# Review paper on Design of DC motor control system Based on 8051 microcontroller

Shripad G. Desai[1], Shubham Yadav[2]

[1]*Assistant professor, Department of Electrical Engineering, Bharati vidyapeeth (Deemed to be university, College of Engineering), Pune*

[2]*Student, Department of Electrical Engineering, Bharati vidyapeeth (Deemed to be university, College of Engineering), Pune*

**Abstract -** **DC engines convert electrical energy into mechanical energy, contrasted and AC engines, DC engines have numerous preferences great speed execution, high beginning force and over-burden, and so forth, it is broadly utilized in hardware industry. MCU control DC engine is a commonplace application in mechanical and electrical control, just between the two closures of the DC engine control combined with a voltage contrast between the voltages it will turn, changing the applied voltage across can change the course of revolution. This paper plans DC engine control framework dependent on miniature regulator is introduced. We use miniature regulator as piece regulator, TA7267BP as driver chip, and four keys to control the DC engine inversions, break relating state pointers. Equipment circuit and reachable technique for programming are likewise introduced decision in controlling miniature DC engine stop, and light the framework is a superior.**

## INTRODUCTION

DC engine has been broadly utilized in different fields among which single-stage, two-stage, three similarly perpetual assortment of working mode, and each class of brushless DC engine drive framework is separated into different, rather half-connect drivers and full extension drivers become the most broadly utilized drive. Full-connect driving mode can be isolated into an assortment of the most normally utilized is the star and calculated connector, select the drive mode will straightforwardly influence the exhibition and cost of the engine, so select the fitting driveway is a first concern. DC basic inward structure, helpful for the support of the engine, and the total end of the basic engine by a mechanical brush and commutator brought about by disappointment, yet additionally enormously expands the life of the engine. Work effectiveness has been fundamentally improved due to the utilization of lasting magnet brushless DC engine creates a consistent, constant attractive field, so it is presently the most effective engine in an electrical machine, in many conditions its perpetual magnet having a generally attractive coefficient [1]. Outskirts Interface Chip microcontroller arrangement is created by American Microchip items. PIC microcontroller equipment framework with its extraordinary plan and guidance, and steadily embraced most of designing staff. Computer chip is a bunch of advancement, improvement, and creation as one of expert single chip producer, its item incorporated application framework plan thoughts, with solid specialized qualities. Items utilizing the new pipeline structure, single-byte guidance framework, installed Flash, and 10-bit A/D converter. With the goal that it has great execution, single-chip advancement speaks to another pattern. PIC MCU with high, medium, and low evaluations three, to meet the improvement needs of various clients, appropriate for application in different fields. Hardware Design of Control System: Microcontroller greatest element is not to participate in absolutely useful collection, yet from the real world, thoughtfulness regarding item execution and value proportion, by building up an assortment of models to meet the various degrees of use necessities. In pragmatic terms, the diverse application prerequisites for Microcontroller capacities and assets are unique. PIC MCU utilizing the premise of Princeton and Harvard engineering with the interesting design of the Harvard transport design, the chip totally inward information transport and guidance transport division for various byte-wide, effective extension guidance word length to lay the specialized premise [2]. Fig.1 shows the equipment circuit structure of frameworks.
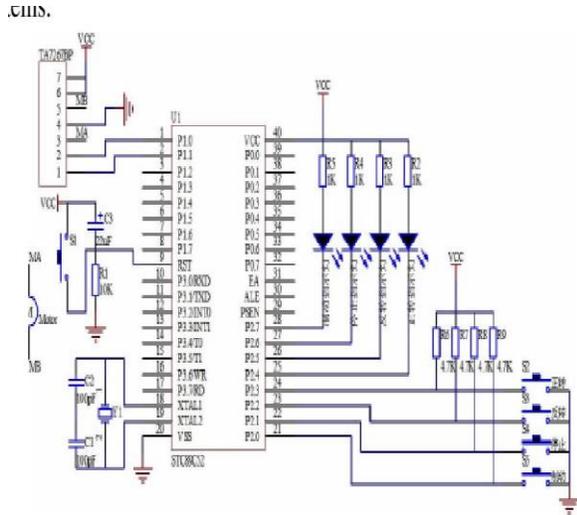
Fig. 1 The hardware circuit structure of systems

Figure: The hardware circuit structure of systems P1.0 and P1.1 are associated with the driver IC TA7267BP 2, 1 pin Microcontroller by evolving the degree of the two pins, to accomplish the four conditions of the engine control. (2) P2.0 and P2.3 are associated with four control catches to control the engine forward, invert, stop, brake. (3) P2.4 a P2.7, individually, and four status lights associated with the showcase for the separate working condition of the engine. As ASIC chip MC33035 DC engines speed control framework, which can be finished IC chip yield rotor position location signal and the PWM signal simultaneously. In spite of the fact that the structure of the framework can be rearranged, decreasing framework cost, yet additionally restricts the further improvement of the framework work, bringing about most places we cannot utilize.

HARDWARE SPECIFICATION

3.1.1 TMS 320 F 28027 Here we have utilized TMS 320 F 28027 with Independent 16-Bit Timer in Each Enhanced Pulse Width Modulator (pew). The datasheet of miniature regulator TMS 320 F 28027 gave the working conditions, pin arrangement of The microcontroller. MS 320 F28027 is intended to work with Code Composer Studio.

- High Efficiency 32-Bit CPU
- Single 3.3-V Supply
- Low expense for both gadget and framework
- Independent 16-Bit Timer in each Enhanced Pulse Width Modulation
- On chip memory

- Up to 22 pins are Individually Programmable.
- Code security module
- 16 x 16 Dual MAC
- Three 32-Bit CPU Timer
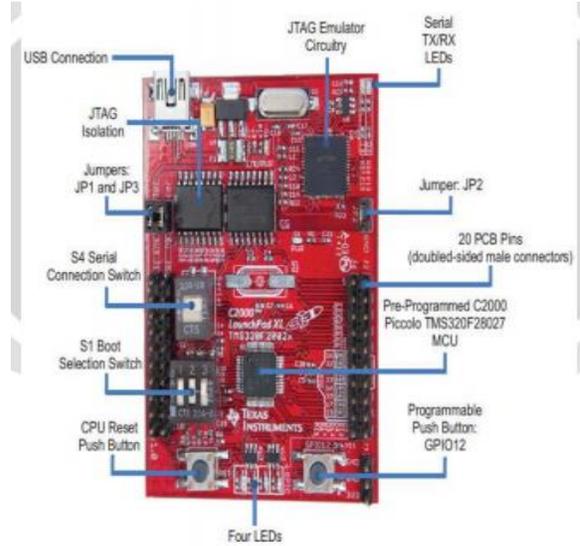- Small bundling
- Code-Efficient (in C/C++ and Assembly)



Figure 2 .TMS 320F28027 Board

H-BRIDGE DRIVER

H-Bridge intended to drive inductive loads, for example, a DC and exchanging power semiconductor. It has 600ma yield current ability. Engine drivers go about as ebb and flow enhancer. This enhancer current sign is utilized to drive engine. H Bridge is an electronic circuit that empowers a voltage to be applied across load one or the other way. The L293 and are fourfold high-momentum half-H drivers. It is utilized in mechanical technology and different applications.
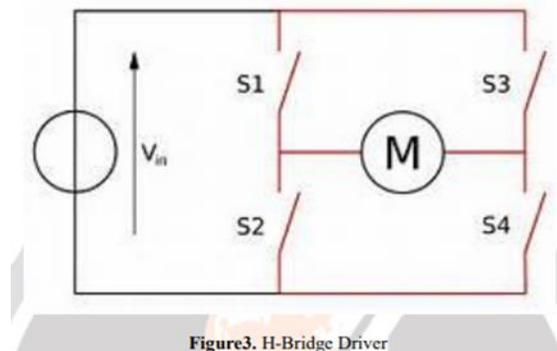


Figure3. H-Bridge Driver

12 V DC MOTOR

12V DC Motor can be utilized in various kinds of advanced mechanics. DC engine is accessible with wide scope of Torque and RPM. DC Motor utilized with following determination.

- Shaft Diameter: 6mm
- Length: 80mm
- Weight: 130 g
- Torque: 1.5 kg.cm

Software Specification- The product improvement is actualized utilizing code arranger studio coordinated advancement climate for programming the TMS 320F 28027.Code arranger studio IDE gives a consistent and simple to utilize climate to compose, construct and troubleshoot C/C++ and constructing agent code. Code Composer Studio speeds the advancement cycle for software engineer who makes and test ongoing applications. It broadens the essential code age apparatuses with a bunch of troubleshooting and constant examination capacities. Code Composer Studio bolsters all periods of the advancement cycle appeared here:
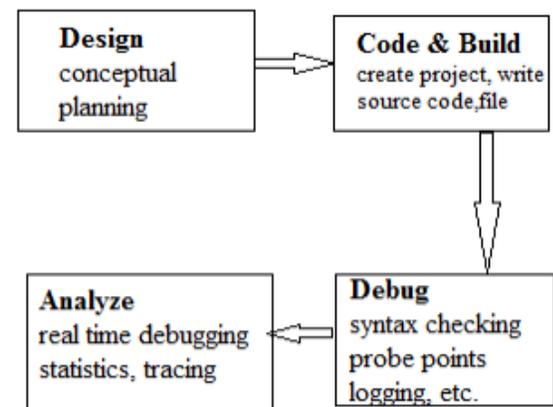


Figure 4. Development cycle

CONCLUSION

DC engine is constrained by utilizing arrangement engineering of variable resistor, however it has more force dispersal. DC engine is likewise constrained by transition and armature control technique, yet it cannot give needed reach. Therefore, voltage control technique is utilized in which miniature regulator create the PWM signal. PWM acquired from computerized IC, simple or microcomputer contains sounds. Miniature regulator based PWM signal age burns-through less force. Because of adaptability of miniature regulator all control calculations can be executed in programming. Consequently, control of DC engine dependent on TMS micro controller having high precision.

REFERENCES

[1] Pratik J Patel, Hardeep J PATEL, Apeksha D Unadkat, Chintan U PATEL, Ass. Prof. Sanjay Bhanderi, "PWM Based Speed Control for a DC Motor" International Journal of Science, Engineering and Technology Research (IJSETR)Volume o6, issue 04 April 2017, ISSN 2278-7798.

[2] Loop Speed Control of DC Motor" International Journal of Engineering Trends and Technology, Volume- 3Issue 2- 2012

[3] A.S.M.Bakibillah, Nazibur Rahman, Md.AnisUzZaman, "Microcontroller based closed loop speed control of DC motor using PWM technique", International journal of computer Applications (0975-8887), volume 108-No.14, Dec.2014.

[4] Shrutishrivastava, Jagashwarrawat, Amit Agraval, "Controlling DC motor using microcontroller PIC16F72 with PWM", International journal of Engineering Research, Volume no.1, Issue no2, pp: 45-47, 01 Dec 2012

[5] Snehlata Sanjay Thakare, Prof. Santosh Kompelli, "Design and Implementation of DC Motor Speed Control Based on PIC Microcontroller" International Journal of Engineering and Computer Science, ISSN: 2319-7242 Volume -3, Issue-9 September 2014 Page No.8075-8079

[6] Bogdancroitoru, Adrian tulbure, Mihaliabrudean, "Microcontroller Based Multiple platform PWM Signal Generation procedures for industrial use", IEEE International conference on Automation, Quality and Testing, Robotics, 2014

[7] ShindeKrishant, TarateAkshay,Taur Sandip, Prof. Jayashree Deka, "Speed control of DC motor using pic 16F877A microcontroller" Multidisciplinary journal of research in engineering and technology .ISSN:2348-6953.

[8] Mekala.N, Muniraj .C "Implementation of PI Controller for 4Φ SRM Drive Using TMS320F28335" PInternational Journal of Power Electronics and Drive System (IJPEDS) Vol.5, No.3, pp.283-292, ISSN: 2088- 8694, February 2015.