

**ENGINEERED PARKING SYSTEMS
MODEL 3416D
Vehicle Loop Detector**



Operating Instructions



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We have designed the new Model 3416D D-TEK vehicle loop detector with the following objectives in mind:

1. Compact package to allow easy installation into small operator housings.
2. All the controls are accessible from the outside for easy installation and operation.
3. Integral loop conditioner is provided, to enable detector operation with marginal loops.
4. Provide all the features and controls necessary for a variety of applications.
5. Use metal housing for maximum durability and RF blocking.
6. Provide maximum surge protection on all inputs and outputs of the detector.

We took extra care to achieve and exceed these objectives. For example the controls are divided into two groups. The group on the front of the detector is for basic operation and the group on the back of the detector is for advanced settings. This way the more advanced settings are not visible to the casual user. There is no skimping on the quality in the D-TEK detector. The housing is made from aircraft quality anodized aluminum. 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 safe" and "fail secure" operation, automatic sensitivity boost, pulse or two presence relay operation and more.

Technical Information

Detector Connections

Pin Function	Harness
A Power	White
B Presence relay Common	Yellow
C Power	Black
D Loop	Grey
E Loop	Brown
F Presence relay N.O.	Blue
G Presence relay N.C.	Red
H Chassis Ground	Green
I Relay 2 Common	Pink or Blk/White
J Relay 2 N.O.	Purple or Red/White

Connections are shown with Dip Switch #4 ON and no vehicle present.

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 a vehicle detection - the Filter function is ON
6. Red Led is Blinking at the end of a vehicle detection - the Extend function is ON
7. Red Led is Blinking during a vehicle detection - 4 minute limited presence time has expired.

Technical Specifications

Power: the detector is available in the following voltages, 110V AC, maximum current draw 100mA. **Low power** detector is available with maximum current draw of 60mA

Temperature: -40F to + 180F

Environmental Protection: Circuit board is conformal coated

Enclosure: Extruded anodized aluminum,

Height = 3.25 inches 83 mm

Width = 2.56 inches 40 mm

Depth = 3.65 inches 90 mm

Output Relays: 5A/125 V AC standard version, 1A/125 V AC low current version

Connector: MS compatible with 10pin Military Threaded wire harness.

Surge Protection: The detector is protected with neon discharge lamps, zenner 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 microhenries 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 indicates 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 three position toggle switch

Infinite Presence Mode: DIP switch selectable
presence **Limited 4 Minutes**

Presence Time: DIP switch selectable

Second Presence Relay: DIP switch selectable

Pulse On Exit / Entry: DIP switch selectable

Fail Safe / Secure : DIP switch selectable

Filter: DIP switch selectable 2 seconds

Extended Detection: DIP switch selectable 3, 6 and 9 seconds

Front Controls

Reset This toggle switch when pushed momentarily down will reset the detector

Frequency Counter This toggle 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.

Frequency This toggle switch controls the loop frequency. Set different frequencies on adjacent loops. Verify frequencies with the frequency counter by counting the Red LED blinks.

Back Controls

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	Pulse on Relay II	Presence on Relay II
2	Pulse on detect	Pulse on Un-detect
3	Constant presence	4 minute limited presence time
4	"Fail Secure"	"Fail Safe"
5	Filter Off	Filter On
6	ASB Off	Automatic Sensitivity Boost On
7	Extend detect	6 seconds
8	Extend detect	3 seconds

(When Dip7 and 8 are in ON position the extend time is 9 seconds.)

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

DIP - Detector Functions

1. Presence function is provided always by the presence relay output on pins 5, 6, and 10. These outputs are active when the detector detects a car. If there is a need for an additional presence output the Relay 2 can be configured as a second presence output by setting DIP 1 to ON position.
2. Pulse function is provided by the Relay 2 output on pins 3, 9, and 11. To obtain pulse on Relay 2 set DIP 1 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 2 to OFF position. To generate pulse on vehicle exit from the loop set DIP 2 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 3 to OFF position. In some applications limited presence time is required. To obtain limited presence time of approximately 4 minutes set DIP 3 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. When DIP 4 is set to ON position the detector works in "Fail Safe" mode of operation the detector will issue a detect signal when a car is detected, loop is disconnected or shorted, or when the power to the detector is interrupted. It is strongly recommended to use the detector in this mode. In some application there is a need to ignore the loop or power failures and only to provide the detect signal when a car is detected on the loop. To ignore loop or power failures set the detector to "Fail Secure" by setting DIP 4 to OFF position. Do not use this setting for application where gates, doors or barriers have to be reversed.
Note: Functions on pins B and G are reversed if DIP 4 is set to OFF
5. 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 5 to ON position. This will cause any detection that is shorter than 2 seconds to be ignored.
6. To increase detection height when detecting high bed vehicles set DIP 6 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.
7. To extend the presence output for 6 seconds after the vehicle left the loop set DIP 7 to ON position.
8. To extend the presence output for 3 seconds after the vehicle left the loop set DIP 8 to ON position.

Note: If DIP Switch 7 and DIP Switch 8 are set to ON position the presence output will be extended 9 seconds after the vehicle leaves the loop.

Trouble Shooting

Symptom	Possible Cause	Correction
Green indicator is not ON	No input voltage	<ol style="list-style-type: none"> 1. Check voltage on pins 1 and 2. 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 D and E 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 D and E 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 megaohms. 2. Check that loop is tightly connected to proper terminals 3. Check that 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 megaohms. 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.