

# L-ATG SERIES



## SINGLE CHANNEL ANTI-TAILGATING LOOP DETECTOR

**Advanced Technology Accurately Audits Revenue Collection At Parking Facilities**



- Provides greater than 99% passenger vehicle count accuracy when used with standard 2.5' x 6' loops
- Designed for revenue control and access control applications
- Identifies tailgating passenger vehicles
- Accumulated count can be displayed on front panel LCD

### Ordering Information

Model L-ATG-XX ← 1, 5, or 35: 1 = 120 VAC Input power  
5 = 12 / 24 VDC or 24 VAC Input power  
35 = 240 VAC Input power

### Overview

Missed vehicle counts mean potential lost revenue. The Model L-ATG loop detector is designed to accurately count passenger vehicles spaced as closely as bumper to bumper. A conventional detector's counting function can be defeated by placing a metal object in the loop detection zone. The Model L-ATG is not affected by this scheme; it will continue to provide accurate counts.

Common applications for the Model L-ATG include auditing revenue collection at parking facilities and detection of multiple passenger vehicles entering or exiting during a single gate cycle.

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## L-ATG SERIES SPECIFICATION

*This is a Performance Specification. It is not intended to be used as Operating Instructions.*

### **General Characteristics:**

**Loop Frequency** The LCD screen displays the actual loop operating frequency. There are eight (8) selectable loop frequency settings (normally in the range of 20 to 100 kilohertz). The actual loop operating frequency is a function of the loop / lead-in network and the components of the loop oscillator circuit.

**Sensitivity** A unique bar graph displayed on the LCD makes it easy to quickly set sensitivity at the ideal level for any loop / lead-in network situation. There are nine (9) selectable sensitivity levels, plus settings for Continuous-Call and Channel-Off. (See **SENSITIVITY, - $\Delta$ L/L, & RESPONSE TIME** table.)

**Continuous-Call** When set to the Continuous-Call state, the detector output is continuously in the Call state regardless of the presence or absence of vehicles over the loop. The loop oscillator is disabled when in the Continuous-Call state. This state is indicated by **CALL** flashing on the LCD. This option is selected from the Sensitivity menu in Program Mode and is useful when troubleshooting equipment related problems.

**Channel-Off** When set to the Channel-Off state, the detector output is continuously in the No Call state regardless of the presence or absence of vehicles over the loop. The loop oscillator is disabled when in the Channel-Off state. This state is indicated by **OFF** flashing on the LCD. This option is selected from the Sensitivity menu in Program Mode and is useful when troubleshooting equipment related problems.

**Call Delay Time** The Model L-ATG has two (2) output relays. Call Delay Time applies to Relay A only and can be adjusted from 0 to 255 seconds in one-second steps. Call Delay time starts counting down when a vehicle enters the loop detection zone. The remaining Call Delay time is continuously displayed on the LCD.

**Call Extension Time** The Model L-ATG has two (2) output relays. Call Delay Time applies to Relay A only and can be adjusted from 0 to 25.5 seconds in 0.1-second steps. Extension time starts counting down when the last vehicle clears the loop detection zone. The remaining Call Extension time is continuously displayed on the LCD. Any vehicle entering the loop detection zone during the Call Extension time period causes the detector to return to the Detect state, and later, when the last vehicle clears the loop detection zone, the full Call Extension time starts counting down again.

**Max Presence Time** When Max Presence Time is set to OFF, True Presence™ mode is selected and the detector will provide a Call output as long as a vehicle is present in the loop detection zone. True Presence™ time applies only for normal size passenger vehicles and for normal size loops (approximately 12 ft<sup>2</sup> to 120 ft<sup>2</sup>). When activated, the detector's Max Presence timer is adjustable from 1 to 999 seconds in one-second steps. The Max Presence function is used to limit presence time by automatically resetting the detector. If this function is enabled (ON), the Max Presence timer begins counting down when a call is initiated and the remaining time is continuously displayed on the LCD. If the loop becomes vacant before the Max Presence timer reaches zero, the call is dropped and no automatic reset occurs. When the Max Presence timer reaches zero, the detector is automatically reset.

**Option 1 - Display Loop Inductance (L) and % Loop Inductance Change (- $\Delta$ L/L)** When Option 1 is OFF, the LCD displays three dashed lines (---) during a No Call state or **CALL** and the Call strength (via the LCD bargraph display) during a Call state. When Option 1 is ON and

the detector is operating in normal display mode, the LCD continuously displays the Loop Inductance value (L) in microhenries ( $\mu$ H) between 15 and 2500  $\mu$ H. By recording the inductance of the loop / lead-in circuit when it is first installed, the actual inductance can be compared to the expected inductance to help identify defective loop / lead-in circuits. When a vehicle is detected, the Call is indicated by means of the DETECT LED and the LCD bargraph display. While in the Call state, the LCD also displays the percentage of inductance change (- $\Delta$ L/L value) while a vehicle is detected. The maximum - $\Delta$ L/L that has occurred is displayed for two seconds unless a greater change occurs. The count down of the Delay, Extension, and/or Max Presence timers is not displayed when Option 1 is ON. Once set to ON, Option 1 will turn OFF after 15 minutes have elapsed.

**Option 2 - Display Vehicle Count** This option has two parameters. Option 2.0 is used to turn the display of vehicle counts on the front panel mounted LCD ON and OFF. Option 2.1 is used to reset the vehicle count to zero.

The detector is capable of accumulating 99,999 vehicle counts before rolling over to zero. When Option 2.0 is ON, the normal display will show the accumulated vehicle count since the vehicle count was last reset. Setting Option 2.1 to ON resets the accumulated vehicle count. The setting of Option 2.1 automatically reverts to the OFF state when the parameter is exited. Loss of power or resetting the detector will not reset the vehicle count.

**Option 3 - Relay B Buzzer** When Option 3 is ON, an audible signal is emitted any time Relay B outputs a count, tailgating, or entry signal. Option 3 will automatically return to the OFF state 15 minutes after being set to ON.

**Option 4 - Training Mode** When Option 4 is ON, the detector is placed in the training mode. This feature is used in conjunction with the Reno A&E Calibration Loop (not included with the detector) to ensure that the detector will accurately detect tailgating vehicles.

**Option 5 - Relay B Output Mode** Option 5 is used to control the output mode of Relay B. Option 5 has seven (7) settings, 5.0 through 5.6. A setting of 5.0 is generally used in applications where the primary concern is accurate counting of passenger vehicle entries. Option 5 settings 5.1 through 5.6 are used in applications where the primary concern is detection of events that are considered to be exceptions to normal entrance occurrences (i.e. tailgating or multiple passenger vehicle entry occurrences).

When Option 5 is set to 5.0, the detector's count total is incremented by one and Relay B provides a 0.25 second pulse count output for each passenger vehicle that passes over the loop.

Option 5 settings 5.1 through 5.3 are used in applications where the primary concern is detection of tailgating events. A tailgating incident occurs when two passenger vehicles are over the loop at the same time. When Option 5 is set to 5.1, 5.2, or 5.3 the detector's count total is incremented by one and Relay B provides a pulse output only when a tailgating incident has been detected. The duration of the pulse output varies depending on the setting of the option. When set to 5.1, the pulse duration is 0.25 second. When set to 5.2, the pulse duration is one second. When set to 5.3, the pulse duration is five seconds.

Option 5 settings 5.4 through 5.6 are used in applications where the primary concern is detection of multiple passenger vehicle entry events. Option 5 settings 5.4, 5.5, and 5.6 function in conjunction with Option 6 (see Option 6 - Control Input Active High / Low below). In a normal entrance scenario, one passenger vehicle enters the controlled area for each cycle of the control input. (In general, the control input is active when the gate is open and inactive when the gate is closed.) There are

## L-ATG SERIES SPECIFICATION (CONT.)

two different output schemes that can occur. The first occurs when Option 5 is set to 5.4, 5.5, or 5.6 and the state of the control input is active (i.e. the gate is open). The detector's count total is incremented by one and Relay B provides a pulse output for each passenger vehicle that crosses the loop after the first passenger vehicle has crossed the loop. Vehicle counts continue to be accumulated until the state of the control input changes (i.e. the gate closes). If the state of the control input is not active (i.e. the gate is closed), Option 5 settings 5.4, 5.5, and 5.6 result in a slightly different output scheme. The detector's count total is incremented by one and Relay B provides a pulse output for every passenger vehicle that crosses the loop. When set to Option 5.4 ON, the pulse duration is 0.25 second. When set to Option 5.5 ON, the pulse duration is one second. When set to Option 5.6 ON, the pulse duration is five seconds.

**Option 6 - Control Input Active High / Low** When Option 6 is OFF, the control input is active when it is in a high state. When Option 6 is ON, the control input is active when it is not in a high state. Proper detector operation requires that the control input is active when the gate or barrier is open.

### Specifications (Physical):

**Weight** 24 oz. (680.4 gm).

**Size** 4.70 inches (11.94 cm) high x 2.50 inches (6.35 cm) wide x 5.90 inches (14.99 cm) deep (excluding connector). Connector adds .675 inch (1.71 cm) to depth measurement.

**Operating Temperature** -40° F to +180° F (-40° C to +82° C).

**Circuit Board** Printed circuit boards are 0.062 inch thick FR4 material with 2 oz. copper on both sides and plated through holes. Circuit board and components are conformal coated with polyurethane.

**Connector** MS3102A-18-1P. (See **Pin Assignments** tables.)

### Specifications (Electrical):

**Power** 89 to 135 VAC, 50/60 Hz, 6 Watts maximum (Model L-ATG-1). 180 to 270 VAC, 50/60 Hz, 6 Watts maximum (Model L-ATG-35). 10 to 30 VAC, 50/60 Hz, 6 Watts maximum / 10 to 30 VDC, 160 mA maximum (Model L-ATG-5).

**Control Input Voltage** 89 to 135 VAC, 50/60 Hz, 6 Watts maximum (Model L-ATG-1). 180 to 270 VAC, 50/60 Hz, 6 Watts maximum (Model L-ATG-35). 10 to 30 VAC, 50/60 Hz, 6 Watts maximum / 10 to 30 VDC, 160 mA maximum (Model L-ATG-5).

**Loop Inductance Range** 20 to 2500 microhenries with a Q factor of 5 or greater.

**Loop Inputs** Transformer isolated. The minimum capacitance added is 0.068 microfarad.

**Lightning Protection** Meets and/or exceeds all applicable NEMA TS 1-1989 specifications for transient voltage protection.

**Reset** When operating in Normal Mode, the detector can be reset by pressing and holding the FUNC pushbutton for three seconds. The detector can also be reset by removing and reapplying power, or by changing either the sensitivity or loop frequency setting. The vehicle count can only be reset by setting Option 2.1 to ON. A detector reset, changing the sensitivity or loop frequency, or loss of power will not reset the vehicle count.

**Relay Rating** The relay contacts are rated for 6 Amps maximum, 150 VDC maximum, and 180 Watts maximum switched power.

### Specifications (Operational):

**Display** The LCD backlighting illuminates whenever any pushbutton is pressed. The backlighting will extinguish 15 minutes after the last pushbutton press.

**Detect Indicator** The detector has a super bright, high intensity, red light emitting diode (LED) to indicate a Call Output, Delay Timing, Extension Timing, Pending State, or Failed Loop condition.

**Response Time** (See **Sensitivity,  $-\Delta L/L$ , & Response Time** table for actual response times.)

**Self-Tuning** The detector automatically tunes and is operational within two seconds after application of power or after being reset. Full sensitivity and hold time require 30 seconds of operation.

**Environmental and Tracking** The detector is fully self-compensating for environmental changes and loop drift over the full temperature range and the entire loop inductance range.

**Grounded Loop Operation** The loop isolation transformer allows operation with poor quality loops (which may include one short to ground at a single point).

**Loop Size** The detector has been designed and tested to operate most effectively when connected to a single loop that measures 2.5 feet (0.76 m) x 6 feet (1.83 m) (nominal dimensions). Connection to multiple loops is not recommended. The loop size can vary from 2 feet (0.61 m) to 3 feet (0.91 m) in the direction of travel and 5 feet (1.52 m) to 7 feet (2.13 m) across the lane. The loop should have three (3), four (4), or five (5) turns of wire.

**Loop Feeder Length** Up to 5000 feet (1500 m) maximum with proper feeder cable and an appropriate loop. NOTE: The detector has been designed and tested to operate most effectively when connected to a single loop that measures 2.5 feet x 6 feet. If the length of the loop feeder cable exceeds 200 feet (58 m), it may be necessary to increase the number of turns in the loop to ensure accurate vehicle counting.

**Loop (Fail) Monitor** If the total inductance of the detector's loop input network goes out of the range specified for the detector, or rapidly changes by more than +/-25%, the detector will immediately enter the Fail-Safe mode and display **LOOP FAIL** on the LCD. The type of loop failure will also be displayed as **L lo** (for -25% change or shorted loop conditions) or **L hi** (for +25% change or open loop conditions). This will continue as long as the loop fault exists. At the time of a loop failure, the LED will begin to flash at a rate of three flashes per second. The LED will continue this display pattern until the detector is manually reset or power is removed. If the loop self-heals, the **LOOP FAIL** message on the LCD will extinguish and the detector will resume operation in a normal manner; except the LED will continue the three flashes per second display pattern, thus providing an alert that a prior Loop Fail condition has occurred. Each loop failure for the detector is counted and accumulated into the Loop Fail Memory. The total number of loop failures written into the Loop Fail Memory (since the last power interruption or manual reset) is viewed by stepping through the functions in Program Mode until the **LOOP FAIL** message is displayed.

# L-ATG SERIES SPECIFICATION (CONT.)

## TABLES

### Sensitivity, $-\Delta L/L$ , & Response Time

Sensitivity	$-\Delta L/L$	Response Time
OFF	-----	-----
1	2.56%	96 +/-16 ms
2	1.28%	96 +/-16 ms
3	0.64%	96 +/-16 ms
4	0.32%	96 +/-16 ms
5	0.16%	96 +/-16 ms
6	0.08%	96 +/-16 ms
7	0.04%	96 +/-16 ms
8	0.02%	96 +/-16 ms
9	0.01%	96 +/-16 ms
CALL	-----	-----

### Default Settings

Function	Setting
Loop Frequency	2
Sensitivity Level	5
Call Delay Time	0
Call Extension Time	0.0
Max Presence Time	OFF
Option 1 - Display Loop Inductance (L) and % Loop Inductance Change ( $-\Delta L/L$ )	OFF
Option 2.0 - Display Vehicle Count	OFF
Option 2.1 - Reset Vehicle Count	OFF
Option 3 - Relay B Buzzer	OFF
Option 4 -, Training Mode	OFF
Option 5 - Relay B Output Mode	5.0
Option 6 - Control Input Active High / Low	OFF

### Pin Assignments

#### (Reno A&E Wiring Harness Model 801-4)

Pin	Wire Color	Function
A	White	AC Neutral / DC Common
B	Brown	Relay A, Normally Open (N.O.)
C	Black	AC Line / DC +
D	Red	Loop
E	Orange	Loop
F	Yellow	Relay A, Common
G	Blue	Control Input
H	Green	Chassis Ground
I	Violet	Relay B, Common
J	Gray	Relay B, Normally Open (N.O.)

NOTE: All pin connections listed above are with power applied, loop connected, and no vehicle detected.