

DSP-10

Full-Featured Vehicle Detector with Two Outputs



Features

- ❖ Wide low voltage operation
- ❖ Works with standard inductive loops as well as Diablo's Mini-Loop.
- ❖ Advanced filtering technology for superior noise tolerance.
- ❖ Works on any in-ground inductive loop from 20 to 1500 microhenries.
- ❖ Can be changed between fail-safe or fail-secure mode in the field.
- ❖ Pulse on Entry or Pulse on Exit for those operators or situations that require this type of signal.
- ❖ Delay and Extension timing functions are available to provide additional flexibility.
- ❖ Four frequency settings to help avoid loop cross-talk situations.
- ❖ Sensitivity Boost for those installations that require reliable detection of semi-truck trailers and high-bed vehicles.
- ❖ Provides two relays outputs, each with a Normally Open and a Normally Closed contact.

The DSP-10 detector has been specifically designed to handle most parking, drive-through, and access control applications. This detector uses sophisticated filtering and processing algorithms to allow the detector to function in noisy electrical conditions and with less than ideal loops. The DSP-10 also supports Diablo Controls Mini-Loop to provide more detection options.

The DSP-10 is full-featured offering outputs for presence, pulse on entry, pulse on exit, or loop failure. Output A can have delay and/or extension applied to modify the behavior of a presence output. Sensitivity boost is available to help eliminate detection drop outs when high bed vehicles or tractor / trailer combinations need to be detected. Extended presence is available to deal with situations where vehicles may be parked over a loop for extended periods of time (several hours). Several diagnostic indications are also available: Low voltage indication, open loop circuit, shorted loop circuit, large inductance change, and prior faults that cleared by themselves. This detector can also be field configured for fail-safe or fail-secure operation (the factory default is fail-safe).

The DSP-10 is a cost-effective detector that provides leading edge noise immunity and is fully featured. The DSP-10 provides many advanced features to provide a great value for your money.

Switch	Function							
1	OFF	Normal Presence			ON	2 Second Delay		
2	OFF	Norm	OFF	2 Sec.	ON	5 Sec.	ON	10 Sec.
3	OFF		ON	Extend	OFF	Extend	ON	Extend
4	OFF	Normal Sensitivity			ON	Sensitivity Boost		
5	OFF	B Pres	OFF	B Entry	ON	B Exit	ON	B Fail
6	OFF		ON	Pulse	OFF	Pulse	ON	Output
7	OFF	Normal Presence			ON	Extended Presence		
8	OFF	Inductive Loop			ON	Mini-Loop		
9	OFF	High	OFF	Med	ON	Med	ON	Low
10	OFF		ON	High	OFF	Low	ON	Low

SPECIFICATIONS

Loop Circuit Inductance: 20 μ H to 1500 μ H

Operating Temperature: -35°F to 165°F (-37°C to 74°C)

Operating Voltages: There are three power versions:
 LV = 10 volts to 40 volts DC or 10 volts to 30 AC
 110 = 100 volts to 135 volts AC
 220 = 200 volts to 270 volts AC

Operating Current:
 LV Version - 75 milliamps max. 50 milliamps typical.
 110 Version - 35 milliamps max. 25 milliamps typical.
 220 Version - 18 milliamps max. 12 milliamps typical.

Output Relay Rating: 3 amps at 300 VAC or 150 VDC.

Pulse Output: 250 ms $\pm$ 15 ms

Size: 2.36" (H) x 1.75" (W) x 4.09" (D)
 59.94 mm x 4.45 mm x 10.39 mm

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SELECTABLE FEATURES

Sensitivity (Rotary Switch): 10 sensitivity settings are available. The factory default setting is 5. The higher the sensitivity setting, the more sensitive the detector.

Setting	0	1	2	3	4	5	6	7	8	9
%ΔL/L	0.48	0.32	0.24	0.16	0.12	0.08	0.06	0.04	0.03	0.02
Response	70 ms ± 10 ms							140 ms ± 20 ms		

2 Second Delay (Switch 1): Delay allows the A output to stay in the de-activated state until the loop has been continuously occupied for 2 seconds. This 2 second delay is "flashed" on the detect LED. If the vehicle leaves before the two seconds has timed out, the output will not occur. *Delay timing only affects the A output.*

1	Function
OFF	Normal Presence
ON	2 Second Delay Time

Extension (Switches 2 and 3): Extension allows the A output to be held in the active state for a period of time after the vehicle has left the loop detection area. While timing extension, the detect LED will flash quickly. *Extension timing only affects the A output.*

2	3	Function
OFF	OFF	No Extension
ON	OFF	2 Second Extension Time
OFF	ON	5 Second Extension Time
ON	ON	10 Second Extension Time

Sensitivity Boost (Switch 4): The sensitivity can be automatically boosted during a detection to improve detection of high-bed vehicles and truck/trailer combinations.

4	Function
OFF	Normal Sensitivity
ON	Sensitivity Boost

Output B Function Select (Switches 5 and 6): The detector will operate in one of four selectable operating modes for the B output.

True Presence - The B output will be activated whenever a vehicle is present. Delay or extension have no influence on the output.

Entry Pulse - The B output will be activated for 250 ms when the loop becomes occupied.

Exit Pulse - The B output will be activated for 250 ms when the loop becomes vacant.

Loop Fail - If the inductive loop fails (opens, shorts, or a large change), the B output will be activated for the duration of the fault.

5	6	Function
OFF	OFF	B Output is Normal Presence Output
ON	OFF	B Output is an "Entry" Pulse
OFF	ON	B Output is an "Exit" Pulse
ON	ON	B Output is a "Fail" Condition

Extended Presence Time (Switch 7): Set DIP switch 7 to off to hold a vehicle's presence for about 30 minutes before tuning it out. Set the switch to on to hold it significantly longer, perhaps up to a few days.

7	Function
OFF	Normal Detection Hold Time
ON	Extended Detection Hold Time

ORDERING INFORMATION

DSP10	DSP – 10 – vvv	vvv = Operating Voltage Selection
	LV	10 to 40 Volts DC, or 10 to 30 Volts AC
	110	110 Volts AC
	220	220 Volts AC

Visit our Website at www.diablocontrols.com for the most current information on all of our products. Specifications are subject to change.



Veteran Owned & Operated

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SELECTABLE FEATURES (Continued)

Sensor Type (Switch 8): Set DIP switch 8 to off to operate with an inductive loop. Set the switch to on to operate with a Diablo Controls mini-loop. The mini-loop mode will always be an entry pulse. **Never use the mini-loop as a safety or obstruction sensor.**

8	Function
OFF	Inductive Loop
ON	Diablo Controls Mini-Loop (Magnetometer)

Frequency (Switches 9 and 10): 4 selectable frequency settings. Actual frequency is dependent on the sensor inductance.

9	10	Function
OFF	OFF	Highest Sensor Frequency
ON	OFF	Medium Highest Sensor Frequency
OFF	ON	Medium Lowest Sensor Frequency
ON	ON	Lowest Sensor Frequency

Output A Fail-Safe (Jumpers J100, J101, J102): The A output Normally Open contact will be closed during vehicle detection, loop failure, or power failure. The jumpers should be placed between the two pins next to the Fail-Safe text on the printed circuit board (Factory Default).

Output A Fail-Secure (Jumpers J100, J101, J102): The A output Normally Open contact will be closed during vehicle detection, but open during loop failure and power failure. The jumpers should be placed between the two pins next to the Fail-Secure text on the printed circuit board.

INDICATORS

Green Power LED: The LED will be on steady to indicate the detector is powered and operating normally. If the LED is not on solid, it is indicating a current or prior fault.

Fault	Display for Current	Display for Prior
Low Voltage	2 Hz with 50% duty cycle	NONE
Open Loop	1 flash ON every 2s	1 flash OFF every 2s
Shorted Loop	2 flashes ON every 2 sec	2 flashes OFF every 2 sec
Large Change	3 flashes ON every 2 sec	3 flashes OFF every 2 sec

Red Detect A LED: The LED will turn on when a vehicle is over the loop detection area. If delay is programmed, the LED will blink slowly during the delay interval. If extension is programmed, the LED will blink fast during the extension interval.

CONNECTOR PINS

Pins	Function
1	AC Hot / DC +
2	AC Neutral / DC COM
3	Relay B Output Normally Open (Closes for detect)
4	Earth Ground
5	Relay A Output Common
6	Relay A Output Normally Open (Closes for detect)
7	Loop
8	Loop
9	Relay B Output Common
10	Relay A Output Normally Closed (Opens for detect)
11	Relay B Output Normally Closed (Opens for detect)