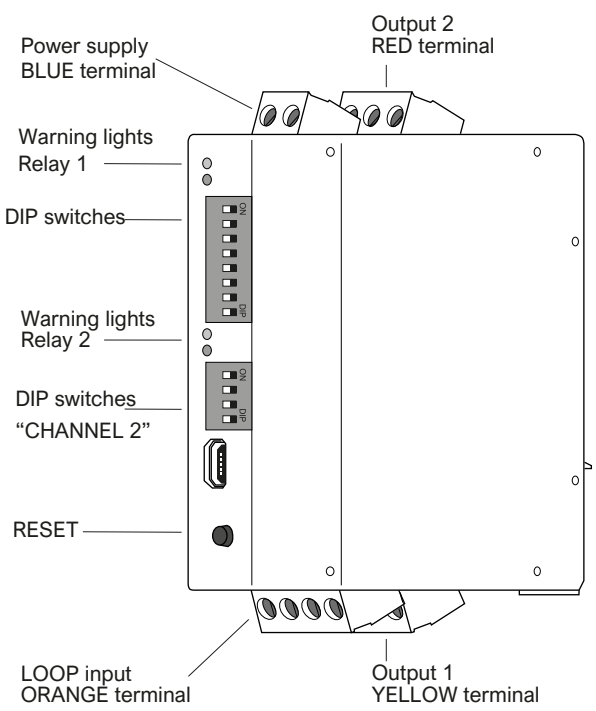
RG02

ver. 03_2021

2 RELAY- MAGNETIC LOOP DETECTOR FOR DIN RAIL INSTALLATION

Installation and user manual



For your safety carefully read the following instuctions and store them for future reference!

1 GENERAL INFORMATION

1.1 For the installation on transit areas controlled by:

- Barriers
- Gates
- Parkings

1.2 PRODUCT OVERVIEW:

RG02 loop detector is a device used for the detection of vehicles through inductive loops with the following characteristics:

- 2-relay loop detector.
- Presence detection or directional detection.
- Galvanic isolation between loop and detector electronics.
- System automatic adjustment after start up.
- Continuous balancing of frequency creep.
- Suitable for monitoring individual parking areas.
- No interference between loop 1 and loop 2.
- Sensitivity adjustment independent from loop inductivity.
- LED signalling when loop is activated.
- Potential-free relay contacts for continuous signal and pulse signal.
- LED signalling of loop frequency.

2 SENSITIVITY SETTINGS

2.1 Sensitivity
Sensitivity can be set on four different levels, and determines the dimension of the vehicle necessary to activate the presence output.
Use DIP-Switch 1 and 2, (Sense A +Sense B) for relay 1 and DIP 3 and 4 (Sense 2 A + Sense 2 B) for relay 2, according to the below table:

Sensitivity level	Relay 1: DIP 1 and 2 - Relay 2: DIP 3 and 4
1 LOW	1/3=OFF ⟵ 2/4=OFF ⟵
2 MEDIUM LOW	1/3=ON ⟶ 2/4=OFF ⟵
3 MEDIUM HIGH	1/3=OFF ⟵ 2/4=ON ⟶
4 HIGH	1/3=ON ⟶ 2/4=ON ⟶

2.2 LOOP ELECTRIC FREQUENCY

The working frequency of the loop depends on the DIP-switch 5, named **Frequency.**
If the installation is already fitted with a loop detector, frequencies have to be different to avoid mutual interferences (Loops of the same detector do not create any kind of disturbance).
When powering the system, the detector performs a loop frequency adjustment.
In case of short power cut (**< 0,1 s**) no new adjustment will be carried out.
A new adjustment however can be manually done using **RESET** key.

2.3 AUTOMATIC RECALIBRATION OFF

DIP-switch 6 (Hold time) regulates the operation in case a vehicle stops remaining on the loop for more than 5 minutes.
If **DIP** is **OFF**, the detector output resets (isignalling "free loop") and the sensor recalibrates.
If **DIP 4** is **ON**, output reset and sensor recalibration do not occur: "loop covered" signal remains on for the entire parking time of the vehicle.

Ricalibration time	DIP Switch 6
5 minutes	OFF ⟵
Endless (no recalibration)	ON ⟶

2.4 OUTPUT 2 - description

Output 1 continously shows the loop status free or covered (no pulses).
Output 2 can work in the same way, or can generate a single pulse at every transit of vehicle
If DIP-switch 7 is positioned OFF, output 2 is continuos (as output 1).
If DIP is positioned ON, output is impulsive; in this last case, **DIPswitch 8** ishows if a pulse has to be generated when vehicle is driving in or driving out.

Output 2 - configuration

Mode	Dip 7	Dip 8
Continous	OFF ⟵	Effectless
Pulse when vehicle is driving in	ON ⟶	OFF ⟵
Pulse when vehicle is driving out	ON ⟶	ON ⟶

2.5 DIP SWITCH 1 AND 2 OF "RELAY 2"

If both dip switches are **ON**, the two outputs allow to detect the direction of movement of each vehicle, even if in the queue.

At every transit of vehicle from loop 1 to loop 2, output 1 sends a single pulse.
At every transit of vehicle from loop 2 to loop 1, output 2 sends a single pulse.
Assuming that a vehicle while driving through the parking area goes first to loop 1 and after to loop 2.
In such scenario:
- every pulse of output 1 shows the entry of a new vehicle.
- every pulse of output 2 shows the exit of a new vehicle.

It is therefore possible to know how many vehicles there are in the parking area.

Attention:
For this type of detection to work, both loops must be placed at a distance such that the vehicles can activate them simultaneously in the following way: first loop activates, the second one too, the first loop releases, the second one too"

2.6 Output switiching (DIP 3 and 4) of "RELAY 2"

Both outputs are provided with **N.O.** and **N.C.** contacts; the **N.C**. contact is closed when sensor is off or faulty, therefore it is not suitable when used as "**free-loop contact"**.
On the other hand **N.O. contact** closes when sensor is working and detects the free loop contact (DIP switch positioned OFF).
DIP switch positioned ON reverts the operation.
Output 2 acts exactly as output 1, if not impulsive configurated.

Status table of outputs N.O. 1 and 2

Sensor status	**Contact** (DIP 3/4=OFF)	**Contact** (DIP 3/4=ON)
OFF/Faulty	opened	opened
Loop error	opened	closed
Vehicle detection	opened	closed
Free loop	closed	opened

3 LED status indicators AND RESET

3.1 WORKING WARNING LIGHTS (Blue and red LED)

Normally, when blue LED is OFF is because power supply is missing or loop is seriously damaged; red LED shows the detection of a vehicle or a temporary sensor self-adjustment.

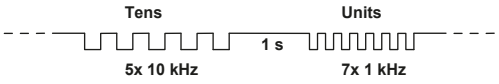
Indicators legenda

RED	BLUE	Status
Off	Off	OFF (no power supply)
Off	On	Free loop, regular operation
On	On	Loop covered, regular operation (vehicle detection)
On	Off	Loop error (disconnected, cut, short circuit)
	Low blinking	Regular operation after loop error (error rectified)
	Quick blinking	Loop calibration in progress
Blinking	Blinking	Calibration completed, frequency signalling

3.2 LOOP FREQUENCY SIGNALLING

After 1 second from loop adjustment, frequency is displayed by both LED flashing.
LED first show frequency expressed in tens of kHz: for every ten, they flash once; after a 1 second pause, they display the 1 kHz units in the same way (if the digit to be displayed is 0, LEDs flash 10 times).
Blinks for 1 kHz units are slightly shorter than for tens of kHz.

57 kHz loop frequency example:



3.3 RESET KEY

Reset key when pressed for 1 second, makes the red LED flashing while sensor recalibrates the loop.
If pressed during 5 seconds, the blue LED starts flashing, and factory values are loaded calibrated to DIP-switches.

4 WARNINGS AND SAFETY TIPS

- The device may only be used for its intended purpose.
- Keep this manual in a safety place for future reference and give a copy to the end user.
- Unauthorized modifications, the use of fake spares and auxiliary devices not recommended by the manufacturer may generate injuries, electric shocks and fires. Therefore they are forbidden and make the warranty void.
- Manufacturer's warranty applies at the moment of purchase at the conditions in force.
  No responsibility is taken for a manual or automatic, improper or incorrect setting of parameters, nor for the improper use of the device.
- Repairs may only be performed by the manufacturer.
- Power supply must comply with requirements for safety extra-low voltage EN 60950-1 and SELV.
- Connection, commissioning, measurement, maintenance and setup of the loop detector should only be performed by qualified electricians with appropriate training and experienced in accident prevention.
- Directives regarding electrical voltages. Comply with VDE regulations. In particular whenever and whatever comply with the VDE 0100, VDE 0550/0551, EN 60335, EN 60065, EN 50110 standards as well as the DGUV fire and accident prevention regulations.

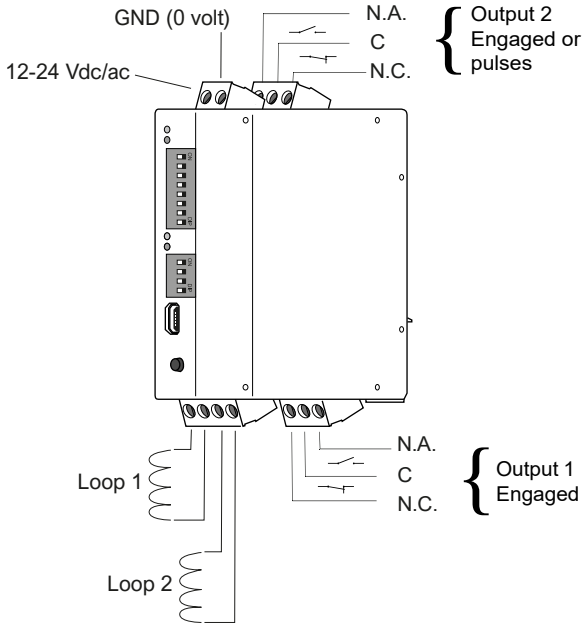
- All works on the device and its installation must be carried out in accordance with national and local electrical regulations.
- The user is responsible for installing and connecting the device who must fullfill the technical standards applied in the country of installation, as well as other regional regulations in force.
  Particular attention must be paid to the sizing of cables, protection fuses, grounding, disconnection, isolation, insulation control and protection against surcharges.

- The device may not be used as a safety component as defined by the Machinery Directive 2006/42/EG, the Construction Products Regulation 305/2011/EU or other safety regulations.

5 TECHNICAL FEATURES

Dimension	22,5 x 94 x 94 mm (L x H x W)
IP rating	20
Power supply	12-24 V ac/dc, 2W max
Working temperature	From -37 °C to +70 °C
Storage temperature	From -40 °C to +85 °C
Relative humidity	95% (non condensing)
Inductivity rate	20-700 µH (100-300 uH recommended)
Operating frequency	30-130 kHz in 2 steps
Sensitivity	from 0,01 % to 0,65 % (Δ f/f) on 4 levels from 0,02 % to 1,3 % (Δ L/L)
Recalibration	5 minutes or endless
Cable length	Max. 200 m
Cable resistance	Max. 20 Ohm (including cable)
Relay	max. 2A, max. 48V dc/ac
Continuous relay	N.O. and N.C. contacts, configurable
Impulsive relay	N.O. and N.C. contacts, configurable
Signal length	> 200 ms
Working time	12 ms
Terminals	Removable screwed blocks

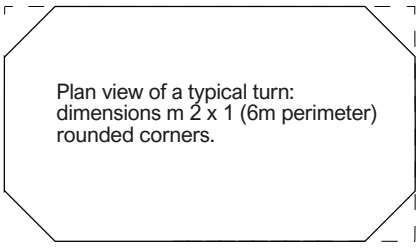
6 WIRINGS



7 LOOP INSTALLATION

Keep at least 15 cm between the loop and other possible fixed metal devices, 50 cm minimum from moving metal devices, and no more than 5 cm from ground (upper final flooring).
Use a normal single-core cable with a section of 1.5 mm² (if cable is interrupted directly, it has to be twice insulation).
Make a preferably square or rectangular loop, preparing a PVC cable duct or making a trace in the flooring as shown in the picture (cut corners at 45 ° to avoid cable breakage).
Lay the cable making as many turns as outlined in the table.
The two ends of the cable must be twisted together (at least 20 times per meter) from the loop to the detector.
Avoid any junction on the cable (if necessary weld ducts together and seal the gasket with heat shrinkable sheath) and keep it separated from main power lines.

Turn perimeter	n° of turns
From 1 to 2 m	6
From 2 to 4 m	5
From 5 to 6 m	4
From 6 to 12 m	3
Over 12	2



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