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Operating Instructions
LMA-1100 "*DEFLECTOMETER*" Series
Single Channel – Single Output – Inductive Loop Vehicle Detectors

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

MODELS	12 VDC to 24 VDC or 24 VAC	120 VAC	240 VAC	Fail Safe	Fail Secure
LMA-1100-LV	●			●	
LMA-1100-120		●		●	
LMA-1100-240			●	●	
LMA-1100S-LV	●				●
LMA-1100S-120		●			●
LMA-1100S-240			●		●

	FAIL SAFE OPERATION		FAIL SECURE OPERATION	
OUTPUT RELAY	POWER FAILURE	LOOP FAILURE	POWER FAILURE	LOOP FAILURE
A	CALL Output	CALL Output	No Output	No Output

2. *DEFLECTOMETER* Indications

STATUS	*DEFLECTOMETER*
0, 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 **D**elay Timing
E	0, 2, 5 or 10 Second **E**xtension Timing
F	Current "Real Time" Loop **F**ailure

3. LED Indications

STATUS	POWER LED	OUTPUT A LED	LOOP FAULT LED
OFF	No Power	Output OFF	Loop Good
ON	Normal Power	Output ON	N/A
2 Hz Flash	N/A	2-Second Delay Timing	N/A
4 Hz Flash	N/A	0, 2, 5, or 10 Second Extension Timing	N/A
1 Flash	Insufficient Line Power	"Real Time" Open Loop	"Real Time" Open Loop if OUTPUT LED and LOOP FAULT LED are flashing. "Prior" Open Loop if only LOOP FAULT LED is flashing.
2 Flashes	N/A	"Real Time" Shorted Loop	"Real Time" Shorted Loop if OUTPUT LED and LOOP FAULT LED are flashing. "Prior" Shorted Loop if only LOOP FAULT LED is flashing.
3 Flashes	N/A	"Real Time" 25% Inductance Change	"Real Time" 25% Change in Inductance if OUTPUT LED and LOOP FAULT LED are flashing. "Prior" 25% Change In Inductance if only LOOP FAULT LED is flashing.

4. Rear Panel DIP Switches and Rotary Switch

2-Position DIP Switch – Loop Frequency

SWITCH	LO	MEDIUM – LO	MEDIUM – HIGH	HIGH	FACTORY DEFAULT
1	ON	OFF	ON	OFF	OFF
2	ON	ON	OFF	OFF	OFF

Loop Frequency (DIPS 1 & 2) is controlled by the rear panel 2-Position DIP switch. On occasion, loops are placed in close proximity; it is necessary to select a different frequency level for each loop to avoid loop interference (crosstalk). Four (4) frequencies are selectable, HIGH being the factory default. Press reset after changing sensitivity setting.

8-Position DIP Switch - Detector Parameter Options

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 "Pulse Mode" Table Below (Switches 6 & 7)		OFF
7			OFF
8	Reserved		N/A

Extension Timing (Switches 4 & 5)

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

Pulse Mode Configurations (Switches 6 & 7)

SWITCH	Pulse On Entry	Pulse On Exit
6	0N	ON
7	0N	OFF

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4. Rear Panel DIP Switches and Rotary Switch (*Continued*)

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 detector 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 hold time is between 5 minutes minimum and 3 hours maximum. When OFF (Infinite Presence Mode), the presence CALL Output hold time will always be maintained as long as a vehicle is located over the loop zone and power is not removed for more than approximately 10 seconds (4 seconds on low voltage models). 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.

2-Second Output Delay (DIP 3): When ON, the CALL Output 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 will be produced.

0, 2, 5, & 10-Second Output Extension (DIPS 4 & 5): Utilizing the "Extension Timing" DIP switch table on the front page or the table located on the side of the detector, the Relay 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 pulse modes.

Pulse Output Modes (DIPS 6 & 7): Utilizing the "Pulse Mode Configurations" DIP switch table on the front page or the table located on the side of the detector, two (2) "Pulse" modes of operation are selectable; Pulse on Entry or Pulse on Exit.

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

10-Position Rotary Switch - Sensitivity

Ten (10) levels of sensitivity are selectable (0 through 9). 0 being lowest and 9 being highest, with normal (factory default) being 4.

The front panel DEFLECTOMETER (7-segment LED) aids in setting the detector to the proper sensitivity level to help insure the detection of all vehicles, including motorcycles and high bed vehicles. This feature is a fantastic aid to all system installers who usually guess what level of sensitivity to set. For typical vehicles (mid-size) utilizing typical roadway loops, when the number 4, 5, or 6 is displayed on the DEFLECTOMETER during the DETECT (Output) period then the sensitivity is set correctly. DEFLECTOMETER reading "5" would be most optimum. Examples of utilizing the DEFLECTOMETER are shown below:

If DEFLECTOMETER reading "7" is displayed during the CALL Output state, then lower the sensitivity setting two (2) levels so the DEFLECTOMETER would now read "5" (DEFLECTOMETER reading "7" – 2 sensitivity levels = DEFLECTOMETER reading "5".

If DEFLECTOMETER reading "2" is displayed during the CALL Output state, then raise the sensitivity setting three (3) levels so the DEFLECTOMETER would now read "5" (DEFLECTOMETER reading "2" + 3 sensitivity levels = DEFLECTOMETER reading "5".

NOTE: THE SENSITIVITY SWITCH DYNAMICALLY UPDATES AFTER EACH SWITCH POSITION CHANGE, ALLOWING YOU TO SWITCH SENSITIVITY SETTINGS WHILE THE VEHICLE IS IN THE LOOP ZONE.

5. Additional Features & Benefits

Reset: The detector can be manually reset by pressing the front panel RESET button or momentarily interrupting power. Note: The detector must be reset after selecting any new switch parameters.

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. When power is restored to the detector, the yellow FAULT LED will automatically indicate the last loop status condition (Open Loop, Shorted Loop, 25% Change In Inductance, or No Loop Problem – See Table on the front page). Momentarily pressing the front panel RESET button will reset the loop fault indicator and the detector. Should you want to review the last loop condition after the detector has been reset, simply PRESS and HOLD the reset button and after 2 seconds the LOOP FAULT indicator will start to indicate the last loop fault condition.

Output "CALL" Memory: A power loss of 10 seconds or less will not drop the vehicle CALL Output. If power is removed from the detector for 10 seconds or less, the detector will automatically remember if a vehicle is present over the roadway loop. Note: The LMA-1100-LV or LMA-1100S-LV (low voltage) models will hold the CALL Output for approximately 4 seconds.

Loop Fault Diagnostics: The Loop Fault LED and 7-Segment DEFLECTOMETER indicate if the detector is within the specified Loop Inductance Range. The detector 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 FAULT LED's continuously emit a sequence of flashes (See LED Indications table on the front page). Additionally, the 7-Segment DEFLECTOMETER displays the letter "F" indicating a current loop fault condition.
If an Open or Shorted fault condition self heals, the OUTPUT LED and the 7-Segment DEFLECTOMETER will return to normal operation. The FAULT LED 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. The fault condition will be indicated by the flash sequence of the fault LED. Pressing the "RESET" button will clear the flash sequence from the LOOP FAULT LED. See "Loop Fault Memory" above for additional information.

Lead-in Lengths: The detector will operate with lead-in lengths up to 5,000 feet with appropriate loops and proper lead-in cable.

Operating Temperature: -30°F to 165°F (-34°C to +74°C).

Pin Assignment (Connections):

Model LMA-1100-LV

Pin	Function
1	12 VDC to 24 VDC / 24 VAC (+)
2	DC Ground / 24 VAC (-)
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

Model LMA-1100-120 and LMA-1100-240

Pin	Function
1	AC Line
2	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