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CONTROL OF A ROBOT CAR WITH TWO COMMANDS VIA HC-05

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ABSTRACT

Currently the control system on a car that has ever been developed is a robot made by a car that can be controlled using the control system button from Android. In this study, researchers wanted to develop previous research on car robot control systems using 2 commands. The first approval system is by using the command button from android where the system sends data in the form of numbers or letters according to user requests, and other commands using Google Voice. Commands sent sentences as a comparison of data from input to output. At the time of the press command on the android application button, and the given press command sends decimal data consisting of 1, 2, 3, A, B and C explained to activate or move the car robot. While for the second command, make forward, backward, left, right and stop running commands from google voice, explain to activate or move the car robot. Based on this, the use of the controller and interface module HC-05 can be operated using 2 commands, although in the transfer, only 1 command must be used.

INTRODUCTION

Control system or control system is a device that is used to give commands, manage the state or condition of an object . The term control system can be practiced manually to control the control of a car or other object. Many studies discuss the remote control system. The control system they designed controls a robot car by utilizing the Button system from Android [1]. conducted research similar to a remote control system, where the interface module used to connect Android to the controller is HC-05 and for the Android control system downloaded from Play store [2].

Based on this, then the researcher wants to develop a previous study of the car robot control system using 2 commands. The first control system using the command button from Android, and other commands using Google voice. The working system of the design of this tool, the car can be controlled by using the button command from Android as

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previous research, and voice commands connected from Google Voice. To connect Google voice to Arduino, then it is interfaced from HC-05 to Android.

METHODE

Arduino nano

Arduino nano is an electronic kit or board type open source electronics and consists of the main components, namely a microcontroller chip with AVR type production from Atmel. The purpose of the existence of a microcontroller is to read the input by processing it to cause output. From the presence of a microcontroller, this can be found in various devices such as mobile phones, MP3 players, DVDs, televisions, air conditioners and many more. In addition, the microcontroller is also useful as a robot controller both toys or from industry. It also mentions that the main component of Arduino is a microcontroller [3].

Motor DC

DC motor is a device that is able to convert electrical energy into kinetic energy or motion energy. DC motor or sometimes called direct current motor, has two terminals, positive and negative. DC motors are usually used to help other devices, such as the use of DC motors in fans, electric drill and others. Although the dc motor does not take much power. In general, electric motors provide a rotation speed of around 3000rpm to 8000rpm, and an operational voltage of 1.5VDC up to 24 VDC [4].

Modul Bluetooth hc-05

Bluetooth type HC-05 module is a Bluetooth SPP (Serial Port Protocol) module that is easy to use for wireless serial communication that converts serial ports to Bluetooth. The HC-05 uses a 3 Mbps Bluetooth V2.0 + EDR (Enhanced Data Rate) modulation using 2.4 GHz radio waves. This module can be used as a slave or a master. HC-05 has 2 configuration modes, namely AT mode and Communication mode. AT mode functions to make configuration settings of HC-05. While the Communication mode functions to perform bluetooth communication with other devices [5].

IC Driver L298N

L298 is a type of motor driver IC that can control the direction of rotation and speed of a DC motor or stepper motor. Able to issue a voltage output for a dc motor and stepper motor of 50 volts. IC l298 consists of logical transistors (TTL) with NAND gates that make it easier to determine the direction of rotation of a dc motor and stepper motor. Can control 2 for dc motors but only can control 1 stepper motor. Its use is most often for robot cars [6].

Software Arduino.ide

Arduino.ide (Integrated Development Program) is a software used to make sketches

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that will be uploaded to the Arduino board itself. Arduino ideas are also classified as integrated software development programs so that various tools or displays are provided and expressed in the form of a menu based interface. By using arduino.ide sketch writing errors or the correctness of sketch writing are immediately proved. Just write a sketch of arduino, ideas and try it on the arduino.ide board yourself, it can be found on the arduino.cc site [7].

Baterai

The 3rd generation battery from a rechargeable battery has a light weight and size. In the design of this study used a Lithium Ion battery type [8].

RESULT AND DISCUSSION

System Block Testing

To design a robot car control system using two commands from Google Voice and Android, each module or block must be tested. The results of the tests carried out when designing a robot car with two control systems:

Arduino Testing with Driver IC

The Arduino voltage test results with driver IC

Table 1. Testing Arduino Voltage with IC L298

Voltage	Pin Motor	Status	information
3.3 VDC	A1	HIGH	Not moving
	A2	HIGH	Not moving
	B1	HIGH	Not moving
	B2	HIGH	Not moving
5 VDC	A1	HIGH	Move Slow
	A2	HIGH	Move slow
	B1	HIGH	Move slow
	B2	HIGH	Move slow
7.4 VDC (Tegangan Eksternal)	A1	HIGH	Quick move
	A2	HIGH	Quick move
	B1	HIGH	Quick move
	B2	HIGH	Quick move

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Image 1. Arduino nano testing with Driver IC

ICDriver Testing with a 12 VDC DC Motor

The driver IC test results with a 12V DC DC Motor

Table 2. Testing of driver ICs with a 12 VDC DC Motor

Voltage	Motor 12 VDC	Status	Information
5 VDC / Internal	Motor left	HIGH	Slow
	Motor right	HIGH	Slow
7,4 VDC / Eksternal	Motor left	HIGH	Quick
	Motor right	HIGH	Quick

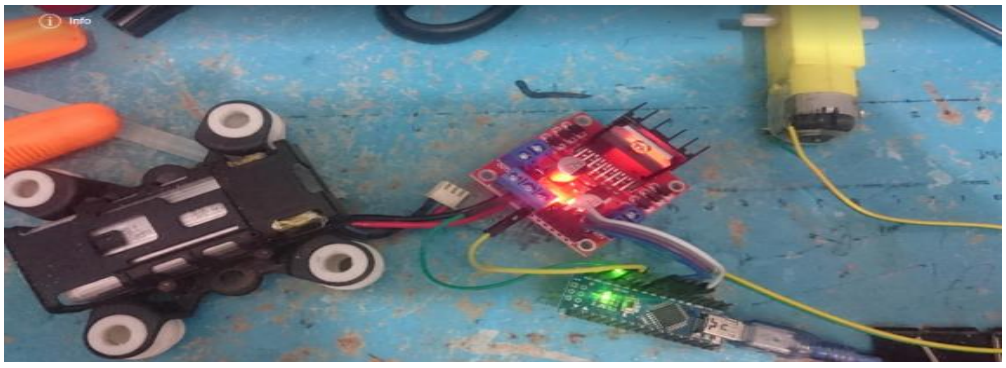

Image 2. Testing of Driver IC with a 12 VDC Motor

Testing HC-05 with Arduino and Android

The HC-05 test results with Arduino and Android

Table 3. Testing HC-05 with Arduino and Android

Voltage Arduino	Address HC 05	Android
3.3 VDC Internal	not detected	Not Connected
5 VDC Internal	detected	Connected

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Testing tool

The results of testing a robot car control system using two commands from google voice and android in the field, shown in table 4.

Table 4. Test results for tools in the field

Command I (Google Voice)				
access password	**Command**	**Motorcycle Conditions**	**Information**	**Android**
Screen 1 Pass : admin	Up	Motor 1 &3 Motor 2 & 4	appear not appear	Connected, minimum distance of 1 meter and maximum 10 meters
	Back off	Motor 1,3 & 4 Motor 2	not appear appear	
	Left	Motor 1,2 & 4 Motor 3	not appear appear	
	Right	Motor 1 Motor 2,3&4	appear not appear	
	Stop	Motor 1,2,3&4	not appear	
command II (Button Android)				
Command Button		**condition Motor**	**information**	**Android**
1		Motor 1&3 Motor 2&4	appear not appear	Connected, minimum distance of 1 meter and maximum 10 meters
2		Motor 1,3&4 Motor 2	not appear appear	
A		Motor 1,2&4 Motor 3	not appear appear	
B		Motor 1 Motor 2,3&4	appear not appear	
123		Motor 1,2,3&4	not appear	
ABC		Motor 1&3 Motor 2&4	Appear not appear	

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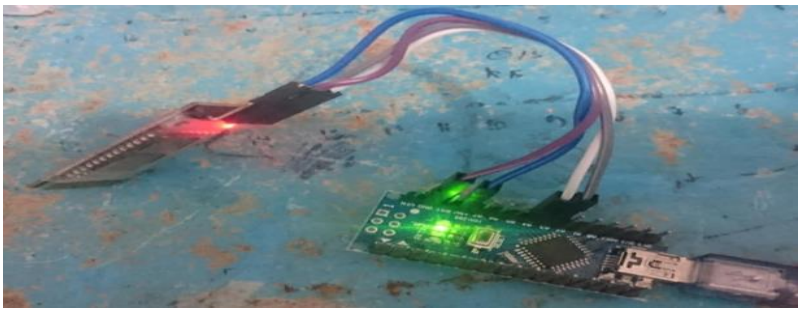

Image 3. Testing HC-05 with Arduino and Android

CONCLUSION

A robot car control system using two commands can be implemented, and at the time of operation, only one command can be read. Performance of the L298 Motor Driver by using two commands, the same as the performance of the car driver when receiving a command. The HC-05 bluetooth module will not error when both commands are activated, this is because, the connection system will automatically disconnect, when one application is stopped.

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