

D-TEK LM Vehicle Loop Detector - Operating Instructions

We at EMX have designed the new D-TEK vehicle loop detector with the following objectives in mind:

1. Compact package to allow easy installation into small operator housings.
2. Integral loop conditioner is provided, to enable detector operation with marginal loops.
3. Provide all the features and controls necessary for a variety of applications.
4. Provide maximum surge protection on all inputs and outputs of the detector.

There is no skimping on the quality in the D-TEK detector. All the switches have gold plated contacts and are sealed for protection. The detector is protected by easily replaceable fuse, snubbing circuitry on the relay contacts, metal oxide varistor on the power input and triple protection on the loop input.

The D-TEK features are extensive and they include full loop diagnostics with frequency counter, 10 sensitivity settings, delay and extend features, "fail secure" operation, automatic sensitivity boost, pulse or two presence relay operation and more.

Technical Information

Detector Connections

<u>Pin</u>	<u>Function</u>
1.	Output B (COM)
2.	Output B (N.O.)
3.	Output B (N.C.)
4.	Output A (COM)
5.	Output A (N.C.)
6.	Output A (N.O.)
7.	Power
8.	Power
9.	Loop
10.	Loop

Front Indicators

1. Green Led is ON - the detector is powered.
2. Red Led is ON - the detector detected a vehicle
3. Green Led is Blinking - the loop failed and is shorted or disconnected
4. Green Led is Blinking with two consecutive fast blinks - the loop failed in the past and now is working correctly.
5. Red Led is Blinking at the start of vehicle detection - the Filter function is ON
6. Red Led is Blinking at the end of vehicle detection - the Extend function is ON
7. Red Led is Blinking during vehicle detection - 4 minute limited presence time expired.

Controls

- Reset SW1 this switch when pushed momentarily down will reset the detector
- Frequency Counter SW2 this switch when pushed momentarily up will count the frequency on the loop. This count is displayed by the Red Led blinks, each blink represents frequency of 10K Hz. Count between 3 to 13 blinks confirms that the loop detector is tuned to the loop.
- Sensitivity This rotary switch controls the detector sensitivity. During normal operation the sensitivity level is set to 3 or 4.

DIP Switch Functions

DIP	OFF	ON
1	Extend detect	3 seconds
2	Extend detect	6 seconds
3	ASB Off	Automatic Sensitivity Boost On
4	Filter Off	Filter On
5		Reserved
6	Constant presence time	4 minute limited presence time
7	Pulse on detect	Pulse on Un-detect
8	Pulse on Relay B	Presence on Relay B
9	Loop Frequency	Control
10	Loop Frequency	Control

When Dip 1 and 2 are in ON position the extend time is 9 seconds.

Warning: Do not use (DIP 6 ON) limited presence setting and / or "Fail Secure" setting for reversing gates, doors or barriers.

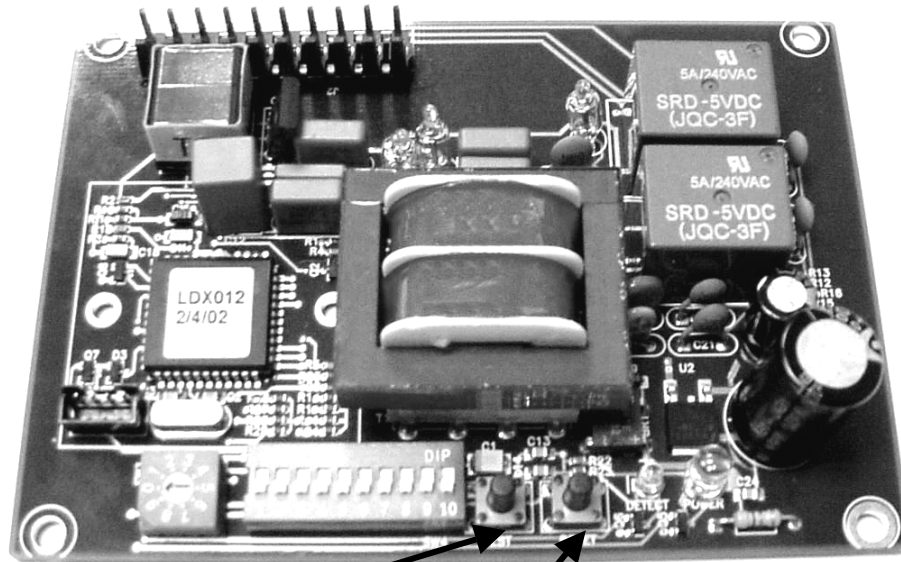
Frequency - DIP switches 9 and 10 control the loop frequency. Set different frequencies on adjacent loops. Verify frequencies with the frequency counter by counting the Red Led blinks.

Loop Frequency	High	Medium High	Medium Low	Low
DIP 9	Off	Off	On	On
DIP 10	Off	On	Off	On

DIP - Detector Functions

1. Presence function is provided always by the presence relay output on pins 4,5, and 6. These outputs are active when the detector detects a car. If there is a need for an additional presence output the Relay B can be configured as a second presence output by setting DIP 8 to ON position.
2. Pulse function is provided by the Relay B output on pins 1, 2, and 3. To obtain pulse on Relay B set DIP 8 to OFF position. The pulse of about 0.5 second can be generated when the car enters the loop or when it exits. To generate pulse on vehicle entry to the loop set DIP 7 to OFF position. To generate pulse on vehicle exit from the loop set DIP 7 to ON position.
3. The presence relay provides constant output as long as the car is detected on the loop. To obtain constant presence time set DIP 6 to OFF position. In some applications limited presence time is required. To obtain limited presence time of approximately 4 minutes set DIP 6 to ON position. Be aware that the detector relay will be released after 4 minutes even if the vehicle is still detected by the detector. This may be a serious hazard in applications where gates, doors or barriers are reversed, therefore never use this option in these applications.
4. In some applications it is necessary to filter out short detections such as cross traffic or short burst of radio frequency such as keying of a CB transmitter. To ignore these short detections set DIP 4 to ON position. This will cause any detection that is shorter than 2 seconds to be ignored.
5. To increase detection height when detecting high bed vehicles set DIP 3 to ON position. This setting will cause the sensitivity to automatically increase once the front axle of the truck is detected. The sensitivity will go back to the normal level once the truck left the loop.
6. To extend the presence output for 6 seconds after the vehicle left the loop set DIP 2 to ON position.
7. To extend the presence output for 3 seconds after the vehicle left the loop set DIP 1 to ON position.

Note: If DIP 1 and DIP 2 are set to ON position the presence output will be extended 9 seconds after the vehicle left the loop.



SW2 (frequency counter)

SW1 (Reset)

Troubleshooting

Symptom	Possible Cause	Correction
Green indicator is not ON	No input voltage	<ol style="list-style-type: none"> 1. Check voltage on pins 7 and 8. 2. Replace internal fuse 3. Check wiring to detector
Green indicator flashes	Loop wire shorted or disconnected	<ol style="list-style-type: none"> 1. Check loop resistance on pins 9 and 10 it should be less than 5 ohms and more than 0.5 ohms.
Green indicator flashes with two consecutive fast blinks	Loop wire was temporarily shorted or disconnected	<ol style="list-style-type: none"> 1. Check loop resistance on pins 9 and 10 while driving over the loop it should be less than 5 ohms and more than 0.5 ohms. The reading should be steady.
Detector stays in detect mode after the car left the loop and fails to undetect.	<ol style="list-style-type: none"> 1. Faulty loop 2. Poorly crimped terminals 3. Loose connections 	<ol style="list-style-type: none"> 1. Perform megger test between loop lead and ground the reading should be larger than 100 mega ohms. 2. Check that loop is tightly connected to proper terminals 3. Check that LOOP splices are tightly soldered and sealed against moisture.
Detector detects intermittently even when there is no car on the loop.	<ol style="list-style-type: none"> 1. Faulty loop 2. Poorly crimped terminals 3. Loose connections 4. Cross-talk between adjacent loop detectors 	<ol style="list-style-type: none"> 1. Perform megger test between loop lead and ground the reading should be larger than 100 mega ohms. 2. Check that loop is tightly connected to proper terminals 3. Check that splices are tightly soldered and sealed against moisture. 4. Set adjacent loops on different frequencies.

Technical Specifications

Power:	The detector is available in the following voltages, 24V AC maximum current draw 100mA.
Temperature:	-40F to + 180F
Environmental Protection:	Circuit board is conformal coated
Size:	Height = 3.2 inches 80 mm Width = 4.50 inches 114 mm
Output Relays:	5A/125 V AC standard version
Connector:	Male Molex 09-72-2101 or equivalent
Surge Protection:	The detector is protected with neon discharge lamps, zener diodes and surge arrestors.
Loop Input:	Transformer isolated
Grounded Loop:	The loop isolation transformer allows operation with poor quality loops.
Loop Inductance Range:	20 to 2000 micro-henries with Q factor of 5 or higher.
Tuning:	Detector automatically tunes to the loop after power application or reset.
Tracking:	Detector automatically tracks and compensates for environmental changes
Power Indicator:	Green LED solid light indicates power
Loop Failure Indicator:	Green LED blinks indicates loop problem
Loop Failure Memory:	Green LED blinks with fast consecutive blinks indicating past loop problem that healed.
Detect Indicator:	Red LED solid light indicates detection
Extend Indicator:	Red LED blinks after a car left the loop indicates time extend feature
Sensitivity:	Is set by 10 position rotary switch
Frequency:	Is set by DIP switch 9 and 10
Infinite Presence Mode:	DIP switch selectable presence
Limited 4 Minutes	DIP switch selectable 4 minute limit
Presence Time:	DIP switch selectable
Second Presence Relay:	DIP switch selectable
Pulse On Exit / Entry:	DIP switch selectable
Fail Safe / Secure:	Factory set to "Fail Secure" (If "Fail Safe is desired contact factory)
Filter:	DIP switch selectable 2 seconds
Extended Detection:	DIP switch selectable 3, 6 and 9 seconds