PROC. INTERNAT. CONF. SCI. ENGIN.
Volume 4, February 2021
Page 22-23

ISSN 1504607797
E-ISSN 1505707533

Design of Prototype Home Door Security System Based Solenoid Door Lock, Magnetic Sesor, Microcontroller Nodemcu Esp8266 and Blynk Application

Indira Prabawati Hanggara[1], Frida Agung Rakhmadi[2]
[1,2,3]Physics Departement, Faculty of Science and Technology, UIN Sunan Kalijaga,
Jl. Marsda Adisucipto No 1 Yogyakarta 55281, Indonesia. Tel. +62-274-540971, Fax. +62-274-519739.
[1]Email: indihanggara@gmail.com

Abstract. This research was motivated by many cases of property theft, so that it is necessary to make preventive efforts. The government together with the DPR have effort, through the Book of Criminal Law (KUHP), one of which is article 483. Although the government and the DPR has made efforts, but in reality there are still cases of theft that occur. Therefore, other efforts are needed minimize the theft of property. Other efforts can be done by strengthening the security system. Security sytem is the form of a house door security system. This research aimed to design a prototype of home door security system based on solenoid door lock, magnetic sensor, NodeMCU ESP8266 microcontroller and Blynk application. This research was conducted in two stages, firstly was design of house mockup using SketchUp Software and secondly was design of pin-pin configuration of the system using Fritzing Software. Design of prototipe home door security system based on solenoid door lock, magnetic sensor, ESP8266 NodeMCU microcontroller and Blynk application was designed using Sketchup Software and Fritzing Software.

Keyword: Security System, SketchUp Software, Fritzing Software.

INTRODUCTION

Property is something that is used by humans in everyday life, such as money, patch, residence and others. Property that has been given by Allah SWT need to be grateful. One form of gratitude is to protect property with right. However, even though property has been properly guarded, theft of property still occurs frequently. Information from Utama (2016) that there are many cases of theft occurred in the Special Region of Yogyakarta (DIY), even the criminal case of theft of property occupy the most criminal acts. For this reason, efforts to safeguard must always be made. These efforts must be made by all elements of society, starting from the government up to the citizen. The government together with the DPR have effort so that the crime of theft does not occur again, through the Book of Criminal Law (KUHP), one of which is article 483 (DPR, 2019). Although the government and the DPR has made efforts to ensure security in the community, but in reality there are still cases of theft that occur. Therefore, other efforts are needed minimize the theft of property. Other efforts can be done by strengthening the security system. Systems that qualify can be created using use solenoid door lock which can be used as a door lock (Guntoro et al, 2013), magnetic sensor used to monitor the status of a door or window on security system (Arafat, 2016), NodeMCU ESP8266 microcontroller which already has facilities to support connection wifi so that making it easier for the user and not need to add more modules wifi in circuit, the buzzer as an alarm and the last is Blynk appication as an interface. Based on the above background, therefore this research aimed to design a prototype of home door security system based on solenoid door lock, magnetic sensor, NodeMCU ESP8266 microcontroller and Blynk application.

MATERIALS AND METHODS

Tools and materials

The tools that need to be prepared are a notebook and the materials that need to be prepared are the SketchUp Software and Fritzing Software. SketchUp Software used to design of house mockup and Fritzing software used to design of pin-pin configuration.

Procedures

The procedure was carried out in two stages. The research stages sequentially shown as in Figure 1.

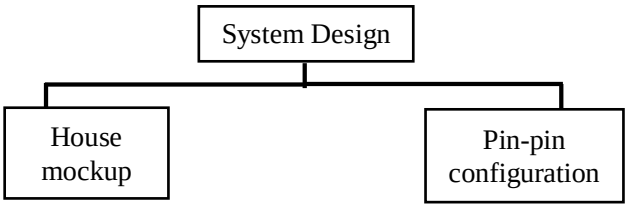

Figure 1. Procedure flow chart

Stages of system design is to get an overview the system. System design has two targets in the form of pictures. The first target is to get an overview of house mockup and the second is to get an overview configuration pin-pin from microcontroller NodeMCU ESP8266 to the components.

RESULTS AND DISCUSSION

Results of system design are divided into two, the first the design of the house mockup and the second is the result of design pin-pin configuration design of the home door security system. The house mockup design has been successfully designed use software Sketchup 2016. The results can be seen at Figure 2.

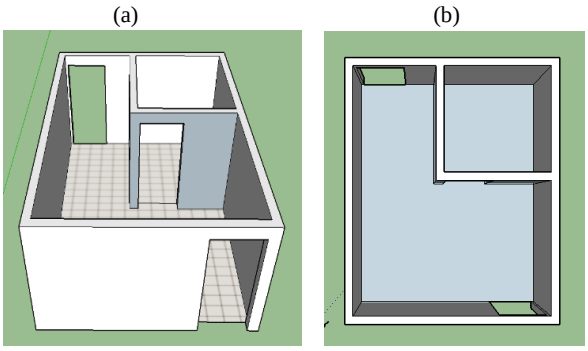

Figure 2. The design of the house mockup (a) is taken from a certain angle (b) taken from above

Design of house mackup security system is made used SketchUp Software. The design on this software has 1:10 comparison with the actual size. This house mockup measures 0.5 x 0.4 x 0.2 meters. The room in the mockup has a size 0.2 x 0.2 x 0.2 meters. The size of each door is 0.9 x 1.8 meters.

The design of the pin-pin configuration of the door security system has also been designed successfully designed using software Fritzing. The results of the configuration design the pins of the door security system are indicated by Figure 3.

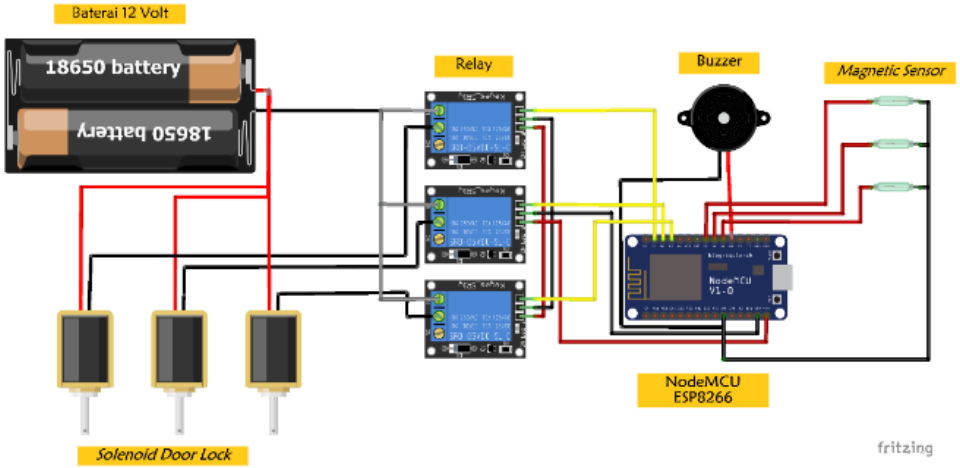

Figure 3. The result of designing the pin-pin configuration of the door security system

The component pin configuration is designed using Fritzing software. The pins on the NodeMCU ESP8266 are connected to a magnetic sensor which is used to read the status of the door, connected to a buzzer which functions as an alarm and connected to a solenoid door lock to control the door.

The door security system uses a solenoid door lock and magnetic sensor which is connected to the NodeMCU ESP8266 and the buzzer. Solenoid door lock and magnetic sensor will be installed on the door, while NodeMCU ESP8266 and buzzer will be on the PCB base. This home door security system can open and monitor house doors using the Blynk application.

The working principle of the system is monitoring home doors and being able to open home doors using the Blynk application. The power supply is the voltage source used by the NodeMCU ESP8266 and the sensors to work. The button on the Blynk application can open the home doors using a solenoid door lock. Magnetic sensors will monitor the state of the door. If the door is broken, the plate on the magnetic sensor will be disconnected. This is what causes the magnetic sensor to detect the state of the door, which is then processed by NodeMCU ESP8266 so that an output in the form of a notification and it will automatically sound the buzzer as an alarm.

CONCLUSIONS

Design of prototipe home door security system based on solenoid door lock, magnetic sensor, ESP8266 NodeMCU microcontroller and Blynk application was designed using Sketchup Software and Fritzing Software.

REFERENCES

Arafat. 2016. Sistem Pengamanan Pintu Rumah Berbasis Internet Of Things (IoT) Dengan ESP8266. *Technologia*, Vol.7 No.4 : 262–268.

Guntoro, H., Somantri, Y., Haritman, E. 2013. Rancang Bangun Magnetic Door Lock Menggunakan Keypad dan Solenoid Berbasis Mikrokontroller Arduino Uno. *ELECTRANS*, Vol.12 No.1 : 39–48.

DPR. 2019. *UU KUHP Buku Kedua*. www.reformasikuhp.org.

Utama, A. 2016. *Kejahatan Tertinggi di Yogya Terjadi di Sleman*. www.cnnindonesia.com.