

# BRD05-PD132

## MAG Single Channel Loop Detector



Date: 01 August 2009, Revision: V1

### 1.0 Introduction

MAG BRD05 is a single channel loop detector designed specifically for parking and vehicle access control application. MAG BRD05-PD132 has been designed using latest technology in order to meet requirement for most of the parking application.

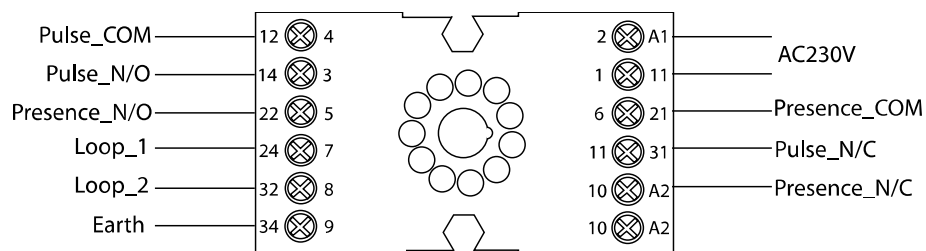
The primary function of the detector is to detect vehicle presence by means of an inductance change, caused the vehicle passing over a loop wire buried under the road surface.



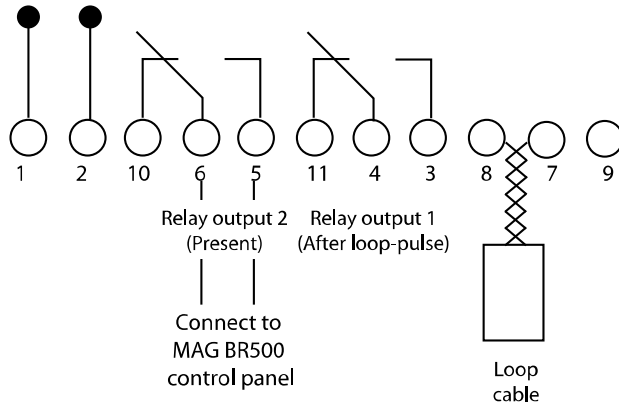
### 2.0 Technical Data

Operating voltage	220V AC
Power consumption	≤ 5VA
Frequency range	20 kHz to 170 kHz
Reaction time	10ms
Sensitivity	Adjustable in 8 increments
Operating temperature	-20°C to +65°C
Storage temperature	-40°C to +85°C
Wiring	50μH to 1000μH Ideal is 100μH to 300μH
Signal holding time	Unlimited / limited when loop is permanently covered 10 minutes
Loop connection wiring	Maximum length 15 meters, twisted at least 20 times per meter
Dimension	76 x 40 x 105 mm (L x W x H)
Net weight	269g

### 3.0 Mounting Base



## 4.0 Connection Diagram



Pin No.	Description
1	Supply
2	Supply
3	Pulse relay NO
4	Pulse relay COM
5	Presence relay NO
6	Presence relay COM
7	Loop
8	Loop
9	Earth
10	Presence relay NC
11	Pulse relay NC

## 5.0 Mode of Operation

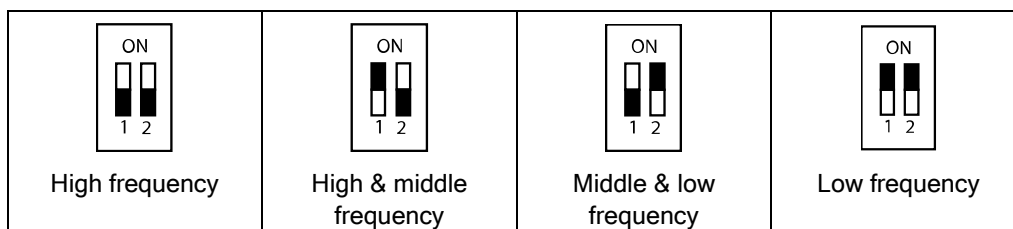
### 5.1 Operational instructions

Once the detector power is **ON**, within 1 seconds the detector will automatically check the loop cable whether functional or not (Please do not leave the vehicle on the loop cable while checking is in progress). If loop cable is functional the “Detect” LED will turn **OFF**.

If the “Detect” LED **blinking** continuously at 1Hz, it means the detector could not detect any connection from the loop cable. Please check the loop cable connection. Re-wire if possible.

### 5.2 Frequency setting - To avoid crosstalk (interference)

The frequency switches are DIP 1 & DIP 2. There are 4 frequency selections as shown the table below:

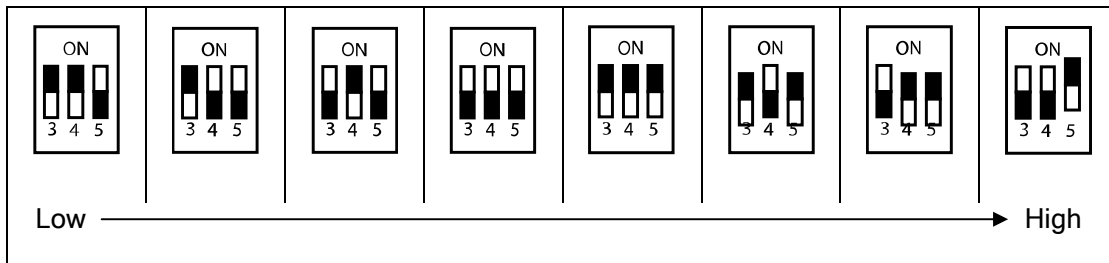


#### NOTE:

If more than one loop detector is used, The detectors must be set-up to ensure that there is no interference (cross talk) between the detectors. This can be achieved by ensuring that the loops of the two detectors are spaced sufficiently apart (approximately 2 meters between adjacent edges), and also ensuring that the detectors are set to different frequencies.

### 5.3 Sensitivity setting

The sensitivity of the detector allows the detector to be selective as to the change of inductance necessary to produce an output. The sensitivity switches are DIP 3, DIP 4, and DIP 5.



Setting the proper sensitivity level for the loop circuit provides stability to the system. If set too high, the detector may detect adjacent traffic. If set too low, the detector may not detect small vehicles or high bed vehicles.

First attempt please set the sensitivity to the lowest level. Increase the sensitivity level until the detector stable when vehicle leaves the loop cable.

### 5.4 Filter option

The degradation / malfunction of the detector may occur if the on-site environment full of electromagnetic / noise disturbance. The filter switcher is DIP 6. Switch DIP 6 **ON** to filter the disturbance. Please note that when DIP 6 switch is **ON**, this may reduce the sensitivity or increase the delay time.

**NOTE:** Improper installation of the loop cable may also lead to detector malfunction. Please re-wire the loop cable.

### 5.5 Function output relay

**Pulse output:** The pulse output can be setup to activate on detection of a vehicle or when the vehicle leaves the loop. Pulse relay 1 second.

**Presence output:** The output will be activated as long as there is a vehicle parked in the loop. The relay de-activates once the vehicle leaves the loop.

Pin3, Pin4 and Pin11: relay pulse output

Pin5, Pin6, Pin10: relay presence output

**Pin7 de-activate** when vehicle enter the loop, Pin2, Pin4 close conduction after 500ms switch-off.

**Pin7 activate** when vehicle leaves the loop, the Pin3, Pin4 close conduction after 500ms switch-off.

When vehicle / metal on the loop, Pin5 and pin 6 close conduction until vehicle leaves the loop.

## 5.6 Duration output time setting

The duration output time setting can be programmed by DIP-switch.

**ON** - infinity duration output (when vehicle is on the loops, duration output infinity)

**OFF** - timer duration output, timer: 10 minutes (after 10 minutes the vehicle leaves the loops, loop will reset.)

## 5.7 Reset

Pressing the reset switch enables the detector to be manually reset during commissioning and testing. This results in the detector re-tuning the sensing loop and becoming ready for vehicle detection.

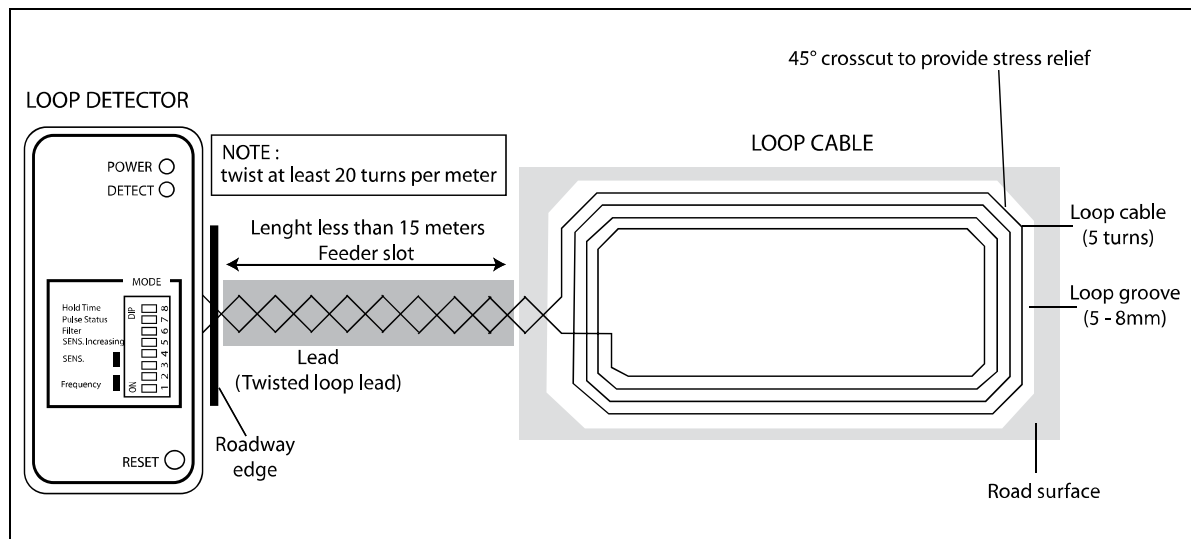
## 6.0 Installation Guide

All permanent loop installations should be installed in the roadway by cutting slots with a masonry cutting disc or similar device. A 45° crosscut should be made across the loop corners to reduce the chance of damage that can be caused to the loop at right angle corners

NOMINAL GROOVE WIDTH: 4mm

NOMINAL GROOVE DEPTH: 30mm to 50mm

A slot must also be cut from the loop circumference at one corner of the loop, leading to the roadway edge to accommodate the feeder.

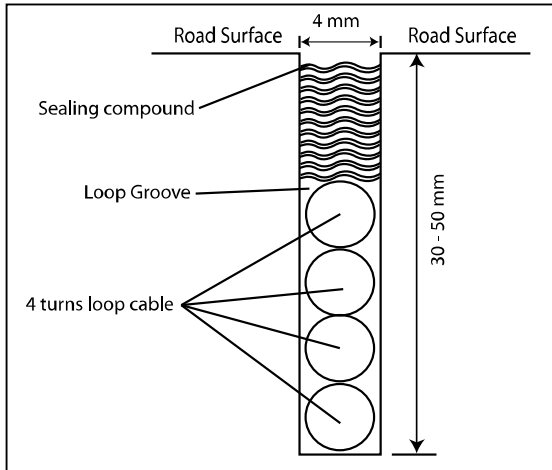


As you can see the above drawing, you can use 1.5mm<sup>2</sup> or 16awg stranded wire and wind minimum 5 turns inside the groove. Then “TWIST” the wire back to Loop Detector.

A continuous loop and feeder is obtained by leaving a tail long enough to reach the detector before inserting the cable into the loop groove. Once the required number of turns of wire is wound into the groove around the loop circumference, the wire is routed again via the feeder slot to the roadway edge. A similar length is allowed to reach the detector and these two free ends are twisted together to ensure they remain in close proximity to one another. (Minimum 20 turns per meter) Maximum recommended feeder length is 15 meters. It should be noted that the loop sensitivity decreases as the feeder length increases, so ideally the feeder cable should be kept as short as possible.

Joints in the loop or feeder are not recommended. Where this is not possible, joints are to be soldered and terminated in a waterproof joint bow. This is extremely important for reliable detector performance. The loops are sealed using a .quick-set. black epoxy compound or hot bitumen mastic to blend with the roadway surface.

### Depth of the groove



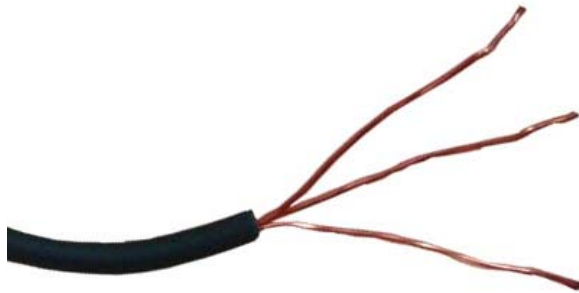
### CAUTION

When you put silicon to fill up the groove, make sure you press tightly downward. This is to ensure that there is all wire is pressed down together and no space for them to move inside the groove. This caution is to ensure reliability, if loop wire can move inside the groove due to vibration when vehicle pass through, it will be unstable.

When winding the wire inside the loop please make sure the wire is not twisted. All wire in the groove have to run almost perfect parallel with each other. Only twist the wire when wire going back to MAG detector.

### Loop Cable

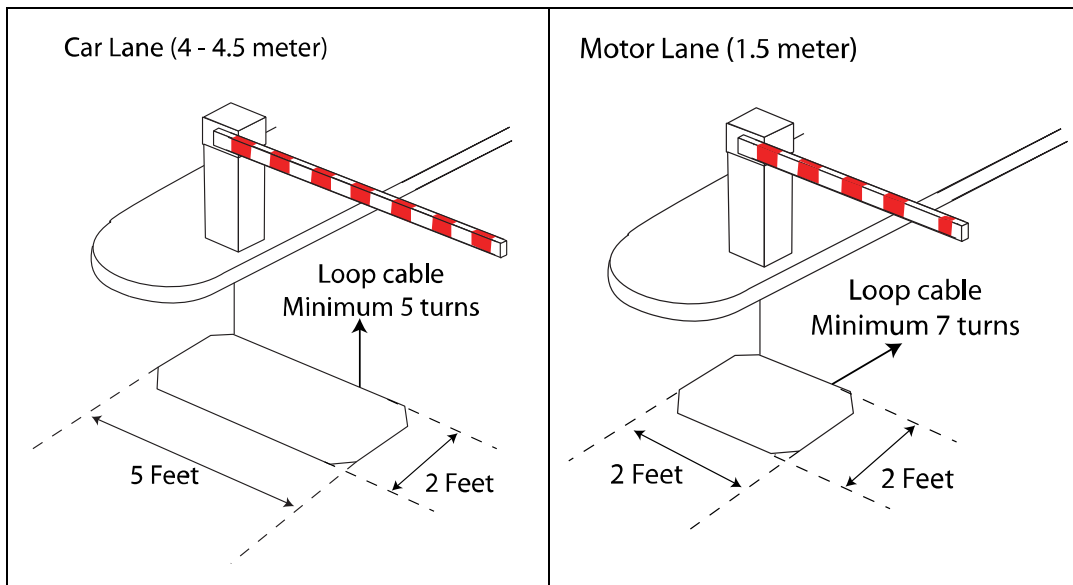
Loop Cable 1.5mm<sup>2</sup> or 16awg stranded wire (3 copper)



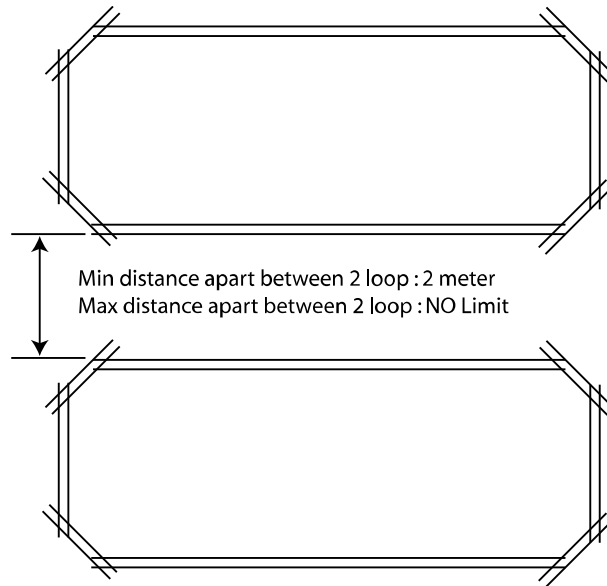
### Typical installation diagram

For Car lane: 2' x 5' x 5 turns

For Motor lane: 2' x 2' x 7 turns



### Adjacent loops connected to different detector modules



### Ideal Loop Detection Rate

Loop Perimeter	Number of Turns	$\mu\text{H}$	Detection Range (Height)
2 feet x 5 feet	5 turns	100 $\mu\text{H}$	45 - 50 cm
2 feet x 5 feet	7 turns	178 $\mu\text{H}$	50 cm - 55 cm
2 feet x 2 feet	7 turns	100 $\mu\text{H}$	47 - 50 cm

*\* Please note the above table is approximately figure only. Actual detection range achieve will depends on interference and site condition.*

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