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MODEL HM1 SERIES

MOTHERBOARD

INSTALLATION AND OPERATING INSTRUCTIONS

I. General

The HM1 Motherboard is available in various AC and DC input voltages and can be configured with Solid-State or Relay Outputs.

The model designation indicates the input voltage and output configuration as follows.

Model HM1-XX-X ← **R** = Relay Outputs, **Blank** = Solid-State Outputs

↑
3 = 120 VAC, **7** = 24 VAC, **23** = 12 VDC, **24** = 24 VDC

NOTE: Solid-State outputs are available only on the Model HM1-23.

II. Installation Instructions

- Using four #8 screws, fasten the Model HM1 Motherboard to a solid surface.
- Make the appropriate connections to the PWR+, PWR-, and EARTH terminals on terminal strip 1 (TS1) as shown in the table below.

Power Input - Terminal Strip 1 (TS1)

Voltage	PWR+	PWR-	EARTH
AC	AC Line	AC Neutral	Ground
DC	DC+	DC-	Ground

Make certain to provide adequate circuit protection by including an in-line fuse in the line or DC+ lead. Suggested fuse ratings are shown in the table below.

Power Input - Fuse Ratings

Model	HM1-3	HM1-7	HM1-23	HM1-24
Fuse	0.062 A	0.75 A	0.25 A	0.25 A

- Connect the loop leads from Loop 1 (Detector 1), Loop 2 (Detector 2), and Loop 3 (Detector 3) to the terminals on terminal strip 1 (TS1) labeled LOOP 1, LOOP 2, and LOOP 3.
- The outputs of Detectors 1, 2, and 3 terminate on terminal strip 2 (TS2). These motherboard outputs connect to the inputs of the control equipment.

Connection Configuration - Terminal Strip 2 (TS2)

Output Type	Output Mode	Normally Open	Normally Closed	Common
Solid-State	Fail-Safe	Terminal A	—	Terminal C
	Fail-Secure	Terminal A	—	Terminal C
Relay	Fail-Safe	Terminal B	Terminal A	Terminal C
	Fail-Secure	Terminal A	Terminal B	Terminal C

NOTE: The Solid-State output is an Open Drain FET output with DC Common tied to Terminal C.

- Terminal strip 3 (TS3) can be used to access the Fail Output circuit (see Section V below).
- Install up to three Model H1 loop detectors onto the Model HM1 Motherboard. Plug the detectors onto the 10-pin male Molex connectors labeled 1, 2, and 3.
- Set the SW1 DIP switches to the appropriate positions. See *DIP Switch Settings - DIP Switch 1 (SW1)* table.
- Apply appropriate power to the HM1 Motherboard.

III. DIP Switch Settings - DIP Switch 1 (SW1)

The HM1 Motherboard incorporates a three-position DIP switch module labeled SW1. Set the individual DIP switch (labeled 1, 2, or 3) to the **ON** position when a detector *is not* connected to the corresponding 10-pin male Molex connector. Set the DIP switch (SW1) to the **OFF** position when a detector *is* connected.

DIP Switch Settings - DIP Switch 1 (SW1)

DIP Switch	On	Off	Default Setting
1	Detector 1 Not Installed	Detector 1 Installed	Off
2	Detector 2 Not Installed	Detector 2 Installed	On
3	Detector 3 Not Installed	Detector 3 Installed	On

VI. Detect Outputs - Terminal Strip 2 (TS2)

The HM1 Motherboard Detect Outputs labeled 1, 2, and 3 terminal strip 2 (TS2) will operate according to the table below when connected as indicated.

Output Type	Fail-Safe Mode				Fail-Secure Mode			
	Call	No Call	Power Failure	Loop Failure	Call	No Call	Power Failure	Loop Failure
Solid-State	A-C	Open	Open	A-C	A-C	Open	Open	Open
Relay	B-C	A-C	B-C	B-C	A-C	B-C	B-C	B-C

A-C = Terminal A connected to Terminal C and no connection to Terminal B.

B-C = Terminal B connected to Terminal C and no connection to Terminal A.

Open = no connection between Terminal A, Terminal B, or Terminal C.

V. Fail Outputs - Terminal Strip 3 (TS3)

The Fail Output circuit on terminal strip 3 (TS3) can be used to send an indication to an external device whenever a detector experiences a loop failure (open loop or shorted loop) or power loss. The following table lists the HM1 Motherboard Fail Outputs when detectors are installed. Contact Reno A&E at (775) 826-2020 or contact@renoae.com for additional information on the use of this feature.

Output Type	Normal Operation	Loop Failure	Power Failure
Solid-State	NO - COM	Open	Open
Relay	NO - COM	NC - COM	NC - COM

NO - COM = Normally Open connected to Common.

NC - COM = Normally Closed connected to Common.

Open = no connection between Terminal A, Terminal B, or Terminal C.

VI. Reset

Press the motherboard mounted pushbutton labeled RESET to reset all detectors. The detectors automatically tune and are operational within two (2) seconds after being reset. Full sensitivity and hold time requires 30 seconds of operation.



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II. Installation Instructions

- Using four #8 screws, fasten the Model HM1 Motherboard to a solid surface.
- Make the appropriate connections to the PWR+, PWR-, and EARTH terminals on terminal strip 1 (TS1) as shown in the table below.

Power Input - Terminal Strip 1 (TS1)

Voltage	PWR+	PWR-	EARTH
AC	AC Line	AC Neutral	Ground
DC	DC+	DC-	Ground

Make certain to provide adequate circuit protection by including an in-line fuse in the line or DC+ lead. Suggested fuse ratings are shown in the table below.

Power Input - Fuse Ratings

Model	HM1-3	HM1-7	HM1-23	HM1-24
Fuse	0.062 A	0.75 A	0.25 A	0.25 A

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- The outputs of Detectors 1, 2, and 3 terminate on terminal strip 2 (TS2). These motherboard outputs connect to the inputs of the control equipment.

Connection Configuration - Terminal Strip 2 (TS2)

Output Type	Output Mode	Normally Open	Normally Closed	Common
Solid-State	Fail-Safe	Terminal A	—	Terminal C
	Fail-Secure	Terminal A	—	Terminal C
Relay	Fail-Safe	Terminal B	Terminal A	Terminal C
	Fail-Secure	Terminal A	Terminal B	Terminal C

NOTE: The Solid-State output is an Open Drain FET output with DC Common tied to Terminal C.

- Terminal strip 3 (TS3) can be used to access the Fail Output circuit (see Section V below).
- Install up to three Model H1 loop detectors onto the Model HM1 Motherboard. Plug the detectors onto the 10-pin male Molex connectors labeled 1, 2, and 3.
- Set the SW1 DIP switches to the appropriate positions. See *DIP Switch Settings - DIP Switch 1 (SW1)* table.
- Apply appropriate power to the HM1 Motherboard.

III. DIP Switch Settings - DIP Switch 1 (SW1)

The HM1 Motherboard incorporates a three-position DIP switch module labeled SW1. Set the individual DIP switch (labeled 1, 2, or 3) to the **ON** position when a detector *is not* connected to the corresponding 10-pin male Molex connector. Set the DIP switch (SW1) to the **OFF** position when a detector *is* connected.

DIP Switch Settings - DIP Switch 1 (SW1)

DIP Switch	On	Off	Default Setting
1	Detector 1 Not Installed	Detector 1 Installed	Off
2	Detector 2 Not Installed	Detector 2 Installed	On
3	Detector 3 Not Installed	Detector 3 Installed	On

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The HM1 Motherboard Detect Outputs labeled 1, 2, and 3 terminal strip 2 (TS2) will operate according to the table below when connected as indicated.

Output Type	Fail-Safe Mode				Fail-Secure Mode			
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Relay	B-C	A-C	B-C	B-C	A-C	B-C	B-C	B-C

A-C = Terminal A connected to Terminal C and no connection to Terminal B.

B-C = Terminal B connected to Terminal C and no connection to Terminal A.

Open = no connection between Terminal A, Terminal B, or Terminal C.

V. Fail Outputs - Terminal Strip 3 (TS3)

The Fail Output circuit on terminal strip 3 (TS3) can be used to send an indication to an external device whenever a detector experiences a loop failure (open loop or shorted loop) or power loss. The following table lists the HM1 Motherboard Fail Outputs when detectors are installed. Contact Reno A&E at (775) 826-2020 or contact@renoae.com for additional information on the use of this feature.

Output Type	Normal Operation	Loop Failure	Power Failure
Solid-State	NO - COM	Open	Open
Relay	NO - COM	NC - COM	NC - COM

NO - COM = Normally Open connected to Common.

NC - COM = Normally Closed connected to Common.

Open = No connection between Terminal A, Terminal B, or Terminal C.

VI. Reset

Press the motherboard mounted pushbutton labeled RESET to reset all detectors. The detectors automatically tune and are operational within two (2) seconds after being reset. Full sensitivity and hold time requires 30 seconds of operation.