



Detection Products for the Traffic & Parking Industries

NP2 Installation and Operation Manual

DETECTION PRODUCTS FOR THE TRAFFIC & PARKING INDUSTRIES

Installation and Operation Manual

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Features

- 10 selectable Sensitivities
- 4 selectable Frequencies
- Wrong voltage protection
- Output Timing – Extend & Delay
- Selectable Presence times
- Selectable Pulse lengths
- Separate Power, Detect and Fault Indicators
- Automatic Sensitivity Boost
- Available in: 240VAC, 120VAC, 24VAC, 24VDC or 12VDC

Specifications.

Size:	1 3/8" wide x 3 3/32" high x 3 1/2" long.
Weight:	Eight (8) ounces, approximate.
Relay Output Rating:	7A, 277VAC/30VDC.
Power Supply:	240VAC, 120VAC, 24VAC, (24VDC, 12VDC) Consumption – 70mA DC or 1 Watt AC.
Temperature Range:	-30 to +180 Fahrenheit.
Inductance Range:	20 to 1500 microhenries, automatically tuned.
Lead-In Length:	Up to 2500 feet with proper loop and lead-in.
Loop Frequency:	Four selectable frequencies, typically in the range of 40 to 150 KHz.

Rear Panel DIP Switch Selections

Relay 1

Extend – switch 1 is for extending the detector output after the vehicle has left the loop. Switch 1 in the OFF position provides no extension. Switch 1 in the ON position provides a 5 second extension once the vehicle leaves the loop. Relay 1 ‘Detect’ LED will flash 4 times per second when extend feature is activated. This extension applies to relay 1 only.

Extend times included: 0 seconds, 2 seconds, 5 seconds, 10 seconds. Standard configuration is: 0 seconds and 5 seconds.

Delay – switch 2 is for providing a 2 second delay, detector will ignore the vehicle until the vehicle has been present over the loop for 2 seconds. Switch 2 in the OFF position provides no delay. Switch 2 in the ON position provides for the 2-second delay. Relay 1 ‘Detect’ LED will flash 2 times per second when delay feature is activated. This delay applies to relay 1 only.

Delay times include: 0 seconds, 2 seconds, 4 seconds. Standard configuration is: 0 seconds and 2 seconds.

Presence Time – switch 3 provides for either a 1 hour presence or permanent presence. Switch 3 in the OFF position provides for 1 hour of presence. Switch 3 in the ON position provides for permanent presence. The above presence settings apply to relay 1 only.

Presence times include: 15 minutes, 30 minutes, 60 minutes, permanent. Standard configuration is: 60 minutes and permanent.

Relay 2

Pulse Length – switch 4 provides for either a 250mS pulse length or a 500mS pulse length. Switch 4 in the OFF position provides a 250mS (standard) pulse length. Switch 4 in the ON position provides a 500mS pulse length. The above settings apply to relay 2 only.

Pulse lengths include: 250mS, 500mS, 1 second, 2 second.

Operating Mode – switch 5 and switch 6 determine the operating mode for Relay 2. The four modes are as follows:

Switch 5 and switch 6 OFF provides relay 2 pulse-on-entry.

Switch 5 ON and switch 6 OFF provides relay 2 pulse-on-leaving.

Switch 5 OFF and switch 6 ON provides for relay 2 presence.

Switch 5 and switch 6 ON provides a relay 2 fault output.

Front Panel Selections

Sensitivity – controlled by front panel rotary switch.

Setting	Level dL/L
0	1.28%
1	0.64%
2	0.32%
3	0.16%
4	0.08%
5	0.06%
6	0.04%
7	0.02%
8	0.01%

Set to position 5 initially and adjust to obtain detection of desired vehicles.

Frequency – four separate settings controlled by front panel DIP switches.

- 2+1 = High
- 2+0 = Medium High
- 1+0 = Medium Low
- 0+0 = Low

Frequency changes by a minimum of 7% between settings.

Reset – front panel reset performs a hard reset of the detector.

Indicators -

Power – Green, solid with correct power supplied.

Relay 1 – Red, solid during detect. (Flashes for delay or extend).

Relay 2 – Red, solid during detect.

Fault – Yellow, solid during current fault, flashing for historical fault.

Factory Settings

Set to HI frequency

Extend/Delay in the OFF position

Pulse length set to 250msec

Relay 1 = fail-safe

Set to Medium sensitivity (5)

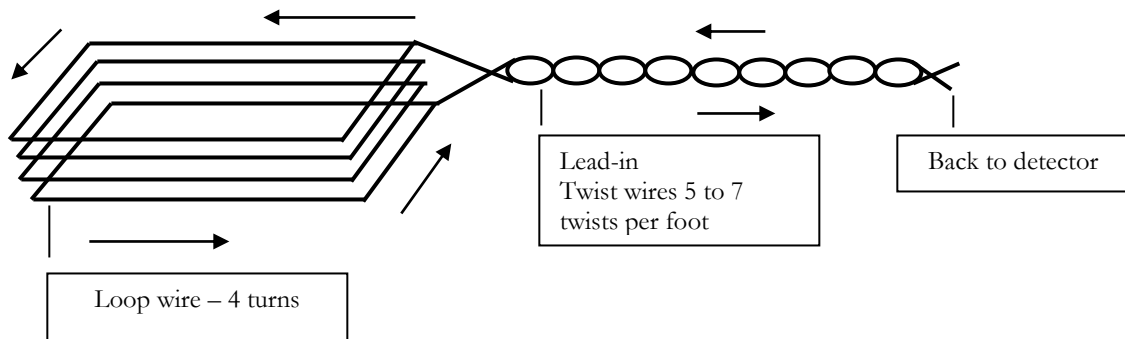
Presence time set to 1 hour

Relay 2 = fail-secure (for power only)

Sensitivity Boost – automatic during detect except in the highest sensitivity setting (9).

Loop Installation

An inductive loop consists of a single length of wire, usually 12 to 18 gauge, wound in a square or rectangle shape often sawcut into the pavement. Both ends of this wire are brought back to the detector and connected to the 'loop' positions as designated on the unit. With the loop properly connected to the detector and the detector unit powered up, a field will be generated around the loop. The detector unit will look for a change in frequency and inductance signaling the presence of a vehicle (metal mass) in the loop field.



The area where vehicles are to be detected determines the size of the loop. Loops can be made in many sizes and shapes depending on detection needs. Typically a square or rectangle loop is used providing maximum coverage and field height. Depending on the perimeter of the loop, a chart has been provided with recommendations on how many turns of wire will be needed.

NUMBER OF TURNS

P E R I M E T E R		4 or 5	2 or 3	2
	10 to 20 feet	X		
	30 to 40 feet		X	
	50 to 100 feet			X

Detection height is a major factor in reliably detecting vehicles of interest. A good rule of thumb is that the small side of the loop will determine field height and provide 1/2 to 2/3rds that distance in detection height.

Ex: 6'x4' loop (4 foot side determines height) will have a field height of 24" to 32".

Ex: 10'x6' loop (6 foot side determines height) will have a field height of 36" to 48".

For truck detection never use less than a 6' small side loop.

Ex: 6'x6', 6'x8', 6'x10' etc.

When using a loop around a gate, remember to keep the loop at least 4' away from the gate. Detection occurs when metal is present in the field generated around the loop i.e.; vehicle chassis, metal gate, metal door.

The depth of the loop is between 1 and 2 inches. Depths over 2 inches just place the loop farther from the vehicle to be detected. The top wire should be down far enough to provide protection (1 inch) from wear and tear on the road surface. Avoid rebar if at all possible, try to stay at least 2 inches above any rebar or wire mesh.

Loop wire insulation is critical to reliable operation. Crosslinked polyethylene is strongly recommended (XLPE or XHHW). Loop wire insulation must be able to withstand abrasion from pavement shifting, moisture and oils. Stranded wire is preferred over solid core because it is less likely to become damaged due to stretching and bending.

A megohmmeter is used to test the loop for leakage to ground due to breaks in insulation. When 'megging' a loop and lead-in the insulation resistance to earth should be greater than 10MO, measured at 500 volts. With a standard Ohm meter look for a series resistance of less than 100. If no meters are available and a loop is questionable, try swapping the detector with a known working detector and note if the problem follows the loop or the detector.

Helpful Tips:

Do not use sharp objects such as a screwdriver to push loop wires into the sawcut.

Small gauge wires (16, 18) are easier to work with – but avoid very long lead-ins with smaller gauges.

Clean sawcut before placing loop wires in.

Avoid splices if possible, use one length of wire from the detector out to and around the loop then back to the detector.

Seat loop wires in sealant before filling the sawcut; encapsulate the loop wires in sealant.

Twist only the lead-in, do not twist wires around the loop
