 - 20	5
929 A	969 A	1009 A	Steam output (SA1) at stop with sound on	0 - 100 %	20
930 A	970 A	1010 A	Steam output (SA1) running with sound on	0 - 100 %	80
931 A	971 A	1011 A	Steam output (SA1) in idle speed with sound on	0 - 100 %	35
932 A	972 A	1012 A	Steam output (SA1) at take-off with sound on During delay (CV 926 A) an connected steam generator will be preheated to this value.	0 - 100 %	100
The following settings for automatically triggered Sounds when driving off					
933 A	973 A	1013 A	Timeout for automatic triggering of sound no. 16 0 = always 255 = never	0 - 255	255
934 A	974 A	1014 A	Dead time of automatic sound function 99 (sTake off hissing) 0 = ex 1 sec., 255 = never	0 - 255	90
Following settings for dynamic sound reactions					
935 A	975 A	1015 A	Recognition "faster"	120 - 138	131
936 A	976 A	1016 A	Recognition "slower"	120 - 138	125
937 A	977 A	1017 A	Sensitivity to load regulation 1 = reacts really fast to 8 = reacts very slowly	1 - 8	6
938 A	978 A	1018 A	Trigger threshold with Motor load increase 128 = Tone change with load increase switched off	0 - 128	3
939 A	979 A	1019 A	Trigger threshold with Motor load decrease 128 = Tone change with load decrease switched off	0 - 128	3

#46193 PIKO Sound Modul

For modern electrical railcar sounds with the SUSI-interface



Characteristics

- Intelligent sound control with up to 40 seconds of original sound coordinated to the operating situation (i.e., speed, etc.) of the locomotive
- Generates the operating (motor) sound of the locomotive, "squealing" brakes, incidental noises while stationary (mechanical devices (e.g., air pumps, etc.), coal shovels, etc.)
- 5 additionally adjustable noises such as whistle, bell, horn, uncoupling sound or door warning signal
- Sound changes as engine load changes, such as up/down grade operation; reaction to load change can be adjusted
- The "Smart-Start": When starting the locomotive, the sound module stops the decoder from operating until the actual starting of the vehicle synchronises with the sound of the motor.
The locomotive does not move until the very starting sound begins.
- Adjustable volume and audio muting: the sound can be faded or turned off by function key, e. g. during travels into and away from a shadow station
- Provisions for a wheel sensor (e. g., reed contact, etc.) for synchronized exhaust sounds with steam locomotives
- Efficient digital output circuitry renders sounds over 6 independent channels
- Up to three modules can be connected to a locomotive decoder, e. g. for multi-engine locomotives
- Comes with speaker and resonating chamber
- Locomotive sounds can be downloaded; various sounds are available at www.uhlenbrock.de

Description

The Intellisound sound module is an auxiliary module for locomotive decoders with the standardized SUSI interface, and can be identified by the appropriate logo. The sound modules supply original, faithfully reproduced sounds of real locomotives. Using "intelligent sound control" the sounds produced are adapted to match the locomotives actual operating environment. Even when driving uphill and downhill, the sounds change to accurately reflect prototypical operation. When the locomotive is supposed to start, the sound module will stop the motor from working (via the decoder) until the actual starting of the vehicle synchronises with the sound of the motor. A diesel locomotive, for instance, roars right before it starts. The decoder stops the train from moving until the roaring is over and the motor sound begins. If the locomotive is stopped, the appropriate "squealing" brake sound is produced. While stationary, different operating noises for the-respective type of locomotive are produced by chance (coal shovels, compressed air). With diesel locomotives, the engine startup and shutdown sounds can be heard when this function is switched on and off. In addition to the driving (motor) sound of the locomotive, which can be switched on and off using the appropriate function key, 3 more sounds can be triggered by function keys. Here, depending upon the type of locomotive (as displayed in the table below), whistle, horn, bell, door warning / closing signal or uncoupling sounds can be played.

If the locomotive travels out of the visible range of a model railway facility, e.g. into a shadow station, then "audio muting" can be softly faded out by a special function key. By pressing the function key again, the sound is gradually faded in, adapting itself to the existing driving conditions (i. e., sound synchronized to the motor speed).

Technical data

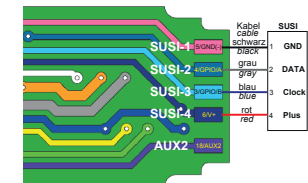
Sound channels:	6
Duration (total) of stored sounds:	40 seconds
Power input:	max. 0.1 A
Size: Modul	17,8 x 11,0 x 4,0 mm
Speaker	13,5 x 19,5 x 4,0 mm

Installation of a Sound modul

Connecting the SUSI-interface

a) If your model's decoder is already equipped with a microSUSI interface (like PIKO #46401), you can insert the Sound Module's microSUSI plug into the microSUSI socket of the decoder. Make sure you orient the plug correctly.

b) If your model's decoder does not feature a microSUSI interface, you can still connect the Sound Module to the decoder via the soldering pads on the decoder's PCB board (see illustration on right). First cut the microSUSI plug from it's wires; then solder the module's red/blue/gray/black wires to the PCB board according to the decoder's instruction manual.



Your model's decoder will now supply the Sound Module with operating voltage and DCC data.

Loudspeaker

Each speaker needs a resonator. It is sometimes possible to use the locomotive body or the wagon body as resonator. If this is not possible, then please use the included plastic resonator. If using the plastic resonator, please make sure that it is glued air-tight to the speaker. Please do close with glue also the hole of the speaker cables as well as any other mounting hole present on the speaker/resonator. The speaker is to be mounted inside the locomotive so that it faces the widest possible „aperture“ towards the outside (e. g., close to a locomotive window, behind an open grid, etc.).



Attaching the sound module

Using a piece of double-sided "sticky" tape, fasten the sound module to any place in the locomotive. The sticky tape holds the sound module reliably in place and protects it from coming in contact with other wires, components, etc.

Start-up

Make sure that placing the module in the locomotive will not cause a short circuit! Also insure that, once you have replaced the body (shell) of the locomotive no wires are "pinched" which could also cause short-circuits to develop.

A short circuit between engine, lighting, pickup shoe, wheel sets and the module can possibly destroy the decoder's components as well as the electronic of the locomotive!

Switching sounds on and off

Each sound module has different, adjustable sounds plus a mute switching function:

Default Operation	Type of Sound	Number of Sound
Function f1	Motor tone	3
Function f2	Conductor whistle	2
Function f3	Uncoupling	4
Function f4	Whistle or horn, permanent	1
Function f5	Shunting	14
Function f6	Station announcement	6
Function f7	Station announcement II	13
Function f8	Mute	8
Function f9	Conductor's whistle, short	5
Function f10	Conductor's whistle, long	12
Function f11	Compressor	15
Function f12	Pantograph	9
Function f13	Fan, manual	98
Function f14	Off brake noise	97

The individual sounds can be switched on and off using special function keys on your digital Command Station/Throttle. The allocation (or mapping) of the various sounds to individual special function keys can be modified using CV's 903 - 915. Decoders are delivered with sounds initially allocated as indicated in the above table.

Additionally, the mute switching function can be mapped to a function key using sound #8. As the locomotive drives out of the visible range of a model railway, e.g. into a shadow station, then the entire sound of the locomotive can be softly faded out by switching on this special function (preset at the factory to function f8). The sound continues to be generated by the module in this "faded out" condition in accordance with the respective driving conditions. If the sound is gradually faded in by subsequently switching the special function off, then the sound again will adapt to the driving conditions in effect at that moment.

Volume

Speaker volume can be changed via CV 902. As shipped from the factory, the volume is set to its maximum level.

Configuring the dynamic change of sound

Settings which affect the sound pertaining to the immediate operating (driving) condition can be modified to accommodate the type of locomotive being used. These settings affect the change of sound with load changes (e.g., uphill and downhill), the speed threshold for triggering the squealing brake sound and the switching threshold for the electrical exhaust with an electric locomotive (E-loco).

CV 925 is used to define load sensitivity. If a value of 1 is programmed here, then the sound reacts very quickly to uphill and/or downhill driving, whereas a value of 8 produces a retarded reaction. CV 921 sets the minimum trigger level for a change of sound for a load increase (going uphill) and CV 922 controls the minimum trigger level for a change of sound for a load decrease (driving downhill). All values depend on the locomotive decoder used as well as the locomotive itself, and therefore must be determined by experimentation.

CV 924 sets the speed threshold at which the brake squealing sound is produced when the speed of the locomotive is reduced.

CV 923 specifies the speed threshold at which point an electric locomotive (E-lok) produces sound for its cooling exhaust.

If you run a diesel locomotive, you can influence the frequency of the exhaust "chuff" sounds. CV 938 is used to define the time between two exhaust sounds at maximum speed while CV 939 can be used to define the period at minimum speed. The larger the value in the CV, the longer the time between the individual exhaust sounds.

The values for these CV's are preset at the factory for Uhlenbrock locomotive decoders for "common" HO locomotives, and can be easily modified to suit other locomotives.

Controlling several sound or special function modules from a locomotive decoder

Up to three sound or special function modules can be controlled through a single SUSI interface. CV 897 is used to allocate each module's own CV address range, thus allowing each module to be programmed independently. To accomplish this, each module must first be connected individually to the locomotive decoder. Its own CV address range is determined by assigning the value 1, 2 or 3 to CV 897. Once all modules are connected, each can be addressed and programmed within its own CV address range. The CV to be modified will depend on the CV address range as specified in the list of CV's at the end of this document. Please note that the explanations in the preceding sections refer to address range #1 (CV's 900 - 925). Use the appropriate CV address from the list of CV's provided in the accompanying table.

Programming

The Configuration Variables (CV's) form the basis for controlling and selecting all possible features and functions of the decoder in accordance with the DCC standard. The sound module is connected to a loco decoder and could be programmed by those methods which are provided by the loco decoder. In the case of an Uhlenbrock loco decoder the sound module can be programmed with the Intellibox, DCC Command Stations and Märklin® Central Units.

Programming with the PIKO Digi-Power-Box or other DCC devices

Use the programming menu of your DCC Command Station (or throttle) to select and program decoder CV's by register, direct or Page Programming mode. Some Command Stations/throttles also support the so called "main track programming" (also known as "operations mode programming"). Please refer to the operating manual of your device for specific instructions.

Table of the Configuration Variables

CV Addr. Range 1	CV Addr. Range 2	CV Addr. Range 3	Description	Allowable Values	Factory Settings
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	-	untersch.
902	942	982	Speaker volume	50 - 200	192
903	943	983	function activates sound „x“ (x = value of the CV) x = 0 no sound is produced x = 1 bell or horn # 2 x = 2 whistle or horn #2 x = 3 motor (driving) sound x = 4 uncoupling or door warning sound x = 5 conductors whistle short x = 6 station announcement x = 8 fade in/out all sounds x = 9 Pantograph (electric locos only) x = 11 Announcing departure x = 12 Conductors whistle long x = 14 Shunting / door closing tone x = 15 Pump / air compressor x = 16 Warning tone x = 17 Blowing / n/a x = 18 Vibrating stoker / n/a x = 95 Steam generator constantly maximum x = 96 Steam generator constantly off x = 97 Function brake noise off x = 98 Manual fan noise function (electric locos only) x = 99 Starting noise manual (steam locos only) x = 200 custom Sound x = 201 custom Sound x = 202 custom Sound x = 203 custom Sound	0 - 18 95 - 99 200 - 203	0
904	944	984	f1 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	3
905	945	985	f2 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	2
906	946	986	f3 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	4
907	947	987	f4 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	1
908	948	988	f5 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	14
909	949	989	f6 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	6
910	950	990	f7 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	13
911	951	991	f8 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	8
912	952	992	f9 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	5
913	953	993	f10 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	12
914	954	994	f11 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	15
915	955	995	f12 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	9
916	956	996	f13 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	98
917	957	997	f14 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	97
918	958	998	f15 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
919	959	999	f16 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
920	960	1000	f17 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
921	961	1001	f18 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	5
922	962	1002	f19 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
923	963	1003	f20 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
924	964	1004	f21 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
925	965	1005	f22 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0
926	966	1006	f23 activates sound „x“ where „x“ is defined as per CV903/943/983	s.o.	0