

LB/DOX/103/03

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REMOTE METER READING OVER POWER DISTRIBUTION LINES.

THESIS PRESENTED

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This thesis was submitted to the department of Electrical Engineering of the
University of Moratuwa - Sri Lanka
in partial fulfillment of the requirements for the
Degree of Master of Philosophy

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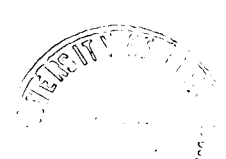
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DECLARATION

The work submitted in this thesis is the result of my own investigations, except where otherwise stated.

It has not already been accepted in substance for any degree, and also is not being concurrently submitted for any other degrees.



Signed

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Delicated to
my loving mother, elder brother
and
teachers

who encouraged me



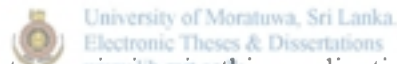
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ABSTRACT

The thesis presents the development of a simple technique for remote reading of utility meters using the low voltage power distribution network.

Remotely reading electricity, gas and water meters have distinct advantages over traditional metering methods. Several communication technologies have been designed and implemented for this purpose using wireless techniques, telephone lines, power transmission and distribution lines. In this study, the last one has been selected as the basis for the development of a remote meter reading system applicable to Sri Lanka.

Power line communication over low voltage distribution lines is a cost effective method for data transmission. But it is complex due to large number of branches, tapings, transformers, different line configurations etc., that are present in the distribution network. The main task of this research is to develop suitable techniques for transfer of data over this network.



The basic concept of data transmission in this application is the change of voltage and current wave at the supply end and the load end respectively of the power system. A series of current pulses are generated representing the data to be transmitted from the consumer end. Similarly, a series of voltage pulses are generated at the supply end to represent the commands to be sent to the consumer. These current and voltage pulses are superimposed with the line current and the line voltage at the load end and the supply end respectively on the power line signal.

The prototype system presented in this thesis shows simulation as well as experimental results relating to the data transmitter, and the software design for the communication subsystem interfacing the meter to the distribution lines. A series of measurements are also carried out to find a suitable time of the day for the data transmission. Associated problems such as harmonics generated due to the insertion of data and the effects of load changes in the distribution network are also discussed.

ACKNOWLEDGEMENT

The research for the Degree of Master of Philosophy was carried out at the Department of Electrical Engineering, University of Moratuwa, Sri Lanka.

I would like to acknowledge the support received under the Science & Technology Personnel Development Project SRI (SF) 1535 by the Asian Development Bank for the work described in this thesis.

I would express firstly great thanks to the Department of Electrical Engineering, and the members of the Post Graduate committee specially, prof. J R Lucas and Prof. Mrs. N Ratnayake, for having accepted me to commence the research for two years time.

I am deeply indebted to my former supervisor Dr A Ranaweera, who gave me this project proposal and confirmed it. He also supervised my research work and encouraged me to go ahead with my works during the first half of the research period.



I must express my profound gratitude and sincere thanks to my supervisors Dr. Mrs. Dileeka Dias and Dr. J P Karunadasa whose guidance, encouragements and motivation in all the time of the research. They also provided constructive comments during my thesis time as well as the preliminary version of this thesis. I was great pleasure to conduct the work under their supervision.

I must specially mentioned Mr. J D Leelasiri, Technical Officer in Electrical Machine Laboratory, University of Moratuwa. He provided me an invaluable support without any hesitation to collect data from Ceylon Electricity Board during day and night, to prepare a laboratory model and model transformers, to order and buy required items in-time and other technical supports. Therefore I would like to express my grateful thanks for giving his hands to success my research.

The research has been supported by the Officers, in Ceylon Electricity Board for collection of on line data from Grid substation Ratmalana and Distribution substation, Katubedda. I am grateful to the staff members in CEB and LECO including Chief Engineers Mr D G Riency Fernando, Mr. S Bogahawatta, Electrical engineers Mrs. Amali , Mr Kusum Shanthi, Electrical Supirintendents Mr. JMDWR Jayawardana and Mr. Waruna Jayawardana.

The contributions of the Technical Officers and the laboratory staff members in Electrical, Electronics & Telecommunication engineering departments specially, Mr. MWD Wasantha, Mr. J C P Wickramaratne, Mr J H J Perera and Mr. K A D S Somasiri are gratefully acknowledged. Specially I am obliged to my friends Chandani Ambepitiya, Nandaka Jayasekara, Bathiya Jayasekara, L Y C Amarasingha, D S Wikramanayake, Wasantha for making me a good environment at the University.



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