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Wireless AC Motor Speed Control System

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Abstract: *In this paper, we demonstrate the feasibility of controlling the speed of an induction motor using a wireless position feedback over an RF link and compare its performance under dynamic- and steady-state conditions with those obtained by using a wire-based position feedback control. An electronic circuit is coupled to the motor to provide the control-speed signal serially from distant microcontroller. A control panel is designed as an interface for the user to select the appropriate speed. This paper presents a high performance electric assisted bicycle system, where the rotor position is obtained by a position estimation technique using terminal quantities of the motor, which has a capability of starting from standstill. The components of the drive system include a wireless torque feedback, an application specific reference torque generation and torque control. The paper explains the implementation details of the position estimation technique that utilize a motor control DSP and provides real time test results to demonstrate its capabilities under real riding conditions including regenerative braking.*

Keywords: Include at least 4 keywords or phrases.

I. INTRODUCTION

In mobile applications, the motor type significantly affects die efficiency and the performance of the drive system. The experiences have shown that the brushless permanent magnet AC (PMAC) motors provide the most desirable characteristics for electric-assisted bicycle. Such motors require the knowledge of the rotor position for the current commutation and the torque control. The rotor position is usually obtained by some form of electromechanical sensors that are directly attached to the nondriving end of the motor shaft. However, direct measurements of the rotor position are not reliable, which is primarily due to the sensitivity of such devices under various environmental conditions and due to the requirements for additional wiring between the motor and its controller. the primarily existing demerits of low-cost wireless control systems are the low confidence, short wireless control distance, poor stability, high quiescent power drain and so on, while those quality wireless control devices are extremely expensive.

II. LITERATURE SURVEY

Sr. No.	Paper	Author	Description
1	Sensor less Permanent Magnet AC Motor Drive with Near Zero-Speed Operation for Electric-Assisted Bicycle	Reiko Raute and Nesirii Ertugrul	The reference value calculation of torque involves a number of feedback signals that are connected to the motor controller. Among these, the pedal torque is measured by a torque transducer mounted on the pedal gear and transmitted to the motor controller via a wireless transmitter.
2	The Design and Achievement of Motor Speed Remote Control System Based on CC2510	Jian-sheng PENG	The hardware device of the motor speed remote control system based on CC2510 can be divided into two parts: the host computer and motor terminal nodes.

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III. BLOCK DIAGRAM

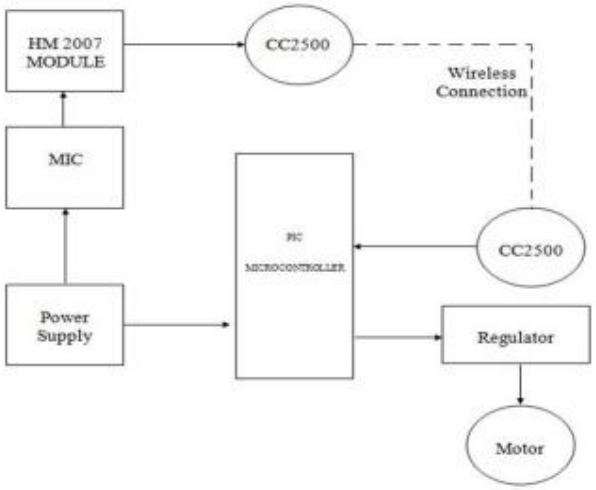

Fig 1. Block Diagram

IV. COMPONENTS REQUIRED

1. Power supply
2. PIC16F877A microcontroller
3. Resistors ¼ watt (1kΩ x 2)
4. Capacitors (22pF x 2)
5. Electrolytic capacitor (1µF)
6. Push button switch (for resetting the PIC)
7. Crystal (4MHz)
8. LED

V. FUTURE SCOPE

In the fan motor controller controls the fan motor speed with the help of heat sensor. This device includes various components like phase control unit and relay circuits. The phase control circuit is the combination of Triac with the firing angle control circuit. The basic full-wave Triac phase control circuit requires five components which consist of a Triac, Diac, potentiometer, capacitor and also resistors. The resistance component and the capacitor are a single-element phase-shift network.

VI. CONCLUSION

The paper provided the details of die system which include voltage vector control and position estimation routines and explained the principal feedback requirements for die real time control system. A special emphasise was given to explain the reference torque generation that is unique to the hybrid bicycle application. Motor speed remote control system based on CC2510 follows the TDMA point-to-multipoint Wireless communication technology theory. By using the low-cost 2.4GHz system-on-chip (SoC) --CC2510 as the core of the wireless control system, the cost of wireless equipment and stability problems can be reduced effectively.

VII. ACKNOWLEDGMENT

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[3]. The Design and Achievement of Motor Speed Remote Control System Based on CC2510 Jian-sheng PENG Department of Physics and electronic engineering Hechi University Yizhou Guangxi 546300 China..