LokSound

LokPilot

ESU

Product overview 2006

Touching HighTech

Admittedly: There are some model railroaders, who have are hard time getting used to the idea of having Digital electronics on their layout now. Having been concerned so far mainly with what the layout might look like, they now need to deal with the "Bits & Bytes" of computer technology. The majority of model railroaders won't venture into this future of model railroading: What would this new fangled, digital multi train control bring?

While many model railroaders still hesitated, in February 1999, at the Toy Fare in Nürnberg, we introduced our first product to a world public:

The LokSound "classic" decoder combined the Digital decoder and a Sound module in one unit. Thus it was possible for the first time, to reproduce, beside the Light-and running functions, the true sounds of a Loco. The LokSound decoder was one of the first Multi-Protocol decoders that made it possible to operate on DCC, as well as on Märklin-Motorola-Layouts.

Our decoder enjoyed an enthusiastic reception by the hobby-press:

Finally, the locos sounded like the prototype. One more milestone on the road to a most realistic layout was passed. And finally, digital model railroad control systems could demonstrate their worth.

ESU grew since those humble beginnings, and can offer you today a vast spectrum of electronics for the (digital) model railroad.

From the beginning, one aim was ease of functionality and operation: For example, the Lok Pilot that we introduced in 2001 had automatic DCC-step recognition, and thus made life for beginners or converts much easier. Our vision has been, and is basically plain: create products which are simple to use by the beginner, but on the other hand offer the sophisticated user expanded functions.

The fact that the world-wide biggest model railroad manufacturers build upon our competence and put ESU-products into their locos, or ask us to develop their Digital Systems for them, is prove that we're on the right track.

Even ten years after our foundation, we continue in this direction and would like to show you on the following pages a host of new products, demonstrating again our ability for innovation.

A highlight here is surely our brand-new **ECoS Digital command station**. Our first digital cab under our own name will put the level higher for simple operation, range of functions and price-performance ratio. It was never easier to run a model railroad. The ECoS central unit offers you the freedom, to integrate your already existing system-components, because beside DCC and Motorola, ECoS also understands Selectrix. Of course, we also integrated the NMRA-conform Duplex communication, so your investment into the future is safe.

The new **LokPilot V3.0** is also prepared for the coming Duplex standard. You can use it with all systems that employ the DCC, Motorola or Selectrix format. Thus the LokPilot is our "Swiss knife" among decoders and lives up to the expectations of even the most sophisticated model railroaders.

Those, who are looking for a "fundamental" decoder, offering good performance with back EMF for DCC at a really fair price, should take a close look at the **LokPilot Basic** on page 30. This decoder, with its, (so far) not attainable price-performance ratio, is going to make all non back-EMF decoders look "old" in the future.

What remains for us right now, is to wish you much pleasure when reading the following pages and to hope that our enthusiastic engagement in the future of model railroading helps you to find new ideas and stimulants in the realm of your hobby.

We thank you for your confidence in us.

Your ESU-team

ECoS


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ECoS - Just Play

We are proud to present to you today our ECoS Digital Central Unit. ECoS is not just another Digital Central Unit on the market: ECoS is the first stepping stone to a comprehensive Control-System, which, with new concepts, will address the subject of model railroad control systems, and revolutionize it. Never was it simpler to run a model railroad.

Right away an important message for all the Pro's: In spite of the entire new innovations we made ECoS compatible with all already existing systems: You can continue to use your present equipment. Now. Promised.

Discover the fascinating possibilities of the ECoS Central-Station on the following pages. But take heed: ECoS performance is so good, that even we had to re-read a few passages, to believe it...

ECoS Features:

The ECoS Central Unit is the first Digital Command Station with our name. With ECoS we want to continue consequently in the same direction we started out with more than seven years ago with our Digital decoders. You may rightly expect more from an ESU-Digital Command Station from the house of ESU.

From the beginning we wanted to be open to, and compatible with, present systems and norms. Just as the first LokSound decoder was a Multi protocol decoder, ECoS is also enormously flexible:

As a Multi protocol Central Unit, ECoS supports the formats DCC, Märklin®-Motorola® and Selectrix®, which means you can continue to use nearly all of your present loco decoders.

With ECoS you can run locos: Via two integrated Cabs with large, easy-grasp motor driven (!) throttle knobs and eight precise click-function keys you control your locos. In combination with the touch screen, you can control up to 20 functions per engine.

With ECoS you can switch turnouts and magnetic-driven accessories: Via a large, graphic switchboard you have access to up to 1420 turnouts (DCC or Motorola® format).

With ECoS you can lay out, and control routes: Simply put turnouts and magnetic accessories graphically in groups and switch them together. Routes will be activated either by s88 occupancy detectors or by key.

With ECoS you can operate shuttle trains real easy: Put a s88 rail contact at both ends of the track, and ECoS will do the rest.

The ECoS built-in booster has so much power that in most cases you don't need additional ones.

ECoS supports EcoSlink, a high speed system bus, based on CAN that transmits data instantaneously to the command station.

With ECoS, it's as simple as never before to program your decoders: The large, background-illuminated LCD screen offers good contrast and displays a lot of information in unabbreviated text. A programming track establishes contact with your decoders.

With ECoS, the new NMRA DCC Duplex Communication is already built-in: As soon as the norm will be made official, you will, in connection with appropriate decoders, discover undreamt-of possibilities.

ECoS is compatible. Besides Selectrix® and Märklin®-Motorola®, ECoS speaks all variants of the DCC-Norm. With the integrated Analog Controllers (Joysticks) you can even control the whistle of LocoSound decoders as precise as never before.

ECoS is expandable. Each ECoS Central Unit sports a network port for connection with a computer. Thus you can update software, or use a computer for operation.

Who ECoS needs:

ECoS is basically the central station for all. Beginners, who are looking for a simple-to-operate Cab, will be at home right away: The large, graphic touch screen display shows all information in plain text; in case of doubt use the integrated help function. Never was it easier to switch to digital control. And ECoS runs DC or AC driven trains.

Even model railroaders, who own already a digital command station, should step up to ECoS: Next to the extreme simple inputs, and the possibilities for route- and shuttle train programming, you will learn to appreciate the manifold programming features for decoders. You can connect your present equipment to the input of EcoSniffer, and continue to use it: You don't need to discard anything that you want to keep using!

Due to its enormous output-performance, the ECoS Central Station is recommended especially also for operators of Gauge 1 or LGB layouts: At last you can run multiple trains without an external booster. Total interplay with our LokSound XL decoders is matter-of-fact.

ECoS

Features:

ECoS leaves the factory with extensive features: Two Cabs with motorized throttle knobs and eight function keys each, plus a two-axis, center-click joystick each. With it, you can blow the whistle of the LokSound V3.5 decoder, analogically, almost as you would with the prototype, or, in the future, control digital cranes perfectly. The large, white background-illuminated liquid crystal display shows all information in plain words. There is a touch-sensitive screen that you can work either with your finger, or the provided peg.

Each ECoS Command Station integrates a 4 Amp.-steady-output booster. Conventional model railroad transformers don't have enough power, which is why we supply you with a stabilized 90 VA (!) power supply. Power aplenty for your layout!

Decoder programming takes place via a dedicated programming track. This is independent of the main-line and normal operation on the layout is not affected during programming. ESU takes this for granted.

The new ECoSlink high speed bus serves as communicator between systems. The bus can be connected to throttles, feedback devices, and other system components, that will be available in the future. ECoSlink is robust (up to 300 feet cable length is no problem) and extremely fast: Forget all others...

Each ECoS Command Station incorporates a galvanically isolated jack for s88 feedback modules. Track-occupancy information can be used for route - as well as shuttle train operation. An ECoSniffer jack is provided for connecting "old", existing Digital COmmand stations. A galvanically isolated jack for connecting DCC-conform or Märklin® 6015 / 6017 compatible boosters tops off the list of ECoS features.

Loco symbol and loco name for easy identification of engine.

Large easy-grip throttle knob with mech. Stop. A loco exchange causes throttle knob to find correct position – automatically, motor driven.

Vinyl-coated function keys with precise click for first 8 loco functions. Reliable touch-function without eye-contact.

Analog two-way joystick with center click. Ideal for Analog control functions of loco. Define e.g. length of whistle blow and kind of sound of LokSound V3.5 - prototype like. Also for navigation in Menu.

Emergency Stop button. Switches off ECoS-Center, when pushed longer than 3 seconds.

Symbol for changeover to the turnout-switch board. 99 keyboards with up to 20 magnetic accessories available. Locos still selectable, of course.

Functions detailed

Run a Loco

The ECoS Central Unit can manage up to 16384 Locos. Each Loco's characteristics are memorized, so in the future you can call each engine by name. Also you can assign a loco-symbol, and these symbols keep you abreast of the function of each loco, regardless of whether it's latching, or non-latching. An extensive navigational menu takes care of finding your Locos quickly; and running them.

Operate turnouts and magnetic accessories

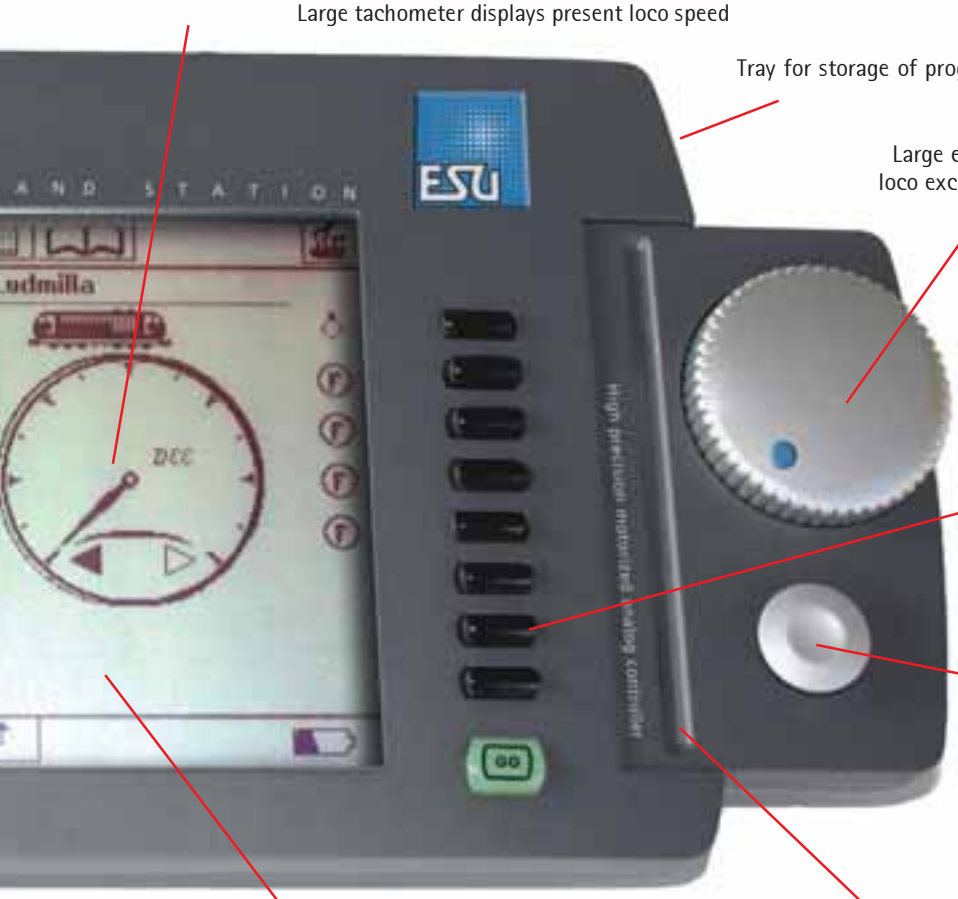
Just like with locos, you can name turnouts and magnetic accessories. The large switching-panel on the screen of your ECoS shows you all turnouts and their switch-position. You can put turnouts in the depot area, and to each magnetic accessory you can assign its exact function, so you can tell simple-, double or 3-way turnouts apart from de-coupler tracks or streetlights, etc.

Routes

Several magnetic articles can easily be grouped as routes. Routes can then be switched like singular turnouts or they can be tied to an occupancy detector: Thus extensive block-control management is possible already. ECoS can manage up to 1024 routes with up to 256 magnetic accessories each.

Shuttle train control

Shuttle train control is a whole new function. Here you only need a (s88) occupancy detector at each end of the track, which you assign via Software to a loco: length of layover, acceleration - and deceleration, or in-between stops can easily be programmed on the ECoS screen. This works with any decoder because the brain of the system sits in the central unit. Up to eight shuttle trains are possible.



Large tachometer displays present loco speed

Tray for storage of programming peg

Large easy-grip throttle knob with mech. Stop. A loco exchange causes throttle knob to find correct position – automatically, motor driven.

Vinyl-coated function keys with precise click for first 8 loco functions. Reliable touch-function without eye-contact.

Analog two-way joystick with center click. Ideal for Analog control functions of loco. Define e.g. length of whistle blow and kind of sound of LokSound V3.5 - prototype like. Also for navigation in Menu.

Full graphic LCD display with touch-screen and white LED background illumination.

Tray for temporary storage of programming peg

Symbolic display only: Actual screen contents may vary

Decoder programming

Thanks to the screen, programming decoders is as simple as never before. All parameters are shown in plain text. The search for - and of - CV's and bits and bytes is a thing of the past. Of course you can call up - and check - all features of your decoder (during operation on the layout) on the main. POM (programming on the main) makes it possible. The addresses of your old Motorola® decoders are ascertained automatically - never again do you have to take your engines apart and check the DIP switch...

Keep using old systems

We make your transfer to ECoS as comfortable as possible: Simply keep also using your "old" system . This is made possible through the built-in EcoSniffer module: The rail output of your present Digital command station is simply connected to the input of the EcoSniffer module. The module listens to all DCC and Motorola packets and translates them for the ECoS command station. This again treats your old system like one,- (or more) additional throttles or turnout-panels. Even those with more than one digital system find a solution: He or she can connect additional EcoSniffer modules to the EcoSlink bus and use any number of different systems together with ECoS.

If that's not enough, go head and expand your layout.

Possibilities of Expansion

Mobile control

ECoS is well prepared for the application of our tetherless radio walk around control: A special receiver card fits into a module terminal, called EcoSlot.

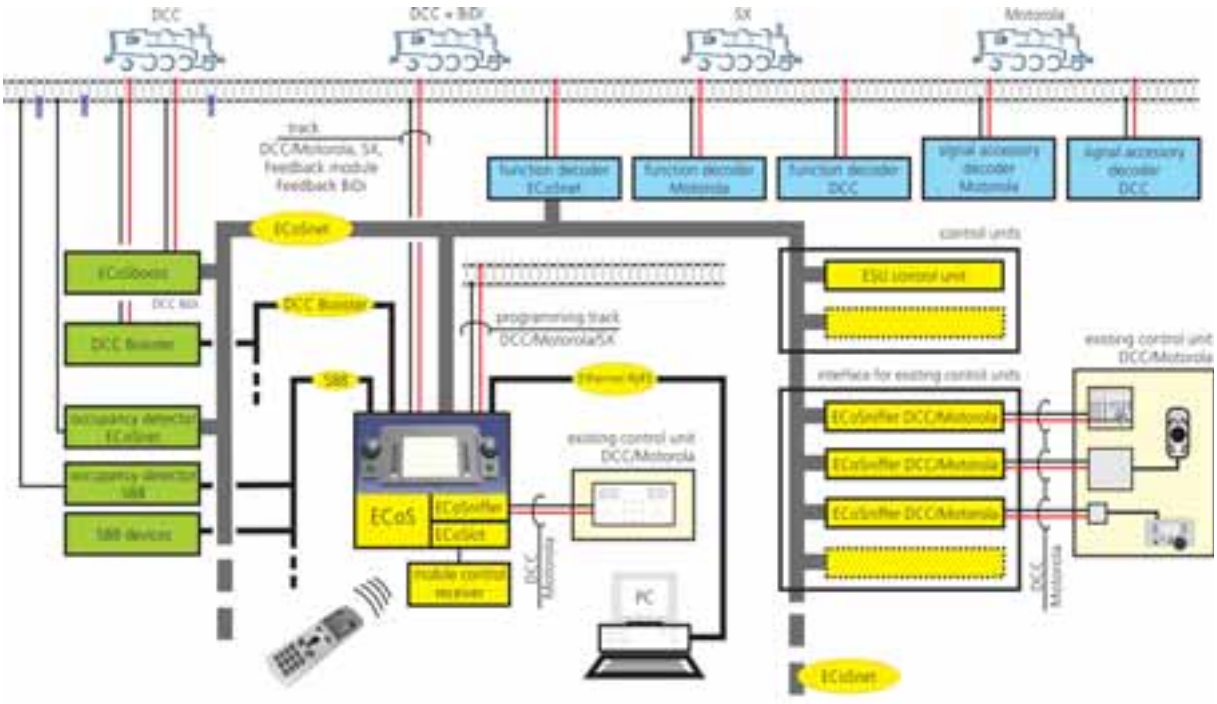
The mobile control integrates perfectly into the ECoS-system and acts like a fully featured cable-bound throttle.

Booster

Of course all DCC conform boosters can be connected to the ECoS Central Station: There is a corresponding socket. Also, the widely known Märklin® 6015 / 6017 boosters (or compatible products) can be used. Alternatively, you can decide on the separately available ECoS booster, which connects directly to the EcoSlink: As a matter of fact, it incorporates a NMRA/DCC RailCom® detector, so you can use their great features.

NMRA/DCC Bidirectional communication

Any DCC compatible Central station, which will hit the market in 2006, should, of course be able to support the latest DCC expansions. That's why ECoS is already prepared for the coming NMRA/DCC Bidirectional standard: Once this standard is passed, a free software update will activate the already build-in feedback receiver. Apart from our ESU decoders, nothing else is needed to reach an unprecedented level of value.



ECoS system overview

FAQ

Why ESU ECoS?

All present central stations are conceptionally at least seven years old. Their mathematical capability and operational interface is simply not suitable to fulfill your (rightful) expectations, in regard to extend of functions and easy workability in today's world.

What's the PC-interface capable of? Will it be freely available?

The PC-interface can be used for Software updates for ECoS, and serves as connection to PC-operational programs. The interface will be made available to all interested software vendors.

Do I still need a LokProgrammer, if I own ECoS?

The programming of decoders with ECoS is about the same, as with the LokProgrammer: The graphic surfaces are similar. In a first step, you can change the CV values of all ESU-decoders. Later on, with the help of the ECoS Command Station, you will be able to perform sound updates for LokSound decoders.

What equipment is in the making for ECoSLink?

ESU will develop a comprehensive Digital system, of which ECoS is the center. Part of it will be tethered throttles, add-on boosters, turnout switch-boards, and much more. Let us surprise you...

Can Loco symbols be changed?

Of course. As well as the loco symbol, the symbols for all function keys can be changed and mapped (which key for what function).

May I continue to use my present mobile control?

Yes. In fall 2006 there will be a software update for ECoS and your mobile control, so that the equipment continues to be compatible. All of this will be free of use and simple to realize. Your investment in a mobile control is protected.

symbolic display

ECoS

NEW 50000 ECoS Command Station, DCC, MOT, SX, Set with Power supply 240V euro, German Manual

Technical Data ECoS

Hardware:

- H4 booster with 4.0 A continuous-load output
- H4 programming track connection, 0.6 A rated
- NMRA DCC Bidirectional Feedback detector with integrated cutout device
- 7 inch QVGA FSTN LCD display with touch screen and sextuple LED backlight (white)
- 32-bit ARM 720T controller, 64 MByte flash ROM, 32 MByte RAM, Linux operating system
- 16 bit real-time co-processor
- 2 motor driven potentiometer throttles with end stop
- 2 two way analog joysticks
- 2 8-function keys, plus stop – and go key
- 3 input sockets for ECoSlink systems
- Connection for ECoSlink Bus Expansion
- Galvanically isolated Booster input for External Boosters
- Galvanically isolated ECoSniffer input for connection of old units
- Galvanically isolated s88-Bus input for feedback devices
- 10/100 MBit Ethernet-connection (RJ 45)
- 1 ECoSlot module for radio-receiver input
- Power supply 90 VA

Software:

- DCC with 14, 28, 128 speed steps, LGB® MTS® compatible function key handling
- Märklin® Motorola® old, new, with 14, 27 or 28 speed steps
- Selectrix® track format
- Up to 9999 addresses for DCC protocol. Up to 20 function keys per loco. Up to 255 addresses for Märklin® Motorola® protocol.
- Märklin® Motorola® and DCC track protocol for control of electromagn. accessories.
- Up to 16384 locos, 2048 turnouts and 1024 route objectives
- 32 MU's (multiple consists) with up to 16 locos each
- Up to 8 shuttle trains (back'n forth) at the same time
- All DCC service modes programming on programming track, POM (programming on the main)
- Programming of Motorola® – and Selectrix® decoders on programming track

Included in delivery:

- ECoS Central Unit
- Peg for touch screen
- Power supply 18V / 5.0 A (90 VA)
- Terminals for main track – and programming track connection, ECoSniffer
- Extensive instruction manual

LokSound

LokSound : Digital Operation – Original Sound

With the LokSound family decoders we offer all model railroaders who want the utmost of authenticity on their layout, a real highlight. With LokSound , the excellent features of ESU-decoders are even more enhanced by the addition of Sound functions. Its sounds simple, but "wow": In the future, your Locos not only run like the prototype, they sound exactly like it!

That's made possible through our award-winning LokSound technology- the reference for good sound on the layout since its introduction in 1999. By the inventor. By ESU.

LokSound decoders are available for various applications, depending on gauge or digital system:

- **LokSound V3.5** for gauges 0 and H0 understand DCC and Motorola.
- **LokSound micro** is suitable for gauges TT and N and speaks DCC, Motorola and Selectrix.
- **LokSoundXL V3.5** for the "big" ones, G and I, also masters DCC and Motorola.
- **LokSound mfx** for gauges 0 and H0 is conceived for the Märklin system.

What's behind the sound?

The core of all LokSound decoders is an extremely capable processor. This is complemented by a sound storage, which contains the sounds, and an extremely powerful audio amplifier. Lastly, the sound is reproduced through especially developed high-performance speakers.

All LokSound decoders are based upon a sound-technology with exceptional key-values: A **flash-memory** records up to 65 seconds of sound data, which is transferred via a polyphonic, **four channel mixer** with an active filter, to the last stage amplifier.

But much more important than the fact that beside the actual prime mover sound, up to three more sounds, such as bell, whistle or brake squeal can be reproduced, is the unique sequence-choice of the sound decoders:

Steam engines, Dieselelectrics.- Dieselhydraulics,- Electro-Locos, or Locos with a transmission (e.g. Rail bus, Doodlebug) can be reproduced. Depending on the type, sound sequences do differ, but are always faithful to the prototype:

Steam locomotives reproduce changing chuffs. Those are coupled to motor control and are load-dependant. When accelerating, chuffs sound harsh, while, when the throttle is closed, only rod-clatter is discernible. The reproduction hereby is so faithful that you can differentiate between the rhythms of a two-.three, or four cylinder loco. The rhythm can either be triggered by an external sensor, absolutely r.p.m.- synchronous, or via back E.M.F (load compensation),speed step dependant.

Diesel engines come in various designs, which are all correctly reproduced: Dieselhydraulic Locos first rev up, before they start moving. Engine r.p.m.-sound is in ratio to speed. LokSound decoders allow your loco, prototype like, to move only when engine r.p.m is high enough. This is only possible through the entity of sound module and decoder. When accelerating or straining, the sound is more intensive, while, when you close the throttle, the prime mover revs down to idle. Diesel-electrical locos keep their prime mover r.p.m nearly constant, but you hear the soft whine of the electro motors.

But even **Electric locomotives** are a treat for the ears: Beside the fan noise, the compressors, or the oil coolers, you hear the whine of the electro motors, the cracks of main switches, or gear noises.

Beside these sound variations, you can activate sounds anytime per **function key**. Thus you can whistle, sound the horn or bell to your heart's content, in front of railroad crossings, or tunnels. Length of sound is up to you.

In the background you hear, coincidentally, the fireman shovelling coal, and the release of compressed air, or steam, by the safety valve. The decoder can couple all this to the function outputs, so that the fire in the firebox really flickers, when the fireman adds coal. LokSound decoders create real station atmosphere. The deceleration-synchronous squeal of the brakes, station-announcements, door banging, or an "all aboard whistle" by the conductor before the train moves out belong here, of course. Your model railroad grows more realistic than ever before.

If all of this were not enough, the flash memory of the LokSound decoder can be erased or re-recorded anytime. In this way it's no problem to change a Steam- into a Diesel sound, for example. You can do this yourself, even later on. You only need the ESU LokProgrammer to do it.

LokSound V3.5 - The benchmark for sound decoders

LokSound V3.5

By now, the third generation of LokSound decoders has been made available. All past experiences, wishes, and suggestions of our customers were brought into its development. The LokSound V3.5 is the standard for Digital sound decoders. No other product can offer you more.

Due to the integration of Digital decoder and sound module, the LokSound decoder measures now only 31x15 mm (1.2x0.6 inch.). Its unique thermal design causes no temperature problems; heat sinks are unknown with a genuine LokSound decoder.

We ship the LokSound V3.5 decoder with an eight-pin NEM652 function plug. The installation into engines with a digital interface is especially simple: Open up the loco, remove the dummy-plug, and plug in the decoder, button up the loco – done!

Operational modes

The LokSound V3.5 recognizes the DCC and Motorola® protocol.

It will operate as well in DCC mode with 14, 28 or 128 speed steps; or on analogue DC layouts. It supports Lenz® LG 100, respectively Roco braking-sections as well as braking in DC blocks with reversed polarity, or the Märklin® braking section, which, from LokSound version 3.5 on, will even be recognized in DCC mode. You can either use two digit (0-127), or four digit (1-9999) addresses, or assign a consist address. The Motorola® protocol makes it possible to run the LokSound decoder with Märklin® stations 6020, 6021, delta, mobile station®, and central station®. Hereby the decoders handle addresses 01-80, stop correctly on the Märklin® braking section, and can be used without problems on all analog AC layouts. During operation, the LokSound decoder converses automatically between all four control modes: AC, Motorola; DC, DCC. That's important, in case you run parts of your layout (e.g. fiddle yard) in analog mode.

Motor management

All customary DC or coreless motors, regardless whether from Roco®, Fleischmann®, Brawa®, Mehano®, Bemo®, Märklin®, Faulhaber® or Maxon® can be hooked up to the powerful, 1.1 A steady-load last stage of the LokSound V3.5 decoder. All-current motors can be continued to use if you replace the field winding with a HAMO magnet. The back EMF with 32 kHz High frequency regulation takes care of a silky smooth, absolutely quiet motor operation and lets your engines crawl super slowly on the layout. A 10-bit A/D-converter makes this possible. Due to Dynamic Drive Control (DCC) you can limit the influence of the load control, and operate really smoothly around the depot and over turnouts, while on the main, when going uphill, the engine slows prototypically down.

Sound

The LokSound V3.5 decoder stores up to 65 seconds of sound data in its 8 MBit flash chip. This is transferred to the last stage audio amplifier via four polyphonic sound channels. The ability of LokSound V3.5 to reproduce sound, such as load dependant strain (de-selectable), or Doppler Effect, brings you closer to reality again. The channel volume can be adjusted separately.

Analog operation

As of LokSound V3.5 load control also functions in analog mode, where you can pre-determine starting- and top speed. Also the sound-sequences are there: LokSound V3.5 offers model railroaders even without a digital system the chance to enjoy LokSound.

Functions

The LokSound V3.5 offers four function outputs with 250 mA continuous-current each that can be allocated individually to a function. Besides beacon, strobe and alternate flashing, there is firebox flicker, as well as Mars light or Gyra light for US models. All function outputs are individually dimmable in 15 steps. Each function output can be allocated to any function key between F0 and F15 (mapping), and complies therefore with the latest NMRA DCC directives.

Furthermore, the combination of sound-and function sequences makes it possible to simulate realistic function events, such as firebox flicker when shoveling coal.

Programming

The LokSound decoder supports all DCC-programming modes. All adjustments are done electronically. This is even true when working with Märklin® control units 6020, 6021, mobile station® and central station®. For these units, the LokSound decoder employs a proven, easily acquired programming procedure. All programmed modifications during Motorola® operation are valid with DCC and vice verse.

Programming configuration variables (CV's) is especially comfortable for owners of our ECoS Command Station: All variations are displayed in plain language on the large screen and can easily be altered – even during operation on the layout.

Safeguard

All function outputs and the motor connection are protected against overload and short-circuit. We want you to enjoy your LokSound decoder as long as possible.

Built-in future

LokSound decoders are firmware-updatable. This means, the internal decoder software can be replaced by new versions, if need be. For this, you only need an ESU LokProgrammer and a PC. You will appreciate the value of this investment, when you realize that any owner of a V3.0 LokSound decoder can, through an update, turn it into a V3.5 LokSound decoder: You can download the software from our homepage – free of charge.

Variety of sound

ESU, as market and technology leader, takes your demands for sound realism very seriously. That's why we offer, for the LokSound V3.5 alone, over 400 (!) sound variants. When you purchase a sound module of a certain prototype from us, you can be sure the sound comes from that loco. Guaranteed! You can count on it.

See pages 14 – 17 for an exact summary of all available sounds.

Technical data LokSound V3.5:

Operational modes:

NMRA/DCC with 14, 28, 128 speed steps
2 digit + 4 digit addresses
Digital Motorola® (old and new)
Analog DC (de-selectable)
Analog AC (de-selectable)
Auto-recognition of operational mode
and DCC speed step selection
Supports Lenz® LG 100, Märklin®, Roco® braking selections
Base-direction bit
Operational status storage
Intelligent programming mode with Märklin® 6021

Throttle:

1.1 A continuous load
Runs DC-, coreless-, and AC motors (auto detect)
Silent, safe 32 kHz pulse width frequency regulation of motor
Overload protection of motor output
Fourth generation load-control (back EMF), de-selectable

Function outputs:

4 outputs, 2 of which for light function
250 mA load per output
Total current of all function outputs ca. 500 mA
Free function allocation (function mapping)
F0 – F12 (V3.5 F0 – F20) possible
Outputs short circuit proof

Sound features:

4 (!) independent sound channels
High performance bridge-tie amplifier, ca 0.6 Watt
Sound data in memory unit changeable
Modes for Steam engines, Diesel-hydraulic locos, Diesel-electrical locos, Electro-locos
8 MBit storage capacity (up to 65 seconds)

Loudspeaker:

Special high-performance speaker, 23mm (.9 in) included.

Dimensions:

31 x 15.5 x 6.5 mm (1.24 x 0.62 x 0.26 inch)

LokSound - Here you have the choice

	Item	Artikel	Type	Description	Suitable for engine
	52401	LokSound	Steam	Universal 2 Zyl. Narow gauge (Prototype: BR 99)	
	52402	LokSound	Steam	Universal 3 Zyl. Normal gauge (Prototype: BR 44, Belg. 25.021)	
	52403	LokSound	Steam	Universal 2/4 Zyl. Normal gauge (Prototype: BR 64)	
	52404	LokSound	Steam	BR 38, P8	
	52405	LokSound	Steam	BR 18, S 3/6	
	52406	LokSound	Steam	BR 01	
	52407	LokSound	Steam	BR 03	
	52408	LokSound	Steam	BR 23	
	52410	LokSound	Steam	BR 50, NMBS-SNCB type 25	
	52411	LokSound	Steam	Universal US-Steam (Prototype: Big Boy, Mikado)	
	52412	LokSound	Steam	Tenweeler, Mountain, Hudson	
	52413	LokSound	Steam	BR 80	
	52417	LokSound	Steam	BR 06	
	52418	LokSound	Steam	BR 05	
	52419	LokSound	Steam	18 201	
	52420	LokSound	Steam	BR 55, NMBS-SNCB type 81	
	52422	LokSound	Steam	BR 78	
	52423	LokSound	Steam	BR 93	
	52425	LokSound	Steam	BR 41	
	52426	LokSound	Steam	BR 01.10 Öl	
NEW	52427	LokSound	Steam	BR03.10 Öl	
NEW	52428	LokSound	Steam	BR44 Öl	
NEW	52429	LokSound	Steam	BR86	
	52430	LokSound	Diesel	V 36 / BR236	
	52431	LokSound	Diesel	V 60 / BR260	
	52432	LokSound	Diesel	V 100 / BR212	
	52433	LokSound	Diesel	Universal Diesel (Prototype: BR 218)	
	52434	LokSound	Diesel	Belgian Bombardier Diesel engine	
	52436	LokSound	Diesel	Universal US-Diesel (Prototype:F 7)	
	52438	LokSound	Diesel	Nohab	
	52439	LokSound	Diesel	VT 11.5, Lyntog	
	52440	LokSound	Diesel	VT 18 / SVT 18.16	
	52441	LokSound	Diesel	VT 628	
	52442	LokSound	Diesel	BR 232 „Ludmilla“	
	52444	LokSound	Diesel	PA-1	
	52445	LokSound	Diesel	Renfe D319	
	52446	LokSound	Diesel	V 200 / BR220	
	52448	LokSound	Diesel	V 320	
	52449	LokSound	Diesel	ICE VT	
	52450	LokSound	Diesel	SVT 137 / VT 08	
	52451	LokSound	Diesel	VT 610	
	52452	LokSound	Diesel	VT 650	
	52454	LokSound	Diesel	VT 98 „Schienenbus“	
	52455	LokSound	Diesel	V 80	
	52456	LokSound	Diesel	ÖBB 2016	
	52457	LokSound	Diesel	SNCF 68000	
	52458	LokSound	Diesel	Adtranz „Blue Tiger“	
	52459	LokSound	Diesel	V 120 DR „Taigatrommel“	
	52460	LokSound	Electric	E 10 / BR110	
	52461	LokSound	Electric	Universal „old style“ Electric engine (Vorbild: E40)	
	52462	LokSound	Electric	E 75	
	52463	LokSound	Electric	E03 / BR103	
	52464	LokSound	Electric	E94 / BR194	
	52465	LokSound	Electric	E120	
	52466	LokSound	Electric	E50 / BR150	
	52467	LokSound	Electric	ICE	
	52468	LokSound	Electric	Universal „modern“ Electric engine (Vorbild: Re 460)	
	52469	LokSound	Electric	BR143	
	52470	LokSound	Electric	E44	
	52471	LokSound	Electric	Krokodil Be 6/8 - Ce 6/8	
	52472	LokSound	Electric	Re 4/4 II	
	52473	LokSound	Electric	Taurus	
	52474	LokSound	Electric	Ae 6/6	
	52475	LokSound	Electric	ÖBB 1044	
	52476	LokSound	Diesel	V180 / BR118	
	52477	LokSound	Steam	BR89 / T3	

LokSound - Here you have the choice

	Item	Artikel	Type	Description	Suitable for engine
NEW	52478	LokSound	Diesel	BR643 „Talent“	
NEW	52479	LokSound	Diesel	KEG 2100	
NEW	52480	LokSound	Diesel	MaK Vossloh G1200 Serie	
NEW	52481	LokSound	Diesel	VT 11.5 TEE „Gasturbine“	
NEW	52482	LokSound	Diesel	VT 12.5 „Stuttgarter Rössle“	
NEW	52483	LokSound	Electric	BR185 / SBB 482	
NEW	52484	LokSound	Electric	E101	
NEW	52485	LokSound	Electric	E141 / E41	
NEW	52486	LokSound	Electric	Eurosprinter	
NEW	52487	LokSound	Electric	ETA / ESA 176 „Limburger Zigarre“	
NEW	52499	LokSound	Steam	Universal 2/4 Zyl. Normal Gauge (Prototype: BR 64) with 21-pin mtc-Interface	
	72400	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with WABCO A-2	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72401	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with WABCO E-2	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72402	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with Leslie A-200	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72403	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with Leslie S3	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72404	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with Leslie S5	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72405	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with Nathan K3	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72406	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with Nathan M3	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
	72407	LokSound	Diesel	ALCO motor 244 12cyl. turbocharged with Nathan M5	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72408	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with WABCO A-2	PA-1/2; PB-1/2; RSD-7;
NEW	72409	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with WABCO E-2	PA-1/2; PB-1/2; RSD-7;
NEW	72410	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with Leslie A-200	PA-1/2; PB-1/2; RSD-7;
NEW	72411	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with Leslie S3	PA-1/2; PB-1/2; RSD-7;
NEW	72412	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with Leslie S5	PA-1/2; PB-1/2; RSD-7;
NEW	72413	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with Nathan K3	PA-1/2; PB-1/2; RSD-7;
NEW	72414	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with Nathan M3	PA-1/2; PB-1/2; RSD-7;
NEW	72415	LokSound	Diesel	ALCO motor 244 16cyl. turbocharged with Nathan M5	PA-1/2; PB-1/2; RSD-7;
NEW	72416	LokSound	Diesel	ALCO motor 251 12cyl. turbocharged with WABCO A-2	FPA-4; FPB-4; switchers
NEW	72417	LokSound	Diesel	ALCO motor 251 12cyl. turbocharged with WABCO E-2	FPA-4; FPB-4; switchers
NEW	72418	LokSound	Diesel	ALCO motor 251 12cyl. turbocharged with Leslie A-200	FPA-4; FPB-4; switchers
NEW	72419	LokSound	Diesel	ALCO motor 251 12cyl. turbocharged with 3Chime Airhorn	FPA-4; FPB-4; switchers
NEW	72420	LokSound	Diesel	ALCO motor 251 12cyl. turbocharged with 5chime Airhorn	FPA-4; FPB-4; switchers
NEW	72421	LokSound	Diesel	ALCO motor 251 16cyl. turbocharged	Diverse
NEW	72422	LokSound	Diesel	ALCO motor 251 6cylinder no turbo 3Chime Airhorn	Shunters
NEW	72423	LokSound	Diesel	EMD 201 8 cylinder without turbo 1-Chime Airhorn	Shunters(e.g. S-; N-Series), Diverse old streamliners
NEW	72424	LokSound	Diesel	EMD 201 12 cyl. without turbo 1-Chime Airhorn	switchers(e.g. SW-; NW; TR-Series), Diverse old streamliners and rare passenger locomotives
NEW	72425	LokSound	Diesel	EMD 201 12 cyl. no turbo 2-Chime Airhorn, d.b.	Canada: GMD1
NEW	72426	LokSound	Diesel	EMD 201 16 cyl. no turbo 2-Chime Airhorn, d.b.	Diverse old streamliners
	72427	LokSound	Diesel	EMD 567 16cyl. no turbo, 2Chime Airhorn	GP7, GP9, F2, F3, F7, F9
	72428	LokSound	Diesel	EMD 567 16cyl. no turbo, 1Chime Airhorn, d.b.	GP7, GP9, F2, F3, F7, F9
	72429	LokSound	Diesel	EMD 567 16cyl. without turbo, 2Chime Airhorn	GP7, GP11, FTA, FTB, FP7, FP9
	72430	LokSound	Diesel	EMD 567 16cyl. no turbo, 2Chime Airhorn, d.b.	GP7, GP11, FTA, FTB, FP7, FP9
	72431	LokSound	Diesel	EMD 567 16cyl. no turbo, 3Chime Airhorn	GP18, GP28
	72432	LokSound	Diesel	EMD 567 16cyl. no turbo, 3Chime Airhorn, d.b.	GP18, GP28, SD7, SD9, SD18
	72433	LokSound	Diesel	EMD 567 16cyl. turbo, 3Chime Airhorn	GP30, GP35, SD24, SD28, SD35
	72434	LokSound	Diesel	EMD 567 16cyl. turbo, 3Chime Airhorn, d.b.	GP30, GP35, GP20
	72435	LokSound	Diesel	EMD 567 16cyl. turbo, 5Chime Airhorn	SD24, SD28, SD35
	72436	LokSound	Diesel	EMD 567 16cyl. turbo, 5Chime Airhorn, d.b.	GP20
	72437	LokSound	Diesel	EMD 567 12cyl. turbo, 1Chime Airhorn, d.b.	E3, E4, E5, E6, E7, E8, E9
	72438	LokSound	Diesel	EMD 567 12cyl. turbo, 2Chime Airhorn, d.b.	E3, E4, E5, E6, E7, E8, E9
	72439	LokSound	Diesel	EMD 567 12cyl. turbo, 3Chime Airhorn, d.b.	E3, E4, E5, E6, E7, E8, E9
	72440	LokSound	Diesel	EMD 645 12cyl. turbo, d.b., 3Chime Airhorn	SD39, SDL39, GP39, GP39-2
NEW	72441	LokSound	Diesel	EMD 645 16cyl. turbo, d.b., 3Chime Airhorn	SD40, SDP40
NEW	72442	LokSound	Diesel	EMD 645 20cyl. turbo, d.b., 3Chime Airhorn	SD45, SDP45, FP45, F45,
NEW	72443	LokSound	Diesel	GE Cat. D17000 8cyl. 1Chime Airhorn	44 ton switcher
NEW	72444	LokSound	Diesel	GE CB FWL-6T, 6cylinder turbo, 1Chime Airhorn	70, 95 ton switcher
NEW	72445	LokSound	Diesel	GE FDL-16, 16 cylinder turbo, 2Chime Airhorn	U25, U28, U30, U33, U34, U36
NEW	72446	LokSound	Diesel	GE FDL-16, 16 cylinder turbo, 2Chime Airhorn, d.b.	U25, U28, U30, U33, U34, U36
NEW	72447	LokSound	Diesel	GE FDL-12, 12 cylinder turbo, 2Chime Airhorn	U23, U50,
NEW	72448	LokSound	Diesel	GE FDL-12, 12 cylinder turbo, 2Chime Airhorn, d.b.	U23, U50,
NEW	72449	LokSound	Diesel	Baldwin VO 6cyl. 1Chime Airhorn	switchers
NEW	72450	LokSound	Diesel	Baldwin VO 6cyl. 2Chime Airhorn	switchers
NEW	72451	LokSound	Diesel	Baldwin 606/606NA1Chime Airhorn	switchers
NEW	72452	LokSound	Diesel	Baldwin 606/606NA 2Chime Airhorn	switchers
NEW	72453	LokSound	Diesel	Baldwin 606SC/606A turbo, 1Chime Airhorn	switchers

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	Item	Artikel	Type	Description	Suitable for engine
NEW	72454	LokSound	Diesel	Baldwin 606SC/606A turbo, 2Chime Airhorn	switchers
NEW	72455	LokSound	Diesel	Fairbanks Morse 6cylinder with Airpipe	Rangierlok
NEW	72456	LokSound	Diesel	Fairbanks Morse 8cyl. with 1Chime Airhorn	switchers
NEW	72457	LokSound	Diesel	Fairbanks Morse 8cyl. with 2Chime Airhorn	switchers
NEW	72458	LokSound	Diesel	Fairbanks Morse 10cylinder with 2Chime Airhorn	switchers
NEW	72459	LokSound	Diesel	Fairbanks Morse 12cyl.s with 2Chime Airhorn	switchers
NEW	72460	LokSound	Diesel	Fairbanks Morse H24-66 Trainmaster	H24-66 Trainmaster
NEW	72461	LokSound	Diesel	Galloping Goose	Galloping Goose
	72462	LokSound	Diesel	GE 7FDL12, 12cyl. turbo, d.b., nathan 3Chime Airhorn	Dash 7, B23-7, BQ23-7, Dash 8, B32-8, C32-8, C36-8, C39-8.
	72463	LokSound	Diesel	GE 7FDL12, 12cyl. turbo, d.b., nathan 5Chime Airhorn	Dash 7, B23-7, BQ23-7, Dash 8, B32-8, C32-8, C36-8, C39-8.
	72464	LokSound	Diesel	GE 7FDL12, 12cyl. turbo, d.b., Leslie 3Chime Airhorn	Dash 7, B23-7, BQ23-7, Dash 8, B32-8, C32-8, C36-8, C39-8.
	72465	LokSound	Diesel	GE 7FDL12, 12cyl. turbo, d.b., Leslie 5Chime Airhorn	Dash 7, B23-7, BQ23-7, Dash 8, B32-8, C32-8, C36-8, C39-8.
	72466	LokSound	Diesel	GE 7FDL16, 16cyl. turbo, d.b.,nathan 3Chime Airhorn	Dash 7, B30-7, B36-7, Dash-8, B36-8, B39-8, Dash8-40, Dash8-44, Super 7, C30-7, C36-7, Dash9-40, Dash9-44, AC4400CW, P23, P42,
	72467	LokSound	Diesel	GE 7FDL16, 16cyl. turbo, d.b.,nathan 5Chime Airhorn	Dash 7, B30-7, B36-7, Dash-8, B36-8, B39-8, Dash8-40, Dash8-44, Super 7, C30-7, C36-7, Dash9-40, Dash9-44, AC4400CW, P23, P42,
	72468	LokSound	Diesel	GE 7FDL16, 16cyl. turbo, d.b., Leslie 3Chime Airhorn	Dash 7, B30-7, B36-7, Dash-8, B36-8, B39-8, Dash8-40, Dash8-44, Super 7, C30-7, C36-7, Dash9-40, Dash9-44, AC4400CW, P23, P42,
	72469	LokSound	Diesel	GE 7FDL16, 16cyl. turbo, d.b., Leslie 5Chime Airhorn	Dash 7, B30-7, B36-7, Dash-8, B36-8, B39-8, Dash8-40, Dash8-44, Super 7, C30-7, C36-7, Dash9-40, Dash9-44, AC4400CW, P23, P42,
NEW	72470	LokSound	Diesel	GE 7FDL16A, 16cyl. turbo, d.b.,nathan 3Chime Airhorn	AC6000CW
NEW	72471	LokSound	Diesel	GE 7FDL16A, 16cyl. turbo, d.b.,nathan 5Chime Airhorn	AC6000CW
NEW	72472	LokSound	Diesel	GE 7FDL16A, 16cyl. turbo, d.b.,Leslie 3Chime Airhorn	AC6000CW
NEW	72473	LokSound	Diesel	GE 7FDL16A, 16cyl. turbo,d.b.,Leslie 5Chime Airhorn	AC6000CW
NEW	72474	LokSound	Diesel	EMD 8-645E 8cyl. d.b., nathan 3Chime Airhorn	SW1000/1001, MP15T, GP15T
NEW	72475	LokSound	Diesel	EMD 8-645E 8cyl. d.b., nathan 5Chime Airhorn	SW1000/1001, MP15T, GP15T
NEW	72476	LokSound	Diesel	EMD 8-645E 8cyl. d.b., Leslie 3Chime Airhorn	SW1000/1001, MP15T, GP15T
NEW	72477	LokSound	Diesel	EMD 8-645E 8cyl. d.b., Leslie 5Chime Airhorn	SW1000/1001, MP15T, GP15T
	72478	LokSound	Diesel	EMD 12-645E 12cyl. d.b., nathan 3Chime Airhorn	SW1500/1504, MP15DC, MP15AC, GP15AC, GP15-1, GP39-2, GP39X, GP49, SDL39
	72479	LokSound	Diesel	EMD 12-645E 12cyl. d.b., nathan 5Chime Airhorn	SW1500/1504, MP15DC, MP15AC, GP15AC, GP15-1, GP39-2, GP39X, GP49, SDL39
	72480	LokSound	Diesel	EMD 12-645E 12cyl. d.b., Leslie 3Chime Airhorn	SW1500/1504, MP15DC, MP15AC, GP15AC, GP15-1, GP39-2, GP39X, GP49, SDL39
	72481	LokSound	Diesel	EMD 12-645E 12cyl. d.b., Leslie 5Chime Airhorn	SW1500/1504, MP15DC, MP15AC, GP15AC, GP15-1, GP39-2, GP39X, GP49, SDL39
	72482	LokSound	Diesel	EMD 16-645E 16cyl. d.b., nathan 3Chime Airhorn	BL20-2, GP38, GP38-2, SD38, SD38-2, F40PH, F40PH-2,
	72483	LokSound	Diesel	EMD 16-645E 16cyl. d.b., nathan 5Chime Airhorn	BL20-2, GP38, GP38-2, SD38, SD38-2, F40PH, F40PH-2,
	72484	LokSound	Diesel	EMD 16-645E 16cyl. d.b., Leslie 3Chime Airhorn	BL20-2, GP38, GP38-2, SD38, SD38-2, F40PH, F40PH-2,
	72485	LokSound	Diesel	EMD 16-645E 16cyl. d.b., Leslie 5Chime Airhorn	BL20-2, GP38, GP38-2, SD38, SD38-2, F40PH, F40PH-2,
	72486	LokSound	Diesel	EMD 16-645F 16cyl. turbo, d.b., nathan 3Chime Airhorn	GP39-X, GP40, GP40X, GP40-2, GP40-2L, GP40P-2, GP50, SD40X, SD40, SD40-2, SD40T-2, SD40-2SS, SD40-2F, SDP40F, F40, SD50S, SD50, SD50F
	72487	LokSound	Diesel	EMD 16-645F 16cyl. turbo, d.b., nathan 5Chime Airhorn	GP39-X, GP40, GP40X, GP40-2, GP40-2L, GP40P-2, GP50, SD40X, SD40, SD40-2, SD40T-2, SD40-2SS, SD40-2F, SDP40F, F40, SD50S, SD50, SD50F
	72488	LokSound	Diesel	EMD 16-645F 16cyl. turbo, d.b., Leslie 3Chime Airhorn	GP39-X, GP40, GP40X, GP40-2, GP40-2L, GP40P-2, GP50, SD40X, SD40, SD40-2, SD40T-2, SD40-2SS, SD40-2F, SDP40F, F40, SD50S, SD50, SD50F
	72489	LokSound	Diesel	EMD 16-645F 16cyl. turbo, d.b., Leslie 5Chime Airhorn	GP39-X, GP40, GP40X, GP40-2, GP40-2L, GP40P-2, GP50, SD40X, SD40, SD40-2, SD40T-2, SD40-2SS, SD40-2F, SDP40F, F40, SD50S, SD50, SD50F
NEW	72490	LokSound	Diesel	EMD 20-645E 20cyl. turbo, d.b., nathan 3Chime Airhorn	SD45-2, SD45T-2
NEW	72491	LokSound	Diesel	EMD 20-645E 20cyl. turbo, d.b., nathan 5Chime Airhorn	SD45-2, SD45T-2
NEW	72492	LokSound	Diesel	EMD 20-645E 20cyl. turbo, d.b., Leslie 3Chime Airhorn	SD45-2, SD45T-2
NEW	72493	LokSound	Diesel	EMD 20-645E 20cyl. turbo, d.b., Leslie 5Chime Airhorn	SD45-2, SD45T-2
NEW	72494	LokSound	Diesel	ALCO 539 6cylinder 1Chime Airhorn	Rangierloks (RS-Series, S-Series)
NEW	72495	LokSound	Diesel	ALCO 539 6cylinder 2Chime Airhorn	Rangierloks (RS-Series, S-Series)
NEW	82400	LokSound	Diesel	EMD 12-710GB 12cyl. turbo, d.b., nathan 3Chime Airhorn	GP59, F59PH, F59PHI, DE30AC
NEW	82401	LokSound	Diesel	EMD 12-710GB 12cyl. turbo, d.b., nathan 5Chime Airhorn	GP59, F59PH, F59PHI, DE30AC
NEW	82402	LokSound	Diesel	EMD 12-710GB 12cyl. turbo, d.b., Leslie 3Chime Airhorn	GP59, F59PH, F59PHI, DE30AC
NEW	82403	LokSound	Diesel	EMD 12-710GB 12cyl. turbo, d.b., Leslie 5Chime Airhorn	GP59, F59PH, F59PHI, DE30AC

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	Item	Artikel	Type	Description	Suitable for engine
	82404	LokSound	Diesel	EMD 16-710GB 16cyl. turbo, d.b., nathan 3Chime Airhorn	GP60, GP60M, GP60B, SD60, SD60F, SD60M, SD60I, SD75M, SD75I
	82405	LokSound	Diesel	EMD 16-710GB 16cyl. turbo, d.b., nathan 5Chime Airhorn	GP60, GP60M, GP60B, SD60, SD60F, SD60M, SD60I, SD75M, SD75I
	82406	LokSound	Diesel	EMD 16-710GB 16cyl. turbo, d.b., Leslie 3Chime Airhorn	GP60, GP60M, GP60B, SD60, SD60F, SD60M, SD60I, SD75M, SD75I
	82407	LokSound	Diesel	EMD 16-710GB 16cyl. turbo, d.b., Leslie 5Chime Airhorn	GP60, GP60M, GP60B, SD60, SD60F, SD60M, SD60I, SD75M, SD75I
	82408	LokSound	Diesel	EMD 16-710GB 16cyl. turbo, d.b., nathan 3Chime Airhorn	SD70, SD70I, SD70M, SD60MAC, SD70MAC, SD90MAC
	82409	LokSound	Diesel	EMD 16-710GB 16cyl. turbo,d.b.,nathan 5Chime Airhorn	SD70, SD70I, SD70M, SD60MAC, SD70MAC, SD90MAC
	82410	LokSound	Diesel	EMD 16-710GB 16cyl. turbo,d.b.,Leslie 3Chime Airhorn	SD70, SD70I, SD70M, SD60MAC, SD70MAC, SD90MAC
	82411	LokSound	Diesel	EMD 16-710GB 16cyl. turbo,d.b.,Leslie 5Chime Airhorn	SD70, SD70I, SD70M, SD60MAC, SD70MAC, SD90MAC
NEW	82412	LokSound	Diesel	EMD 20-710GB 20cyl. turbo,d.b.,nathan 3Chime Airhorn	SD80MAC
NEW	82413	LokSound	Diesel	EMD 20-710GB 20cyl. turbo,d.b.,nathan 5Chime Airhorn	SD80MAC
NEW	82414	LokSound	Diesel	EMD 20-710GB 20cyl. turbo,d.b., Leslie 3Chime Airhorn	SD80MAC
NEW	82415	LokSound	Diesel	EMD 20-710GB 20cyl. turbo, d.b., Leslie 5Chime Airhorn	SD80MAC
NEW	82416	LokSound	Diesel	EMD 16-265H 16cyl. turbo, d.b., nathan 3Chime Airhorn	SD90MAC-H, SD90MAC-H11, SD89MAC
NEW	82417	LokSound	Diesel	EMD 16-265H 16cyl. turbo, d.b., nathan 5Chime Airhorn	SD90MAC-H, SD90MAC-H11, SD89MAC
NEW	82418	LokSound	Diesel	EMD 16-265H 16cyl. turbo, d.b., Leslie 3Chime Airhorn	SD90MAC-H, SD90MAC-H11, SD89MAC
NEW	82419	LokSound	Diesel	EMD 16-265H 16cyl. turbo, d.b., Leslie 5Chime Airhorn	SD90MAC-H, SD90MAC-H11, SD89MAC
	82420	LokSound	Diesel	EMD JT42CWR (Class66)	Class66, gibt es noch nicht in USA
NEW	82450	LokSound	Steam	SHAY	Shay
NEW	82451	LokSound	Steam	Heissler	Heissler
NEW	82452	LokSound	Steam	Mogul	Mogul
NEW	82453	LokSound	Steam	Climax	Climax
	82454	LokSound	Steam	Big Boy	Big Boy
	82455	LokSound	Steam	Mikado	Mikado
NEW	82456	LokSound	Steam	2-6-2 Tank	2-6-2
NEW	82457	LokSound	Steam	0-6-0	0-6-0
NEW	82458	LokSound	Steam	4-4-0 American	4-4-0 American
	82459	LokSound	Steam	4-8-4 Class J	4-8-4 Class J
NEW	82460	LokSound	Steam	2-8-0 Consolidation	2-8-0 Consolidation
NEW	82461	LokSound	Steam	4-6-0	4-6-0
NEW	82462	LokSound	Steam	2-6-6-2 Articulated	2-6-6-2- Articulated
NEW	82463	LokSound	Steam	4-6-6-4 Challenger	4-6-6-4 Challenger
NEW	82464	LokSound	Steam	2-8-8-2	2-8-8-2
NEW	82465	LokSound	Steam	2-8-2	2-8-2
NEW	82466	LokSound	Steam	2-6-0	2-6-0
NEW	82467	LokSound	Steam	4-8-2	PA M1B_M1A
NEW	82468	LokSound	Steam	2-10-0	2-10-0
	82469	LokSound	Electric	Pennsylvania GG-1	GG-1

LokSound micro

LokSound micro – Premiere in N gauge

LokSound micro

The LoSound micro is the latest newcomer to the successful LokSound family. With measurements of only 28 mm x 10mm x 5mm (1.1 x .4 x .2 inch) it is small enough to fit into gauge N and TT rolling stock. Still you get all the features: The LokSound micro incorporates a complete Digital decoder, which, besides DCC and Motorola®, also understands Selectrix®. Beside the two light outputs, we were even able to integrate a sound-section, equal to that of its bigger brothers, and two user selectable function outputs.

The LokSound micro will be shipped with a 6 wire harness and a NEM651 compatible interface, together with a new 16 x 25 mm (0.6 x 1.0 inch) speaker.

Operational modes

The LokSound micro handles DCC, Motorola® and Selectrix®. In DCC mode it will operate with 14, 28 or 128 speed steps. The decoder recognizes the speed step number automatically. It supports Lenz® LG 100, respectively Roco® braking sections as well as braking in DC sections with reversed polarity, or the Märklin® braking section. You can either use a short address (0 – 127), or a long address (1 – 9999), or assign a consist address. The Motorola® protocol enables the LokSound micro decoder to operate with Märklin® stations 6020, 6021, delta®, mobile station® and central station®. The decoder handles addresses 01 – 80, and stops correctly on the Märklin® braking-section. On Selectrix®-layouts you may use all 112 addresses. During operation, the LokSound micro decoder converts fully automatically between all control modes (Motorola®, DCC, Selectrix®, DC).

Motor management

DC or coreless motors (Faulhaber®, Maxon®) can be connected to the 0,5A steady-current, last stage. The load control (back EMF) with 32 kHz High frequency regulation guarantees silky smooth, absolutely quiet motor operation and lets your engines crawl super slowly on the layout. With Dynamic Drive Control (DDC) you can curb the influence of the load control and operate smoothly and steadily around the depot area and over turnouts, while on the (fast) main, going uphill, the loco slows down prototypically.

Sound

The LokSound micro decoder stores up to 65 seconds of sound data in its 8 MBit flash-chip. This is transferred to the last stage audio amplifier via four polyphonic sound channels. Load dependent strain (de-selectable) is as self-evident as Doppler-effect, as is separate volume adjustment for the different channels.

Analog operation

Back EMF as well as the sound feature is fully serviceable in Analog mode.

Functions

The LokSound micro sports four 180 mA steady-current function outputs, which can be allocated individually to a function. They are dimmable in 15 steps. Beside beacon, strobe and alternate flashing, there is simulated firebox flicker, as well as Mars light or Gyra light. Each function output can be allocated to any function key between F0 and F15 (mapping). The combination of sound and light functions makes it possible to simulate realistic function events, such as firebox flicker when shoveling coal.

Programming

The LokSound micro supports all DCC-programming modes. All adjustments are done electronically. This applies even to the Märklin® Central station 6020, 6021, mobile station® and central station®. For these units, the LokSound micro decoder employs a proven procedure that's easily mastered. All programmed changes during Motorola®-operation are valid with DCC and Selectrix®, and vise verse.

The programming of configuration variables (CV's) is especially comfortable for owners of our ECoS command station: All variations are displayed in plain language on the large screen and can easily be altered – even during operation on the layout!

Safeguard

All function outputs and the motor output are protected against overload and short circuits. We want you to enjoy your LokSound micro decoder for a long time.

Built-in future

LokSound micro decoders are firmware updatable. This means, the interne decoder software can be brought up to new versions, if necessary.

Variety of sound

If the assortment of 14 factory-delivered sounds doesn't appeal to you (see table on page 19), you can always revert to LokSound V3.5 sounds – an option that offers you over 200 (!) sounds for your LokSound micro.

LokSound micro - Here you have the choice

Item	Artikel	Type	Description
52801	LokSound micro	Steam	Universal 2 Zyl. Narrow gauge (Prototype: BR 99)
52802	LokSound micro	Steam	Univers. 3 Zyl. Normal gauge (Prototype: BR 44, Belg. 25.021)
52803	LokSound micro	Steam	Universal 2/4 Zyl. Normal gauge (Prototype: BR 64)
52819	LokSound micro	Steam	BR18 201
52833	LokSound micro	Diesel	Universal Diesel (Prototype: BR 218)
52836	LokSound micro	Diesel	Universal US-Diesel (Prototype:F 7)
52838	LokSound micro	Diesel	Nohab
52842	LokSound micro	Diesel	BR 232 „Ludmilla“
52846	LokSound micro	Diesel	V200 / BR220
52850	LokSound micro	Diesel	Triebwagen SVT137 / VT08
52859	LokSound micro	Diesel	V 120 DR „Taigatrommel“
52861	LokSound micro	Electric	Universal „old style“ Electric (Prototype: E40)
52873	LokSound micro	Electric	Taurus
52876	LokSound micro	Diesel	V180 / BR118

Technical Data LokSound micro

Operational modes:

NMRA/DCC with 14, 28, 128 speed steps
2 digit + 4 digit addresses
Motorola® with 14 or 28 speed steps (no Analog AC !).
Selectrix® system
Analog DC (de-selectable)
Automatic recognition of operational mode and DCC speed step selection
Supports Lenz® LG 100, Märklin®, Roco® braking sections
Wrong-direction bit
Storage of operational status (Memory)
Intelligent programming mode with Märklin® 6021

Throttle:

0.5 A continuous load
Runs DC-, coreless - and AC motors (auto detect)
Silent, safe 32 kHz Pulse width frequency motor regulation
Overload protection of motor output
Fourth generation back EMF, de-selectable

Function outputs:

4 outputs, 2 of which for light functions
180 mA load per output
Ca.350 mA total load of all function outputs
Free function allocation (function mapping), F0 - F20 possible
Outputs short circuit protected

Sound Features:

4 (!) independent Sound channels
High performance Bridge Tie Load Amplifier, ca. 0,5 Watt
Sound data in memory changeable
Modes for Steam engines, Diesel hydraulic locos, Diesel electrical locos, Electro locos
8 MBit Storage capacity (up to 65 sec's)

Loudspeaker:

Special high-quality speaker, 16 x 25 mm (.6 x 1.0 in) included

Dimensions in mm:

28,5 x 10 x 5

LokSoundXL V3.5: Big sound for big engines

LokSoundXL

The name tells it all: The LokSoundXL is intended for the big locos of gauge G and I. It works with DCC – or Märklin®-Motorola systems, as well as with LGB®-MTS®'s typical domino sequencing set up for the function keys. The LokSoundXL V3.5 size 51 x 40 mm, (2,04 x 1,6 in) fits in all locos of these gauges, and is shipped with a robust screw terminal connection for easy installation.

Operational modes

The LokSoundXL V3.5 handles DCC and Motorola®. In DCC mode it will operate with 14, 28 or 128 speed steps. The decoder recognizes the speed step number automatically. It supports Lenz® LG 100, respectively Roco® braking sections, as well as braking in DC-Sections with reversed polarity, or the Märklin® braking section (even in DCC operation). You can either use a two digit (1 – 127) or a four digit address (1 – 9999), or assign a consist address. The Motorola® protocol makes it possible to run the LokSound decoder with Märklin® stations 6020, 6021, delta®, mobile station® and central station®. The decoder commands hereby addresses 1 – 80, and stops correctly on the Märklin® braking section.

During operation, the LokSoundXL V3.5 decoder converts automatically between all control modes (Motorola®, DCC, AC, DC).

Motor management

The powerful output stage (3.0A continuous-current) will run models with even two prime movers. All known DC- and coreless motors (e.g. Mabuchi®, Bühler®, Faulhaber® or Maxon®) can be used. The load control (back EMF) with 32 kHz High frequency regulation takes care of a silky smooth, absolutely silent motor operation, and lets your engines crawl super slowly on the layout.

A 10-bit A/D converter makes this possible. With Dynamic Drive Control (DDC) you can limit the influence of load control and operate really smoothly in the depot area and over turnouts; while on the (fast) main, when going uphill, the engine slows prototypically down.

Sound

The LokSoundXL V3.5 decoder stores up to 65 seconds of sound data in its 8 MBit flash chip. This is transferred to a 1.5 Watt, last stage high performance bridge tied amplifier via four polyphonic sound channels. Together with our ESU Loudspeakers (16 – 32 Ohm) or Hi-Fi loudspeakers (8 – 16 Ohm), your engines will really sound their best in the future. Load dependent strain (de-selectable) is as much taken for granted, as Doppler effect, or separate volume adjustment for each of the channels.

Analog operation

Back EMF as well as the sound of the LokSoundXL V3.5 decoder is fully serviceable in Analog mode.

Functions

From experience it is known that there is much to switch in big locos. That's why we provided for eight (!) function outputs. Each output can be allocated to a function: Besides beacon, strobe and alternate flashing, there is firebox flicker simulation, as well as Mars light or Gyra light for US models. All function outputs are individually dimmable in 15 steps. Each function output can be allocated to any function key between F0 and F15 (mapping). Furthermore the combination of sound – and function sequences makes it possible to simulate realistic function events, such as firebox flicker when shoveling coal.

Programming

The LokSoundXL decoder supports all DCC-programming modes. All adjustments are done electronically. This applies even when working with Märklin® center stations 6020, 6021, mobile station® and central station®. For these units, the LokSoundXL decoder employs a proven, easily acquired programming procedure. All programmed changes during Motorola® operation are valid with DCC – and vice verse.

Programming configuration variables (CV's) is especially simple for owners of our ECoS Command Station: All modifications are displayed in plain words on the large screen and can easily be altered – even during operation on the layout.

Safeguard

All function outputs and the motor connection are protected against overload and short circuit. We'd like you to enjoy your LokSoundXL decoder as long as possible.

Built-in future

LokSoundXL decoders are firmware updatable. This means, the internal decoder software can be replaced by new versions, if necessary. To do this, you only need an ESU LokProgrammer and a PC. You will appreciate the value of this investment, when you realize that any owner of a LokSoundXL V3.0 decoder can, through an update turn it into a LokSoundXL V3.5 decoder: You can download the software from our homepage – free of charge.

Variety of Sound

ESU, as market and technology leader in the realm of sound, takes your demands for sound realism very seriously. That's why we offer over 100 (!) sound variants just for the LokSoundXL V3.5 !

An exact overview of all available sounds can be found in the table on page 21.

When you purchase a sound module of a certain prototype from us, be assured the sound comes from that loco. Guaranteed. You can count on it.

Technical Data LokSoundXL V3.5:

Operational modes:

NMRA/DCC with 14, 28, 128 speed steps
2 digit+4 digit addresses
Digital Motorol®a (old and new)
Analog DC (de-selectable)
Analog AC (de-selectable)
Automatic recognition of operational mode, and DCC speed-step selection
Supports Lenz® LG 100, Märklin®, Roco® braking sections
Wrong-direction bit
Stores operational status (Memory)
Intelligent programming mode with Märklin® 6021

Throttle:

3.0 A Continuous load
Runs DC-, coreless – and AC motors (auto detect)
Silent, safe, 32 kHz pulse width frequency motor regulation
Motor output overload protection
Load control (back EMF), (de-selectable)

Function outputs:

8 outputs, 2 of which for light functions
600 mA load per output
Total load of all function outputs 2.0 A
Free function allocation (function mapping) F0 – F15 (V 3.5 F0 – F20)
Outputs short-circuit protected

Sound features:

4 (!) independent sound channels
High performance bridge-tied load amplifier, ca. 1.5 Watt, low-distortion., sound data in memory unit changeable
Modes for Steam engines, Diesel hydraulic locos, Diesel electric locos, Electro-locos.
8 MBit Storage capacity (up to 65 seconds)

Loudspeaker:

Not included

Dimensions:

51 x 40 x 14 mm (2.04 x 1.6 x 0.56 inch)

LokSoundXL - Here you have the choice

	Item	Artikel	Type	Description
	52501	LokSoundXL	Steam	Universal 2 Zl. Narrow gauge (Prototype: BR 99)
	52502	LokSoundXL	Steam	Universal 3 Zyl. Normal gauge (Prototype: BR 44, Belg. 25.021)
	52503	LokSoundXL	Steam	Universal 2/4 Zyl. Vollspur (Prototype: BR 01)
	52504	LokSoundXL	Steam	BR 38, P8
	52505	LokSoundXL	Steam	BR 18, S 3/6
	52507	LokSoundXL	Steam	BR 03
	52510	LokSoundXL	Steam	BR 50, NMBS-SNCB type 25
	52512	LokSoundXL	Steam	Universal US-Dampf (BigBoy, Santa Fe)
	52513	LokSoundXL	Steam	BR 80
	52514	LokSoundXL	Steam	BR 91
	52520	LokSoundXL	Steam	BR 55, NMBS-SNCB type 81
	52522	LokSoundXL	Steam	BR 78
	52523	LokSoundXL	Steam	US-Shay
	52524	LokSoundXL	Steam	US-Heissler
	52525	LokSoundXL	Steam	US-Mogul
	52526	LokSoundXL	Steam	Sächs. IV K
NEW	52529	LokSoundXL	Steam	BR86
	52530	LokSoundXL	Diesel	V36
	52531	LokSoundXL	Diesel	V60/ BR260

LokSoundXL - Here you have the choice

	Item	Artikel	Type	Description	For engine
	52532	LokSoundXL	Diesel	V100 / BR212	
	52533	LokSoundXL	Diesel	Universal Diesel (Prototype: BR 218)	
	52534	LokSoundXL	Diesel	Köf	
	52536	LokSoundXL	Diesel	Universal US-Diesel (Prototype: Santa Fe, F7)	
	52546	LokSoundXL	Diesel	V200 / BR220	
	52560	LokSoundXL	Electric	E10 / BR110	
	52561	LokSoundXL	Electric	Universal „old style" Electric (Prototype: E40)	
	52563	LokSoundXL	Electric	E03 / BR103	
	52564	LokSoundXL	Electric	E94 / BR194	
	52566	LokSoundXL	Electric	E50 / BR150	
	52569	LokSoundXL	Electric	Räth. Krokodil	
	52570	LokSoundXL	Electric	E44	
	52571	LokSoundXL	Electric	GE 4/4	
	52572	LokSoundXL	Electric	Krokodil Be 6/8 - Ce 6/8	
NEW	72500	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with WABCO A-2	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72501	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with WABCO E-2	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72502	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with Leslie A-200	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72503	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with Leslie S3	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72504	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with Leslie S5	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72505	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with Nathan K3	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72506	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with Nathan M3	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72507	LokSoundXL	Diesel	ALCO motor 244 12Cyl. turbo with Nathan M5	FA-1/2; FPA-2; FB-1/2; FPB-2; switchers
NEW	72508	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbo with WABCO A-2	PA-1/2; PB-1/2; RSD-7;
NEW	72509	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbo with WABCO E-2	PA-1/2; PB-1/2; RSD-7;
NEW	72510	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbo with Leslie A-200	PA-1/2; PB-1/2; RSD-7;
NEW	72511	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbod with Leslie S3	PA-1/2; PB-1/2; RSD-7;
NEW	72512	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbo with Leslie S5	PA-1/2; PB-1/2; RSD-7;
NEW	72513	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbod with Nathan K3	PA-1/2; PB-1/2; RSD-7;
NEW	72514	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbo with Nathan M3	PA-1/2; PB-1/2; RSD-7;
NEW	72515	LokSoundXL	Diesel	ALCO motor 244 16Cyl. turbo with Nathan M5	PA-1/2; PB-1/2; RSD-7;
NEW	72527	LokSoundXL	Diesel	EMD 567 16Cyl. no turbo, 1Chime airhorn,	GP7, GP9, F2, F3, F7, F9
NEW	72528	LokSoundXL	Diesel	EMD 567 16Cyl. no turbo, 1Chime airhorn, d.b.	GP7, GP9, F2, F3, F7, F9
NEW	72529	LokSoundXL	Diesel	EMD 567 16Cyl. no turbo, 2Chime airhorn,	GP7, GP11, FTA, FTB, FP7, FP9
NEW	72530	LokSoundXL	Diesel	EMD 567 16Cyl. no turbo, 2Chime airhorn, d.b.	GP7, GP11, FTA, FTB, FP7, FP9
NEW	72531	LokSoundXL	Diesel	EMD 567 16Cyl. no turbo, 3Chime airhorn,	GP18, GP28
NEW	72532	LokSoundXL	Diesel	EMD 567 16Cyl. no turbo, 3Chime airhorn, d.b.	GP18, GP28, SD7, SD9, SD18
NEW	72533	LokSoundXL	Diesel	EMD 567 16Cyl. with turbo, 3Chime airhorn,	GP30, GP35, SD24, SD28, SD35
NEW	72534	LokSoundXL	Diesel	EMD 567 16Cyl. with turbo, 3Chime airhorn, d.b.	GP30, GP35, GP20
NEW	72535	LokSoundXL	Diesel	EMD 567 16Cyl. with turbo, 5Chime airhorn,	SD24, SD28, SD35
NEW	72536	LokSoundXL	Diesel	EMD 567 16Cyl. with turbod, 5Chime airhorn, d.b.	GP20
NEW	72537	LokSoundXL	Diesel	EMD 567 12Cyl. no turbo, 1Chime airhorn (d.b.)	E3, E4, E5, E6, E7, E8, E9
NEW	72538	LokSoundXL	Diesel	EMD 567 12Cyl. no turbo, 2Chime airhorn (d.b.)	E3, E4, E5, E6, E7, E8, E9
NEW	72541	LokSoundXL	Diesel	EMD 645 16Cyl., turbo, d.b. and 3Chime airhorn	SD40, SDP40
NEW	72542	LokSoundXL	Diesel	EMD 645 20Cyl., turbo, d.b. and 3Chime airhorn	SD45, SDP45, FP45, F45,
NEW	72543	LokSoundXL	Diesel	GE Cat. D17000 8Cyl., no turbo, 1Chime airhorn	44 ton switcher
NEW	72545	LokSoundXL	Diesel	GE FDL-16, 16Cyl.s, turbo, 2Chime airhorn	U25, U28, U30, U33, U34, U36
NEW	72546	LokSoundXL	Diesel	GE FDL-16, 16Cyl.s, turbo, 2Chime airhorn, d.b.	U25, U28, U30, U33, U34, U36
NEW	72566	LokSoundXL	Diesel	GE 7FDL16, 16Cyl.s, turbo, d.b., nathan 3Chime airhorn	Dash7, 8, 8-40, 8-44, 9-40, 9-44, B30-7, 36-7, 36-8, 39-8, Super7, C30-7, 36-7, AC4400CW, P23, 42,
NEW	72567	LokSoundXL	Diesel	GE 7FDL16, 16Cyl.s, turbo, d.b., nathan 5Chime airhorn	Dash7, 8, 8-40, 8-44, 9-40, 9-44, B30-7, 36-7, 36-8, 39-8, Super7, C30-7, 36-7, AC4400CW, P23, 42,
NEW	72568	LokSoundXL	Diesel	GE 7FDL16, 16Cyl.s, turbo, d.b., Leslie 3Chime airhorn	Dash7, 8, 8-40, 8-44, 9-40, 9-44, B30-7, 36-7, 36-8, 39-8, Super7, C30-7, 36-7, AC4400CW, P23, 42,
NEW	72569	LokSoundXL	Diesel	GE 7FDL16, 16Cyl.s, turbo, d.b., Leslie 5Chime airhorn	Dash7, 8, 8-40, 8-44, 9-40, 9-44, B30-7, 36-7, 36-8, 39-8, Super7, C30-7, 36-7, AC4400CW, P23, 42,
NEW	72574	LokSoundXL	Diesel	EMD 8-645E 8Cyl., no turbo, d.b., nathan 3Chime airhorn	SW1000/1001, MP15T, GP15T
NEW	72575	LokSoundXL	Diesel	EMD 8-645E 8Cyl., no turbo, d.b., nathan 5Chime airhorn	SW1000/1001, MP15T, GP15T
NEW	72576	LokSoundXL	Diesel	EMD 8-645E 8Cyl., no turbo, d.b., Leslie 3Chime airhorn	SW1000/1001, MP15T, GP15T
NEW	72577	LokSoundXL	Diesel	EMD 8-645E 8Cyl., no turbo, d.b., Leslie 5Chime airhorn	SW1000/1001, MP15T, GP15T
NEW	72594	LokSoundXL	Diesel	ALCO 539 6Cyl., 1Chime airhorn, no turbo	Rangierlok (RS-Series, S-Series)
NEW	72595	LokSoundXL	Diesel	ALCO 539 6Cyl., 2Chime airhorn, no turbo	Rangierlok (RS-Series, S-Series)
NEW	82508	LokSoundXL	Diesel	EMD 16-710GB 16Cyl., turbo, d.b., nathan 3Chime airhorn	SD70, 70I, 70M, 60MAC, 70MAC, 90MAC
NEW	82509	LokSoundXL	Diesel	EMD 16-710GB 16Cyl., turbo, d.b., nathan 5Chime airhorn	SD70, 70I, 70M, 60MAC, 70MAC, 90MAC
NEW	82510	LokSoundXL	Diesel	EMD 16-710GB 16Cyl., turbo, d.b., Leslie 3Chime airhorn	SD70, 70I, 70M, 60MAC, 70MAC, 90MAC
NEW	82511	LokSoundXL	Diesel	EMD 16-710GB 16Cyl., turbo, d.b., Leslie 5Chime airhorn	SD70, 70I, 70M, 60MAC, 70MAC, 90MAC
NEW	82554	LokSoundXL	Steam	Dampflok Big Boy	Big Boy
NEW	82557	LokSoundXL	Steam	0-6-0	0-6-0
NEW	82558	LokSoundXL	Steam	4-4-0 American	4-4-0 American
NEW	82561	LokSoundXL	Steam	4-6-0	4-6-0
NEW	82564	LokSoundXL	Steam	2-8-8-2	2-8-8-2
NEW	82565	LokSoundXL	Steam	2-8-2	2-8-2
NEW	82566	LokSoundXL	Steam	2-6-0	2-6-0
NEW	82567	LokSoundXL	Steam	4-8-2	4-8-2
NEW	82569	LokSoundXL	Electric	Pennsylvania GG-1	GG-1

What you always wanted to know about mfx®

Märklin® systems is not just a simple expansion of an existing system, but a consequential, courageous step forward, offering not only unprecedented ease in the control of locos, turnouts and signals, but many more play-functions as well. The essential pre-requisite for this "new world" is the mfx®-data format, on which Märklin® systems is based. Behind it lies nothing less than the completely new development of a revolutionary Digital system with integrated feedback. The combination with suitable systems command centers results in fascinating possibilities for running trains.

Address: No more

The most important news: With mfx®, the punching in of loco addresses is a thing of the past. Simply call your locos by name!

There are no addresses in a mfx®-system, all locos fitted with a mfx-decoder register automatically at the command station! Right-way you'll see the engine's name on the display. This is "plug & play" at its best. Of course you can change the name anytime you wish and make a "Ludmilla" out of a "BR232", for example. Forget the old procedure of first searching for the address of each new loco in the manual.

Functions galore

Another thing of the past is the trial-and-error pushing of function buttons: "Gee, where did I put that Telex coupler?" On the mfx® station's display you see a symbol next to each key, corresponding to its function. Each mfx® decoder handles up to 16 functions. That's why mfx® stands for the utmost in play value. Think of sound – and light effects, control of couplers and pantographs and much, much more.

Ultra precise control

Each mfx®-decoder incorporates 128 steps for smooth acceleration. The motor is driven especially safely by high frequency power – ideal even for coreless motors.

Infinite number of locos

We are sure the number of your locos will increase heavily. That's why the mfx®-system allows you to operate up to 16384 locos, turnouts or signals – simultaneously! The total number is only limited by the command station.

Easy operation

In spite of the multitude of engines, you will easily stay in control at all times: At the command station you can comfortably change all parameters of an mfx®-decoder. Program the top-speed while running the loco! Forget the times when you had to open it to do so, or put it on a dedicated programming track. With mfx® you can program your loco's decoder on the main while running it independently of all other locos. This is made possible by the built-in feedback, which constitutes genuine Duplex communication between station and decoder.

Compatibility

Our mfx-®decoders were conceived especially for Märklin® rolling stock: LokPilot mfx and LokSound mfx are not only 100% compatible with systems, in addition they offer many more attractive functions. Convince yourself of the virtues of the two ESU decoders and treat your locos to the freedom of the "new world".

Simplicity

All ESU mfx®-decoders are being shipped with an 8-wire NEM interface and are therefore not only suitable for installation in Märklin® rolling stock; installation into locos with an interface is especially simple: Open the engine – remove dummy plug, plug in decoder – close up the engine – done!

LokSound mfx

LokSound mfx really brings your Locos to Life

LokSound mfx

As a convinced owner of Märklin®-systems, who puts emphasis on realistic operation, you can't pass up LokSound mfx.

Operational modes

The multi-protocol LokSound mfx decoder handles mfx® and Motorola®. You can use it with all past Märklin® stations, such as 6020, 6021 and delta®; or on analog AC layouts. The decoder supports addresses 1 – 80, and stops correctly on the Märklin® braking section. In combination with a mfx® station, it shows off all the mfx® advantages.

Motor management

The last stage output runs DC- or coreless motors. The field-winding of an all-current motor must be replaced by a permanent magnet (see page 44). The load control (back EMF) with 32 kHz High frequency regulation takes care of silky smooth, absolutely silent motor operation, and lets your engines crawl super-slowly on the layout.

Sound

The LokSound mfx decoder can replay all loco typical sounds. It can record up to 65 seconds of sound in its 8 MBit flash-chip. Besides load-dependant operational sound it can reproduce air – or water pumps, switching noise, brake squeal or other sound sequences. These are transferred via four polyphonic channels to the last stage audio amplifier.

Analog operation

The LokSound mfx also works (without sound) on analog AC layouts. Even starter – and top speed can be controlled. At last you can slow down your old high-speed locos.

Functions

The LokSound mfx decoder sports four function outputs, which can be allocated individually to a function, and are dimmable in 15 steps. Besides beacon, strobe and alternate flashing, there is simulated firebox flicker, as well as Mars light or Gyra light.

Programming

All parameters of the LokSound mfx decoder can be modified comfortably with the systems's stations, right during operation. The built-in genuine Duplex communication between systems's central unit and decoder makes this possible. For owners of 6020,-6021 – or delta® stations, the LokSound mfx decoder utilizes the time-proven, simple programming procedure.

Safeguard

All function outputs and the motor connection are overload, – and short circuit protected.

Built-in future

LokSound mfx decoders are firmware updatable: The interne decoder software can be replaced.

Variety of sound

ESU offers the LokSound mfx decoder in many different variations for your preferred prototype. All parameters are factory pre-adjusted (default), so that the screen of your mfx®-station not only displays the correct loco type, but also the function-status symbol.

Technical Data LokSound mfx:

Operational modes:

mfx® with 128 speed steps
Motorola® (old and new) with 14 or 28 speed steps
Analog AC (de-selectable)
Automatic recognition of operational mode
Supports Märklin® brake section
Wrong-direction bit
Stores operational status
Intelligent programming mode with Märklin® 6021

Throttle:

1.1 A continuous load
Runs DC-, coreless and AC motors (with Hamo-retrofit)
Silent, safe 32 kHz Pulse-width frequency regulation
Motor output overload protected
Fourth generation back EMF (de-selectable)

Function outputs:

4 outputs, 2 of which for light functions
250 mA load per output
Total current of all functions ca. 500 mA
Free function allocation (function mapping)
Outputs short-circuit protected

Sound features:

4 (!) independent sound channels
High Performance bridge-tied amplifier, ca. 0.6 Watt
Sound data in memory chip changeable
Modes for Steam engines, Diesel hydraulic locos, Diesel electric locos, Electro locos.
8 MBit storage capacity (up to 65 seconds)

Loudspeaker:

High-quality loudspeaker, 23mm,(.92 in.) included

Dimensions:

31 x 15.5 x 6.5 mm (1.24 x 0.62 x 0.26 inch)

LokSound mfx - Here you have the choice

	Item	Artikel	Type	Description
	62401	Loksound mfx	Steam	Universal 2 Zyl. Narrow Gauge (Prototype: BR 99)
	62402	Loksound mfx	Steam	Univers. 3 Zyl. Normal Gauge (Prototype: BR 44, Belg. 25.021)
	62403	Loksound mfx	Steam	Universal 2/4 Zyl. Normal Gauge(Prototype: BR 64)
	62404	Loksound mfx	Steam	BR 38, P8
	62405	Loksound mfx	Steam	BR 18, S 3/6
	62406	Loksound mfx	Steam	BR 01
	62407	Loksound mfx	Steam	BR 03
	62408	Loksound mfx	Steam	BR 23
	62410	Loksound mfx	Steam	BR 50, NMBS-SNCB type 25
	62411	Loksound mfx	Steam	Universal US-Steam (Prototype: Big Boy, Mikado)
	62412	Loksound mfx	Steam	Tenweeler, Mountain, Hudson
	62413	Loksound mfx	Steam	BR 80
	62419	Loksound mfx	Steam	18 201
	62420	Loksound mfx	Steam	BR 55, NMBS-SNCB type 81
	62422	Loksound mfx	Steam	BR 78
	62423	Loksound mfx	Steam	BR 93
	62425	Loksound mfx	Steam	BR 41
	62426	Loksound mfx	Steam	BR 01.10 Öl
NEW	62427	Loksound mfx	Steam	BR03.10 Öl
NEW	62428	Loksound mfx	Steam	BR44 Öl
NEW	62429	Loksound mfx	Steam	BR86
	62430	Loksound mfx	Steam	V36
	62431	Loksound mfx	Steam	V60 / BR260
	62432	Loksound mfx	Steam	V100 / BR212
	62433	Loksound mfx	Diesel	Universal Diesel (Prototype: BR 218)
	62434	Loksound mfx	Diesel	Belgian Bombardier Diesel engine
	62436	Loksound mfx	Diesel	Universal US-Diesel (Prototype:F 7)
	62438	Loksound mfx	Diesel	Nohab
	62439	Loksound mfx	Diesel	VT 11.5, Lyntog
	62440	Loksound mfx	Diesel	VT 18 / SVT 18.16
	62441	Loksound mfx	Diesel	VT 628
	62442	Loksound mfx	Diesel	BR 232 „Ludmilla“
	62444	Loksound mfx	Diesel	PA-1
	62445	Loksound mfx	Diesel	Renfe D319
	62446	Loksound mfx	Diesel	V200 / BR220
	62450	Loksound mfx	Diesel	VT 08 / SVT 137
	62451	Loksound mfx	Diesel	VT 610
	62452	Loksound mfx	Diesel	VT 650
	62454	Loksound mfx	Diesel	VT 98 „Schienenbus“
	62456	Loksound mfx	Diesel	ÖBB 2016
	62457	Loksound mfx	Diesel	SNCF 68000
	62458	Loksound mfx	Diesel	Adtranz „Blue Tiger“
	62459	Loksound mfx	Diesel	V 120 DR „Taigatrommel“
	62461	Loksound mfx	Electric	Universal „old style“ Electric engine (Prototype: E40)
	62462	Loksound mfx	Electric	E 75
	62463	Loksound mfx	Electric	E03 / BR103
	62464	Loksound mfx	Electric	E94 / BR194
	62465	Loksound mfx	Electric	E 120
	62466	Loksound mfx	Electric	E50 / BR150
	62467	Loksound mfx	Electric	ICE
	62468	Loksound mfx	Electric	Universal „Modern style“ Electric engine (Prototype: Re 460)
	62469	Loksound mfx	Electric	BR143
	62470	Loksound mfx	Electric	E 44
	62471	Loksound mfx	Electric	Krokodil Be 6/8 - Ce 6/8
	62472	Loksound mfx	Electric	Re 4/4 II
	62473	Loksound mfx	Electric	Taurus
	62474	Loksound mfx	Electric	Ae 6/6
	62475	Loksound mfx	Electric	ÖBB 1044
NEW	62477	Loksound mfx	Steam	BR89/T3
NEW	62478	Loksound mfx	Diesel	BR643 „Talent“
NEW	62479	Loksound mfx	Diesel	KEG 2100
NEW	62480	Loksound mfx	Diesel	MaK Vossloh G1200 Serie
NEW	62481	Loksound mfx	Diesel	VT 11.5 TEE „Gasturbine“
NEW	62482	Loksound mfx	Diesel	VT 12.5 „Stuttgarter Rössle“
NEW	62483	Loksound mfx	Electric	BR185 / SBB 482
NEW	62484	Loksound mfx	Electric	E101
NEW	62485	Loksound mfx	Electric	E141 / E41
NEW	62486	Loksound mfx	Electric	Eurosprinter
NEW	62487	LokSound mfx	Electric	ETA / ESA 176 „Limburger Zigarre“
NEW	62499	Loksound mfx	Steam	Universal 2/4 Zyl. Normal Gauge (Prototype: BR 64) with 21-pin mtc-connector

Loudspeakers

Loudspeakers for great Sound

The loudspeaker is an important part of the LokSound system. Therefore, we utilize only especially developed high performance loudspeakers, which match the characteristics of the sound decoder. Here, the old saying is true: The bigger the speaker, the better the sound. That's why we offer speakers in various sizes. One of them will surely fit into your engine.

Should the occasion arise that there is not enough room; the speaker can be fitted into a "ghost car", directly behind the loco. An essential accessory is the sound chamber, since it provides the necessary acoustic back pressure to the speaker membrane. It comes with most loudspeakers.

For LokSound V3.5, LokSound micro and LokSound mfx decoders we offer our loudspeakers in these sizes: 13 mm (.5"), 16 mm (.64"), 16 x 25 mm (.64" x 1"), 20 mm (.8"), 23 mm (.92"), 28 mm (1.12"), 20 x 40 mm (.8" x 1.6"), and 40 mm (1.6"). By virtue of the internal design of the decoders, the speakers feature a specially customized impedance of 100 Ohms. Only these speakers may be used.

For the LokSound XL we offer loudspeakers with 16, resp. 32 Ohms impedance, in the sizes 40 mm (1.6"), 57 mm (2.28"), and 78 mm (3.9"); including sound chamber. The LokSound XL decoder works with all loudspeakers with an impedance of between 8 and 32 Ohms.

Loudspeakers for LokSound micro, LokSound V3.5, LokSound mfx:

NEW	50339	Loudspeaker 13mm, 100 Ohms, without sound chamber
	50447	Two Loudspeaker 16mm, 50 Ohms each, with sound chamber
NEW	50440	Loudspeaker 16mmx25mm, square, 100 Ohms, without sound chamber
	50441	Loudspeaker 20mm, 100 Ohms, with sound chamber
	50442	Loudspeaker 23mm, 100 Ohms, with sound chamber
	50443	Loudspeaker 28mm, 100 Ohms, with sound chamber
	50444	Loudspeaker 40mm, 100 Ohms, with sound chamber

Loudspeakers for LokSoundXL

	50448	Loudspeaker 20mm x 40mm, square, 100 Ohms, with sound chamber
	50449	Loudspeaker 40mm, 32 Ohms, with sound chamber
	50445	Loudspeaker 57mm, 16 Ohms, with sound chamber
	50446	Loudspeaker 78mm, 32 Ohms, with sound chamber

Conversion Kits

A retrofit – simple with ESU

For certain loco models we offer you a complete conversion kit for easy installation: The set contains all necessary hardware, a suitable loudspeaker and a LokSound decoder, which already has been tuned for the model. It is pre-programmed with the original sound of the Loco and settings have been programmed. At the same time we kept in mind the particular characteristics of the Loco; for example, we gave the fire engine a flashing blue light and the original wail of the horn.

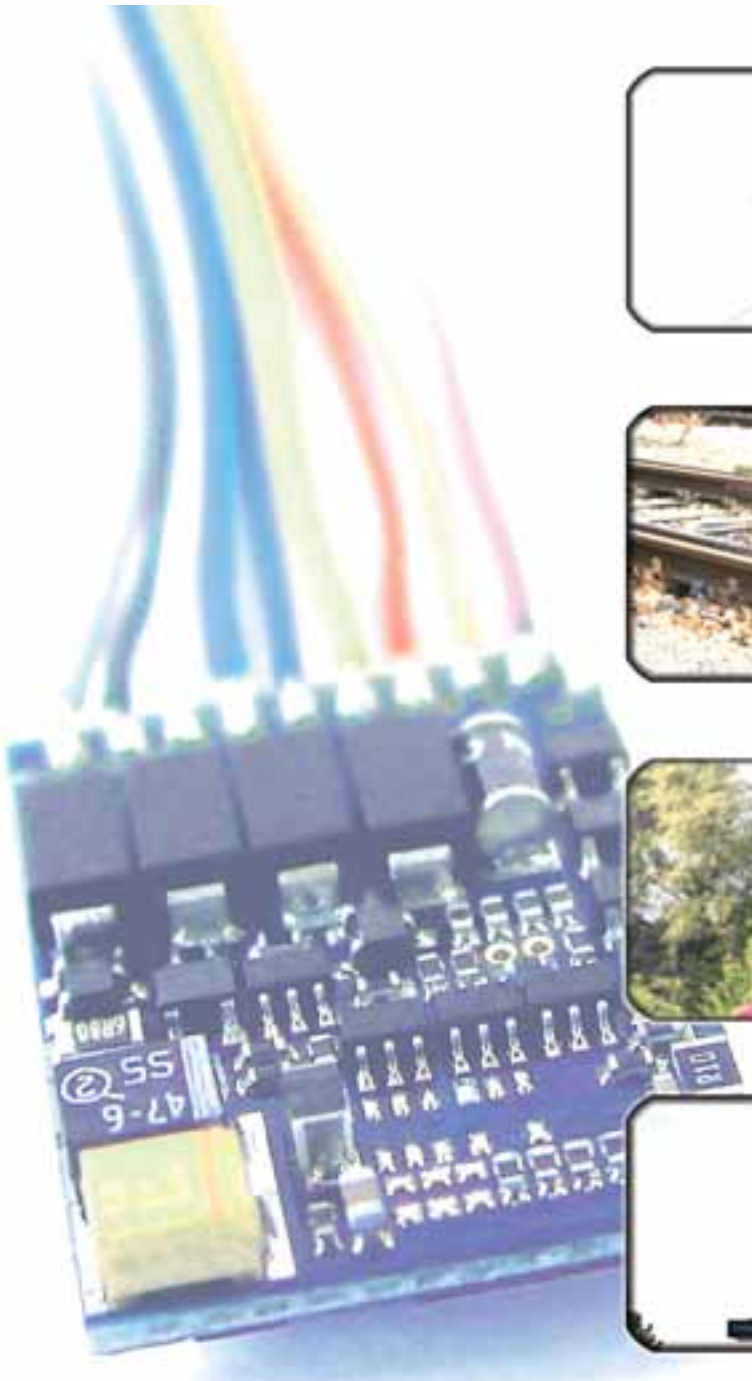
Safe yourself the trouble of finding small parts, and programming the decoder: We do it for you!

Conversion kits for H0

	51263	Conversion kit for Märklin® E03 /BR103 (3053) LokSound, Loudspeaker, accessories, installation manual
	51207	Conversion kit for Märklin® BR 03 (3085) LokSound, Loudspeaker, accessories, installation manual
	61450	Conversion kit for Märklin® SVT 137 (37770) Loksound mfx Decoder with 40x20 mm Loudspeaker; carefully pre-set for this engine (15 Funktionen);
NEW	61451	Conversion kit for Märklin® „Firefighter locomotive“ from set 29750, LokSound mfx Decoder with sirene, loudspeaker, flashing blue light, carefully pre-set for this engine; installation manual

Conversion kits for large Scales

	51360	Conversion kit for Märklin® BR 141 (54213): LokSoundXL, Loudspeaker, installation manual
	51361	Conversion kit for Märklin® BR 110 (54214); LokSoundXL, Loudspeaker, installation manual
	51332	Conversion kit for Märklin® V100 Startpackung; LokSoundXL, Loudspeaker, installation manual

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LokPilot – The Jewel among Decoders

Digital decoders and jewellery have at least on thing in common: With all the silver – or gold plated rhinestones for sale, it's not easy for some people to make an informed choice. The sophisticated buyer will go for the real thing, therefore being sure of its lasting value.

The same holds true for the decoders of our LokPilot series: Each one provides you with unique functions that will easily convince you. This is where ESU's leading edge technology comes fully into play. Since its arrival in 2001, ESU LokPilot decoders have been used by thousands of satisfied customers. Well known model railroad producers, who factory-deliver their locos with built-in LokPilot decoders, may serve as reference for the superb quality of our decoders.

LokPilot decoders are available in several formats, depending upon gauge or Digital system.

Gauge H0:

- The **LokPilot Basic** is our entrance model, and appeals to the price-conscious DCC-modeler.
- The **LokPilot V2.0** can be used with DCC and Motorola®, and is for those, who don't want to be committed to a format.
- The **LokPilotDCC V2.0** on the other hand applies to the discerning DCC-user, whose ambitions the LokPilot Basic doesn't satisfy.
- The **LokPilot V3.0**, top of the range, speaks DCC, Motorola® and Selectrix®. Armed for the coming NMRA DCC Duplex (BiDi) Standard, it is predestined for all ambitious model railroaders with technical vision and an appetite for new technologies.
- The **LokPilot mfx** could be the choice of all Märklin®-systems fans, who want maximum play value.

Gauge N, TT:

- The **LokPilot micro** speaks DCC, Motorola® and Selectrix® and opens up all possibilities for the N-Gauger.

Gauge G, 1:

- The **LokPilotXL** commands DCC and Motorola® and puts out 3.0 A's continuous power.
- The **LokPilotXL DCC** speaks DCC only, but offers additional programming settings. It also provides 3.0 A's steady current.

What LokPilot decoders can do

No matter which LokPilot decoder you choose, you will profit from their outstanding key properties:

Operational modes

Almost all LokPilot decoders are genuine Multi-protocol decoders with fully automatic recognition of the operational mode – on the fly. The decoder analyses the track signal and filters out its packet. Changing between Digital and Analog and back again is possible with no problem. That's important in case your fiddle yard is still being operated conventionally. Furthermore, all LokPilot decoders recognize, and comply with all relevant braking sections, such as Roco®'s, Lenz®'s or Märklin®'s, and stop correctly. What's more, all decoders for N and H0 are equipped with a memory that retains the present operational status for dependable operation, in case of a voltage interruption due to dirty rails. LokPilot decoders are designed for a maximum of compatibility with its particular system, so that even infrequent play situations can be handled. That's why all Motorola® capable decoders feature the typical Wrong-direction bit.

Motor management

The most important function of a Digital decoder is motor management. Therefore, all LokPilot decoders are universally usable and can be employed with all customary DC model railroad motors, such as Roco®, Fleischmann®, Brawa®, Mehano®, Bemo®, LGB®, Hübner®, Märklin® or others. Even coreless motors (e.g. Faulhaber® or Maxon®) can be connected. You can keep using all-current motors, if you replace the field winding with a permanent magnet. See page 44.

Load control (back EMF) with 15.5 resp. 40 kHz High frequency regulation guarantees silky smooth, absolutely silent motor operation, and lets your engine crawl on the layout super slowly. A new function (not for LokPilotXL) is the option to limit the influence of load control. That means you can glide really smoothly around the depot and over turnouts, while on the (fast) main, when going uphill, the engine slows down prototypically, if you don't override it with the throttle.

Analog world

Quite a few LokPilot decoders are being used as an electronic reverser, instead of a directional, mechanical relay. Therefore it's possible to limit the starter – and top speed with the new decoders (not LokPilotXL) during analogue operation. At last you can slow down your old, fast locos.

Safeguard

All function outputs and the motor connection are overload – and short circuit protected. We want you to enjoy your LokPilot decoder for as long as possible.

LokPilot Basic

LokPilot Basic – more than basic

LokPilot Basic

In the past, every once in a while we received inquiries for a robust, affordable DCC decoder, which would meet the basic standards.

We're proud to present here our answer to the challenge: The LokPilot Basic was developed from scratch with the aim to bring you a decoder which would satisfy the needs of the majority of model railroaders. On one hand it offers all the fundamental functions, while on the other hand it is easy on the wallet.

The result is convincing: The LokPilot Basic is surely not a stripped down, technically obsolete decoder, on the contrary: It contains the most modern, on the world market presently available technology.

Like all other LokPilot decoders, the LokPilot Basic is convincing due to its excellent load control, good slow speed characteristics, three function outputs and its robust build-up. Simple handling and practical programmability are self-evident.

The LokPilot Basic lends itself to all popular DCC-systems and, thanks to the concentration for the essential features, sports a so far unbeatable price/performance ratio.

At last, you don't need to work without a decoder featuring load control for your locos anymore, but have access to a fully matured brand.

We ship the LokPilot Basic with an 8-wire NEM interface. Installing it into locos with a digital interface is especially simple: Open up loco – remove dummy plug – plug in decoder – close loco – that's it!

Operational modes

The LokPilot Basic supports the worldwide recognized DCC protocol. In this mode it can be utilized with 14, 28 or 128 speed steps, or on Analog DC layouts. It supports Lenz® LG 100 resp. Roco® braking sections as well as braking in DC sections with reverse polarity. You can use addresses 1 – 119. During operation, the LokPilot Basic decoder converses fully automatically between operational modes (DC, DCC).

That's important in case you run parts of your layout (fiddle yard) in analog mode.

Motor management

All popular DC – or coreless motors regardless whether from Roco®, Fleischmann®, Brawa®, Mehano®, Liliput®, Bachmann®, Kato®, Bemo®, Faulhaber® or Maxon® will be driven by the 0.75A continuous-current last stage of the LokPilot Basic decoder. The 31 kHz High frequency load control takes care of silky smooth, absolutely quiet motor operation and lets your engines crawl slowly on the layout. The load control can be optimized via 3 CV's for the motor in use. Thanks to mass-simulation the loco won't jerk, even with only 14 speed steps.

Analog world

The LokPilot Basic works also with no problems on Analog DC layouts, which means in spite of the club you belong to being analog; you can still run your locos.

Functions

The LokPilot Basic offers three 180 mA steady-current outputs, dimmable together in 7 steps. Therefore you can wire up the cab illumination or a smoke generator besides the two standard reversing head lights. The built-in switching speed mode, and the option to switch off the acceleration- and deceleration rate with the touch of a key, helps you to glide smoothly around the depot area.

Programming

All programmable adjustments are done electronically. It's not necessary to open up the loco anymore. Since the LokPilot Basic knows all DCC programming modes, and all values are inserted with two digits, programming with all known central stations is a cinch.

Especially comfortable is the programming of parameters for owners of our ECoS command station: All modifications are displayed on the large screen in plain language, and can be changed most easily.

Safeguard

All function outputs and the motor connection are protected against overload and short circuit. We want you to enjoy your LokPilot Basic decoder as long as possible.

LokPilot Basic		
NEW	52690	LokPilot Basic DCC+DC, with wire harness 88mm and 8-pin DCC plug (NEM652),

Technical Data LokPilot Basic:

Operational modes:

NMRA/DCC with 14, 28, 128 speed steps
2-digt addresses
Analog DC (de-selectable)
Automatic recognition of operational mode, and DCC speed-step selection
Supports Lenz® LG 100 and Roco® braking-sections

Throttle:

0.7A continuous load
Runs DC-and coreless motors
Silent, safe 31 kHz Pulse width frequency regulation
Motor output overload protected

Function outputs:

3 outputs, 2 of which for light functions
180 mA load per output
ca.350mA total load of all function outputs
Outputs short circuit protected
Switching speed selectable
Acceleration and deceleration de-selectable

Dimensions:

25.5 x 15.5 x 4.5 mm (1.02 x .62 x .18 inch)

LokPilot Basic FAQ

Who will use the LokPilot Basic?

The LokPilot Basic appeals to operators, who are looking for a reliable, load regulated decoder without bric-a-brac.

Is there enough motor-current for H0?

Yes. The LokPilot Basic decoder delivers a continuous-current of 0.7 A. That's enough to run most modern, 5 pole motors, such as those from Fleischmann®, Brawa®, Roco®, Mehano®, Liliput®, Bachmann®, Electrotren®, Bemo® or PCM® with no problems.

For the circular Märklin® – or Fleischmann® motors we recommend the LokPilot V2.0/V3.0

Which command stations are compatible with LokPilot Basic?

The LokPilot Basic works with all central units, which employ the NMRA/DCC system, such as Roco®, Lokmaus II/III, Fleischmann® Lok Boss® and Twin Center®, Uhlenbrock® Intellibox® and Daisy®, Lenz® digital plus®, Digitrax®, Zimo®, ZTC® control and others.

Programming with all DCC-centers is easy, because for one, the number of configuration variables is concise. On the other hand, only two-digit numbers are used.

What happens to the LokPilot Basic if there is a voltage interruption?

The current draw of the LokPilot Basic could be lowered thanks to state-of-the-art technology. Therefore it handles dirty spots even without memory.

What can the LokPilot do, that the LokPilot Basic can't?

Considerably more. The LokPilot handles 4-digit-consist addresses (consist mode). The LokPilot V2.0/V3.0 has enough power to run older Fleischmann® or Märklin® circular motors, or even locos with 2 prime movers.

LokPilot V2.0/V3.0 sports 4 individually dimmable function outputs, which are capable of lighting effects, such as blinking lights or firebox flicker. Furthermore, you can freely choose the allocation of function keys (mapping). With LokPilot V2.0/V3.0 you can program starter – and top speed even in analog mode.

In addition, the LokPilot V2.0/V3.0 speaks also the Motorola® protocol and can be utilized on analog AC layouts.

There's a detailed table that compares all decoder-characteristics on page 47.

LokPilot V2.0

The LokPilot V2.0 – One for All, All in One!

LokPilot V2.0

The LokPilot V2.0 follows in the footsteps of the successful ESU LokPilot decoder. It continues to improve the excellent features of the LokPilot decoder even more, and sets new levels regarding functionality, price/performance ratio and current-draw.

Operational modes

The LokPilot V2.0 handles DCC and Motorola®. In DCC mode it will operate with 14, 28 or 128 speed steps. The decoder recognizes the speed-step numbers automatically. It supports Lenz® LG 100 resp. Roco® braking sections as well as braking in DC sections with reversed polarity, or the Märklin® braking section. You can either use a two digit (1 – 127) or a four digit (1 – 9999) address, or assign a consist address. The Motorola® protocol makes it possible to run the LokPilot V2.0 decoder with Märklin® stations 6020, 6021, delta, mobile station, and central station.

There the decoder commands addresses 1 – 80, and comes to a stop correctly on the Märklin® braking section. The LokPilot V2.0 converts automatically during operation between all control modes (Motorola®, DCC, DC and AC).

Motor management

The LokPilot V 2,0's slow- and top speed can be customized by three steps or a loadable speed table, defined by 28 steps. The loadable speed table is valid for 14, 28 and 128 speed steps, which is not necessarily the norm with other digital decoders. Thanks to ESU's unique mass simulation, no abrupt transits are discernable, even with only 14 speed steps.

Fourth generation back EMF, with 40 kHz pulse width frequency, takes care of super silent, smooth motor operation, especially with coreless motors. The load control can be adapted easily to various motor – and gearing combinations.

With Dynamic Drive Control (DDC) you can curb the influence of the load control and operate real smoothly in the depot area and over turnouts, while on the fast main, when going uphill, the engine slows down prototypically.

Analog operation

With LokPilot V2.0 it's possible to limit the start – and top speed of your loco, even during analog operation; and you can determine which of the functions should be active. Therefore, the LokPilot V2.0 is ideal for locos, which are too fast with a conventional reverser relay.

Functions

Individually programmable acceleration and deceleration (both de-selectable) and selectable switching speed is taken for granted with LokPilot V2.0. For lighting, its 4 function outputs can be dimmed separately, and allocated to functions. There is: Slow light up-and off for lamps (Dimmer), fire box flicker, Gyra-and Mars light, strobe and double strobe, flashing and alternate flashing. The new ESU function mapping allows you to allot each function freely to keys F0 – F12, even multiple assignments are possible.

Programming

The LokPilot V2.0 supports all DCC programming modes. All programming is done electronically. (This is also true for Märklin® centers 6020, 6021, mobile station and central station). For these units, the LokPilot V2.0 decoder employs a proven, easily acquired programming procedure. Editing configuration variables (CV's) is especially convenient for owners of our ECoS Central Station: All variations are displayed in plain language on the large screen and can easily be modified – even during operation on the layout.

Accident prevention

The Wrong-direction bit of the LokPilot V2.0 is responsible for correct direction: locos which leave an analog section and enter a digital part of the layout, will not reverse direction instantly and back up again. If there is an interruption, the decoder remembers instantly its last speed-status, and starts accelerating again, as quickly as possible.

Safeguard

All function outputs and the motor connection are overload – and short circuit protected.

Built-in future

The internal decoder software can be replaced by a new version, if need be.

LokPilot V2.0 / LokPilotDCC V2.0			
	52600	LokPilot V2.0	Multiprotocol decoder (MM / DCC), with 8-pin plug according to NEM 652
	52601	LokPilot V2.0 DCC	DCC decoder, with 8-ping plug according to NEM 652
	52602	LokPilot V2.0	Multiprotocol decoder (MM / DCC), with 6-pin plug according to NEM 651
	52603	LokPilot V2.0 DCC	DCC Decoder, with 6-pin plug according to NEM 651
NEW	52618	LokPilot V2.0	Multiprotocol decoder (MM / DCC), with 21-pin mtc-connector

The LokPilotDCC V2.0 - A Global Player

LokPilotDCC V2.0

The LokPilotDCC V2.0 is a global player. This pure DCC-decoder is a mature, robust and flexible decoder for the world wide standard. The LokPilotDCC V2.0 offers state-of-the-art technology at a fair price and can be utilized on all DCC compatible layouts, or with analog DC.

Operational modes

The LokPilotDCC V2.0 commands DCC through 14, 28 or 128 speed steps. The decoder recognizes the speed-step numbers automatically. It supports Lenz® LG 100 resp. Roco® braking sections as well as braking in DC sections with reversed polarity. You can either assign two digit (1 – 27), or four digit (1 – 9999) addresses, or even a consist address. During operation the decoder converts automatically between DCC, – or DC control modes.

Motor management

The LokPilotDCC V2.0's slow and top speed can be defined by three steps or a loadable speed table. Thanks to ESU's unique mass simulation, no abrupt transits are discernable, even with only 14 speed steps.

Fourth generation back EMF, with 40 kHz Pulse width frequency, takes care of extremely silent, smooth motor operation, especially with coreless motors. The load control can be adapted easily to various motor – and gearing combinations.

With Dynamic Drive Control (DDC) you can restrict the influence of load control and operate really smoothly around the depot area and over turnouts, while on the (fast) main, when going uphill, the engine slows down prototypically.

Analog operation

With LokPilotDCC V2.0 it's possible to curb the start – and top speed of your loco, even during analog operation; and you can determine which of the functions should be active in analog mode.

Functions

Individually programmable acceleration and deceleration (both de-selectable), and selectable switching speed is taken for granted with LokPilotDCC V2.0. For lighting, its 4 function outputs can be dimmed separately, and allocated to functions. This includes, but is not limited to: Dimmer, firebox flicker, Gyra and Mars light, strobe and double strobe, flashing and alternate flashing. The new ESU function mapping allows you to allocate each function freely to keys F0 – F12, even multiple assignments are possible.

Programming

The LokPilotDCC V2.0 supports all DCC programming modes. All programming is done electronically. Programming configuration variables (CV's) is especially comfortable for owners of our ECoS Central Station: All variations are displayed in plain language on the large screen and can most easily be edited – even during operation.

Accident prevention

In case of an interruption the decoder remembers its last speed-status and starts up again, as quickly as possible.

Safeguard

All function outputs and the motor connection are protected against overload and short circuits.

Built-in future

The internal decoder software can be updated to a new version, if necessary.

Technical Data LokPilot V2.0 / LokPilotDCC V2.0:

Operational modes:

NMRA/DCC with 14, 28 and 128 speed steps, 2+4 digit addresses
Analog/DC
Digital Motorola® (old and new)*
Analog AC (de-selectable)*
Automatic recognition of operational mode, & DCC speed step selection
Supports Lenz® LG 100, Märklin®, Roco® braking sections
Wrong direction bit/stores operational status
Intelligent programming mode with Märklin® 6021
Switching speed, and acceleration – and deceleration key selectable

Throttle:

1.1 A continuous load
Runs DC-, coreless, - and AC motors (with a permanent magnet)
Silent, safe, 40 kHz Pulse-width frequency motor regulation
Motor output overload protection
Fourth generation back EMF (de-selectable)

Function outputs:

4 outputs
180 mA load per output, total load ca. 350 mA
Free function allocation (function mapping)
Outputs short circuit protected

Dimensions:

23.5 x 15.5 x 5.5 mm (0.94 x 0.62 x 0.22 inch)

***** Not for LokPilotDCC V2.0

LokPilot V3.0 – The Swiss Knife among Decoders

NEW 2006

LokPilot V3.0

From the 3rd quarter 2006 ESU introduces the once again improved version of the successful LokPilot decoder – the LokPilot V3.0. Those who thought that LokPilot decoders are so good that nothing could be improved, will be coerced into changing their minds by our untiring designers.

Driven by the goal to always bring to you the best possible decoder, the LokPilot V3.0 is the all purpose decoder. Flexible as a Swiss Knife, the LokPilot V3.0 supports DCC, Motorola®, DC and AC, and even Selectrix®. Also, its hardware is prepared for the coming NMRA Duplex Communication – as soon as that's official, a simple firmware update offers you undreamt-of possibilities – free of charge.

Operational modes

The LokPilot V3.0 commands DCC through 14, 28 and 128 speed steps, as well as Motorola® and Selectrix®. The decoder recognizes the speed-step numbers automatically. It supports Lenz® LG 100 resp. Roco® braking sections as well as Zimo®'s HLU-commands, or the braking in DC braking sections with reversed polarity, or the Märklin® braking section (even for DCC). You can either use two digit (1 – 127), or four digit (1 – 9999) addresses or assign a consist address. The Motorola® protocol enables the LokPilot V3.0 decoder to run with Märklin® stations 6020, 6021, delta, mobile station® and central station®. The decoders can command addresses 1 – 255, and come to a stop correctly on the Märklin® braking section. With Selectrix® layouts you have the choice of up to 122 addresses. The LokPilot V3.0 converts during operation fully automatically between all control modes (Motorola®, DCC, DC, AC and Selectrix®).

Motor management

The LokPilot V3.0's slow and top speed can be customized by three steps or a loadable speed table, defined by 28 steps. The loadable speed table is valid for 14, 28 and 128 speed steps, which is unusual for other digital decoders. Even with only 14 speed steps, there are no jerky transits discernable, thanks to ESU's unique mass simulation.

Fourth generation load control (back EMF) employs 32 kHz Pulse width frequency, and takes care of extremely silent, smooth motor operation, especially with coreless motors. Your locos will crawl super slowly – thanks to 10 bit technology. The back EMF can easily be adapted to various motor – and gearing combinations.

With Dynamic Drive Control (DDC) you can limit the influence of back EMF and glide real smoothly around the depot area and over turnouts, while on the main, when going uphill, the engine slows down prototypically.

Analog operation

With LokPilot V3.0 it's not only possible to limit the start – and top speed of your loco in analog mode, you can even determine which of the functions should be active. Even load control is active. Therefore, the LokPilot V3.0 is ideal for locos, which are too fast with a conventional reverser relay. At last your locos crawl in analog mode as slowly as you're used to with digital layouts.

Functions

Individually programmable acceleration and deceleration (both de-selectable) and selectable switching-speed is taken for granted with LokPilot V3.0. Its 4 function outputs achieve 250 mA load each, are separately dimmable and can be allocated to functions individually. There are dimmer, firebox flicker, Gyra – and Mars light, strobe – and double strobe, flashing and alternate flashing, and time-limited functions (e.g. for coupler). The special ESU function mapping allows you to assign each function freely to keys F0 – F15, even multiple assignments are possible.

Programming

The LokPilot V3.0 supports all DCC programming modes including POM (Programming on the Main). All programming is done electronically; for Märklin® stations 6020, 6021, mobile station® and central station®. For these units the LokPilot V3.0 employs a time proven, easily acquired programming procedure. Programmed modifications during Motorola® operation are valid with DCC – and Selectrix® operation and vice verse. Programming configuration variables (CV's) is especially simple for owners of our ECoS Control station: All options are displayed in plain language on the large screen and can easily be edited – even during operation on the layout.

Accident prevention

The LokPilot V3.0 supports the indispensable wrong-direction bit for operation on Märklin® layouts, preventing locos leaving an analog section and entering a digital part of the layout, from instantly reversing direction and backing up out again. After an interruption, the decoder remembers its last status and starts up again, as quickly as possible.

Safeguard

All function outputs and the motor connection are overload – and short circuit protected.

Built-in future

The LokPilot V3.0 is firmware updatable. As soon as standardization is completed, you will be able to bring the decoder up to the latest DCC Duplex standard.

See page 36 for technical data and order numbers

The new LokPilotDCC V3.0 – DCC Future built-in

NEW 2005

LokPilotDCC V3.0

With the LokPilotDCC V3.0, ESU introduces the again reviewed, third variant of the successful LokPilotDCC decoder. Those who thought that LokPilot decoders are good enough not to merit an improvement will have to change their minds. Our untiring designers know better.

The LokPilotDCC V3.0 is first choice for all those model railroaders, who always want the best: Thanks to its prepared hardware, it's ready for the coming NMRA Bidirectional communication. As soon as that's official, a simple firmware update brings you expanded play value – free of charge.

Operational modes

The LokPilotDCC V3.0 handles DCC with 14, 28 and 128 speed steps, and recognizes the speed step numbers automatically. It supports Lenz® LG 100 resp. Roco® braking sections as well as Zimo®'s HLU commands, or braking in DC braking sections with reversed polarity. You can either use two digit, - (1 – 127), or four digit addresses (1 – 9999), or assign a consist address. Also, it converts automatically between control modes. Since it's prepared for the NMRA/DCC Bidirectional communication, a simple update will enable it to capitalize on that feature. Especially in combination with our ECoS station, the future will bring unprecedented play options.

Motor management

The LokPilotDCC V3.0's slow and top speed can be customized by three steps or a loadable speed table, defined by 128 steps. The loadable speed table is valid for 14, 28 or 128 speed steps, which is not necessarily the norm for other decoders. Due to ESU's unique mass simulation, no abrupt transits are discernable – even with 14 speed steps.

Fourth generation load control (back EMF) utilizes up to 32 kHz Pulse width frequency, achieving super silent, smooth motor operation, especially with coreless motors. The load control can easily be adapted to various motor – and gearing combinations.

With Dynamic Drive Control (DDC) you can limit the Influence of load control and glide real smoothly around the depot area and over turnouts, while on the (fast) main, when going uphill, the loco slows down prototypically.

Analog operation

With LokPilotDCC V3.0 it's not only possible to program the start – and top speed of your loco in analog mode, you can even determine which of the functions should be active – including load control! At last your locos crawl even in analog mode as slowly as you're used to with Digital layouts.

Functions

Individually programmable acceleration and deceleration (both de-selectable), and selectable switching speed is self evident with LokPilotDCC V3.0. Its 4 function outputs achieve 250 mA (!) load each, are separately dimmable and can be allocated to functions individually. There are Dimmer, firebox flicker, Gyro – and Mars light, strobe – and double strobe, flashing and alternate flashing, as well as time limited functions (e.g. for coupler). The special ESU function mapping allows you to assign each function freely to keys F0 – F15; even multiple assignments are no problem.

Programming

The LokPilotDCC V3.0 supports all DCC programming modes including POM (Programming on the Main).

Especially simple is the programming of configuration variables (CV's) for owners of our ECoS Central Station: All options are displayed in plain language on the large screen and can easily be edited – even while operating on the layout.

Accident prevention

If desired, the LokPilotDCC V3.0 can measure and memorize the loco's last speed. After an interruption it starts up again as quickly as possible.

Safeguard

All function outputs and the motor terminal are overload – and short circuit protected.

Built-in future

The LokPilot DCCV3.0 is firmware updatable. As soon as standardization is completed, you can update it to the latest DCC Duplex norm.

See page 36 for technical data and order numbers.

Technical data LokPilot V3.0 / LokPilotDCC V3.0

Operational modes:

NMRA/DCC 14, 28 and 128 speed steps, armed for DCC Duplex communication
2 digit and 4 digit addresses
Digital Motorola® (old and new)*
Selectrix®*
Analog DC (de-selectable)
Analog AC (de-selectable)*
Automatic recognition of operational mode, & DCC speed selection
Supports Lenz® LG 100, Märklin®, Roco® braking section and Zimo® HLU commands
Base-direction bit / stores operational status
Intelligent programming mode with Märklin® 6021
Switching speed, and acceleration and deceleration key selectable

Throttle:

1.1 A continuous load
Runs DC-. Coreless-, and AC motors (with permanent magnet)
Silent, safe 16/32 kHz Pulse width frequency motor regulation
Motor output overload protection
Fourth generation back EMF (de-selectable)

Function outputs:

4 outputs
250 mA load per output
500 mA total load of all function outputs
Free function allocation (function mapping)
Outputs short circuit protected

Dimensions:

23.5x 15.5 x 5.5 mm
(0.94 x 0.62 x 0.22 inch)

* Not for LokPilotDCC V3.0

LokPilot V3.0 / LokPilotDCC V3.0

NEW	52610 LokPilot V3.0	LokPilot Multiprotocol decoder (MM/DCC/SX), with 8-plug according to NEM 652
NEW	52611 LokPilotDCC V3.0	DCC Decoder, with 8-pin plug according to NEM 652
NEW	52612 LokPilot V3.0	LokPilot Multiprotocol decoder (MM/DCC/SX), with 6-pin plug according to NEM 651
NEW	52613 LokPilotDCC V3.0	DCC Decoder, with 6-pin plug according to NEM 651
NEW	52614 LokPilot V3.0	LokPilot Multiprotocol decoder (MM/DCC/SX), with 21-pin mtc-connector

LokPilot V3.0 FAQ

How does LokPilot V3.0 differ from LokPilot V2.0?

The LokPilot V3.0 is armed for the coming DCC Bidirectional Communication and can be used even on Selectrix® layouts. Furthermore, the output loads have been increased, and the LokPilot V3.0 obeys Zimo® HLU commands.

Will there be both decoders?

From the third quarter 2006 the LokPilot V3.0 will gradually replace the LokPilot V2.0. Both decoders will be available for sometime. You got the choice.

How about the 21-wire mtc interface?

ESU will also offer the LokPilot V3.0 with the newly introduced 21-wire interface, developed for a set of companies (incl. Märklin®, Trix®, Brawa®, PCM®). This makes a retrofit for locos with such an interface a snap.

What will Bidirectional Communication bring?

The NMRA DCC Bidirectional Communication (also known as RailCom®) enables the decoder to feedback information to the central station. In the future this opens up a new range of play options and simplifies interaction with Digital technology considerably. At last decoder and station talk to one another…

You will know more about your decoders in the future with Bidirectional communication: During operation all CV's can be transferred to – and edited, at the station; You know the temperature and the actual speed of your locos, and thanks to Duplex communication you will easily locate your engines on the layout. To slow down in front of red signals, or be aware of low-speed sections will easily be accomplished.

The LokPilot mfx – the All-round Talent

LokPilot mfx

The LokPilot mfx was developed from scratch especially for the mfx® data format. It reflects years of experience, gathered by ESU during the engineering of digital decoders.

Operational modes

The LokPilot mfx is a genuine multi-protocol decoder: Besides its main field of application in combination with mfx stations, it handles Motorola® command stations (e.g. Märklin® 6021) as well as conventional AC driven layouts. The LokPilot mfx recognizes the operational mode fully automatically and converts on the fly.

Motor management

The LokPilot mfx runs DC – and coreless motors directly, while all-current motors need a Hamo-magnet retrofit. The motor is driven by 40 kHz Pulse width frequency (PWM) for a super silent, safe run. Together with the 128 mfx speed steps and fourth generation back EMF, unprecedented performance is realized.

Analog operation

The LokPilot mfx also operates on Analog AC layouts, on which even starter – and top speed can be limited individually. At last you can slow down your old high-speed runners.

Functions

The LokPilot mfx sports four function outputs, which can be dimmed, and allocated individually to a function. Besides beacon, strobe and alternate flashing, there is a Mars light as well as a Gyra light.

Programming

The LokPilot mfx can be adapted to any loco or operational mode. For this, you can comfortably change parameters with the systems-stations - during operation and without having to open the loco or put it on a programming track. That's made possible through the built-in, genuine Duplex communication between systems-center station and decoder. For owners of 6020, 6021 – or delta stations the LokPilot mfx decoder utilizes the time-proven, simple programming procedure.

Safeguard

All function outputs and the motor connection are overload – and short circuit protected.

Built-in future

The interne decoder software can be replaced by a new firmware update, if need be.

Technical Data LokPilot mfx:

Operational modes:

mfx with 128 speed steps
Motorola® (old and new) with 14 speed steps
Analog AC (de-selectable)
Automatic recognition of operational mode
Supports Märklin® braking section
Wrong-direction bit / stores operational status
Intelligent programming mode with Märklin® 6021
Switching speed, and acceleration-and deceleration key selectable

Throttle::

1.1 A continuous load
Runs DC-, coreless-, and AC motors (with Hamo retrofit)
Silent, safe 32 kHz Pulse width frequency motor regulation
Motor output overload protected
Fourth generation back EMF (de-selectable)

Function outputs:

4 outputs, 2 of which for lighting
180 mA load per output
350 mA total load of all function outputs
Free function allocation (function mapping)
Outputs short circuit protected

Dimensions:

23 x 15.5 x x6.5 mm
(0.94 x 0.62 x 0.22 inch)

LokPilot mfx

	61600	LokPilot mfx	Multiprotocol decoder, mfx® / Motorola® with 8-pin plug according to NEM652

LokPilot micro (page 38)

NEW	52680	LokPilot micro	Multiprotocol decoder(DCC/SX), with 6-pin plug (NEM 651) with wire harness
NEW	52681	LokPilot micro	Multiprotocol decoder(DCC/SX), with 6-pin plug (NEM 651) without wire harness

LokPilot micro

The LokPilot micro - We shrank the Decoder!

LokPilot micro - with and without harness

The LokPilot mico is the first decoder from the house of ESU, which was designed especially for the needs of the N-gauger. It combines all the good characteristics of the LokPilot V2.0 decoder, and meets the requirements of the N-gauge community. With a size of only 13.5 x 9.0 x 3.0 mm (0.94 x 0.36 x 0.12 inch) it should find room in any piece of rolling stock.

The LokPilot micro comes in two variants: With a NEM 651 norm 6 wire harness-plug combo, or with 6 permanently to the decoder fastened connection pins.

Operational modes

The LokPilot micro handles DCC, Motorola® and Selectrix®. In DCC mode it will operate with 14, 28 or 128 speed steps. The decoder recognizes the speed step numbers automatically. It supports Lenz® LG 100 resp, Roco® braking sections as well as braking in DC sections with reversed polarity, or the Märklin® braking section. You can either use a two digit (1 – 127) – or a four digit (1 – 9999) address, or assign a consist address. The Motorola® protocol makes it possible to run the LokPilot micro decoder with Märklin® station 6020, 6021, delta, mobile station®, and central station®. There the decoder commands addresses 1 – 80, and comes to a halt correctly on the Märklin® braking section. On Selectrix® layouts you have access to all 112 addresses. The LokPilot micro converts during operation fully automatically between all control modes (Motorola®, DCC, Selectrix®, DC).

Motor management

The 0.5 A continuous-load output handles DC-and coreless motors (Faulhaber®, Maxon®). 40 kHz High frequency regulation takes care of silky smooth, super silent motor operation, and lets your engines crawl extra slowly on the layout. With Dynamic Drive Control (DDC) you can limit the influence of the load control and operate real smoothly in the depot area and over turnouts, while on the (fast) main, when going uphill, the engine slows down prototypically.

Analogbetrieb

The LokPilot micro is fully serviceable on conventional DC-layouts.

Functions

Individually programmable acceleration and deceleration (both de-selectable) and selectable switching speed is taken for granted with LokPilot micro. For lighting its 2 function outputs handle 140 mA each, can be dimmed separately for brightness, and allocated to functions, such as dimmer (slow light up and off for lamps), Gyra – and Mars light, strobe and doublestrobe, and flashing and alternate flashing. The new ESU function mapping allows you to allot each function freely to keys F0 – F12, even multiple allotments are possible.

Programming

The LokPilot micro supports all DCC programming modes. All programming is done electronically. This is also valid for Märklin® centers 6020, 6021, mobile and central station®. For these units, the LokPilot micro employs a proven, easily acquired programming procedure. Programmed changes during Motorola® operation are valid with DCC – and Selectrix® operation and vice verse.

Programming configuration variables (CV's) is especially simple for owners of our ECoS Central station: All options are displayed in plain language on the large screen and can easily be edited – even during operation on the layout.

Accident prevention

If desired, the LokPilot micro measures and memorizes the loco's last speed. After an interruption it starts up again as quickly as possible.

Safeguard

All function outputs and the motor terminal are overload – and short circuit protected.

Built-in future

LokPilot micro decoders are firmware updatable. You can replace the decoder's interne software if you wish.

See ordering numbers on page 37

Technical Data LokPilot micro:

Operational modes:

NMRA/DCC with 14, 28 and 128 speed steps, 2+4 digit addresses
Digital Motorola® (old and new) (no analog AC!)
Selectrix® system
Analog DC (de-selectable)
Automatic recognition of operational mode, & DCC speed step selection
Supports Lenz® LG 100, Märklin®, Roco® braking sections
Wrong-direction bit / stores operational status
Intelligent programming mode with Märklin® 6021
Switching speed -, and acceleration and deceleration key selectable

Throttle:

0.5 A continuous load
Runs DC and coreless motors
Silent, safe 40 kHz Pulse width frequency motor regulation
Motor terminal overload protected
Fourth generation load back EMF (de-selectable)

Function outputs:

2 outputs
140 mA load per output
ca. 280 mA total load all function outputs
Free function allocation (function mapping)
Outputs short circuit protected

Dimensions:

13.5 x 9 x 3 mm
(0.54 x 0.36 x 0.12 inch)

LokPilotXL for big Gauges

LokPilotXL

ESU's LokPilotXL is a powerful decoder for big gauges in a small size. It is a multi protocol decoder, employing four important, for big-gaugers relevant operational modes: A LokPilotXL–equipped engine manages not only Digital NMRA/DCC or Märklin®/Motorola®, but also runs on analog DC – or AC layouts. You can take your loco with you anywhere in the future with no problem. The LokPilotXL supports the Märklin® braking section and offers the ESU braking mode, with which you can stop accurately to the millimeter on braking sections, regardless of whether you enter the section with high-speed or really slowly.

The LokpilotXL utilizes good load control, which, thanks to 15.5 kHz Frequency motor regulation, will help many an old loco to run unexpectedly softly and quietly.

Important for fans of the big gauges is a really powerful decoder: Therefore the motor output can carry a load of 3.0 Amps, which is enough for engines with two prime movers. The four function outputs can carry 0.6 A each. The total load for all function outputs may be up to 2.0 A's (!).

Also we provided a terminal on the LokPilotXL for connecting an external back up capacitor, in case of bad operational conditions, caused by dirty rails in your backyard.

The LokPilotXL DCC

LokPilotXL^{DCC}

One decoder - two variants

While the LokPilotXL appeals mainly to the users of Märklin® Motorola® systems, the garden-railroaders with pure DCC-systems will make use of the LokPilotXL DCC. This doesn't offer Motorola® operation, but instead offers expanded software functions:

The loadable speed table makes it possible to adapt the decoder exactly to the model. With its help it's possible to achieve a most realistic acceleration – and deceleration rate. Thanks to NMRA/DCC-conform function mapping the function outputs can be allocated nearly arbitrarily to the function keys. Fans of long trains can assign a consist address. It's nice to know that LokPilotXL DCC also handles LGB®-MZS® station's domino toggle, and thus remains LGB® compatible to 100%.

For aficionados of American models we integrated also the most important lighting effects, such as Mars light, Ditch light and Gyra light. Of course for lighting, each function output can be dimmed separately. MU-ing (consisting) has been optimized. With the excellent ESU braking mode you can stop exactly to a fraction of an inch on the braking section.

Technical data LokPilotXL : Order. No. 51700

Operational modes:

NMRA/DCC with 14, 28, 128 speed steps
2 – and 4 digit addresses
Digital Motorola®
Analog DC & Analog AC (de-selectable)
Automatic recognition of operational mode and DCC speed step selection
Supports Lenz® LG 100, Märklin®, Roco® braking sections
Intelligent programming mode with Märklin® 6021

Throttle:

3.0 A continuous load
Runs DC – and coreless motors
Silent, safe 15.5 kHz Pulse width frequency motor regulation
Motor output overload protection
Load control (back EMF), (de-selectable)

Function outputs:

4 outputs, 2 of which for lighting functions, dimmable together
600 mA load per output
2 A's total function output load
Outputs short circuit protected. Switching speed. ABV de-selectable

Dimensions:

55 x 25 x 10 mm
(2.2 x 1.0 x .4 inch)

LokPilotXLDCC: Order. No. 51700

Operational modes:

NMRA/DCC with 14, 28, 128 speed steps
2 – and 4 digit addresses
Advanced consisting
Analog DC (de-selectable)
Automatic recognition of operational mode, and DCC speed step selection.
Supports Lenz® LG 100, Roco® braking sections

Throttle:

3.0 A continuous load
Runs DC – and coreless motors
Silent safe 15.5 kHz Pulse width frequency motor regulation
Motor output overload protection
Back EMF (de-selectable)

Function outputs:

4 outputs, 2 of which for lighting functions, dimmable separately
600 mA load per output
2 A's total load, all function outputs
Function mapping, acc. NMRA. Switching speed.
ABV de-selectable

Dimensions:

55 x 25 x 10 mm
(2.2 x 1.0 x .4 inch)

mobile control - your personal Declaration of Independence

mobile control

Freedom through radio communication

Run your locomotives and turnouts freely and untethered. By employing fast state-of-the-art Duplex Radio Communication you'll have a range of more than 300 feet. There is no interference by sun or neon light, outside or in the basement, or even concrete walls. The base station can be hooked up to various, on the market available Digital systems, so you can expand your existing Digital control systems anytime by adding a radio set.

Ergonomics and function in one

Mobile control is a WAC Radio Throttle without compromise to functions and handles as easily as your cellular phone. Due to its ergonomical engineering, you can work it with one hand. A large display informs you about your locos and turnouts.

The graphic-like LCD display always tells you about the most important operational parameters such as loco address, loco symbol, speed (in mph or speed steps), as well as function key status. Up to ten functions can be selected with separate keys. Additionally you can switch electr.-magnetic accessories with mobile control: You operate your layout intuitively; On the display you see the setting of your turnouts and signals. Switching is done by a simple key-stroke.

Convenience and safety

Mobile control and base station can be protected against un-authorized use by a pin-code. That prevents your neighbor from playing with your layout. Plug it into a Digital station and start running trains.

More fun at play

The display of the mobile control not only indicates information such as loco address and speed step number, but also additional information that increases play value with the hobby. Each loco can be assigned to a plain language name. Never again will you have to remember loco addresses. With one glance you'll recognize the kind of loco, whose freely selectable symbol you just put in. For each of the function keys assigned to a loco you can determine whether it will be latching – or non latching; ideal for controlling LokSound engines with remotely activated couplers. The coupler is active as long as you push the correspondent key.

For each loco you can insert the top-speed in km/hr (mph) instead of speed step numbers. mobile control figures out automatically the speed and displays the corresponding value.

mobile control is simple to handle in spite of its manifold function options. Scrolling the thumb wheel speeds the engine up – or down. A push on the wheel changes the loco's direction of travel.

The menu talks you through all editing and programming, text is shown in plain language.

Simple hook-up to many Digital systems

Included in delivery is the base station, which is hooked up to the particular Digital station in use. When connecting sets with X-bus, e.g. Lenz® digital plus® or Roco® LokMaus II/R3, use the included X-bus cable. If using sets employing the I²C-Bus, e.g. Märklin® 6021, the base station is simply plugged in to the side of the Digital station. As far as that Digital system is concerned, the mobile control acts as an additional hand held. The base station coordinates the communication between the Digital system and the mobile control. The Digital station's scale of performance will then be taken over by the mobile control.

Fantastic possibilities become apparent especially in combination with our ECoS Central Station: Since ECoS and mobile control synchronize their data, you have to put in loco name- or symbol only once and remain up to date with all units. That's made possible by a special receiver module, which is part of ECoS station's ECOSlot terminal. In this way each mobile control converts to a fully fledged remote for the ECoS-system. Customers, who already own a mobile control, can also utilize it together with ECoS after update. The necessary software is provided by ESU – free of charge as you've come to expect.

The Base Station connects to:

- Märklin® 6021®
- Lenz® digital plus
- ROCO® LokMaus II® / R3
- Atlas® commander
- Uhlenbrock® Intellibox®

The Receiver Module connects to:

- ESU ECoS®

Loco control:

- NMRA/DCC with 14, 28, 128 speed steps
- Up to 9999 addresses.
- Märklin®/Motorola® old and new

Turnout control:

- Easy operation through an informative, concise, fully graphic display
- Menu guidance in plain language
- Real names for locos and turnouts
- Duplex communication to receiver
- Fully compatible to ECoS Station

- Range up to 300 feet outside
- Up to 16 units possible

mobile control

mobile control			
NEW	50100	mobile control	remote throttle + Receiver module for ECoS, german / english menu language
	51100	mobile control	remote throttle + Base station, german / english menu language
	51101	mobile control	remote throttle, german / english menu language

LokProgrammer – for that special Sound

LokProgrammer

Want to listen to the sound spectrum of your favorite loco, or the special sound of that loco around the corner in the yard – on your model railroad? No problem with ESU's LokProgrammer!

One prerequisite: A PC with sound card and Windows. Simply record the original sound of your engine and edit it at home with your computer. Many customers did this already successfully. Even if you don't yet belong to this elite group of LokSound Pro's, the LokProgrammer is still a very useful tool for you. It is the easiest way to program your ESU-decoder. You need no programming experience, thanks to the graphic screen everything falls into place with a few mouse clicks.

Sound

With the LokProgrammer you can erase the sound data of any LokSound decoder as many times as you wish, and replace it with a different sound. To this end we offer on our homepage more than 200 different, fully matching sounds of various prototypes and locos for downloading on your computer. Also you can edit just parts of a sound project: You don't like the decoder's whistle? Just replace it with one of the many others. Suitable sources beside those offered by us, are in Windows *.wav format available. Sound – even voice or music is no problem for our decoders. With the LokProgrammer's aid you use the entire flexibility and functionality offered by LokSound decoders.

Programming

By the same token, all other ESU decoders profit from the LokProgrammer's versatility; no matter if DCC, Multiprotocol - or mfx decoder. With its help it's possible to edit all parameters of the particular decoder simply and conveniently. The available options depend on the kind of decoder. Beside addresses and acceleration - and deceleration settings, this concerns above all the allotment of function keys (function mapping), the allocation of special effects to the individual outputs, or the lamp brightness. The LokProgrammer can also help when optimizing back EMF parameters or the loadable speed table. All options can be programmed very conveniently: There is no tedious punching-in of CV-numbers at the Digital station anymore.

Hook up

It's this simple: The LokProgrammer is a small programming box, which is wired between the PC and a programming track. To connect it you need either a vacant serial interface, or you use the included USB-adapter cable (works with Windows 2000 or Windows XP). For power we include a 500 mA wall power supply. If your needs are greater (e.g. for gauge I engines), you can also use a conventional model railroad transformer.

Software

After hook-up you start up the especially user-friendly LokProgrammer software, which is included on CD-ROM. This runs on all modern Windows-systems from Windows 98. Just put the loco with the ESU decoder on your programming track, and right away you can read, edit or program it. The Programmer automatically recognizes the decoder in the engine.

Simplicity

The LokProgrammer is recommended not only for the use with our ESU decoders: By now, many well known model railroad manufacturers factory-furnish their locos with ESU-decoders, which of course can be modified again within the frame work of their technical specifications – with the help of the LokProgrammer. You see, purchasing a LokProgrammer pays off in any case.

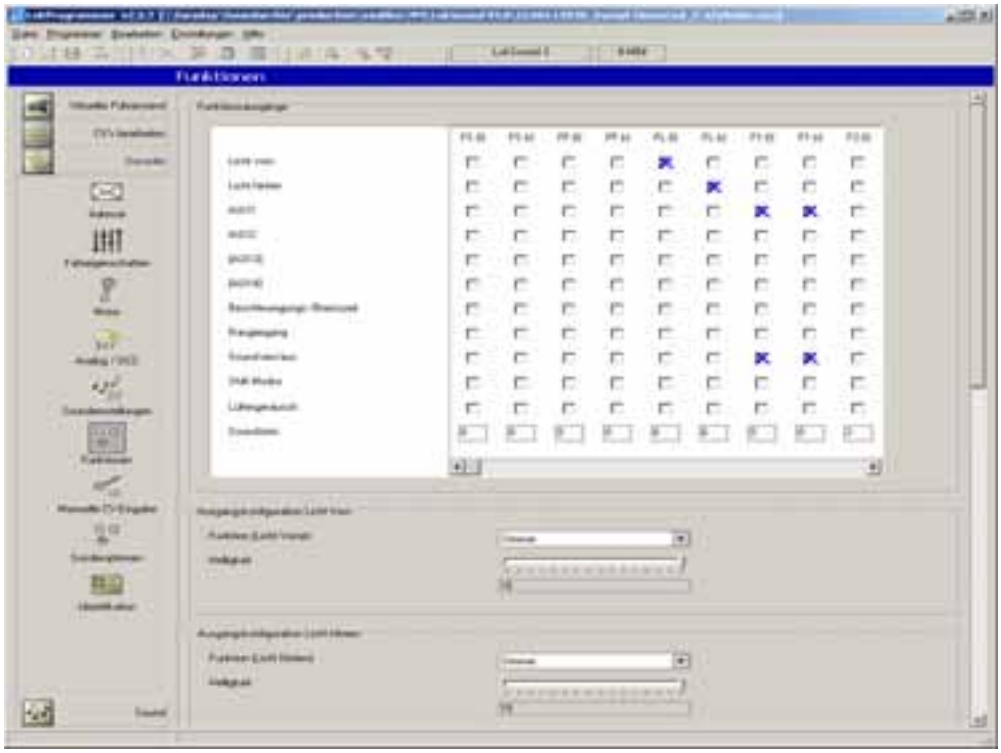
Upgrades

The LokProgrammer can also be instrumental in updating decoders. Almost all ESU decoders are updatable, in case you desire a new software version. To do this, you only need the LokProgrammer and a small update-program, which you can download from our homepage.

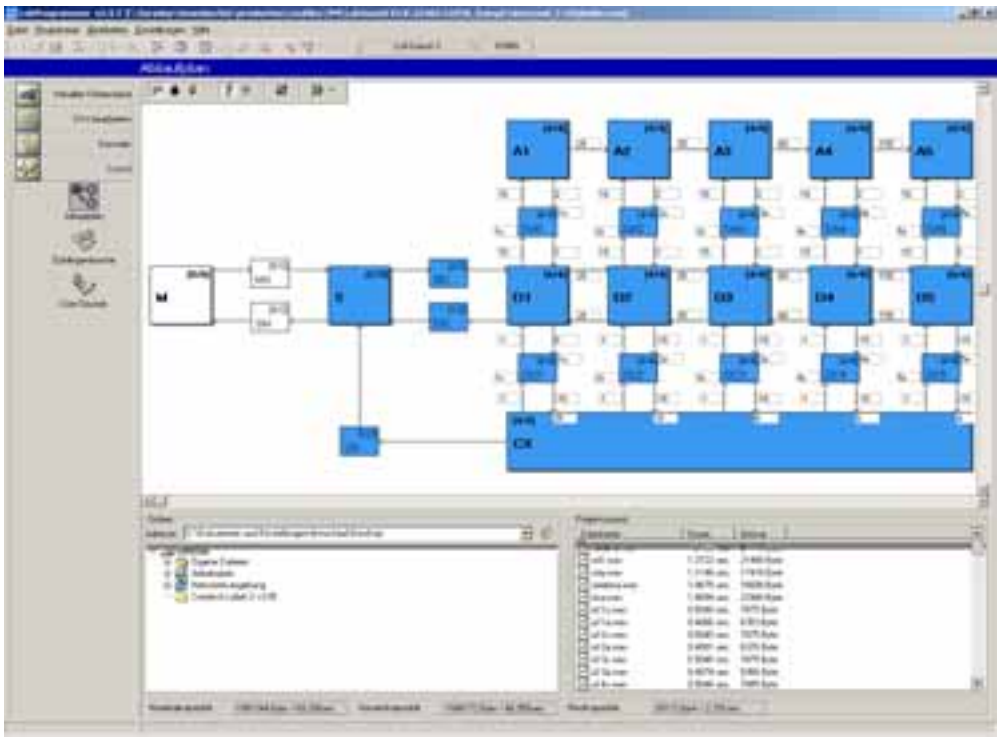
The future

LokProgrammer software is being reviewed continuously. The latest, pertinent version can always be downloaded from our homepage, or can be installed automatically, through an internet-update function, on your computer.

LokProgrammer		
53451	LokProgrammer set	LokProgrammer unit, power supply, serial cable, manual, CD, USB adapter



All programming (here: Function key allocation) super convenient per mouse-click. It couldn't be simpler.



Unparalleled programming options for sound sequencing.

Only ESU can offer you this!

Accessories

Any model railroader, wanting to fit decoders into locos, knows the problems arising when trying to get the small parts required for the installation. ESU wants to help you and therefore offers you directly some sensible, often needed parts.

Permanent magnets

For the retrofit of old Märklin all-current motors you need a permanent magnet. It replaces the present field winding, and in combination with a LokSound – or LokPilot decoder, helps to make your loco run astonishingly smooth.

We offer 3 different magnets, depending on the particular armature. You find the armature code number on a spare-parts sheet, which you can download from www.maerklin.de/service.

Permanent magnet 51960

Permanent magnet 51961

Permanent magnet 51962

Miniature relays

With our small relay, loads are controllable whose draw exceeds the decoder's function output. Put the relay between output and load.

miniature relay 51963

Cable harness

If the loco in question features no Digital interface and you don't want to cut off the interface-plug of your loco, simply make use of one of our harnesses 51950 resp. 51951: Solder in the harness and then plug in the decoder. That's how the Pro's do it!

cable harness 51950

Accessories			
	51960	Permanent magnet	like No. 220560, for armature 217450, D=24.5mm, for Motor holder 216730, 211990, 228500
	51961	Permanent magnet	like No. 220450, für armature 200680, D=18.0mm, for Motor holder 204900
	51962	Permanent magnet	like No. 235690, for armature 231440, D=18.0mm, for Motor holder 231350
	51963	Relay	1 A miniature relay, 16 Volts
	51950	Cable harness	with 8-pin socket according to NEM 652, DCC colours, length=30cm
NEW	51951	Cable harness	with 6-pin socket according to NEM 651, DCC colours, length=30cm

Change over of skis

Many railcars are equipped with a ski at both ends. In order to function correctly in block sections, and braking timely in front of red signals, it is vital for the decoder to employ only one ski for (voltage) pick up – depending on direction of travel.

This to achieve is precisely the responsibility of our ski change-over electronics: It is hooked up between pick up and LokPilot-or LokSound decoder: After re-programming, all ESU decoders (not LokPilot Basic, LokPilotXL DCC) can send a control-pulse that talks to the change-over electronics and then selects the "correct" ski. This combination works perfectly and without interference in Digital – and analog mode.

ski change-over electronics

Thin cables

Who doesn't know the problem: if you work on locos and decoders (e.g. run wires from loco to tender), you need thin, extremely flexible cables. These are not always easy to get. Responding to many requests from our customers, as of now we offer you super thin cables (AWG 36) with an outside diameter of only 0.5 mm (0.02 inch), in all common DCC colors. They come in 10 m (30 feet) bundles at an affordable price.

Thin cables white & purple

Thin cables black & red

Thin cables orange & green

Thin cables grey & yellow

Thin cables brown & blue

Accessories

NEW	51964	Ski change-over electronics for use with LokSound / LokPilot decoders
NEW	51940	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, white colour
NEW	51941	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, purple colour
NEW	51942	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, black colour
NEW	51943	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, red colour
NEW	51944	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, orange colour
NEW	51945	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, green colour
NEW	51946	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, grey colour
NEW	51947	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, yellow colour
NEW	51948	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, brown colour
NEW	51949	Super thin cable, 0.5mm diameter, AWG36, 10m bundle, blue colour

LokSound Showcase

LokSound – Listen to the sound

On the previous pages we told you much about our products and their amazing properties. What's not possible with a printed catalog is to demonstrate to you "live" the fascinating sound sequences of our LokSound decoders.

But there is a solution now: We engineered a glass showcase for letting you experience LokSound "live": You'll find the showcase at selected, well trained LokSound retailers all over Germany, Austria and Switzerland. Before you buy, sample the LokSound extensively in peace and quiet, and then consult the well trained expert.

Your LokSound dealer and ESU look forward to your visit!

Experience LokSound at the following locations:

Train & Play Modelleisenbahnen
Breite Str. 7 • D - 30159 Hannover
Telefon: 0511 / 2712701 • FAX: 0511 / 9794430
Email: info@train-play.de

Modellzentrum Hildesheim GmbH
Peiner Landstr. 213 • D - 31135 Hildesheim
Telefon: 05121 / 289940 • FAX: 05121/ 2899412
Email: Modellbahnecke.Weiss@t-online.de
Internet: www.modellbahnecke.de

Modellbahnland Bonn-Rhein-Sieg e.K.
Stiftsplatz 5 • D - 53111 Bonn
Telefon: 0228 / 342410 • FAX: 0228 / 348919
Email: Modellbahnland@t-online.de
Internet: www.modellbahnland.com

Euro Tecnica GmbH
Prümer Str. 55 • D - 53940 Losheim/Eifel
Telefon: 06557 / 920640 • FAX: 06557 / 931064
Email: euro.tecnica@t-online.de
Internet: www.euro-tecnica.de

Hachenburger Modellbahnschauanlage
Adolph-Kolping-Str. 24 • D - 57627 Hachenburg
Telefon: 02662 / 1095 • FAX: 02662 / 1438
Email:modellbahnschau-hachenburg@web.de
Internet: www.modelleisenbahnschau-hachenburg.de

Bieger Spielwaren
Ubierstr. 11 • D - 65719 Hofheim/Ts.
Telefon: 06192 / 24870 • FAX: 06192 / 22843
Email: spBieger@aol.com
Internet: www.bieger-spielwaren.de

Weizenhöfer P. R. / Modellbahn-Modellauto
Möglinger Str. 17 • D - 71636 Ludwigsburg-Pflugfelden
Telefon: 07141 / 260001 • FAX: 07141 / 200319
Email: info@modellbahn-modellauto.de
Internet: www.modellbahn-modellauto.de

Drehscheibe Inh. Peter Fischer GbR
Holzheimerstr. 11 • D - 73037 Göppingen
Telefon: 07161 / 659433 • FAX: 07161 / 659435
Email: drehscheibe-goeppingen@t-online.de

Lok Shop eK
Schultheiß-Kiefer Strasse 10 • D - 76229 Karlsruhe-Grötzingen
Telefon: 0721 / 9483730 • FAX: 0721 / 9483735
Email: mail@lokshop.de
Internet: www.lokshop.de

Modellbahnprofis Riffler und Ruhland OHG
Feldmochingerstr. 35 • D - 80992 München
Telefon: 089 / 1403031 • FAX: 089 / 1404845
Email: kontakt@modellbahnprofis.de
Internet: www.modellbahnprofis.de

Auto-Modellbahn-Welt Hödl
Untere Bahnhofstr. 50 • D - 82110 Germering
Telefon: 089 / 8415357 • FAX: 089 / 89410121
Email:info@modellbahn-hoedl.de
Internet: www.modellbahn-hoedl.de

Volldampf 2000
Ottostrasse 7 • D - 89134Blaustein
Telefon: 07304 / 41426 / • FAX: 07304 / 921216
Email:info@volldampf2000.de
Internet: www.volldampf2000.de

Modelleisenbahnen Scholz
Clichystr. 28 • D - 89518Heidenheim
Telefon: 07321 / 41644 • FAX: 07321 / 48502
Email: Scholz@ModScholz.de
Internet: www.Modscholz.de

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Färberstr.34 • D - 90402 Nürnberg
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Internet: www.eisenbahn-doerfler.de

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Modellbahnstube W+ D
Hirschwalder Straße 23 • D - 92286 Rieden
Telefon: 09624 / 91015 • FAX: 09624 / 91484

Spielwaren Georg Nußstein
Regensburger Str. 4 • D - 93133 Burglengenfeld
Telefon: 09471 / 70120 • FAX: 09471 / 701225
Email: georg.nusstein@t-online.de
Internet: www.spielwaren-nusstein.de

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Lazarettgasse 18 • A - 8020 Graz
Telefon: ++43 (0)316 / 774527 • FAX: ++43 (0)316 / 774527
Email: kuk-modellbahnen@gmx.at

Hobby Shop GmbH
Ribistrasse 7 • CH - 4460 Gelterkinden
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Email: info@hobby-shop.ch
Internet: www.hobby-shop.ch

Modellbauland Hauptwil
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Telefon: +41 (0)71 / 4225520 • FAX: ++41 (0)71 / 4225519
Email: info@modellbauland.ch
Internet: www.modellbauland.ch

Decoder comparison chart

Operatinal modes	LokPilot Basic	LokPilot V2.0	LokPilot^{DCC} V2.0	LokPilot mfx	LokPilot V3.0	LokPilot^{DCC} V3.0	LokPilot micro	LokPilotXL	LokPilotXL^{DCC}	LokSound V3.5	LokSound mfx	LokSound micro	LokSoundXL V3.5
DCC													
14, 28, 128 speed steps	OK	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
2-digit addresses	OK	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
4-digit addresses	-	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
Consist Mode	-	OK	OK	-	OK	OK	OK	-	OK	OK	-	OK	OK
LGB pulse control	-	OK	OK	-	OK	OK	OK	-	OK	OK	-	OK	OK
automatic speed step detection	-	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
Lenz LG 100, ROCO brake unit	OK	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
ZIMO HLU-commands	-	-	-	-	OK	OK	-	-	-	-	-	OK	-
DC mode	OK	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
Motorola®													
14 speed steps	-	OK	-	OK	OK	-	OK	-	-	OK	OK	OK	OK
28 speed steps	-	-	-	-	OK	OK	-	OK	-	-	-	-	-
Address 1 - 80	-	OK	-	OK	OK	-	OK	OK	-	OK	OK	OK	OK
Address 1 - 127	-	-	-	-	-	-	-	OK	-	-	-	-	-
Address 1 - 255	-	-	-	-	OK	-	-	-	-	-	-	-	-
Märklin® brake unit	-	OK	-	OK	OK	-	OK	-	-	OK	OK	OK	OK
Selectrix®	-	-	-	-	OK	-	OK	OK	-	-	-	OK	-
AC modes	-	OK	-	OK	OK	-	-	-	-	OK	OK	-	OK
Automatic detection of operational mode	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Throttle													
DC-, coreless motors,													
AC motors with permanent magnet	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
PWM frequency	31,25 kHz	40,00 kHz	40,00 kHz	40,00 kHz	32,00 kHz	32,00kHz	40,00 kHz	15,50 kHz	15,50 kHz	32,00 kHz	32,00 kHz	32,00 kHz	32,00 kHz
Load control in Digital mode	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Load control in Analog mode	-	-	-	-	OK	OK	-	-	-	OK	-	OK	OK
Adjustable starting- and max. voltage for Analog mode	-	OK	OK	OK	OK	OK	OK	-	-	OK	OK	OK	OK
Mass simulation for 14 speed step operation	-	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
DDC (Dynamic Drive Control)	-	OK	OK	-	OK	OK	OK	-	-	OK	-	OK	OK
Continuous motor current	0,7A	1,1A	1,1A	1,1A	1,1A	1,1A	0,5A	3,0A	3,0A	1,1A	1,1A	0,5A	3,0A
Short circuit protection	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Function outputs													
Number of Funktion outputs	3	4	4	4	4	4	2	4	4	4	4	4	8
Current per each output	180mA	180mA	180mA	180mA	250mA	250mA	140mA	600mA	600mA	250mA	250mA	180mA	600mA
Short circuit protection	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Brightness control for outputs	combined	separatly	separatly	separatly	separatly	separatly	separatly	combined	separatly	separatly	separatly	separatly	separatly
Light effects like Blinking lights, Strobe, Gyra light, Marslight, Zoom, Firebox flickering, Ditch Light	-	OK	OK	OK	OK	OK	OK	-	OK	OK	OK	OK	OK
Timer-controlled Function outputs	-	-	-	-	OK	OK	-	-	-	-	-	-	-
Function Mapping acc. NMRA (F0 bis F8)	-	-	-	-	-	-	-	-	OK	-	-	-	-
Function Mapping acc. ESU (F0 bis F15)	-	OK	OK	-	OK	OK	OK	-	-	OK	-	OK	OK
Function Mapping mfx® with Icon assignment	-	-	-	OK	-	-	-	-	-	-	OK	-	-
Switcher mode (de-selectable)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
ABV de-selectable)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Sound													
Polyphonic 4-channel sound	-	-	-	-	-	-	-	-	-	OK	OK	OK	OK
Flash memory for sound data	-	-	-	-	-	-	-	-	-	8 MBit	8 Mbit	8 Mbit	8 Mbit
Power of BTL-amplifier (sinus)	-	-	-	-	-	-	-	-	-	0,6W	0,6W	0,5W	1,5W
Programming													
DCC-Servicemode programming modes (Register Mode, Address Only, Direct Mode)	OK	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
DCC POM (Programming On the Main)	-	OK	OK	-	OK	OK	OK	OK	OK	OK	-	OK	OK
Programming mode for Märklin 6021	-	OK	-	OK	OK	-	OK	OK	-	OK	OK	OK	OK
mfx®-configuration on the Main	-	-	-	OK	-	-	-	-	-	-	OK	-	-
Special features													
mfx® Feedback system	-	-	-	OK	-	-	-	-	-	-	OK	-	-
NMRA DCC BiDi Feedback system	-	-	-	-	OK	OK	-	-	-	-	-	-	-
Storage of current operational state (Memory)	-	OK	OK	OK	OK	OK	OK	-	-	OK	OK	OK	OK
Motorola-Wrong-direction bit	-	OK	-	OK	OK	-	OK	-	-	OK	OK	OK	OK
Specification													
Dimensions in mm	25,5x15,5x4,5	23,0x15,5x5,5	23,0x15,5x5,5	23,0x15,5x5,5	23,0x15,5x5,5	23,0x15,5x5,5	13,5x9,0x3,0	55,0x25,0x10,0	55,0x25,0x10	31,0x15,5x6,5	31,0x15,5x6,5	28,0x10,0x5,0	51,0x40,0x14,0
8-pin plug according toNEM652 with cable harness	52690	52600	52601	61600	52610	52611	-	-	-	524xx	624xx	-	-
6-ppin plug according to NEM651 with cable harness	-	52602	52603	-	52612	52613	52680	-	-	-	-	528xx	-
6-pin plug according to NEM651	-	-	-	-	-	-	52681	-	-	-	-	-	-
21-pin mtc-connector	-	52618	-	-	52614	-	-	-	-	52499	-	-	-
Screw terminals	-	-	-	-	-	-	-	51700	51701	-	-	-	525xx

Epilogue...

Seminars

ESU is aware of the fact that in spite of all the efforts to make model railroad electronics easier to grasp, there is enormous desire to know "more". That's why we began holding seminars periodically for retailers six years ago. We instruct your dealer how to install and program ESU LokSound decoders as efficiently as possible.

Our homepage helps

We realize that model railroad electronics requires intensive guidance even, and especially before you buy. Our goal is to win you as a satisfied customer. With our products we want to please you and enrich your hobby.

Hopefully this brochure stirred your imagination and answered many of your questions.

If you still have queries you should take a look at our website. There you can delve in depth into our treasure chest of articles.

Sounds and software

For our LokSound decoders we have many more sounds than we can offer via order number. So, if you need sound for a somewhat exotic loco, feel free to browse in our database.

Furthermore, you always find the latest software for the LokProgrammer in the internet. You can download it free of charge.

Manuals

From the internet you can also download all the manuals for our products, finding all the details.

You're welcome to use this additional source of information getting to know our products before you purchase them.

Have fun!

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