RENO BX Series Single Channel Loop Detectors Instruction Manual

Contents

RENO BX Series Single Channel Loop Detectors

Specifications

- Loop Detector Type: Inductive Loop Detector
- Loop Wire Types: 14, 16, 18, or 20 AWG with cross-linked polyethylene insulation
- Recommended Loop Wire: Reno LW-120 for 1/8 slots, Reno LW-116-S for 1/4 slots

General
Please verify the source voltage before applying power. The model designation indicates the input power required, output configuration, and Fail-Safe / Fail-Secure configuration for the detector as follows.

Model BX-x-xx-x ← Blank = Fail-Safe, **S** = Fail-Secure

Blank = Conventional Outputs
RO = Reversed Outputs
E = Euro Outputs

3 = 120 VAC
4 = 12 VDC / 24 VDC / 24 VAC
8 = 240 VAC

The detector is factory configured for either Fail-Safe or Fail-Secure operation (see unit side label). The output state of each output relay in either Fail-Safe or Fail-Secure mode is listed in the table below.

Relay	Fail-Safe		Fail-Secure	
	Power Failure	Loop Failure	Power Failure	Loop Failure
A	Call	Call	No Call	No Call
B	No Call	No Call	No Call	No Call

Indicators and Controls

Power / Detect / Fail LEDs
The detector has one green and two red LED indicators that are used to provide an indication of the detector's power status, output state, and/or loop failure conditions. The table below lists the various indications and their meanings.

Status	PWR (Power) LED	DET (Detect) LED	FAIL LED
Off	No power or low power	Output(s) Off	Loop OK
On	Normal power to the detecto r	Output(s) On	Open Loop
Flash	N/A	4 Hz – Two-second timing delay activated	1 Hz – Shorted Loop 3 Hz – Prior Loop Failure

Note If the supply voltage drops below 75% of the nominal level, the PWR LED will turn off, providing a visual indication of low supply voltage. Model BX detectors will operate with supply voltage as low as 70% of nominal supply voltage.

Front Panel Rotary Switch (Sensitivity)
The eight-position rotary switch selects one of eight (8) sensitivity levels as shown in the table below. O is lowest and 7 is highest, with normal (factory default) being 3. Use the lowest sensitivity setting that will consistently detect the smallest vehicle that must be detected. Do not use a sensitivity level higher than necessary.

Position	0	1	2	3 *	4	5	6	7
–ΔL/L	1.28%	0.64%	0.32%	0.16% *	0.08%	0.04%	0.02%	0.01%

Front Panel DIP Switches

Frequency (DIP Switches 1 and 2)
In situations where loop geometry forces loops to be located near one another, it may be necessary to select different frequencies for each loop to avoid loop interference, commonly known as crosstalk. DIP switches 1 and 2 can be used to configure the detector to operate at one of four frequencies corresponding to Low, Medium / Low, Medium / High, and High as shown in the table below.
NOTE After changing any frequency switch setting(s), the detector must be reset by momentarily changing one of the other switch positions

Switch		Frequency		
	Low (0)	**Medium / Low (1)**	**Medium / High (2)**	**High (3) ***
1	ON	OFF	ON	OFF *
2	ON	ON	OFF	OFF *

Presence Hold Time (DIP Switch 3)
Output A always functions as a presence output. DIP switch 3 can be used to select one of two presence hold

times; Limited Presence or True Presence™. Both modes provide a Call output when a vehicle is present in the loop detection zone. True Presence™ is selected when DIP switch 3 is OFF. If DIP switch 3 is ON, Limited Presence is selected. Limited Presence will typically hold the Call output for about one to three hours. True Presence™ will hold the Call as long as the vehicle is present in the loop detection zone provided that power is not interrupted or the detector is not reset. TruePresence™ time applies only for normal-size automobiles and trucks and normal-size loops (approximately 12 f? to 120 fî). The factory default setting is OFF (True Presence™ Mode).

Sensitivity Boost (DIP Switch 4)
DIP switch 4 can be turned ON to increase sensitivity during the detect period without changing the sensitivity during the no detect period. The boost feature has the effect of temporarily increasing the sensitivity setting by up to two levels. When a vehicle enters the loop detection zone, the detector automatically boosts the sensitivity level. As soon as no vehicle is detected, the detector immediately returns to the original sensitivity level. This feature is particularly useful in preventing dropouts during the passage of high-bed vehicles. The factory default setting is OFF (no Sensitivity Boost).

Output Delay (DIP Switch 5)
A two-second delay of Outputs A and B can be activated by setting DIP switch 5 to the ON position. Output delay is the time the detector outputs are delayed after a vehicle first enters the loop detection zone. If the two-second Output Delay feature is activated, the output relays will only be turned on after two seconds have passed with a vehicle continuously present in the loop detection zone. If the vehicle leaves the loop detection zone during the two-second delay interval, detection is aborted and the next vehicle to enter the loop detection zone will initiate a new full two-second delay interval. The detector indicates that a vehicle is being detected but that the outputs are being delayed, by flashing the front panel DET LED at a four Hz rate with a 50% duty cycle. The factory default setting is OFF (no Output Delay).

Relay B Fault Output (DIP Switch 6)
When DIP switch 6 is in the ON position, Output B will operate in Fault mode. When operating in Fault mode, Relay B will provide a fault indication only when a loop fault condition exists. If a loss of power occurs, Relay B will operate as a Fail-Secure output. If the loop fault condition self-corrects, Relay B will resume operation in the No-Fault output state. The factory default setting is OFF (Relay B Presence or Pulse).
NOTE Setting this switch to the ON position overrides the settings of DIP switches 7 and 8

Relay B Output Mode (DIP Switches 7 and 8)
Relay B has four (4) modes of operation: Pulse-on-Entry, Pulse-on-Exit, Presence, and Fault. Fault mode is selected with DIP switch 6. (See the Relay B Fault Output section on page 2 for details.) DIP switches 7 and 8 are used to configure the Presence and/or Pulse output modes of Relay B. When set to operate in Pulse mode (DIP switch 8 set to OFF), Relay B can be set to provide a 250-millisecond pulse when a vehicle enters or exits the loop detection zone. DIP switch 7 is used to select Pulse-on-Entry or Pulse-on-Exit. When DIP switch 7 is OFF, Pulse-on-Entry is selected. When DIP switch 7 is ON, Pulse-on-Exit is selected. When set to operate in Presence mode (DIP switch 8 set to ON), Output B's presence hold time is the same as Output A. The table below shows the various combinations of switch settings and Relay B modes of operation.

Switch	Pulse-on-Entry *	Pulse-on-Exit	Presence	Presence
7	OFF *	ON	OFF	ON
8	OFF *	OFF	ON	ON

Reset
Changing any DIP switch position (except 1 or 2) or the Sensitivity level setting will reset the detector. After changing the frequency selection switches the detector must be reset.

Call Memory
When power is removed for two seconds or less, the detector automatically remembers if a vehicle was present and a Call was in effect. When power is restored, the detector will continue to output a Call until the vehicle leaves the loop detection zone (loss of power or power dips of two seconds or less will not bring a gate arm down onto

cars as they wait at the gate).

Failed Loop Diagnostics
The FAIL LED indicates whether or not the loop is currently within tolerance. If the loop is out of tolerance, the FAIL LED indicates whether the loop is shorted (one Hz flash rate) or open (steady ON). If and when the loop returns to within tolerance, the FAIL LED will flash at a three-flashes-per-secondd rate to indicate that an intermittent loop fault has occurred and has been corrected. This flash rate will continue until another loop fault occurs, the detector is reset, or power to the detector is interrupted.

Pin Connections (Reno A & E Wiring Harness Model 802-4)

Pin	Wire Color	Function		
		Conventional Outputs	**Reversed Outputs**	**Euro Outputs**
1	Black	AC Line / DC +	AC Line / DC +	AC Line / DC +
2	White	AC Neutral / DC Common	AC Neutral / DC Common	AC Neutral / DC Common
3	Orange	Relay B, Normally Open (N.O.)	Relay B, Normally Closed (N.C.)	Relay B, Normally Open (N.O.)
4	Green	No Connection	No Connection	Relay B, Common
5	Yellow	Relay A, Common	Relay A, Common	Relay A, Normally Open (N.O.)
6	Blue	Relay A, Normally Open (N.O.)	Relay A, Normally Closed (N.C.)	Relay A, Common
7	Gray	Loop	Loop	Loop
8	Brown	Loop	Loop	Loop
9	Red	Relay B, Common	Relay B, Common	No Connection
10	Violet or Black / White	Relay A, Normally Closed (N.C.)	Relay A, Normally Open (N.O.)	Relay A, Normally Closed (N.C.)
11	White / Green or Red / White	Relay B, Normally Closed (N.C.)	Relay B, Normally Open (N.O.)	Relay B, Normally Closed (N.C.)

Note All pin connections listed above are with power applied, loop(s) connected, and no vehicle detected.
Warnings Separately, for each loop, a twisted pair should be created consisting of only two (2) loop wires running the entire distance from the loop to the detector (including runs through all wiring harnesses) at a minimum of six (6) complete twists per foot. For trouble-free operation, it is highly recommended that all connections (including

crimped connectors) be soldered.

Loop Installation

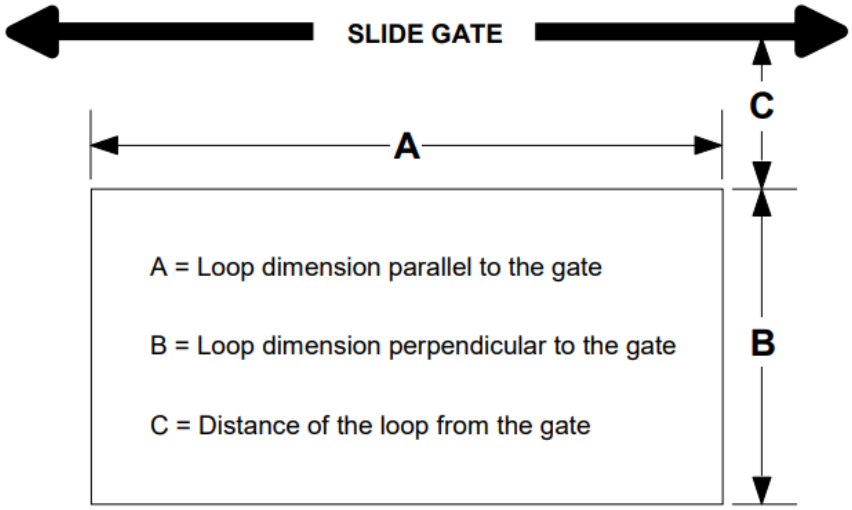
The vehicle detection characteristics of an inductive loop detector are greatly influenced by the loop size and proximity to moving metal objects such as gates. Vehicles such as small motorcycles and high-bed trucks can be reliably detected if the proper size loop is selected. If the loop is placed too close to a moving metal gate, the detector may detect the gate. The diagram below is intended as a reference for the dimensions that will influence the detection characteristics.

General Rules

1. The detection height of a loop is 2/3 the shortest leg (A or B) of the loop. Example: Short leg = 6 feet, Detection Height = 4 feet.
2. As the length of leg A is increased, distance C must also increase.

A =	6 ft	9 ft	12 ft	15 ft	18 ft	21 ft
C =	3 ft	4 ft	4.5 ft	5 ft	5.5 ft	6 ft

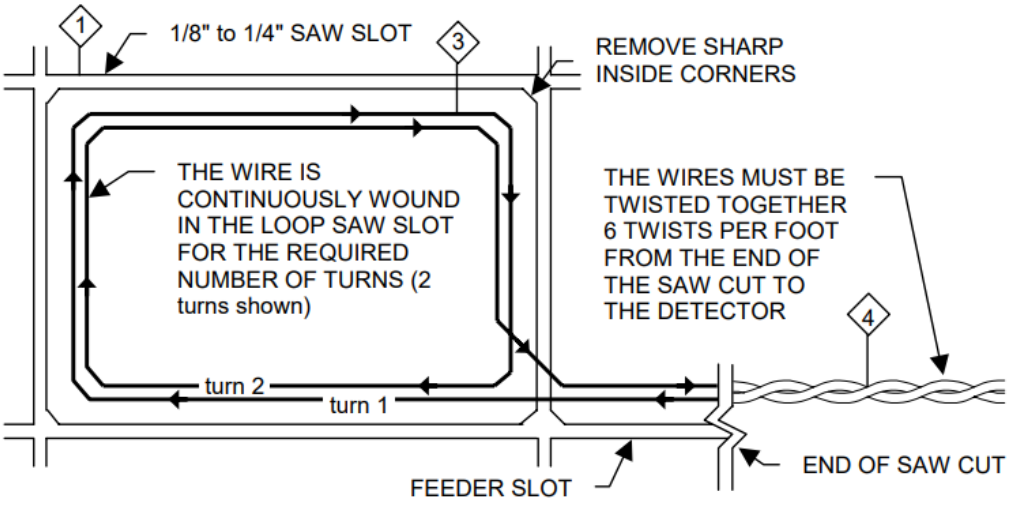
For reliable detection of small motorcycles, legs A and B should not exceed 6 feet.

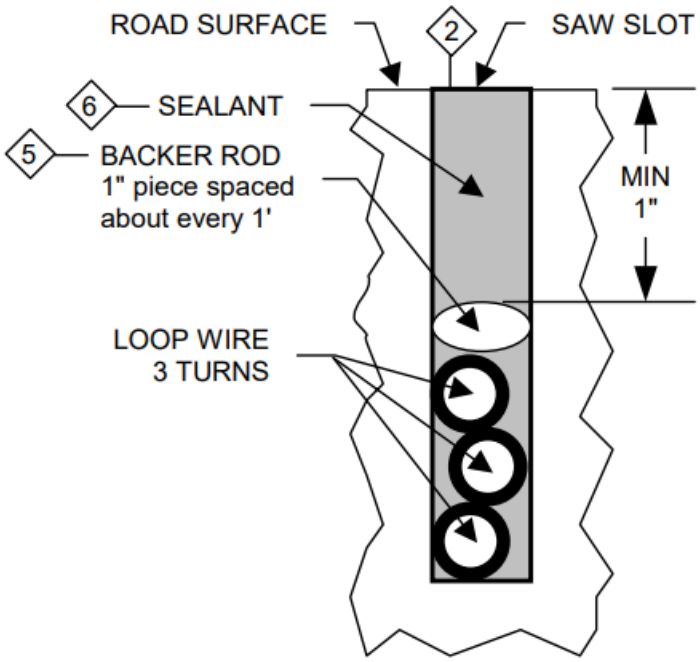


1. Mark the loop layout on the pavement. Remove sharp inside corners that can damage the loop wire insulation. ¡et the saw to cut to a depth (typically 2″ to 2.5″) that ensures a minimum of 1″ from the top of the wire to the pavement surface. The saw cut width should be larger than the wire diameter to avoid damage to the wire insulation when placed in the saw slot. Cut the loop and feeder slots. Remove all debris from the saw slot with compressed air. Check that the bottom of the slot is smooth.
2. It is highly recommended that a continuous length of wire be used to form the loop and feeder to the detector. Loop wire is typically 14, 16, 18, or 20 AWG with cross-linked polyethylene insulation. Use a wood stick or roller to insert the wire into the bottom of the saw slot (do not use sharp objects). Wrap the wire in the loop saw slot until the desired number of turns is reached. Each turn of wire must lay flat on top of the previous turn.
3. The wire must be twisted together a minimum of 6 twists per foot from the end of the saw slot to the detector.
4. The wire must be held firmly in the slot with 1″ pieces of backer rod every 1 to 2 feet. This prevents the wire from floating when the loop sealant is applied.

5. Apply the sealant. The sealant selected should have good adhering properties with contraction and expansion characteristics similar to those of the movement material

LOOP PERIMETER	NUMBER OF TURNS
10 feet - 13 feet	5
14 feet - 26 feet	4
27 feet - 45 feet	3
46 feet - 100 feet	2
100 feet and up	1





FAQs

Q: What wire types are recommended for loop installation?
A: Loop wire types recommended are 14, 16, 18, or 20 AWG with cross-linked polyethylene insulation.

Q: How should I adjust the loop dimensions for optimal vehicle detection?
A: Follow the guidelines in the manual to adjust loop dimensions A, B, and C based on gate length and vehicle

type.

Q: What is the recommended loop wire for different slot sizes?
A: Reno LW-120 is recommended for 1/8 slots, and Reno LW-116-S is recommended for 1/4 slots.

Documents / Resources

	RENO BX Series Single Channel Loop Detectors [pdf] Instruction Manual BX Series Single Channel Loop Detectors, BX Series, Single Channel Loop Detectors, Channel Loop Detectors, Loop Detectors

References

- User Manual