

MD2009 METAL LOOP DETECTOR

Sensing loop position:

- A safety loop should be positioned where the largest amount of metal of the vehicle will be present when that vehicle is in the path of the moving gate, door or boom pole. Be aware that metal gates, doors or poles could activate the loop detector if they pass within range of the sensing loop.
- A free exit loop should be positioned +/- one and a half car lengths away from the gate, door or boom pole, on the approach side for traffic exiting.
- In cases where more than one loop is installed ensure there is at least 2m between the sensing loops to prevent cross-talk interference between the loops. (Also see Dip-switch 1 option and number of turns around the loop below)

Sensing loop dimensions and shape:(Figure 1)

- A square or rectangular slot of +/- 4mm should be cut into the road surface 30 – 50mm deep.
- The recommended minimum distance between either of the parallel sides is 1m.
- Cross cut the corners by 45° to prevent damage to the cable as it passes around the corners.
- The feeder slot will need to be wider to allow for the required twisting of the feeder.

Sensing loop wire:

- Single length copper "Panel Flex" (Stove wire)
- Silicone insulated
- Minimum cross section - 1.5mm².
- Joints in the wire are not recommended. If made they should be soldered and weatherproofed sufficiently.

Number of turns around the loop:

- Loop circumference 7-10m - 3 turns
- Loop circumference >10m - 2 turns
- Loop circumference < 7m - 4 turns
- In cases where 2 loops are adjacent to each other, use 3 turns in one and 4 turns in the other to help prevent cross-talk interference.

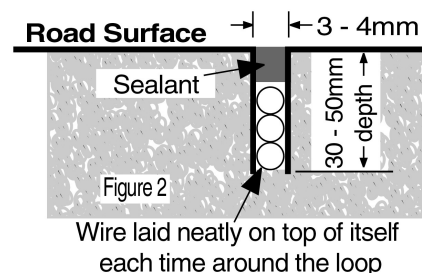
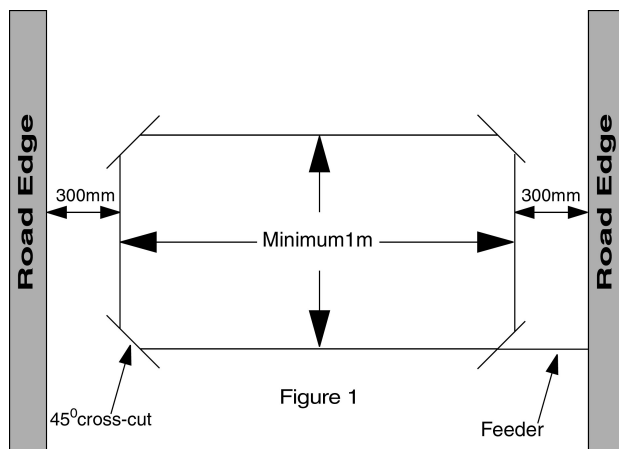
Detector position and installation:

- Install the detector in a weatherproof housing.
- The detector should be as close to the sensing loop as possible.

Installation summary:


Run the single length of wire from the detector, around the loop 3 times (see " Number of turns of loop" above) and then back to the detector. The 2 ends running to the loop and returning from the loop of the same length of cable is known as the feeder and must be twisted together 20 – 30 times per meter. The twisting will shorten the feeder, so allow excess cable when starting out from the detector and on the return from the loop.

Once complete seal the loop slots with an epoxy compound or bitumen filler. (It is recommended this is only done after the detector has been connected and tested).



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		ET SYSTEMS MD2009 Metal loop detector	
		<input type="checkbox"/> OFF <input type="checkbox"/> ON	
Freq.	1	<input type="checkbox"/> Low	1 <input type="checkbox"/> High
Sens.	2	<input type="checkbox"/> Low	2 <input type="checkbox"/> Low/Med.
	3	<input type="checkbox"/> Med./High	3 <input type="checkbox"/> High
	3	<input type="checkbox"/> High	3 <input type="checkbox"/> High
Boost	4	<input type="checkbox"/> Off	4 <input type="checkbox"/> On
RLY 1 Pres.	5	<input type="checkbox"/> Limited Presence	5 <input type="checkbox"/> Permanent Presence
RLY 2 Pulse	6	<input type="checkbox"/> Pulse on Detect	6 <input type="checkbox"/> Pulse on Undetect
Filter	7	<input type="checkbox"/> Off	7 <input type="checkbox"/> On
Reset	8	<input type="checkbox"/> Normal	8 <input type="checkbox"/> Reset



1 - AC or +VDC
2 - AC or 0VDC
3 - RLY2 N/O
4 - RLY2 COM
5 - RLY1 N/O
6 - RLY1 COM
7 - SENSING LOOP
8 - SENSING LOOP
9 - Household Earth
10 - RLY1 N/C
11 - RLY2 N/C

WARNING! Before powering up check the voltage rating for this unit!

Outline of the Dip-switch setting options:-

**Please note: The MD2009 must be reset (Dip 8 below) every time a setting change is made to the dip-switches.
On initial power up the detector will also reset.**

Dip-switch 1 – Freq. (Frequency):-

This setting is used in cases where two or more loop detectors and sensing loops have been installed. (The sensing loops and detectors should be positioned at least 2m apart). Set one detector to HI frequency and the other set to LO frequency to minimize the effects of crosstalk between the two systems.

OFF = Low frequency
ON = High frequency

Dip-switch 2 and 3 – Sensitivity:-

This setting determines the necessary change to the loop frequency to trigger the detector, as metal passes across the sensing loop area.

2 OFF and 3 OFF =	Low sensitivity	1% of loop frequency
2 ON and 3 OFF =	Low to Medium sensitivity	0.5% of loop frequency
2 OFF and 3 ON =	Medium to High sensitivity	0.1% of loop frequency
2 ON and 3 ON =	High sensitivity	0.02% of loop frequency

Dip-switch 4 - Boost mode:-

With boost mode on the detect sensitivity will be as per dip-switch 2 and 3. The undetected (release) sensitivity, however, will be set high 0.02% change in frequency.

This mode is used, when the height of the undercarriage of a vehicle increases as it passes over the sensing loop. This prevents the loss of detection of the vehicle.

OFF = No boost active
ON = Boost mode active

Dip-switch 5 – Relay 1 permanent presence or limited presence mode:-

This setting determines how long **Relay 1** remains active when a vehicle is stopped within the sensing loop area.

ON = Permanent presence mode. The relay will remain active for as long as a vehicle is detected within the sensing loop area. When the vehicle clears the sensing loop area, the relay will deactivate.

OFF = Limited presence mode. With **limited presence** mode on the detector will only activate **Relay 1 for 30min.** If the vehicle has not moved after **25min the buzzer will sound** to alert the user that the relay will **deactivate** after another 5min. Moving the vehicle across the sensing loop area again, after **Relay 1** has deactivated, will re-activate the detector for 30min.

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Dip-switch 6 – Relay 2 Response (when):-

This setting determines when **Relay 2** will activate.

OFF = PULSE ON DETECT. Activates immediately the vehicle is detected in the sensing loop area.

ON = PULSE ON UNDETECT. Activates immediately the vehicle leaves the sensing loop area.

Dip-switch 7 – Filter :-

This setting provides a 2sec delay between when the metal object is detected and when the relays activate. This option is used to prevent false activations when small or fast moving objects pass through the loop area. This option can be used where an electric fence nearby is the cause of false activations. If the object does not remain in the area for 2sec. The detector will not activate the relays.

Dip-switch 8 – Reset:-

Please note: The MD2009 must be reset every time a setting change is made to the Dip-switches!

To reset, switch Dip-switch 8 on for approximately 2 seconds and then off again. The detector then completes the loop test routine.

Relay 1 and 2 status:

Relays		Vehicle Present	No vehicle present	Loop faulty	No Power
Presence relay (1)	N/O	Closed	Open	Closed	Closed
	N/C	Open	Closed	Open	Open
Pulse relay (2)	N/O	Pulses closed 1 sec.	Open	Open	Open
	N/C	Pulses open 1 sec.	Closed	Closed	Closed

On power up or reset the following will occur:-

Ensure the sensing loop area has been cleared of all loose pieces of metal, tools and vehicles before powering up or resetting the detector!

Detector auto-tests the sensing loop:

- **Faulty loop – Open loop or loop frequency below 20Khz:**
 - **Fault LED** - 3 flashes, 3sec pause, 3 flashes, 3sec pause.....this continues until the faulty loop is corrected and the detector is reset.
 - **Buzzer** - 3 beeps, 3sec pause, 3 beeps, 3sec pause.....repeats five times and then silences.
 - If the loop circuit is continuous (measure with continuity meter) then increase the loop frequency by adding more turns of wire.
 - **Faulty loop – Short circuited or loop frequency above 120Khz:**
 - **Fault LED** – 6 flashes, 3sec pause, 6 flashes, 3 sec pause -this continues until the faulty loop is corrected and the detector is reset.
 - **Buzzer** – 6 Beeps, 3sec pause, 6 beeps, 3sec pause.....repeats 5 times and then silences.
 - If there is no short circuit in the loop circuit then reduce the number wire turns around the loop to reduce the loop frequency.
 - **Good loop:**
 - All three the **Detect LED**, **Fault LED** and the **buzzer** will beep/flash (count) between 2 and 11 times to indicate the loop frequency.
 - 1 Count = 10Khz
- For example; 3 counts x 10Khz = Loop frequency of 30 – 40Khz.

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Buzzer and LED indications after initial power up/reset:

- **Detect LED -**
 - 1 sec flashes 1 sec apart - No vehicle (metal) detected in loop area.
 - On permanently - Vehicle(metal) detected in loop area.

- **Fault LED -**
 - 3 flashes 3 sec apart - Loop wire is open circuit (check terminal 7 & 8 connections and if detector is plugged into the base properly)Use Dip-switch 8 reset after correction is made.

 - 6 flashes 3 sec apart - Loop wire is short circuited. Use Dip-switch 8 after correction is made.

- **Buzzer -**
 - Tone as long as vehicle is in loop area - Buzzer sounds to confirm the first ten detections after power up or reset.

 - Continuous tone with no vehicle in the loop area - Loose wiring in terminals 1,2,7 or 8. Check if detector is plugged into the base properly. Use Dip-switch 8 if any correction is made.



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