

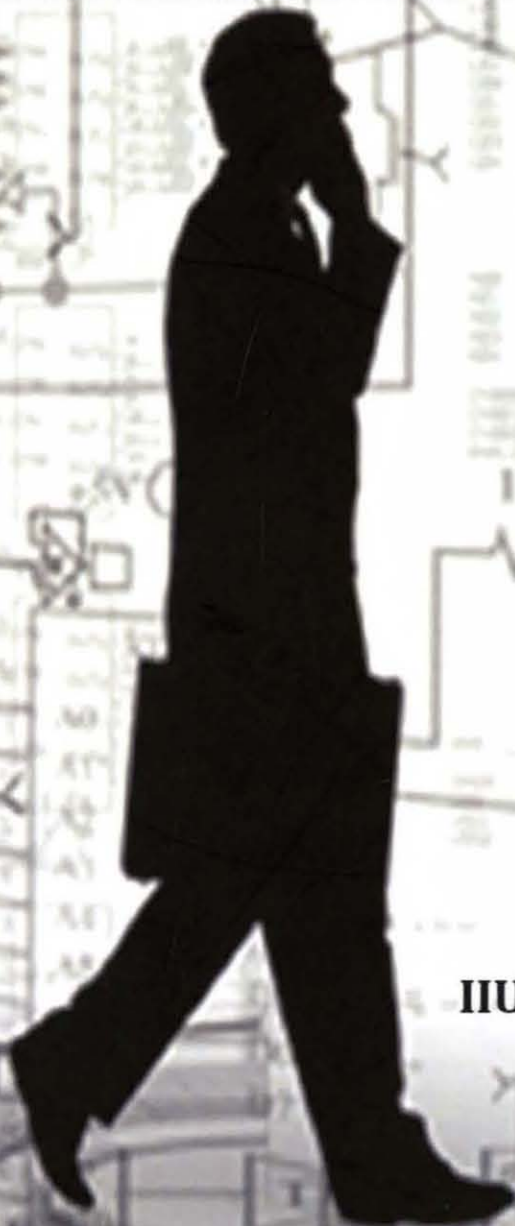
PRINCIPLES OF TRANSDUCER DEVICES AND COMPONENTS

Edited by

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IIUM PRESS

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Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Sheroz Khan, Jalal Chebil & Othman Khalifa: Principles of Transducer
Devices and Components

ISBN: 978-967-418-172-7

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed By:
IIUM PRINTING SDN.BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan
Tel: **+603-6188 1542 / 44 / 45** Fax: **+603-6188 1543**
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Chapter 37

APPLICATION AND CASE STUDIES OF MAGNETIC INDUCTION

ATIKA ARSHAD, RUMANA TASNIM, SHEROZ KHAN, AHM ZAHIRUL ALAM

37.0 INTRODUCTION

The on-going development in the field of sensors applications has opened up several possibilities for significant improvements in the advancement of bio-implantable devices or medical equipment. Some researchers have designed and developed inductive sensors for various applications such as tongues drive system enabling a person with severe disabilities to sense. It determines users' intentions by tracking the movements of a permanent magnetic tracer wirelessly that is secured on their tongues using an array of magnetic sensors [1].

37.1 APPLICATIONS AND CASE STUDIES

In the magneto-inductive sensor the alternating current (AC) impedance of a soft ferromagnetic material alters with the longitudinal component of a direct current (DC) magnetic field. There have been many studies that have resulted in models and designs concerning wireless power delivery to an implant. A method for transferring power of microwatt level to small medical implantable devices (see Figure 37.1) has been developed. Here also the magnetic inductive sensor has been proposed and the technique of power transfer through electromagnetic induction has been used. This method of power transfer is through using mutually coupled coils making a non-contact means of excitation of implanted electronic device. The inductive link is modeled by an equivalent circuit, deriving the relevant equations justifiably used to calculate the exact transmission efficiency of the suggested link. The change in the materials of which the core of the coils is made of is definitely a deciding factor in evaluating the performance of the overall power transmission link. Design parameters such as the magnetic material used in the core, the frequency at which transmission is made, and the effect of load resistance is studied.