

## 7800 SERIES RM7838A Relay Module

### SPECIFICATION DATA



### APPLICATION

The Honeywell RM7838A is a microprocessor based, integrated burner control for industrial process semi-automatically fired gas, oil or a combination of fuels for single burner industrial applications. The RM7838A is intended to replace the R4138A, B, C, and D but does not include an override on momentary power interruptions. The RM7838A System consists of a Relay Module, Subbase, Amplifier, Keyboard Display Module and Purge Card. Options include Personal Computer Interface, Data ControlBus™ Module, Remote Display Mounting, First-Out Expanded Annunciator and Combustion System Manager™ Software.

The RM7838A is programmed to provide a level of safety, functional capability and features beyond the capability of conventional controls.

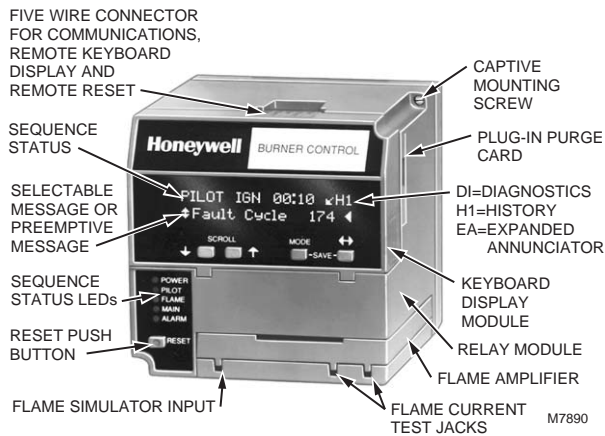
The basic function of the RM7838A is to delay admission of fuel to the combustion chamber until the pilot flame has been proven and then to monitor the flame through the run period while providing system status indication, system or self-diagnostics and troubleshooting.

### FEATURES

- **Safety features:**
  - Closed loop logic test.
  - Dynamic input check.
  - Dynamic safety relay test.
  - Dynamic self-check logic.
  - Expanded safe-start check.
  - Internal hardware status monitoring.
  - Tamper resistant timing and logic.
  - High Fire Purge Rate Switch test.
- Access for external electrical voltage checks.
- Provides 0.8 to 3.0 second Flame Failure Response Time (FFRT), depending on amplifier selected.
- Application flexibility.
- Communication interface capability.
- First-out annunciation and system diagnostics are provided by 2 row by 20 column Vacuum Fluorescent Display (VFD) located on the Keyboard Display Module.
- First-out expanded annunciation with 26 Light Emitting Diodes (LEDs) for limits and interlocks (optional).
- Five sequence information LEDs, see Fig. 1.
- Interchangeable plug-in flame amplifiers.
- Local or remote annunciation of RM7838 operation and fault information (optional).
- Dependable, long-term operation provided by microcomputer technology.
- Nonvolatile memory for retaining history files and sequencing status after loss of power.
- Remote reset capability (optional).
- **Burner controller data:**
  - Sequence status.
  - Sequence time.
  - Hold status.
  - Lockout/alarm status.
  - Flame signal strength.
  - Expanded annunciator status.
  - Total cycles of operation.
  - Total hours of operation.
  - Fault history of six most recent faults:
    - Cycles of operation at the time of the fault.



- Expanded annunciator data at the time of the fault.
  - Fault message and code.
  - Hours of operation at the time of the fault.
  - Sequence status at the time of the fault.
  - Sequence time at the time of the fault.
- Diagnostic information:
- Device type.
  - Flame amplifier type.
  - Flame failure response time.
  - Manufacturing code.
  - On/Off status of all line voltage digital inputs.
  - Selected purge time.
- Software revision and version of RM7838A and Keyboard Display Module.
- Status of configuration jumper.



**Fig. 1. Keyboard Display Module and Sequence Status LEDs.**

## SPECIFICATIONS

### Electrical Ratings (See Table 1):

Voltage and Frequency: 120 Vac (+10/-15%), 50 or 60 Hz (±10%).

Keyboard Display Module: 13.0 Vdc peak full wave rectified (+20/-15%).

Power Dissipation:

RM7838: 10 Watts maximum.

Display Module: 3 Watts maximum.

Maximum Total Connected Load: 2000 VA.

Fusing: Total Connected Load: 15A Fast Blow, maximum, type SC or equivalent.

### Environmental Ratings:

Ambient Temperature:

Operating: -40°F to +140°F (-40°C to +60°C).

Storage: -40°F to +150°F (-40°C to +66°C).

Humidity: 85% RH continuous, noncondensing.

Vibration: 0.5G environment.

**Dimensions:** See Fig. 2.

### Weight:

RM7838A: 1 pound 13 ounces, unpacked.

Keyboard Display Module: 4 ounces, unpacked.

### Approval Bodies:

Underwriters Laboratories Inc. listed, File No. MP268, Guide No. MCCZ.

Canadian Standards Association certified, LR9S329-3.

Factory Mutual approved, Report No. J.I.1V9A0.AF.

IRI acceptable.

Federal Communications Commission, Part 15, Class B—Emissions.

**Mounting:** Q7800A for panel mount or Q7800B for wall or burner mount.

### Required Components

Required for Operation:

Plug-in Flame Signal Amplifier (see Table 2).

ST 7800A Plug-in Purge Timer Cards, Selectable:

2 seconds to 30 minutes.

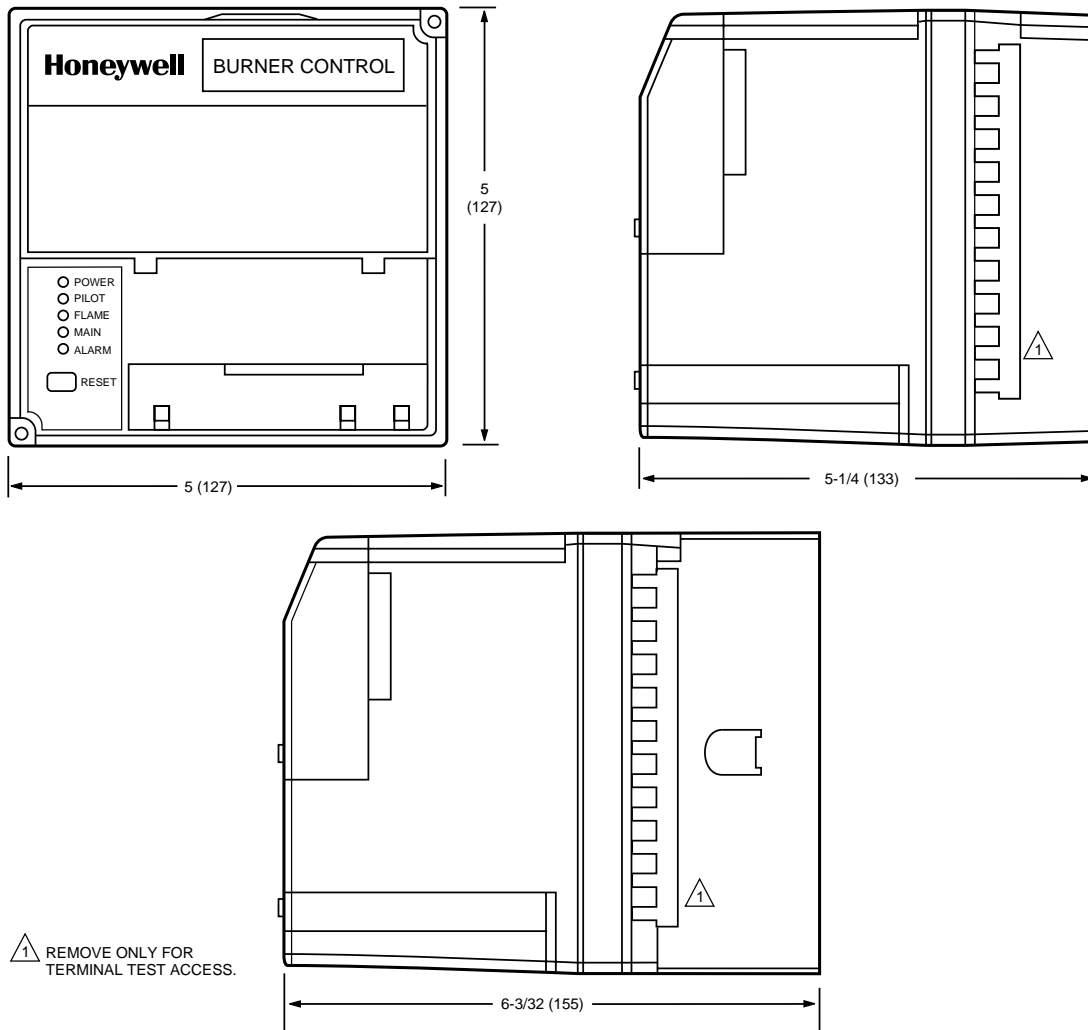
Table 1. Terminal Ratings.

Terminal No.	Description	Ratings
G	Flame Sensor Ground <sup>a</sup>	60 to 220 Vac, current limited.
Earth G	Earth Ground <sup>a</sup>	—
L2(N)	Line Voltage Common	—
3	Alarm	120 Vac, 1A pilot duty.
4	Line Voltage Supply (L1)	120 Vac (+10/-15%), 50 or 60 Hz ( $\pm 10\%$ ). <sup>b</sup>
5	Unused	—
6	Start/Stop Switch Input	120 Vac, 1mA.
7	Running Interlock	120 Vac, 8A run, 43A inrush.
8	Intermittent Pilot	120 Vac. <sup>c</sup>
9	Main Fuel Valve	120 Vac. <sup>c</sup>
10	Ignition	120 Vac. <sup>c</sup>
F(11)	Flame Sensor	60 to 220 Vac, current limited.
12-18	Unused	—
19	High Fire Switch Input	120 Vac, 1mA.
20	Unused	—
21	Run Enabled/Flame Proven	120 Vac, 2A pilot duty.
22	Shutter	120 Vac, 0.5A.

<sup>a</sup> The RM7838A must have an earth ground providing a connection between the subbase and the control panel or the equipment. The earth ground wire must be capable of conducting the current to blow the 15A fuse (or breaker) in event of an internal short circuit. The RM7838A needs a low impedance ground connection to the equipment frame, which, in turn, needs a low impedance connection to earth ground.

<sup>b</sup> 2000 VA maximum connected load to RM7838A Assembly.

<sup>c</sup> See Tables 3 and 4



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**Fig. 2. Mounting Dimensions of RM7838A Relay Module, Q7800A Subbase, and Q7800B Subbase, respectively, in in. ((mm)).**

**Table 2. Sequence Timing For Normal Operation.**

Device	Initiate	Standby	Purge	Pilot Flame Establishing Period (PFEP)	Run
RM7838A	10 sec.	*	**	4/10 sec.	*

\*STANDBY and RUN can be an infinite time period.

\*\*PURGE will be determined by which ST7800A purge card is selected.

**Table 3. Combinations for Terminals 8, 9, and 10.**

Combination No.	Pilot Fuel 8	Main 9	Ignition 10	Intermittent Pilot Valve 21
1	C	F	No Load	No Load
2	B	F	No Load	No Load
4	F	F	A	No Load
5	No Load	F	A	F
6	D	F	A	No Load
8	D	D	A	No Load
9	No Load	D	A	D

**Table 4. Composition of Each Combination.**

A	B	C	D	F
4.5A ignition	50 VA Pilot Duty plus 4.5A ignition.	180 VA ignition plus Motor valve with: 660 VA inrush, 360 VA open.	2A Pilot Duty	64 VA Pilot Duty plus Motor Valves with: 3850 VA inrush. 700 VA Open. 250 VA hold.

**Accessories:**

## Keyboard Display Modules (KDM):

- S7800A1001 English language (Standard with RM7838A Relay Module).
- S7800A1035 French language.
- S7800A1043 German language.
- S7800A1050 Italian language.
- S7800A1068 Spanish language.
- S7800A1118 Katakana (Japanese) language.
- S7800A1126 Portuguese language.

## Communications:

- Q7700A1014 Network Interface Unit, 120 Vac, 50/60 Hz applications, external modem required.
- Q7700B1004 Network Interface Unit with universal 100 to 250 Vac, 50/60 Hz external power supply, external modem required.
- QS7800A1001 ControlBus Module, standard.
- QS7800B1000 ControlBus Module, multidrop.
- QS7850A1006 ControlBus Module, General Purpose Interface.
- ZM7850A1001 Combustion System Manager™ software.

S7810A1009 Data ControlBus™ Module (if no KDM is used).

S7810B1007 Data ControlBus™ Module, Multi-Drop Switch Module.

S7810M1003 ModBus Module.

## Miscellaneous:

- A7800A1002 7800 SERIES Tester.
- S7820A1007 Remote Reset Module.
- S7830A1005 Expanded Annunciator, 120 Vac, 50/60 Hz.
- 203541 Data ControlBus™ Connector, 5-wire.
- 203765 Remote Display Mounting Bracket.
- 221729 Dust Cover, Relay Module.
- 204718A Keyboard Display Module Cover, NEMA 4, clear.
- 204718B Keyboard Display Module Cover, NEMA 1, clear.
- 204718C Keyboard Display Module Cover, NEMA 4, clear with reset button.
- 205321B Flush Display mounting kit.
- 221818A Extension Cable, display, 5 ft (1524 mm).
- 221818C Extension Cable, display, 10 ft (3048 mm).
- 123514A Rectification Flame Simulator.
- 203659 Ultraviolet Flame Simulator.
- 203968A Remote Display Power Supply, 13 Vdc, plug-in..

**Table 5. Flame Detection System.**

Plug-in Flame Signal Amplifiers					Applicable Flame Detectors		
Type	Color	Self-Checking	Model	Flame Failure Response Time	Fuel	Type	Models
Rectification	Green	No	R7847A	0.8 or 3 sec.	Gas	Rectifying Flame Rod Holders <sup>a</sup>	C7004, C7007, C7011. Complete Assemblies: C7008, C7009, Q179.
		No	R7847A	3 sec.	Gas, oil, coal	Ultraviolet (Purple Peeper™)	C7012A,C <sup>b</sup> .
		Dynamic AMPLI-CHECK™	R7847B <sup>c</sup>	0.8 or 3 sec.	Gas	Rectifying Flame Rod Holders <sup>a</sup>	C7004, C7007, C7011. Complete Assemblies: C7008, C7009, Q179.
		Dynamic AMPLI-CHECK™	R7847B <sup>c</sup>	3 sec.	Gas, oil, coal	Ultraviolet (Purple Peeper™)	C7012A,C <sup>b</sup>
		Dynamic Self-Check	R7847C <sup>d</sup>	3 sec.	Gas, oil, coal	Ultraviolet (Purple Peeper™)	C7012E,F.
Infrared	Red	No	R7848A	3 sec.	Gas, oil, coal	Infrared (Lead Sulfide)	C7015.
		Dynamic AMPLI-CHECK™	R7848B <sup>c</sup>	3 sec.	Gas, oil, coal	Infrared (Lead Sulfide)	C7015.
Ultraviolet	Purple	No	R7849A	0.8 or 3 sec.	Gas, oil	Ultraviolet (Minipeeper)	C7027, C7035, C7044. <sup>b</sup>

Table 5. Flame Detection System. (Continued)

Plug-in Flame Signal Amplifiers					Applicable Flame Detectors		
Type	Color	Self-Checking	Model	Flame Failure Response Time	Fuel	Type	Models
		Dynamic AMPLI-CHECK™	R7849B <sup>c</sup>	0.8 or 3 sec.	Gas, oil	Ultraviolet (Minipeeper)	C7027, C7035, C7044. <sup>b</sup>
		Dynamic Self-Check	R7861A <sup>d</sup>	0.8 or 3 sec.	Gas, oil	Ultraviolet	C7061.
	Blue	Dynamic Self-Check	R7886A <sup>d</sup>	3 sec.	Gas, oil, coal	Ultraviolet (Adjustable Sensitivity)	C7076.
Optical	White	Dynamic AMPLI-CHECK™	R7851B	0.8 or 3 sec.	Gas, oil, coal	Optical (UV, IR, Visible Light)	C7927, C7935, C7915, C7962.
		Dynamic Self-Check	R7851C <sup>d</sup>	3 sec.	Gas, oil, coal	Optical (UV only)	C7961.

<sup>a</sup> Order flame rod separately; see holder instructions.

<sup>b</sup> The C7012A,C, C7027, C7035, and C7044 Flame Detectors should be used only on burners that cycle on-off at least once every twenty-four hours. Appliances with burners that remain on continuously for twenty-four hours or longer should use the C7012E,F Flame Detector with the R7847C Amplifier, the C7061A Flame Detector with the R7861 Amplifier, or the C7076A,D Flame Detector with the R7886A Amplifier as the ultraviolet flame detection system.

<sup>c</sup> Circuitry tests the flame signal amplifier at least 12 times a minute during burner operation and shuts down the boiler if the amplifier fails.

<sup>d</sup> Circuitry tests all electronic components in the flame detection system (amplifier and detector) 12 times a minute during burner operation and shuts down the burner if the detection system fails.



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