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**SECURITY SYSTEMS**  
**Loop Detector**

**USER GUIDE**  
**&**  
**INSTALLATION INSTRUCTIONS**

*PD232*  
*LOOP DETECTOR*

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## INSTALLATION & USER GUIDE



The detector must be installed in a convenient weatherproof location as close as possible to the loop antenna.

**WARNING:**

- 1) Installation and operation by service personnel only,
- 2) Disconnect power before working on this unit.

A correct loop configuration and detector installation will ensure a successful inductive loop detection system.

## OPERATIONAL CONSTRAINTS

### Crosstalk

When two loop configurations are in close proximity, the magnetic field of one can overlap and disturb the field of the other.

This phenomenon, known as crosstalk, can cause false detections and detector lock-up. Crosstalk can be eliminated by:

- a. Careful choice of operating frequency. The closer together the two loops, the further apart the frequencies of operation must be.
- b. Where possible, a minimum spacing of 7 feet between loops should be adhered to.
- c. Careful shielding of feeder cables if they are routed together with other electrical cables. The shield must be earthed at the detector end only.

### Reinforcing

The existence of reinforced steel below the road surface has the effect of reducing the inductance, and therefore the sensitivity of the loop detection system. In this case, two additional turns of wire should be added to the loop.

The ideal spacing between the loop cable and steel reinforcing is 6 inch. Although this is not always practically possible. The slot depth should be kept as shallow as possible.

Taking care that no part of the loop or feeder remains exposed after the sealing compound has been applied.

## INSTALLATION INFORMATION

### Loop and Feeder Specification

The loop must consist of insulated wire with a minimum copper cross-sectional area equivalent to 1,5 square millimeters. The feeder should be of the same material, but twisted, a minimum of 20 twists per meter.

Joints in the loop or feeder are not recommended. Where this is not possible, joints are to be soldered and terminated in a waterproof junction box. This is extremely important for reliable detector performance.

Where long loop feeders are used or feeders are routed together with other electrical wiring the use of a screened cable is suggested for the feeder. The screen must be earthed at the detector end only.

### Sending Loop Geometry

Sensing loop should, unless site conditions prohibit, be rectangular in shape and should normally be installed with the longest sides at right angles to the direction of traffic movement. These sides should ideally be 3 feet apart.

The length of the loop will be determined by the width of the roadway to be monitored. The loop should reach to within 1 foot of each edge of the roadway.

In general, loops having a circumference measurement in excess of 30 feet should normally be installed using 2 turns of wire, while loop of less than 30 feet in circumference should have three or more turns. Loops with a circumference measurement of less than 18 feet should have four turns. It is good practice at time of installation to construct adjacent loops with alternate three and four turn windings to minimize crosstalk.

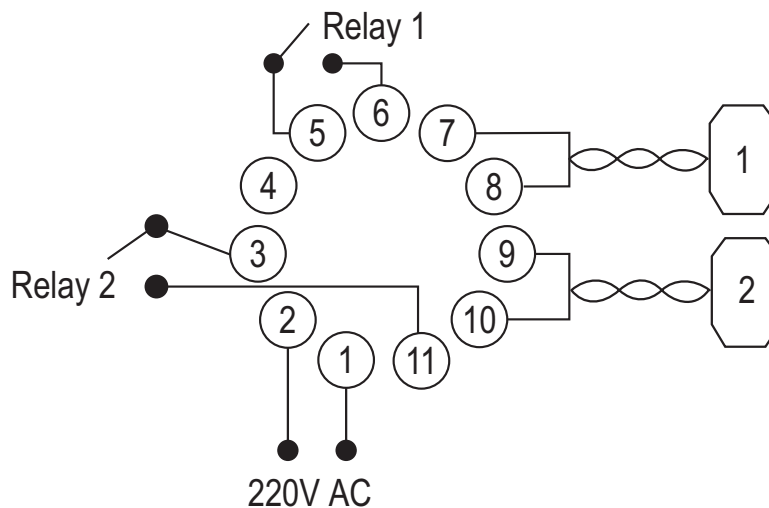
### Loop installation

All permanent loops 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 cable at right angle corners. A slot must also be cut from the loop circumference at one corner of the loop to the roadway edge to accommodate the feeder. Please refer to the loop documentation for the slot width and depth.

A continuous loop and feeder is obtained by leaving a tail long enough to reach the detector before inserting the cable into the loop slot. Once the required number of turns of wire is wound into the slot around the loop circumference, the wire is routed again via 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 10 turns per foot). Maximum recommended loop feeder length is 300 feet. 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. The loops are seated using a "quick-set" black epoxy compound or hot bitumen mastic to blend with the roadway surface.

## Wiring

Pin	Designation	
1	Live	220 VAC
2	Neutral	
3	Relay 2 – Common	
4	Open	
5	Relay 1 – Common	
6	Relay 1 – N/O	
7	Loop 1	Twist this Pair
8	Loop 1	
9	Loop 2	Twist this Pair
10	Loop 2	
11	Relay 2 – N/O	



## Dip Switch

Number	Designation								
8	Presence detection	ON=Permanent, OFF=limited							
7	Automatic Sensitivity Boost	ON/OFF							
6	Sensitivity Loop 1	ON	Low	OFF	Medium	ON	Medium	OFF	High
5		ON		ON		Low		OFF	
4	Sensitivity Loop 2	ON	Low	OFF	Medium	ON	Medium	OFF	High
3		ON		ON		Low		OFF	
2	Frequency Loop 1	ON=Low, OFF=High							
1	Frequency Loop 2	ON=Low, OFF=High							

### Dip Switch 1 & 2 – Frequency

These switches allow the loop frequency to be shifted high or low depending on the switch position. The ideal frequency of the loop is determined by the loop size and the frequency of the switch simply causes a frequency shift on the loop.

Where two loops are connected to the detector it is advisable to make sure that different frequency is used for each one.

## Dip Switch 3,4,5 & 6 – Sensitivity

The sensitivity setting allows the detector to be selective as to the change of inductance necessary to produce an output. Each loop has four sensitivity selections ranging from low to high.

## Dip Switch 7– Automatic Sensitivity Boost

Automatic sensitivity boost is a mode that alters the "undetected" level of the detector. The detector will use the dip-switch-sensitivity in order to "detect" and once detected, will switch to High-Sensitivity until it reaches "undetected" level.

## Dip Switch 8– Presence Detection

The presence time may be set to permanent presence or to limited presence in permanent presence mode the detector will continuously compensate for all environmental changes whilst there is a vehicle present over the loop. In limited presence mode the detector will change to "undetected" after 10 minutes of continuous detection.

## Jumpers

There are 3 jumpers located inside the PD-0234, which are used to alter the output relay configuration of the detector. The jumpers have been placed inside the unit to avoid incorrect operation due to selection by an unauthorized operator.

ID	Designation		
LK1	AB-logic	1-2	Presence AB-logic
		2-3	Pulse AB-logic
		Open	No AB-logic (default)
LK5	Channel 1 Output Mode	Open: Pulse, Closed: Presence (default)	
LK6	Channel 2 Output Mode	Open: Pulse, Closed: Presence (default)	

## USAGE

The PD-0234 provides visual indications on the front of the unit, together with relay contacts on the connector at the rear of the unit. The red power status LED indicates that the unit has been powered. The green channel status LED's below indicate vehicle absence/presence for each loop, as well as indications if there is a fault on the loop.

When powered on, the unit will self-calibrate. Avoid having a vehicle on any of the loops during power on self-calibration. Self-calibration takes approx, 1 second. During calibration, both channel LED's will blink if AB-logic is selected.

After calibration, both channel LED's will turn off (assuming no objects are being detected on the corresponding loops), and the power LED will remain steady ON.

If a loop fault is detected, the respective channel LED will come on and flash indicating a fault, until the fault is corrected.



## TROUBLESHOOTING

Observation	Fault	Remedy
Red LED is OFF	No or incorrect power supplied to the detector	Measure the voltage on pins 1-2. It should be in the 110 V AC range
	Fuse inside the detector is broken	Find the reason why the fuse broke, and replace the fuse
After initial 1 sec calibration period, a Green channel LED is blinking steadily	The detector cannot properly operate the loop.	Check if the corresponding loop is connected properly, and measure if the loop is not broken.
After initial 1 sec calibration period, the Green Channel LED flashes intermittently and the relay chatters	The loop getting spurious detects due to: <ul style="list-style-type: none"> <li>a) Crosstalk with adjacent</li> <li>b) Faulty loop or feeder connection.</li> </ul>	Eliminate crosstalk or fix the loop or feeder connection.