System Water Purifier With Arduino Based PID Control

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Abstract

Dirty water can endanger the health and mental safety of humans, which can lead to outbreaks of cholera, ringworm, scabies, diarrhea/dysentery, and typhoid which are some of the diseases that arise from dirty water which are still consumed without further processing. To deal with dirty water, researchers have a solution with a water filtering system using a water purification system with an Arduino- based Pid sensor control, where the water will be filtered in the water treatment then the water will be detected by the LDR sensor is still cloudy or clean, if the water is still cloudy, Arduino will send the command to relay to turn on the water pump so that the water will flow back to the water treatment. if the water is clean, the water will be put into the container that has been provided. Then the results from the water will be displayed in the application that was made using the Inventor app. Verify the results of system testing that the application is running very well when displaying the results of the system being created.

Keywords — Dirty water, LDR sensor, Water treatment, Relay, App Invent

1. INTRODUCTION

Difficulty in obtaining clean water is one of the problems that need to get careful attention. Because getting clean water according to certain standards is an expensive thing. This is because it has been polluted by various kinds of waste, both waste from household activities, waste from industrial activities, and from other activities. The dependency of housewives on clean water is also increasing along with the growing population. Therefore, good treatment is needed so that it can change water from poor water quality to get clean water quality for the needs of housewives. According to the Indonesian Ministry of Health, water that has requirements includes tasteless, odorless, colorless, and does not contain heavy metals (Ministry of Health, 2003).

In water management, a good control system is needed to support the process running smoothly. In the control system at the regional water company, several processes already use a distributed control system where all controls can be monitored through the application.

The control system using the PID method is sufficient to run pro on a water purifier because the control system is quite simple and very often used because this control system is compatible to be combined with other control systems, such as App Inventor using Android.

This study discusses the purification of water that is stored in a container that will automatically be filtered and cleared by filtering using an Arduino-based PID control system. The system will be implemented in homes where daily needs for clean water are lacking and use rivers as a source of water. Based on the background above, a needs analysis was carried out for the components used in making the research entitled "Arduino-Based PID Control Water Purification System".

2. RESEARCH METHODS

2.1. Object Study

Object study This is a System Water Purifier With control PID Arduino based which has a number of a component such as Arduino uno r3, water pumps, relays, LDR sensors, PID sensors,

and components other. Programming will be made through the Arduino IDE, App Inventor, and will be controlled via android.

2.2. Research Tools

Component Design System Water Purifier With Arduino Based PID Control is Arduino UNO R3, LDR Sensor, Temperature Sensor, Bluetooth CH-05, LED Light, Water Pump, Jumper Cables, and Adapter. Software used are Arduino IDE and MIT APP Inventor.

2.3. Design System

2.3.1. Method Data Collection

Which methods will be taken in finishing the task end This among them are :
a.　Studies Literature
Search and collect related literature and studies _ with the problems on the job end this, fine form articles, books references, data from the internet, and other related sources with problem task end.
b.　Observation
c.　The method used in a manner direct observes how the existing management process For made material consideration researcher in making task end made. _
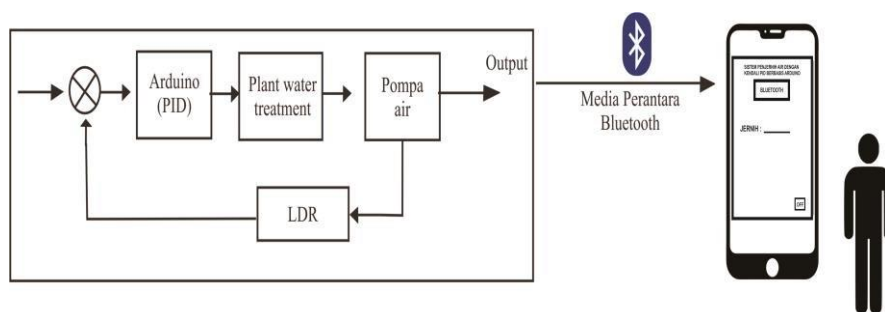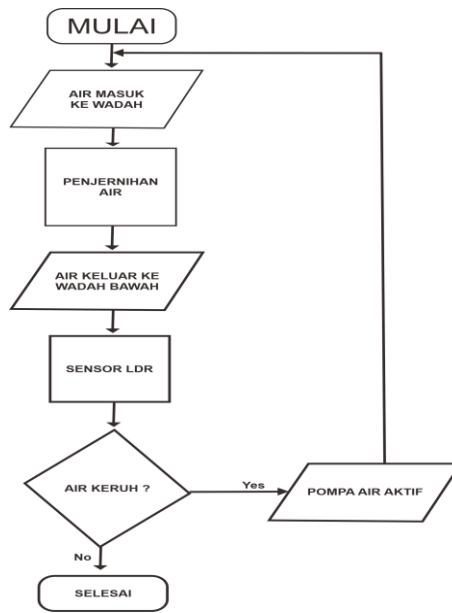
2.3.2. System Block Diagram Design

Figure 1. System Block Diagram Design

2.3.3. System Flowcharts

System flowchart

2.4. Hardware and Electronic Design
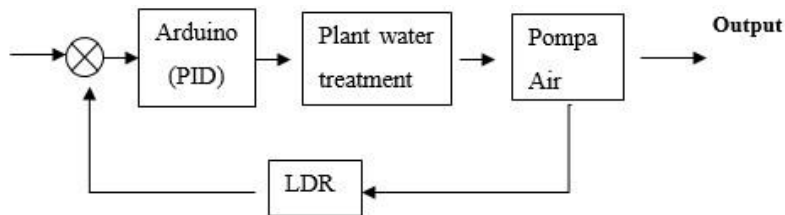
2.4.1. Draft Device Hard

Figure 3. Design Device Hard

Design device hard started with designing principle Work tools, and continued with designing Suite tools by integrating _ a number of the device to become a system, which consists of Arduino Uno R3, a *water treatment plant,* an LDR sensor, a relay, and a water pump. In the design device loud system, If the Application the Bluetooth button is clicked so automatically will connected to Bluetooth, Bluetooth is a liaison between Arduino and Inventor applications. Then the Bluetooth will be connected to the system For displays water purification data.
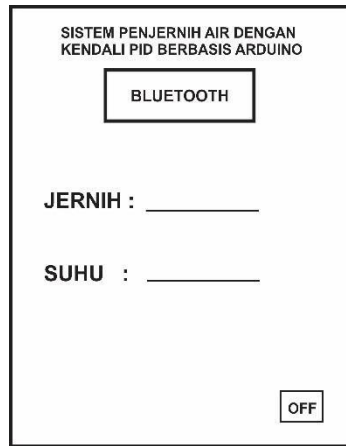
2.4.2. Appearance

Figure 4. Display Application Water Purifier

3. RESULTS AND DISCUSSION

Implementation This will explain details about Design System Water Purifier With control *pid* Arduino based, where still water dirty will enter to water treatment, then the water will down to the receptacle to detect the LDR sensor for water already Still murky then Arduino will give an order to the relay for turn on the water pump to return water filtered until No murky again. Water yield will be displayed using the application to user.
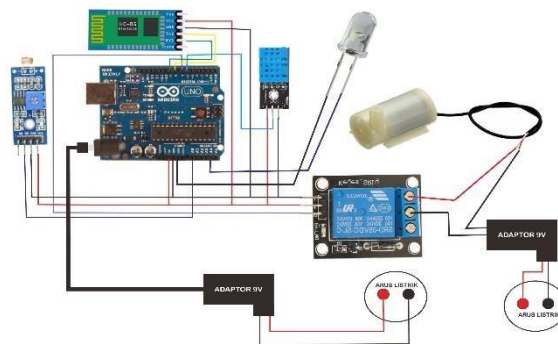
3.1. Suite Component System

Figure 5. Series Comments system

3.2. Implementation Device Soft

Appearance results from the connected Bluetooth via android. And following This how it looks.
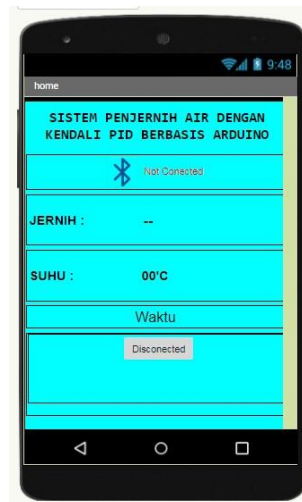
Figure 6. Display Device Soft

4. CONCLUSION

The conclusion from the system created _ is a whole tool This Work with well, only just in stage connect Still There is an obstacle in distance.

And there is a number of points Another conclusion, namely :

a. The whole system proven can walk with Good proven with LDR Sensor if mark error and the PID output close to the set point is obtained the best PID tuning value at kp = 1 , ki = 0.2 , kd = 0.01 so the system will walk with Good For clear water.

b. Design system water purifier and PID control that is accessed by android too Can be used with Good proven with capable displays data on the application android.

5. SUGGESTION

For future development tools, it This Possible Can add databases to in appearance application so that history already done can display back. Water filters for water purifiers can according to the prototype used in the system be created.

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