MIRCOM®
Advanced Life Safety Solutions

# FA-102T

## Fire Alarm Control Panel


**Installation and Operation Manual**

LT-514 Rev.7
December 2009

# Table Of Contents

# List of Figures

# Introduction

The FA-102T is a supervised two-zone 24VDC Fire Alarm Control Panel. The panel provides the following features:

- Two Class B detection zones
- One Class B signal zone, 1.25A
- DIP switch selectable signal circuit outputs such as temporal or steady
- Alarm and trouble relay contacts
- Remote trouble and A.C. ON indication
- Individual zone silence/disconnect switch
- Buzzer silence switch
- Subsequent alarm operation
- LED indicators for zone alarm and trouble, A.C. On, Battery Fault, Ground Fault, Common Trouble, Signal Trouble and Signal Silenced

# Mechanical Installation

The panel can be surface or flush mounted. Refer to Figure 1 on page 5 for dimensions.

**Surface Mounting**

1. Mark the location of the four mounting holes.
2. Install the top two screws into the wall and place the panel over the screws.
3. Install the bottom screws and tighten down all four screws.

**Flush Mounting**

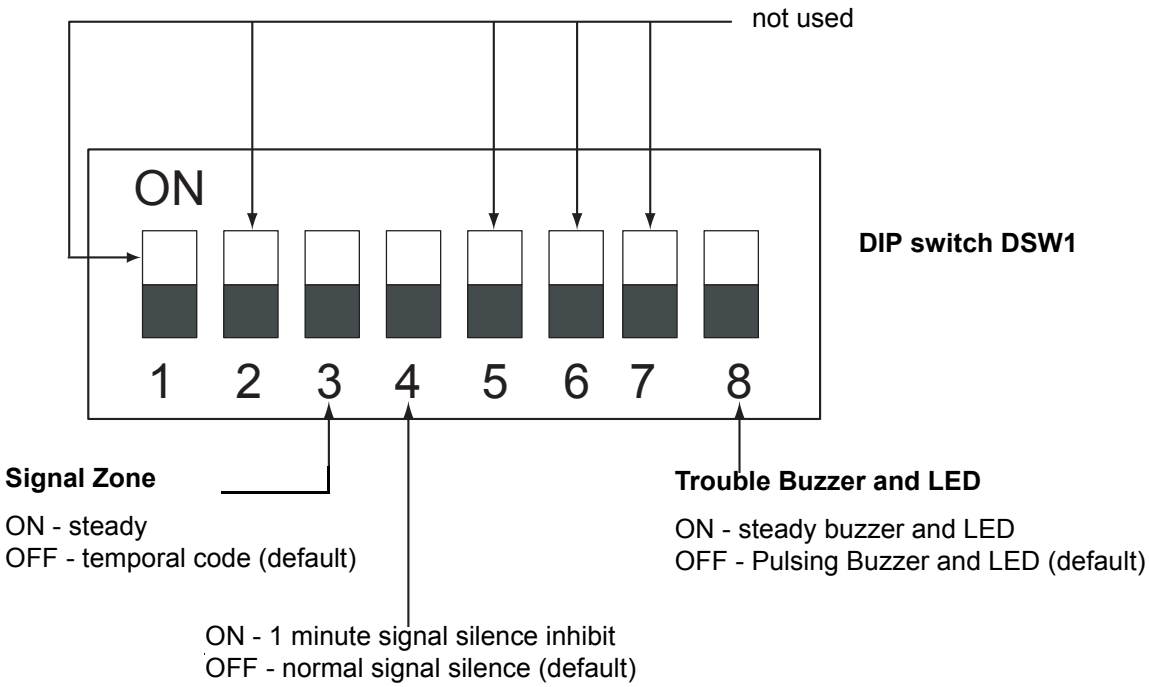
1. Make the wall cut-out according to the panel dimensions.
2. Remove the control panel door.
3. Mount the flush mounting trim (model FA-102TR) to the back box using the screws and nuts provided with the flush mounting kit.
4. Re-install the door on top of the flush trim. The cam lock may require a minor adjustment in order to compensate for the flush trim.

# Function Selection

The following jumpers are available for function selection. Refer to Figure 2 on page 6 for location.

- **JW1**: Cut for resettable +24V DC supply.
- **JW2**: Cut to make auxiliary relay disconnectable.
- **JW3**: Cut for normally open trouble contacts.
- **JW4:** Cut for normally closed trouble contacts.

DIP switch DSW1 is used to set the preferred signal zone 1 output, the signal silence inhibit, and the common trouble flash rate. The default output for the signal zone is temporal code.




- **Temporal Code:** 3 rounds of 0.5 second ON, 0.5 second OFF, then 1.5 second pause.
- **Steady:** Signal on continuously.

**Note:** Any time the DIP switches in DSW1 are positioned (ON or OFF), the panel must be reset by holding the Reset button for 5 seconds.

# Wiring

## Detection Zone

The system has two detection zones. Refer to Figure 3 on page 7 for wiring instruction and to Figure 4 on page 8 for wire size.

## Signal Zone

There is one signal zone available for bells and horns providing 1.25A of signal power. Refer to Figure 3 on page 7 for wiring instruction and to Figure 5 page 8 on for wire size.

## Alarm and Trouble Relays

Alarm and trouble relay contacts are provided. Refer to Figure 6 on page 9 for contact location and designation.

### Remote Annunciation

Annunciation outputs are provided for remote trouble indicator and buzzer. Refer to Figure 6 on page 9 for wiring instruction.

### A.C. Power and Batteries

The A.C. power is connected to the terminal block above the transformer.

Use Gel Cell or Sealed Lead-Acid type of batteries only. Connect the batteries after power up. Use 24V 4AH batteries for 24 hours standby and 5 or 30 minutes of alarm. For greater accuracy, use "Appendix B: Battery Calculations (Selection Guide)" on page 14.

**ELECTRICAL RATING:** 120V, 60Hz / 240V, 50Hz

## Trouble Indicators and Controls

Refer to Figure 2 on page 6 for the location of indicators and controls.

### Common Trouble LED

The yellow Common Trouble LED will flash and the buzzer will sound for any trouble in the panel (unless DSW1-8 is ON, then the Common Trouble LED will illuminate steadily and the buzzer will sound).

### Buzzer/Buzzer Silence Switch

The buzzer will sound intermittently for any trouble. For any alarm in the system the buzzer will sound steadily. Operating the buzzer silence switch will silence the buzzer. Any subsequent alarm or trouble will resound the buzzer. Operating the buzzer silence switch OFF normal will sound the buzzer steadily.

### Zone Trouble LED

The yellow Zone Trouble LED will illuminate steadily for an open loop in the zone. Refer to Figure 2 on page 6 for the location of indicators and control.

### Battery Fault LED

Battery removal, low voltage and open battery leads will turn on the yellow Battery Fault LED and the Common Trouble LED.

### Ground Fault LED

Any ground fault of 10K ohms or less will turn on the yellow ground fault LED steadily, flashing the Common Trouble LED and sounding the common trouble buzzer intermittently.

### Signal Trouble LED

The yellow Signal Trouble LED will illuminate steadily for any open or short. (The LED is located behind the display plate.)

# Sequence of Operation

Refer to Figure 2 on page 6 for the location of indicators and controls.

### Normal

All indicators are normally OFF except for the green A.C. On LED.

### Alarm

A red zone alarm LED will illuminate steadily for an incoming alarm.

### Signal Silence

If the 60 second signal silence inhibit is selected, the signal cannot be silenced for 60 seconds after an alarm initiation. Once the 60 seconds have expired, pushing the signal silence switch to the right will silence all the bells and horns. Once the signal has been silenced, the signal silenced LED will illuminate. If the switch is in the OFF normal position to the right while there is no alarm condition, the panel will indicate trouble.

### Reset/Lamp Test

Operating the reset switch will restore all latched functions in the panel. The smoke detectors will reset if all products of combustion are cleared from their chambers. Holding the reset switch for five seconds will cause the panel to preform a lamp test as well as reset the panel.

# System Checkout

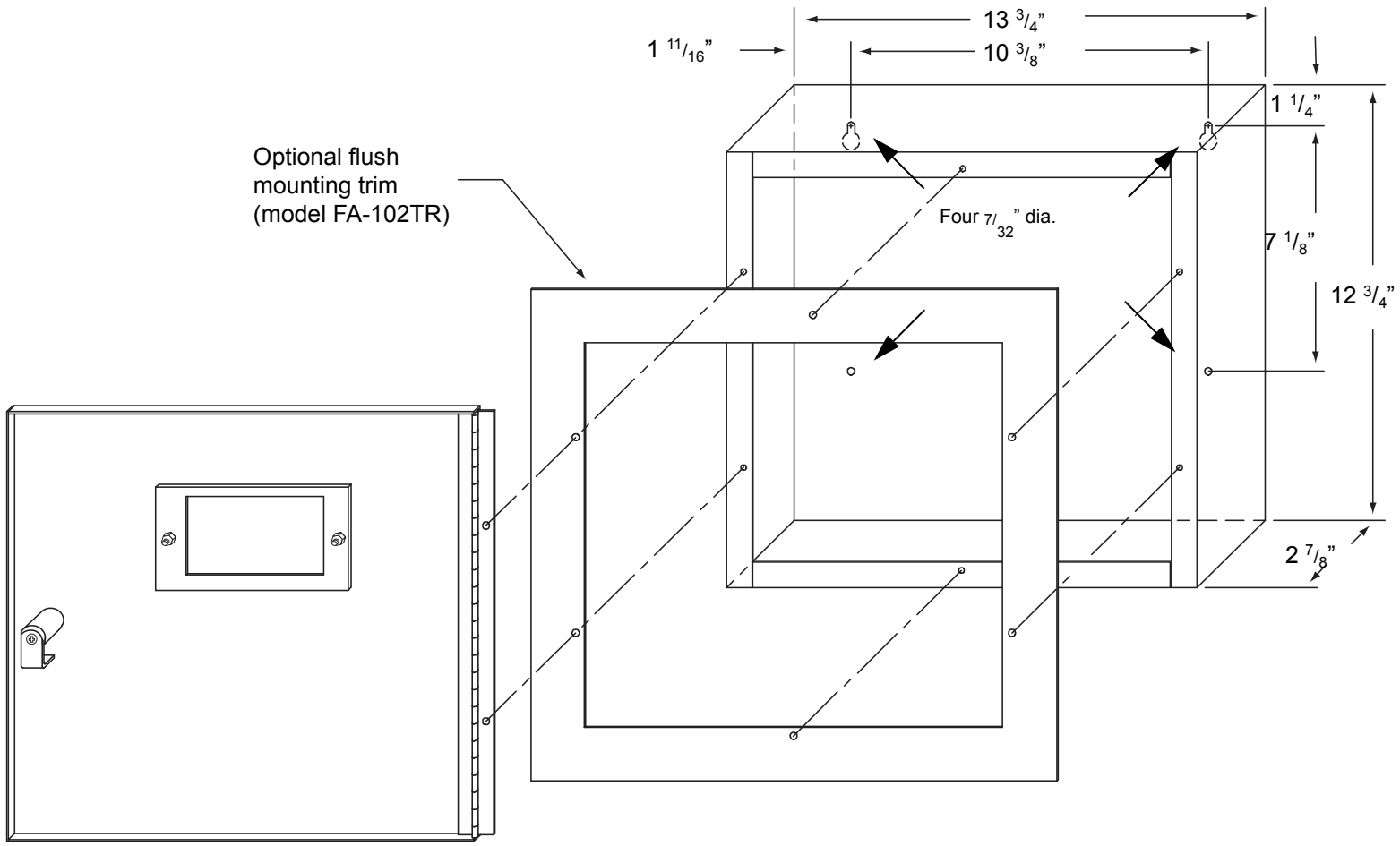
Before turning the power on,

1. Check all external wiring for opens, shorts or grounds.
2. Check that transformer cables are securely connected.
3. Check the *A.C.* power wiring for proper connection. To prevent sparking, *do not* connect batteries.
4. Check that all switches are in the normal position to the left.

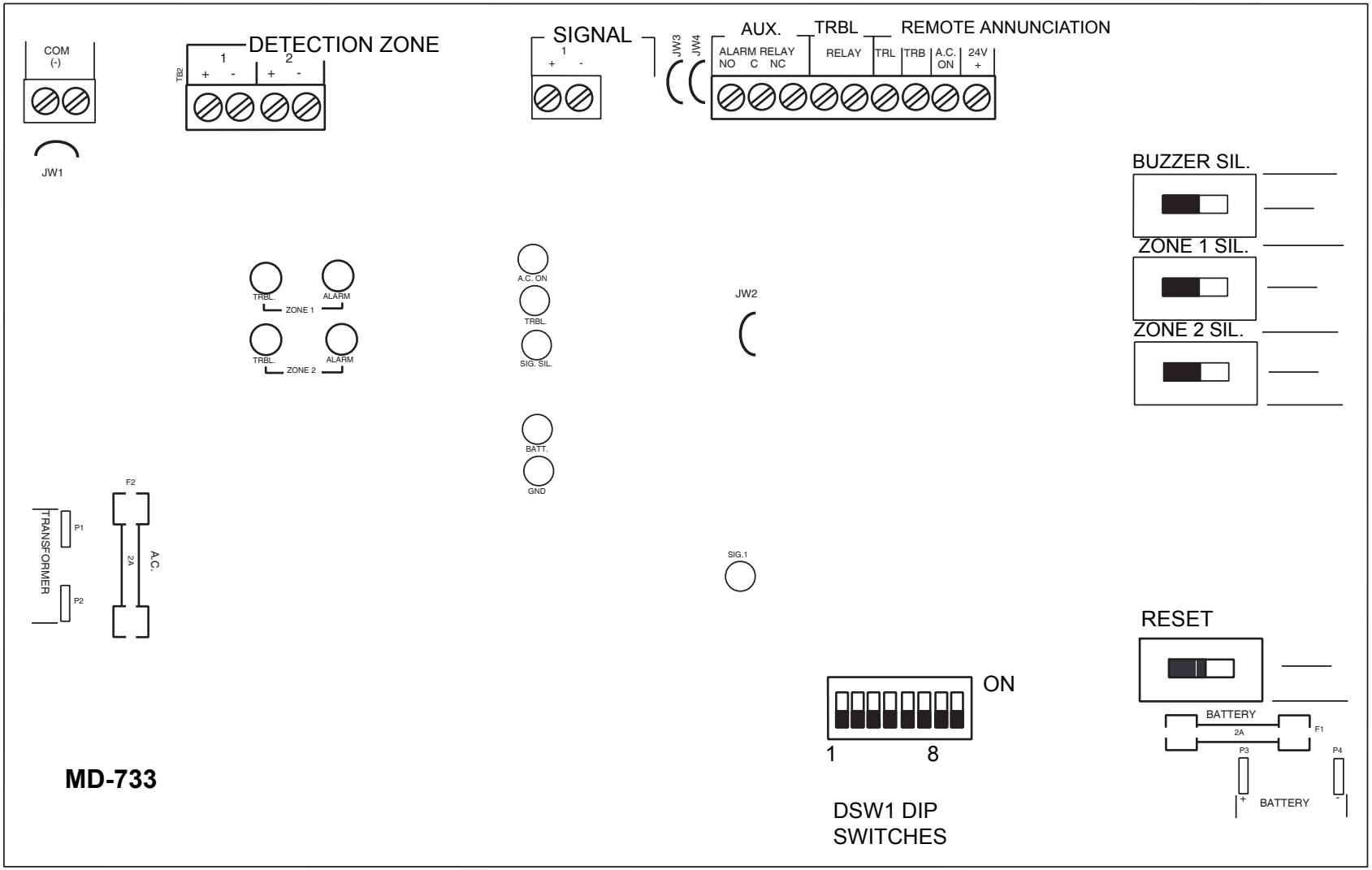
# Power up and Troubleshooting

1. After completing all of the system checkout procedures, power up the panel. The A.C. On LED should illuminate.The trouble buzzer should sound intermittently, the Common Trouble LED should flash, indicating battery fault.
2. Connect the batteries carefully, observing the correct polarity.The Common Trouble LED should extinguish. If the Common Trouble LED stays on, check the front panel for the illumination of the following LEDs:
   - **Battery LED** indicates that the battery voltage may be too low (below 20.4V). Replace batteries as required.
   - **Ground Fault LED** indicates a ground on one or more of the extended wires.
   - **Zone Trouble LED** indicates an open loop or a signal silence switch is in the OFF normal position to the right.
   - **Signal Trouble LED** indicates an open loop or short in the signal zone.

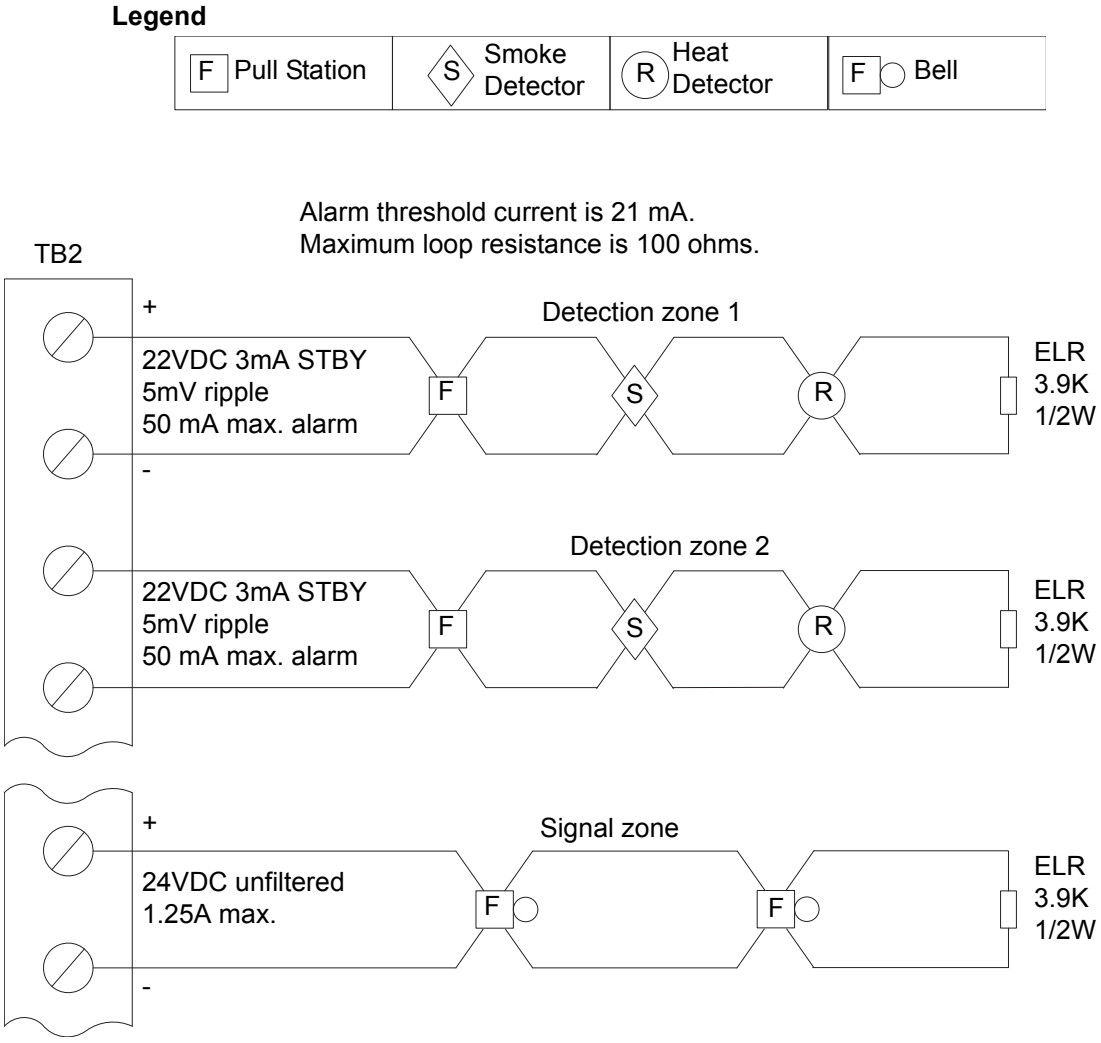
## Figure 1: Backbox and flush trim mounting details



## Figure 2: Circuit Board Layout



## Figure 3: Detection and signal wiring



# Wiring Tables and Information

## Figure 4: Wiring table for detection zone

| Wire Gauge | Maximum Wiring Run to Last Device (ELR) | |
|---|---|---|
| (AWG) | ft. | m |
| 22 | 2990 | 910 |
| 20 | 4760 | 1450 |
| 18 | 7560 | 2300 |
| 16 | 12000 | 3600 |
| 14 | 19000 | 5800 |
| 12 | 30400 | 9200 |

**Note:** Maximum loop resistance should not exceed 100 ohms.

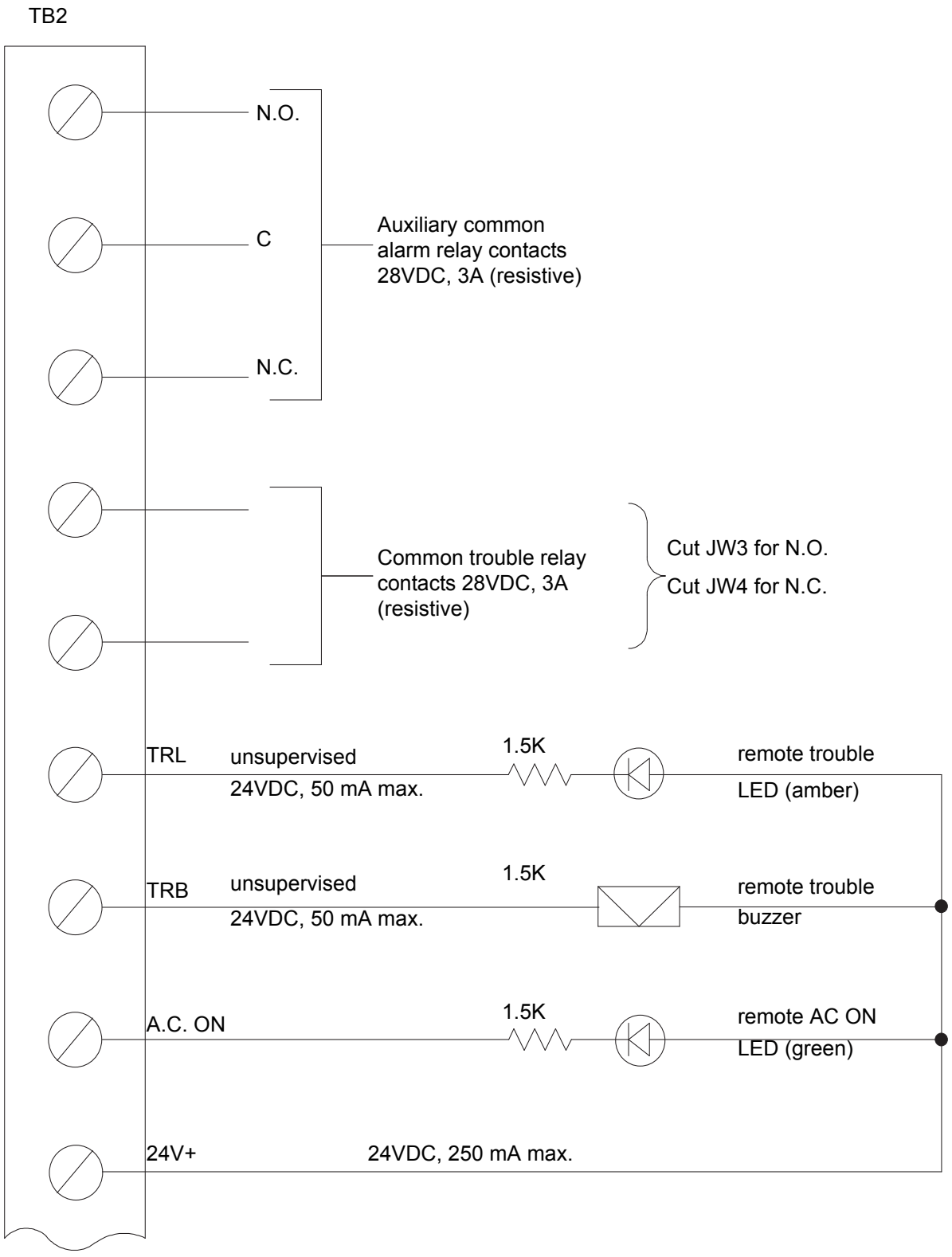
## Figure 5: Wiring table for bells and horns

Signal circuits are rated for 1.25 amperes each.

| Total Signal Load | Maximum Wiring Run to Last Device (ELR) | | | | | | | | 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 |

**Note:** Maximum voltage drop should not exceed 1.8 volts.

## Figure 6: Alarm and trouble relay contacts and remote annunciation wiring instructions



# Appendix A: Compatible Devices

## Underwriters' Laboratories of Canada (ULC) Canadian 2-Wire Smoke Detector Control Panel

**Notes:**

- Reset time, hold for five seconds minimum.
- Whether mixing different models of compatible smoke detectors, or using the same model on the same Circuit, total standby current of all detectors must not exceed 3 mA.

| Make Model / Base | Make Model / Base | Make Model / Base |
|---|---|---|
| **Mircom** | **Cerebrus Pyrotronics** | **Fenwal** |
| MIR-525 | D1-2 | PSD-7131/70-201000-001 |
| MIR-525T | D1-3/DB-3S | PSD-7131/70-201000-002 |
| **System Sensor** | **Mirtone** | PSD-7131/70-201000-003 |
| 1400-A | 73471 | PSD-7131/70-201000-005 |
| 2400-A | 73494 | PSD-7130/70-201000-001 |
| 1451-A/B401B | 73575 | PSD-7130/70-201000-002 |
| 1451-A/B406B | 73495/73486 | PSD-7130/70-201000-003 |
| 2451-A/B401B | 73495/73487 | PSD-7130/70-201000-005 |
| 2451-A/B406B | 73595/73486 | PSD-7128/70-201000-001 |
| 1451DH/DH400A | 73595/73497 | PSD-7126/70-201000-002 |
| 2451-A/DH400A | 73594/73400 | PSD-7126/70-201000-003 |
| **Edwards** | 73405/73400 | PSD-7126/70-201000-005 |
| 6249C | 73594/73401 | PSD-7129/70-201000-000 |
| 6250C | 73405/73401 | PSD-7125/70-201000-001 |
| 6264C | **Simplex** | PSD-7126/70-201000-002 |
| 6266C | 2098-9110 | PSD-7125/70-201000-003 |
| 6269C | | PSD-7125/70-201000-005 |
| 6270C | | CPD-7021/70-201000-001 |
| 6269C-003 | | CPD-7021/70-201000-002 |
| 6270C-003 | | CPD-7021/70-201000-003 |
| | | CPD-7021/70-201000-005 |

## Underwriters' Laboratories of Canada (ULC) Canadian Signal Zone Compatible Devices

| Make Model |
|---|
| **Mircom** |
| BL-6B |

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# Appendix B: Battery Calculations (Selection Guide)

Use the form below to determine the required batteries.

| IMPORTANT NOTICE |
|---|
| The main AC branch circuit connection for the Fire Alarm Control Unit must provide a dedicated continuous power without provision of any disconnect devices. Use #12 AWG wire with 600-volt insulation and proper over-current circuit protection that complies with the local codes. |

**Power Requirements (All currents are in amperes)**

| Model Number | Description | Qty | | Standby | Total Standby | Alarm | Total Alarm |
|---|---|---|---|---|---|---|---|
| FA-102T | Fire Alarm, 2 Det, 1 Sig | | X | 0.076 | = | 0.135 | = |
| RTI-1 | Remote Trouble Indicator | | X | 0.035 | = | 0.035 | = |
| 2-Wire Smoke Detectors | | | X | ♦ 0.0001 | = | * 0.090 | = 0.090 |
| 4-Wire Smoke Detectors | | | X | | = | | = |
| Signal Load (bells, horns, strobes, and etc.) | | | | | | | = |
| Total currents (Add above currents) | | | | Standby | (**A**) | | (**B**) |

### Total Current Requirement

ALARM (**B**)_____ Amps.

### Battery Capacity Requirement

**(**[STANDBY (**A**) _____ ] X [(24 or 60 Hours) _____ ]**)** + **(**[ALARM (**B**) _____ ] X [♣Alarm in Hr.] _____**)** = (**C**) _____AH

### Battery Selection

Multiply (**C**) by 1.20 to derate battery.

**Note:** Batteries BA-104 (4.0AH) and BA-1065(6.5AH) fit into the backboxes; all larger batteries such as BA-110(10AH) and the BA-117(17AH) require an external battery box.

* Assuming three Initiating Circuits in alarm.

♣ Use **0.084** for five minutes of alarm or **0.5** for thirty minutes of alarm as a multiplier figure.

♦ Using the **MIR-525/U** 2-wire smoke detector. See Appendix "A", for other available smoke detectors .

**Applicable Standards:** ULC S-524, ULC-527-99, wiring is in accordance with Canadian Electrical Code, C22.1, Part 1, Section 32

# 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. together with its subsidiaries and affiliates (collectively, the “Mircom Group of Companies”) 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 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 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 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 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);

•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 must first obtain an authorization number. Mircom 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’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 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 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 must first obtain an authorization number. Mircom will not accept any shipment whatsoever for which prior authorization has not been obtained.

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

Products which Mircom 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.

*The foregoing information is accurate as of the date of publishing and is subject to change or revision without prior notice at the sole discretion of the Company*

**WARNING: Mircom 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 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.**

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