



RFTECHNOLOGIES[®]

Alarming Band Receiver

Installation Guide

PN 0510-1001-H



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PN: 0510-1001-H
Release Date: 11/18/08

Installers must read this Guide before using the Product

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Conforms to **UL Std. 294**


(3048736)


Important Warnings


It is important for your facility to implement and enforce the following WARNINGS in order to keep all equipment functioning properly.


 **WARNING**
INSTALLATION AND CONFIGURATION—It is the responsibility of the facility to follow the installation instructions carefully and to use the components and supplies specified by RF Technologies, Inc. for all installations.
Failure to use the components and supplies specified by RF Technologies, Inc. may result in equipment and/or system failure.

 **WARNING**
SYSTEM MAINTENANCE AND TESTING—It is the responsibility of the facility to establish and facilitate a regular maintenance schedule for your system. This includes regular inspection, testing, and cleaning. RF Technologies, Inc. recommend monthly maintenance and testing of your system. It is also recommended that your facility keep records of maintenance and test completions.
Failure to provide regular maintenance and testing of these products may result in equipment and/or system failure.

 **WARNING**
SYSTEM INSPECTION—It is the responsibility of the facility to establish and facilitate a regular inspection schedule for your system. RF Technologies, Inc. recommend quarterly inspections of your system for safety and performance by a qualified RF Technologies, Inc. representative.
To arrange for a quarterly inspection by RF Technologies, Inc., call our Technical Support Department at (800)-669-9946 or (262) 790-1771.
Failure to provide regular inspection of these products may result in equipment and/or system failure.

 **WARNING**
USER TRAINING—It is the responsibility of the facility to implement structured training procedures for all employees using the system. Only users who have received adequate training on the use of the system should use the system.
Failure to adequately train employees may cause system failure due to user error. In addition, incorrect use of the equipment may also result in system failure.

 **WARNING**
DISPOSAL—At the end of their service life the products described in this manual, as well as accessories (i.e. lithium batteries, banding material, disposable pads, etc.), must be disposed of in compliance with all applicable federal, state and local guidelines regulating the disposal of products containing potential environmental contaminants. Dispose of the packaging material by observing the applicable waste control regulations.

 **WARNING**
PRODUCT WARRANTIES—Failure to follow the Warnings and Cautions in this guide voids any and all Product Warranties.

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Preface

System Overview

This guide provides information about the Alarming Band Receivers (ABRs), a components of the 9450 System. It provides detailed instructions about installing the components as well as specific requirements.

The 9450 System monitors doors, elevators, hallways, and stairwells, to assist staff in monitoring patients in a facility. A small transmitter is placed on the ankle or the wrist of a patient. If a transmitter is detected in an Exit Alarm Zone, an alarm sounds at the exit. Depending on which equipment you have installed, the 9450 System can automatically lock doors and deactivate elevators.

In addition, if the 9450 System in your facility includes computers, an alarm also sounds at a Central Server and its network of Client computers. The Central Server and Client computer(s) also identify which patient sounded the alarm and the exit where the alarm occurred.

The 9450 System Cut Band Feature option provides further security by alerting staff if a transmitter band is tampered with, or if certain wires in the system is cut or damaged. Additionally, if your system contains a Staff Alert Panel, a redundant alarm sounds if certain wires are cut or damaged.



WARNING: The 9450 system is designed and intended to work in conjunction with a facility's overall patient security program, including reasonable operating policies and procedures. The 9450 system, by itself, cannot prevent the mismatch, abduction or elopement of patients.

Intended Audience

The Alarming Band Receiver Installation Guide is intended for users who install and configure the 9450 System. It includes detailed information about the 9450 System, the Alarming Band Receiver, how to wire the Alarming Band Receiver to the 9450 System, and the specifications of an Alarming Band Receiver.

Additional Detailed Documentation

Documentation for the 9450 System is available in Portable Document Format (PDF) on the 9450 System Documentation CD-ROM. The 9450 System Documentation includes the following guides:

- Delayed Egress Exit Alarm Controller Installation Guide
- Exit Alarm Controller Installation Guide
- Exit Alarm Receiver Installation Guide
- Alarming Band Controller Installation Guide
- Central Power Supply Installation Guide
- Ethernet and Device Network Installation Guide
- Alarming Band Receiver Installation Guide
- 9400 Alarming Band Receiver Installation Guide
- CodeLock Installation Guide
- Quick Look Display and Interface Installation Guide
- Staff Alert Panel Installation Guide
- UHF Antenna Installation Guide
- Infant Transmitter User Guide
- Adult Transmitter User Guide
- Patient Transmitter User Guide
- Model 30 Keypad Installation Guide
- Infant Security System Administrator's Guide
- Wanderer Monitoring System Administrator's Guide
- Wanderer Monitoring Software User Guide
- Infant Security Software User Guide
- Patient Monitoring System Administrator's Guide
- Patient Monitoring Software Guide
- Product Warranty

Contact Information

For more information about RF Technologies, Inc. products, go to www.rft.com. For technical support, contact (800) 669-9946 or (262) 790-1771. For questions or comments about 9450 documentation, contact the RF Technologies Technical Publications team at techpubs@rft.com.

Product Warranty

Product Warranty information can be found on the 9450 System Documentation CD-ROM or with your original system proposal and invoice.

Preface

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Installing Alarming Band Receivers

Introduction

Alarming Band Receivers (ABRs) are placed strategically throughout the monitored area to receive signals from the transmitters worn by patients. The Alarming Band Receiver alerts staff if the band that holds the transmitter is tampered with or cut.

Alarming Band Receivers must be located near the ceiling, above the ceiling tile. Each Antenna should normally be placed 40 feet apart. In areas where multiple sources of interference are present, such as near nursing stations and nurseries, Alarming Band Receivers must be spaced at 30 foot intervals.

Record the location and address of each device on the floor plan of your facility so that it can be entered into the software database. See the UHF Antenna Installation Guide for information about installing the antennae.

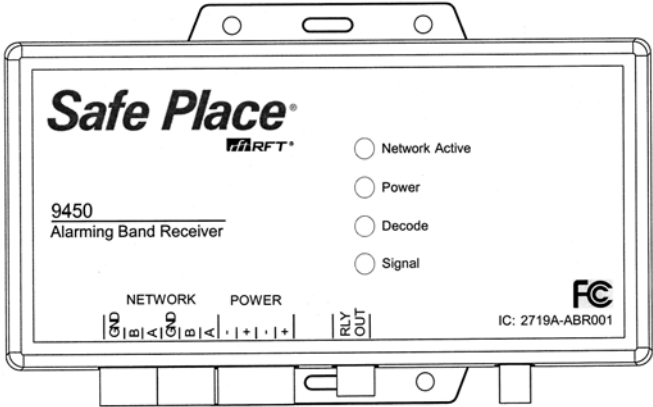


FIGURE 1.1: Alarming Band Receiver

Mounting an Alarming Band Receiver

When you mount the Alarming Band Receiver, verify the following:

- Alarming Band Receivers must be located near the ceiling, above the ceiling tile.
- Receivers must be spaced at 40-foot intervals. In areas where multiple sources of interference are present, such as near nursing stations and nurseries, ABRs must be spaced at 30-foot intervals.
- Alarming Band Receivers can be held in place with screws, cable ties, Velcro®, or double-sided tape.
- Record the location and address of each device on the floor plan so that it can be entered into the database.
- Be sure to set the DIP switches on each device.
- Be sure the power switch is moved to the ON position.



WARNING: When installing products, you must follow standard, accepted safety practices, such as wearing safety glasses.



WARNING: Before cutting openings or drilling holes through walls, you must verify that you will not strike any wiring or plumbing.

Wiring the Alarming Band Receiver

Wiring the Alarming Band Receiver

Use the following steps to wire an Alarming Band Receiver.



WARNING: You must verify that the 9450 System's Central Power Supply is OFF before wiring any system components. Failing to do this may result in injury or death.

To wire the alarming band receiver

1. Use 16-gauge, 2-conductor wire to provide power: connect red to “+” and black to “-”.
Power can be provided to the Alarming Band Receiver directly from a Central Power Supply or from a nearby device, such as another receiver, an Exit Alarm Controller, or a Quick Look Display. The other power terminals can be used to supply power to the next device. **Make sure to keep consistent polarity for the power connections.**
2. Connect the Alarming Band Receiver to another device or to the Central Server wallplate using a Category 5, 4-pair wire at the NETWORK terminal.
3. Terminate resistors.

Each of the subnets requires resistor terminations to ensure proper communication. Normally, the devices at opposite ends of a daisy-chain configuration must have termination resistors. The cabling termination facilities for each subnet at the Central Server include one of the required termination resistors. One other device on each of the subnets, typically the one farthest away from the Central Server must be configured to insert the other required termination resistor. The other devices in the subnets must be configured to not insert the termination resistor.

There are two means of providing a termination resistor on the ABR. The first is a jumper placed across the three pin header located beneath the removable door on the underside of the ABR enclosure (see Figure 2.1).

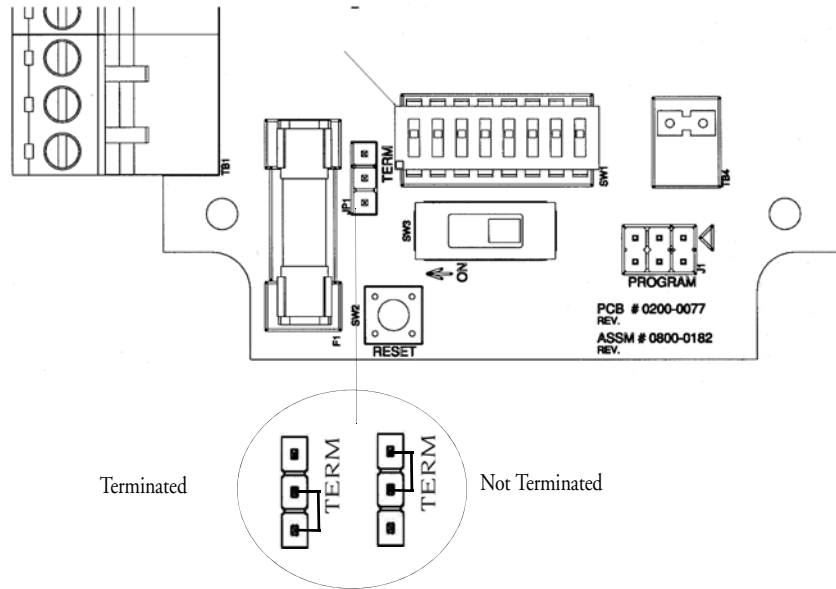


FIGURE 2.1: Resistor terminations using a jumper

The second is to attach a radial 100 ohm resistor across the Network termination between terminals A and B (see Figure 2.2).



FIGURE 2.2: Resistor termination using a radial 100 ohm resistor

4. If necessary, use the rest of the network terminals to connect the next device on the Network.
5. To connect the Alarming Band Receiver to the Staff Alert Panel, use 22-gauge, 4-conductor cable.

For more information, see the *Staff Alert Panel Installation Guide*.

- a. Connect the red wire from the previous device for the zone terminal of the Staff Alert Panel into one RLY OUT terminal.
- b. Splice the black wires together.
- c. If the device is the last in the run, place the black wire from the previous device into the other terminal.
- d. Connect the other end of the black wire to the Common Terminal on the Staff Alert Panel.

NOTE: The Normally Closed (NC) RLY OUT contacts signal an alarm only when the ABR is no in regular communication with the Server computer.

To	Terminal(s)	Gauge	Conductors	Wire Color
Power	+, -	#16	2 conductor	Red, Black
Network	A, B, GND	Category 5e	8 conductor	Standard
Staff Alert Panel	RLY OUT	#22	4 conductor	Black, Red
Antenna	F-jack	RG-6 coaxial	1 conductor	Gray cable

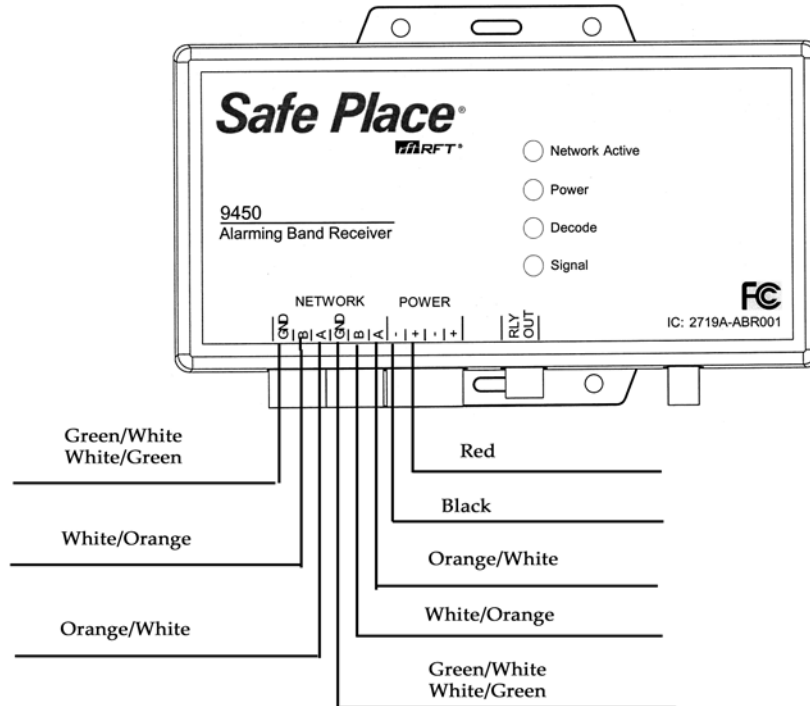


FIGURE 2.3: Wiring the Alarming Band Receiver

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Programming the ABR Settings

Setting the Dip Switches

Before mounting the receivers, open the back panel of each device and set the DIP switches to assign a network address to each Alarming Band Receiver in an RS-485 subnet. The 9450 System supports up to 31 devices on each RS-485 subnet. The valid range of network addresses for each device on a subnet is 1-31; there is no switch setting to distinguish subnets from each other since separate wiring connections exist on the Central Server for each subnet. Refer to the “Dip Switch Operations Table” on page 12 for DIP Switch positions. Write the number of the device address on the provided label and adhere it to the receiver.

Record the location and address of each device on the floor plan of your facility so that it can be entered into the software database.

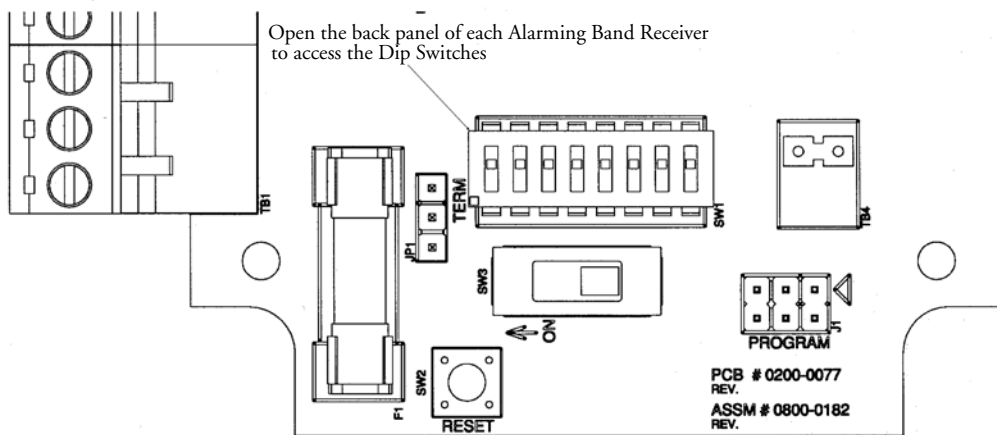


FIGURE 3.1: Alarming Band Receiver Panel

The following table provides details about how to set an RS-485 network address for a device. Switches 4-8 set the network subnet address for the device; switches 1-3 are not used.

Dip Switch Operations Table

Address	SW4 (16)	SW5 (8)	SW6 (4)	SW7 (2)	SW8 (1)
Not Allowed	0	0	0	0	0
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0
25	1	1	0	0	1
26	1	1	0	1	0
27	1	1	0	1	1
28	1	1	1	0	0
29	1	1	1	0	1
30	1	1	1	1	0
31	1	1	1	1	1

Alarming Band Receivers receive signals from the transmitters worn by patients. When the band that holds the transmitter is tampered with, the Alarming Band Receiver sends the signal to the Central Server. If the Central Server is not operational, an alarm is signalled on the Relay Output Contacts.

The LEDs on the Alarming Band Receiver signify the following:

- Active - The green LED indicates that data is being sent or received from the Central Server through the RS-485 network.
- Power - The red LED indicates that power is available to the system.
- Decode- The green LED indicates that the signal has been received and properly decoded.
- Signal - The yellow LED indicates that a signal is being received.

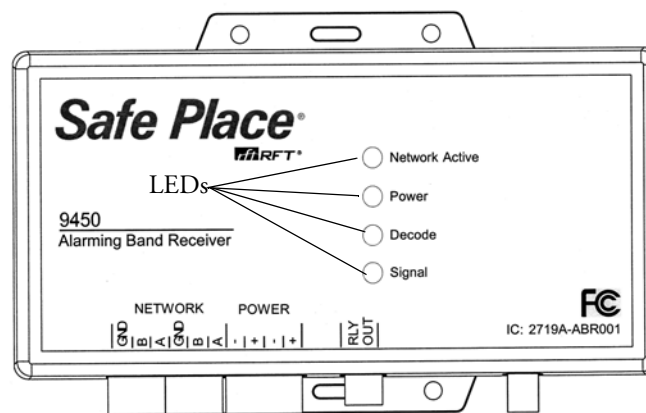


FIGURE 3.2: The Alarming Band Receiver's LEDs

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Testing an Alarming Band Receiver

Testing the Alarming Band Receiver

Before you activate the Alarming Band Receivers, it is necessary to test their overall functionality.



CAUTION: You must test all Alarming Band Receivers prior to use to verify proper operation. Failure to test the Alarming Band Receivers before use can result in system failure and/or a mismatch, abduction, or elopement. In addition, failure to test Alarming Band Receivers voids the RF Technologies Product Warranty.

To test the Alarming Band Receivers

1. Be sure that all of the Alarming Band Receivers are wired according to the floor plan, and are powered by the Central Power Supply or other powered 9450 System device.
2. With the test transmitter in your hand, move to a location 25 feet from the UHF Antenna. You will be near the edge of the receiver's 60-foot oval zone.
3. Move the switch on the test transmitter to the **CHECK VLF/UHF** position. If the receiver is operating correctly, the green DECODE LED and the yellow SIGNAL LED on the receiver flashes, indicating that the signal has been received and decoded.
4. Next, move to various locations within the 60-foot zone, verifying that the receiver is operating correctly. Identify any large, metal objects that can interfere with the signal, and test the reception with the metal object between you and the Alarming Band Receiver.
5. To simulate the action of tampering with a transmitter band, move the switch on the test transmitter to the **ALARM OFF** position; if the test transmitter is within range of an UHF Antenna's 50-foot zone, an alarm will sound at the Central Server and Clients. If the Central Server is not responding, or if the wires have been tampered with, the Staff Alert Panel alarms instead.
6. To test the operation of the Alarming Band Receivers independently, regardless of the status of the Staff Alert Panel and the Central Server, use the hanging LED included with your 9450 System. Plug the terminal block attached to the LED into the circuit board of the Alarming Band Receiver. If the receiver is operating correctly, the green DECODE LED flashes as described above, indicating that the signal has been received and decoded.

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Chapter 5

Alarming Band Receiver Specifications

Power Supply	9-16 V DC or AC, 150 mA
Operating Temperature	0 - 40 degrees Celsius (32 to 104 degrees Fahrenheit)
Outputs	Normally Closed relay contact opens upon alarm when the Alarming Band Receiver is not in regular communication with a server.
Indicators	Network Active = Green LED Power = Red LED Decode = Yellow LED Signal = Yellow LED
Current Consumption Specification	150mA
Fuse	Littlefuse 239,700 mA, 250V, 5x20 mm, Delay RF P/N: 0240-0001
Wiring	Network = CAT 5e Power = 16/2 stranded Staff Alert Panel = 22/4 stranded Antenna = Coaxial
Range	30ft. (9.1m), minimum per telemetry receiver antenna
FCC Approval	Declaration of Conformity on File
Dimensions	6.7 x 3.25 x 1.3 inches
Weight	.55lb (.25 kg)
Color	Gray
Enclosure	UL94VO ABS Plastic
Part Number	9450-0208-K

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