



# Light-Signal Decoder

for light-signals with LED

from the *Digital-Professional-Series* !

**LS-DEC-SNCF-G** Part-No.: **510413**

>> finished module in a case<<

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

For direct digital control of:

- ⇒ up to four Light Signals with max. 4 lamps of the French State Railway Company - Société Nationale des Chemins de fer Français (SNCF).
- ⇒ up to two SNCF-Signals with 5 to 9 lamps and up to 16 signal aspects.

With implemented **dimming function** and short **dark phase** between signal aspects.

This product is not a toy! Not suitable for children under 14 years of age!  
The kit contains small parts, which should be kept away from children under 3!  
Improper use will imply danger of injuring due to sharp edges and tips! Please store this instruction carefully.



## Introduction/Safety instruction:

You have purchased the Light-Signal Decoder **LS-DEC-SNCF** 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 Littfinski DatenTechnik (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 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.
- We designed our devices for indoor use only.

## 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 whenever **no connector plug bridge** is inserted in position **J2**.

The decoder is suitable for **Märklin-Motorola** data format, if you insert a **connector plug bridge** on **J2**.

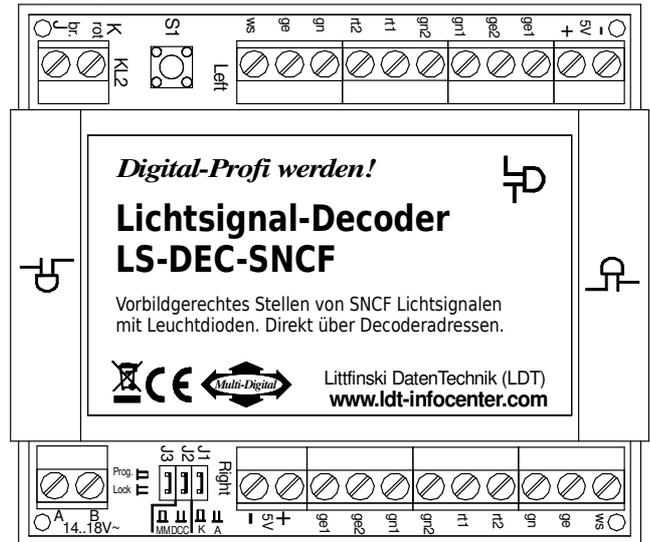
The decoder receives the **digital information** via the clamp **KL2**. Connect the clamp with a rail or even better connect the clamp to an own digital main ring supply assuring the supply of digital information to be free from any interference.

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'**.

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 plug 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.

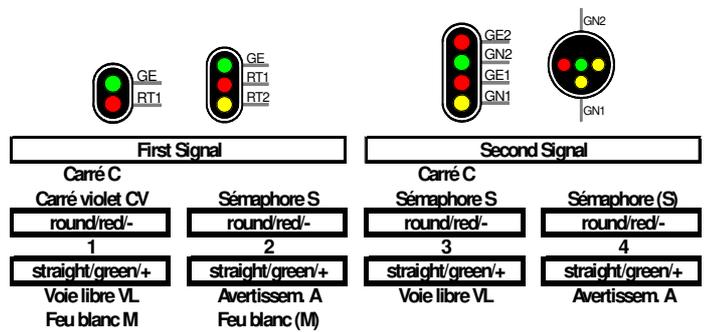
### Series resistors:

**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**.

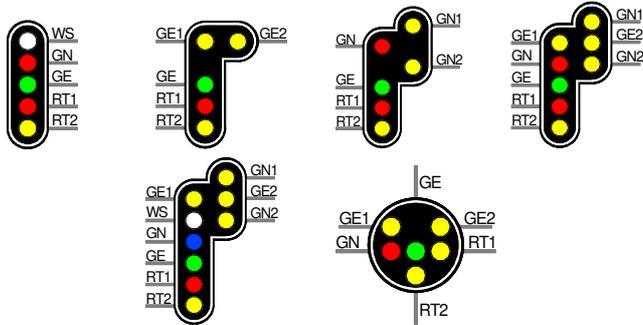
For assigning the **single cables of the light emitting diodes** to the **correct clamp connection** please attend to the below **signal images**. The **marks** next to **signal light diodes** are not corresponding to the actual light-color but to the marking of the **connection at the Light-Signal Decoder 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 2- to 4-aspect signals on each clamp bar:



## 2. One up to 16-aspect Signal on each clamp bar:



11-aspect Signal			
<b>Carré C</b> round/red- 1 straight/green+ Voie libre VL	<b>Sémaphore S</b> round/red- 2 straight/green+ Avertissem A	<b>group 1</b> round/red- 3 straight/green+ group 2	round/red- 4 straight/green+
<b>Carré violet CV</b> round/red- 1 straight/green+ Feu blanc M	<b>Sémaphore (S)</b> round/red- 2 straight/green+ Feu blanc (M)	round/red- 3 straight/green+ group 2	round/red- 4 straight/green+
<b>Ralentissement 60/ Feu ja. d. (F)+(A)</b> round/red- 1 straight/green+ Feu vert d. (VL)	<b>Disque D</b> round/red- 2 straight/green+ Feu jaune d. (A)	round/red- 3 straight/green+ group 3	round/red- 4 straight/green+
<b>Ralentissement 30 R</b> round/red- 1 straight/green+ Ralentissement 60 (F)	<b>Rappel de ralentissm 30 RR</b> round/red- 2 straight/green+ Rappel de ralentissm 60 (RR)	round/red- 3 straight/green+ group 4	round/red- 4 straight/green+

Further sample connections are available at the internet on our Web-Site ([www.ltd-infocenter.com](http://www.ltd-infocenter.com)) at the section "Sample Connections". Additionally you can find detailed information about the Light-Signal Decoder LS-DEC-SNCF at our Web site within the section "Digital-Compendium" at chapter 2.

### 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 2 to 4 aspect signals** or **one up to 16 aspect 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 2- to 4-aspect signals**. If you activate a key for switching a turnout **round** or a signal to **red** you have selected the option to switch **one up to 16-aspect signal**. For **both programming modes (left and right clamp bar)** you can **individual select** if **two 2- to 4-aspect signals** or **one up to 16-aspect 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** the 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 2- to 4-aspect signals on each clamp bar:

If you have adjusted the Light-Signal Decoder **LS-DEC-SNCF** for **switching two 2- to 4-aspect signals** by **programming one clamp bar** as shown at the **picture under 1**, on the first page of this instruction you can e.g. switch the **first signal to drive (Voie libre VL)** with **address 1** and **key green**.

Please activate the **key green** of the **address 3** and the **second signal** will be switched to **drive (Voie libre VL)**.

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 up to 16-aspect signal on each clamp bar:

If you have **adjusted the LS-DEC-SNCF** by **programming the address of one clamp bar** for switching **one up to 16-aspect signal** the **picture left under 2** will indicate the status.

Via the **two first addresses** of the **clamp bar** of this programmed **four fold address group** is it possible to **switch four signal aspects**.

As a total of **16 signal aspects** can be controlled the selection of one of **four signal aspect groups** has to be performed via the **addresses 3 and 4**. The occupancy of keys below the signal shows the relation. After switching—on the signal indicates **stop (Carré C)**. If now e.g. the **aspect Ralentissement 30 R** shall be indicated is it required at first to activate the address 4, key **red** for the **third signal aspect group** and then the address 1 key **red**.

Only the **thick framed keys** of the table will be required for switching the signal.

### 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 too 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.

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