Single Channel Loop Detector

Model – MiniLoop

The MiniLoop is a single channel inductive loop detector designed for parking and access control applications. 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.

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.

The MiniLoop is a compatible replacement for most single channel detectors on the market and is easy to set-up and install.

Features

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.

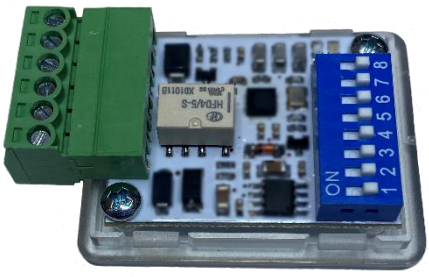
Sensitivity Boost. (ASB) This feature sets the undetect level to maximum sensitivity and is used to prevent loss of detection of high-bed vehicles.

Permanent Presence. This feature ensures detection of the vehicle will be maintained when the vehicle is parked over the loop for extended periods.

Relay Modes. The detect relay may be configured for a pulse output or presence output. The pulse output can be configured to be energised on detection of a vehicle or when the vehicle leaves the loop. In presence mode, the relay output can be configured to be Fail-Safe of Fail-Secure.

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

Indicators



Power Indicator. ***(RED)*** This LED Indicator illuminates when power is present.

Detect Indicator. ***(BLUE)*** This LED Indicator is illuminated when there is a vehicle over the loop.

Loop Tuning. Loop tuning is indicated by fast alternating flashing of the power and detect led's.

Loop Fault condition. A loop fault is indicated by slow alternating flashing of the power and detect led's.

Technical Specifications

Power supply	12 - 24VDC 34mA max.
Relay *(Normally open contact)*	Change over contact 0.3A @ 125VAC | 1A @ 30VDC
Response time	Approximately 120ms after vehicle enters loop.
Indicators	LED indicators show: Power, Detect state, Tuning and Loop Fault.
Detector tuning range	15 - 1500uH
Loop Frequency	Approx. 23 – 130KHz
Environmental tracking	Automatic Compensation
Protection	TVS diode protection on loop and supply inputs.
Connector	6way plug, accepts up to 1.5mm^2 wire.
Dimensions	18mm (height) X 36mm (width) X 55mm (Depth incl. connector).
Operating Temperature	-40°C to +80°C
Storage Temperature	-40°C to +85°C

Switch Settings

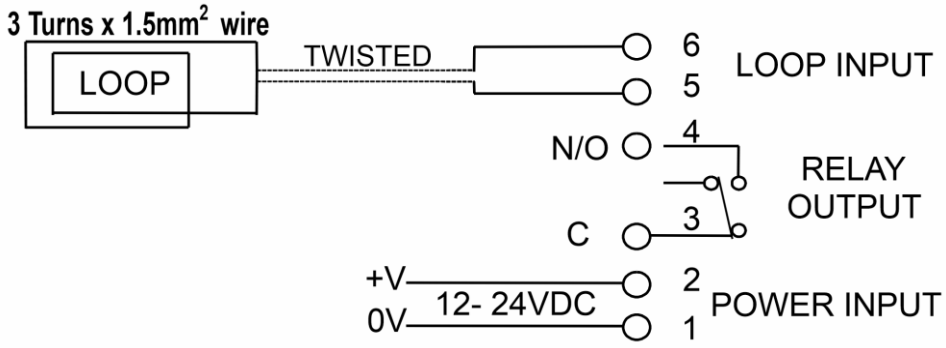
MiniLoop Switch Settings

Switch No.	Function	ON	OFF
8	Frequency	Low	High
6,7	Sensitivity 1%	6 & 7	-
6,7	Sensitivity 0.5%	6	7
6,7	Sensitivity 0.1%	7	6
6,7	Sensitivity 0.02%	-	6 & 7
5	ASB	On	Off
4	Permanent Presence	On	Off
3	Relay Mode	Pulse	Presence
2	In Pulse Mode (sw3 ON)	Undetect	Detect
	In Presence Mode (sw3 OFF)	Fail-Safe	Fail-Secure
1	Pulse Time	1 Sec	0.2 Sec

Relay Functionality

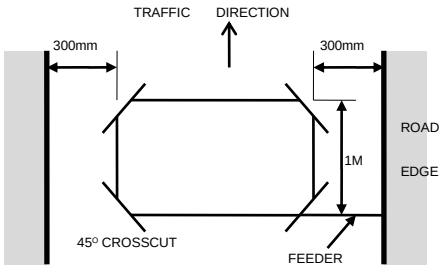
RELAY MODE	SW2	VEHICLE PRESENT	NO VEHICLE	LOOP FAULTY	NO POWER
PRESENCE (SW3 OFF)	ON	RELAY OPEN *(FAIL SAFE)*	RELAY CLOSED	RELAY OPEN	RELAY OPEN
	OFF	RELAY CLOSED *(FAIL SECURE)*	RELAY OPEN	RELAY OPEN	RELAY OPEN
PULSE (SW3 ON)	ON	Pulse on Undetect	OPEN	OPEN	OPEN
	OFF	Pulse on Detect	OPEN	OPEN	OPEN

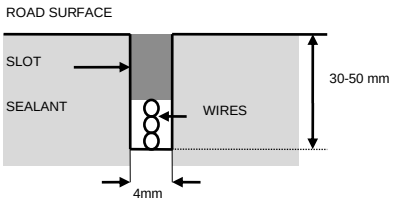
Wiring Diagram



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.

Diagnostics

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The POWER LED is not on.	No power supply voltage on the input.	Check that the power supply is correctly wired to the detector.
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 LED's are indicating a LOOP FAULT (Slow alternating flash).	The loop inductance is too 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.