Single Channel Loop Detector

Model - LD107 Series

The LD107 is an ultra low power single channel inductive loop detector designed for parking and access control applications.

The LD107 can be configured for low power for operation from a battery or solar panel. The detector consumes less than 2mA of supply current when there is no vehicle on the loop.

The detector is connected to an inductive loop mounted in the road surface. When vehicles pass over the loop the detector switches on an output.

The use of microprocessor and surface mount technology enables a large number of functions to be incorporated into a small package. The LD107 is easy to set-up and install.

Applications

Typical applications in the parking and access control environments are safety loops for barriers or gates, arming loops for activating card dispensers, entry or exit loops and vehicle counting.

Features

Reset Switch. 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. The reset switch should be operated every time any of the switch settings are changed.

Switch selectable Sensitivity. The detect sensitivity is the minimum change in inductance required to produce a detect output. (%ΔL/L). Four sensitivity settings are available on the switches to allow flexibility in configuration.

Switch selectable Frequency. The frequency of the loop is determined by the inductance of the loop and the frequency switch setting. If the frequency switch is on, the frequency is reduced. It may be necessary to change the frequency to prevent cross-talk between adjacent loops on different detectors.

Sensitivity Boost. This feature sets the undetect level to maximum sensitivity and is used to prevent loss of detection of high-bed vehicles.

Filter Option. This option is used to provide a delay of 2 Seconds between detection of the vehicle and switching of the output relay. This delay is normally used to prevent false detection of small or fast moving objects.

Permanent Presence. This feature ensures detection of the vehicle will be maintained when the vehicle is parked over the loop for extended periods. Not enabled in low power mode.

Pulse Relay Selection. The Presence relay may be configured as a pulse relay and to energise on detection of a vehicle or to energise when the vehicle leaves the loop.

Selectable Pulse Time. This feature sets the length of time that the pulse relay will be energised. 1 Second or 0.2 Second.

Low Power Option. When switched on this feature puts the detector into low power mode.

Indicators

Detect Indicator. This LED Indicator is illuminated when there is a vehicle over the loop or the loop is faulty. This LED can also be used to determine the loop frequency. On reset, count the number of times the LED flashes. Multiply this number by 10KHz.For example: if the LED flashes 6 times, then the loop frequency is between 60KHz and 70KHz. The detect led will periodically flash on for short period of time to indicate that the detector is operating correctly.

Technical Specifications

Power supply	10 – 50 VDC 8 – 35 VAC 50/60Hz
Supply Current (Approximate values)	Normal mode: Un detect – 11mA In Detect – 15mA Low Power mode: Un detect – 1.5mA In Detect – 6mA
Relay	Change over contact 0.5A/220VAC (normally energized)
Response time	Normal mode: Approximately 120ms after vehicle enters loop. Low power mode: Approximately 1sec after vehicle enters loop.
Indicators	LED indicators show: Power/ Detect state.
Detector tuning range	15 - 1500uH
Loop Frequency	Approx. 23 – 130KHz
Environmental tracking	Automatic Compensation
Protection	Loop isolation transformer with zener diodes and gas discharge tube.
Connector	11 Pin Connector on rear of unit.
Dimensions	80mm (height) X 40mm (width) X 79mm (Depth excl. connector).
Operating Temperature	-40°C to +80°C
Storage Temperature	-40°C to +85°C

Switch Settings

LD107 Switch Settings			
Switch No.	**Function**	**ON**	**OFF**
9,10	Sensitivity Hi (0.02%)	-	S9/S10
9,10	Sensitivity Med Hi (0.05%)	S10	S9
9,10	Sensitivity Med Lo (0.1%)	S9	S10
9,10	Sensitivity Lo (0.5%)	S9/S10	-
8	Pulse Mode	Undetect	Detect
7	Relay Mode	Pulse	Presence
6	ASB	On	Off
5	Filter	2 Sec	Off
4	Pulse Time	1 Sec	0.2 Sec
3	Permanent Presence	On	Off
2	Power Mode	Low	Normal
1	Frequency	Low	High

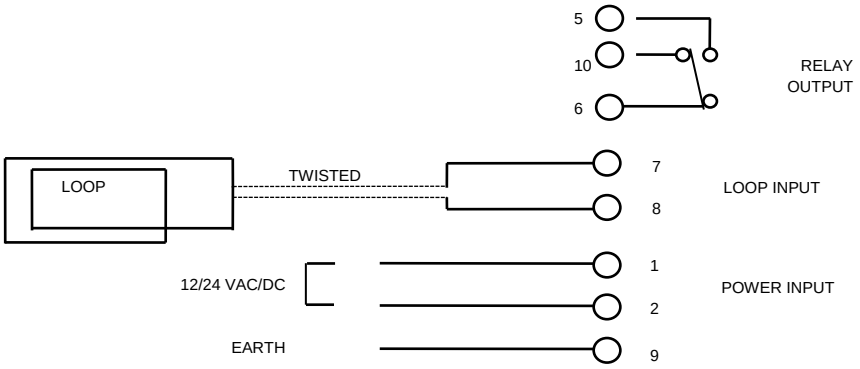
Relay Functionality

RELAY		**VEHICLE PRESENT**	**NO VEHICLE**	**LOOP FAULTY**	**NO POWER**
PRESENCE RELAY	**N/O**	**CLOSED**	**OPEN**	**OPEN**	**OPEN**
	N/C	**OPEN**	**CLOSED**	**CLOSED**	**CLOSED**
PULSE RELAY	**N/O**	**PULSE CLOSED**	**OPEN**	**OPEN**	**OPEN**
	N/C	**PULSE OPEN**	**CLOSED**	**CLOSED**	**CLOSED**

Diagnostics

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The detect led does not flash very slowly.	No power supply voltage on the input.	Check that the power supply is correctly wired to the detector. (Terminals 4 and 5)
The DETECT LED flashes erratically.	There may be a poor connection in the loop or loop feeder. The detector may be experiencing crosstalk with the loop of an adjacent detector.	Check all wiring. Tighten screw terminals. Check for broken wires. Try changing frequencies using the frequency switch. Put the detector with the larger loop onto low frequency and the detector with the smaller loop onto high frequency.
The DETECT LED randomly stays on.	Faulty loop or loop feeder wiring. Movement of the loop in the ground.	Check the wiring. Tighten screw terminals. Check for pinched or bent wires. Is the feeder wire twisted? Check for cracks in the road surface near the loop.
The DETECT LED is flashing.	The loop inductance is to small or the loop is short circuit. The loop inductance is too large or the loop is open circuit.	Check that there is no short circuit on the loop feeder wiring or the loop. If there is no short circuit then the inductance is to small and more turns of wire should be added to the loop. Check that there is electrical continuity on the loop. This can be done using a multimeter on the ohms range (< 5 Ω). If the loop inductance is too large then try reducing the number of turns.

Wiring Diagram

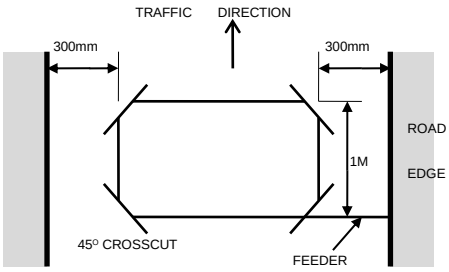


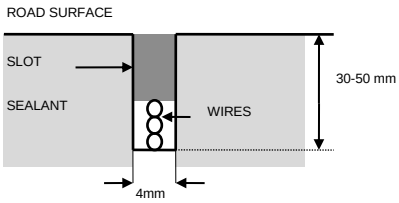
Wiring Connections

1	+ 12 TO 24VAC/DC SUPPLY
2	- 12 TO 24VAC/DC SUPPLY
7	LOOP TWISTED
8	LOOP WIRE
9	EARTH
6	Relay COM
10	Relay N.C.
5	Relay N.O.

Loop Installation Guide

1. The detector should be installed in a waterproof housing as close to the loop as possible.
2. The loop and feeder should be made from insulated copper wire with a minimum cross-sectional area of 1.5mm^2. The feeder should be twisted with at least 20 turns per metre. Joints in the wire are not recommended and must be soldered and made waterproof. Faulty joints could lead to incorrect operation of the detector. Feeders which may pick up electrical noise should use screened cable, with the screen earthed at the detector.
3. The loop should be either square or rectangular in shape with a minimum distance of 1 metre between opposite sides. Normally 3 turns of wire are used in the loop. Large loops with a circumference of greater than 10 metres should use 2 turns while small loops with a circumference of less than 6 metres should use 4 turns. When two loops are used in close proximity to each other it is recommended that 3 turns are used in one and 4 turns in the other to prevent cross-talk.
4. Cross-talk is a term used to describe the interference between two adjacent loops. To avoid incorrect operation of the detector, the loops should be at least 2 metres apart and on different frequency settings.
5. For loop installation, slots should be cut in the road using a masonry cutting tool. A 45^o cut should be made across the corners to prevent damage to the wire on the corners. The slot should be about 4mm wide and 30mm to 50mm deep. Remember to extend the slot from one of the corners to the road-side to accommodate the feeder.
6. Best results are obtained when a single length of wire is used with no joints. This may be achieved by running the wire from the detector to the loop, around the loop for 3 turns and then back to the detector. The feeder portion of the wire is then twisted. Remember that twisting the feeder will shorten its length, so ensure a long enough feeder wire is used.
7. After the loop and feeder wires have been placed in the slot, the slot is filled with epoxy compound or bitumen filler.





Contact Details

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