MODEL GT-200-LRT

(Firmware Version GT 2.x)

TWO CHANNEL LOOP DETECTOR
WITH DELAY AND EXTENSION TIMING

OPERATING INSTRUCTIONS

GENERAL

The Model GT-200-LRT is a two channel, scanning card rack type loop detector. This detector provides reliable train detection for Light Rail Train detection applications by incorporating special features that prevent lock-ups caused by high electric currents found in electrified railroads when loops are placed between the rails.

The detector automatically tunes and is operational within two seconds after application of power or a reset. Full sensitivity and hold time require approximately 30 seconds of operation. The detector is fully self-compensating for environmental changes and loop drift over the full temperature range. Each channel is programmed using a front panel eight-position DIP switch. Call Delay and Call Extension timing functions are programmed using PC board mounted DIP switches. Each channel has one dual color (green/red) LED indicator. The LED provides an indication of the output state and loop failure conditions. Normal output conditions are indicated when the LED is illuminated in green or orange. Loop failure conditions are indicated when the LED is illuminated in red. A built-in test mode provides means for verifying proper operation of the DIP switches, loop oscillator circuitry, and LED indicators.

CONTROLS AND INDICATORS

Front Panel Switches

Two eight-position DIP switches are labeled **1**, for channel 1 and **2**, for channel 2.

SENSE LEVEL (4 2 1)	8 Sensitivity Levels: **0** to **7** (See Sensitivity Level Section)
PULS PRES	← Pulse / Presence →
FAST NORM	← Fast / Normal Response →
FREQ (1 2)	4 Frequency Selections: **0** to **3** (See Loop Frequency Section)
DISABLE (←)	← Disable / Operate →

Factory Default Settings Shown

Channel Disable

When the **DISABLE** switch is in the disable position, the channel's output is continuously in the No Call state regardless of the presence or absence of vehicles over the loop. The loop oscillator is off when the channel is in the disabled state.

NOTE: Changing the Channel Disable DIP switch resets the detector channel.

Loop Frequency

Each channel has four (4) selectable loop frequencies.

FREQ (1 2)

High (0)   Medium High (1)   Medium Low (2)   Low (3)

Fast/Normal Response Mode

DIP switch 4 is used to select the detector's response time.

Normal Mode is recommended. Use Fast Response for speed and occupancy applications.

NOTE: Changing the Fast/Normal Response Mode DIP switch setting resets the detector channel.

Pulse/Presence Mode

DIP switch 5 controls the output mode of each channel.

PRESENCE (**PRES**): Presence Mode provides a Call hold time of at least four minutes (regardless of vehicle size) and typically one to three hours.

PULSE (**PULS**): Pulse Mode generates a single 125 millisecond pulse output for each vehicle entering the loop detection zone. Any vehicle remaining in the loop detection zone longer than two seconds will be tuned out providing full sensitivity for any vacant portion of the loop detection zone. Full sensitivity for the entire loop detection zone is recovered within one second following the departure of vehicles.
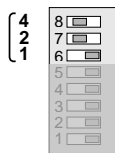
NOTE: Changing the Presence/Pulse DIP switch setting resets the detector channel.

Sensitivity Level

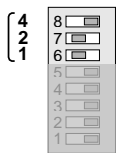Each detector channel has eight (8) sensitivity selections.
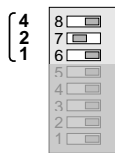

"**7**" (0.01 % -ΔL/L)   "**6**" (0.02 % -ΔL/L)   "**5**" (0.04 % -ΔL/L)   "**4**" (0.08 % -ΔL/L)
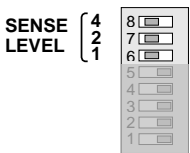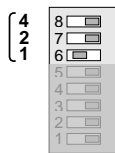
"**3**" (0.16 % -ΔL/L)   "**2**" (0.32 % -ΔL/L)   "**1**" (0.64 % -ΔL/L)   "**0**" (1.28 % -ΔL/L)

NOTE: Changing the Sensitivity Level setting resets the detector.

Audible Detect Feature (Buzzer)

A front panel pushbutton switch labeled **BUZZER** is used to enable the audible detect feature. Either channel can have this feature activated. When this feature is active the channel LED illuminates with an orange color. The first time the pushbutton is pressed a 50 millisecond audible signal confirms the activation of Channel 1. The second time the pushbutton is pressed two 50 millisecond audible signals confirm the activation of Channel 2. To deactivate this feature press and hold the pushbutton for one second. A 250 millisecond audible signal confirms the deactivation of the feature. This feature automatically turns off 15 minutes following activation.

NOTES: 1) When operating in Pulse mode the buzzer will cease if a vehicle occupies the detection zone for more than two seconds.

2) The buzzer is activated whenever a vehicle is detected in the loop. This allows the technician to directly verify loop function without being concerned with Delay and/or Extension timing functions.

PC Board Mounted Programming DIP Switches

The two-position DIP switch labeled **S3** is used to activate the "Test Mode" and the "100 Millisecond Minimum Output Mode".

Test Mode

When **S3** switch 1 is turned *ON*, the Test Mode is activated. For more information on Test Mode, refer to the Model GT-200-LRT Operation Manual.

NOTE: The Test Mode DIP switch must be OFF for normal detector operation.

100 Millisecond Minimum Output Mode

When operating in Presence Mode two modes of operation are available for the Call outputs. Either "Normal Mode" or "100 Millisecond Minimum Output Mode", which is selected by **S3** switch 2. In "Normal Mode" the Call outputs are active without a minimum Call output time. In the "100 Millisecond Minimum Output Mode" each Call output duration will be a minimum of 100 milliseconds.

Call Delay and Call Extension

The four, six-position DIP switches labeled **S1**, **S2**, **S4**, and **S5** located on the PC Board are used to program Call Delay and/or Call Extension. DIP switch **S1** controls Channel 1 Delay Timing, DIP switch **S2** controls Channel 1 Extension Timing, DIP switch **S4** controls Channel 2 Delay Timing, and DIP switch **S5** controls Channel 2 Extension Timing. To turn any of these DIP switches *ON*, push the switch up.

Call Delay (S1 and S4)

Each DIP switch has six (6) switches labeled **1** second, **2** seconds, **4** seconds, **8** seconds, **16** seconds, and **32** seconds. The programmed delay time is the total value of all switches turned *ON*.

Channel 1 - S1
Channel 2 - S4

ON 1 2 3 4 5 6 1 2 4 8 16 32 **63 Seconds**	ON 1 2 3 4 5 6 1 2 4 8 16 32 **36 Seconds**	ON 1 2 3 4 5 6 1 2 4 8 16 32 **32 Seconds**	ON 1 2 3 4 5 6 1 2 4 8 16 32 **0 Seconds**

Call Extension (S2 and S5)

Each DIP switch has six (6) switches labeled **1/4** second, **1/2** second, **1** second, **2** seconds, **4** seconds, and **8** seconds. The programmed extension time is the total value of all switches turned *ON*.

Channel 1 - S2
Channel 2 - S5

ON 1 2 3 4 5 6 ¼ ½ 1 2 4 8 **15.75 Seconds**	ON 1 2 3 4 5 6 ¼ ½ 1 2 4 8 **9 Seconds**	ON 1 2 3 4 5 ¼ ½ 1 2 4 8 **8 Seconds**	ON 1 2 3 4 5 6 ¼ ½ 1 2 4 8 **0 Seconds**

Reset

Changing the position of any individual channel's front panel DIP switches (except the Frequency switches) resets the channel.

The detector can be reset by connecting a logic ground to Pin C or by the interruption of power.

Pin Assignments

Pin	Function	Pin	Function
A	DC Common	1	No Connection
B	DC +	2	No Connection
C	Reset Input	3	No Connection
D	Channel 1 Loop Input	4	Channel 1 Loop Input
E	Channel 1 Loop Input	5	Channel 1 Loop Input
F	Channel 1 Output, Collector	6	No Connection
H	Channel 1 Output, Emitter	7	No Connection
J	Channel 2 Loop Input	8	Channel 2 Loop Input
K	Channel 2 Loop Input	9	Channel 2 Loop Input
L	Chassis Ground	10	No Connection
M	No Connection	11	No Connection
N	No Connection	12	No Connection
P	No Connection	13	No Connection
R	No Connection	14	No Connection
S	No Connection	15	No Connection
T	No Connection	16	No Connection
U	No Connection	17	No Connection
V	No Connection	18	No Connection
W	Channel 2 Output, Collector	19	No Connection
X	Channel 2 Output, Emitter	20	No Connection
Y	No Connection	21	No Connection
Z	No Connection	22	No Connection

Detect/Fail Indicators

Each channel includes one dual color (green/red) light emitting diode (LED). The LED displays three colors; green, red, and orange.

NOTE: If either channel has the audible detect feature activated, that channel's Detect/Fail LED will be illuminated in an orange state for any Call output condition.

Detect / Fail LED	Output Status
OFF	No Call Output
GREEN - Solid	Call Output
ORANGE - Solid	Call Output Audible Detect Feature Activated
GREEN - Four flashes per second	No Call Output Vehicle Detected Delay Timing active
ORANGE - Four flashes per second	No Call Output Vehicle Detected Delay Timing active Audible Detect Feature Activated
GREEN - 16 flashes per second	Call Output Detection zone vacant Extension Timing active
RED – Solid ON	Open Loop Failure
RED - One Hz flash rate (50% Duty Cycle)	Shorted Loop Failure
RED - Three 50 ms flashes per second	Prior Loop Failure - Current Loop OK
RED - Three 50 ms flashes per second followed by a **GREEN-** 750 ms flash	Call Output Prior Loop Failure - Current Loop OK
RED - Three 50 ms flashes per second followed by an **ORANGE** - 750 ms flash	Call Output Prior Loop Failure - Current Loop OK Audible Detect Feature Activated
RED - Three 50 ms flashes per second followed by **GREEN** - four flashes per second	No Call Output Vehicle Detected Delay Timing active Prior Loop Failure - Current Loop OK
RED - Three 50 ms flashes per second followed by **ORANGE** - four flashes per second	No Call Output Vehicle Detected Delay Timing Active Prior Loop Failure - Current Loop OK Audible Detect Feature Activated
RED - Three 50 ms flashes per second followed by **GREEN** - 16 flashes per second	Call Output Detection zone vacant Extension Timing active Prior Loop Failure - Current Loop OK