LMD624 Series

FOUR CHANNEL
LOOP DETECTORS

Four channel rack mount detector with DEFLECTOMETER®, four loop frequencies, three modes of operation. The Model LMD624T includes Delay and Extend timing.

FEATURES

- Automatic Tuning
- Lightning & Surge Protection
- Four Frequency Levels
- Fail Safe Output Configuration
- Separate Color Coded LED indicators
- Wide Loop Inductance Range: 20 to 2500 micro Henries

HIGHLIGHTS

- Call Strength Indicator
- Dynamic Sensitivity Programming
- Frequency Meter
- Push Button Programming
- Output CALL Test Mode
- Delay and Extension Timing (Model 624T only)

NEMA CABINET COMPATIBLE **ATC CABINET COMPATIBLE**

DEFLECTOMETER Call Strength Indictor: The Call Strength Indicator provides the technician with a simple one-step method for accurately setting the optimum level of sensitivity that ensures accurate vehicle detection of all vehicles, including motorcycles and high-bed trucks. When a medium size vehicle is over the roadway loop, a DEFLECTOMETER Call Strength value of “5” assures that the optimum sensitivity has been achieved. You can adjust the DEFLECTOMETER reading dynamically without moving the vehicle by using the front panel UP or DOWN sensitivity buttons.

Frequency Meter: The built-in Frequency Meter reports the operating frequency of the loop network. Ensuring that adjacent loops are separated by at least 5 KHz will avoid crosstalk problems and future service calls.

Output CALL Test Mode: The Output Call Test Mode provides a straight forward way to test that the Controller Unit is receiving an active output from the detector. This eliminates the need for cabinet test switches and associated wiring. A huge time saving feature during system set-up and trouble-shooting.

Advanced Loop Diagnostics: The Fault (FLT) indicator displays the type of fault: Short, Open or 25% change of inductance. The Fault Monitor will report and store three types of loop faults; Open Loops, Shorted Loops, and 25% sudden changes in inductance. Each type of fault is indicated by a unique sequence of flashes allowing the user to diagnose loop failures at a glance.

Delay and Extension Timing (624T Only): Delay and Extension Timing is provided for all four channels via PCB mounted DIP switches.

Half Width Front Panel (624H Only): DProvides four channels of detection with a half-width front panel (1.14” inches / 28.9 mm).

Controls: Front panel push buttons allow the user to set the Sensitivity Level, Operational mode, and nominal Frequency independently on each channel.

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Setting Sensitivity - Front Panel Push Buttons: The DEFLECTOMETER® (front panel 7-segment LED) aids in setting the DETECTOR quickly and easily to the most optimum sensitivity level to ensure the trouble-free detection of all vehicles, including motorcycles and high bed vehicles. For typical vehicles (mid-size vehicle / small pick up) utilizing properly installed roadway loops, a Call Strength of 5 displayed on the DEFLECTOMETER during the DETECT output period indicates an optimum sensitivity setting. For high profile vehicles (commercial trucks, 4x4's, etc.), a Call Strength value of 4 will be optimum. For low profile vehicles (sports cars, etc...), a Call Strength value of 6 will be optimum.

Adjusting sensitivity using the DEFLECTOMETER®: The DEFLECTOMETER® should read zero (0) with no vehicle over the roadway loop. When a typical mid-sized vehicle is completely in the detection zone (DET indicator On), the Call Strength value should be adjusted up or down until the DEFLECTOMETER® displays the desired optimum value of 5 (or 4 or 6 as described above).
If a typical vehicle located over the roadway loop causes the Call Strength "7" to be displayed on the DEFLECTOMETER®, the sensitivity should be decreased two levels. This can be done by pressing the front panel SENS⇓ button two times to achieve the Call Strength value of 5.
If a typical vehicle located over the roadway loop causes the number "2" to be displayed on the DEFLECTOMETER®, the sensitivity should be increased three levels. This can be done by pressing the front panel SENS⇑ button three times to achieve the Call Strength value of 5.
Note: The DEFLECTOMETER call strength dynamically updates after each sensitivity level change, allowing you to change sensitivity settings while a vehicle remains in the loop detection zone.

Manually Adjusting Sensitivity: The detector offers 9 levels of sensitivity (1 to 9). Level 9 is the highest sensitivity. Sensitivity Level can be manually set to any desired value by pressing the front panel SENS buttons (⇑or⇓) when a vehicle is NOT over the roadway loop (DET indicator Off). The first time a SENS button (⇑or⇓) is pressed, the current Sensitivity Level is displayed on the DEFLECTOMETER® for 3 seconds. If either SENS button (⇑or⇓) is pressed again before the 3 second period ends, the Sensitivity Level will increase (SENS⇑) or decrease (SENS⇓). The new Sensitivity Level value will be displayed on the DEFLECTOMETER® display for 3 seconds. The factory default Sensitivity setting is level 6.

Sensitivity	ΔL / L
1	2.56%
2	1.28%
3	0.64%
4	0.32%
5	0.16%
6	0.08%
7	0.04%
8	0.02%
9	0.01%

Loop Frequency / Loop Frequency Display: One of four frequency settings may be selected via the front panel FREQ push button to alleviate interference which may occur when loops connected to different detectors are located adjacent to one another. To help prevent or diagnose crosstalk problems, the loop frequency is displayed on the front panel DEFLECTOMETER®. The current loop frequency is displayed after pressing the FREQ button to display the current Frequency Level. The frequency is shown in KHz with a "-" symbol displayed both before and after the numeric digits shown on the DEFLECTOMETER®.
For example, after pressing the FREQ button once the display sequence might show:
"3" ⇒ "-" ⇒ "2" ⇒ "7" ⇒ "-"
This sequence would indicate Frequency Level "3" and a loop reference frequency of 27 KHz. Detectors on adjacent loops should all be separated by at least 5 KHz.

Loop Fault Monitoring: The Detector continuously checks the integrity of the loop. The system is able to detect shorted or open circuit loops, or sudden changes in inductance exceeding 25% of the nominal inductance. If a fault is detected, the OUT and FLT indicators continuously emit a sequence of flashes. Additionally, the DEFLECTOMETER® displays the letter "F" indicating a current loop fault. Each type of fault is identified by a unique flash sequence:

Flash Sequence	Fault
1 flash	Open Circuit Loop
2 flashes	Shorted Circuit Loop
3 flashes	25% excessive change in inductance

If the Open or Shorted fault condition self heals, the DET indicator and DEFLECTOMETER® will return to normal operation. The FLT indicator will continue to flash with the sequence signifying the type of fault that was last detected. In the case of the excessive inductance change fault, the unit will retune to the new inductance after a period of two seconds and continue operation. The fault condition will be indicated by the flash sequence of the FLT indicator.

Operational Modes:
Presence: A Presence output mode may be selected from the front panel MODE push button. If presence mode is selected then a choice of short (S) or long (L) can be selected. Short Presence is defined as 30 minutes and Long Presence is defined as 120 minutes.
Pulse: A Pulse output mode (P) may be selected from the front panel MODE push button. In Pulse mode, a 125 ms ± 25ms width pulse will be output for each vehicle entering the loop.
Call: A continuous CALL output (C) may be selected from the front panel MODE push button which will simulate the presence of a vehicle. This mode is used for testing the CALL output of a channel.
Channel Off: The Channel Off (-) may be selected from the front panel Mode push button. This option turns OFF the channel and disables the oscillator.

Call Delay Timer for Presence & Pulse Modes (624T only): For each channel, a delay time of 1 to 63 seconds may be selected by setting the appropriate PCB mounted DIP switches to the ON position. Call Delay time starts counting down when a vehicle enters the loop detection area. During the Delay time the DET indicator will flash two times per second and the DEFLECTOMETER will display the letter "d". Delay time can be overridden by a True (low) signal at the Timer Control input.

Specifications subject to local environmental conditions, and may be subject to change.
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Call Extension Timer for Presence Mode (624T only): For each channel, an extend time of 0.25 to 15.75 seconds can be set via the EXTEND DIP switches. The numeric sum of the switches in the On position is equal to the Extend time. Two modes are provided:
Extend Always (default): Call Extend time starts counting down when the last vehicle clears the loop detection zone. During the Extend time the DET indicator will flash four times per second and the DEFLECTOMETER will display the letter "E". Any vehicle entering the loop detection zone during the Extend time period causes the Extend timer to be reset and the output maintained. The Timer Control input has no effect on this mode.
Extend on Green (EOG): Call Extend time starts counting down when the last vehicle clears the loop detection zone if the Timer Control input is True (low). During the Extend time the DET indicator will flash four times per second and the DEFLECTOMETER will display the letter "E". Any vehicle entering the loop detection zone during the Extend time period causes the Extend timer to be reset and the output maintained. The Extend on Green mode is enabled by a factory installed diode located at OPT6 on the pcb. Consult the factory for details.

Timer Control Inputs (624T only): Timer Control inputs are provided for each channel to modify the operation of the Delay and Extension functions. The application of a True (low) state voltage will inhibit the Delay timing function and/or enable the Extend timing function. Timer Control inputs are primarily provided for downward compatibility.

Status Outputs: Each channel includes a separate output which is used to transmit operational status information to a Bus Interface Unit (BIU). Fault information is transmitted by means of pulse-width modulation. Pulse widths shown are +10ms.

Status	Output Condition
Normal operation / No fault	Continuous ON (low)
Watchdog fail / Power Supply fail	Continuous OFF (high)
Open circuit loop	50ms OFF, 50ms ON
Short circuit loop	100ms OFF, 50ms ON
25% change in inductance	150ms OFF, 50ms ON

DC Supply Voltage:
Minimum.....10.8 VDC
Maximum.....28.8 VDC

DC Supply Current:
Maximum.....100 mA

DC Timer Control Inputs (624T Only):
True (low, 50 mA).....Less than 8 VDC
Maximum Current.....100 mA

Optically Isolated Outputs: Outputs are fail-safe such that a Detector with no power will provide the True (low) Call state.
True (low, 50 mA).....Less than 1.5 VDC
Maximum Current.....100 mA

Environmental: Operating Temperature Range: -30ºF to 165ºF (-34ºC to 74ºC)

Mechanical: International Card with 44 pin double sided edge connector.

- Height = 4.5" (114.3mm)
- Width = 2.34" (59.4mm)
- Width (LMD624H) = 1.14" (28.9mm)
- Depth (excluding handle) = 6.875" (174.6mm)

Pin Assignment:

Pin	Function	Pin	Function
A	Logic Ground	1	Reserved (624T = Ch 1 Timer Control Input)
B	DC Supply	2	Reserved (624T = Ch 2 Timer Control Input)
C	Ext. Reset	3	Reserved (624T = Ch 3 Timer Control Input)
D	Ch 1 Loop Input	4	Ch 1 Redundant Loop Input
E	Ch 1 Loop Input	5	Ch 1 Redundant Loop Input
F	Ch 1 Output (+)	6	Reserved
H	Ch 1 Output (-)	7	Ch 1 Status Output
J	Ch 2 Loop Input	8	Ch 2 Redundant Loop Input
K	Ch 2 Loop Input	9	Ch 2 Redundant Loop Input
L	Chassis Ground	10	Reserved (624T = Ch 4 Timer Control Input)
M	Reserved	11	Reserved
N	Reserved	12	Reserved
P	Ch 3 Loop Input	13	Ch 3 Redundant Loop Input
R	Ch 3 Loop Input	14	Ch 3 Redundant Loop Input
S	Ch 3 Output (+)	15	Reserved
T	Ch 3 Output (-)	16	Ch 3 Status Output
U	Ch 4 Loop Input	17	Ch 4 Redundant Loop Input
V	Ch 4 Loop Input	18	Ch 4 Redundant Loop Input
W	Ch 2 Output (+)	19	Reserved
X	Ch 2 Output (-)	20	Ch 2 Status Output
Y	Ch 4 Output (+)	21	Reserved
Z	Ch 4 Output (-)	22	Ch 4 Status Output

Model Options:

Model	Feature
LMD624	
LMD624H	Half Width Front Panel
LMD624T	Delay and Extension Timing

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