

# **ENFORCER®**

**LD-1123-PAQ**

Loop Detector

**Manual**



**Features:**

- Single loop input
- 3 Adjustable sensitivity settings
- 2 Form "C" relay outputs
- 11-pin connector
- ABS plastic housing
- Power-on automatic reset
- Automatic drift compensation for varying environmental conditions
- Auto fault detection
- Terminal block included

# ENFORCER Loop Detector

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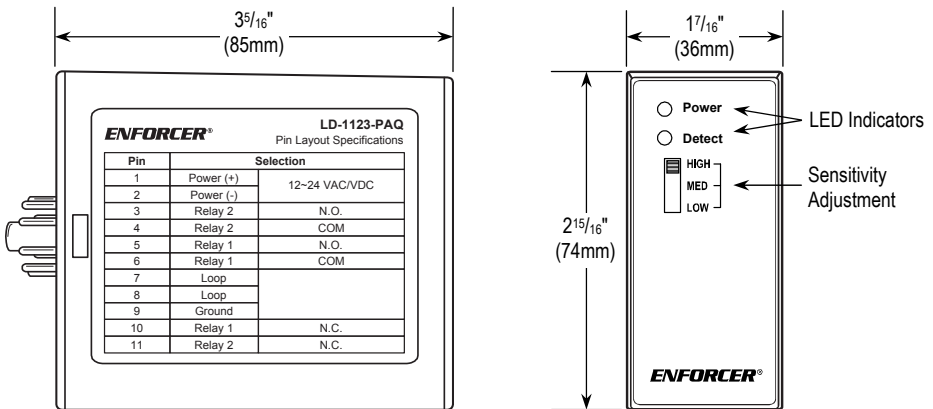
## Introduction:

The LD-1123-PAQ Loop Detector is designed to be used with gates or other vehicle detection systems. The LD-1123-PAQ is connected to an input loop which is buried in the pavement. If a vehicle is over the input loop, the detector sends a signal to perform such actions as opening a gate, holding a gate open, or indicating that a vehicle is in a bay.

## Parts List:

1x Loop Detector                      1x Terminal Block                      1x Manual

## Overview:



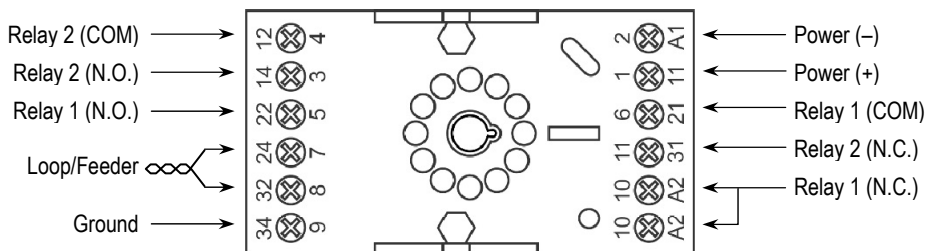
**Specifications:**

Operating voltage		12~24 VAC/VDC
Current draw	Standby	40mA@12VDC / 40mA@24VDC
	Active	50mA@12VDC / 60mA@24VDC
Loop induction range		80~300 $\mu$ H
Sensitivity		3 levels of sensitivity
Reaction time		100ms
Vehicle detection mode		Combines relays #1 and #2 to detect vehicle presence, with pulse on entry
Presence output		Temporary (triggers relay #1 as long as vehicle is in the loop, times out after 5 minutes)
Pulse output		Pulses relay #2 on entry
Fault output		Relay #2 is continually energized and the green LED stays on
Pulse output time		200ms
LEDs	Red	Power indicator
	Green	Status indicator (vehicle detected or fault)
Input / Output protection		Built in surge and transient protection
IP Rating		IP54
Case material		Black ABS plastic
Operating humidity		Up to 95% without condensation
Operating temperature		-40°~149°F (-40°~65°C)
Dimensions		2 <sup>15</sup> / <sub>16</sub> "x1 <sup>7</sup> / <sub>16</sub> "x3 <sup>5</sup> / <sub>16</sub> " (74x36x85 mm)
Weight		7.2-oz (203g)

**NOTE:** Vehicle detection will timeout after 5 minutes, after which relay #1 will no longer be triggered. The vehicle must then exit and re-enter the loop to trigger relay #1.

**Terminal Block and Connections:**

The terminal block LD-ACC-TB is included for easy wiring and installation. Remove the terminal block from the loop detector to access the terminal screws.



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### Installation:

The wiring harness LD-ACC-WH (not included) is also available in place of the terminal block. The wiring harness connections are shown below.



LD-ACC-WH

### Wiring Harness Connections:

Item	Color	Pin No.	Connection Notes
Wire 1	Black	Pin 1	Power (+)
Wire 2	White	Pin 2	Power (-)
Wire 3	Red	Pin 3	Relay 2 — N.O.
Wire 4	Purple	Pin 4	Relay 2 — COM
Wire 5	Blue	Pin 5	Relay 1 — N.O.
Wire 6	Yellow	Pin 6	Relay 1 — COM
Wire 7	Brown	Pin 7	Loop
Wire 8	Grey	Pin 8	Loop
Wire 9	Green with yellow	Pin 9	Ground
Wire 10	Pink	Pin 10	Relay 1 — N.C.
Wire 11	Green	Pin 11	Relay 2 — N.C.

### Possible Relay Outputs:

Status	Relay #1	Relay #2 (entry pulse)	Relay #2 (fault output)
<b>No vehicle detected</b>	De-energized	De-energized	De-energized
<b>Vehicle presence</b>	Energized	De-energized	De-energized
<b>Vehicle enters loop range</b>	Energized	200ms pulse	De-energized
<b>Vehicle exits loop range</b>	De-energized	De-energized	De-energized
<b>Fault in loop circuit</b>	De-energized	De-energized	Energized

### LED Indicators:

The loop detector has two LEDs.

1. Red indicates power
2. Green indicates the current status (after power-up self-test, depending on settings)
  - a. Detection status – Indicates when vehicle is detected
  - b. Fault warning – Indicates a short circuit, open circuit, or when the inductance exceeds the permitted range

**Installation Notes:****Loop and feeder specifications**

1. The induction loop and feeder cable (not included) should be insulated multi-strand copper conductor with a minimum of  $1/16$  sq. inch (1.5mm<sup>2</sup>) cross-sectional area (#18 AWG or larger) made of a single un-spliced length of cable from the detector, around the loops, and back to the detector.
2. Loop or feeder splicing is not recommended. Make sure that the cable is long enough to also account for the twisting of the feeder. Where this is not possible, splices should be soldered and terminated in a waterproof junction box.
3. The loop length will be determined by the width of the roadway to be monitored. In general, loops with a circumference in excess of 32 feet (10m) should have 3 turns of the loop cable or more. Loops with a circumference of less than 20 feet (6m) should have 4 turns.
4. Use 1~2 inch sections of backer rod sized to fit snugly in the slot and placed above the cable every 1~2 feet to keep the cable at the bottom of the slot to provide the maximum protection.

**Metal reinforcement**

- The existence of metal reinforcement such as steel rebar below the road surface could change the loop inductance. In such a case, add an additional two turns to the loop.
- "Feeder" refers to the portion of the cable between the loop and the loop detector. The feeder wires should be twisted together at least 4~6 times per foot (12~18 times/m). Note that sensitivity decreases with increasing feeder length, but this is negligible except for feeder cables of 500 feet or more.

**Crosstalk**

When two loops are in close proximity, the magnetic field of one may overlap and disturb the field of the other. This phenomenon, known as crosstalk, can cause false detection and detector lock up.

To eliminate crosstalk:

1. Keep a minimum spacing of 80" (2m) between adjacent loops.
2. Carefully screen feeder cables. If they are routed together with other electric cables, the end of the feeder cable connected to the detector must be grounded to earth.

**Detector mounting**

The detector should be mounted in a protected location that is near the loop and is easily accessible for troubleshooting. Ideally, a technician should be able to see the loop from the detector location. The feeder cable length should not exceed 16ft (5m).

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## Installation:

The inductive loop should be installed under the surface of the road. The loop should be at least 4 feet (1.2m) from the path of any gate or other large metal object to avoid interference. Cut slots in the road with a masonry cutting disc or similar device. Make a 45° crosscut 8~12 inches (20~30 cm) from the corners of the loop to reduce the chance of damage to the loop that could happen with right angle corners.

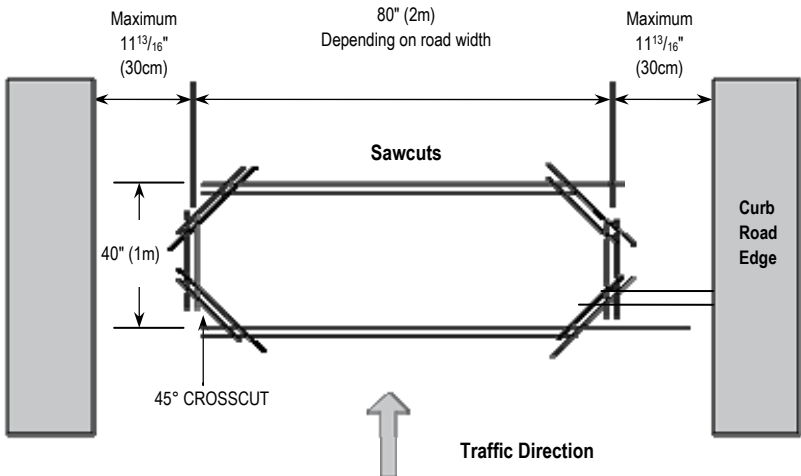
- Nominal slot width:  $\frac{3}{16}$ " (4mm), wide enough so that the loop fits easily with some gap for the sealant to fully enclose the loops
- Nominal slot depth:  $1\frac{3}{16}$ "~ $1\frac{15}{16}$ " (30~50 mm)

Cut a slot at one corner of the loop to the roadway edge for the loop feeder cable. Clean all debris from each cut with compressed air and check for any sharp edges to avoid damage to the loop. Seal the loops using quick-set black epoxy compound or hot bitumen mastic (adhesive) to blend with the roadway surface.

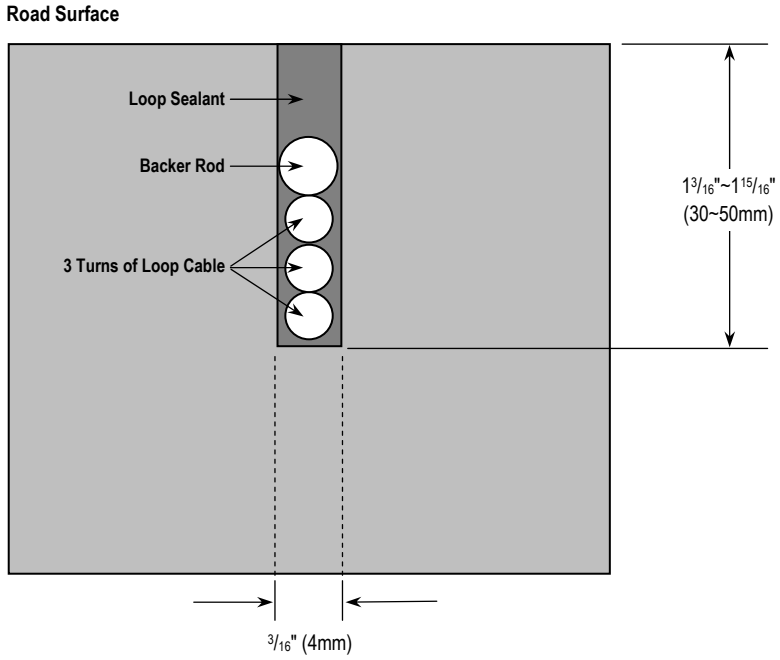
### Note when two or more inductive loops are mounted adjacent to each other:

When the road width is 80" (2m), the minimum distance between loops should be 80" (2m).

When the road width is 160" (4m), the minimum distance between loops should be 120" (3m).



Loop Installation (continued):



**NOTE:** Actual depth depends on number of loops. Depth may be less in concrete pavement to reduce potential for interference from rebar.

# ENFORCER Loop Detector

Also Available from **SECO-LARM®**:

## ETL Sensors



E-936-S45RRGQ

## 7-Day Timer



SA-027WQ

## Heavy-Duty Outdoor Keypad



SK-3523-SDQ

## Weldable Magnetic Gate Locks



E-942F-1KS3Q

## Troubleshooting:

Sensor does not detect the vehicle

- Make sure that unit is powered up (red LED is lit) and has completed the initial self-test
- Adjust the sensitivity setting
- Check for fault in the loop or loose connection to detector

Sensor's green LED lights when vehicle is detected, but there is no output

- Check wiring between the sensor and device to be triggered

Detector continues to detect even after a vehicle leaves the loop

- Check for fault in the loop or loose connection to detector

Detector sometimes detects even when there is no vehicle over the loop

- Check for fault in the loop or loose connection to detector
- Check for cross-talk between adjacent loops – adjust frequency
- Check whether the loop is being triggered by other metallic objects nearby – gates, metal doors, pavement reinforcement
- Loop may not be securely installed in pavement to prevent movement or moisture intrusion

Green LED stays on

- Check for loop short circuit
- Check for loose connection between the loop and detector

**WARRANTY:** This SECO-LARM product is warranted against defects in material and workmanship while used in normal service for one (1) year from the date of sale to the original customer. SECO-LARM's obligation is limited to the repair or replacement of any defective part if the unit is returned, transportation prepaid, to SECO-LARM. This Warranty is void if damage is caused by or attributed to acts of God, physical or electrical misuse or abuse, neglect, repair or alteration, improper or abnormal usage, or faulty installation, or if for any other reason SECO-LARM determines that such equipment is not operating properly as a result of causes other than defects in material and workmanship. The sole obligation of SECO-LARM and the purchaser's exclusive remedy, shall be limited to the replacement or repair only, at SECO-LARM's option. In no event shall SECO-LARM be liable for any special, collateral, incidental, or consequential personal or property damage of any kind to the purchaser or anyone else.

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