


**TECHNO ECONOMIC ANALYSIS, DESIGN AND
IMPLEMENT A SUITABLE COMMUNICATION
METHOD FOR UTILITY SYSTEMS**

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The above candidate has carried out research for the Masters Thesis under my supervision.

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Abstract

This thesis presents a research work which is carried out to optimize the Zigbee based remote meter reading network. There are various technologies available to automate the meter reading such as PLC, GSM, Optical fibre and RF technologies. As far as utilities providers are concerned, their focus is on a reliable RMR system to read the meter at minimum possible cost. The development of a reliable RMR system is highly dependent on telecommunication infrastructure which is costly if GPRS is used as a way of communication. Therefore, research were done in depth to analyse the cost and function of RMR system as large number of sensors are used in the electrical utility.

This particular research is on data concentrator based RMR system focusing on the analysing of communication delay and resource optimization.

In this research Matlab Simulink software was used for simulations and Visual Studio C# is used for creating the software. Several simulations were carried out in this research, for simulating communication speed, communication path and study the behaviour with the presence of noises.

As the final outcome of the research, software was developed for selecting Zigbee power rating based on GPS locations and generated algorithms for calculating communication delay and path which can be incorporated to the coordinator.



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List of Abbreviations

Abbreviation	Description
RMR	Remote Meter Reading
RF	Radio Frequency
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
PLC	Power Line Carrier
AMR	Automatic Meter Reading
SIM	Subscriber Identity Module
IOT	Internet of Things
RSSI	Received Signal Strength Indicator
ZTR	ZigBee Tree Routing
STR	Shortcut Tree Routing
AODV	Ad Hoc On Demand Distance Vector
DSDV	Destination Sequenced Distance Vector
TOD	Time Of Day
OBIS	Object Identification System
EDIS	Energy Data Identification System
LQI	Line Quality Index
LED	Light Emitting Diode
LD	Laser Diode



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