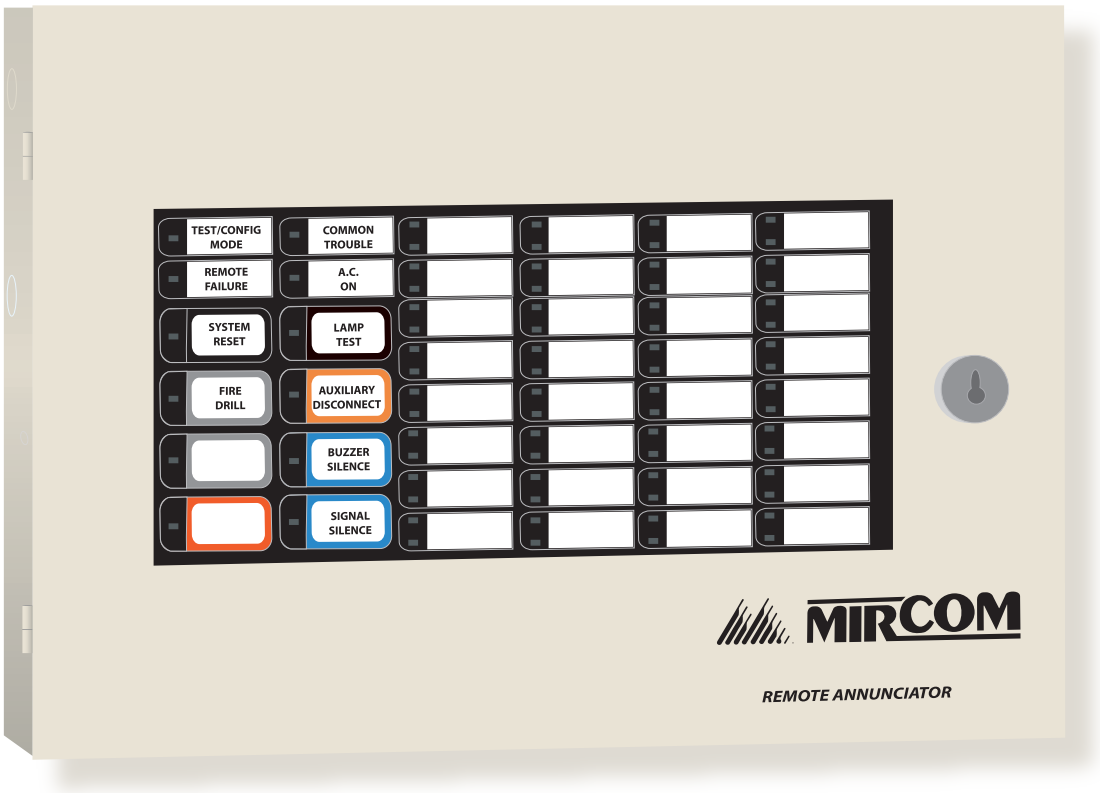
MIRCOM®
Advanced Life Safety Solutions

RA-1000 Series

Remote Multiplex Annunciator Panels



Installation and Wiring Manual

LT-617 Rev. 13
November 29 2006

Contents

Introduction

Mircom's modular design RA-1000 Series Remote Multiplex Annunciator panels provide a large capacity of annunciation (up to 208 points) with Mircom's standard FA-1000 Series Fire Alarm Control Panels. The RAM-1032(TZ) Main Annunciator Chassis is a 32-circuit annunciator that may be expanded with up to four RAX-1048(TZ) Adder Annunciator Chassis to a maximum of 208 circuit display points. The RAM-1032TZ is the same as the RAM-1032 with 32 added zoned trouble LEDs. The RAM-1016(TZ) Main Annunciator Chassis is a 16-circuit non expandable annunciator. The RAM-1016TZ is the same as the RAM-1016 with 16 added zoned trouble LEDs. The RAX-1048TZ is the same as the RAX-1048 with 48 added zoned trouble LEDs. Each circuit indicator is a bi-colour LED that is automatically configured to match the fire alarm control panel configuration. There are five types of enclosures available: the BB-1001, BB-1002, BB-1003, BB-1008, and BB-1012 which can take 1,2,3,8,12 chassis respectively.

Technical Support

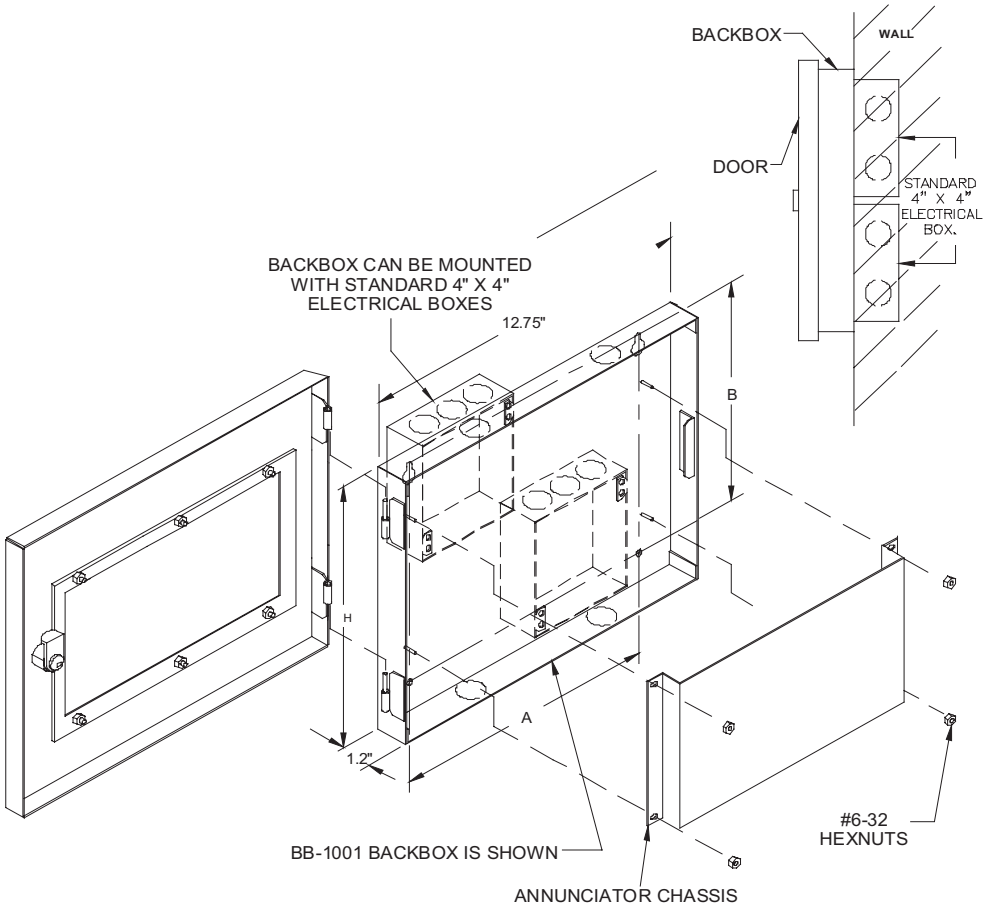
For all technical support inquiries, please contact Mircom's Technical Support Department between 8 A.M. and 5 P.M. (EDT) Monday through Friday, excluding holidays.

Local Phone: 905-660-4655 **Toll-Free Phone:** 1-888-660-4655

Local Fax: 905-660-4113 **Toll-Free Fax:** 1-888-660-4113

Installation Instructions

BACKBOX	HEIGHT H	MOUNTING A(IN.)	MOUNTING B(IN.)
BB-1001	9.0”	9.95”	7.5”
BB-1002	18.0”	9.95”	16.5”
BB-1003	26.5”	9.95”	24.9”
BB-1008	33.0”	20.9”	35.2”
BB-1012	45.0”	20.9”	52.0”



Note that the RAM-1032(TZ) and the RAM-1016(TZ) are supplied with the NP-680 laser printable label sheet. Column 1A or 1B (English or French) is selected for either a 2-stage or 1-stage system respectively. Discard column three and fill out the last four columns with the blanks after they have been printed. The RAX-1048(TZ) is supplied with the NP-681 blank laser printable label sheet.

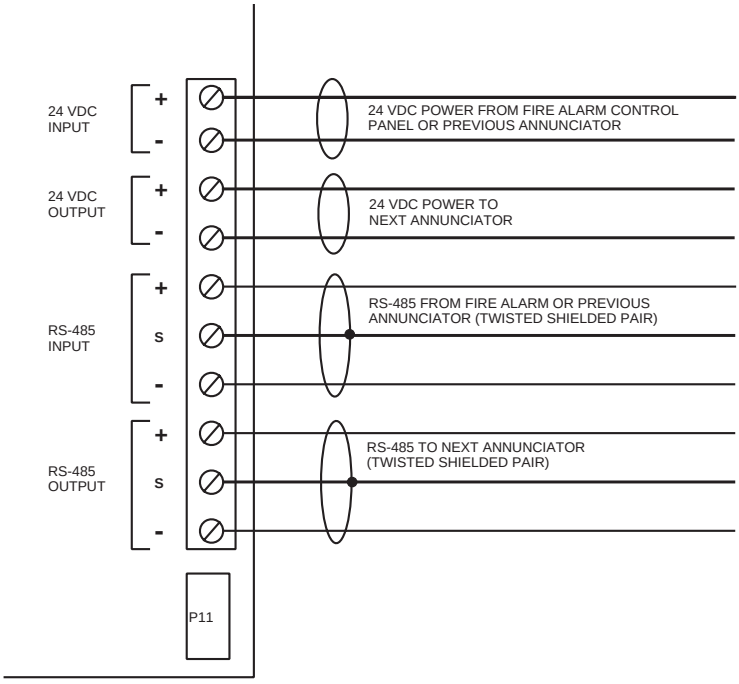
Note: The RA-1000 normally displays Initiating Circuit Status (no individual circuit troubles); however, models RAM-1016TZ, RAM-1032TZ, and RAX-1048TZ will allow individual circuit trouble indication. Indicating and Relay Circuits are not remotely displayed. For more details, see the Fire Alarm Control Panel manual.

Wiring Instructions

RS-485 WIRING

The RS-485 wiring to the RAM-1032(TZ) and RAM-1016(TZ) Module is recommended to be twisted shielded pair as shown in the diagram. The wire gauge may be:

- 22 AWG up to 2000 ft.
- 20 AWG up to 4000 ft.



24V DC POWER WIRING

The RS-485 wiring from the fire alarm control panel to the annunciator(s) must be point-to-point from the fire alarm panel to the first annunciator, then to the next annunciator, and so on. No star wiring or T-tapping is allowed. Each RAM-1032(TZ) and RAM-1016 Annunciator Module has a 120 ohm end-of-line resistor on its RS-485 output terminals. This is removed on all except the last wired module.

The 24 VDC field wiring needs to be of an appropriate gauge for the number of annunciators and the total wiring run length. Use the *Current Drain for Battery Calculations* on page 8 to calculate the maximum current for all annunciators summed together .

Note: All circuits are power limited and must use type FPL, FPLR, or FPLP power limited cable.

ATTENTION: Accidentally connecting any of the 24 VDC wires to the RS-485 wiring will result in damage to the annunciator and/or to the fire alarm control panel to which it is connected.

Max for all Annunciators	Maximum Wiring Run to Last Annunciator								Max Loop Resistance
	18AWG		16AWG		14AWG		12AWG		
Amperes	ft.	m	ft.	m	ft.	m	ft.	m	Ohms
0.06	2350	716	3750	1143	6000	1829	8500	2591	30
0.12	1180	360	1850	567	3000	915	4250	1296	15
0.30	470	143	750	229	1200	366	1900	579	6
0.60	235	71	375	114	600	183	850	259	3
0.90	156	47	250	76	400	122	570	174	2
1.20	118	36	185	56	300	91	425	129	1.5
1.50	94	29	150	46	240	73	343	105	1.2
1.70	78	24	125	38	200	61	285	87	1.0

DIP Switch Settings

Each annunciator assembly (main and adder chassis') needs to be assigned a unique, sequential Address via the Main Chassis DIP Switch SW1. DIP Switch SW2 is used to allow disabling of some Front Panel push buttons (when individual switches are "ON" then the corresponding push button is disabled).

The RA-1000 DIP switches are set as:

		DIP SWITCH SW1			**DIP SWITCH SW2**
SW1-1	=	Address A0	SW2-1	=	Disable System Reset button
SW1-2	=	Address A1	SW2-2	=	Disable Fire Drill button
SW1-3	=	Address A2	SW2-3	=	Disable Acknowledge button
SW1-4	=	Address A3	SW2-4	=	Disable General Alarm button
SW1-5	=	Must be set to "OFF" when used with FA-1000, FA-300, and FA-200 Series	SW2-5	=	Not Used
SW1-6	=	Not Used	SW2-6	=	Disable Auxiliary Disconnect button
SW1-7	=	Not Used	SW2-7	=	Not Used
SW1-8	=	**Checksum Select**	SW2-8	=	Disable Signal Silence button

Checksum Select:

ON when used with FX-2000 (16 bit checksum)

OFF when used with FA-1000, FA-300 and FA-200 Series (8 bit checksum)

For FA-1000, FA-300, and FA-200 Series Panels

Set the annunciator "Address" (see the manual for the fire alarm control panel being used), as follows in the table below:

DIP Switch Positions	**Annunciator Address**														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SW1-1 (A0)	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW1-2 (A1)	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW1-3 (A2)	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW1-4 (A3)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON

Notes: Annunciators on a common RS-485 connection must be numbered sequentially; i.e.: 1,2,3,4, and not randomly such as 5,3,8, 14!! Note that NOT ALL annunciator "Addresses" are valid for all Fire Alarm Control Panels. Refer to the Fire Alarm Control Panel Manual for further information

For FX-2000 Panels

Set the annunciator “Address” (see the manual for the fire alarm control panel being used), as follows in the table below:

Address	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	Address	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5
33	ON	OFF	OFF	OFF	OFF	**49**	ON	OFF	OFF	OFF	ON
34	OFF	ON	OFF	OFF	OFF	**50**	OFF	ON	OFF	OFF	ON
35	ON	ON	OFF	OFF	OFF	**51**	ON	ON	OFF	OFF	ON
36	OFF	OFF	ON	OFF	OFF	**52**	OFF	OFF	ON	OFF	ON
37	ON	OFF	ON	OFF	OFF	**53**	ON	OFF	ON	OFF	ON
38	OFF	ON	ON	OFF	OFF	**54**	OFF	ON	ON	OFF	ON
39	ON	ON	ON	OFF	OFF	**55**	ON	ON	ON	OFF	ON
40	OFF	OFF	OFF	ON	OFF	**56**	OFF	OFF	OFF	ON	ON
41	ON	OFF	OFF	ON	OFF	**57**	ON	OFF	OFF	ON	ON
42	OFF	ON	OFF	ON	OFF	**58**	OFF	ON	OFF	ON	ON
43	ON	ON	OFF	ON	OFF	**59**	ON	ON	OFF	ON	ON
44	OFF	OFF	ON	ON	OFF	**60**	OFF	OFF	ON	ON	ON
45	ON	OFF	ON	ON	OFF	**61**	ON	OFF	ON	ON	ON
46	OFF	ON	ON	ON	OFF	**62**	OFF	ON	ON	ON	ON
47	ON	ON	ON	ON	OFF	**63**	ON	ON	ON	ON	ON
48	OFF	OFF	OFF	OFF	ON						

On the RAX-1048(TZ) Adder Annunciator Chassis:

P1: Connects to the Main Annunciator Chassis, or to the previous Adder Annunciator Chassis.

P2: Connects to the Next Adder Annunciator Chassis.

On the RAM-1032(TZ) Main Annunciator Chassis:

P2: Connects to the first Adder Annunciator Chassis.

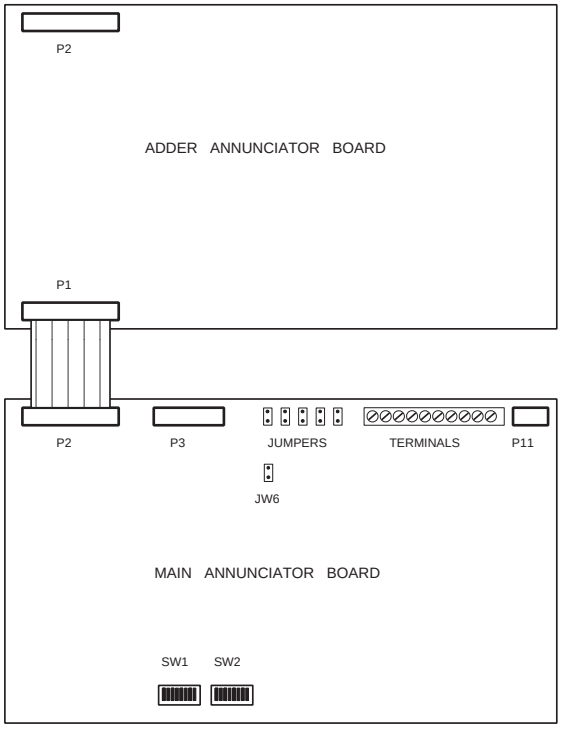
P3,P11: Not used.

Jumpers: Factory set. *Do not change*.

Terminals: See *Wiring Instructions* on page 3 for details.

SW1, SW2: Set DIP Switches as described in “DIP Switch Settings” on page 4.

JW6: RS-485 termination jumper. Remove on all except for last RAM-1032(TZ).



On the RAM-1016(TZ) Main Annunciator Chassis:

P2: Not used. No expansion allowed.

P3,P11: Not used.

Jumpers: Factory set. *Do not change*.

Terminals: See *Wiring Instructions* on page 3 for details.

SW1, SW2: Set DIP Switches as described in “DIP Switch Settings” on page 4.

JW6: RS-485 termination jumper. Remove on all except for last RAM-1016(TZ).

Specifications and Features

Enclosure Models

BB-1001: Backbox for one annunciator chassis with keylock door.

BB-1002: Backbox for up to two annunciator chassis with keylock door.

BB-1003: Backbox for up to three annunciator chassis with keylock door.

BB-1008: Backbox for up to eight annunciator chassis with keylock door.

BB-1012: Backbox for up to twelve annunciator chassis with keylock door.

Notes:

1. Enclosure finish: painted semi-gloss off white.
2. Material: BB-1001, BB-1002, BB-1003 are 18 GA. (0.048") thick CRS except the BB-1003 Door, which is 16 GA (0.060”). BB-1008, BB-1012 backboxes are 16 GA. (0.060") thick CRS, Doors are 14 GA (0.075”).
3. See *Installation Instructions* on *page 2* for enclosure dimensions.

Module Models

RAM-1032(TZ) Main Annunciator Chassis, 32 Display Points (TZ version has 32 extra trouble displays)

- 20 to 39 VDC (filtered or full-wave-rectified)
- Sealed membrane-like buttons and LED indicators.
- Local Buzzer, Indicators (AC-On, Common Trouble, Remote Failure, Aux. Disconnect, Acknowledge, General Alarm, Signal Silence, Test/Config Mode), and Controls (System Reset, Lamp Test, Fire Drill, Aux. Disconnect, Buzzer Silence, Signal Silence, General Alarm, Acknowledge).
- Buzzer silence activation silences the main fire alarm panel buzzer and all attached annunciator buzzers.
- Annunciation of up to 32 points (with trouble annunciation on the TZ version).
- Expandable by using up to four RAX modules.
- Standby: 50 mA Max., All LEDs “On”: 150 mA Max.
- TZ version: Standby 50mA Max., All LEDs “On”: 300mA Max.

RAM-1016(TZ) Main Annunciator Chassis, 16 Display Points (TZ version has 16 extra trouble displays)

- 20 to 39 VDC (filtered or full-wave-rectified)
- Sealed membrane-like buttons and LED indicators.
- Local Buzzer, Indicators (AC-On, Common Trouble, Remote Failure, Aux. Disconnect, Acknowledge, General Alarm, Signal Silence, Test/Config Mode), and Controls (System Reset, Lamp Test, Fire Drill, Aux. Disconnect, Buzzer Silence, Signal Silence, General Alarm, Acknowledge).
- Buzzer silence activation silences the main fire alarm panel buzzer and all attached annunciator buzzers.
- Annunciation of up to 16 points (with trouble annunciation on the TZ version).
- Non-expandable.
- Standby: 50 mA Max., All LEDs “On”: 75 mA Max.
- TZ version: Standby 50mA Max., All LED’s “On” 150 mA Max.

RAX-1048(TZ) Adder Annunciator Chassis, 48 Display Points (TZ version has 48 extra trouble display points)

- Interconnect via one ribbon cable to RAM-1032(TZ) or to previous RAX-1048(TZ).
- Annunciation of up to 48 additional points (with trouble annunciation on the TZ version).
- Standby: 15 mA Max., All LEDs “On”: 100 mA Max.
- TZ version: Standby: 15mA Max., All LEDs “On”: 200mA Max.

Current Drain for Battery Calculations

The lamp test feature draws the maximum normal current because it illuminates all lamps on one chassis at a time. Thus the currents are:

Normal Standby Current = 50 mA+ _____ X 15 mA = _____
(number of adder chassis)

Maximum = 150 mA+ _____ X 15 mA= _____
(number of adder chassis)

Use the **Normal Standby Current** for battery size calculations (see the fire alarm control panel manual for battery calculations) and includes the current drain for the Trouble Buzzer, Trouble LED, and one alarm LED. Use the **Maximum Current** to calculate the wire size (see *Wiring Instructions* on page 3).

Warranty & Warning Information

Warning Please Read Carefully

Note to End Users: This equipment is subject to terms and conditions of sale as follows:

Note to Installers

This warning contains vital information. As the only individual in contact with system users, it is your responsibility to bring each item in this warning to the attention of the users of this system. Failure to properly inform system end-users of the circumstances in which the system might fail may result in over-reliance upon the system. As a result, it is imperative that you properly inform each customer for whom you install the system of the possible forms of failure.

System Failures

This system has been carefully designed to be as effective as possible. There are circumstances, such as fire or other types of emergencies where it may not provide protection. Alarm systems of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some reasons for system failure include:

•*Inadequate Installation*

A Fire Alarm system must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. An inspection and approval of the initial installation, or, after any changes to the system, must be conducted by the Local Authority Having Jurisdiction. Such inspections ensure installation has been carried out properly.

•*Power Failure*

Control units, smoke detectors and many other connected devices require an adequate power supply for proper operation. If the system or any device connected to the system operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be fully charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as a fire alarm system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

•*Failure of Replaceable Batteries*

Systems with wireless transmitters have been designed to provide several years of battery life under normal conditions. The expected battery life is a function of the device environment, usage and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. While each transmitting device has a low battery monitor which identifies when the batteries need to be replaced, this monitor may fail to operate as expected. Regular testing and maintenance will keep the system in good operating condition.

•*Compromise of Radio Frequency (Wireless) Devices*

Signals may not reach the receiver under all circumstances which could include metal objects placed on or near the radio path or deliberate jamming or other inadvertent radio signal interference.

•*System Users*

A user may not be able to operate a panic or emergency switch possibly due to permanent or temporary physical disability, inability to reach the device in time, or unfamiliarity with the correct operation. It is important that all system users be trained in the correct operation of the alarm system and that they know how to respond when the system indicates an alarm.

•*Automatic Alarm Initiating Devices*

Smoke detectors, heat detectors and other alarm initiating devices that are a part of this system may not properly detect a fire condition or signal the control panel to alert occupants of a fire condition for a number of reasons, such as: the smoke detectors or heat detector may have been improperly installed or positioned; smoke or heat may not be able to reach the alarm initiating device, such as when the fire is in a chimney, walls or roofs, or on the other side of closed doors; and, smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building.

•*Software*

Most Mircom products contain software. With respect to those products, Mircom does not warranty that the operation of the software will be uninterrupted or error-free or that the software will meet any other standard of performance, or that the functions or performance of the software will meet the user's requirements. Mircom shall not be liable for any delays, breakdowns, interruptions, loss, destruction, alteration or other problems in the use of a product arising our of, or caused by, the software.

Every fire is different in the amount and rate at which smoke and heat are generated. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches or arson.

Even if the smoke detector or heat detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

•*Alarm Notification Appliances*

Alarm Notification Appliances such as sirens, bells, horns, or strobes may not warn people or waken someone sleeping if there is an intervening wall or door. If notification appliances are located on a different level of the residence or premise, then it is less likely that the occupants will be alerted or awakened. Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners or other appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.

•*Telephone Lines*

If telephone lines are used to transmit alarms, they may be out of service or busy for certain periods of time. Also the telephone lines may be compromised by such things as criminal tampering, local construction, storms or earthquakes.

•*Insufficient Time*

There may be circumstances when the system will operate as intended, yet the occupants will not be protected from the emergency due to their inability to respond to the warnings in a timely manner. If the system is monitored, the response may not occur in time enough to protect the occupants or their belongings.

•*Component Failure*

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

•*Inadequate Testing*

Most problems that would prevent an alarm system from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested as required by national standards and the Local Authority Having Jurisdiction and immediately after a fire, storm, earthquake, accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

•*Security and Insurance*

Regardless of its capabilities, an alarm system is not a substitute for property or life insurance. An alarm system also is not a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation.

IMPORTANT NOTE: End-users of the system must take care to ensure that the system, batteries, telephone lines, etc. are tested and examined on a regular basis to ensure the minimization of system failure.

Limited Warranty

Mircom Technologies Ltd. warrants the original purchaser that for a period of two years from the date of manufacture, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Mircom Technologies Ltd. shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labor and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original owner must promptly notify Mircom Technologies Ltd. in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period.

International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Mircom Technologies Ltd. shall not be responsible for any customs fees, taxes, or VAT that may be due.

Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

•damage incurred in shipping or handling;

•damage caused by disaster such as fire, flood, wind, earthquake or lightning;

•damage due to causes beyond the control of Mircom Technologies Ltd. such as excessive voltage, mechanical shock or

•water damage;

•damage caused by unauthorized attachment, alterations, modifications or foreign objects;

•damage caused by peripherals (unless such peripherals were supplied by Mircom Technologies Ltd.);

•defects caused by failure to provide a suitable installation environment for the products;

•damage caused by use of the products for purposes other than those for which it was designed;

•damage from improper maintenance;

•damage arising out of any other abuse, mishandling or improper application of the products.

Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Mircom Technologies Ltd. must first obtain an authorization number. Mircom Technologies Ltd. will not accept any shipment whatsoever for which prior authorization has not been obtained. NOTE: Unless specific pre-authorization in writing is obtained from Mircom management, no credits will be issued for custom fabricated products or parts or for complete fire alarm system. Mircom will at its sole option, repair or replace parts under warranty. Advance replacements for such items must be purchased.

Note: Mircom Technologies Ltd.'s liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty.

Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) And of all other obligations or liabilities on the part of Mircom Technologies Ltd. neither assumes nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

This disclaimer of warranties and limited warranty are governed by the laws of the province of Ontario, Canada.

Out of Warranty Repairs

Mircom Technologies Ltd. will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Mircom Technologies Ltd. must first obtain an authorization number. Mircom Technologies Ltd. will not accept any shipment whatsoever for which prior authorization has not been obtained.

Products which Mircom Technologies Ltd. determines to be repairable will be repaired and returned. A set fee which Mircom Technologies Ltd. has predetermined and which may be revised from time to time, will be charged for each unit repaired.

Products which Mircom Technologies Ltd. determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

WARNING: Mircom Technologies Ltd. recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

NOTE: Under no circumstances shall Mircom Technologies Ltd. be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property.

MIRCOM MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS GOODS DELIVERED, NOR IS THERE ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, EXCEPT FOR THE WARRANTY CONTAINED HEREIN.

Notes

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