

H1 SERIES



PC BOARD TYPE SINGLE CHANNEL DETECTOR



2.50" High x 2.75" Wide x 0.85" Deep

Ordering Information:

Model H1-XX-X ← M, F, or E: M = Male, F = Female, E = Euro Connector



12 or LP: 12 = Standard or LP = Low Power

Overview:

The Model H1-12-F is a direct replacement for the Model H-12-F. Although the Model H1 has enhanced features (italicized above), it is plug-in compatible with existing Model H-12-F installations. The H1-LP detector is a low power version. In order to conserve power, the H1-LP detector output response times are slightly slower and the Detect LED is automatically disabled 3 minutes after reset or power up to conserve power. Both versions are full feature detectors in a compact package.

- 12 VDC input power.
- 3 solid state (FET) outputs:
 - Presence (Output A).
 - *Presence, pulse-on-entry or pulse-on-exit (Output B).*
 - Fail output.
- Output A selectable for Fail-Safe or Fail-Secure operation.
- *Delay Outputs A & B for 0, 2, 5, or 10 seconds.*
- *Extend Outputs A & B (when in presence) for 0, 2, 5, or 10 seconds.*
- *8 levels of sensitivity.*
- Sensitivity Boost, for gate operation where high-bed vehicles might be encountered.
- "DETECT" Memory feature maintains detection during momentary power interruptions of up to 2 seconds.
- "Fail" LED indicates loop failures that are current or that have occurred.
- 4 loop frequencies.
- *Low Power version available (current draw 4 milliamps).*

H1 SERIES SPECIFICATION

This is a Performance Specification. It is not intended to be used as Operating Instructions.

Loop Frequency: Four selectable frequencies (normally in the range of 15 to 100 kilohertz) are DIP switch selectable.

Sensitivity: Vehicle detection results from a sufficient negative change in loop inductance (- $\Delta L/L$). Eight detection sensitivity levels are rotary switch selectable. (See "SENSITIVITY , - $\Delta L/L$, & RESPONSE TIME " table).

Sensitivity Boost: A DIP switch may be turned on to increase sensitivity only during the Detect State. When a vehicle enters the loop detection zone, the detector sensitivity is automatically boosted to a higher level than the vacant loop setting. The boosted sensitivity remains throughout the Detect State. When the vehicle leaves the loop detection zone, the sensitivity immediately returns to the vacant loop setting. This feature helps prevent dropouts during the passage of high bed vehicles and is particularly useful in sliding gate situations.

Output A TruePresence™: TruePresence™ will hold Output A in the "Detect" state for as long as the vehicle is present in the loop and power is not removed or reset applied. The TruePresence™ time applies only for normal size automobiles and trucks and for normal size loops (approximately 12 to 120 sq. ft.).

Fail-Safe/Fail-Secure Operation: When operating in the fail-safe mode Output A will assume the "Detect" output state during a loop fault condition. An additional fail-safe mode can be selected if Output A is used to drive an external relay. This mode would deactivate the relay if power or the loop fails. When in the fail-secure mode Output A will not respond to loop failures.

Delay Call: 0, 2, 5, or 10 second delay of Outputs A and B can be activated by setting DIP switches. Output delay is the time the detector outputs are delayed after a vehicle first enters the loop detection area. If the Delay feature is activated, the output will only be turned on after the selected delay time has passed with a vehicle continuously present in the loop detection area. If a vehicle leaves the loop detection area during the delay interval, detection is aborted and the next vehicle to enter the loop detection area will initiate a new full delay interval. By flashing the Detect LED at 2 Hz with a 50% duty cycle, the detector indicates that a vehicle is being detected but that the outputs are being delayed.

Extend Call: 0, 2, 5, or 10 second extension time can be activated by setting DIP switches to extend the signals of Outputs A & B (only if output B is set to presence output - Extension time will not affect output B when set to pulse mode). Extension time starts counting down when the vehicle leaves the loop detection zone. Any vehicle entering the loop detection zone before the extension time expires causes the detector to return to the detect state (regardless of the setting of the delay timer) and resets the extension timer. The detector will indicate that the extension interval is currently timing by flashing the Detect LED at 4 Hz with a 50% duty cycle.

Output B Modes of Operation: Output B has two modes of operation selected by DIP switches, Presence or Pulse. When in the presence mode, the presence hold time is the same as Output A. When in the pulse mode, the 250 millisecond pulse can be either pulse-on-entry (when the vehicle enters the loop area) or pulse-on-exit (When the vehicle exits the loop area). Output B is a fail-secure output in the presence or pulse modes.

Detect Indicator: The red LED is steady On while a vehicle is being detected. Flashing at 2 Hz with a 50% duty cycle indicates that the delay interval is currently timing. Flashing at 4 Hz with a 50% duty cycle indicates that the extension interval is currently timing. NOTE: On the Low Power Version the Detect LED is only operational during the first 3 minutes of power or after a reset. After 3 minutes of operation the Detect LED automatically turns off to conserve power.

Fail Indicator: The FAIL LED indicates whether or not the loop is currently within tolerance. If out of tolerance, the LED indicates the current loop failure by a short flash (20 mS) every second. If and when the loop returns to within tolerance, the FAIL LED will flash (20 mS) once every 5 seconds to indicate an intermittent loop fault has occurred and corrected. This flash rate will continue until another loop fault occurs, the detector is RESET, or the detector loses power.

Detector Reset: Changing the position of DIP Switch 10 (Presence / Pulse Mode) or DIP Switch 3 (Fail-Safe / Fail-Secure) will reset the detector. The detector can also be reset by momentarily pulling Pin 5 (Reset Pin) to ground. After changing the Frequency selection switches (DIP Switches 1 & 2), the detector will require a reset.

Detect Memory: The Detect State of the detector is maintained during momentary power interruptions of up to 2 seconds.

Low Power Version (H1-LP): When configured this way, the detector scans to conserve power, output response times are slower, and the Detect LED is automatically disabled 3 minutes after reset or power up except when the detector is in CALL. The H1-LP detector can be selected to operate in high speed mode, but the H1-12 will not operate in the low power mode.

Self Tuning: The detector automatically tunes and is operational within 2 seconds after application of power or after being reset. Full sensitivity and hold time requires 30 seconds of operation.

Environmental & Tracking: The detector is fully self-compensating for environmental changes and loop drift over the full temperature range and the entire loop inductance range.

Loop Inductance Range: 20 to 1000 microhenries with a Q factor of 5 or greater.

Loop Feeder Length: Up to 2500 feet (762 m) maximum with proper feeder cable and appropriate loops.

Loop Input: Transformer isolated. The minimum capacitance added by the detector or 0.10 microfarad.

Grounded Loop Operation: The loop isolation transformer allows operation with poor quality loops (which may include one short to ground at a single point).

Lightning Protection: The detector can tolerate, without damage, a 10 microfarad capacitor charged to 1,000 volts being discharged directly into the loop input terminals, or a 10 microfarad capacitor charged to 1,000 volts being discharged between either loop terminal and earth (chassis) ground.

Solid State Outputs: Open drain FET. Source to common. Rated for maximum continuous current of 2.5 amps. Rated for up to 25 VDC.

Power: 10 to 14 VDC, 21 milliamps max.

Low Power Version (H1-LP): 10 to 14 VDC, 4 milliamps max (with Detect LED deactivated after the first 3 minutes of operation).

Operating Temperature: -30°F to +180°F (-34°C to +82°C).

Connector: Molex (P/N 09-48-3105) 10 pin in-line female, connector centered on 2.50" side of PCB. (See "PIN ASSIGNMENTS" table).

Size: 2.50" high x 2.75" wide x 0.85" deep (excluding connector).

Weight: 1.9 oz (54 gm).

TABLES

SENSITIVITY, - $\Delta L/L$, & RESPONSE TIME:

Switch Position	0	1	2	3*	4	5	6	7
- $\Delta L/L$	2.56%	1.28%	0.64%	0.32%	0.16%	0.08%	0.04%	0.02%
H1-12	N/A	17 \pm 5	17 \pm 5	35 \pm 10	50 \pm 15	75 \pm 25	120 \pm 40	120 \pm 40
H1-LP	N/A	120 \pm 40	120 \pm 40	120 \pm 40	120 \pm 40	120 \pm 40	120 \pm 40	120 \pm 40

* Denotes factory default.

PIN ASSIGNMENTS:

Pin	Function
1	Loop
2	Loop
3	DC Common
4	12 VDC (+)
5	Reset
6	FAIL Output
7	DC Common
8	Output A
9	Output B
10	Relay / Solid State Fail-Safe Operation

FACTORY DEFAULT SETTINGS:

Switch	ON	OFF	Factory Default
1	Four (4) Frequency Selections		OFF
2			ON
3	Fail-Secure	Fail-Safe	OFF
4	Sensitivity Boost	No Boost	OFF
5	Four (4) CALL Delay Selections		OFF
6			OFF
7	Four (4) CALL Extension Selections		OFF
8			OFF
9	Pulse on Exit	Pulse on Entry	OFF
10	Output B Presence	Output B Pulse	OFF