LMA-100 SERIES

INDUCTIVE LOOP VEHICLE DETECTORS

- SINGLE CHANNEL
- SINGLE PROGRAMMABLE RELAY OUTPUT

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.

The wide range of EDI 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.

ENHANCED FEATURES

Two Models Cover ALL Voltages:	LMA-100-LV operates on 12VDC, 24VDC, and 24VAC LMA-100-HV operates on 120VAC and 240VAC
Advanced Loop Diagnostics:	The Loop Fault Monitor continually checks the integrity of the loop and will report and store three types of loop faults; Open Loops, Shorted Loops, and 25% sudden changes of 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 POWER (Loop Fault) LED. A power loss or reset will not delete this memory. A MUST FOR TROUBLESHOOTING!
CALL (DETECT) Output Memory:	The detector will not drop a CALL (DETECT) state if power is lost for a minimum of 4 seconds or less.

STANDARD FEATURES

- ☑ **Four (4) Sensitivity Levels**
- ☑ **Four (4) Frequency Levels**
- ☑ **Automatic Tuning**
- ☑ **Lightning & Surge Protection**
- ☑ **Compatible with ALL Radio Controls & Remote Openers**
- ☑ **Sensitivity Boost**
- ☑ **Fail Safe and Fail Secure Configurations**
- ☑ **Separate Color-Coded LED Indicators**
- ☑ **Wide Loop Inductance Rage: 20 to 2500 microHenries**

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Designed, Manufactured and Tested in the United States of America

LMA-100 SERIES INDUCTIVE LOOP VEHICLE DETECTORS

Single Channel with Programmable Relay Output

SPECIFICATION

Controls: Rear mounted DIP switch and a front panel Reset push button allow the user to set up operational parameters including frequency & sensitivity.

Reset (Power up): The Detector can be manually reset by pressing the front panel RESET button or interrupting power.

Loop Frequency (8 Position DIP Switch - DIP 1 & 2): One of four settings (normally in the range of 13 to 150 kilohertz) may be selected from the rear panel DIP switch to alleviate interference which may occur when loops connected to different detectors are located adjacent to one another.

Sensitivity (8 Position DIP Switch – DIP 3 & 4): The Detector offers 4 levels of sensitivity (High, Medium-High, Medium-Low, and Low). Sensitivity can be manually set to a desired level using the rear panel DIP switch. The factory default setting is Medium-Low.

Sensitivity Boost (8 Position DIP Switch - DIP 5): When ON, sensitivity will increase only during the DETECT Output period without changing the sensitivity of a vacant loop. When a vehicle enters the loop, the Detector sensitivity is boosted to a higher level than the vacant loop setting. The boosted sensitivity remains throughout the DETECT Output period. When the vehicle leaves the loop, the sensitivity returns to the vacant loop setting. This feature helps prevent dropouts during the passage of high bed vehicles and is exceptionally useful in sliding gate situations.

Presence Mode Types (8 Position DIP Switch - DIP 6): Two modes of Presence operation are selectable; Limited Presence or Infinite Presence. When ON (Limited Presence Mode), the presence DETECT Output hold time is between 5 minutes minimum and 3 hours maximum. Hold time depends on loop geometry; number of wire turns in the loop, vehicle size, and position of the vehicle relative to the loop zone. When OFF (Infinite Presence Mode), the presence DETECT Output hold time will always be maintained as long as a vehicle is located over the loop zone and power is not removed from the Detector.

Presence & Pulse Modes (8 Position DIP Switch - DIP 7 & 8): Four modes of operation are selectable from the rear panel DIP switch; Presence, Pulse on Entry, Pulse on Exit, or Fault.

Switch 7	Switch 8	Function
OFF	OFF	Presence
OFF	ON	Presence
ON	OFF	250 millisecond pulse on vehicle exit.
ON	ON	250 millisecond pulse on vehicle entry.

Fail Safe Operation (Models LMA-100-LV & LMA-100-HV): When the loop fails or power is removed, continuity exists between Common & Normally Open.

Fail Secure Operation (Models LMA-100S-LV & LMA-100S-HV): When the loop fails or power is removed, continuity exists between Common & Normally Closed.

Loop Fault Monitoring: The Detector continuously checks the integrity of the loop. The system is able to detect a shorted or open circuit loop, or sudden changes in inductance exceeding 25% of the nominal inductance. If a fault is detected, the OUTPUT and POWER (Loop Fault) indicators continuously emit a sequence of flashes:

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 OUTPUT indicators will return to normal operation. The POWER (Loop Fault) 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 then be indicated by the flash sequence of the POWER (Loop Fault) indicator.

Pressing the “Reset” button will reset the Detector and clear the flash sequence from the POWER (Loop Fault) indicator. To review the last loop fault condition, simply press and hold the “Reset” button for 2 seconds. See “Loop Fault Memory” below.

Power (Loop Fault) Status Indicator (Green LED): Solid ON indicates normal power status during detector operation. The POWER Indicator will flash every 2 seconds during low input voltage (Brown out) conditions, indicating insufficient input voltage. The POWER indicator also serves as the Loop Fault Indicator. See “Loop Fault Monitoring” above for details.

Detect Output Status Indicator (Red LED):

- Vehicle Detection = Steady ON

Loop Fault Memory: Previous loop faults are stored in non-volatile (internal) memory. If power is interrupted, for any length of time, the Detector will not loose the last loop condition status, which is valuable information for troubleshooting purposes. When power is restored to the Detector, the green POWER (Loop Fault) indicator will automatically display the last loop fault status condition (open loop, shorted loop, 25% change in inductance or no loop problem occurred). Momentarily pressing the front panel Reset button will reset the loop fault memory and the Detector. Once cleared from the current display, to review the previous loop fault condition, simply press and hold the reset button for 2 seconds. See “Loop Fault Monitoring” above.

CALL (DETECT) Output Memory: A power loss of 4 seconds or less from nominal input voltage will not loose the CALL state. If power is removed for 4 seconds or less and then restored, the Detector will automatically restore the CALL state present before the power loss.

Loop Inductance (Tuning) Range: 20 to 2500 micro-Henry with a Q factor greater than 5.

Self Tuning: The Detector will automatically tune to any loop and lead-in combination within the tuning range upon application of power. The unit may be retuned by adjusting the Sensitivity DIP switch control (DIP 3 & 4).

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 Input (Lightning Protection): The loop input incorporates lightning and transient protection devices and the loop oscillator circuitry is transformer-isolated. The lightning protection will withstand the discharge of a 10 uF capacitor charged to 2,000V across the loop inputs or between either loop input and 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.

Input / Output Circuitry Isolation: The loop inputs are isolated by means of the internal loop isolation transformer. The outputs are isolated by means of the output relay.

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

Output Relay Rating(s): Contacts are rated 5A, 250 VAC, 30 VDC.

Construction: Printed circuit boards are double sided 2 oz copper with plated through holes. Circuit boards are 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: 2.875” (7.30 cm.) long x 1.3750” (3.49 cm.) wide x 3.0625” (7.78 cm.) tall
- Weight: 10 oz.

Power Supply:

- Model LMA-100-LV & LMA-100S-LV: 10 to 32 VDC or 14 to 28 VAC, 75 mA max.
- Model LMA-100-HV & LMA-100S-HV: 95 to 250 VAC, 50/60 Hz, 0.5 Watts max.

Connector: Rear mount 11 pin male Molex “Amphenol” P/N 86CP11.

Pin Assignment (Connections):

Pin	Function
1	DC / AC (+) / Line
2	DC Ground / AC (-) / Neutral
3	No Connection
4	No Connection
5	Output Relay, Common
6	Output Relay, Normally Open (Closes for DETECT)
7	Loop Input
8	Loop Input
9	No Connection
10	Output Relay, Normally Closed (Opens for DETECT)
11	No Connection

NOTE: Relay contacts are shown with power applied, loops connected and no vehicle in the loop zone (No DETECT Output).

Default Settings:

- Sensitivity ..... Medium-Low
- Output Relay ..... Infinite Presence
- Sensitivity Boost ..... OFF