LMA-1800

INDUCTIVE LOOP VEHICLE DETECTOR

- SINGLE CHANNEL
- DUAL PROGRAMMABLE SOLID STATE OUTPUTS
- PLUG-IN COMPATIBLE WITH:
  - Chamberlain/Elite SL3000, CSW200
  - Advanced Access Automation CSL2000, CSW2000, RSW1000
  - All-O-Matic SL100-DC, SL 150-DC, OH 200DC, SW 300DC, SW350DC
  - Intelligate Systems IQ500, IQ5000
  - Linear (OSCO) SL & SW Series with APeX controller
  - SECOM Late model operators with 10-pin Molex connectors
  - Viking Access Models L-3, F-1, T-21, H-10, B-12, Q-4
  - Apollo 4300, 4500

Eberle Design, Inc. (EDI) provides access professionals with reliable, high quality mission critical vehicle detection products that will improve the performance and lifecycle of your access control systems.

EDI’s wide range of vehicle detection products help technicians save valuable time and maximize profits by quickly installing, accurately trouble-shooting, and reliably maintaining access control systems with easy to use hi-tech vehicle detectors that provide built-in set-up tools, frequency & sensitivity meters, and non-volatile diagnostic history, all of which are valuable and always available – Because they’re built-in!

ENHANCED FEATURES

**DEFLECTOMETER®**: The front panel 7-segment LED DEFLECTOMETER® provides visual feedback and assistance for setting the correct sensitivity, reading the frequency of the loop, reporting Loop Faults, and indicating Delay & Extension Timing functions.

**Sensitivity Meter**: With a typical size vehicle over the roadway loop, the DEFLECTOMETER® functions as a Sensitivity Meter. The optimum sensitivity setting should provide a reading of “5”. You can adjust the DEFLECTOMETER® reading by using the front panel UP or DOWN sensitivity buttons. Automatic quantitative feedback of the loop system operation ensures that the detector is set to the most optimum sensitivity level to detect ALL vehicles, including motorcycles and high-bed vehicles.

**Frequency Meter**: Following power-up or reset, the DEFLECTOMETER® will indicate a 2 or 3 digit number (quickly flashes) that indicates the loop frequency of the loop & loop network. Keeping your loops separated by at least 5 KHz avoids crosstalk problems and future service calls.

**Ten (10) Levels of Sensitivity**: 10 levels of sensitivity (0 to 9) can be easily set using the UP or DOWN push buttons.

**One Model Covers ALL Low Voltages**: LMA-1800 operates on 12VDC, 24VDC, and 24VAC

**Advanced Loop Diagnostics**: The Loop Fault Monitor continually checks the integrity of the loops and will report and store 3 types of loop faults; Open Loops, Shorted Loops, and 25% sudden changes in inductance.

**Loop Fault Memory**: The Loop Fault Memory uses internal Non-Volatile memory to store and display the current and previous loop faults utilizing the front panel “Loop Fault” LED and DEFLECTOMETER®. A power loss or reset will not delete this memory. A MUST FOR TROUBLESHOOTING!

**Call Output Memory**: The detector will not drop a Call state if power is lost for a minimum of 4 seconds or less.

**2 Second Delayed Detection**: A 2-second CALL delay time can be provided via the program DIP switch.

STANDARD FEATURES

- Automatic Tuning - Lightning & Surge Protection - Four (4) Frequency Levels - Compatible with ALL radio controls & remote openers - Sensitivity Boost - Fail Safe and Fail Secure Configurations - Separate Color-Coded LED indicators - Wide Loop Inductance Range: 20 to 2500 micro Henries – Velcro pull tab for easy extraction from the rack

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LMA-1800 DEFLECTOMETER® INDUCTIVE LOOP VEHICLE DETECTOR
Single Channel with Dual Programmable Solid State Outputs

SPECIFICATION

Controls: PCB mounted DIP switch (8 position) and front panel push buttons allow the user to set up operational parameters including frequency selection and sensitivity levels. The system is designed to detect moving vehicles and is not intended to continuously monitor fixed or stationary objects.

Reset (Power up): The detector will automatically reset to its default settings after being turned off. Upon power up, the loop frequency will display itself, followed by the loop sensitivity and output status. The system will then enter a readiness state, with all outputs in the OFF state.

Setting Sensitivity - Front Panel Sensitivity Push Buttons
The DEFLECTOMETER® (front panel 7-segment LED) aids in setting the DETECTOR and 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 value 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 DEFLECTOMETER® reading of 4 will be optimum. For low profile vehicles (sports cars, etc…), a DEFLECTOMETER® reading of 6 will be optimum

Adjusting sensitivity using the DEFLECTOMETER® (recommended): The DEFLECTOMETER® should read zero (0) with no vehicle over the roadway loop. When the typical vehicle is completely in the detection zone (OUTPUT ON), the sensitivity 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 number “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.

If a typical vehicle located over the roadway loop causes the number “2” to be displayed on the DEFLECTOMETER®, the sensitivity should be increased two levels. This can be done by pressing the front panel SENS button three times

NOTE: THE DEFLECTOMETER® DYNAMICALLY UPDATES AFTER EACH SENSITIVITY LEVEL CHARGE TO CHANGE SENSITIVITY SETTINGS WHILE A VEHICLE REMAINS IN THE LOOP DETECTION ZONE.

Adjusting sensitivity without using the DEFLECTOMETER® (manually setting sensitivity): The DETECTOR offers 10 levels of sensitivity (0 to 9). Level 9 is the highest sensitivity. Sensitivity can be manually set to any desired level by pressing the front panel SENS button ( or ) when a vehicle is NOT over the roadway loop. The first time a SENS button ( or ) is pressed, the current sensitivity level is displayed on the DEFLECTOMETER® for 5 seconds. If either SENS button ( or ) is pressed again before the 5 second period ends, the sensitivity setting will increase (SENS ) or decrease (SENS ). The new sensitivity value will be displayed on the DEFLECTOMETER® display for 5 seconds. The factory default Sensitivity setting is level 4.

Loop Fault Monitoring: The detector continuously checks the integrity of the loop. If a fault is detected, the DETECT and POWER LEDs continuously emit a sequence of flashes. Additionally, the 7-Segment DEFLECTOMETER displays the code “F1”, “F2”, or “F3” indicating a current loop fault. Each type of fault is identified by a different flash sequence:

<table>
<thead>
<tr>
<th>Flash Sequence</th>
<th>Fault</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 flash</td>
<td>Open Circuit Loop</td>
<td>F 1</td>
</tr>
<tr>
<td>2 flashes</td>
<td>Shorted Circuit Loop</td>
<td>F 2</td>
</tr>
<tr>
<td>3 flashes</td>
<td>25% excessive change in inductance</td>
<td>F 3</td>
</tr>
</tbody>
</table>

If the Open, Shorted or Fail fault condition self-heals, the Output LED's and 7-Segment DEFLECTOMETER will return to normal operation. The POWER LED 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 return to the new inductance value after a period of two seconds and continue operation. The fault condition will be indicated by the flash sequence of the POWER LED. Pressing the “Reset” button will reset the detector and clear the flash sequence from the POWER LED (Note: After pressing reset, the frequency will be displayed on the DEFLECTOMETER). Should you want to review the last loop fault condition, simply press and hold the “Reset” button for 2 seconds. See “Loop Fault Monitoring”

CALL Output Memory: A power loss of 3 seconds or less will not drop the CALL (DETECT) Output. Basically when power is removed for 3 seconds or less, then restored, the detector will automatically remember the last condition before the power loss. If a vehicle is present over the roadway loop.

Self Tuning: The Detector will automatically tune to any loop and lead-in combination within the tuning range up to power application of power.

Environmental Tracking: The Detector automatically and continuously compensates for component drift and environmental effects throughout the tuning range and across the entire temperature range.

Loop Inductance (Tuning Range): 20 to 250 micro-Henry with a Q factor greater than 5.

Loop Input (Lightning Protection): The loop input incorporates lightning and transient protection devices and the loop oscillator circuit is transformer-isolated. The lightning protection will withstand the shock of a 10 kV capacitor charged to 2,000 volts applied to either loop input and earth ground. The transformer isolation allows operation with a loop which is grounded at a single point.

Grounded Loop Operation: The Detector will operate when connected to poor quality loops including those that have a short to ground at a single point.

Internal Circuitry Isolation: All internal electronic circuitry is isolated from the loop by means of the loop isolation transformer.

Lead-in Length: The Detector will operate with lead-in (feeder) lengths up to 5,000 feet with appropriate loops and proper lead-in cable.

Output Rating(s): Open Collector Transistor referenced to DC Common. Max current rating 100 mamps. Max voltage 30 VDC.

Construction: Printed circuit boards are double sided 1oz copper with plated through holes. Circuit boards are conformally coated for environmental protection.

Environmental:
- Operating Temperature Range: -34°C to +74°C (-30°F to 165°F)
- Humidity Range: 0 to 95% relative

Mechanical:
- Dimensions: 2.30” (6.84 cm) high x 2.75” (6.98 cm) wide x 0.80” (2.03 cm) thick
- Weight: 1.50 oz. (42 g)

Power Supply:
- 10 to 30 VDC or 14 to 26 VAC, 50 ma max.

Connector: Rear mount 10 pin male female Molex type 09-48-1104. Mates with other male PCB 0.156” pitch headers used by many gate, parking and access control devices.

Pin Assignment (Connections):

<table>
<thead>
<tr>
<th>Pin Function</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Loop Input</td>
<td>A</td>
</tr>
<tr>
<td>2 Loop Input</td>
<td>B</td>
</tr>
<tr>
<td>3 Power (+10 to 30 VDC or 26 VAC)</td>
<td>ON</td>
</tr>
<tr>
<td>4 No Connection</td>
<td>OFF</td>
</tr>
<tr>
<td>5 No Connection</td>
<td>OFF</td>
</tr>
<tr>
<td>6 Output A</td>
<td>OFF</td>
</tr>
<tr>
<td>7 Output B Inverted</td>
<td>OFF</td>
</tr>
<tr>
<td>8 Output A (Presence Output)</td>
<td>OFF</td>
</tr>
<tr>
<td>9 Power (+10 to 30 VDC or 26 VAC)</td>
<td>OFF</td>
</tr>
<tr>
<td>10 DC Common</td>
<td>OFF</td>
</tr>
</tbody>
</table>

NOTE: Power applied on either pin 3 or 9, or both.

Default Settings:
- Sensitivity & Output: Level 4
- Input 1 & 8: Infinite Presence
- Input B: Fail Output
- Sensitivity Boost: Off
- Fail Safe: On
- Loop Fault Delay: Off
- Configuration: Fail Safe

Output “A” Status Indicator: (Red LED):
- Vehicle Detection (On) and High Sensitivity
- Loop Fault Conditions (See Loop Fault Monitoring)
- 2-Second Delay = Flashes at a 2 Hz rate

Output “B” Status Indicator: There is no status indicator for Output “B”