# SOFTWARE DEFINED RADIO USING DYNAMIC PARTIAL RECONFIGURATION

By

Ahmed Mohamed Sadek Mabrouk

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfilment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Electronics and Communications Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

Prof. Dr. Amin Mohamed Nassar
Professor
Electronics and Communications Engineering Department
Faculty of Engineering, Cairo University

Dr. Hassan Mostafa Hassan
Assistant Professor
Electronics and Communications Engineering Department
Faculty of Engineering, Cairo University

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Approved by the Examining Committee:

---

Prof. Dr. Amin Mohamed Nassar, Thesis Main Advisor

---

Prof. Dr. Ibrahim Mohamed Qamar, Internal Examiner

---

Prof. Dr. El-Sayed Mostafa Saad, External Examiner
(Electronics and Communications Engineering, Helwan University)

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2016

| | |
|---|---|
| **Engineer's Name:** | Ahmed Mohamed Sadek Mabrouk |
| **Date of Birth:** | 07/06/1983 |
| **Nationality:** | Egyptian |
| **E-mail:** | ahmd.sadk@gmail.com |
| **Phone:** | +201000765843 |
| **Address:** | 2 El-Gehad St., Wadi El-Nile St.<br>Meet Ockba, Agouza, 12411<br>Giza, Egypt |
| **Registration Date:** | 01/10/2010 |
| **Awarding Date:** | ..../..../2016 |
| **Degree:** | Master of Science |
| **Department:** | Electronics and Communications Engineering |

**Supervisors:**

Prof. Dr. Amin Mohamed Nassar
Dr. Hassan Mostafa Hassan

**Examiners:**

| | |
|---|---|
| Prof. Dr. Amin Mohamed Nassar | (Thesis Main Advisor) |
| Prof. Dr. Ibrahim Mohamed Qamar | (Internal Examiner) |
| Prof. Dr. El-Sayed Mostafa Saad | (External Examiner)<br>(Electronics and Communications Engineering, Helwan University) |

**Title of Thesis:**

# Software Defined Radio using Dynamic Partial Reconfiguration


**Key Words:**
Software Defined Radio; Dynamic Partial Reconfiguration; FPGA; Run-Time Reconfiguration; Multiband Multistandard Communication System



**Summary:**
A novel design is proposed for implementing different communication chains using adaptable single chain and results shows an improvement in area and power consumption. This proposed work shows the advantages of using FPGA feature, Dynamic Partial Reconfiguration (DPR), in the implementation of Software Defined Radio (SDR) System that can switch among different communication standards such as 2G, 3G, LTE, and WIFI. The SDR system is being hardware reconfigured real time to simulate Multiband / Multistandard communication systems, where the reconfiguration is being held on FPGA partially and dynamically while the FPGA is fully functioning.

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# Dedication

To my mother (Wafaa) soul, my father (Mohamed), my wife (Hoda), my son (Abd ALLAH), family (Nehal, Nisma, Mohamed) and nephews (Lojain, Jana, Malek, Maryem) who supported me to complete this work.

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**Arabic Abstract** ١