

OpenBAS | BUILDING
AUTOMATION
SYSTEM

OpenBAS-HV-RF433R

Wireless Receiver

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1.0 Introduction

This document provides information on installing the OpenBAS-HV-RF433R Wireless Receiver.

1.1 OpenBAS-HV-RF433R Wireless Receiver

Mircom's OpenBAS-HV-RF433R Wireless Receiver is a wireless 433 MHz RF receiver that integrates up to 10 wireless transmitters and thermostats into NX series controllers except for OpenBAS-HV-NX4AO.

1.2 Features

Mircom's OpenBAS-HV-RF433R Wireless Receiver integrates into Mircom's unified platform for automating HVAC and mechanical rooms as well as incorporating energy management features and lighting control to offer building owners and managers a seamless operation with the following features:

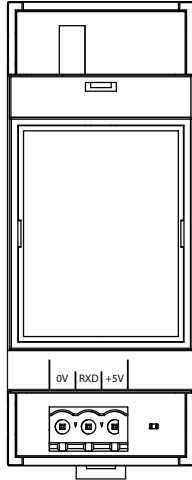
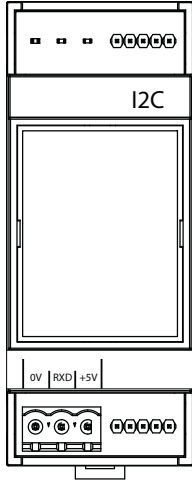
- Modular design to cover any small, medium or large project.
- Industry standard field bus protocols to integrate into any existing BAS system, such as BACnet, Modbus, Optomux, N2-Open, and ASCII.
- Advanced Networking to integrate into IP networks and use the most advanced features and protocols such as distributed computing, USB and Cloud storage, HTML5, JavaScript, XML, Ajax, SMS, and GSM.
- Modular add-ons for every Building Automation System solution.
- The OpenBAS software which provides owners and managers a single solution for managing all their building's automation needs.

2.0 Overview

2.1 OpenBAS-HV-RF433R Components

2.1.1 Controllers

Table 1 OpenBAS-HV-RF433R Controllers

Picture	Model	Description
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>RF module</p>  </div> <div style="text-align: center;"> <p>I2C module</p>  </div> </div>	OpenBAS-HV-RF433R	<p>Wireless 433 MHz RF receiver that integrates up to 10 wireless transmitters and thermostats into OpenBAS-LC-NX12R and OpenBAS-HV-NX series controllers</p> <p>Mounts in a DIN rail-mounted box</p>

3.0 Installation



Note: Installation of OpenBAS-HV-RF433R controllers should be in accordance with the Canadian Electrical Code or the National Electrical Code, and comply with all local regulations. Final acceptance is subject to the Local Authority Having Jurisdiction (AHJ).

3.1 Parts of the Enclosure

The OpenBAS-HV-RF433R consists of two modules: the RF module and the I2C module. The RF module receives information wirelessly from the OpenBAS-HV-WLSTH thermostat. The I2C module is connected to any OpenBAS NX controller, or an OpenBAS-NWK-ETH3 controller through the I2C connection.

The RF module and the I2C module communicate with each other over wires (shown in section 4.2 on page 16). The maximum wiring distance between the RF module and the I2C module is 49 feet (15 m).

Each module consists of a circuit board and an enclosure.

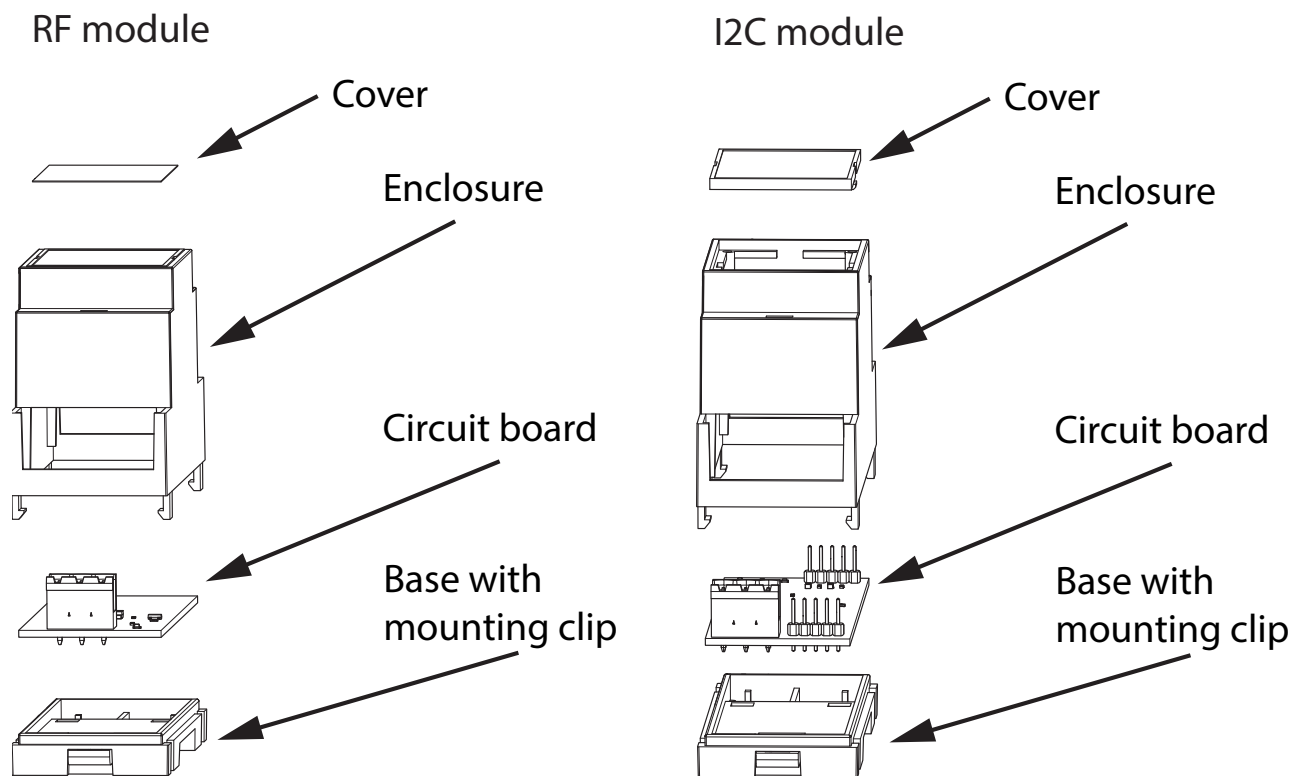


Figure 1 Parts of the enclosure

To remove the circuit board from the enclosure



Caution: **Risk of Electric Shock.** Disconnect the mains power and disconnect the controller from all wiring before opening the enclosure.



Attention: Always hold circuit boards by the edges to prevent damage from static electricity. Always wear an anti-static bracelet when handling circuit boards.

1. Insert a flathead screwdriver under the tabs on the enclosure, shown in Figure 2, in order to lift the tabs and remove the base.

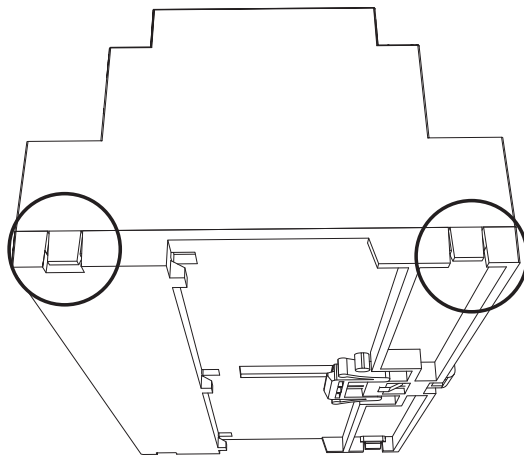


Figure 2 Tabs on enclosure

2. Hold the circuit board with one hand, and with the other hand lift the tabs so that you can remove the circuit board from the enclosure. See Figure 3.

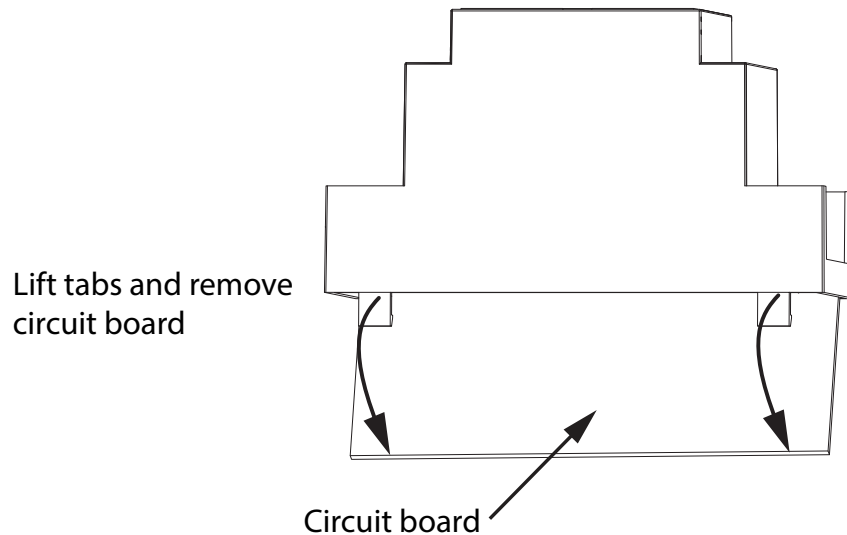


Figure 3 Lift tabs and remove circuit board



Attention: Be careful not to break the tabs. Do not apply excessive force.

3.2 Controller Board Connections

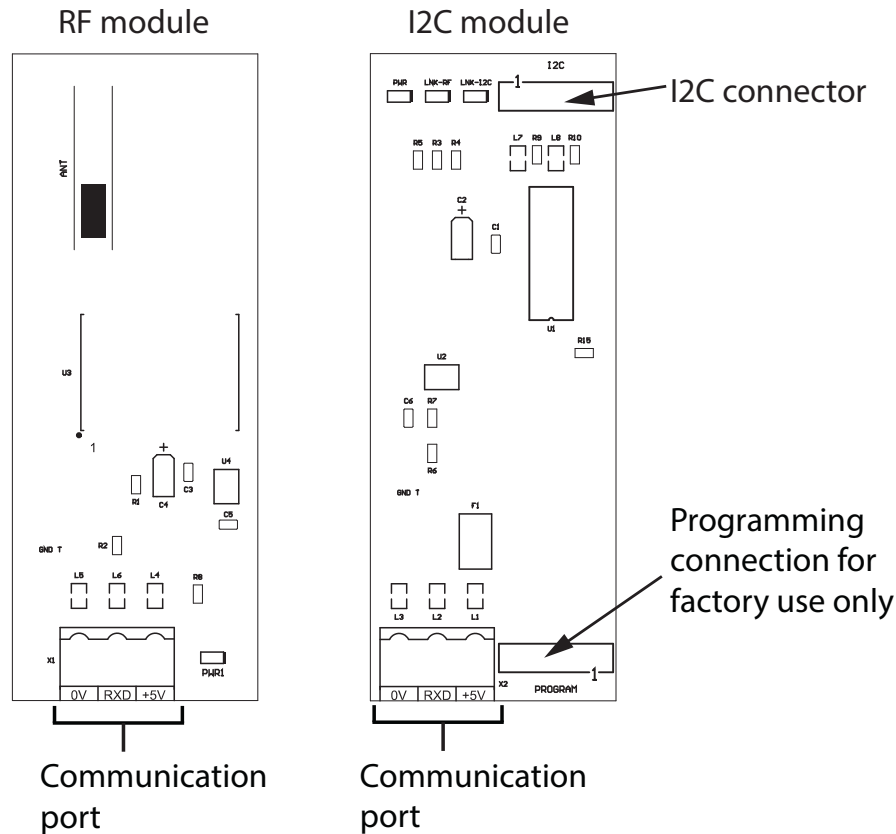


Figure 4 Board connections

3.3 Installing Accessories



Attention: This job must be performed only by a certified technician as dangerous voltages might be present inside of the enclosure. Always disconnect the power before installing accessories.

3.3.1 I2C Connector

Connect the I2C port of the I2C module (shown in Figure 4) to the I2C port of an OpenBAS controller. The maximum length of the connection is 1 foot (30 cm).

The OpenBAS-HV-RF433R receives power from the OpenBAS controller that it is connected to.



Note: When connecting the I2C ports on 2 devices, make sure to connect pin 1 on the first device to pin 1 on the second device. Pin 1 is marked by a dot or a "1".

3.4 Enclosure Dimensions

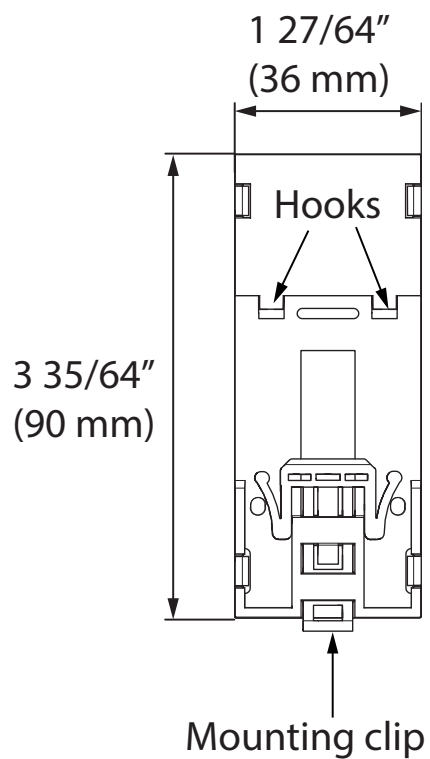


Figure 5 Enclosure (back view)

3.5 Assembly

To put the circuit board in the enclosure

1. Hold the circuit board with one hand, and with the other hand lift the tabs so that you can fit the circuit board into the enclosure as shown below.



Note: Make sure that the board is the right way up: the terminal labels on the enclosure must match the terminal labels on the circuit board.

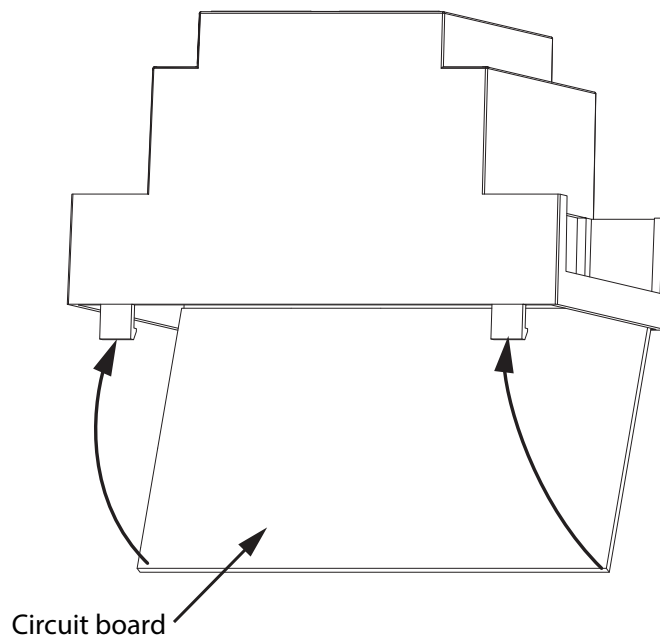


Figure 6 Fit the circuit board in enclosure

2. Snap the base onto the enclosure. Make sure that the mounting clip is on the bottom.
3. Snap the cover in place. Make sure that the Mircom logo is the right way up.



Attention: Always hold circuit boards by the edges to prevent damage from static electricity. Always wear an anti-static bracelet when handling circuit boards.

3.6 Mounting the Enclosures



Attention: Mount the RF module on a DIN rail in a UL-compliant plastic box to allow reception of RF signals from the OpenBAS-HV-WLSTH transmitter.

Mount the I2C module on a DIN rail in a UL-compliant metal or plastic box.

Do not drill holes in the enclosure or modify the enclosure in any way.

To mount the enclosure on a DIN rail

Mount the enclosure so that the terminal labels are the right way up and the mounting clip is on the bottom as shown in Figure 9.

1. Mount a section of DIN rail so that there is enough space for the enclosure to be mounted.
2. Slide the hooks under the rail and push the enclosure to secure it on the DIN rail. The mounting clip locks it in place.

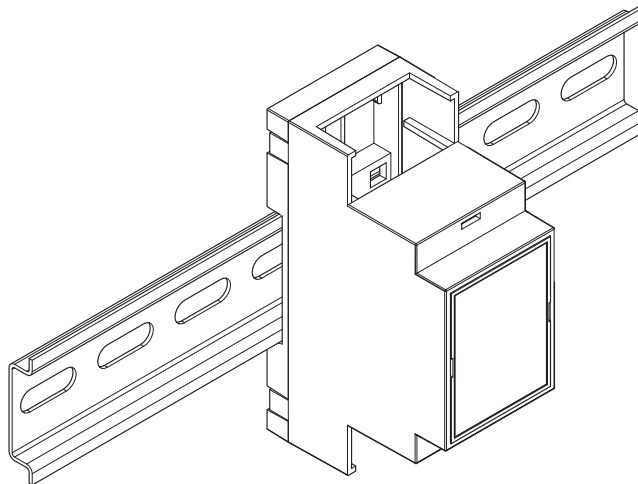


Figure 7 Enclosure mounted on DIN rail (circuit board not shown)

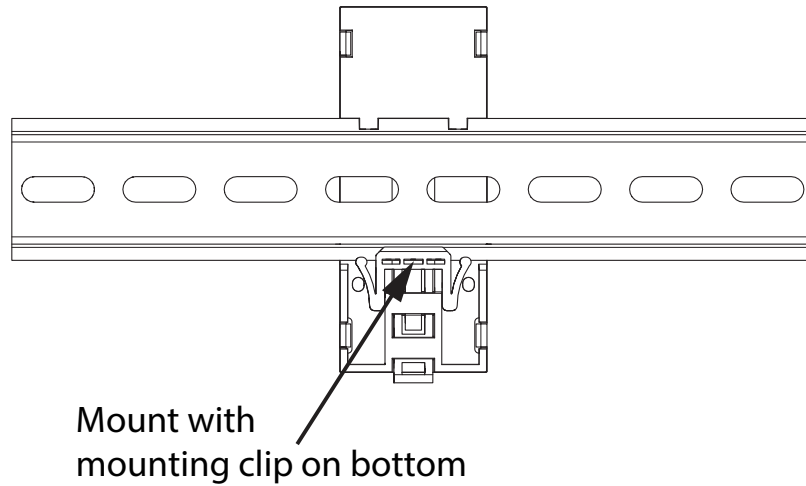


Figure 8 Enclosure mounted on DIN rail (back view)

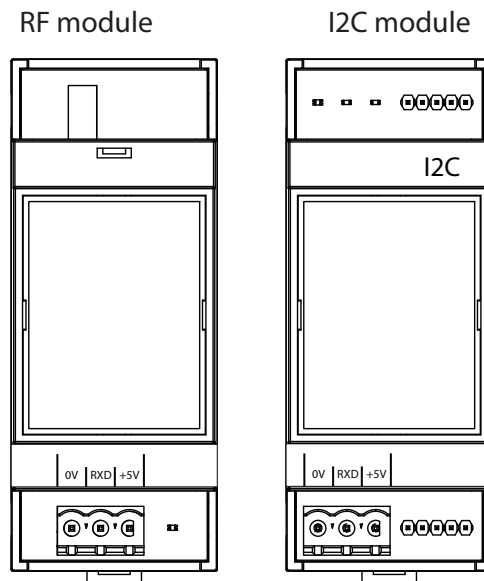


Figure 9 OpenBAS-HV-RF433R

To remove the enclosure from the DIN rail

- With your hands or with a small flathead screwdriver, pull the mounting clip to release the enclosure from the DIN rail, and carefully pull the enclosure off the DIN rail.

4.0 Field Wiring



Note: Installation of OpenBAS-HV-RF433R automation controllers must be in accordance with the Canadian Electrical Code or the National Electrical Code, and comply with all local regulations. Final acceptance is subject to the Local Authority Having Jurisdiction (AHJ).

4.1 Wiring the Terminals

Figure 4 on page 11 shows the location of the terminals. The terminals are depluggable for ease of wiring.

4.1.1 Required Tools

Tools needed:

- Precision or jeweler's screwdriver set
- Wire cutter
- Wire stripper

4.1.2 Installation Tips

- Perform visual inspection of circuit board and parts for obvious issues.
- Use a wire tie to group wires for easy identification and neatness.

4.2 Networking the RF and I2C Modules

Figure 10 shows the connection between the RF and I2C modules.

- Use AWG 22 cable between the two modules.
- Use shielded wire and connect the shield to the 0V terminal of the I2C module.
- Maximum length: 49 feet (15 m)

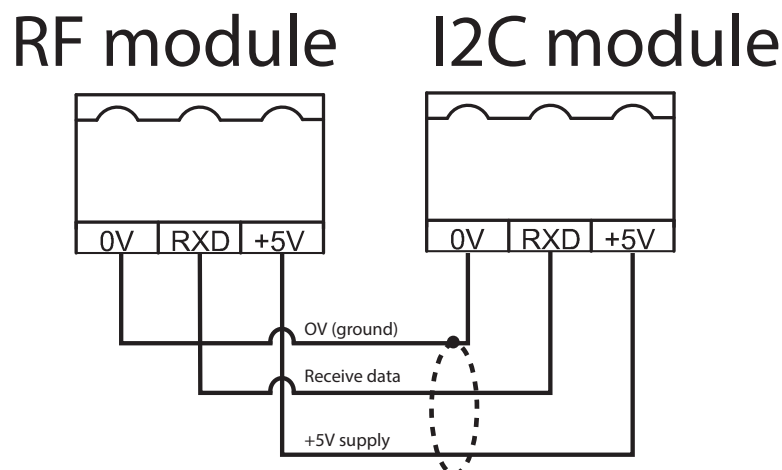


Figure 10 Networking the RF and I2C modules

4.3 Wireless Communication

See LT-6131 "OpenBAS-HV-WLSTH Installation Manual" for a description of how the OpenBAS-HV-RF433R receives information wirelessly with OpenBAS-HV-WLSTH.

4.4 Circuit Board LEDs

- PWR: Is red when the unit is powered
- LINK-RF: Solid green to indicate communication over the wireless link. Flashes green to indicate that the communication with the wireless transmitter is lost for more than 90 seconds
- LINK-12C: Solid green to indicate communication over the I2C port. Flashes green to indicate that the communication over the I2C port is lost

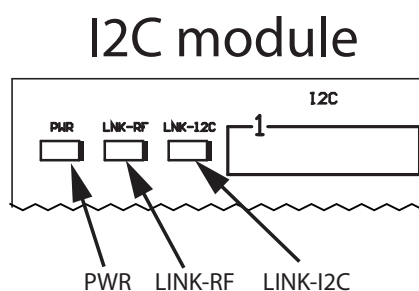


Figure 11 LEDs

5.0 Specifications

Standards:	UL 60730-1
Input:	12 Vdc, 26 mA max., or 24 Vdc, 26 mA max., or 24 Vac 50/60 Hz, 74 mA max. Powered over I2C connector
Wireless Characteristics:	Frequency: 433 MHz Range: 15 m (49 ft) indoors, 30 m (98 ft) outdoors with line of sight
Physical Characteristics:	Weight: 360 g (12.8 oz) Enclosure dimensions: 1 27/64" x 3 35/64" x 2 17/64" (36 mm x 90 mm x 58 mm)
Ambient Conditions:	Operating Temperature: 0° to 40°C (32° to 104°F) Shipping and storage temperature: -40°C to 60°C (-40° to 140°F) Indoor Use Only
Purpose of Control:	Operating Control, HVAC Control
Construction of Control:	Independently Mounted, for Panel Mount
Action Type and additional features:	Type 1.C
Pollution Degree:	2
Software Class:	Class A
Rated Impulse Voltage:	2500V

6.0 Warranty and Warning Information

WARNING!

Please read this document **CAREFULLY**, as it contains important warnings, life-safety, and practical information about all products manufactured by the Mircom Group of Companies, including Mircom and Secutron branded products, which shall include without limitation all fire alarm, nurse call, building automation and access control and card access products (hereinafter individually or collectively, as applicable, referred to as “**Mircom System**”).

NOTE TO ALL READERS:

1. **Nature of Warnings.** The within warnings are communicated to the reader out of an abundance of caution and create no legal obligation for Mircom Group of Companies, whatsoever. Without limiting the generality of the foregoing, this document shall NOT be construed as in any way altering the rights and obligations of the parties, governed by the legal documents that apply in any given circumstance.
2. **Application.** The warnings contained in this document apply to all Mircom System and shall be read in conjunction with:
 - a. the product manual for the specific Mircom System that applies in given circumstances;
 - b. legal documents that apply to the purchase and sale of a Mircom System, which may include the company's standard terms and conditions and warranty statements;
 - c. other information about the Mircom System or the parties' rights and obligations as may be application to a given circumstance.
3. **Security and Insurance.** Regardless of its capabilities, no Mircom System is a substitute for property or life insurance. Nor is the system a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation. Building automation systems produced by the Mircom Group of Companies are not to be used as a fire, alarm, or life-safety system.

NOTE TO INSTALLERS:

All Mircom Systems have been carefully designed to be as effective as possible. However, there are circumstances where they may not provide protection. Some reasons for system failure include the following. As the only individual in contact with system users, please bring each item in this warning to the attention of the users of this Mircom 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:

4. **Inadequate Installation.** All Mircom Systems must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. National standards require an inspection and approval to be conducted by the local authority having jurisdiction following the initial installation of the system and following any changes to the system. Such inspections ensure installation has been carried out properly.
5. **Inadequate Testing.** Most problems that would prevent an alarm a Mircom System from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested by the local authority having jurisdiction 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.

NOTE TO USERS:

All Mircom Systems have been carefully designed to be as effective as possible. However, there are circumstances where they may not provide protection. Some reasons for system failure include the following. The end user can minimize the occurrence of any of the following by proper training, testing and maintenance of the Mircom Systems:

6. **Inadequate Testing and Maintenance.** It is imperative that the systems be periodically tested and subjected to preventative maintenance. Best practices and local authority having jurisdiction determine the frequency and type of testing that is required at a minimum. Mircom System may not function properly, and the occurrence of other system failures identified below may not be minimized, if the periodic testing and maintenance of Mircom Systems is not completed with diligence and as required.
7. **Improper 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. A Mircom System may not function as intended during an emergency situation where the user is unable to operate a panic or emergency switch by reason of permanent or temporary physical disability, inability to reach the device in time, unfamiliarity with the correct operation, or related circumstances.
8. **Insufficient Time.** There may be circumstances when a Mircom 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.
9. **Carelessness or Safety Hazards.** Moreover, 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 or children playing with matches or arson.
10. **Power Failure.** Some Mircom System components require adequate electrical power supply to operate. Examples include: smoke detectors, beacons, HVAC, and lighting controllers. 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 Mircom Systems or other electronic equipment. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.
11. **Battery Failure.** If the Mircom 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. Some Mircom Systems use replaceable batteries, which have a limited life-span. The expected battery life is variable and in part dependent on 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. Moreover, some Mircom Systems do not have a battery monitor that would alert the user in the event that the battery is nearing its end of life. Regular testing and replacements are vital for ensuring that the batteries function as expected, whether or not a device has a low-battery monitor.
12. **Physical Obstructions.** Motion sensors that are part of a Mircom System must be kept clear of any obstacles which impede the sensors' ability to detect movement. Signals being communicated by a Mircom System may not reach the receiver if an item (such as metal, water, or concrete) is placed on or near the radio path. Deliberate jamming or other inadvertent radio signal interference can also negatively affect system operation.

13. **Wireless Devices Placement Proximity.** Moreover all wireless devices must be a minimum and maximum distance away from large metal objects, such as refrigerators. You are required to consult the specific Mircom System manual and application guide for any maximum distances required between devices and suggested placement of wireless devices for optimal functioning.
14. **Failure to Trigger Sensors.** Moreover, Mircom Systems may fail to operate as intended if motion, heat, or smoke sensors are not triggered.
 - a. Sensors in a fire system may fail to be triggered when the fire is in a chimney, walls, roof, or on the other side of closed doors. Smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building. In this situation the control panel may not alert occupants of a fire.
 - b. Sensors in a nurse call system may fail to be triggered when movement is occurring outside of the motion sensors' range. For example, if movement is occurring on the other side of closed doors or on another level of the residence or building the motion detector may not be triggered. In this situation the central controller may not register an alarm signal.
15. **Interference with Audible Notification Appliances.** Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners, appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.
16. **Other Impairments.** Alarm notification appliances such as sirens, bells, horns, or strobes may not warn or waken a sleeping occupant if there is an intervening wall or door. It is less likely that the occupants will be alerted or awakened when notification appliances are located on a different level of the residence or premise.
17. **Software Malfunction.** Most Mircom Systems contain software. No warranties are provided as to the software components of any products or stand-alone software products within a Mircom System. For a full statement of the warranties and exclusions and limitations of liability please refer to the company's standard Terms and Conditions and Warranties.
18. **Telephone Lines Malfunction.** Telephone service can cause system failure where telephone lines are relied upon by a Mircom System. Alarms and information coming from a Mircom System may not be transmitted if a phone line is out of service or busy for a certain period of time. Alarms and information may not be transmitted where telephone lines have been compromised by criminal tampering, local construction, storms or earthquakes.
19. **Component Failure.** Although every effort has been made to make this Mircom System as reliable as possible, the system may fail to function as intended due to the failure of a component.
20. **Integrated Products.** Mircom System might not function as intended if it is connected to a non-Mircom product or to a Mircom product that is deemed non-compatible with a particular Mircom System. A list of compatible products can be requested and obtained.

Warranty

Purchase of all Mircom products is governed by:

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<https://www.mircom.com/purchase-terms-and-conditions>

<https://www.mircom.com/software-license-terms-and-conditions>

