Design and Implementation of a Driving System for Switch Reluctance Motor SRM(6/8) Using PC

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Abstract

The paper describes a method of driving system for switch reluctance motor (SRM6/8) with 4 phases by using: PC through (RS232), driving circuit utilizing microcontroller (Atmega 8535), and operating algorithm, which is stored in the microcontroller. The operation of the motor is monitored by using an interface which is designed to monitor and change the motor parameters such as speed, voltage and current. This method can be used for monitoring the motor operating in inaccessible environment.

The driving system for switch reluctance motor (SRM6/8), which is the topic of this research, was designed and manufactured in the laboratory by using the solid iron. The coils are carried by the poles which are fixed inside the solid iron cylinder.

Both, the motor and the executants driving model, have been tested, the performance curves and the results were plotted and discussed in respect of curves forms, current, voltage phases, total current and voltage received from the source. These parameters can be controlled by using the mentioned interface in the softwore.

Keywords: Atmega 8535, SRM, driving of SRM, SRM and its control,

For the abstract in Arabic see pages (275-283).

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References

- N. H. Mvungi, " Sensorless Commutation Control of Switched Reluctance Motor, International Journal of Applied Science, Engineering and Technology Volume 4, No.1, 2007 ISSN 1307-4318
- H. Klode, A. M. Omekanda and B. Lequesne, S. gopalakrishnan, GM Research Labs, A. Khalil, S. Underwood and I. Husain, the Univ. of Akron , " The Potential of Switched Reluctance Motor Technology for Electro-Mechanical Brake Applications". Copyright © 2006,SAE International.
- Application Not, NEC, " Switched Reluctance Motor Control with µPD78KO/KX2", Document No. U18498EE1VO AN00, Date Published December 2006, © NEC Electronics 2006, Printed in Germany.
- Abbas Sandouk, Dr. M.Aldosoky, Dr. Habil Gerhard Harold, "Desing and Execution Acontrolled Switch Reluctance Motor To be Used in Electric Cars", Doctorate Thesis, Damas Univ., 2005 .
- Michael T. Direnzo, " Switched Reluctance Motor Control-Basic Operation and Example Using the TMS320F240", Application Report, SPRA420A-February, 2000, TEXAS INSTRUMENTS.
- Michael T. DiRenzo, Digital Signal Processing Solutions, Switched Reluctance Motor Control – Basic Operation and Example Using the TMS320F240, Application ReportSPRA420A - February 2000, Texas Instruments.
- NEC, Application Note Switch reluctance motor control with µPD78K0/KX2, Document No. U18498EE1V0AN00,
- Date published December 2006, © NEC Electronics 2006, Printed in Germany
- Ali AL Jazi., Abbas Sandouk, " Design and Execution A Driving System for Switch Reluctance Motor SRM (3/4) Using PC "**,** Damascus Journal , 2010.