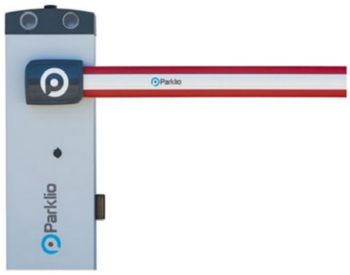
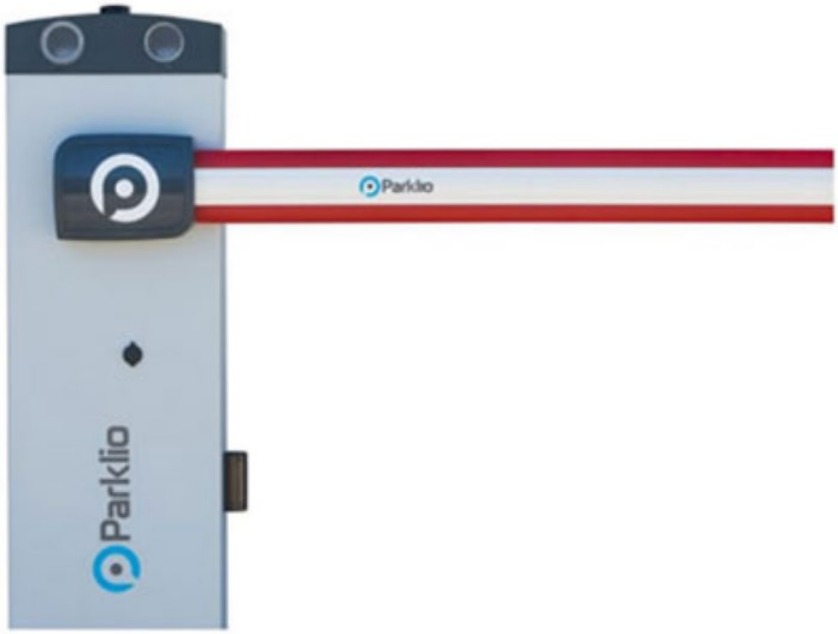


Parklio Magnetic Loop for Gate User Manual

Parklio Magnetic Loop for Gate User Manual



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Statement of Conditions
In the interest of improving internal design, operational function, and/or reliability, ParklioTM reserves the right to make changes to the products described in this document without notice. ParklioTM does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Thank you for the confidence you have shown us by purchasing our product!

Please read this manual first!

Dear Customers,
We hope that all your expectations of this product will be fulfilled. Every ParklioTM product is manufactured using the latest technologies and has undergone rigorous quality control procedures.

The User Guide will help you use your product quickly and safely.
Read the user manual before installing and using your product. Always follow the safety instructions.
Keep this user manual at hand for future reference.

Contents

Important remarks

For any installation problem please contact our Customer Service.

Parklio has the right to modify the product without previous notice; it also declines any responsibility to damage or injury to people or things caused by improper use or wrong installation.

Please read this instruction manual very carefully before installing and programming your control unit.

- This instruction manual is only for qualified technicians, who specialise in instal- lations and automations.
- The contents of this instruction manual do not concern the end user.
- Every programming and/or every maintenance service should be done only by qualified technicians.

The installation, testing and commissioning of door and gate automation devices must be performed by qualified and skilled personnel, who must assume responsibility for setting up the tests envisaged depending on the risks present; and verify compliance in accordance with legal and regulatory requirements.

- Parklio are not deemed responsible for injuries and damage resulting from im- proper use of the product; other than that envisaged in this manual.
- Packing materials must be disposed of in full compliance with local regulations.
- Ensure that the back-up battery cannot become immersed in water or other liq- uids.
- Should any liquids penetrate inside the device, disconnect it immediately from the automation device and contact the V2 assistance service; use of the device under such conditions can lead to hazardous situations.
- Do not store the back-up battery close to strong sources of heat or expose it to naked flames; such actions can damage it and be the cause of malfunctions, fire or other hazardous situations
- In order to avoid the risk of leakage of hazardous substances from the back-up battery in the case where the device is not used for long periods of time, it is preferable to disconnect it from the automated device and store it in a dry place.

Description and intended use

Induction loop detectors such as traffic detectors are electronic sensors for inductive detection of metallic objects. Using induction loops, for example, vehicles are detected, and depending on the device, their design and direction of movement. The traffic detectors are operated in combination with various induction loops and electronic controllers, such as frequency converters or PLC controllers. The areas of application are, for example, the detection, monitoring and counting of vehicles in the areas of traffic engineering, door and barrier controller, parking and tunnel monitoring as well as traffic light systems.

Product characteristics

The traffic detectors have the following properties:

- 1 loop channel (single-channel variants) or 2 loop channels (dual-channel vari- ants)
- 2 potential-free relay outputs with changeover contact (R24 variants)
- 4 open collector outputs (O24 variants)
- 8-pole DIP switch for configuration
- 4-pole DIP switch for advanced configuration
- 2 or 4 LEDs for the indication of detector and loop states
- USB interface for diagnostics and advanced configuration
- Connection for power supply (AC/DC)
- Galvanic isolation between loops and electronics
- Automatic adjustment of the device after switch-on
- Continuous adjustment of frequency drifts to suppress environmental influences
- Sensitivity independent of loop inductance
- Fixed hold times regardless of the loop coverage
- Direction detection based on two loop channels (dual-channel variants)
- Multiplexing prevents mutual interferences of the loop channels (dual-channel variants)
- Compact plastic housing for mounting on DIN rail in control cabinet

Vehicle detection

Whether a metallic object is located in the loop area is identified via an LC oscillator (electrical oscillatory circuit). The channel output is switched according to the output function configured.

Output signals

Depending on the output configuration, presence, pulse or direction signals or direction logics as well as loop faults are output. For the pulse signal, it is also possible to select whether an output should occur when a loop is driven past or vacated. In addition to inversion of the output signal, both outputs can individually be permanently switched on or off.

Alignment of the loop channels

When the detector is switched on or the reset button on the front is pressed for one second, an alignment of the loop channels is run. If there has been an interruption of power, an automatic alignment only takes place if the operating voltage has been interrupted for at least 0.5 seconds. Alignment takes around one second if no vehicles drive over the loop in this time. External influences on the loop frequency may result in longer alignment times, and their causes must be determined and eliminated.

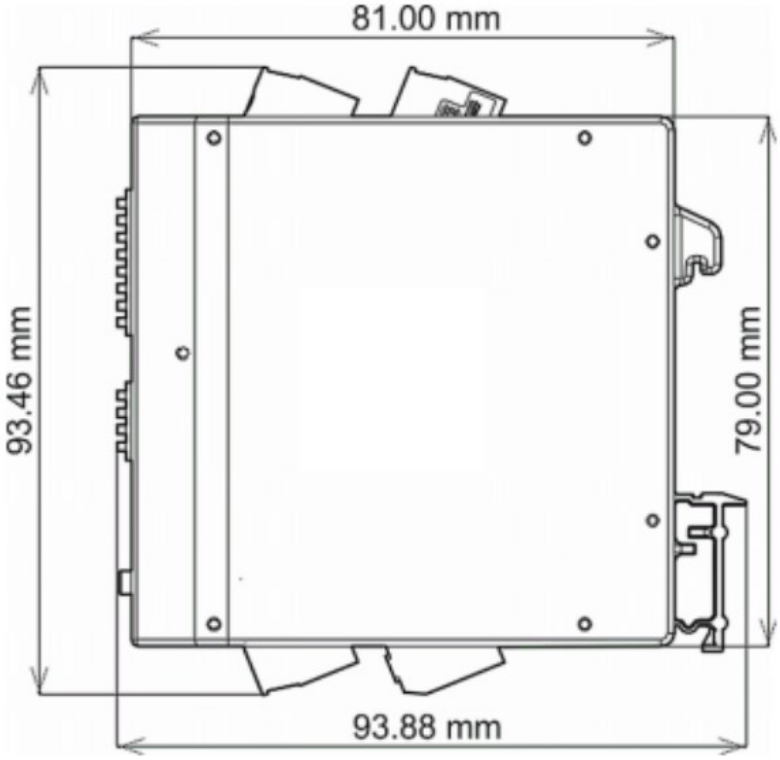
Scanning of the loop channels

The dual-channel traffic detector can evaluate two loop channels. The timed scanning of the loops is carried out in multiplex mode. They are connected to the common oscillatory circuit oscillator over a multiplexer. This prevents the loops interfering with each other. The connected induction loops are switched on and off in rapid succession. Current is only ever supplied to one loop at a time. This means that both loops can be operated at the same frequency. The cycle time of a scan in multiplex mode is 12 ms.

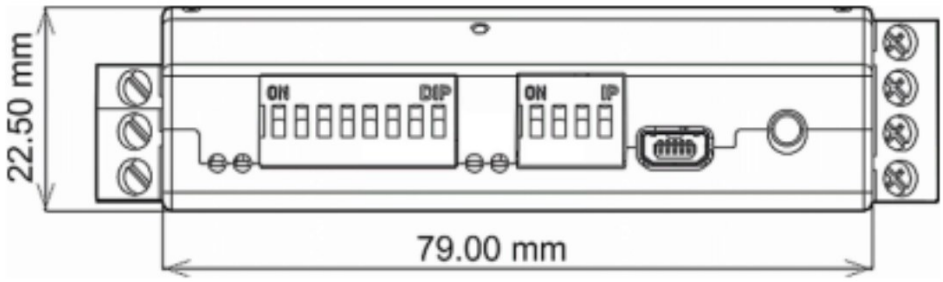
Loop error detection

Loop closure and loop break are identified as loop errors. If no induction loop is connected to the loop channel, this corresponds to a loop break error status. Once a loop error has been detected, the loop channel switches off. This may cause the available operating modes to be restricted, for example direction detection. When one loop channel is switched off by the Detector Tool, this does not affect the second, connected loop channel (2 channel versions).

Housing dimensions

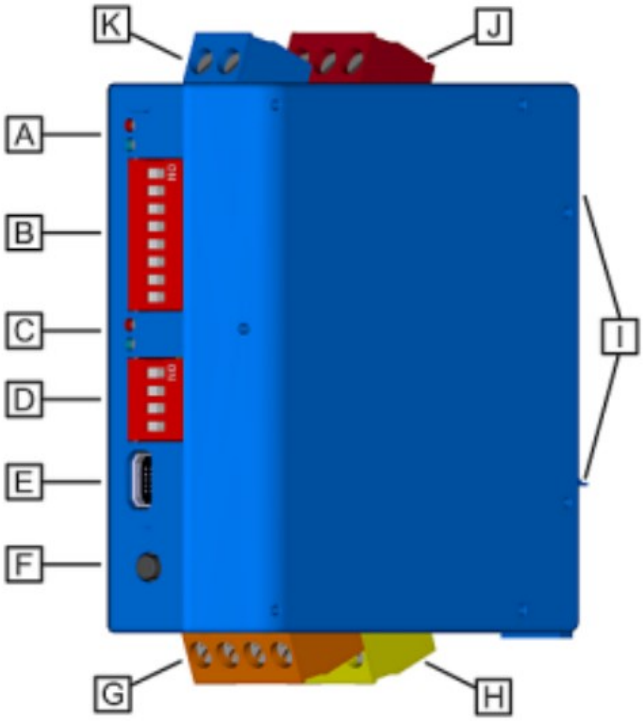


Side view



Front view

Device components



Index	Component	Description
A	Loop channel LEDs 1 (red + blue)	Status indicators for the loops and the detector
B	DIP switch 1	Basic settings for the detector
C	Loop channel LEDs 2 (red + blue)	Status indicators for the loops and the detector
D	DIP switch 2 (MNH2 variant)	Basic settings for the detector
E	USB connection	PC interface for configuration and diagnostics
F	Reset button	Factory settings or fresh adjustment
G	Loop inputs (orange)	Connections for induction loops
H	**Output 1 terminal block:** • Relay output 1 (yellow, R24 variant) • Open collector output 1 (green, O24 Variant)	Signal outputs for controller
I	Mounting bracket	Mounting device for TS35 DIN rail
J	**Output 2 terminal block**: • Relay output 2 (red, R24 variant) • Open collector output 2 (green, O24 Variant	Signal outputs for controller
K	AC/DC connection (blue)	Connections for power supply

Technical data

Specifications	
Housing	Plastic housing, ABS, blue
Mounting method	TS35 DIN rail
Dimensions	22.5 x 79.0 x 81.0 mm (W x H x L, without terminals)
Power supply (1 x blue)	2-pole terminal block (see Note 3) 10 – 30 VDC / 10 – 26 VAC, max . 2 W (SELV)
Power consumption	Typically 500 mW
Protection class	|||
Protection type	IP20
Environmental conditions	
• permitted operating temperature	-37 – +70 °C
• permissible storage temperature	-40 – +85 °C
• relative humidity	< 95 % (non-condensing)
Loop properties	
max. inductivity range	20 – 700 H (see note 1)
recommended inductivity range	100 – 300 H
• operating frequency	30 – 130 kHz
• cable length	200 m
• internal resistance	20 Ω (including cable)
• min. insulation resistance to earth	100 kΩ (constant, including cable)
• insulation voltage, loop inputs	1 kV (galvanic isolation)

Note:

1. Limitations on loop inductance For loop inductances outside the recommended range, only one frequency level may be available. For very small loop inductance, the maximum loop resistances are lower.
2. **Current load of the relay contacts**

The rigid gold plating on the relay contacts will be destroyed if the switching current exceeds 100 mA. Relays with contacts that are prestressed in this man- ner can only reliably switch currents over 100 mA!

3. **Terminal block data**

   Grid dimension 5.0 mm, conductor cross-section 0.25 – 2.5 mm², AWG 24-12

Electrical connections

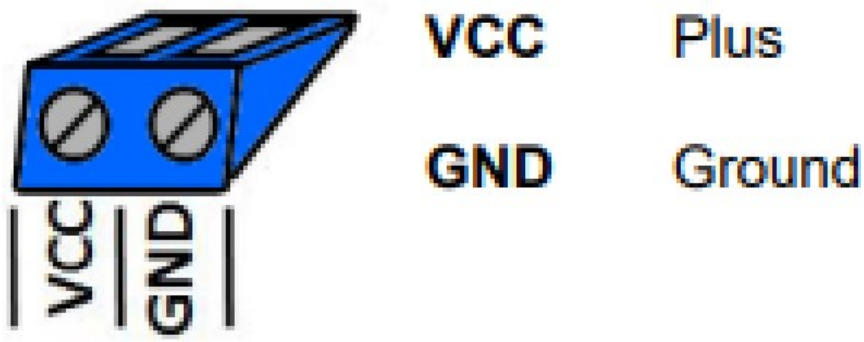
In the following section, the connections for the inputs and outputs are described.

Power supply

The detector can be operated with direct or alternating current , according to the requirements for Safety Extra-Low Voltages (SELV) of Protection Class III.

Note the permitted power supply Comply with the technical data and safety instructions!

The power supply is connected to the blue terminal block.



Power supply connection (blue)

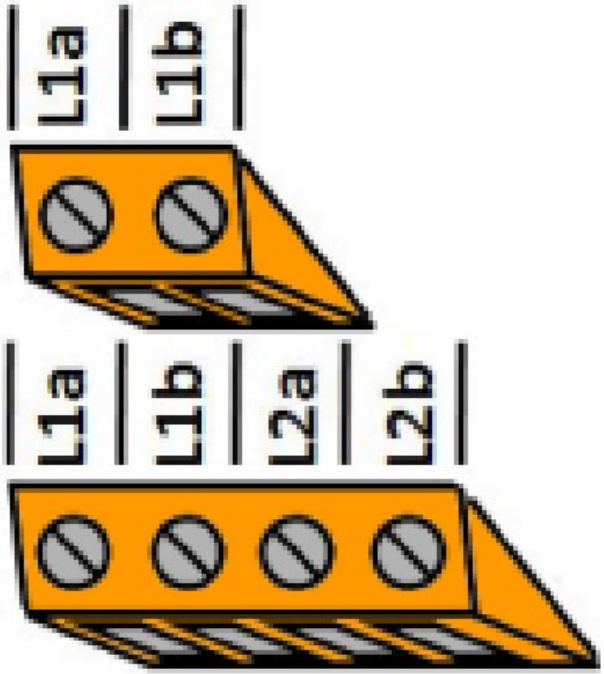
Loop inputs

Up to two analogue inputs for the induction loops on the terminal block are located on the underside of the traffic detector. The terminal block is either 2-pole or 4-pole, depending on the product variant.

The induction loops are connected to the orange terminal blocks as shown in the illustration.

L1a Induction loop channel 1 connections **L1b**
L2a Induction loop channel 2 connections
L2b (dual-channel variants)

Loop connections (orange)



Signal outputs

The open collector outputs are primarily intended for applications with high switching rates and low output power, e.g. PLC controller. Each signal output can be inverted. In this case, when the power supply is turned on, normally open contacts function as normally closed contacts, and vice versa. This happens by switching between open circuit and closed circuit principle. Loop faults can also be interpreted as loop covered or as loop free.

Status	Normally closed contact (NC)		Normally open contact (NO)	
	Not inverted (open circuit)	Inverted (closed circuit)	Not inverted (open circuit)	Inverted (closed circuit
Voltage off				
Detector ready loop free				
Loop covered				
Loop failure	(loop covered by default configurable as loop free with Detector Tool)			

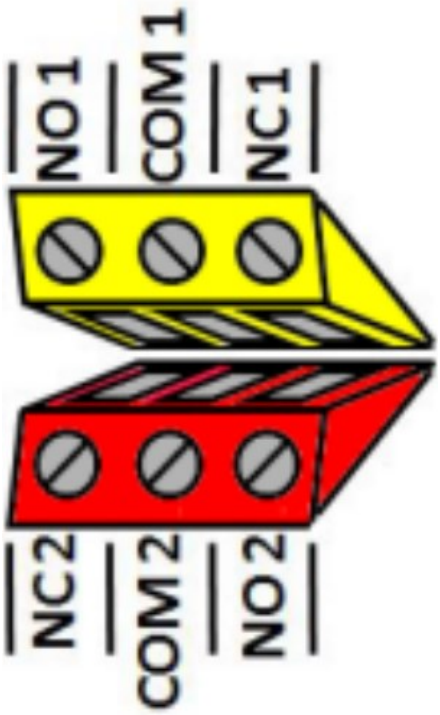
Switching states of the signal outputs

Relay outputs with changeover contact

The relay outputs are designed as changeover contacts. This allows the contacts to be connected as normally closed (NC) or as normally open (NO) contacts. The relays are potential-free and suitable for many different switching modes.

The analogue outputs of the (R24) relay variants are connected to the red and yellow terminal blocks as shown in the following illustration.

NO1 Normally open contact to output 1 or output 2 **NO2**
COM1 Common contact to output 1 or output 2 **COM2**
NC1 Normally closed contact to output 1 or output 2 **NC2**



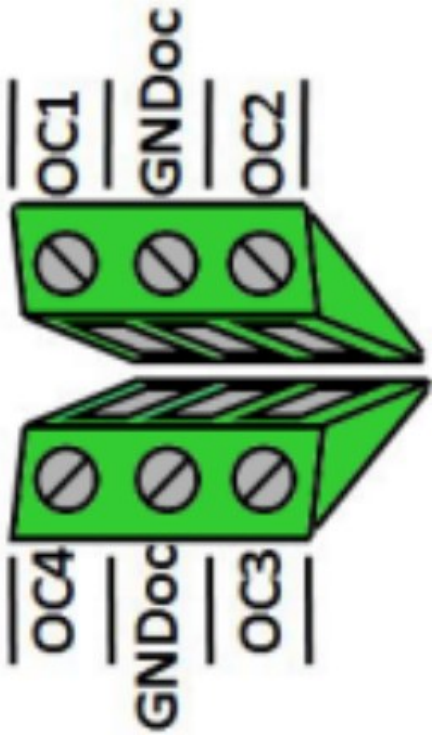
Relay connections 1 (yellow) and 2 (red)

Open collector outputs

The detector with four open collector outputs switches to GND (emitter) when triggered. For each loop channel, one signal output is provided for the coverage status (object detection) and one output for malfunctions (fault signal).

The digital outputs of the open-collector variants (O24) are connected to the green terminal blocks as shown in the following illustration.

Open collector connections 1-2 and 3-4 (green)
OC1 Object detection channel 1
OC2 Object detection channel 2
OC3 Fault indication channel 1
OC4 Fault indication channel 2
GNDoc Ground (emitter)



Assembly and electrical installation

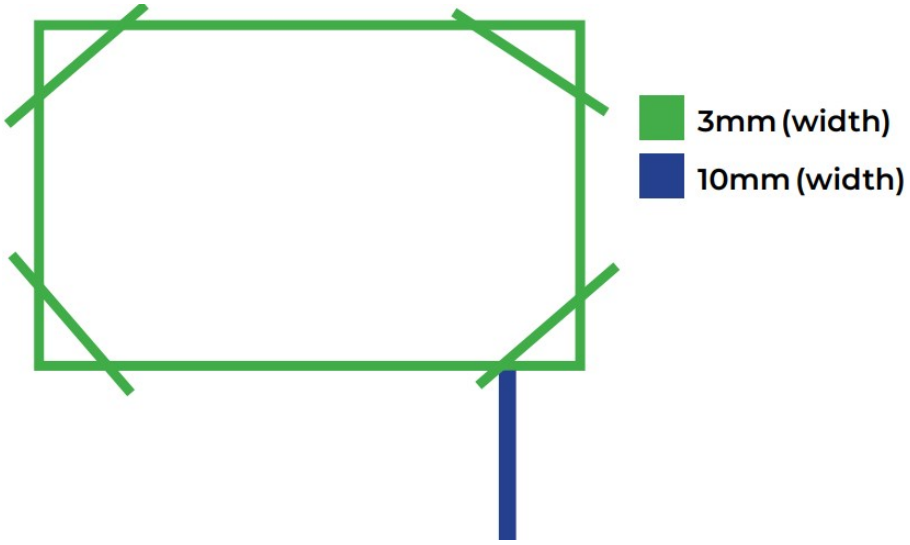
In the following section, assembly and electrical installation are described.

NOTE Illustrations and technical data on the device can be found on the illustrations and technical data on the housing and connections in the sections at the beginning of this document.

Setting up the magnetic loop

Realisation of the loop

Use a flexible cable with section 1,5 mm2 Insofar as possible, the loop must have a shape like it is shown in the picture below.



The number of turns depends on the perimeter (P):

Loop perimeter (cm)	Number of turns
P < 300	6
300 < P < 400	5
400 < P < 600	4
600 < P < 1200	3
1200 < P < 1400	2

The minimum clearance between two loop cables is 65 cm. The closest loop cable of a retractable bollard (distance at the axis) or of any mobile metal object is 80 cm

In case that a current line passes close to a loop, it is appropriate that it observes a minimum distance of the loop with respect to the path of the electrical cable:

Type of voltage (T)	Minimum distance
230 V < T < 5000 V	2 metres
5000 V < T	10 metres

Loop tail:
Each installation loop has its own loop tail; it is impossible to bind several loops to a detector with a common loop tail
A loop tail cannot exceed 150 metres (length of the cable).

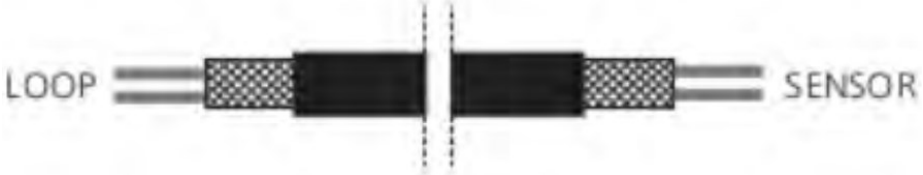
Realisation of the loop tail (Lc)

Lc < 10 m

Starting from the loop corner until the detector bollard, keep the same cable and twist the two wires along the entire length of the loop tail with a minimum of 12 twists per metre

10 m < Lc < 150 m

Make the actual loop by meeting the instructions of paragraph (Realisation of the loop). At the loop corner make a splice between the loop cable (VGV1.52) and the shielded cable (Use a shielded cable of the Belden type for the loop tail). Weld the conductor wires among them (wire to wire welding). Insulate the thus manufactured loop to the detector and connect the braid of the cable to the earthing.



Functional test:

Once positioned, proceed with the following measures and check compliance with the following parameters:

Inductance read at the detector	25-800 mH
Insulation resistance with the respect to earthing (mea sure with the help of an insula- tor voltmeter)	> 5 MOhm
Internal resistance of the loop and of the loop tail (me asure with the help of a multimeter)	< 20 Ohm

Connecting the power supply

Maintain the permitted voltage The following power supplies are permitted:

- 10 – 30 VDC
- 10 – 26 VAC

Also refer to chapter Electrical connections.

Connect the inputs and outputs with no voltage present All inputs and outputs must be connected before switching on the power supply.

Connecting the power cable

1. Follow the warning and safety instructions and take the appropriate precau- tions.
2. If necessary, pull the terminal block out of the socket.
3. Loosen the screws on the blue terminal block.
4. Insert up to 5 mm of stripped cable into the slot at the side of the blue terminal block and fasten.
5. Tighten the screw.
6. If necessary, insert the terminal block back into the blue 2-pole socket.

The power cable is firmly attached to the terminal block with no exposed wires.

Attach the power cable to the power source

1. Comply with the warning and safety instructions for the external device.
2. Follow the manufacturer’s instructions on wiring the outputs on the external device.

The power cable is connected to the power source.

Connect the relay outputs

Connecting the relay outputs

1. Follow the warning and safety instructions and take the appropriate precautions.
2. If necessary, pull the red or yellow terminal block out of the socket.
3. Loosen the screws on the blue terminal block.
4. Insert up to 5 mm of stripped cable into the slot on the side of the terminal block and fasten.

5. Tighten the screw.
6. If necessary, insert the terminal block back into the red or yellow 3-pole socket.

The cables of the relay outputs are firmly attached to the terminal block with no exposed wires.

Connecting the induction loops

The requirements for the induction loops differ according to the area of application. Allow the supplier to advise on the installation of the induction loops.

1. Follow the warning and safety instructions and take the appropriate precautions.
2. If necessary, pull the orange terminal block out of the socket.
3. Loosen the screws on the blue terminal block.
4. Insert up to 5 mm of stripped cable into the slot on the side of the terminal block and fasten.
5. Tighten the screw.
6. If necessary, insert the terminal block back into the orange 4-pole socket.

The induction loops are firmly attached with no exposed wires.

Commissioning

Connecting the induction loops

1. Follow the warning and safety instructions and take the appropriate precautions.
2. If necessary, pull the orange terminal block out of the socket.
3. Loosen the screws on the blue terminal block.
4. Insert up to 5 mm of stripped cable into the slot on the side of the terminal block and fasten.
5. Tighten the screw.
6. If necessary, insert the terminal block back into the orange 4-pole socket.

The induction loops are firmly attached with no exposed wires.

LED status indicators

The LEDs (light emitting diodes) on the front side indicate the state of the loops and the detector. There are two LEDs for each loop channel:

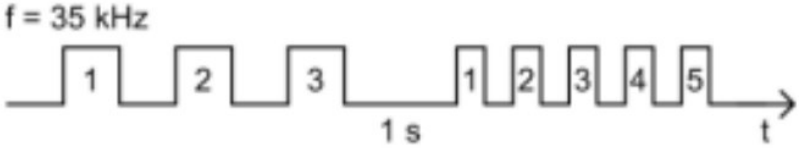
- The red LED indicates the coverage status of the respective loop
- The blue LED indicates the operating status of the detector

Red LED	Blue LED	Description of status
		No power supply, detector inactive
		Detector ready, loop connected, no object detected
		Detector ready, loop connected, object detected
		No loop connected, loop break, loop closure
		Ready for operation following earlier, now rectified, loop error orsettings changed with Detector Tool (DIP switch not up-to-date
		Frequency alignment is running
		After frequency adjustment, both LEDs simultaneously display the set lo op frequency in a flash code (see Flash code illustrated example)

LED signal colours

Key to LED symbols

LED flash code following a frequency alignment



LED display of loop frequency

NOTE:
LED position The LEDs for loop channel 1 are located at the top or side of the device, while loop channel 2 are in the middle.

Adjusting sensitivity (switch-on threshold)

The switch-on threshold can be selected in 255 increments in the range between 0.01% and 2.55% f/f. The higher the switch-on threshold, the lower is the sensitivity for signal activation.

Typical settings

- Generally speaking, sensitivity is adjusted in large steps, and the switch-on thresh- old selected is not greater than 640.
- Switch-on thresholds of over 640 and fine tuning may not be required for differ- entiation between vehicles. It is possible to differentiate, for example, buses with large loops (e.g. 10.0 m x 2.5 m) and correspondingly high threshold values (>1000)

NOTE
Minimising interference factors:
In order to minimise interference factors, the sensitivity should be as low as possible, i.e. the value of the switch on threshold should be as high as possible.

DIP (Sense a)	DIP (Sense b)	Detector Tool (switch-on threshold)	Sensitivity (Δf/f)
ON	ON	10	0,01 % Level high (highest sensiti vity)
		20	0,02%
		30	0,03%
OFF	ON	40	0,04% Level medium-high
		50	0,05,%
		…	…
		150	0,15%
ON	OFF	160	0,16% Level medium-low
		170	0,17%
		…	…
		630	0,63%
OFF	OFF	640	0,64% level medium-low (factory s etting)
		650	0,65%
		…	…
		1000	1,00%
		…	…
		2550	2,55% Level minimum (lowest sen sitivity)

Disposal

This product may only be uninstalled by qualified technical personnel following suitable procedures for removing the product correctly and safely. This product consists of numerous different materials. Some of these materials may be recycled, while others must be disposed of correctly at the specific recycling or waste management facilities indicated by local legislation applicable for this category of product. Do not dispose of this product as domestic refuse. Observe local legislation for differentiated refuse collection, or hand the product over to the vendor when purchasing an equivalent new product. Local legislation may envisage severe fines for the incorrect

disposal of this product.
Warning! Some parts of this product may contain substances that are harmful to the environment or dangerous and which may cause damage to the environment or health risks if disposed incorrectly

Safety warnings

This section contains safety instructions that will help to protect you from risk of injury or property damage. Failure to follow these instructions will invalidate all warranties.

- Do not use the barrier, if you have not read and understood the operating in- structions before.
- Before first use of the barrier, make sure that all the parts listed in these instruc- tions are inside of the original packaging.
- Only plugs, batteries, chargers, spare parts and power supplies, supplied by the manufacturer of the barrier should be used. Use of non-manufacturer provided parts may affect the loss of warranty.
- Ignoring usage instructions, improper installation and use of the barrier may re- sult in damage to the barrier or injuries to the user. Instructions should always be at hand.
- Never expose the inner workings to water.
- The device must be exclusively installed on a hard, flat concrete floor.
- The device and external supply must be disconnected from power supply during installation, maintenance, cleaning and repairs.
- Leave the barrier repairs to a specialist. Improper repairs may lead to an accident or a malfunction in the unit.
- Please charge the battery to full capacity before first use.
- Only charge the battery pack with the provided power adapter.
- The battery pack is fragile, please handle it with care. Do not expose the battery to direct heat.
- The battery pack is intended to be used only with Parklio products, use with oth- er products is not recommended. Parklio is not responsible for any damage caused to the equipment or the battery pack when used incorrectly.
- Make sure to close the power input plug of the battery pack before use to seal the port from water ingress.
- The warranty does not cover consumable parts of the device, colour fading and chipping, increased noise as a result of ageing of the device and other aesthetic effects that do not affect its functionality or safety. Never use chemical solvents on the product as it may cause an explosion.
- Strictly follow the instructions for proper installation and connection to the electrical network.
- The installer must provide a device (e.g. magnetothermic switch) ensuring the omnipolar sectioning of the equipment from the power supply. The standards require a separation of the contacts of at least 3 mm in each pole (EN 60335-1).
- Installation requires mechanical and electrical skills, therefore it shall be carried out by qualified personnel only, who can issue the Compliance Certificate concerning the whole installation.
- The upstream electric system shall comply with the laws and rules in force.
- Do not install the product in explosive environments and atmospheres, the presence of inflammable gases or fumes is a serious safety hazard.

PARKLIO (PARKLIO D.O.O.) HAS THE RIGHT TO MODIFY THE DEVICE WITHOUT PREVIOUS NOTICE. PARKLIO (PARKLIO D.O.O.) DECLINES ANY RESPONSIBILITY FOR DAMAGE OR INJURY TO PEOPLE OR THINGS CAUSED BY IMPROPER USE OR WRONG INSTALLATION. THE APPLIANCE HAS BEEN ESTABLISHED ACCORDING TO ALL VALUENT SAFETY CRITERIA AND STANDARDS. HOWEVER, WE RECOMMEND THAT WITHOUT THE NEEDED HELP AND SUPERVISION, CHILDREN, A PERSON OF

DISABLED PHYSICAL, MOTOR OR PERSONAL EQUALITY AND RELATED PEOPLE WITHOUT PREVIOUS EXPERIENCE OR KNOWLEDGE DO NOT USE THE BARRIER. EXCEPTION IS THE DEVICE USAGE UNDER ADEQUATE SUPERVISION, IF THEY HAVE RECEIVED SAFETY INSTRUCTIONS AND TRAINING, OR IF THEY ARE INFORMED ABOUT THE DANGER CAUSED BY IMPROPER USAGE. THE SAME RECOMMENDATION IS FOR JUVENILES AND THEIR USAGE OF THE DEVICE. DO NOT ALLOW CHILDREN TO PLAY WITH THE DEVICE. DO NOT LET CHILDREN CLEAN THE DEVICE, USE IT, NOR MAINTAIN IT, WITHOUT ADEQUATE SUPERVISION.

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Documents / Resources

	Parklio Magnetic Loop for Gate [pdf] User Manual Magnetic Loop for Gate, Magnetic, Loop for Gate, Gate

References

- Smart parking for everyone | Parklio - New parking future