

16-fold Feedback Module

for the s88-feedback bus

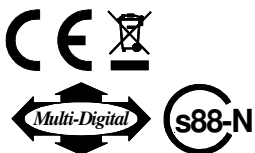
from the *Digital-Professional-Series!*

RM-88-N-F Part-No.: **310112**

>> finished module <<

- ⇒ with 16 input connections, switching against ground (e.g. for contact tracks [one isolated rail], switch tracks or reed-contacts).
- ⇒ for s88-standard connections and s88-N (with 6-poles s88-pinbars as well as RJ-45 sockets and suitable for 5 and 12V bus voltage).
- ⇒ suitable for the digital control: Märklin-Digital~/=, CS 1, 2, 3 plus and L88, Intellibox, TWIN-CENTER, 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 years of age! 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 feedback module **RM-88-N** for your digital model railway.

The **RM-88-N** is a high quality product, which is supplied within the *Digital-Professional-Series* of Littfinski DatenTechnik (LDT).

We are wishing you having a good time using this product.

The finished modules come 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 damage caused by improper use or installation.
- Also, note that electronic semiconductors are very sensitive to electrostatic discharges and can be destroyed by them. Therefore, discharge yourself before touching the modules on a grounded metal surface (e.g. heater, water pipe or protective earth connection) or work on a grounded electrostatic protection mat or with a wrist strap for electrostatic protection.
- 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 any installation.

General functions:

The feedback module **RM-88-N** contains 16 inputs, which will switch against ground. The module is compatible to the Märklin feedback module s88.

Connecting the RM-88-N to command stations or interfaces:

Up to 31 feedback modules **RM-88-N** can evaluate the reports of a Märklin **INTERFACE**, Central Station 1, 2 and 3 plus,

Intellibox, TWIN-CENTER, EasyControl, ECoS, HSI-88(-USB) and DiCoStation.

On each Märklin **Memory** can be up to 3 feedback modules **RM-88-N** connected.

The Märklin **Module Link L88 (60883)** provides the operation of 31 **RM-88-N** per bus line.

All feedback modules will receive the **operating current** from the **s88-feedback bus**.

If you want to extend your layout with **RM-88-N** feedback modules you can combine those with our feedback modules **RM-DEC-88(-Opto)**, **RM-88-N-O**, **RM-GB-8(-N)** respectively with s88 feedback module of other manufacturers.

The **addresses** of the **feedback modules** are related to the **sequence** of the **connection** to the **command station** respectively to the **interface**. The **feedback module**, which is directly connected to the central unit, will receive always the **address 1**. Further details can be found within the **operation instruction** of your **command station** respectively your **interface**.

The feedback module **RM-88-N** contain **two 6-poles pin-bars** for the **s88-standard connection** and as well two **RJ-45**

sockets for a bus connection according to **s88-N**. At the **RM-88-N** are **pin-bars** and **sockets** marked with **OUT** and **IN**.

Out indicates the **connection in direction to the command station or interface**. **IN** indicates the **connection to the next following feedback module** within the **s88-bus line**.

Command stations and **interfaces** are always equipped with an **s88-input** for an **s88-standard connection**.

For the **s88-standard connection** is an **interference protected twisted s88-bus cable** with **original s88-bus plugs** available.

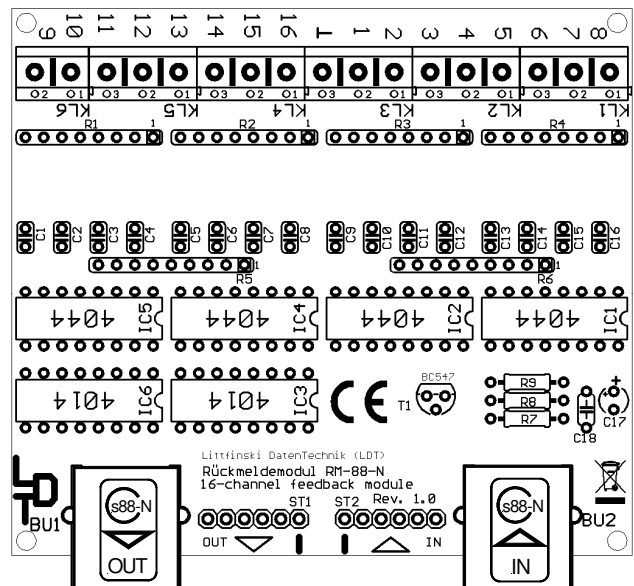
The **plugs** of the **s88-bus cable** are **correct attached** onto the **6-poles pin-bar** of the **RM-88-N** if the **white single wire**

corresponds with the **white marking** on the **pc-board** next to the **pin-bar**.

The direction of the **cable has to be directly away from the feedback module**. **Additionally attend** to the position of the **plugs** on the **6-poles pin-bars**. **No offset will be acceptable**.

For the **s88-N** s88-bus connection we offer a **screened blue patch-cable** with **RJ-45 plugs**.

Attention: **Command stations with PC-network connection** (e.g. **Central Station 1, 2 and 3 plus** and **ECoS**) contain as well a **RJ-45 socket**. **It is not acceptable to connect the RM-88-N to the RJ-45 network sockets**.



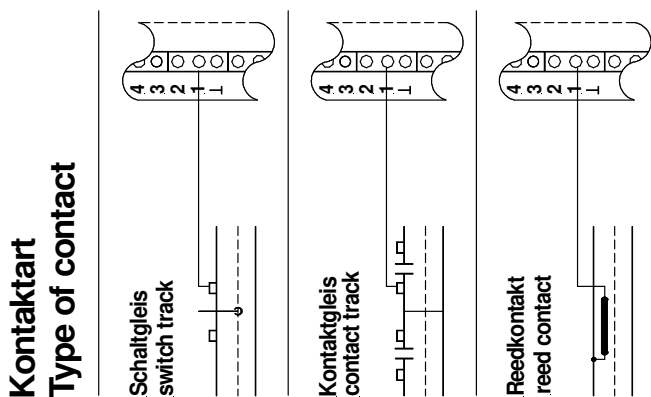
Connection of contacts:

1. Three-conductor rail-system

At the feedback module **RM-88-N** all contacts can be connected which are switching against ground (mostly **digital wire "brown"**).

Therefore is it possible to switch against the feedback module connection clamp marked \perp or against the connection 0 (brown) of the rails.

Switch rails, contact rails and reed-contacts can be connected to the clamps 1 to 16 as shown below.



At section 2 (two-conductor rail system) you can find an additional possibility to connect reed-contacts. The second connection of the reed-contact will not be soldered to the connection 0 of the track but connected to the ground clamp \perp at the feedback module.

All shown above connections are conform exactly to the known wiring of the Märklin feedback module s88.

Further sample connections can be found at the Internet on our Web Site (www.ldt-infocenter.com) at the section "**Downloads**" and "**Sample Connections**".

Beside the single sample connections we recommend the file "**RM-88_Info**" within the section "**Downloads**".

To avoid interferences and wrong occupancy reports by feedback module, which are switching against ground, is it recommended not to install the connection cable to the 16 inputs together with digital current carrying cables (e.g. common cable channel).

If the connection cables to the contacts are very long and installed very narrow (e.g. within one cable with several wires) it can even come to some signal transfer between two wires. Although only one section is actually occupied several sections can be reported to be occupied.

But also the particularly simple **track occupied report** from **contact rails** (one isolated rail) can initiate problems because the isolated rail runs inevitable parallel to the digital current carrying middle conductor.

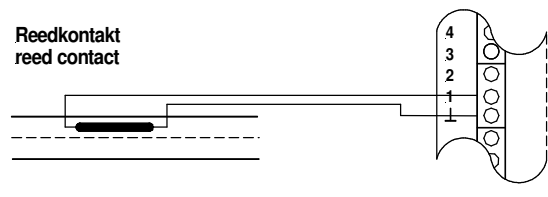
As longer a contact track as sooner interferences are possible. As a result the input can be switched temporarily to be occupied although no train is on the respective track section.

The described problems can be solved by using interference **suppression diodes** or **decoupling diodes** before the single inputs. A sample wiring can be found on our Web Site at the section "**Sample Connections**".

Alternative is it possible to use the feedback module **RM-88-N-O** that is less sensitive against interferences due to **opto-coupling inputs**.

2. Two-conductor rail-system:

If you use **reed contacts** or other **potential-free contacts** for feedback signals on your layout you can install the wiring to the feedback module **RM-88-N** as shown at the below circuit.



Even the **shortest switch impulses** will be transferred by the feedback module **RM-88-N** because they will be **stored** via the **s88-feedback bus** until the digital control unit or the interface will request this information.

Feedback module from our **Digital-Professional-Series** are easy to use on your digital model railroad, as they **are 100% compatible** with the s88 feedback bus.

Accessories:

For safe **installation** of the feedback module below your model layout we offer an **installation set** under the order code **MON-SET** and for the assembled kits a sturdy exact matching **case** (order code: **LDT-01**).

Further products from our Digital-Professional-Series:

RM-88-N-O
16-fold feedback module with integrated **opto coupling-inputs** for the s88-feedback bus.

RM-GB-8
8-fold feedback module with integrated occupancy detectors for the s88 feedback bus.

S-DEC-4
4-fold turnout decoder for 4 magnet accessories with free programmable decoder addresses and possible external power supply.

M-DEC
4-fold decoder for motor driven turnouts. For motors up to 1A. With free programmable decoder addresses. Drives can be connected directly with the decoder output.

LS-DEC
Light signal decoder for up to 4 LED train signals. Signal signs will be originally dimmed up and down and directly positioned via the decoder address.

Made in Europe by
Littfinski DatenTechnik (LDT)
Bühler electronic GmbH
Ulmenstraße 43
15370 Fredersdorf / Germany
Phone: +49 (0) 33439 / 867-0
Internet: www.ldt-infocenter.com

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