Conventional Switching to Drive A Brush DC Geared Servomotor

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Abstract. Conventional switching can be used to drive a brush dc geared servomotor, in terms of adjusting the position to our liking. For brush geared dc servomotor drivers we use a switching bridge where each arm is used a power transistor, in the process of switching bridge need to be considered the area where the short circuit is likely to occur, to avoid it we use dead time, as well as the possibility of a short circuit due to the upper arm and the lower arm of the bridge turns on at the same time for that it is necessary to make a transistor-transistor logic circuit so that the upper arm will not turn on when the lower arm is on or vice versa. From the results of conventional switching, it is able to drive the DC brush geared servomotor to the desired position.

1. Introduction

1.1 Background
The background of this research is to make it easier for young researchers to develop a brushless dc geared servomotor switching system before entering a more difficult switching system known as space vector switching in other more complex uses such as switching for brushless dc geared servomotor, inverters. Here the dc geared servomotor brush switching system is for use as position control[1][2] in the order 0.50 with warm geared. It is expected that the physics of the brush dc geared servomotor is quite small, the torque is large with warm gear, the size is quite small because the gear ratio is quite 1/10. Conventional switching for driving brushed dc geared servomotor can be used for precision motion control[3][4] such as rockets that have high speed and large thrust, for that, it needs precise control, large torque, small physics[5][6].

1.2 Formulations
In this study, the researchers limited themselves to only developing a conventional switching driver bridge for brush geared dc servomotor, starting from (except software on the CPU or microcontroller which is discussed in another article), I/O, conditioning, protection[7][8], signal switching, gain, bridge, power. supply for CPU, signal switching, and bridge and output voltage for brush dc geared servomotor.

1.3 Identification
The identification of conventional switching problems for driving a brushed dc geared servomotor is as follows:
   a) Switching algorithm for bridge,
   b) Rule of the switching system[9][10],

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c) Wiring bridge.

1.4 Research Objectives and Authenticity

The purpose of this reset is to develop a practical, conventional switching system to drive the brush dc geared servo motor according to the target we command.

1.5 Research Uses

The benefits of this research are to find out from the basic principles of switching\[11][12] brush dc geared servomotor and to develop the parts that can still be developed, among others, software development, protection development, power development (voltage and current), so that consumer satisfaction can be increased. Conventional switching to drive brush dc geared servomotor can be used for precision motion control such as rockets which have high speed and large thrust, for that it needs precise control, large torque, small physics.

2. Research Method

This research method can be seen in simple terms like the following flowchart image. In switching so that the output voltage can be directly used by the 24 Vdc motor, the 1-phase ac input must be increased from 24Vac to $\sqrt{2}\times24$Vac. It is rectified and leveled and at the same time a filter[13][14] with C. In simple terms, the research method can be described in figure 1. The following signal processing flowchart:

![Figure 1. Signal Processing Flowchart](attachment:image1.png)

3. Results and Discussion

3.1 Results

The results obtained for signal processing I/O = Out in Figure 1. The signal processing flowchart is in accordance with the following figure:
Figure 2. Ts clock time

Figure 3. Upper leg gain

Figure 4. Lower leg gain

Figure 5. Switching system
3.2 Discussion

In switching\cite{15}\cite{16} so that the output voltage can be directly used by a 24 VDC motor, the 1 phase ac input must be increased from 24 VAC to $\sqrt{2}$x24 VAC. Switching transistors or MOSFETs must use a transistor or MOSFET that is faster, namely 1 to 5 ns, its rise time and downtime.

4. Conclusions and Suggestions

4.1 Conclusions

Conventional switching to drive brushed dc geared servomotor using conventional switching principles is the basis of switching science for young researchers to be able to adapt to a switching system that is more complex and with better results.

4.2 Suggestions

To make a dc bridge switching system to control the rotation of the brush dc geared servomotor it is very useful to use the dc brush geared servomotor for position control.

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