



Feedback Module with integrated 8-fold track occupancy detectors

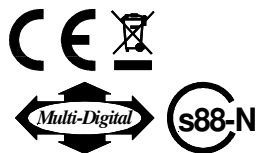
for the s88-feedback bus
from the *Digital-Professional-Series* !

RM-GB-8-N-G Part-No.: 320103

>> finished module in a case <<

- ⇒ **controls up to 8 different tracks**
(current detection from 0,001[1mA] up to 3 ampere).
- ⇒ **integrated voltage control**
(avoiding "track free" feedback in case of power failures).
- ⇒ **separated by opto isolation**
(between track and feedback bus).
- ⇒ for **s88 standard connections and s88-N(5V)**
(with 6-poles s88-pinbars and RJ-45 sockets).
- ⇒ **suitable for following digital systems:**
Märklin CS1 and 2, CS3 (plus) over L88 with 5V, Twin-Center, Intellibox, HSI-88(-USB), EasyControl, ECoS, DiCoStation.

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 Information:

You have purchased the 8-fold feedback module **RM-GB-8-N** with integrated detection of track occupancy for your model railway. The **RM-GB-8-N** 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 finished module in a case comes with **24 month warranty**.

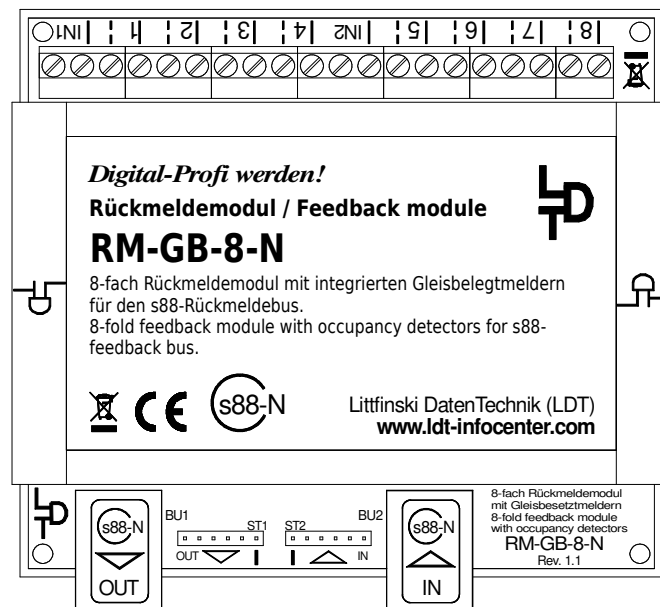
- Please read the following instructions carefully. Warranty will expire due to damages caused by disregarding the operating instructions. LDT will also be not liable for any consequential damages caused by improper use or installation.
- We designed our devices for indoor use only.
- **Attention:** Please switch off your digital control unit and unplug all transformers from AC-current before starting to assemble the unit.

General functional description:

The **RM-GB-8-N** feedback module combines the **occupied track detection** and the **feedback report** function. The **8 detectors for occupied tracks** work by **detection of current**. In cases a connected track is occupied by an **object** with a minimum of 0,001 Ampere (1mA) **consuming current**, the track will be detected as occupied.

Locomotive decoder, coach lights or **axles** with electrical resistance are **consumer of electrical power** and therefore induce the detection of an occupied track.

The **maximum DC current** on the tracks can be up to **3 Ampere per output**. A **peak current** of **7 Ampere** will be possible at **short term**. Then has the **booster** to identified the **overload** or the **short circuit** and has to **cut-off the current**.



The **track voltage** and the **feedback bus** are separated by **opto-galvanic**. The current for the tracks can therefore safely be supplied from different transformers without having a negative effect on the digital control units.

The **modular concept** of **occupied track detectors** and **feedback decoders** implements a considerable galvanical problem: as soon as there is no electrical power on the tracks, all tracks are detected as free because no consuming current is detected. There are track occupied detectors available on the market which use an auxiliary voltage to solve this problem, but this can influence sometimes the locomotive decoder causing disturbances and is therefore no suitable solution.

As the feedback module **RM-GB-8-N** has a build-in intelligence (microprocessor Z86... [IC1], we have integrated a solution called **voltage monitor**. In case of voltage drop or short circuit there is

no inaccurate "free track" detection and report back via the feedback bus to the digital control unit or the PC. All track occupancies will be "**frozen**" during this phase of voltage interruption.

As soon as there is current on the tracks again the actual situations on the tracks will be detected and reported back via the feedback bus.

The **RM-GB-8-N feedback module** is suitable for a **decentralize installation** underneath of the model railway installation. There are 4-bores on the edges of the modules for quick and easy installation. Suitable **assembly parts** (plastic distance spacers and wood screws) are available under the order code **MON-SET**.

Connecting the RM-GB-8-N to Digital Central Units respectively Interfaces:


Digital Central Units and **Interfaces** can control up to **496 feedback contacts** via the **s88-Feedback bus**. Therefore will be the occupation reports of up to **62 RM-GB-8-N** evaluated.

Electrical power will be supplied from the **s88-feedback bus** to all feedback modules. This will apply for the **s88-standard feedback modules** and as well as for the feedback modules **RM-GB-8-N**. The power consumption of the standard feedback modules is considerable low. The **RM-GB-8-N** requires 0,003 Ampere (3mA) only.

The **s88 feedback bus** of **digital central units** and **interfaces** can mostly supply a maximum load of up to 0.5 Amp. If the maximum quantity of 62 feedback modules **RM-GB-8-N** are connected, the bus has to supply $62 \times 0,003A = 0,186A$.

If you want to extend your model railway layout with **RM-GB-8-N** feedback modules you can easily combine those with our feedback modules **RM-DEC-88(-Opto)** and **RM-88-N(-Opto)** or s88 feedback modules of other manufacturers.

The **address** of the **feedback modules** is related to the **sequence** of the **connection** to the **digital central unit** or to the **interface**. The **feedback module** which is **directly connected** to the **central unit** will get always the **address 1**. Further details are available within the **operation instructions** of your **digital central unit** or the **interface**.


The **RM-GB-8-N** contains **two 6-poles pin bars** for the s88-standard connection and two **RJ-45 sockets** for a bus connection in accordance to .

At the **RM-GB-8-N** are the **pin bars** and **sockets** marked with **OUT** and **IN**.

OUT is the **connection in direction of the digital central unit** or **interface**. **IN** shall be **connected to the next following feedback module** within the **s88 bus line**.

Digital central units and **interfaces** contain always a **s88-input** for a **s88-standard connection**.

We supply an **interference protected twisted s88-bus-cable** with **original s88-bus plugs** for the **s88-standard connection**. The **plugs** of the **s88-bus-cable** are **correct assembled** on the **6-poles pin bar** of the **RM-GB-8-N** when the position of the **white single wire corresponds** to the **white marking** on the pc-board **next to the pin bar**. The **cable shall lead directly away from the feedback module**. **Additionally attend** to the **correct position of plug** to **prevent any offset to the 6-poles pin bar**.

For a secure s88-bus connection in accordance to  we offer an **interference protected blue patch cable** with **RJ-45 plugs**.

Attention: **Digital central units** with **PC-network connection** (e.g. **Central Station 1, 2 and 3** and **ECoS**) contain as well a **RJ-45 socket**.

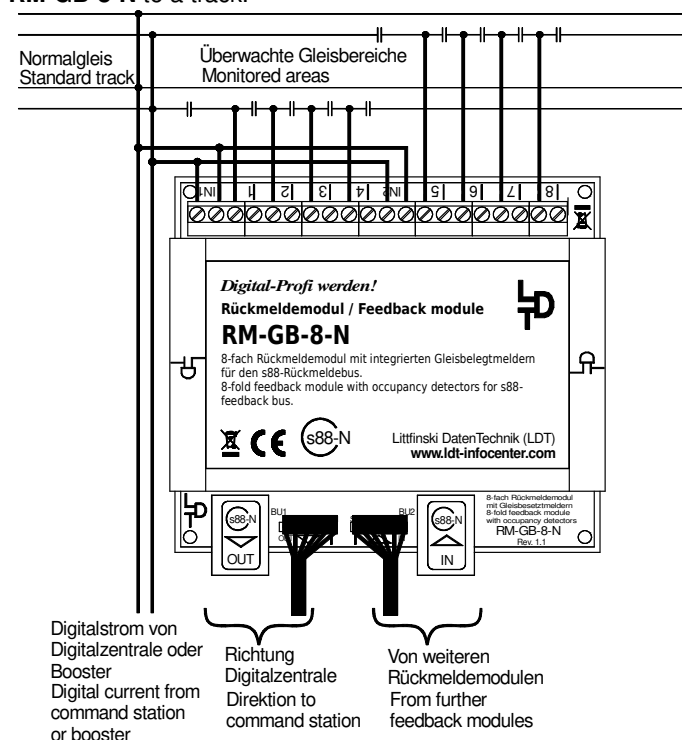
The RJ-45 network socket shall never be connected to the RM-GB-8-N!

The **RM-GB-8-N** shall be operated only with a **s88-bus voltage of 5V**. If the **Digital-command station** or the **Interface** offers the possibility to use either **5V** or **12V** for the **s88-bus voltage** the **5V has to be selected**. The operation of the **s88-connection** at the bottom of the **Märklin CS3 plus (60216)** with a constant **s88-**

bus voltage of 12 Volt will not be permitted because this will **damage the feedback module**. It is absolutely required to set the **Märklin L88 (60883) sliding switch** onto a **s88-bus voltage of 5Volt**.

Connecting track sections:

Below draft clarifies how to connect the feedback module **RM-GB-8-N** to a track.



Digital current will be supplied to the **RM-GB-8-N** via input **IN1** and **IN2**. **IN1** provides current to the output **1** to **4** and **IN2** provides current to the output **5** to **8**. The two inputs **IN1** and **IN2** are **electrical separated**.

Therefore will it be possible for example to supply **IN1** from the digital command station (control unit) and **IN2** from a booster. With reason to have a correct feedback report it is required to supply digital current to both inputs (**IN1** and **IN2**).

By using the control unit or a booster on **IN1** or **IN2** connect the **digital current** for the **supply** of the **continuous rail** to the **clamp** with the **continuous white line**.

Output clamps 1 to 8 shall be connected to those **isolated tracks**, which shall be **monitored**. As indicated in the draft it is sufficient to **isolate one rail**. The **clamp** with the **dotted line** shall be connected to the rail **track section** to be **monitored**. Detailed sample connections for various application can be downloaded from our web-site (www.ldt-infocenter.com) within the section "**Downloads**".

To avoid short circuits when locomotives are crossing the transitions of each monitored track, always the same connecting sequence of the tracks has to be strictly followed.

In case of a short circuit when crossing the transition (control unit will switch to EMERGENCY STOP) please check the connections and eventually change the cables of the monitored track at the respective OUTPUT clamps.

Anti-interference capacitors can lead to an erroneous occupied detection of the track and should therefore not be used within the monitored track.

If you apply **electrical resistant coating** to the **axles** of your trains you should measure the resistance value with a Multimeter afterwards.

A resistance between **5** and **10 KOhm** will guarantee a safe monitoring by the occupied track detection of the feedback module **RM-GB-8-N**.

Customary used **resistance axles** with a resistance value of **18 KOhm** will just be monitored, provided that the rails **are very clean** and the railway coaches have a sufficient contact to the rails. In such case it will be recommended, to fit **two resistance axles** to the coach to receive a total resistance value of about **9 KOhm**. This will assure a save monitoring even when the rails are not perfect clean.

Trouble shooting:

What to do if something is not working as described above?

If you have purchased the **RM-GB-8-N** module as a kit, please carefully check all parts and all soldered joints.

Important: Both inputs (**IN1** and **IN2**) have to be connected to a digital current.

Possibly test the single monitoring function of the modules first before connecting it to the tracks.

To do this you can use a resistor (couple of hundred Ohm) or a small model lamp to simulate the occupied situation on each output clip.

Without resistor or incandescent lamp the detection of the input should be indicated as "free", with a resistor or incandescent lamp your digital control unit or PC should show an "occupied" situation.

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