INTEGRATED BURGLAR ALARM SYSTEM

PROJECT INDEX  PRJ 079

presented by

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F17/2362/2005

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OBJECTIVE

- The problem definition required an in-depth study regarding integrated burglar alarm systems.
- The alarm was designed to go on due to any of the following conditions which are monitored on PC: entry of burglar, door is opened and door handle is locked.
project scope

- To design a motion detector.
- To design a circuit to indicate whether the door is open or closed.
- To design a circuit to detect the touching of the door handle.
- To develop software for the PC which will indicate with the entry of burglar, door is opened and door handle is locked.
Introduction

- An integrated burglar alarm system is installed to monitor for any intrusion into unauthorized premise.
- The desired output of your burglar alarm system causes a specified alarm output and quickly responds whenever the sensors identify valid conditions which have activated the alarm.
- The unit’s ability in communicating back to its monitoring system is truly a crucial aspect for determining the efficiency of the alarm.
Types of motion sensors

- **Passive infrared sensors (PIR)**
  Work by detecting heat emitted by people or objects

- **Ultrasonic detectors**
  The active ultrasonic sensor is a motion detecting device that emits ultrasonic sound energy into a monitored area and reacts to a change in the reflected energy pattern.

- **Microwave sensors**
  Sensors generate an electromagnetic (RF) field between transmitter and receiver, creating an invisible volumetric detection zone.
Types of motion sensors

- **Photoelectric sensors**
  Photoelectric beam sensors transmit a beam of infrared light to a remote receiver creating an ‘electronic fence’.

- **Dual technology detectors**
  Dual technology uses a combination of both microwave and passive infrared technology in combination with AND logic to provide a lower false alarm rate (FAR) sensor than either of the sensor independently.

- **Active infrared sensors**
  Most infrared cells use cadmium sulphide or cds cells to detect infrared radiation.
Magnetic contacts

- Magnetic contacts are used to sense when a door or window has been opened.
- Contacts can be surface mounted on a door or window or flush mounted so that they can be concealed when the door or window is closed.
Mechanical switches

- Mechanical switches detect the opening of a protected door or window using mechanical contact switches, which are spring-loaded to trigger an alarm when a door or window is opened.
Design

- The programming language used was visual basic.
- Passive infrared sensors (PIR) was chosen.
- The software used was visual studio.
- The mechanical switch used was pushbutton switch.
Passive infrared sensors (PIR)
CIRCUIT DESIGN

- MOTION DETECTION UNIT
- DOOR OPENING DETECTION UNIT
- DOOR HANDLE DETECTION UNIT
- PC (CONTROL PANEL)
Software design

1. Start
2. Device detect
3. Set device
4. Intrusion detected?
   - NO: Start again
   - YES: Process information and show on screen and beep
5. Stop button
   - NO: Intrusion detected?
   - YES: End
TEST AND RESULTS

WAITHAKA SECURITY SYSTEMS

<table>
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<tr>
<th>ALARM STATUS</th>
<th>DEVICE CONNECTED AND SET AND RUNNING</th>
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<td>MOTION SENSOR</td>
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<td>DOOR SWITCH</td>
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[Buttons]
- Reset Alarm
- Stop Run
- Exit
WAITHAKA SECURITY SYSTEMS

**ALARM STATUS**
DEVICE CONNECTED AND SET AND RUNNING

**MOTION SENSOR**

**DOOR SWITCH**

**DOOR HANDLE**
INTRUSION DETECTED

**Buttons:**
- RESET ALARM
- STOP RUN
- EXIT
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Buttons:
- [RESET ALARM]
- [STOP RUN]
- [EXIT]
CONCLUSION

- This project was set out to realize an integrated burglar alarm system that could be monitored on PC.
- The project was implemented and determined to be functioning correctly for the monitoring of the three conditions as laid out in the objectives.
RECOMMENDATIONS AND FUTURE WORK

- Using wireless instead of hard-wired.
- Using a USB port instead of parallel port.
- Mobile phone can be used to monitor.
Q & A

THANK YOU!

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