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## **ANALYZING THE EFFICIENCY OF THE MICROCONTROLLERS**

**NurulHasan Shaikh<sup>1</sup>, Dr. Yash Pal Singh<sup>2</sup>**

**Department of Electronics and Communication Engineering**

**<sup>1,2</sup>OPJS University, Churu (Rajasthan) – India**

### **ABSTRACT**

*The old mechanical drives and traditional drives were supplanted with the electrical drives and the interest for the computerized drives exists which prompt build up the electrical drives. The power drives are broadly utilized as a part of the industrial control applications. The different control methodologies are utilized to control the drives, yet the advancement in semiconductor technology helped the utilization of power devices in the drives. The interest for minimized, solid and computerized drives existed and the advancement of the drive has occurred the correct way in an assortment of utilizations like power supply, pulling forces, vehicles, and so on which has no limits for the improvement. PC made the control procedures simple however past that the microprocessor-based single stage drives are requested in the remote zones.*

### **1. INTRODUCTION**

Request for control of power existed for a long time which drove the early advancement of drives. Power taking care of capacities and exchanging velocity of power drives has been expanded with improvement in semiconductor technology. It is conceivable to plan superior drives for Microcontroller utilizing the microprocessor. Presently days the different estimation systems and control plans are picking up significance, and more consideration is paid towards the advancement of such drives. As of late the development of improvement in the technology is shooting with the past changes [1]. The PC based improvement of Microcontroller drives supported by programming that puts the best answer for the drive. The microprocessor-based drive likewise outlines a conservative low

powersupply which makes its appropriateness in the industrial and remote applications.

Fig.1 demonstrates a general finish definite framework chart to control the microcontroller encouraged single stage Microcontroller drive. The control devices incorporate an enhanced strategy for PWM control. There is an immediate microprocessor-based control. The change in the controlled PWM strategy limits both pinnacle transistor current and controller misfortune with better sinusoidal waveforms. The framework control produces the fitting recurrence and current abundance motion by utilizing the microprocessor. The Fig. 1 demonstrates the single stage transistor connect microcontroller. The terminating of transistor grouping is 1-4 and 2-3 which gives Power to the Microcontroller.



element. The microprocessor gives the computerized control information either high or low at its port [2]. The time of outstanding the information high is controlled by utilizing the low-level computing construct programming.

The settled interim of which the beat stays high at the port and furthermore stays low for settled interim of time. The time frame over which is kept high relies upon the postpone time. This yield of the port is utilized to drive the base of the power transistor, and thus the proportional power is controlled by utilizing this strategy. The proportional power gives open - circle control plot has been detailed for the speed control of the Microcontroller drive bolster development from the voltage source microcontroller. The speed of the Microcontroller relies upon the beat width given to the base of the power transistor. The shut circle method isn't utilized in this because the microprocessor if self-controls the beat width through programming and consequently speed is controlled. A rectifier module is a mix of diode scaffold and capacitor bank. The scaffold is framed by a blend of 4 power diodes (1N4006) which changes over AC flag to DC.

A dc channel capacitor bank is associated with the contribution to the microcontroller and serves to channel the info voltage and give a low impedance way to the high-frequency currents created by the microcontroller amid PWM exchanging. Air conditioning controller is an electric controller driven by an alternating current (AC). There is two composers. The principal composes the Microcontroller or no concurrent controller that depends on the little distinction in speed between the

Rotating Magnetic Field (RMF) and the rotor to incite a rotor current. The second sort is the synchronous controller. It doesn't depend on the microcontroller, and henceforth, it can turn precisely at the provided frequency. The current that is conveyed produces a magnetic field on the rotor through slip rings or by changeless magnet [3].

### **3. VARIABLE FREQUENCY DRIVE**

Variable Frequency Drive (VFD) is a sort of flexible speed drive. It is utilized to control speed and torque of the controller. This is finished by changing controller input frequency and voltage. VFD fundamentally controls the speed and torque of Standard microcontroller AC controllers. The frequency and also the adequacy of AC waveform which is conveyed are shifted in this manner sparing cash and power. VFD comprises of three primary sub-frameworks: AC controller, principle drive controller get together and a drive administrator interface. The utilization of VFD is more often than not in three stages Microcontroller. A few sorts of single stage Microcontrollers can be utilized. The VFD controller involves connecting rectifier, Direct Current (DC) interface, and a microcontroller.

The DC interface comprises of a capacitor which smoothes out the scaffold rectifier's DC swell yield. Subsequently, it gives a solid contribution to the microcontroller. The microcontroller changes over the DC input voltage to a sinusoidal AC yield voltage utilizing microcontroller's Switching components [4]. The exchanging components are the power semiconductor devices. IGBT's (Insulated Gate Bipolar

Transistor) are normally used as microcontroller's exchanging components.

Figure3 demonstrates the essential piece chart of VFD.

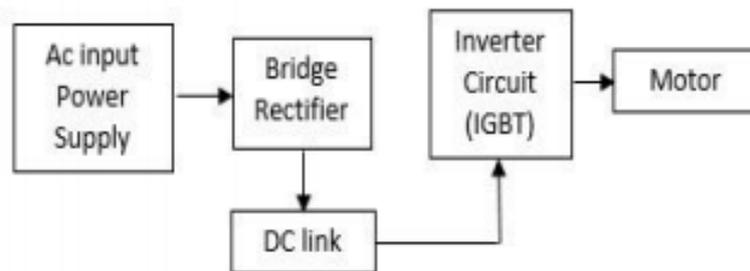


Figure 3: Basic Block Diagram

The AC controller contains the Microcontroller controller and the changeless magnet controller, both of which have assumed a key part in the general advance of the controller drive industry [5]. Fig. 3 demonstrates a current (Microcontroller controller) and AC servo drives (perpetual magnet AC controller and their controllers). The controllers appeared in Fig. 1 utilizes the most recent that industrial technology brings to the table in power semiconductors utilizing the most exceptional controller drive control calculations as vector control, Such controllers are universal in fluctuated industrial and business utilization of the present day and age [6].

#### 4. AC MOTOR DRIVES

Both of these drives are referred to as Voltage Source Inverters, a term which will soon be clear. Since the power topology includes a large DC bus capacitor as a filter, and since it is the voltage that is modulated to provide variable voltage, variable frequency to the AC controller, such amicrocontroller topology is called a Voltage Source Microcontroller and forms the integral part of most present day AC controller Drives [7]. A typical schematic of the present day AC controller drive is shown in Figure 4.

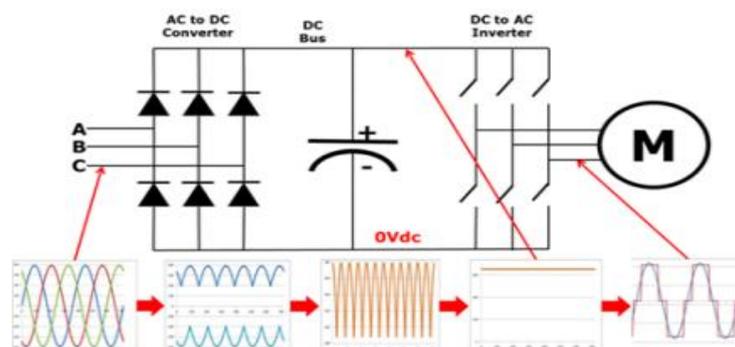


Figure 4: Schematic of a typical voltage source microcontroller based AC controller drive

The broadly useful AC controller drives commonly give steady motion to the Microcontroller. Since the controller motion is the ratio of the voltage to the frequency (V/f) connected to the controller, this ratio is held consistent to accomplish steady transition operation. Transport lines and other frictional burdens require such profiles. For divergent burdens like fans and pumps, the motion in the controller can be changed to take a square function. By doing this, the power devoured by the controller turns into a cubic function of speed (Pocf) empowering huge energy investment funds [8].

Regardless of whether the V/f is held steady in these kinds of utilization, there is as yet noteworthy energy reserve funds contrasted with consistent speed drives, where substantial misfortunes are related with valve or damper control. On account of the square sort torque qualities of the heap, voltage decrease at bringing down speed extend is conceivable enhances proficiency further. The speed of the Microcontroller can be controlled by different strategies. The stator frequency control is one of most straightforward techniques to control the speed of the Microcontroller.

A voltage source microcontroller is described by a solid D.C. voltage supply at the info. The D.C. supply might be settled or variable. The microcontroller application may incorporate movable speed A.C. drives, controlled voltages, and frequency power supplies, UPS and microcontroller warming. In a voltage fed microcontroller, the power semiconductor devices dependably demonstrate steady forward predisposition because of the D. C. supply voltage. Consequently, some constrained

recompense is required when utilizing thyristors. On the other hand self-commutating with base or gate drive is conceivable when utilizing GTOs, MOSFETs, transistors or IGBTs

Energy monitoring and targeting (M&T) is an energy efficiency technique based on the standard management axiom stating that "you cannot manage what you cannot measure" [9]. M&T techniques provide energy managers with feedback on operating practices, results of energy management projects, and guidance on the level of energy use that is expected in a certain period. Importantly, they also give early warning of unexpected excess consumption caused by equipment malfunctions, operator error, unwanted user behaviors, lack of effective maintenance and the like.

Advanced Metering Infrastructure (AMI) are frameworks that measure, gather, and dissect energy utilization, and speak with metering devices, for example, electricity meters, gas meters, warm meters, and water meters, either on ask for or on a timetable [10]. These frameworks incorporate equipment, programming, correspondences, shopper energy showcases and controllers, client related frameworks, Meter Data Management (MDM) programming, and provider business frameworks. Government offices and utilities are moving in the direction of advanced metering infrastructure (AMI) frameworks as a feature of bigger "Smart Grid" activities. AMI broadens current advanced meter reading (AMR) technology by giving two-way meter correspondences, enabling summons to be sent toward the home for numerous reasons, including

"time-of-utilization" evaluating data, request reaction activities, or remote administration detaches. Remote innovations are basic components of the "Neighborhood Area Network" (NAN), totaling a work configuration of up to a large number of meters for the back pull to the utility's IT central command.

## 5. CONCLUSION

The present subject manages the plan of single stage Microcontroller drive utilizing the microprocessor. The drive is outlined in the microcontroller based circuits. The terminating beats for the transistor microcontroller are finished by utilizing the PWM beats created by the microprocessor. The required PWM flag age programming is composed of low-level computing construct. The single stage supply is changed over to dc and after that utilizing the transistor microcontroller AC flag, separate stage supply is produced. The Buffer is used for the driving and enhancement reason. Microcontroller still forms the work horse of today's industry. Applications that use Microcontroller may not need very high precision position and velocity control. Such applications typically use what is known in the industry as "General Purpose AC Motor Drives". However, the machine tool industry that caters to the semiconductor manufacturing and other sophisticated industries, require highly precise and controlled motion. Permanent magnet controllers are the controller of choice because of their smaller size, higher efficiency, lower inertia, and hence higher controllability.

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