

#56429 Sound module and speaker for PIKO #56429 BR 412 ICE 4

Sound module and speaker for all HO decoders
with SUSI interfaces



Features

- channel sound quality in 12-bit resolution
 - 8-channel sound system
 - 128 Mbit memory for up to 495 seconds of digitized prototype sound
 - 22.05 kHz Frequency
 - Powerful 2.5-Watt digital output
 - Start-up and shut-down sequences when switching the engine sound function sound on or off
 - Up to 31 individual sounds, activated via 28 function keys
 - Load-regulated sound variations (start-up cycle, going upgrade or downgrade, braking, idling, etc.)
 - Adjustable overall sound volume and individually adjustable volume for individual sounds
 - Fade-in, fade-out function for hidden staging yards or travel through tunnels, etc.
 - Random sounds such as engine fans, air compressor, etc.
 - Automatic brake squeal
 - Additional custom sounds downloadable via the PIKO SmartProgrammer/Tester
- ...and much more!

Introduction:

This PIKO Sound module delivers digitized original sound from the 1:1 prototype via 12-Bit resolution in 22.05 kHz frequency. The decoder's intelligent sound control automatically reacts to the operating state of the model. For example, the engine sound reflects the speed of the model, or if the train is under heavy load or traveling uphill. Brakes will squeal if the train comes to a stop. When the main engine sound function is activated, a start-up sequence will ensue. If the model is running in silent mode and the main engine sound function key is activated, the model will stop and the engine start-up sequence will cycle itself and the model will begin to move again, with the engine sound playing in-synch with the increasing speed of the model. In a diesel locomotive this means that the sound of the prime mover growing to life will cycle itself before the model turns a wheel. When a locomotive or trainset is idling, various operating sounds will activate randomly, like air compressors switching on or off, auxiliary power units, or, in the case of steam locomotives, coal being shoveled. These random sounds can also be activated individually by function keys. For railcars with manual transmissions or for electric locomotives with phased traction motors, these progressively tiered sounds are played according to the speed of the model. If the main engine sound is switched off when the locomotive is idling, a corresponding shut-down sequence is cycled which includes the sound of the cab door closing as the crew leaves the cab (depending on the model).

Thanks to 8-channel technology, the locomotive's running sound can remain activated while other sounds are individually activated; each using 1 of 28 function keys. These other sounds are typically the whistle or horn, the bell, or a door warning tone depending on the model. If the locomotive travels beyond the visible area of a layout (i.e. a hidden staging yard) the "Soundfader" function can be used to softly fade out the locomotive sound by pressing the Soundfader function key. When the locomotive reappears, its sound can be slowly faded in again. Nearly all sounds have individually adjustable volumes that are controlled via CV programming and can be assigned to any function key up to F28. During operation it is possible to change the overall volume of the sound decoder in three steps via a function key.

When running in analog mode (depending on the decoder), only the model's main engine sound will activate. Please keep in mind that interference-free sound operation using PWM (Pulse Width Modulation) analog throttles cannot be guaranteed due to the large number of often unstable systems available on the market.

Sound volume settings

The overall volume of the PIKO sound module can be changed in SUSI bank 2 (CV 1021 = 2) via CV 900. To do this, you first program CV 1021 to a value of 2 and then program CV 900 to the value of the desired sound volume. The individual sounds of the sound module are stored in so-called slots, of which up to 32 are available depending on the type of locomotive. The sound volume of each individual sound is adjusted via CVs 900 - 931 in SUSI bank 4 (CV 1021 = 4). To do this, you first program CV 1021 to a value of 4 and then program the CV of whichever sound (900 - 931) that you would like to change to the value of the desired sound volume.

Function Mapping for Individual Sounds

Function key assignments for each individual sound are assigned in SUSI bank 8 via CVs 900 - 931. To assign a sound a specific function key you first program CV 1021 to a value of 8 and then choose which sound's CV (900 - 931) should be re-assigned to a different function key; up to F28.

Technical Data

Sound resolution:	12 Bit
Sound channels:	8
Sound memory	128 MBit (up to 495 seconds)
Frequency:	22,05 kHz
Output:	2,5 Watt
Current usage:	up to 160 mA
Dimensions:	24,6 x 15,3 x 3,6 mm (1" x 0.6" x 0.1" in.)

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Adjustable times for random sounds

The playback frequency of random sounds such as the fan noise of an electric locomotive or coal shoveling in a steam locomotive are adjustable by two CVs. CV 905 of SUSI bank 2 can be used to set the minimum amount of time that must elapse before a random sound can be repeated. CV 906 of SUSI bank 2 can be used to set the maximum amount of time that must elapse before a random sound is repeated.

Installing a Sound Module

SUSI interface

Insert the SUSI plug into the SUSI socket of your decoder. Make sure that the pins of the SUSI plug are lined-up correctly with the holes in the SUSI socket. The decoder will supply the sound module with power and data.

Speaker

Install the speaker in the speaker housing on the bottom of the locomotive

A short circuit can ruin the Sound module and destroy the model's electronics!

Installing the Sound module

Using the double-sided adhesive pad provided, attach the Sound module to the desired location inside the model. The adhesive pad protects the Sound module from coming in contact with conductive surfaces and holds it securely in-place. Please note that due to the German Electromagnetic Compatibility Act (EMV law), the Sound module may only be used in models that have the CE symbol. When installing the Sound module make sure it does not touch any conductive surfaces inside the model thus causing a short circuit, and that no wires are squeezed when the shell of the model is replaced.

Switching Sounds on and off

The individual sounds can be switched on and off using their respective function keys. The assignment of sounds to their respective function keys can be changed via CV's 900 to 931 in SUSI bank 8 of the Sound module (see CV table).

Assignment of the function keys

F0*	Lighting on/off	F9	Horn	F18	Air release 1
F1	Engine	F10	Door locator signal	F19	Air release 2
F2*	Cab light FS 1	F11	Doors open/close	F20	Battery main switch
F3*	Cab light FS 2	F12	Station announcement 1	F21	Sander valve
F4*	Interior lighting	F13	Station announcement 2	F22	Brake test
F5*	High beam headlights FS1	F14	Station announcement 3	F23	Rail clack Sound
F6*	High beam headlights FS2	F15	Station announcement 4	F24	Flange squeal
F7*	Switching (Shunting) mode	F16	Conductor's whistle	F25	Volume control
F8*	Start-up/braking inertia	F17	Pantograph	F26	Mute

* Locomotive decoder functions

Programming

In their factory default state, all Sound module functions can be changed using configuration variables (CVs) according to DCC Standards. The Sound module can be programmed with SUSI-komm software and Sound Loading Adapter, or on a programming track via the model's decoder. Decoders can be programmed using an Intellibox or a Motorola-based DCC command station. With non-PIKO locomotive decoder you should follow the respective manufacturer's instructions. The Sound module can be reset to factory settings independently of the decoder. First, CV 1021 must be programmed to a value of 0 and then CV 905 to a value of 1. You must maintain this programming sequence.

Programming with DCC

Use the programming menu of your DCC command station to program the decoder CVs in either register mode, direct CV mode, or page programming mode. You can also program the decoder on the main line (POM programming) using a DCC command station. Please refer to your DCC system's manual for more information on programming.

CV table for programming SUSI banks 1 - 8

SUSI-bank (CV 1021 =)	CV	Description	Range	Value*
0 (read only)	900	Manufacturer ID	-	162
	901	Version number	-	Varies
	902	Resetting sound CVs (to reset, set a value unequal to 0)	0, 1	0
1 (read only)	900	Hardware ID	-	16
	901	Version number	-	Varies
2	900	Overall volume	0 - 255	200
	905	Minimum random sound interval	0 - 255	40
	906	Maximum random sound interval	0 - 255	80
	910	Function key assignment for sound off	0 - 28	26
	911	Function key assignment for volume control	0 - 28	25
3	900 - 928 929 - 939	Speed step thresholds for switching sounds, linear in 9 steps	0 - 255	0 - 252 255
4	900 - 931	Volume settings of individual sounds		
	900	Sound Volume - Engine	0 - 255	150
	901	Sound Volume - Fan	0 - 255	200
	902	Sound Volume - Horn	0 - 255	250
	903	Sound Volume - Door locator signal	0 - 255	100
	904	Sound Volume - Doors	0 - 255	200
	905	Sound Volume - Pantograph	0 - 255	200
	906	Sound Volume - Battery main switch	0 - 255	200
	907	Sound Volume - Conductor's whistle	0 - 255	200
	908	Sound Volume - Sander valve	0 - 255	200
	909	Sound Volume - Brake test	0 - 255	200
	910	Sound Volume - Station announcement 1	0 - 255	150
	911	Sound Volume - Station announcement 2	0 - 255	250
	912	Sound Volume - Station announcement 3	0 - 255	250
	913	Sound Volume - Station announcement 4	0 - 255	200
	914	Sound Volume - Air release 1	0 - 255	200
	915	Sound Volume - Air release 2	0 - 255	200
	928	Sound Volume - Rail clack Sound	0 - 255	150
	929	Sound Volume - Break squeal	0 - 255	200
	930	Sound Volume - Flange squeal	0 - 255	200
931	Sound Volume - Random sounds	0 - 255	64	
8	900 - 931	Function key mapping of the single sounds		
	900	Function key - Engine	0 - 28	1
	901	Function key - Fan	0 - 28	1
	902	Function key - Horn	0 - 28	9
	903	Function key - Door locator signal	0 - 28	10
	904	Function key - Doors open/close	0 - 28	11
	905	Function key - Pantograph	0 - 28	17
	906	Function key - Battery main switch	0 - 28	20
	907	Function key - Conductor's whistle	0 - 28	16
	908	Function key - Sander valve	0 - 28	21
	909	Function key - Brake test	0 - 28	22
	910	Function key - Station announcement 1	0 - 28	12
	911	Function key - Station announcement 2	0 - 28	13
	912	Function key - Station announcement 3	0 - 28	14
	913	Function key - Station announcement 4	0 - 28	15
	914	Function key - Air release 1	0 - 28	18
	915	Function key - Air release 2	0 - 28	19
	928	Function key - Rail clack Sound	0 - 28	23
	929	Function key - Break squeal	0 - 28	1
	930	Function key - Flange squeal	0 - 28	24
931	Function key - Random sounds	0 - 28	1	

* factory setting