



INTRODUCTION
TO RATICATOR:
REMOTE MONITORING



Background



It is universally known that rodents cause substantial damage to homes, businesses, farms, food facilities, food warehouses, our possessions and they spread disease. It is a world-wide problem. Mankind has created all manner of traps, and poisons to combat mice and rats. Until now, virtually all rodent traps were archaic and in most cases inhumane. Today's second generation rodenticides are no better. Rodent poisons pose a serious threat to children, pets and a whole host of wildlife. The U.S. EPA and other similar state agencies are currently pursuing a very active campaign to eliminate rodenticides from retail shelves all across the nation.

The Raticator Overview

- We would like to introduce to you the Raticator. We are the inventors and creators of this form of technologically advanced rodent control with thousands of satisfied customers. The Raticator Max utilizes 4 “D” cell flashlight batteries to humanely exterminate both mice and rats. It has an extended 24/7 monitoring life of approximately one year or the extermination of 50+ rodents per set of batteries. The newest Max design will offer a 100% success rate if the rodent simply enters the Raticator. The Raticator Max uses breakthrough infrared sensing technology including a unique delivery system that is designed to humanely exterminate rodents that intrude into homes, businesses, agricultural facilities, and more.



- Most rat traps on the market today are exclusively designed to kill rats (not mice). Likewise, virtually all mouse traps won't work on rats. The Raticator is successful on both without the blood or gore or undesirable aspects associated with snap traps or glue boards. Environmentally preferred – the Raticator is poison free, clean, easy to operate, and offers years of service to the customer.

Product Description

The new Raticator Max utilizes a revolutionary infrared detecting system to sense the presence of a mouse, rat or other rodent. The newly designed unique delivery system, including stainless steel kill pads is housed in an aesthetic plastic canister. With an enlarged chamber, the Raticator Max is perfect for both larger rats and small mice. Further, the extended battery life makes this unit particularly suited for environments with on-going rodent infestations and commercial applications. A

new upgrade in the delivery system insures that when the rodent enters the Raticator Max, it will be humanely exterminated with a quick but deadly shock. No blood, no gore, no mess, and no poisons to endanger pets or the environment. There is no need to touch a rodent ever again.

- Additional product information and rodent facts can be reviewed at raticator.com.



Remote Monitoring of Raticator

The newly upgraded Raticator Max will offer remote monitoring by radio to customers with varying needs, including warehouses or similar commercial environments where multiple units are needed. The new wireless technology allows a customer to receive notifications of trap success, low batteries, units removed from the network (theft), and an array of report functions.

Remotely monitored Raticators are versatile. They can be equipped with a variety of transmitters that accommodate the particular customer's objectives. Transmitters and systems can be selected to allow Wi-Fi conductivity and notice to the customer. We believe our product will have wide appeal in a wide array of commercial environments including food facilities and warehouses, hotels, restaurants, agricultural locations, government, and private residential applications as well.

An important component is the added benefit of varied reporting mediums to the client. Commercial accounts, e.g. food processing or warehouse customers, will undoubtedly want extensive reporting particularly suited to their own needs and requirements. Specifically, the F.D.A. has stringent reporting guidelines related to rodent control that must be met by the food industry. Others will be satisfied with email or text notification. It is proposed that a customer can elect to have the ability to not only be initially notified by text or email, but be able to log onto the wireless network website and observe which unit or units have been successful. The Raticator will offer all of this capability, at a very affordable cost, something entirely unique to the present world of rodent control. Simply stated, we have brought rodent control into the 21st Century. We welcome your interest.



The wireless reporting capability of the Raticator Max is built around the XBee™ family of digital radio modems from Digi International™ (www.digi.com). Although this solution does not represent the lowest cost approach, it has the advantage of providing a variety of wireless formats all utilizing a common physical footprint, uniform hardware interface and highly similar software interface. Off-the-shelf modules are available for multiple common wireless data protocols such as IEEE standard 802.15.4 wireless sensor networks (e.g. Zigbee™) and 802.11 Wi-Fi. Various standard radio frequency allocations are supported so that versions of the system are marketable world-wide. All XBee family members are fully approved and type-accepted in the areas of the world for which they are intended.



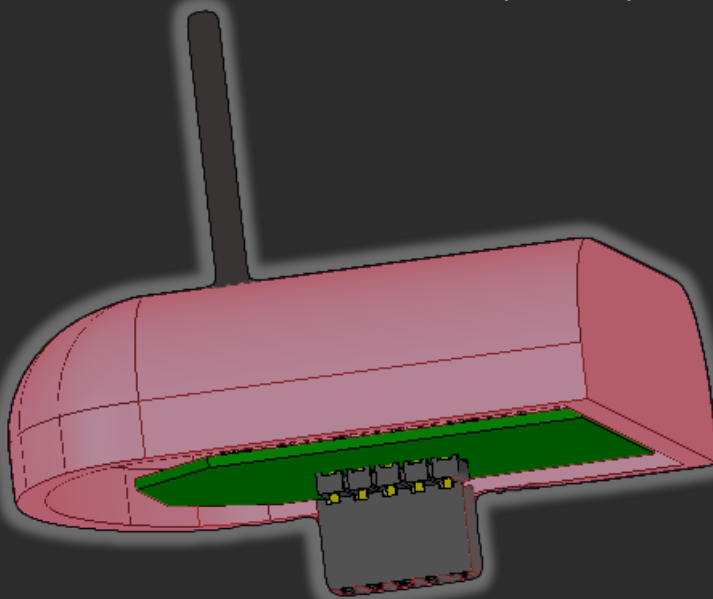
Raticator Wireless Development Details



Physical Configuration

- The standard retail Max model of today includes an accessory jack on the cover of the electronics compartment for connection of the simple Raticator Indicator which is a wired device that can be located remotely from the main Raticator unit. It is a simple two-wire connection having two "states" that the Raticator Indicator uses to indicate standby or trap activated conditions. However, the Raticator electronics package includes provision to utilize a different style connector with ten signal/power connections. The Raticator can be manufactured with either type of connector to facilitate either the stand-alone version or the wireless capability.

- When the Raticator is intended for use in a wireless environment, the printed circuit board is manufactured with the ten-pin connector which is accessed through a rectangular hole in the plastic cover of the electronics compartment. A wireless subsystem that includes a separate small plastic housing, a small accessory printed circuit board and the XBee wireless modem module is attached to the exterior of the main electronics compartment cover and utilizes the ten-pin interface connector for its power and data connections. Alternately, this subsystem can be built into a plastic housing that includes the cover of the main electronics compartment.



Current Status of the Design Process

At this time the wireless design development has progressed to the point that trap status reporting via radio has been demonstrated in the laboratory. The initial configuration has targeted the industrial market where it is envisioned that a large number of traps (Wireless-equipped Raticators) are deployed around a large warehouse facility. For this environment, an IEEE 802.15.4 wireless sensor network was deemed most appropriate. For this type of application a number of choices are available from within the Digi XBee family that allow for either a many-to-one style of network or a self-configuring, self-healing mesh network configuration. For simplicity of initial development the XBee-Pro 900 modules and a many-to-one networking scheme were chosen. These modems operate in the 900 MHz ISM band and feature relatively high-power transmitters and can work reliably up to 28 miles in an ideal outdoor environment. Of course, the expected environment is an indoor one with buildings constructed of steel and concrete and

containing various products that will have unpredictable signal absorbing and blocking characteristics so it is expected that the effective range will be reduced considerably but should still be sufficient for a large facility covering multiple acres and perhaps multiple floors. The many-to-one network configuration was chosen because in this application information flows only between individual traps and a central hub or router that provides data connectivity out to the Internet.

A simple proprietary data protocol was developed that supports adding and removing traps from the network and allows multiple distinct but overlapping networks to exist without interference or confusion. The traps report their status (standby/"sprung" and battery condition) at pre-programmed intervals and when a kill sequence is completed. Between reporting events the electronics are placed in a low-power-consumption "sleep" mode for extended battery life.

Future Development Possibilities

- Because of the inherent flexibility of the XBee family of embedded RF (Radio Frequency) modules, alternate network configurations can be utilized with ease. Different Digi modules can be substituted for the ones utilized so far with only minor firmware changes required to support them. Thus, different radio frequency bands can be utilized so that the products can be marketed in areas of the world with different regulatory environments and different networking configurations such as mesh and Wi-Fi are easily implemented. Also, because the wireless subsystem utilizes its own small printed circuit board it is eminently feasible to utilize radio modems from other manufacturers with only a small amount of hardware redesign. When the system has been widely deployed and much field experience has been obtained it will be relatively simple to move to lower cost radio solutions from other manufacturers if that is deemed desirable.
- Adding other sensors such as an accelerometer to monitor for traps that might have been tipped over and are thus going to be ineffective can also be easily implemented with the physical design that is being developed.



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