

# Home Security Alarm System Using LabVIEW

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## **Abstract**

*Home security has been a major issue as crime rate is increasing and everybody wants to take proper measures to prevent intrusion. The basic purpose of a home alarm system is to keep ourselves secured, and to safeguard our home. When the alarm is triggered, it emits a loud sound to frighten away intruders. An alarm security system is absolutely essential for anyone who wants to protect their property from those who might try to steal it. The work presented in this report is LabVIEW based simulated home security alarm system which acts as an electronic security guard for the home.*

**Keywords:** LabVIEW, security, alarm, sensor, front panel, intruders

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## **INTRODUCTION**

The purpose of home alarm system is to alert the homeowners to unauthorized entry attempts into the houses. Home security systems should be evaluated by and installed in regard to the areas in which burglars are most likely to enter your residence. Studies have shown that most intruders will enter through a front door, by either forcing it open or simply kicking it in. Others enter through ground floor windows or the back door of the home which may offer more privacy and less lighting than a front door entrance.

The security systems can provide protection from fire, flood, and medical emergencies along with protection from robbery as well. With the development of new electronic technologies and their integration with older, traditional building technologies, smart house is at last becoming a real possibility. There are many types of security systems available today. There are many other reasons why people need security at their homes.

The first reason that this system is established is to create a peace of mind for people, so that they can feel safe inside or outside their homes [1, 2]. This will help them to execute their work without any fear of their security.

The other reason is to help in getting timely information about visitors at house. Through the use of security cameras users are able to monitor the situation at their homes and get timely information about persons visiting their homes. Conventional security systems keep homeowners, and their property, safe from intruders.

A smart home security system, however, offers many more benefits. Home automation technology notifies homeowners of any problems, so that they can investigate. Artificial intelligence programs keep track of the homeowner's habits, and other important information, and notify emergency personnel when necessary.

The most basic alarm consists of one or more sensors to detect intruders, and an alerting device to indicate the intrusion. However, a typical premises security alarm employs the following components; premises control unit (PCU), or panel, sensors, alerting devices, keypads, interconnections and security devices. In addition to the system itself, security alarms are often coupled with a monitoring service. In the event of an alarm, the premises control unit contacts a central monitoring station. Operators at the station

see the signal and take appropriate action, such as contacting property owners, notifying police, or dispatching private security forces. Such signals may be transmitted via dedicated alarm circuits, telephone lines, or internet.

This paper concerns mainly with the prevention of entry of the intruders in to the house on account of security and safety issues. Here the design is mainly based on the software based security alarm system design. The aim of the design i.e. buzzing of the alarm takes place when the code is typed incorrect in the software control process. Even if the door is opened in any case by chance, it closes of within five seconds leaving no chance for the intruder to escape from the home and will be trapped inside itself.

This complete application is designed using the software provided by the National Instruments known as LabVIEW (meaning Laboratory for Virtual Instrument Engineers Workbench). The project is of the simulation type as it needs no external process input from the real time world [3–5]. More and more, we are seeing new technologies come in the market that pass control of your security into your own hands. For dozens of years, the technologies behind a home alarm system have remained the same sensors that detect an intrusion, and an alarm signal that is sent to a central monitoring station, which then contacts local authorities and dispatches them to your home.

The problem with this old model is that thieves, over the years, have grown wise to it. The lack of innovation has caused a growing need for new technologies and advances in the security industry that help thwart the loopholes that have been exposed over the years. Now this paper can be assumed as an overcoming method against the old models, because there is no possibility for the intruders to enter the house as they do not know the code for opening the door or side door. Even if they enter without the notice of the homeowners when the doors are open they still get trapped because they again need

to enter the code to open the door for exit. The code is however decided by the owner and hence there is no chance to escape through any means and thus it can be said that complete safety is ensured [5–8].

## METHODOLOGY

### To Design a Home Security Alarm System using LabVIEW

Home security is all about keeping your home, your loved ones, and your property safe from robbery. The loss of costly items is only one aspect of home security. Perhaps even more important is the prevention of personal violation, injury, and danger, which a home security system can go a long way toward preventing. Home security systems are a valuable, vital asset to keep your family and your valuables safe from any harm. The home appliances control system with an affordable cost was thought to be built that should be mobile providing remote access to the appliances and allowing home security. So a home alarm system is built using LabVIEW in order to ensure more security, less cost and fast computation. To protect home from unauthorized entities, three possible cases are taken as shown in Figure 1. First case considers entry from front door only where keypad is connected. Other two cases consider the possible entries from side doors or side windows. The home alarm system is created in LabVIEW by setting a suitable code for alarm to work. The code for actual alarm is fixed. We assume that a person can enter the home either through front door, side door or windows. In first case, the person will enter the code through keypad; if the code is not matched with the fixed value of code then a written warning will be displayed. If again the code is not correct then panic button will ring. It is noted that after 5 sec, our system automatically clears the code which we enter earlier. In second case, the person will enter through side doors or the windows. The side door and side windows have sensors with them. Sensor senses the signal and transmits it to the alarm. In this way when any person comes from any of the entry zone, the whole procedure is followed in a similar manner.

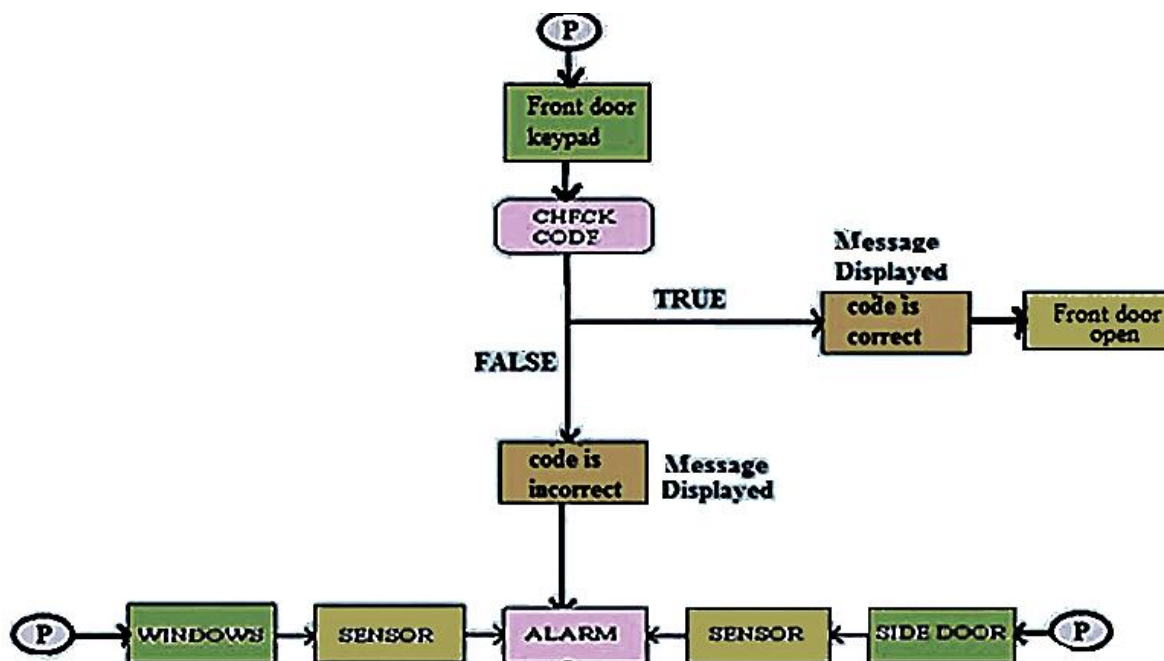


Fig. 1: Flow Chart of Home Alarm System where P Stands for Person.

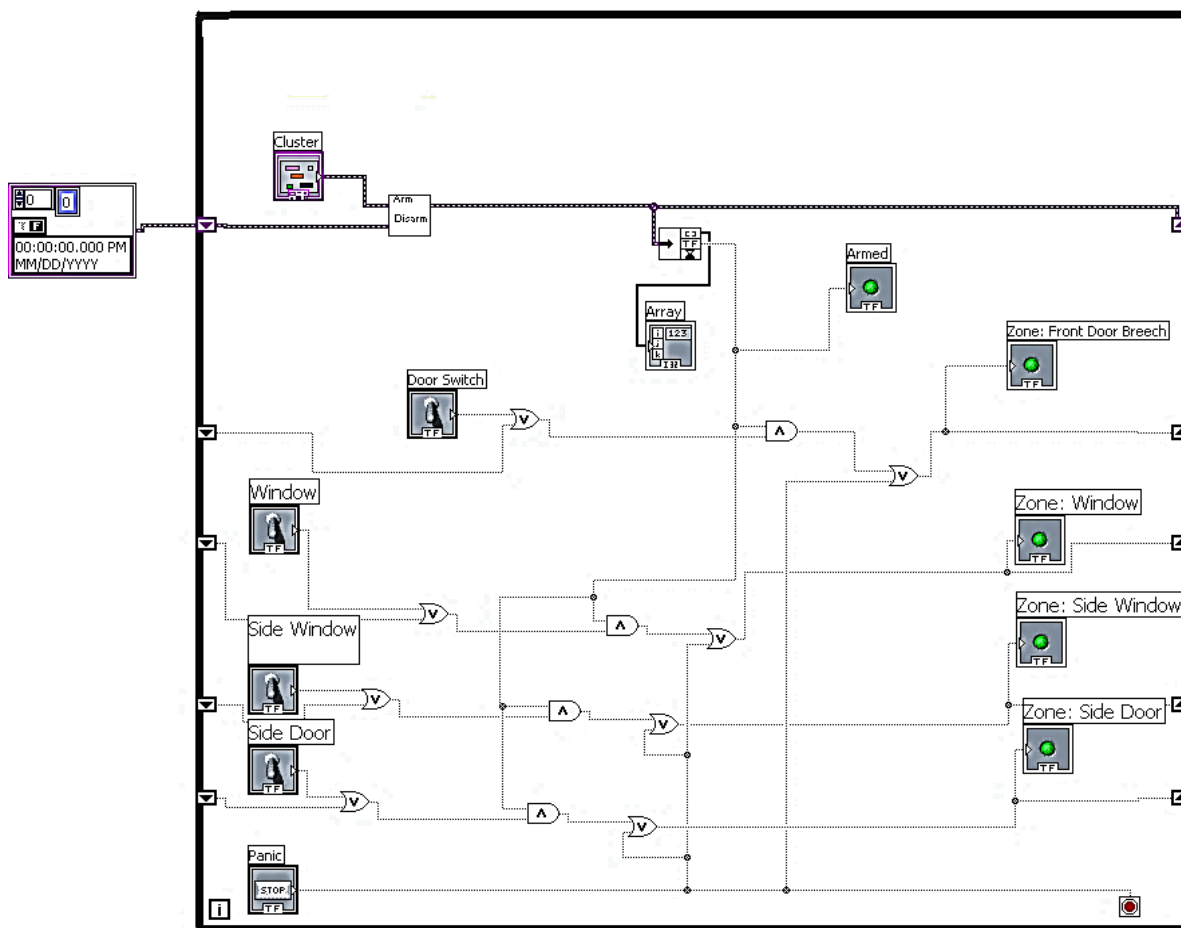


Fig. 2: Block Diagram.

**Block Diagram and Front Panel Operation**

The LabVIEW design comprises of two panels simultaneously programmed by operating one panel. That is when a particular VI is selected on front panel it also appears on block diagram (with corresponding notations) and vice versa. Figure 2 is the designed LabVIEW block diagram for home security alarm system. An alarm system with entry indicators has been created. To arm, enter the correct code in succession, after 5 sec the inputted code will clear and will arm. To disarm enter the correct code again.

Firstly we need to give some code such as 100000 in an array with the help of a cluster and then the LED armed will glow. Then change the code such as 100100 then the door switch will be ON and the LED door will glow. Similarly, when we push the window button upwards, then that zone window LED will glow. When we push the side window button upwards that zone: side window LED will glow. When we push the frontbench

window upwards, then the zone: front bench window LED will glow. After all these will glow if the panic button is pressed then all the buttons will go downwards and all the LED's will get switched off at once. If we again have to access the armed then it will be possible only after 5 sec. In between if any intruder tries to open any of the doors or windows it does not access the code [9].

**SIMULATION RESULTS**

LabVIEW (Laboratory Virtual Instrumentation Engineering Workbench) is an easy platform and development environment for a visual programming language from National Instruments. LabVIEW is commonly used for data acquisition, instrument control, and industrial automation on a variety of platforms including Microsoft Windows, various versions of UNIX, Linux, and Mac OS X. The desired simulated outputs of home security alarm system are obtained using LabVIEW are shown in Figures 3–5.

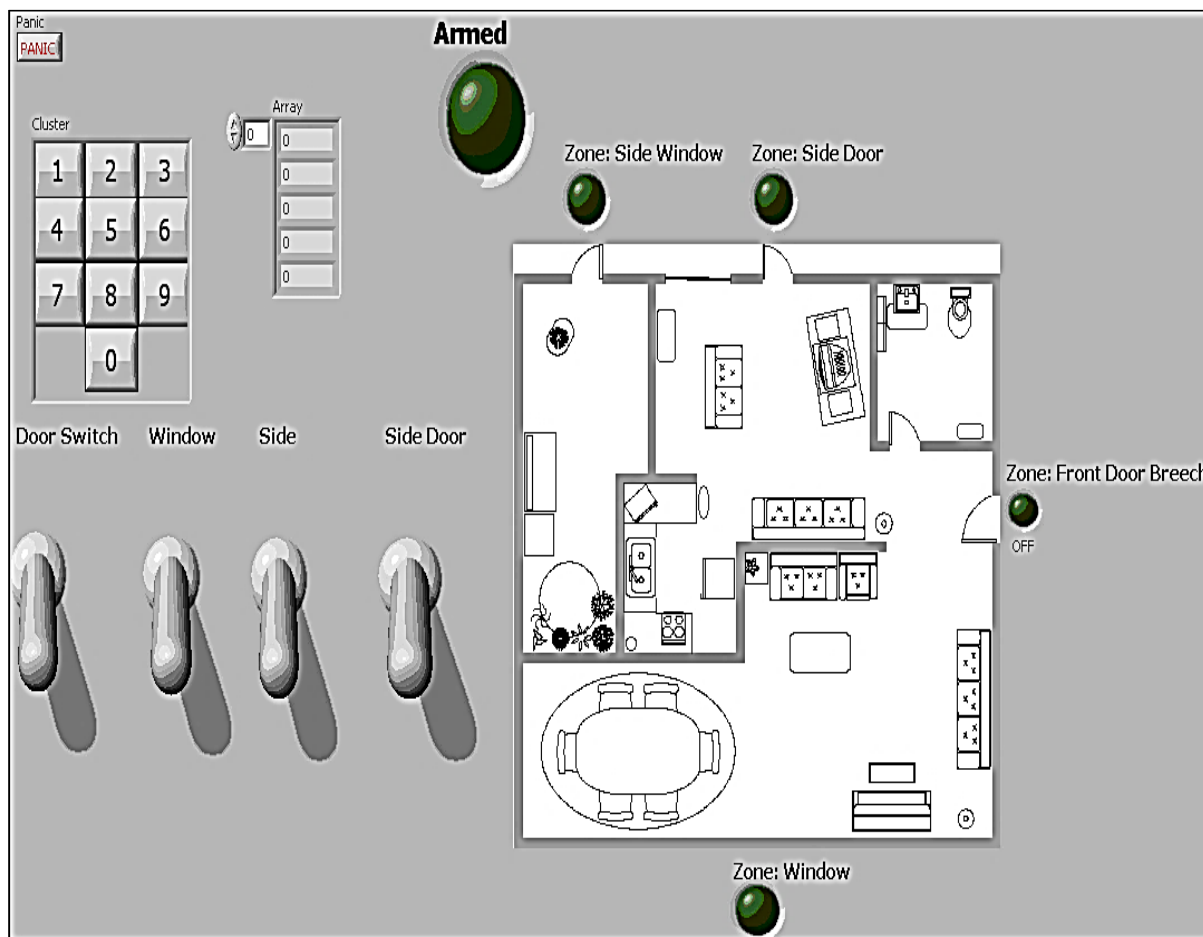


Fig. 3: Front Panel.

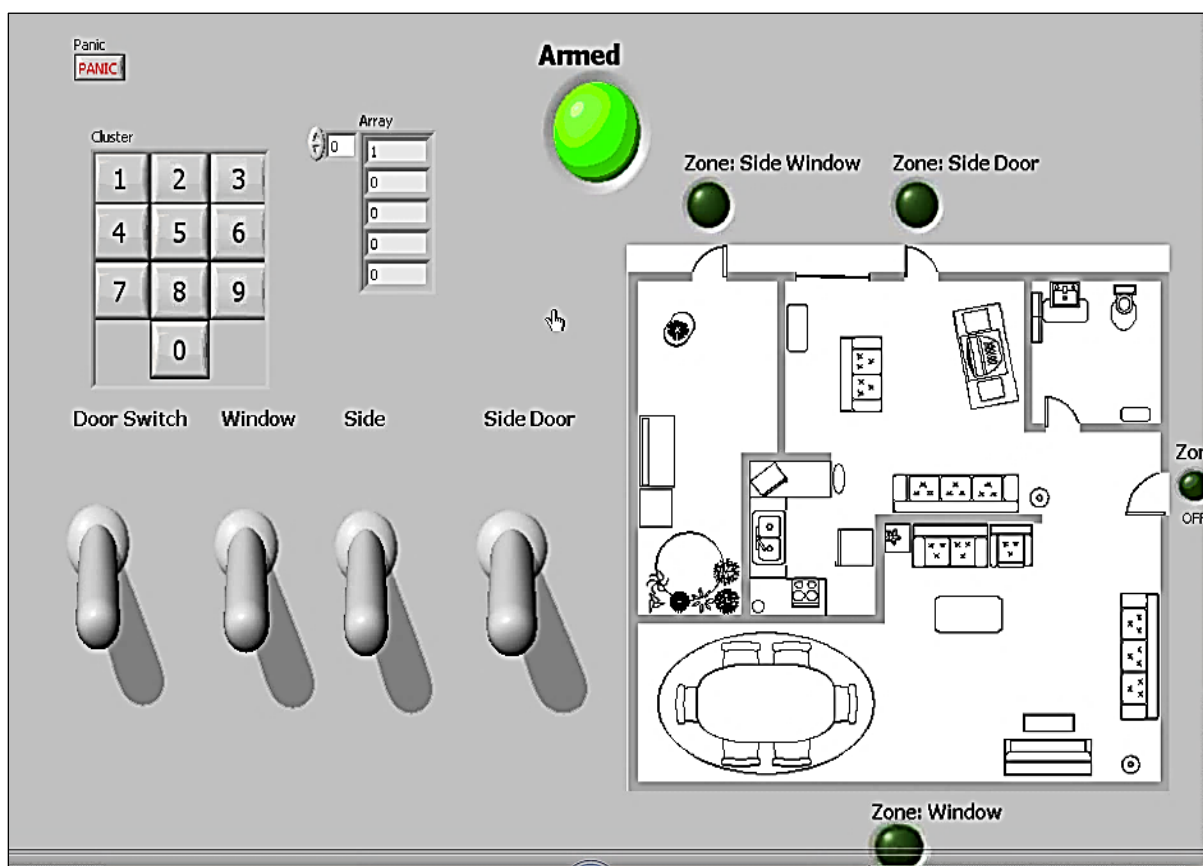


Fig. 4: Output when Code is given for Armed.

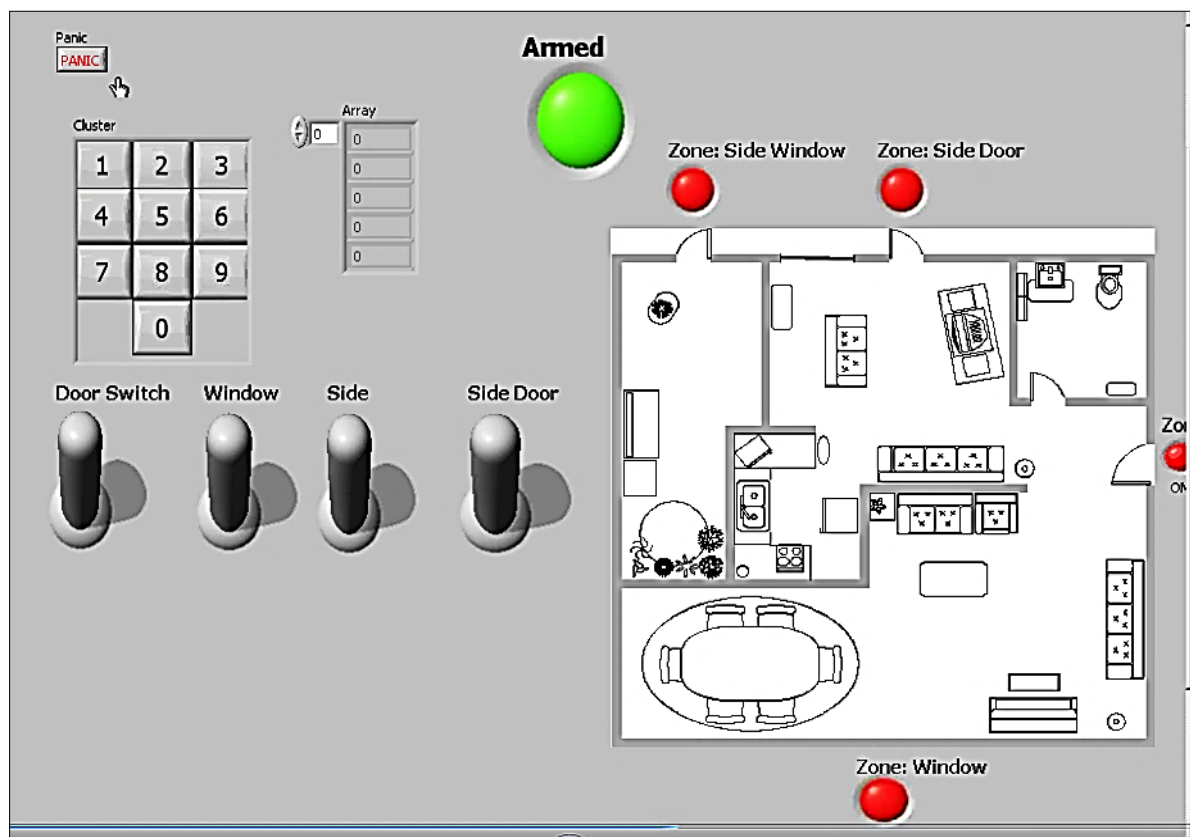
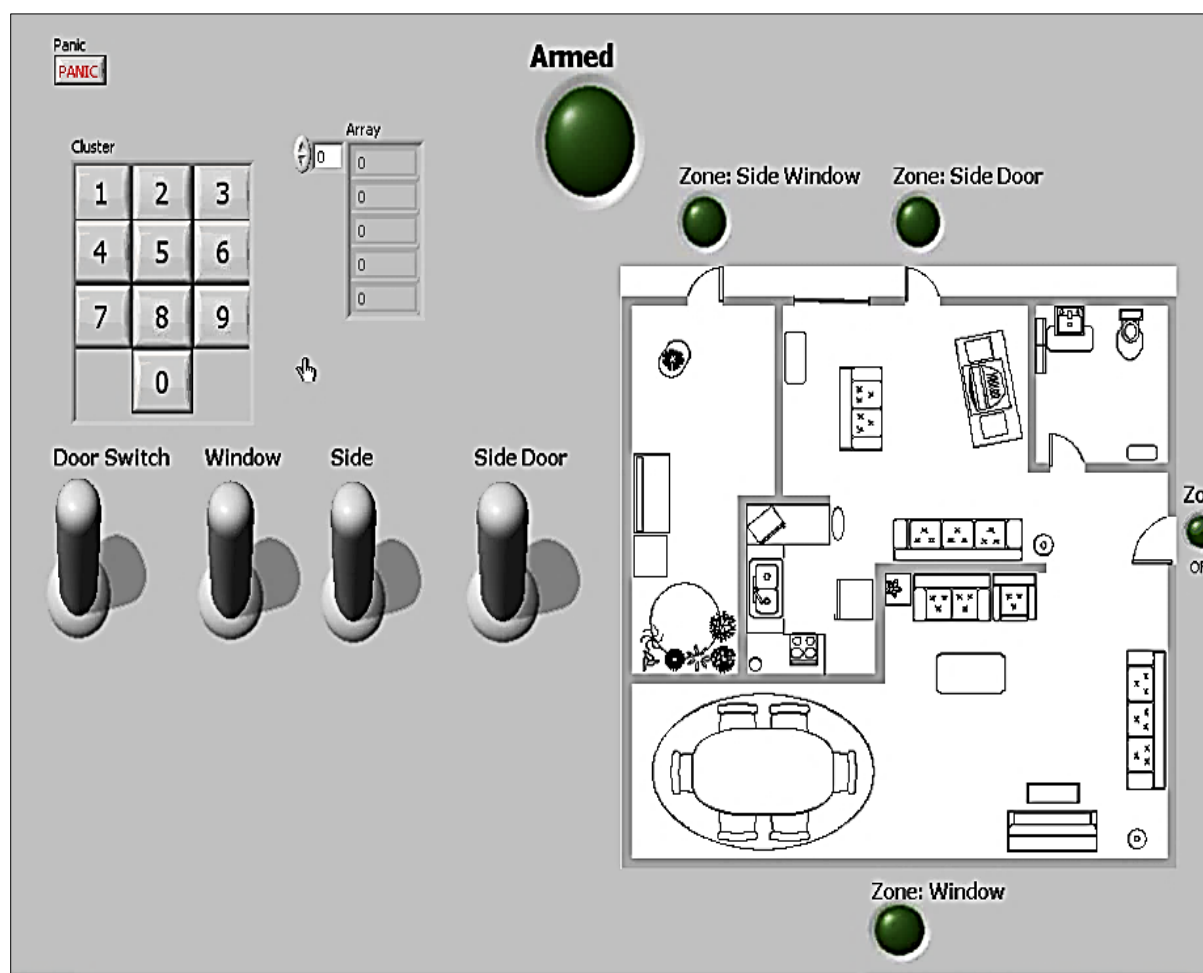


Fig. 5: Output when All the Switches are turned on.



**Fig. 6:** Output after Selecting the Panic Button on the Front Panel.

## CONCLUSION

According to industry experts, we are in for some big surprises that have the potential to make our lives easier, safer, more productive and more enjoyable.

This paper presents the importance of home alarm system for home security. Installing home security systems are not status symbols anymore but rather they have become a great necessity in today's environment. A properly secured and monitored home can definitely give you that peace of mind for you and for your family.

The fear of theft and burglary always annoys many people. When lock and keys become less safe, one can seek the help of electronic security systems or home alarm system. Various applications of home alarm systems are in buildings, hospitals, banks, electrical control rooms, heat treating furnaces, data and telecommunication, etc.

## REFERENCES

1. Guneet Kour, Jaswanti. Labview Based Alarm Systems in Home. ISSN: 2250-0987. Jaswanti *et al.* *UNIASCIT*. 2012; 2(3): 305–307p.
2. Krishna, Ravindra. Design and Implementation of Remote Home Security System Based on WSNS and GSM Technology. *International Journal of Engineering Science & Advanced Technology (IJESAT)*. 2012; 2(1): 139–142p.
3. Sleman, Alafandi, Moeller. Integration of Wireless Field bus and Wired Field Bus for Health Monitoring. *Proceeding of DTP International Conference on Home Security*. 2009; 1–2p.
4. Sikandar, Aihab, Shehzad. SMS Based Wireless Home Appliance Control System (HACS) for Automating Appliances and Security. *International Journal of Informing Science and Information Technology*. 2009; 6.

5. Singh, Gupta, Bishnoi. Self Initiated SMS/MMS Enabled Home Security System. *Int J Eng Sci Technol.* 2011; 3(3): 2412–2420p.
6. Robles, Kim. A Review on Security in Smart Home Development. *International Journal of Advanced Science and Technology (IJAST).* 2010; 15.
7. [www.uniascit.in](http://www.uniascit.in)
8. [www.crown.panam.edu](http://www.crown.panam.edu)
9. Larsen Ronald W. *LABVIEW for Engineers.*

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