Littfinski DatenTechnik (LDT)

LD

Operating Instruction

Light signal decoder

for light-signals with LED
from the *Digital-Professional-Series* !
LS-DEC-SJ-G Part-No.: 510313

>> finished module in a case <<

Suitable for the digital systems:
Märklin-Motorola and **DCC**

For direct digital control of:

⇒ up to four Hsi2- or Hsi3-light signals of the Swedish State Railway (SJ) with 2 or 3 signal aspects.

⇒ up to two Fsi2-, Fsi3-, Hsi4- or Hsi5-light signals of the Swedish State Railway (SJ) with 2 to 7 signal aspects.

Realistic operation of the signal aspects by implemented **dimming function** and short **dark phase** between the switching of the signal aspects.

CE

Multi-Digital

4 038264 024391

Introduction/Safety instruction:

You have purchased the Light-signal decoder **LS-DEC-SJ** for your model railway as a finished module in a case.

The **LS-DEC** is a high quality product that is supplied within the *Digital-Professional-Series* of **L**ittfinski **D**aten**T**echnik (**LDT**).

We wish you having a good time using this product.

The Light-signal decoder **LS-DEC** of the *Digital-Professional-Series* can be easily operated on your digital model railway.

By using a **connector plug bridge** you can **choose** if you want to connect the decoder to a **Märklin-Motorola** system or to a digital system with **DCC** standard.

The finished module and the finished module in a case comes with **24 month warranty**.

• Please read the following instructions carefully. Warranty will expire due to damages caused by disregarding the operating instructions. **LDT** will also not be liable for any consequential damages caused by improper use or installation.

Connecting the decoder to your digital model railway layout:

• **Attention: Before starting the installation-work switch off the layout voltage supply (switch-off the transformers or disconnect the main supply).**

The Light-signal decoder **LS-DEC** is suitable for the **DCC data format** as used e.g. by **Lenz-Digital Plus**, **Roco-Digital** (switching via **Keyboard** or **multiMAUS** only; switching via **Lokmaus 2®** and **R3®** is not possible), **Zimo, LGB-Digital, Intellibox, TWIN-CENTER, DiCoStation, ECoS, EasyControl, KeyCom-DC** and **Arnold-Digital / Märklin-Digital=** respectively **Central Station 2 (60214/60215)** whenever **no connector plug bridge** is inserted in position **J2**.

The decoder is suitable for **Märklin-Digital~ / Märklin Systems** or **Märklin-Motorola** (e.g. **Control-Unit, Central Station, Intellibox, DiCoStation, ECoS, EasyControl, KeyCom-MM**) if you insert a **connector plug bridge on J2**.

The decoder receives the **digital information** via the clamp **KL2**. Connect the clamp with a rail or even better connect the clamp to an own digital main ring supply assuring the supply of digital information to be free from any interference.

Please attend to the marking on clamp **KL2**. The colors **'red'** and **'brown'** next to the clamp are usually used by **Märklin-Motorola** systems **(e.g. Märklin-Digital~ / Märklin Systems / Intellibox DiCoStation / ECoS / EasyControl).**

Lenz-Digital systems are using the letters **'J'** and **'K'**.

In case you assemble the decoder to an **Arnold-Digital (old)-** or **Märklin-Digital=** system, you have to connect **'black'** to **'K'** and **'red'** to **'J'**.
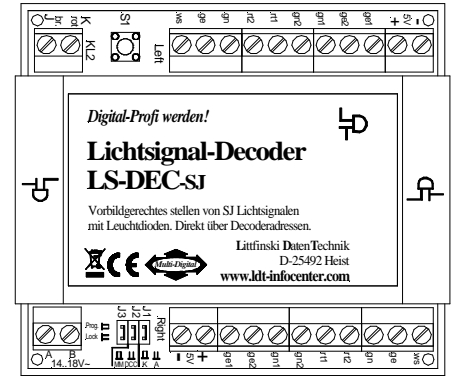
The decoder receives the **power supply** via the two poles clamp **KL1**. The voltage shall be within a range of 14..18V~ (alternate voltage output of a model rail road transformer).

If you do **not** want to supply voltage **separately from a transformer** to the **LS-DEC decoder** you can **connect** the clamp **KL1 to** clamp **KL2** with two wires. In this case the decoder will get the power supply **completely** from the **digital network.**

Connecting the signals:

General:
Up to **4 signals** can be connected to the **Light-signal decoder LS-DEC**. **Two signals per each 11poles clamp bar**. The connection sequence of the two clamps is identical. The following description refers mainly to one clamp only. As you can see at the identical markings the description is also valid for the second clamp.

Common connection:
All LED-signals of any manufacturer are designed in accordance to the same principle. One wire of all light emitting diodes of a signal will be generally connected to a common cable. Depending if all anodes or all cathodes are connected together the signals will be called as **common anodes-** respectively **common cathodes-signal.**

If you use signals with **common anodes** you have to clamp this cable to the connection marked **'+'**. In addition you shall **not insert** the **connection plug bridge in J1** in this case**.** If you use signals with **common cathodes** you have to clamp this cable to the connection marked **'-'**. In this case you shall **insert** the **connection plug bridge in J1**.

The second connection of each light emitting diode is separated and mostly color marked at the end and contains a series resistor.
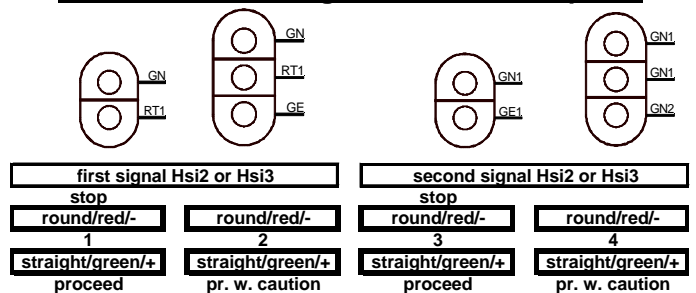
Series resistors:
Light emitting diodes have **always** to be **operated** with a suitable **series resistor** to prevent that they will be destroyed. For this prevention **all outputs** contain already a **series resistor** of **330 Ohm integrated** on the printed circuit board of the **Light-signal decoder LS-DEC.** Is there no further external resistor available the diode-current will be about 10mA. This provides **sufficient brightness**.

For assigning the **single cables of the light emitting diodes** to the **correct clamp connection** please attend to the below **signal images**. The **marks** next to **signal light diodes** are not corresponding to the actual light-color but to the marking of the **connection at the Light-signal decoder LS-DEC.**

If you do not know the correct allocation of the single wires to the light emitting diodes you can **test** the function by connecting the wires to clamp **RT1**. This output is **active** because the decoder switches **all signals to red after switching on**.

1.   Two Hsi2- or Hsi3-Signals on each clamp bar:

first signal Hsi2 or Hsi3 stop		second signal Hsi2 or Hsi3 stop	
round/red/- 1	round/red/- 2	round/red/- 3	round/red/- 4
straight/green/+ proceed	straight/green/+ pr. w. caution	straight/green/+ proceed	straight/green/+ pr. w. caution

short cut: **pr. w. caution ➔ proceed with caution**

2. One Fsi2- or Fsi3-Signal on each clamp bar:
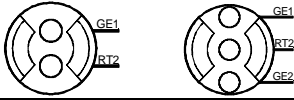
signal Fsi2 or Fsi3			
expect stop			
round/red/-	round/red/-	round/red/-	round/red/-
1	**2**	**3**	**4**
straight/green/+	straight/green/+	straight/green/+	straight/green/+
expect proceed	ex. pr. w. cau.		

short cut: **ex. pr. w. cau. ➔ expect proceed with caution**

3. One Hsi4- or Hsi5-signal on each clamp bar:
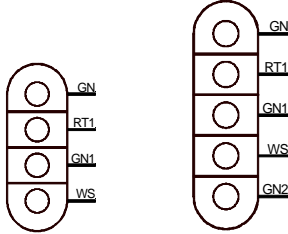
signal Hsi4 or Hsi5			
stop	expect proceed	expect stop	short distance
round/red/-	round/red/-	round/red/-	round/red/-
1	**2**	**3**	**4**
straight/green/+	straight/green/+	straight/green/+	straight/green/+
proceed	pr. w. caution	ex. pr. w. cau.	

short cuts:
- **expect proceed** ➔ **expect proceed next main signal**
- **pr. w. caution** ➔ **proceed with caution**
- **expect stop** ➔ **expect stop next main signal**
- **ex. pr. w. cau.** ➔ **expect proceed with caution next main signal**
- **short distance** ➔ **proceed with caution short distance to next signal**

Further sample connections are available at the internet on our Web-Site (www.ldt-infocenter.com) at the section "**Sample Connections".**
Additionally you can find detailed information about the Light-signal decoder **LS-DEC-SJ** at our Web site within the section "**Digital-Compendium**".

Programming the decoder address:

- The **jumper J3** has to be **inserted** for the programming of the decoder addresses**.**
- **Switch-on** the **power supply** of your model rail way.
- Activate the **programming key S1**.
- At **least two light emitting diodes** on a **signal** connected to the **left clamp** block (on this decoder side is the programming key S1) will be **automatically** switched over **every 1,5 seconds** in a flashing mode. This indicates that the decoder is in the **programming mode.**
- **Press** now **one key** of the **fourfold address-group to be assigned** to the **left clamp block** of the decoder. For programming the decoder address you can as well release a turnout switch signal via your model railway software.
  Remarks: The **decoder addresses for magnet accessories** also to be used for switching the **signal-aspects** are combined into **groups of four**. The address 1 to 4 will be the first group. The address 5 to 8 will be the second group etc. Each clamp block of a **LS-DEC** decoder can be assigned to any of these groups. It does not matter which of the eight possible keys used for programming will be activated. The decoder stores always the complete group of keys.
  If the Light-signal decoder **LS-DEC** shall control on this clamp bar **two Hsi2- or Hsi3-signals** or **one Fsi2-, Fsi3-, Hsi4- or Hsi5-signal** this has to be adjusted together with the decoder address. If you activate within the programming mode one key of the desired group of four keys designated for switching a turnout **straight** or a signal to **green** the decoder will be set for the controlling of **two Hsi2- or Hsi3-signals**.

  But if you activate a key for switching a turnout **round** or a signal to **red** you have selected the option to switch **one Fsi2-, Fsi3-, Hsi4- or Hsi5-signal**. For **both programming modes** (**left and right clamp bar**) you can **individual select** if **two Hsi2- or Hsi3-signals or one Fsi2-, Fsi3-, Hsi4- or Hsi5-signal** shall be digital controlled.

- If the decoder has **recognized the assignment** correctly the connected **light emitting diode** will flash a little **faster**. Afterwards the **flashing slows down** to the **initial 1,5 seconds** again.
  In case the decoder will not recognize the address it could be that the two digital information connections (clamp 2) are wrong connected. For testing this, switch off the power supply, exchange the connection on KL2 and start addressing again.
- Press now the **programming key S1** again. At least **two light emitting diodes** connected to the **right clamp block** will flash now.
  Repeat the programming of this **fourfold-address block** as described above.
- Now **press** the programming key S1 a **third time** for **leaving the programming mode**. All signals will be **automatically switched** to **STOP**.

Signal switching:

The **opposite sample connections** show how the **fourfold address-group** can be set by use of **8 keys** of the **push button panel** for setting the turnouts or signals. Between each pair of keys are **e.g.** the addresses 1 to 4. The two keys **red** and **green** for each address are **assigned** to the turnout position **round** or **straight** respectively the **corresponding signal aspect** which is indicated **above** or **below** key.

The **actual address section** is related to which **fourfold address-group** has been selected during the programming.

If you use a **remote control LH100** of Company Lenz Elektronik then **red** will be the **minus key** and **green** the **plus key**.

1. Two Hsi2- or Hsi3- signals with 2 or 3 signal aspects on each clamp bar:

If you have adjusted the Light-Signal decoder **LS-DEC-SJ** for **switching two Hsi2- or Hsi3-signals** by **programming one clamp bar** as shown at **picture left** under **1** you can e.g. switch the **first signal** to **drive** (**proceed**) with **address 1** and **key green.**
The LED marked with **GN** indicates this at the **first signal**.
Please activate the **key green** of the **address 3** and the **second signal** will be switched to **drive** (**proceed**). The LED marked with **GN1**

The **first signal** will be always switched via the **address 1 and 2**. The **second signal** of the **clamp bar** will be switched via **the address 3 and 4** of the programmed **four fold address group.**

2. One Fsi2-, Fsi3-, Hsi4- or Hsi5-signal with 2 to 7 signal aspects on each clamp bar:

If you have **adjusted** the **LS-DEC-SJ** by **programming** the **addresses** of **one clamp bar** for switching **one Fsi2-, Fsi3-, Hsi4- or Hsi5-signal** the sample 2 for Fsi2- and Fsi3- will be as reference as well as the sample 3 for Hsi4- or Hsi5-signals.
As shown within the **sample 2**, one **Fsi2-signal** will be controlled by the **first address** of the programmed **four-fold address group**. The second, third and fourth address will remain vacant. One **Fsi3-signal** will be controlled via the **first and second address.** The third and fourth address will remain vacant. If one **Hsi4-** or **Hsi5-signal** will be digital controlled via the **clamp bar** is it possible to **digital control 5** (for **Hsi4**) or **7** (for **Hsi5**) **signal aspects** as per **sample 3**. For e.g. is it possible to switch via the **third address** and the key **red** the **signal aspect** "**expect stop next main signal"**. At the **Hsi4-signal** the second **green** LED will **flash** for this signal aspect and by the **Hsi5-signal** the **green** LED at the signal center will flash **exemplary**.

Attention:

The **Light-signal decoder LS-DEC** switches the signal aspects not just on and off but is dimming the light emitting diodes realistic up and down. Even between the signal aspects a short off-phase is provided. Further digital commands received during this switch-over-time of about 0,4 seconds will not be taken up from the decoder. Please take care that the switching-commands are not in a to fast sequence. The impression is absolutely realistic if the switching is considerable slow.

If the **jumper J3** will be removed after programming of the decoder addresses the **memory storage** of the **Light-signal decoder LS-DEC** will be **protected** against any alteration.