FINGERPRINT KEYS ON MOTORCYCLES USING ARDUINO UNO R3 FINGERPRINT SENSOR

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ABSTRACT

Technological development and increasing human needs are two things that mutually influence one another, an additional security system that is better for both the user and the vehicle itself and is easy to use by the vehicle owner. One of the tools that can be used to help fulfill this security system is a fingerprint lock on a motorcycle using the Arduino uno r3 fingerprint sensor, a device made for motorized vehicle security systems using a fingerprint sensor to increase security on motorbike vehicles designed to use a relay. single channel as a link between hardware and software. With the increase in crime, especially motor vehicle theft today, it is not surprising that more and more people want a modern motorized vehicle security system that can secure their vehicles. To make a fingerprint lock tool on a motorcycle using the Arduino uno R3 fingerprint sensor, which is as follows, the Arduino uno R3, fingerprint sensor, single channel relay, and buzzer. Testing tools to determine whether or not a tool designed on a motorcycle using Arduino Uno R3 can be seen from the percentage obtained from testing the tool. Testing the fingerprint lock tool on a motorcycle using the Arduino uno R3 fingerprint sensor with a percentage of 68.8% of people who responded with a YES rating and 31.3% of people gave a NO response, it can be concluded that the tool can work well and the tool is able to help in the field of motorcycle safety Testing tools to determine whether or not a tool designed on a motorcycle using Arduino Uno R3 can be seen from the percentage obtained from testing the tool. Testing the fingerprint lock tool on a motorcycle using the Arduino uno R3 fingerprint sensor with a percentage of 68.8% of people who responded with a YES rating and 31.3% of people gave a NO response, it can be concluded that the tool can work well and the tool is able to help in the field of motorcycle safety Testing tools to determine whether or not a tool designed on a motorcycle using Arduino Uno R3 can be seen from the percentage obtained from testing the tool. Testing the fingerprint lock tool on a motorcycle using the Arduino uno R3 fingerprint sensor with a percentage of 50% of people who responded with a YES rating and 50% of people gave a NO response, it can be concluded that the tool can work well and the tool is able to help in the field of motorcycle safety.

Key Word: Relay, Fingerprint, Arduino uno r3

1. INTRODUCTION

At this time the harshness of life caused many people to darken the eyes. They justify any means to meet their daily needs in order to survive, such as: robbery, corruption, stealing, and other criminal acts. One of the current criminal acts is the criminal act of motor vehicle theft. With the increase in crime, especially motor vehicle theft today, it is not surprising that more and more people want a modern motorized vehicle security system that can secure their vehicles. The solution that is usually done by motorized vehicle owners today is only to use a key (padlock) or an alarm, but vehicle owners often forget to put a key (padlock), or an alarm on their vehicle.

Therefore, an additional security system is needed that is better for both the user and the vehicle itself and is easy to use by the vehicle owner. One of the tools that can be used to help fulfill the security system is a motorcycle fingerprint lock. Fingerprint lock and motorcycle tracker is a device made for motorized vehicle security systems using a fingerprint sensor to increase security for motorbikes that are designed to use a single channel relay as a link between hardware and software. The fingerprint sensor is

a tool for matching a person's fingerprint pattern with a pattern stored in the sensor's memory, and is also used as a substitute for a ignition key to start a motorcycle.

The reason the researcher took the title above was to reduce the crime rate of motorcycle theft and to increase the security of motorbikes that still use manual locks.

2. RESEARCH METHODS

The method used in this research is a qualitative method with the type of research and development. This method aims to produce and test products so as to create a quality product. The product to be developed in this research is the Motorcycle Fingerprint Key Using the Arduino Uno R3.
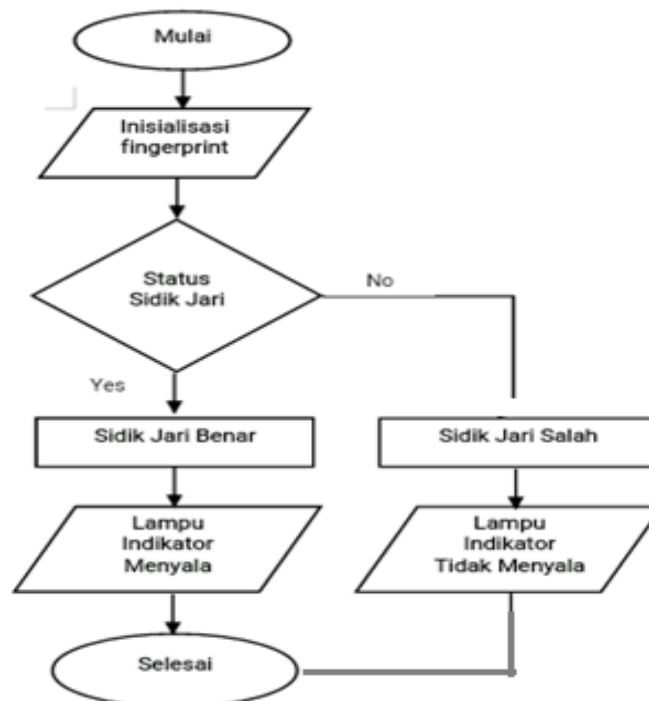

Figure 3.5 Fingerprint lock flowchart

From the flowchart above, it can be explained how the tool functions, we must first register the finger that will be registered, the finger will be scanned first and will be taken a picture then the image will be saved in Atmega 328 memory. If the finger is registered then Atmega328 will give orders to activate the socket, it will show the matches of each registered finger. If the finger is not registered, then the ATM will not give orders.

3. RESULTS AND DISCUSSION

In this chapter, the author described the preparation of the components and equipment used as well as practical steps, then display the component test data. Tests are carried out repeatedly to produce data that is truly precise. Before testing, the authors first studied the tool so that the data could represent the overall test results.

3.1 Testing Objectives

Component testing is useful for producing equipment specification data or for obtaining measurement points on tools that have been made, so that when an error or damage occurs, it can be analyzed appropriately and easily to repair it. Testing of this tool includes testing the system as a whole, this is done to find out the system as a whole, this is done to find out the system is running well.

3.2 Testing Method

This testing method is carried out with alpha, namely testing the components of the tool which is carried out by the author by checking all components of the tool with the program code to find out whether the components of the tool can work properly or not. Simply put, the alpha testing process is a process of evaluating as much as possible by the application developer or the developer to ensure that their digital product meets the standards they set before the application product finally reaches the hands of the application user. This testing only involves the development team.

3.3 Testing Arduino Uno R3

In this Arduino Uno test, it was tested by connecting the Arduino Uno R3 with a voltage source. If the led on the Arduino is on, it can be ascertained that the Arduino can work properly. This test is intended to check whether the input and output data can work in accordance with the system's job description. The components needed are Arduino Uno R3, Breadboard, jumper cables, resistors and leds.

In the Arduino program test above, the pin used to turn on the led light is pin number 1, if the pin is HIGH then the led will light up for five seconds while the pin is LOW then the led will go out for three seconds. If the led on Arduino lights up, it can be ascertained that Arduino can work properly. This test aims to check whether the input and output data can work in accordance with the system's job description.

Figure 4.1 Testing Arduino Uno R3

3.4 Testing Relays

In testing the relay program, the pin used to connect the relay is pin number 2, if the pin is HIGH, the relay read data 1 for five seconds, while the pin is LOW, the relay read 0 for 5 seconds. If the green led light on the relay lights up, it can be ascertained that the Arduino relay can work properly. This test aims to check whether the relay's input and output data can work in accordance with the system's job description. The green indicator light on the relay lights up for 5 seconds.
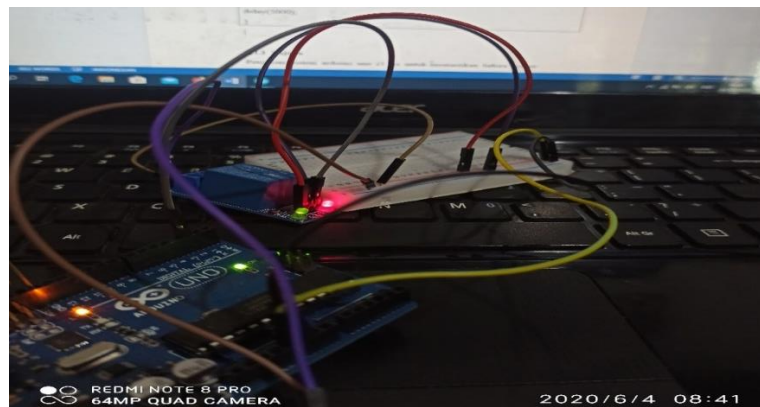
Figure 4.2 Live lamp relay

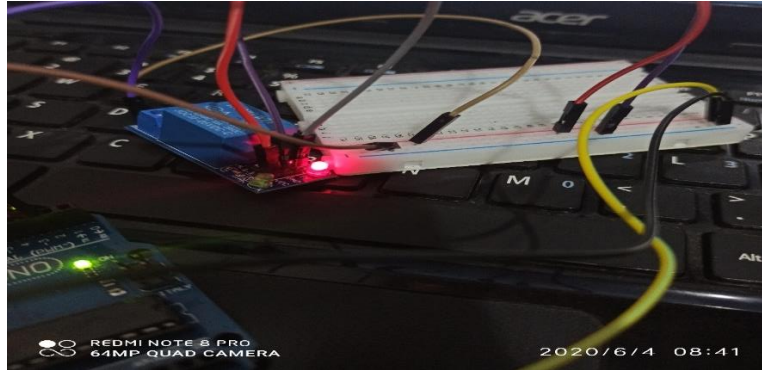The green indicator light on the relay is off for 5 seconds.

Figure 4.3 Relay off

3.5 Fingerprint Testing
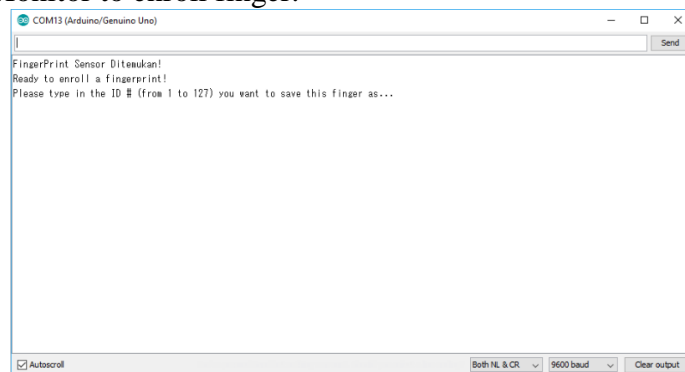
Open Serial Monitor to enroll finger.

Figure 4.4 Fingerprint Enrollment Monitor Series

Enter a number from 1-127, the number to save the finger, click Send or press Enter. Place finger on Fingerprint sensor.
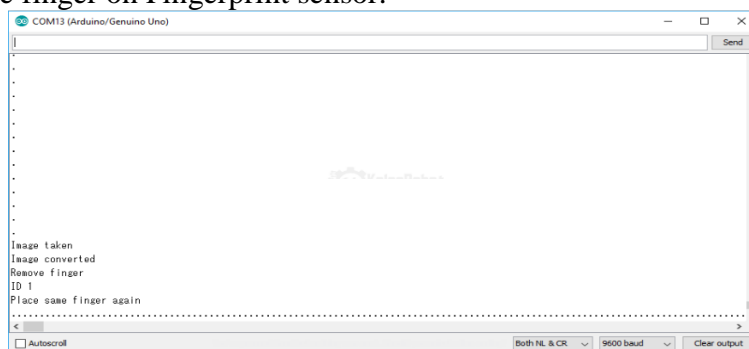

Figure 4.5 Serial Finger Enrollment Process Monitor

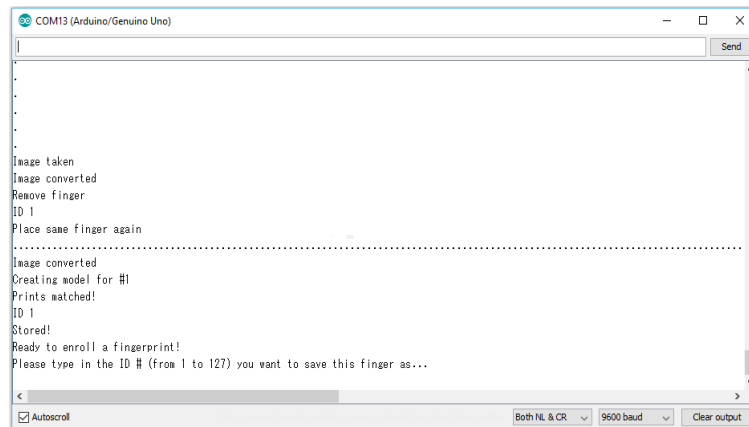Release your finger, Then put it back for Confirmation.

Figure 4.6 Completed Finger Enrollment Monitor Serial

If there is already a stored statement, it means that the finger was successfully registered.
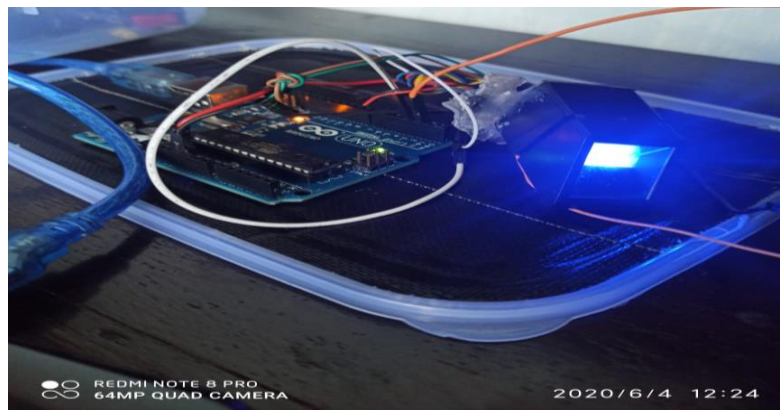

Figure 4.7 Fingerprint Sensor

3.6 Buzzer Testing

Buzzer testing is used to check whether the buzzer is working or not. If it has been successfully uploaded, the buzzer reads sound.
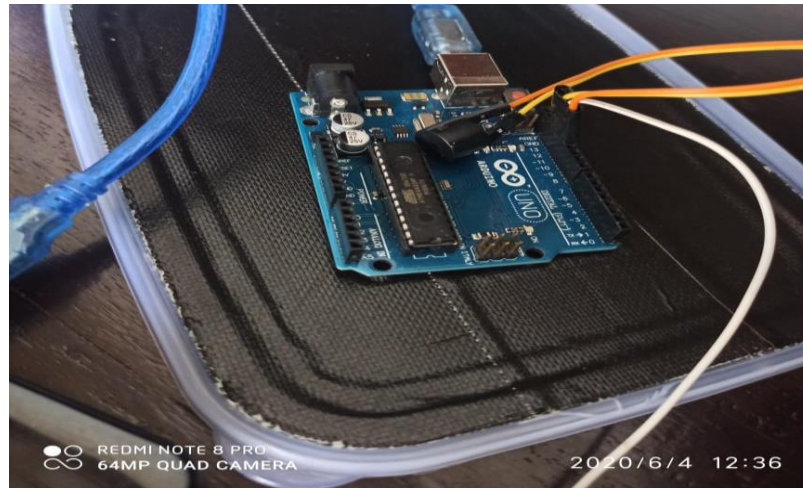
Figure 4.8 Buzzer

3.7 Testing the fingerprint lock tool on a motorcycle

This fingerprint lock test is used to make sure the tool works as intended by using the program. From testing the series of tools, it can be explained that the motorcycle indicator light up after the key is positioned on and after the finger is attached to the fingerprint sensor. The position of the finger when placing the finger on the sensor, the finger is dry, the position of the finger is upright or upside down.
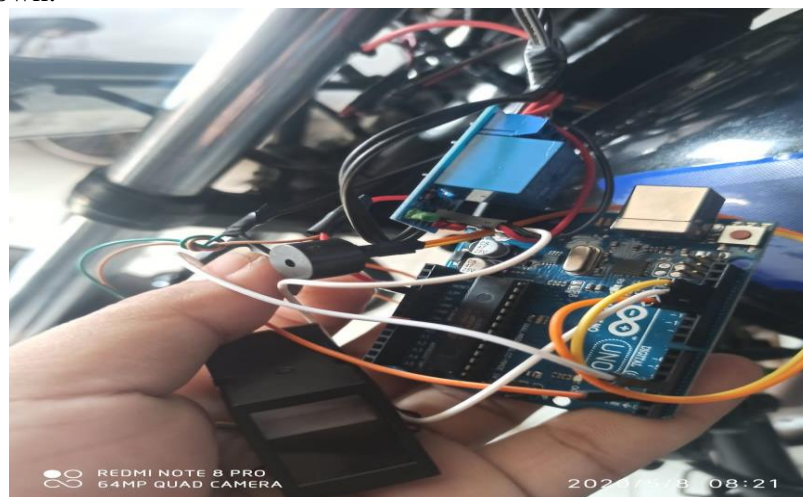

Figure 4.9 Fingerprint Lock

3.8 Purpose of Testing Tools

Testing the Arduino Uno R3 system is to ensure that the Arduino system used in this study is not damaged. So that the program embedded in the microcontroller can be used as an additional fingerprint key as expected.

3.9 Tools Used

1. Arduino Uno R3

2. AS608 Fingerprint Sensor
3. Jumper Cables
4. PC / Laptop
5.Software (Arduino IDE)
6. USB board cable Arduino Uno
7. Single Channel Relay
8. Arduino buzzer

3.10 Equipment Testing Procedure

Basically this test is only to find out what fingerprint lock iswhich is made according to what was planned and knows the results of the testing of the tool whether it is in accordance with what was planned and expected. The steps in the process of testing a motorcycle fingerprint lock are:Connect the fingerprint sensor VCC cable to the 5V Arduino and connect the GND cable to the Arduino GND port. Then connect the TX cable to pin 2 Arduino, RX cable to pin 3 Arduino and connect the VCC relay to Arduino 5V and GND relay to Arduino GND pin. Then connect the IN relay port to pin 13 Arduino connect pin (+) bazzer on pin 12 Arduino and pin (-) bazzer on GND Arduino. To supply power, Arduino uses current (+) in the motorcycle lock which is combined with the cable from the motor lock to the CDI of the motorcycle and current (-) Arduino uses the motorcycle body.

Table 4.1 Table Testing Tools

Finger Conditions	Turns on	No flame
When the position of the fingers is upright and dry	√	
When the position of the fingers is upright and slightly wet	√	
When the position of the fingers tilted to the right and dry		√
When the position of the fingers tilted to the right and slightly wet		√
When the position of the fingers is straight down and dry	√	
When the position of the fingers is straight down and slightly wet	√	
When the position of the fingers tilted to the left		√

and dry		
When the position of the fingers tilted to the left and slightly wet		√

Based on table 4.1 above, the percentage of testing the fingerprint lock tool on a motorcycle using the Arduino uno R3 shows that the test results turn on by a percentage of 50%, and do not turn on by a percentage of 50%.

4. CONCLUSION

Testing tools to determine whether or not a tool designed on a motorcycle using Arduino Uno R3 can be seen from the percentage obtained from testing the tool. The design of a device on a motorcycle uses the Arduino uno R3 with a 50% light on and 50% off percentage.

5. SUGGESTION

The suggestions that researchers can provide to develop future research are as follows: This research can be used as reference material and documentation for the library as a reference material for future researchers, as well as material to improve the quality of journals and scientific works for all students.

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