

Table of Configuration Variables

CV	Name	Description	Range	Default
1	Locomotive address	DCC/Motorola® address of locomotive	1 - 127	03
2	Start voltage	Sets the minimum speed of the locomotive	0 - 255	03
3	Acceleration	This value multiplied by 0.25 is the time from stop to maximum speed.	0 - 255	60
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 locomotive	0 - 255	195
13	Analogue mode F1-F8	Status of functions F1 to F8 in analogue mode Bit Description Value 0 Function F1 1 1 Function F2 2 2 Function F3 4 3 Function F4 8 4 Function F5 16 5 Function F6 32 6 Function F7 64 7 Function F8 128	0 - 255	01
17	Extended locomotive address	Long address of the loco. CV17 contains byte with higher value, CV18 contains byte with lower value. Only active when function in CV29 is switched on (see below).	192 - 9999	192
18				128
19	Consist Address	Address for consist operation. 1 – 127 consist address active, normal direction 129 – 255 consist address active reverse direction	0-255	0
27	Brake mode	Allowed brake modes 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 in driving direction 16		0
28	RailCom® Configuration	Settings for RailCom® Bit Function Value 0 Channel 1 Address broadcast disabled 0 Channel 1 Address broadcast enabled 1 1 No data transmission allowed on Channel 2 0 Data transmission allowed on Channel 2 2		131
29	Configuration register	The most complex CV within the DCC standards. This register contains important information, some of which are only relevant for DCC operation. 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 CV2, 5, 6 0 Speed curve through CV67 - 94 16 5 Short addresses (CV1) in DCC mode 0 Long addresses (CV17 + 18) in DCC mode 32		30
31	Index register H	Selection page for CV257-512	16	16
32	Index register L	Selection page for CV257-512	0,1,2,3	0

49	Extended Configuration #1	Additional important settings for LokSound Decoders Bit Description Value 0 Enable Load control (Back-EMF) 1 Disable Load control (Back-EMF) 0 1 DC Motor PWM frequency 0 20 kHz motor pulse frequency 0 40 kHz motor pulse frequency 2 2 Märklin® Delta Mode 0 Disable Märklin® Delta Mode 0 Enable Märklin® Delta Mode 4 3 Consecutive addresses for Motorola® (find in 3.4.1.4.) 4 Automatic DCC speed step detection 0 Disable DCC speed step detection 0 Enable DCC speed step detection 16 5 LGB® function button mode 0 Disable LGB® function button mode 0 Disable LGB® function button mode 32 6 Zimo® Manual Function 0 Disable Zimo® Manual Function 0 Enable Zimo® Manual Function 64 7 Consecutive addresses for Motorola® (find in 3.4.1.4.)	0 - 255	19
50	Analogue mode	Selection of allowed analogue modes Bit Function Value 0 AC Analogue Mode 0 Disable AC Analog Mode 0 Enable AC Analog Mode 1 1 DC Analogue Mode 0 Disable DC Analog Mode 0 Enable DC Analog Mode 1	0-3	03
52	Load control parameter «K» for slow driving	„K“-component of the internal PI-controller for the low speed steps. Defines the effect of load control. The higher the value, the stronger the effect of Back EMF control.	0-255	18
53	Control Reference voltage	Defines the Back EMF voltage, which the motor should generate at maximum speed. The higher the efficiency of the motor, the higher this value may be set. If the engine does not reach maximum speed, reduce this parameter.	0-255	122
54	Load control parameter „K“	„K“-component of the internal PI-controller. Defines the effect of load control. The higher the value, the stronger the effect of Back EMF control.	0-255	43
55	Load control parameter „I“	„I“-component of the internal PI-controller. Defines the momentum (inertia) of the motor. The higher the momentum of the motor (large flywheel or bigger motor diameter, the lower this value has to be set.	0-255	60
56	Operating range of load control	0 – 100 % Defines up to which speed in % load control will be active. A value of 32 indicates that load control will be effective up to half speed.	1-255	255
63	Sound volume	0 = low, 192 = max. volume		135
124	Extended Configuration #2	Additional important settings for LokSound Decoders Bit Description Value 0 Bi-directional bit: Enable driving direction when shifting direction 1 Disable driving direction 0 1 Disable decoder lock with CV15 / 16 0 Enable decoder lock with CV15 / 16 2 3 Disable serial protocol for C-Sinus 0 Enable serial protocol for C-Sinus 8 4 Adaptive regulation frequency 0 Constant regulation frequency 16		21
125	Starting voltage Analogue DC			90
126	Maximum speed Analogue DC			130
127	Starting voltage Analogue AC			90
128	Maximum speed Analogue AC			130

5. Appendix

5.1. Programming Long Addresses

As described in chapter 3.2.1.2. the long address is split into two CVs. The byte with the higher value of the address is in CV17. This byte determines the range in which the extended address will be located. For instance, if you enter the value 192 in CV17 then the extended address may be between 0 and 255. If 193 is written into CV17 then the extended address will be between 256 and 511. You can continue this up to addresses with values of 9984 and 10239. The possible values are shown in the table below.

5.2. Write address

To programme a long address you first of all need to calculate the values for CV17 and CV18 and then programme it. Please note that it is not possible to programme addresses via the programming mode "POM".

To programme the long address proceed as follows:

- First you determine the desired address, for instance 4007.
- Then you look for the appropriate address range in the table below. The value to be entered into CV17 can be found in the column on the right. In our example, it is 207.

The value for CV18 is established as follows:

```
desired address          4007
minus first address in the address range  -3840
=====
equals                    value for CV18  167
```

- 167 is therefore the value to be entered in CV18. Thus your decoder is now programmed to address 4007.

5.3. Read out address

If you wish to read out the address of a locomotive please read the values of CV17 and CV18 one after another and proceed then in reverse order:

Let's assume you have read:

CV17 = 196; CV18 = 147. Look up the corresponding address range in the table below. The first possible address within this range is 1024. Then you have to add the value from CV18 and you arrive at the locomotive address:
1024 + 147 = 1171

Address Range			Address Range			Address Range		
from	to	CV17	from	to	CV17	from	to	CV17
0	255	192	3584	3839	206	7168	7423	220
256	511	193	3840	4095	207	7424	7679	221
512	767	194	4096	4351	208	7680	7935	222
768	1023	195	4352	4607	209	7936	8191	223
1024	1279	196	4608	4863	210	8192	8447	224
1280	1535	197	4864	5119	211	8448	8703	225
1536	1791	198	5120	5375	212	8704	8959	226
1792	2047	199	5376	5631	213	8960	9215	227
2048	2303	200	5632	5887	214	9216	9471	228
2304	2559	201	5888	6143	215	9472	9727	229
2560	2815	202	6144	6399	216	9728	9983	230
2816	3071	203	6400	6655	217	9984	10239	231
3072	3327	204	6656	6911	218			
3328	3583	205	6912	7167	219			

Hotline:

In case of questions, we are ready to answer them for you! Directly contact our technician:

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56361 PIKO Sound Decoder Kit for diesel locomotive SU/SP 45 PKP



1. Introduction

This LokSound V4.0 M4 decoder is a versatile digital decoder integrating a full-featured, 8 channel sound system, various lighting outputs and a 1.1A motor controller. This key component of your newly acquired PIKO SU/SP 45 PKP is responsible for all functions, such as motor control, control of all lighting functions and all sound and special sound functions. The LokSound decoder speaks M4 as well as DCC with RailComPlus®, Motorola® and Selectrix® and can be used on analogue layouts as well. The decoder can be programmed with DCC or Märklin® command stations and recognises operational modes "on-the-fly".

You don't need to make any settings yourself. LokSound decoders can be operated on either DC or AC layouts.

The PIKO SU/SP 45 PKP is preset at the factory for immediate operation. Nevertheless, we kindly ask you to first read these instructions before you set this locomotive onto a powered track.

1.1. Decoder features

The appropriate operating mode is selected automatically. You do not have to change any parameters.

Track Voltage	47 Volts maximum
Operation modes	DCC, MM, SX, M4, AC, DC
Steady state motor current	1.1 A
Function output current	0.25 A each
Number of function outputs	6
Total current of function outputs	0.5 A
Audio amplifier	2W@40ohms load
Speaker impedance	4-8 Ohms
Memory capacity	32 MBit
Number of Sound channels	8
Dimensions	30.3 mm x 15.5 mm x 6.0 mm

Important Warnings

- Do not expose to wet and humid conditions.
- Always disconnect the circuit when installing the decoder.
- Please install the body shell before applying voltage.
- Make sure that no wires are squeezed or cut by the model's transmission parts when reassembling the locomotive.
- To avoid risk of short circuit, ensure that open ends of wires do not come into contact with any metal parts of the Locomotive.
- Caution in soldering the speaker! Avoid solder bridges between the wiring! The decoder will be destroyed!
- Handle the speaker with extreme care: Do not touch the membrane or apply pressure!

2. Operation

2.1. Function assignments

Key	Function	Key	Function
F0	Directional lighting on/off	F11	Shunting Radio
F1	Sound on/off	F12	Compressed air valve
F2	High pitched airhorn	F13	Coupling / Uncoupling
F3	Deep pitched airhorn	F14	Compressor
F4	Fuel pump	F15	Hand brake
F5	Shunting mode / Shunting lighting	F16	Rail clank sound on/off
F6	Preheater	F17	Curve squeal sound on/off
F7	Station announcement #1 / "Train leaves"	F18	Deactivate brake sound
F8	Conductors whistle	F19	Train lighting: the loco pulls, white
F9	Lighting drivers cab FS 1	F20	Train lighting: the loco pushes, red
F10	Lighting drivers cab FS 2	F21	Sound fader (tunnel mode)

The default address for DCC operation is "03".

2.2. Using your LokSound decoder under DCC

Simply set your controller to this locomotive number and place it on the mainline. If everything is set up properly, the PIKO SU/SP 45 PKP should react as shown on the table 2.1.

If you use a DCC system which supports RailComPlus®, it will most likely ask you to change the locomotive address.

All function button icons will be displayed correctly after the assignment of the new address.

