

**Sudan University of Science and Technology**

**Faculty of Engineering and Technology**

**College of post Graduate Studies**

**Department of Electronic Engineering**

**In collaborative with  
Centre of Engineer and Technical Studies (CETS)**

**Remote Control via GSM Network**

**التحكم عن بعد عن طريق شبكة الجي اس ام**

Report submitted in partial fulfillment of the requirement for the degree of

M.Sc

In

**TELECOMMUNICATION ENGINEERING**

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**This work is dedicated to:**

My Parents,

Brothers,

Sisters,

Relatives,

Friends,

And colleagues.

**Who are looking forward**

**To see this work in light**

## ACKNOWLEDGEMENT

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## **ABSTRACT**

Today every thing is going to be digital and wireless, and the cell phone is the key player in wireless technology, the trends in wireless technology changing day-by-day and today the work is going on how to develop remote devices. Remote communication allows us to control electronic devices without having to be near them.

The objective of this project was to design a system to be controlling (switch on or off) electronic devices remotely via GSM network without the presence of man and to reduce the time factor.

There are two key components to the project design,

### **1-Remote unit**

This unit consists of cell phone which is present in the remote place.

### **2-Local unit**

This contains one cell phone and a Local Control Section, Local Control Section consists of a DTMF Receiver (DTMF decoder), BASIC Stamp 2-IC, ULN2003 Darlington Driver and the electronic devices

The remote unit (mobile) remotely controlled (turned off /on) the electronic device successfully

## مستخلص

في ظل التقدم المتواصل في عالم الإتصالات و التقنيات الحديثه التي تتطور يوم بعد يوم والتي أسهمت في تطور حياة الانسان يعد التطور في مجال التحكم عن بعد في الأجهزة الإلكترونية من أهم هذه التقنيات، حيث أن التحكم عن بعد يسمح لنا بتشغيل الاجهزة الإلكترونية من دون الحاجة بأن نكون بالقرب منها .

الهدف من هذا المشروع كان تصميم نظام يقوم بالتحكم في الاجهزة الإلكترونية عن بعد وذلك بتشغيلها او إيقافها من خلال إستخدام النظام الخلوي نظام (GSM) .

يتكون هذا النظام من جزئين أساسيين وهما

1. وحدة التحكم عن بعد (Remote unit)

هذه الوحدة تتكون من الهاتف الخلوي

2. الوحدة المحلية (Local unit)

هذه الوحدة تتكون من الهاتف الخلوي ووحدة التحكم المحلية والتي تحتوي (DTMF)

(Receiver)، (BASIC Stamp 2-IC)، (ULN2003 Darlington Driver) و الاجهزة الإلكترونية المراد التحكم بها.

تم التحكم في الاجهزة الإلكترونية بنجاح وذلك بتشغيلها وإيقافها عن طريق وحدة التحكم عن

بعد من خلال شبكة الهاتف الخلوي (GSM)

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## **List of abbreviations**

AMPS	Advance mobile phone System
ADC	Analog-to-digital converter
AUC	Authentication Center
BS	Base Station
BS1-2C	BASIC Stamp 2 Integrated Circuit
BS1-IC	BASIC Stamp 1 Integrated Circuit
BSC	Base Station Controller
BSS	Base Station Subsystem
BTS	Base Transceiver Station
CEPT	Conference of European Posts and Telegraphs
CGI	Cell Global Identity
CI	Cell Identity
EDGE	Enhanced Data rates for GSM Evolution
EEPROM	Electrically Erasable Programmable Read-Only Memory
EIR	Equipment Identity Register
FCC	Federal Communications Committee
FDMA	Frequency Division Multiple Access
GSM	Global System for Mobile Communication
HLR	Home Location Register
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union- Telecommunication sector
LA	Location Area
LAI	Location Area Identity
LCS	Location Services
LED	Light-emitting diode
MS	Mobile Station
MSC	Mobile services Switching Center
NMC	Network Management Center
NSS	Switching Sub-System
OMC	Operation and Maintenance Center
OSS	Operation & Support System

PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
SIM	Subscriber Identity Module
SS	Switching System
TACS	Total Access Communication System
TDMA	Time Division Multiple Access
UMTS	Universal Mobile Telecommunication Services
VLR	Visitor Location Register