



ESU

LokSound Select Direct Micro

- ✓ For N scale locomotives. Easy Drop in Design!
- ✓ Uses 4, 8 or 16 Ohm speakers
- ✓ Six output functions, 50mA each. Two outputs hardwired to SMT - mount LEDs
- ✓ LED for Headlight and Rearlight can be length-adjusted. Two free outputs.
- ✓ Suitable for use with any DCC system or DC
- ✓ Decoder with BEMF (aka Load compensation)
- ✓ Fully reprogrammable Decoder using ESU LokProgrammer

ESU LLC
 23 Howard Street
 Montoursville
 Pennsylvania 17754
 USA



73199
 LokSound Select Direct Micro OEM
 Universal Sound
 Ready for Programming
 Suitable for many N scale engines 41044645 731994

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. Supports Lenz® LG 100 braking sections, ABC brake sections and «Brake on DC» Runs DC and coreless motors.
Power	0.75 A continuous load / 1.00A peak load. Silent, safe 40,00 kHz pulse width frequency motor BEMF. Motor output overload protected Shunting speed and momentum key-selectable
Sound (Not for 54650)	Audio amplifier: 1.5W @ 4 Ohms load. Speaker impedance between 4 Ohms and 16 Ohms Memory Capacity 32 MBits. 8 Sound channels, all playable at once! Library of over 100 sounds available for download. DCC Service mode & DCC POM (Programming on Main). RailCom® Feedback system. RailComPlus® automatic registration. 6 powered outputs.
Programming Features	NON-SOUND VERSION
Function outputs	Output AUX1 and AUX2 hardwired to LEDs. Outputs AUX3 and AUX4 available on Soldering Pads. Headlight and Rearlight need to be connected to 3mm LEDs. These can be adjusted to length 66.0 x 8.2 x 4.5 2.60 x 0.32 x 0.18 73199
dimensions in mm	66.0 x 8.2 x 4.5
dimensions in inch	2.60 x 0.32 x 0.18
Item-Number	54650

CE

This product is not a toy. Not recommended for children under 14 years of age.
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

MADE IN CHINA

ESU P/N 03871-19437

www.esu.eu

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	Manufacturer's ID: ESU - Writing value 8 in this CV triggers a reset	151	-
17/18	Long address of the loco	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
19	Consist Address	Allowed brake modes		28
27	Brake mode	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	This CV contains important information to setup your decoder		12
		Bit Function Value		
		0 Reversed direction of travel	1	
		1 28 or 128 speed steps DCC	2	
		2 Enable analog operation	4	
		3 Enable RailCom®	8	
		4 Speed curve through CV 67 - 94 (instead of CV 2,5,6)	16	
		5 Long addresses (CV 17 + 18) in DCC mode	32	
31	Index register H	Should be either "0" or "16" for LokSound Decoders	16	16
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	0 Disable Load control (Back-EMF) 1 40 kHz motor pulse frequency (internwise 20 kHz) 2 Enable DCC speed step detection	0 - 255	19
61	Random sound «min»	Multiplied by 0.25 it is the time in seconds for the shortest random sound interval	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	0 - 255	-
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	
		1 Enable decoder lock with CV 15 / 16	2	
		2 Enable prime mover startup delay	4	
		3 reserved	8	
		4 Constant regulation frequency	16	
		5 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
134	ABC-Mode „Sensibility“	Threshold, from which asymmetry on ABC shall be recognised	4 - 32	12

Select Direct Micro Item #73199

The Select Direct Micro OEM Item #73199 was created to upgrade DC versions of Locos offering Factory ESU Sound. This board could also replace a factory equipped LokPlot Micro Direct Non Sound decoder. ESU Factory equipped locos already contain phosphor bronze pick-ups "pressure connections" for motors and sometimes speaker (mounted in the fuel tank) Simply slide the non-sound decoder or analog printed circuit board out of the frame and replace it with the 73199 decoder. If the loco was designed to be sound ready with ESU sound normally it will also use the pre-installed "SMDs" so nothing more is needed.

Adding a speaker to an N Scale Installation

Provisions may have to be taken to add a speaker to the frame as space in N Scale is very limited.

Please be careful not short the 2 halves of the frame together as they are usually the left and right rail pick up conduits. A metal speaker touching both halves of the frame could destroy the decoder if not properly insulated.

Warnings

- Do not expose to wet and humid conditions and Avoid mechanical force or pressure on the decoder
- Never solder on the circuit board, extend cables if necessary.
- Never wrap the decoder in insulation tape, since this may cause overheating.
- Any wiring has to be carried out while power is disconnected.
- Make sure that neither the decoder nor any blank wire ends may come into contact with the engine chassis (risk of short circuit).
- Never operate a LokSound 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

Select Direct Micro Item #73100

The Select Direct Micro Item #73100 Decoder will work in many brands including Atlas, Kato, and InterMountain. In order to install it into your locomotive, you need to remove the old, analog printed circuit board first.

Check the length of the LEDs for headlight and rear light first. Then, cut the length of the new LEDs that are supplied with EACH 73100 decoder and cut the terminals so that the length matches the old circuit board.

Solder the LEDs to the 73100 board and make sure you pay attention to the polarity of the LED. If desired the original LED from the Analog could also be used. Again, please be sure the polarity is correct or the LED will not illuminate.

Figure 1 shows the general connection diagram.

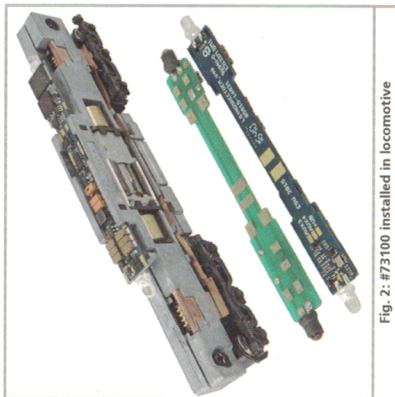


Fig. 2: #73100 installed in locomotive

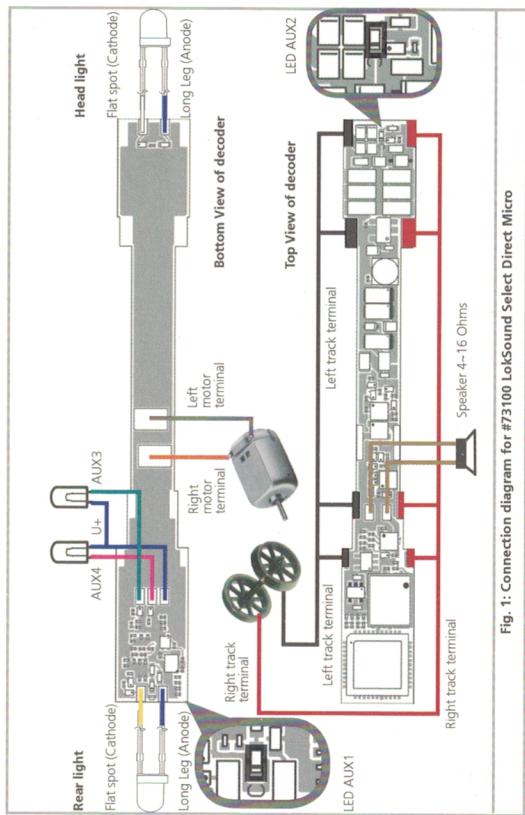


Fig. 1: Connection diagram for #73100 LokSound Select Direct Micro

Function outputs

For AUX3 and AUX4, You can wire all kind of loads to the function outputs. However, LEDs with Resistor are recommended.

Please make sure that the load does not exceed the permitted maximum current and there are no short circuits.

If you like to use LEDs, a resistor with a rating between 470 Ohms and 2.2 KOhms need to be wired in 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

See the full manual online at www.loksound.com

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

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

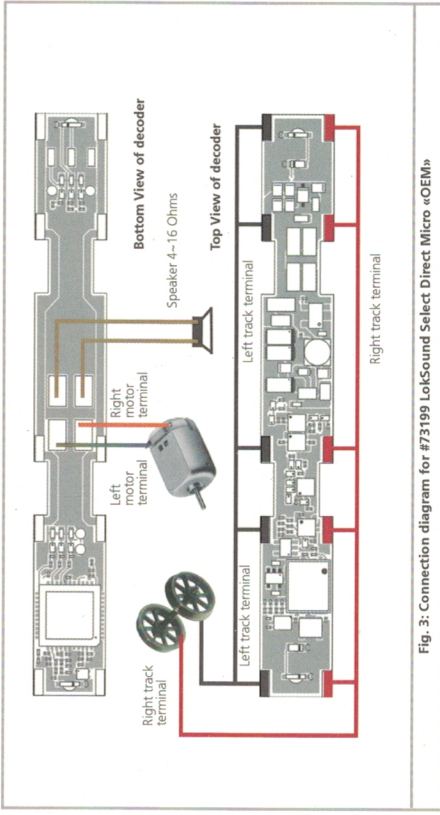


Fig. 3: Connection diagram for #73199 LokSound Select Direct Micro