Control System Design for Information and Data Communication Video Booth 360⁰ Using Internet of Things Media

Irawan.H[1*], Abdul Rakhman[2], Siswandi Siswandi[3], R.A Halimahtussa'diyah[4],Reynaldi.A[5]

[1-5] Electro Department, State Polytechnic of Sriwijaya , Srijaya Negera Street Bukit Besar, Palembang - Indonesia
siswandi@polsri.ac.id

Abstaract. The art of videography has developed over time. Starting with the discovery of the photographic camera and siluloid film in the 16th century. The discovery of the photographic camera and celluloid film came from a wooden box, and in the box there was an obscure lens. The obscure lens is a small hole located in the middle of the box or as the center.Testing of the tool's response to the graphical user interface design is carried out to test each command response function given through the application whether it is functioning and working as it should according to the design or not. This test is carried out by testing one by one the widget functions that have been prepared previously by monitoring them on the serial monitor tool. The following are the results of the tests carried out starting from blynk connection testing, power ON button access testing, power OFF button access testing, motor rotation speed control slider access function testing, CCW rotation direction widget function testing, CW rotation direction widget function testing, function testing ON OFF the LED downlight, until the blynk application code uses the Arduino IDE. This test is carried out to test the success of the Blynk application connection to the hardware device used. In carrying out this test, the first thing to do is activate the electrical current on the hardware that has been arranged and connect the application connection to the designed hardware device.

Keywords: Arduino, MIT app, Blynk app, Camera 360, Sensor and Transducer, DC Motor

1. Introduction

From this celluloid film, the illusion of a fixed image was discovered, and this illusion was produced not from movement. With the emergence of motion pictures by Thomas Alva Edison, videography continues to develop. Apart from that, he also made a kinetiscope which was later developed by Lumiere [1,2].

Developments in videography continued, until finally Thomas Alva together with Lumiere succeeded in inventing videography by combining a camera and projector into one unit to produce films. Currently, the need for videography is increasing. Videography is not only used in the entertainment industry, but is also used as a

documentation medium at formal events such as weddings, seminar activities, concert activities, and other big celebrations.

The test was carried out to test the function of the PWM output data produced by the microcontroller when controlling the motion and speed of the DC motor. Testing is carried out via a serial communication data monitor on a serial monitor with a baudrate of 9600 according to the specified baudrate value programming. It can be observed that the influence of speed settings on application slider access will affect the shape of the resulting PWM signal. For the PWM value itself, the resulting variable duty cycle value will be directly proportional to the addition of the input slider percentage value.

Internet connection testing can be connected for the first time between the tool and the system being designed. From the test results, it was found that the fastest time obtained to make an initial connection was 06.31 seconds and the longest time to establish a connection was 11.05 seconds with an average time of 6,893 seconds. From the results of this test, it can be concluded that the time required to make a network connection until the device is ready for use is no more than 12 seconds of initial preparation so that the device can be used with relatively short preparation.

2.   Design System

As explained in the design objectives, in designing a tool there are steps that are related to each other. These steps are divided into two parts, namely installation and testing of the tool. The software creation part must be carried out carefully so that the expected results can be achieved well and error factors can be minimized.

Furthermore, block diagrams are one of the most important parts in designing a tool. From the block diagram, you can understand the working principle of the entire circuit. Following is the block diagram of the entire circuit.
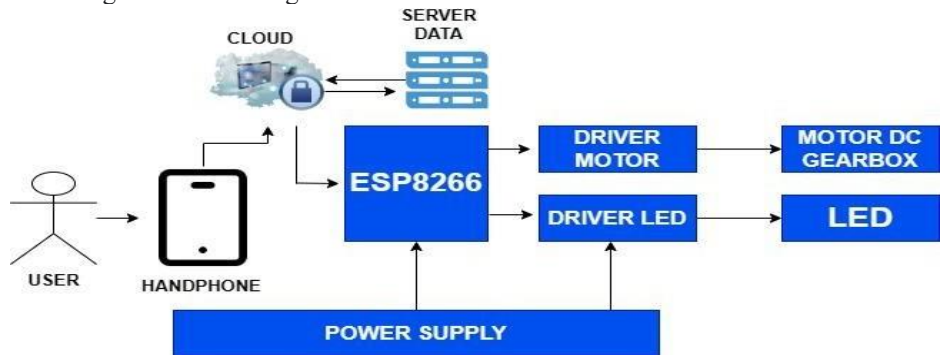

Fig.1. Complete diagram Block of the circuit to be design

Based on the block diagram image, it can be seen that the control command data processing flow starts from access made by the user on the smartphone side. In this case, the user can input commands to activate the 360° spin video booth with a number of favorite mode options, which are provided through the desired interface.

The input settings provided on the application interface consist of: input settings for the spinner motor rotation speed, through this mode, the user can adjust the spinner movement speed requirements 360° according to the desired taste and mode.

This setting is carried out by the system by applying PWM mode which is driven through a series of motor drivers to the DC motor driving the spinner. Apart from being able to set the movement speed value of the 360° spinner motor, the user can also have full control over timer restrictions to determine how long the 360° video booth rotates for capturing or short video recording, so that every time the 360° video booth is used, the system can set the desired duration by implementing a timer by giving a stop command via the DC motor driver. As an additional decorative mode, there are RGB LEDs that can light up when the 360° video booth is running, giving an attractive impression to the device being designed. Tool design drawings are needed to design the shape of the tool to be built, accompanied by illustrations of the placement of each component part as well as illustrations of the tool when used. The following is a design drawing of the tool that will be designed.
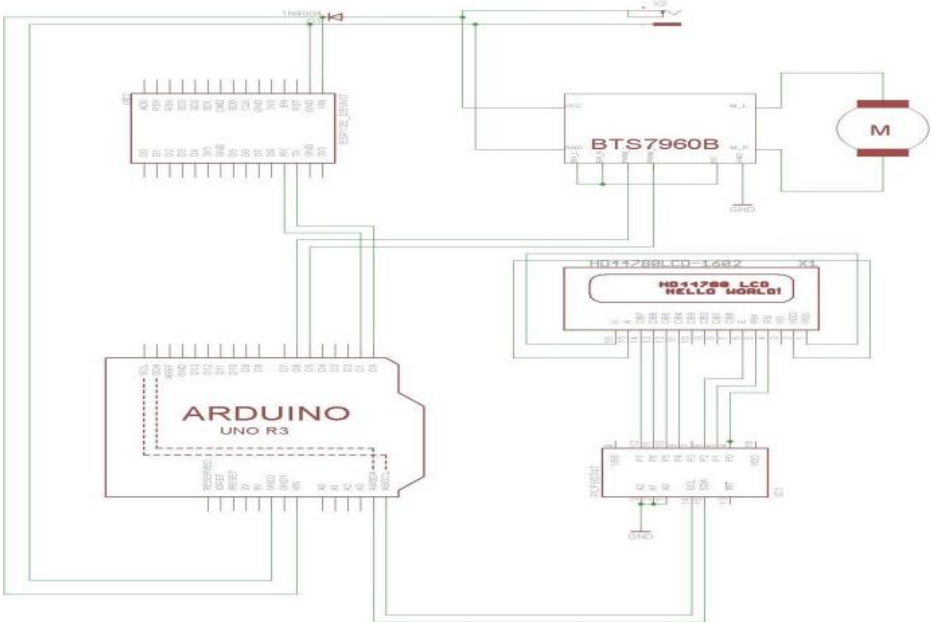
Fig.2. Complete series of Control System Design for Information and Data Communication Video Booth 360⁰ Using Internet of Things Media

Fig.3. Disign Control System Design for Information and Data Communication Video Booth 360^0 Using Internet of Things Media

This tool works when the adapter is plugged into electricity and then the ESP8266 process block and DC motor will be active. When several people are standing in the booth, press the ON button on the application, the Android camera installed on the pole will rotate 360° and start recording the people standing in the booth. The speed of rotation of the pole on the Android can be controlled through the application that has been created. Apart from being able to control the speed of rotation of the driving motor, the application can also control the direction of movement of the rotating motor to the right or to the left. The video booth is also equipped with a ring light and down light which can be adjusted when to turn on according to needs. After finishing recording, press the OFF button on the application to stop rotating the camera pole. This tool can be used 2-3 people. The results of the recording can later be shared with video users booth.

3. Result and Discussion

This test is carried out by testing one by one the widget functions that have been prepared previously by monitoring them on the serial monitor tool. The following are the results of the tests carried out starting from blynk connection testing, power ON button access testing, power OFF button access testing, motor rotation speed control slider access function testing, CCW rotation direction widget function testing, CW rotation direction widget function testing, function testing ON OFF the LED downlight, until the blynk application code uses the Arduino IDE.

This test is carried out to test the success of the Blynk application connection to the hardware device used. In carrying out this test, the first thing to do is activate the electrical current on the hardware that has been arranged and connect the application connection to the designed hardware device. Henceforth, the results of the hardware

device's response to the connection success status are monitored via a serial monitor as shown in the image below.
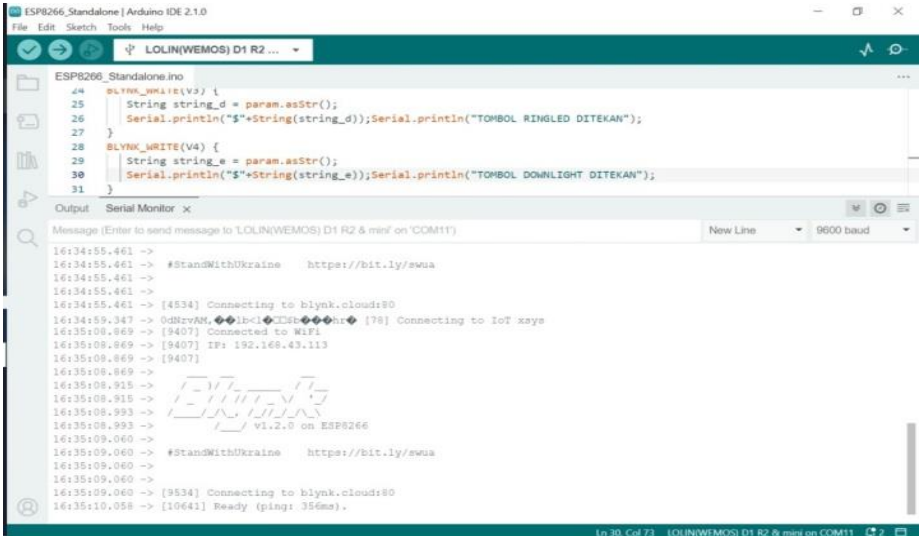

**Fig.4.** Blynk connection testing on hardware design

Parameters for the success of the hardware response to the activation command are then monitored via a serial monitor. The table below is this connection test carried out to find out how long it takes for the system to connect to the internet.

Table 1. Test Internet connection

| No.	Time (second)	Connection
1.	10.08	Ok
2.	08.79	Ok
3.	11.05	Ok
4.	09.89	Ok
5.	07.28	Ok
6.	08.08	Ok
7.	06.31	Ok
8.	07.45	Ok
9.	09.22	Ok
10.	10.37	Ok

From the internet connection tests that have been carried out, it was found that the average time required for the system to connect to the internet was 8,852 seconds with the connection statement being connected. Next, to test the function of accessing the

power ON button on the application regarding the response to activating the 360° video booth motor. Testing is carried out by accessing the ON button function in the application and observing the response of the designed hardware device. The parameters for the success of the hardware response to the activation command are then monitored via the following serial monitor below.
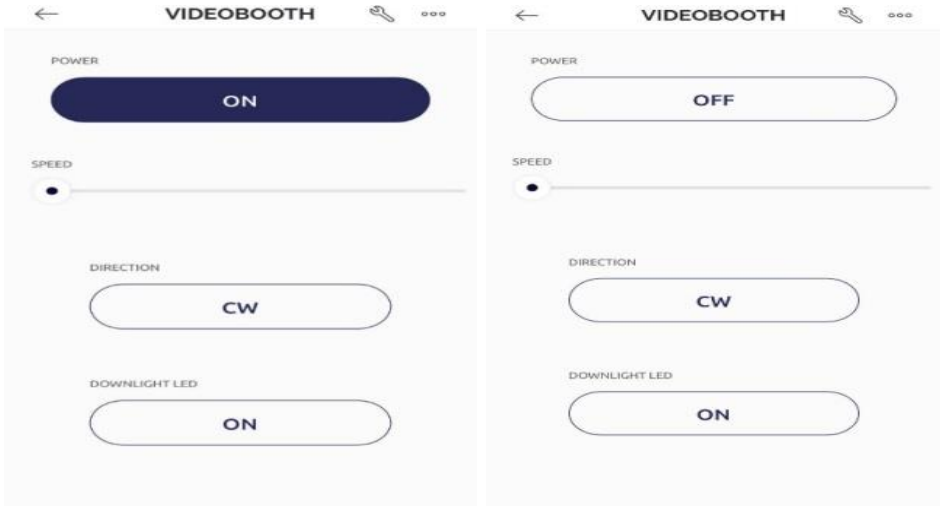
Fig. 5. Results apearance Blnky app for Power ON/OFF

Next, Testing the Slider Access Function for Motor Rotation Speed Control, this test was carried out to test the slider access function to adjust the rotational speed value of the drive motor in the 360° video booth. Accessing this speed setting is done by moving the slider button on the Blynk application at 25% speed and then monitoring it via the following serial monitor is below.
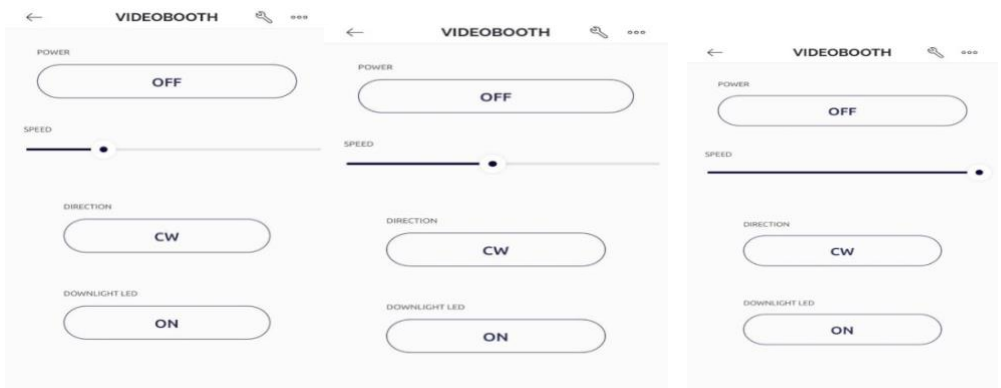
Fig.6. Slider button with 25%, 50% and 100% shift speed

Accessing this speed setting is done by moving the slider button on the Blynk application at 50% speed and then monitoring it via the following serial monitor is

below. Accessing this speed setting is done by moving the slider button on the Blynk application at 100% speed and then monitoring it via the following serial monitor is below. The following is a table of test results carried out using the Gdrive speed test application.

Table 2. Results Transmision data speed

No	Second	Upload Speed Average	Download Speed Average
1	10 Second	1.9 MB	3.0 MB
2	20 Second	1.8 MB	3.1 MB
3	30 Second	1.6 MB	2.0 MB
4	40 Second	3.1 MB	4.2 MB
5	50 Second	3.3 MB	4.1 MB

This test was carried out to download the results of the 360° video booth recording, users can do this directly by accessing QR code scanning so they can access the recording results files published on GDrive.

Fig.7. QR code

4.   Conclusion

From the test results it can be concluded that the software that has been designed for the tool can run well and work according to its function. When the power supply is turned on, the device is ready to be controlled. Before starting the Videobooth 360° device, make sure that the NodeMCU is connected to the Blynk application via Wi-Fi. For the results of the internet connection testing carried out in Table 1, it was found that the average time required for the system to connect to the internet was 9.638 seconds with the connection statement being connected. With a time of 9,638 seconds for the system to connect to the internet, this is quite fast. Internet connection testing can be connected for the first time between the tool and the system being designed. From the test results, it was found that the fastest time obtained to make an initial connection was 06.31 seconds and the longest time to establish a connection was 11.05 seconds with an average time of 6,893 seconds. From the results of this test, it can be concluded that the time required to make a network connection until the device is ready for use is no more than 12 seconds of initial preparation so that the device can be used with relatively short preparation.

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