SUDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Fault Detection in Transmission Line Using GPS and GSM

اكتشاف الاعطال في خطوط النقل باستخدام جهاز تحديد المواقع والنظام العالمي للاتصال (الجوال)

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الآيـــــــــــة

قال تعالي

(وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُم مِّن الْعِلْمِ إِلاَّ قَلِيلاً)

صدق الله العظيم

سورة الإسراء الآية 85

Dedication

.....To My Father

.....To My Mother

....And All friends Where Ever They Are

Acknowledgment

Janks to everyone who lead

this thesis from the dark to the

light with a special thanks to

Dr. Fath Elrahman Ismael Khalifa

المستخلص

الأخطاء (الأعطال) التي تحدث في المنظومة يمكن أن يؤثر في الهدف الأساسي الذي من اجله تم تصميم النظام . إن مشكلة تحديد موقع العطل في خطوط النقل أصبحت معقدة ومكلفة وذلك لانه يعتمد في تحديده علي حساب المعاوقة والتي تعتمد علي التيار والجهد وبناءا عليه يتم تحديد موقع العطل تقريبا . فكرة هذا المشروع هو حل مشكلة تحديد موقع الأعطال في خطوط النقل بطريقة دقيقة باستخدام جهاز تحديد المواقع و المتحكم الدقيق وحساس الجهد وجهاز إرسال الرسائل إلي الهواتف النقالة بطريقة سريعة ودقيقة وآمنة . طريقة عمل هذه الدائرة تتم عندما يحدث عطل في خطوط النقل يتحسس جهاز حساس الجهد العطل ويقوم بإرسال إشارة إلي المتحكم الدقيق ينبهه بحدوث العطل ، عندها يقوم المتحكم الدقيق بإرسال إشارة إلي جهاز تحديد المواقع الذي يقوم بتحديد موقع العطل وفي أي خط حدث العطل ، وبعدها يتم إرسال رسالة نصية تحتوي علي موقع حدوث العطل ورقم الخط الذي حدث فيه العطل إلي هاتف المسئول . وبعد إجراء الاختبارات علي الدائرة تحصلنا علي نتائج جيدة في تحديد الموقع ورقم الخط بدقة وسرعة عالية .

Abstract

A fault is an unexpected change of the system functionality ,which causes deviation of a plant behavior from that which is specified it .

The problem of detect the location of fault in transmission line has become complex and expensive which depended on The current mechanism used to detect the fault in power transmission lines approximated by the calculation of the impedance obtained from voltage and current data. The works of this thesis is to find solution of how detected and located of fault in the transmission line by making use of GPS , GSM , microcontroller and power sensor the proposed system determine the location of fault accurately and quickly as possible. This process is done when the power sensor sensed the transmission line and found a fault in it ,then send signal to microcontroller (processing units) Alert occurrence of fault in the transmission line , after that The global positioning system detected the location of interruption and global system for mobile communication send message to supervisor this message include the details of location and number of line.

At the end of research we have acquired results that it can be determined where the error with high accuracy.

List of Figures

Figure Number	Title	Page
2.1	Classification of fault location methods	9
2.2	One line diagram of a faulted transmission line	11
3.1	contains of control unit	16
3.2	sending and detecting module (GPS and GSM)	16
3.3	block diagram of microcontroller	19
3.4	describe the mobile station	26
3.5	the um interface or Air interface	27
3.6	pins of lcd and distribution how it connection	28
3.7	power supply circuit	29
3.8	RS232 on DB9 connector and pins description	30
3.9	null modem connection	31
3.10	Pins of MAX232 and interfacing with micro	32
3.11	All component of the design	33
4.1	Block diagram of sending circuit	35
4.2	Block diagram of receiving circuit	36
4.3	the general design circuit	37
4.4	AC power sources	38
4.5	control unit circuit	39
4.6	MAX232 circuit and RS232 cable	40
4.7	DC power supply(solar sources)	41
4.8	circuit of sending and detecting units	41

4.9	flow chart of sequences operation	43
4.10	Describe when the fault occur in line 1	44
4.11	Describe when the fault occur in line 2	45
4.12	Describe when the fault occur in line 3	46
4.13	Describe when the fault occur in line 2 &line 3	47
4.14	Describe when the fault occur in line 1&line 2 and line3	48
4.15	Describe the normal operation	48

List of Table

table Number	Title	Page
3.1	Pins descriptions function of ATMEGA 16	20
4.1	The Result of Test	49

List of Abbreviation

ADC	Analog To Digital Conversion
AC	Alternating Current
ALU	Arithmetic Logic Unit
ATMEGA	microcontroller family
BTS	Base Transceiver Station
CGI	Cell Global Identification
CISC	Complex Instruction Set Computer
CPU	Central Processing Unit
DC	Direct Current
DCE	Data Communication Equipment
DTE	Data Terminal Equipment
EGSM	Extended Global System for Mobile
EHV	Exeter High Voltage
EEPROM	Electrically Erasable Programmable Read Only Memory
EIA	Electronic Industries Association
GMSK	Gaussian Minimum Shift Keying
GSM	Global System for Mobile
GPS	Global Positioning System

GND	Ground
IP	Internet Protocol
I/O	(Input /Output)Unit
LAI	Local Area Identity
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IMSI	International Mobile Subscriber Identity
JTAG	Joint Test Group
LCD	Liquid Crystal Display
LPC	Linear Predictive Coding
MCS	Master Control Station
MS	Mobile Station
ME	Mobile Equipment
MIP	Mobile Internet Protocol
PIN	Personal Identification Number
PUK	Personal Unblocking Key
PLMN	Public Land Mobile Network
PLC	Programmable Logic Controllers
RS-232	Recommended Standard -232

SRAM	Static Random Access Memory
SCADA	Supervisory Control And Data Acquisition
SPI	Serial Peripheral Interface
SMS	Services Massage Service
SIM	Subscriber Identity Module
SPN	Service Provider Name
TDMA	Time Division Multiple Access
TMSI	Temporary Mobile Subscriber Identity
TRX	Transceivers
TQFP	Thin Quad Flat Pack
TTL	Transistor - Transistor Logic
USART	Universal Synchronous Receiver Transmitter
UTS	Universal Total Station
VCC	Digital Supply Voltage
VLR	Visitor Location Register

List of Contains

NO	Title	page
	الاستهلال	II
	Dedication	III
	Acknowledgement	IV
	المستخلص	V
	Abstract	VI
	List of figures	V11
	List of table	IX
	List of abbreviation	X
	List of Contains	XIII
CHAPTER ONE : INTRODUCTION		
1.1	Preface	1
1.2	Problem Statement	2
1.3	Proposed solution	2
1.4	Research objective	2
1.5	Methodology	3
1.6	Thesis outline	4
CHAPTER TWO: LITERATURE REVIEW		
2.1	Introduction to fault detection	5
2.2	Related works	7
2.2.1	Travelling waves for finding the fault location	7
2.2.1.1	Classification of developed fault location method	9
2.2.2	Fault location using magnetic field sensing coils	11
2.2.3	Use GPS in EHV for Fault detection and protection	12
2.3	Analysis of related works	14

CHAPTER THREE SYSTEM DESIGN

3.1	System design	15
3.2	AVR microcontroller (ATMEGA 16)	17
3.3	Global positioning system	21
3.3.1	Accuracy	22
3.3.2	Time keeping	22
3.3.3	Error sources and analysis	22
3.3.4	Structure	22
3.4	Global system for mobile communication	23
3.4.1	GSM specifications	24
3.4.2	GSM network Architecture	24
3.4.2.1	Mobile station	25
3.4.2.2	Base transceiver station	26
3.5	Liquid crystal display	27
3.5.1	Feature of Liquid crystal display	28
3.6	Power supply circuit	29
3.7	RS232	30
3.7.1	RS232 on DB9	30
3.8	MAX232	31
3.9	Solar charger	32

CHAPTER FOUR SIMULATION AND HARDWARE IMPLEMENTATION

4.1	Preface	34
4.2	Block diagram of basic operation	34
4.3	Circuit diagram of fault detection in transmission line	36
4.3.1	Processing unit	37
4.3.1.1	Power sensor	37

4.3.1.2	Control unit	39
4.3.1.3	MAX 232 and RS232 cable	40
4.3.1.4	DC power supply	40
4.3.2	Sending and Detecting units	41
4.4	Flow chart sequences operation	42
4.5	Hardware operation	44
4.5.1	Case 1 fault occur in line 1	44
4.5.2	Case 2 fault occur in line 2	45
4.5.3	Case 3 fault occur in line 3	46
4.5.4	Case 4 fault occur in line 2 and line 3	46
4.5.5	Case 5 fault occur in line 1, line 2 and line 3	47
4.5.6	Case 6 in the normal operation	48
4.6	Testing and Resulting	49
4.7	Programming (code)	50

CHAPTER FIVE CONCLUSION AND RECOMMENDATIONS

5.1	Conclusion	51
5.2	Recommendations	51
	References	53
	APPENDIX A	