

# 625X

Inductive Loop Detector

Installation Guide



**Sarasota Series Detectors**

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Peek Traffic Corporation  
2906 Corporate Way  
Palmetto, FL 34221 USA

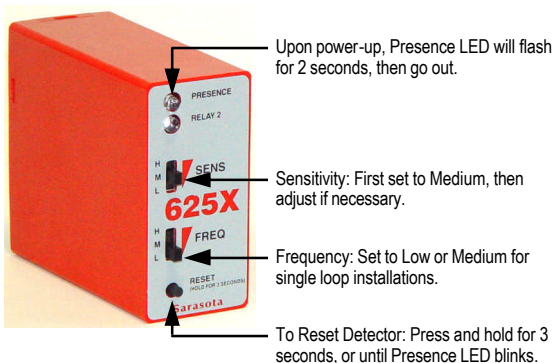
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## Quick Setup

1. Verify the input voltage by looking at the label on the back of the detector (located just under the connector.)
2. Terminate the wiring harness to the proper connector on the terminal strip for each of the desired functions (power, desired outputs, loop, etc.)
3. Connect the harness to the detector.
4. Verify power is reaching the detector. (The Presence LED should come on and flash for two seconds, then go out.)
5. Set sensitivity switch (SENS) to Medium (M).
6. Adjust the frequency (FREQ) to Low (L) for a single loop. For multiple loop applications, set each detector to a different frequency setting.
7. Press and hold the RESET button for three seconds, until the Presence LED flashes. The detector is ready to operate.



## Setup Details

1. Power is supplied to the unit on pins 1 & 2 (black & white.)
2. Ground the unit by taking pin 4 (green) to the Operator ground.
3. The most common hook-up is for using the Presence relay, pins 5 & 6 (yellow & blue.) The Presence relay common, pin 5 (yellow), is taken to the common of the terminal strip on the Operator.  
The Presence relay  
N.O. Normally Open, pin 6 (blue) is taken to either Open, Close, Hold Open, etc. (i.e. whichever function is to be performed when presence is detected.)
4. For a second Presence or Pulse output, Relay 2 on pins 3 & 9 is used. Relay 2 Normally Open (N.O.) is on pin 3 (orange) and is taken to either Open, Close, Hold Open, etc. (whichever function is to be performed.) If a Normally Closed (N.C.) output is necessary, use pin 11 (white/red). The Relay 2 common, pin 9 (red) is taken to the common on the terminal strip of the Operator.
5. The loop leads come into the detector on pins 7 & 8 (gray & brown.) This is from the loop to the ground. These leads must be twisted all the way to the detector for proper operation.  
(See diagram on page 7.)

## 625X Pin Connections

<u>Pin</u>	<u>Function</u>	<u>Wire Color</u>
1	120VAC or 24VAC	Black
2	AC Neutral Common	White
3	Relay 2 N.O. (Normally Open)	Orange
4	Chassis Ground	Green
5	Presence Relay Common	Yellow
6	Presence Relay (Normally Open)	Blue
7	Loop	Gray
8	Loop	Brown
9	Relay 2 Common	Red
10	Presence Relay (Normally Closed)	White/Black
11	Relay 2 (Normally Closed)	White/Red

## Loop Installation Tips

The loop consists of a 12 to 18 gauge stranded wire suitable for direct burial with low AC and DC resistance. The size of your loop will be determined by the width of the area in which you need detection, and the height of the vehicles you need to detect. If high-bed trucks will be detected, the loop should be no less than 6' on a side (i.e. at least 6'×6'.)

Smaller loops are suitable for car or fork truck detection. The depth of the saw cut is typically 1¼" to 2", and from ¼" to 3/8" wide. Cut the corners of the loop to 45° angles to avoid pulling loop wires around a 90° corner and risk damaging the wires. Do not push the loop wires into the saw-cut with a sharp object. Be sure to keep the loops a minimum of 2" above any rebar or wire mesh installed in the roadway.

The loop wire is wound to form a coil (usually 3 to 5 turns.) Ideally, there should be no splices in the loop. Or, in other words, attach your loop wire to the gray wire in the wiring harness, run the loop out to your saw-cut, go around the saw cut the recommended number of times, return the loop wire back to the detector. Twist the lead-in portion of the loop wires at least 5 to 7 twists per foot, and then connect the other end of the loop wire to the brown wire on the wiring harness. The lead-ins and loop should be made of one continuous piece of wire.

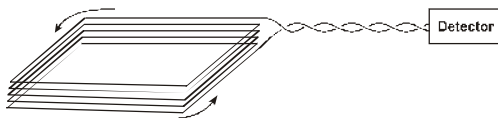
**Important:** Twist only the lead-in (the part of the loop wire that runs from the edge of the loop back to the detector.)

**Do not twist the wires in the loops themselves.**

## Testing the Loop

A good loop is critical for reliable operation from your detector. When installing your loop, take great care not to damage the insulation of the wire. Breaks in the insulation can cause the wire to act as a wick — pulling in moisture, corroding the wire itself, and causing erratic operation from the detector. Cross-link polyethylene is the most popular insulation and is strongly recommended (XHHW), in 16 or 18 gauge. If the lead-in is extremely long, increase the wire size. The insulation must be able to withstand wear and abrasion from the shifting of pavement, moisture, and attacks by solvents and oils, as well as able to withstand high-temperature sealants. Stranded wire is recommended over solid wire, because of its mechanical characteristics. Stranded wire is more likely to survive bending and stretching than solid wire.

Megging a loop and lead-in should have an insulation resistance to earth greater than  $20M\Omega$ , measured at 500 Volts. One end of the loop goes to one lead from the meggar, and the other lead from the meggar goes to a good ground. The loop should also display a series resistance of less than  $10\Omega$  with a standard Ohm meter. If a problem with a loop is suspected, try swapping the detector with a known good detector and see if the problem follows the detector or the loop.



## 4 Foot Loop Width

Loop Size (ft)	Inductance( $\mu\text{H}$ )*			
	1 Turn	2 Turns	3 Turns	4 Turns
4 x 4	7	20	44	78
4 x 6	8	25	56	100
4 x 10	12	36	81	144
4 x 15	17	50	112	199
4 x 20	21	64	143	253
4 x 25	26	78	174	
4 x 30	30	91	204	
4 x 35	35	105	235	
4 x 40	39	119	266	
4 x 45	44	132		
4 x 50	49	146		
4 x 55	53	160		
4 x 60	58	174		
4 x 65	62	187		
4 x 70	67	201		
4 x 75	71	215		
4 x 80	76	228		
4 x 85	81	242		
4 x 90	85	256		
4 x 95	90	270		
4 x 100	94	283		



## 6 Foot Loop Width

Loop Size (ft)	Inductance( $\mu\text{H}$ )*			
	1 Turn	2 Turns	3 Turns	4 Turns
6 x 4	8	25	56	100
6 x 6	10	31	70	124
6 x 10	14	43	96	171
6 x 15	19	58	129	229
6 x 20	24	72	161	286
6 x 25	29	87	194	
6 x 30	34	101	226	
6 x 35	38	116	259	
6 x 40	43	130		
6 x 45	48	145		
6 x 50	53	159		
6 x 55	58	173		
6 x 60	63	188		
6 x 65	67	202		
6 x 70	72	217		
6 x 75	77	231		
6 x 80	82	246		
6 x 85	87	260		
6 x 90	91	275		
6 x 95	96	289		
6 x 100	101	303		

\*optimum detection range is between 70 $\mu\text{H}$  and 250 $\mu\text{H}$

## Output Configuration Options

**Presence** means the relay will be energized the entire time a metal mass is within the field generated by the loop. The 625X has the ability to provide two presence outputs. Relay 2 can be set for presence or pulse.

Relay 1 is always presence (pins 5 & 6, yellow and blue wires), however Relay 2 on the 625X can be assigned to one of several output configurations.

Relay 2 (pins 3 & 9, Orange and Red wires) can be set for presence using the switches on the back panel. Set switch 3 to OFF and switch 2 to ON

**Pulse on Entry** means that the relay 2 will be energized as soon as a metal mass enters the field generated by the loop. On the back panel, set switch 3 to OFF and switch 2 to OFF. This pulse will last 125mS.

**Pulse on Exit** means that relay 2 will be energized when a metal mass has left the loop. Set switch 3 to ON and switch 2 to OFF. The pulse will last 125mS.

**Loop fault output** means the relay will be energized if there is a current fault (open loop, shorted loop or greater than a 25% inductance change.) Set switch 3 to ON and switch 2 to ON.

Switches 2 & 3 control which output function of Relay 2 is used.

Switch 1 ON doubles the sensitivity settings on the front panel

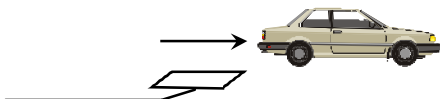




**Presence**—Constant presence (detect)  
while metal is over the loop



**Pulse on Entry**—Momentary pulse  
when metal enters the loop



**Pulse on Exit**—Momentary pulse when metal  
leaves the loop

## Sensitivity

Six sensitivity settings are available using the 3-position front panel slide switch and DIP switch 1 on the back panel.

(Refer to the diagram on the previous page.)

**SW1 = OFF (to the number side)**

**SW1 = ON (to the ON side)**

At the above switch settings, the front panel slide switch positions yield the following sensitivities:

SW1 = OFF

Max = 0.04%

Med = 0.16%

Min = 0.64%

SW1 = ON

Max = 0.02%

Med = 0.08%

Min = 0.32%

The above sensitivities are for the detect threshold when a vehicle enters the loop. The detector has a SENSITIVITY BOOST facility in which the drop sensitivity decreases to half its numerical initial value (except the 0.02 setting.)

Always operate the detector on the lowest sensitivity possible while still detecting the desired vehicles. Construct the loop for your specific job. Remember, the smallest side of the loop will determine how high off the ground you will be able to detect a vehicle. Your loop will have an effective field at a height equal to 1/2 to 2/3rds of the size of the smallest side of the loop.

Example: A 6'x6' loop has a smallest side of 6', therefore your detector can reliably see a vehicle at 3' to 4' above the loop wires. A 6' x 3' loop has a smallest side of 3', so your detector will reliably see a vehicle up to 1½' to 2' above the loop wires.

Also remember, your loop will sense metal off to the sides, although not from as far as directly above the loop. Do not install the loop too closely to any moving metal. The detector does not know the difference between a vehicle and a metal door or gate. Keep your loop far enough away from any moving metal to avoid false detections, approximately 4' at least.

# Troubleshooting

**Q: The detector LED blinks, and it won't detect anything.**

**A:** A blinking LED indicates there is a problem tuning the loop. An open loop, shorted loop, bad connection to the harness, loop wires twisted around the entire loop and not just the lead-in, or not enough turns in the loop are possible causes.

**Q: The detector won't let the door or gate down, it just reverses and goes back up**

**A:** The loop has been installed too close to the door. A loop detector does not know the difference between a vehicle and a moving metal door or gate. If turning down the sensitivity does not help, consult the factory or move the loop farther away from the metal object, at least 4 feet away.

**Q: The detector doesn't detect trucks**

**A:** The sensitivity is not high enough or the loop is too small to detect the generally higher metal chassis of a truck. Adjust the sensitivity or increase the size of the loop so that it can detect the truck. A loop can typically detect any metal that is less than 1/2 to 2/3 the distance of the smallest side of the loop.

**Q: The detector is erratic**

**A:** Detectors are generally very stable. If you see erratic behavior, check the loop for continuity and leakage to ground. Check for constant supply voltage. Check to see that the detector and operator are properly grounded. Check to see that the wiring harness is securely attached.

# 625X Specifications

## Dimensions

3"H × 1½"W × 3½"L, excluding connector  
(76 mm × 38 mm × 89 mm)

## Supply Power

120VAC, 24VAC, 12VDC, or 24VDC  
Preset on order and delivery

## Temperature Range

-40°C to +85°C (-40°F to +185°F)

## Outputs

Presence and Relay 2 are changeover relay contacts rated at 250VAC, 5A, 150W/600VA max.

## Inductance Range

18 to 1800 microHenries automatically tuned

## Frequency Range

10 to 97 kHz

## Lightning and Transient Protection

Zener diode protection from over-voltage induced on loop and feeder leads. Flash over-protection from loop to earth. Protection exceeds NEMA specification.

## **Frequencies**

One of three operating frequency ranges can be selected using the front panel slide switch. The purpose of this is to avoid crosstalk in multi-loop installations and to tune to loop inductance ranges.

## **Reset**

The Reset button must be pressed for three seconds to reset, and automatically retune, the detector. If pressed for less than three seconds, the device will indicate if any historical loop faults have occurred since the last reset. (See next item.)

## **Loop Fault Indications**

If the 625X detects a loop fault, for example an open loop, a shorted loop, or a change in the loop's inductance of more than 25%, then the Presence LED will flash quickly (16 times each second.) If the fault condition corrects itself, the Presence LED and detector will resume normal operation. If the Reset button is pressed for less than 3 seconds, the detector will flash at 16 Hz if one of these temporary faults was detected at any time since the detector was last reset. When the button is released, the detector will resume normal operation after approximately three seconds.

## **Presence Time**

60 minutes standard

## **Presence Time Options**

8 minutes, 16 minutes, or permanent

## About the 625X

- Small size: 3"H x 1½"W x 3½"L (76 x 38 x 89 mm)
- Failsafe or Failsecure outputs
- Increased sensitivity
- Six selectable sensitivities
- Easy to use controls
- Second relay output mode is selectable
  - Pulse on Entry
  - Pulse on Exit
  - Second presence output
  - Loop fault output
- 120VAC or 24VAC input
- Automatic sensitivity boost
- Current and historical loop fault indicators
- Compatible with existing equipment
- Automatic tuning
- Consistent presence time



### Sarasota Detectors

2906 Corporate Way  
Palmetto, FL 34221  
Ph: (800) 245-7660  
Fax: (941) 365-0837

Email: [Tech.Support@peektraffic.com](mailto:Tech.Support@peektraffic.com)  
Web: [www.peaktraffic.com](http://www.peaktraffic.com)