CV	Name	Description	Range	Default
1	Loco address	Short (2 digit) address of locomotive	1 - 127	3
2	Start voltage	Minimum speed of the locomotive	1 - 255	3
3	Acceleration	This value multiplied by 0.25 is the time from stop to maximum speed	0 - 255	80
4	Deceleration	This value multiplied by 0.25 is the time from maximum speed to stop	0 - 255	80
5	Maximum speed	Maximum speed of the locomotive	0 - 255	255
6	Medium speed	Medium speed of locomotive	0 - 255	88
8	Manufacturer's ID	Manufacturers's ID ESU - Writing value 8 in this CV triggers a reset to factory default values	151	-
17 & 18	Long address of the loco	Long address of engine (see full manual online at www.loksound.com)		
19	Consist Address	Additional address for consist operation. Value 0 or 128 means: consist address is disabled 1 – 127 consist address active, normal direction 129 – 255 consist address active reverse direction	0-255	0
27	Brake mode	Allowed brake modes		28
		Bit / Function / Value		
		0 ABC braking, voltage higher on the right hand side 1		
		1 ABC braking, voltage higher on the left hand side 2		
		2 ZIMO® HLU brakes active 4		
		3 Brake on DC, if polarity against driving direction 8		
		4 Brake on DC, if polarity like driving direction 16		
		7 Loco brakes with constant brake distance, if FS=0 128		
28	RailCom® Configuration	Settings for RailCom®		131
		Bit / Function / Value		
		0 Channel 1 Address broadcast enabled 1		
		1 Data transmission allowed on Channel 2		
		7 RailCom® Plus automatic loco recognition active 128		
29	Configuration register	Calculated field. Add up the values you want to activate, then write this number into CV 29.		12
		Bit / Function / Value		
		0 Normal direction of travel 0 Reversed direction of travel 1		
		1 14 speed steps DCC 0 28 or 128 speed steps DCC 2		
		2 Disable analog operation 0 Enable analog operation 4		
		3 Disable RailCom® 0 Enable RailCom® 8		
		4 Speed curve through CV 2, 5, 6 0 Speed curve through CV 67 - 94 16		
		5 Short addresses (CV 1) in DCC mode 0 Long addresses (CV 17 + 18) in DCC mode 32		
31	Index register H	Should be either "0" or "16" for LokSound Decoders	16	16

CV	Name	Description	Range	Default
32	Index register L	CV 32=0 if accessing CVs 1- 255, CV 31=1,2,3 if accessing CVs 257-511	0 - 4	0
48	Master Sound Select	Selects the prime mover sound (0, 16, 32, 64), the horn (0-15), the bell (0,64), Brake Squeal Sound (0, 128) - add the numbers up for each selection to get the final value of CV 48. Will vary between sound files. Locate the sound file description on our web site for valid values.	0 - 255	
49	Extended Configuration #1	Bit / Description / Value	0 - 255	19
		0 Enable Load control (Back-EMF) 1 Disable Load control (Back-EMF) 0		
		1 DC Motor PWM frequency 20kHz motor pulse frequency 0 40 kHz motor pulse frequency 2		
		2 Reserved 0 0		
		3 Reserved 0		
		4 Automatic DCC speed step detection Disable DCC speed step detection 0 Enable DCC speed step detection 16		
		5 LGB® function button mode Disable LGB® function button mode 0 Enable LGB® function button mode 32		
		6 Reserved 0 64		
		7 Reserved 0 128		
50	Analogue mode	Selection of allowed analogue modes	0 - 3	3
		Bit / Description / Value		
		0 AC Analogue Mode (Only LokSound V4.0) Disable AC Analog Mode 0 Enable AC Analog Mode 1		
		1 DC Analogue mode Disable DC Analogue mode 0 Enable DC Analogue Mode 2		
61	Random sound «min»	Multiplied by 0.25 it is the time in seconds for the shortest random sound interval. F	0 - 255	120
62	Random sound «max»	Multiplied by 0.25 it is the time in seconds for the longest random sound interval.	0 - 255	200
63	Sound volume «Master»	Master volume for all sounds.	0 - 192	192
64	Brake sound threshold «Brake On»	If the actual loco speed step is smaller than or equals the value indicated here, the brake sound is triggered.	0 - 255	100
65	Brake sound threshold «Brake Off»	If the actual loco speed step is smaller than the one indicated here (up to 255), the brake sound will be switched off again. .	0 - 255	25
66	Forward Trim	Divided by 128 is the factor used to multiply the motor voltage when driving forward. The value 0 deactivates the trim.	0 - 255	128
67-94	Speed table	Defines motor voltage for speed steps. The values „in between" will be interpolated.	0 - 255	-

CV	Name	Description	Range	Default
95	Reverse Trim	Divided by 128 is the factor used to multiply the motor voltage when driving backwards. Value 0 deactivates the trim.	0 - 255	128
113	Power Fail Bypass	The time that the decoder bridges via the PowerPack after an interruption of voltage. Unit: A multiple of 0.016384 sec.	0 - 255	50
124	Extended Configuration #2	Additional important settings for decoders	-	24
		Bit / Description / Value		
		0 Bi-directional bit: Enable driving direction when shifting direction. 1 Disable driving direction. 0		
		1 Disable decoder lock with CV 15 / 16 0 Enable decoder lock with CV 15 / 16 2		
		2 Disable prime mover startup delay 0 Enable prime mover startup delay 4		
		3 Disable serial protocol for C-Sinus 0 Enable serial protocol for C-Sinus 8		
		4 Adaptive regulation frequency 0 Constant regulation frequency 16		
		5 Motor safety when blocking. Motor is not switched off when blocked. 0 Motor is switched off for a few seconds when blocked to avoid burnout 32		
125	Starting voltage Analog DC		0 - 255	30
126	Maximum speed Analog DC		0 - 255	130
127	Starting voltage AC	(ONLY for LokSound V4.0)	0 - 255	50
128	Maximum speed Analog AC	(ONLY for LokSound V4.0)	0 - 255	150
134	ABC-Mode „Sensibility"	Threshold, from which asymmentry on ABC shall be recognised.	4 - 32	12

See the full manual online at **www.loksound.com**

Quick Start Guide

LokSound Select
LokSound V4.0

Technical Data for LokSound Select and LokSound V4.0 Decoders		
Operational modes	NMRA/DCC with 14, 28, 128 speed steps.	
	2-digit (short) and 4-digit (long) addresses.	
	Analog DC operation (de-selectable).	
	Automatic recognition of operational mode and DCC speed step selection.	
Power	Runs all DC and coreless motors.	
	Silent, safe 31,25 kHz pulse width frequency BEMF	
	Motor output overload protection	
	8 pin and 21MTC decoders	1.10A continuous load / 2.00 A peak load
	Next18 / Select Micro and V4.0 decoders	0.75A continuous load / 1.00 A peak load
Function outputs	8 pin Select and V4.0 decoders	Up to 6 outputs (6 powered)
	21MTC Select and V4.0 decoders	Up to 8 outputs (4 powered, 4 logic)
	Next18 / Select Micro and V4.0 decoders	Up to 6 outputs (4 powered, 2 logic)
Sound	Audio amplifier: 2W @ 4 Ohm load	
	Speaker impedance 4 - 16 Ohms	
	Memory capacity 32 MBit	
	8 sound channels, all playable at once!	
	Over 20 different sounds!	
Programming Features	DCC Servicemode & DCC POM (Programming on Main).	
	RailCom® Feedback system. RailComPlus® automatic Registration.	

Warnings

- Do not expose to wet and humid conditions.
- Avoid mechanical force or pressure on the decoder.
- Only use the minimum amout of solder needed.
- Always disconnect power before handling the decoder.
- Never wrap the decoder in electrical tape, as this may cause overheating.
- Make sure that neither the decoder nor any blank wire ends may come into contact with the engine chassis (risk of short circuit).
- Make sure that no wires are squeezed / cut when reassembling the locomotive.
- Never operate a LokSound decoder unattended.

Requirements for Installation

The locomotive must be in perfect operating condition prior to the conversion: Only a locomotive with faultless mechanical properties and smooth running characteristics in analogue mode is worth converting to digital. Check and replace all wear and tear parts such as motor brushes, wheel contacts, light bulbs etc., if necessary.

Installing the Decoder

Locomotives with 8-pin interface

Some LokSound decoders are supplied with an 8-pin plug (refer to Fig 1). Remove the dummy plug from the socket. Insert the plug of the decoder in such a way that pin 1 of the plug (this is the side with the red / orange wires) sits next to the corner of the socket that is usually marked with *, +, • or "1".

Do not rely on the assumption that the wires of the harness have to face in a certain direction: the only reliable reference is the marking of pin 1.

Pin	Description	Color
1	Right motor terminal	orange
2	Rear light	yellow
3	Output AUX1	green
4	Left track terminal	black
5	Left motor terminal	gray
6	Head light	white
7	Common (+pole)	blue
8	Right track terminal	red

Fig. 1: LokSoun with 8-pin interface

Locomotives with 21MTC interface

Some LokSound decoders are equipped with a 21MTC interface (fig. 2) You can insert the decoder in two ways: either the pins are put through the decoder (most common); the socket of the decoder remains visible after installation (mounting on top) or the decoder is inserted in such a way that the pins go straight into the socket. Which of the two mounting positions is the correct one depends solely on the locomotive. The position of the marker-pin is the crucial indicator. Plug the decoder into the socket in such a way that the locomotive interface corresponds with the decoder. Do not apply too much pressure when inserting the plug. The decoder must go in without force.

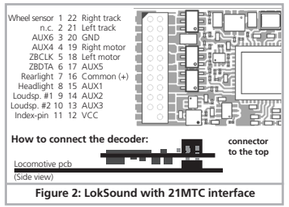

Figure 2: LokSound with 21MTC interface

Locomotives without interface

All LokSound decoders have an interface (plug). There is no "wires-only" version. Please remove the plug at the end of the harness should hard wiring become necessary.

First, please cut all wires installed in the locomotive. Take special care to remove any connections to the chassis (ground): the motor leads must be positively potential-free, in other words they may not have any contact to the chassis or body or the wheels and wheel contacts. Figure 3 and Figure 4 shows all connections.

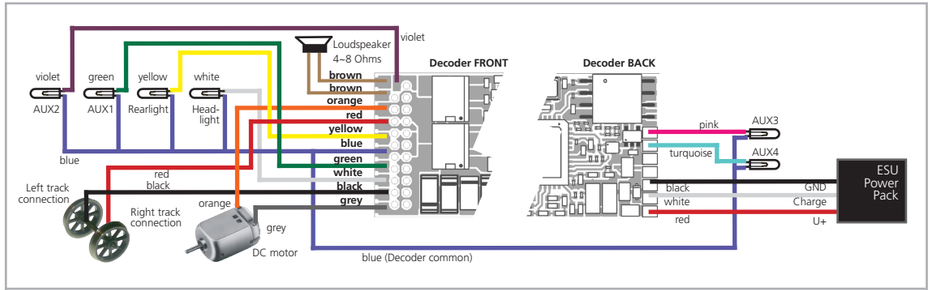

Figure 3: LokSound Decoder - Wiring Diagram

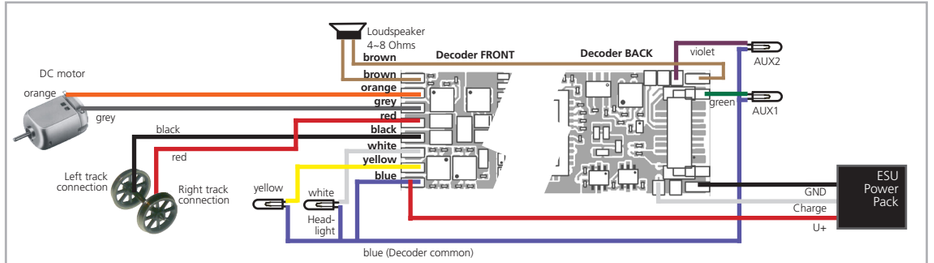

Figure 4: LokSound micro Decoder - Wiring Diagram

Function outputs

You can wire all kind of loads to the function outputs.

Please make sure that the load does not exceed the permitted maximum current and there are no short circuits. The outputs of the LokSound have protection but if an external voltage is applied, the outputs may suffer damage or destruction.

Only install bulbs rated 16V or higher and with a nominal current draw, that does not exceed 50 mA. If you like to use LEDs, a resistor with a rating between 470 Ohms and 2.2 kOhms need to be wired in series. Running the LED without resistor will lead to their immediate destruction!

DCC Operation

The LokSound works with any DCC system.. Remove any capacitors that are wired into the track feeders. This could impair the functionality of the decoder.

The address is set to 03 with 28 speed steps.

Decoder Reset

You can reset the decoder to the default settings at any time. In most cases POM programming will not work to reset a decoder. Please use a separate programming track.

Enter the value 08 into CV 08.

To complete the reset, power to the decoder must be interrupted.

Volume Control

Master volume is controlled with CV 63. The range is 0 - 192.

Individual volumes (CVs as shown) range from 0 - 128

Default Function Assignment - DIESEL

Function	Effect	Volume CV
F0	Directional Headlights	-
F1	Bell	283
F2	Playable Airhorn	275
F3	Coupler	291
F4	Dynamic Brake	299
F5	AUX3 (Rotary Beacon)	-
F6	AUX1 + AUX2 (Front Ditchlights)	-
F7	Switching Mode	-
F8	Sound (On / Off)	259
F9	Drive Hold	-
F10	Locomotive (Independent) Brake	-
F11	Radiator (Fan) Sound	315
F12	Dimmer (Headlights)	-
F13	AUX4 (Rear Ditchlights)	-
F14	-	-
F15	Fast Spitter Valve	371
F16	Spitters on Shutdown	-
F17	Brake Set / Brake Release	-
F18	Sanding Valve	355
F19	Short Air Let Off	363
F20	Compressor	307
F21	Slow Spitter Valve	387
F22	Air Dryer	427
F23	-	-
	Random Sounds	461
	Brake Squeal	459

Default Function Assignment - STEAM

Function	Effect	Volume CV
F0	Directional Headlights	-
F1	Bell	283
F2	Whistle	275
F3	Coupler	291
F4	Coast Mode	-
F5	AUX3 (Mars light)	-
F6	AUX2 (Cab Light)	-
F7	Manual Cylinder Cocks	427, 435
F8	Sound (On / Off)	259, 443
F9	Heavy Load Mode	-
F10	Locomotive (Independent) Brake	-
F11	Coal Shoveling	371
F12	Dimmer	-
F13	AUX4 (Class Lights)	-
F14	Air Pump Variable Speed	307
F15	Air Pump Slow	411
F16	Injector	323
F17	Auto Brake Set / Release Off	-
F18	Ash Dump	355
F19	Blowdown	403
F20	Savety Valve	331
F21	Airhorn	419
F22	Grade Crossing Sequence	379
F23	Oil Headlights (No dynamo)	-
	Random Sounds	461
	Brake Squeal	459

Make sure that Index CV 31 is set to 16 and Index CV 32 is set to 1 before changing a volume CV

Make sure that Index CV 31 is set to 16 and Index CV 32 is set to 1 before changing a volume CV

All function buttons are fully mappable. This allows you to customize your Function Assignments in any way you wish. Please see our full manual for information on how to arrange this.