

Arduino Uno-Based Automatic Controller for Clothes Dryer Tool

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Abstract: Erratic weather changes cause continuous rain, so clothes that have been washed will take a long time to dry and become damp. The process is carried out in open air and requires quite a large space. The aim of this research is to design an Arduino Uno-based automatic clothes dryer that can dry clothes and determine the dryness level of clothes automatically. The research method used is research and development where the process of developing a clothes dryer system which previously used a heater is now perfected by using a light hair dryer and two fans. The results of testing the tool system begin with the time being set by an Arduino timer and the temperature being set by a humidity sensor.

Keywords: Arduino Uno, Arduino Uno Controller, Automatic Controller, System Controller

INTRODUCTION

In this modern era of technology almost everyone has this tool electronics used For various type interest in the life daily man in to dry clothing. The most common problem Because existence change the weather is not determined cause Rain down Keep going continuous, partial big public rely on heat energy sun For to dry clothes so that to dry clothes become long.

Machine washer wear is one of the form rapid technology its development. With existence development technology the of course there are a lot machine wash what's done equipped with a controller automatic. Controller is a process of regulation various factors in a tools for implementation in accordance with provisions (Hermansyah et al., 2020).

Controller is very useful tool in make product in accordance with specification since from the beginning of the process until end of process. Controllers are also related with control which is system control that can to control, to organize, to command and to control A tool For do something. In a way theory control is arrangement from a number of components that are assembled such that appearance so that able and can arrange the system Alone or system outside of it in a way general as for effective controller have accurate, timely , objective and comprehensive , flexible characteristics as well as prescriptive and operational (Aditya & Wahyudin, 2021).

Automatic is replacement power man with power machine that is automatic do and work on work so that No need Again supervision man (Baco et al., 2022). Automatic can also be interpreted A field knowledge we are sued For create / change A manual machine becomes automatic , basically automatic used For help man in do things are possible , because like We know that man own limitations in matter accuracy (Pangkey et al., 2021). Tools are a objects used For do something tools, furniture, used For reach the purpose and intent used For make it easier work We in life everyday. Clothes is material textiles and fibers used as closing body. clothes is need main man besides food and place accuse / place stay (house).

Clothes also have function For protect body from weather, light sun, dust as well as animal disturbance, protecting body from other dangerous objects skin , and cover or disguise lack its usage . Arduino is development from the running wiring software on the open /source platform of software and hardware. Devices hardness has an Atnel AVR processor and the software has a programming language myself. For flexibility , programs included through bootload use downloader For in a way direct via ISP port, no need device hard apart for make code new board with Enough use USB cable (Fauzi et al., 2020).

Study controller automatic on the tool dryer clothes based on Arduino Uno currently This has Lots developed , in research previously Lukman Aditya and Didi wahyudin , “ System Dryer Clothes Automatic Microcontroller Based ” (Shofiyullah & Muharom, n.d.).

METHOD

In compilation journal this, using a number of method research conducted. Methods study used as guide in conduct research so that the results obtained No deviate from the expected goal. As for the method research used is as following:

1. Literature Study

In stages This writer do collection required references in do research. This is aiming For to obtain information and data required For writing journal. References used originate from various type source among them is journals, books, and related internet sites with study This.

2. System Analysis

It is A activity For know How method Work from the system like how is the manufacturing process, how is the system walking, data needs, and others.

3. System testing

Step by step this is the system that was created furthermore tested whether walk in accordance with what is expected and can be functioning with Good.

4. System Documentation

Do system documentation start from stages beginning until system testing, for furthermore made in form report study thesis. The system documentation aims to For show description of the process of creating a system.

Microprocessor is a form device electronics made become a packaging small and used as processor For all over series electronics (Wisaksono, 2019).

Embedded network systems connect network with network interface to source access. Connected network Can So Local Area Network (LAN), Wide Area Network (WAN) or internet. Connection can use cable or wireless. Networked embedded systems can categorized based on the connection the.

Microcontroller Atmega is 8 bit microcontroller. Atmega have more peripherals Lots compared to with series ATTiny (Khakim, 2023).

System Work controller automatic on the tool dryer clothes Arduino Uno based is shown in the block diagram figure 1 below This:

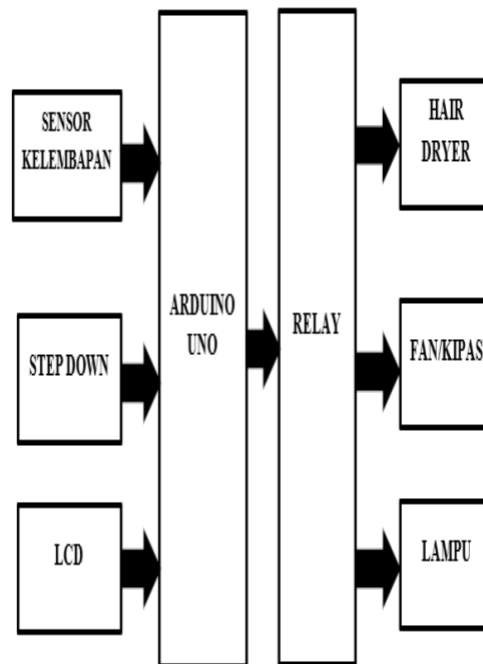


Figure 1. Tool Block Diagram

System work on every The components in the image are explained as following:

1. Arduino Uno has function For control system that makes it easy user in various field electronics. With use arduino uno, making application become more easy and cheap , and also can used For develop object , take input from various switches or sensors as well control various lights and other physical outputs (Fahmizal et al., 2022).

Below are 2 examples of Arduino Uno images:



Figure 2. Arduino uno

Moisture Sensor is a sensor that is capable of give information temperature and humidity. principle his work is give mark output in the form of electrical quantities as consequence the presence of water between plate the sensor capacitor. Here are 3 examples of moisture sensors below This:



Figure 3. Moisture Sensor

3. Ste down is device electricity that works reduce voltage One Power current back and forth. Step down is also possible change voltage tall current low and also current high. Here image 4 examples Step Down below This:

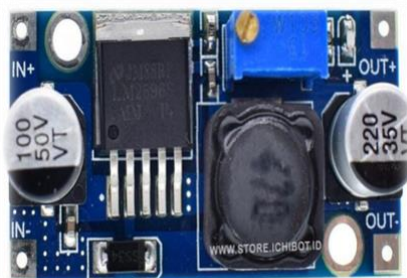


Figure 4. Step Down

LCD (Liquid Crystal Display) is a type of display media that uses liquid crystals as the main display. LCD (Liquid Crystal Display) can display an image/character because there are many points of light (pixels) consisting of one liquid crystal as a point of light. Although called a point of light, this liquid crystal does not emit light itself. Here Figure 5 examples of LCD below This:



Figure 5.LCD

5. A relay is a switch that is operated electrically and is an electromechanical component that consists of 2 main parts, namely electromagnetic (coil) and mechanical (a set of switch contacts). Relays use the electromagnetic principle to move the switch contacts so that with a small electric current (low power) it can conduct high voltage electricity. The following Figure 6 examples of relays below This:

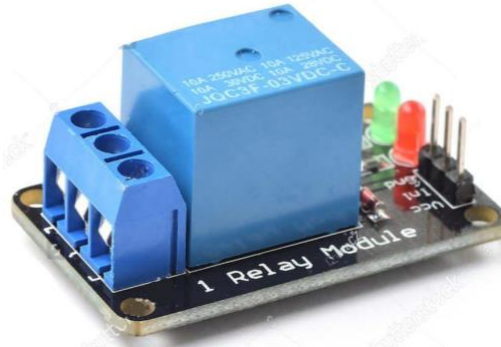


Figure 6. Relay

As for the principle from relays like electromagnet (coil), armature, switch Contact Point (Switch), and Spring. Some relay function that has been commonly applied into the equipment electronics among them is:

- a. Relay is used For operate function logic (logic function)
- b. Relay is used For give function delay time (time delay function)
- c. Relay is used For control circuit voltage tall with help from signal voltage low.
- d. There is also a relay functioning For protect the motor or component other from excess voltage.

6. Hair dryer works For give temperature heat on clothes. Hair dryer is the final process in the dryer clothes automatic, hair dryer start Work after accept order from LCD button arduino uno and clothes will dry automatic (Damawidjaya Biksono, 2022) [10] , and examples hair dryer picture can be seen in the following figure 7.



Figure 7. Hair Dryer

7. DC Brushless Fan (fan) is functioning For help circulation air hot in the space and throw it away to outside come on to in room. Another function of the fan is regulate the volume of air to be circulated in space, and examples The image of the DC Brushless fan can be seen in the following image 8. This.



Figure 8. DC brushless Fan

9. Lights incandescent is a devices that can produce light moment flowing current electricity. Current the electricity in question This can originate power electricity generated by the power plant electricity centralized such as PLN and generators or power electricity generated by Batteries and Accumulators. Function light in making tool This aiming as heating clothes (Yolanda, 2022), and examples picture Light incandescent can be seen in Figure 9. Below This.



Figure 9. Lamp Incandescent

Design Devices Hard

Design device hard done with to do installation pda component tool dryer clothes. Tools and materials used in design This between other as following:

- a) Acrylic
- b) Plywood
- c) Arduino Uno
- d) Relay
- e) Step Down
- f) Humidity Sensor
- g) Hair Dryer
- h) Fan
- i) Lights
- j) Water Reservoir
- k) Pilo paint
- l) Cable
- m) LCD
- n) Granny
- o) Electric Drill
- p) Pliers & Screwdriver

Calculations on each test data that has derivative like acquisition power, energy, current electricity and so on with method count from the result data testing or measurement for example voltage and current. Voltage and current measured with a voltmeter and ampere meter.

- a. Arduino uno testing is carried out as controller from all over component system designed on the tool the.
- b. LCD testing is carried out with see whether LCD screen on or dead when USB cable connected to the laptop.
- c. Humidity sensor testing was carried out on the Arduino Uno program where We can set level limit dryness in the contained water content dressed

RESULT

Following is picture tool the dryer that has been finished designed and ready For used along with its components such as Arduino Uno R3, relay, step down, LCD, fan, hair dryer, humidity and light sensor, and display front tool can be seen in the following figure 16 This.



Figure 16. Front View of the Tool

Following is Figure 17 which is appearance behind from tool dryer clothes that become place gathering component along with cable on the part behind this is also available reset button for turn on tool dryer clothes.

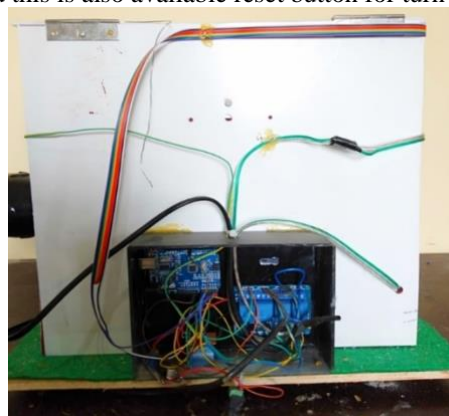


Figure 17. Display Back of Tool

Furthermore is Figure 18, view front dryer clothes When turned on. How to use it there is with connect tool current electricity after That connect USB cable to the laptop then insert clothes into the tool dryer in a way One one by one then the LCD will display temperature and humidity of clothing.

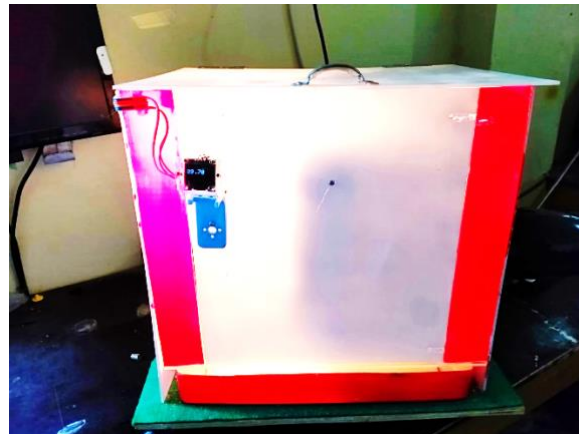


Figure 18. Tool Display When Turned On

Following is Figure 19 which is appearance in on the tool dryer clothes moment used



Figure 19. Tool section view in

DISCUSSIONS

Research result is a conclusion and analysis data about A system controller automatic on the tool dryer clothes based on arduino uno. Data collected based on testing conducted to tool plans made. Furthermore need known about what has been designed and how it works system. Design This is A the system works as tool dryer clothing. How it works from A controller automatic on the tool dryer clothes based on Arduino uno is as following:

- This tool equipped with LCD as marker tool dryer clothes currently used or No.
- 2. If the LCD is it's on, it's on means tool currently used.
- 3. If the humidity sensor works + LCD lights up, then the relay also automatically automatic will active /on. While if the humidity sensor No working + LCD not working light up then the relay also does not will on /off.

CONCLUSION

The conclusions drawn during workmanship and manufacturing Controller Automatic On Dryer Clothes Based on Arduino Uno, is as the following: (1) This tool using a working Arduino Uno as tool controller main from overall system to be more effective, and lcd as tool Supporter For display temperature at the time drying. (2) All component Controller Automatic On Dryer Clothes Arduino Uno based running in accordance with design. (3) Drying time influenced by temperature and time, the longer the time and the more tall the given temperature, the higher fast drying process.

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