

# LMA-1250-LP "DEFLECTOMETER™" Series Operating Instructions

## Low Power Single Channel / Dual Output Inductive Loop Vehicle Detector

### 1. Connect to proper source voltage

Verify the source voltage before applying power. The "Pin Assignment" side label on the unit indicates the input power required for each model and indicates either Fail Safe operation or Fail Secure operation.

| MODEL       | 10-40 VDC or 14-35 VAC | 95 VAC to 250 VAC | Fail Safe | Fail Secure |
|-------------|------------------------|-------------------|-----------|-------------|
| LMA-1250-LP |                        |                   |           |             |

  

| FAIL SECURE OPERATION |               |                           |
|-----------------------|---------------|---------------------------|
| OUTPUT RELAY          | POWER FAILURE | LOOP FAILURE              |
| A                     | No Output     | See Output A Mode (DIP 8) |
| B                     | No Output     | See "Output B Mode" Table |

### 2. DEFLECTOMETER™ Indications

| STATUS                    | DEFLECTOMETER                                                                         |
|---------------------------|---------------------------------------------------------------------------------------|
| 0                         | No Call                                                                               |
| 1, 2, 3, 4, 5, 6, 7, 8, 9 | Sensitivity Meter (4, 5 & 6 = Optimum Sensitivity Setting for Loop & Lead-in Network) |
| d                         | 2-Second Delay Timing                                                                 |
| E                         | 2, 5 or 10 Second Extension Timing                                                    |
| F                         | Current "Real Time" Loop Failure                                                      |

### 3. LED Indications

All display indicators operate according to the table below following a power-up, reset, or pressing of the SENS↑ or SENS↓ buttons. The displays will then remain active for two minutes. After two minutes the DEFLECTOMETER™ will turn off to save power. The POWER indicator will then pulse at approximately 2Hz. The OUTPUT and FAULT indicators will always operate according to the table below:

| STATUS                                | FRONT PANEL INDICATORS |              |              |               |
|---------------------------------------|------------------------|--------------|--------------|---------------|
|                                       | POWER                  | OUTPUT       | LOOP FAULT   | DEFLECTOMETER |
| Normal, No Call                       | ON                     | OFF          | OFF          | 0             |
| Normal, Call                          | ON                     | ON           | OFF          | 1 thru 9      |
| Output Delay Mode                     | ON                     | 2 Hz Flash   | OFF          | d             |
| Output Extension Mode                 | ON                     | 4 Hz Flash   | OFF          | E             |
| Current Fault: Open Loop              | ON                     | Single Flash | Single Flash | F             |
| Current Fault: Shorted Loop           | ON                     | Double Flash | Double Flash | F             |
| Current Fault: 25% Inductance Change  | ON                     | Triple Flash | Triple Flash | F             |
| Previous Fault: Open Loop             | ON                     | Normal       | Single Flash | Normal        |
| Previous Fault: Shorted Loop          | ON                     | Normal       | Double Flash | Normal        |
| Previous Fault: 25% Inductance Change | ON                     | Normal       | Triple Flash | Normal        |

### 4. Setting Sensitivity - Front Panel Sensitivity Push Buttons

The DEFLECTOMETER™ (front panel 7-segment LED) aids in setting the LMA-1250-LP 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 indicator 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 three levels. This can be done by pressing the front panel SENS↑ button three times.

**NOTE: THE DEFLECTOMETER™ DYNAMICALLY UPDATES AFTER EACH SENSITIVITY LEVEL CHANGE, ALLOWING YOU TO CHANGE SENSITIVITY SETTINGS WHILE A VEHICLE REMAINS IN THE LOOP DETECTION ZONE.**

#### Adjusting sensitivity without using the DEFLECTOMETER™ (manually setting sensitivity):

The LMA-1250-LP 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 buttons (↑ 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 then be displayed on the DEFLECTOMETER™ display for 5 seconds. The factory default Sensitivity setting is level 4.

### 5. Rear Panel DIP Switches

#### Loop Frequency – Two Position DIP Switch

| SWITCH | LOW | MEDIUM – LOW | MEDIUM – HIGH | HIGH | FACTORY DEFAULT |
|--------|-----|--------------|---------------|------|-----------------|
| 1      | ON  | OFF          | ON            | OFF  | OFF             |
| 2      | ON  | ON           | OFF           | OFF  | OFF             |

**Loop Frequency** is controlled by the rear panel 2-Position DIP switch. On occasion, loops are placed in close proximity and it is necessary to select a different frequency level for each loop to avoid interference (crosstalk). Four frequencies are selectable, HIGH being the factory default.

**Measuring Loop Frequency:** With no vehicle in the detection zone, press RESET and review the two or three digits (in Kilohertz) that quickly flash before the DEFLECTOMETER™ changes back to zero. The most significant digit of the frequency is flashed first in the sequence. This unique feature allows you to read and reliably separate the frequency of each detector loop. The LMA-1250-LP frequency should be adjusted such that there is a minimum of 5 Kilohertz of separation between all adjacent loops. Loop frequency is also displayed at power-up.

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### LMA-1250-LP Parameter Options – Eight Position DIP Switch

| SWITCH | ON                                                  | OFF                                       | FACTORY DEFAULT |
|--------|-----------------------------------------------------|-------------------------------------------|-----------------|
| 1      | Sensitivity Boost                                   | No Sensitivity Boost                      | OFF             |
| 2      | Limited Presence                                    | Infinite Presence                         | OFF             |
| 3      | 2-Second Delay Timing                               | No 2-Second Delay Timing                  | OFF             |
| 4      | See "Extension Timing" Table Below (Switches 4 & 5) |                                           | OFF             |
| 5      |                                                     |                                           | OFF             |
| 6      | See "Output B Mode" Table Below (Switches 6 & 7)    |                                           | OFF             |
| 7      |                                                     |                                           | OFF             |
| 8      | Output A No Detect in Fault Mode (fail secure)      | Output A Detect in Fault Mode (fail safe) | OFF             |

#### Extension Timing (Switches 4 & 5)

| SWITCH | 0 Seconds | 2 Seconds | 5 Seconds | 10 Seconds |
|--------|-----------|-----------|-----------|------------|
| 4      | OFF       | ON        | OFF       | ON         |
| 5      | OFF       | OFF       | ON        | ON         |

#### Output B Mode (Switches 6 & 7)

| SWITCH | Pulse On Entry | Pulse On Exit | Duplicate Output A | ON During Loop Fault |
|--------|----------------|---------------|--------------------|----------------------|
| 6      | OFF            | OFF           | ON                 | ON                   |
| 7      | OFF            | ON            | OFF                | ON                   |

**Sensitivity Boost (DIP 1):** When ON, sensitivity will increase only during the CALL Output period without changing the sensitivity of a vacant loop. When a vehicle enters the loop, the LMA-1250-LP sensitivity is boosted to a higher level than the vacant loop setting. The boosted sensitivity remains throughout the CALL 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 Output Modes (DIP 2):** When ON (Limited Presence Mode), the presence CALL Output A 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 in the loop zone. When OFF (Infinite Presence Mode), the presence CALL Output A hold time will always be maintained as long as a vehicle is located over the loop zone and power is not removed from the LMA-1250-LP.

**Two Second Output Delay (DIP 3):** When ON, the CALL Outputs A & B will be delayed for a period of 2 seconds after a vehicle has entered the loop zone. If the vehicle does not remain in the loop zone for the full 2 seconds the delay timer will terminate and no CALL Output A or B will be produced.

**Output Extension (DIPS 4 & 5):** Utilizing the settings shown in the "Extension Timing" DIP switch table above, or the label located on the side of the LMA-1250-LP, the Output A can be selected to hold a CALL output for either 2, 5 or 10 seconds after the vehicle has left the loop zone. This feature does not affect Output Pulse modes or Output B.

**Output B Mode (DIPS 6 & 7):** Utilizing the settings shown in the "Output B Mode" DIP switch table above, or the label located on the side of the LMA-1250-LP, four output modes of operation are selectable for Output B. Output A always operates in Presence mode.

In the **Pulse on Entry Mode**, the Output B provides a 250-millisecond pulse when a vehicle enters the loop zone.

In the **Pulse on Exit Mode**, the Output B provides a 250-millisecond pulse when a vehicle exits the loop zone.

In the **Duplicate Output A Mode**, the Output B operates in presence mode and follows the operation of Output A.

In the **ON During Loop Fault Mode**, the Output B is On during a current loop fault condition.

**Output A Mode (DIP 8):** When ON (Fail Secure Mode), the Call Output A is Off during a current loop fault condition. When OFF (Fail Safe Mode), the Call Output A is On during a current loop fault condition. Output A is always Off (Fail Secure) for a loss of power.

## 6. Additional Features & Benefits

**Reset:** The LMA-1250-LP can be manually cleared and retuned by pressing the front panel RESET button or by interrupting power. The current loop frequency is displayed immediately after pressing RESET (flashing digits). See "Measuring Loop Frequency" in section 5.

**Loop Fault Diagnostics:** The LOOP FAULT indicator and 7-Segment DEFLECTOMETER™ indicate if the LMA-1250-LP is within the specified loop inductance range. The LMA-1250-LP is able to detect Open Loops, Shorted Loops, or sudden changes in loop inductance exceeding 25% of the nominal inductance. If a Loop Fault is detected, the OUTPUT and LOOP FAULT indicators continuously emit a sequence of flashes (See the "LED Indications" table in section 3). Additionally, the 7-Segment DEFLECTOMETER™ displays the letter "F" indicating a current loop fault condition.

If a fault condition self-heals, the OUTPUT indicators and the 7-Segment DEFLECTOMETER™ will return to normal operation. The LOOP FAULT indicator will continue to flash with the sequence signifying the type of loop 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. Pressing the RESET button will clear the flash sequence from the LOOP FAULT indicator.

**Loop Fault Memory:** Previous loop faults are stored in non-volatile internal memory. If power is interrupted for any length of time, the LMA-1250-LP will not lose the last loop condition status. After power is restored to the LMA-1250-LP, the yellow LOOP FAULT indicator will automatically indicate the last loop status condition (Open Loop, Shorted Loop, 25% Change In Inductance, or No Loop Problem). See the "LED Indications" table in section 3. Momentarily pressing the front panel RESET button will clear the LOOP FAULT indicator and retune the LMA-1250-LP. Should you want to review the last loop condition after the LMA-1250-LP has been reset, simply PRESS and HOLD the RESET button and after 2 seconds the LOOP FAULT indicator will indicate the last loop fault condition.

## 7. Connector Pin Assignments:

| PIN | FUNCTION                                           |
|-----|----------------------------------------------------|
| 1   | 12 VDC to 24 VDC / 24 VAC (+)                      |
| 2   | DC Ground / 24 VAC (-)                             |
| 3   | Output Relay B, Normally Open (Closes for DETECT)  |
| 4   | No Connection                                      |
| 5   | Output Relay A, Common                             |
| 6   | Output Relay A, Normally Open (Closes for DETECT)  |
| 7   | Loop Input                                         |
| 8   | Loop Input                                         |
| 9   | Output Relay B, Common                             |
| 10  | Output Relay A, Normally Closed (Opens for DETECT) |
| 11  | Output Relay B, Normally Closed (Opens for DETECT) |

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